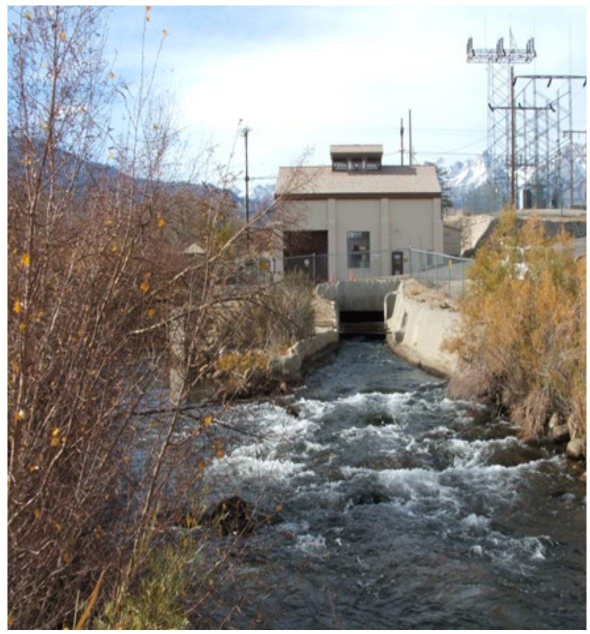
SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project

(FERC Project No. 1394)



DRAFT LICENSE APPLICATION

TECHNICAL REPORTS

VOLUME III (2 OF 4)

SOUTHERN CALIFORNIA EDISON

An EDISON INTERNATIONAL® Company

JANUARY 2022

List of Final Techncial Reports in this File

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project
(FERC Project No. 1394)

DRAFT LICENSE APPLICATION

FINAL TECHNICAL REPORT
INSTREAM FLOW NEEDS ASSESSMENT
(AQ1)

Southern California Edison
1515 Walnut Grove Ave
Rosemead, CA 91770

January 2022

Support from:

Kleinschmidt

TABLE OF CONTENTS

LIST OF PHOTOS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

During Technical Working Group (TWG) meetings, Southern California Edison (SCE) and stakeholders identified the need for an Instream Flow Needs Study Plan that focused on creeks located below Project plant diversions, and to a lesser extent on Birch and McGee creeks below Project diversions. The Study Plan detailed SCE's study objectives, study area, methods, results, and discussion of the proposed study effort. A preliminary Instream Flow Needs Technical Report was prepared in March 2020 summarizing data collected in 2019, along with draft results from data collected in early 2020. This included PHABSIM modeling for brown trout and Owens sucker in most study reaches designed by the TWG, and Habitat Criteria Mapping (HCM) analyses of empirical data from a stream segment where modeling was infeasible. The remaining analyses were completed in 2020 and are reported below.

This report builds on the preliminary Instream Flow Needs Technical Report discussed above, the Initial Study Report (ISR) submitted November 4, 2020, the Updated Summary Report (USR) filed in November 2021 and includes data and results of study plan implementation not previously discussed in other reports or memorandums. This report does not evaluate station operations, habitat suitability, water quality, sediment transport, or hydrology data. These analyses will be completed in conjunction with the rest of relicensing studies as part of the overall National Environmental Policy Act (NEPA) process and in consultation with the TWG.

SCE received various comments from CDFW on the preliminary Instream Flow Needs Technical Report in May 2020, June 2021, and October 2021. Responses to those comments are provided in Section 5.0 of this report.

2.0 STUDY OBJECTIVES

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, the Bishop Creek plant bypass reaches, and Birch and McGee creeks. A separate Sediment and Geomorphology Study addresses the effect of Project operations 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. CDFW propose to manage Bishop Creek below Powerhouse No. 4 primarily for species indigenous to the Owens Watershed and lower Bishop Creek (specifically Owens sucker [*Catostomus fumeiventris*] and speckled dace). CDFW manages Bishop Creek upstream from Powerhouse No. 4 primarily as a self-sustaining fishery for introduced brown trout (*Salmo trutta*). Birch and McGee Creeks currently maintain passively managed brook trout (Salvelinus fontinalis) populations and are managed for speckled dace.

Year-round minimum flow requirements were established for most of the subject reaches 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 up to 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.

2.1 STUDY AREA

The South and Middle forks of Bishop Creek above Powerhouse No. 2, and Bishop Creek between the Powerhouse No. 2 spillway and Powerhouse No. 6 (Figure 2.1-1) were identified by the CDFW as the overall study area for purposes of this study. Reaches below Powerhouse No. 4 are managed primarily for native non-game species including Owens sucker and speckled dace, whereas reaches upstream from Powerhouse No. 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.

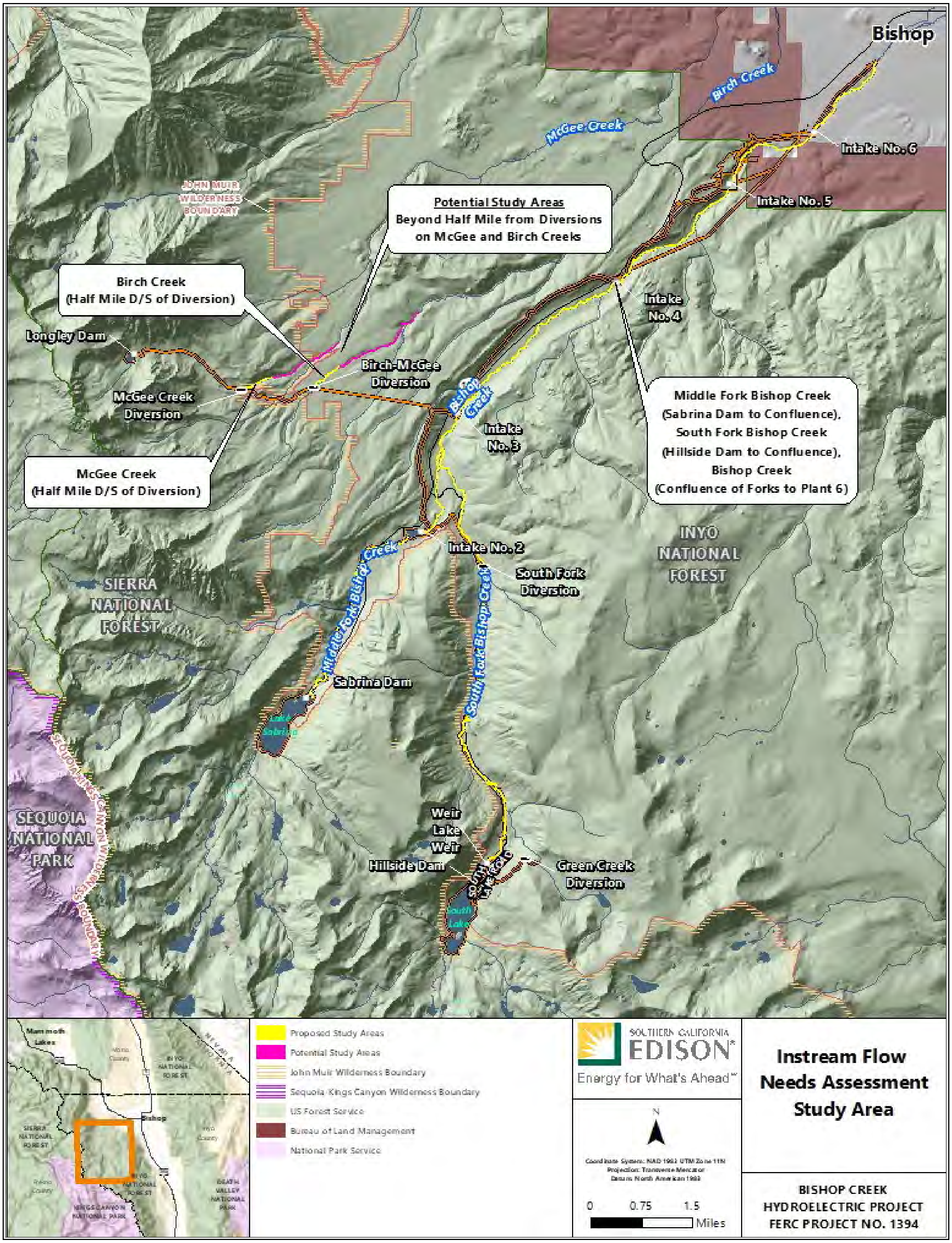


Figure 2.1-1 Instream Flow Needs Assessment Study Area

3.0 METHODS

The scope of this study was 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 were 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.

CDFW recommended an Instream Flow Incremental Methodology (IFIM) study for Bishop Creek watershed 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, which simulates reach-specific habitat suitability at various flow increments representing selected fish species. One-dimensional (1-D) (transect-based) hydraulic models were used to simulate channel hydraulics in various areas of interest.

A simplified IFIM approach using empirical data collected at a range of flows, rather than simulation was used to assess flows in reaches of Bishop Creek unsuitable for PHABSIM modeling, and on Birch and McGee creeks.

Consistent with IFIM protocol, a study team comprised of agency and SCE biologists, along with aquatic TWG members, made technical decisions regarding input parameters and review of study results. Specifically, the team provided 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.

These decisions were made during the winter and spring of 2019-2020 on multiple conference calls with TWG participants, agencies, and SCE.

3.1 MODIFICATIONS TO METHOD

No modifications to the study plan were necessary.

3.2 STUDY SITE SELECTION AND MESOHABITAT MAPPING

The study methods involved a phased approach, beginning with mapping mesohabitat distribution in the study area as Phase 1.

Delineation was conducted using a drone to mark mesohabitat boundaries and identify dominant substrates and hydraulics and take detailed photographs and video of mesohabitat and candidate study sites. The upstream and downstream boundary of each mesohabitat unit within the study area was geo-referenced, and the information transferred to both a geographic information system (GIS) format and annotated photos and video clips for TWG review. Details were provided in the Instream Flow Needs Report in May 2020.

3.2.1 Data Collection and Modeling

A detailed description of data collection and modeling methods was presented in the Instream Flow Needs technical report reviewed and discussed by the TWG in May 2020 and are hereby incorporated by reference. In summary, habitat-discharge relationships were modeled 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). An empirical flow demonstration study adapting the HCM (Stillwater Sciences 2009) method was substituted for PHABSIM in reaches 4, 6, and a portion of reach 8 because these study sites were not conducive to hydraulic simulation with PHABSIM.[1] This kind of approach can be used when a PHABSIM simulation would not be feasible or cost-effective.

3.2.2 Macroinvertebrates

SCE received review comments from CDFW on the technical report in May 2020. In regard to macroinvertebrates, CDFW commented:

> "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. This goal was accomplished as written in the Technical Memo, but …The Technical Memo did not address…Macroinvertebrates in Technical Study Plans."

SCE addressed 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.

The October 4, 2019, Mesohabitat Survey memorandum briefly described reach-specific dominant substrates and were discussed with the TWG during the related conference call. These were subsequently quantified in greater detail on each PHABSIM transect, as

[1] This includes turbulent, high gradient channel conditions in reaches 4 and 6, and complex braided channel conditions in part of reach 8.

representative of habitat conditions within each reach. In general, substrates were dominated by boulders, but with patches of gravel and cobble, all of which are substrates suitable for macroinvertebrates. SCE describes these substrates in the context of macroinvertebrate habitat as part of this Final Technical Report (Section 5.0).

3.2.3 Analysis

The preliminary Instream Flow Needs Technical Report (SCE 2020) provided with Progress Report No. 3 documented the methods and results of the study. This report completes the data gathering and analysis for Birch and McGee Creeks as well as previously unsurveyed reaches in Bishop Creek. It is anticipated that in subsequent stages of relicensing, the basic flow and weighted usable area (WUA) relationships will be applied in consultation with the Aquatics TWG to evaluate station operations, habitat suitability, water quality, sediment transport, and hydrology data.

3.2.4 Modified Approach for Birch and McGee Creeks

An empirical flow study adapting the HCM method was conducted at one site on each creek in September 2020 in accordance with TWG recommendations. SCE consulted with the TWG to determine species (brook trout and speckled dace), and general areas for study site locations during 2020.

4.0 STUDY RESULTS

Results from the 2020 field study season are discussed below.

4.1 HABITAT SUITABILITY SUMMARY RESULTS

Table 4.1-1 summarizes habitat suitability provided by existing minimum flows in each study reach. This is the existing condition against which proposed alternatives may be compared. Habitat suitability varied among reaches, species, and life stages from 11 percent (adult brown trout in Middle Fork below the Intake 2 diversion) to 100 percent (speckled dace, McGee Creek). In general, existing flows provide a relatively high level of suitability for brown trout juveniles and speckled dace, with mixed results for other species and life stages. A large number of sites registered 90 percent or greater habitat suitability under existing flows:

- for juvenile sucker and brown trout, Intake 5 Bypass;
- for juvenile brown trout, Intake 4 Bypass, Middle Fork below Sabrina Lake; South Fork below Intake 2 diversion and below South Lake;
- for all life stages, Intake 2 bypass below the confluence of South and Middle forks.

It was not feasible to model hydraulics in the Intake 5 Bypass (Reach 1) at the existing 1 cfs; however, speckled dace habitat achieves 97-100 percent suitability at flows of 4 to 6 cfs respectively, and Owens sucker suitability is gradually increasing throughout the lower end of the modeled range. Existing minimum flows on Birch and McGee creeks provide 90 and 100 percent habitat suitability, respectively, for speckled dace, and 76 and 87 percent habitat suitability, respectively, for brook trout.

One consideration for flows in the Intake 4 Bypass below Coyote Creek (Reach 3) is the varying additional contribution of inflow from Coyote Creek, which was gaged at the time of the study (November 2019) as flowing at 3 cfs. This is an unregulated tributary that provides varying inflow and therefore, unlike other reaches, is a dynamic influence independent of project operation. Thus, a flow release of 5 cfs from the Intake 4 spillway may result in Reach 4 experiencing a net of 8 cfs under the observed conditions.

Table 4.1-1 Relative habitat suitability of existing minimum flows in 10 bypass reaches of Bishop Creek, and in Birch and McGee creeks.

Location	Fishery Management Priority	Species	Life stage	Current Min. Flow	Percent Of Max WUA
Intake 6 bypass	indigenous species	speckled dace	adult	1 CFS	Unavailable[1]
		Owens sucker	juvenile		
		Owens sucker	adult		
		brown trout	juvenile		
		brown trout	adult		
Intake 5 bypass	indigenous species	speckled dace	adult	18 CFS	41%
		Owens sucker	juvenile		94%
		Owens sucker	adult		41%
		brown trout	juvenile		92%
		brown trout	adult		23%
Intake 4 bypass (below Coyote Creek)	self-sustaining brown trout	brown trout	juvenile	5 CFS[2]	~99%
		brown trout	adult		~55%
Intake 4 bypass (above Coyote Creek)	self-sustaining brown trout	brown trout	juvenile	5 CFS	98%
		brown trout	adult		85%
Intake 3 bypass	self-sustaining brown trout	brown trout	juvenile	13 CFS	~76%
		brown trout	adult		~16%
Intake 2 bypass (below south and middle forks)	self-sustaining brown trout	brown trout	juvenile	14 CFS	~90%
		brown trout	adult		~97 %
Intake 2 bypass (Middle Fork above South Fork)	self-sustaining brown trout	brown trout	juvenile	7 CFS	80%
		brown trout	adult		11%
Middle Fork (below Sabrina Lake)	self-sustaining brown trout	brown trout	juvenile	13 CFS	93%
		brown trout	adult		23%
South Fork (below Intake 2 diversion)	self-sustaining brown trout	brown trout	juvenile	7 CFS	~99%
		brown trout	adult		~36%
South Fork (below South Lake)	self-sustaining brown trout	brown trout	juvenile	13CFS	~90%
		brown trout	adult		~44%
Birch Creek	indigenous species	speckled dace	adult	0.25 CFS	90%
		brook trout	adult		76%
McGee Creek	indigenous species	speckled dace	adult	1 CFS	100%
		brook trout	adult		87%

1 This PHABSIM model was not accurate at flows less than 4 cfs.

2 Exclusive of flow contributed by Coyote Creek

4.2 2020 Field Results

The TWG reviewed the preliminary Instream Flow Needs Technical Report on May 7, 2020, which included a detailed discussion of results, including discussion of study reach-specific trends in the data for Bishop Creek Reaches 1-5, and 7-10. This report incorporates by reference the tables and figures from Appendix AQ-1 of the ISR submitted to FERC in November 2020 (see Appendix A).

The results reported below are from:

- 2020 data from Birch and McGee creeks;
- 2020 data from reaches 4 and 6 on Bishop Creek; and
- Supplemental PHABSIM modeling in reaches 1 and 2 for speckled dace.

Study site HCM habitat suitability heatmaps showing the spatial distribution of suitability quartiles among cells and transects for each life stage at each flow increment are provided in Appendix A. Surveyed cross-sections showing channel profiles and changes in depth and wetted width are provided in Appendix B.

4.2.1 Birch Creek

The Birch Creek study site was in a run-riffle complex in the vicinity of the junction of the Buttermilk Road and highway 168 on Bureau of Land Management (BLM) land (Figure 3-1) where the creek has a gradient of approximately 2 percent. The creek bed is typically less than 10-feet-wide with a dense woody riparian canopy, well-defined banks, and boulder/cobble/small gravel substrates (Photo 5.2-1). The study site was approximately 100-feet-long, with transects spaced at 10-foot intervals using a longitudinally oriented measuring tape to guide transect interval spacing.

Verticals were arranged on each transect at about 1-foot intervals and headpins and tailpins were driven into the bank crests to define endpoints of each transect (Photo 5.2-3). This divided the area into a mosaic of rectangular 1-foot by 10-foot cells. Data collection followed methods described in the draft technical report. One additional step was to conduct limited tree branch pruning to facilitate data collection in areas of dense tree canopy. Three flow increments were measured, including one which was half the existing minimum flow and another that was double the existing flow. Depth, velocity, and wetted width were therefore measured at 0.10, 0.25 (current minimum flow) and 1.0 cfs.

Habitat suitability of the three flows were empirically measured (Figure 5.2-1 and Table 5.2-1). The greatest gains in wetted area occurred between 0.1 and 0.25 cfs, as 0.25 cfs typically wets the channel toe to toe and additional flow does not add any significant wetted area. Wetted area at 0.25 cfs is 86 percent of that achieved by a 400 percent flow increase to 1 cfs. Similarly, habitat suitability for speckled dace reaches an inflection point at 0.25 cfs, where 90 percent of the suitability occurs that is achieved at 1 cfs.

Brook trout suitability was much lower than speckled dace and did not reach an inflection point but increased gradually throughout the flow range. A flow of 0.25 cfs provides 76 percent of the suitability achieved at 1 cfs.

Photo 4.2-1 Transect Tape in Centerline of Stream Channel to Guide Placement of Transect Locations

Photo 4.2-2 Birch Creek Study Area

Photo 4.2-3 Birch Creek Typical Transect Arrangement

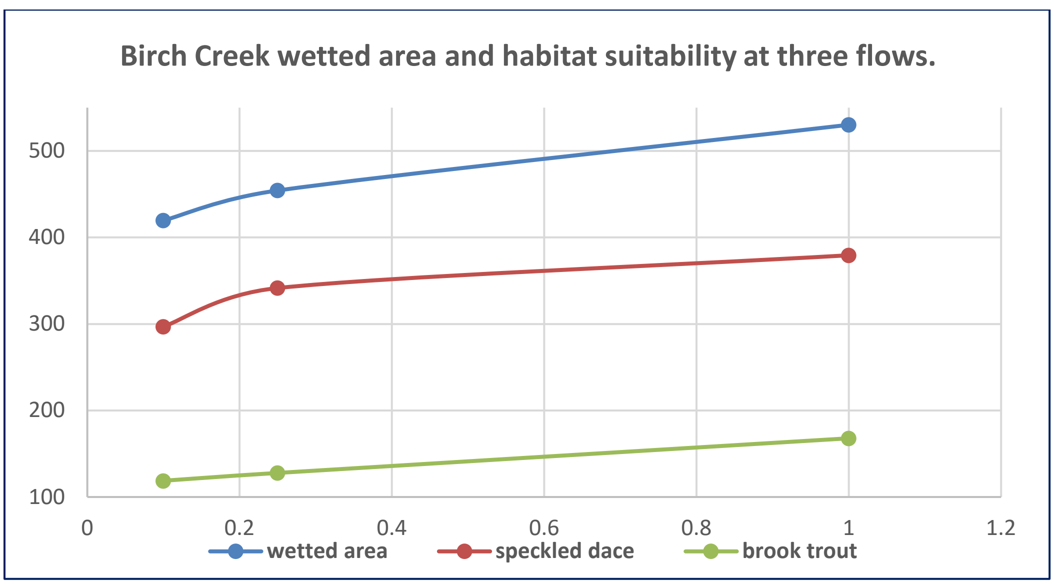


Figure 4.2-1 Birch Creek Wetted Area and Habitat Suitability at Three Flows

Table 4.2-1 Birch Creek Wetted Area (Square Feet) and Habitat Suitability At Three Flows

Discharge (CFS)	Wetted Area		Speckled Dace		Brook Trout	
0.1	419.6	79%	296.9	78%	118.8	71%
0.25	454.3	86%	341.5	90%	127.8	76%
1	530.2	100%	379.4	100%	167.8	100%

4.2.2 McGee Creek

The McGee Creek study site was in a run-riffle complex about 2 miles west of the Birch Creek site at a trailhead along the Buttermilk Road on U.S. Forest Service (USFS) land (Figure 2.1-1) where the creek has a gradient of approximately 2-3 percent. The creek bed is typically 10-feet-wide with a dense woody riparian canopy, well-defined banks, and boulder/cobble/small gravel substrates (Photo 5.2-4). The study site was approximately 100-feet-long, with transects spaced at 10-foot intervals using a longitudinally oriented measuring tape for guidance. A small, ephemeral, man-made dam composed of piled rocks created a backwater for a short distance in the middle of the study reach (Photo 5.2-7). The dam and backwater segments do not represent typical or natural stream conditions and were thus excluded from the survey.

Data collection followed the same procedures as at Birch Creek; verticals were arranged on each transect at about 1-foot intervals and headpins and tailpins were driven into the bank crests to define endpoints of each transect (Photo 5.2-4). Limited tree branch pruning was conducted to facilitate data collection in areas of dense tree canopy. Three flow increments were measured, including one which was half the existing minimum flow and another that was double the existing flow. Depth, velocity, and wetted width were therefore measured at 0.5, 1.0 (current minimum flow) and 2.0 cfs.

Habitat suitability of the three flows were empirically measured (Figure 5.2-2 and Table 5.2-2). The greatest gains in wetted area occurred between 0.5 and 1.0 cfs, as 1.0 cfs typically wets the channel toe to toe and additional flow does not add any significant wetted area (Appendix B). Wetted area at 1.0 cfs is 93 percent of that achieved by doubling the flow to 2 cfs. Habitat suitability for speckled dace peaks at 1.0 cfs; habitat suitability at 2 cfs is similar to that achieved at 0.5 cfs. Brook trout suitability was much lower than speckled dace and increased gradually throughout the flow range. The existing minimum flow of 1.0 cfs provides 87 percent of the suitability achieved at 1 cfs.

Photo 4.2-4 McGee Creek Channel Looking Downstream Study Area

Photo 4.2-5 McGee Creek Channel from Above

Photo 4.2-6 McGee Creek Study Area Manmade Stone Dam (Excluded from Survey)

Photo 4.2-7 McGee Creek Manmade Dam Related Backwater Area (Excluded from Survey)

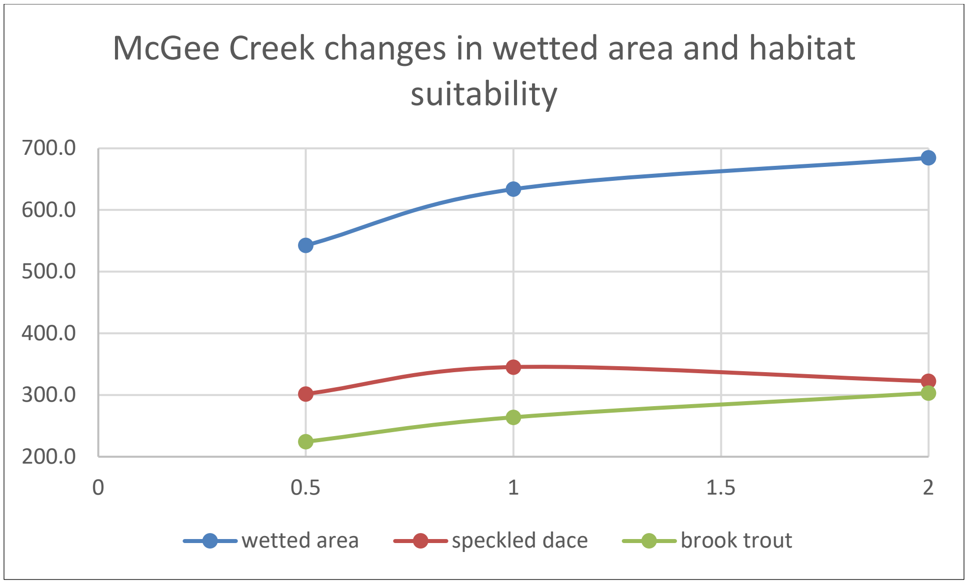


Figure 4.2-2 McGee Creek Changes in Wetted Area and Habitat Suitability

Table 4.2-2 McGee Creek Wetted Area (Square Feet) and Habitat Suitability at Three Flows

Discharge (CFS)	Wetted Area		Speckled Dace		Brook Trout	
0.5	542.7	*79%*	301.9	*87%*	224.4	*74%*
1	633.8	*93%*	345.4	*100%*	264.0	*87%*
2	684.5	*100%*	322.4	*93%*	303.3	*100%*

4.2.3 Bishop Creek Reach 4

The Bishop Creek Reach 4 study site was in a high gradient run-riffle about 300 feet upstream from the confluence with Coyote Creek (Figure 2.1-1) where the creek has a high gradient slope dominated by riffles, short runs, plunge pools, and cascades. The creek bed is typically 30-feet-wide with steep well-defined banks and forest canopy, and boulder-dominated substrates (Photo 5.2-8). The study site was approximately 100-feet-long, with transects spaced at 5-foot intervals, encompassing run and steep gradient riffle habitat.

Three flow increments were measured, including one which was approximately half the existing minimum flow and another that was double the existing flow. Depth, velocity, and wetted width were therefore measured at approximately 2.0, 5.0 (current minimum flow) and 10 cfs.

Habitat suitability of the three flows were empirically measured (Figure 4.2-3 and Table 4.2-3). The greatest gains in wetted area occurred between 2 and 5 cfs; flows greater than 5 do not add any significant wetted area but primarily increase depth (Appendix B). Wetted area at 5.0 cfs is 92 percent of that achieved by doubling the flow to 10 cfs. Habitat suitability for juvenile brown trout has an inflection point at 5 cfs and only increased another 2 percent at 10 cfs. Adult brown trout suitability was much lower than juvenile habitat suitability, has a less-pronounced inflection at 5 cfs, and increases gradually by another 15 percent to 10 cfs.

Photo 5.2-8 Bishop Creek Study Area Run Habitat (Looking Upstream)

Photo 5.2-9 Bishop Creek Steep Gradient Riffle/Cascades (Looking Downstream)

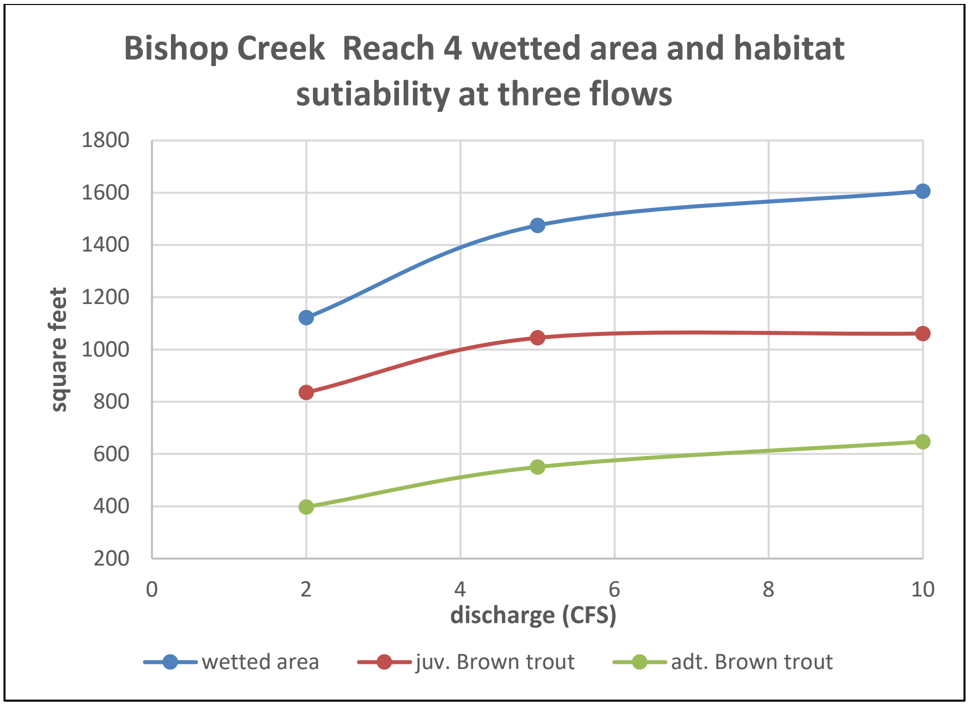


Figure 4.2-3 Bishop Creek Reach 4 Wetted Area and Habitat Suitability at Three Flows

Table 4.2-3 Bishop Creek Reach 4 Wetted Area (Square Feet) and Habitat Suitability at Three Flows

Discharge (CFS)	Wetted Area		Juvenile Brown Trout		Adult Brown Trout	
2	1,121.6	70%	835.5	79%	397.7	61%
5	1,474.9	92%	1,044.6	98%	550.3	85%
10	1606.5	100%	1,061.1	100%	647.4	100%

4.2.4 Bishop Creek Reach 6

The Bishop Creek Reach 6 study site was in a high gradient run-riffle about 500 feet upstream from the confluence with the Intake 3 forebay pool (Figure 2.1-1) where the creek is dominated by riffles, short runs, plunge pools, and cascades. The creek bed is typically 30-feet-wide with steep well-defined banks and forest canopy, and boulder-dominated substrates (Photo 4.2-10).

The study site was approximately 100-feet-long, with four transects encompassing run and steep gradient riffle habitat. Three flow increments were measured, including one which was approximately half the existing minimum flow and another that was more than double the existing flow. Depth, velocity and wetted width were therefore measured at approximately 6.0, 10.0 (current minimum flow) and 25 cfs.

Habitat suitability of the three flows were empirically measured (Figure 4.2-4 and Table 4.2-4). Wetted area does not change significantly between 6 cfs and 10 cfs and then gradually increases toward 25 cfs. Habitat suitability for juvenile brown trout is highest at 6 cfs and declines at higher flows due to increased areas of unsuitably high velocity. Adult brown trout suitability is similar at both 6 cfs and 10 cfs, lower than juvenile habitat suitability (about 94 percent of the suitability present at 25 cfs), and increases gradually throughout the flow range.

Photo 4.2-10 Bishop Creek Study Site 6 Area Pocket Run Habitat (Looking Upstream)

Photo 4.2-11 Bishop Creek Site 6 Steep Gradient Riffle/Cascades (Looking Downstream)

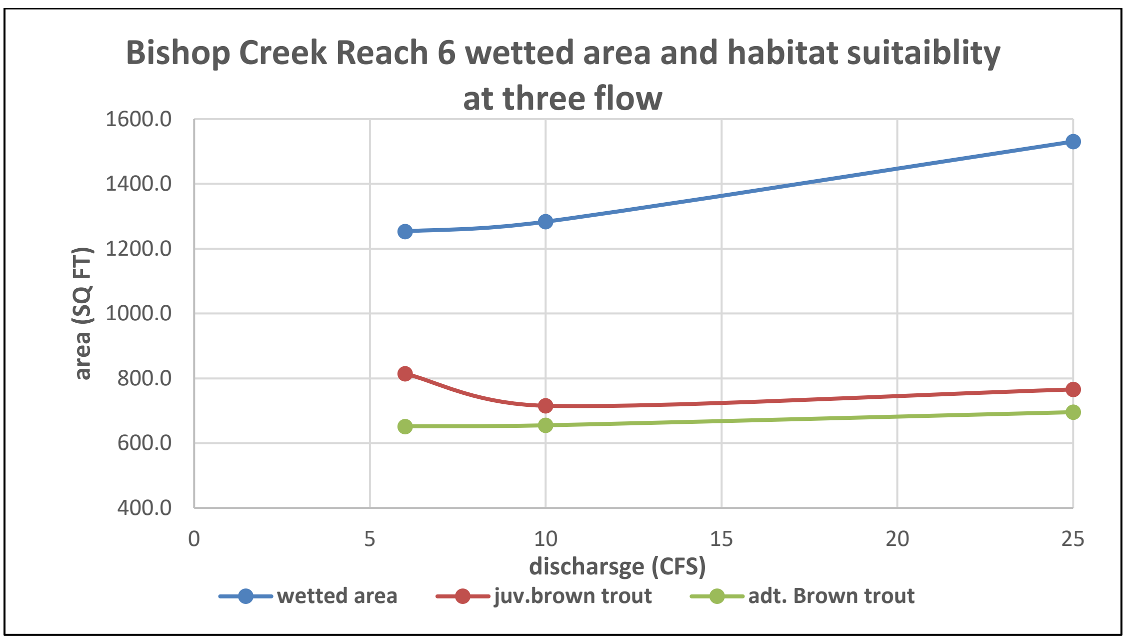


Figure 4.2-4 Bishop Creek Reach 6 Wetted Area and Habitat Suitability At Three Flow

Table 4.2-4 Bishop Creek Reach 6 Wetted Area (Square Feet) and Habitat Suitability at Three Flows

Discharge (CFS)	Wetted Area		Juvenile Brown Trout		Adult Brown Trout	
6	1,253.5	82%	814.0	100%	651.7	94%
10	1,283.3	84%	715.2	88%	655.0	94%
25	1,530.5	100%	765.6	94%	695.5	100%

4.2.5 Bishop Creek Reach 1

The Bishop Creek Reach 1 study site is in the mid-point of the Intake 6 bypass reach. Reach 1 extends from Plant 6 upstream to the Intake 6 forebay pool spillway and is generally 15- to 40-feet-wide; substrate is dominated by small and large boulder and patches of cobble substrate, with a narrow band of riparian vegetation comprised of bushes and some small tree canopy. Riffle and pockets of pool/riffle complex mesohabitat types dominate this reach. Flow increments were modeled from 6 cfs to 100 cfs. PHABSIM modeling results for brown trout and Owens sucker were previously described in the 2020 Technical Report; this report updates prior modeling with results for speckled dace.

Flows of 6 cfs to 10 cfs provide between 95 and 100 percent of maximum speckled dace habitat suitability, and suitability gradually declines at higher flows due to increases in both velocity and depth (Figure 4.2-5 and Table 4.2-5).

Table 4.2-5 Bishop Creek Project. Habitat Suitability for Brown Trout, Owens Sucker and Speckled Dace Between 6 and 100 Cfs in Reach 1

Discharge (cfs)	Wetted Area	Trout Adult	% Optimal	Trout Juvenile	% Optimal	Owens Sucker Adult	% Optimal	Owens Sucker Juvenile	% Optimal	Speckled Dace	% Optimal
6	31,468	326	24	6,163	68	5,184	23	16,237	79	3,777	97%
8	33,731	374	27	6,927	77	6,977	31	17,630	86	3,875	100%
10	36,267	521	38	7,052	78	8,329	37	18,441	90	3,690	95%
12	37,808	598	43	7,541	84	9,356	42	18,365	90	3,506	90%
14	39,157	655	47	7,741	86	10,407	47	18,480	90	3,336	86%
16	40,032	716	52	7,901	88	11,256	50	18,730	91	3,240	84%
18	41,089	764	55	7,998	89	12,061	54	19,022	93	3,196	82%
20	42,658	805	58	8,490	94	13,090	59	19,502	95	3,206	83%
25	46,045	875	63	9,008	100	15,031	67	20,517	100	3,053	79%
50	50,812	1,057	76	8,284	92	18,313	82	19,080	93	2,224	57%
75	59,722	1,235	89	7,877	87	21,319	95	19,357	94	1,616	42%
100	61,323	1,387	100	4,356	48	22,345	100	19,436	95	1,323	34%

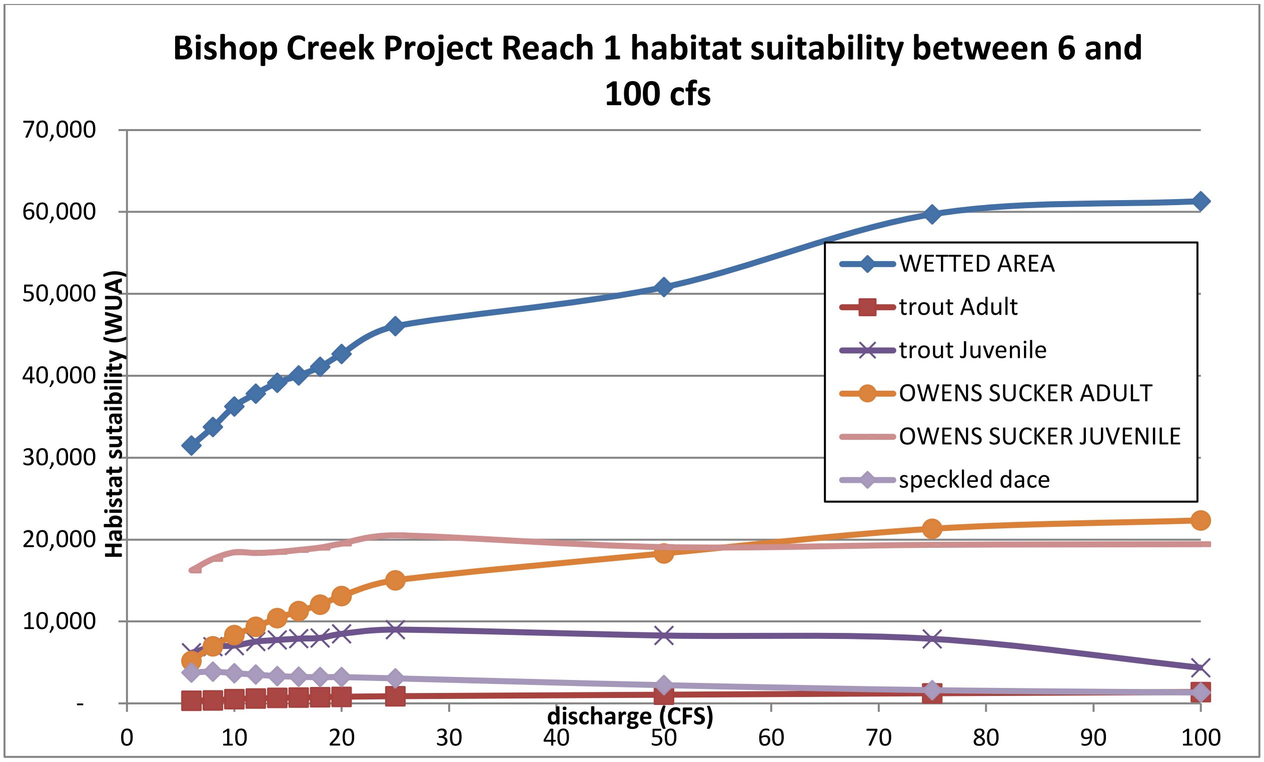


Figure 4.2-5 Reach 1 Habitat Suitability Between 6 and 100 cfs

4.2.6 Bishop Creek Reach 2

The Bishop Creek Reach 2 study site is in the mid-point of the Intake 5 bypass Reach where the creek is dominated by riffles and runs and is generally 25- to 30 feet-wide; substrate is dominated by small boulder and patches of cobble, with a narrow band of riparian vegetation comprised of bushes and some small tree canopy. This reach is incrementally steeper than Reach 1, and thus riffle mesohabitat dominates this reach. PHABSIM modeling results for brown trout and Owens sucker were described in detail in the 2020 Technical Report. Flow increments were modeled between 4 cfs and 100 cfs. This report updates prior modeling with results for speckled dace.

There is a bimodal peak in habitat suitability for speckled dace (Table 4.2-6 and Figure 4.2-6). The first occurs at 6 cfs where 65 percent of maximum WUA occurs. As flow increases, areas in the thalweg decline in suitability as depth and velocity increases exceed preferences for the species. Flows of 6 cfs to 10 cfs provide between 90 and 100 percent of maximum juvenile habitat suitability, and suitability gradually declines at flows above 8 cfs as the thalweg becomes unsuitably deep and fast, limiting usable habitat to the stream margins. WUA remains depressed until approximately 25 cfs (Figure 4.2-6 and Table 4.2-6). At higher flows, a perched sand bar at a relatively high bed elevation captured by transect 2.3 begins to be inundated and this provides additional WUA (Figure 4.2-7).

Table 4.2-6 Bishop Creek Project. Habitat Suitability for Brown Trout, Owens Sucker and Speckled Dace Between 6 and 100 cfs in Reach 2

Discharge	Wetted Area	Trout Adult	Percent Optimal	Trout Juvenile	Percent Optimal	Sucker Adult	Percent Optimal	Sucker Juvenile	Percent Optimal	Speckled Dace	Percent Optimal
4	18,163	581	6	3,299	51	1,620	8	9,335	55	2,453	64%
6	19,902	785	8	4,218	65	2,619	13	11,168	66	2,495	65%
8	21,386	988	10	4,992	77	3,739	18	12,948	76	2,196	57%
10	22,859	1,216	13	5,470	84	4,810	24	14,030	83	1,964	51%
12	23,724	1,434	15	5,702	88	5,792	28	14,656	86	1,803	47%
14	24,516	1,645	17	5,822	89	6,722	33	15,169	89	1,725	45%
16	25,100	1,885	20	5,924	91	7,578	37	15,628	92	1,646	43%
18	25,783	2,163	23	6,012	92	8,401	41	16,026	94	1,575	41%
20	26,449	2,479	26	6,103	94	9,233	45	16,370	96	1,549	40%
25	28,109	3,340	35	6,319	97	11,126	55	16,831	99	1,654	43%
50	31,349	6,643	70	6,509	100	16,809	82	16,451	97	2,679	69%
75	34,051	8,655	91	6,340	97	19,285	95	16,990	100	3,863	100%
100	35,214	9,493	100	6,162	95	20,395	100	15,973	94	2,445	63%

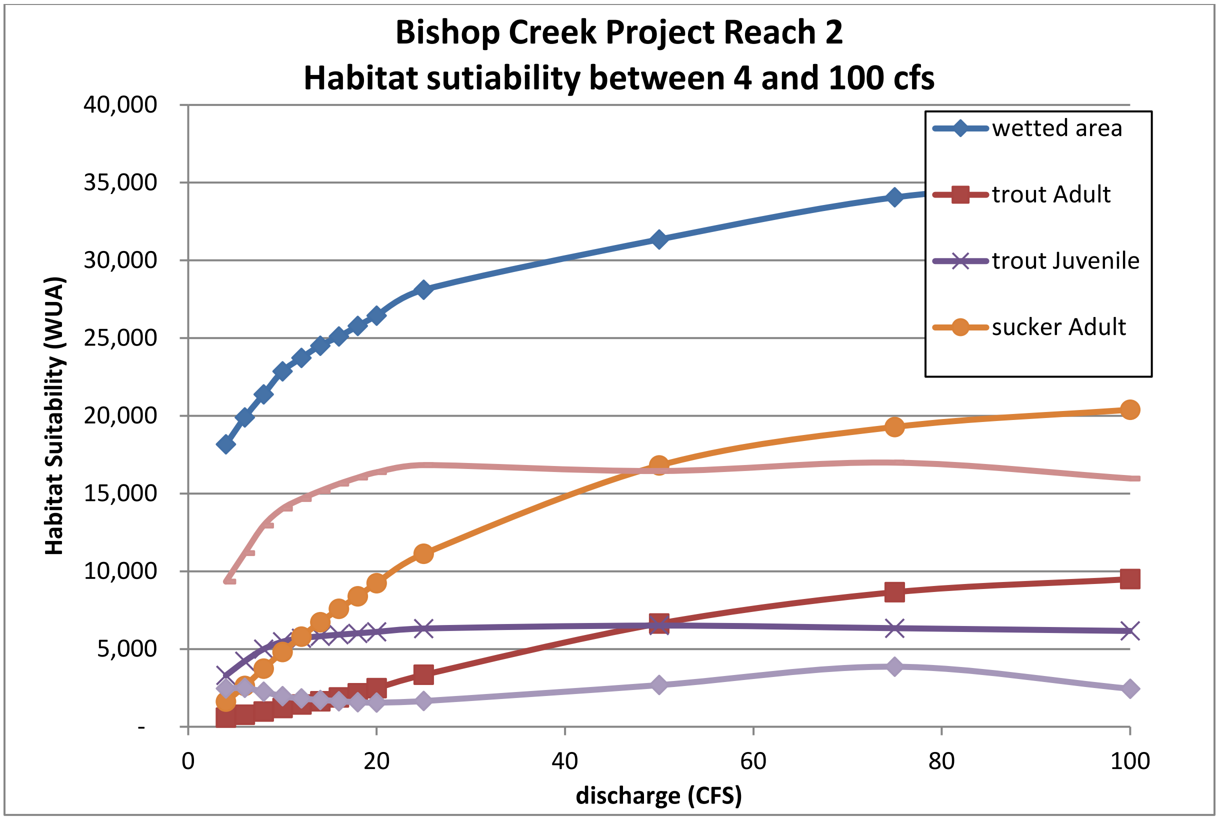


Figure 4.2-6 Reach 2 Habitat Suitability Between 4 and 100 cfs

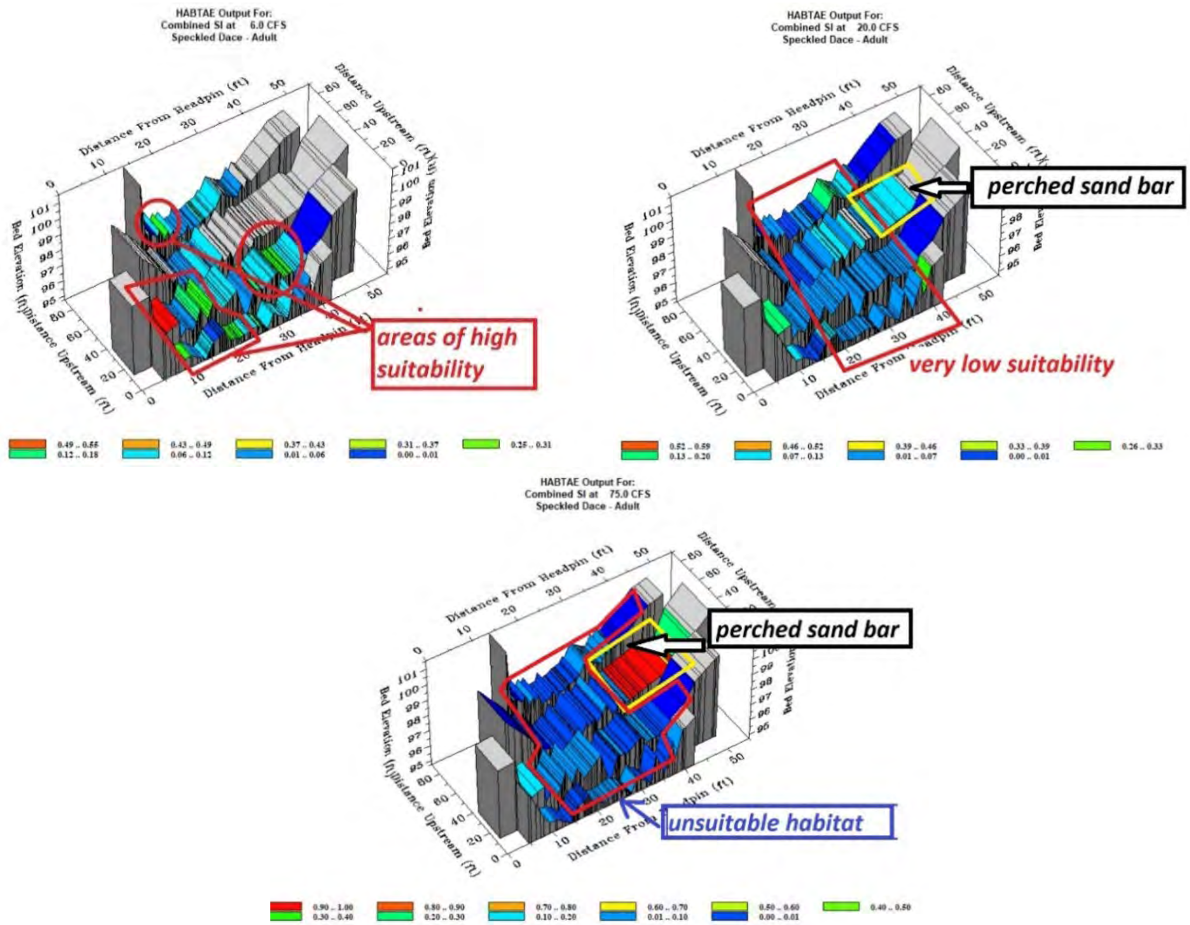


Figure 4.2-7 Reach 2 Study Area; Changes in Speckled Dace Habitat Suitability at 6, 20 And 75 cfs Heat Color Spectrum: Red is Most Suitable, Yellow/Green is Moderate Suitability, Dark Blue is Unsuitable

4.2.7 MACROINVERTEBRATES

Benthic macroinvertebrates that occupy creeks in the study area may include various aquatic insects such as mayflies and stoneflies. Larval life stages of these insects inhabit streambeds where they provide potential forage for other ecosystem members such as fish and other vertebrates. These invertebrates utilize interstitial spaces between substrates for shelter and feeding, gravel, cobble and small boulder are preferred substrates (Kleinschmidt 2013, Vermont ANR [unpublished data]). Conversely, fines such as silt and sand are less suitable as there is little if any interstitial water flow within the benthic layer to support the life stage.

Mesohabitat mapping (SCE 2019) and subsequent IFIM analyses of study reaches (SCE 2020) demonstrates that the study area is dominated by a homogenous mix of cobble and boulder substrates with patches of gravel. All are substrates suitable for macroinvertebrates. Other less suitable substrates such as silt, sand, and other fines are confined to patches along stream margins and downstream of large object velocity shelters such as boulders. It may therefore be concluded that habitat suitability for macroinvertebrates in the study area is not substrate-limited, and that habitat suitability trends for macroinvertebrates can be approximated by reviewing the wetted width and wetted area calculations presented in these studies.

5.0 CONSULTATION SUMMARY

SCE distributed periodic progress reports on the following schedule:

- Progress Report 1: December 19, 2019
- Progress Report 2: April 14, 2020
- Progress Report 3: July 24, 2020
- Initial Study Report (Progress Report 4): October 30, 2020
- Initial Study Meeting: November 10, 2020
- 2021 Progress Report 1: March 2, 2021
- 2021 Progress Report 2: May 28, 2021
- 2021 Progress Report 3: August 27, 2021
- Updated Study Report (2021 Progress Report 4): November 4, 2021
- Updated Study Report Meeting: November 18, 2021

Eight technical memoranda summarizing the 2019 study implementation were submitted with Progress Report 2 filed with FERC on April 14, 2020. Following that filing, SCE hosted a TWG meeting on May 7, 2020 to discuss the 2019 study season, work completed to date and the technical memoranda. After the meeting, TWG members submitted comments on the technical memoranda and SCE provided a general response to those comments as part of Progress Report 3, filed with FERC July 24, 2020.

In addition, during 2020, SCE consulted by phone and email with Aquatic TWG members (specifically CDFW and USFS) to determine habitat suitability criteria for speckled dace, brook trout and to finalize study details for Birch and McGee creeks.

The Initial Study Report (ISR) was filed with FERC on October 30, 2020 and a virtual ISR Meeting was held on November 10, 2020. No additional comments were received from TWG members or stakeholders on the IFIM ISR materials or on the previously provided responses to comments.

Three progress reports were filed in 2021 after the ISR, as identified above. This Final Technical Report was submitted to agencies and stakeholders for a 60-day review period on May 14, 2021. The comment period was extended, at the request of the agencies, and comments received on this report are shown in Table 5.1-1. A meeting was held with CDFW and USFS on October 6, 2021 to discuss those comments received as well as SCE’s draft responses to them.

SCE held a Project Effects meeting on October 28, 2021 for all stakeholders and agencies to discuss what project effects (if any) had been identified through the implementation of each of the approved study plans.

The Updated Study Report (USR) was filed with FERC on November 4, 2021, and a USR Meeting was held on November 18, 2021. At this meeting, SCE only discussed those studies which were still in progress at the time of the ISR (Water Quality, Sediment and Geomorphology, Operations Model, Recreation Use and Needs, Recreation Facilities Condition Assessment, Project Lands and Boundary, and Cultural and Tribal Studies). The IFIM Assessment was not discussed at the USR, and thus received no comments.

Table 5.1-1 provides a summary of comments received to date for this study and responses to those comments.

Table 5.1-1 Comment Response Table

<table>
<tr><th>Comment Number</th><th>Study</th><th>Date of Comment</th><th>Entity</th><th>Comments</th><th>SCE Response</th></tr>
<tr><td>21</td><td>Instream Flow Incremental Methodology Technical Memorandum</td><td>May 21, 2020</td><td>CDFW</td><td>This goal was accomplished as written in the technical memorandum, but it differs from the Goals and Objectives stated in the Volume III Technical Study Plans. The technical memorandum did not address Section 3.1.2.8 Macroinvertebrates in Technical Study Plans: 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.</td><td>The October 4, 2019 Mesohabitat Survey memorandum briefly described reach-specific dominant substrates and discussed with the TWG during the related conference call. These were subsequently quantified in greater detail on each PHABSIM transect, each of which was selected in consultation with the CDFW and other TWG participants as representative of habitat conditions within each reach.

These substrates are discussed in the context of macroinvertebrate habitat in Section 5.2.7 of this Final Technical Report and in the Section 8.5 in Exhibit E of the Draft License Application (DLA).</td></tr>
<tr><td>22</td><td>Instream Flow Incremental Methodology Technical Memorandum</td><td>May 21, 2020</td><td>CDFW</td><td>The intended meaning of “optimal habitat suitability” should be defined in the methods section, or possibly replaced by a more appropriate term…. Most of the brown trout weighted usable area (WUA) curves do not reach their peak in the narrow range of flows that were simulated. Therefore, the ‘optimum’ cannot be stated. The study design does not require the determination of optimal, so replacement of the term with a more appropriate term should not be controversial. CDFW recommends replacing the term ‘optimum’ with ‘modelled boundary’ in most cases.</td><td>Optimum habitat as used by SCE refers to the maximum amount of WUA achieved at a flow within the modeled range in cases the peak occurs at a low or intermediate flow within the range modeled. SCE notes that the CDFW’s general comment that “Most of the brown trout weighted usable area curves (WUA) do not reach their peak in the narrow range of flows that were simulated” is only partially correct, and primarily applies to only the adult life stage within certain reaches. The report confirms that juvenile brown trout WUA peaks at flows within the model range in all except two study reaches, and most commonly at flows at the lower end of the modeled range. In all cases habitat suitability for juvenile trout increased only slightly throughout the higher range of flows. Adult WUA peak in three of the study reaches within the flow range, and the data generally show that of the remaining reaches, incremental gains in adult WUA at flows greater than 25- 50 are very slight up to 100 cfs.

<table>
<tr><th>Reach</th><th>Juv. Trout (peak WUA flow)</th><th>Adult Trout (peak WUA flow)</th></tr>
<tr><td>1</td><td>25 cfs</td><td>Minimal WUA at all flows</td></tr>
<tr><td>2</td><td>50 cfs</td><td>Minimal WUA gains at higher flows</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Comment Number</th><th>Study</th><th>Date of Comment</th><th>Entity</th><th>Comments</th><th>SCE Response</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td><table><tr><td>3</td><td>6 cfs</td><td>20 cfs</td></tr><tr><td>5</td><td>100 cfs</td><td>100 cfs</td></tr><tr><td>8</td><td>50 cfs</td><td>Minimal WUA gains at higher flows</td></tr><tr><td>9</td><td>6 cfs</td><td>Minimal WUA gains at higher flows</td></tr><tr><td>10</td><td>6 cfs</td><td>37 cfs</td></tr></table>
SCE appreciates having the discussion regarding WUA but as noted in the report discussion, does not agree that maximum trout WUA is necessarily the goal or metric that should drive our analyses.

WUA analyses is included in the Section 8.5 of Exhibit E of the DLA.</td></tr>
<tr><td>23</td><td>Instream Flow Incremental Methodology Technical Memorandum</td><td>May 21, 2020</td><td>CDFW</td><td>Page 2-9. The reference to ‘adult suitability’ should be clarified to indicate which species is being characterized.</td><td>SCE clarifies that the “adult suitability” references adult Brown Trout. Clarification is included throughout Section 8.5 of Exhibit E of the DLA.</td></tr>
<tr><td>24</td><td>Instream Flow Incremental Methodology Technical Memorandum</td><td>May 21, 2020</td><td>CDFW</td><td>Page 2-10. Use of the word ‘embankments’ to describe habitat in the reach 5 study site should be reconsidered. To the best of our knowledge no embankments have been constructed within the referenced site.</td><td>SCE notes CDFW’s distinction and concurs that no study sites were in the vicinity of constructed embankments. The use of the word embankment is not included in Exhibit E of the DLA.</td></tr>
<tr><td>25</td><td>Instream Flow Incremental Methodology Technical Memorandum</td><td>May 21, 2020</td><td>CDFW</td><td>Page 3-2. References to the Stillwater report should be ‘in prep,’ not ‘in press.’</td><td>SCE notes CDFW’s distinction and concurs that at the time the report was filed “in prep.” would be a more accurate term. Since that time, it can be considered to have been published for purposes of this relicensing procedure.</td></tr>
<tr><td>26</td><td>Instream Flow Incremental Methodology Technical Memorandum</td><td>May 21, 2020</td><td>CDFW</td><td>Page 3-3. The statement ‘Maintaining wild populations [of fish] means that recruitment from younger life stages should be optimized’ is not correct. No evidence suggests the population is recruitment limited. Maintaining wild populations depends on provision of adequate habitat for populations of adults, not maximizing recruitment.</td><td>SCE notes CDFW’s distinction; SCE’s observation was merely to note that the adult fish lifestage must be recruited from younger lifestages such as juveniles and therefore the importance of managing nursery habitat should not be overlooked to maintain a self-sustaining population.</td></tr>
</table>

Comment Number	Study	Date of Comment	Entity	Comments	SCE Response
27	Instream Flow Incremental Methodology Technical Memorandum	May 21, 2020	CDFW	Page 3-3. The phrase 'ichthyomechanics in terms of navigating velocities' should be restated using broadly accepted vocabulary. We suspect the intention is to refer to bioenergetics.	SCE notes CDFW's distinction. However, ichthyomechanics refers to the ability of a fish's swimming strength and agility, whereas bioenergetics refers to metabolic processes that support the animal's ability to swim. Based on this definition, SCE feels the term is correctly applied.
1	Instream Flow Needs and Assessment – AQ 1	June 21, 2021, and October 4, 2021	CDFW	The lack of inflection point in Bishop Creek reaches 4 and 6 may be the result of not including a broad enough range of flows. October 14, 2021, CDFW Updated Comment: CDFW previously requested a broader range of study flows in planning meetings, but SCE declined to include them. Brandon Kulick's description of why IFM was deemed unsuitable for reaches 4 and 6 is appropriate.	SCE selected a robust flow spread ranging from ½ the existing flow through double the existing flow. The absence of a sharp inflection point is due to measuring three flow increments (as per USFS and CDFW direction). Additional increments may better express an inflection point, although this was not a goal of the study. Flow increments are discussed in Section 8.5 of Exhibit E of the DLA.
2	Instream Flow Needs and Assessment – AQ 1	June 21, 2021, and October 4, 2021	CDFW	The current flow regime does not provide adequate habitat for adult brown trout (*Salmo trutta*) and adult brook trout (*Salvelinus fontinalis*). Reaches should be identified that have the potential to provide additional adult trout habitat if minimum instream flows are increased. October 14, 2021, CDFW Updated Comment: There are no specific criteria developed for Bishop Creek. The intent of this study was to determine what flows would be improve available habitat for adult BT. The Synthesis report will be useful. CDFW will look to species health and distribution data from fish and BMI monitoring. Then we can use operations modeling and IFIM results to see where we may be able to alter project operations to improve available habitat.	The term "adequate" is vague and could be interpreted as any value greater than Minimal or less than Maximum. SCE understands that CDFW does not have a formal definition of this term. CDFW should advise SCE of their science- based criteria so that this can be better quantified. SCE's definition of habitat suitability and adequate habitat is described in Section 8.5 of Exhibit E of the DLA.

Comment Number	Study	Date of Comment	Entity	Comments	SCE Response
				The term 'adequate habitat' can be defined somewhat on a case-by-case basis by a combination of the following scientific and measurable characteristics: stream flow, water quality, food sources, physical habitat, and biotic interactions.	
3	Instream Flow Needs and Assessment – AQ 1	June 21, 2021, and October 4, 2021	CDFW	Discuss the conflicting habitat needs of the fish species and life stages. Discuss which reaches can currently or could provide for those needs if Project operations are altered. October 14, 2021, CDFW Updated Comment: This is best addressed in a meeting this winter. CDFW fisheries management objectives are to preserve and maintain the current fishery as self-sustaining and to allow a quality sport fishery.	SCE agrees that in certain study reaches and at some flow ranges, WUA curves among species and life stages do conflict. There are numerous techniques for balancing flow recommendations in such cases (Bovee 182). SCE recognizes that solutions will vary reach-specifically and is looking for guidance from CDFW prior to discussing alternative flow releases This is likely best handled in a meeting/workshop format after fully understanding the operations model and project hydrology. SCE's discussion of WUA and life stages is found in Section 8.5 of Exhibit E of the DLA.
4	Instream Flow Needs and Assessment – AQ 1	June 21, 2021	CDFW	Analysis of the maximum weighted usable area (WUA) curve is a necessary part of determining flow regimes and is referenced frequently in the literature. CDFW recommends that SCE follow the established methodology for this analysis.	As stated, this is too vague to respond to quantitatively as there are numerous methods for analyzing weighted usable area. SCE requests further clarification. This is likely best handled in a meeting/workshop format after fully understanding the operations model and project hydrology. WUA analyses is included in Section 8.5 of Exhibit E of the DLA.
5	Instream Flow Needs and Assessment – AQ 1	June 21, 2021 and October 4, 2021	CDFW	Several habitat cross-sectional profiles demonstrated scenarios where the minimum instream flow release could result in the creation of isolated pools and potential stranding of fish. The minimum instream flow releases that could results in stranding should be identified and avoided.	SCE notes this and will review water depths associated with proposed habitat protective flow releases relative to stranding. SCE's discussion of CDFW's comment regarding the potential for fish stranding due to minimum instream flow releases is found in Section 8.5 of Exhibit E of the DLA.

6.0 REFERENCES

Bovee, K.D. 1982. A guide to stream habitat analysis using the instream flow incremental methodology. (Office of Biol. Service FWS/OBS-82-26). Washington, DC.: USFWS, U.S. Dept. of Interior.

Bovee, K.D., Lamb, B.L., Bartholow, J.M., Stalnaker, C.B., Taylor, J. & Henriksen, J. 1998. Stream habitat analysis using the instream flow incremental methodology. (Biological Resources Division Information and Technology Report USGS/BRD-1998-0004/ viii). U.S. Geological Survey.

EA Engineering, Science, & Technology, Inc. (EA). 1988. Instream flow and fisheries report for the Bishop Creek Hydroelectric Project. EA Engineering, Science, & Technology, Inc. Lafayette, California prepared for Southern California Edison, Rosemead, CA.

Stillwater Sciences. 2009. Lower McCloud River Instream Flow Study (FA-S8) Technical memorandum 56 (TM-56). Habitat Criteria Mapping on the Lower McCloud River. 60 pp.

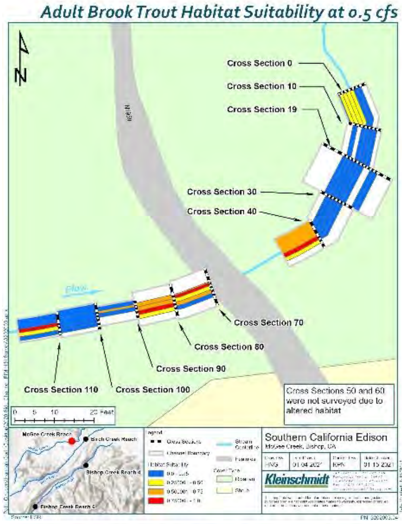
Southern California Edison (SCE). 2020. Bishop Creek Flow Needs Report, March 2020

APPENDIX A

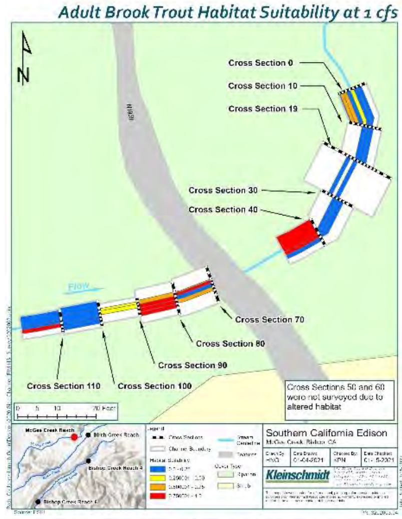
HABITAT SUITABILITY TABLE

McGee Creek

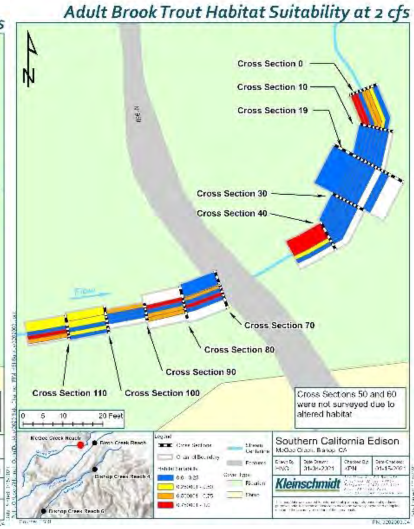
Adult Brook Trout Habitat Suitability at 0.5 cfs



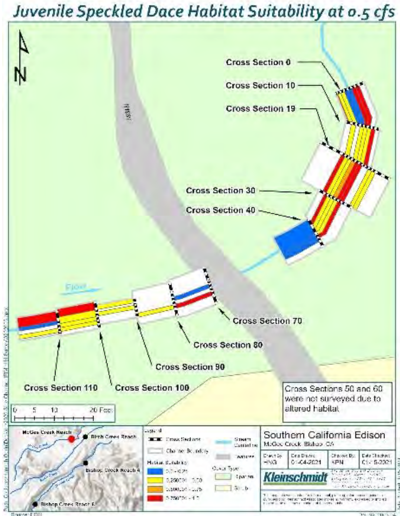
Adult Brook Trout Habitat Suitability at 1 cfs



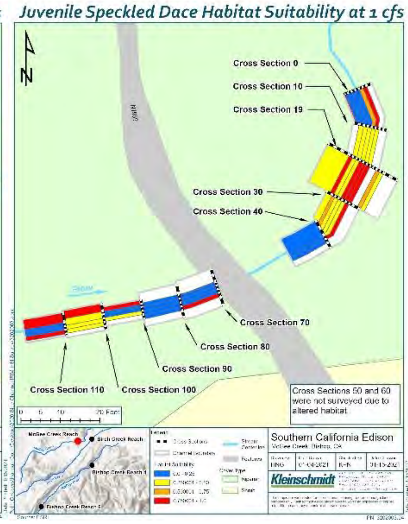
Adult Brook Trout Habitat Suitability at 2 cfs



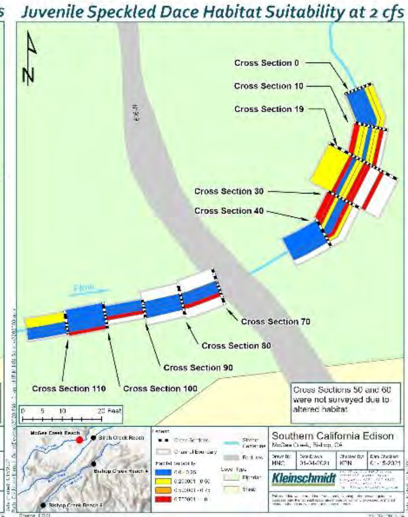
Juvenile Speckled Dace Habitat Suitability at 0.5 cfs



Juvenile Speckled Dace Habitat Suitability at 1 cfs

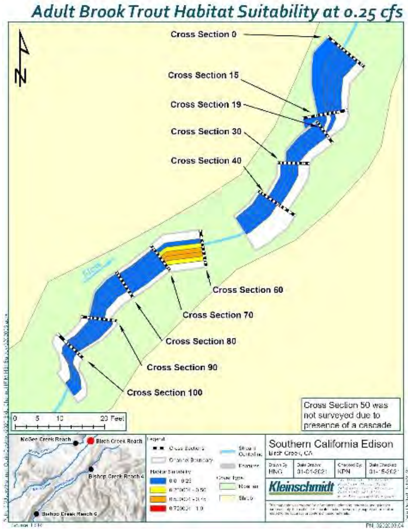


Juvenile Speckled Dace Habitat Suitability at 2 cfs

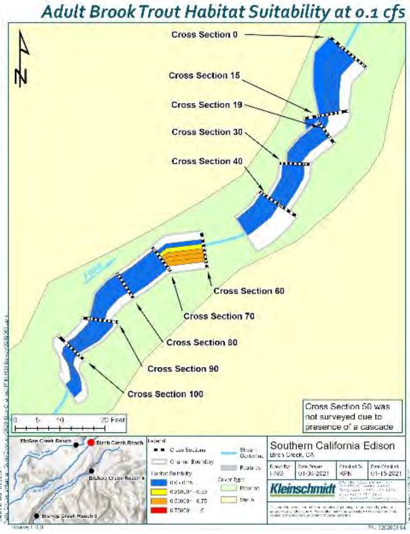


Birch Creek

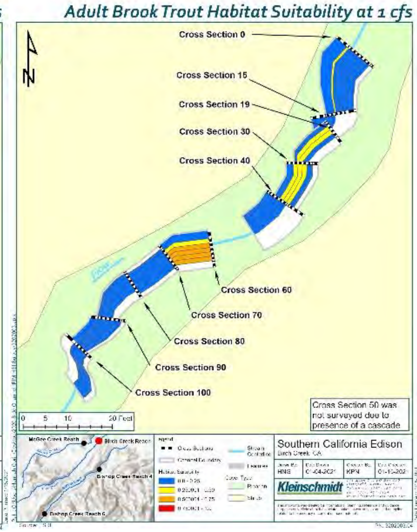
Adult Brook Trout Habitat Suitability at 0.25 cfs



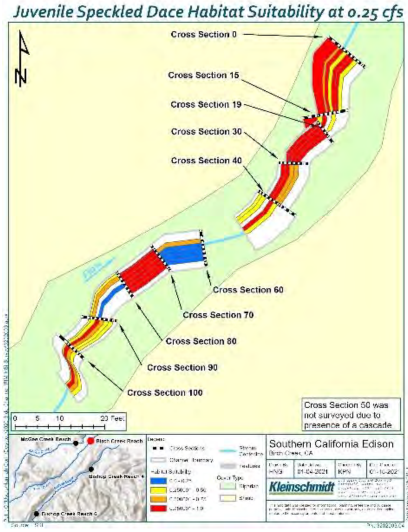
Adult Brook Trout Habitat Suitability at 0.1 cfs



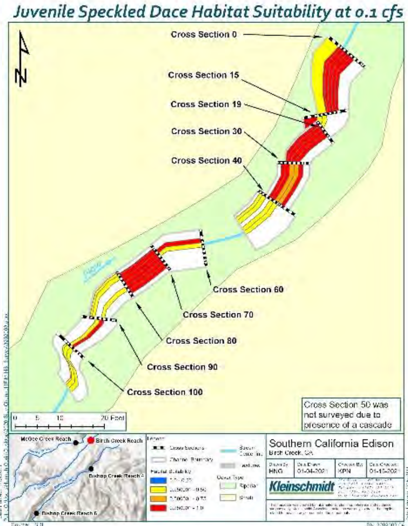
Adult Brook Trout Habitat Suitability at 1 cfs



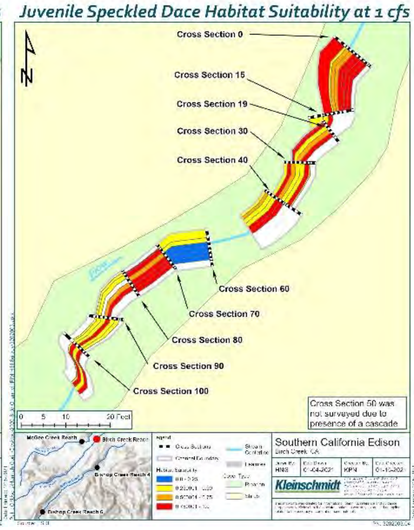
Juvenile Speckled Dace Habitat Suitability at 0.25 cfs



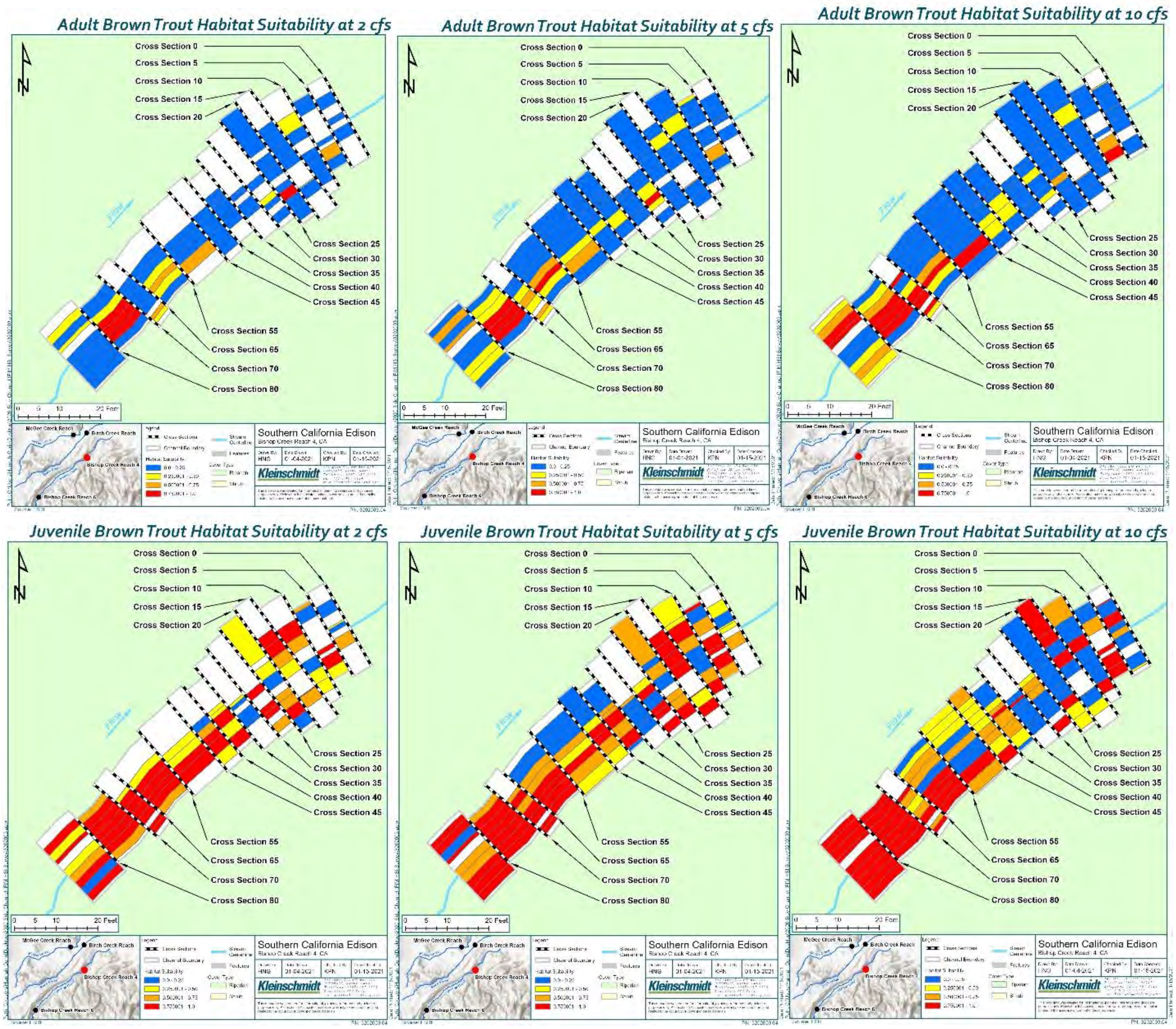
Juvenile Speckled Dace Habitat Suitability at 0.1 cfs



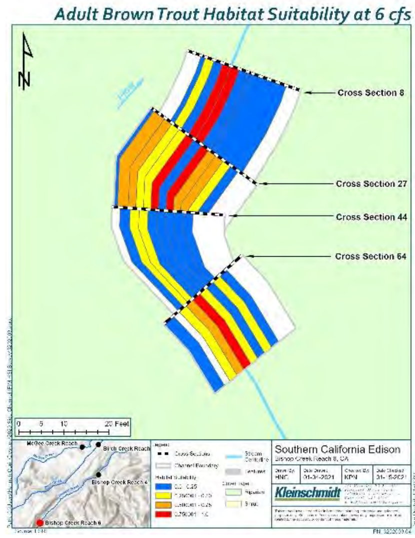
Juvenile Speckled Dace Habitat Suitability at 1 cfs

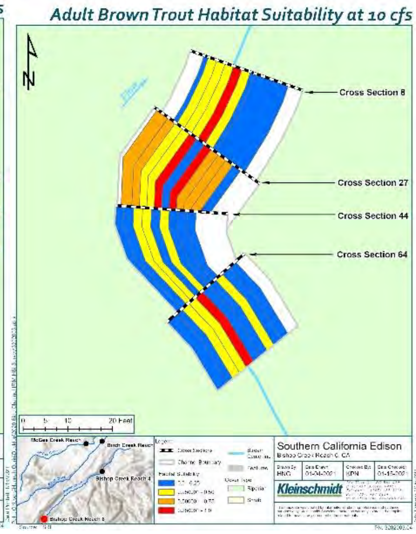


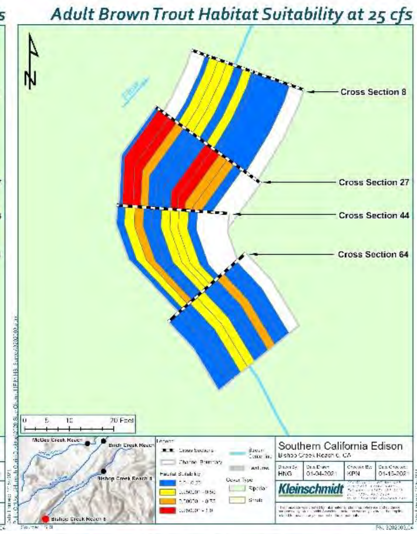
Bishop Creek Reach 4

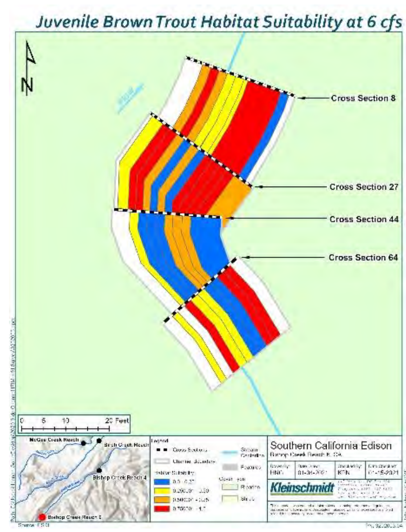


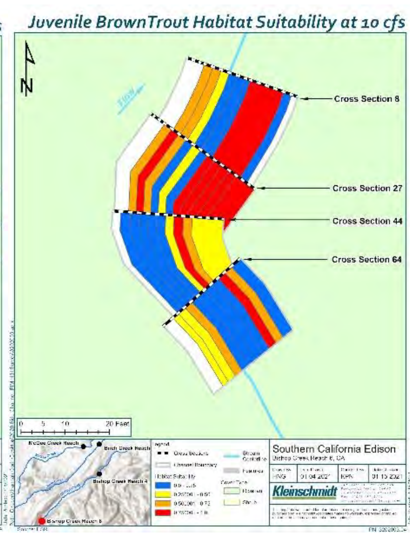
Bishop Creek Reach 6

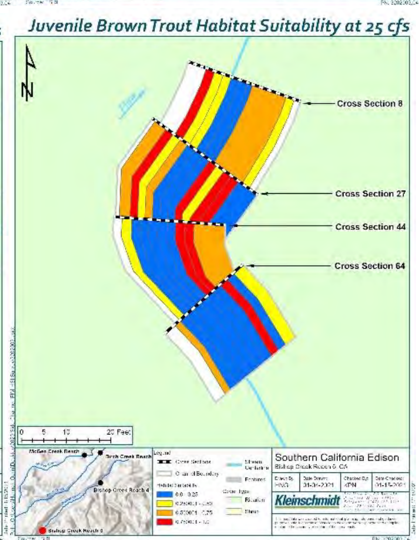








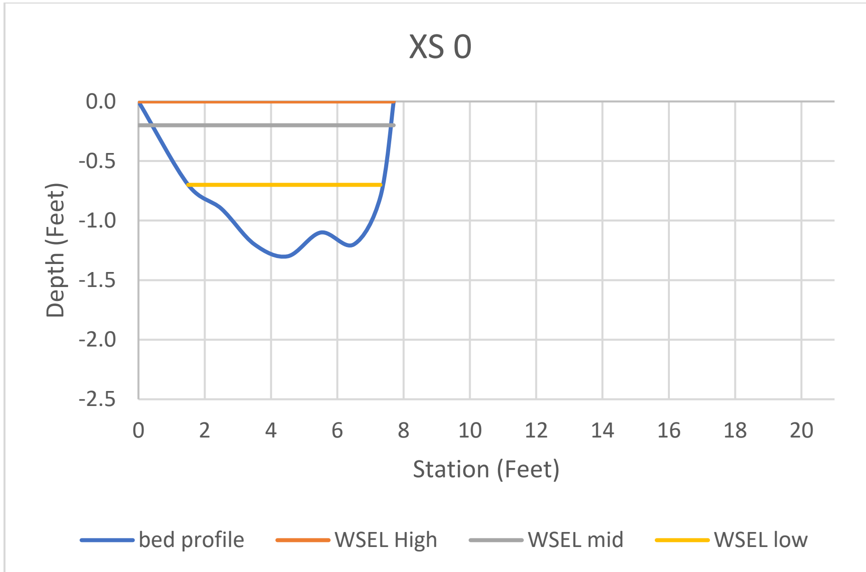


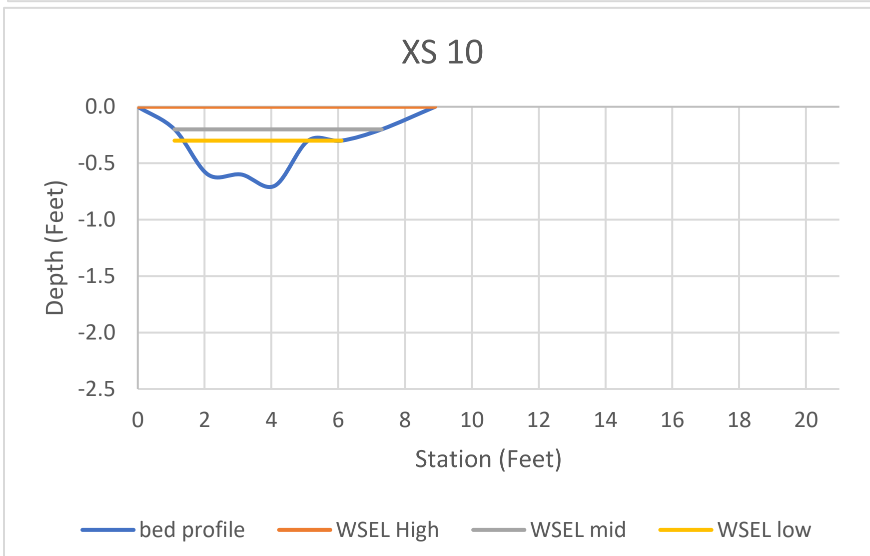


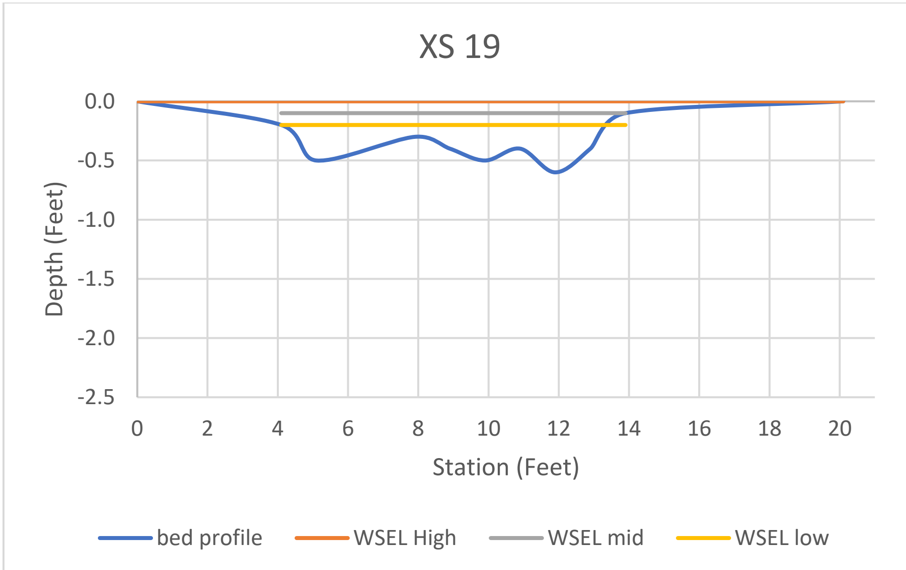
APPENDIX B

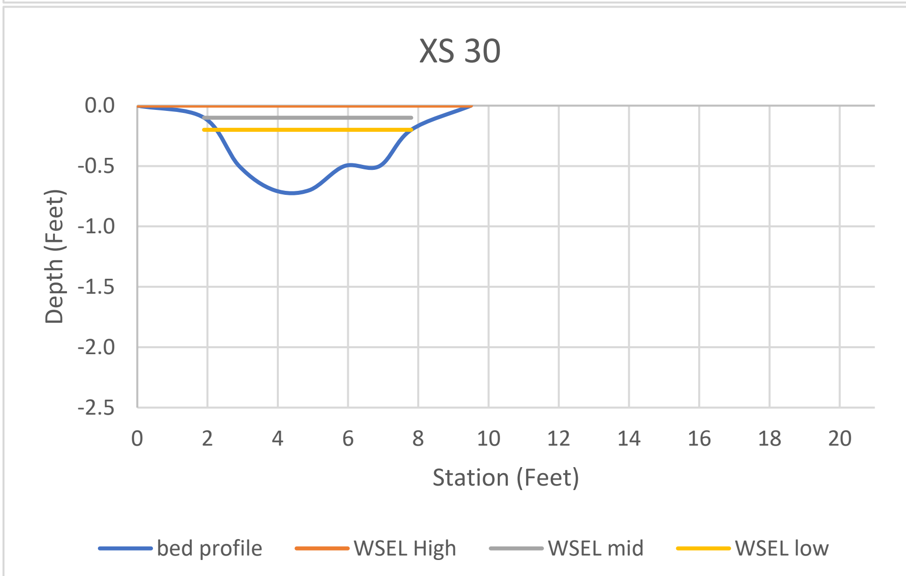
HABITAT CROSS-SECTIONAL PROFILES

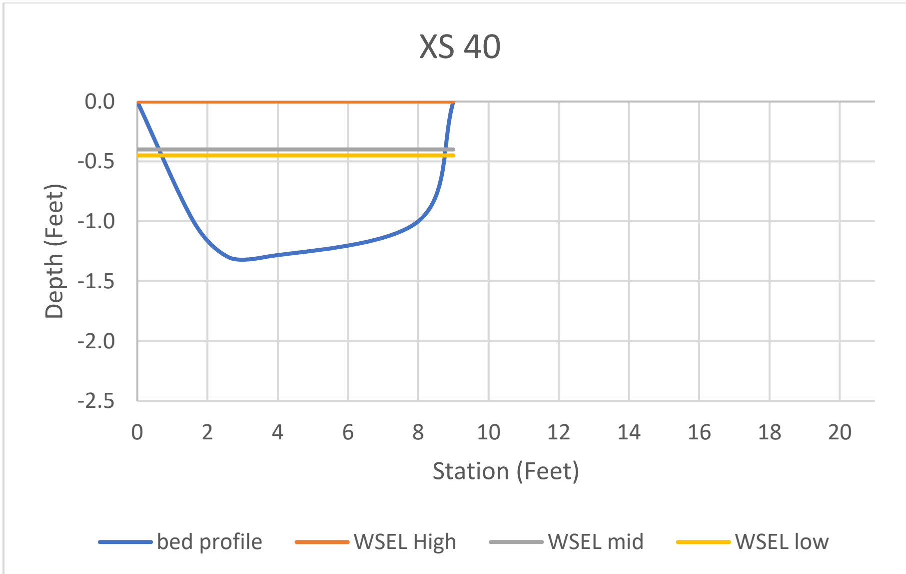
McGee Creek


XS 0
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
Depth (Feet)
0
2
4
6
8
10
12
14
16
18
20
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

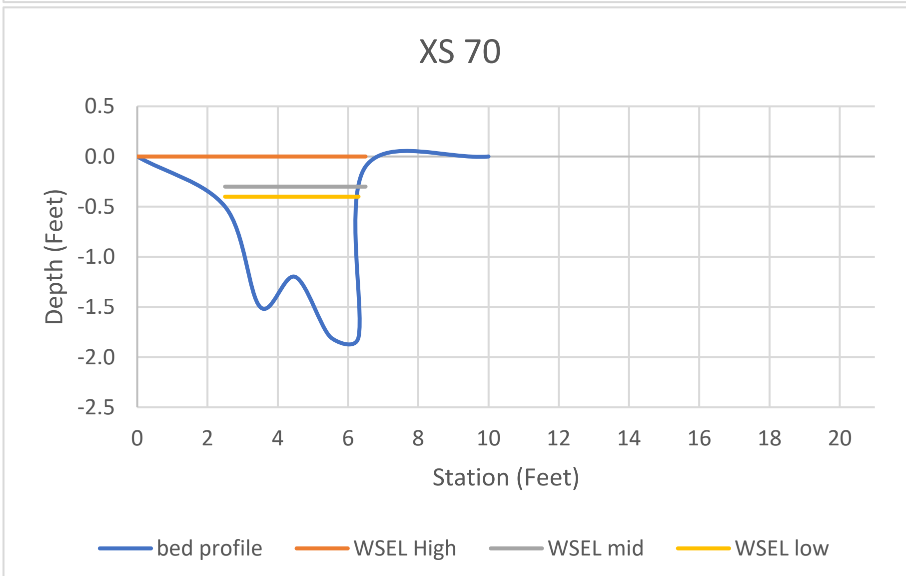

XS 10
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
Depth (Feet)
0
2
4
6
8
10
12
14
16
18
20
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low


XS 19
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
Depth (Feet)
0
2
4
6
8
10
12
14
16
18
20
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

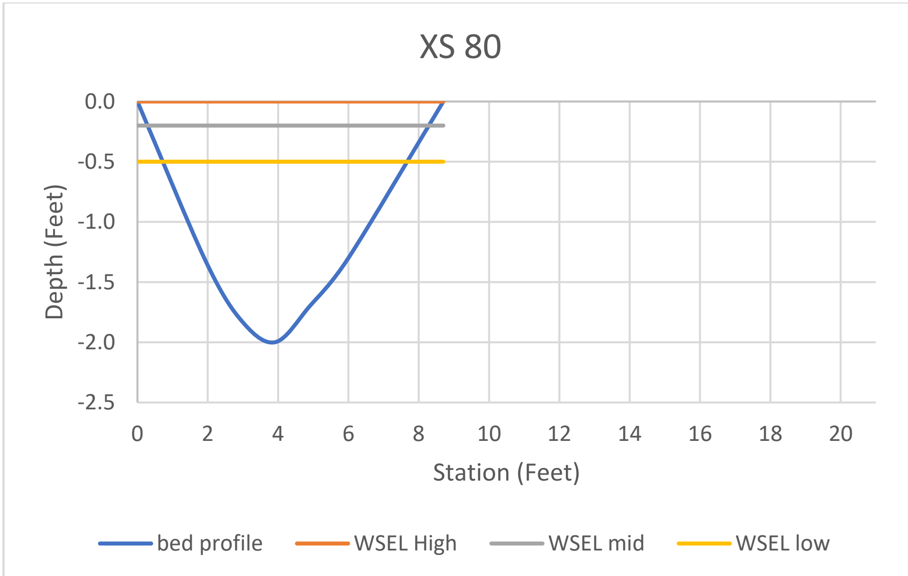

XS 30
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
Depth (Feet)
0
2
4
6
8
10
12
14
16
18
20
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

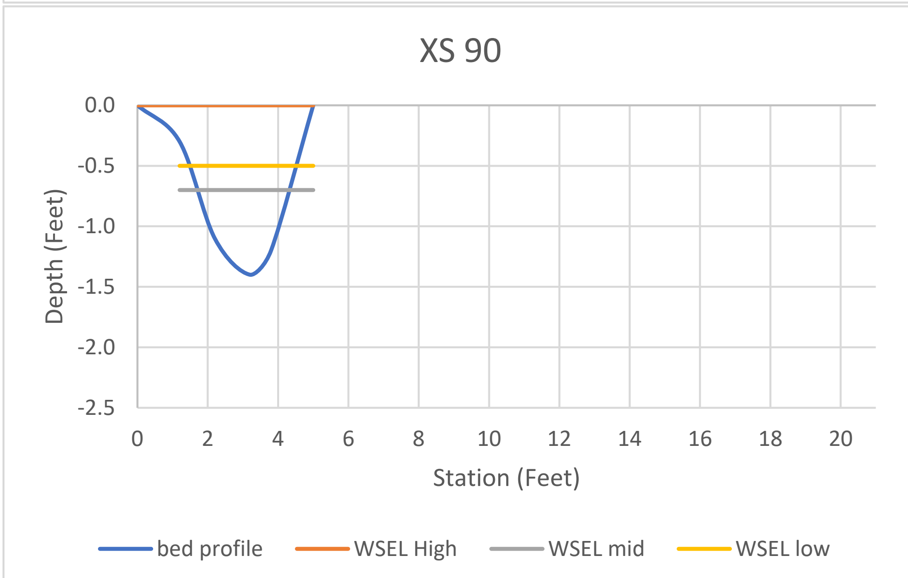


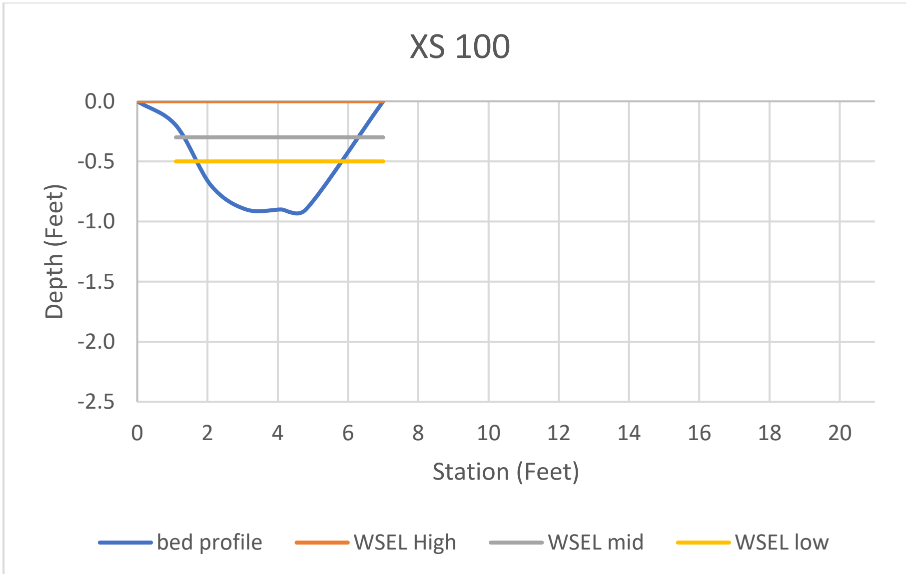
XS 40
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
Depth (Feet)
0
2
4
6
8
10
12
14
16
18
20
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

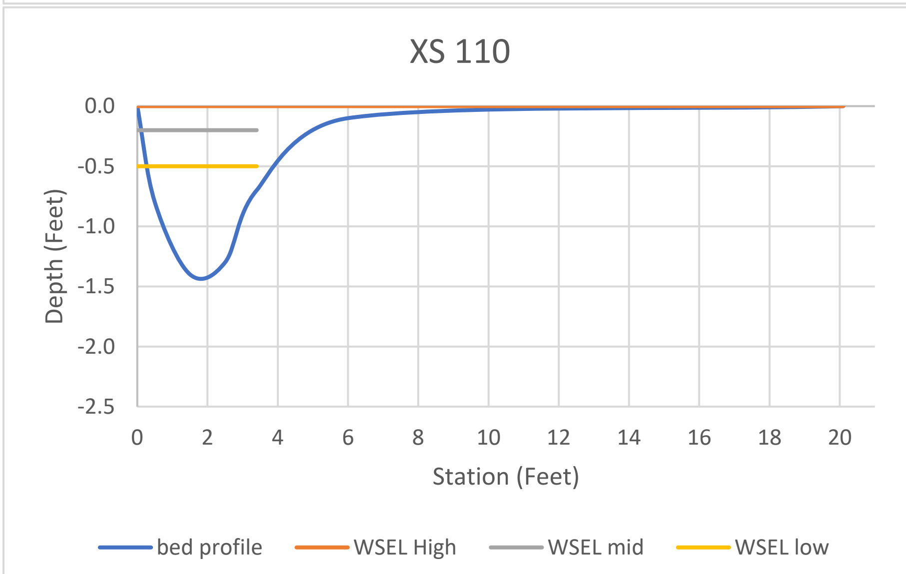


XS 70
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
Depth (Feet)
0
2
4
6
8
10
12
14
16
18
20
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

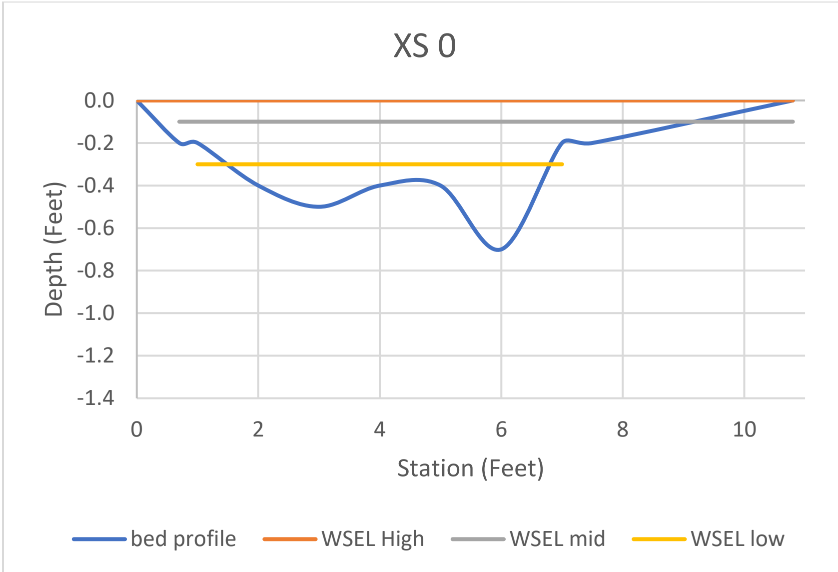

XS 80
Depth (Feet)
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
0
2
4
6
8
10
12
14
16
18
20
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

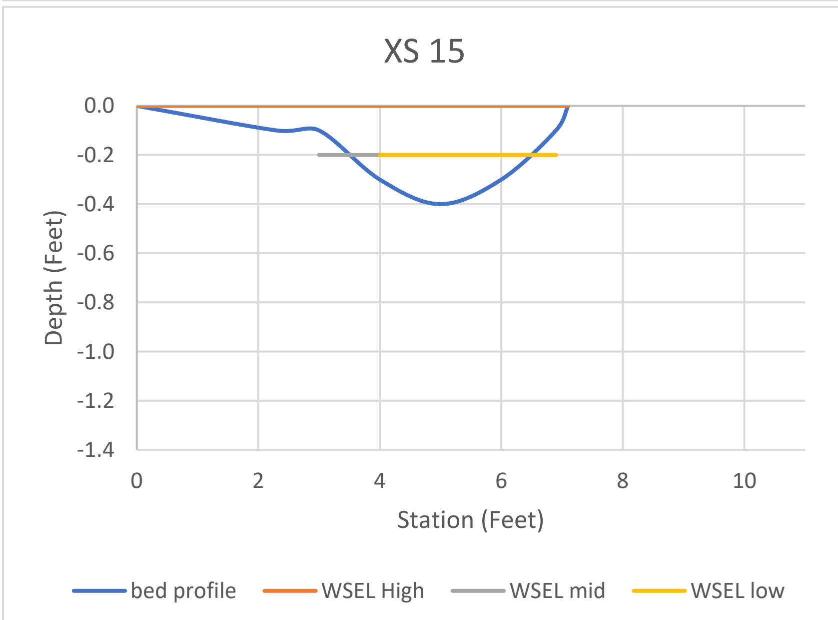

XS 90
Depth (Feet)
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
0
2
4
6
8
10
12
14
16
18
20
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

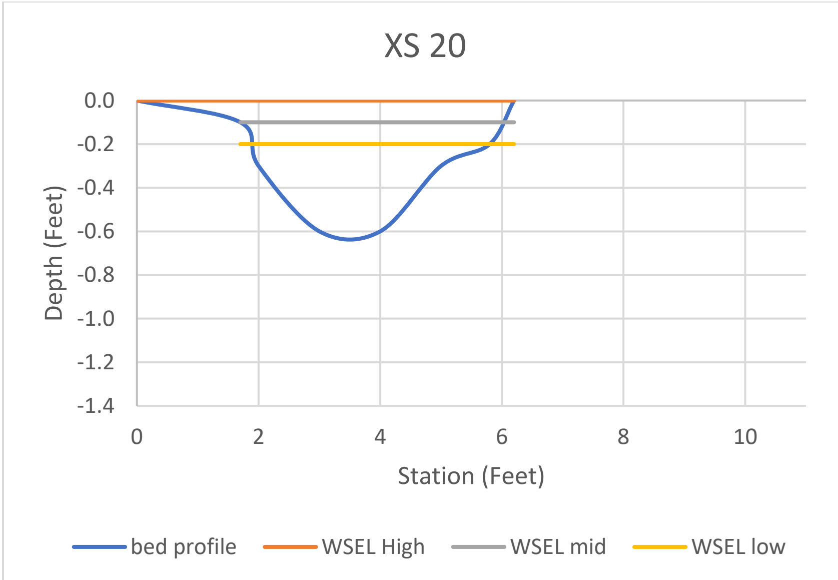

XS 100
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
Depth (Feet)
0
2
4
6
8
10
12
14
16
18
20
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

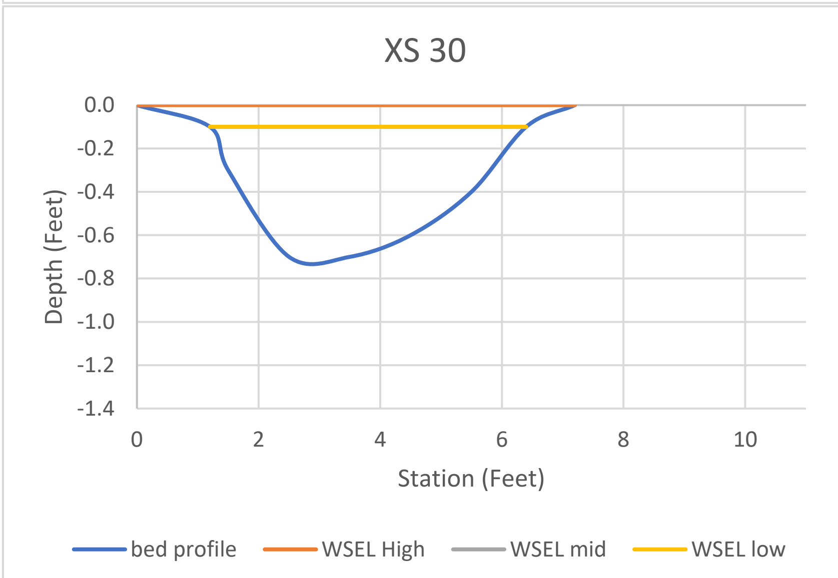

XS 110
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
Depth (Feet)
0
2
4
6
8
10
12
14
16
18
20
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

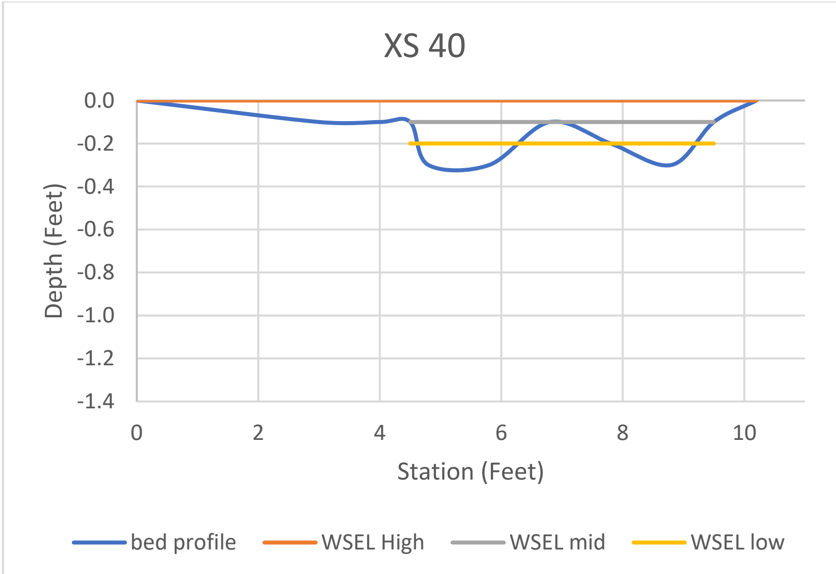
Birch Creek

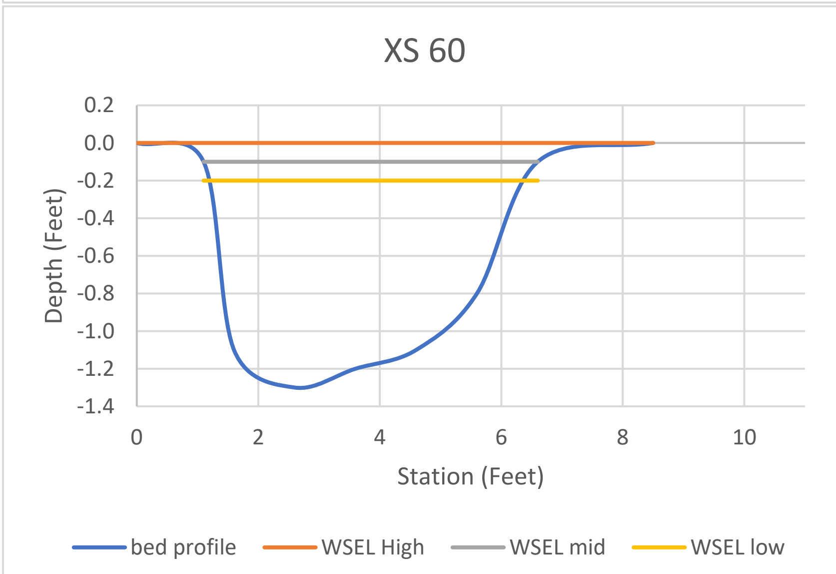

XS 0
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
-1.2
-1.4
Depth (Feet)
0
2
4
6
8
10
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

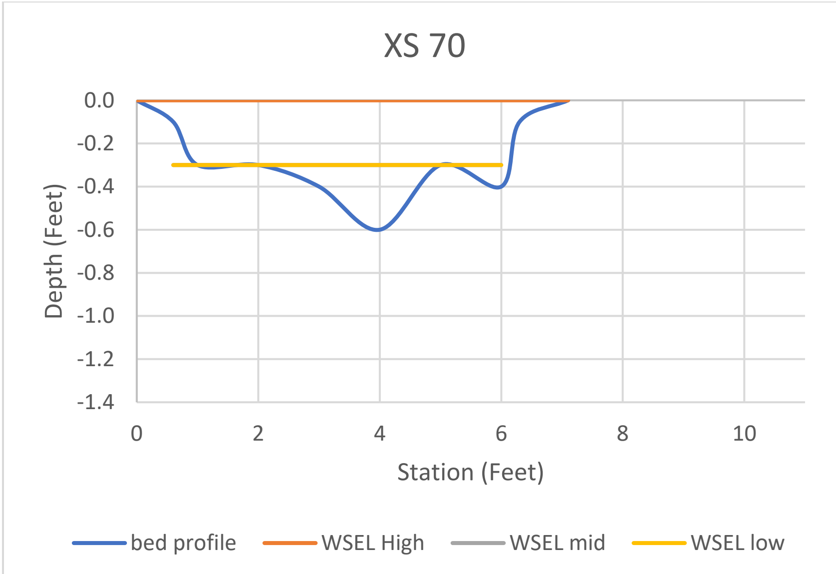

XS 15
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
-1.2
-1.4
Depth (Feet)
0
2
4
6
8
10
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

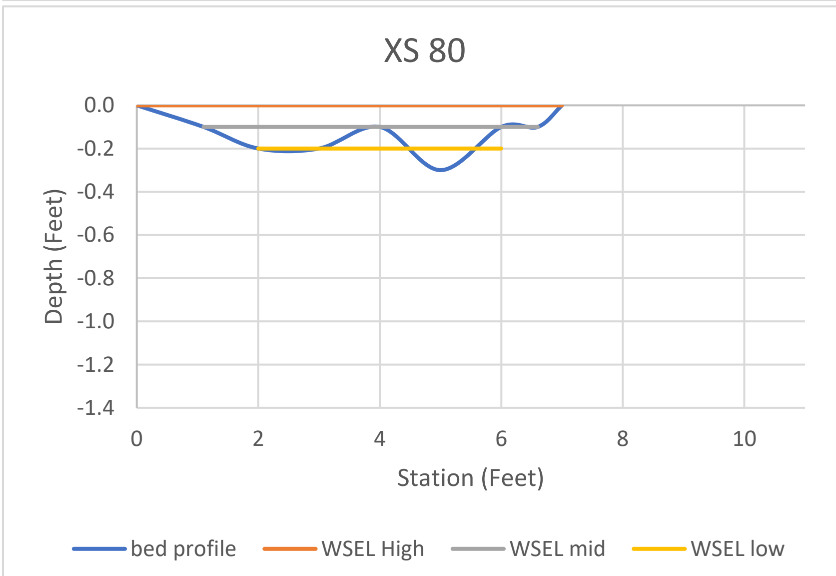

XS 20
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
-1.2
-1.4
Depth (Feet)
0
2
4
6
8
10
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

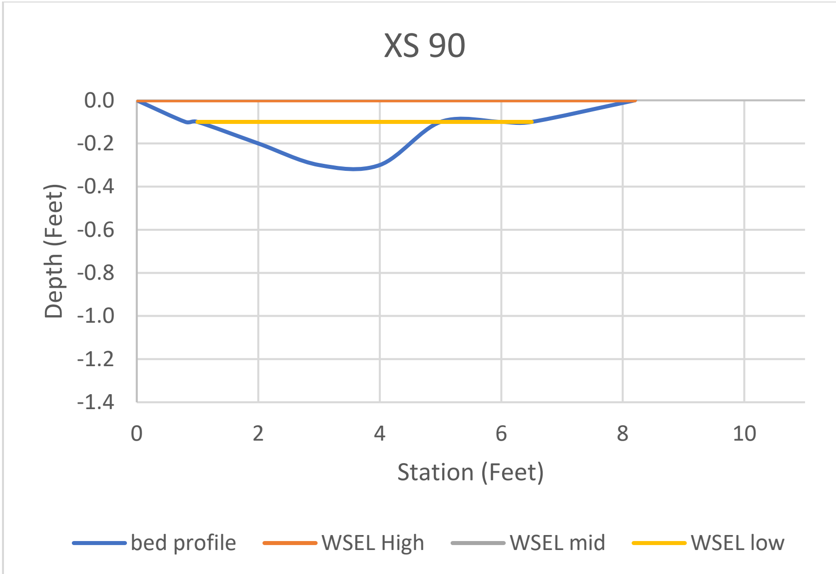

XS 30
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
-1.2
-1.4
Depth (Feet)
0
2
4
6
8
10
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

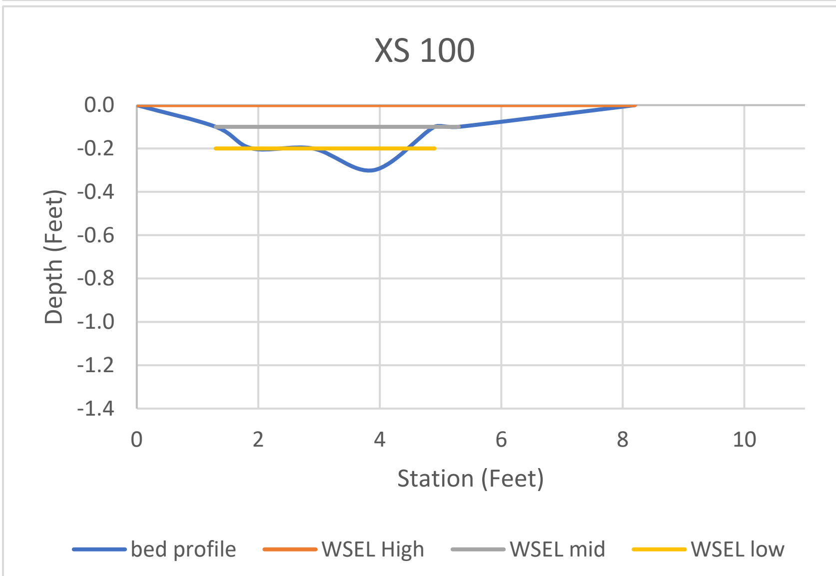

XS 40
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
-1.2
-1.4
Depth (Feet)
0
2
4
6
8
10
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low


XS 60
0.2
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
-1.2
-1.4
Depth (Feet)
0
2
4
6
8
10
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

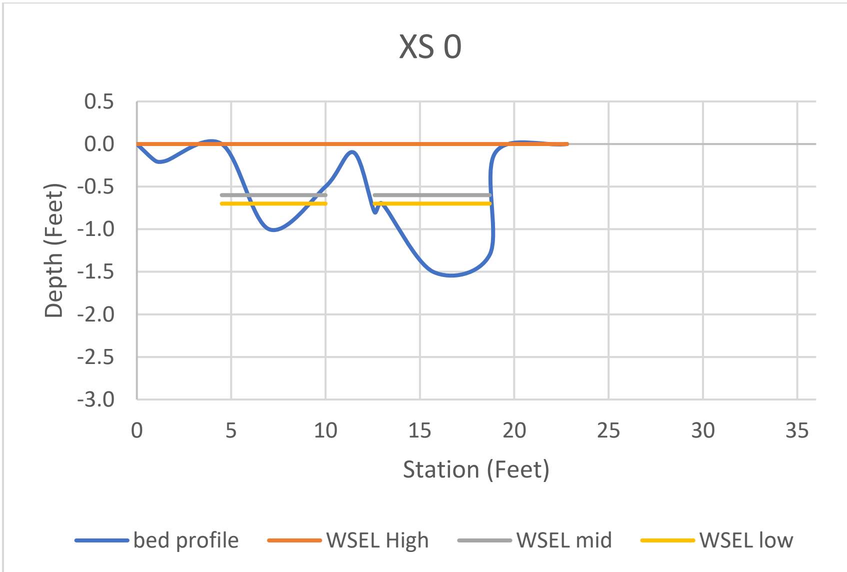

XS 70
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
-1.2
-1.4
Depth (Feet)
0
2
4
6
8
10
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

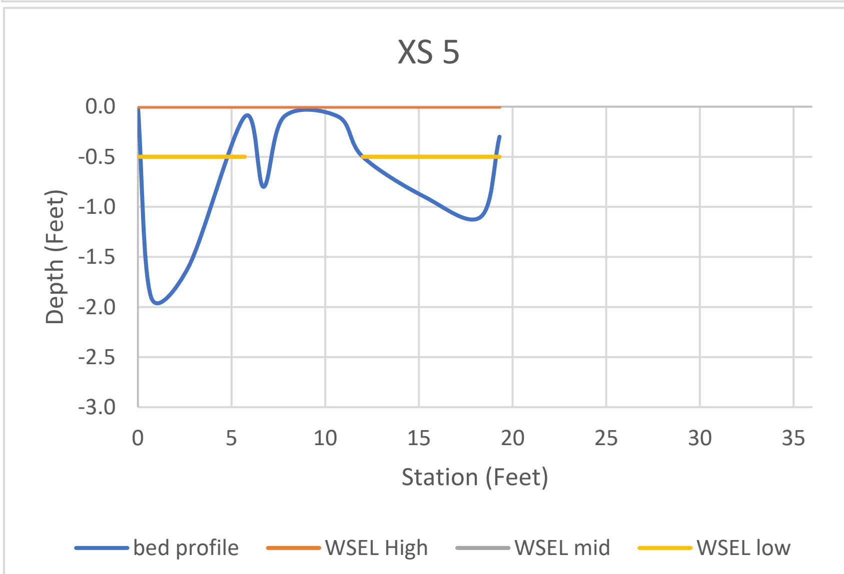

XS 80
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
-1.2
-1.4
Depth (Feet)
0
2
4
6
8
10
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

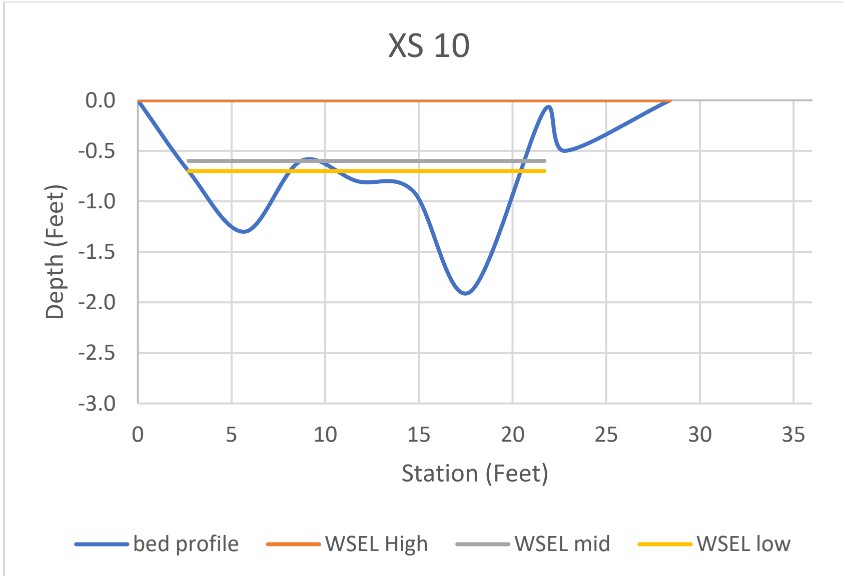

XS 90
Depth (Feet)
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
-1.2
-1.4
0
2
4
6
8
10
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

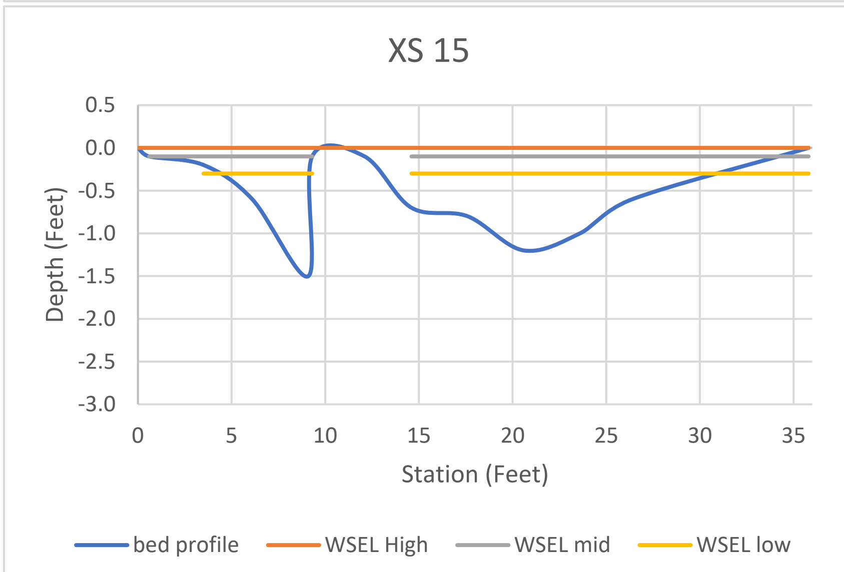

XS 100
Depth (Feet)
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
-1.2
-1.4
0
2
4
6
8
10
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

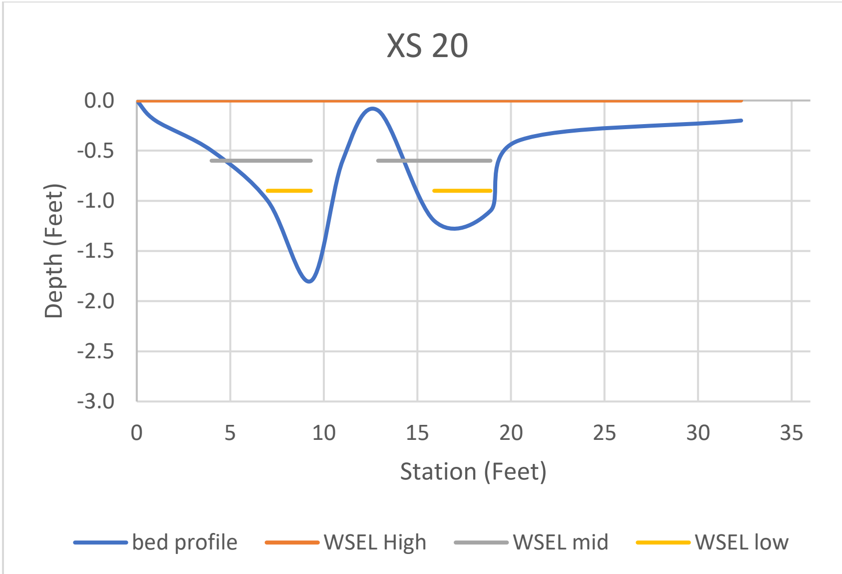
Bishop Creek Reach 4

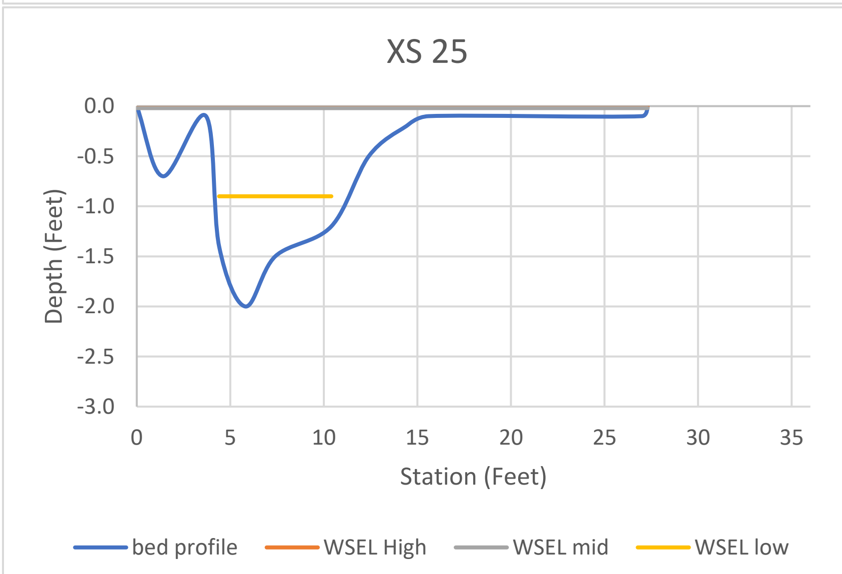


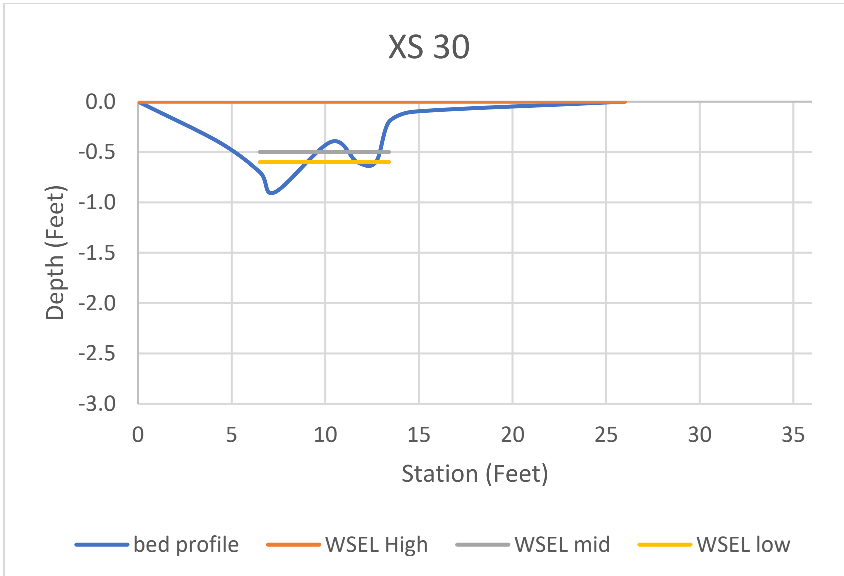


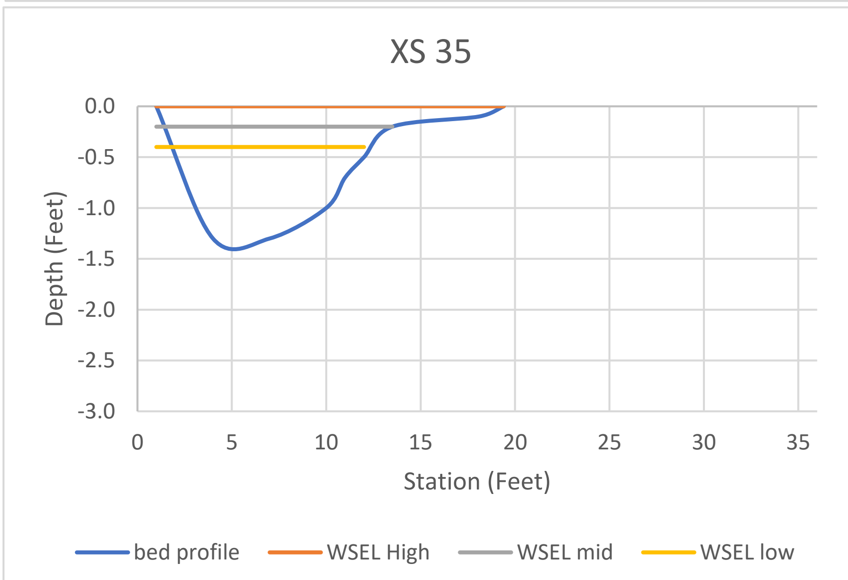

XS 10
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
Depth (Feet)
0
5
10
15
20
25
30
35
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

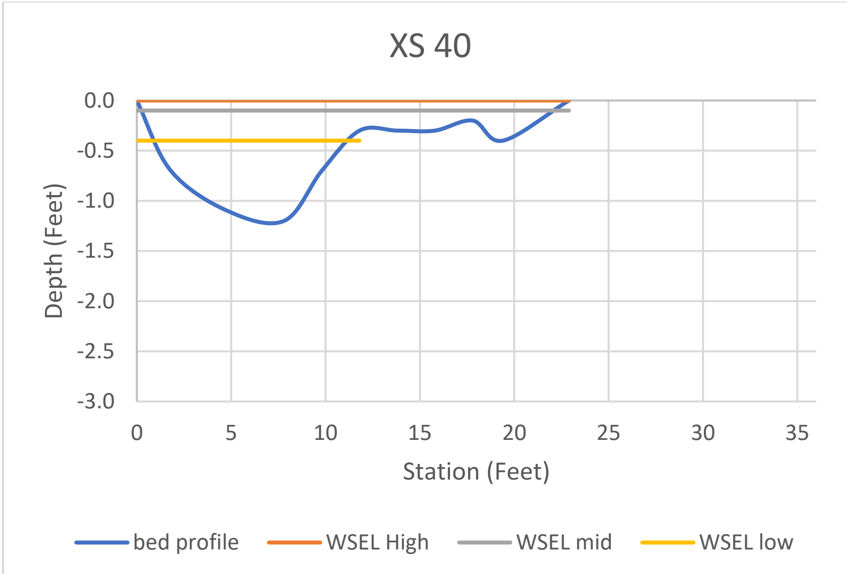

XS 15
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
Depth (Feet)
0
5
10
15
20
25
30
35
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

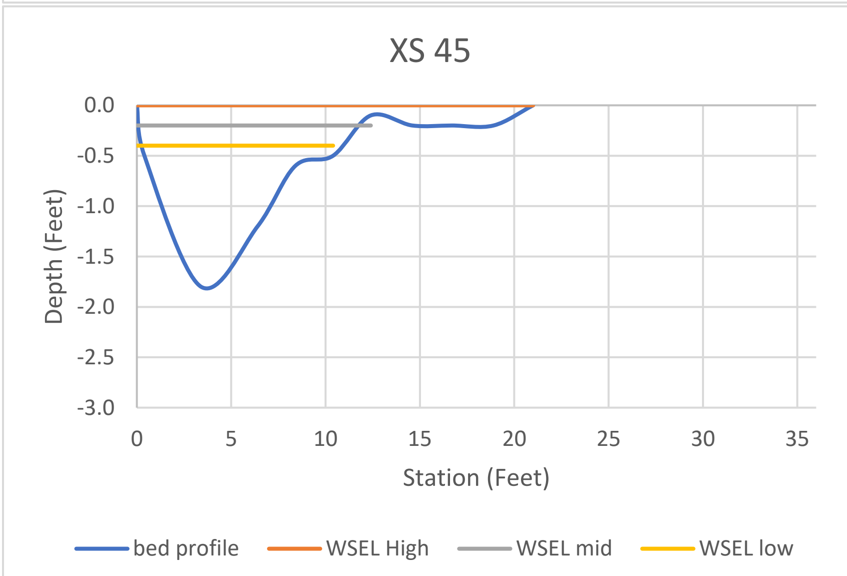

XS 20
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
Depth (Feet)
0
5
10
15
20
25
30
35
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

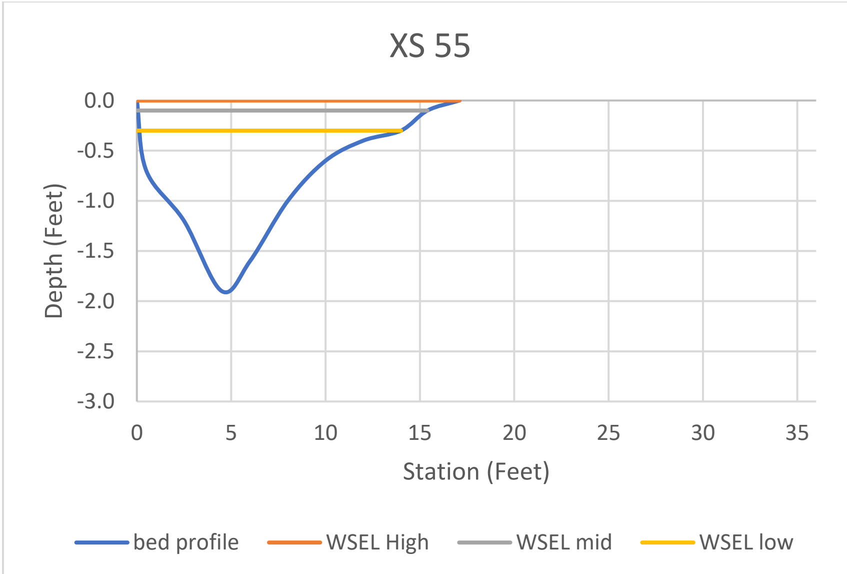

XS 25
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
Depth (Feet)
0
5
10
15
20
25
30
35
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low


XS 30
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
Depth (Feet)
0
5
10
15
20
25
30
35
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

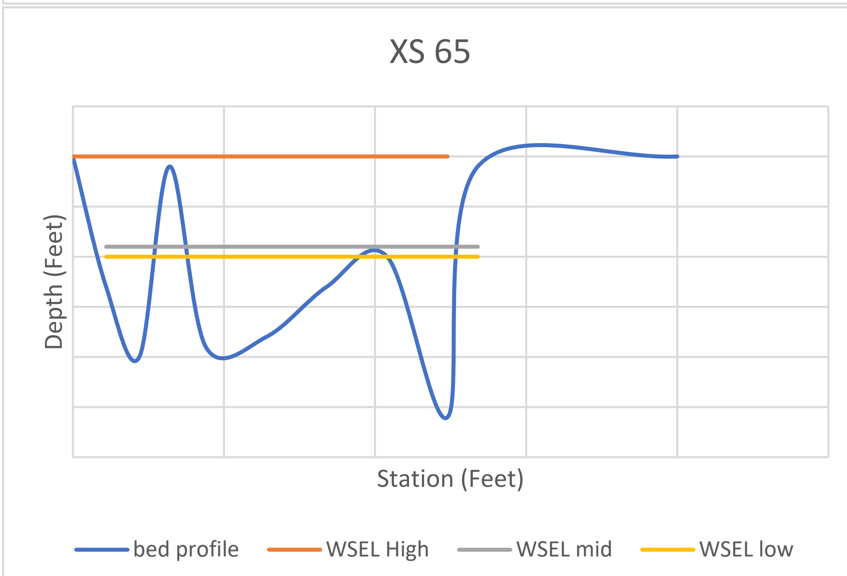

XS 35
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
Depth (Feet)
0
5
10
15
20
25
30
35
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low


XS 40
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
Depth (Feet)
0
5
10
15
20
25
30
35
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

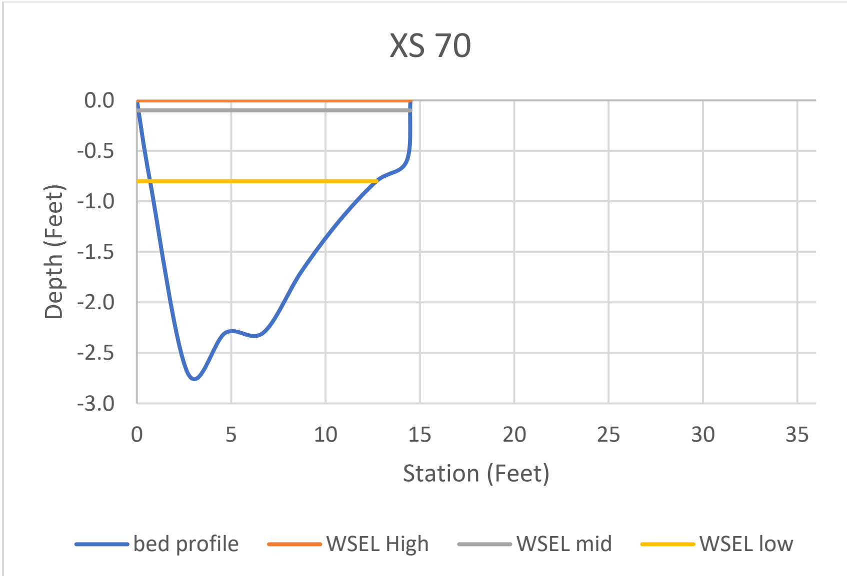

XS 45
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
Depth (Feet)
0
5
10
15
20
25
30
35
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

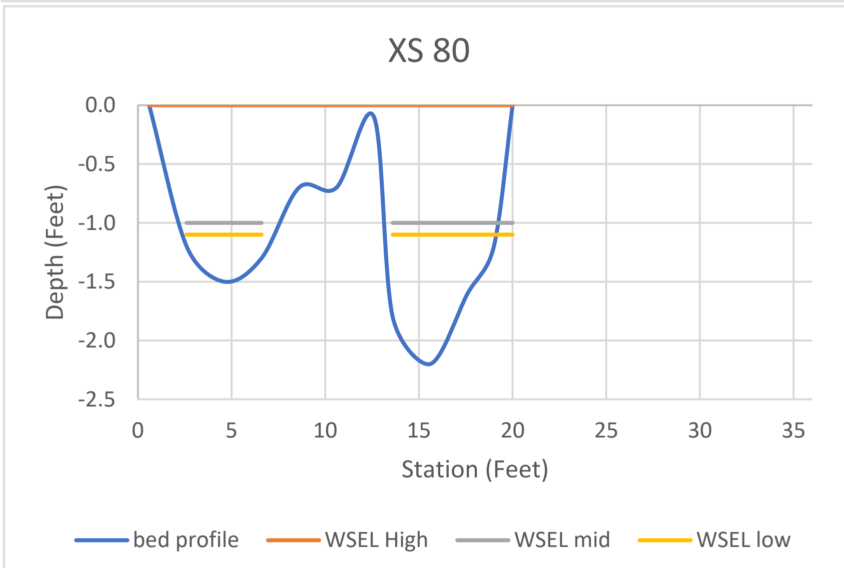


XS 55
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
Depth (Feet)
0
5
10
15
20
25
30
35
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

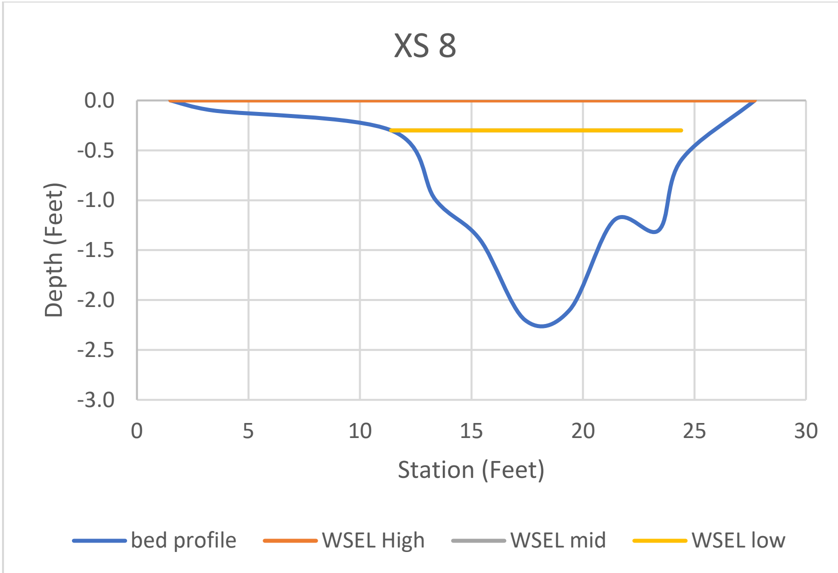


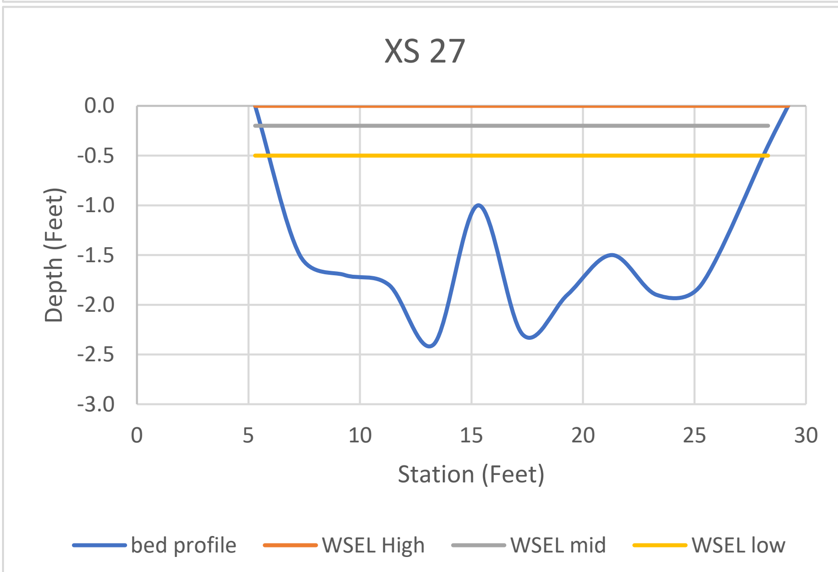
XS 65
Depth (Feet)
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

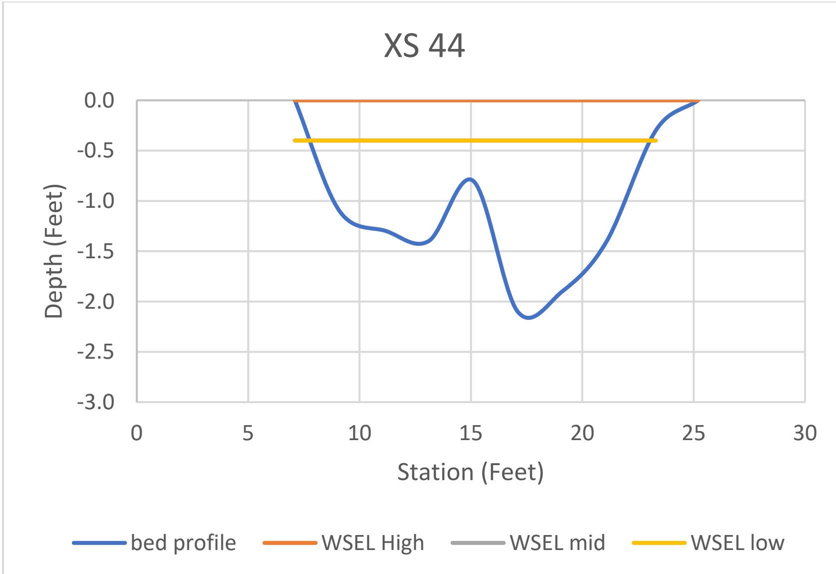

XS 70
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
Depth (Feet)
0
5
10
15
20
25
30
35
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

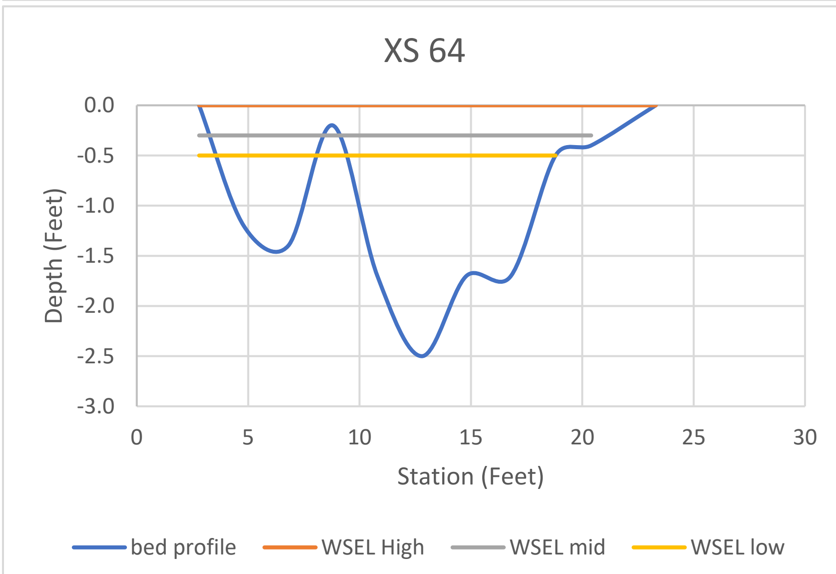

XS 80
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
Depth (Feet)
0
5
10
15
20
25
30
35
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

Bishop Creek Reach 6






XS 44
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
Depth (Feet)
0
5
10
15
20
25
30
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low


XS 64
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
Depth (Feet)
0
5
10
15
20
25
30
Station (Feet)
bed profile
WSEL High
WSEL mid
WSEL low

APPENDIX C

HABITAT SUITABILITY CONSULTATION

Memorandum

To: Bishop Creek Fish and Aquatics Technical Working Group

From: Brandon Kulik

Date: June 25, 2020 **Document No.** 3202003.04_ME_001

Re: **INSTREAM FLOW STUDY - HABITAT SUITABILITY CRITERIA**

The Fish and Aquatics Technical Working Group discussed developing a Bishop Creek instream flow study, that included the species and lifestages for which Habitat Suitability Criteria (HSC) would be required (during scoping for the Bishop Creek Project relicensing) in 2018 and 2019). This memorandum updates the discussion between the U.S. Forest Service (USFS), California Department of Fish and Wildlife (CDFW), and SCE/Kleinschmidt Associates for developing HSC for following species and lifestages:

- Adult and juvenile brown trout (*Salma trutta*)
- Adult and juvenile Owens sucker (*Catostomus fumeiventris*)
- Adult speckled dace (*Rhinichthys osculus*)

On March 14, 2020, the USFS and CDFW participated in a conference call with Brandon Kulik, Kleinschmidt, the lead fisheries scientist for the Bishop Creek relicensing, to discuss, review, and finalize HSC for brown trout and Owens sucker. There was concurrence with the proposed criteria, which Kleinschmidt used to complete the PHABSIM model for brown trout and Owens sucker. CDFW subsequently provided raw data for the Owens speckled dace that was used to develop HSC curves for this species. This memorandum provides recommended HSC curves for depth, velocity, and substrate, for Owens speckled dace based on that consultation.

CDFW provided a summary of habitat preference observations for Owens speckled dace on May 20, 2020, collected in Pine Creek (north of Bishop Creek), using point measurements of depth, substrate, cover and width where speckled dace were encountered[1]. CDFW processed the data using a Pearson Chi-Square Goodness of Fit Test based on over 600 individual fish observations. In general, the data showed that

[1] No velocity data were collected by CDFW; after further consultation it was agreed that another dace species with similar overall autecology and available velocity data could be used as a surrogate.

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project
(FERC Project No. 1394)

DRAFT LICENSE APPLICATION

FINAL TECHNICAL REPORT
OPERATIONS MODEL (AQ2)

Southern California Edison
1515 Walnut Grove Ave
Rosemead, CA 91770

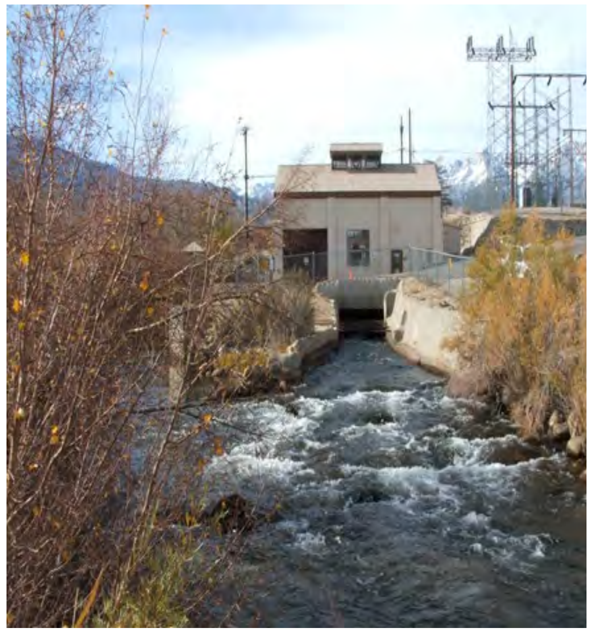
January 2022

Support from:

Kleinschmidt

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project (FERC Project No. 1394)



FINAL TECHNICAL REPORT OPERATIONS MODEL (AQ2)

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

JANUARY 2022

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

During the initial Technical Working Group (TWG) meetings, Southern California Edison (SCE) and stakeholders identified the need to develop a user-friendly Operations Model to assist stakeholders and SCE to identify key hydrologic connections among the components of the Project. This technical report summarizes the development and application of a model created to simulate the Bishop Creek Hydroelectric Project's (Project) operation relative to water resource allocation in support studies conducted on the aquatic and riparian environment. A thorough description of the Project's physical features, flow routing, hydrologic characteristics, regulatory and legal requirements, and powerhouse generating equipment were presented in the Initial Study Report filed on October 30, 2020 and are incorporated by reference. Minor subsequent modifications to the model were incorporated following additional consultation, to include flow contributions from the Birch-McGee nodes, as well as additional hydrograph for results. Overview graphics are provided below for convenience.

2.0 MODEL DESCRIPTION

The operations model was developed as an Excel-based platform to facilitate user accessibility. The purpose of the model is to evaluate impacts from potential changes to the operations within the Bishop Creek system. Using information supplied by SCE, available flow data downloaded from United States Geological Survey (USGS), and snow course measurement data from National Resource Conservation Service (NRCS), logic was developed to allocate hydrologic resources on a daily temporal resolution. The model determines the ability to meet target flows based upon period of record associated with available hydrologic data necessary to represent the system's primary contributions. Storage records for the two primary reservoirs, as well as the flow through Plant 6, were fundamental datasets for constructing can calibrating the model, and result in a start date of 1990.

The file containing the model is divided into tabs for user input and results; hydrologic contributions; and logic for allocation. In addition to the summary graph tab, a more detailed input and summary tab provides more descriptive statistical results of the model and a comparison with a baseline scenario (reflective of current flow targets). Where the majority of the statistics are provided in the input and summary tab, additional post-processing calculations may still be required for alternative flows in lower flow years (described in comment response number 7). Hydrographs and flow exceedance curves are also provided in tabs for select locations. Separate tabs for snowpack and streamflow hydrologic datasets are used as datasets for inflow and determination of year type. Tabs for each of the five powerhouses contain arrays of calculations that represent physical elements of the project, or nodes where logic governs the flow daily at that location within the system.

The summary graph tab with inputs for flow targets at set locations of interest allows user to change flow targets. Results of the ability to meet these targeted daily allocations is displayed next to inputs, and storage graphs for Lake Sabrina and South Lake are also displayed for each year type on the summery graph tab.

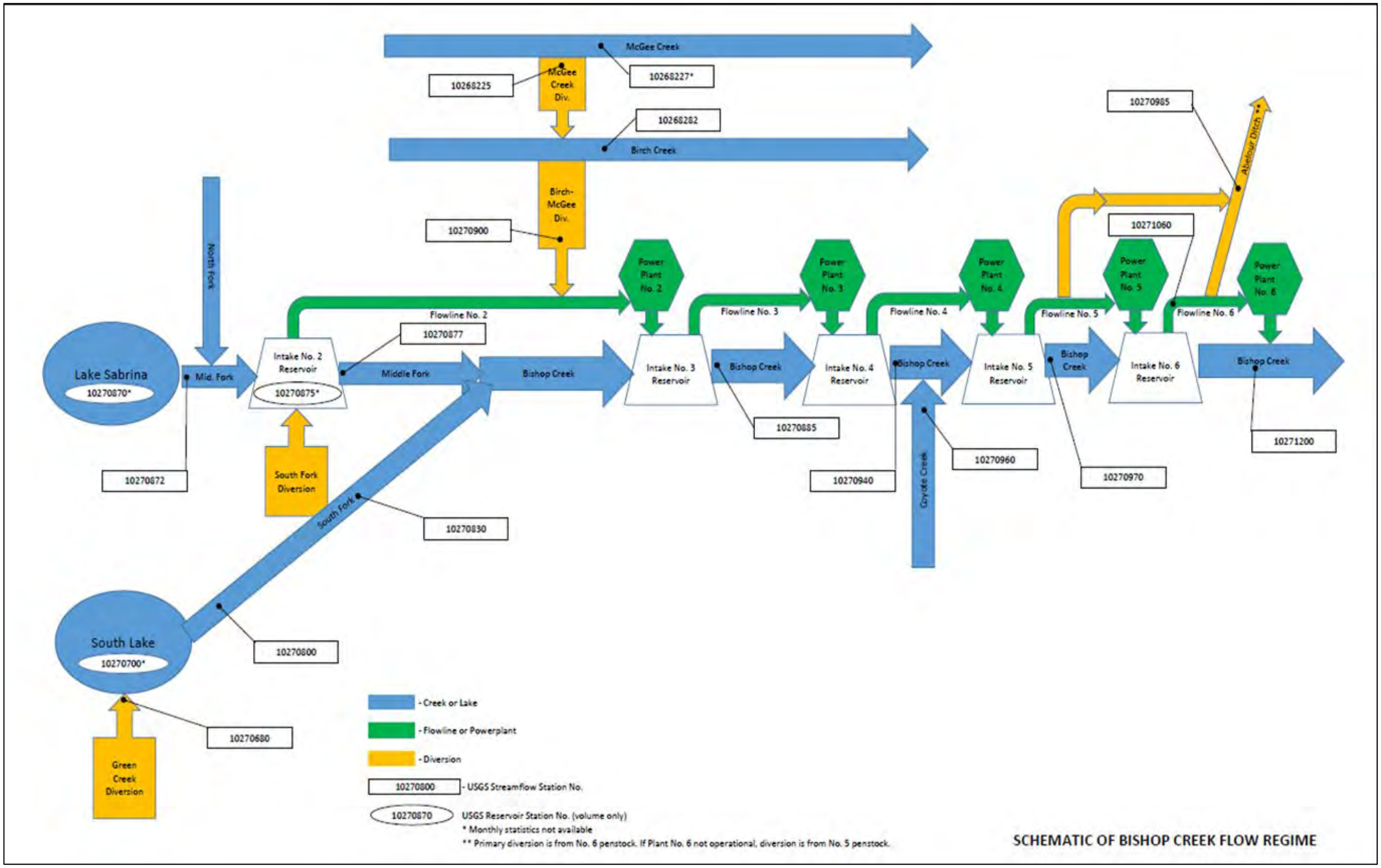


Figure 2.1-1 Bishop Creek Flow Routing

2.1 Flow and Storage Inputs

Inflow contributions were calculated for each node within the model on a daily basis. A mass-balance based on storage change and gaged flows was used for nodes where data was available. Ungauged contributions were either prorated from representative gage data based on drainage area ratio or synthesized based on historic records predating the aforementioned period of daily data records. Lake Sabrina and South Lake represent the primary storage reservoirs for the system, while the gaged releases from those reservoirs are used as a mass balance approach to calculating the daily inflow to each of those nodes. North Fork, Coyote Creek, seepage and small springs, and general area runoff constitute the ungauged contributions to the system. Minor contributions from the Longley reservoir are captured via one gage measuring combined flows from McGee and Birch diversions.

Inflow to the system is independent of how water is allocated, and therefore correlates with greater precision. The total daily inflow is calculated as the flows that exit the system plus the increase in storage. Flows that leave the system are measured at the same three locations as the reflective nodes in the model: through the plant 6 powerhouse, in the bypass reach below the intake reservoir for plant 6, and in Abelour Ditch. The historic inflows are calculated using historic data for two gages measuring flow through and bypassing plant 6, and in Abelour Ditch. Daily storage measurements in both Lake Sabrina and South Lake provide the actual increase or decrease, and the model calculates a daily storage based the previous day's calculated storage, inflow and outflow from each reservoir. These were summed with the model-calculated daily increase in storage in both Lake Sabrina and South Lake. For this historic inflow dataset, two flow gages at plant 6 and one on Abelour Ditch were summed for the historic daily releases.

Table 2.1-1 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

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
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
2017-18	3265	2911	2488	2649	2111	2879	6459	10540	14114	13304	7708	3053	71481
2018-19	2731	2341	2456	2686	2892	2331	5466	10251	26724	24997	11010	5547	99432
2019-20	3067	2734	3143	2682	2297	2522	4799	11976	10311	6127	4150	2722	56530
Average	2670	2448	2591	2645	2403	2702	3891	9670	15419	13319	7000	3675	68433

Figure 2.1-2 and Figure 2.1-3 represent the operating rule curve for normal, wet and dry water years. The area-capacity curves that are used by Project operators to manage reservoir elevation and discharge were included in the Operations Model.

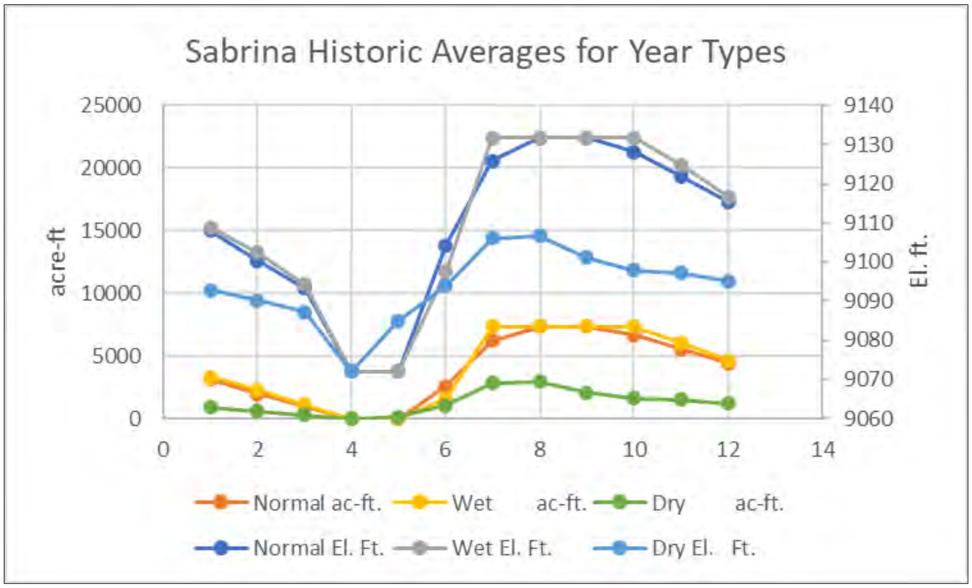


Figure 2.1-2 Sabrina Historic Averages for Year Types

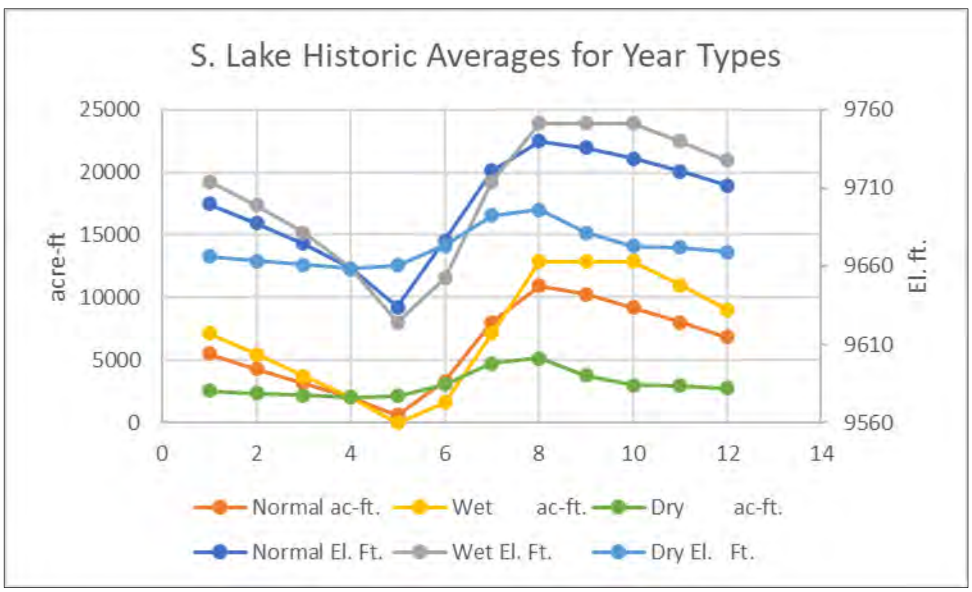


Figure 2.1-3 South Lake Historic Averages for Year Types

2.2 Model Calculation Logic

Physical constraints, then flow allocation priorities, are the basis for logic that drives calculation of daily flow allocation. Physical constraints are represented within the model as the basic structure for hydraulic thresholds. Hydraulic capacity of turbines and flowlines as well as reservoir storage capacities determine upper limits for flows through equipment and triggering spilling from reservoirs and intakes, while lower limits on storage are fixed to trigger “or inflow” releases. These values drive model calculations and limits such as spilling when a storage reservoir reaches a spillway elevation, or when an intake reservoir is full and the powerhouse flow capacity is maximized, or the model resorting to “or inflow” releases when storage is depleted.

Within the physical logic constraints, daily flow allocations are prioritized for water rights and regulatory requirements, including the Chandler Decree requirements and FERC license minimum flow requirements. When these are met, the model logic targets storage elevations based upon historic averages associated with a reflective water year categorization. Flows above required bypassed reaches that are released for storage management are used for generation up to the capacity of each plant’s hydraulic capacity. Water year types are determined based upon spring snow course measurements, and used to categorize each year as wet, normal, or dry. Wet and dry years are calculated as having snow course measurements 25 percent higher or lower than the long-term average. Future planning for resource allocation is also incorporated in the logic, with various forecast durations set on the Input and Summary tab, default set at 90 days to reflect current SCE planning. This prioritizes storage for minimum flow needs to meet the period selected over the daily storage target.

2.3 Calibration

Hydrologic calibration was performed using a mass balance comparison of total daily inflow as calculated by the model versus those measured by gages. Historic flow releases do not necessarily follow the exact logic coded into the model, which is a representation of current requirements and typical operations. Some releases predate the current regulatory targets, and some planning efforts by SCE to conserve flows has occasionally resulted in changes to daily targets. SCE may also use excess storage at any given time to facilitate system load demands as a priority over following a daily storage target. These factors reduce the accuracy of correlating daily outflows between the model-calculated and historic values. A graphic comparison of model versus historic outflows and calculated inflows demonstrates these factors.

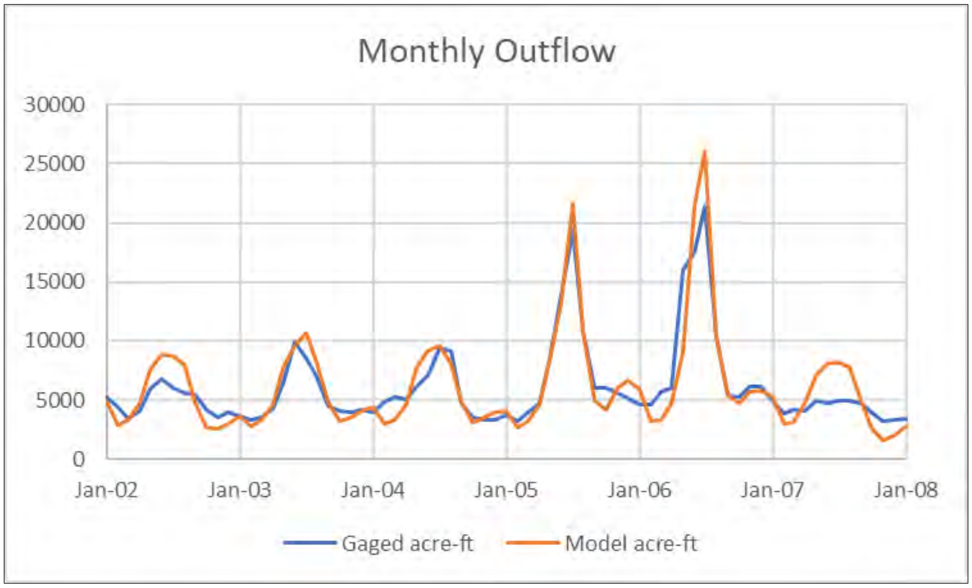


Figure 2.3-4 Monthly Overflow

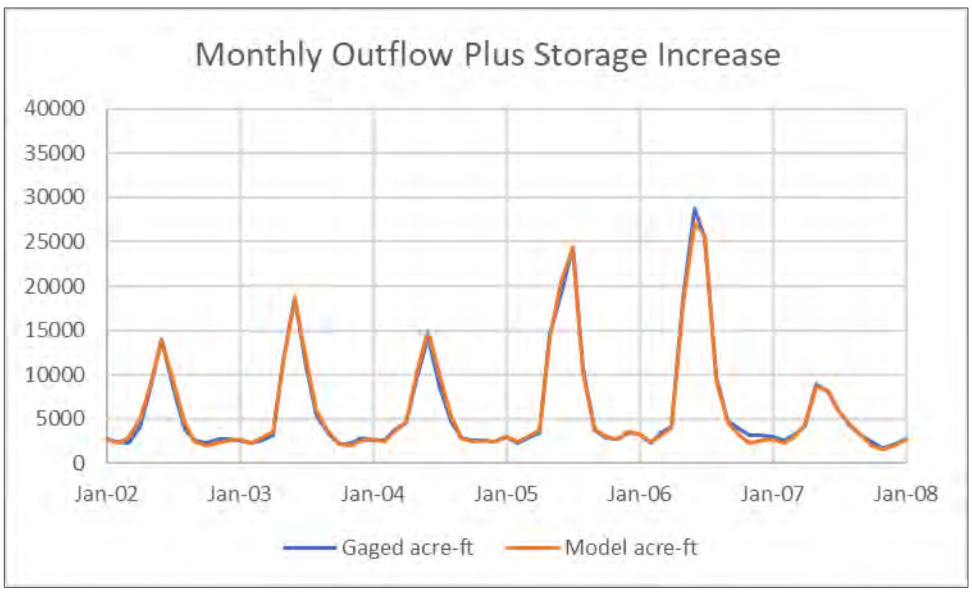


Figure 2.3-5 Monthly Overflow Plus Storage Increase

The two daily inflow datasets were plotted for direct correlation. Because of the distance between the reservoirs and the gages measuring flow exiting the project, the duration between releasing water from upper storage reservoirs and exiting the system is long enough to negatively impact the correlation. The average of concurrent daily inflow totals increases the correlation, with longer averages having better correlation. Single day, three- and five-day average correlations were examined (Figure 2.3-6 through Figure 2.3-8). A nearly two percent increase occurs when changing from single to three-day average correlation. As the incremental benefit of using five-day was less than a half percent, this dataset was deemed acceptable for developing corrective regression formulae.

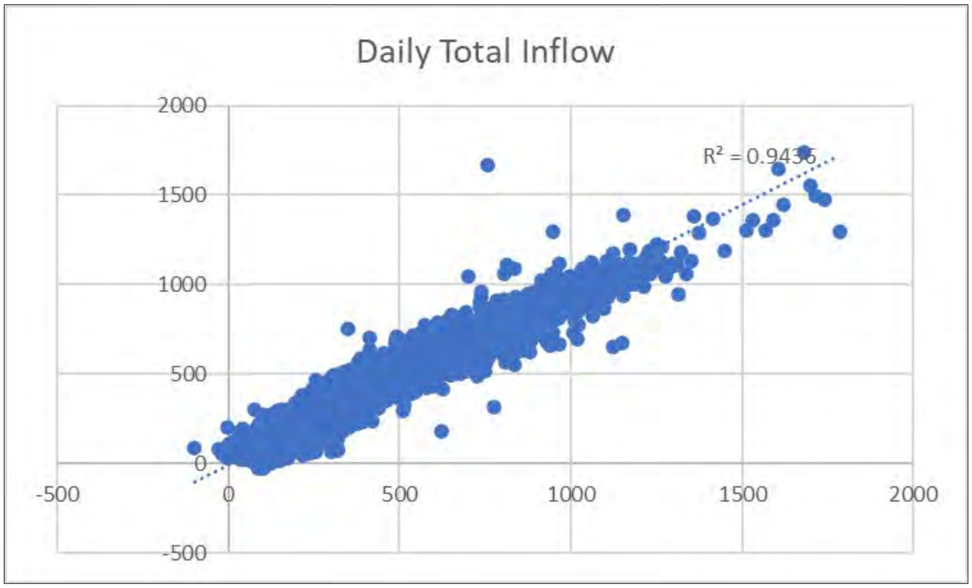


Figure 2.3-6 Daily Total Inflow

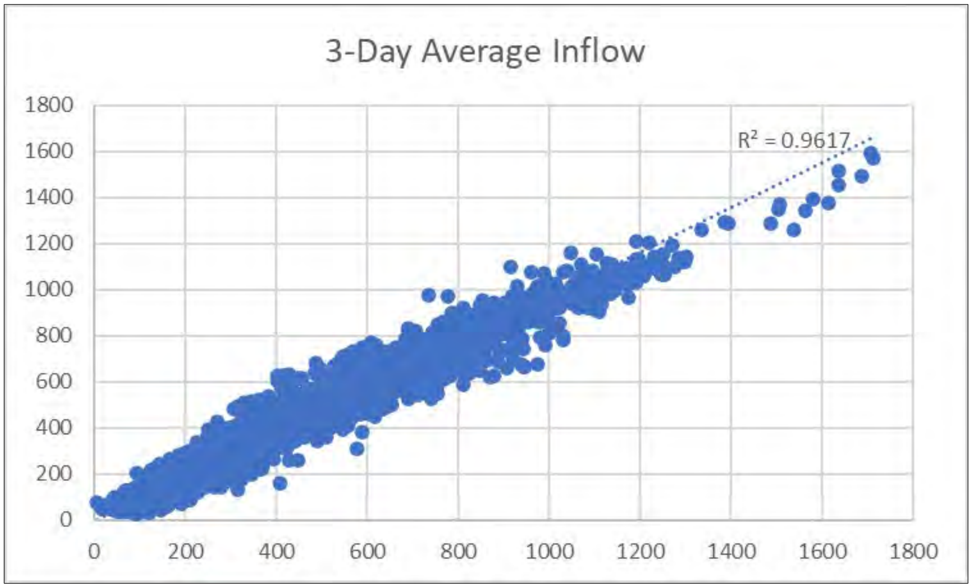


Figure 2.3-7 3-Day Average Inflow

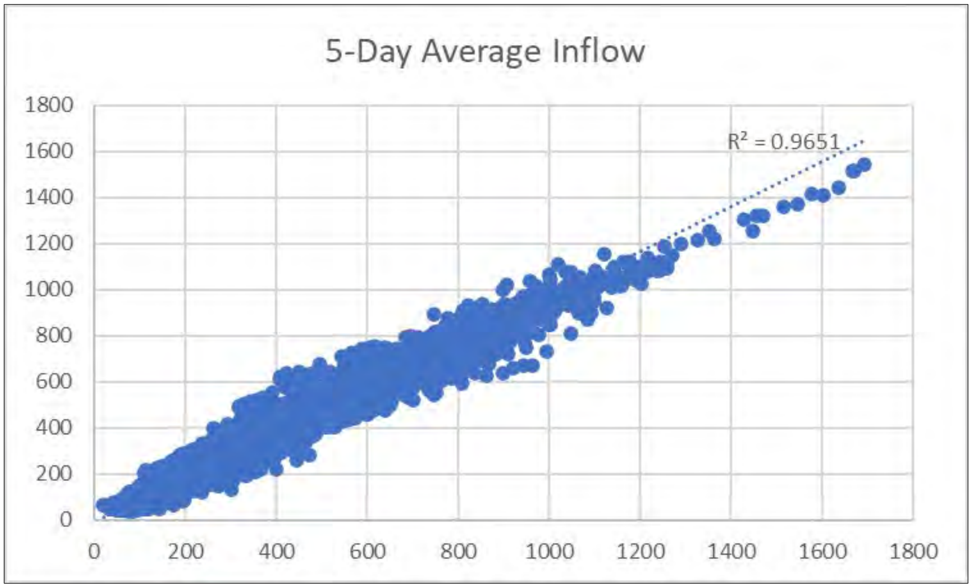


Figure 2.3-8 5-Day Average Inflow

The 5-day average model and gaged inflows were separated into monthly datasets to represent seasonal variability more accurately (Figure 2.3-9). The results of the monthly correlations are included as Appendix A. Using these sorted datasets, equations were developed to apply to monthly calculated inflows and applied at each point of inflow in the model, reflective of that point's contributing drainage area. After this correction was applied to each inflow point, the resulting average value was calculated for each month and compared with the average calculated gage inflow. Additional correction factors were applied to bring the average monthly model-calculated inflow within a tenth of a percent.

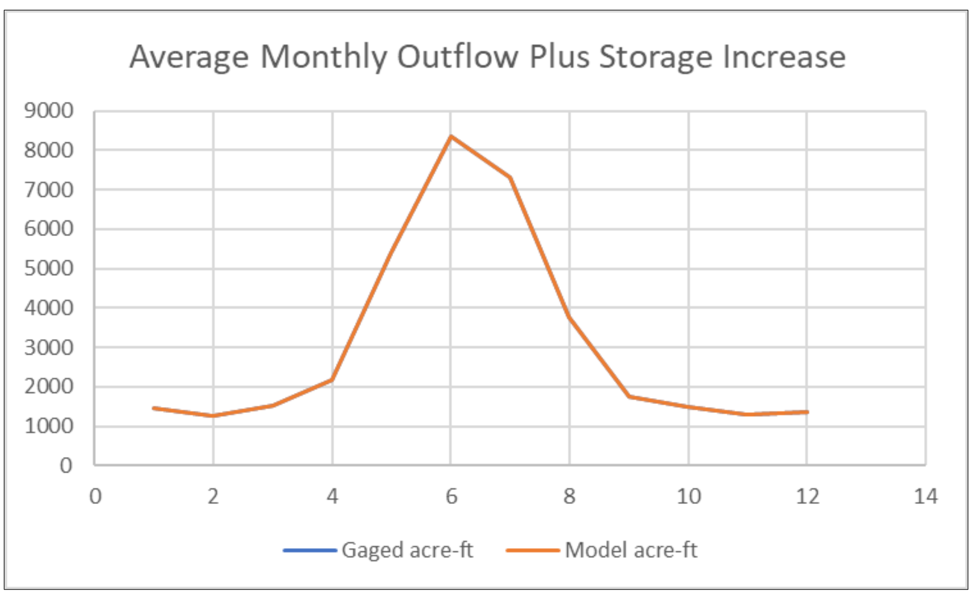


Figure 2.3-9 Average Monthly Outflow Plus Storage Increase

Daily deviations exist, and some seasonal and even annual total calculated values deviate from gauge-measured inflows. While synthesizing or prorating flow contributions from ungauged sources increases overall model accuracy, error exists because not all inflow is measured. Given the availability of data, the model is calibrated and adjusted to the extent possible. The model represents the hydrology of the system and represents the normal operation of the existing features under current regulatory requirements.

2.4 Application and Results

The intent of the model is to measure the ability of the Bishop Creek system to meet flow targets determined beneficial by studies conducted in support of the licensing process. Flow allocations that enhance various reaches can be entered into the model as alternative scenarios to the current baseline conditions. Entering flow targets for cells designated for specific channel reaches on the Summary Graph tab results in the model calculating the percent of successful days when the target flow is missed. The resulting percentage is displayed in a cell adjacent to the flow target; impacts to all other reaches' target flows are calculated, displayed adjacent to their reflective entry cells. The percentage of missed target flows attributable to dry years is also displayed for each location. The model also checks for success in meeting the "or inflow" alternative minimum flow requirement at each location. Using the "Flow Reset" macro changes all flow input values to the current pre-license targets.

Cells displaying the results are color-formatted based on calculated percentages, allowing a quick visual of impacts across the system based on changes made to any target flow. The greater percentage of time a target is missed, the redder the format, while greener format is applied as the target is more consistently met.

On the Input & Summary tab, baseline target flows are listed for comparison to alternative scenario flows, with missed percentage values shown for each. Results for missed target percentages are further categorizing into wet, normal, and dry years for each location. Comparison of relative increases or decreases from the baseline results are calculated for each location.

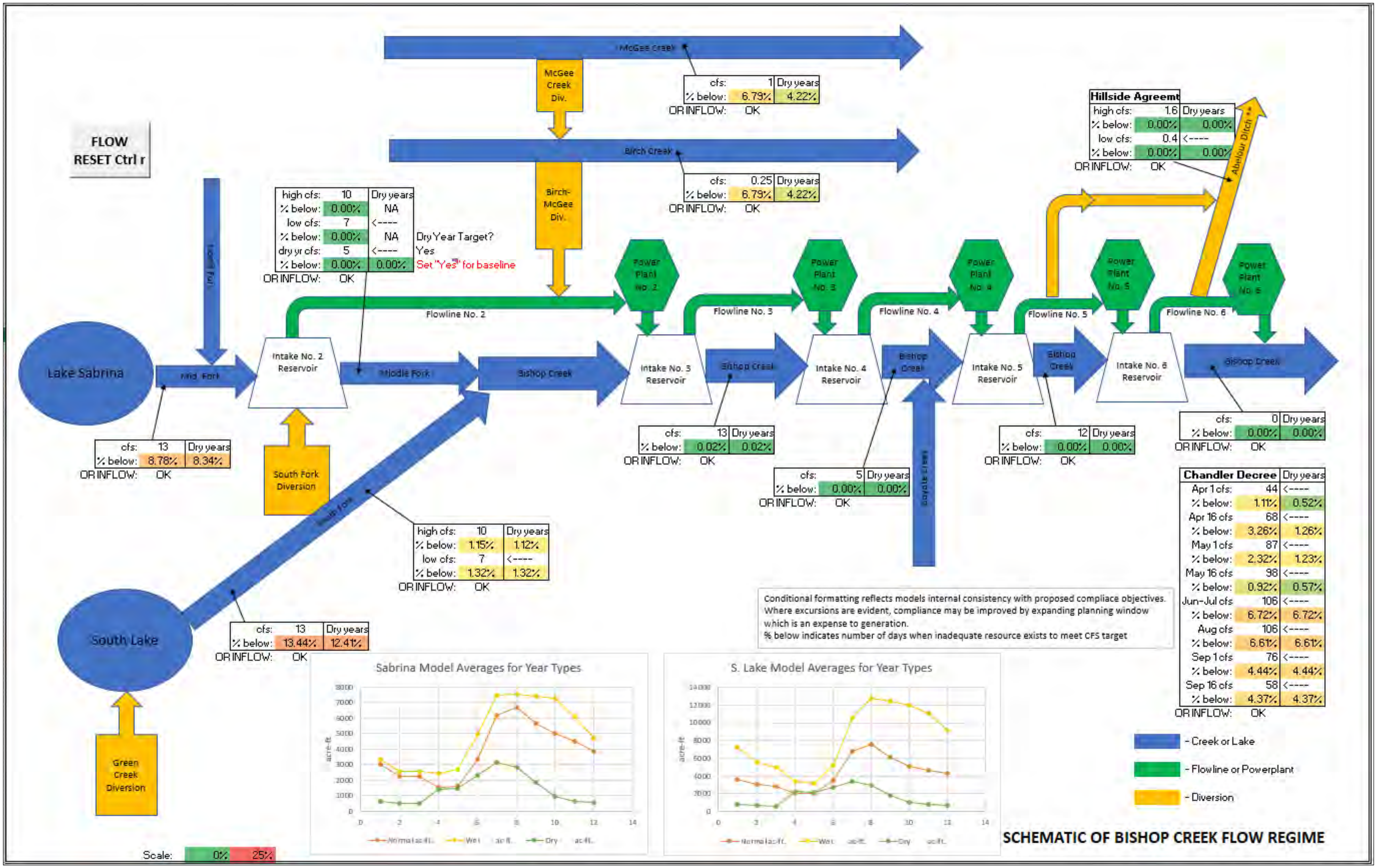


Figure 2.4-10 Baseline Model Summary Graph Input & Result

3.0 CONSULTATION SUMMARY

SCE distributed periodic progress reports on the following schedule:

- Progress Report 1: December 19, 2019
- Progress Report 2: April 14, 2020
- Progress Report 3: July 24, 2020
- Initial Study Report (Progress Report 4): October 30, 2020
- Initial Study Meeting: November 10, 2020
- 2021 Progress Report 1: March 2, 2021
- 2021 Progress Report 2: May 28, 2021
- 2021 Progress Report 3: August 27, 2021
- Updated Study Report: November 4, 2021
- Updated Study Report Meeting: November 18, 2021

Three progress reports were filed in 2021 after the ISR, as identified above. This Final Technical Report was submitted to agencies and stakeholders for a 60-day review period on August 16, 2021. Comments received on this report are shown in Table 3.1-1. Meetings were held with CDFW and USFS on October 13, November 4, and December 8, 2021 to discuss those comments received as well as SCE's draft responses to them.

SCE held a Project Effects meeting on October 28, 2021 for all stakeholders and agencies to discuss what project effects (if any) had been identified through the implementation of each of the approved study plans.

The Updated Study Report (USR) was filed with FERC on November 4, 2021, and a USR Meeting was held on November 18, 2021. At this meeting, SCE only discussed those studies which were still in progress at the time of the ISR (Water Quality, Sediment and Geomorphology, Operations Model, Recreation Use and Needs, Recreation Facilities Condition Assessment, Project Lands and Boundary, and Cultural and Tribal Studies). All comments received to date, including those from the USR, are included in the table below.

Table 3.1-1 Comment Response Table

Comment Number	Report	Location	Comment	Proposed Resolution
1	AQ 2	Figures 2-6 through 2-8	Although the R^2 values for these charts are high, the daily, 3-day and 5-day inflow comparisons have lower accuracy at higher daily inflows. The report should explain in more detail the genesis of this source of error and whether it has been corrected for in the modeling. And if not corrected how does this affect the results of the water balance? The report states in the next paragraph that "Additional correction factors were applied to bring the average monthly model-calculated inflow within a tenth of a percent." Were those additional factors used to make up for ungauged inflow?	This was discussed with CDFW on October 13, 2021, and SCE agreed to provide clarification. **SCE Response:** **Short response**: Identified potential sources of undercalculating higher inflows include: • Prorating gauged inflows to ungauged contributions by direct drainage area ratio that may non-linearly vary under a range of flows and antecedent conditions, • Inaccuracy of storage and streamflow gages, and • Synthesized inflow contributions from North Fork Bishop Creek and Coyote Creek. However, the model accurately reflects the water balance as demonstrated by calculated vs gaged comparisons over the hydrologic record. The high-flow data tail is relatively insignificant as compared to the overall dataset. We did explore changing the polynomial from the 2nd order to a 6th order to see if we could adjust for the bias – the change not result in a meaningful change in the R^2 **Expanded response:** The correction factors were incorporated to more closely align average inflows from all points of contribution, both gaged and ungauged. The correction factor table references appear in formulae where inflows are added in each Power House (PH) tab.

Comment Number	Report	Location	Comment	Proposed Resolution
				The methods of synthesizing contributions were detailed in the Memorandum Re: Bishop Creek Operations Model Structure, December 21, 2018. Bias in all flows has been corrected by applying monthly regression equations at each inflow contribution formula within the model. The 5-day average inflow data subsets were sorted for developing second-order regression equations. The application of these regression equations was applied to all flow contributions throughout the model as a corrective measure, not just ungauged contributions. The additional correction factors were incorporated to closely align average inflows from all points of contribution, but gaged and ungauged. The correction factor is also applied to all inflow contributions throughout the model. Bias in the high end flows shown on the upper portion of the graph represent a very small number of days. Even after corrective measures, the bias exists. The water balance for 30 years has a gaged sum of 2.221 MAF. The unbiased sum is 2.112 MAF, the regression corrected is 2.170 MAF, and the additional factor increases it to 2.222 MAF. On an annual basis, the final total is overpredicted by 50 acre-feet, or 0.007 cfs.

Comment Number	Report	Location	Comment	Proposed Resolution
2	ISR	Page 100	The initial study report states that: *While much of the logic imbedded is complex, formulae are visible and can be traced to determine both inputs (precedents) and effects (dependents) in othercells.* Although the model may be designed this way, only a locked version of the model has been provided to date, and so precedents and dependent cells cannot be easily traced in Excel.	This was discussed with CDFW on October 13, 2021, and SCE has since provided an unlocked version. CDFW agrees that SCE will keep the "master" version for documenting model runs.
3	ISR	Page 90	Can unimpaired hydrologic data sets be provided to the licensing participants in DSS or Excel format? CDFW requested a copy of dataset with regression factors applied so that they can compare unimpaired hydrology (calculated) to regulated flow at any point in the system.	This was discussed with CDFW on October 13, 2021, and SCE agreed to provide clarification. **SCE Response:** SCE believes these data are already available, but stakeholder would benefit from an overview of how to access: The calibration process resulted in second order polynomial values used throughout the model, tabulated in the Hydrology tab under CA35 cell heading "Monthly Adjustments." Setting the factor input values (next comment) below cell CE50 equal to 1, setting the second and first order coefficients in the Monthly Adjustments table equal to 1, and the zero-order coefficients equal to 0 eliminates all

Comment Number	Report	Location	Comment	Proposed Resolution
				multiplier and regression effects on inflow contributions throughout the model. The net inflow daily gage-calculated and model-predicted values are provided, which was the basis of the calibration. With the Monthly Adjustments and factor inputs changed, these will revert the model-predicted values to the unimpaired dataset.
4	ISR	Page 107	The ISR states that “A simple multiplier was applied to each inflow point, then adjusted until the average monthly inflow matched historical gauge totals.” Where arethese multipliers listed?	This was discussed with CDFW on October 13, 2021 Similar to the Monthly Adjustments, these simple multipliers are located on the Hydrology tab under CA50 cell heading “Multiplier Adjustments.” The “factor input” values were iteratively adjusted until the average monthly inflow ratio was within 0.1%. SCE agreed to provide clarification in the final AQ 2 report.
5	ISR	Page 108	The ISR states that: “*System outflows were modeled using average reservoir operations for the period reflective of the existing license. Changes tothese operations can be made by adjusting target storage levels in each reservoir at the start of each month, for each year designation (wet, dry, or normal).”* Where can those be modified? Are these supposed to be modified in the “storage” tab? If so, this would	This was discussed with CDFW on October 13, 2021, and SCE agreed to provide input on where those modifications could be made. **SCE Response:** Daily storage target values are interpolated based on historic monthly start storage values. These are tabulated under “Storage Targets at Beginning of Month for Year Type” cell AF2 on the “Storage” tab for year type for both reservoirs. Adjustment to model operations would be performed by adjusting target storage values (in acre-feet) in this table. As the model prioritizes storage for planned allocation, adjusting

Comment Number	Report	Location	Comment	Proposed Resolution
			be good to add to the inputs tab. This would be good to add a description of this option to AQ 2 as well.	these values may not significantly impact results, although no sensitivity on this has been performed.
6	Model	Model Logic	McGee Creek Diversion, Birch McGee Diversion and Green Creek Diversion do not have active modeling. There is no way to operate the diversion differently. If this is something stakeholders may want, that functionality should be added to the operations modeling.	This was discussed with CDFW on October 13, 2021, and SCE agreed to provide input on where those modifications could be made. **SCE Response:** SCE understands that there is new interest in looking at flows in Birch and McGee creeks to address some potential for managing meadows lower in the creek. These management goals were not part of the original scoping of the study program or the operations model. We see difficulties in building this in at this point (as explained below) but believe there is a good workaround to provide agencies with necessary information to understand the system. From a practical standpoint, the physical extent of the model was limited by data adequacy, much like the period of record and the temporal resolution. Where datasets are significantly lacking, simulating flow in abundance introduces error and may curtail or eliminate the calibration. Where daily storage records for Lake Sabrina and South Lake were limiting factors in selecting the start of the model period, the diversions' gage datasets and concerns about limitations in measurement capacity were not adequate for fully extending the model without introducing additional error. Adjustments to these diversions would impact the net flow contributions to the model and increased releases

Comment Number	Report	Location	Comment	Proposed Resolution
				downstream of the diversions would effectively be daily net reductions to the Bishop Creek project. These have not been incorporated into the model due to lack of gage records and limitations on measurements. **As an alternative to incorporating these**, a simple addition to flow allocation could be artificially added to all bypassed reaches in the model. While it would not account for times of excess flow availability, it would provide some relative impact on the results. Trying to accurately incorporate changes to these flow into model as independent adjustable variables would be very difficult given the data limitations, and generally stated, are not significant in magnitude for the system. **Resolution:** SCE met with CDFW again on December 8; at this meeting, it was agreed that inputs for the McGee and Birch Creek bypassed flows would be added as model inputs. The adjustments to those flow targets can be changed as other targets on the summary graph input tab, and the results displayed as percent missed target days as well. Alternative scenarios are calculated as adjustments from the contribution to the model input at flowline to powerhouse 2, which has a net total of both diversion contributions. This dataset is largely complete for the model period of record (93.5 percent), and changes can be quantified with confidence. Conversely, the McGee and Birch downstream gages have just 1.6 and 12.3 percent of the daily data for the model period of record, inadequate for accurately quantifying changes. Because the ability of meeting the flows is measured with a single combined gage, allocations when inadequate flow is

Comment Number	Report	Location	Comment	Proposed Resolution
				available could either be prioritized for one reach over the other, or both could fall short. It was agreed that equally meeting both targets would be an adequate representation at the meeting.
7	Model	Model Logic	The model logic does not allow variation in water year types other than at Intake Number 2. Is it possible to include the ability to have water year types for other release locations in the project?	This was discussed with CDFW on October 13, 2021 – CDFW was interested in storage year types based on different [water] year type classification. SCE agreed to provide input on which of the types of water year types would/could be included, which could allow relicensing participants to decide which year typing would be appropriate for other instream flows, if considered. **SCE Response:** This would require significant additional structural changes to the model, and likely impact schedule, and it's unclear that this type of granularity is needed given what we understand as management objectives for Bishop Creek. As an alternative, we propose putting alternate flows in for locations of interest, then observing results as tabulated for the specific year types on the "Input & Summary" tab, columns O, P and Q below row 5. **Resolution:** SCE met with CDFW again on December 8; at this meeting, it was agreed that the model would remain without additional locations having alternative flows based on year types. Using the Intake Res 2 release location, lower flows were run for year-round requirement and compared with the results of running just for low flow year, and having a default higher flow year-round. After running a wide range

Comment Number	Report	Location	Comment	Proposed Resolution
				of flows in the location, the sensitivity analysis had calculated results of missed target flow being within 0.5 percent. One additional post-processing calculation must be made for this: the results of a lower flow run must be divided by 0.3, as this represents the percent of years modeled that are categorized as low flow.
8	Model	Model output	Hydrograph output for each stream reach as an additional output tab would be helpful toaid stakeholders in using the model to understand how rivers may be affected by project operations.	We need clarification of this request, to understand the output metric of interest. Is it looking at what percent of time specific flows are met at each reach? Flow exceedance curves at each reach? **Resolution:** SCE met with CDFW again on December 8; at this meeting, SCE showed sample graphs and data displays for 3 locations in the system. Hydrographs included are total period of record, last decade of record, select wet, normal and dry years. Percent exceedance graphs are also provided. Graphs depict the scenario input and the baseline, which reflects the current release requirements. Graphs are left adjustable, such that users can change the x-axis to more adequately examine specific durations of interest. CDFW agreed that the visual displayed represented the information sought; however, CDFW may seek to add additional locations for future analysis.
9	Model	Model input	Where are the definitions for“wet”, “normal,” and “dry” years located?	Discussed during meeting Will verify this is clarified in final report. Under the “Snowpack” tab, comment in cell H5 for “Year Type.” Comment reads “set as +/- 25% of average, matches determination from license article 105 for Int. Res. 2 release requirement.” The 25 percent matches the dry year release

Comment Number	Report	Location	Comment	Proposed Resolution
				determination, and the wet year was set to match. For the modeled period of record, this resulted in a breakdown of years reflecting wet/normal/dry as 33/37/30 percentages.
10	Model	Model input	If possible, it would be good to have Chandler Decree and existing FERC required flows listed in some way in the input tab, or a separate tab in the model. Using the model alone, it's hard to reference how much each of the flow variables can be toggled within/compared to the existing requirements.	**SCE Response:** These are provided in the "Input & Summary" tab under K5, "Baseline existing cfs target" for each location and season/year type (when applicable). If this does not address CDFW's need, we can discuss further.
11	Model	Model input	Is there any way to include ramping rates or geomorphic pulse flows below project facilities?	**SCE Response:** Addition of geomorphic pulse flows and ramping rates would be well beyond the scope of this model or any resource questions identified during FERC's scoping process and SCE is not aware of any new information that would warrant expanding this model to include this capability. From a feasibility standpoint, these modifications would not be feasible without significant additional data collection and modeling including bathymetry, measurements of stage-discharge relationships. SCE would like to know if there is a specific need that has been identified that would warrant a discussion about how to develop necessary information. **Clarification from November 4, 2021 meeting:** USFS clarified that their interest was in knowing whether it is feasible to do a sediment pulse in a given year. For instance, what is the water budget for a year and is a pulse flow

Comment Number	Report	Location	Comment	Proposed Resolution
				achievable (at what volume, for how long)? And how many times in the period of record did those opportunities occur **Revised SCE Response**: SCE will assess those questions, how best to answer them, and understand the limits of the information the model is providing in planning for sediment movement. SCE anticipates incorporating this information into the anticipated PME measures for sediment management.

4.0 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).

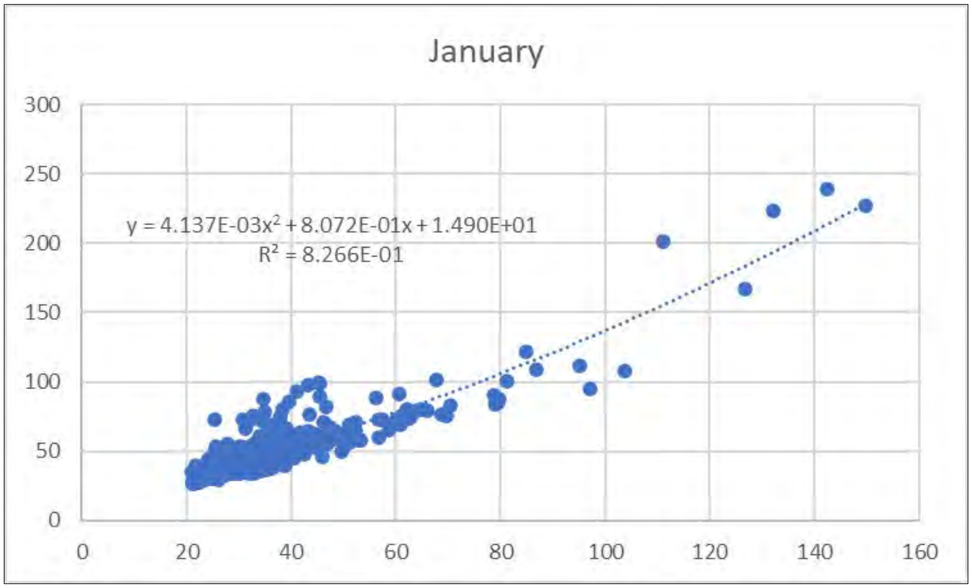
SCE, 2020. Initial Study Report; prepared by Kleinschmidt Associates. Filed October 30, 2020. Portland, Oregon.

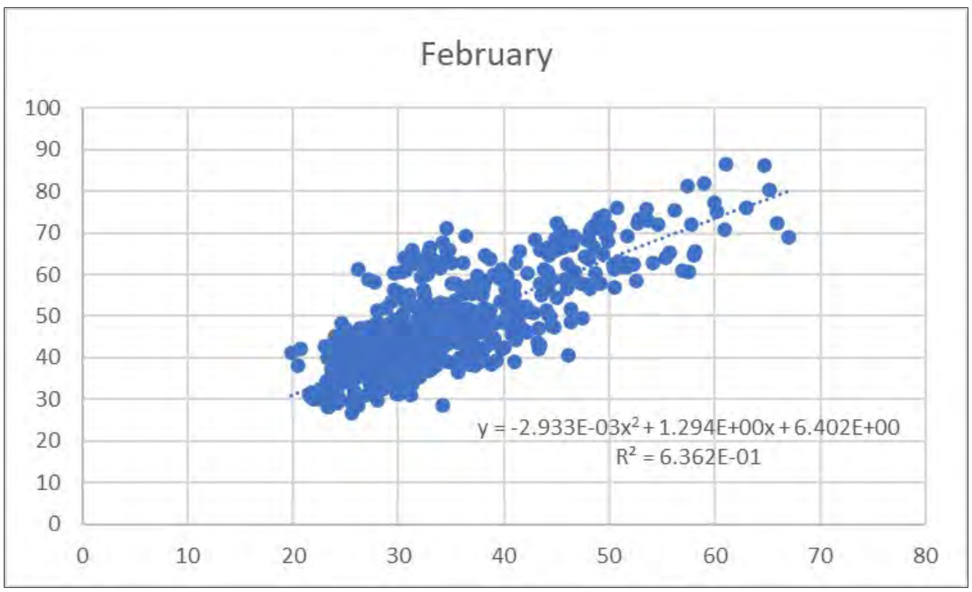
Southern California Edison (SCE). 2002. FERC License Exhibit A document. General Description and Specifications of Mechanical, Electrical, and Transmission Equipment. May, 2002

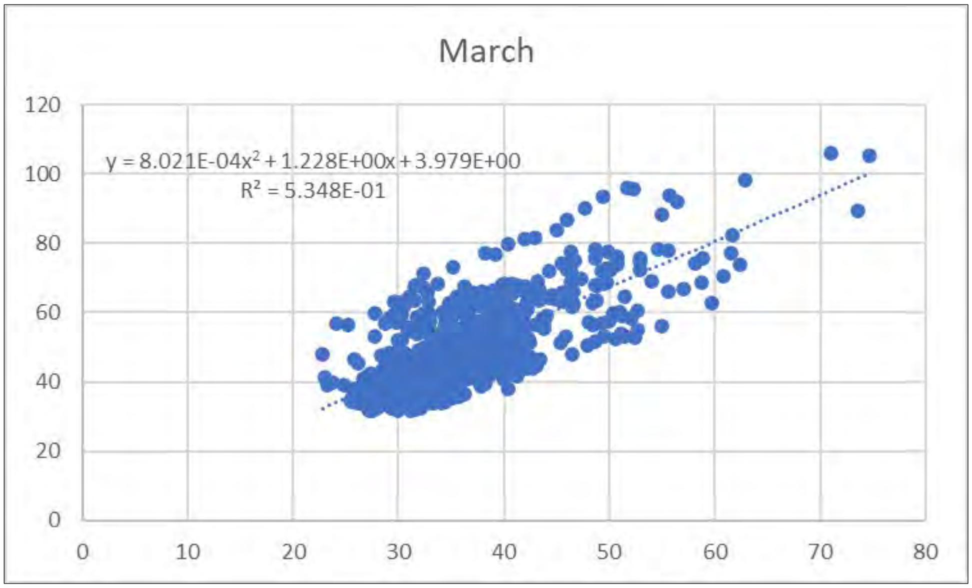
United States Department of Agriculture (USDA). 2019. Land Management Plan for the Inyo National Forest. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd589652.pdf.

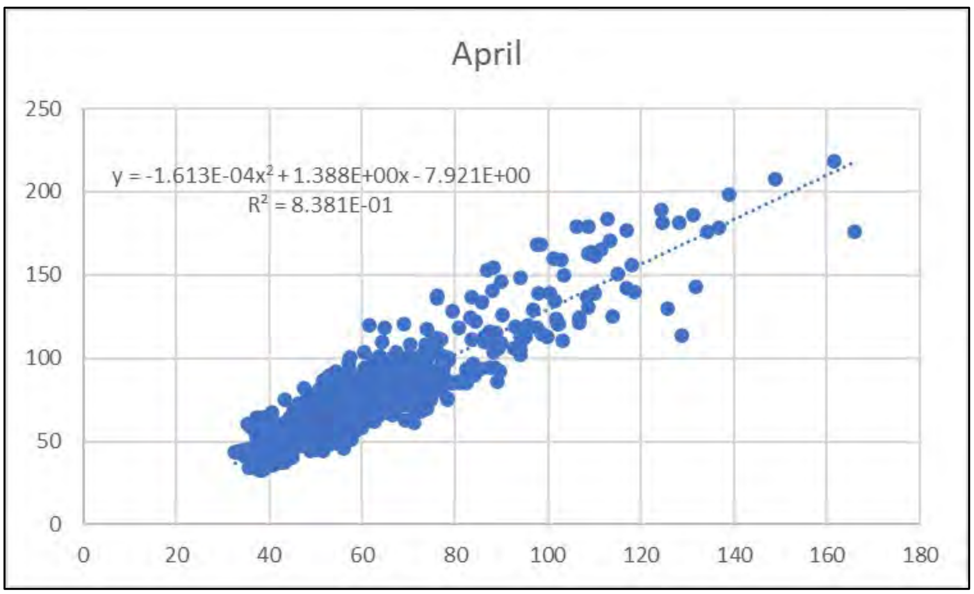
APPENDIX A

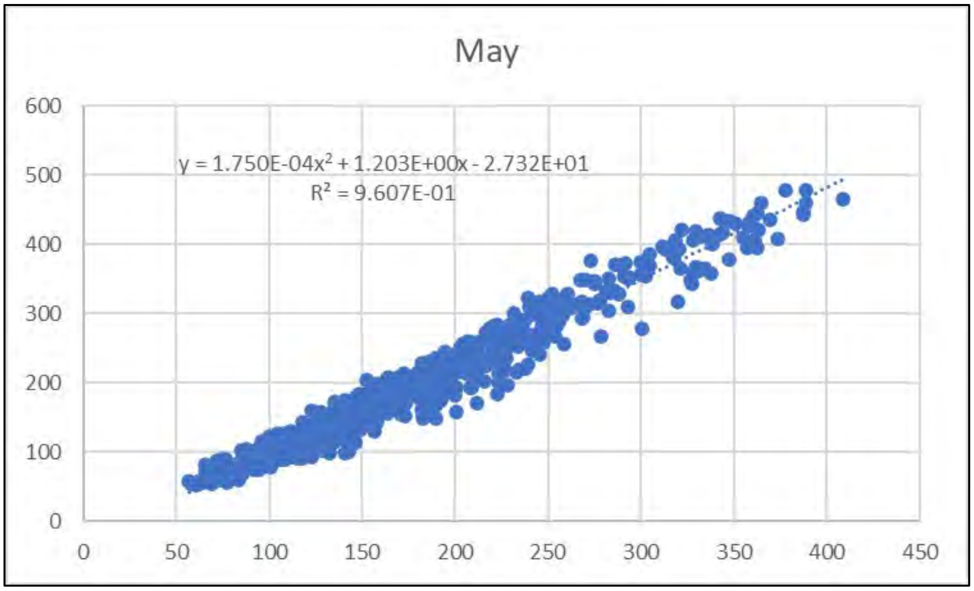
MONTHLY CALIBRATION RESULTS

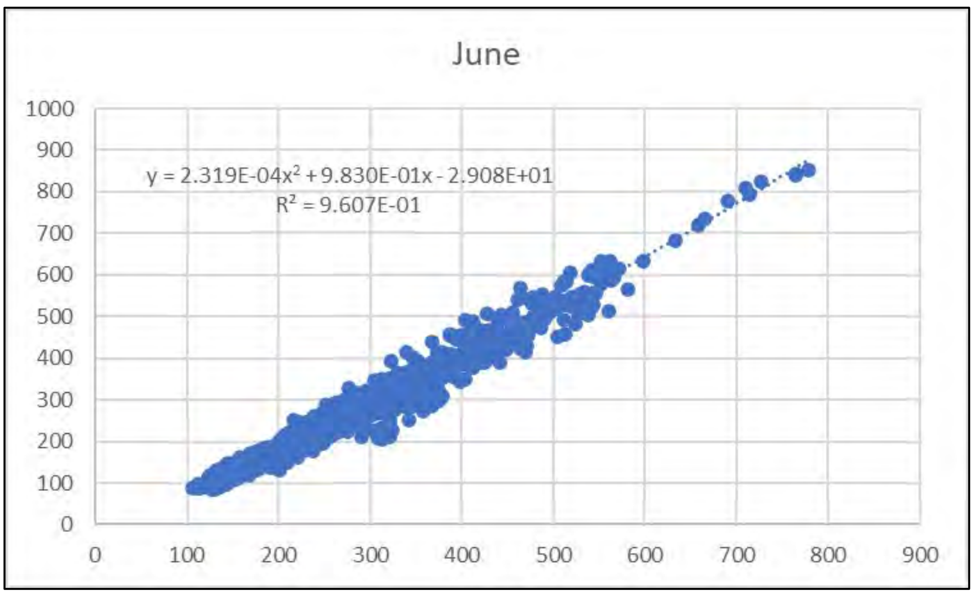

January
y = 4.137E-03x² + 8.072E-01x + 1.490E+01
R² = 8.266E-01
300
250
200
150
100
50
0
0
20
40
60
80
100
120
140
160

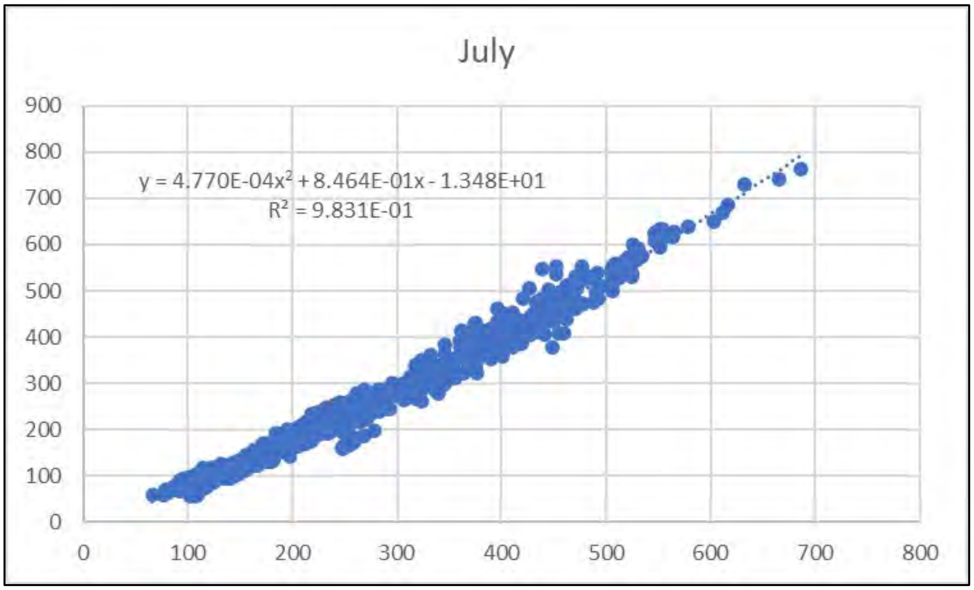

February
y = -2.933E-03x² + 1.294E+00x + 6.402E+00
R² = 6.362E-01
100
90
80
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80

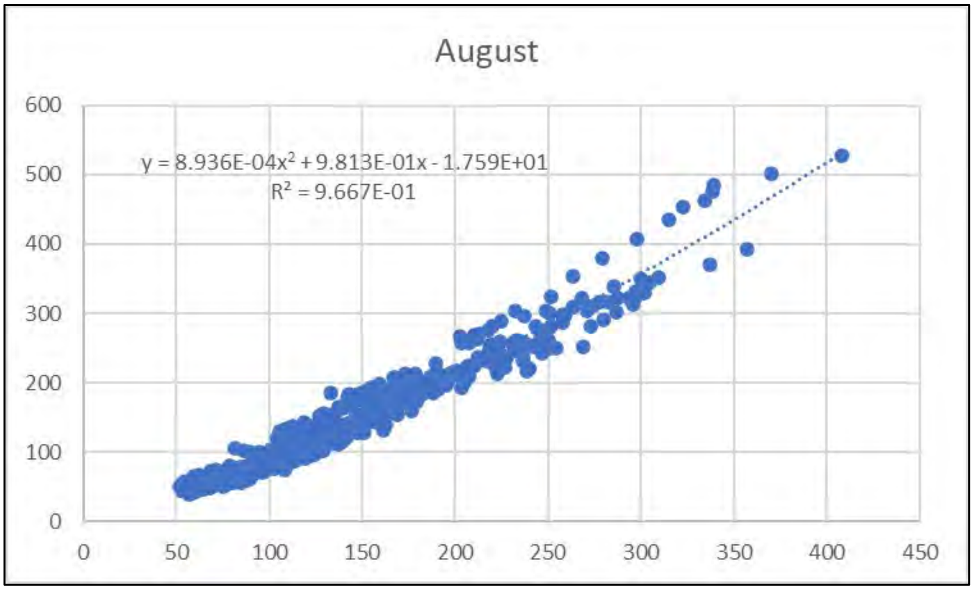

March
y = 8.021E-04x² + 1.228E+00x + 3.979E+00
R² = 5.348E-01
120
100
80
60
40
20
0
0
10
20
30
40
50
60
70
80

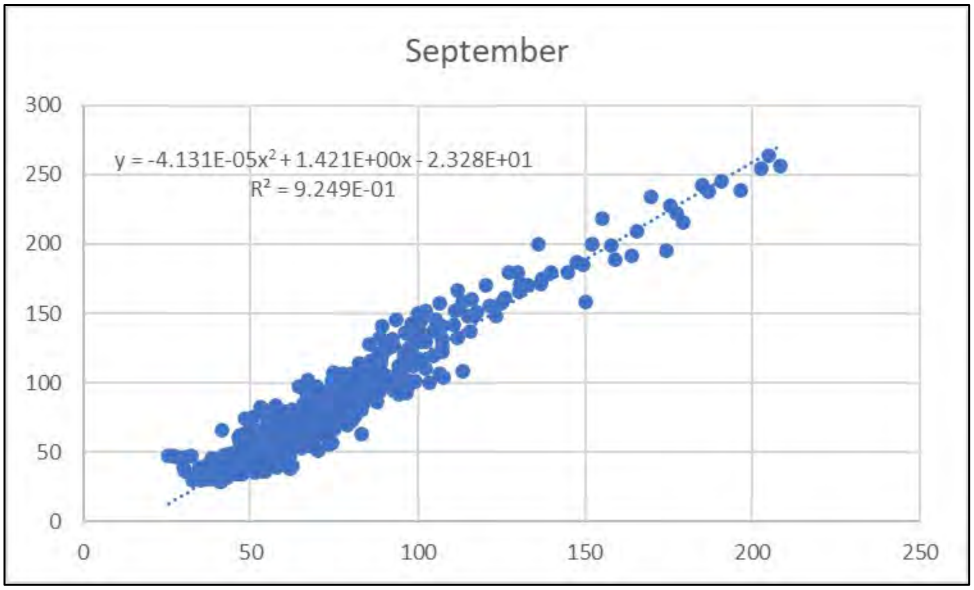

April
y = -1.613E-04x² + 1.388E+00x - 7.921E+00
R² = 8.381E-01
250
200
150
100
50
0
0
20
40
60
80
100
120
140
160
180

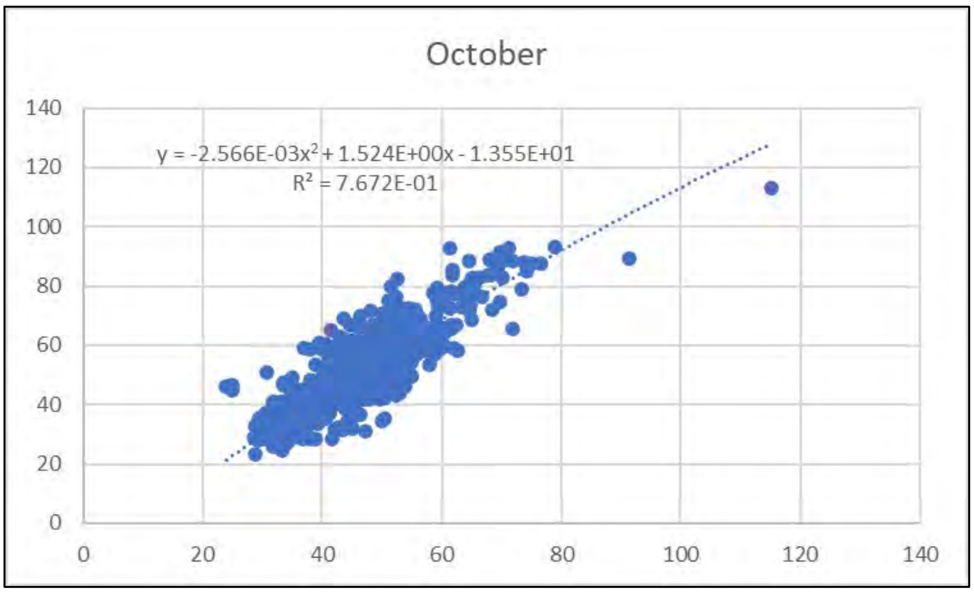

May
y = 1.750E-04x² + 1.203E+00x - 2.732E+01
R² = 9.607E-01
600
500
400
300
200
100
0
0
50
100
150
200
250
300
350
400
450

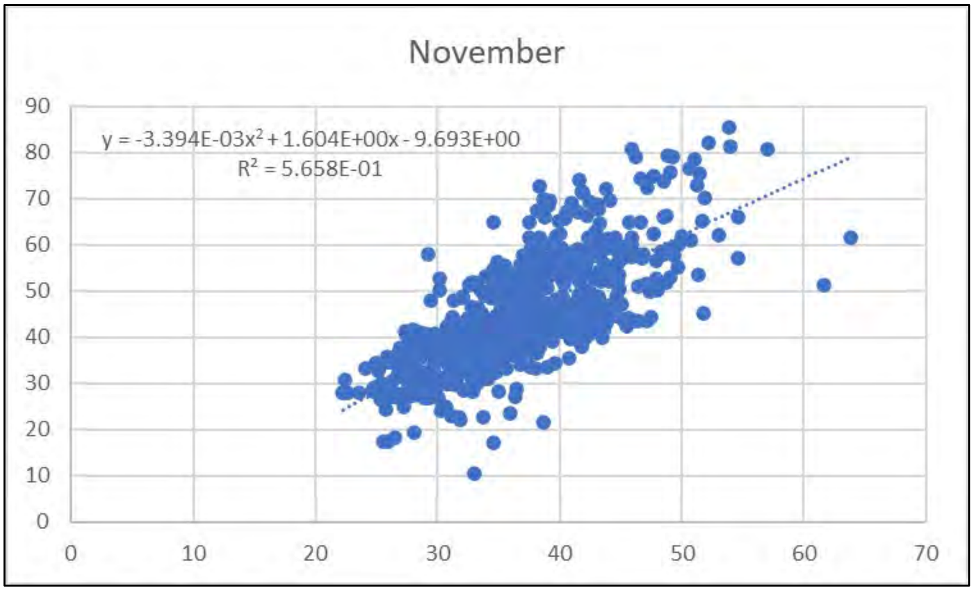

June
y = 2.319E-04x² + 9.830E-01x - 2.908E+01
R² = 9.607E-01
1000
900
800
700
600
500
400
300
200
100
0
0
100
200
300
400
500
600
700
800
900

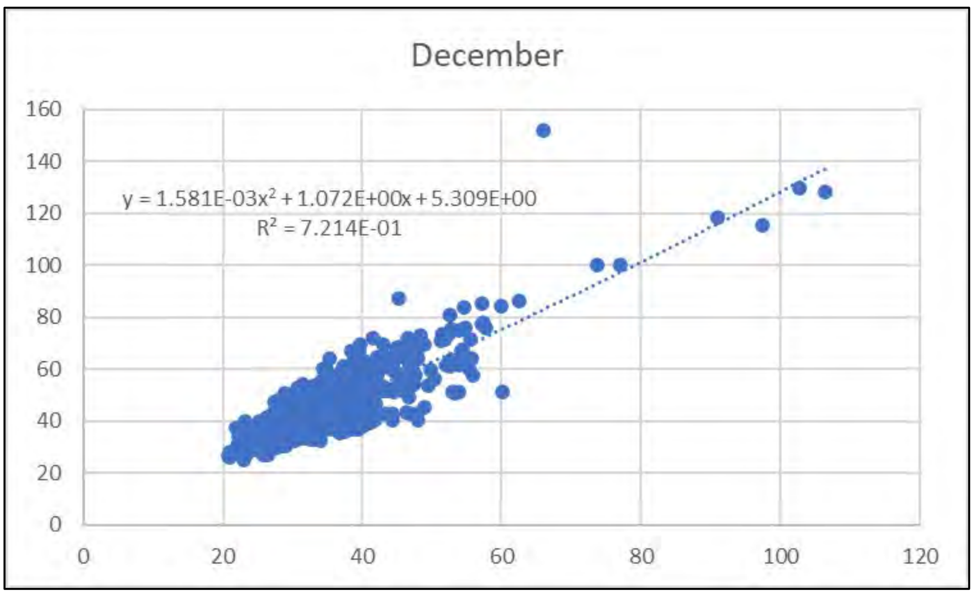

July
y = 4.770E-04x² + 8.464E-01x - 1.348E+01
R² = 9.831E-01
900
800
700
600
500
400
300
200
100
0
0
100
200
300
400
500
600
700
800


August
y = 8.936E-04x² + 9.813E-01x - 1.759E+01
R² = 9.667E-01
600
500
400
300
200
100
0
0
50
100
150
200
250
300
350
400
450


September
y = -4.131E-05x² + 1.421E+00x - 2.328E+01
R² = 9.249E-01
300
250
200
150
100
50
0
0
50
100
150
200
250


October
y = -2.566E-03x² + 1.524E+00x - 1.355E+01
R² = 7.672E-01
140
120
100
80
60
40
20
0
0
20
40
60
80
100
120
140

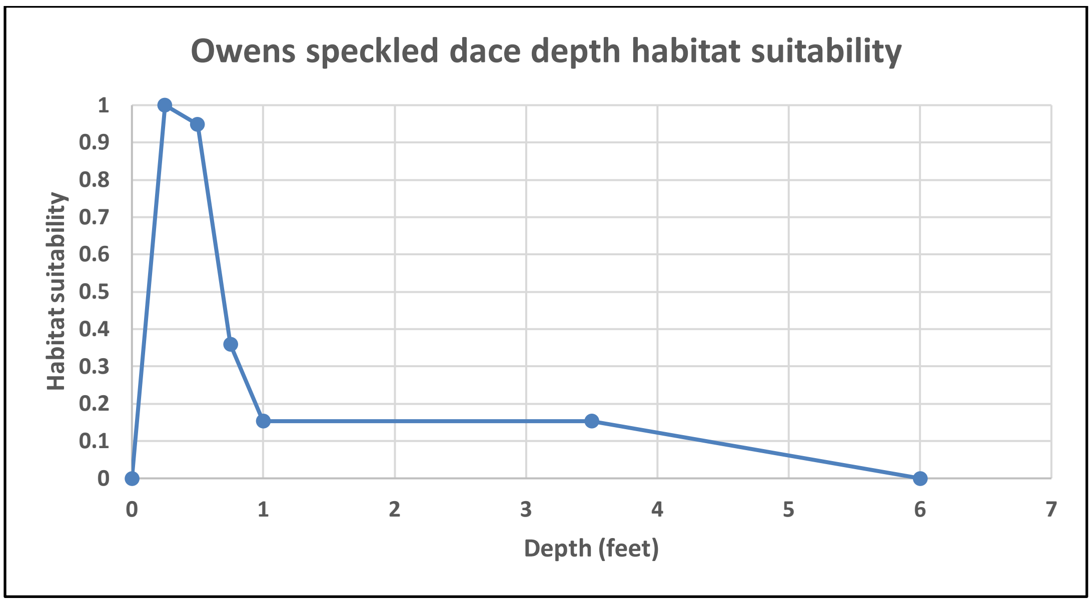

November
y = -3.394E-03x² + 1.604E+00x - 9.693E+00
R² = 5.658E-01
90
80
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70


December
y = 1.581E-03x² + 1.072E+00x + 5.309E+00
R² = 7.214E-01
160
140
120
100
80
60
40
20
0
0
20
40
60
80
100
120

speckled dace do not prefer pools but tend to be positively correlated with run habitat and prefer habitat with more silt. In locations where more than 10 speckled dace were caught, 79 percent of survey locations consisted of 50 percent or more silt with little correlation to other substrates. Most speckled dace were associated with depths of 0.5 meter (approximately 19 inches or less.

The preference data (*i.e.* frequency of occurrence at a particular metric value) for depth was converted to a HSC value on scale of 0.0. to 1.0 by converting to percent and then normalizing on a scale of 0-1. The resulting depth habitat suitability index curve was smoothed as it approached zero. This approach was used to adapt velocity preference data derived from literature into an HSC format.

Depth



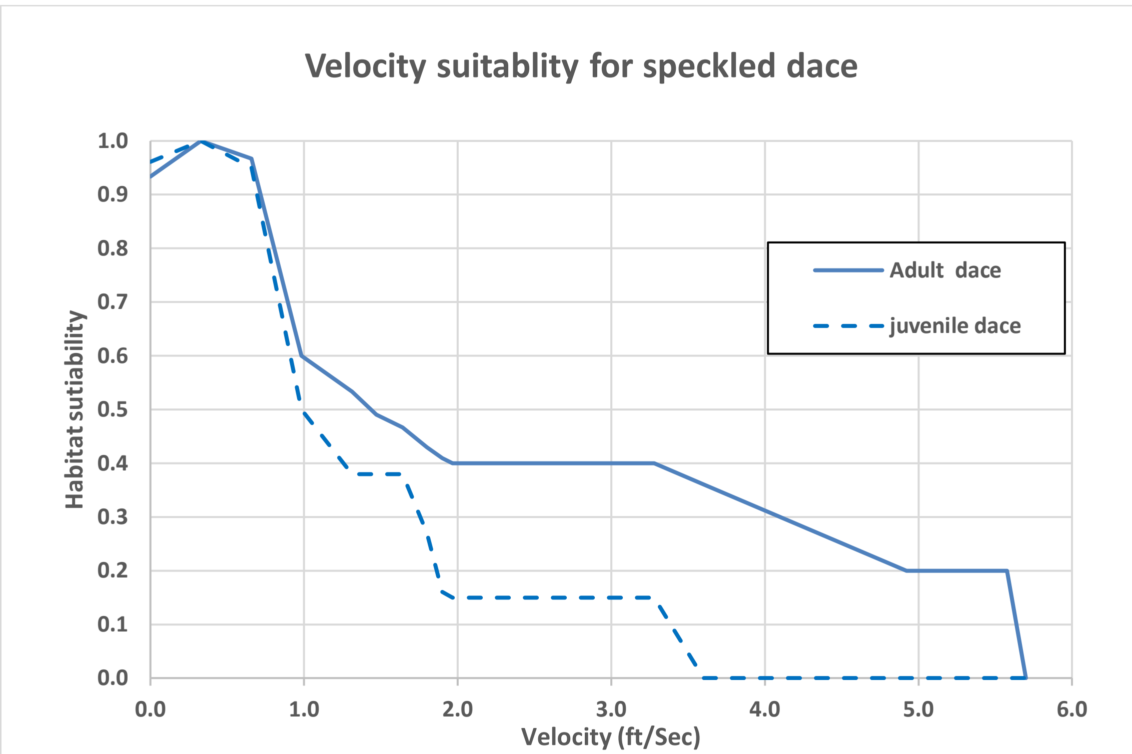
Velocity

Based on a literature review, it appears that the speckled dace (*Rhinichtys oculus*) is a reasonable surrogate candidate for the Owens speckled dace. Speckled dace occur among the larger bottom substrates of riffle habitats where they can hide from predators and feed on aquatic insects.

According to Bonar, *et al*., 2010,

> *Speckled dace usually live in clear, well-oxygenated water with abundant deep cover and moving water, most often occupying water less than 60.0 cm deep in riffles and runs (Valdez et al. 2001, Moyle 2002). Rinne (1992), Speckled dace are often found among boulders and cobble, although they can also be occasionally found in soft substrates (Gido and Propst 1999). Speckled dace usually inhabit relatively cold waters in desert streams and have been collected at temperatures between 9 and 27°C (Deacon et al. 1987).*

Moyle and Baltz (1985) developed HSC for speckled dace, in Deer Creek, CA, a small stream (9.096 m^3/sec mean annual discharge) including velocity. For purposes of this modeling effort, we adopted their mean column velocity criteria.



Substrate

CDFW data indicated a strong affinity for silt substrates, but no distinct preferences for other substrates. A strict statistical analysis would therefore assign silt a suitability index of 1.0 and consider other substrates as unsuitable. This approach, if unmodified would have the unintentional effect of rendering most if not all of the study reaches as unsuitable at any flow because silt is a very uncommon substrate; most of each study reach is dominated by cobble, gravel, and boulder. Calculated changes in depth, velocity and wetted area would be cancelled out by a suitability rating of 0.0 for most study site cells., To allow the model to function, it was suggested to give partial credit to coarser substrates. Bonar, *et al*. 2010 notes qualitatively that "*Sites preferred by speckled dace were relatively shallow (9.0 – 30.0 cm), with fast flowing waters (2.2 – 26.8 cm. s -1) and relatively coarse substrates (gravel – boulders).*" This suggests that some speckled dace (albeit a different species) have at least some tolerance for coarser substrates. Therefore, the following alternative is proposed:

Substrate Type	HSC Rating
fines (*silt, muck*)	1.0
sand	0.75
gravel	0.25
cobble	0.2
boulder	0.1

LITERATURE CITED

Bonar, S.A., N. Mercado-Silva, and D. Rogowski. 2010. Habitat use by the fishes of a southwestern desert stream: Cherry Creek, Arizona. USGS Arizona Cooperative Fish and Wildlife Unit Fisheries Research Report 02-10. 45 pp.

Moyle. P.B. and D. Baltz 1985. Microhabitat Use by an Assemblage of California Stream Fishes: Developing Criteria for Instream Flow Determinations. *Trans. Am. Fish Soc.* 114:695-704.

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project
(FERC Project No. 1394)

DRAFT LICENSE APPLICATION

FINAL TECHNICAL REPORT
FISH DISTRIBUTION BASELINE STUDY
(AQ3)

Southern California Edison
1515 Walnut Grove Ave
Rosemead, CA 91770

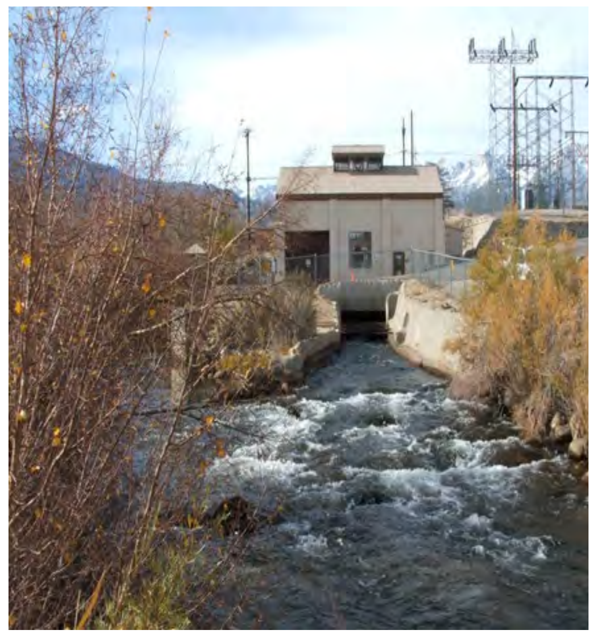
January 2022

Support from:

Kleinschmidt

Southern California Edison

Bishop Creek Hydroelectric Project (FERC Project No. 1394)



Final Technical Report Fish Distribution Baseline Study (AQ3)

January 2022

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

Bishop Creek is the largest tributary to the Owens River and enters the river near the City of Bishop in Inyo County, California. When the current license was issued in 1994, the Federal Energy Regulatory Commission (FERC) established minimum flow requirements in Bishop Creek of 18 cubic feet per second (cfs) below Powerhouse No. 4 (Intake 5) and 5 cfs below Powerhouse No. 3 (Intake 4). Baseline fish population monitoring efforts in Bishop Creek began in 1991, and population monitoring efforts continued through 2010 following changes to minimum instream flow releases (Sada and Rosamond 2010; Sada, 2006; Sada and Knapp 1993). The Bishop Creek Stream Fish Distribution Technical Report focuses on identifying the presence and distribution of fish species and characterizing fish populations within the Project area that may be affected by Project operations, as described in the for the Bishop Creek Fish Distribution Baseline Study Plan (AQ 3) approved by FERC on November 4, 2019. This report includes the results of fish population sampling in the Bishop Creek watershed during September 2019. Information on reservoir fish populations is included in the Bishop Creek Reservoirs Fish Distribution Study (AQ 4) Technical Report (SCE 2021).

Data and preliminary results for this survey were previously reviewed with the Bishop Creek Aquatics Technical Working Group (TWG) in May 2020, following distribution of Progress Report No. 2 on April 14, 2020.

This report builds on the April 14, 2020 interim report, but does not draw conclusions about potential Project effects, or consistency with the desired future conditions as described in the Land Management Plan for Inyo National Forest (INF) (USFS 2018). These analyses will be completed in conjunction with the rest of relicensing studies as part of the overall National Environmental Policy Act (NEPA) process and in consultation with the aquatics TWG.

2.0 REVIEW OF EXISTING INFORMATION

Project facilities (13 dams and diversions, 5 powerhouses, and associated intakes) are sited along Bishop Creek and nearby Birch and McGee creeks. Bishop Creek has a total drainage area of approximately 70-square-miles from its headwaters to its confluence with the Owens River. South Lake and Lake Sabrina are the major storage reservoirs in the watershed. Southern California Edison (SCE) manages the releases from the storage reservoirs for purposes of hydro-generation and meeting water allocation requirements in accordance with the Chandler Decree (1922). 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 (*Salmo trutta*), brook trout (*Salvelinus fontinalis)* and rainbow trout (*Oncorhynchus mykiss*), managed by the California Department of Fish and Wildlife (CDFW). CDFW introduced each of these three non-indigenous trout species and manages them to support angling harvest. “Catchable” size rainbow trout (roughly 12 inches) were stocked in South Fork Bishop Creek, Middle Fork Bishop Creek, and Lower Bishop Creek regularly between April and September 2019; no other trout species were stocked in Bishop Creek by CDFW in 2019 (CDFW 2019). Segments of Bishop Creek below Project reservoirs support self-sustaining brown trout populations, and McGee and Birch creeks maintain scattered populations of brook trout.

SCE monitored the Bishop Creek brown trout population at intervals from 1988 through 2010 (Sada and Rosamond 2010). Sada and Rosamond (2010) determined that population parameters such as growth, age, and abundance remained similar to that of other regional Sierra Nevada 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*).

Owens sucker (*Catostomus fumeiventris*) are believed to have been informally introduced into Lake Sabrina (N. Buckmaster, CDFW, *personal communication*) where they have established a large and self-sustaining population with the potential to spillover to downstream reaches of Bishop Creek. 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 Engineering (1987) netted an unidentified sucker from Lake Sabrina, which the authors speculated was an Owens sucker.

3.0 LIFE HISTORY INFORMATION

CDFW currently manages waters in the Project area as a popular stocked rainbow trout fishery. Bishop Creek presently supports a self-sustaining brown trout fishery, while McGee and Birch creeks maintain small brook and possibly brown trout populations. Introduced species such as Owens sucker and Owens speckled dace (*Rhinichthys osculus robustus*) also occupy Project waters.

3.1 BROWN TROUT

Brown trout are an introduced species to the Bishop Creek watershed and have 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 °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.*

3.2 BROOK TROUT

Brook trout are an introduced species to the Bishop Creek watershed with small populations present in South Lake and Lake Sabrina in the upper watershed. During monitoring efforts conducted between 1991 through 2010 in Bishop Creek below the diversions for Plant 3 and Plant 5, brook trout were only captured during one year (Sada and Knapp 1993; Sada 1997; Sada 2006; Sada and Rosamond 2010). Brook trout are not currently stocked in the Bishop Creek watershed (CDFW 2019) and are expected to be uncommon based on lack of stocking and historically low observations.

Brook trout are native to the northeastern United States and eastern Canada and have been introduced throughout most of California. Although widely introduced throughout California, they have primarily become established in small spring-fed headwater streams and in isolated mountain lakes. Brook trout can tolerate a wide range of water temperatures from 1°C up to 26°C; however, they prefer temperatures of 14–19°C (Moyle 2002). Brook trout feed primarily on insects but will consume whatever prey items are most abundant, including smaller fish. Growth is highly variable, but in most California locations, they rarely exceed 300 mm (millimeters) total length (TL), and individuals over five years old are rare (Moyle 2002).

Spawning can occur by the end of their first summer for males and at the end of the second summer for females when fish are as small as 100 mm fork length (FL) (Moyle 2002). Brook trout typically spawn anytime between September and January at temperatures between 4–11°C (Moyle 2002). Optimal spawning locations are found in water >0.4 meters deep with spring upwelling and gravel substrate ranging from 5–30 mm in diameter; however, suboptimal spawning conditions can still support self-sustaining populations (Moyle 2002).

3.3 Rainbow Trout

Rainbow trout are an introduced species to the Bishop Creek watershed. Rainbow trout are frequently stocked in South Fork Bishop Creek, North Fork Bishop Creek, and Lower Bishop Creek near the City of Bishop (CDFW 2019). Various size rainbow trout may be stocked; stocking during the sampling year (2019) included rainbow trout in the “catchable” size range (roughly 12 inches) (CDFW 2019). During monitoring efforts conducted between 1991 through 2010 in Bishop Creek below the diversions for Plant 3 and Plant 5, rainbow trout were only captured during one year (Sada and Knapp 1993; Sada 1997; Sada 2006; Sada and Rosamond 2010).

Rainbow trout historically occupied streams that drain to the Pacific coast, with the exception of a few subpopulations that are occur in isolated locations near the edge of watersheds draining to the Pacific (Moyle 2002). Transplanted rainbow trout have been introduced into coldwater streams throughout the world and are likely the most widely distributed fish in California (Moyle 2002). Rainbow trout can tolerate a wide range of water temperatures from <1°C up to 26°C; however, optimal growth occurs at temperatures around 15–18°C (Baltz et al. 1987).

In streams, rainbow trout feed primarily on drifting aquatic organisms and terrestrial insects but will consume benthic invertebrates. Growth rates for rainbow trout in small high-gradient streams are around 70–75 mm per year during their first years and then decrease to around 40–50 mm per year in their third and fourth year when fish typically reach 235 mm FL (Snider and Linden 1981). Habitat preference changes with life stage, where rainbow trout fry (<50 mm standard length [SL]) are often found in shallow water along stream margins; juveniles (50–120 mm SL) are found in deeper water, usually with rocky substrate or other cover; and larger fish often seek out deeper habitats in slow velocity holding areas adjacent to high velocity water where invertebrate drift is high, such as slow water pockets behind rocks in riffle and run habitat or at the head of pools (Moyle, 2002).

Spawning generally occurs when rainbow trout are in their second or third year and fish are at least 130 mm FL (Moyle 2002). Rainbow trout spawning typically takes place between February and June but low temperatures in high mountain areas can delay spawning as late as August (Moyle 2002). Spawning occurs in coarse gravel ranging from 10–130 mm diameter typically located in the tails of pools or in riffles (Moyle 2002).

3.4 OWENS SUCKER

The Owens sucker was introduced into the Bishop Creek watershed and are known to occupy Lake Sabrina. Historic surveys in Bishop Creek conducted between 1991–2010 did not capture any Owens speckled dace (Sada and Knapp 1993; Sada 1997; Sada 2006; Sada and Rosamond 2010). No Owens suckers were captured during the current study. This species occupies waters specifically in the Owens River Valley but have migrated via the Owens Aqueduct to the Santa Clara River drainage.

This species prefers soft-bottomed runs in cool-water streams and the bottoms of lakes and reservoirs. Owens sucker 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 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. 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.*

3.5 OWENS SPECKLED DACE

Owens speckled dace are native to the Owens River and its tributaries. Historic surveys in Bishop Creek conducted between 1991–2010 did not capture any Owens speckled dace (Sada and Knapp 1993; Sada 1997; Sada 2006; Sada and Rosamond 2010); however, observations have been documented in North Fork Bishop Creek. No Owens speckled dace were captured during the current study. The following summary of Owens speckled dace life history is excerpted from Moyle et al. 1995:

> *In general, speckled dace feed on small aquatic insects and algae (Moyle 1976). They typically live three years and attain a maximum size of 80 mm SL in inland basins (Moyle 1976). Owens speckled dace, however, rarely exceed 50 mm SL in length.*

Speckled dace from the Owens Basin are known to occupy a variety of habitats ranging from small coldwater streams and hot-spring systems, although they are rarely found in water exceeding 29°C. They also have been found in irrigation ditches near Bishop. Despite the large variety of habitats apparently suitable to speckled dace of the Owens Basin, their disappearance from numerous localities since the 1930s and 1940s suggests their vulnerability to habitat modifications or to invasion by exotic fishes.

4.0 STUDY OBJECTIVES

The primary goal of the Bishop Creek Fish Distribution Baseline Study is to acquire information on the current distribution of game and non-game fish species of interest and the growth and density of wild brown trout populations in the Project area. To address this goal, this study was designed with the following objectives:

- Characterize fish populations and distribution in Project-influenced stream reaches:
- Assess if recruitment of Owens sucker has occurred downstream of Lake Sabrina and South Lake in Bishop Creek;
- Assess the distribution of other fish species in Project waters (streams and Project intakes);
- Determine if naturally reproducing brown trout populations are consistent with levels documented from 1991 through 2010 at historical monitoring locations; and
- Evaluate population health and condition of recreationally important trout species (e.g., brown trout, rainbow trout, and brook trout) in lotic habitat affected by Project operations.
- Evaluate select, localized water quality parameters that may affect the growth and distribution of fish species; and
- Determine whether future Project facilities and operations are consistent with the Desired Conditions described in the Land Management Plan for the Inyo National Forest (USDA 2019) as they relate to ecological sustainability and diversity of plant and animal communities.

4.1 STUDY AREA

The study area included the Bishop Creek watershed downstream of Project reservoirs (i.e., South Lake and Lake Sabrina) to Powerhouse No. 5. This section of the watershed ranges in elevation from approximately 4,900 feet to 8,500 feet. Bishop Creek is separated into multiple segments by a series of powerhouses and intakes. Sample sites were selected in six locations within Project-affected reaches of Bishop Creek, Middle Fork Bishop Creek, and South Fork Bishop Creek (Figure 4.1-1). Two of the six sample sites were historical sample locations (Sada 3 and Sada 5) selected for comparison with historical fish monitoring data from Bishop Creek.[1] The remaining four sample sites

[1] The historic Sada 3 site showed clear evidence of having become a frequently visited angling location. To minimize any potential bias resulting from angling exploitation, a site with similar habitat was selected in a more remote area downstream from the original site.

(South Fork, Middle Fork [Cardinal Village], Intake 4, and Intake 5) were selected to assess fish species distribution. The locations of these sample sites specifically targeted suitable habitat for Owens sucker and Owens speckled dace, primarily considering low channel gradients, smaller substrates (i.e., South Fork and Cardinal sites), or availability of large pool habitat (i.e., Intake 4 and Intake 5 sites) (Figure 4.1-1). Sample sites were selected based on habitat characteristics in consultation with CDFW and the U.S. Forest Service (USFS) during study plan development.

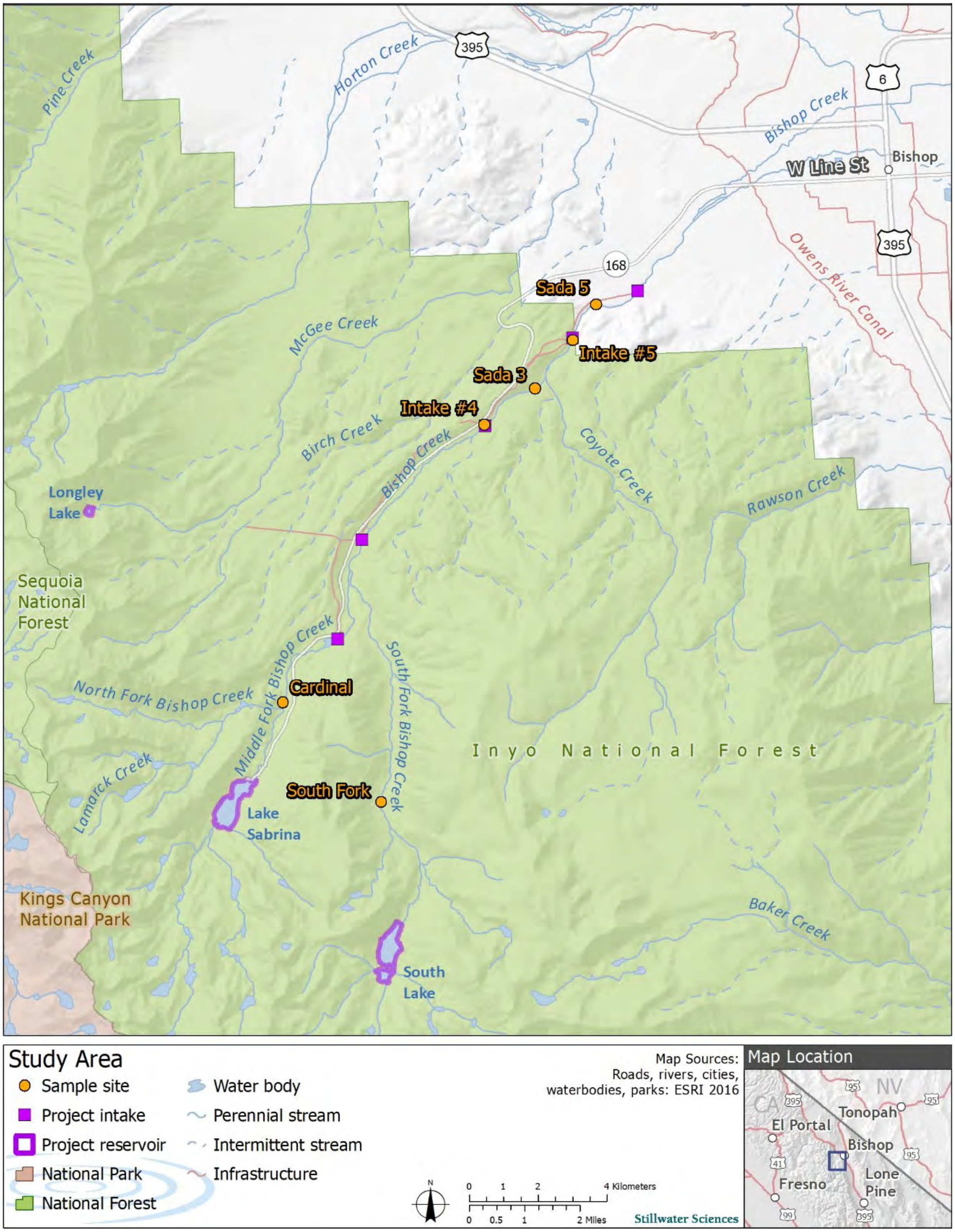


Figure 4.1-1 Stream Fish Distribution Sample Sites

5.0 METHODS

5.1 FISH SAMPLING

Fish surveys were conducted from September 22–26, 2019. Stream sampling methods included multiple-pass depletion backpack electrofishing at the Sada 5 and Sada 3 sample sites, gill netting at Project intakes, and single-pass backpack electrofishing at the South Fork and Cardinal sample sites (Table 5.1-1). All sites were sampled to assess fish species composition, distribution, and fish condition. The Sada 5 and Sada 3 sample sites were also sampled to estimate abundance for comparison with historical monitoring data. Relative abundance was summarized as percent composition using the total count of fish observed at each sample site. Fish age class structure was assessed at stream sample sites using backpack electrofishing. Length-frequency histograms were developed for all fish species captured at each sample site. Breaks or modalities within the histogram for each trout species were evaluated to determine approximate age classes. Fish scales were taken on-site from approximately 50 fish (rainbow trout and/or brown trout) of different age classes and were aged by CDFW staff. Historical fish age data collected from Bishop Creek (Walsh and Williams 1991)[2] were plotted along with length-frequency and scale ages from this study.

Sample methods are summarized by location in Table 5.1-1. Photographs of habitat conditions and block net locations are provided in Appendix A.

[2] The age class system used in Walsh and Williams (1991) did not include young-of-the year YOY fish but considered brown trout ranging from 36 mm to 103 mm as age 1+ fish. To convert the age class system used in Walsh and Williams (1991) to match the age class system in this report the following updates were made: age 1+ fish are referred to as YOY, age 2+ fish are referred to as age 1+, and age 3+ fish are referred to as age 2+.

Table 5.1-1 Sample Site Locations and Sampling Dates during the September 2019 Survey

Sample Site Name	Site Description	Location (UTM NAD 83)[a]		Sample Method	Survey Dates	Sampling Rationale
		Easting	Northing			
Sada 5	Bishop Creek downstream of Intake 5	367749	4132748	Multiple-pass depletion backpack electrofishing	9/22–23/2019	Document species distribution, abundance, fish condition, and age class structure for comparison with historical monitoring data
Sada 3[b]	Bishop Creek upstream of Coyote Creek	365839	4130446	Multiple-pass depletion backpack electrofishing	9/26/2019	Document species distribution, abundance, fish condition, and age class structure for comparison with historical monitoring data
Intake 4	Margin and open water lentic habitat	364306	4129497	Gill netting	9/24/2019	Document species distribution and fish condition
Intake 5	Margin and open water lentic habitat	367006	4131759	Gill netting	9/25/2019	Document species distribution and fish condition
Cardinal	Middle Fork Bishop Creek downstream of Lake Sabrina	357978	4121838	Single-pass backpack electrofishing	9/24/2019	Document species distribution, fish condition, and age class structure
South Fork	South Fork Bishop Creek downstream of South Lake	360580	4118679	Single-pass backpack electrofishing	9/25/2019	Document species distribution, fish condition, and age class structure

[a] UTM is a coordinate system (universal transverse Mercator) NAD83 is the North American Datum 1983 geodetic reference system.

[b] Sample site was relocated from the historical location.

5.1.1 Single-Pass Electrofishing

Single-pass electrofishing was conducted at Middle Fork (Cardinal) and South Fork Bishop Creek (South Fork) sample sites. One representative segment 196-feet-long was sampled at South Fork due to uniform channel conditions, whereas four segments totaling 387 feet were sampled at Cardinal to capture variable channel conditions, including pool, riffle, run, and side-channel habitats.

Block nets were used to section sites and/or stream segments to prevent migration in and out of the sample site and to increase capture probabilities. Two biologists with Smith-Root LR-24 backpack electrofishers and three netters began electrofishing at the downstream block net and proceeded upstream. A single pass through each segment was made by the electrofishing crew. As fish were captured (netted), they were placed in buckets with aerated stream water and periodically transferred to a live-car until the completion of the pass. The captured fish were processed upon completion of each pass. Fish data recorded included species identification, total length, (FL; mm), and weight (grams [g]). At each sample site, scale samples were collected from up to 20 brown trout distributed across each 50 mm size increment greater than 100 mm. Scales were taken from the fish's left side below the dorsal fin and above the lateral line, and then placed in individually labeled envelopes. Using the same methods, scale samples were collected opportunistically from other trout species captured including rainbow trout and brook trout. Scales were later analyzed by CDFW in their Bishop laboratory to characterize age/size class.

5.1.2 Gill Netting

Gill netting was conducted at sample sites in Intake 4 and Intake 5. A single gill net approximately 80-feet-long with variable mesh sizes ranging from 0.75 inch to 2.50 inches was deployed in each intake. The net was deployed perpendicular to the shoreline with one end attached to the shore and the other end anchored in deeper water. The gill net was deployed in Intake 4 for a single 13-hour period spanning from evening until morning. At Intake 5, the gill net was deployed for a 9-hour period from morning until evening; however, because no fish were captured during the initial set, the gill net was redeployed for a 14-hour period from evening through morning. All fish captured were processed as previously described.

5.1.3 Multiple-Pass Electrofishing

Multiple-pass depletion backpack electrofishing, following procedures described by Reynolds (1996), was conducted at two sample sites (Sada 5 and Sada 3) for comparison to historical fish monitoring data from Bishop Creek. Each site was approximately 393-feet-long. To repeat methods used during historical monitoring efforts, each sample site was divided into five segments. Block nets were installed at the upstream and downstream ends of each segment to prevent migration in and out of the sample site and to facilitate an accurate assessment of sample populations.

Two biologists with Smith-Root LR-24 backpack electrofishers and three netters began at the downstream block net and proceeded upstream. As fish were captured (netted), they were placed in buckets with aerated stream water and periodically transferred to a live-car until the completion of the pass. Upon completion of each pass, all captured fish were processed as previously described. After processing, fish were held in a live-car outside the boundary of the segment until the completion of the final pass. Once the fish from the final pass were processed, all fish were returned to the segment. A minimum of three passes were conducted within each segment. If there was poor depletion after three passes, a fourth pass was performed.

Trout abundance, density, and biomass were calculated for sites sampled using multiple-pass electrofishing. Abundance was calculated as the total number of fish captured at each site. Density and biomass estimates were calculated for each segment and then averaged over the entire sample site for brown trout and for all trout species combined. Multiple-pass depletion values were analyzed using the MicroFish V. 3.0 software package (Van Deventer and Platts, 2006) to generate maximum-likelihood population estimates. Biomass was calculated by multiplying the average fish weight per segment by the calculated segment density and then adding all the segment values to get the total site biomass.

5.1.4 Trout Condition

Trout condition was evaluated for all trout captured. The weight-to-length relationship of individual trout was assessed as a method of identifying the nutritional state or health of the fish related to size and growth. A fish condition factor (Ricker, 1975), a measure of this nutritional state, was calculated for each trout. Individual condition factors (k) were calculated by the following formula:

$$\mathrm{k} = \frac{\text{wet weight (g)} \times 10^5}{[\text{fork length (mm)}]^3}$$

The mean condition of trout was calculated by averaging individual condition factors for each trout species at each sample site.

5.1.5 Current and Historical Brown Trout Population Data Comparison

Brown trout population data collected from the Sada 5 and Sada 3 sample sites in 2019 were compared to population data from historical monitoring sites collected between 1991 and 2010 (Sada and Rosamond 2010; Sada 2006; Sada and Knapp 1993). Brown trout density estimates from 2019 were compared to previous monitoring results using a two-tailed t-test with unequal variance to determine if 2019 density is significantly different. Biomass values from previous studies are reported as the site mean biomass and upper and lower range of values which do not allow for comparison using t-tests.

5.2 Habitat Conditions

Habitat descriptors and physical habitat measurements were recorded at each sample site. Each segment was characterized by habitat type (e.g., pool, run, or riffle). The length of each segment was measured along the thalweg to the nearest tenth of a meter, and the mean width of each sampling segment was calculated by measuring the width of the wetted channel to the nearest tenth of a meter at six or more evenly spaced transects. The area of each sampling segment was calculated by multiplying the site length by mean width. The approximate maximum depth and the estimated discharge of the sample site were recorded. Substrates and fish cover were visually estimated at each sample site. Water temperature, dissolved oxygen (DO), pH, electrical conductivity, and specific conductance were measured using a YSI™ Pro Plus multi-parameter meter at the time of sampling.

5.3 MODIFICATIONS TO METHODS

As noted above, the historic Sada 3 site showed clear evidence of having become a frequently visited angling location. To minimize any potential bias resulting from angling exploitation, a site with similar habitat was selected in a more remote area downstream from the original site. No other modifications were made to this study.

6.0 RESULTS

6.1 COMPOSITION AND DISTRIBUTION

Three fish species were observed in the Bishop Creek watershed: brown trout, rainbow trout, and brook trout. No Owens suckers were observed, indicating no recruitment of this species in Bishop Creek downstream of Lake Sabrina and South Lake (Table 6.1-1). No Owens speckled dace were observed. Composition and distribution patterns appeared similar throughout the Bishop Creek watershed with brown trout being the most abundant species at all locations, and while rainbow trout were observed at all sample sites, they only accounted for a small percentage of the fish captured (Figure 6.1-1). A single brook trout was captured at Intake 5. Rainbow trout represented a larger portion of the fish species captured in Project intakes compared to the stream sample sites, but overall fish capture numbers were relatively low in the intakes, likely due to the different sampling methods (i.e., gill net versus single-pass and multiple-pass electrofishing). During 2019, rainbow trout in the “catchable” size range (roughly 12 inches) were stocked throughout the study area, including in Bishop Creek, Middle Fork Bishop Creek, and South Fork Bishop Creek (CDFW 2019).

Table 6.1-1 Fish Species Capture Totals by Sample Site during the September 2019 Survey

Fish species (common name)	Sada 5	Sada 3	South Fork	Cardinal	Intake 4	Intake 5
Brown trout	186	103	45	145	2	7
Rainbow trout	8	10	3	1	1	4
Brook trout	0	0	0	0	0	1
Total	**194**	**113**	**48**	**146**	**3**	**12**

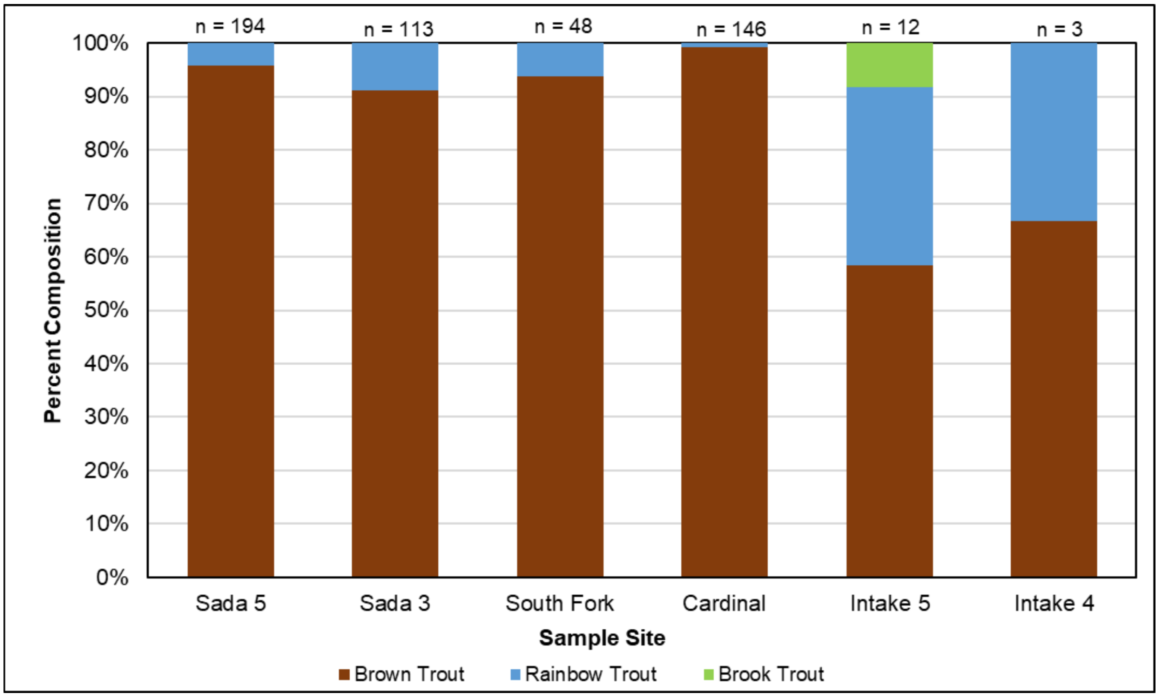


Figure 6.1-1 Fish Species Composition Observed in the Bishop Creek Watershed during September 2019 Survey

6.2 ABUNDANCE, DENSITY, AND BIOMASS

Of the two sites sampled using multiple-pass electrofishing, trout abundance was higher at the Sada 5 sample site; however, biomass was greater at the Sada 3 sample site. Brown trout, the most abundant species at both sites, were the primary driver of the population estimates. Trout abundance, density, and biomass in Bishop Creek at the Sada 5 and Sada 3 sample sites are summarized by site in Table 6.2-1 and Figure 6.2-1. Trout abundance and biomass are presented by segment in Appendix C, and individual fish data are provided in Appendix D.

Table 6.2-1 Trout Population Abundance, Estimated Density, and Estimated Biomass at the Sada 5 and Sada 3 Sample Sites, September 2019

Sample site	Site length (m)	Average width (m)	Trout species	Number captured	Biomass (g/m^2)			Density (Trout per mile)		
					Est.	Lower 95% C.I.	Upper 95% C.I.	Est.	Lower 95% C.I.	Upper 95% C.I.
Sada 5	122	6.3	Rainbow	8	0.13	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	186	5.72	3.89	7.55	2,889	2,032	3,745
			All Trout	194	5.85	5.06	6.65	2,983	2,220	3,747
Sada 3	123	5.1	Rainbow	10	1.58	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	103	9.08	2.46	15.70	1,354	1,222	1,485
			All Trout	113	10.58	4.00	17.16	1,486	1,334	1,637

CI= Confidence Interval

[a] Depletion pattern and low capture numbers for rainbow trout did not allow for density estimates.

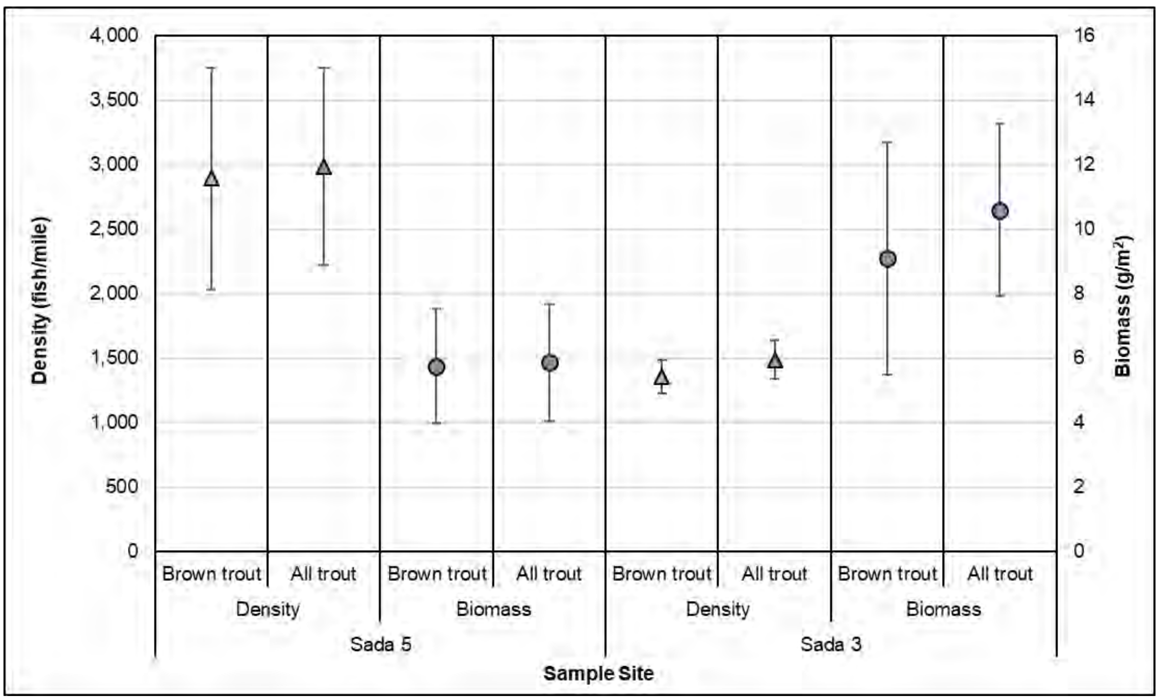


Figure 6.2-1 Estimated Density and Biomass (with 95% confidence intervals) for Brown Trout and All Trout at the Sada 5 and Sada 3 Sample Sites, September 2019

6.3 AGE CLASS DISTRIBUTION

During the 2019 sampling effort, brown trout were observed at each sampling location with most fish ranging from young-of-year (YOY) up to age 3+ with a few older fish observed. Both sites had fish as old as 4+; the Sada 3 sample site had brown trout as old as 7+. Length-at-age size ranges based on scale analysis, length frequency distribution, and previously reported values are presented in Table 6.3-1. Ranges of fish lengths for each age class during this study were narrower than the values provided in Walsh and Williams (1991) (Table 6.3-1 and Figure 6.3-1 through Figure 6.3-5).

Table 6.3-1 Trout Age Based on Length Frequency Histograms and Scale Analysis

Fish Species	Age	Fork Length Range Based on 2019 Scale Analysis (mm)[a]			Fork Length Range Based on Length-Frequency Nodes (mm)[b]	Fork Length Range Reported in Walsh and Williams (1991) (mm)[c]
		Sada 5	Sada 3	Cardinal		
Brown Trout	YOY	--[d]	100	--[d]	< 120	36–103
	1+	100–112	97–100	107–149	90–170	87–219
	2+	178–248	140–172	137–236	130–220	136–327
	3+	250	150–204	167–182	180–250	--
	4+	240	199	--[d]	210–290	--
	5+	--[d]	198–270	--[d]	>290	--
	6+	--[d]	--[d]	--[d]	--	--
	7+	--[d]	289	--[d]	--	--
Rainbow Trout	YOY	--[d]	--[d]	--[d]	--	--
	1+	--[d]	--[d]	--[d]	--	--
	2+	--[d]	170–176	--[d]	--	--
	3+	--[d]	147–174	--[d]	--	--
	4+	--[d]	--[d]	--[d]	--	--
	5+	--[d]	233	--[d]	--	--
	6+	--[d]	--[d]	--[d]	--	--
	7+	--[d]	--[d]	--[d]	--	--
	8+	--[d]	--[d]	285	--	--

[a] Fish were not aged from scales collected at the South Fork, Intake 4, or Intake 5 sample sites.

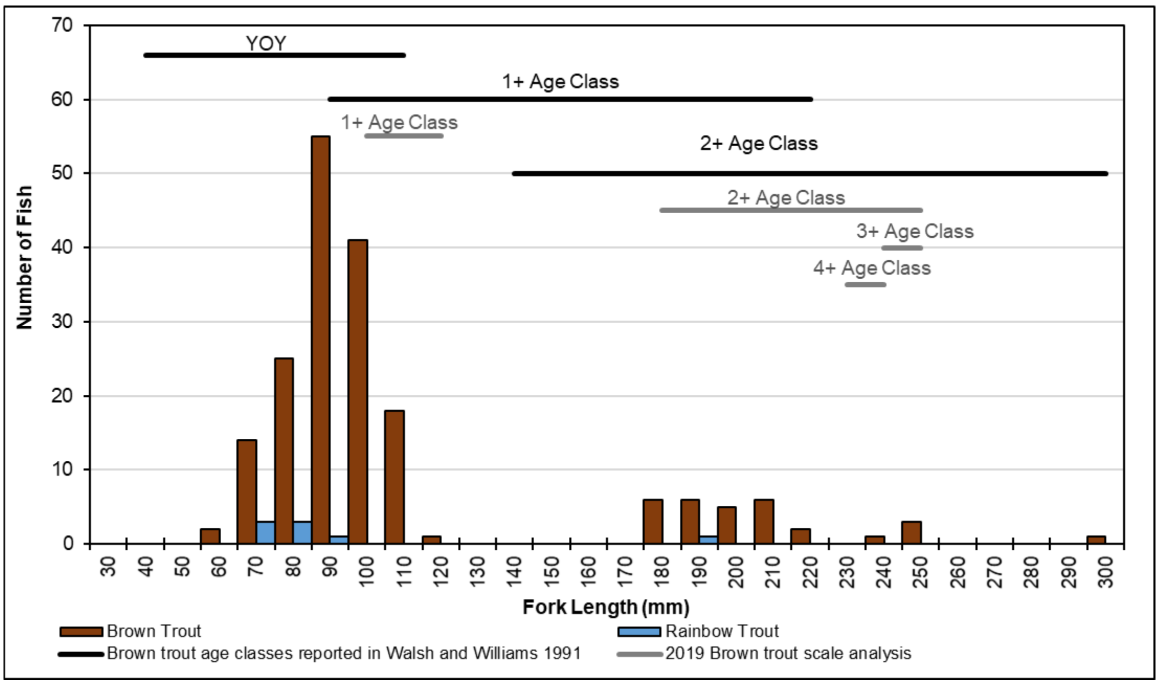
[b] Distinct nodes were not apparent on the length frequency distribution for brown trout longer than 290 mm FL or for rainbow trout of any size due to low numbers captured.

[c] Brown trout age class data in Walsh and Williams (1991) included YOY, age 1+ and age 2+; no rainbow trout ages were reported.

[d] Scales were not aged from fish in this size class (N. Buckmaster, CDFW, *personal communication*).

Brown trout captured at the Sada 5 sample site were predominately smaller fish, less than 110 mm FL. Although no scales were aged from brown trout less than 100 mm FL at the Sada 5 sample site, they are expected to fall within the YOY age class based on the length-frequency distribution and scale age data reported in Walsh and Williams (1991). Brown trout within the age 1+ and age 2+ age classes were common but in lower numbers than the YOY age class. A few brown trout longer than 220 mm FL were captured and likely fall within the age 2+ through age 4+ range. The overlap in fish lengths at specific age classes is typically due to variability in individual fish growth rates and is fairly common, especially for older age classes. The greater fish length assigned to age 3+

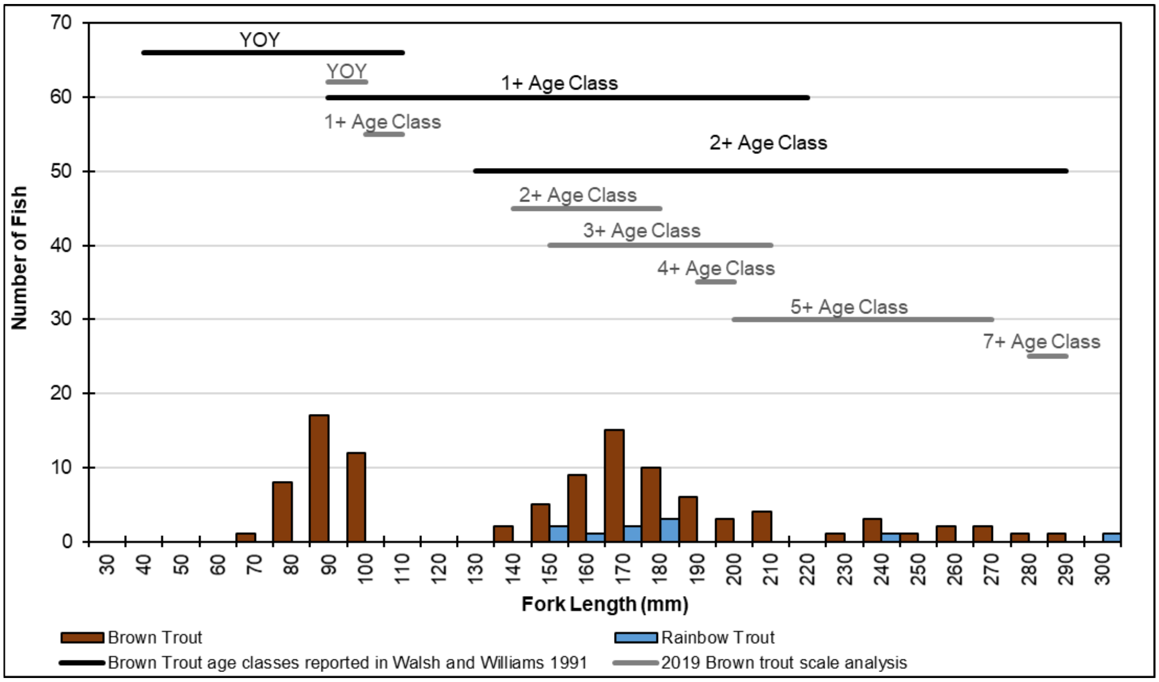
brown trout compared to age 4+ brown trout is likely due to age-class size overlap and the small sample size of scales analyzed from fish in both age classes (n = 1). The largest brown trout captured at the Sada 5 sample site was 299 mm FL and was likely age 5+ or older. The gap in sizes of brown trout observed between 120 mm and 180 mm at the Sada 5 sample site (Figure 6.3-1) may indicate unfavorable 2018 environmental conditions that limited fish survival or growth or delayed the spawning season. Multiple age classes of brown trout and a high abundance of young fish suggest that brown trout are successfully reproducing within this segment of Bishop Creek. The low number of rainbow trout captured at the Sada 5 sample site did not allow for identification of specific age classes; however, the large range in sizes observed suggest at least two age groups were observed (Figure 6.3-1). Rainbow trout less than 100 mm FL observed at the Sada 5 sample site suggest that a small population of rainbow trout is reproducing in this section of Bishop Creek.



Source: Walsh and Williams 1991

Figure 6.3-1 Length-frequency and Age Class Structure of Trout Species Captured at the Sada 5 Sample Site by Electrofishing in September 2019 Compared to Brown Trout Age Classes Identified in 1991

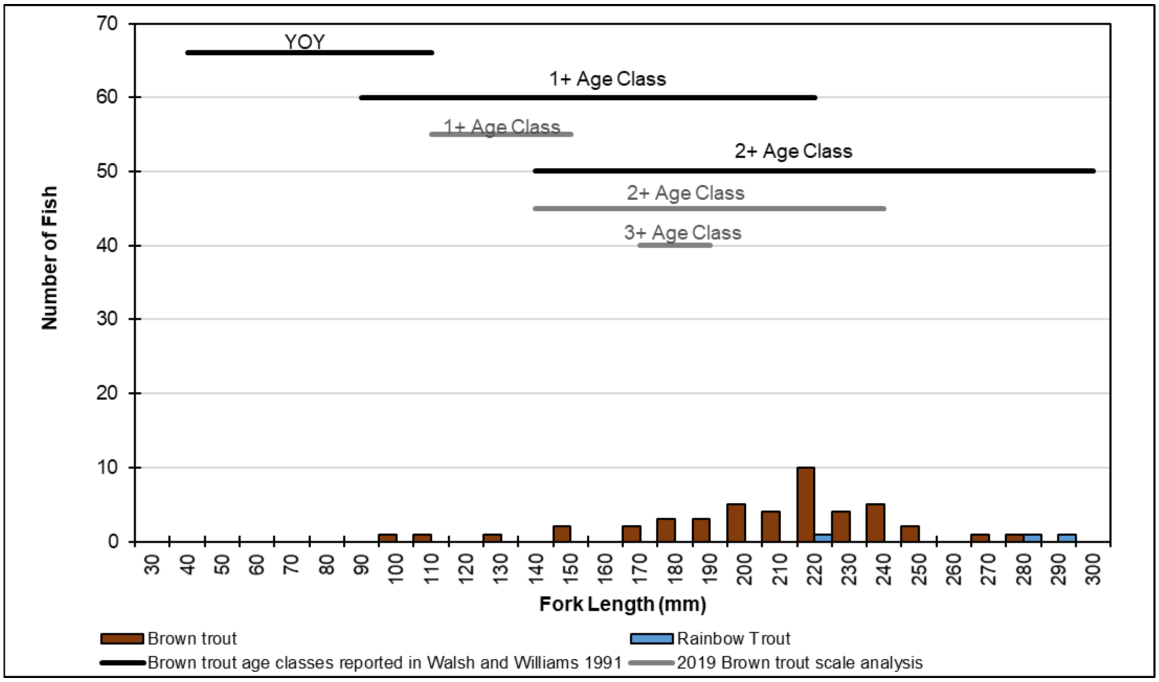
At the Sada 3 sample site, brown trout were fairly evenly distributed within the YOY through age 3+ age classes with lower abundance of larger fish from age 4+ and 5+ (Figure 6.3-2). A single fish was estimated to be age 7+ based on scale analysis suggesting that brown trout older than age 5+ are rare within this section of Bishop Creek (Figure 6.3-2). As previously discussed, the overlap in fish lengths at specific age-classes is typically due to variability in individual fish growth rates and becomes more apparent for older age classes. Rainbow trout captured at the Sada 3 sample site were between the 2+ and 6+ (or older) age classes (Figure 6.3-2).



Source: Walsh and Williams 1991

Figure 6.3-2 Length-frequency and Age Class Structure of Trout Species Captured at the Sada 3 Sample Site by Electrofishing in September 2019 Compared to Brown Trout Age Classes Identified in 1991

Scales collected from fish at the South Fork sample site revealed signs of regeneration and/or damage and were therefore considered unreliable for aging. The length-frequency distribution for the South Fork sample site shows very few brown trout in the presumptive YOY and 1+ age classes relative to older age classes, which is atypical for trout populations (Figure 6.3-3). The skewed age-class distribution is likely an artifact of the unique habitat conditions (i.e., slow, deep water with sand and gravel substrate) that are more suitable for adult brown trout but less suitable for YOY brown trout, which are typically associated with shallow water and rocky substrate (Raleigh et al. 1986). Based on scale analyses from the Cardinal sample site, most brown trout at the South Fork sample site were likely within the age 2+ to age 3+ range. The narrow range of lengths assigned to age 3+ brown trout that falls within the length range for age 2+ brown trout is likely due to the small sample size of scales analyzed from age 3+ brown trout (n = 2) and the potential for variable growth between age-classes.

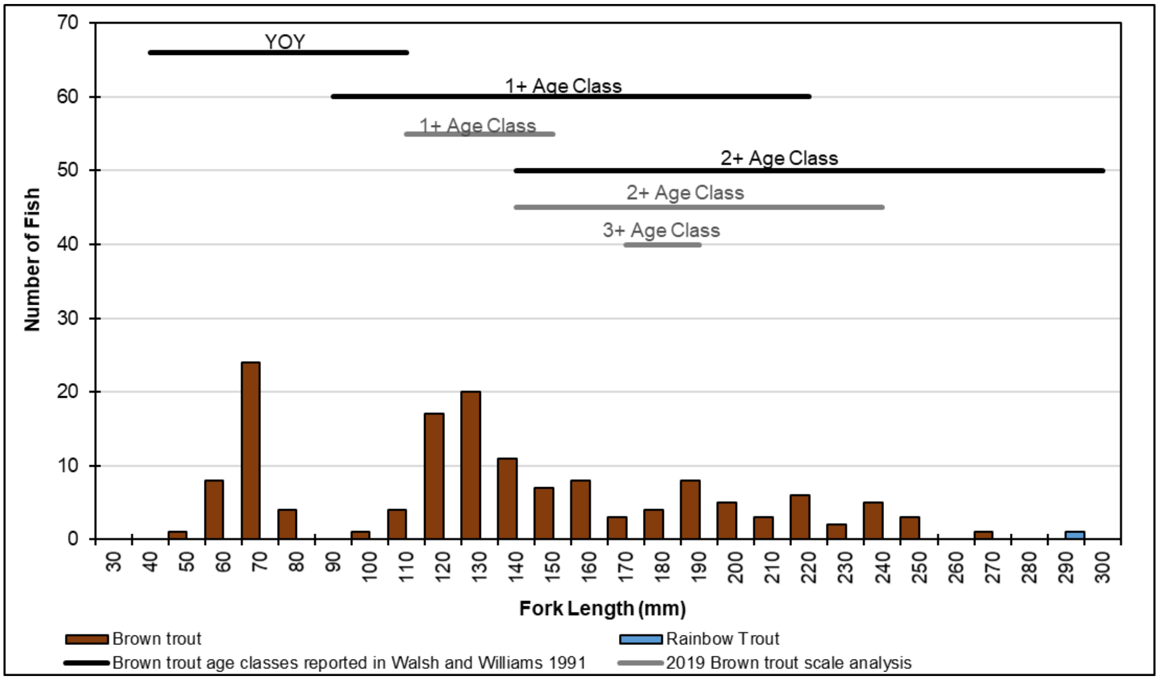


Source: Walsh and Williams 1991

Notes: Scales were not aged from fish at the South Fork sample site; scale analyses shown are based on ages from fish captured at the Cardinal sample site.

Figure 6.3-3 Length-frequency and Age-class Structure of Trout Species Captured at the South Fork Sample Site by Electrofishing in September 2019 Compared to Brown Trout Age Classes Identified in 1991

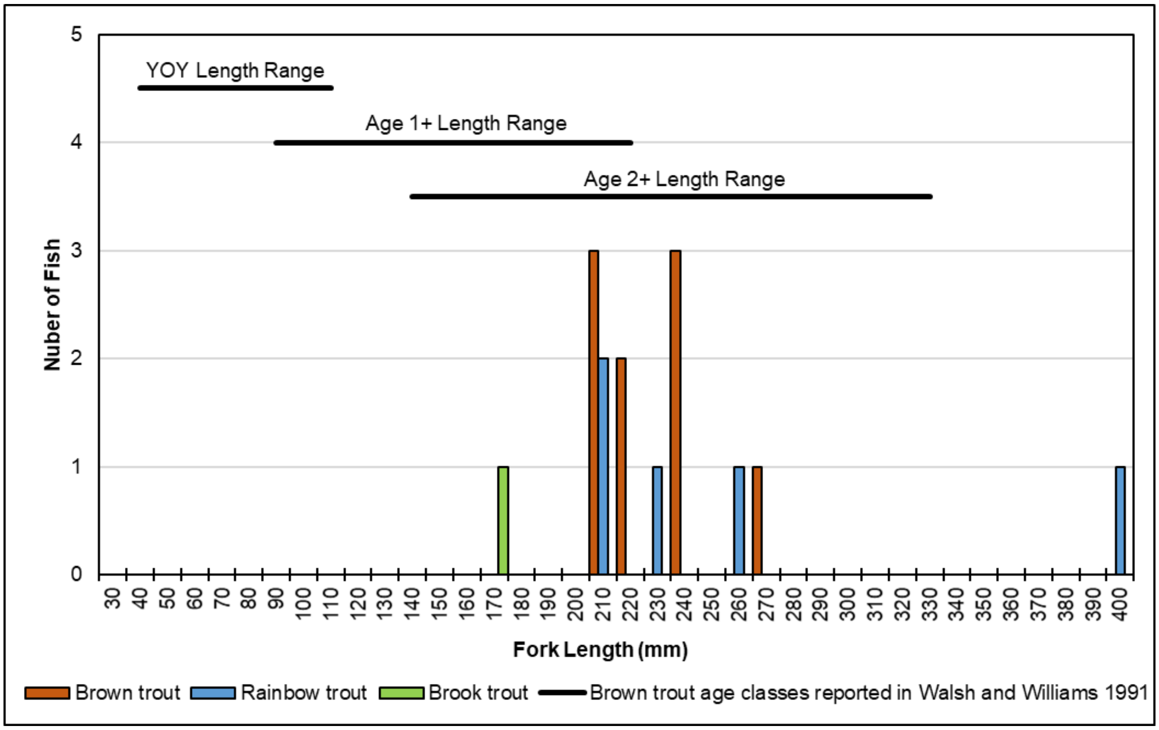
At the Cardinal sample site, brown trout estimated to fall within the YOY age class were observed in relatively high numbers, with lower numbers of brown trout through age 4+ (Figure 6.3-4). The single rainbow trout captured at the Cardinal sample site was estimated to be age 8+. The overall length distribution for brown trout at the Cardinal sample site suggests multiple age classes indicative of a self-supporting population of brown trout.



Source: Walsh and Williams 1991

Figure 6.3-4 Length-frequency and Age-class Structure of Trout Species Captured at the Cardinal Sample Site by Electrofishing in September 2019 Compared to Brown Trout Age Classes Identified in 1991

Lengths of brown trout captured in Project intakes ranged from approximately 160 mm FL to 400 mm FL. Scales collected from fish in Intake 4 and Intake 5 revealed signs of regeneration and/or damage and were therefore considered unreliable for aging. Based on ages observed from other locations in the Bishop Creek watershed, fish captured in Project intakes likely ranged from age 1+ up to age 5+ or older (Figure 6.3-5). Gill netting was selective for fish longer than approximately 100 mm; therefore, the fish lengths observed may not be representative of the true fish size and age distribution in these locations and cannot be compared to creek sites where samples were obtained by electrofishing.



Source: Walsh and Williams 1991

Figure 6.3-5 Length-frequency and Age-class Structure of Fish Species Captured by Gill Netting in Project Intakes in September 2019, Compared to Brown Trout Age Classes Identified in 1991

6.4 Fish Condition

Site-specific mean condition factors (k-values) of trout sampled at all sites in 2019 ranged from 0.92 to 1.21[3], indicating that trout were generally in good condition (Table 6.4-1).

[3] Condition factors in western Sierra Nevada streams typically range from 0.8 to 2.0, with a mean condition factor generally 1.2 or below (Beak 1991; EA 1987; Ebasco Environmental 1993; Wilcox 1994; Hanson Environmental 2005), while Rabe (1967) reported the condition factor to be between 0.9 and 1.1 for rainbow trout in Alpine lakes. Arismendi et al. (2011) cites broader ranges (0.5 to 2.0); however, condition is dependent on the sampling season, species, strain of trout, state of sexual maturity, and the way fish length is defined (e.g., fork length, total length, or standard length), which is not often documented with the results.

Table 6.4-1 Trout Condition (k-value) Calculated for Fish Captured September 2019

Stream	Sample site	Trout species	(n)	Mean k-value	k-value range
Bishop Creek	Sada 5	Rainbow	8	1.10	0.83–1.30
		Brown	186	1.08	0.78–1.31
	Sada 3	Rainbow	10	1.03	0.93–1.10
		Brown	103	0.97	0.79–1.13
	Intake 5	Brook	1	0.95	0.95
		Rainbow	4	0.98	0.92–1.05
		Brown	7	1.00	0.92–1.08
	Intake 4	Rainbow	1	1.21	1.21
		Brown	2	1.12	1.09–1.16
Middle Fork Bishop Creek	Cardinal	Rainbow	1	0.94	0.94
		Brown	145	0.92	0.65–1.14
South Fork Bishop Creek	South Fork	Rainbow	3	1.09	1.01–1.21
		Brown	45	0.96	0.75–1.70

6.5 Current and Historical Brown Trout Population Data Comparison

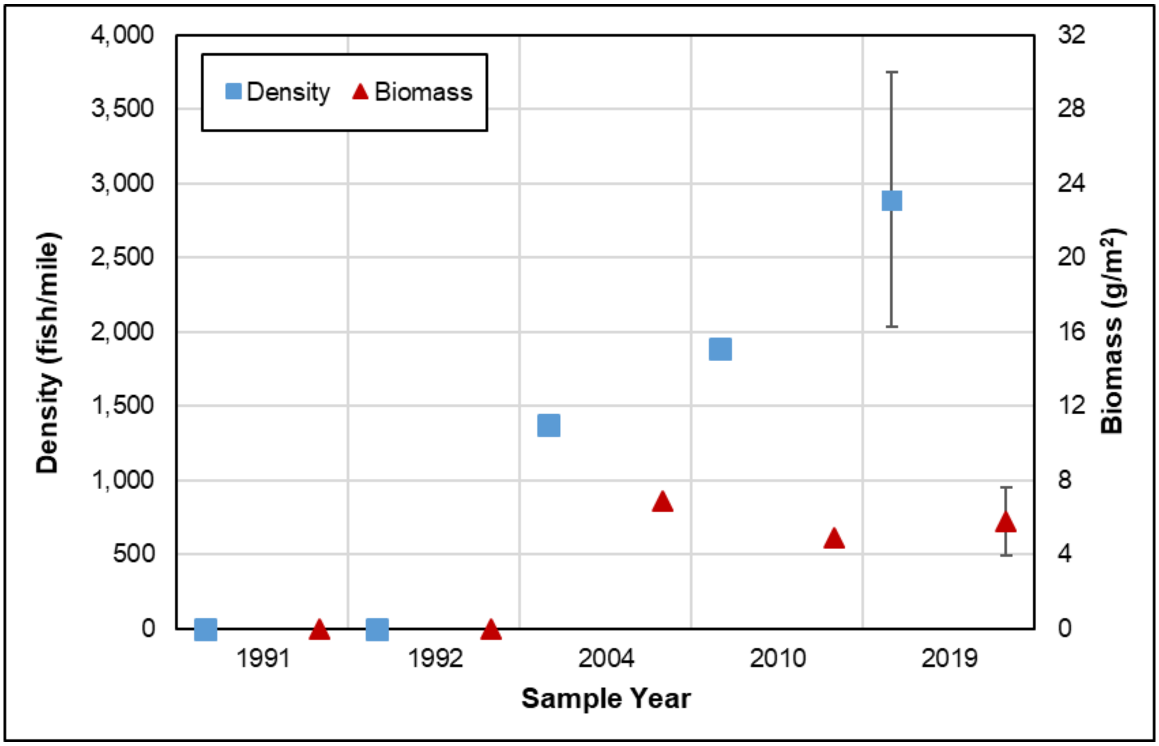
6.5.1 Abundance and Biomass

The estimated density for brown trout in Bishop Creek at the Sada 5 sample site during 2019 was significantly higher (P=0.045) than in all previous years, while biomass was within the range of prior years (Table 6.5-1 , Figure 6.5-1). The Sada 5 site was dry during 1991 and 1992 monitoring efforts, so no fish were captured (Sada 2006). At the Sada 3 sample site, the estimated density and biomass for brown trout during 2019 were higher than in 2010 but lower than in previous years (Figure 6.5-2); however, no significant difference was detected between any of the estimated densities at this site during these sample years (Table 6.5-1).

Table 6.5-1 Results from Two-tailed T-tests with Unequal Variances Comparing Density Estimates at Sada 5 and Sada 3 for 2019 and Previous Monitoring Efforts

Sample years	P-values	
	Sada 5	Sada 3
2019 and 2010	0.015	0.221
2019 and 2004	0.045	0.504
2019 and 1992	n/a [a]	0.265
2019 and 1991	n/a [a]	0.275

[a] This location was dry during 1991 and 1992, so no fish were captured during those years.
Note: Light grey highlight indicates significant differences at α = 0.05.



Note: This location was dry during 1991 and 1992, so no fish were captured during those years

Figure 6.5-1 Brown Trout Estimated Density and Biomass (with 95% confidence intervals) at the Sada 5 Sample Site during 2019 and Previous Studies

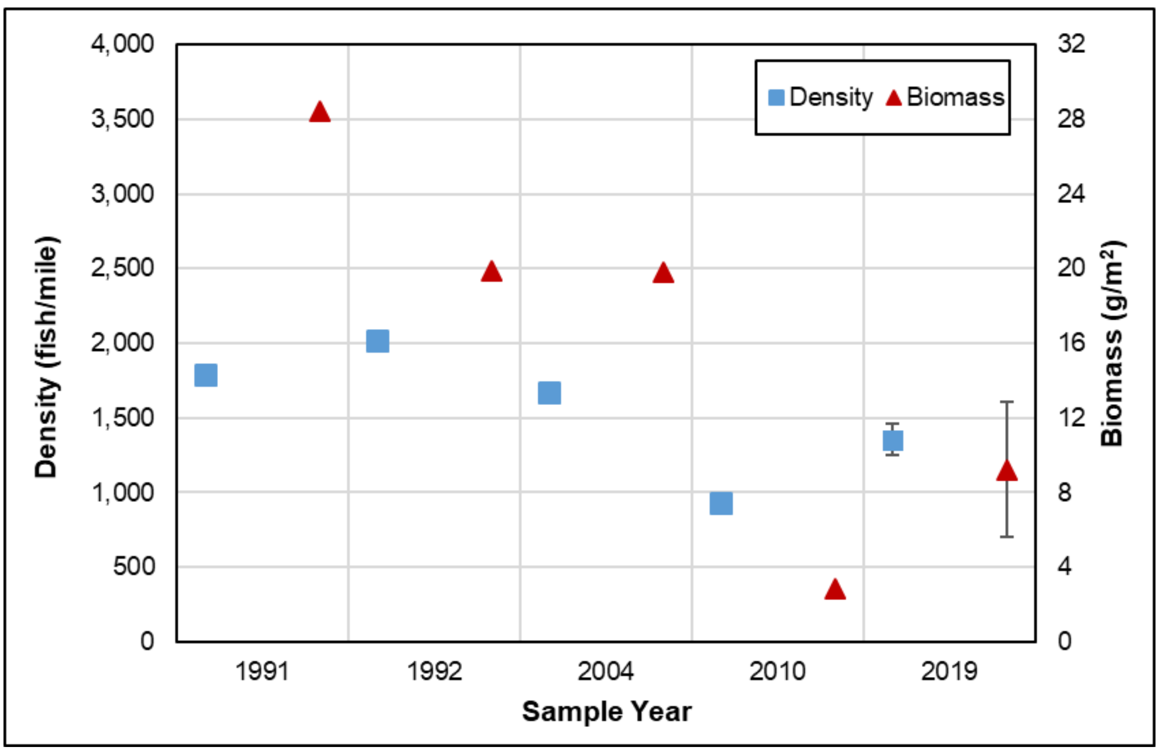


Figure 6.5-2 Brown Trout Estimated Density and Biomass in Bishop Creek at the Sada 3 Sample Site during 2019 (with 95% Confidence Intervals) and Previous Studies

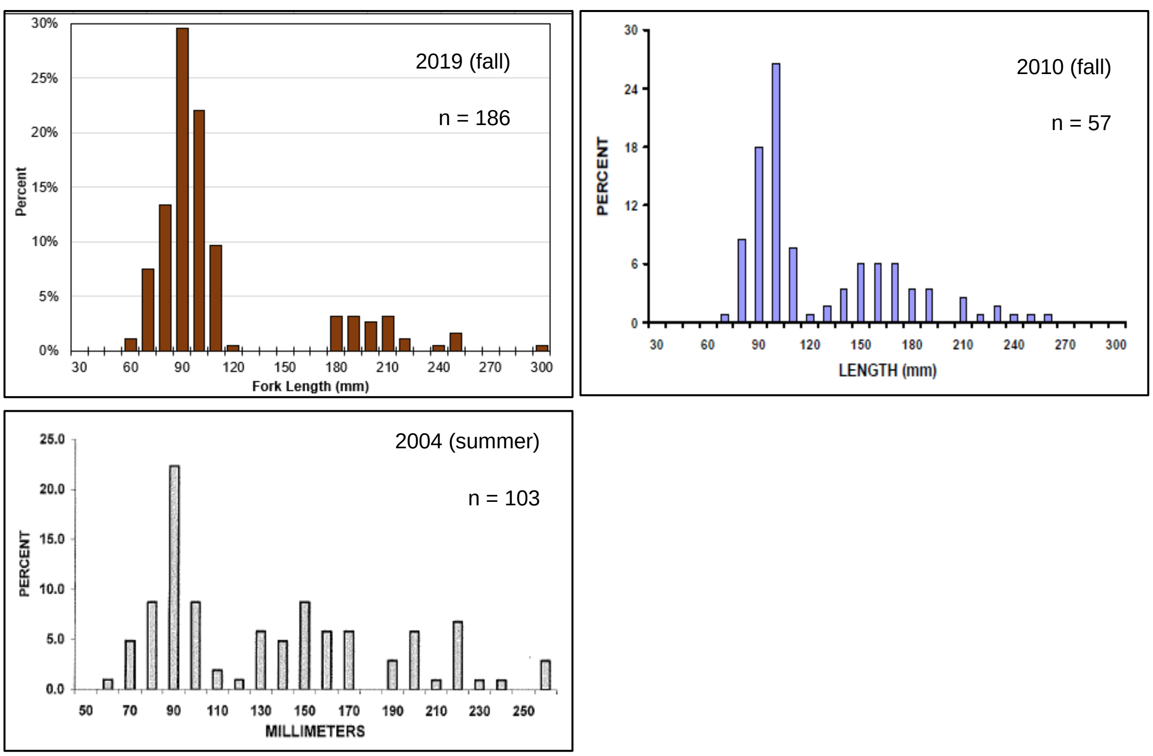
6.5.2 Age Class Distribution and Fish Condition

On average, brown trout captured at the Sada 5 sample site during 2019 were slightly smaller than fish captured during the two previous survey years, whereas brown trout captured at the Sada 3 sample site during 2019 were slightly larger than fish captured during previous years (Table 6.5-2). The age-class distribution of brown trout in Bishop Creek at the Sada 5 sample site appeared similar across all sample years, showing a typical length-frequency distribution where YOY have the highest abundance followed by fewer of each subsequent age class, reflecting attrition due to natural mortality and angling exploitation (Figure 6.5-3). Length-frequency histograms for the Sada 3 sample site show a more typical distribution for brown trout in 2019, whereas length-frequency histograms from previous monitoring years had a higher proportion of older age classes indicative of lower recruitment (Figure 6.5-4).

Table 6.5-2 Average Brown Trout Length and Weight for the Sada 5 and Sada 3 Sample Sites during 2019 and Previous Studies in Bishop Creek

Sample year and season	(n)	Mean fork length (mm)	Range (mm)	Average weight (g)	Range (g)
Sada 5					
2019 Fall	186	106.2	53–299	23.3	1.8–326.8
2010 Fall	117	121.4	67–259	29.3	3.2–165.6
2004 Summer[a]	103	130.6	54–263	24.4	1.2–127.1
1991 and 1992[b]	--	--	--	--	--
Sada 3					
2019 Fall	103	147.9	66–289	51.8	3.6–235.4
2010 Fall	57	127.8	70–287	29.8	4.1–179.0
2004 Summer[a]	130	132.0	77–205	49.6	7.5–152.5
1991 Fall	120	147.5	73–250	38.5	4.7–100.5
1992 Fall	143	135.4	69–213	32.5	3.7–101.9

[a] The Sada 5 and Sada 3 sample sites were not sampled during the fall of 2004 due to high flows.
[b] The Sada 5 sample site was dry during the 1991 and 1992 monitoring efforts.



Note: Brown trout were not observed at the Sada 5 sample site during 1991 and 1992 when the stream channel was dry.

Figure 6.5-3 Brown Trout Length-frequency Distribution at the Sada 5 Sample Site Based on Fork Length

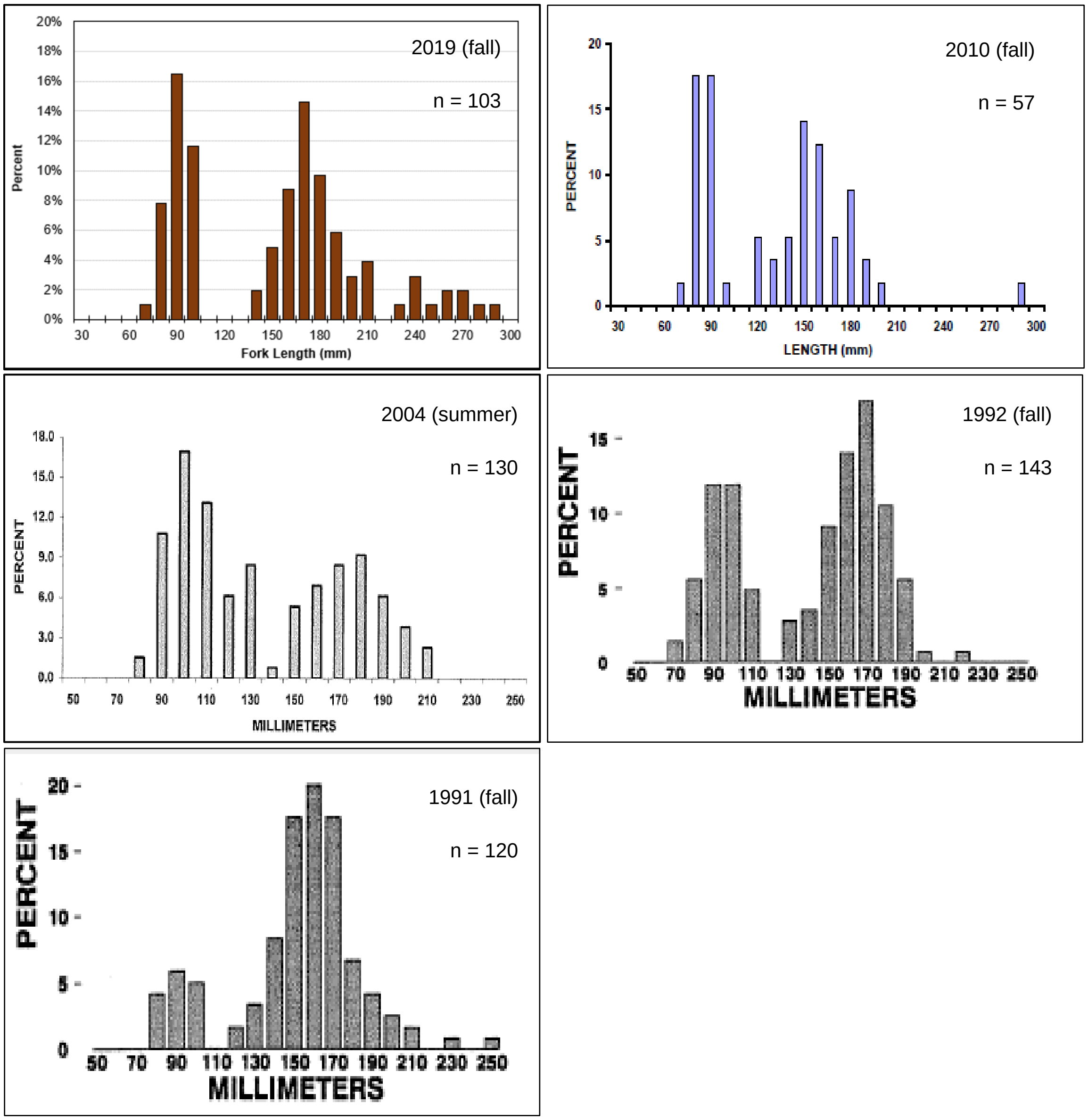


Figure 6.5-4 Brown Trout Length-frequency Distribution at the Sada 3 Sample Site Based on Fork Length

The average fish condition was similar across years at both the Sada 5 and Sada 3 sample sites (Table 6.5-3).

Table 6.5-3 Brown Trout Condition at the Sada 5 and Sada 3 Sample Sites during 2019 Compared to Historic Values

Sample period	(n)	Mean condition
Sada 5		
September 2019	186	1.090
Fall 2010	117	0.990
Summer 2004	130	0.999
Fall 1991–1992[a]	0	--
Sada 3		
September 2019	103	0.970
Fall 2010	57	0.980
Fall 2004	103	0.998
Fall 1991	120	0.98
Fall 1992	143	0.99

[a] The Sada 5 sample site was dry during 1991 and 1992 sampling efforts.

6.6 HABITAT CONDITIONS

General habitat conditions in the Bishop Creek watershed are summarized by sample site in Table 6.6-1 . Habitat condition data and water chemistry are provided in Appendix B. Riffle was the dominant habitat type at most stream sample sites except for South Fork, which primarily contained run habitat. The Sada 5 and Sada 3 sample sites had larger substrates (boulder and cobble) than the South Fork and Cardinal sample sites (cobble, gravel, and sand).[4] Estimated stream discharge was higher at the Sada 5 and Sada 3 sample sites than at the farther upstream South Fork and Cardinal sample sites. Water quality conditions measured during the study were comparable with reported values required to maintain and enhance cold freshwater habitat for DO levels and pH (CRWQCB 1995), while water temperatures were generally colder than the optimal ranges reported for brown trout (NDEP 2017) (Table 6.6-2).

Table 6.6-1 Summary of Habitat Conditions during the September 2019 Survey

Sample Site	Habitat Type (%)			Substrate		Water Temperature (ºC)	Discharge (cfs)[1]
	Pool	Riffle	Run	Dominant	Subdominant		
Sada 5	5	90	5	Boulder	Cobble	10.0	22
Sada 3	28	58	14	Boulder	Cobble	13.8	20
South Fork	20	0	80	Sand	Gravel	8.5	14
Cardinal	16	61	23	Cobble	Gravel	11.0	10

[1] Discharge values provided by Southern California Edison

[4] The Sada 5, Sada 3, Cardinal, and South Fork sites are also Instream Flow Incremental Methodology (IFIM) study sites used in the Instream Flow Needs Physical Habitat Simulation (PHABSIM) model

Table 6.6-2 Water Quality Measurements at Sample Sites during September 2019 and Optimal Ranges Reported for Brown Trout

SAMPLE SITE	DISSOLVED OXYGEN (mg/L)[a]	WATER TEMPERATURE (°C)	pH
Sada 5	9.70	9.2	7.73
Sada 3	8.62	13.8	6.98
South Fork	7.99	8.5	7.28
Cardinal	8.07	11.0	6.77
Intake 4	10.18	8.6	6.84
Intake 5	8.52	9.8	7.60
Water Quality Criteria			
	> 7.00 [b]	12–19°C [c]	6.5–8.5 [b]

[a] milligrams per liter (mg/L)

[b] CRWQCB (1995) criteria for cold freshwater habitat

[c] NDEP (2017) optimal temperature for brown trout.

7.0 DISCUSSION

7.1 Fish Populations and Distribution in Project-Influenced Stream Reaches

The 2019 surveys found no evidence of Owens sucker recruitment in the reaches of Bishop Creek below Lake Sabrina and South Lake. No Owens speckled dace were detected in the study area. Only three fish species were observed in the study area: brown trout and rainbow trout, which were distributed throughout Bishop Creek downstream of South Lake and Lake Sabrina, and brook trout, which had a more limited distribution. Low abundance and the lack of historic data for both rainbow trout and brook trout within the study area limited the ability to analyze these populations; therefore, overall population discussion for the study area focuses on the brown trout populations.

Comparison of the naturally reproducing brown trout populations to the levels documented at historical monitoring locations indicate that naturally reproducing brown trout populations at the Sada 5 and Sada 3 sample sites are generally consistent with levels documented during monitoring from 1991 through 2010. Overall, the brown trout population at the Sada 5 sample site appears to be stable or growing compared to previous levels. Brown trout density estimates at the Sada 5 sample site are highest for the 2019 sample year compared to previous years, and the higher density is partially driven by higher numbers of YOY fish. Fish captured at the Sada 5 sample site in 2019 had slightly higher condition factors with a broader range of sizes present compared to previous years. At the Sada 3 sample site, the brown trout population data collected during this study were generally within range of prior studies (1991–2010), although results were more variable at this site across survey years.

Based on the absence of brown trout stocking in 2019 (CDFW, 2019), presence of the YOY age class, broad age-class distribution throughout most of the study area, and presence of suitable spawning habitat at most sample sites where brown trout of reproductive age (age 3+ and 4+ [Taube, 1976]) were present, brown trout populations appear to be naturally reproducing and sustaining. Locations with multiple years of data (Sada 5 and Sada 3 sample sites) suggest that the brown trout population size is stable or increasing. Three out of the four sample sites showed high numbers of YOY fish indicating signs of recruitment. The South Fork sample site did not have high numbers of YOY, likely because the habitat conditions (i.e., the predominately sand substrate lacking escape cover) at that location were not favorable for YOY brown trout, but YOY brown trout habitat appears abundant in nearby higher gradient locations where larger substrate is available. This is likely a source of recruitment to the population of larger fish in the South Fork sample site.

Scale analysis from brown trout estimated some fish captured during this study were over 7 years old (Table 6.3-1), which is considered fairly long-lived in California where the oldest brown trout was previously estimated to be 9 years old (Moyle, 2002). In addition, several brown trout captured in 2019 were estimated to be age 3+ or older based on both scale analysis and length-frequency distribution, which indicates that the population includes reproductive adult fish. Although many brown trout captured during this study were estimated to be age 3+ or older, they rarely exceeded 250 mm FL and tended to have slower growth rates compared to other locations. Brown trout growth rates are highly variable but average approximately 100 mm per year for the first three years and then roughly 50 mm per year thereafter (Simpson and Wallace, 1982, as cited in Adams et al., 2008). Growth rates in the study area are likely constrained by limited prey and cold water temperatures, which are generally below the optimal ranges reported for brown trout (12°C to 19°C [NDEP, 2017]). While trout smaller than 200 mm FL can prey on both invertebrates or small fish, once stream-dwelling salmonids reach around 270 mm FL, they must be predominately piscivorous to grow larger (Keeley and Grant, 2001). The only two fish prey sources for mature trout in Bishop Creek are either smaller rainbow trout or brown trout (especially YOY). However, the low number of YOY trout observed is likely less than the quantity needed to maintain the bioenergetic demands of mature resident trout (Beauchamp, 1990).

The brown trout populations in the study area appear healthy based on criteria described in Moyle et al., (1998), including age-class structure (evidence of reproduction), population size, and individual health. Brown trout populations in the study area included multiple age classes with evidence of reproduction. Comparison with historic monitoring data indicates that the brown trout populations are either stable or growing. Individual fish appeared healthy with condition factors within the range considered healthy for trout populations in Sierra Nevada streams (Ebasco Environmental, 1993; Wilcox, 1994; EA, 1987; Beak, 1991). Growth rates for brown trout within the study area may be lower than in other watersheds, but they do not appear to be limiting the population, recruitment, or condition of the fish.

7.2 Localized Water Quality Parameters that May Affect the Growth and Distribution of Fish Species

Water quality conditions observed during this study are suitable for brown trout with high oxygen levels, cold water temperatures, and suitable pH levels. Although water temperatures may be slightly cooler than optimal, thus limiting brown trout growth, they do not appear to be having an adverse effect on the overall health of the brown trout population or its distribution within the study area.

Before minimum flow requirements were established, Bishop Creek below Intake 5 occasionally experienced extensive periods with no flow and, therefore, did not historically support an aquatic community (SCE, 1986). Results from this study and previous studies have not documented native fish species within the Project area. Bishop Creek is a popular destination for recreational angling where nonnative trout are targeted. As a popular sport fish, brown trout are considered a desirable nonnative fish. Results from this study suggest that there is a healthy, naturally reproducing population of brown trout in the study area, which is in line with the Desired Conditions described in the Land Management Plan for the Inyo National Forest (USDA 2019) as they relate to ecological sustainability and diversity of plant and animal communities.

Desired Conditions described in the Land Management Plan for the Inyo National Forest (USDA 2019) relevant to this study include the following:

1. **(SPEC-FW-DC) 01:** Sustainable populations of native and desirable nonnative, plant and animal species are supported by healthy ecosystems, essential ecological processes, and land stewardship activities, and reflect the diversity, quantity, quality, and capability of natural habitats on the Inyo National Forest.
2. **(SPEC-FW-DC) 05:** The Inyo National Forest provides high quality hunting and fishing opportunities. Habitat for nonnative fish and game species is managed in locations and ways that do not pose substantial risk to native species, while still contributing to economies of local communities.
3. **(RCA-RIV-DC) 01:** Stream ecosystems, riparian corridors, and associated stream courses sustain ecosystem structure; are resilient to natural disturbances (such as flooding) and climate change; promote the natural movement of water, sediment and woody debris; and provide habitat for native aquatic species or desirable nonnative species.

Based on findings of this study, there does not appear to be a conflict with the desired conditions.

8.0 CONSULTATION SUMMARY

During studies, biologists consulted and coordinated with CDFW to analyze fish scale samples collected during the 2019 surveys. CDFW provided scale age analysis results on February 7, 2020. These results were summarized in the Bishop Creek Stream Fish Distribution Technical Memorandum, distributed as a draft in April 2020.

Site selection and placement was determined in consultation with CDFW and USFS in 2019.

SCE distributed periodic progress reports on the following schedule:

- Progress Report 1: December 19, 2019
- Progress Report 2: April 14, 2020
- Progress Report 3: July 24, 2020
- Initial Study Report (Progress Report 4): October 30, 2020
- Initial Study Meeting: November 10, 2020
- 2021 Progress Report 1: March 2, 2021
- 2021 Progress Report 2: May 28, 2021
- 2021 Progress Report 3: August 27, 2021
- Updated Study Report Filing: November 4, 2021
- Updated Study Report Meeting: November 18, 2021

Three progress reports were filed in 2021 after the ISR, as identified above. This Final Technical Report was submitted to agencies and stakeholders for a 60-day review period on May 14, 2021. The comment period was extended, at the request of the agencies, and comments received on this report are shown in Table 8.1-1. A meeting was held with CDFW and USFS on October 6, 2021 to discuss those comments received as well as SCE’s draft responses to them.

SCE held a Project Effects meeting on October 28, 2021 for all stakeholders and agencies to discuss what project effects (if any) had been identified through the implementation of each of the approved study plans. The Updated Study Report (USR) was filed with FERC on November 4, 2021, and a USR Meeting was held on November 18, 2021. At this meeting, SCE only discussed those studies which were still in progress at the time of the ISR (Water Quality, Sediment and Geomorphology, Operations Model, Recreation Use and Needs, Recreation Facilities Condition Assessment, Project Lands and Boundary, and Cultural and Tribal Studies). The Baseline Fish Distribution Study was not discussed at the USR, and thus received no comments.

Table 8.1-1 Comment Response Table

Comment Number	Study	Date of Comment	Entity	Comments	SCE Response
28	Bishop Creek Fish Distribution Technical Memo	May 21, 2020	CDFW	[SCE] Addressed but did not specifically refer to naturally reproducing brown trout populations. CDFW recommends the technical memorandum assess the distribution of the naturally reproducing brown trout populations. [Referring to *Assess distribution of other fish species in Bishop Creek downstream from Lake Sabrina and South Lake.*]	The discussion section (Section 7.1) of the FTR report has been revised to specify that the brown trout observed in the study area "*appear to be naturally reproducing and sustaining.*" Section 8.5 of Exhibit E of the DLA includes language about naturally reproducing and sustaining brown trout populations.
28	Bishop Creek Fish Distribution Technical Memo	May 21, 2020	CDFW	An analysis was done but no real discussion. CDFW recommends the technical memorandum provide a discussion of the population comparison and the evaluation showing the populations are self-sustaining consistent with levels documented during the 1990s through 2010. [Referring to *Obtain population data 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.*]	The Discussion Section (Section 7.2) of the FTR report has been revised to include a comparison of the current population data to historic population data for the Sada 5 and Sada 3 Sample Sites. Historical comparisons between Sada 5 and Sada 3 with current population data is discussed in Section 8.5 of Exhibit E of the DLA.
30	Bishop Creek Fish Distribution Technical Memo	May 21, 2020	CDFW	Reported in Appendix B but not evaluated. [Referring to *Evaluate select, localized water quality parameters that may affect the growth and distribution of fish species*.]	A full evaluation of localized water quality parameters has been added to this report including detailed results (Section 7.6) and discussion (Section 8.2). A summary of the water quality parameters discussed in the FTR is included in Section 8.5 of Exhibit E of the DLA.
31	Bishop Creek Fish	May 21, 2020	CDFW	The technical memorandum determined that study results suggest that trout	The Discussion Section of this report has been revised to include rational supporting

Comment Number	Study	Date of Comment	Entity	Comments	SCE Response
	Distribution Technical Memo			populations within Bishop Creek sample sites are in line with the 'Desired Conditions' described in the Land Management Plan for the Inyo National Forest (USDA 2019). It is unclear how this determination was made. CDFW recommends the technical memorandum provide more detail on the methodology and assessment.	the conclusion that the brown trout populations observed in Bishop Creek are in line with "Desired Conditions" included in the Land Management Plan for the Inyo National Forest (USDA 2019). The Desired Conditions for the Inyo National Forest in relation to brown trout and water quality is discussed in the FTR and included in the Section 8.5 of Exhibit E of the DLA.
1	Fish Distribution Baseline Study (Creeks) – AQ3	June 21, 2021; updated October 4, 2021	CDFW	The report should include a discussion of the flow regime during the lifespan of the sampled fishes (2016-2019) - the flows in the creek are not necessarily indicative of the bypass flow regime required by the license. <u>October 14, 2021, CDFW Updated Comment:</u> Of concern is that the report assumes that the MIF will be continued in the new license, however, this has not yet been determined. The sentence should be removed. The Forest Service (FS) asked why we see differences in the bypass reaches; Kleinschmidt stated that the study wasn't designed to determine why there are differences in the bypass reaches. CDFW agrees the study was not designed to answer this question.	SCE understands that this request was prompted by an observed change in growth of trout in the two historic Bishop Creek survey reaches that occurred in 2017 (N. Buckmaster, personal communication). The Final License Application (FLA) will report on any flow variances from minimum instream flows (MIFs); however, SCE reviewed project operation data for the past 5 years and confirmed there were no flow regime deviations within the two surveyed stream reaches. Additionally, the Operations Model has not identified any systematic/systemic issues with meeting the current MIF requirements, and will be useful for investigating the compliance challenges with any changes to MIF MIF and flow variances are discussed in Section 8.5 in Exhibit E of the DLA.

Comment Number	Study	Date of Comment	Entity	Comments	SCE Response
2	Fish Distribution Baseline Study (Creeks) – AQ3	June 21, 2021; updated October 4, 2021	CDFW	The trend of decreasing brown trout biomass (Figure 7.5-2) since 1991 should be discussed in further detail	Wild riverine fish populations are rarely perfectly stable and routinely increase or decrease naturally over time due to varying environmental, ecological or angling pressure factors. SCE notes that the brown trout population developed and expanded subsequent to the inception of the habitat-based flow during the prior relicensing. Brown trout populations in Project reaches would have adapted to the habitat-based flows initiated under the current License in 1994. The subsequent wild riverine fish populations would be expected to increase and decrease naturally over time as they become established and due to varying environmental, ecological, or angling pressure factors. Both the biomass and density estimate at the Sada 3 Study Site for 2010 and 2019 are lower than estimates from 1991, 1992, and 2004; however it is unclear whether the differences in biomass are statistically significant. While the density estimates at the Sada 3 Study Site were lower in 2019 compared to estimates from 1991, 1992, and 2004, results from the t-test analysis indicate there is no significant difference between the population size in 2019 compared to prior years. Additionally, while the biomass estimates for 2019 is lower compared to 1991, 1992, and 2004, individual fish sizes were actually larger in 2019 compared to prior years based on the average length and weight for brown trout captured. Biomass values reported from

Comment Number	Study	Date of Comment	Entity	Comments	SCE Response
					previous studies do not include sufficient detail (i.e., standard error) to perform a t-test to evaluate whether differences in biomass between sample years are statistically significant; however, given the population densities and individual fish sizes, the population does not appear to be statistically different from prior years. This comment is addressed in Section 8.5 of Exhibit E of the DLA.
3	Fish Distribution Baseline Study (Creeks) – AQ3	June 21, 2021; updated October 4, 2021	CDFW	For each species and each reach, use the data to discuss if the overall population characteristics align with current agency management goals (e.g., native, non-native fish) and strategies (e.g., active versus passive management). October 14, 2021, CDFW Updated Comment: CDFW's concern is that California has such a diverse array of stream habitats that a single reach-based criteria and goal is infeasible. Other resources besides the CDFW Management Report include the Bear Creek 5937 studies, Flosi (2010), and the Rush Creek synthesis report. Of these, the Synthesis report is probably the most relevant. Also, CDFW's Fisheries Branch is updating the 'Strategic Trout Management Plan', but it will be some time.	In developing the Study Plan, SCE included relevant resource management plans and objectives provided by TWG participants. SCE also considered published guidance, including the Inyo National Forest Land Management Plan. Existing management objectives provided by CDFW in the Strategic Plan for Trout Management; A Plan for 2004 and Beyond (CDFW 2003) do not include clear guidance on reach-based assessments. SCE requests that CDFW provide detailed agency management targets for each reach. SCE can then collaborate with CDFW to develop this discussion. SCE will incorporate a discussion of relevant CDFW management goals, if a copy and/or citation is provided prior to the development of the FLA. Materials used in Study Plan development are included in Section 8.5 of Exhibit E of the DLA.

9.0 REFERENCES

Adams, P., C. James, C. Speas. 2008. Brown trout (Salmo trutta) species and conservation assessment. Prepared for the Grand Mesa, Uncompahgre, and Gunnison National Forests.

Arismendi, I., B. Penaluna, and D. Soto. 2011. Body condition indices as a rapid assessment of the abundance of introduced salmonids in oligotrophic lakes of southern Chile. Lake and Reservoir Management, 27: 1, 61-69.

Baltz, D. M., B. Vondracek, L. R. Brown, and P. B. Moyle. 1987. Influence of temperature on microhabitat choice by fishes in a California stream. Transactions of the American Fishery Society. 116:12–20.

Beak Consultants Incorporated (Beak). 1991. Instream flow requirements for brown trout, Rush Creek, Mono County. California Department of Fish and Game Stream Evaluation Report 91-1. Sacramento, California.

Beauchamp, D. A. 1990. Seasonal and diel food habits of rainbow trout stocked as juveniles in Lake Washington. Transactions of the American Fisheries Society 119:475–482.

California Department of Fish and Wildlife (CDFW). 2019. California Department of Fish and Wildlife provisional fish releases - 2019/2020. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=74004&inline.

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.

California Regional Water Quality Control Board (CRWQCB) Lahontan Region. 1995. Water Quality Control Plan for the Lahontan Region: North and South Basins. March 31.

Chandler Decree 1922. 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).

EA Engineering. 1987. Eastside Sierra Hydroelectric Relicensing Studies: Impacts of Reservoir Drawdown on Fish Populations. Prepared for Southern California Edison. March 1987.

Ebasco Environmental. 1993. North Fork Stanislaus River Basin 1992 fish population surveys. Prepared for Northern California Power Agency. Sacramento, California.

Hanson, C. H. 2005. Assessment of habitat quality and availability within the lower Big Sur River: April-October 2004. Prepared by Hanson Environmental, Inc., Walnut Creek, California for El Sur Ranch, Monterey, California.

Jenkins, T. M., S. Diehl, K. W. Kratz, and S. D. Cooper. 1999. Effects of population density on individual growth of brown trout in streams. Ecology, 80(3): 941–956.

Keeley, E. R., and J. W. A. Grant. 2001. Prey size of salmonid fishes in streams, lakes, and oceans. Canadian Journal of Fisheries and Aquatic Sciences 58: 1,122–1,132.

Moyle, P.B. 1976. Inland Fishes of California. University of California Press, Berkeley.

Moyle, P. B. 2002. Inland fishes of California. Revised edition. University of California Press, Berkeley.

Moyle, P. B., M. P. Marchetti, J. Baldrige, and T. L. Taylor. 1998. Fish Health and Diversity: Justifying Flows for a California Stream. Fisheries Management 23 (7): 6–15.

Moyle, P. B., R. M. Yoshiyama, J. E. Williams, and E. D. Wikramanayake. 1995. Fish species of special concern in California. Second edition. Prepared by University of California, Department of Wildlife and Fisheries Biology, Davis, California for California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California.

Nevada Department of Environmental Protection (NDEP). 2017. Brown Trout (Salmo trutta) thermal tolerance analyses – juvenile and adult, summer. May. Available online at: https://ndep.nv.gov/uploads/water-wqs-docs/BrownTTA.pdf.

Rabe, F.W. 1967. The Transplantation of Brook Trout in Alpine Lake. The Progressive Fish Culturist. 29(1):53-55.

Raleigh, R. F., L. D. Zuckerman, and P. C. Nelson. 1986. Habitat suitability index models and instream flow suitability curves: brown trout, revised. U.S. Fish and Wildlife Service, Biological Report 82 (10.124). 65 pp.

Reynolds, J.B. 1996. Electrofishing. Pages 83–120 in B.R. Murphy and D.W. Willis, editors. Fisheries Techniques. Second Edition. American Fisheries Society, Bethesda, Maryland.

Ricker, W.E. 1975. Computation and interpretation of biological statistics of fish populations. Fisheries Research Board of Canada. Bulletin 191.

Sada, D.W. 1997. Fish population surveys from 1991—1996, Bishop, McGee, and Mill Creeks. Inyo and Mono counties, California. Unpublished Report to Southern California Edison Company. Rosemead, CA.

Sada, D.W. 2006. 2004 fish population surveys Bishop and McGee creeks, Bishop Inyo County, California. Unpublished report to Southern California Edison Company. Rosemead, California.

Sada, D.W., and R.A. Knapp 1993. Fish population monitoring during 1991 and 1992 in Bishop, McGee, and Mill Creeks Inyo and Mono counties, California. Unpublished report to Southern California Edison Company. Rosemead, California. April 1.

Sada, D.W., and C. Rosamond. 2010. 2009 and 2010 fish population surveys, Bishop and McGee creeks, Inyo County, California. Unpublished report to Southern California Edison Company. Rosemead, California. December 11.

SCE (Southern California Edison). 2021. Bishop Creek reservoirs fish distribution (AQ 4), technical report. Prepared by Stillwater Sciences and Kleinschmidt. Prepared for Southern California Edison. February.

Simpson, J.C. and R.L. Wallace. 1982. Fishes of Idaho. University of Idaho Press, Moscow, ID. 238 pp.

Snider, W.M. and A. Linden. 1981. Trout growth in California streams. California Department of Fish and Game, Inland Fisheries Administrative Report. 81: 1–11.

Southern California Edison (SCE) 1986. Application for New License: Project No. 1394. Bishop Creek Project

Taube, C. M. 1976. Sexual Maturity and Fecundity in Brown Trout of the Platte River, Michigan. Transactions of the American Fisheries Society. 105(4): 529–533.

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

Van Deventer, J.S., and W.S. Platts. 2006. Microcomputer software system for generating population statistics from electrofishing data, user's guide for MicroFish 3.0. General Technical Report INT-254. U.S. Department of Agriculture, Forest Service, Intermountain Research Station.

Walsh, W.A., and T. Williams. 1991. The ecology of Bishop Creek brown trout (Salmo trutta L.). Volume I field studies. Prepared by BioSystems Analysis, Inc. Tiburon, California for Southern California Edison. Rosemead, California.

Wilcox, S.D. 1994. South Fork Power Project fish population monitoring 1993. Prepared by Ebasco Environmental for Oroville-Wyandotte Irrigation District. Sacramento, California.

APPENDIX A

SITE PHOTOS

Figure A-1 Sada 5 segment 1, lower block net looking upstream, September 22, 2019

Figure A-2 Sada 5 segment 1, lower block net and segment 2 lower block net looking downstream, September 22, 2019

Figure A-3 Sada 5 segment 2, upper block net looking downstream, September 22, 2019

Figure A-4 Sada 5 segment 3, lower block net looking downstream, September 23, 2019

Figure A-5 Sada 5 segment 3, lower block net looking upstream, September 23, 2019

Figure A-6 Sada 5 segment 3, upper block net and segment 4, lower block net looking upstream, September 23, 2019

Figure A-7 Sada 5 segment 3, upper block net and segment 4, lower block net looking downstream, September 23, 2019

Figure A-8 Sada 5 segment 4, upper block net and Segment 5, lower block net looking downstream, September 23, 2019

Figure A-9 Sada 5 segment 4, upper block net and segment 5, lower block net looking upstream, September 23, 2019

Figure A-10 Sada 5 segment 5, upper block net looking upstream, September 23, 2019

Figure A-11 Sada 5 segment 5, upper block net looking downstream, September 23, 2019

Figure A-12 Sada 3 segment 1, lower block net looking downstream, September 26, 2019

Figure A-13 Sada 3 segment 1, lower block net looking upstream, September 26, 2019

Figure A-14 Sada 3 segment 1, upper block net and segment 2 lower block net looking upstream, September 26, 2019

Figure A-15 Sada 3 segment 1, upper block net and segment 2, lower block net looking downstream, September 26, 2019

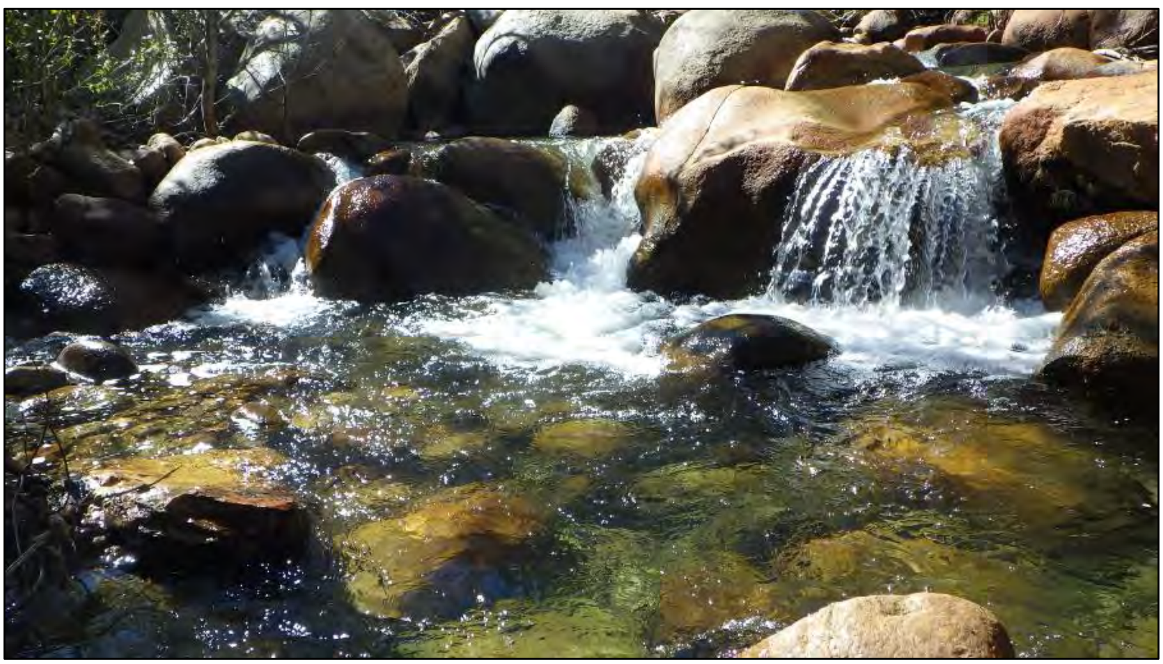


Figure A-16 Sada 3 segment 2, upstream end at natural break, September 26, 2019

Figure A-17 Sada 3 step pool habitat in segment 1 (left) and segment 2 (right), September 26, 2019

Figure A-18 Sada 3 segment 3, lower block net looking downstream, September 26, 2019

Figure A-19 Sada 3 segment 3, lower block net looking upstream, September 26, 2019

Figure A-20 Sada 3 upper natural barrier and overall site condition, September 26, 2019

Figure A-21 Sada 3 segment 4, lower block net looking upstream, September 26, 2019

Figure A-22 Sada 3 segment 4, lower block net looking downstream, September 26, 2019

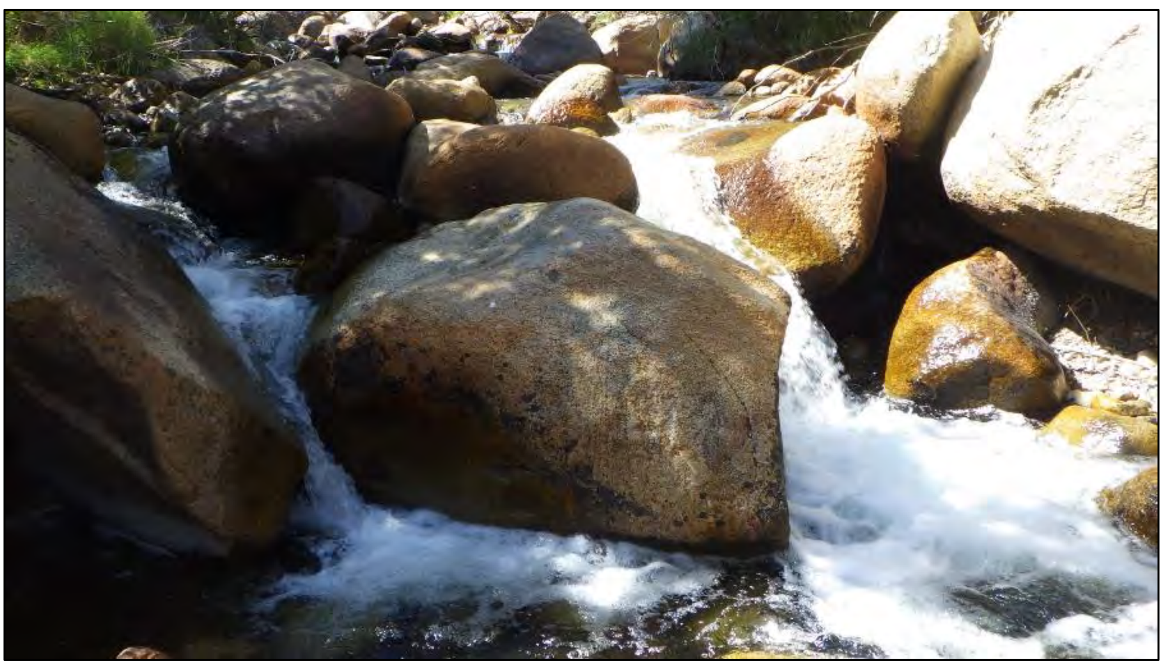


Figure A-23 Sada 3 segment 4, upper natural barrier, September 26, 2019

Figure A-24 Sada 3 segment 5, lower block net looking upstream, September 26, 2019

Figure A-25 Sada 3 segment 5, lower block net looking downstream, September 26, 2019

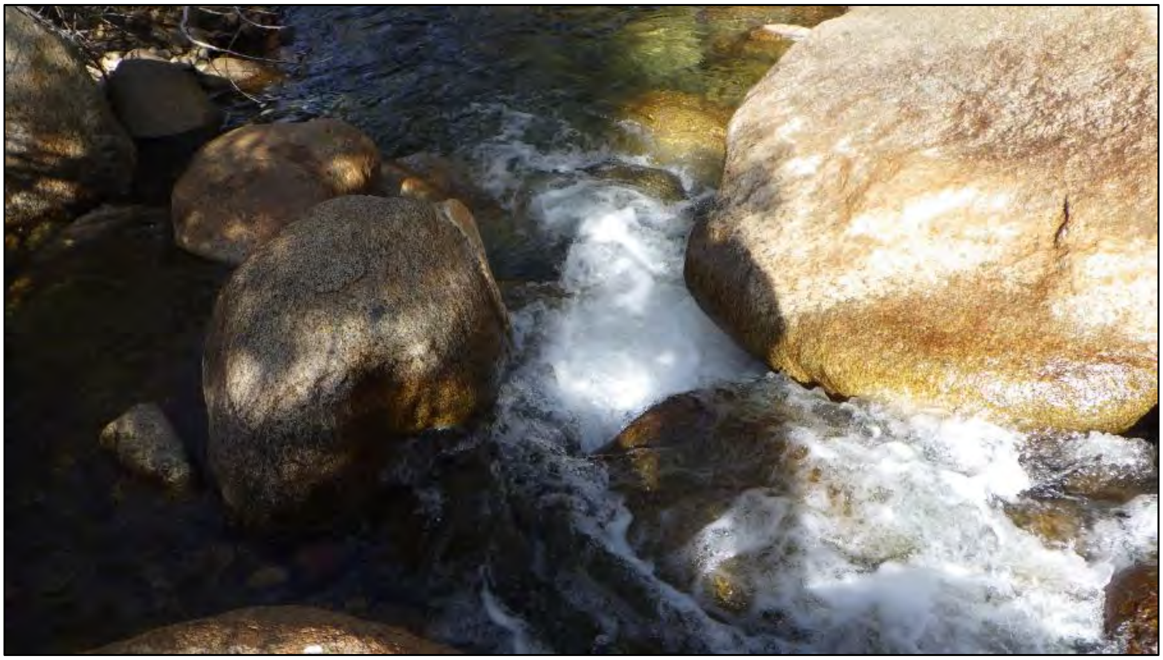


Figure A-26 Sada 3 segment 5, upper natural barrier, September 26, 2019

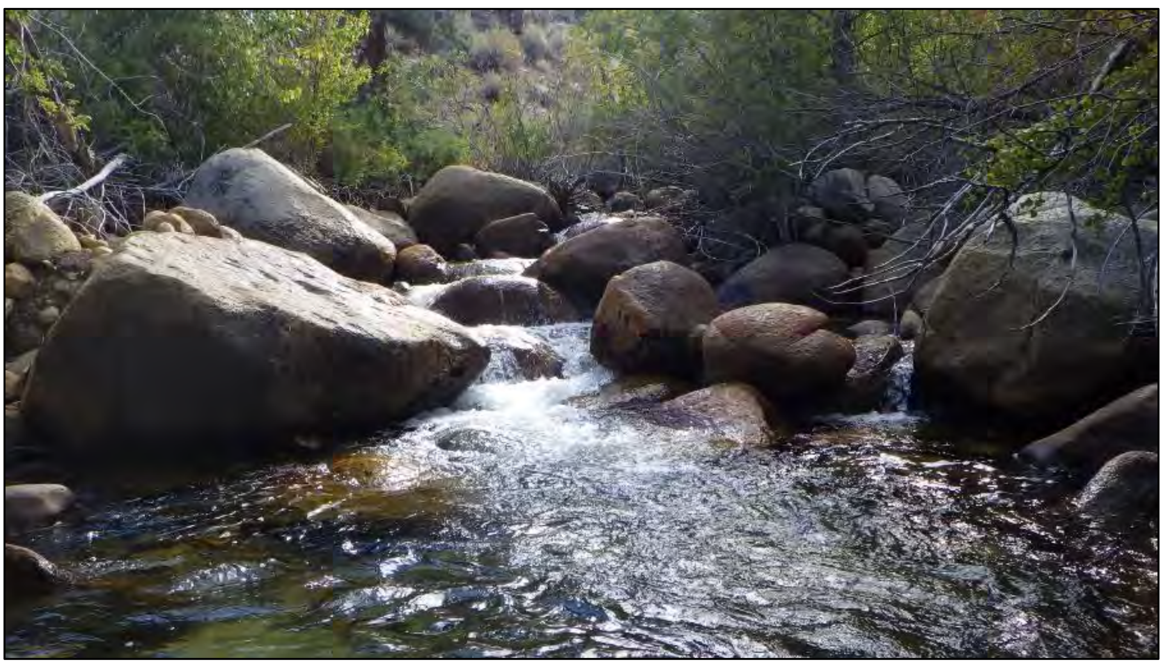


Figure A-27 Sada 3 segment 5, upper natural barrier looking upstream, September 26, 2019

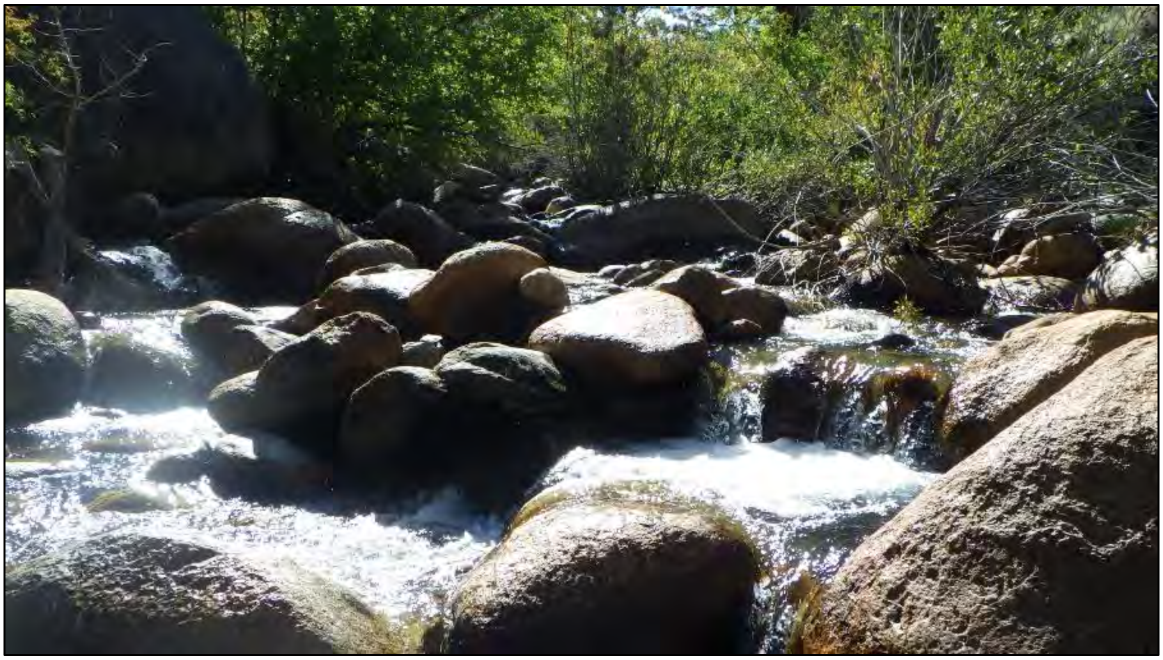


Figure A-28 Sada 3 segment 5, high gradient riffle habitat, September 26, 2019

Figure A-29 South Fork Bishop Creek lower block net looking downstream, September 25, 2019

Figure A-30 South Fork Bishop Creek lower block net looking upstream, September 25, 2019

Figure A-31 South Fork Bishop Creek deep pool habitat, September 25, 2019

Figure A-32 South Fork Bishop Creek boulder cover and undercut bank habitat, September 25, 2019

Figure A-33 Cardinal side channel habitat conditions, September 24, 2019

Figure A-34 Cardinal lower segment large woody debris cover habitat, September 24, 2019

Figure A-35 Cardinal upper segment riffle habitat, September 24, 2019

Figure A-36 Cardinal lower segment B undercut bank and run habitat, September 24, 2019

Figure A-37 Forebay 4 overview photo, September 24, 2019

Figure A-38 Forebay 5 overview photo and gillnet placement, September 25, 2019

Figure A-39 Brook trout captured by gillnet in Forebay 5, September 25, 2019

Figure A-40 Brown trout captured by electrofishing at Sada 5, September 23, 2019

Figure A-41 Rainbow trout captured by electrofishing at Sada 3, September 26, 2019

Figure A-42 Brown Trout captured by electrofishing at South Fork Bishop Creek, September 26, 2019

Figure A-43 Suspected hatchery rainbow trout captured by electrofishing at South Fork Bishop Creek, September 26, 2019

APPENDIX B

BISHOP CREEK STREAM FISH DISTRIBUTION STUDY SAMPLE SITE HABITAT AND WATER QUALITY DATA

Table B-1 Summary of Physical Habitat Measurements at Sample Sites, September 2019

Sample site	Segment	Habitat type (%)			Segment width (m)					Avg. width (m)	Length (m)	Max depth (ft)	Substrate composition (%)						Cover %						
		Pool	Low gradient riffle	Run	1	2	3	4	5				Bedrock	Boulder	Cobble	Gravel	Sand	Silt	Undercut bank	Bubble	Instream veg.	Over-hanging veg.	No cover	Lg. woody material	Lg. boulder
Sada 5	1	10	90		8.4	7.7	4.8	6.6	4.6	6.4	29.1	3.0		90	10				10	5		10	25		50
	2		100		5.1	6.0	5.5	5.7	5.5	5.6	25.0	2.5		75		25				20		10	20		50
	3		90	10	11.5	7.2	6.3	6.1	6.3	7.5	19.8	2.5		60	30	10			10	5		15			20
	4		100		8.3	8.1	6.8	4.0	5.3	6.5	23.5	2.5		50	40	10				10		30	40		20
	5	10	80	10	6.0	4.2	6.2	5.0	5.2	5.3	25.0	4.0		50	50				5	10	5	10	60		10
Sada 3	1		100		4.4	4.9	3.6	5.2	4.0	4.4	25.0	3.0		60	40				25			50			25
	2	45	5	50	4.5	5.6	3.2	5.9	5.9	5.0	29.9	2.0		33	33	33			10	10		10	30		40
	3	30	60	10	4.4	3.9	4.1	5.9	4.3	4.5	21.0	3.0		70	30				5	15		5	5		70
	4	35	65		5.2	4.6	4.2	2.6	4.0	4.1	21.5	3.5		85	10		5		5	10			15		70
	5	30	70		5.7	8.1	9.6	7.3	7.7	7.7	25.7	3.0		65	30		5		10	5		10			75
South Fork	1	20		80	8.1	6.0	12.4	7.0	8.7	8.4	60.0	4.0		10	5	15	70		15			15	45		25
Cardinal	Side Channel	15	5	80	3.5	3.3	3.4	3.4	3.7	3.4	24.7	1.0				75	20	5	5			40	50	5	
	Lower Segment	20	80		5.0	6.5	8.0	6.8	7.5	6.8	19.7	2.0			90	10			10	5		20	20	45	
	Upper Segment		100		7.8	9.5	7.2	5.7	7.7	7.6	51.0	2.5		50	50				5	10			80	5	
	Lower Segment B	50	20	30	5.3	2.4	8.3	7.0	10.2	6.6	23.0	3.5			75	25			40		5	30	20	5	

Table B-2 Summary of Water Chemistry Measurements at Project Sites in Bishop Creek, September 2019

Site	Date	Dissolved oxygen		Conductivity (uS/cm)		Temp (°C)	Discharge (cfs)	pH	Visibility (ft)
		%	mg/l	to 25°C	to °C				
Sada 5	9/22/2019	84.6	9.70	46.8	33	9.2	22	7.73	clear
Sada 3	9/26/2019	83.8	8.62	44.7	35	13.8	14	6.98	clear
South Fork	9/25/2019	68.6	7.99	36.4	25	8.5	15	7.28	clear
Cardinal	9/24/2019	73.5	8.07	26.7	20	11.0	20	6.77	clear
Forebay 4	9/24/2019	87.4	10.18	41.8	29	8.6	n/a	6.84	>10
Forebay5	9/25/2019	75.1	8.52	82.9	59	9.8	n/a	7.60	>10

APPENDIX C

TROUT ABUNDANCE, DENSITY, AND BIOMASS AT THE SADA 5 AND SADA 3 SAMPLE SITES

Table C-1 Trout abundance, density, and biomass at the Sada 5 and Sada 3 sample sites, September 2019

Segment number	Length (ft)	Average width (m)	Trout species	Fish removal pattern	Total no. observed	Biomass (g/m^2)	Density					
							Trout per m^2			Trout per mile		
							Estimate	Lower 95% C.I.	Upper 95% C.I.	Estimate	Lower 95% C.I.	Upper 95% C.I.
Sada 5												
1	29.1	6.4	Rainbow	2, 0, 0	2	0.03	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	21, 7, 5	33	6.31	0.19	0.16	0.21	1,936	1,659	2,212
			All Trout	23, 7, 5	35	6.34	0.20	0.17	0.23	2,046	1,770	2,323
2	25.0	5.6	Rainbow	1, 0, 0, 0	1	0.46	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	11, 6, 11, 4	32	6.59	0.36	0.08	0.64	3,219	708	5,729
			All Trout	12, 6, 11, 4	33	7.05	0.35	0.12	0.57	3,090	1,094	5,086
3	19.8	7.5	Rainbow	2, 0, 0	2	0.05	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	28, 10, 4	42	4.43	0.29	0.26	0.32	3,488	3,164	3,812
			All Trout	30, 10, 4	44	4.48	0.30	0.28	0.32	3,650	3,407	3,894
4	23.5	6.5	Rainbow	1, 0, 0	1	0.04	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	19, 12, 2	33	3.18	0.22	0.20	0.25	2,328	2,054	2,602
			All Trout	20, 12, 2	34	3.22	0.23	0.20	0.26	2,397	2,123	2,671
5	25.0	5.3	Rainbow	1, 0, 1	2	0.07	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	25, 12, 9	46	8.45	0.41	0.30	0.51	3,476	2,575	4,377
			All Trout	26, 12, 10	50	8.52	0.44	0.32	0.56	3,734	2,704	4,764
Site	122.4	6.3	Rainbow	7, 0, 3	8	0.13	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	104, 47, 31	186	5.80	0.29	0.20	0.39	2,889	2,032	3,745
			All Trout	111, 47, 32	194	5.92	0.30	0.22	0.39	2,983	2,220	3,747

Segment number	Length (ft)	Average width (m)	Trout species	Fish removal pattern	Total no. observed	Biomass (g/m^2)	Density					
							Trout per m^2			Trout per mile		
							Estimate	Lower 95% C.I.	Upper 95% C.I.	Estimate	Lower 95% C.I.	Upper 95% C.I.
Sada 3												
1	25.0	4.39	Rainbow	2, 0, 0	2	1.06	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	16, 3, 2	21	12.59	0.19	0.18	0.20	1,352	1,287	1,416
			All Trout	18, 3, 2	23	13.66	0.21	0.20	0.22	1,481	1,416	1,545
2	29.9	4.99	Rainbow	2, 0, 0	2	0.38	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	25, 6, 4	35	11.53	0.24	0.22	0.26	1,938	1,776	2,099
			All Trout	27, 6, 4	37	11.91	0.25	0.23	0.26	1,991	1,884	2,099
3	21.0	4.52	Rainbow	0, 0, 1	1	4.18	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	14, 8, 2	24	12.03	0.26	0.22	0.31	1,916	1,609	2,222
			All Trout	14, 8, 3	25	16.21	0.28	0.22	0.35	2,069	1,609	2,529
4	21.5	4.12	Rainbow	0, 1, 0	1	0.77	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	9, 1, 0	10	7.37	0.11	0.11	0.11	749	749	749
			All Trout	9, 2, 0	11	8.14	0.12	0.12	0.12	823	823	823
5	25.7	7.68	Rainbow	3, 1, 0	4	1.52	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	9, 2, 2	13	2.67	0.07	0.06	0.08	814	689	939
			All Trout	12, 3, 2	17	4.19	0.09	0.08	0.10	1,065	939	1,190
Site	123.1	5.1	Rainbow	7, 2, 1	10	1.58	--[a]	--[a]	--[a]	--[a]	--[a]	--[a]
			Brown	73, 20, 10	103	9.24	0.17	0.16	0.19	1,354	1,222	1,485
			All Trout	80, 22, 11	113	10.82	0.19	0.17	0.21	1,486	1,334	1,637

[a] Density estimates could not be calculated due to low capture numbers or poor fish removal pattern.

APPENDIX D

FISH CAPTURE DATA FOR THE BISHOP CREEK STREAM FISH DISTRIBUTION STUDY

Table D-1 Stream fish distribution monitoring data for Bishop Creek, September 2019

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout		69	66	2.9	1.01
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-1	95	90	7.8	1.07
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-2	99	95	9.3	1.08
9/22/2019	Bishop Creek	Sada 5	1	1	Rainbow trout		82	79	5.3	1.10
9/22/2019	Bishop Creek	Sada 5	1	1	Rainbow trout		69	66	2.4	1.10
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-3	93	90	8.0	1.18
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-4	99	95	9.4	1.07
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-5	95	92	9.2	1.28
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-6	104	100	10.7	1.08
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout		82	79	6.3	1.05
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout		99	94	9.0	0.98
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout		85	81	5.6	1.11
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout		92	89	6.9	1.13
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout		83	80	5.7	1.12
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-7	198	186	72.4	1.13
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-8	102	98	10.5	1.25
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-9	215	208	102.0	0.95
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-10	101	97	11.4	1.13
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout		93	90	6.9	1.02
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-11	202	193	81.4	1.29
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-12	228	218	105.6	1.24
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-13	258	250	202.0	1.07
9/22/2019	Bishop Creek	Sada 5	1	1	Brown trout	S5-14	255	245	182.3	0.83
9/22/2019	Bishop Creek	Sada 5	1	2	Brown trout		77	74	4.3	1.06
9/22/2019	Bishop Creek	Sada 5	1	2	Brown trout	S5-15	106	102	12.0	1.13
9/22/2019	Bishop Creek	Sada 5	1	2	Brown trout	S5-16	115	110	14.6	1.10
9/22/2019	Bishop Creek	Sada 5	1	2	Brown trout	S5-17	110	108	12.3	0.98

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/22/2019	Bishop Creek	Sada 5	1	2	Brown trout	S5-18	114	109	13.1	1.01
9/22/2019	Bishop Creek	Sada 5	1	2	Brown trout	S5-19	112	109	14.0	1.08
9/22/2019	Bishop Creek	Sada 5	1	2	Brown trout		98	93	9.6	1.19
9/22/2019	Bishop Creek	Sada 5	1	3	Brown trout		93	89	7.2	1.02
9/22/2019	Bishop Creek	Sada 5	1	3	Brown trout		91	86	7.3	1.15
9/22/2019	Bishop Creek	Sada 5	1	3	Brown trout	S5-20	184	178	59.6	1.06
9/22/2019	Bishop Creek	Sada 5	1	3	Brown trout	S5-21	105	100	10.9	1.09
9/22/2019	Bishop Creek	Sada 5	1	3	Brown trout	S5-22	198	189	78.3	1.16
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout	S5-23	107	104	11.3	1.00
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout	S5-24	115	112	13.3	0.95
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout	S5-25	186	179	56.5	0.99
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout		91	88	6.4	0.94
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout		89	85	6.6	1.07
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout	S5-26	255	245	174.6	1.19
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout	S5-27	199	185	69.0	1.09
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout	S5-28	249	240	163.3	1.18
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout		78	75	4.3	1.02
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout	S5-29	112	105	13.1	1.13
9/22/2019	Bishop Creek	Sada 5	2	1	Rainbow trout		191	182	64.5	1.17
9/22/2019	Bishop Creek	Sada 5	2	1	Brown trout	S5-30	211	200	93.2	1.07
9/22/2019	Bishop Creek	Sada 5	2	2	Brown trout	S5-31	184	175	60.7	1.13
9/22/2019	Bishop Creek	Sada 5	2	2	Brown trout		78	75	4.0	0.95
9/22/2019	Bishop Creek	Sada 5	2	2	Brown trout		91	86	6.7	1.05
9/22/2019	Bishop Creek	Sada 5	2	2	Brown trout		87	81	5.9	1.11
9/22/2019	Bishop Creek	Sada 5	2	2	Brown trout		90	86	6.8	1.07
9/22/2019	Bishop Creek	Sada 5	2	2	Brown trout	S5-32	216	204	93.3	1.10
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout		94	90	8.4	1.15
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout		99	95	8.9	1.04

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout	S5-33	105	100	11.5	1.15
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout	S5-34	102	99	10.3	1.06
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout		92	89	8.3	1.18
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout		93	90	8.2	1.12
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout		79	75	4.4	1.04
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout		77	75	4.7	1.11
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout		86	84	6.2	1.05
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout	S5-35	105	101	11.0	1.07
9/22/2019	Bishop Creek	Sada 5	2	3	Brown trout		92	89	7.6	1.08
9/22/2019	Bishop Creek	Sada 5	2	4	Brown trout		90	86	7.2	1.13
9/22/2019	Bishop Creek	Sada 5	2	4	Brown trout	S5-36	104	100	10.3	1.03
9/22/2019	Bishop Creek	Sada 5	2	4	Brown trout	S5-37	116	110	16.0	1.20
9/22/2019	Bishop Creek	Sada 5	2	4	Brown trout		73	71	3.5	0.98
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout	S5-38	107	100	11.2	1.12
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		73	68	3.3	1.05
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		60	56	2.1	1.20
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout	S5-39	202	191	78.4	1.13
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		73	68	3.5	1.11
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		81	76	5.1	1.16
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		90	84	6.3	1.06
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		81	76	4.9	1.12
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout	S5-40	217	210	108.7	1.17
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		93	88	8.2	1.20
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout	S5-41	181	173	57.0	1.10
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		76	73	4.3	1.11
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		98	93	8.9	1.11
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		72	68	3.6	1.14
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		96	90	7.6	1.04

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout	S5-42	111	105	11.8	1.02
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout	S5-43	105	100	10.7	1.07
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout	S5-44	196	186	71.1	1.10
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		106	100	11.9	1.19
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		94	90	8.1	1.11
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		87	83	6.4	1.12
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		113	106	13.4	1.13
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		88	84	6.7	1.13
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		86	81	5.8	1.09
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		90	85	6.9	1.12
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		91	85	6.7	1.09
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		75	71	3.3	0.92
9/23/2019	Bishop Creek	Sada 5	3	1	Brown trout		74	70	3.5	1.02
9/23/2019	Bishop Creek	Sada 5	3	2	Rainbow trout		76	71	3.9	0.95
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		68	64	2.5	0.97
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		70	66	2.8	1.11
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		77	73	4.3	1.08
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		106	100	10.8	1.15
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		95	90	8.4	1.05
9/23/2019	Bishop Creek	Sada 5	3	2	Rainbow trout		69	64	3.4	0.99
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		100	95	9.0	1.08
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		71	68	3.1	1.01
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout	S5-45	221	208	96.8	1.00
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		99	94	8.4	1.09
9/23/2019	Bishop Creek	Sada 5	3	2	Brown trout		66	63	2.5	1.30
9/23/2019	Bishop Creek	Sada 5	3	3	Brown trout		82	77	5.2	1.14
9/23/2019	Bishop Creek	Sada 5	3	3	Brown trout		116	110	14.9	1.12
9/23/2019	Bishop Creek	Sada 5	3	3	Brown trout		74	70	3.5	1.02

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/23/2019	Bishop Creek	Sada 5	3	3	Brown trout		88	82	5.8	1.05
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		102	97	9.1	1.00
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout	S5-46	219	210	107.6	1.16
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout	S5-47	206	197	95.0	1.24
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout	S5-48	193	184	72.2	1.16
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		94	89	7.8	1.11
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		86	82	6.6	1.20
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		83	79	5.4	1.10
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		82	78	5.3	1.12
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		95	90	7.8	1.07
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		100	95	9.5	1.11
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		100	95	9.7	1.13
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		111	109	12.6	0.97
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		103	98	9.4	1.00
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		100	94	8.9	1.07
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		103	98	10.9	1.16
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		105	100	10.5	1.05
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		81	76	5.4	1.23
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		74	70	3.6	1.05
9/23/2019	Bishop Creek	Sada 5	4	1	Brown trout		85	81	5.8	1.09
9/23/2019	Bishop Creek	Sada 5	4	1	Rainbow trout		82	77	5.6	1.23
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		87	83	5.0	0.87
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		88	82	-- [a]	-- [a]
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		77	73	4.4	1.13
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		80	76	5.0	1.14
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		80	75	4.3	1.02
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		91	85	--[a]	-- [a]
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		101	96	9.6	1.09

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		97	91	7.8	1.04
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		95	100	9.1	0.91
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		86	91	7.3	0.97
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		101	107	12.2	1.00
9/23/2019	Bishop Creek	Sada 5	4	2	Brown trout		68	72	3.2	0.86
9/23/2019	Bishop Creek	Sada 5	4	3	Brown trout		77	82	4.6	0.83
9/23/2019	Bishop Creek	Sada 5	4	3	Brown trout		85	89	5.8	0.82
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		93	88	8.0	1.17
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		88	83	6.3	1.10
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout	S5-49	226	218	120.1	1.16
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		74	71	2.8	0.78
9/23/2019	Bishop Creek	Sada 5	5	1	Rainbow trout		70	66	3.2	1.08
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		87	84	6.4	1.13
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		95	91	8.5	1.19
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		93	88	8.1	1.18
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout	S5-50	198	190	80.8	1.26
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		71	67	3.8	1.15
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		89	86	7.3	1.17
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		97	92	9.1	1.26
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		96	92	9.8	1.13
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		90	86	7.2	1.16
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		108	103	12.7	1.09
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		94	91	8.2	1.17
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		93	88	8.0	0.99
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout	S5-51	183	177	55.1	1.10
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout	S5-52	221	210	102.3	1.07
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		93	88	7.3	1.16
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		102	96	10.3	1.18

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		102	97	10.8	1.12
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout		104	98	10.5	1.31
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout	S5-53	180	172	66.6	1.02
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout	S5-54	202	191	71.3	1.22
9/23/2019	Bishop Creek	Sada 5	5	1	Brown trout	S5-55	310	299	326.8	1.11
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		99	94	8.9	1.07
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		114	108	14.0	1.11
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		95	90	7.9	1.08
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		74	71	3.7	1.03
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		67	64	2.7	1.03
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		90	86	7.6	1.19
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		114	107	13.2	1.08
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		94	90	7.8	1.07
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		80	76	4.3	0.98
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		95	90	6.9	0.95
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		94	89	7.9	1.12
9/23/2019	Bishop Creek	Sada 5	5	2	Brown trout		93	90	8.1	1.11
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		110	105	13.2	1.14
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		91	87	7.3	1.11
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		90	86	7.1	1.12
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		56	53	1.8	1.21
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		72	68	3.5	1.11
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		96	91	8.7	1.15
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		83	80	5.8	1.13
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		100	95	8.9	1.04
9/23/2019	Bishop Creek	Sada 5	5	3	Brown trout		88	84	6.8	1.15
9/23/2019	Bishop Creek	Sada 5	5	3	Rainbow trout		87	83	6.3	1.10
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout		94	89	8.0	1.13

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S-3-1	159	150	37.5	0.93
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout		95	90	7.4	0.86
9/26/2019	Bishop Creek	Sada 3	1	1	Rainbow trout	S5-2	170	160	55.4	0.92
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout		96	90	8.1	1.04
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-3	270	261	204.7	1.03
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-4	174	164	54.1	0.98
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-5	188	177	65.3	1.13
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-6	219	210	118.7	1.00
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout		87	83	6.6	1.03
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-7	195	184	76.3	1.06
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-8	187	182	69.0	0.90
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-9	283	270	204.0	0.96
9/26/2019	Bishop Creek	Sada 3	1	1	Rainbow trout	S3-10	180	170	61.4	1.07
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-11	169	161	46.1	1.04
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-12	244	235	156.0	0.98
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-13	208	198	93.6	1.13
9/26/2019	Bishop Creek	Sada 3	1	1	Brown trout	S3-14	196	184	73.7	1.05
9/26/2019	Bishop Creek	Sada 3	1	2	Brown trout	S3-15	194	185	80.0	1.10
9/26/2019	Bishop Creek	Sada 3	1	2	Brown trout	S3-16	105	99	11.2	0.97
9/26/2019	Bishop Creek	Sada 3	1	2	Brown trout	S3-17	105	100	10.2	0.88
9/26/2019	Bishop Creek	Sada 3	1	3	Brown trout		96	92	9.1	1.03
9/26/2019	Bishop Creek	Sada 3	1	3	Brown trout	S3-18	170	162	42.6	0.87
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout		82	78	5.4	0.98
9/26/2019	Bishop Creek	Sada 3	2	1	Rainbow trout	S3-19	158	148	39.5	0.84
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout		96	85	7.4	0.91
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout		88	84	6.2	0.89
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-20	165	157	40.0	0.93
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-21	168	159	44.3	0.99

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout		95	92	8.5	0.88
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout		89	85	6.2	0.83
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-22	305	289	235.4	0.99
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-23	166	158	45.3	0.88
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout		86	83	5.6	1.05
9/26/2019	Bishop Creek	Sada 3	2	1	Rainbow trout	S3-24	188	176	64.8	0.91
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-25	183	176	64.4	0.96
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-26	182	173	54.8	0.99
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-27	204	196	81.8	0.97
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-28	172	165	50.3	0.82
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-29	176	167	52.9	0.89
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-30	291	278	201.1	1.06
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout		89	85	6.3	0.98
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-31	236	234	138.7	1.03
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-32	181	172	58.3	0.97
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-33	185	176	65.5	0.90
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-34	211	199	91.0	0.95
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-35	164	156	39.8	0.97
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-36	199	190	75.0	0.98
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-37	181	171	57.4	1.00
9/26/2019	Bishop Creek	Sada 3	2	1	Brown trout	S3-38	170	162	48.2	0.98
9/26/2019	Bishop Creek	Sada 3	2	2	Brown trout		87	83	6.4	0.97
9/26/2019	Bishop Creek	Sada 3	2	2	Brown trout		79	75	4.8	0.97
9/26/2019	Bishop Creek	Sada 3	2	2	Brown trout		86	82	6.1	0.96
9/26/2019	Bishop Creek	Sada 3	2	2	Brown trout		94	90	8.7	1.05
9/26/2019	Bishop Creek	Sada 3	2	2	Brown trout	S3-39	168	160	45.7	0.96
9/26/2019	Bishop Creek	Sada 3	2	2	Brown trout	S3-40	100	96	9.8	0.98
9/26/2019	Bishop Creek	Sada 3	2	3	Brown trout		81	77	5.0	0.94

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/26/2019	Bishop Creek	Sada 3	2	3	Brown trout		175	167	49.5	0.92
9/26/2019	Bishop Creek	Sada 3	2	3	Brown trout		94	90	7.2	0.87
9/26/2019	Bishop Creek	Sada 3	2	3	Brown trout		159	150	39.8	0.99
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout	S3-41	160	151	37.7	0.92
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		171	163	49.6	0.99
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout	S3-42	261	251	174.8	0.98
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		152	146	33.8	0.96
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		95	91	7.8	0.91
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		79	76	5.0	1.01
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		69	66	3.6	1.10
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout	S3-43	259	245	161.0	0.93
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		91	87	7.9	1.05
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		164	158	45.8	1.04
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		79	76	5.3	1.07
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		179	170	56.3	0.98
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout		181	174	61.2	1.03
9/26/2019	Bishop Creek	Sada 3	3	1	Brown trout	S3-44	234	225	131.0	1.02
9/26/2019	Bishop Creek	Sada 3	3	2	Brown trout		76	73	4.6	1.05
9/26/2019	Bishop Creek	Sada 3	3	2	Brown trout		177	171	51.2	0.92
9/26/2019	Bishop Creek	Sada 3	3	2	Brown trout		77	74	3.6	0.79
9/26/2019	Bishop Creek	Sada 3	3	2	Brown trout		162	155	38.6	0.91
9/26/2019	Bishop Creek	Sada 3	3	2	Brown trout		169	161	45.6	0.94
9/26/2019	Bishop Creek	Sada 3	3	2	Brown trout		97	93	9.5	1.04
9/26/2019	Bishop Creek	Sada 3	3	2	Brown trout		171	163	42.7	0.85
9/26/2019	Bishop Creek	Sada 3	3	2	Brown trout	S3-45	219	210	107.2	1.02
9/26/2019	Bishop Creek	Sada 3	3	3	Brown trout		95	91	8.4	0.98
9/26/2019	Bishop Creek	Sada 3	3	3	Brown trout		75	72	4.4	1.04
9/26/2019	Bishop Creek	Sada 3	3	3	Rainbow trout	S3-46	310	295	328.1	1.10

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout		92	88	7.8	1.00
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout		182	173	56.0	0.93
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout		164	157	44.1	1.00
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout		155	149	34.0	0.91
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout	S3-47	147	140	30.0	0.94
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout	S3-48	214	204	95.1	0.97
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout		174	166	55.3	1.05
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout		180	170	56.8	0.97
9/26/2019	Bishop Creek	Sada 3	4	1	Brown trout		195	184	75.7	1.02
9/26/2019	Bishop Creek	Sada 3	4	2	Brown trout	S3-49	270	260	197.9	1.01
9/26/2019	Bishop Creek	Sada 3	4	2	Rainbow trout	S3-50	185	175	67.9	1.07
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout		88	84	7.0	1.03
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout		91	87	7.4	0.98
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout	S3-51	105	100	11.5	0.99
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout	S3-52	102	97	9.6	0.90
9/26/2019	Bishop Creek	Sada 3	5	1	Rainbow trout	S3-53	185	174	59.2	0.89
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout	S3-54	249	237	136.9	0.99
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout		170	162	48.6	0.99
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout		151	144	34.0	0.93
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout		147	140	29.7	0.91
9/26/2019	Bishop Creek	Sada 3	5	1	Brown trout		99	94	8.8	0.93
9/26/2019	Bishop Creek	Sada 3	5	1	Rainbow trout	S3-55	157	147	38.2	0.99
9/26/2019	Bishop Creek	Sada 3	5	1	Rainbow trout	S3-56	170	161	48.5	0.99
9/26/2019	Bishop Creek	Sada 3	5	2	Brown trout		186	176	63.8	0.99
9/26/2019	Bishop Creek	Sada 3	5	2	Brown trout		99	96	9.1	0.94
9/26/2019	Bishop Creek	Sada 3	5	2	Rainbow trout	S3-57	244	233	154.9	1.07
9/26/2019	Bishop Creek	Sada 3	5	3	Brown trout		178	170	51.8	0.92
9/26/2019	Bishop Creek	Sada 3	5	3	Brown trout	S3-58	223	210	108.4	0.98

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF1	231	219	120.0	1.14
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF2	274	265	211.5	1.03
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Rainbow trout		291	280	249.2	1.01
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Rainbow trout		220	220	128.9	1.21
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF3	237	226	226.7	1.70
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF4	257	242	145.9	0.86
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF5	226	215	101.5	0.88
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF6	220	212	104.8	0.98
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF7	228	216	112.3	0.95
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF8	229	218	106.3	0.89
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF9	202	193	77.0	0.93
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF10	185	173	56.5	0.89
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF11	228	220	114.8	0.97
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF12	114	108	14.0	0.94
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF13	172	162	43.7	0.86
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF14	197	185	74.5	0.97
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF15	212	202	85.0	0.89
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF16	230	272	113.3	0.93
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF17	179	169	56.7	0.99
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Rainbow trout		297	285	277.4	1.06
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF18	241	232	132.7	0.95
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF19	182	172	53.6	0.89
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF20	218	210	96.1	0.93
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF21	230	220	117.8	0.97
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF22	190	179	61.7	0.90
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF23	156	147	32.0	0.84
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF24	133	125	22.8	0.97
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF25	210	202	87.1	0.94

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		99	95	9.2	0.95
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF26	242	233	137.4	0.97
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF27	223	212	83.5	0.75
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF28	263	250	162.0	0.89
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF29	229	221	126.9	1.06
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF30	197	187	77.7	1.02
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		227	215	116.3	0.99
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		252	240	142.1	0.89
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		249	240	159.5	1.03
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		229	221	110.5	0.92
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		211	200	81.1	0.86
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF31	151	142	28.5	0.83
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		211	200	84.0	0.89
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		205	193	77.6	0.90
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		204	192	77.6	0.91
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		239	229	146.5	1.07
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		243	234	142.0	0.99
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		225	217	100.4	0.88
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout	SF32	192	181	69.0	0.97
9/25/2019	South Fork Bishop Creek	South Fork	1	1	Brown trout		211	204	98.0	1.04
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-1	221	212	103.9	0.96
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		56	59	1.8	1.02
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		55	53	1.1	0.66
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-2	194	185	75.4	1.03
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-3	152	143	30.8	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		66	62	2.5	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-4	141	133	24.2	0.86
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		70	66	3.3	0.96

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		70	66	3.0	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		52	50	1.6	1.14
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		57	54	1.7	0.92
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		103	98	10.4	0.95
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-5	122	116	16.1	0.89
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		67	64	2.6	0.86
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		69	65	2.4	0.73
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-6	184	175	58.2	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-7	113	108	13.4	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-8	132	126	21.2	0.92
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-9	138	130	21.3	0.81
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-10	125	118	17.7	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-11	191	187	72.2	1.04
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-12	158	148	36.9	0.94
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-13	135	127	22.4	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout		64	61	2.3	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-14	112	107	13.4	0.95
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-15	190	181	65.1	0.95
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-16	182	175	59.3	0.98
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-17	246	236	148.0	0.99
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-18	120	112	15.0	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Side Channel	1	Brown trout	C-19	123	116	16.0	0.86
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-20	122	116	16.0	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout		67	64	2.8	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-21	145	137	26.8	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-22	126	119	19.2	0.96
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-23	234	226	128.8	1.01
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-24	244	238	150.3	1.03

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-25	118	112	15.0	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-26	255	246	158.6	0.96
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-27	135	127	22.6	0.92
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-28	234	225	124.7	0.97
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-29	121	115	16.5	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout		69	65	2.8	0.85
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-30	260	250	183.7	1.05
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-31	135	127	20.7	0.84
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-32	246	235	142.4	0.96
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-33	189	179	61.5	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-34	150	142	29.8	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-35	176	167	49.0	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-36	134	128	23.4	0.97
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-37	190	182	70.1	1.02
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower Segment	1	Brown trout	C-38	118	112	15.9	0.97
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		66	63	6.2	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-39	207	200	86.3	0.97
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-40	225	214	107.4	0.94
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-41	141	132	24.2	0.86
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-42	137	129	23.9	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		62	59	2.0	0.84
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-43	133	127	22.9	0.97
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		61	58	2.1	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		138	130	22.2	0.84
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		125	118	17.0	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		134	126	22.3	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-44	221	212	111.5	1.03
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		139	131	25.2	0.94

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-45	175	156	42.2	0.79
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		131	125	19.8	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		64	60	2.2	0.84
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-46	212	204	91.2	0.96
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-47	252	242	154.1	0.96
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		124	118	17.7	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-48	219	209	104.0	0.99
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		137	130	21.5	0.84
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		133	127	22.1	0.94
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-49	163	156	37.5	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-50	205	195	78.5	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		68	65	2.8	0.89
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-51	213	204	90.2	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		120	113	15.6	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-52	240	239	149.0	1.08
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		71	67	3.2	0.89
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-53	192	182	64.2	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		66	63	2.5	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-54	187	176	56.6	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-55	153	145	32.1	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		149	140	29.8	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-56	227	218	114.8	0.98
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-57	163	155	38.2	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		68	64	3.0	0.95
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		141	132	24.1	0.86
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		110	104	11.3	0.85
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-58	196	189	49.3	0.65
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		142	134	26.0	0.91

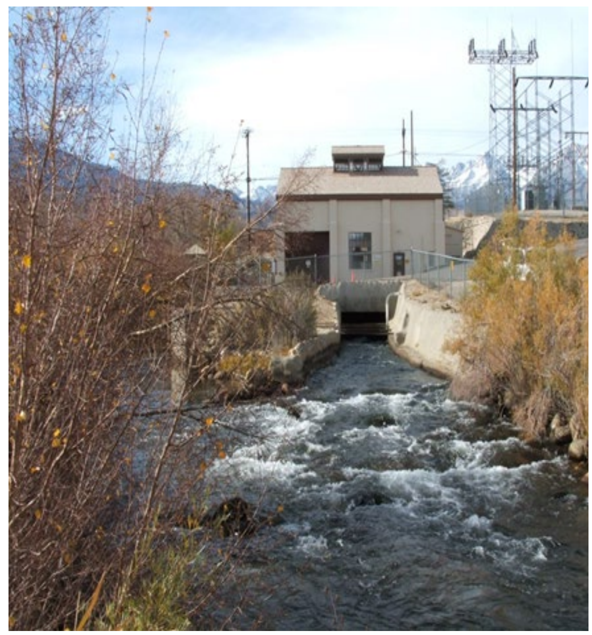
Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-59	171	160	44.9	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		143	135	27.4	0.94
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		79	75	5.3	1.07
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-60	225	214	106.4	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		71	68	3.4	0.95
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		137	129	24.0	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-61	158	149	34.6	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		165	157	41.0	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		167	159	42.9	0.92
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-62	201	191	74.9	0.92
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-63	203	194	78.5	0.94
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		70	66	3.1	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		137	130	22.6	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		152	144	31.2	0.89
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		127	121	19.8	0.97
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		140	133	25.1	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		142	134	28.7	1.00
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout	C-64	204	195	84.5	1.00
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		165	157	44.6	0.99
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		65	63	2.4	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		136	128	22.7	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		71	67	3.0	0.84
9/24/2019	Middle Fork Bishop Creek	Cardinal	Upper Segment	1	Brown trout		168	161	44.9	0.95
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		66	62	2.4	1.01
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		121	114	16.2	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		129	121	20.1	0.94
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		241	232	147.9	1.06
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Rainbow trout	C-65	299	285	252.2	0.94

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		228	214	109.8	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		275	265	215.0	1.03
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		65	61	2.6	0.95
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		113	106	13.5	0.94
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		64	60	2.2	0.84
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		197	189	69.2	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		147	138	28.1	0.88
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		73	69	3.6	0.93
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		70	65	3.0	0.87
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		79	75	4.0	0.81
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		178	170	52.0	0.92
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		127	120	20.5	1.00
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		131	124	22.0	0.98
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		78	74	4.3	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		75	71	3.8	0.90
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		57	54	1.9	1.03
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		120	114	15.8	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		198	187	73.2	0.94
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		161	152	41.3	0.99
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		68	64	2.8	0.89
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		65	62	2.3	0.84
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		137	130	24.5	0.95
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		118	111	15.0	0.91
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		69	65	3.2	0.97
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		151	143	31.8	0.92
9/24/2019	Middle Fork Bishop Creek	Cardinal	Lower B	1	Brown trout		118	112	15.3	0.93
9/24/2019	Bishop Creek	Forebay 4	--	F4-1	Rainbow trout	F4-1	385	400	690.0	1.21
9/24/2019	Bishop Creek	Forebay 4	--	F4-1	Brown trout	F4-2	276	262	243.1	1.16

Date	Stream	Site	Segment	Pass	Species	Scale sample ID	Fork length (mm)	Total length (mm)	Weight (g)	k-value
9/24/2019	Bishop Creek	Forebay 4	--	F4-1	Brown trout	F4-3	253	240	176.9	1.09
9/25/2019	Bishop Creek	Forebay 5	--	F5-1	Brook trout	F5-2	177	168	52.8	0.95
9/25/2019	Bishop Creek	Forebay 5	--	F5-1	Brown trout	F5-1	245	238	158.3	1.08
9/25/2019	Bishop Creek	Forebay 5	--	F5-1	Brown trout	F5-4	218	205	103.3	1.00
9/25/2019	Bishop Creek	Forebay 5	--	F5-1	Brown trout	F5-8	249	239	167.1	1.08
9/25/2019	Bishop Creek	Forebay 5	--	F5-1	Brown trout	F5-9	227	217	123.0	1.05
9/25/2019	Bishop Creek	Forebay 5	--	F5-1	Brown trout	F5-10	230	216	111.8	0.92
9/25/2019	Bishop Creek	Forebay 5	--	F5-1	Brown trout	F5-11	223	209	102.5	0.92
9/25/2019	Bishop Creek	Forebay 5	--	F5-1	Brown trout	F5-12	218	205	98.4	0.95
9/25/2019	Bishop Creek	Forebay 5	--	F5-1	Rainbow trout	F5-3	221	208	101.8	0.94
9/25/2019	Bishop Creek	Forebay 5	--	F5-1	Rainbow trout	F5-6	269	254	204.1	1.05
9/25/2019	Bishop Creek	Forebay 5	--	F5-1	Rainbow trout	F5-7	239	223	125.7	0.92
9/25/2019	Bishop Creek	Forebay 5	--	F5-1	Rainbow trout	F5-8	218	205	104.2	1.01

[a] Weight not recorded, therefore condition (k-value) could not be determined for these fish.

SOUTHERN CALIFORNIA EDISON
Bishop Creek Hydroelectric Project
(FERC Project No. 1394)



DRAFT LICENSE APPLICATION
FINAL TECHNICAL REPORTS
VOLUME III (3 OF 4)

SOUTHERN CALIFORNIA EDISON

An EDISON INTERNATIONAL® Company

JANUARY 2022

List of Technical Reports in this File

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project
(FERC Project No. 1394)

DRAFT LICENSE APPLICATION

FINAL TECHNICAL REPORT
RESERVOIR FISH DISTRIBUTION STUDY
(AQ4)

Southern California Edison
1515 Walnut Grove Ave
Rosemead, CA 91770

January 2022

Support from:

Kleinschmidt

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

Project operations may directly or indirectly influence fish resources occupying Project waters, primarily by regulating water levels of reservoirs, or by altering flows in stream reaches. Within in Project reservoirs, indirect effects on fisheries may result from altered habitat due to reservoir water level management or increased public access. The Bishop Creek Reservoirs Fish Distribution Study (AQ 4) characterizes fish species composition and distribution within the two Project reservoirs (South Lake and Lake Sabrina) and Longley Lake following methods described in Study AQ 4, approved by the Federal Energy Regulatory Commission (FERC) on November 4, 2019. This report includes the results of reservoir population sampling in South Lake, Lake Sabrina, and Longley Lake and bathymetric surveys of South Lake and Lake Sabrina, completed during 2020. Information on stream fish populations is included in the Bishop Creek Fish Distribution Study (AQ 3) Final Technical Report (SCE 2021a).

Data and preliminary results for this survey were previously reviewed with the Bishop Creek Aquatics Technical Working Group (TWG) in May 2020, following distribution of Progress Report #2 on April 14, 2020.

Further data was provided in the Intial Study Report filed with FERC on November 10 2020. This report builds on those two previous reports but does not draw conclusions about potential Project effects. These analyses will be completed in conjunction with the rest of relicensing studies as part of the overall National Environmental Policy Act (NEPA) process and in consultation with the aquatics TWG.

2.0 REVIEW OF EXISTING INFORMATION

Project facilities, including thirteen dams and diversions and five powerhouses, are sited along Bishop Creek and nearby 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 (Figure 3.1-1). SCE manages the water releases from the storage reservoirs for purposes of hydro-generation and meeting water allocation requirements in accordance with the Chandler Decree (1922). Longley Lake Dam discharges water to McGee Creek which is diverted to Birch Creek and then to Bishop Creek via Bishop Creek Powerhouse No. 2.

This network of creeks and reservoirs supports both stocked and self-sustaining non-native trout fisheries, including brown trout (*Salmo trutta*), brook trout (*Salvelinus fontinalis*), and rainbow trout (*Oncorhynchus mykiss*). The California Department of Fish and Wildlife (CDFW) introduced each of these three non-native trout species and manages them to support angling harvest. Naturally-spawned trout from tributary headwater creeks upstream of the reservoirs may migrate downstream into Project reservoirs; however, the Project reservoirs also have a heavily stocked put-and-take rainbow trout fishery. The abundance of rainbow trout in the reservoirs is primarily a function of stocking intervals and angler catch rates, and residency time for most stocked rainbow trout in the reservoirs is believed to be very short (N. Buckmaster, CDFW personal communication). “Catchable” size rainbow trout (roughly 12 inches) were scheduled for frequent stocking in South Lake and Lake Sabrina during 2020; no other fish species were included in CDFW’s stocking schedule for the Bishop Creek watershed in 2020 (CDFW 2019). While no stocking currently occurs at Longley Lake, brook trout were historically stocked there and a population is currently present.

Owens suckers (*Catostomus fumeiventris*; California species of special concern) were informally introduced into Lake Sabrina (N. Buckmaster, CDFW, personal communication). The species’ native range includes waters of the Owens River Valley, but it has also become established in the Santa Clara River via water transfers from the Owens Aqueduct. Adult Owens suckers were observed spawning in a shallow arm of Lake Sabrina near the eastern end of the dam during a field visit in early June 2018. EA Engineering (1987) netted an unidentified sucker from Lake Sabrina, which the authors speculated was an Owens sucker. Although there is potential for spillover from Lake Sabrina to downstream reaches of Bishop Creek, Owens suckers are not believed to have colonized other portions of the watershed and were not observed during 2020 surveys (SCE 2021a).

Owens suckers prefer 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. Literature on Owens sucker spawning in resevoirs is limited; however, in Crowley Reservoir, spawning occurs in large aggregations near springs and gravel patches along the shoreline at depths of 1–2 meters as well as in tributary streams (Moyle 2002). Larval suckers become juveniles at approximately 19–22 millimeters (mm) total length (TL) and hide under cover along stream margins and in backwaters. Within the Owens River, Owens suckers are most common in stream reaches with long runs and few riffles (Deinstadt et al. 1986, as cited in CDFW n.d.) where habitat is characterized by fine substrate, water temperatures ranging from 7–13 degrees Celsius (°C), and pH ranging from 7.9–8.0 (CDFW n.d.). Adult Owens suckers are bottom-oriented in pool habitat and in lakes regardless of depth (CDFW n.d.).

3.0 STUDY OBJECTIVES

Objectives of the Study include the following:

- Characterize populations and status of fish species in Lake Sabrina and South Lake
    - Document presence and/or absence of Owens suckers 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 (INF) (USDA 2019) as they relate to ecological sustainability and diversity of plant and animal communities

3.1 STUDY AREA

The study area includes South Lake, Lake Sabrina, and Longley Lake (Figure 3.1-1). Individual fish sampling sites within each Project reservoir are described below. South Lake is situated in the upper end of South Fork Bishop Creek at an elevation of 9,750 ft and is the largest of the Project reservoirs with a storage of 12,883 acre-feet at normal maximum reservoir level. Lake Sabrina is located on Middle Fork Bishop Creek at an elevation of 9,131 ft and has a net storage capacity of 8,376 acre-feet at normal maximum reservoir level. Longley Lake is located at the headwaters of McGee Creek at an elevation of 10,708 ft and is the smallest reservoir included in this study with a surface area of approximately 10 acres.

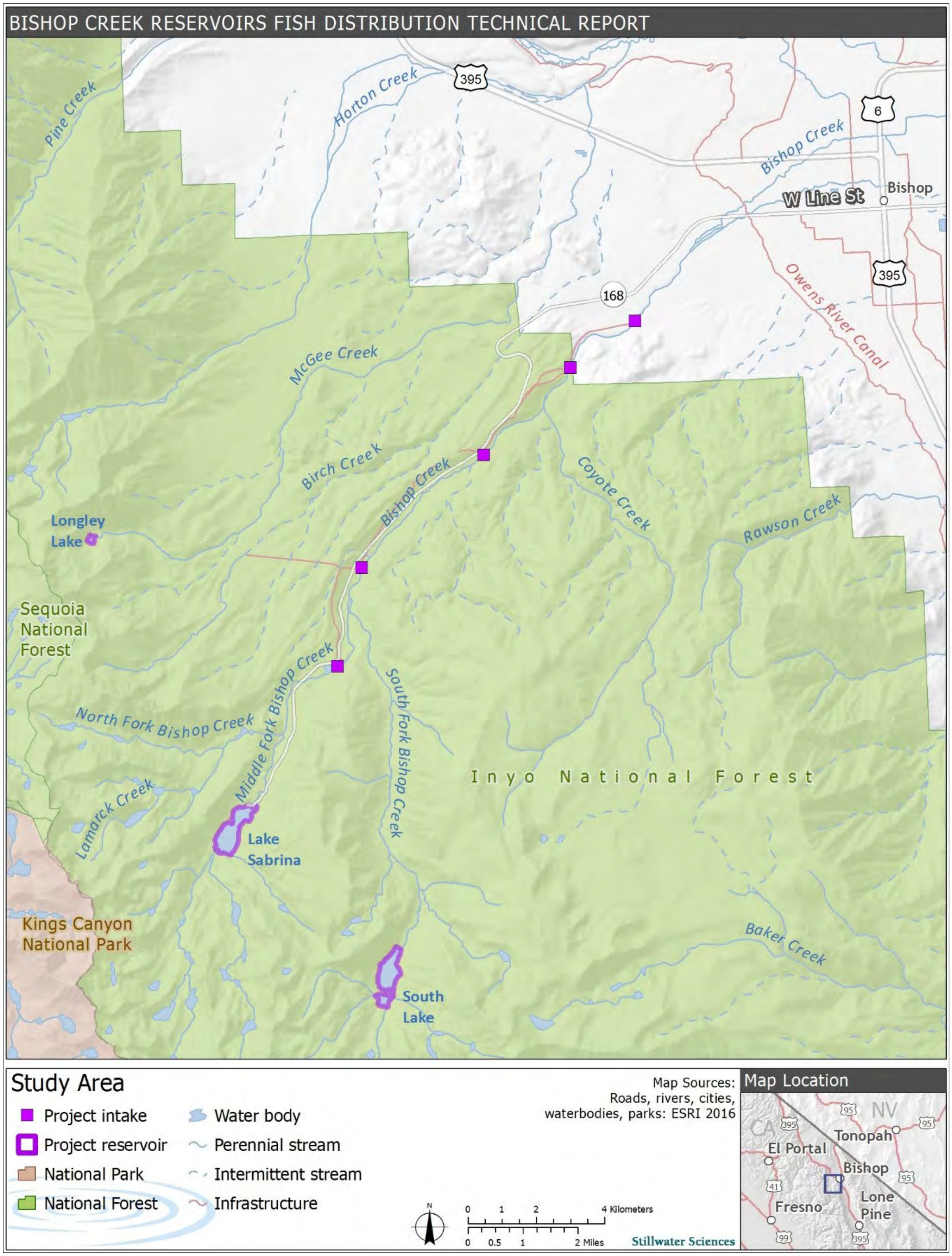


Figure 3.1-1 Bishop Creek Reservoir Fish Distribution survey locations, South Lake, Lake Sabrina, and Longley Lake

4.0 METHODS

Reservoir fish surveys were conducted from June 3 to 16, 2020 and September 7 to 11, 2020. Fish sampling methods included:

- Weekly daytime boat electrofishing and beach seining surveys targeting Owens sucker spawning habitat to document the presence and/or absence of Owens suckers at Lake Sabrina and South Lake during the spawning season (June);

- Early and late summer night electrofishing surveys to characterize reservoir fish population assemblages in Lake Sabrina and South Lake (September); and

- A single, late-summer gill netting effort to characterize the reservoir fish population assemblage in Longley Lake (September).

Additionally, South Lake and Lake Sabrina bathymetry was mapped using vessel-mounted, single beam echo-sounder systems from July 27 to August 6, 2020 to allow assessment of fish habitat in the reservoirs.

4.1 OWENS SUCKER SURVEYS

Owens sucker surveys were conducted in Lake Sabrina and South Lake during the peak spawning season to increase the likelihood of capture. Surveys were conducted in each reservoir once per week over a three-week period between June 3 and 16, 2020. Monitoring locations targeted suitable spawning habitat (i.e., shallow locations with flowing or well-aerated water and coarse sand and/or gravel substrates) but also included locations along the reservoir margins with larger substrate (i.e., boulders) to get full coverage of available habitat (Figure 4.1-1 and Figure 4.1-2). Start and end points for each sample site were obtained using a handheld global positioning system (GPS), and electrofishing shock time was recorded for each pass.

Surveys were conducted during the day using standard beach seining and boat electrofishing methods (Reynolds 1996). Suitable beach seine locations (e.g., shallow water free of obstructions such as large rocks and woody debris) were rare in both reservoirs; therefore, boat electrofishing was used as the primary method. During each monitoring event, biologists recorded the date and time of sampling; measured *in situ* water conditions approximately 1 meter below the water surface, including temperature, dissolved oxygen (DO), conductivity, and pH using a calibrated YSI™ Pro Plus multiparameter meter; and noted other conditions including water clarity and weather conditions (i.e., air temperature, wind speed, and cloud cover/precipitation). Photos were taken at each monitoring location to document general habitat conditions, which primarily focused on bank substrate types (e.g., sand, gravel, boulders), shoreline steepness, and tributary inflow. Observations of Owens suckers spawning activities (e.g., redd formations or spent adults) were also documented during surveys.

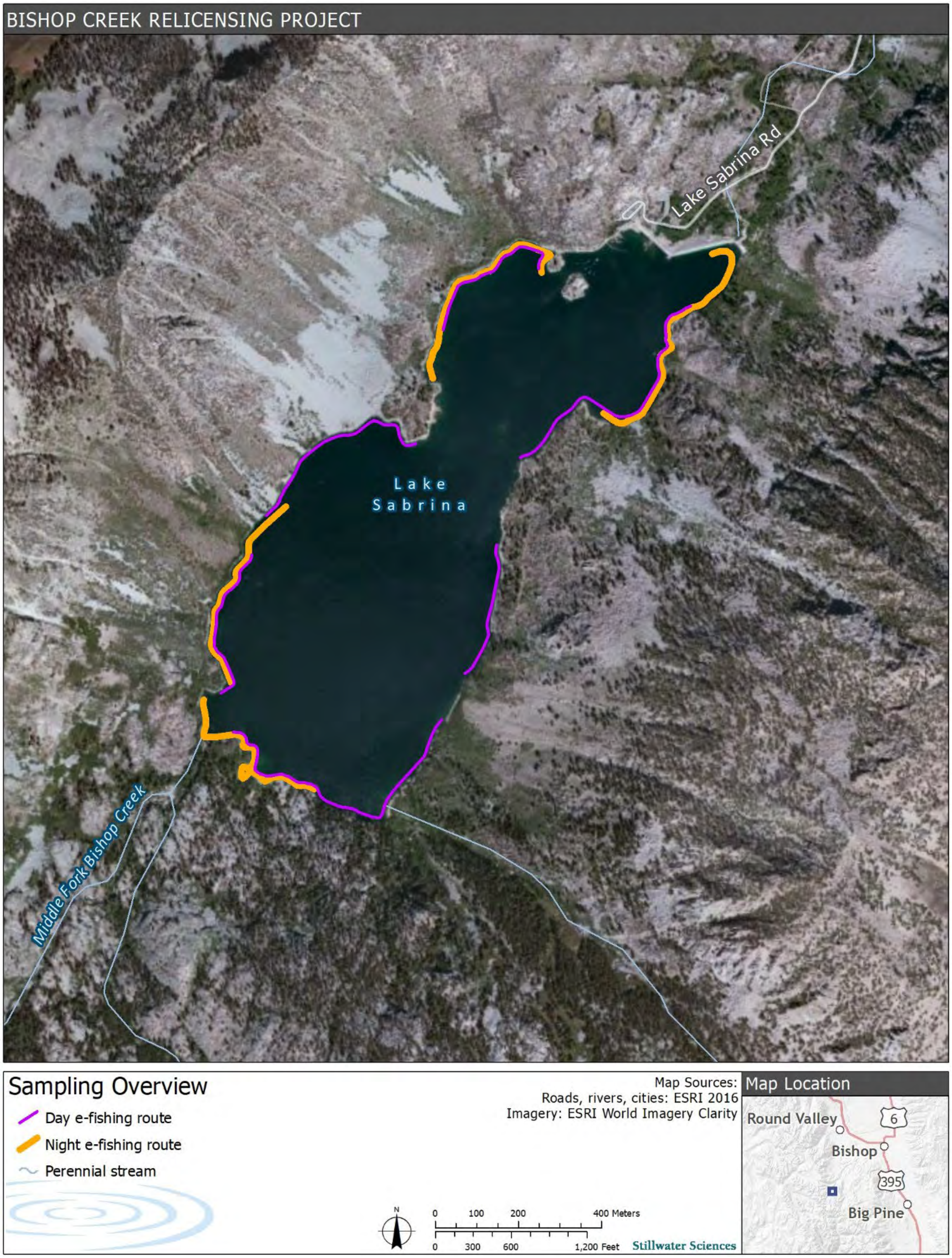


Figure 4.1-1 Lake Sabrina Boat Electrofishing Locations

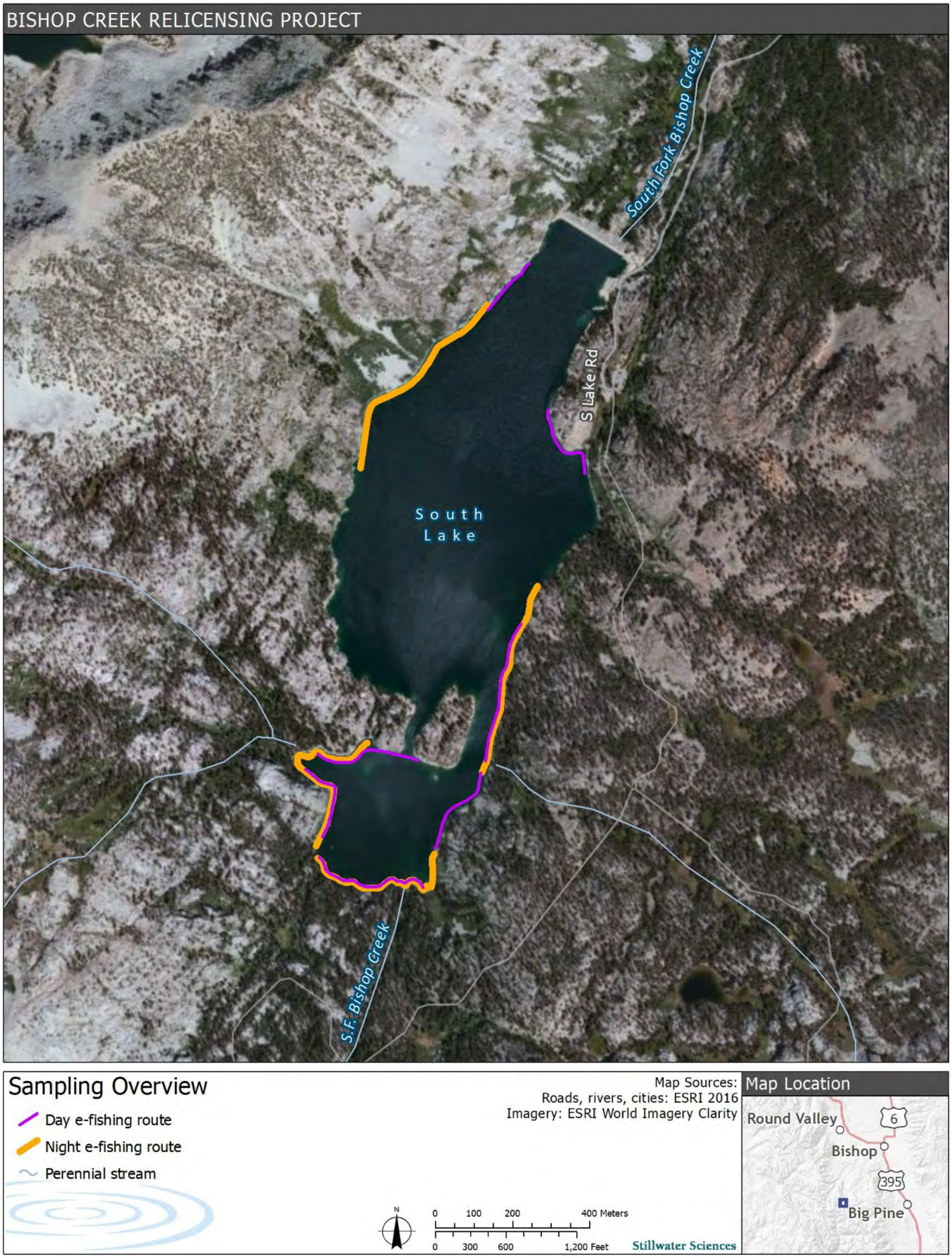


Figure 4.1-2 South Lake Boat Electrofishing Locations

As fish were captured (netted), they were placed in aerated containers with ambient reservoir water until the completion of each pass. Captured fish were processed after sampling at each location. Fish data recorded included species identification, fork length (FL; mm), TL (mm), and weight (grams [g]). A subset of 27 Owens suckers were fatally captured to obtain operculum samples for fish aging and scale samples; all other captured fish were returned to the source water immediately following processing. Operculum bones were removed and placed in individually labeled envelopes. Scales were taken from the left side of the body below the dorsal fin and above the lateral line and placed in individually labeled envelopes. Scale samples were also collected opportunistically from other species (e.g., rainbow trout and brook trout). Operculum and scale samples will be sent to the CDFW Bishop field office for future analyses.

4.2 Reservoir Fish Assemblage Surveys

Reservoir fish assemblage surveys were conducted in Lake Sabrina and South Lake using nighttime boat electrofishing from June 10 to 12, 2020 and September 9 to 11, 2020. Four sites, ranging from approximately 1,600 feet (ft) to 2,200 ft in length, were established along the shorelines of both lakes. Sample sites were established in representative near-shore habitat (Figure 4.1-1 and Figure 4.1-2). Start and end points for each sample site were obtained using hand-held GPS. Electrofishing shock time was recorded. As fish were captured (netted), they were placed in aerated containers with reservoir water until the completion of the pass. Captured fish were processed after sampling at each location. Fish data recorded included species identification, FL (mm), TL (mm), and weight (g). Water temperature and DO profiles were measured with a YSI™ Pro Plus multiparameter meter near the dam of each reservoir. Measurements were recorded at one-meter intervals from the water surface to the substrate.

Reservoir fish assemblage surveys were conducted at Longley Lake using gill netting on September 7 and 8, 2020. Two gill nets, approximately 80-feet-long by 6-feet-tall with variable mesh sizes ranging from 0.75 inch to 2.50 inches, were deployed in different sections of the reservoir (Figure 4.2-1). One net was deployed at the cove in front of the dam with each end attached to the shore and the middle section resting on the reservoir bottom at a depth of approximately 20 feet. The other net was deployed near the southeast corner of the reservoir, oriented perpendicular to the shoreline with one end attached to the shore and the other end anchored in water approximately 20 ft deep. Both gill nets were deployed for two extended periods spanning from 1500 on September 7 to midnight on September 8, 2021 and from approximately 0100 to 1200 on September 8, 2021. Captured fish were placed in an aerated container with ambient reservoir water for processing. Fish data recorded included species identification, FL (mm), TL (mm), and weight (g). Date, time, sample duration, and prevailing weather conditions for each net set period were recorded. Water temperature and DO were measured with a YSI™ Pro Plus multiparameter meter calibrated at the lake.

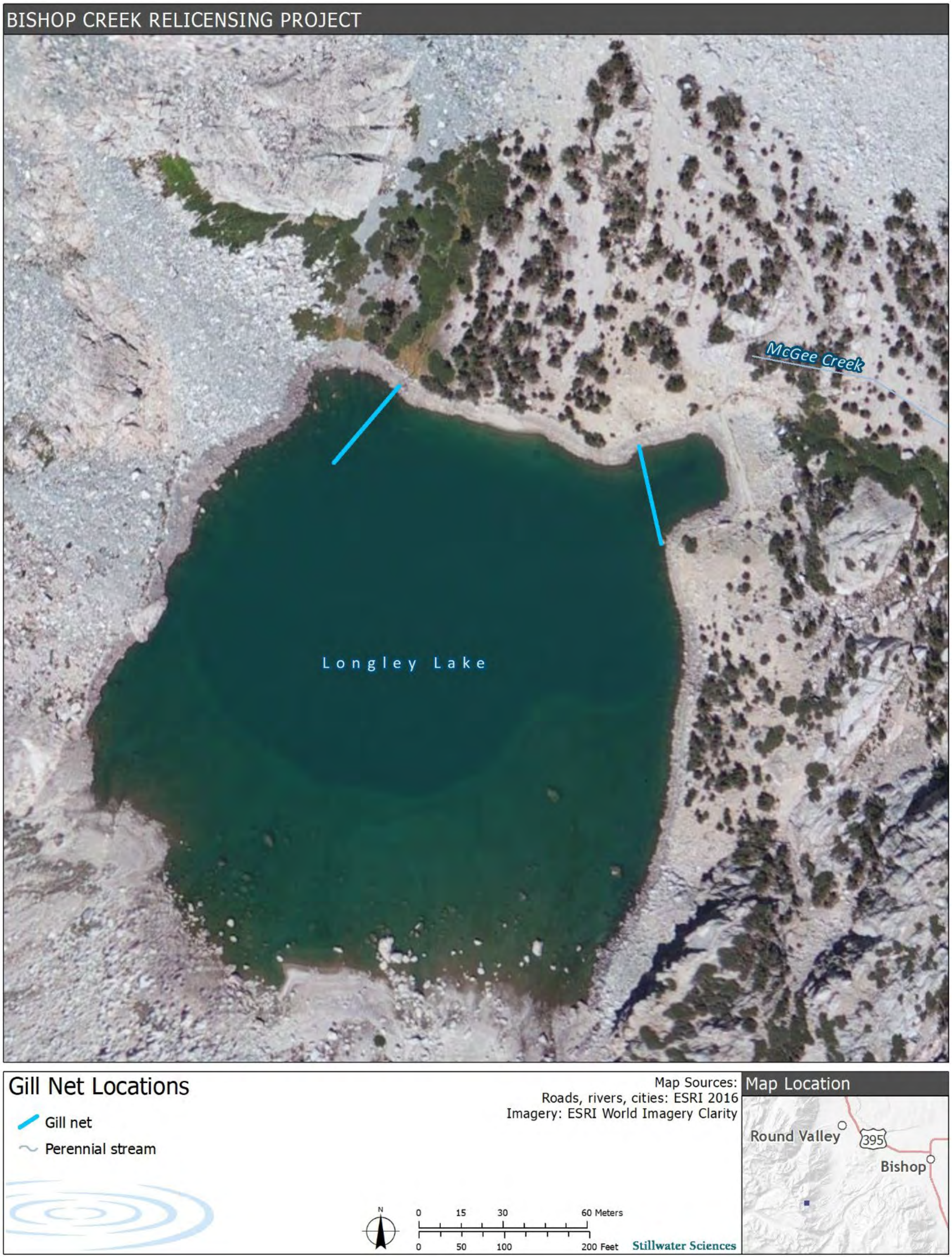


Figure 4.2-1 Longley Lake Gill Net Placement, September 2020

4.3 Reservoir Bathymetry

South Lake and Lake Sabrina reservoir bathymetry was mapped between July 27 and August 6, 2020. Prior to conducting the reservoir bathymetry surveys, semi-permanent benchmarks were installed in large bedrock outcrops at both reservoirs. Benchmark coordinates were established with National Geodetic Survey Online Positioning User Service (NGS OPUS) processing service. The benchmarks were used as the Global Navigation Satellite System (GNSS) base station location for each subsequent reservoir bathymetry and water surface elevation survey. CEEPULSE 200-kiloHertz (kHz) single beam and Ohmex SonarMite 235-kHz single-beam systems were used to measure reservoir depth.

A 16-foot aluminum survey vessel with a 20-horsepower outboard motor and an electric trolling motor were utilized to survey deep, open-water reservoir areas, and an inflatable kayak was utilized to survey the perimeters and other shallow water areas. Both single-beam systems consisted of a transducer hardwired to a small, portable black box echo processing unit with processed depths output via cable or Bluetooth. For each system, the transducer was mounted directly beneath a global navigation satellite system (GNSS) real-time kinematic (RTK) antenna or robotic total station (RTS) prism, and depth soundings were fed directly to Trimble TSC3 survey controllers and recorded by the survey software. With this setup, precise horizontal and vertical coordinates were recorded simultaneously with depth soundings as a RTS tracked the survey vessel as it moved along transect lines.

Planning transect lines were created prior to fieldwork and loaded on the survey controllers to serve as a navigation guide and ensure adequate transect spacing. The planning transect lines were created with a nominal minimum grid spacing of 200 ft in open water and adjusted to increase transect density in shallow water areas, which were identified as the most likely critical Owens sucker spawning habitat. During data collection, the survey vessels moved along transect lines at speeds up to approximately 4 knots and continuously recorded position and depth at time intervals ranging from 2–5 seconds. Small course corrections or irregular vessel tracks occurred where it was necessary to avoid obstructions and other recreational vessels and to remain on track when strong winds made it difficult to navigate in straight survey lines.

A bar check was performed at the start of each survey day to ensure adequate function of the echo sounder systems. The bar check consisted of holding the sounder in a fixed position over a flat hard surface (bedrock or boat ramp) and comparing continuous depth soundings to physical depth measurements. Cross track survey lines were also conducted to evaluate bathymetry reliability.

4.4 Owens Sucker and Reservoir Fish Assemblage Analysis Methods

Fish population data were entered into an Excel spreadsheet for reduction, tabulation, and summary. Capture data were summarized by species composition and capture method. In addition, length-frequency histograms were developed for all fish species captured to estimate age-class structure and growth rates. Breaks or modalities within the histogram were evaluated for each trout species and compared to available literature to determine approximate age classes.

Fish capture results are reported both as total catch and in terms of catch per unit effort (CPUE). CPUE for fishes captured by beach seine and electrofishing was calculated by dividing number of fish of each species captured by the total surface area of water sampled using site lengths obtained with the hand-held GPS and widths that were estimated based on the boat's distance from shore and the effective shock area around the anodes. CPUE for fishes captured by gill net was calculated by dividing the number of fish captured by the dimensions of the gill net and the length of time fished (e.g., fish/[ft^2 x hr]). CPUE was summarized by reservoir and species.

The weight-to-length relationship of individual trout was assessed as a method of identifying the nutritional state or health of the fish related to size and growth. Condition factor (Ricker 1975), a measure of this nutritional state, was calculated for each trout. Individual condition factors (k) were calculated by the following formula:

$$\mathrm{k} = \frac{\text{wet weight (g)} \times 10^5}{[\text{fork length (mm)}]^3}$$

The mean condition of trout was calculated by averaging individual condition factors for each trout species at each sample site.

5.0 MODIFICATIONS TO METHODS

The methods for the reservoir fish assemblage surveys described in the Study Plan approved by FERC on November 4, 2019 stated that sampling for Owens suckers would include a site visit to each monitoring station at least once per week during the spawning season (approximately early May through early July) to confirm presence/absence of the species. This design assumed that suckers would be potentially difficult to collect. However, large schools of Owens suckers were observed congregating in shallow water along the lake margins in early June and were observed building redds by mid-June with sufficiently high number of fish captured at Lake Sabrina (n = 105) to confirm presence. These data and observations collected between June 3 and June 16, 2020 were adequate to characterize the Owens sucker population, identify spawning areas, and observe spawning activity. Therefore, the surveys were concluded on June 16, 2020.

Total gill net set times in Longley Lake included one approximately 9-hour set time and one approximately 11-hour set time, which were both slightly less than the 12-hour set times included in the study plan. Sampling at Longley Lake occurred during severe wildfire events nearby that complicated already difficult access conditions. These conditions required longer than anticipated travel time to and from the lake, and premature termination of the sampling due to safety concerns, which resulted in a minor decrease in total set times for gill nets. However, sampling periods included times of day when trout species are most active (evening, night, and dawn hours) and when capture efficiency is highest, and it is anticipated that fish capture data collected during this study are sufficient to characterize the fish population in Longley Lake.

Owens sucker opercula were collected for fish age analysis by CDFW; however, opercula aging is not yet complete and is not part of this study.

6.0 RESULTS

6.1 HABITAT CONDITIONS

Both South Lake and Lake Sabrina showed signs of thermal stratification during the June sampling effort, while DO levels remained similar throughout the water column (Figure 6.1-1 and Figure 6.1-2). Thermal stratification occurred between 5 and 6 meters below the water surface in South Lake and between 6 and 8 meters below the water surface in Lake Sabrina. Water temperatures ranged from 6.0°C to 10.9°C in South Lake and from 9.5°C to 12.8°C in Lake Sabrina. Thermal stratification was not observed during the September sampling effort with both South Lake and Lake Sabrina showing uniform temperatures throughout the water column. DO levels in South Lake were slightly lower during September than in June. Equipment malfunction during the September effort resulted in unreliable DO readings below the water surface in Lake Sabrina; however, DO levels measured near the water surface (with a different instrument) showed a similar decrease in levels compared to surface DO levels observed at South Lake. Water temperatures at Longley Lake were slighly lower than the other two reservoirs, but DO levels were simlar between all three reservoirs (Table 6.1-1). Overall, water temperatures were cool and DO levels were high throughout the study area in June with warmer water temperatures and lower DO levels measured in September, although still within the suitable range for the four fish species observed during this study. Sample site conditions are provided in Appendix A and habitat overview photographs are inclulded in Appendix B.

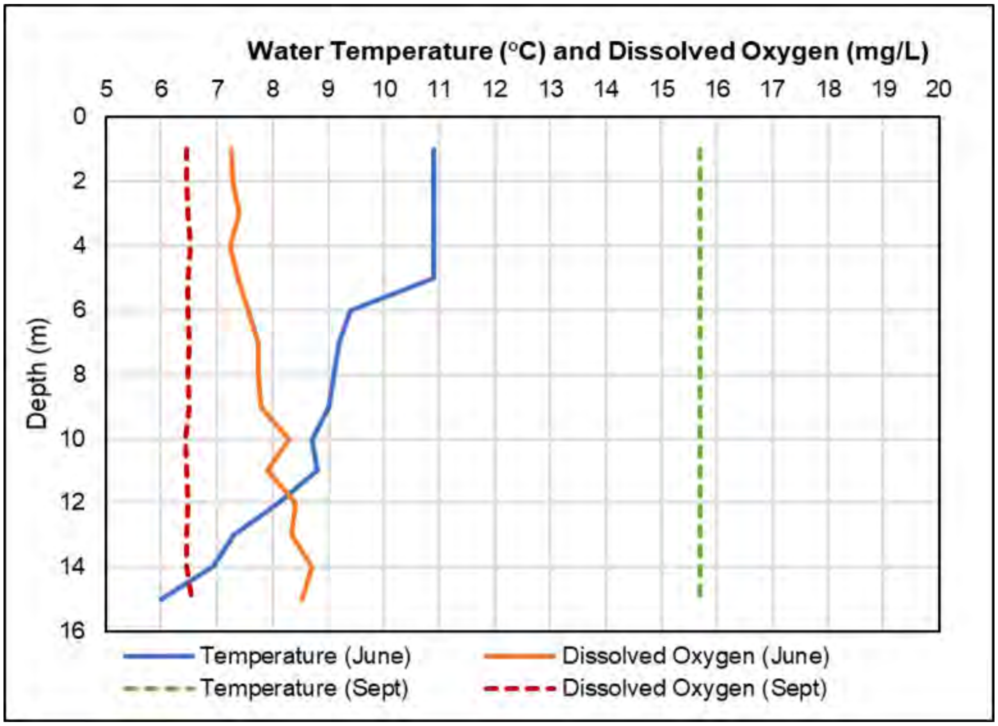


Figure 6.1-1 Water Temperature and Dissolved Oxygen Profiles for South Lake, June and September 2020

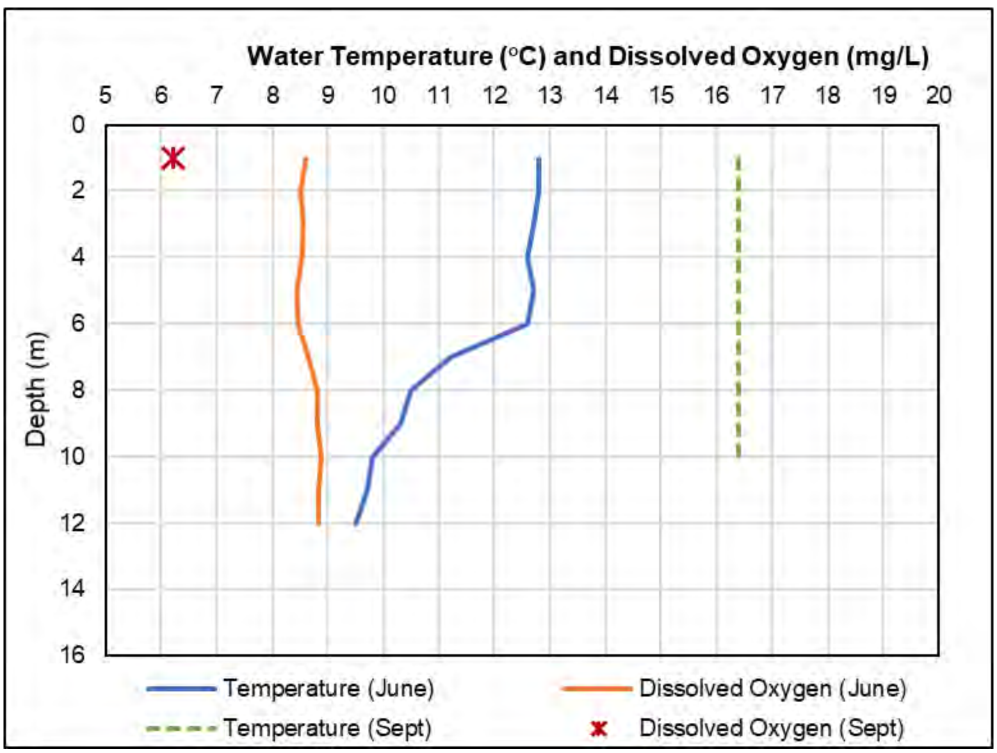


Figure 6.1-2 Water Temperature and Dissolved Oxygen Profiles for Lake Sabrina, June and September 2020

Table 6.1-1 Water Quality Conditions at Fish Sampling Locations in Project Reservoirs during June and September 2020

Reservoir	Survey Month	Dissolved Oxygen mg/L [1]		Conductivity µS/cm [2] (25 °C)		Conductivity µS/cm [2] (adjusted to °C)		Water Temperature (°C)		pH	
		min	max	min	max	min	max	min	max	min	max
South Lake	June	8.60	10.06	15.0	25.8	18.5	25.8	11.4	12.7	5.57	7.9
	Sept.	6.42	6.42	14.6	16.0	17.7	19.8	15.5	15.8	8.13	8.43
Lake Sabrina	June	8.18	9.94	14.5	19.4	14.1	19.2	9.6	11.2	6.36	7.04
	Sept.	5.83	6.21	13.0	13.1	15.6	15.6	16.4	16.6	8.07	8.46
Longley Lake	Sept.	6.31	6.31	7.0	7.0	9.2	9.2	12.8	12.8	7.85	7.85

[1] milligrams per liter (mg/L)

[2] microsiemens per centimeter (µS/cm)

6.2 Species Composition and Distribution

A total of 677 fish were captured during the June and September 2020 reservoir surveys (including combined Owens sucker and reservoir fish assemblage surveys). The captured species indicate that the fishery in South Lake, Lake Sabrina, and Longley Lake is composed of coldwater trout species. Lake Sabrina also supports a large self-sustaining population of Owens suckers (Table 6.2-1), which were numerically the most abundant fish species captured in Lake Sabrina. Owens suckers were not observed in South Lake or Longley Lake. Of trout species, rainbow trout were the most abundant in Lake Sabrina and South Lake (Figure 6.2-1 and Figure 6.2-2), likely as a result of frequent stocking, while brook trout was the only fish species captured in Longley Lake (Figure 6.2-3).

Catch-per-unit-effort (CPUE) for fishes captured during spring and fall showed some variability by gear type, location, and season (Table 6.2-2). Overall, CPUE was fairly similar when comparing similar methods between South Lake and Lake Sabrina, while gill netting in Longley Lake had the highest CPUE.

Table 6.2-1 Fish Species and Number Captured during 2020 Reservoir Sampling

Family	Scientific Name	Common Name	Lake Sabrina		South Lake		Longley Lake	Total
			JUNE[1]	SEPT.	JUNE[1]	SEPT.	SEPT.	
Salmonidae	*Salmo trutta*	Brown Trout	1	0	26	31	0	58
	Oncorhynchus mykiss	Rainbow Trout	81	58	128	48	0	315
	Salvelinus fontinalis	Brook Trout	27	19	57	24	27	154
Catostomidae	*Catostomus fumeiventris*	Owens Sucker	105	45	0	0	0	150
Total			214	122	211	103	27	677

[1] Results for June include fish captured during day electrofishing and beach seining conducted during the Owens sucker surveys and the night boat electrofishing surveys conducted for the reservoir fish assemblage surveys. Only night electrofishing was conducted in Lake Sabrina and South Lake during the September sampling effort.

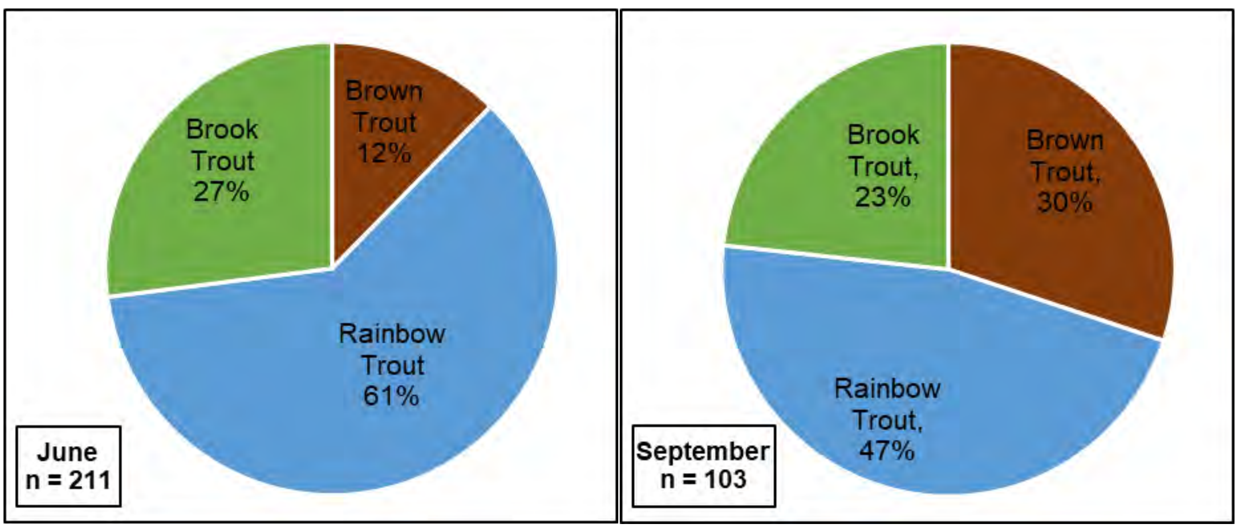


Figure 6.2-1 Fish Species Composition for South Lake during 2020 Sampling

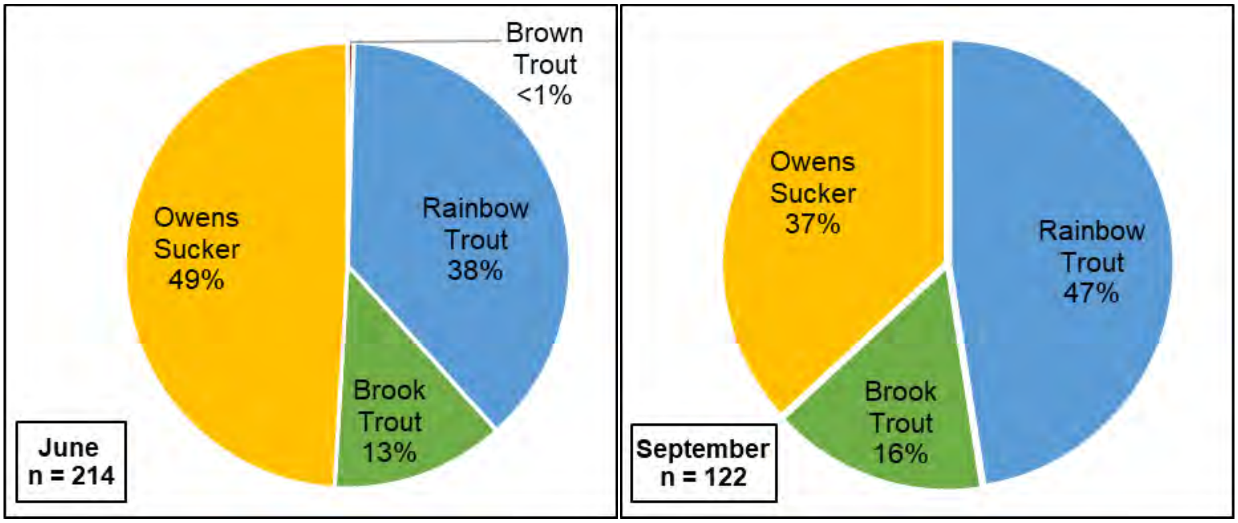


Figure 6.2-2 Fish Species Composition for Lake Sabrina during 2020 Sampling

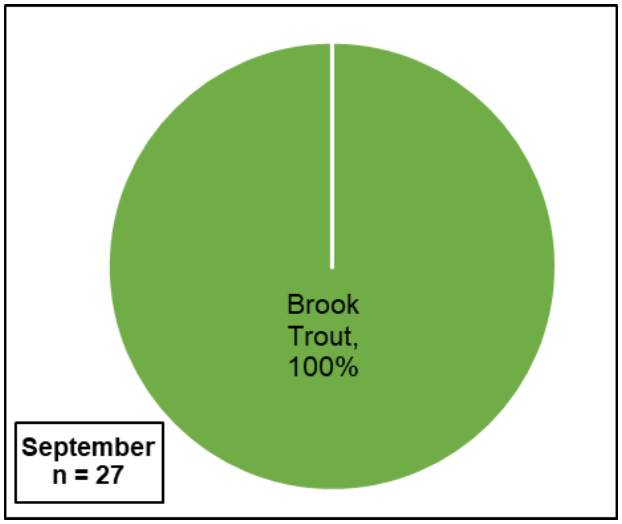


Figure 6.2-3 Fish Species Composition for Longley Lake, September 2020

Table 6.2-2 Fish Catch per Unit Effort by Survey Method During 2020 Sampling

Reservoir	Method	Catch per Unit Effort (CPUE)[1] x 1,000				
		Brown trout	Rainbow trout	Brook trout	Owens Sucker	Total
June Sampling Efforts						
South Lake	Daytime Boat Electrofishing	0.07	0.31	0.25	0.00	0.63
	Nighttime Boat Electrofishing	0.16	0.85	0.13	0.00	1.15
	Beach Seine	0.07	0.07	1.13	0.00	1.28
Lake Sabrina	Daytime Boat Electrofishing	0	0.20	0.10	0.25	0.55
	Nighttime Boat Electrofishing	0.01	0.48	0.12	0.64	1.25
September Sampling Efforts						
South Lake	Nighttime Boat Electrofishing	0.28	0.43	0.22	0.00	0.93
Lake Sabrina	Nighttime Boat Electrofishing	0.00	0.69	0.22	0.53	1.44
Longley Lake	Gill Net	0.00	0.00	2.12	0.00	2.12

[1] CPUE Gill Nets= Fish/(ft^2 x hr), CPUE Electrofisher and Beach Seine= Fish/ft^2

6.3 Age Class Distribution

Length-frequency histograms were generated to assess age classes for fish species captured and were compared with length-at-age information provided by Moyle (2002). Growth rates for the trout species captured during this study are highly variable (Moyle 2002), and rainbow trout reared in hatcheries likely grow at different rates compared with naturally produced fish. Little information exists on the growth rates of Owens suckers, so length frequency was compared with age classes of a similar species, Tahoe suckers (*Catostomus tahoensis*). Despite this variation, the length-frequency distribution of fish observed in all three reservoirs indicated multiple age classes were present, including young-of-the-year (YOY) fish, suggesting natural reproduction is occuring for most species in these locations. Age classes for fishes within the individual Project reservoirs are discussed below.

6.3.1 South Lake

Fish captured in South Lake were all members of the family Salmonidae, including brown trout, rainbow trout, and brook trout ranging from approximately 50–550 mm FL. Brown trout included fish expected to be within all age classes from YOY up to approximately age 3+ ; rainbow trout included fish expected to be within all age classes from YOY to well over age 3+; and brook trout included fish expected to be within all age classes from YOY up to 3+ (Figure 6.3-1 through Figure 6.3-3).

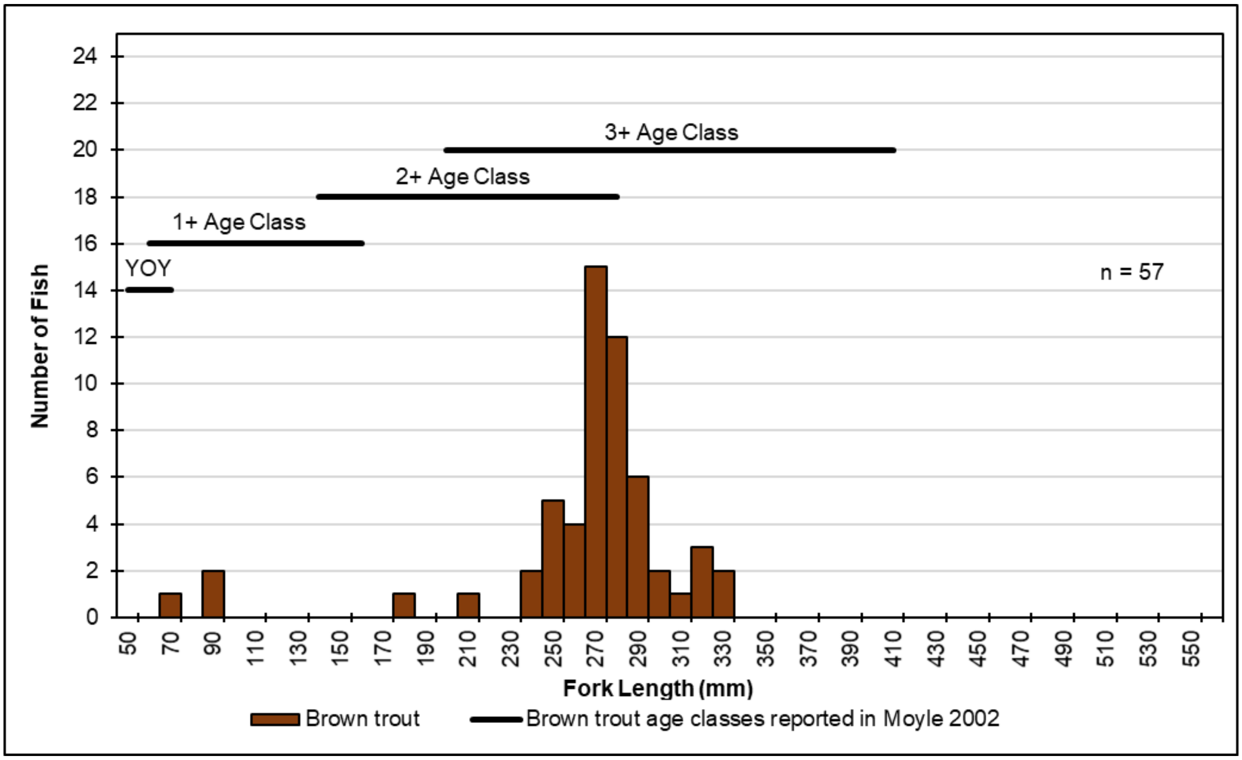


Figure 6.3-1 Length Frequency Histogram for Brown Trout Captured in South Lake during 2020 Sampling

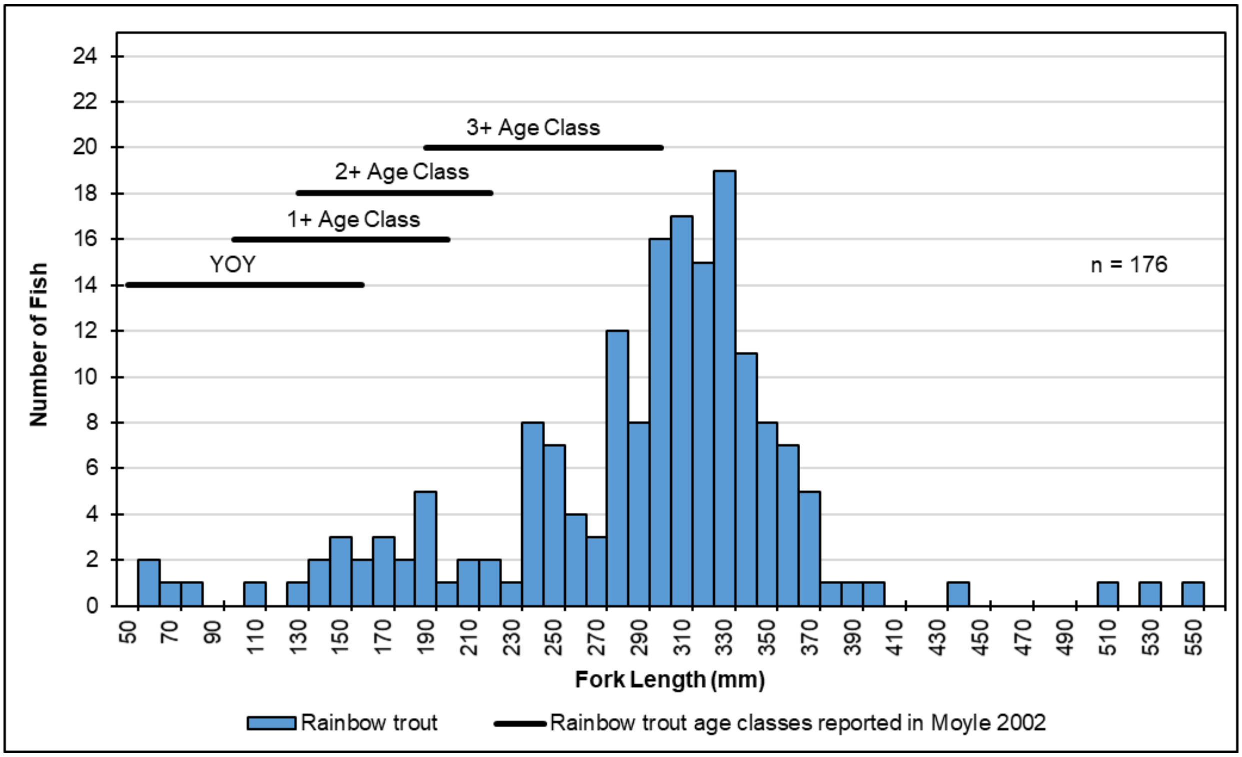


Figure 6.3-2 Length Frequency Histogram for Rainbow Trout Captured in South Lake during 2020 Sampling

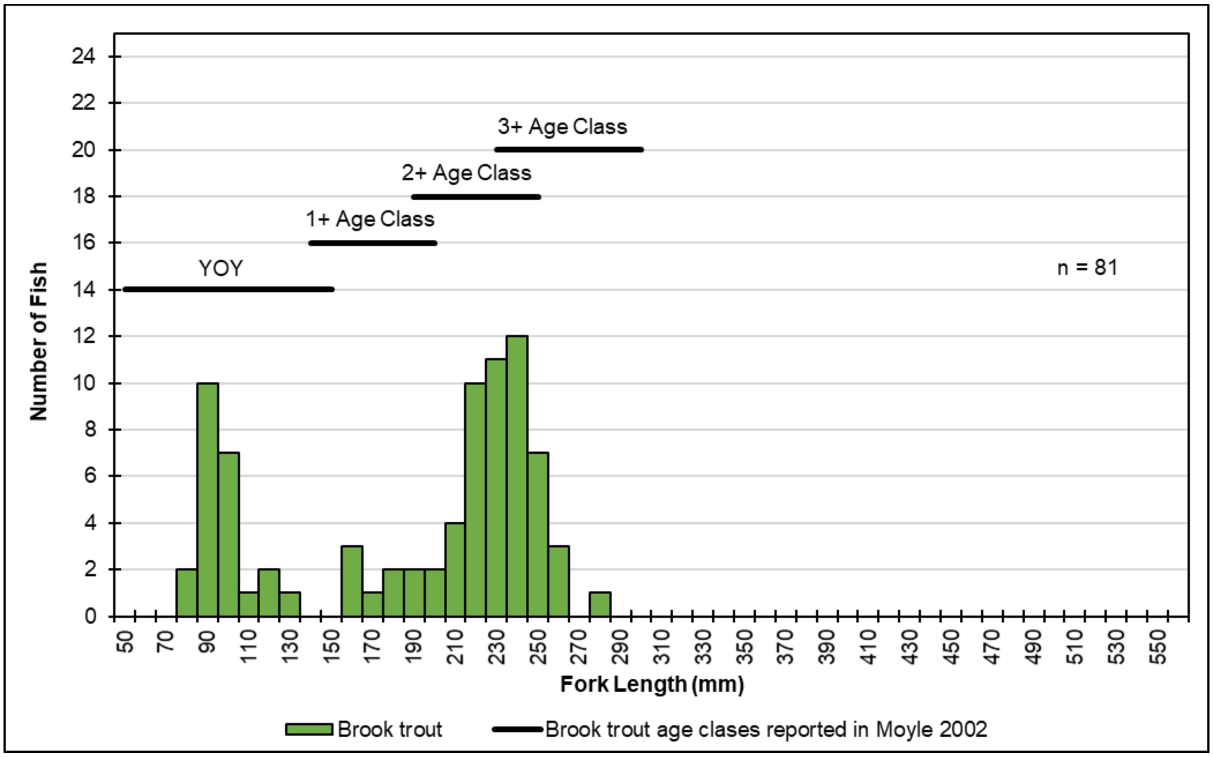


Figure 6.3-3 Length Frequency Histogram for Brook Trout Captured in South Lake during 2020 Sampling

6.3.2 LAKE SABRINA

Fish captured in Lake Sabrina included fish from the family Salmonidae, including brown trout, rainbow trout, and brook trout ranging from approximately 50–650 mm FL, and Owens suckers (family Catastomidae) ranging from approximately 70–380 mm FL. The size distribution of rainbow trout and brook trout captured in Lake Sabrina indicate multiple age classes are present with some fish from both species expected to fall within the YOY age class (Figure 6.3-4 and Figure 6.3-5). A single brown trout was captured that was approximately 650 mm FL which is expected to be in the 5+ age class or older (Figure 6.3-5). Owens suckers likely included fish within all age classes from YOY to age 6+ or older (Figure 6.3-6); however, age and growth have not been well documented for this species.

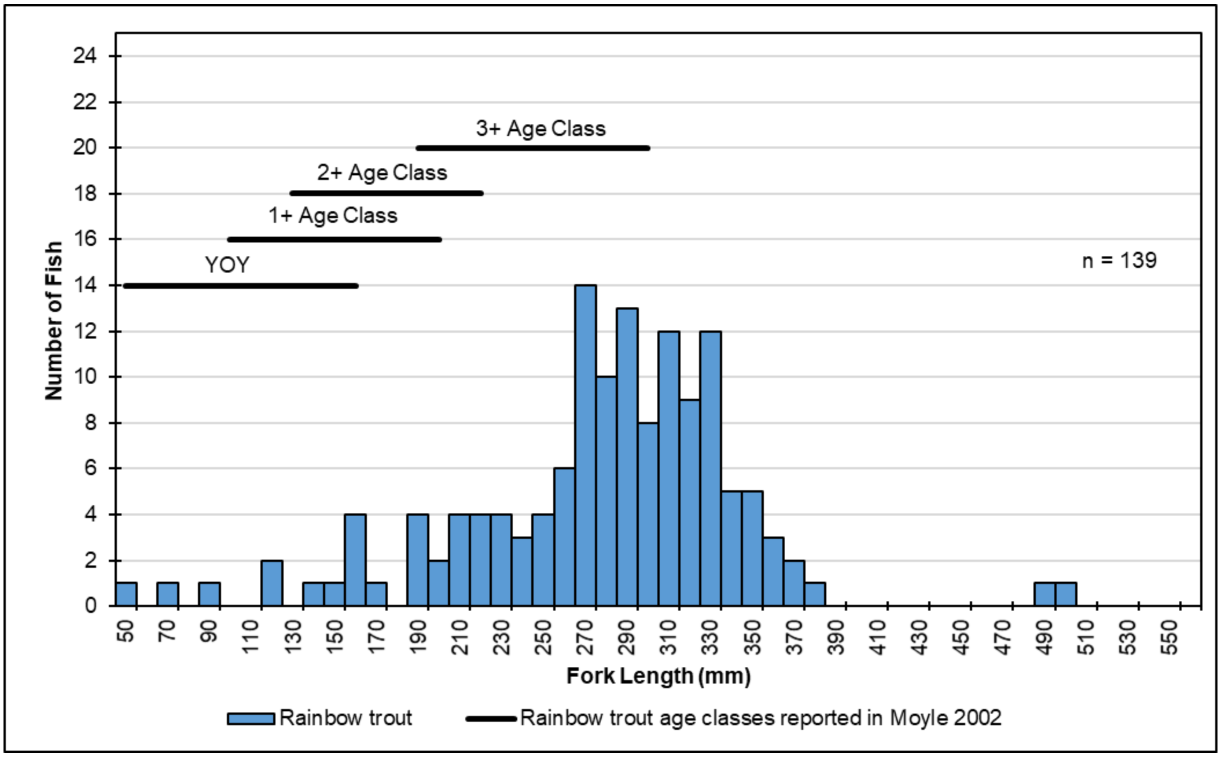


Figure 6.3-4 Length Frequency Histogram for Rainbow Trout Captured in Lake Sabrina during 2020 Sampling

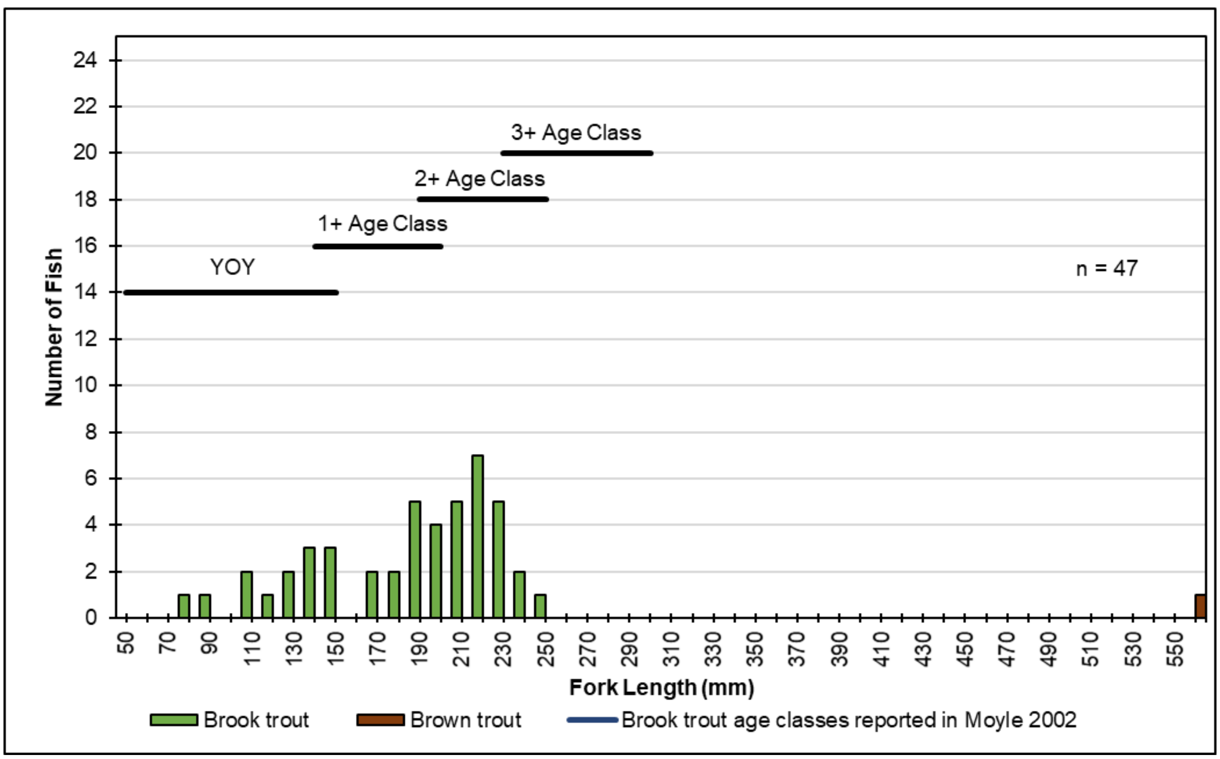


Figure 6.3-5 Length Frequency Histogram for Brook Trout and Brown Trout Captured in Lake Sabrina during 2020 Sampling

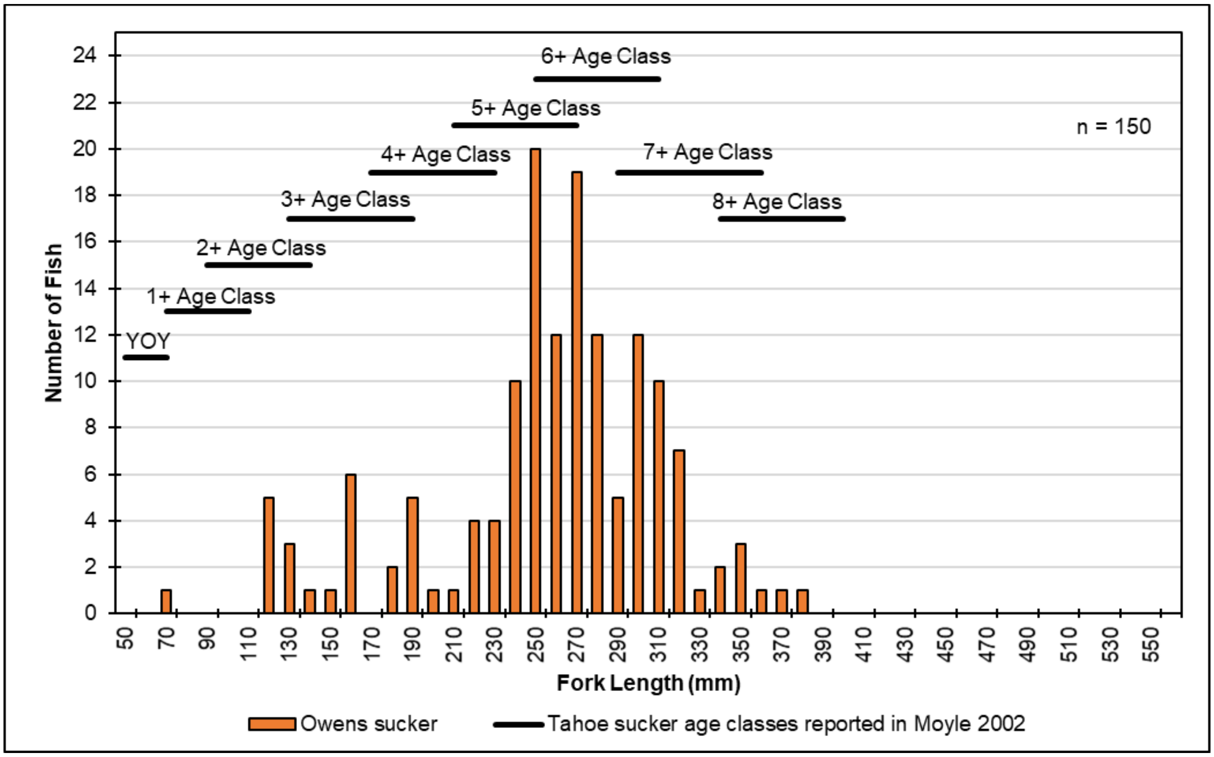


Figure 6.3-6 Length Frequency Histogram for Owens Suckers Captured in Lake Sabrina during 2020 Sampling

6.3.3 LONGLEY LAKE

Brook trout were the only fish species captured in Longley Lake, and the narrow size distribution makes estimating age structure difficult. The brook trout captured in Longley Lake ranged from 190–255 mm FL and the observed sizes likely fall within the 2+ and 3+ age classes, based on size-at-age estimates for brook trout reported in Moyle (2002) and observations in Lake Sabrina (Figure 6.3-7). The absence of brook trout less than 190 mm FL is likely a result of the gill net mesh size which is selective for fish larger than 100 mm.

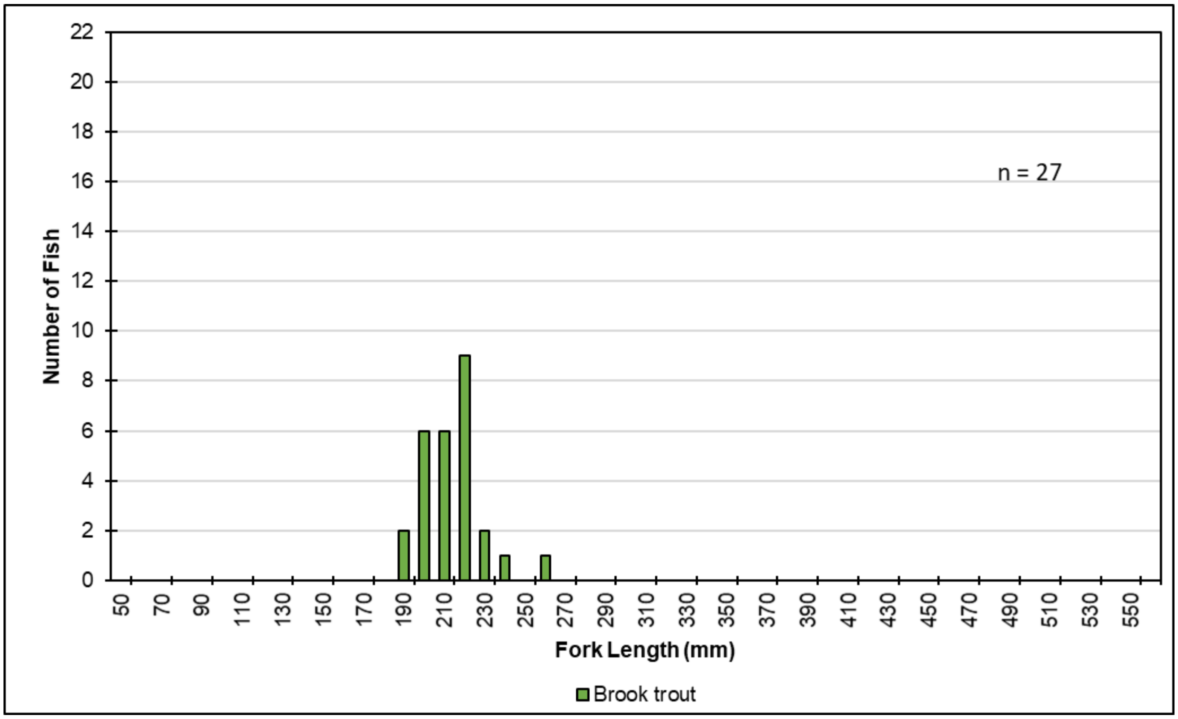


Figure 6.3-7 Length Frequency Histogram for Fish Captured in Longley Lake during 2020 Sampling

6.4 FISH CONDITION

The mean trout condition within the Project reservoirs sampled in 2020 ranged from 1.06–1.34[1], indicating that trout were generally in good condition (Table 6.4-1). Length and weight data for all fish captured during this study are provided in Appendix C.

[1] Condition factors in western Sierra Nevada streams typically range from 0.8 to 2.0, with a mean condition factor generally 1.2 or below (Beak 1991; EA, 1987; Ebasco Environmental 1993; Wilcox, 1994; Hanson Environmental 2005), while Rabe (1967) reported the condition factor to be between 0.9 and 1.1 for rainbow trout in Alpine lakes. Arismendi et al., (2011) cites broader ranges (0.5 to 2.0); however, condition is dependent on the sampling season, species, strain of trout, state of sexual maturity, and the way fish length is defined (e.g., fork length, total length, or standard length), which is not often documented with the results.

Table 6.4-1 Condition Factors (k) for Fish Captured in Project Reservoirs during 2020 Sampling Effort

Reservoir	Species	Number captured	Fork Length (mm)		Average k-value[1]
			min	max	
June Sampling Effort					
South Lake	Brook trout	57	85	280	1.16
	Brown trout	26	68	330	1.08
	Rainbow trout	128	58	437	1.12
Lake Sabrina	Brook trout	27	77	239	1.19
	Brown trout	1	648	648	--[2]
	Rainbow trout	81	44	380	1.11
	Owens sucker	105	114	360	1.34
September Sampling Effort					
South Lake	Brook trout	24	195	255	1.12
	Brown trout	31	180	313	1.06
	Rainbow trout	48	168	168	1.07
Lake Sabrina	Brook trout	19	130	246	1.22
	Brown trout	0	na	na	Na
	Rainbow trout	58	90	495	1.12
	Owens sucker	45	61	375	1.26
Longley Lake	Brook Trout	27	190	255	1.27

Notes: -- Not calculated, mm = millimeters, na = not applicable
[1] Fish condition factor
[2] Fish weight exceeded scale capacity

6.5 RESERVOIR BATHYMETRY

Bathymetric surveys were conducted at water surfacce elevations of 9,753 feet in South Lake and 9,124 feet in Lake Sabrina. Based on the mapping and normal surface elevations of South Lake (9,751.3 feet) and Lake Sabrina (9,131.6 feet), the maximum depth of South Lake would be 223 ft and the maximum depth of Lake Sabrina would be 252 feet. The maximum depth was located near the middle of the northern section of South Lake (Figure 6.5-1) and near the middle section of Lake Sabrina (Figure 6.5-2). Based on the relatively steep reservoir shorelines and limited littoral zones in these reservoirs, overall nutrient levels are anticipated to be low and the productivity is likely limited.

Areas with suitable spawning depths for Owens suckers (i.e., water between 3- and 6-feet-deep) are primarily located along the reservoir margins in both lakes. In South Lake, additional spawning habitat may be provided by a large shoal when water surface elevations reach approximately 9,725 feet, or by a second shoal when the water surface elevation reaches approximately 9,700 feet (Figure 6.5-1). In Lake Sabrina, the littoral zone is realtively restricted, and areas with low gradients may provide suitable spawning habitat that extend well beyond the lake margins, especially along the north shore along the northern section of the reservoir (Figure 6.5-2), and avaialble habitat is likely to be similar under a range of water surface elevations.

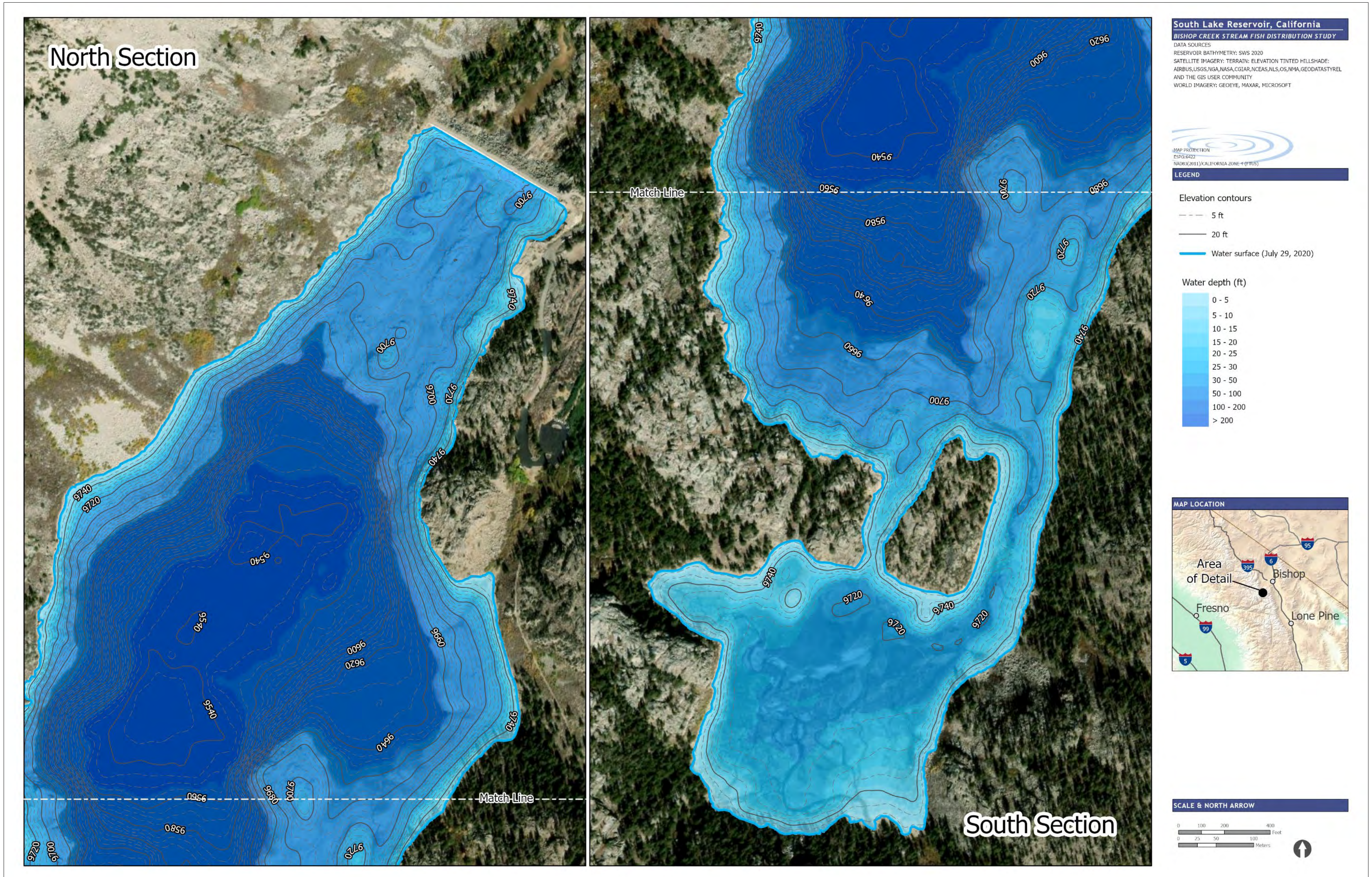


Figure 6.5-1 Bathymetry Map for South Lake

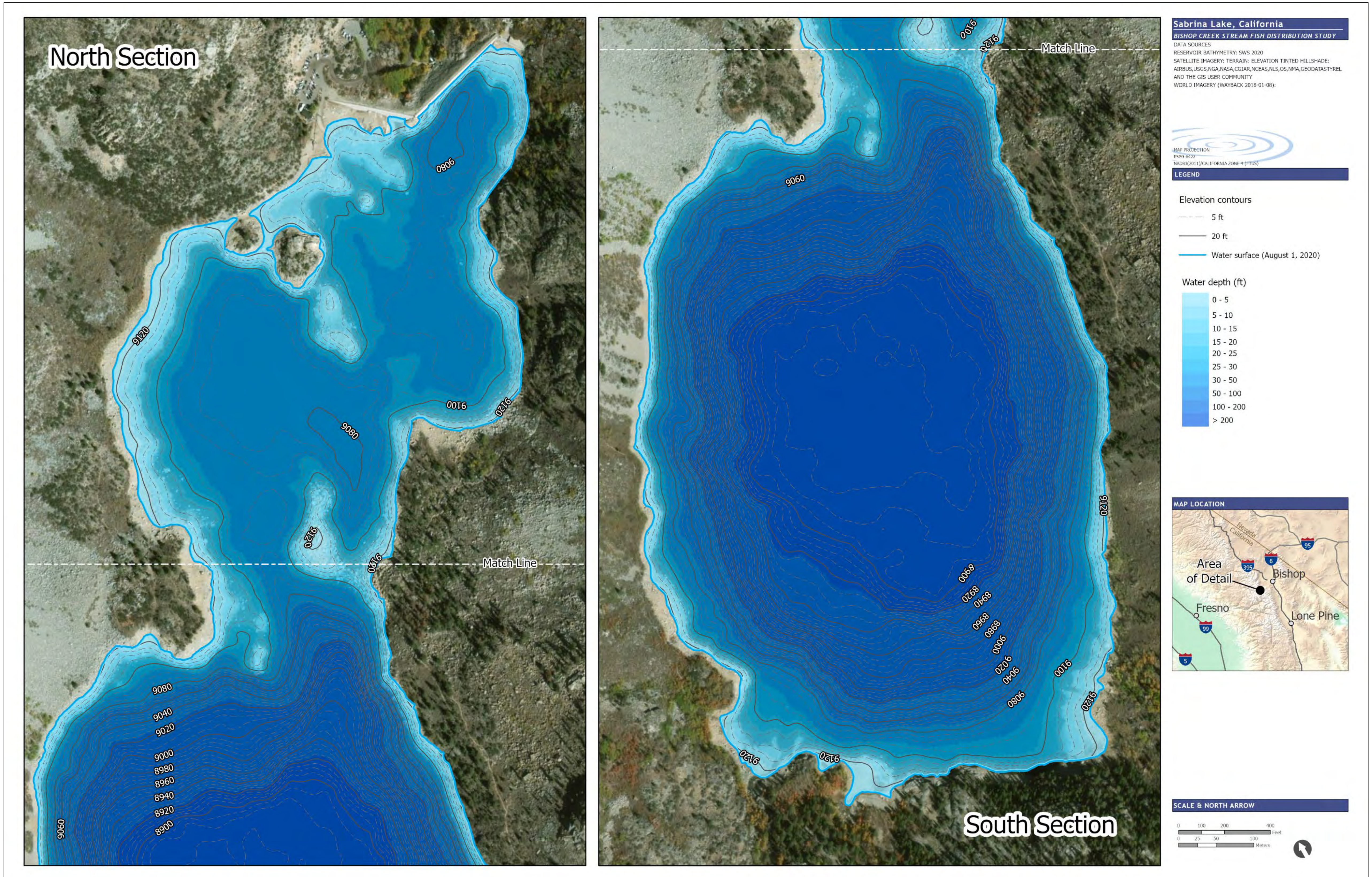


Figure 6.5-2 Bathymetry Map for Lake Sabrina

7.0 DISCUSSION

7.1 LOCALIZED WATER QUALITY PARAMETERS THAT MAY AFFECT THE GROWTH AND DISTRIBUTION OF FISH SPECIES

The cold-water temperatures and generally high oxygen levels measured in all three reservoirs throughout the study are suitable for trout. Optimal temperatures for growth of rainbow trout are approximately 15–18 °C, but a wide range of temperatures can be tolerated (Moyle 2002). At low temperatures, rainbow trout can tolerate DO levels around 2 mg/L, but growth normally requires DO levels near saturation (Moyle 2002). DO saturation levels are approximately 7 mg/L at 9,000 feet elevation in water that is 15°C, and DO saturation is slightly lower at 10,000 feet. Both brown trout and brook trout require similar conditions for growth but can occur over a wider range of temperature and DO levels (Moyle 2002). Therefore, localized water quality parameters are expected to support sufficient periods of growth for trout in these reservoirs (Table 6.1-1).

7.2 FISH POPULATIONS AND DISTRIBUTION IN PROJECT RESERVOIRS

7.2.1 SOUTH LAKE

Fish populations in South Lake are made up of a mix of hatchery and naturally produced trout. YOY brown trout, rainbow trout, and brook trout were captured during reservoir surveyes suggesting some natural reproduction occurs for each species. Multiple age classes of all three trout species were captured in South Lake during 2020 even though stocking records indicate only rainbow trout were stocked in South Lake during 2019 and 2020 (CDFW 2019). Relatively high numbers of rainbow trout captured in South Lake appeared to be of hatchery descent based on observations of worn fins and other deformities on rainbow trout captured during the study. No other species showed signs of hatchery descent. Angling pressure appears to be high in South Lake based on several fish captured with fishing line in their stomachs and mouths. No Owens suckers were captured or observed in South Lake during this study.

7.2.2 LAKE SABRINA

Fish populations in Lake Sabrina are made up of a mix of hatchery and naturally produced trout along with a seemingly large population of naturally reproducing Owens suckers. YOY rainbow trout and brook trout were captured during reservoir surveys suggesting some natural reproduction occurs for these species. Unlike in South Lake, brown trout were nearly absent from the catch, with only a single brown trout captured . Rainbow trout is the only species currently stocked by CDFW and were the most abundant trout species. While hatchery fish cannot always be distinguished from naturally produced fish, a high proportion of rainbow trout captured in Lake Sabrina showed signs indicative of fish from hatchery orgins, such as worn fins and other physical deformities. Angling pressure appears to be greater at Lake Sabrina compared to South Lake, which may account for the near absence of brown trout observed. Several captured fish had fishing line in their stomachs and mouths. Owens suckers appear to have established a self-sustaining population within Lake Sabrina, based on their high relative abundance and age-class distribution, which included fish ranging from YOY to the 6+ age class or older.

7.2.3 LONGLEY LAKE

A self-sustaining population of brook trout occurs within Longley Lake. Brook trout density appears to be higher at Longley Lake than at South Lake or Lake Sabrina, as indicated by higher CPUE for fish captured at Longley Lake, even though no stocking currently occurs. The sampling method used at Longley Lake was selective for larger fish, so no YOY fish were captured; however, natural reproduction is likely occuring based on the high abundance of fish and observations of relatively young age 2+ to 3+ fish captured. Overall, brook trout were fairly small in size, but this is typical of high elevation populations in California (Moyle 2002).

7.3 INYO NATIONAL FOREST DESIRED CONDITIONS

Results from this study provide only a limited basis for comparison with the Desired Conditions described in the Land Management Plan for the INF (USDA 2019). The conditions included in the Land Management Plan focus on ecological sustainability and diversity of plant and animal communities, both native and non-native; however, heavy angling pressure in South Lake and Lake Sabrina likely limit self-sustaining populations of non-native game species (i.e., trout). Both South Lake and Lake Sabrina are managed as a put-and-take fishery where heavy stocking occurs followed by rapid removal from heavy angling pressure. However, these fisheries do appear to be contributing to economies to the local communities as evident by the marinas and resorts associated with South Lake and Lake Sabrina. Furthermore, no native fish were present within this section of the watershed prior to stocking, so no risk is being posed by non-native game fish species. Therefore, these conditions meet the criteria included in desired condition (SPEC-FW-DC)-05 as listed below:

> ***(SPEC-FW-DC) 05:*** *The Inyo National Forest provides high quality hunting and fishing opportunities. Habitat for non-native fish and game species is managed in locations and ways that do not pose substantial risk to native species, while still contributing to economies of local communities.*

Only Longley Lake appears to support sufficient numbers of brook trout to support a sustainable population of non-native game fish. Owens suckers, while not historically present in the upper Bishop Creek watershed, are native to the basin and appear to have established a self-sustaining population within Lake Sabrina. These populations meet the criteria included under the desired condition (SPEC-FW-DC)-01 as listed below:

> ***(SPEC-FW-DC) 01:*** *Sustainable populations of native and desirable non-native, plant and animal species are supported by healthy ecosystems, essential ecological processes, and land stewardship activities, and reflect the diversity, quantity, quality, and capability of natural habitats on the Inyo National Forest.*

8.0 CONSULTATION SUMMARY

Biologists contacted CDFW on May 21, June 1, and June 2, 2020 to coordinate the reservoir sampling approach and CDFW's aging of Owens sucker opercula collected during the June 2020 surveys. SCE distributed periodic progress reports on the following schedule:

- Progress Report 1: December 19, 2019
- Progress Report 2: April 14, 2020
- Progress Report 3: July 24, 2020
- Initial Study Report (Progress Report 4): October 30, 2020
- Initial Study Meeting: November 10, 2020
- Progress Report 1: March 2, 2021
- Progress Report 2: May 28, 2021
- Progress Report 3: August 27, 2021
- Updated Study Report Filing: November 4, 2021
- Updated Study Report Meeting: November 18, 2021

Three progress reports were filed in 2021 after the ISR, as identified above. This Final Technical Report was submitted to agencies and stakeholders for a 60-day review period on May 14, 2021. The comment period was extended, at the request of the agencies, and comments received on this report are shown in Table 8.1-1. A meeting was held with CDFW and USFS on October 6, 2021 to discuss those comments received as well as SCE's draft responses to them. SCE held a Project Effects meeting on October 28, 2021 for all stakeholders and agencies to discuss what project effects (if any) had been identified through the implementation of each of the approved study plans.

The Updated Study Report (USR) was filed with FERC on November 4, 2021, and a USR Meeting was held on November 18, 2021. At this meeting, SCE only discussed those studies which were still in progress at the time of the ISR (Water Quality, Sediment and Geomorphology, Operations Model, Recreation Use and Needs, Recreation Facilities Condition Assessment, Project Lands and Boundary, and Cultural and Tribal Studies). The Reservoir Fish Distrbution Study was not discussed at the USR, and thus received no comments.

Table 8.1-1 Consultation Summary

Comment Number	Study	Date of Comment	Entity	Comments	SCE Response
1	Fish Distribution Study (Reservoirs) – AQ 4	October 4, 2021	CDFW	CDFW agrees that most rainbow trout captured are hatchery-origin. A plot showing this should be included if data was collected on what percentage of rainbow trout had worn fins. <u>October 14, 2021, CDFW Updated Comment:</u> Size of planted trout will be from 1-inch up to 18-inches, but most trout stocked will be around 7-10 inches. Fin wear has been established as a useful indicator of hatchery origin in some systems. Roger and Jeff (HWT) used fin wear to document hatchery trout in the EF Carson in 2008.	Data collection on fin wear was not included as part of this study plan. However, crews did collect incidental information on general fish health including fish origin as hatchery, wild, or unknown based on fin wear, fish deformities, and coloration. From that qualitative data, a large portion of rainbow trout (53% in Sabrina and 57% in South Lake) appeared to be of hatchery origin, with 27% to 30% identified as unknown origin, while 14% to 18% appeared to be wild. Information on recruitment is also available in the Length- Frequency histograms (i.e., age-class distribution plots), which suggest some natural reproduction is occurring in both South Lake and Lake Sabrina This comment is addressed in Section 8.5 of Exhibit E of the Draft License Application (DLA).
2	Fish Distribution Study (Reservoirs) – AQ 4	October 4, 2021	CDFW	Brook trout recruitment in Longley reservoir appears to be limited (no young of the year were captured)- was there a reason for this. <u>October 14, 2021, CDFW Updated Comment:</u> Trout are typically stream spawners. Very little spawning occurs in the reservoir. However, at times Brook trout may be able to spawn in the lakes with sufficient groundwater inflow, and it may be the case in Longley.	SCE employed gillnets to collect presence-absence data in Longley Reservoir at the recommendation of CDFW and USFS. Neither the gear nor the study methodology was designed to collect YOY trout. This comment is addressed in Section 8.5 of Exhibit E of the DLA.

Comment Number	Study	Date of Comment	Entity	Comments	SCE Response
				Minnow traps or e-fishing the shoreline may have helped to document YOY presence in Longley. Tiered study using unbaited minnow traps in the stream up steams (not in reservoirs) to capture YOY and document spawn could also have been used. CDFW understands we are past proposing new studies. Recruitment should be expressed as survival to age 1. Recruitment and spawn are two different things.	
3	Fish Distribution Study (Reservoirs) – AQ 4	October 4, 2021	CDFW	Use ArcGIS to make Owens sucker (Catostomus fumeiventris) suitability maps a different reservoir levels and use Project operational knowledge to determine when and how Project operations (e.g., increasing or decreasing reservoir levels) could impact the quality or quantity of Owens sucker habitat. <u>October 14, 2021, CDFW Updated Comment:</u> [2]Owens sucker are a CDFW species of special concern. They are not a nuisance species, and they are not a game species. The Sabrina population is the least genetically diverse population of Owens sucker, but it is still the only native fish in the Project area. CDFW interest	Suitability mapping for sucker habitat in Project Reservoirs is outside the scope of the FERC approved study plan. However, general habitat availability can be assessed from the bathymetry figures included in the Technical Report. The bathymetry figure for Lake Sabrina show areas with low gradients that likely provide suitable spawning habitat extend well beyond the lake margins, especially along the north shore along the northern section of the reservoir, and available habitat is likely to be similar under a range of water surface elevations. A large and robust population of Owens sucker was observed in Lake Sabrina while no Owens sucker were observed in South Lake during this study. In Lake Sabrina, spawning behavior was observed with Owens sucker congregating in large groups along sand and gravel substrate along most of the reservoir shoreline, and redds were observed within the back of coves at the southern end of the

[2] https://wildlife.ca.gov/Conservation/SSC/Fishes and https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=104359&inline.

Comment Number	Study	Date of Comment	Entity	Comments	SCE Response
				for Owens sucker are conservation of the species.	reservoir. Owens sucker spawning typically occurs during the late spring and early summer when reservoir levels are rising. Current and proposed reservoir operations appear to be supporting a healthy population. This comment is addressed in Section 8.5 of Exhibit E of the DLA.

9.0 REFERENCES

Bradford, D. F. 1989. Allotropic distribution of native frogs and introduced fishes in high Sierra Nevada lakes of California: implication of the negative effect of fish introductions. Copeia 1989(3):775-778.

Bradford, D.F., S.D. Cooper, T.M. Jenkins, K. Kratz, O. Samelle, and A.D. Brown. 1998. Influences of natural acidity and introduced fish on faunal assemblages in California alpine lakes. Canadian Journal of Fisheries and Aquatic Sciences 55(11):2478-2491.

California Department of Fish and Wildlife (CDFW). 2019. California Department of Fish and Wildlife provisional fish releases - 2019/2020. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=74004&inline.

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.

Chandler Decree 1922. 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).

EA Engineering. 1987. Eastside Sierra Hydroelectric Relicensing Studies: Impacts of Reservoir Drawdown on Fish Populations. Prepared for Southern California Edison. March 1987.

Finlay, J. C., and V. T. Vredenburg. 2007. Introduced trout sever trophic connections in watersheds: consequences for a declining amphibian. Ecology 88(9):2187-2198.

Knapp, R.A., and K.R. Matthews. 2000. Non-native fish introductions and the decline of the mountain yellow-legged frog from within protected areas. Conservation Biology 14:428-438.

Moyle, P.B. 2002. Inland fishes of California. Revised edition. University of California Press, Berkeley.

Reynolds, J.B. 1996. Electrofishing. In Fisheries Techniques (2nd edition). Murphy, B. R., and D. W. Willis (eds.). American Fisheries Society, Bethesda, MD. pp 221–252.

Ricker, W.E. 1975. Computation and interpretation of biological statistics of fish populations. Fisheries Research Board of Canada. Bulletin 191.

Southern California Edison (SCE). 2021a. Bishop Creek fish distribution (AQ 3), final technical report. Prepared by Stillwater Sciences and Kleinschmidt. Prepared for Southern California Edison.

Southern California Edison (SCE). 2021b. Bishop Creek Wildlife initial study report (TERR 4), final technical report. Prepared by Kleinschmidt for Southern California Edison.

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

APPENDIX A

RESERVOIR SAMPLE SITE CONDITIONS

Table A-1 Reservoir Sample Site Conditions Data, June and September 2020

Reservoir Name	Survey	Site Location Description	Site length (ft)	Site width (ft)	Sample Date	Start Time	End Time	Total Area Fished (ft^2)	Sample time (seconds, except where noted)	Water Depth (at Site)			pH	Dissolved Oxygen		Conductivity		Water Temp. (°C)	Depth of YSI reading (ft):	Weather
										Max.	Avg.	Min.		(mg/l)[1]	(%)	µS/cm[2] (25 °C)	µS/cm[2] (adjusted to °C)			
June Sampling																				
Lake Sabrina	Owens Sucker	East of southern Inlet	700	20	6/4/2020	12:30	13:30	14,000	1,281	8.0	4.0	2.0	7.04	9.94	92.7	14.4	19.1	12.2	3.0	overcast
Lake Sabrina	Owens Sucker	North shore, western end of lake	1,455	15	6/4/2020	15:15	15:45	21,825	913	8.0	4.0	2.0	7.04	9.94	92.7	14.4	19.1	12.2	3.0	overcast, warm breezy
Lake Sabrina	Owens Sucker	Cove just north of main inlet	200	20	6/4/2020	14:50	15:05	4,000	348	10.0	6.0	4.0	7.04	9.94	92.7	14.4	19.1	12.2	3.0	overcast, sprinkling, breezy
Lake Sabrina	Owens Sucker	Cove near marina	400	20	6/4/2020	10:50	11:30	8,000	932	8.5	5.0	2.0	6.84	9.74	88.7	15.0	19.4	12.7	3.0	Clear, p-cloudy, hot
Lake Sabrina	Owens Sucker	Cove near marina	1,000	20	6/8/2020	12:15	12:40	20,000	566	7.0	5.0	3.0								clear, breezy
Lake Sabrina	Owens Sucker	North shore mid reservoir	700	10	6/8/2020	13:20	13:41	7,000	755	10.0	4.0	2.0								clear, breezy
Lake Sabrina	Owens Sucker	Near SW Trib	1,600	10	6/8/2020	14:50	15:24	16,000	1,432	15.0	5.0	1.0								clear, sunny, breezy
Lake Sabrina	Night Efishing	Cove at dam	2,177	15	6/11/2020	20:40	21:10	32,655	1,406	10.0	4.0	2.0		8.61	81.6			12.8	3.0	clear, windy
Lake Sabrina	Night Efishing	Cove near marina	1,821	15	6/11/2020	22:30	23:00	27,315	1,379	10.0	4.0	1.0		8.61	81.6			12.8	3.0	clear, breezy
Lake Sabrina	Night Efishing	Northwest shore	1,698	15	6/11/2020	23:49	0:30	25,470	1,231	12.0	4.0	2.0		8.61	81.6			12.8	3.0	clear, breezy
Lake Sabrina	Night Efishing	Tributaries	1,643	15	6/11/2020	1:20	1:46	24,645	1,002	10.0	5.0	1.0		8.61	81.6			12.8	3.0	clear, cool
Lake Sabrina	Owens Sucker	South shore, western end of lake	1,000	15	6/16/2020	11:00	11:30	15,000	778	15.0	5.0	2.0	6.36	8.18	76.0	19.2	14.5	12.2	2.0	clear, windy
Lake Sabrina	Owens Sucker	North shore, western end of lake	1,500	15	6/16/2020	12:25	13:00	22,500	1,070	15.0	5.0	2.0	6.36	8.18	76.0	19.2	14.5	12.2	2.0	clear, windy
Lake Sabrina	Owens Sucker	Cove at dam	1,000	10	6/16/2020	10:15	10:45	10,000	904	8.0	5.0	2.0	6.91	8.64	78.9	14.1	19.2	11.4	2.0	clear, windy
South Lake	Seine	Inlet 3	140	90	6/3/2020	13:23	14:23	12,600	na	4.0	2.0	0.5	7.67	10.06	89.7	17.7	24.5	10.5	3.0	clear, breezy
South Lake	Seine	Inlet 1	50	30	6/3/2020	11:32	12:23	1,500	na	5.0	3.0	0.0	7.29	10.00	92.7	15.0	21.1	10.1	3.0	clear, light breeze
South Lake	Owens Sucker	Inlet 1 (northern inlet) to Inlet 2	2,000	20	6/9/2020	12:13	13:03	40,000	2,093	8.0	4.0	1.0	5.92	8.66	78.2	17.5	24.0	11.0	3.0	sunny, breezy
South Lake	Owens Sucker	Inlet 2 to inlet 3	1,500	20	6/9/2020	14:00	14:50	30,000	1,125	10.0	4.0	1.0	5.92	8.66	78.2	17.5	24.0	11.0	3.0	cloudy, breezy
South Lake	Owens Sucker	North of Launch Ramp	150	15	6/9/2020	16:00	16:10	2,250	141	10.0	5.0	1.0	5.57	8.60	76.1	18.3	25.8	9.6	3.0	sunny, breezy
South Lake	Night Efishing	South Shore	1,743	15	6/10/2020	2:20	2:45	26,145	1,031	10.0	5.0	1.0								clear, cold, calm
South Lake	Night Efishing	Inlet 2 to Inlet 3	1,634	15	6/10/2020	0:20	0:52	24,510	809	8.0	3.0	1.0								clear, calm
South Lake	Night Efishing	Inlet 1 (northern inlet) to Inlet 2	1,614	20	6/10/2020	22:50	23:37	32,280	1,581	12.0	4.0	2.0								clear, calm
South Lake	Night Efishing	North Shore	1,882	15	6/10/2020	3:10	3:40	28,230	1,259	15.0	5.0	2.0								clear, cold, calm
South Lake	Owens Sucker	Inlet 3	200	20	6/15/2020	12:25	13:00	4,000	1,053	8.0	3.0	1.0	6.78	8.75	77.3	16.0	22.3	10.3	3.0	cloudy
South Lake	Owens Sucker	Inlet 2	750	15	6/15/2020	13:10	13:50	11,250	1,083	10.0	4.0	2.0	6.78	8.75	77.3	16.0	22.3	10.3	3.0	clear, windy

Reservoir Name	Survey	Site Location Description	Site length (ft)	Site width (ft)	Sample Date	Start Time	End Time	Total Area Fished (ft²)	Sample time (seconds, except where noted)	Water Depth (at Site) Max.	Avg.	Min.	pH	Dissolved Oxygen (mg/l)[1]	(%)	Conductivity µS/cm[2] (25 °C)	µS/cm[2] (adjusted to °C)	Water Temp. (°C)	Depth of YSI reading (ft):	Weather
South Lake	Owens Sucker	South Shore	1,000	15	6/15/2020	13:55	14:35	15,000	923	15.0	5.0	2.0	6.09	9.28	84.1	22.5	18.5	10.8	2.0	clear, breezy
September Sampling																				
Lake Sabrina	Night Efishing	NW Shore	1,698	15	9/10/2020	0:00	0:31	25,470	1,125	12.0	5.0	2.0	8.15	6.01	62.3	15.6	13.0	16.4	3.0	clear
Lake Sabrina	Night Efishing	Cove near Marina	1,821	15	09/09/2020	22:21	22:58	27,315	1,424	12.0	4.0	1.5	8.26	5.83	59.9	15.6	13.1	16.4	3.0	clear
Lake Sabrina	Night Efishing	NW Shore to trib	1,643	15	9/10/2020	0:44	1:20	24,645	1,426	15.0	4.0	1.5	8.46	6.07	62.3	15.6	13.1	16.6	3.0	clear
Lake Sabrina	Night Efishing	Cove near Dam	2,177	15	9/9/2020	20:50	21:43	32,655	1,772	14.0	5.0	2.0	8.07	6.21	63.5	15.6	13.1	16.4	3.0	clear
South Lake	Night Efishing	South Shore	1,743	15	9/11/2020	23:40	23:59	26,145	26,145	12.0	6.0	2.0	8.13	6.42	64.4	19.8	16.0	15.5	3.0	clear, cold
South Lake	Night Efishing	Inlet 2 to Inlet 3	1,634	15	9/11/2020	22:15	22:38	24,510	24,510	10.0	5.0	2.0	8.13	6.42	64.4	19.8	16.0	15.5	3.0	clear, cold
South Lake	Night Efishing	Inlet 1 (northern inlet) to Inlet 2	1,614	20	9/11/2020	20:51	21:16	32,280	32,280	10.0	6.0	2.0	8.13	6.42	64.4	19.8	16.0	15.5	3.0	clear, cold
South Lake	Night Efishing	North Shore	1,882	15	9/11/2020	20:00	20:20	28,230	28,230	10.0	6.0	2.0	8.43	6.42	64.4	17.7	14.6	15.8	3.0	clear, cold
Longley Lake	Gill net	Gill net 2, set 2	80	1	9/8/2020	2:00	12:20	80	10 hr 20 min	20.0	8.0	2.0	7.85	6.31	59.8	9.2	7.0	12.8	2.0	clear, smoky, cold
Longley Lake	Gill net	gill net 1, set 2	80	1	9/8/2020	1:15	12:15	80	11 hrs	20.0	8.0	2.0	7.85	6.31	59.8	9.2	7.0	12.8	2.0	clear, smoky, cold
Longley Lake	Gill net	Gill net 2	80	1	9/7/2020	16:00	1:30	80	9.50 hrs	20.0	8.0	2.0	7.85	6.31	59.8	9.2	7.0	12.8	2.0	smoky, windy
Longley Lake	Gill net	Gill net 1	80	1	9/7/2020	15:30	0:30	80	9 hrs	20.0	8.0	2.0	7.85	6.31	59.3	9.2	7.0	12.8	2.0	smoky, windy

[1] milligrams per liter (mg/L)

[2] microsiemens per centimeter (µS/cm)

APPENDIX B

RESERVOIR SAMPLE SITE PHOTOS

Figure B-1 South Lake, shoreline conditions south of inlet 1 (northern inlet), June 3, 2020

Figure B-2 South Lake, shoreline conditions at inlet 1 (northern inlet), June 3, 2020

Figure B-3 South Lake, shoreline conditions at western end of lake, June 3, 2020

Figure B-4 South Lake, shoreline conditions at southern inlet, June 3, 2020

Figure B-5 Lake Sabrina, shoreline conditions at southern inlet, June 4, 2020

Figure B-6 Lake Sabrina, steep shoreline conditions east of southern inlet, June 4, 2020

Figure B-7 Lake Sabrina, general site overview looking west from mid-lake, June 4, 2020

Figure B-8 Lake Sabrina, general site overview looking east from mid-lake, June 8, 2020

Figure B-9 Longley Lake, gill net #1 placement and general site conditions, September 14, 2020

Figure B-10 Longley Lake, gill net #2 placement and general site conditions, September 14, 2020

APPENDIX C

RESERVOIR FISH CAPTURE DATA

Table C-1 South Lake Fish Capture Data, June 2020

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
South Lake	Inlet 3	Seine	Day	brook trout	78	83	4.6	0.97	none	unknown	
South Lake	Inlet 3	Seine	Day	brook trout	79	83	4.7	0.95	none	unknown	
South Lake	Inlet 3	Seine	Day	brook trout	85	94	6.4	1.04	none	unknown	Missing part of tail
South Lake	Inlet 3	Seine	Day	brook trout	88	93	6.6	0.97	none	unknown	
South Lake	Inlet 3	Seine	Day	brook trout	89	93	7.5	1.06	SL-2	unknown	
South Lake	Inlet 3	Seine	Day	brook trout	89	94	7.1	1.01	none	unknown	
South Lake	Inlet 3	Seine	Day	brook trout	90	94	8.2	1.12	none	unknown	
South Lake	Inlet 3	Seine	Day	brook trout	90	95	6.5	0.89	none	unknown	
South Lake	Inlet 3	Seine	Day	brook trout	90	95	6.9	0.95	none	unknown	
South Lake	Inlet 3	Seine	Day	brook trout	90	94	7.4	1.02	none	unknown	
South Lake	Inlet 3	Seine	Day	brook trout	91	96	7.8	1.04	none	unknown	
South Lake	Inlet 3	Seine	Day	brook trout	93	97	8.4	1.04	none	unknown	
South Lake	Inlet 3	Seine	Day	brook trout	94	99	8.4	1.01	none	unknown	
South Lake	Inlet 3	Seine	Day	brook trout	94	100	7.7	0.93	none	unknown	
South Lake	Inlet 3	Seine	Day	brook trout	108	113	11	0.87	none	unknown	
South Lake	Inlet 3	Seine	Day	brook trout	118	125	17.6	1.07	SL-1	unknown	
South Lake	Inlet 3	Seine	Day	brown trout	81	86	5.4	1.02	none	unknown	
South Lake	Inlet 3	Seine	Day	rainbow trout	51	54	1.4	1.06	none	unknown	
South Lake	Inlet 1 to Inlet 2	E-fish	Day	brook trout	85	89	6.8	1.11	none	unknown	
South Lake	Inlet 1 to Inlet 2	E-fish	Day	brook trout	88	93	8.9	1.31	none	unknown	

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
South Lake	Inlet 1 to Inlet 2	E-fish	Day	brook trout	159	167	60	1.49	none	unknown	
South Lake	Inlet 1 to Inlet 2	E-fish	Day	brook trout	172	181	60	1.18	SL2-7	unknown	
South Lake	Inlet 1 to Inlet 2	E-fish	Day	brook trout	184	192	70	1.12	none	unknown	
South Lake	Inlet 1 to Inlet 2	E-fish	Day	brook trout	213	221	110	1.14	none	unknown	
South Lake	Inlet 1 to Inlet 2	E-fish	Day	brook trout	215	224	110	1.11	SL2-9	unknown	Jaw deformed
South Lake	Inlet 1 to Inlet 2	E-fish	Day	brook trout	221	230	120	1.11	SL2-10	unknown	
South Lake	Inlet 1 to Inlet 2	E-fish	Day	brook trout	225	235	80	0.70	SL2-1	unknown	
South Lake	Inlet 1 to Inlet 2	E-fish	Day	brook trout	225	236	70	0.61	SL2-2	unknown	Injured
South Lake	Inlet 1 to Inlet 2	E-fish	Day	brook trout	238	252	160	1.19	SL2-8	unknown	
South Lake	Inlet 1 to Inlet 2	E-fish	Day	brook trout	253	255	140	0.86	SL2-5	unknown	
South Lake	Inlet 1 to Inlet 2	E-fish	Day	brown trout	265	279	110	0.59	SL2-12	unknown	Dead before capture
South Lake	Inlet 1 to Inlet 2	E-fish	Day	brown trout	315	329	340	1.09	SL2-11	unknown	
South Lake	Inlet 1 to Inlet 2	E-fish	Day	rainbow trout	233	247	170	1.34	SL2-6	wild	Ripe male
South Lake	Inlet 1 to Inlet 2	E-fish	Day	rainbow trout	235	250	130	1.00	none	hatchery	Unhealthy
South Lake	Inlet 1 to Inlet 2	E-fish	Day	rainbow trout	313	322	280	0.91	SL2-3	unknown	Mature/ripe male
South Lake	Inlet 1 to Inlet 2	E-fish	Day	rainbow trout	313	320	280	0.91	none	unknown	Ripe female
South Lake	Inlet 1 to Inlet 2	E-fish	Day	rainbow trout	315	322	310	0.99	SL2-4	unknown	Ripe female
South Lake	Inlet 2 to Inlet 3	E-fish	Day	brook trout	93	96	8.6	1.07	none	unknown	
South Lake	Inlet 2 to Inlet 3	E-fish	Day	brook trout	100	104	10.3	1.03	none	unknown	
South Lake	Inlet 2 to Inlet 3	E-fish	Day	brook trout	160	165	40	0.98	none	unknown	
South Lake	Inlet 2 to Inlet 3	E-fish	Day	brook trout	180	189	90	1.54	none	unknown	

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
South Lake	Inlet 2 to Inlet 3	E-fish	Day	brook trout	202	210	120	1.46	none	unknown	
South Lake	Inlet 2 to Inlet 3	E-fish	Day	brook trout	210	221	130	1.40	none	unknown	
South Lake	Inlet 2 to Inlet 3	E-fish	Day	brook trout	211	221	120	1.28	none	unknown	
South Lake	Inlet 2 to Inlet 3	E-fish	Day	brook trout	231	238	130	1.05	none	unknown	
South Lake	Inlet 2 to Inlet 3	E-fish	Day	brook trout	233	243	130	1.03	none	unknown	
South Lake	Inlet 2 to Inlet 3	E-fish	Day	brook trout	234	245	140	1.09	none	unknown	
South Lake	Inlet 2 to Inlet 3	E-fish	Day	brown trout	82	86	5.9	1.07	none	unknown	
South Lake	Inlet 2 to Inlet 3	E-fish	Day	brown trout	330	345	320	0.89	SL2-18	unknown	
South Lake	Inlet 2 to Inlet 3	E-fish	Day	rainbow trout	58	61	2.4	1.23	none	unknown	
South Lake	Inlet 2 to Inlet 3	E-fish	Day	rainbow trout	146	154	50	1.61	none	unknown	Dark w/ parr marks
South Lake	Inlet 2 to Inlet 3	E-fish	Day	rainbow trout	149	156	41.1	1.24	none	wild	Mature male
South Lake	Inlet 2 to Inlet 3	E-fish	Day	rainbow trout	162	171	60	1.41	none	unknown	Parr marks
South Lake	Inlet 2 to Inlet 3	E-fish	Day	rainbow trout	180	194	30	0.51	SL2-17	unknown	Dark color
South Lake	Inlet 2 to Inlet 3	E-fish	Day	rainbow trout	199	215	120	1.52	none	unknown	
South Lake	Inlet 2 to Inlet 3	E-fish	Day	rainbow trout	211	222	100	1.06	none	hatchery	
South Lake	Inlet 2 to Inlet 3	E-fish	Day	rainbow trout	241	256	180	1.29	SL2-14	unknown	Dark color
South Lake	Inlet 2 to Inlet 3	E-fish	Day	rainbow trout	268	284	220	1.14	SL2-15	wild	Mature male & dark
South Lake	Inlet 2 to Inlet 3	E-fish	Day	rainbow trout	275	280	190	0.91	SL2-16	unknown	
South Lake	Inlet 2 to Inlet 3	E-fish	Day	rainbow trout	291	304	100	0.41	none	unknown	
South Lake	Inlet 2 to Inlet 3	E-fish	Day	rainbow trout	314	322	240	0.78	SL2-13	unknown	Male, mature & dark

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
South Lake	Inlet 2 to Inlet 3	E-fish	Day	rainbow trout	315	323	170	0.54	none	unknown	Ripe female, missing pectoral fins
South Lake	Inlet 2 to Inlet 3	E-fish	Day	rainbow trout	325	334	341	0.99	none	unknown	
South Lake	Inlet 2 to Inlet 3	E-fish	Day	rainbow trout	350	380	520	1.21	none	hatchery	All fins worn & operculum partially missing
South Lake	North from launch ramp	E-fish	Day	NO FISH				No Entry	none	unknown	
South Lake	Inlet 2	E-fish	Night	brook trout	219	228	130	1.24	none	unknown	
South Lake	Inlet 2	E-fish	Night	brook trout	225	234	150	1.32	none	unknown	
South Lake	Inlet 2	E-fish	Night	brook trout	241	249	180	1.29	none	unknown	
South Lake	Inlet 2	E-fish	Night	brook trout	250	263	180	1.15	SL3-18	unknown	
South Lake	Inlet 2	E-fish	Night	brook trout	254	261	180	1.10	SL3-11	unknown	
South Lake	Inlet 2	E-fish	Night	brook trout	280	293	190	0.87	SL3-15	unknown	
South Lake	Inlet 2	E-fish	Night	brown trout	238	250	180	1.34	SL3-12	unknown	
South Lake	Inlet 2	E-fish	Night	brown trout	265	279	220	1.18	none	unknown	
South Lake	Inlet 2	E-fish	Night	brown trout	266	280	210	1.12	none	unknown	
South Lake	Inlet 2	E-fish	Night	brown trout	269	275	190	0.98	none	hatchery	
South Lake	Inlet 2	E-fish	Night	brown trout	278	287	260	1.21	none	unknown	
South Lake	Inlet 2	E-fish	Night	brown trout	291	305	320	1.30	none	unknown	
South Lake	Inlet 2	E-fish	Night	brown trout	309	321	240	0.81	SL3-19	unknown	Skinny
South Lake	Inlet 2	E-fish	Night	rainbow trout	125	134	40	2.05	SL3-21	wild	

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
South Lake	Inlet 2	E-fish	Night	rainbow trout	159	167	70	1.74	SL3-20	wild	
South Lake	Inlet 2	E-fish	Night	rainbow trout	240	240	140	1.01	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	245	256	140	0.95	none	hatchery	Skinny
South Lake	Inlet 2	E-fish	Night	rainbow trout	247	261	220	1.46	SL3-17	wild	
South Lake	Inlet 2	E-fish	Night	rainbow trout	250	263	180	1.15	SL3-13	wild	Dark male, ripe
South Lake	Inlet 2	E-fish	Night	rainbow trout	275	285	220	1.06	SL3-16	wild	
South Lake	Inlet 2	E-fish	Night	rainbow trout	280	295	290	1.32	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	280	296	250	1.14	SL3-14	wild	Male
South Lake	Inlet 2	E-fish	Night	rainbow trout	280	300	260	1.18	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	285	305	290	1.25	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	287	295	280	1.18	none	unknown	
South Lake	Inlet 2	E-fish	Night	rainbow trout	290	300	280	1.15	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	291	297	270	1.10	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	295	311	320	1.25	SL3-10	unknown	
South Lake	Inlet 2	E-fish	Night	rainbow trout	295	305	310	1.21	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	300	320	370	1.37	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	301	315	240	0.88	none	unknown	
South Lake	Inlet 2	E-fish	Night	rainbow trout	302	311	280	1.02	none	unknown	
South Lake	Inlet 2	E-fish	Night	rainbow trout	303	319	350	1.26	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	303	321	360	1.29	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	305	310	320	1.13	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	307	315	290	1.00	none	hatchery	

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
South Lake	Inlet 2	E-fish	Night	rainbow trout	309	317	300	1.02	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	310	320	330	1.11	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	310	321	370	1.24	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	311	315	350	1.16	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	316	331	330	1.05	none	unknown	
South Lake	Inlet 2	E-fish	Night	rainbow trout	318	331	320	1.00	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	320	331	380	1.16	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	325	332	380	1.11	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	325	331	360	1.05	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	328	351	350	0.99	none	wild	
South Lake	Inlet 2	E-fish	Night	rainbow trout	335	345	470	1.25	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	335	345	380	1.01	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	340	358	470	1.20	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	344	351	470	1.15	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	345	355	460	1.12	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	347	355	460	1.10	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	360	366	510	1.09	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	365	390	550	1.13	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	365	380	550	1.13	none	hatchery	
South Lake	Inlet 2	E-fish	Night	rainbow trout	110	119	30	2.25	SL3-22	unknown	
South Lake	South Shore	E-fish	Night	brook trout	125	132	20	1.02	SL3-25	wild	
South Lake	South Shore	E-fish	Night	brown trout	285	296	220	0.95	none	unknown	

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
South Lake	South Shore	E-fish	Night	rainbow trout	139	148	45	1.68	SL3-23	wild	
South Lake	South Shore	E-fish	Night	rainbow trout	187	198	90	1.38	SL3-26	unknown	
South Lake	South Shore	E-fish	Night	rainbow trout	235	250	140	1.08	SL3-24	wild	
South Lake	South Shore	E-fish	Night	rainbow trout	280	293	270	1.23	none	hatchery	
South Lake	South Shore	E-fish	Night	rainbow trout	295	315	290	1.13	none	wild	Pretty fish
South Lake	South Shore	E-fish	Night	rainbow trout	323	338	410	1.22	none	unknown	
South Lake	South Shore	E-fish	Night	rainbow trout	355	375	440	0.98	none	hatchery	
South Lake	South Shore	E-fish	Night	rainbow trout	360	370	540	1.16	none	hatchery	
South Lake	North shore	E-fish	Night	brook trout	117	122	20	1.25	SL3-32	unknown	
South Lake	North shore	E-fish	Night	brook trout	188	195	80	1.20	SL3-31	unknown	
South Lake	North shore	E-fish	Night	brook trout	239	252	140	1.03	none	unknown	
South Lake	North shore	E-fish	Night	brown trout	250	263	210	1.34	none	unknown	
South Lake	North shore	E-fish	Night	brown trout	250	265	220	1.41	none	unknown	
South Lake	North shore	E-fish	Night	rainbow trout	162	173	70	1.65	none	unknown	
South Lake	North shore	E-fish	Night	rainbow trout	182	195	80	1.33	none	unknown	
South Lake	North shore	E-fish	Night	rainbow trout	290	305	280	1.15	none	unknown	
South Lake	North shore	E-fish	Night	rainbow trout	300	312	220	0.81	none	Hatchery	
South Lake	North shore	E-fish	Night	brook trout	199	210	120	1.52	SL3-30	unknown	
South Lake	North shore	E-fish	Night	brook trout	214	221	110	1.12	none	unknown	
South Lake	North shore	E-fish	Night	brook trout	230	245	130	1.07	none	unknown	
South Lake	North shore	E-fish	Night	brown trout	264	275	180	0.98	none	unknown	
South Lake	North shore	E-fish	Night	brown trout	270	284	220	1.12	none	unknown	

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
South Lake	North shore	E-fish	Night	rainbow trout	141	150	40	1.43	none	wild	
South Lake	North shore	E-fish	Night	rainbow trout	177	191	80	1.44	none	wild	
South Lake	North shore	E-fish	Night	rainbow trout	182	195	70	1.16	SL3-28	unknown	
South Lake	North shore	E-fish	Night	rainbow trout	207	225	100	1.13	SL3-27	unknown	
South Lake	North shore	E-fish	Night	rainbow trout	220	238	140	1.31	none	hatchery	Tapered body, deformed
South Lake	North shore	E-fish	Night	rainbow trout	240	265	170	1.23	none	hatchery	
South Lake	North shore	E-fish	Night	rainbow trout	268	275	200	1.04	none	hatchery	
South Lake	North shore	E-fish	Night	rainbow trout	280	300	250	1.14	none	hatchery	
South Lake	North shore	E-fish	Night	rainbow trout	280	291	220	1.00	none	hatchery	
South Lake	North shore	E-fish	Night	rainbow trout	288	300	160	0.67	none	unknown	Skinny, likely hatchery
South Lake	North shore	E-fish	Night	rainbow trout	290	298	240	0.98	none	hatchery	
South Lake	North shore	E-fish	Night	rainbow trout	292	307	270	1.08	none	hatchery	
South Lake	North shore	E-fish	Night	rainbow trout	295	319	290	1.13	none	unknown	
South Lake	North shore	E-fish	Night	rainbow trout	300	300	290	1.07	none	hatchery	
South Lake	North shore	E-fish	Night	rainbow trout	300	310	280	1.04	none	unknown	
South Lake	North shore	E-fish	Night	rainbow trout	310	325	320	1.07	none	hatchery	
South Lake	North shore	E-fish	Night	rainbow trout	312	320	285	0.94	none	hatchery	
South Lake	North shore	E-fish	Night	rainbow trout	324	335	330	0.97	none	hatchery	Female, mature
South Lake	North shore	E-fish	Night	rainbow trout	325	340	340	0.99	none	hatchery	
South Lake	North shore	E-fish	Night	rainbow trout	357	375	450	0.99	SL3-29	wild	
South Lake	Inlet 1	E-fish	Night	brook trout	163	171	70	1.62	none	unknown	

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
South Lake	Inlet 1	E-fish	Night	brook trout	216	229	130	1.29	none	unknown	
South Lake	Inlet 1	E-fish	Night	brown trout	261	275	220	1.24	SL3-4	unknown	
South Lake	Inlet 1	E-fish	Night	brown trout	262	277	220	1.22	SL3-5	unknown	
South Lake	Inlet 1	E-fish	Night	brown trout	269	281	220	1.13	SL3-6	unknown	
South Lake	Inlet 1	E-fish	Night	brown trout	287	299	220	0.93	SL3-3	unknown	
South Lake	Inlet 1	E-fish	Night	brown trout	288	301	240	1.00	none	unknown	
South Lake	Inlet 1	E-fish	Night	brown trout	318	335	320	1.00	SL3-8	unknown	
South Lake	Inlet 1	E-fish	Night	rainbow trout	139	146	50	1.86	SL3-9	unknown	
South Lake	Inlet 1	E-fish	Night	rainbow trout	181	191	80	1.35	SL3-7	unknown	
South Lake	Inlet 1	E-fish	Night	rainbow trout	240	253	110	0.80	none	hatchery	Skinny
South Lake	Inlet 1	E-fish	Night	rainbow trout	245	262	150	1.02	none	hatchery	Unhealthy (thin)
South Lake	Inlet 1	E-fish	Night	rainbow trout	249	260	150	0.97	none	hatchery	
South Lake	Inlet 1	E-fish	Night	rainbow trout	259	270	190	1.09	none	wild	Male, ripe
South Lake	Inlet 1	E-fish	Night	rainbow trout	280	294	150	0.68	none	hatchery	Fishing line w/ weight hanging from mouth
South Lake	Inlet 1	E-fish	Night	rainbow trout	294	300	230	0.91	none	unknown	
South Lake	Inlet 1	E-fish	Night	rainbow trout	306	321	230	0.80	none	unknown	
South Lake	Inlet 1	E-fish	Night	rainbow trout	308	315	320	1.10	none	hatchery	Female expelling eggs
South Lake	Inlet 1	E-fish	Night	rainbow trout	310	319	260	0.87	SL3-2	wild	
South Lake	Inlet 1	E-fish	Night	rainbow trout	321	347	330	1.00	none	hatchery	

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
South Lake	Inlet 1	E-fish	Night	rainbow trout	322	329	330	0.99	none	hatchery	
South Lake	Inlet 1	E-fish	Night	rainbow trout	325	340	350	1.02	none	hatchery	
South Lake	Inlet 1	E-fish	Night	rainbow trout	331	345	260	0.72	SL3-1	unknown	Silver color, but no worn fins
South Lake	Inlet 1	E-fish	Night	rainbow trout	331	348	400	1.10	none	hatchery	
South Lake	Inlet 1	E-fish	Night	rainbow trout	345	363	380	0.93	none	hatchery	Worn pectoral fins
South Lake	Inlet 1	E-fish	Night	rainbow trout	353	358	470	1.07	none	hatchery	
South Lake	Inlet 1	E-fish	Night	rainbow trout	358	372	440	0.96	none	hatchery	
South Lake	Inlet 1	E-fish	Night	rainbow trout	365	370	500	1.03	none	hatchery	
South Lake	Inlet 3	E-fish	Day	brook trout	95	101	11.5	1.34	SL-1	unknown	
South Lake	Inlet 3	E-fish	Day	brook trout	236	245	140	1.07	none	unknown	
South Lake	Inlet 3	E-fish	Day	brook trout	244	254	160	1.10	none	unknown	
South Lake	Inlet 3	E-fish	Day	brown trout	282	296	220	0.98	none	unknown	
South Lake	Inlet 3	E-fish	Day	rainbow trout	62	65	3	1.26	none	wild	
South Lake	Inlet 3	E-fish	Day	rainbow trout	271	290	210	1.06	none	hatchery	
South Lake	Inlet 3	E-fish	Day	rainbow trout	329	351	370	1.04	none	wild	
South Lake	Inlet 3	E-fish	Day	rainbow trout	349	365	460	1.08	none	hatchery	
South Lake	Inlet 2	E-fish	Day	brook trout	154	162	41.7	1.14	SL-2	unknown	
South Lake	Inlet 2	E-fish	Day	rainbow trout	331	338	360	0.99	none	unknown	Ripe female
South Lake	South Shore	E-fish	Day	brown trout	68	71	2.8	0.89	none	unknown	
South Lake	South Shore	E-fish	Day	brown trout	324	334	380	1.12	SL-3	unknown	
South Lake	South Shore	E-fish	Day	rainbow trout	72	75	3.5	0.94	none	unknown	

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
South Lake	South Shore	E-fish	Day	rainbow trout	153	157	35	0.98	none	unknown	Mort
South Lake	South Shore	E-fish	Day	rainbow trout	228	241	120	1.01	none	unknown	Mature male
South Lake	South Shore	E-fish	Day	rainbow trout	231	247	150	1.22	none	unknown	
South Lake	South Shore	E-fish	Day	rainbow trout	280	287	190	0.87	none	unknown	
South Lake	South Shore	E-fish	Day	rainbow trout	288	300	290	1.21	none	unknown	Mature male
South Lake	South Shore	E-fish	Day	rainbow trout	437	446	700	0.84	SL-4	unknown	

[1] Fish condition factor

Table C-2 Lake Sabrina Fish Capture Data, June 2020

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	Cove near marina	E-fish	Day	Owens sucker	249	266	130.0	0.84	SAB-2	unknown	
Lake Sabrina	Cove near marina	E-fish	Day	Owens sucker	260	275	165.0	0.94	SAB-1	unknown	
Lake Sabrina	Cove near marina	E-fish	Day	Owens sucker	265	281	180.0	0.97	SAB-3	unknown	
Lake Sabrina	Cove near marina	E-fish	Day	rainbow trout	300	319	220.0	0.81	SAB-4	unknown	
Lake Sabrina	East of southern inlet	E-fish	Day	Owens sucker	115	121	20.9	1.37	SAB-9	unknown	
Lake Sabrina	East of southern inlet	E-fish	Day	Owens sucker	127	135	20.1	0.98	SAB-12	unknown	
Lake Sabrina	East of southern inlet	E-fish	Day	Owens sucker	160	170	56.4	1.38	SAB-8	unknown	
Lake Sabrina	East of southern inlet	E-fish	Day	Owens sucker	218	230	70.0	0.68	none	unknown	
Lake Sabrina	East of southern inlet	E-fish	Day	Owens sucker	245	260	150.0	1.02	none	wild	
Lake Sabrina	East of southern inlet	E-fish	Day	Owens sucker	261	282	160.0	0.90	SAB-6	unknown	
Lake Sabrina	East of southern inlet	E-fish	Day	Owens sucker	263	284	290.0	1.59	SAB-10	unknown	
Lake Sabrina	East of southern inlet	E-fish	Day	Owens sucker	268	287	180.0	0.94	none	unknown	
Lake Sabrina	East of southern inlet	E-fish	Day	Owens sucker	288	305	260.0	1.09	none	unknown	
Lake Sabrina	East of southern inlet	E-fish	Day	Owens sucker	305	325	340.0	1.20	SAB-5	unknown	

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	East of southern inlet	E-fish	Day	Owens sucker	318	335	390.0	1.21	SAB-7	unknown	
Lake Sabrina	East of southern inlet	E-fish	Day	rainbow trout	201	212	106.7	1.31	SAB-14	wild	Mature male (milted)
Lake Sabrina	East of southern inlet	E-fish	Day	rainbow trout	250	265	210.0	1.34	SAB-15	wild	
Lake Sabrina	East of southern inlet	E-fish	Day	rainbow trout	261	272	200.0	1.12	SAB-13	wild	Photos
Lake Sabrina	East of southern inlet	E-fish	Day	rainbow trout	298	314	200.0	0.76	SAB-11	hatchery	Stub nose, mort found floating before capture
Lake Sabrina	East of southern inlet	E-fish	Day	rainbow trout	314	320	320.0	1.03	none	unknown	Missing eyeball
Lake Sabrina	Cove just north of main inlet	E-fish	Day	none				na	none	unknown	
Lake Sabrina	North Shore, western end of lake	E-fish	Day	brook trout	103	107	10.8	0.99	none	unknown	
Lake Sabrina	North Shore, western end of lake	E-fish	Day	brook trout	104	109	9.1	0.81	none	unknown	
Lake Sabrina	North Shore, western end of lake	E-fish	Day	Owens sucker	124	133	27.3	1.43	none	unknown	
Lake Sabrina	North Shore, western end of lake	E-fish	Day	Owens sucker	146	155	42.4	1.36	none	unknown	
Lake Sabrina	North Shore, western end of lake	E-fish	Day	Owens sucker	224	237	90.0	0.80	none	unknown	

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	North Shore, western end of lake	E-fish	Day	Owens sucker	266	285	180.0	0.96	none	unknown	
Lake Sabrina	Cove near marina	E-fish	Day	Owens sucker	255	271	No entry	na	none	Unknown	Male
Lake Sabrina	Cove near marina	E-fish	Day	Owens sucker	341	367	450.0	1.13	SAB2-1	unknown	Female, expelling eggs
Lake Sabrina	North shore mid reservoir	E-fish	Day	brook trout	176	185	100.0	1.83	none	wild	
Lake Sabrina	North shore mid reservoir	E-fish	Day	brook trout	205	215	120.0	1.39	none	wild	
Lake Sabrina	North shore mid reservoir	E-fish	Day	brook trout	230	236	150.0	1.23	none	wild	
Lake Sabrina	North shore mid reservoir	E-fish	Day	brook trout	239	248	160.0	1.17	SAB2-5	wild	
Lake Sabrina	North shore mid reservoir	E-fish	Day	Owens sucker	160	170	30.0	0.73	none	unknown	Female
Lake Sabrina	North shore mid reservoir	E-fish	Day	Owens sucker	210	225	70.0	0.76	SAB2-4	unknown	Female w/ eggs, narrow fin w/o tubercles
Lake Sabrina	North shore mid reservoir	E-fish	Day	Owens sucker	223	236	120.0	1.08	none	unknown	Narrow anal fin w/o tubercle. Female
Lake Sabrina	North shore mid reservoir	E-fish	Day	Owens sucker	234	249	150.0	1.17	none	unknown	Female
Lake Sabrina	North shore mid reservoir	E-fish	Day	Owens sucker	245	261	190.0	1.29	none	unknown	Male
Lake Sabrina	North shore mid reservoir	E-fish	Day	Owens sucker	265	285	220.0	1.18	none	unknown	Male
Lake Sabrina	North shore mid reservoir	E-fish	Day	Owens sucker	299	316	290.0	1.08	SAB2-2	unknown	Female

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	North shore mid reservoir	E-fish	Day	Owens sucker	300	319	210.0	0.78	SAB2-3	unknown	Male, wide anal fin w/ tubercles
Lake Sabrina	North shore mid reservoir	E-fish	Day	rainbow trout	150	157	70.0	2.07	none	wild	
Lake Sabrina	North shore mid reservoir	E-fish	Day	rainbow trout	265	275	210.0	1.13	none	hatchery	
Lake Sabrina	Near SW trib	E-fish	Day	brook trout	82	86	6.1	1.11	none	unknown	
Lake Sabrina	Near SW trib	E-fish	Day	brook trout	112	117	12.6	0.90	none	unknown	
Lake Sabrina	Near SW trib	E-fish	Day	brook trout	187	196	73.3	1.12	SAB2-9	unknown	
Lake Sabrina	Near SW trib	E-fish	Day	brook trout	214	227	110.0	1.12	SAB2-10	unknown	
Lake Sabrina	Near SW trib	E-fish	Day	Owens sucker	250	268	190.0	1.22	none	unknown	Male
Lake Sabrina	Near SW trib	E-fish	Day	rainbow trout	44	46	1.0	1.17	none	unknown	
Lake Sabrina	Near SW trib	E-fish	Day	rainbow trout	68	72	2.4	0.76	none	unknown	
Lake Sabrina	Near SW trib	E-fish	Day	rainbow trout	228	240	140.0	1.18	none	unknown	
Lake Sabrina	Near SW trib	E-fish	Day	rainbow trout	260	274	170.0	0.97	none	hatchery	Really thin
Lake Sabrina	Near SW trib	E-fish	Day	rainbow trout	260	275	200.0	1.14	SAB2-7	wild	Mature male
Lake Sabrina	Near SW trib	E-fish	Day	rainbow trout	267	280	220.0	1.16	SAB2-6	wild	
Lake Sabrina	Near SW trib	E-fish	Day	rainbow trout	276	288	210.0	1.00	none	hatchery	Thin
Lake Sabrina	Near SW trib	E-fish	Day	rainbow trout	282	293	240.0	1.07	none	hatchery	Fungus on anal fin
Lake Sabrina	Near SW trib	E-fish	Day	rainbow trout	288	299	250.0	1.05	none	hatchery	Worn pec fins
Lake Sabrina	Near SW trib	E-fish	Day	rainbow trout	310	319	290.0	0.97	none	hatchery	
Lake Sabrina	Near SW trib	E-fish	Day	rainbow trout	311	320	295.0	0.98	none	unknown	
Lake Sabrina	Near SW trib	E-fish	Day	rainbow trout	313	328	330.0	1.08	none	unknown	Bright silvery/healthy

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	Near SW trib	E-fish	Day	rainbow trout	350	370	450.0	1.05	SAB2-8	unknown	Silvery/healthy
Lake Sabrina	Near SW trib	E-fish	Day	rainbow trout	380	393	630.0	1.15	none	hatchery	
Lake Sabrina	Tributaries	E-fish	Night	brook trout	195	204	115.0	1.55	SAB3-28	unknown	
Lake Sabrina	Tributaries	E-fish	Night	Owens sucker	114	121	20.0	1.35	none	unknown	
Lake Sabrina	Tributaries	E-fish	Night	Owens sucker	155	165	60.0	1.61	SAB3-27	unknown	Female
Lake Sabrina	Tributaries	E-fish	Night	Owens sucker	200	212	120.0	1.50	none	unknown	Male
Lake Sabrina	Tributaries	E-fish	Night	Owens sucker	245	264	260.0	1.77	none	unknown	Female
Lake Sabrina	Tributaries	E-fish	Night	Owens sucker	263	279	250.0	1.37	none	unknown	Female
Lake Sabrina	Tributaries	E-fish	Night	Owens sucker	295	313	380.0	1.48	none	unknown	Female
Lake Sabrina	Tributaries	E-fish	Night	Owens sucker	296	313	370.0	1.43	none	unknown	Female
Lake Sabrina	Tributaries	E-fish	Night	Owens sucker	300	319	340.0	1.26	none	unknown	Female
Lake Sabrina	Tributaries	E-fish	Night	Owens sucker	310	329	410.0	1.38	none	unknown	Female
Lake Sabrina	Tributaries	E-fish	Night	Owens sucker	329	346	515.0	1.45	none	unknown	Female
Lake Sabrina	Tributaries	E-fish	Night	Owens sucker	360	385	550.0	1.18	SAB3-26	unknown	Female
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	289	302	300.0	1.24	none	unknown	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	290	305	220.0	0.90	none	hatchery	Skinny/unhealthy
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	292	306	290.0	1.16	none	unknown	

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	310	316	320.0	1.07	none	hatchery	Missing operculum and fins
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	316	325	340.0	1.08	none	hatchery	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	320	325	300.0	0.92	none	hatchery	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	320	335	330.0	1.01	none	hatchery	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	321	326	390.0	1.18	none	hatchery	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	321	335	340.0	1.03	none	hatchery	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	325	335	340.0	0.99	none	hatchery	No fins
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	327	335	360.0	1.03	none	hatchery	Mature, female
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	329	341	390.0	1.10	none	hatchery	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	355	369	410.0	0.92	none	hatchery	
Lake Sabrina	Tributaries	E-fish	Night	brook trout	77	81	6.2	1.36	none	unknown	
Lake Sabrina	Tributaries	E-fish	Night	brook trout	206	216	120.0	1.37	none	unknown	
Lake Sabrina	Tributaries	E-fish	Night	brook trout	226	237	150.0	1.30	none	unknown	
Lake Sabrina	Tributaries	E-fish	Night	Owens sucker	115	122	40.0	2.63	none	unknown	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	135	143	40.0	1.63	SAB3-30	wild	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	215	231	150.0	1.51	SAB3-29	wild	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	216	220	140.0	1.39	none	wild	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	242	255	225.0	1.59	none	wild	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	256	267	190.0	1.13	none	wild	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	282	296	295.0	1.32	none	wild	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	285	302	220.0	0.95	none	hatchery	Old tapered body/ unhealthy
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	289	304	240.0	0.99	none	unknown	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	291	305	300.0	1.22	none	wild	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	295	314	280.0	1.09	none	wild	

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	305	325	290.0	1.02	none	unknown	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	315	324	370.0	1.18	none	hatchery	
Lake Sabrina	Tributaries	E-fish	Night	rainbow trout	357	367	430.0	0.95	none	hatchery	
Lake Sabrina	Cove at dam	E-fish	Night	brook trout	130	139	26.3	1.20	SAB3-2	unknown	
Lake Sabrina	Cove at dam	E-fish	Night	brook trout	195	202	100.0	1.35	SAB3-13	unknown	
Lake Sabrina	Cove at dam	E-fish	Night	brook trout	197	207	90.1	1.18	SAB3-14	unknown	
Lake Sabrina	Cove at dam	E-fish	Night	brook trout	215	223	110.0	1.11	SAB3-12	unknown	
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	230	244	200.0	1.64	none	unknown	Male
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	233	245	160.0	1.26	SAB3-7	unknown	Male
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	240	255	200.0	1.45	SAB3-9	unknown	Male
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	246	260	210.0	1.41	SAB3-10	unknown	Male
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	248	262	220.0	1.44	SAB3-11	unknown	Male
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	254	270	230.0	1.40	none	unknown	Male
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	255	270	220.0	1.33	none	unknown	Male
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	255	270	230.0	1.39	none	unknown	Male
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	265	278	250.0	1.34	none	unknown	Male
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	265	280	240.0	1.29	none	unknown	Male

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	265	285	260.0	1.40	none	unknown	Male
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	270	290	290.0	1.47	none	unknown	Male
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	270	285	260.0	1.32	none	unknown	Male
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	270	283	280.0	1.42	none	unknown	Male
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	272	290	310.0	1.54	none	unknown	Female
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	275	290	290.0	1.39	none	unknown	Female
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	277	295	300.0	1.41	none	unknown	Female
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	278	290	330.0	1.54	none	unknown	Male
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	280	292	250.0	1.14	none	unknown	Male
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	288	304	310.0	1.30	none	unknown	Male
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	295	310	350.0	1.36	none	unknown	Female
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	304	320	420.0	1.49	none	unknown	Female, fat
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	305	320	320.0	1.13	none	unknown	Female
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	310	327	410.0	1.38	none	unknown	
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	315	332	440.0	1.41	SAB3-1	unknown	
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	315	332	420.0	1.34	none	unknown	Female

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	320	340	520.0	1.59	none	unknown	Female
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	340	355	520.0	1.32	none	unknown	Male
Lake Sabrina	Cove at dam	E-fish	Night	Owens sucker	350	370	580.0	1.35	SAB3-8	unknown	Female
Lake Sabrina	Cove at dam	E-fish	Night	rainbow trout	240	255	130.0	0.94	SAB3-3	unknown	
Lake Sabrina	Cove at dam	E-fish	Night	rainbow trout	263	272	160.0	0.88	none	hatchery	
Lake Sabrina	Cove at dam	E-fish	Night	rainbow trout	277	290	180.0	0.85	none	hatchery	
Lake Sabrina	Cove at dam	E-fish	Night	rainbow trout	280	291	250.0	1.14	SAB3-6	unknown	Mort, ripe female
Lake Sabrina	Cove at dam	E-fish	Night	rainbow trout	290	303	260.0	1.07	none	hatchery	
Lake Sabrina	Cove at dam	E-fish	Night	rainbow trout	290	300	300.0	1.23	none	hatchery	
Lake Sabrina	Cove at dam	E-fish	Night	rainbow trout	305	315	290.0	1.02	SAB3-5	unknown	
Lake Sabrina	Cove at dam	E-fish	Night	rainbow trout	307	315	280.0	0.97	none	hatchery	
Lake Sabrina	Cove at dam	E-fish	Night	rainbow trout	330	340	350.0	0.97	SAB3-4	unknown	
Lake Sabrina	Cove at dam	E-fish	Night	rainbow trout	335	350	400.0	1.06	none	hatchery	No dorsal fin
Lake Sabrina	Cove near marina	E-fish	Night	brook trout	215	224	120.0	1.21	SAB3-18	unknown	
Lake Sabrina	Cove near marina	E-fish	Night	brook trout	224	237	140.0	1.25	SAB3-17	unknown	
Lake Sabrina	Cove near marina	E-fish	Night	Owens sucker	115	121	22.0	1.45	SAB3-20	unknown	
Lake Sabrina	Cove near marina	E-fish	Night	Owens sucker	127	134	32.3	1.58	SAB3-19	unknown	
Lake Sabrina	Cove near marina	E-fish	Night	Owens sucker	216	231	140.0	1.39	none	unknown	
Lake Sabrina	Cove near marina	E-fish	Night	Owens sucker	245	260	210.0	1.43	none	unknown	Male

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	Cove near marina	E-fish	Night	Owens sucker	245	262	210.0	1.43	none	unknown	Male
Lake Sabrina	Cove near marina	E-fish	Night	Owens sucker	249	267	210.0	1.36	none	unknown	Male
Lake Sabrina	Cove near marina	E-fish	Night	Owens sucker	255	271	240.0	1.45	none	unknown	Male
Lake Sabrina	Cove near marina	E-fish	Night	Owens sucker	263	280	240.0	1.32	none	unknown	Male
Lake Sabrina	Cove near marina	E-fish	Night	Owens sucker	267	282	260.0	1.37	none	unknown	Male
Lake Sabrina	Cove near marina	E-fish	Night	Owens sucker	273	290	260.0	1.28	none	unknown	Male
Lake Sabrina	Cove near marina	E-fish	Night	Owens sucker	275	295	300.0	1.44	none	unknown	Female
Lake Sabrina	Cove near marina	E-fish	Night	Owens sucker	291	312	300.0	1.22	none	unknown	Male
Lake Sabrina	Cove near marina	E-fish	Night	Owens sucker	295	314	350.0	1.36	none	unknown	Male
Lake Sabrina	Cove near marina	E-fish	Night	Owens sucker	298	318	300.0	1.13	none	unknown	Male
Lake Sabrina	Cove near marina	E-fish	Night	Owens sucker	308	327	360.0	1.23	none	unknown	Female
Lake Sabrina	Cove near marina	E-fish	Night	rainbow trout	248	255	160.0	1.05	SAB3-16	unknown	
Lake Sabrina	Cove near marina	E-fish	Night	rainbow trout	265	273	160.0	0.86	none	unknown	
Lake Sabrina	Cove near marina	E-fish	Night	rainbow trout	268	277	230.0	1.19	none	unknown	Ripe female
Lake Sabrina	Cove near marina	E-fish	Night	rainbow trout	330	341	500.0	1.39	SAB3-15	unknown	
Lake Sabrina	Northwest shore	E-fish	Night	brook trout	190	203	90.0	1.31	SAB3-23	unknown	

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	Northwest shore	E-fish	Night	brook trout	216	223	140.0	1.39	none	unknown	
Lake Sabrina	Northwest shore	E-fish	Night	brook trout	222	222	130.0	1.19	none	unknown	
Lake Sabrina	Northwest shore	E-fish	Night	Owens sucker	120	124	25.0	1.45	SAB3-25	unknown	
Lake Sabrina	Northwest shore	E-fish	Night	Owens sucker	160	172	70.0	1.71	SAB3-24	unknown	Male
Lake Sabrina	Northwest shore	E-fish	Night	brown trout	648	648		No Entry	SAB3-21	wild	Brown trout too large to weigh
Lake Sabrina	Northwest shore	E-fish	Night	Owens sucker	211	221	140.0	1.49	none	unknown	
Lake Sabrina	Northwest shore	E-fish	Night	Owens sucker	228	245	190.0	1.60	none	unknown	Male
Lake Sabrina	Northwest shore	E-fish	Night	Owens sucker	240	255	250.0	1.81	none	unknown	Female
Lake Sabrina	Northwest shore	E-fish	Night	Owens sucker	241	256	200.0	1.43	none	unknown	Male
Lake Sabrina	Northwest shore	E-fish	Night	Owens sucker	249	263	200.0	1.30	none	unknown	Male
Lake Sabrina	Northwest shore	E-fish	Night	Owens sucker	250	265	230.0	1.47	none	unknown	Female
Lake Sabrina	Northwest shore	E-fish	Night	Owens sucker	260	279	260.0	1.48	none	unknown	Male
Lake Sabrina	Northwest shore	E-fish	Night	Owens sucker	268	285	270.0	1.40	none	unknown	Male
Lake Sabrina	Northwest shore	E-fish	Night	Owens sucker	288	308	345.0	1.44	none	unknown	
Lake Sabrina	Northwest shore	E-fish	Night	Owens sucker	289	306	350.0	1.45	none	unknown	Female
Lake Sabrina	Northwest shore	E-fish	Night	Owens sucker	306	323	420.0	1.47	none	unknown	

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	Northwest shore	E-fish	Night	Owens sucker	315	333	440.0	1.41	none	unknown	Female
Lake Sabrina	Northwest shore	E-fish	Night	Owens sucker	345	370	670.0	1.63	none	unknown	Female
Lake Sabrina	Northwest shore	E-fish	Night	rainbow trout	186	202	110.0	1.71	none	unknown	
Lake Sabrina	Northwest shore	E-fish	Night	rainbow trout	201	216	115.0	1.42	SAB3-22	unknown	
Lake Sabrina	Northwest shore	E-fish	Night	rainbow trout	206	222	130.0	1.49	none	unknown	
Lake Sabrina	Northwest shore	E-fish	Night	rainbow trout	253	271	200.0	1.24	none	unknown	
Lake Sabrina	Northwest shore	E-fish	Night	rainbow trout	263	276	290.0	1.59	none	hatchery	
Lake Sabrina	Northwest shore	E-fish	Night	rainbow trout	275	288	170.0	0.82	none	hatchery	Unhealthy/skinny
Lake Sabrina	Northwest shore	E-fish	Night	rainbow trout	281	291	270.0	1.22	none	hatchery	
Lake Sabrina	Northwest shore	E-fish	Night	rainbow trout	291	314	300.0	1.22	none	unknown	
Lake Sabrina	Northwest shore	E-fish	Night	rainbow trout	299	310	210.0	0.79	none	hatchery	Missing eye
Lake Sabrina	Northwest shore	E-fish	Night	rainbow trout	312	327	260.0	0.86	none	hatchery	Unhealthy/skinny
Lake Sabrina	Northwest shore	E-fish	Night	rainbow trout	313	320	240.0	0.78	none	hatchery	
Lake Sabrina	Northwest shore	E-fish	Night	rainbow trout	329	350	400.0	1.12	none	unknown	
Lake Sabrina	Northwest shore	E-fish	Night	rainbow trout	341	360	470.0	1.19	none	hatchery	
Lake Sabrina	Cove at dam	E-fish	Day	Owens sucker	274	292	260.0	1.26	none	unknown	

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	South shore, western end of lake	E-fish	Day	brook trout	133	137	19.8	0.84	SB4-2	unknown	
Lake Sabrina	South shore, western end of lake	E-fish	Day	brook trout	167	178	52.0	1.12	none	unknown	
Lake Sabrina	South shore, western end of lake	E-fish	Day	brook trout	204	211	70.0	0.82	none	unknown	
Lake Sabrina	South shore, western end of lake	E-fish	Day	Owens sucker	239	254	200.0	1.46	none	unknown	Male
Lake Sabrina	South shore, western end of lake	E-fish	Day	Owens sucker	275	291	310.0	1.49	none	unknown	Female
Lake Sabrina	South shore, western end of lake	E-fish	Day	rainbow trout	226	235	180.0	1.56	none	wild	
Lake Sabrina	South shore, western end of lake	E-fish	Day	rainbow trout	270	284	160.0	0.81	none	hatchery	Silvery, no eye
Lake Sabrina	South shore, western end of lake	E-fish	Day	rainbow trout	278	290	190.0	0.88	none	wild	
Lake Sabrina	South shore, western end of lake	E-fish	Day	rainbow trout	279	290	195.0	0.90	none	hatchery	
Lake Sabrina	South shore, western end of lake	E-fish	Day	rainbow trout	287	298	150.0	0.63	none	hatchery	
Lake Sabrina	South shore, western end of lake	E-fish	Day	rainbow trout	350	366	465.0	1.08	SB4-1	unknown	

Reservoir	Site ID	Sample Method	Sample Period (day or night)	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	North Shore, western end of lake	E-fish	Day	brook trout	210	223	90.0	0.97	none	unknown	
Lake Sabrina	North Shore, western end of lake	E-fish	Day	Owens sucker	152	161	60.0	1.71	SB4-3	unknown	Female
Lake Sabrina	North Shore, western end of lake	E-fish	Day	Owens sucker	310	322	370.0	1.24	none	unknown	Female

[1] Fish condition factor

Table C-3 South Lake Fish Capture Data During Nighttime Boat Electrofishing, September 2020

Reservoir	Site ID	Sample Method	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
South Lake	South Shore	E-fish	brook trout	195	200	97.6	1.32	none	wild	
South Lake	South Shore	E-fish	brown trout	180	190	68.9	1.18	none	wild	
South Lake	South Shore	E-fish	rainbow trout	260	273	208.9	1.19	none	hatchery	
South Lake	South Shore	E-fish	brown trout	261	272	174.3	0.98	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	508	520.7	1,896.0	1.45	none	hatchery	75% fish caught at mouth of inlet
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	546.1	558.8	2,721.6	1.67	none	hatchery	Mort
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	520.7	527.1	2,268.0	1.61	none	hatchery	Mort
South Lake	Inlet 2- inlet 3	E-fish	brown trout	280	295	no entry	na	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brook trout	214	224	112.1	1.14	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brook trout	250	261	156.0	1.00	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brook trout	206	216	113.8	1.30	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brown trout	260	272	163.4	0.93	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brook trout	245	260	152.9	1.04	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brook trout	240	254	148.9	1.08	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brown trout	240	250	150.6	1.09	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brook trout	234	241	118.0	0.92	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brook trout	220	227	117.4	1.10	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brown trout	280	292	no entry	na	none	wild	No weight too heavy
South Lake	Inlet 2- inlet 3	E-fish	brown trout	270	283	no entry	na	none	wild	No weight too heavy
South Lake	Inlet 2- inlet 3	E-fish	brook trout	240	247	142.9	1.03	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	375	393	no entry	na	none	hatchery	No weight too heavy
South Lake	Inlet 2- inlet 3	E-fish	brown trout	290	296	no entry	na	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	320	340	no entry	na	none	hatchery	No weight too heavy
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	248	264	no entry	na	none	hatchery	No weight too heavy
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	340	358	no entry	na	none	unknown	No weight too heavy

Reservoir	Site ID	Sample Method	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	312	322	no entry	na	none	hatchery	No weight too heavy
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	308	323	no entry	na	none	unknown	No weight too heavy
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	365	372	no entry	na	none	hatchery	No weight too heavy
South Lake	Inlet 2- inlet 3	E-fish	brown trout	280	293	no entry	na	none	wild	No weight too heavy
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	345	363	no entry	na	none	unknown	No weight too heavy
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	360	378	no entry	na	none	hatchery	No weight too heavy
South Lake	Inlet 2- inlet 3	E-fish	brown trout	265	275	no entry	na	none	wild	No weight too heavy
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	325	335	no entry	na	none	hatchery	No weight too heavy
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	320	330	no entry	na	none	hatchery	No weight too heavy
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	335	352	no entry	na	none	hatchery	No weight too heavy
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	385	400	no entry	na	none	hatchery	Mort
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	330	345	no entry	na	none	hatchery	Mort
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	345	360	no entry	na	none	hatchery	Mort
South Lake	Inlet 2- inlet 3	E-fish	brook trout	230	241	144.6	1.19	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brook trout	230	240	133.4	1.10	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	323	338	no entry	na	none	hatchery	Mort
South Lake	Inlet 2- inlet 3	E-fish	brook trout	255	265	172.8	1.04	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brook trout	223	238	131.0	1.18	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	300	312	no entry	na	none	hatchery	Mort
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	337	355	no entry	na	none	hatchery	Mort
South Lake	Inlet 2- inlet 3	E-fish	brown trout	273	283	no entry	na	none	wild	Mort
South Lake	Inlet 2- inlet 3	E-fish	brown trout	271	283	no entry	na	none	wild	Mort
South Lake	Inlet 2- inlet 3	E-fish	brown trout	255	267	164.9	0.99	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brown trout	260	270	161.5	0.92	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	rainbow trout	233	248	148.9	1.18	none	unknown	
South Lake	Inlet 2- inlet 3	E-fish	brown trout	265	278	no entry	na	none	wild	Mort
South Lake	Inlet 2- inlet 3	E-fish	brook trout	228	236	138.8	1.17	none	wild	

Reservoir	Site ID	Sample Method	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
South Lake	Inlet 2- inlet 3	E-fish	brown trout	290	302	no entry	na	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brown trout	275	292	no entry	na	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brown trout	248	258	no entry	na	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brook trout	215	226	99.8	1.00	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brown trout	280	292	no entry	na	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brook trout	235	242	139.8	1.08	none	wild	
South Lake	Inlet 2- inlet 3	E-fish	brown trout	270	283	no entry	na	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	308	318	255.0	0.87	none	hatchery	
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	293	302	240.0	0.95	none	hatchery	
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	400	421	520.0	0.81	none	hatchery	
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	328	350	335.0	0.95	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	325	340	345.0	1.01	none	hatchery	
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	330	350	370.0	1.03	none	hatchery	
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	320	333	300.0	0.92	none	unknown	
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	335	350	345.0	0.92	none	hatchery	
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	365	380	495.0	1.02	none	hatchery	Minimal fin wearing
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	320	329	270.0	0.82	none	hatchery	
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	340	360	330.0	0.84	none	hatchery	
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	295	300	190.0	0.74	none	hatchery	
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	328	344	334.5	0.95	none	hatchery	
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	310	326	334.5	1.12	none	hatchery	
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	330	338	334.5	0.93	none	hatchery	
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	262	277	170.1	0.95	none	unknown	Mort
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	182	192	70.9	1.18	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brown trout	271	289	243.8	1.22	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brown trout	273	285	226.8	1.11	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brown trout	265	278	187.1	1.01	none	wild	

Reservoir	Site ID	Sample Method	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
South Lake	Inlet 1- Inlet 2	E-fish	brown trout	272	285	215.5	1.07	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brown trout	294	309	243.8	0.96	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brown trout	260	271	226.8	1.29	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brown trout	313	327	328.9	1.07	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brown trout	280	291	187.1	0.85	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brown trout	210	223	102.1	1.10	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brook trout	238	248	141.7	1.05	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brook trout	219	231	130.4	1.24	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brook trout	242	250	141.7	1.00	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brook trout	223	234	130.4	1.18	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brook trout	230	237	187.1	1.54	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brook trout	202	212	102.1	1.24	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brook trout	245	253	158.8	1.08	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brook trout	238	243	113.4	0.84	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	205	225	85.0	0.99	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	rainbow trout	168	178	56.7	1.20	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brown trout	250	265	170.1	1.09	none	wild	
South Lake	Inlet 1- Inlet 2	E-fish	brown trout	250	262	187.1	1.20	none	wild	
South Lake	North Shore	E-fish	rainbow trout	280	289	250.0	1.14	none	hatchery	Worn fins
South Lake	North Shore	E-fish	rainbow trout	260	271	125.0	0.71	none	unknown	Snake-like, skinny
South Lake	North Shore	E-fish	rainbow trout	287	297	290.0	1.23	none	hatchery	
South Lake	North Shore	E-fish	rainbow trout	306	332	460.0	1.61	none	unknown	
South Lake	North Shore	E-fish	rainbow trout	257	266	175.0	1.03	none	hatchery	
South Lake	North Shore	E-fish	rainbow trout	300	312	270.0	1.00	none	hatchery	

[1] Fish condition factor

Table C-4 Lake Sabrina Fish Capture Data During Nighttime Boat Electrofishing, September 2020

Reservoir	Site ID	Sample Method	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	NW shore	E-fish	Owens sucker	368	391	570.0	1.14	none	wild	
Lake Sabrina	NW shore	E-fish	Owens sucker	256	273	250.0	1.49	none	wild	
Lake Sabrina	NW shore	E-fish	rainbow trout	217	224	140.0	1.37	none	hatchery	Worn fins
Lake Sabrina	NW shore	E-fish	rainbow trout	321	328	335.0	1.01	none	hatchery	Worn fins
Lake Sabrina	NW shore	E-fish	rainbow trout	296	301	270.0	1.04	none	hatchery	Worn fins
Lake Sabrina	NW shore	E-fish	rainbow trout	220	232	135.0	1.27	none	hatchery	Worn fins
Lake Sabrina	NW shore	E-fish	rainbow trout	230	240	150.0	1.23	none	unknown	
Lake Sabrina	NW shore	E-fish	rainbow trout	205	216	100.0	1.16	none	unknown	
Lake Sabrina	NW shore	E-fish	rainbow trout	196	210	100.0	1.33	none	unknown	
Lake Sabrina	NW shore	E-fish	rainbow trout	120	129	20.0	1.16	none	wild	
Lake Sabrina	Cove near marina	E-fish	Owens sucker	139	147	55.0	2.05	none	wild	
Lake Sabrina	Cove near marina	E-fish	Owens sucker	220	233	165.0	1.55	none	wild	
Lake Sabrina	Cove near marina	E-fish	Owens sucker	305	324	375.0	1.32	none	wild	
Lake Sabrina	Cove near marina	E-fish	Owens sucker	182	192	115.0	1.91	none	wild	
Lake Sabrina	Cove near marina	E-fish	Owens sucker	250	264	190.0	1.22	none	wild	
Lake Sabrina	Cove near marina	E-fish	Owens sucker	244	260	210.0	1.45	none	wild	
Lake Sabrina	Cove near marina	E-fish	Owens sucker	263	277	240.0	1.32	none	wild	
Lake Sabrina	Cove near marina	E-fish	Owens sucker	305	324	295.0	1.04	none	wild	
Lake Sabrina	Cove near marina	E-fish	Owens sucker	299	316	220.0	0.82	none	wild	
Lake Sabrina	Cove near marina	E-fish	Owens sucker	240	256	190.0	1.37	none	wild	
Lake Sabrina	Cove near marina	E-fish	Owens sucker	244	260	225.0	1.55	none	wild	
Lake Sabrina	Cove near marina	E-fish	Owens sucker	257	275	250.0	1.47	none	wild	
Lake Sabrina	Cove near marina	E-fish	Owens sucker	157	166	60.0	1.55	none	wild	
Lake Sabrina	Cove near marina	E-fish	Owens sucker	175	185	80.0	1.49	none	wild	
Lake Sabrina	Cove near marina	E-fish	brook trout	190	199	95.0	1.39	none	unknown	

Reservoir	Site ID	Sample Method	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	Cove near marina	E-fish	brook trout	195	206	105.0	1.42	none	unknown	
Lake Sabrina	Cove near marina	E-fish	brook trout	220	232	130.0	1.22	none	unknown	
Lake Sabrina	Cove near marina	E-fish	rainbow trout	345	360	380.0	0.93	none	hatchery	Worn fins
Lake Sabrina	Cove near marina	E-fish	rainbow trout	310	319	275.0	0.92	none	hatchery	Worn fins
Lake Sabrina	Cove near marina	E-fish	rainbow trout	333	341	275.0	0.74	none	hatchery	Worn fins
Lake Sabrina	Cove near marina	E-fish	rainbow trout	187	200	90.0	1.38	none	unknown	
Lake Sabrina	Cove near marina	E-fish	rainbow trout	257	267	190.0	1.12	none	unknown	
Lake Sabrina	Cove near marina	E-fish	rainbow trout	252	266	190.0	1.19	none	unknown	
Lake Sabrina	Cove near marina	E-fish	rainbow trout	156	163	50.0	1.32	none	wild	
Lake Sabrina	Cove near marina	E-fish	brook trout	227	239	140.0	1.20	none	unknown	
Lake Sabrina	Tributaries	E-fish	rainbow trout	482.6	495.3	1485.0	1.32	none	hatchery	Worn top of caudal fin
Lake Sabrina	Tributaries	E-fish	rainbow trout	495.3	508	1750.0	1.44	none	hatchery	Worn top of caudal fin
Lake Sabrina	Tributaries	E-fish	Owens sucker	375	395	1105.0	2.10	none	wild	
Lake Sabrina	Tributaries	E-fish	rainbow trout	325	346	320.0	0.93	none	hatchery	
Lake Sabrina	Tributaries	E-fish	rainbow trout	250	255	175.0	1.12	none	hatchery	
Lake Sabrina	Tributaries	E-fish	rainbow trout	335	351	0.0	na	none	hatchery	Very thin
Lake Sabrina	Tributaries	E-fish	rainbow trout	326	341	330.0	0.95	none	hatchery	Hook and line sticking out of mouth
Lake Sabrina	Tributaries	E-fish	rainbow trout	310	325	295.0	0.99	none	hatchery	
Lake Sabrina	Tributaries	E-fish	rainbow trout	188	205	150.0	2.26	none	hatchery	
Lake Sabrina	Tributaries	E-fish	rainbow trout	340	357	275.0	0.70	none	hatchery	Very tiny/snake-like
Lake Sabrina	Tributaries	E-fish	rainbow trout	305	320	275.0	0.97	none	hatchery	
Lake Sabrina	Tributaries	E-fish	rainbow trout	280	291	220.0	1.00	none	hatchery	
Lake Sabrina	Tributaries	E-fish	rainbow trout	361	371	430.0	0.91	none	hatchery	

Reservoir	Site ID	Sample Method	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	Tributaries	E-fish	rainbow trout	355	364	430.0	0.96	none	hatchery	Ripe female, spraying eggs
Lake Sabrina	Tributaries	E-fish	rainbow trout	340	355	370.0	0.94	none	hatchery	
Lake Sabrina	Tributaries	E-fish	rainbow trout	306	319	275.0	0.96	none	hatchery	
Lake Sabrina	Tributaries	E-fish	rainbow trout	350	365	420.0	0.98	none	hatchery	
Lake Sabrina	Tributaries	E-fish	rainbow trout	240	249	165.0	1.19	none	hatchery	
Lake Sabrina	Tributaries	E-fish	rainbow trout	309	320	240.0	0.81	none	hatchery	
Lake Sabrina	Tributaries	E-fish	brook trout	180	188	75.0	1.29	none	unknown	
Lake Sabrina	Tributaries	E-fish	brook trout	131	136	35.0	1.56	none	unknown	
Lake Sabrina	Tributaries	E-fish	rainbow trout	365	379	400.0	0.82	none	wild	
Lake Sabrina	Tributaries	E-fish	rainbow trout	306	333	300.0	1.05	none	wild	
Lake Sabrina	Tributaries	E-fish	rainbow trout	185	193	150.0	2.37	none	wild	
Lake Sabrina	Tributaries	E-fish	rainbow trout	264	273	195.0	1.06	none	wild	
Lake Sabrina	Tributaries	E-fish	brook trout	131	141	25.0	1.11	none	wild	
Lake Sabrina	Tributaries	E-fish	Owens sucker	335	356	490.0	1.30	none	wild	
Lake Sabrina	Tributaries	E-fish	Owens sucker	240	255	220.0	1.59	none	wild	
Lake Sabrina	Tributaries	E-fish	rainbow trout	290	304	220.0	0.90	none	hatchery	
Lake Sabrina	Tributaries	E-fish	brook trout	190	200	75.0	1.09	none	unknown	
Lake Sabrina	Tributaries	E-fish	Owens sucker	285	305	290.0	1.25	none	wild	
Lake Sabrina	Tributaries	E-fish	rainbow trout	158	169	60.0	1.52	none	wild	
Lake Sabrina	Tributaries	E-fish	brook trout	246	248	160.0	1.07	none	wild	
Lake Sabrina	Tributaries	E-fish	brook trout	212	219	105.0	1.10	none	wild	
Lake Sabrina	Tributaries	E-fish	rainbow trout	90	95	8.4	1.15	none	wild	
Lake Sabrina	Tributaries	E-fish	brook trout	144	152	36.0	1.21	none	wild	
Lake Sabrina	Tributaries	E-fish	brook trout	145	154	32.6	1.07	none	wild	
Lake Sabrina	Tributaries	E-fish	brook trout	189	198	67.0	0.99	none	wild	
Lake Sabrina	Tributaries	E-fish	brook trout	130	137	25.5	1.16	none	wild	
Lake Sabrina	Tributaries	E-fish	brook trout	150	160	43.6	1.29	none	wild	

Reservoir	Site ID	Sample Method	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	Tributaries	E-fish	rainbow trout	113	120	15.5	1.07	none	wild	
Lake Sabrina	Tributaries	E-fish	Owens sucker	61	65	3.2	1.41	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	320	334	395.0	1.21	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	276	292	310.0	1.47	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	269	275	265.0	1.36	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	318	335	380.0	1.18	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	300	316	360.0	1.33	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	280	298	320.0	1.46	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	295	313	385.0	1.50	none	wild	Male- super long anal fin
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	260	275	275.0	1.56	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	187	203	110.0	1.68	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	250	266	240.0	1.54	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	241	257	220.0	1.57	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	248	264	250.0	1.64	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	178	197	no entry	na	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	237	253	210.0	1.58	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	233	247	195.0	1.54	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	189	200	no entry	na	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	276	293	no entry	na	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	237	252	no entry	na	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	243	258	no entry	na	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	262	278	220.0	1.22	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	260	273	260.0	1.48	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	183	193	no entry	na	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	258	268	250.0	1.46	none	wild	
Lake Sabrina	Cove at Dam	E-fish	Owens sucker	182	191	105.0	1.74	none	wild	
Lake Sabrina	Cove at Dam	E-fish	rainbow trout	262	266	245.0	1.36	none	hatchery	Worn fins
Lake Sabrina	Cove at Dam	E-fish	rainbow trout	240	243	200.0	1.45	none	hatchery	Worn fins
Lake Sabrina	Cove at Dam	E-fish	rainbow trout	161	172	65.0	1.56	none	unknown	Fat
Lake Sabrina	Cove at Dam	E-fish	rainbow trout	290	295	no entry	na	none	unknown	

Reservoir	Site ID	Sample Method	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Lake Sabrina	Cove at Dam	E-fish	rainbow trout	151	160	50.0	1.45	none	unknown	
Lake Sabrina	Cove at Dam	E-fish	brook trout	210	219	120.0	1.30	none	unknown	
Lake Sabrina	Cove at Dam	E-fish	rainbow trout	264	276	165.0	0.90	none	hatchery	Worn fins
Lake Sabrina	Cove at Dam	E-fish	brook trout	214	223	130.0	1.33	none	unknown	
Lake Sabrina	Cove at Dam	E-fish	rainbow trout	269	278	220.0	1.13	none	unknown	
Lake Sabrina	Cove at Dam	E-fish	rainbow trout	152	163	40.0	1.14	none	unknown	
Lake Sabrina	Cove at Dam	E-fish	rainbow trout	261	274	210.0	1.18	none	unknown	
Lake Sabrina	Cove at Dam	E-fish	rainbow trout	280	285	235.0	1.07	none	hatchery	Photos of worn fins
Lake Sabrina	Cove at Dam	E-fish	brook trout	167	175	55.0	1.18	none	unknown	
Lake Sabrina	Cove at Dam	E-fish	rainbow trout	264	272	195.0	1.06	none	hatchery	
Lake Sabrina	Cove at Dam	E-fish	rainbow trout	226	233	135.0	1.17	none	hatchery	
Lake Sabrina	Cove at Dam	E-fish	rainbow trout	276	291	240.0	1.14	none	unknown	
Lake Sabrina	Cove at Dam	E-fish	rainbow trout	325	335	395.0	1.15	none	hatchery	Fishing line out of anal vent
Lake Sabrina	Cove at Dam	E-fish	rainbow trout	275	286	285.0	1.37	none	hatchery	
Lake Sabrina	Cove at Dam	E-fish	rainbow trout	196	204	90.0	1.20	none	hatchery	
Lake Sabrina	Cove at Dam	E-fish	rainbow trout	310	314	325.0	1.09	none	hatchery	Worn fins
Lake Sabrina	Cove at Dam	E-fish	brook trout	231	247	150.0	1.22	none	unknown	

[1] Fish condition factor

Table C-5 Longley Lake Gillnetting Fish Capture Data, September 2020

Reservoir	Site ID	Sample Method	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Longley Lake	Gill net 1, set 1	gill net	brook trout	211	221	105.0	1.12	LR-1	wild	Mort
Longley Lake	Gill net 1, set 1	gill net	brook trout	215	222	105.0	1.06	LR-2	wild	
Longley Lake	Gill net 1, set 1	gill net	brook trout	205	213	85.0	0.99	LR-3	wild	
Longley Lake	Gill net 1, set 1	gill net	brook trout	214	224	105.0	1.07	LR-4	wild	
Longley Lake	Gill net 1, set 1	gill net	brook trout	190	200	90.0	1.31	LR-5	wild	
Longley Lake	Gill net 1, set 2	gill net	brook trout	203	212	120.0	1.43	none	wild	Mort
Longley Lake	Gill net 1, set 2	gill net	brook trout	207	217	95.0	1.07	none	wild	
Longley Lake	Gill net 2, set 1	gill net	brook trout	220	228	120.0	1.13	LR-6	wild	
Longley Lake	Gill net 2, set 1	gill net	brook trout	192	203	80.0	1.13	LR-7	wild	
Longley Lake	Gill net 2, set 1	gill net	brook trout	219	231	135.0	1.29	LR-8	wild	Mort
Longley Lake	Gill net 2, set 1	gill net	brook trout	197	206	105.0	1.37	LR-9	wild	
Longley Lake	Gill net 2, set 1	gill net	brook trout	194	206	105.0	1.44	LR-10	wild	
Longley Lake	Gill net 2, set 1	gill net	brook trout	191	198	105.0	1.51	LR-11	wild	Mort
Longley Lake	Gill net 2, set 1	gill net	brook trout	215	224	120.0	1.21	LR-12	wild	
Longley Lake	Gill net 2, set 1	gill net	brook trout	255	205	225.0	1.36	LR-13	wild	Mort
Longley Lake	Gill net 2, set 1	gill net	brook trout	210	217	125.0	1.35	LR-14	wild	
Longley Lake	Gill net 2, set 1	gill net	brook trout	194	207	85.0	1.16	LR-15	wild	
Longley Lake	Gill net 2, set 1	gill net	brook trout	211	221	120.0	1.28	none	wild	
Longley Lake	Gill net 2, set 1	gill net	brook trout	218	221	120.0	1.16	none	wild	
Longley Lake	Gill net 2, set 1	gill net	brook trout	203	209	135.0	1.61	none	wild	Mort
Longley Lake	Gill net 2, set 1	gill net	brook trout	221	231	150.0	1.39	none	wild	
Longley Lake	Gill net 2, set 1	gill net	brook trout	193	199	115.0	1.60	none	wild	
Longley Lake	Gill net 2, set 1	gill net	brook trout	190	204	105.0	1.53	none	wild	
Longley Lake	Gill net 2, set 2	gill net	brook trout	237	252	170.0	1.28	none	wild	
Longley Lake	Gill net 2, set 2	gill net	brook trout	228	238	120.0	1.01	none	wild	

Reservoir	Site ID	Sample Method	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	k-value[1]	Otolith/ Scale Sample ID	Origin	Notes
Longley Lake	Gill net 2, set 2	gill net	brook trout	208	215	120.0	1.33	none	wild	
Longley Lake	Gill net 2, set 2	gill net	brook trout	215	226	110.0	1.11	none	wild	

[1] Fish condition factor

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project
(FERC Project No. 1394)

DRAFT LICENSE APPLICATION

DRAFT TECHNICAL REPORT
WATER QUALITY STUDY (AQ5)

Southern California Edison
1515 Walnut Grove Ave
Rosemead, CA 91770

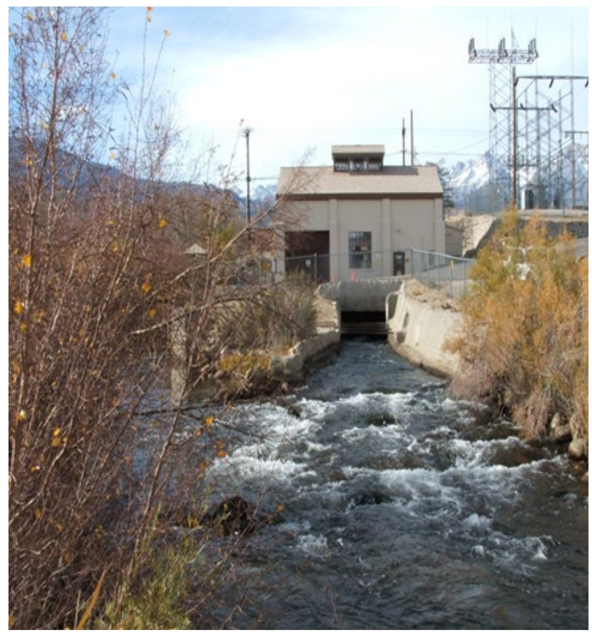
January 2022

Support from:

Kleinschmidt

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project
(FERC Project No. 1394)



DRAFT TECHNICAL REPORT
WATER QUALITY STUDY (AQ5)

SOUTHERN CALIFORNIA EDISON

An EDISON INTERNATIONAL® Company

JANUARY 2022

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

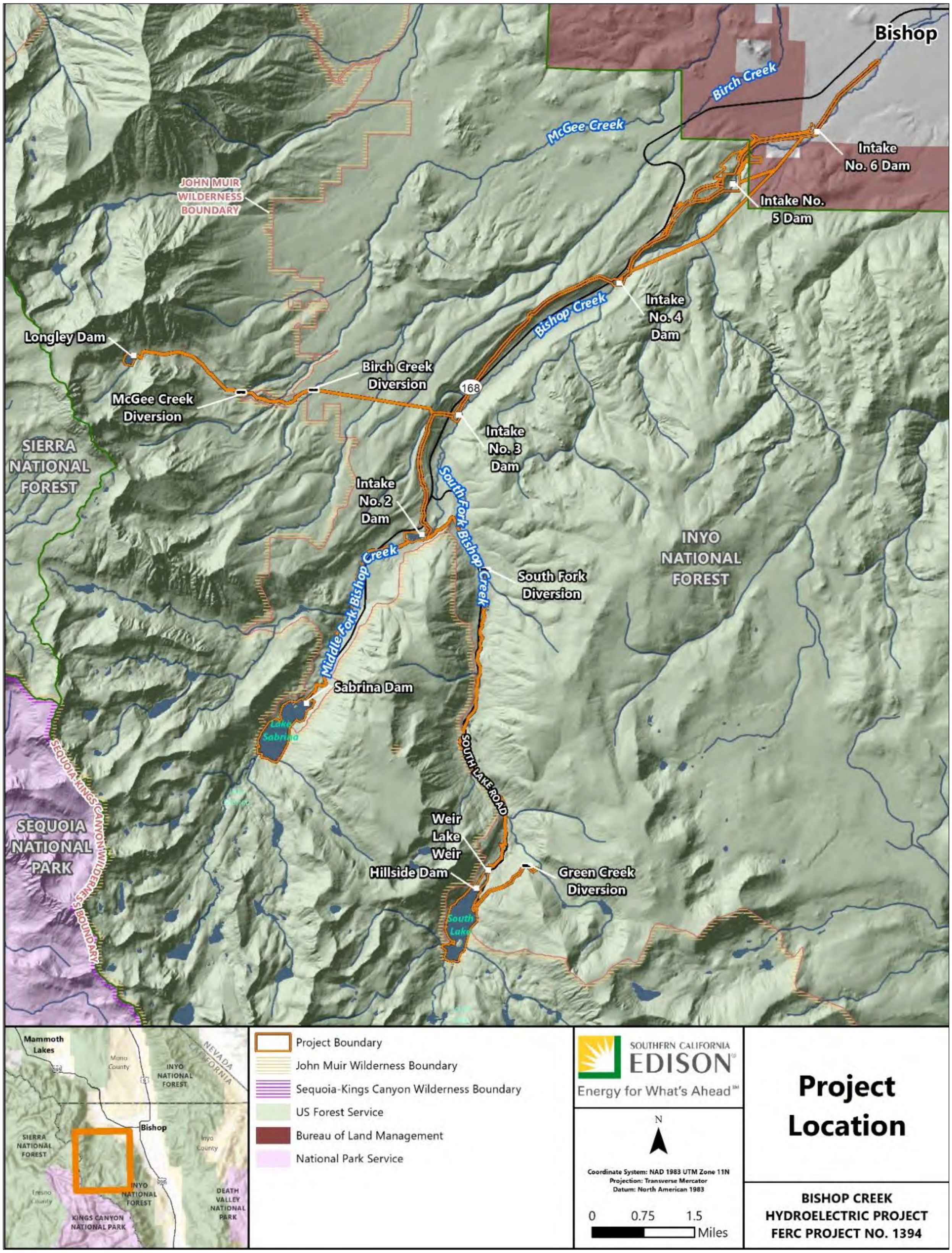
LIST OF APPENDICES

1.0 INTRODUCTION

1.1. BACKGROUND

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 1.1-1). The licensee operates the Project under a 30-year license issued by FERC on July 19, 1994. As the current license is due to expire on June 30, 2024, SCE has initiated the formal relicensing process utilizing the Integrated Licensing Process (ILP) by filing the Notification of Intent (NOI) and Pre-Application Document (PAD) with FERC on May 1, 2019.

During the TWG meetings, and in written comments, stakeholders identified the need to develop an understanding of water quality parameters in the Project area. Draft study plans were distributed with the PAD and revised after receiving comments pursuant to 18 CFR § 5.9. FERC approved the Revised Study Plan (RSP) with its Study Plan Determination on November 4, 2019. As described in Section 7.0 below, SCE has kept FERC and the TWGs regularly informed on the study plan implementation. After filing the Updated Study Report (USR) with FERC on November 4, 2021, SCE held an USR meeting on November 18, 2021. Preliminary data on the water quality study program was presented in the USR; this Water Quality Annual Report builds on those materials and presents the results of the 2021 monitoring program.


Bishop
Birch Creek
McGee Creek
Intake No. 6 Dam
Intake No. 5 Dam
JOHN MUIR WILDERNESS BOUNDARY
Intake No. 4 Dam
Bishop Creek
Longley Dam
Birch Creek Diversion
McGee Creek Diversion
168
Intake No. 3 Dam
SIERRA NATIONAL FOREST
Intake No. 2 Dam
South Fork Bishop Creek
Middle Fork Bishop Creek
INYO NATIONAL FOREST
South Fork Diversion
Sabrina Dam
Lake Sabrina
SOUTH LAKE ROAD
SEQUOIA-KINGS CANYON WILDERNESS BOUNDARY
SEQUOIA NATIONAL PARK
Weir Lake Weir
Hillside Dam
Green Creek Diversion
South Lake
Mammoth Lakes
INYO NATIONAL FOREST
Bishop
SIERRA NATIONAL FOREST
INYO NATIONAL FOREST
DEATH VALLEY NATIONAL PARK
KINGS CANYON NATIONAL PARK
Project Boundary
John Muir Wilderness Boundary
Sequoia-Kings Canyon Wilderness Boundary
US Forest Service
Bureau of Land Management
National Park Service
SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead
N
Coordinate System: NAD 1983 UTM Zone 11N
Projection: Transverse Mercator
Datum: North American 1983
0 0.75 1.5 Miles
Project Location
BISHOP CREEK HYDROELECTRIC PROJECT FERC PROJECT NO. 1394

2.0 PROJECT NEXUS

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 to establish a baseline for the future. 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 were to:

- Monitor water quality[1] for 2 years on a regular basis at multiple monitoring sites:
    - Above-Project: establish reference baseline conditions of inflow from natural runoff in the watershed
    - In-Project: assess how/if water quality changes throughout various facilities within the Project Area (i.e., various depths and locations in South Lake and Lake Sabrina, powerhouse discharges)
    - Below-Project: assess any/all potential impacts Project operations may have on water quality that is leaving the Project Area
- Monitor water temperature for 2 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 National Forest" (USDA 2019) as they relate to ecological sustainability and diversity of plant and animal communities.

[1] For the purposes of this study, water quality was monitored for dissolved oxygen (DO), water temperature, turbidity, conductivity, total dissolved solids, orthophosphate, nitrate, total nitrogen, and E.coli.

3.0 REVIEW OF EXISTING INFORMATION

3.1. WATER QUALITY BENEFICIAL USES, OBJECTIVES, GOALS

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 use planning, permitting, and enforcement authorities to meet this responsibility. Every water body within the LRWQCB jurisdiction is designated a set of beneficial uses that are protected by appropriate water quality objectives as described in the Basin Plan for the Lahontan Region ([Basin Plan], LRWQCB 1995).

For smaller tributary streams in which beneficial uses are not specifically designated, they are granted with the same beneficial uses as the streams, lakes, or reservoirs to which they are a tributary. Table 3.1-1 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 repressurization.
- **Ground Water Recharge (GWR)** - Beneficial uses of waters used for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.
- **Freshwater Replenishment (FRSH) -** Beneficial uses of waters used for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).
- **Hydropower Generation (POW) –** Uses of water for hydroelectric power generation.

- **Water Contact Recreation (REC-1) –** Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, whitewater activities, fishing, or use of natural hot springs.

- **Non-Contact Water Recreation (REC-2) –** Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tide pool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.

- **Commercial and Sportfishing (COMM) -** Beneficial uses of waters used for commercial or recreational collection of fish or other organisms including, but not limited to, uses involving organisms intended for human consumption.

- **Cold Freshwater Habitat (COLD) –** Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

- **Wildlife Habitat (WILD)** – Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

- **Preservation of Biological Habitats of Special Significance (BIOL)** - Beneficial uses of waters that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, and Areas of Special Biological Significance (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 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 3.1-2 and Table 3.1-3.

Table 3.1-1 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 Supply	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		

Table 3.1-2 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 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 3.1-3 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 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

Source: LRWQCB, 1995

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)

3.2. PREVIOUS INVESTIGATIONS

3.2.1. BISHOP CREEK

In 1974, Environmental Science and Engineering (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:

- Total dissolved solids (TDS) remained very low throughout the summer, less than 30 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 the North Fork of Bishop Creek 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 the 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 providing a larger percentage of the baseflow of the stream. The groundwater generally has more contact time with the underlying bedrock resulting in higher concentrations of major ions (ESE 1975).

The ESE report (1975) 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 Ca 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 ESE report (1975) stated that the likely reason for the decrease was the routing of water for power generation purposes. Table 3.2-1 and Table 3.2-2 provides a summary of the water quality characteristics for the various watersheds sampled.

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.

3.2.2. South Lake and Lake Sabrina

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 n.d.). The following discussion presents the results of that investigation.

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 3.2-3 and Table 3.2-4. Field measurements of water temperature, pH and DO 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. Overall, water temperature decreased with increasing depth. DO 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 DO values dropped to less than 38 percent saturation.

Table 3.2-1 Bishop Creek – Project No. 1394 Physical and Chemical Characteristics of North and Middle Forks of Bishop Creek June-November 1974

Parameter	Sample Location										
	S1	S2	S2A	S3	S4	S6	S6A	S7	S8	S19 Bishop Creek @ Hwy 395 (*)	
	Range	Range	Range	Range	Range	Range	Range	Range	Range	Sprin g	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

Source: ESE 1975
(*) Spring: May 1974; Fall: November 1974
(--) indicates analysis not performed.

Table 3.2-2 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

Source: Lund, n.d.

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

Table 3.2-3 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 3.2-4 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 DO 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 at the same time-period, include Gem and Waugh lakes

DO 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.

Measurements of the chemical characteristics of the lakes were taken in fall 1985 and are presented in Table 3.2-5. The chemical composition of these lake waters appears typical for reservoirs in the Sierra Nevada elevation and latitude. 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 3.2-5 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	---	---	---	---

Source: Lund, n.d.

Notes: [a] Samples collected September 1985

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 3.2-6.

The water quality was similar to that observed in previous studies with Ca 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 above Intake 2. Water temperature was generally less than 62.6̊F. Two biological parameters 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 per 100 ml, respectively; exceeding the basin standard of 20 cfu/100 ml for fecal coliform.

Samples collected over the 2-year period of 2015 and 2016 indicated non-detectable values for fecal coliform or *E. coli* for Bishop Creek (total of three samples) at the USFS boundary. Studies conducted by the LRWQCB for Bishop Creek concluded that the impaired portion of Bishop Creek was located below Powerhouse 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 3.2-6 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 calcium carbonate [$CaCO_3$])	(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)

Source: CEDEN 2018

Notes:

[a] Basin Plan for Bishop Creek at Intake 2

[b] United States Environmental Protection Agency (USEPA) secondary standard for pH

[c] NA = Not Applicable – no current MCL

[d] California Drinking Water Program (CDWP) secondary MCL

[e] CDWP primary MCL.

[f] .cfu

[g] Lahontan Basin Plan

[h] Basin Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California

BOLD Equal to or above current MCLs or notification levels

3.3. Study Area

Figure 3.3-1 below shows the study area for the Bishop Creek Water Quality Study.

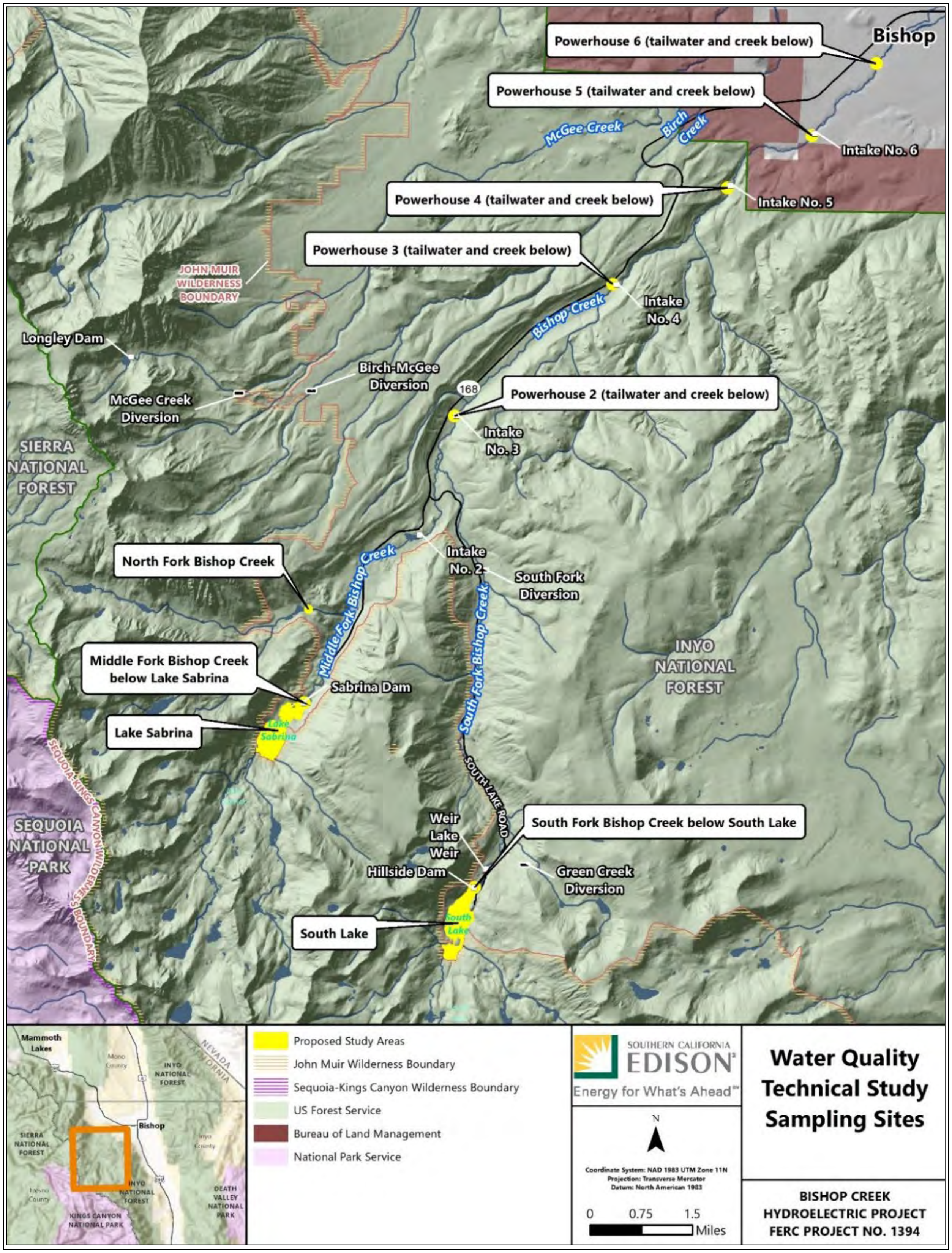


Figure 3.3-1 Water Quality Technical Study Area

4.0 METHODS

This section is a summary of parameters monitored and methodologies used during the study period. Further detail regarding sampling procedures and methods is discussed in Section 4.5 of this document. The overall program is summarized in Table 4.4-1.

4.1. PARAMETERS MONITORED

The Study Plan identified the below parameters to be monitored:

- Water Temperature (in °C)
- TDS
- Dissolved Oxygen (DO) (in mg/l)
- Conductivity (in µmhos/cm)
- Total Dissolved Solids (TDS)
- Total Nitrogen
- Nitrate (NO3) as Nitrogen
- Orthophosphate (PO4) as P (dissolved)
- Turbidity
- Water Clarity (Secchi Disk)
- Escherichia coli (E. coli)

4.2. VERTICAL PROFILES OF DISSOLVED OXYGEN AND WATER TEMPERATURE

Vertical profiles of DO and temperature were 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 DO and temperature were taken monthly in June and ending in October 2021. The following schedule was proposed for collecting the vertical profiles for each year of the study:

- June, July, August, September, and October

The following sampling locations were proposed:

- Deepest point in Lake Sabrina (estimated at 220-feet-deep at full capacity)
- Deepest Point in South Lake (estimated at 220-feet-deep at full capacity)

When collecting DO and temperature profiles, the same sampling location was visited each time so that the relative change in the profile (DO and temperature) can be determined throughout the summer. DO and temperature readings were taken every meter from the water surface to the lake bottom. Lake surface elevation was also recorded during each sampling date.

4.3. BISHOP CREEK DISSOLVED OXYGEN AND TEMPERATURE SAMPLING

Bishop Creek DO and water temperature sampling was 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. DO and temperature measurements would be sampled mid-depth in the middle, if accessible, otherwise adjacent to the bank of the stream. DO and water temperature data were recorded using a calibrated hand-held digital instrument. The following sampling locations were sampled:

- 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

4.4. SAMPLING FOR SECCHI DISK, TURBIDITY, CONDUCTIVITY, TOTAL DISSOLVED SOLIDS, ORTHOPHOSPHATE, TOTAL NITROGEN, NITRATE AND E. COLI

Sampling for Secchi disk, Turbidity, Conductivity, Total Dissolved Solids, Orthophosphate, Total Nitrogen, Nitrate, and *E.Coli* was generally conducted starting in June and ending in October. Specific sampling periods for each parameter are described below.

4.4.1. Secchi Disk Readings

The sampling period for Secchi disk readings occurred in June, July, August, September, and October. Locations sampled were within the deepest portion of Lake Sabrina and South Lake at the same locations used for water temperature and DO profiles. At each site, one sample was taken using the Secchi disk to approximate depth of the euphotic zone/light penetration.

4.4.2. Turbidity, Conductivity, Total Dissolved Solids, Orthophosphate, Total Nitrogen and Nitrate

The sampling period for turbidity, conductivity, total dissolved solids, orthophosphate, total nitrogen, and nitrate occurred a minimum of once per month during June, July, August, and late September. Sampling locations included lakes and rivers. Lake sampling occurred within a deep hole of Lake Sabrina and South Lake, and at two points: one above and one below the thermocline. The riverine sampling locations included: 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; and Bishop Creek below Powerhouse No. 6. The U.S. Geological Survey (USGS) sampling protocol and procedures were followed for all sampling events.

4.4.3. E. coli [2]

The sampling frequency for *E. coli* occurred on six separate events starting July 1 and ending August 15. Locations sampled included South Lake and Lake Sabrina, adjacent to the boat ramp; and Intake No. 2 Forebay from an easily accessible location adjacent to the shore.

4.4.4. General

At each of the creek sampling events the following information was recorded:

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

[2] [2] If any sample detects greater than 50 col/100 ml of E. coli, microbial source tracking methods (MST [qPCR]) were performed to assess if the E. coli originates from humans.

Table 4.4-1 Locations, Parameters and Sampling Frequency for Water Quality Study

LOCATION	PARAMETERS									
	Water Temperature	Dissolved Oxygen	Secchi Disk	Turbidity	Conductivity	Total Dissolved Solids	Total Kjeldahl Nitrogen (a)	Nitrite + Nitrate as N (a)	Nitrate as N	Orthophosphate as PO4	E. coli
LAKES											
Lake Sabrina											
Deepest Point	J, Jy, A, S, O (b, c)	J, Jy, A, S, O (b)	J, Jy, A, S, O	NA (d)	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	NA
Adjacent to Boat Ramp	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	July 1-August 15 (e)
South Lake											
Deepest Point	J, Jy, A, S, O (b)	J, Jy, A, S, O (b)	J, Jy, A, S, O	NA	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	NA
Adjacent to Boat Ramp	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	July 1-August 15 (e)
Intake # 2 Forebay	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	July 1-August 15 (e)
SURFACE FLOWS											
North Fork Bishop Creek (background)	J, 2Jy, 2A, 2S, O	J, 2Jy, 2A, 2S, O	NA	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	NA
Middle Fork Bishop Creek below Lake Sabrina	J, 2Jy, 2A, 2S, O	J, 2Jy, 2A, 2S, O	NA	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	NA
South Fork Bishop Creek below South Lake	J, 2Jy, 2A, 2S, O	J, 2Jy, 2A, 2S, O	NA	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	NA
Bishop Creek below Powerhouse No. 2	J, 2Jy, 2A, 2S, O	J, 2Jy, 2A, 2S, O	NA	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	NA
Bishop Creek below Powerhouse No. 3	J, 2Jy, 2A, 2S, O	J, 2Jy, 2A, 2S, O	NA	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	NA
Bishop Creek below Powerhouse No. 4	J, 2Jy, 2A, 2S, O	J, 2Jy, 2A, 2S, O	NA	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	NA
Bishop Creek below Powerhouse No. 5	J, 2Jy, 2A, 2S, O	J, 2Jy, 2A, 2S, O	NA	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	NA
Bishop Creek below Powerhouse No. 6	J, 2Jy, 2A, 2S, O	J, 2Jy, 2A, 2S, O	NA	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	J, Jy, A, S	NA
Tailwater of Powerhouse No. 2	J, 2Jy, 2A, 2S, O	J, 2Jy, 2A, 2S, O	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tailwater of Powerhouse No. 3	J, 2Jy, 2A, 2S, O	J, 2Jy, 2A, 2S, O	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tailwater of Powerhouse No. 4	J, 2Jy, 2A, 2S, O	J, 2Jy, 2A, 2S, O	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tailwater of Powerhouse No. 5	J, 2Jy, 2A, 2S, O	J, 2Jy, 2A, 2S, O	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tailwater of Powerhouse No. 6	J, 2Jy, 2A, 2S, O	J, 2Jy, 2A, 2S, O	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

(a) – Lab analysis parameters needed to calculate Total Nitrogen.
(b) –Vertical profile of dissolved oxygen and water temperature at the deepest point on the lake.
(c) – J=June, Jy=July, A=August, S=September, O=October. All locations indicated are sampled once per month unless month is preceded by a number which indicates the number of times samples were collected during that month.
(d) – NA=Not Applicable.
(e) – A total of 6 samples were collected and analyzed during the 45-day period,

4.5. SAMPLING PROCEDURES AND METHODS

This section specifies the procedures used for collecting surface water measurements and/or water quality samples for chemical analysis. Several methods for collecting surface water samples were used, depending on the type of surface water to be sampled (i.e., tailraces, streams, lakes).

4.5.1. LAKE SAMPLING PROCEDURES

Field measurements of dissolved oxygen and water temperature were collected at the deepest portion of the lake based on the 1980 bathymetric survey (see Bishop Creek Water Quality Implementation Plan [BCWQIP] [SCE, 2020]). The maximum depth for Lake Sabrina and South Lake was initially reported to be 78 feet and 130 feet, respectively. However, subsequent onsite measurements indicated that Lake Sabrina and South Lake were approximately 240 and 223 feet deep, respectively. Field measurements of DO and water temperature measurements were collected starting at 0.5 meter below the water surface and at 1 meter below water surface and continuing in 1-meter increments until the total depth of the lake was obtained. Measurements were recorded on the appropriate forms and/or field notebook. Copies of the field forms are included in Appendix A.

Secchi disk measurements were collected at the same location as the field measurements for DO and water temperature. The Secchi depth measurement procedures are summarized in Standard Operating Procedure (SOP) for surface water sampling (SW-001) in the BCWQIP (SCE 2020).

If a thermocline[3] is identified from the monthly field measurements of water temperature and dissolved oxygen, water quality samples for laboratory analysis and field measurement of conductivity were collected at above and below the thermocline. If no thermocline is identified, water samples were collected at one-half of the Secchi depth and 80 percent of the total depth of the lake at the time of sampling.

Water samples for conductivity, TDS, orthophosphate, total nitrogen, and nitrate were collected using either a peristaltic pump or discrete depth sampler (Kemmerer or Van Dorn bottle) in accordance with SOP for surface water sampling (SW-001) in BCWQIP (SCE, 2020). Water samples for E. coli and MST (qPCR) were collected near shore using a grab sampling method.

4.5.2. SURFACE WATER SAMPLING PROCEDURES

Surface water sampling refers to the collection of water samples for the purposes of field or laboratory testing of water collected from a flowing water site. A flowing water site can refer to streams and tailraces in which water flows unidirectionally.

[3] A thermocline is the horizontal plane in a thermally stratified lake located at the depth where water temperature decreases most rapidly (greater than 1 ºC per meter) with depth.

Field measurements of dissolved oxygen, turbidity, conductivity, and water temperature were collected from straight reaches having uniform flow, and having a uniform and stable bottom contour, and where constituents are well mixed along the cross-section. Field measurements were collected in accordance with SOP for surface water sampling (SW-001) in BCWQIP (SCE 2020).

Water samples for laboratory testing were collected using either the grab sample method or swing sampler in accordance with SOP for surface water sampling (SW-001) in BCWQIP (SCE 2020).

4.5.3. Field Analytical Methods

Field measurements of dissolved oxygen, turbidity, conductivity, and water temperature were conducted using the methods indicated in Table 4.5-1 and with SOP for surface water sampling (SW-001) in BCWQIP (SCE 2020).

Table 4.5-1 Field Methods

Analysis	Method	Method REPORTING Limit
Dissolved Oxygen in mg/L	EPA 360.1	0.1 mg/L
Water Temperature in ºC	EPA 170.1	0.1 ºC
Conductivity in µmhos/cm @25 ºC	EPA 120.1	1 µS/cm
Turbidity in NTUs	EPA 180.1	varies

Notes:
mg/L=milligrams per liter;
ºC=degrees Centigrade;
µmhos/cm=micro-mhos per centimeter;
NTU=Nephelometric turbidity units.

4.5.4. Field Calibration Methods

The equipment used in collecting field data includes a variety of instruments. Proper maintenance, calibration, and operation of each instrument are the responsibility of the individual assigned to each task. Instruments and equipment used during the study are maintained, calibrated, documented for calibration, and operated according to the manufacturers' guidelines and recommendations and SOP for field instrument calibration (SW-002) in BCWQIP (SCE 2020).

4.5.5. Laboratory Methods

In general, the selected laboratory will adhere to those recommendations promulgated in Title 21, Code of Federal Regulations (CFR) Part 58, Good Laboratory Practices; and criteria described in Methods for Chemical Analysis of Water and Wastes (EPA 1979; EPA-600/4-79-202). Water samples collected for chemical analysis during this Project were tested in accordance with the standard analytical procedures established by the EPA Methods for Chemical Analysis of Water and Wastes (EPA 1979; EPA-600/4-79-202), American Society for Testing and Materials, or Standard Methods for the Examination of Water and Wastewater and are indicated in Table 4.5-2.

Table 4.5-2 Laboratory Methods

ANALYSIS	Method	Method REPORTING Limit (units)	Holding TIME
Total Dissolved Solids	SM 2540C	10 mg/L	7 days
Total Nitrogen by calculation	calculation	---	---
Nitrite + Nitrate as N	EPA 353.2	0.20 mg/L	28 days
Total Kjeldahl Nitrogen	EPA 351.2	0.10 mg/L	28 days
Nitrate as N	EPA 300.0	0.11 mg/L	2 days
Orthophosphate as P	EPA 365.3	0.10 mg/L	2 days
E. coli	SM 9222G	20 col/100 ml	24 hours*
MST (qPCR)	BacHum or HF183	---	48 ours

Notes:
*- Per SWAMP guidelines for monitoring E. coli in ambient water.
SM=Standard Methods for the Examination of Water and Wastewater; EPA= Method for Chemical Analysis of Waters And Wastes, EPA-600/4-79-020; N=Nitrogen; P=Phosphorus.

The samples for each analytical parameter were collected and preserved in the appropriate sample containers as presented in Table 4.5-3. The sample containers provided by the analytical laboratories were new, pre-cleaned, pre-loaded with the appropriate preservative, and delivered in a clean cooler.

Table 4.5-3 Sampling Container and Preservation Requirements

ANALYSIS	Method	Container	Preservation
Total Dissolved Solids	SM 2540C	500 ml -poly	<6ºC
Nitrite + Nitrate as N	EPA 353.2	250 ml - poly	<6ºC, H_2SO_4
Total Kjeldahl Nitrogen	EPA 351.2	250 ml - poly	<6ºC, H_2SO_4
Nitrate as N	EPA 300.0	60 ml - poly	<6ºC
Orthophosphate as P	EPA 365.3	250 ml - poly, filtered	<6ºC
E. coli	SM 9222G	100 ml, glass	<6ºC
MST (qPCR)	BacHum or HF183	1000 ml, polypropylene	<10ºC

Notes:
SM=Standard Methods for the Examination of Water and Wastewater; EPA= Method for Chemical Analysis of Waters and Wastes, EPA-600/4-79-020; N=Nitrogen; P=Phosphorus; poly=polyethylene; ml=milliliters; ºC= degrees centigrade; H_2SO_4=sulfuric acid.

4.5.6. Sample Labeling and Chain-of-Custody

Sample labels were completed for each sample using indelible ink. The labels include sample number and location, type of sample, date and time of sampling, sampler's name (or initials), preservation method, and analyses to be performed. The completed sample labels were affixed to each sample container.

A chain-of-custody record accompanied all samples. During transfer, individuals relinquishing and receiving the samples sign, date, and note the time on the record. The chain-of-custody form documents the sample custody transfer from the sampler, through a courier, to the laboratory.

All laboratory water quality samples were managed in accordance with SOP for Sample Management (SW-003) in BCWQIP (SCE 2020). All laboratory reports for each sampling period are included in Appendix B.

4.5.7. Modification to Methods

The original Study Plan specified the use of the Sierra Nevada Aquatic Research Laboratory (SNARL) to conduct the laboratory analysis of *E. coli* and MST (qPCR). Due to the Covid-19 pandemic, SNARL was not available to conduct the analyses. Weck Laboratories was engaged to conduct the *E. coli* analysis using Standard Method 9223B along with a holding time of 24-hours which followed the SWAMP guidelines for monitoring *E. coli* in ambient water. Source Molecular (acquired by LuminUltra in August 2021), in Florida, was engaged to conduct the MST (qPCR) analysis for any samples that exceeded 50 MPN/100 ml of *E. coli*. Three samples exceeded the 50 MPN/100 ml of *E. coli,* and the MST analysis is reported in Section 5.0.

Additionally, the total depth for both lakes was greater than was previously reported. Equipment used to collect vertical profiles of DO and water temperature were unable to obtain the maximum depth of the lakes during the June 2020 sampling period. Additional equipment was obtained to reach the bottom of the lakes in subsequent profiles conducted in June 2021 through October 2021. Lake profile locations and bathymetry data from the Final Technical Report Bishop Creek Reservoirs Fish Distribution Study (AQ 4) (SCE 2021) is included in Appendix D.

5.0 RESULTS

5.1. South Lake

5.1.1. Dissolved Oxygen and Water Temperature Profiles

5.1.1.1. June 2021

A DO and water temperature profile was conducted on June 16, 2021, at the deepest point in South Lake. The maximum depth at the profile point on June 16, 2021, was 48.5 meters (159.1 feet) with a lake surface elevation of 9693.20 feet msl. DO ranged from 9.53 mg/L at a depth of 18 meters (59.1 feet) below water surface (BWS) to 0.0 mg/L at a depth of 40 meters (131.2 feet) BWS. In general, DO saturation was above 95 percent and often exceeded 100 percent in the upper portion of the lake. DO saturation declined sharply to less than 10 percent at 35 meters (114.8 feet) BWS (see Appendix C, Table C-1). No thermocline[4] was identified.

Figure 5.1-1 presents a profile of DO and water temperature over the surveyed water column and Appendix C (Table C-1) presents the individual values recorded for each depth interval.

5.1.1.2. July 2021

The DO and water temperature profile was conducted on July 27, 2021, at the deepest point in South Lake. The maximum depth at the profile point on July 27, 2021, was 44.8 meters (147.0 feet) with a lake surface elevation of 9676.00 feet msl. DO ranged from 8.80 mg/L at a depth of 17 meters (55.8 feet) BWS and 0.00 mg/L at a depth of 33 meters (108.3 feet) BWS. In general, DO saturation was above 95 percent and often exceeded 100 percent in the upper portion of the lake. DO saturation declined sharply to less than 0 percent at 33 meters (108.3 feet) BWS (see Appendix C, Table C-2). A thermocline was identified at approximately 15-18 meters (49.2 – 59.1 feet) BWS. Figure 5.1-2 presents a profile of DO and water temperature over the surveyed water column and Appendix C (Table C-2) presents the individual values recorded for each depth interval.

5.1.1.3. August 2021

The DO and water temperature profile was conducted on August 23, 2021, at the deepest point in South Lake. The maximum depth at the profile point on August 23, 2021, was 39.8 meters (130.6 feet) with a lake surface elevation of 9664.61 feet msl. DO ranged from 8.61 mg/L at a depth of 13.5 meters (44.3 feet) BWS and 0.00 mg/L at a depth of 21 meters (68.9 feet) BWS. In general, DO saturation was above 100 percent in the upper portion of the lake. DO saturation declined sharply to less than 10 percent at 26 meters (85.3 feet) BWS (see Appendix C, Table C-3). A thermocline was identified at approximately 11-14 meters (36.1 – 45.9 feet) BWS. Figure 5.1-3 presents a profile of DO and water temperature over the surveyed water column and Appendix C (Table C-3) presents the individual values recorded for each depth interval.

[4] A thermocline is defined as the horizontal plane in a thermally stratified lake located at the depth where water temperature decreases most rapidly (greater than 1 ºC per meter) with depth.

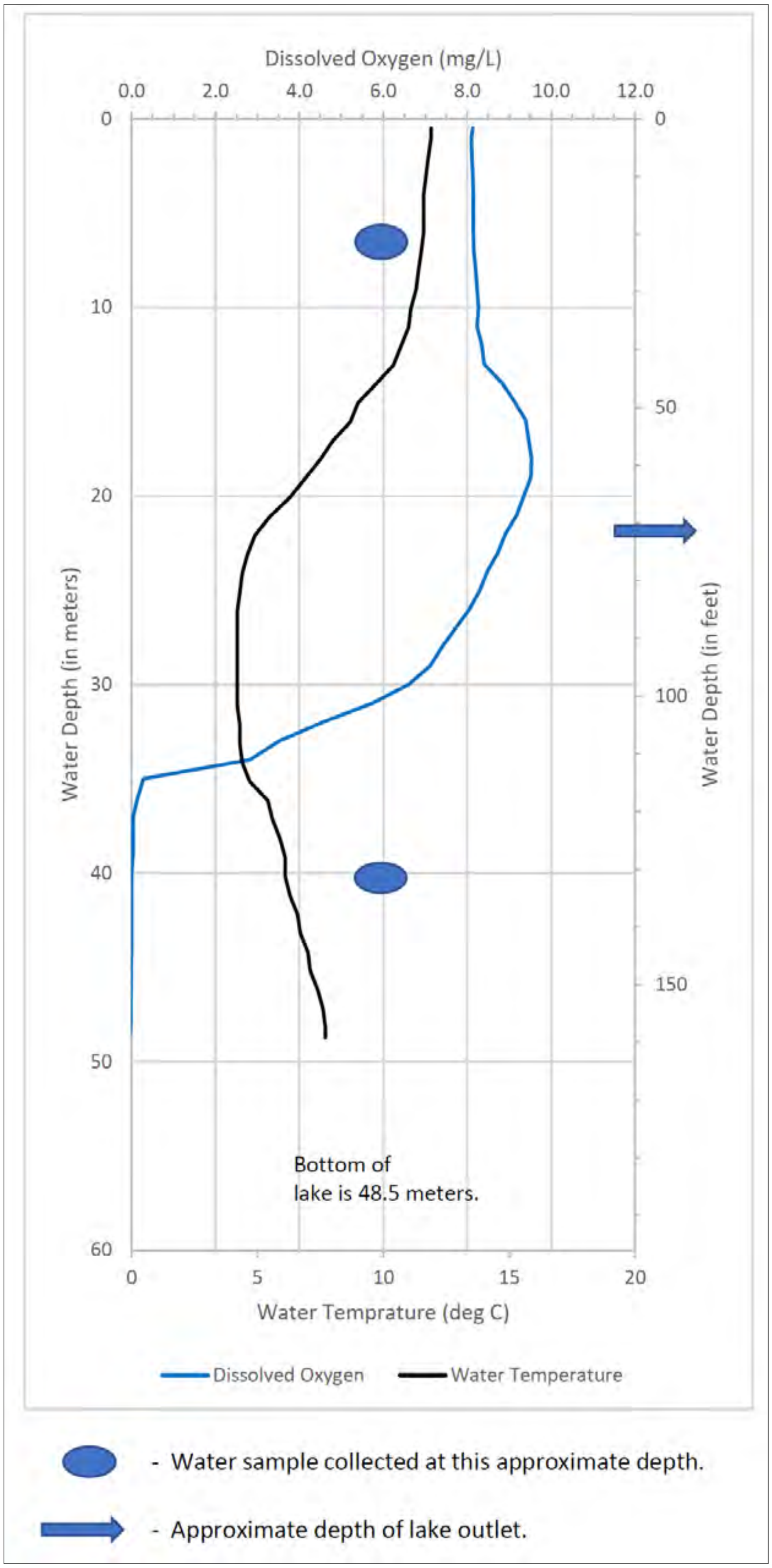


Figure 5.1-1 South Lake Dissolved Oxygen and Water Temperature Profile June 2021

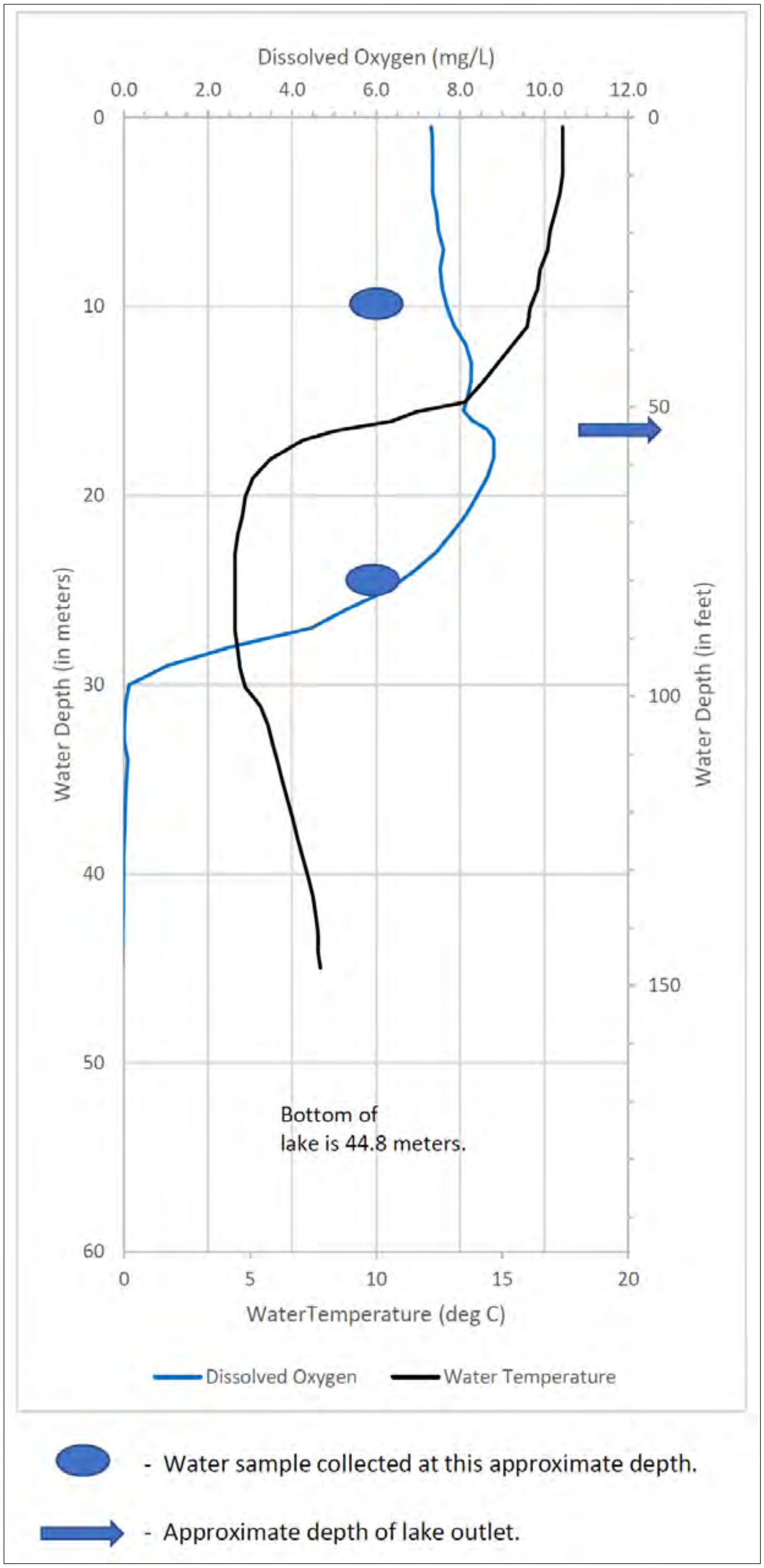


Figure 5.1-2 South Lake – Dissolved Oxygen and Water Temperature Profile – July 2021

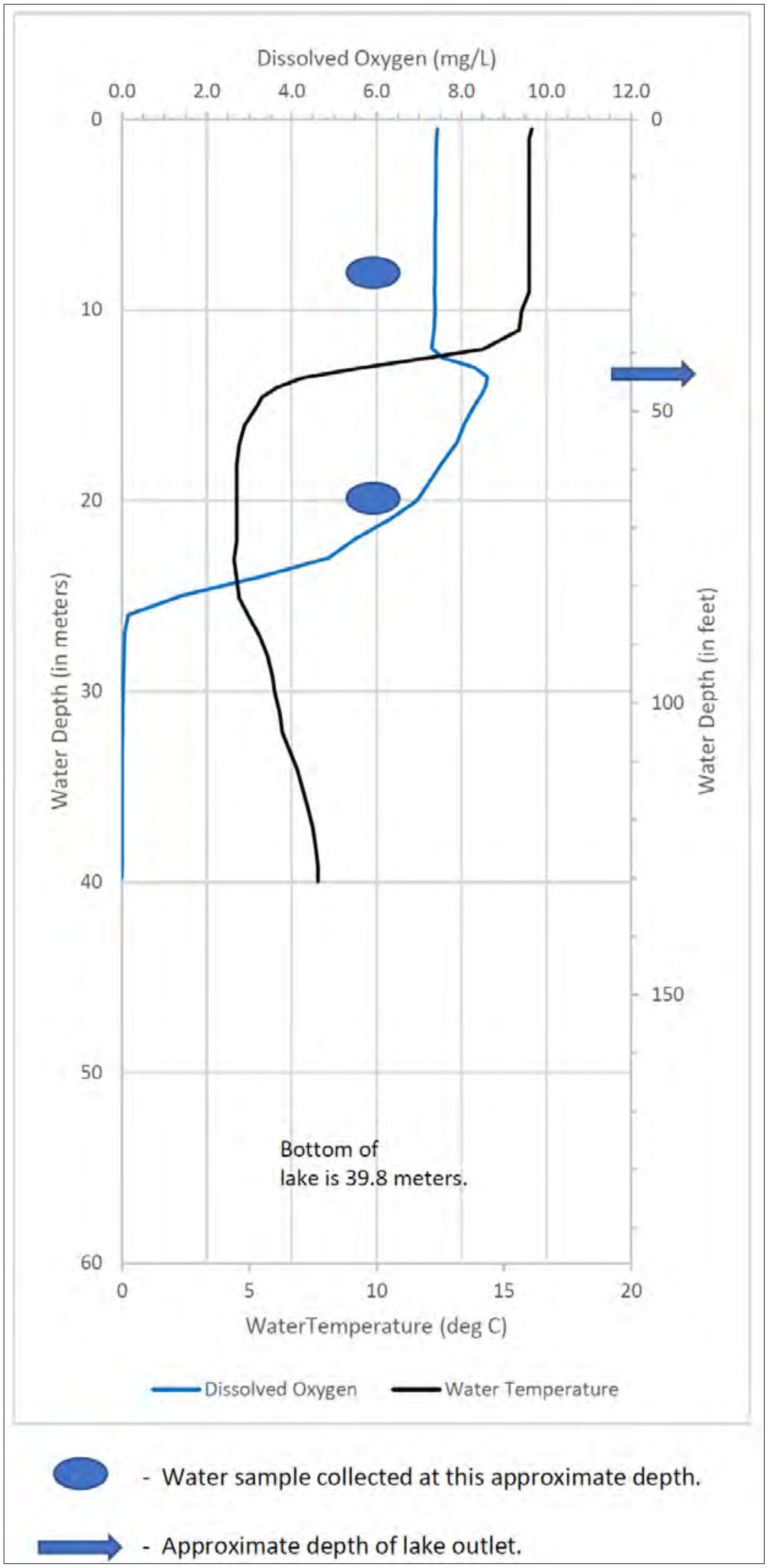


Figure 5.1-3 South Lake – Dissolved Oxygen and Water Temperature Profile – August 2021

5.1.1.4. September 2021

The DO and water temperature profile was conducted on September 21, 2021, at the deepest point in South Lake. The maximum depth at the profile point on September 21, 2021, was 35.1 meters (115.2 feet) with a lake surface elevation of 9648.37 feet msl. DO ranged from 8.94 mg/L at a depth of 9.25 meters (30.3 feet) BWS and 0.00 mg/L at a depth of 33 meters (108.3 feet) BWS. DO saturation was above 100 percent in the upper portion of the lake. DO saturation declined sharply to less than 5 percent at 20 meters (65.6 feet) BWS (see Appendix C, Table C-4). A thermocline was identified at approximately 8 - 10 meters (26.2 – 32.8 feet) BWS. Figure 5.1-4 presents a profile of DO and water temperature over the surveyed water column and Appendix C (Table C-4) presents the individual values recorded for each depth interval.

5.1.1.5. October 2021

The DO and water temperature profile was conducted on October 5, 2021, at the deepest point in South Lake. The maximum depth at the profile point on October 5, 2021, was 32.5 meters (106.5 feet) with a lake surface elevation of 9641.70 feet msl. DO ranged from 8.51 mg/L at a depth of 9.5 meters (31.2 feet) BWS and 0.04 mg/L at a depth of 32.5 meters (106.6 feet) BWS. DO saturation was above 100 percent in the upper portion of the lake. DO saturation declined sharply to less than 5 percent at 18 meters (59.1 feet) BWS (see Appendix C, Table C-5). A thermocline was identified at approximately 7 - 10 meters (23.0 – 32.8 feet) BWS. Figure 5.1-5 presents a profile of DO and water temperature over the surveyed water column and Appendix C (Table C-5) presents the individual values recorded for each depth interval.

5.1.1.6. Summary

The DO and water temperature profiles for South Lake were similar for each monitoring period throughout the summer and early fall. Each exhibited elevated DO readings in the upper two thirds of the lake and extremely low DO readings in the bottom portion of the lake (approximately 12 meters below the outlet). When compared to the previous monitoring period, the ranges for DO in 2021 were similar to ranges observed in 2020 (see Table 5.1-1).

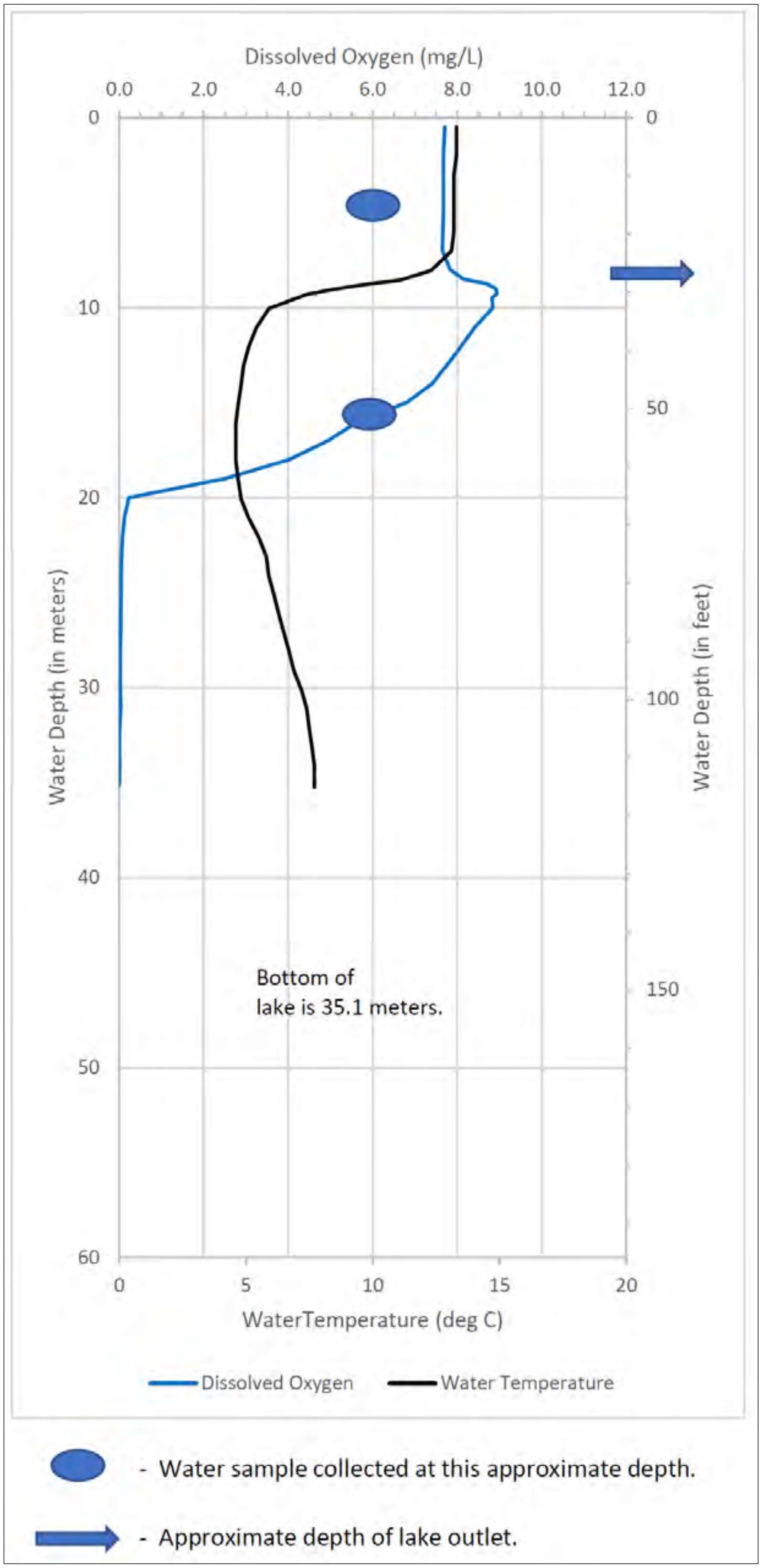


Figure 5.1-4 South Lake – Dissolved Oxygen and Water Temperature Profile – September 2021

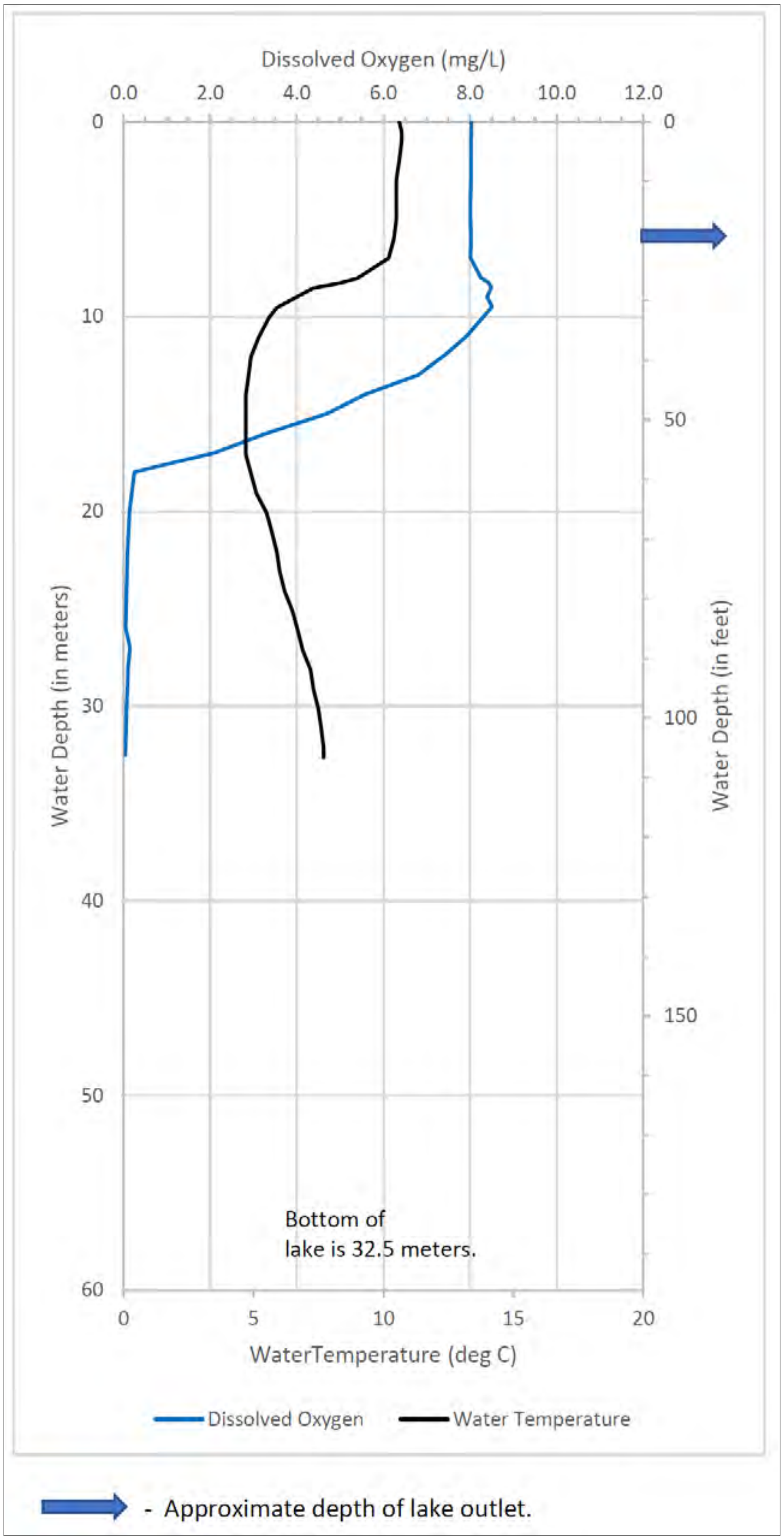


Figure 5.1-5 South Lake – Dissolved Oxygen and Water Temperature Profile – October 2021

Table 5.1-1 Summary of Dissolved Oxygen Levels in South Lake from Vertical Transects

Year (a)	Lake Surface Elevation Range (ft msl)	Range of Dissolved Oxygen above/below Outlet (b)		
		Position (c)	Maximum	Minimum
2020	9747.82 – 9734.02	Above	9.61	7.07
		Below	8.55	0.00
2021	9693.20 – 9641.70	Above	9.53	7.30
		Below	8.94	0.00

Notes:
a – Five transects were conducted in each calendar year.
b – From instantaneous measurements at 1 meter intervals from lake surface to bottom of survey/lake.
c – Position above or below lake outlet.

Except for the decrease in lake level elevation observed in 2021 versus 2020, the graph for DO versus elevation were similar between monitoring periods (see Figure 5.1-6).

The very low DO readings and the rise in water temperature in the lower portion of the lake (see Figure 5.1-6) is suggestive of a stratified lake. Boehrer and Schultze (2008) indicated that meromictic lakes can occur when chemically different bottom layer, called a monimolimnion, has continuously been present for a least one annual cycle. Higher concentrations of dissolved substances have increased density sufficiently to resist deep recirculation and the exchange rates with the mixolimnion (the freely circulating upper layer of a meromictic lake) are small enough that chemically different conditions are sustained continuously. Figure 5.1-7 presents an example of DO, water temperature and conductivity with depth in a meromictic lake observed in Germany's Former Mining Area of Merseburg-Ost. As the stratification remained into the 2021 monitoring period, this suggests that South Lake for the monitoring period of 2020-2021 indicates that South Lake is exhibiting the characteristics of a meromictic lake.

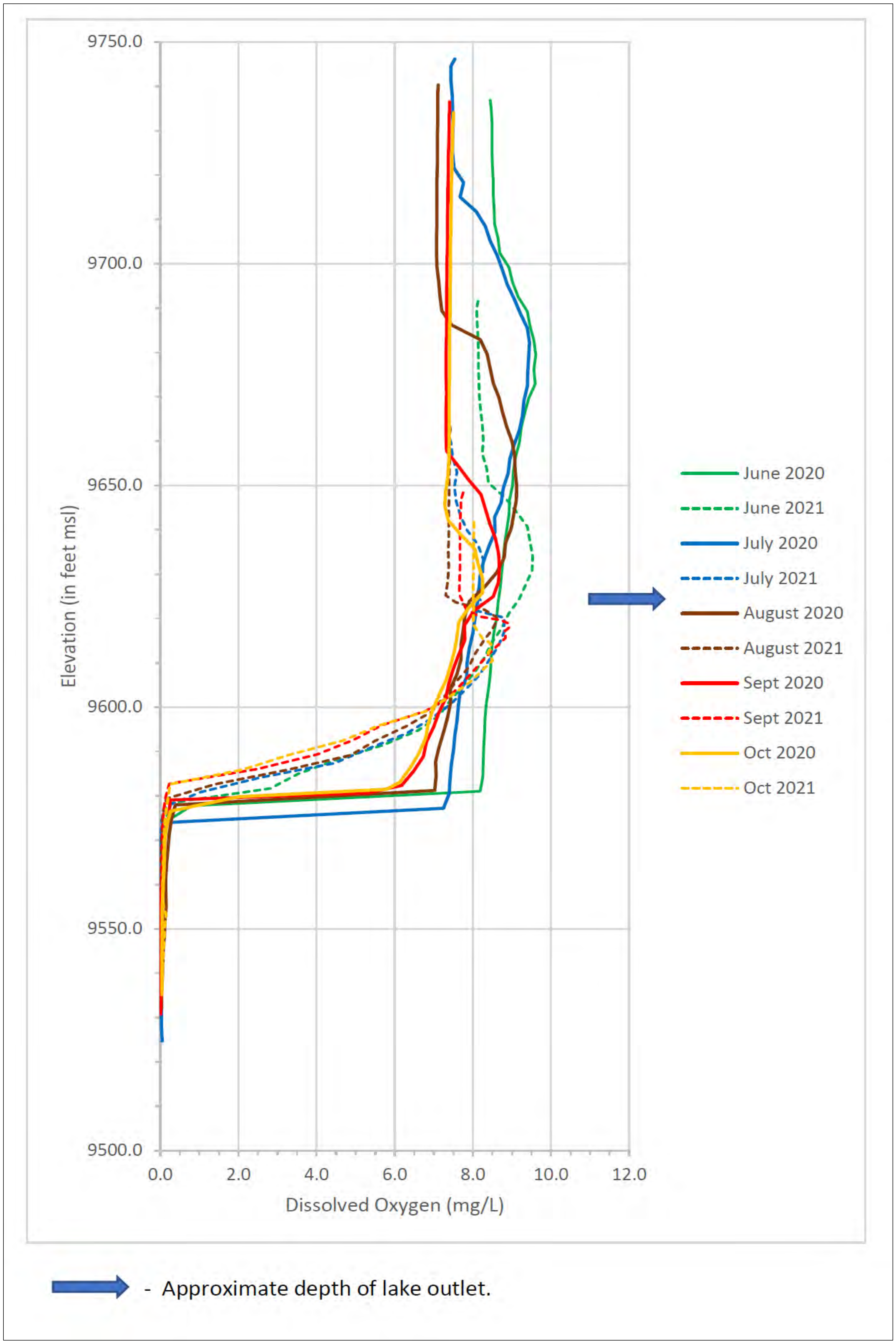
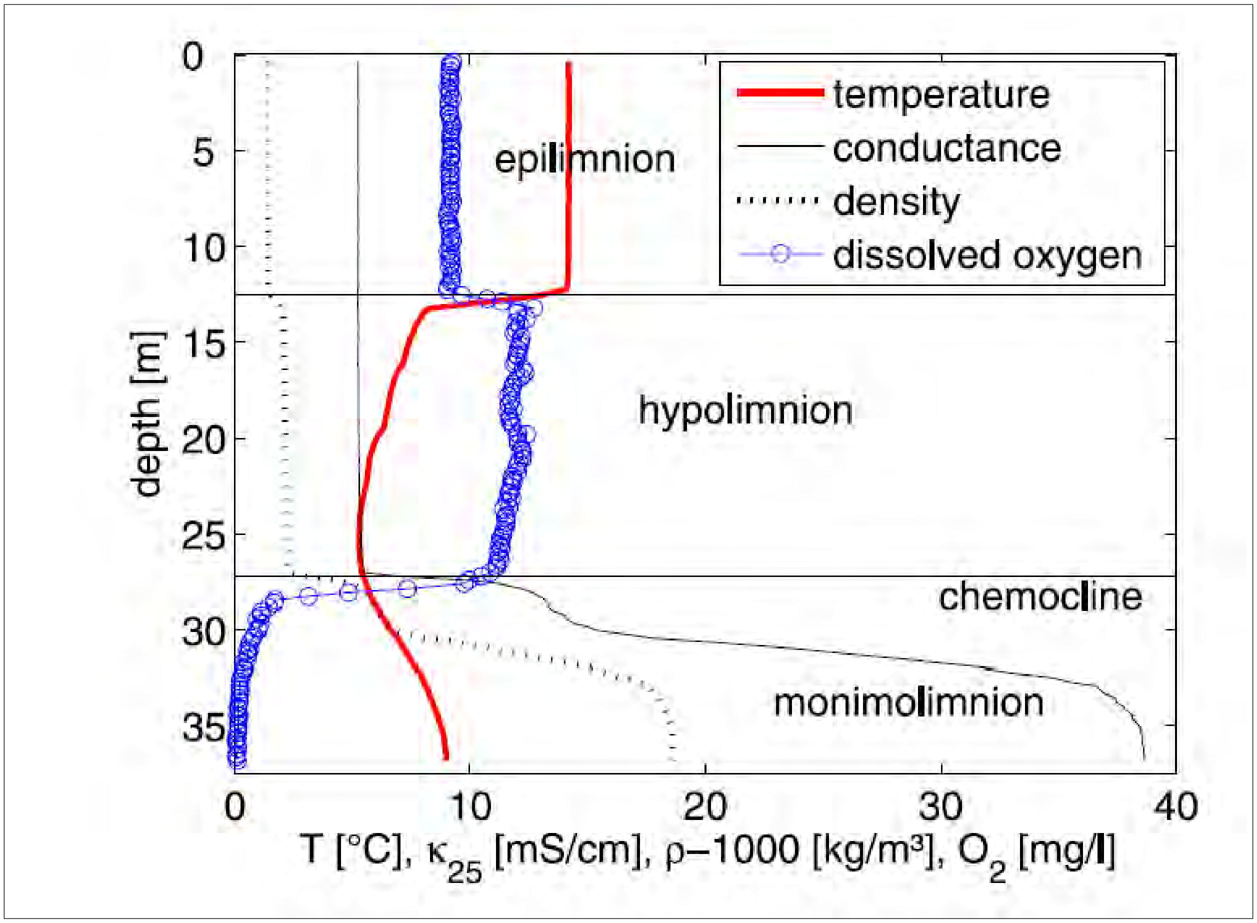


Figure 5.1-6 South Lake - Comparison of 2020 to 2021 Vertical DO Profiles with Lake Elevation



Source: Boehrer & Schultze 2008

Figure 5.1-7 DO, Water Temperature and Conductivity in a Meromictic Lake in Rassnitzer in Former Mining Area Merseburg-Ost, Germany

5.1.2. General Water Quality of South Lake

5.1.2.1. 2021 Monitoring Period

Field water quality testing and laboratory water quality samples were collected during the same time periods that DO profiles were conducted and are presented in Table 5.1-2. Field measurements indicated Secchi disk depth ranged from 6.25 – 13.5 meters BWS between June and October sampling periods. A thermocline was not identified in the June sampling period however thermoclines were detected in the subsequent monitoring periods and ranged from 7 – 10 meters in the October sampling period to 15 – 18 meters in the July sampling period. The following water quality measurements are based on collection of measurements above and below the observed thermoclines (which also corresponds to above and below the outlet of the lake).

Conductivity ranged from 30 microSiemens/cm (µS/cm) to 40 µS/cm in the shallow sampling zone and 68 µS/cm to 2,230 µS/cm in the deeper sampling zone. Laboratory water quality analysis indicated values of TDS ranging from not detected (ND) <10 mg/L to 40 mg/L in the shallow sampling zone (above the thermocline) to 36 mg/L to 1,300 mg/L in the deeper sampling zone (below the thermocline).

Nitrate as Nitrogen (NO_3-N) was ND<0.110 - <0.230 for all samples collected in South Lake. Total nitrogen as N ranged from ND<0.10 to 0.17 mg/L in the shallow sampling zone to ND<0.10 mg/L to 5.5 mg/L in the deeper sampling zone. Orthophosphate as phosphorus (PO_4-P) was not detected in all samples from the shallow sampling zone and ranged from ND<0.010 mg/L to 0.12 mg/L in the deeper sampling zone.

5.1.2.2. Comparison to 2020 Monitoring Period

During the 2020 monitoring period, total dissolved solids (TDS) ranged from ND<10 mg/L to 1,100 mg/L for all samples with an average of 18 mg/L for samples collected above the outlet. During the 2021 monitoring period, TDS values were similar ranging from ND<10 mg/L to 1,300 mg/L for all samples with an average of 21.5 mg/L for samples collected above the outlet. Total Nitrate as Nitrogen (NO3-N) was not detected in any samples for both monitoring periods. Total Nitrogen (Total-N) was detected and ranged from ND<0.30 mg/L to 5.2 mg/L with an average of ND<0.30 mg/L for samples collected above the outlet in the 2020 monitoring period. Total-N had similar values in the 2021 monitoring period and ranged from ND<0.10 mg/L to 5.5 mg/L for all samples with an average of 0.108 mg/L for samples collected above the outlet. Ortho-Phosphate as P (PO4-P) ranged from ND<0.01 mg/L to 0.17 mg/L with an average on ND<0.01 mg/L for samples collected above the outlet in the 2020 monitoring period. PO4-P had similar values in the 2021 monitoring period ranging from ND<0.01 mg/L to 0.12 mg/L with all samples collected above the outlet reporting ND<0.01 mg/L (see Table 5.1-2).

5.1.3. Bacteriological

Bacteriological samples were collected between July 1 and August 15, 2021 and analyzed for *E. coli*. A total of seven samples were collected with all samples reporting non-detect at ND<1.0 most probable number in 100 milliliters (MPN/100ml) and are presented in Table 5.1-3.

5.1.3.1. Comparison to Basin Plan Objectives

For samples collected above the outlet, TDS averaged 18 mg/L for the 2020 monitoring period and 21.5 mg/L for the 2021 monitoring period which are both above the basin objective for South Lake of 12 mg/L. Considering that South Lake is a headwaters lake in the Bishop Creek drainage, the elevated number appears to reflect background conditions and the original basin plan objectives for South Lake are indicative of limited data used to establish the water quality objectives for South Lake.

NO3-N was not detected in any samples for both monitoring periods. Total-N was not detected in the 2020 monitoring period and averaged 0.1 mg/L for the 2021 monitoring period and equal to the South Lake basin plan objective of 0.1 mg/L. PO4-P was detected but all values were below basin plan objectives for samples collected above the outlet (Table 5.1-1).

Table 5.1-1 Summary of Laboratory Results for South Lake for Samples collected above the Outlet Depth for 2020-2021 Monitoring Periods

Year	Parameter	Total Dissolved Solids (mg/L)	Nitrate as N (mg/L)	Total Nitrogen (mg/L)	Ortho phosphate as P (mg/L)
2020	Maximum	33	ND<0.110	ND<0.30	0.011
	Minimum	ND<10	ND<0.110	ND<0.30	ND<0.010
	Average*	18	ND<0.110	ND<0.30 (ND<0.10)**	ND<0.010
2021	Maximum	40	ND<0.110	0.17	ND<0.010
	Minimum	ND<10	ND<0.110	ND<0.10	ND<0.010
	Average*	21.5	ND<0.110	0.11	ND<0.010
Basin Objective (annual average/90th percentile)		12/20	0.1/0.1	0.1/0.4	0.03/0.04

Notes:
* Arithmetic average is for all samples collected. For samples with ND values, 1/2 of the ND value was used to calculate average when more than one sample had detectable values, otherwise the ND value was used.
** Data collected during 2020 and 2021 have indicated that TKN makes up the entire amount of Total-N. The average for TKN is used as an average for the 2020 period.

Table 5.1-2 Field Water Quality Measurements and Laboratory Results of South Lake Samples, June - October 2021

							POSITION IN RELATION TO OUTLET		FIELD MEASUREMENTS (a)		LABORATORY ANALYSIS					
													Total Nitrogen			
YEAR	SAMPLE DESIGNATION	DATE	TIME	LAKE SURFACE ELEVATION (b) (ft msl)	THERMO-CLINE	SAMPLE DEPTH (meters)	Outlet Depth (meters)	Above/Below Outlet	Secchi Disk Depth (meters)	Conductivity (µS/cm @25°C)	Total Dissolved Solids (mg/L)	Nitrate as N (mg/L)	Total Nitrogen (mg/L)	Nitrite + Nitrate as N (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Ortho phosphate as P (mg/L)
2020	SL-DP-5	6/15/2020	9:15	9738.50	No	5	36	above	10.5	30	15	ND<0.110	ND<0.30	ND<0.200	ND<0.10	ND<0.010
	SL-DP-31.5	6/15/2020	9:00			31.5	36	above		110	16	ND<0.110	ND<0.30	ND<0.200	ND<0.10	0.011
	SL-DP-4	7/28/2020	10:30	9747.82	No	4	39	above	8.5	30	ND<10	ND<0.110	ND<0.30	ND<0.200	ND<0.10	ND<0.010
	SL-DP-54	7/28/2020	10:05			54	39	below		1,880	1,100	ND<0.110	5.2	ND<0.200	5.2	0.17
	SL-DP-15	8/25/2020	12:20	9741.96	Yes, 17-18 meters	15	37	above	11.75	40	30	ND<0.110	ND<0.30	ND<0.200	ND<0.10	ND<0.010
	SL-DP-20	8/25/2020	11:55			20	37	above		70	33	ND<0.110	ND<0.30	ND<0.200	ND<0.10	ND<0.010
	SL-DP-20	9/23/2020	12:05	9736.50	Yes, 34-35 meters	20	35	above	9.75	37	10	ND<0.110	ND<0.30	ND<0.200	ND<0.10	ND<0.010
	SL-DP-42	9/23/2020	12:50			42	35	below		53	31	ND<0.110	ND<0.30	ND<0.200	ND<0.10	ND<0.010
	(c)	10/5/2020	(c)	9734.02	Yes, 28-35 meters	(c)	(c)	(c)	12.0	(c)						
										Maximum	1,100	ND<0.110	5.2 (e)	ND<0.200	ND<0.10	0.17 (e)
										Minimum	ND<10	ND<0.110	ND<0.30	ND<0.200	ND<0.10	ND<0.010
										Arithmetic Average (d)	18	ND<0.110	ND<0.30	ND<0.200	ND<0.10	0.011
2021	SL-DP-7	6/16/2021	10:30	9693.20	No	7	22	above	13.5	37	40	ND<0.230	ND<0.10	ND<0.200	ND<0.10	ND<0.010
	SL-DP-40	6/16/2021	11:00			40	22	below		2,230	1,300	ND<0.110	5.5	ND<0.200	5.5	0.12
	SL-DP-10	7/27/2021	9:45	9676.00	Yes, 15-18 meters	10	17	above	8.75	31	23	ND<0.110	0.17	ND<0.200	0.17	ND<0.010
	SL-DP-24	7/27/2021	10:15			24	17	below		73	36	ND<0.110	0.15	ND<0.200	0.15	ND<0.010
	SL-DP-8	8/23/2021	10:30	9664.61	Yes, 11-14 meters	8	13	above	8.75	40	18	ND<0.110	0.16	ND<0.200	0.16	ND<0.010
	SL-DP-20	8/23/2021	11:05			20	13	below		68	46	ND<0.110	ND<0.10	ND<0.200	ND<0.10	0.029
	SL-DP-4	9/21/2021	10:25	9648.37	Yes, 8-10 meters	4	8	above	6.25	30	ND<10	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
	SL-DP-16	9/21/2021	10:50			16	8	below		90	42	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
	(c)	10/5/2021	(c)	9641.70	Yes, 7-10 meters	(c)	(c)	(c)	(c)	(c)						
										Maximum	1,300	ND<0.230	5.5 (e)	ND<0.200	5.5 (e)	0.12 (e)
										Minimum	ND<10	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
										Arithmetic Average (d)	21.5	ND<0.110	0.108	ND<0.200	0.108	ND<0.010
										Basin Objective (annual average/90th percentile)	12/20	0.1/0.1	0.1/0.4	---	---	0.03/0.04

Notes:
a – for dissolved oxygen and water temperature, see vertical profiles
b – at time of sampling
c – no laboratory water quality sample collected
d – average is for samples collected above the outlet. For samples with ND values, ½ of the ND value was used to calculate average when more than one sample had a detectable value, otherwise the ND value was used.
e – maximum values for these constituencies were collected below the outlet
ND = not detected at the indicated detection limit

Table 5.1-3 Summary of Water Quality Analysis for *E. Coli* from Various Lakes in the Bishop Creek Watershed July 1 - August 15, 2020 and 2021

DATE	*E. COLI* (MPN/100 ml)		
	South Lake Boat Ramp	Lake Sabrina Boat Ramp	Intake 2 Reservoir
7/13/2020 (a)	ND<1.0	ND<1.0	24
7/16/2020	1.0	ND<1.0	3.1
7/27/2020	ND<1.0	ND<1.0	18
7/30/2020	ND<1.0	ND<1.0	6.3
7/31/2020	ND<1.0	ND<1.0	6.3
8/3/2020	ND<1.0	ND<1.0	ND<1.0
8/5/2020	ND<1.0	3.1	1.0
2020 Maximum	1.0	3.1	24
2020 Minimum	ND<1.0	ND<1.0	ND<1.0
2020 Geometric Mean (b)	1.0	1.21	4.73
7/12/2021 (a)	ND<1.0	ND<1.0	28
7/15/2021	ND<1.0	ND<1.0	8.6
7/26/2021	ND<1.0	310 (c)	2.0
7/28/2021	ND<1.0	6.3	4.1
7/29/2021	ND<1.0	180 (c)	210 (c)
8/2/2021	ND<1.0	17	6.3
8/5/2021	ND<1.0	3.1	5.2
2021 Maximum	ND<1.0	310	210
2021 Minimum	ND<1.0	ND<1.0	2.0
2021 Geometric Mean (b)	ND<1.0	16.3	8.86
Inland Surface Water Objective	100/320 (d)		

Notes:
a – The initial sampling dates were excluded from the geometric mean calculation as the samples were analyzed outside of the holding time of 24 hours.
b – For samples with ND values, ND value of 1 was used to calculate the geometric mean when more than one sample had a detectable value, otherwise the ND value was used.
c – qPCR analysis was conducted on this sample and the laboratory reported Non-Detect at the method detection limit of 150 human biomarkers per 100 ml. No human DNA was detectable.
d – From Basin Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California: Geometric Mean/Maximum

5.2. Lake Sabrina

5.2.1. Dissolved Oxygen and Water Temperature Profiles

5.2.1.1. June 2021

A DO and water temperature profile was conducted on June 17, 2021, at the deepest point in Lake Sabrina. The maximum depth achieved at the profile point on June 17, 2020, was 65.3 meters (214.2 feet) with a lake surface elevation of 9099.50 feet msl. DO ranged from 10.16 mg/L at a depth of 14 meters (45.9 feet) BWS and 4.70 mg/L at a depth of 65.3 meters (214.2 feet) BWS. A thermocline was identified between 8-10 meters (26.2 feet and 32.8 feet) BWS. Figure 5.2-1 presents a profile of DO and water temperature over the surveyed water column and Appendix C (Table C-6) presents the individual values recorded for each depth interval.

5.2.1.2. July 2021

The DO and water temperature profile was conducted on July 28, 2021, at the deepest point in Lake Sabrina. The maximum depth at the profile point on July 28, 2021, was 63 meters (206.7 feet) with a lake surface elevation of 9098.58 feet msl. DO ranged from 9.77 mg/L at a depth of 13 meters (42.7 feet) BWS and 4.33 mg/L at a depth of 63 meters (206.7 feet) BWS. DO saturation was above 100 percent in the upper portion of the lake. DO saturation gradually declined to less than 60 percent at 59 meters (193.6 feet) BWS (see Appendix C, Table C-7). A thermocline was identified between 7 – 11 meters (23.0 feet and 36.1 feet) BWS. Figure 5.2-2 presents a profile of DO and water temperature over the surveyed water column and Appendix C (Table C-7) presents the individual values recorded for each depth interval.

5.2.1.3. August 2021

A DO and water temperature profile was conducted on August 24, 2021, at the deepest point in Lake Sabrina. The maximum depth at the profile point on August 24, 2021, was 62.2 meters (204.1 feet) with a lake surface elevation of 9099.31 feet msl. DO ranged from 10.41 mg/L at a depth of 12 meters (39.4 feet) BWS and 4.23 mg/L at a depth of 62.2 meters (204.1 feet) BWS. DO saturation was above 100 percent in the upper portion of the lake. DO saturation gradually declined to less than 60 percent at 60 meters (196.8 feet) BWS (see Appendix C, Table C-8). A thermocline was identified between 9 – 11 meters (29.5 – 36.1 feet) BWS. Figure 5.2-3 presents a profile of DO and water temperature over the surveyed water column and Appendix C (Table C-8) presents the individual values recorded for each depth interval.

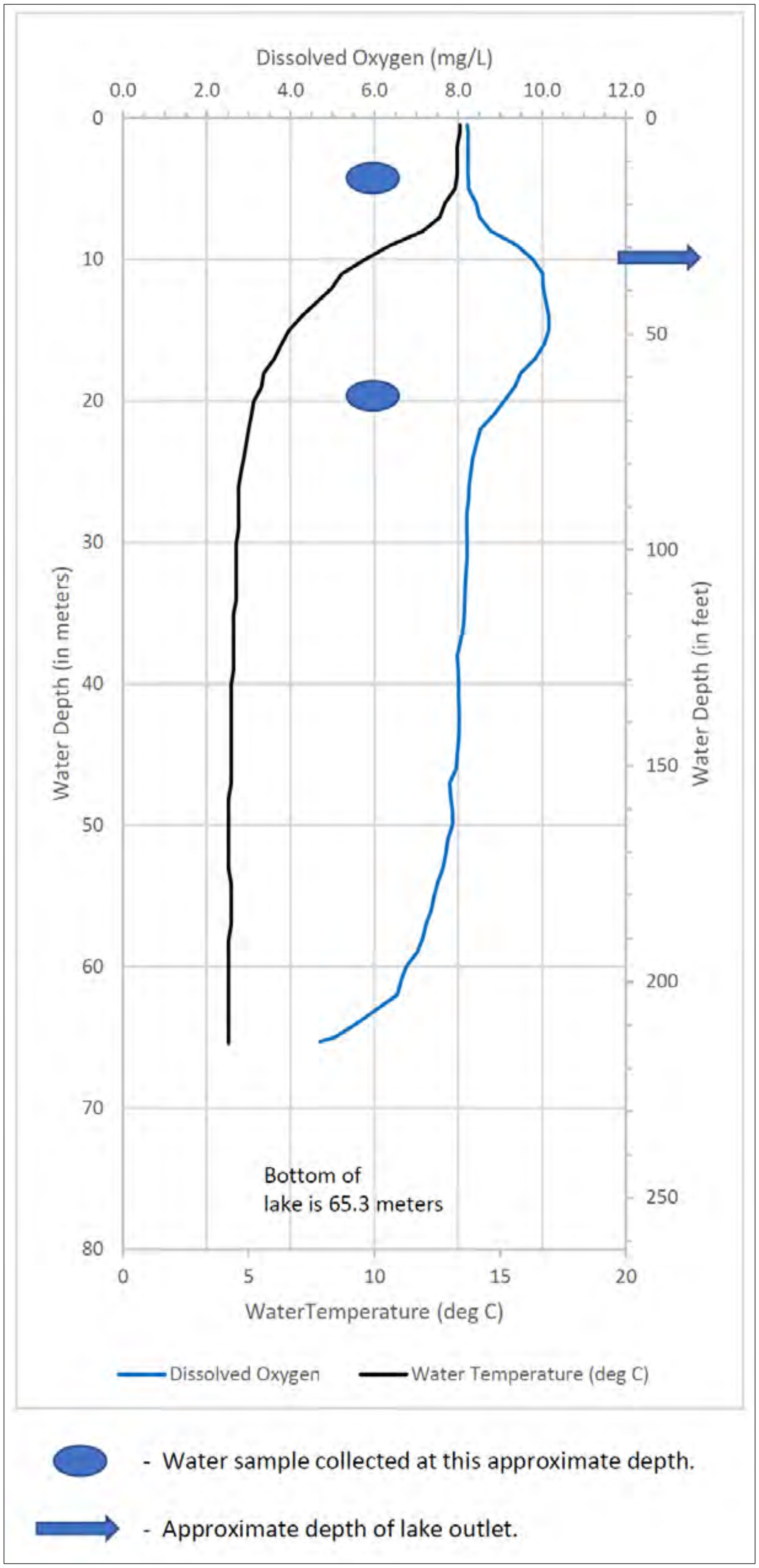


Figure 5.2-1 Lake Sabrina Dissolved Oxygen and Water Temperature Profile – June 2021

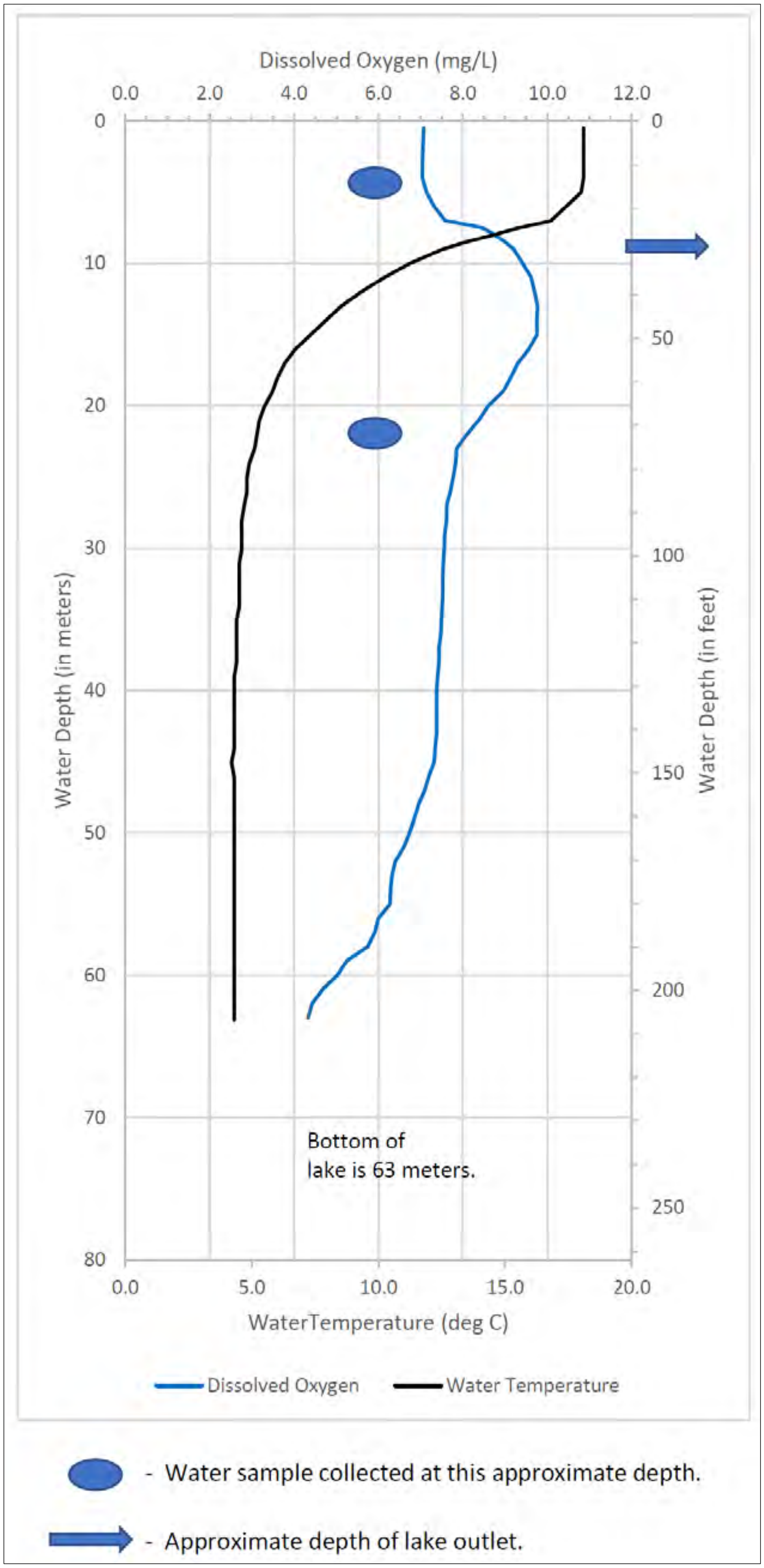


Figure 5.2-2 Lake Sabrina Dissolved Oxygen and Water Temperature Profile – July 2021

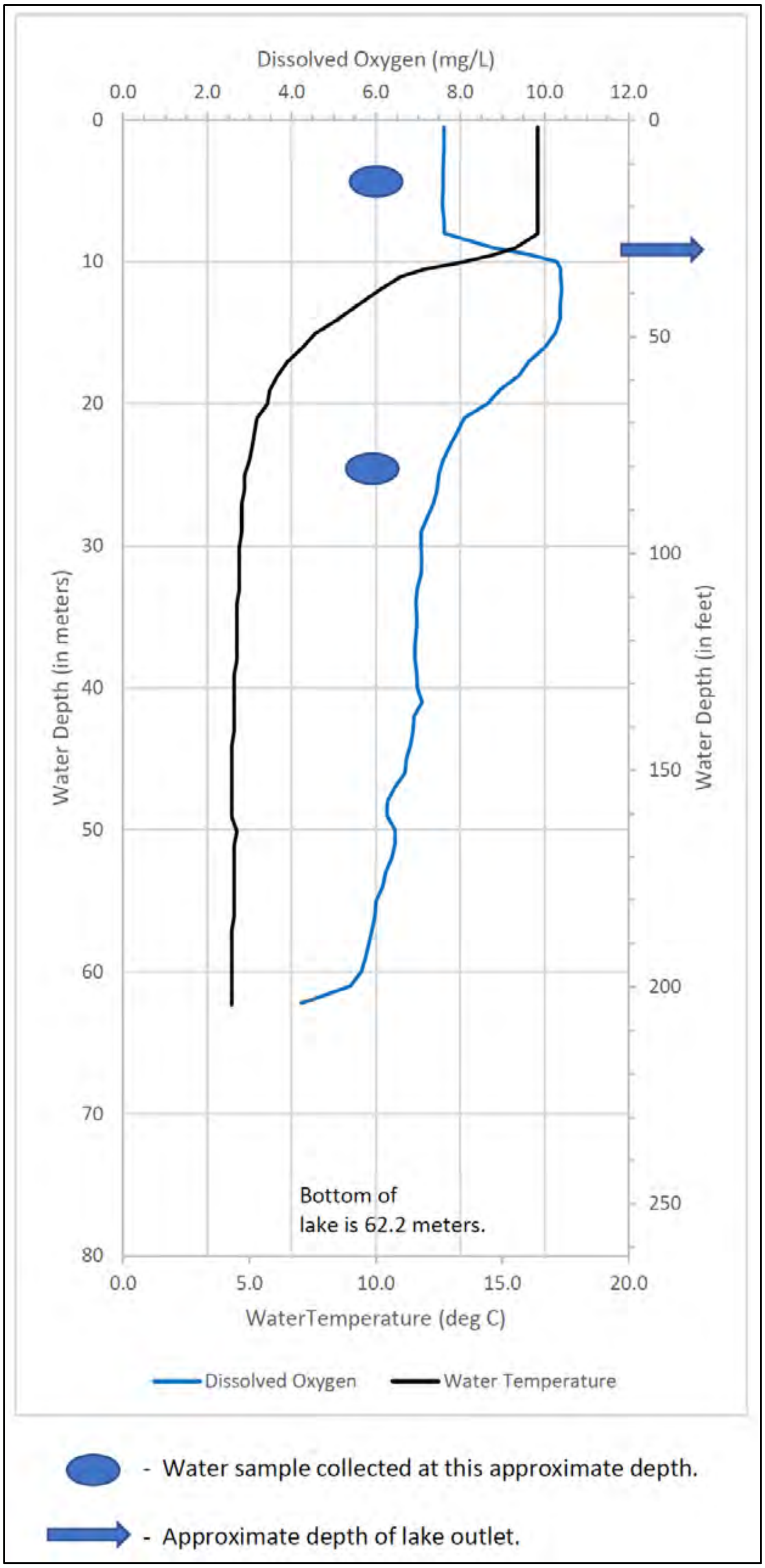


Figure 5.2-3 Lake Sabrina Dissolved Oxygen and Water Temperature Profile – August 2021

5.2.1.4. September 2021

A DO and water temperature profile was conducted on September 20, 2021, at the deepest point in Lake Sabrina. The maximum depth at the profile point on September 20, 2021, was 62.9 meters (206.4 feet) with a lake surface elevation of 9096.74 feet msl. DO ranged from 10.31 mg/L at a depth of 13 meters (42.7 feet) BWS and 2.17 mg/L at a depth of 62.9 meters (206.4 feet) BWS. DO saturation was above 100 percent in the upper portion of the lake. DO saturation gradually declined to less than 60 percent at 52 meters (170.6 feet) BWS (see Appendix C, Table C-9). A thermocline was identified between 11 – 16 meters (36.1 feet and 52.5 feet) BWS. Figure 5.2-4 presents a profile of DO and water temperature over the surveyed water column and Appendix C (Table C-9) presents the individual values recorded for each depth interval.

5.2.1.5. October 2021

A DO and water temperature profile was conducted on October 5, 2021, at the deepest point in Lake Sabrina. The maximum depth at the profile point on October 5, 2021, was 63.5 meters (208.3 feet) with a lake surface elevation of 9095.09 feet msl. DO ranged from 10.14 mg/L at a depth of 14 meters (45.9 feet) BWS and 0.11 mg/L at a depth of 63.5 meters (208.3 feet) BWS. DO saturation was above 100 percent in the upper portion of the lake. DO saturation gradually declined to less than 10 percent at 63 meters (206.7 feet) BWS (see Appendix C, Table C-10). A thermocline was identified between 12 – 14 meters (39.4 feet and 45.9 feet) BWS. Figure 5.2-5 presents a profile of DO and water temperature over the surveyed water column and Appendix C (Table C-10) presents the individual values recorded for each depth interval.

5.2.1.6. Summary

The DO and water temperature profiles for Lake Sabrina were similar for each monitoring period throughout the summer and early fall. Each exhibited elevated DO readings in the upper two thirds of the lake and a gradual decline in DO near the bottom portion of the lake (well below the lake outlet). When compared to the previous monitoring period, the ranges for DO in 2021 were similar to ranges observed in 2020 (see Table 5.2-1).

Table 5.2-1 Summary of Dissolved Oxygen Levels in Lake Sabrina from Vertical Transects

Year (a)	Lake Surface Elevation Range (ft msl)	Range of Dissolved Oxygen above and below Outlet (b)		
		Position (c)	Maximum	Minimum
2020	9118.62 – 9108.97	Above	9.87	7.00
		Below	10.03	0.05
2021	9099.50 – 9095.09	Above	9.78	7.04
		Below	10.41	0.11

Notes:
a – Five transects were conducted in each calendar year.
b – From instantaneous measurements at 1-meter intervals from lake surface to bottom of survey/lake.
c – Position above or below lake outlet.

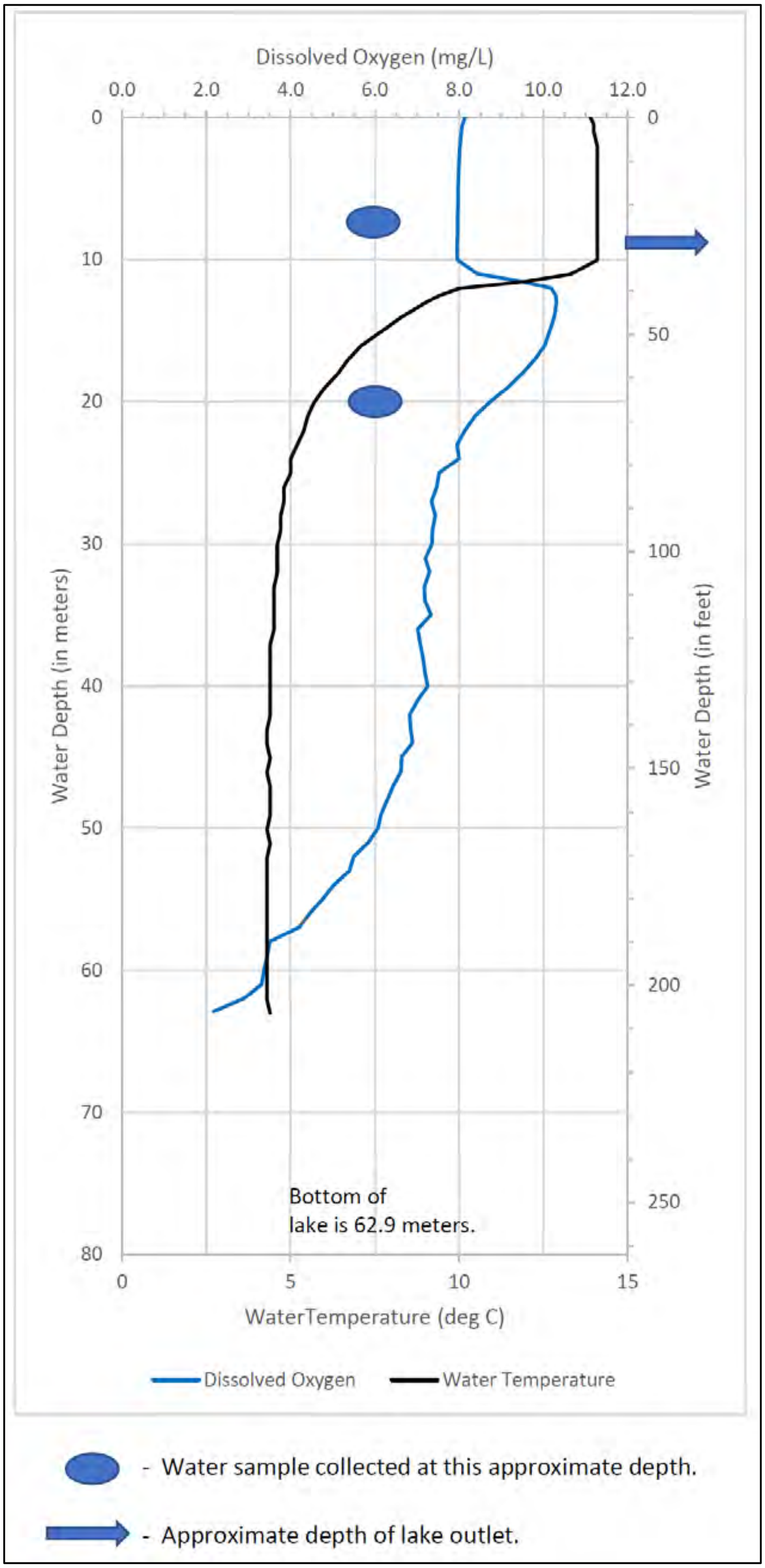


Figure 5.2-4 Lake Sabrina – Dissolved Oxygen and Water Temperature Profile – September 2021

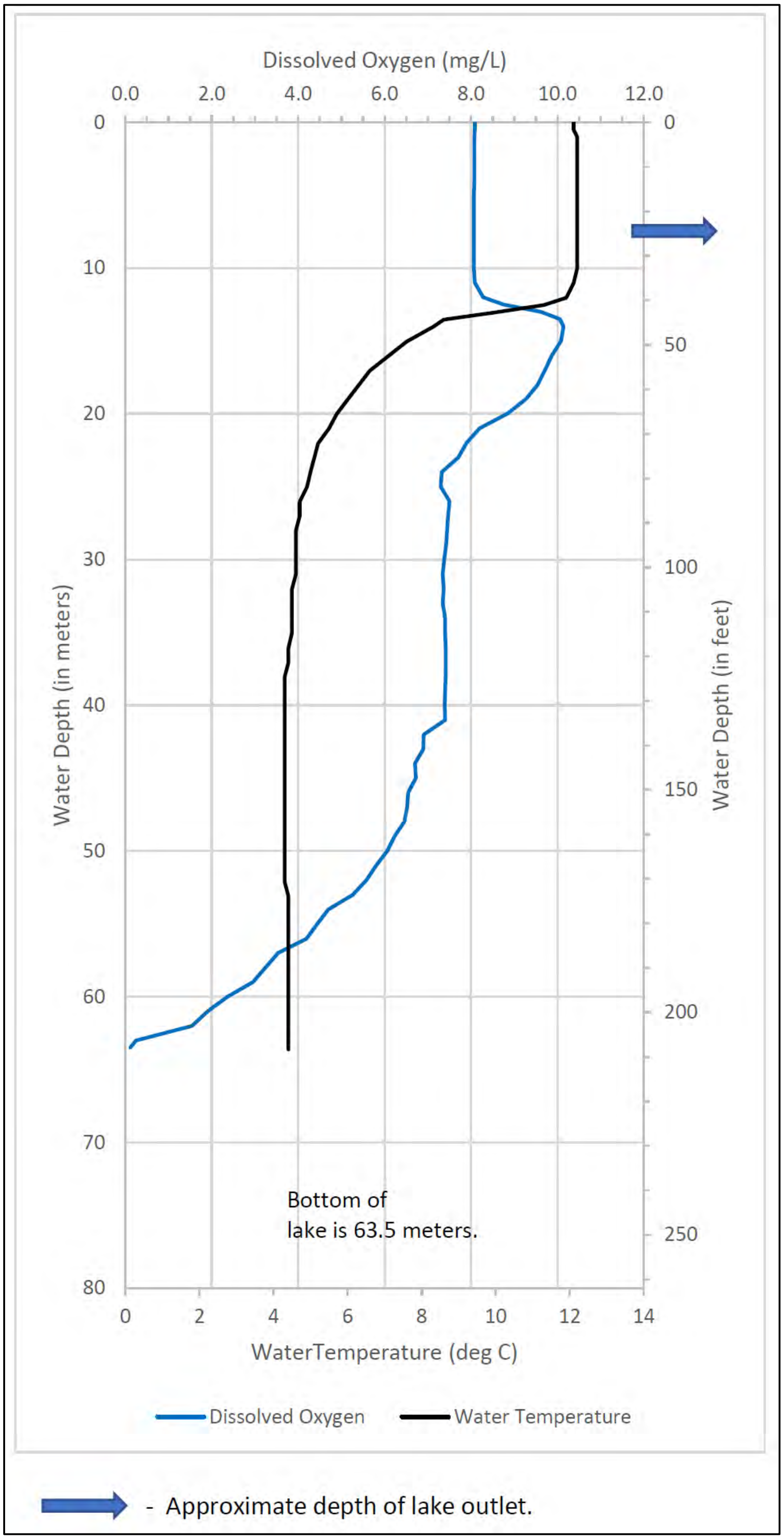


Figure 5.2-5 Lake Sabrina – Dissolved Oxygen and Water Temperature Profile – October 2021

Except for the decrease in lake level elevation observed in 2021 versus 2020, the graph for DO versus elevation were similar between monitoring periods (see Figure 5.2-6).

5.2.2. General Water Quality of Lake Sabrina

5.2.2.1. 2021 Monitoring Period

Field water quality testing and laboratory water quality samples were collected during the same time periods that DO profiles were conducted and are presented in Table 5.2-2. Field measurements indicated Secchi disk depth of 8.75 – 12.25 meters between June and October sampling periods. Thermoclines were identified during all sampling periods and ranged from 7 – 11 meters in the July sampling period and 11 – 16 meters during the September sampling period. The following measurements are based on collection of measurements above and below the observed thermoclines (which also corresponds to above and below the outlet). Conductivity ranged from 23 - 34 µS/cm in the shallow zone (above the thermocline) to 26 – 30 µS/cm in the deeper zone (below the thermocline).

Laboratory water quality analysis for all sampling periods indicated very low values of TDS ranging from 12 mg/L to 19 mg/L in the shallow sampling zone and 14 mg/L to 24 mg/L in the deeper zone.

NO_3-N was ND<0.110 for all samples collected in Lake Sabrina. Total nitrogen as N ranged from ND<0.10 mg/L to 0.11 mg/L in the shallow sampling zone and ND<0.10 mg/L to 0.15 mg/L in the deeper sampling zone. PO_4-P was not detected at ND<0.010 mg/L for all samples collected.

5.2.2.2. Comparison to 2020 Monitoring

During the 2020 monitoring period, TDS ranged from 11 mg/L to 39 mg/L for all samples with an average of 21 mg/L for samples collected above the outlet. During the 2021 monitoring period, TDS values were similar ranging from 12 mg/L to 24 mg/L for all samples with an average of 16 mg/L for samples collected above the outlet. NO3-N was not detected in any samples for both monitoring periods. Total-N was detected and ranged from ND<0.30 mg/L to 0.52 mg/L for all samples with an average of ND<0.30 mg/L for samples collected above the outlet in the 2020 monitoring period. Total-N had similar values in the 2021 monitoring period and ranged from ND<0.10 mg/L to 0.11 mg/L for all samples with an average of ND<0.10 mg/L for samples collected above the outlet. PO4-P was detected once at 0.022 mg/L during the 2020 monitoring period for all samples. PO4-P was not detected in the 2021 monitoring period. Table 5.2-2 presents a summary of the laboratory results for Lake Sabrina.

5.2.2.3. Comparison to Basin Plan Objectives

For samples collected above the outlet, TDS averaged 21 mg/L for the 2020 monitoring period and 16 mg/L for the 2021 monitoring period which are both above the basin plan objective for Lake Sabrina of 10 mg/L. Considering that Lake Sabrina is a headwaters lake in the Bishop Creek drainage, the elevated number appears to reflect background conditions and the original basin objectives for Lake Sabrina are indicative of limited data used to establish the original water quality objectives.

NO3-N was not detected in any samples for both monitoring periods. Total-N was not detected in the 2020 monitoring period and was detected only once at 0.11 mg/L and averaged ND<0.1 mg/L for the 2021 monitoring period and below the Lake Sabrina basin objective of 0.3 mg/L. PO4-P was detected once but all values were below basin objectives for samples collected above the outlet (Table 5.2-2).

Table 5.2-2 Summary of Laboratory Results for Lake Sabrina for Samples collected above the Outlet Depth for 2020-2021 Monitoring Periods

Year	Parameter	Total Dissolved Solids (mg/L)	Nitrate as N (mg/L)	Total Nitrogen (mg/L)	Ortho phosphate as P (mg/L)
2020	Maximum	31	ND<0.110	ND<0.30	0.022
	Minimum	11	ND<0.110	ND<0.30	ND<0.010
	Average*	21	ND<0.110	ND<0.30 (0.1)**	ND<0.010
2021	Maximum	19	ND<0.110	0.17	ND<0.010
	Minimum	12	ND<0.110	ND<0.10	ND<0.010
	Average*	16	ND<0.110	ND<0.10	ND<0.010
Basin Objective (annual average/90th percentile)		10/17	0.2/0.3	0.3/0.6	0.03/0.05

Notes:
* Arithmetic average is for all samples collected. For samples with ND values, 1/2 of the ND value was used to calculate average when more than one sample had detectable values, otherwise the ND value was used.
** Data collected during 2020 and 2021 have indicated that TKN makes up the entire amount of Total-N. The average for TKN is used as an average for the 2020 period.

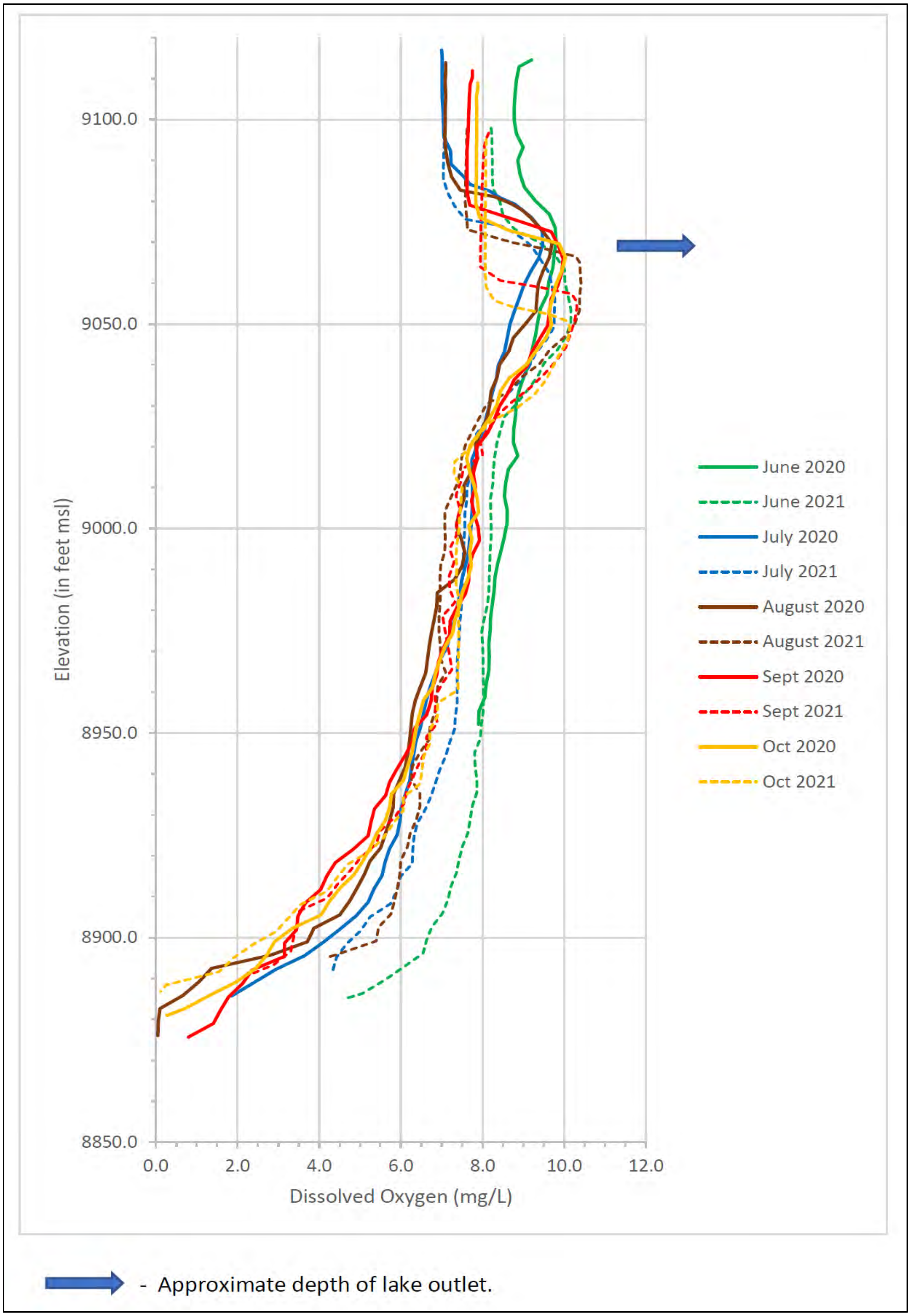


Figure 5.2-6 Lake Sabrina - Comparison of 2020 with 2021 Vertical DO Profiles with Lake Elevation

Table 5.2-3 Field Water Quality Measurements and Laboratory Results of Lake Sabrina Samples, June - October 2021

YEAR	SAMPLE DESIGNATION	DATE	TIME	LAKE SURFACE ELEVATION (b) (ft msl)	THERMO-CLINE	SAMPLE DEPTH (meters)	POSITION IN RELATION TO OUTLET		FIELD MEASUREMENTS (a)		LABORATORY ANALYSIS					
													Total Nitrogen			
							Outlet Depth (meters)	Above/Below Outlet	Secchi Disk Depth (meters)	Conductivity (µS/cm @25°C)	Total Dissolved Solids (mg/L)	Nitrate as N (mg/L)	Total Nitrogen (mg/L)	Nitrite + Nitrate as N (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Ortho phosphate as P (mg/L)
2020	LS-DP-8	6/17/2020	9:00	9116.20	Yes, 11-12 meters	8	15	above	7.5	30	16	ND<0.110	ND<0.30	ND<0.200	ND<0.10	ND<0.010
	LS-DP-15	6/17/2020	9:30			15	15	above		20	25	ND<0.110	0.30	ND<0.200	0.30	ND<0.010
	LS-DP-7	7/29/2020	11:25	9118.62	Yes, 9-14 meters	7	15	above	12.0	20	11	ND<0.110	ND<0.30	ND<0.200	ND<0.10	ND<0.010
	LS-DP-16	7/29/2020	10:55			16	15	below		30	12	ND<0.110	ND<0.30	ND<0.200	ND<0.10	ND<0.010
	LS-DP-8	8/24/2020	12:30	9115.53	Yes, 10-14 meters	8	14	above	10.0	30	31	ND<0.110	ND<0.30	ND<0.200	ND<0.10	ND<0.010
	LS-DP-17	8/24/2020	12:05			17	14	below		40	39	ND<0.110	0.52	ND<0.200	0.52	ND<0.010
	LS-DP-7	9/21/2020	11:10	9111.89	Yes, 10-14 meters	7	13	above	10.25	23	20	ND<0.110	ND<0.30	ND<0.200	ND<0.10	0.022
	LS-DP-28	9/21/2020	11:50			28	13	below		39	25	ND<0.110	ND<0.30	ND<0.200	0.11	ND<0.010
	(c)	10/5/2020	(c)	9108.97	Yes, 10-13 meters	(c)	(c)	(c)	11.0	(c)						
										Maximum	39	ND<0.110	0.52	ND<0.200	0.52	0.022
										Minimum	11	ND<0.110	ND<0.30	ND<0.200	ND<0.10	ND<0.010
										Average (d)	21	ND<0.110	ND<0.30	ND<0.200	0.10	ND<0.010
2021	LS-DP-5	6/17/2021	9:30	9099.50	Yes, 8-10 meters	5	10	above	8.75	23	19	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
	LS-DP-20	6/17/2021	10:00			20	10	below		26	24	ND<0.110	0.11	ND<0.200	0.11	ND<0.010
	LS-DP-5	7/28/2021	9:45	9098.58	Yes, 7-11 meters	5	9	above	12.25	26	12	ND<0.110	0.11	ND<0.200	0.11	ND<0.010
	LS-DP-22	7/28/2021	10:05			22	9	below		27	20	ND<0.110	0.15	ND<0.200	0.15	ND<0.010
	LS-DP-5	8/24/2021	10:15	9099.31	Yes, 9-11 meters	5	9.5	above	11.75	23	15	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
	LS-DP-25	8/24/2021	10:40			25	9.5	below		26	14	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
	LS-DP-8	9/20/2021	10:20	9096.74	Yes, 11-16 meters	8	9	above	10.25	34	16	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
	LS-DP-20	9/20/2021	10:45			20	9	below		30	20	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
	(c)	10/5/2021	(c)	9095.09	Yes, 12-14 meters	(c)	(c)	(c)	(c)	(c)						
										Maximum	24	ND<0.110	0.11	ND<0.200	0.11	ND<0.010
										Minimum	12	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
										Arithmetic Average (d)	16	ND<0.110	ND<0.10	ND<0.200	0.065	ND<0.010
										Basin Objective (annual average/90th percentile)	10/17	0.2/0.3	0.3/0.6	---	---	0.03/0.05

Notes:
a - For dissolved oxygen and water temperature, see vertical profiles.
b - At time of sampling.
c – No laboratory water quality sample collected.
d - average is for samples collected above the outlet. For samples with ND values, 1/2 of the ND value was used to calculate average when more than one sample had a detectable value, otherwise the ND value was used.
ND=Not detected at the indicated detection limit.

5.2.3. Bacteriological

A total of seven samples were collected during the 2020 monitoring period and only one sample had a detectable value of *E. coli* with a value of 3.1 MPN/100 ml. The 2021 monitoring period had five detectable values ranging from 3.1 to 310 MPN/100 ml detectable values for *E. coli*. The geometric mean was calculated at 16.3 MPN/100 ml and was well below the Inland Surface Water Plan objective of 100 MPN/100 ml. The highest value of 310 MPN/100 ml is below the Inland Surface Water Plan 90th percentile level of 320 MPN/100 ml (See Table 5.1-3). Table 5.1-3 summarizes the results for *E. coli* for Lake Sabrina. Two samples exceeded the 50 MPN/100 ml for conducting qPCR analysis; one sample collected on July 26, 2021, had 310 MPN/100 ml and one sample collected on July 29, 2021, had 180 MPN/100 ml. The qPCR analysis revealed that both samples had no detectable human DNA present.

5.3. Intake 2 Reservoir

5.3.1. Bacteriological

A total of seven samples were collected during the 2020 monitoring period and values ranged from ND<1.0 to 24 MPN/100 ml. The geometric mean was calculated at 4.73 MPN which is well below the Inland Surface Water Plan objective of 100 MPN/100 ml. The 2021 monitoring period ranged from 2.0 to 210 MPN/100 ml for *E. coli*. The geometric mean was calculated at 8.86 MPN/100 ml and was well below the Inland Surface Water Plan objective of 100 MPN/100 ml. The highest value of 210 MPN/100 ml is below the Inland Surface Water Plan 90th percentile objective level of 320 MPN/100 ml (See Table 5.1-3). Table 5.1-3 summarizes the results for *E. coli* for Intake 2 Reservoir. One sample exceeded the 50 MPN/100 ml for conducting qPCR analysis; the sample collected on July 29, 2021, had 210 MPN/100 ml. The qPCR analysis revealed that the sample had no detectable human DNA present.

5.4. Bishop Creek

5.4.1. Dissolved Oxygen and Water Temperature

5.4.1.1. 2021 Monitoring Period

Water temperature ranged from 8.4 °C to 18.4 °C with the lower values occurring near the upper reaches of Bishop Creek and the higher values generally occurring in the lower reaches of Bishop Creek. DO occurred in a narrow range from 7.08 mg/L to 9.74 mg/L. The oxygen saturation level for the observed water temperature and air pressure was generally above 98 percent and often exceeded 100 percent for all monitored reaches of Bishop Creek.

Table 5.4-1 presents the DO and water temperature values obtained during the June-October 2021 monitoring period.

Table 5.4-1 Dissolved Oxygen and Water Temperature Measurements for Bishop Creek June - October 2021

LOCATION	STATION DESIGNATION	DATE	TIME	MEAN DAILY DISCHARGE * (cfs)	AIR TEMPERATURE Measured (deg F)	AIR TEMPERATURE Calculated (deg C)	WATER TEMPERATURE (deg C)	DISSOLVED OXYGEN (mg/L)	BAROMETRIC PRESSURE (in Hg)	CALCULATED DO SATURATION ** (%)
North Fork of Bishop Creek	BC-NF-1	6/14/2021	10:40	11	70	21.1	14.3	8.27	21.35	113.0%
		7/12/2021	7:30	13	63	17.2	16.2	7.92	21.60	111.4%
		7/26/2021	8:30	13	58	14.4	15.8	7.41	21.40	103.5%
		8/5/2021	11:15	12	71	21.7	16.6	7.86	21.55	110.6%
		8/25/2021	10:20	9.0	68	20.0	13.8	8.30	21.40	110.9%
		9/9/2021	11:30	6.4	78	25.6	16.1	8.17	21.47	116.6%
		9/22/2021	10:55	5.8	65	18.3	12.4	8.35	21.55	107.6%
		10/4/2021	11:20	5.8	46	7.8	8.5	8.70	21.43	103.5%
South Fork of Bishop Creek below South Lake	BC-blw-SL	6/14/2021	11:25	41	70	21.1	8.4	8.61	21.10	103.9%
		7/12/2021	9:45	36	70	21.1	12.7	7.91	21.34	103.4%
		7/26/2021	10:00	35	61	16.1	14.1	7.46	21.15	103.4%
		8/5/2021	12:23	30	71	21.7	15.8	7.26	21.27	101.4%
		8/25/2021	11:05	29	65	18.3	15.6	7.24	21.25	102.6%
		9/9/2021	12:45	25	71	21.7	15.2	7.40	21.19	104.8%
		9/22/2021	11:45	20	65	18.1	14.3	7.51	21.25	104.1%
		10/4/2021	12:50	24	52	11.1	11.0	7.96	21.13	113.4%
Middle Fork of Bishop Creek below Lake Sabrina	BC-blw-LS	6/14/2021	9:35	31	64	17.8	14.1	7.44	21.55	100.3%
		7/12/2021	8:55	36	66	18.9	17.4	7.46	21.74	107.2%
		7/26/2021	9:15	14	60	15.6	18.4	7.08	21.55	103.9%
		8/5/2021	11:30	14	71	21.7	17.4	7.37	21.69	105.9%
		8/25/2021	10:35	15	68	20.0	16.2	7.22	21.55	101.6%
		9/9/2021	12:20	15	72	22.2	16.7	7.25	21.61	102.0%
		9/22/2021	10:20	15	68	20.0	14.2	7.60	21.70	102.4%
		10/4/2021	12:15	16	46	7.8	11.5	7.93	21.56	109.8%
Bishop Creek below Powerhouse No. 2	BC-blw-PH2	6/14/2021	12:05	14	74	23.3	12.6	8.73	---	---
		7/13/2021	8:45	14	73	22.8	15.1	8.09	23.22	104.2%
		7/29/2021	10:25	14	69	20.6	14.2	8.21	23.20	103.5%
		8/5/2021	10:45	14	83	28.3	15.3	7.94	23.20	102.3%
		8/25/2021	9:20	14	67	19.4	13.0	8.47	---	---
		9/9/2021	10:55	13	79	25.8	14.7	8.10	23.18	102.1%
		9/22/2021	10:00	16	69	20.6	11.5	8.68	23.30	112.4%
		10/4/2021	13:45	16	61	16.1	9.1	9.25	23.15	103.9%
Bishop Creek below Powerhouse No. 3	BC-blw-PH3	6/14/2021	12:30	6.4	75	23.9	13.9	8.57	23.75	103.0%
		7/13/2021	9:35	6.3	79	26.1	15.8	8.21	23.90	103.1%
		7/29/2021	9:45	6.4	70	21.1	14.6	8.30	23.90	101.9%
		8/5/2021	10:10	6.4	84	28.9	16.5	7.95	23.88	102.0%
		8/25/2021	8:50	6.4	68	20.0	13.5	8.51	23.85	102.2%
		9/9/2021	10:20	6.4	80	26.7	15.2	8.19	23.88	102.8%
		9/22/2021	9:30	6.5	70	20.9	12.4	8.80	23.95	102.1%
		10/4/2021	14:10	6.5	65	18.3	9.7	9.36	23.84	102.5%
Bishop Creek below Powerhouse No. 4	BC-blw-PH4	6/15/2021	8:05	19	74	23.3	12.8	9.14	24.75	103.4%
		7/13/2021	10:20	20	85	29.4	16.0	8.53	24.89	104.1%

LOCATION	STATION DESIGNATION	DATE	TIME	MEAN DAILY DISCHARGE * (cfs)	AIR TEMPERATURE Measured (deg F)	AIR TEMPERATURE Calculated (deg C)	WATER TEMPERATURE (deg C)	DISSOLVED OXYGEN (mg/L)	BAROMETRIC PRESSURE (in Hg)	CALCULATED DO SATURATION ** (%)
		7/29/2021	9:10	21	70	21.1	15.0	8.60	24.85	102.8%
		8/5/2021	9:45	21	83	28.3	16.4	8.33	24.86	101.7%
		8/25/2021	8:15	21	67	19.4	13.5	8.87	24.80	102.7%
		9/9/2021	9:35	21	80	26.7	15.0	8.62	24.82	104.2%
		9/22/2021	8:45	20	72	22.2	12.2	9.27	24.95	103.6%
		10/4/2021	14:35	21	67	19.4	9.8	9.69	24.79	102.2%
Bishop Creek below Powerhouse No. 5	BC-blw-PH5	6/15/2021	8:35	1.0	75	23.9	13.2	8.80	25.15	99.4%
		7/13/2021	10:55	1.1	87	30.6	17.1	8.32	25.21	102.5%
		7/29/2021	8:35	1.2	70	21.1	15.3	8.42	25.20	99.4%
		8/5/2021	9:25	1.2	81	27.2	17.0	8.15	25.20	100.4%
		8/25/2021	7:40	1.3	70	21.1	14.0	8.65	25.15	99.9%
		9/9/2021	8:55	1.3	77	25.0	15.6	8.58	25.17	101.3%
		9/22/2021	8:15	1.3	68	20.2	12.3	9.11	25.35	100.6%
		10/4/2021	14:55	1.1	71	21.7	10.7	9.55	25.15	100.7%
Bishop Creek below Powerhouse No. 6	BC-blw-PH6	6/15/2021	9:05	103	76	24.4	12.8	9.30	25.35	102.7%
		7/13/2021	11:20	105	88	31.1	16.8	8.61	25.44	102.6%
		7/29/2021	8:05	79	70	21.1	15.2	8.65	25.45	100.9%
		8/5/2021	8:45	74	81	27.2	16.6	8.30	25.44	98.9%
		8/25/2021	7:15	65	68	20.0	13.6	8.94	25.40	101.0%
		9/9/2021	8:25	57	76	24.4	15.4	8.70	25.41	102.7%
		9/22/2021	7:45	54	67	19.2	11.9	9.36	25.60	109.8%
		10/4/2021	15:15	52	71	21.7	10.5	9.74	25.37	102.7%
				2021 Maximum	88	31.1	18.4	9.74	25.60	116.6%
				2021 Minimum	46	7.8	8.4	7.08	21.10	98.9%
				2021 Average	71	21.4	14.1	8.33	23.36	104.0%

Notes:

* - Instantaneous measurements made on North Fork of Bishop Creek. All other values were calculated on a mean daily average discharge.

** - Saturation based on calculated DO saturation at reported water temperature and ambient barometric pressure.

5.4.1.2. Comparison to 2020 Monitoring Period

During the 2020 monitoring period, DO ranged from 7.12 mg/L to 9.68 mg/L with an average of 8.62 mg/L. During the 2021 monitoring period, DO values were similar ranging from 7.08 mg/L to 9.74 mg/L with an average of 8.33 mg/L. DO saturation for all values during both monitoring periods was above 98 percent saturation. Table 5.4-2 presents a summary of DO and water temperature for Bishop Creek for both monitoring periods.

Table 5.4-2 Summary of Dissolved Oxygen and Water Temperature for Bishop Creek 2020-2021 Monitoring Periods

Year	Parameter	Water Temperature (deg C)	Dissolved Oxygen (mg/L)	Barometric Pressure (in Hg)	Calculated DO Saturation (%)
2020	Maximum	17.8	9.68	25.53	124.9%
	Minimum	6.9	7.12	21.15	98.0%
	Average*	12.7	8.62	23.36	104.3%
2021	Maximum	18.4	9.74	25.60	116.6%
	Minimum	8.4	7.08	21.10	98.9%
	Average*	14.1	8.33	23.36	104.0%

Notes:
* Arithmetic average is for all samples collected.

5.4.2. General Water Quality of Bishop Creek

Field and laboratory water quality samples were collected along Bishop Creek in June, July, August, and September 2021 and are summarized in Table 5.4-3. Turbidity ranged from 1.57 to 6.26 NTU with the highest concentration at Bishop Creek below Powerhouse No. 5 during the July sampling period. Generally, Bishop Creek had values of turbidity below 5 NTU for all locations and all sampling periods. Conductivity ranged from 23 to 70 µS/cm@25°C with the highest concentration observed at Middle Fork of Bishop Creek below Lake Sabrina during the July sampling period. Generally, conductivity increased in value as you progressed downstream in the Bishop Creek watershed.

TDS ranged from 14 mg/L to 46 mg/L with the highest concentration occurring below Powerhouse No. 4 in August 2021.

NO_3-N was reported to below the detection limit (ND<0.110 mg/L) in all samples. Total Nitrogen ranged from ND<0.10 mg/L to 0.37 mg/L with the highest concentration detected in the South Forth of Bishop Creek below South Lake during the September sampling period.

Table 5.4-3 Field Water Quality Measurements and Laboratory Results of Bishop Creek Samples for Bishop Creek June - September 2021

					FIELD MEASUREMENTS (a)				LABORATORY MEASUREMENTS					
											Total Nitrogen			
LOCATION	STATION DESIGNATION	DATE	TIME	MEAN DAILY DISCHARGE (cfs) (b)	Water Temperature (deg C)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Conductivity (µS/cm@25C)	TDS (mg/L)	NO_3 as N (mg/L)	Total Nitrogen (mg/L)	$NO_2 + NO_3$ as N (mg/L)	TKN (mg/L)	PO_4 as P (mg/L)
North Fork of Bishop Creek	BC-NF-1	6/14/2021	10:40	11	14.3	8.27	1.96	32	32	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
		7/26/2021	8:30	13	15.8	7.41	1.85	30	29	ND<0.110	0.13	ND<0.200	0.13	ND<0.010
		8/25/2021	10:20	9.0	13.8	8.30	2.78	32	25	ND<0.110	0.12	ND<0.200	0.12	ND<0.010
		9/22/2021	10:55	5.8	12.4	8.35	2.23	38	28	ND<0.110	0.17	ND<0.200	0.17	ND<0.010
South Fork of Bishop Creek below South Lake	BC-blw-SL	6/14/2021	11:25	41	8.4	8.61	1.57	37	37	ND<0.110	0.15	ND<0.200	0.15	ND<0.010
		7/26/2021	10:00	35	14.1	7.46	2.03	33	24	ND<0.110	0.12	ND<0.200	0.12	ND<0.010
		8/25/2021	11:05	29	15.6	7.24	2.95	31	14	ND<0.110	0.11	ND<0.200	0.11	ND<0.010
		9/22/2021	11:45	20	14.3	7.51	4.68	40	29	ND<0.110	0.37	ND<0.200	0.37	ND<0.010
Middle Fork of Bishop Creek below Lake Sabrina	BC-blw-LS	6/14/2021	9:35	31	14.1	7.44	2.13	29	26	ND<0.110	0.16	ND<0.200	0.16	ND<0.010
		7/26/2021	9:15	14	18.4	7.08	1.75	70	28	ND<0.110	0.12	ND<0.200	0.12	ND<0.010
		8/25/2021	10:35	15	16.2	7.22	2.94	23	14	ND<0.110	0.12	ND<0.200	0.12	ND<0.010
		9/22/2021	10:20	15	14.2	7.60	3.09	29	23	ND<0.110	0.11	ND<0.200	0.11	ND<0.010
Bishop Creek below Powerhouse No. 2	BC-blw-PH2	6/14/2021	12:05	14	12.6	8.73	2.45	42	34	ND<0.110	0.19	ND<0.200	0.19	ND<0.010
		7/29/2021	10:25	14	14.2	8.21	3.23	47	45	ND<0.110	ND<0.10	ND<0.200	ND<0.10	0.018
		8/25/2021	9:20	14	13.0	8.47	3.11	50	27	ND<0.110	0.12	ND<0.200	0.12	ND<0.010
		9/22/2021	10:00	16	11.5	8.68	3.42	54	31	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
Bishop Creek below Powerhouse No. 3	BC-blw-PH3	6/14/2021	12:30	6.4	13.9	8.57	2.24	46	43	ND<0.110	0.11	ND<0.200	0.11	ND<0.010
		7/29/2021	9:45	6.4	14.6	8.30	2.55	50	40	ND<0.110	0.19	ND<0.200	0.19	ND<0.010
		8/25/2021	8:50	6.4	13.5	8.51	2.12	52	23	ND<0.110	0.19	ND<0.200	0.19	ND<0.010
		9/22/2021	9:30	6.5	12.4	8.80	3.97	58	40	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
Bishop Creek below Powerhouse No. 4	BC-blw-PH4	6/15/2021	8:05	19	12.8	9.14	5.60	52	41	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
		7/29/2021	9:10	21	15.0	8.60	2.61	51	43	ND<0.110	0.13	ND<0.200	0.13	ND<0.010
		8/25/2021	8:15	21	13.5	8.87	2.64	55	46	ND<0.110	0.11	ND<0.200	0.11	ND<0.010
		9/22/2021	8:45	20	12.2	9.27	2.69	62	35	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
Bishop Creek below Powerhouse No. 5	BC-blw-PH5	6/15/2021	8:35	1.0	13.2	8.80	3.31	51	33	ND<0.110	0.13	ND<0.200	0.13	ND<0.010
		7/29/2021	8:35	1.2	15.3	8.42	6.26	52	44	ND<0.110	0.12	ND<0.200	0.12	ND<0.010
		8/25/2021	7:40	1.3	14.0	8.65	2.86	54	35	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
		9/22/2021	8:15	1.3	12.3	9.11	3.15	62	19	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
Bishop Creek below Powerhouse No. 6	BC-blw-PH6	6/15/2021	9:05	103	12.8	9.30	2.50	47	38	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
		7/29/2021	8:05	79	15.2	8.65	2.89	51	44	ND<0.110	0.12	ND<0.200	0.12	ND<0.010
		8/25/2021	7:15	65	13.6	8.94	2.28	56	26	ND<0.110	0.10	ND<0.200	0.10	ND<0.010
		9/22/2021	7:45	54	11.9	9.36	2.61	60	35	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
				2021 Maximum	(c)	(c)	6.26	70	46	ND<0.110	0.37	ND<0.200	0.37	0.018
				2021Minimum	(c)	(c)	1.57	23	14	ND<0.110	ND<0.10	ND<0.200	ND<0.10	ND<0.010
				2021 Average	(c)	(c)	2.89	46	32	ND<0.110	0.12	ND<0.200	0.12	ND<0.010

Notes:
[a] Concurrent measurement when laboratory samples were collected
[b] Instantaneous measurements made on North Fork of Bishop Creek. All other values were calculated on a mean daily average discharge
[c] See Table 5.4-1 for DO and water temperature values.
N= Nitrogen; NO_2=Nitrite; NO_3=Nitrate, P= Phosphorus; PO_4=Orthophosphate; TDS=Total Dissolved Solids; TKN=Total Kjeldahl Nitrogen.

PO_4-P was detected in only one sample at 0.018 mg/L collected from Bishop Creek below Powerhouse No. 2 during the July sampling period. All other samples were below the detection limit of ND<0.010 mg/L.

5.4.3. Comparison to 2020 Monitoring Period

During the 2020 monitoring period, TDS ranged for all locations along Bishop Creek from ND<10 mg/L to 41 mg/L with an average of 26 mg/L. During the 2021 monitoring period, TDS was similar ranging from 14 mg/L to 46 mg/L with an average of 32 mg/L. NO3-N was not detected in any samples for both monitoring periods. Total-N was detected and ranged from ND<0.30 mg/L to 1.1 mg/L with an average of 0.19 mg/L in the 2020 monitoring period. Total-N had similar values in the 2021 monitoring period and ranged from ND<0.10 mg/L to 0.37 mg/L with an average of 0.12 mg/L. PO4-P was detected but all values were below basin objectives. - presents a summary of the laboratory results for Bishop Creek.

Table 5.4-4 Summary of Laboratory Results for Bishop Creek 2020-2021 Monitoring Periods

Year	Parameter	Total Dissolved Solids (mg/L)	Nitrate as N (mg/L)	Total Nitrogen (mg/L)	Ortho phosphate as P (mg/L)
2020	Maximum	41	ND<0.110	1.1	0.044
	Minimum	ND<10	ND<0.110	ND<0.30	ND<0.010
	Average*	26	ND<0.110	0.19	ND<0.010
2021	Maximum	46	ND<0.110	0.37	0.018
	Minimum	14	ND<0.110	ND<0.10	ND<0.010
	Average*	32	ND<0.110	0.12	ND<0.010
Bishop Creek Below Lake Sabrina**					
2020	Maximum	30	ND<0.11	0.41	0.017
	Minimum	10	ND<0.11	ND<0.30	ND<0.010
	Average*	19	ND<0.11	0.2	0.01
	Average***	19	ND<0.11	0.1	0.01
2021	Maximum	28	ND<0.11	0.16	ND<0.010
	Minimum	14	ND<0.11	0.11	ND<0.010
	Average*	23	ND<0.11	0.1	ND<0.010
	Average***	23	ND<0.11	0.1	ND<0.010
Basin Objective (annual average/90th percentile)		27/29	0.1/0.2	0.1/0.4	0.05/0.09

Notes:
* Arithmetic average is for all samples collected. For samples with ND values, 1/2 of the ND value was used to calculate average when more than one sample had detectable values, otherwise the ND value was used.
** Closest Bishop Creek monitoring location to Basin Plan objective location (Bishop Creek near Intake No. 2).
*** Arithmetic average is for all samples collected. For samples with ND values, Zero was used for ND values to calculate average when more than one sample had detectable values, otherwise the ND value was used.

5.4.4. Comparison to Basin Plan Objectives

A comparison was made of general water quality for Bishop Creek below Lake Sabrina (BC-blw-LS) to water quality objectives for Bishop Creek near Intake No. 2 in the Basin Plan. For the 2020 monitoring period, TDS ranged from 10 mg/L to 30 mg/L with an average of 19 mg/L which is below the basin plan objective of 27 mg/L. During the 2021 monitoring period, TDS was similar ranging from 14 mg/L to 28 mg/L with an average of 23 mg/L which is below the basin plan objective. NO3-N was not detected in any samples for both monitoring periods. Total-N was detected and ranged from ND<0.30 mg/L to 0.41 mg/L with an average of between 0.1 mg/L and 0.2 mg/L in the 2020 monitoring period which is at or slightly above the 0.1 basin plan objective. Total-N had similar values in the 2021 monitoring period and ranged from ND<0.11 mg/L to 0.16 mg/L with an average of 0.1 mg/L which is equal to the basin plan objective. PO4-P was detected in 2020 but was ND<0.010 mg/L in 2021. All values for both periods were below basin plan objectives. Table 5.4-4 presents a summary of the laboratory results for Bishop Creek.

5.5. Powerhouse Tailwater

5.5.1. Field Water Temperature and Dissolved Oxygen

Water temperature ranged from 9.1 °C to 16.8 °C with generally the lower values occurring in tailwater in the powerhouses in the upper reaches of Bishop Creek and the higher values generally occurring in the powerhouse tailraces from the lower reach of Bishop Creek. DO occurred in a very narrow range from 7.77 mg/L to 9.72 mg/L. The oxygen saturation level for the observed water temperature and air pressure at each of the tailraces was generally above 96 percent and often exceeded 100 percent for the monitored tailraces of each of the powerhouses.

Table 5.5-1 presents the field DO and water temperature values obtained from the various tailraces during the June-August 2021 monitoring period.

Table 5.5-1 Field Water Quality Measurements for Powerhouse Tailwater June - October 2021

LOCATION	STATION DESIGNATION	DATE	TIME	FIELD MEASUREMENTS					CALCULATED DISSOLVED OXYGEN SATURATION * (%)
				Air Temperature		Water Temperature (deg C)	Dissolved Oxygen (mg/L)	Barometric Pressure (in Hg)	
				Measured (deg F)	Calculated (deg C)				
Tailwater at Powerhouse No. 2	TW@PH2	6/14/2021	11:55	74	23.3	12.4	8.58	23.05	103.4%
		7/13/2021	8:30	73	22.8	15.4	7.94	23.22	102.3%
		7/29/2021	10:15	69	20.6	14.4	8.06	23.20	101.6%
		8/5/2021	10:30	83	28.3	16.0	7.77	23.20	102.2%
		8/25/2021	9:10	67	19.4	13.7	8.22	23.15	101.3%
		9/9/2021	10:45	80	26.7	15.3	7.95	23.15	102.4%
		9/22/2021	9:50	69	20.3	11.3	8.72	23.25	112.9%
		10/4/2021	13:30	61	16.1	9.1	9.17	23.11	103.0%
Tailwater at Powerhouse No. 3	TW@PH3	6/14/2021	12:20	75	23.9	13.2	8.65	23.70	103.9%
		7/13/2021	9:15	79	26.1	15.5	8.22	23.90	103.2%
		7/29/2021	9:30	70	21.1	14.4	8.33	23.90	102.3%
		8/5/2021	10:00	83	28.3	16.2	8.00	23.88	102.6%
		8/25/2021	8:35	68	20.0	13.7	8.46	23.80	101.6%
		9/9/2021	10:00	80	26.7	14.9	8.25	23.84	101.3%
		9/22/2021	9:10	71	21.4	13.0	8.64	23.95	102.5%
		10/4/2021	14:00	65	18.3	9.6	9.25	23.80	101.3%
Tailwater at Powerhouse No. 4	TW@PH4	6/15/2021	7:55	73	22.8	12.1	8.99	24.75	101.7%
		7/13/2021	10:00	84	28.9	16.0	8.43	24.85	102.9%
		7/29/2021	9:00	70	21.1	14.7	8.57	24.85	100.2%
		8/5/2021	9:35	83	28.3	16.3	8.16	24.83	100.8%
		8/25/2021	8:00	66	18.9	13.6	8.69	24.80	100.6%
		9/9/2021	9:20	80	26.7	15.0	8.48	24.80	102.6%
		9/22/2021	8:35	67	19.3	11.7	9.18	24.95	110.3%
		10/4/2021	14:30	67	19.4	9.9	9.57	24.76	101.0%
Tailwater at Powerhouse No. 5	TW@PH5	6/15/2021	8:25	75	23.9	12.3	8.80	25.15	97.2%
		7/13/2021	10:40	87	30.6	16.3	8.21	25.21	99.0%
		7/29/2021	8:25	70	21.1	14.9	8.44	25.20	97.5%
		8/5/2021	9:15	81	27.2	16.8	8.26	25.20	99.6%
		8/25/2021	7:30	70	21.1	13.7	8.54	25.15	96.5%
		9/9/2021	8:45	77	25.0	15.3	8.61	25.17	101.6%
		9/22/2021	8:00	66	19.0	12.0	8.88	25.35	98.1%
		10/4/2021	14:45	71	21.7	10.0	9.45	25.14	99.7%
Tailwater at Powerhouse No. 6	TW@PH6	6/15/2021	8:55	76	24.4	13.2	9.14	25.35	103.3%
		7/13/2021	11:10	88	31.1	16.6	8.59	25.44	102.4%
		7/29/2021	7:50	70	21.1	15.3	8.54	25.45	99.6%
		8/5/2021	8:55	81	27.2	16.6	8.40	25.44	100.1%
		8/25/2021	7:05	68	20.0	13.7	8.89	25.40	100.4%
		9/9/2021	8:15	76	24.4	15.8	8.53	25.41	100.7%
		9/22/2021	7:30	66	18.9	12.1	9.07	25.60	99.0%
		10/4/2021	15:05	71	21.7	10.4	9.72	25.37	102.5%
			2021 Maximum	88	31.1	16.8	9.72	25.60	112.9%
			2021 Minimum	61	16.1	9.1	7.77	23.05	96.5%
			2021 Average	74	23.2	13.8	8.61	24.49	101.6%

Notes:

* - Saturation based on calculated DO saturation at reported water temperature and ambient barometric pressure.

5.5.2. Comparison to 2020 Monitoring Period

During the 2020 monitoring period, water temperature ranged from 10.5°C to 15.4°C with an average of 12.9°C. During the 2021 monitoring period, water temperature of the Powerhouse tailwater was similar ranging from 9.1°C to 16.8°C with an average of 13.8°C. DO ranged from 8.17 mg/L to 9.64 mg/L in 2020 and 7.77 mg/L to 9.72 mg/L in 2021. DO saturation of the Powerhouse tailwater averaged over 100 percent for both monitoring periods. Table 5.5-2 summarizes the results for the 2020-2021 monitoring periods.

Table 5.5-2 Summary of Dissolved Oxygen and Water Temperature for Powerhouse Tailwaters 2020-2021 Monitoring Periods

Year	Parameter	Water Temperature (deg C)	Dissolved Oxygen (mg/L)	Barometric Pressure (in Hg)	Calculated DO Saturation (%)
2020	Maximum	15.4	9.64	25.54	114.1%
	Minimum	10.5	8.17	23.11	95.6%
	Average*	12.9	8.82	24.53	102.9%
2021	Maximum	16.8	9.72	25.60	112.9%
	Minimum	9.1	7.77	23.05	96.5%
	Average*	13.8	8.61	24.49	101.6%

Notes:
* Arithmetic average is for all samples collected.

6.0 DISCUSSION

The Water Quality Study has completed the second year of the proposed 2-year investigation. Water quality data has been collected on water quality of upstream lakes and creeks as well as Project facilities. The water quality data will assist in establishing baseline conditions and assist in assessing any impacts that the Project operations may have on the existing water quality. In addition, the water quality data will assist in assuring Project facilities and operations are consistent with the current water quality goals and objectives for Bishop Creek in the Water Quality Control Plan.

7.0 CONSULTATION SUMMARY

SCE consulted with the TWGs regularly through the filing of periodic progress reports. The following key milestones were observed:

- Progress Report 1: December 19, 2019
- Progress Report 2: April 14, 2020
- Progress Report 3: July 24, 2020
- Initial Study Report (ISR; Progress Report 4): October 30, 2020
- ISR Meeting: November 10, 2020
- Progress Report 1: March 2, 2021
- Progress Report 2: May 28, 2021
- Progress Report 3: August 27, 2021
- Updated Study Report (USR) filing: November 4, 2021
- USR Meeting: November 18, 2021

Eight technical memoranda summarizing the 2019 study implementation were submitted with Progress Report 2. Following that filing, SCE hosted a TWG meeting on May 7, 2020, to discuss the 2019 study season, work completed to date and the technical memoranda. After the meeting, TWG members submitted comments on the technical memoranda and SCE provided a general response to those comments as part of Progress Report 3. The Initial Study Report (ISR) was filed with FERC on October 30, 2020, and a virtual ISR Meeting was held on November 10, 2020. The State Water Resources Control Board filed a comment letter during the comment period offering support for the ongoing study program with no requested changes or modifications. No other comments were received from TWG members or stakeholders on the ISR materials or on the previously provided responses to comments.

Three progress reports were filed in 2021 after filing the ISR, as identified above. SCE held a Project Effects meeting on October 28, 2021 for all stakeholders and agencies to discuss what project effects (if any) had been identified through the implementation of each of the approved study plans.

The Updated Study Report (USR) was filed with FERC on November 4, 2021. A Water Quality Technical Memo was filed with the USR and was then distributed to agencies and stakeholders for a 60-day review period on November 5, 2021. No comments were received on that memo, however comments were received on the USR as shown in Table 7.1-1.

A USR Meeting was held on November 18, 2021. At this meeting, SCE only discussed those studies which were still in progress at the time of the ISR (Water Quality, Sediment and Geomorphology, Operations Model, Recreation Use and Needs, Recreation Facilities Condition Assessment, Project Lands and Boundary, and Cultural and Tribal Studies). Comments received to date on the Water Quality study are included in the table below.

Table 7.1-1 Comment Response Table

Comment No.	Study	Date of Comment	Entity	Comment	Response
33	Water Quality Technical Memo	May 21, 2020	CDFW	In Section 5.2, CDFW recommends identifying the range of minimum as well as maximum possible depths in this section, as well as use of consistent units of depth (feet or meters) in future reports.	The Water Quality Study Report will provide the total depth of the lake at the monitoring point at the time of sampling in both feet and meters. This comment is addressed in Section 8.4 of Exhibit E of the Draft License Application (DLA).
34	Water Quality Technical Memo	May 21, 2020	CDFW	Section 6.1.1 indicates vertical profiles will be taken at 1-meter increments. To better understand the strength and stability of potential thermal stratification, CDFW recommends adding an additional vertical station at the spacing of 0.5 m wherever the temperature difference between two vertical stations is equal to or greater than 2º C.	SCE does not believe that the additional granularity is warranted for the vertical dissolved oxygen and water temperature profiles planned at South Lake and Lake Sabrina. See note in Section 6.1.1 of the WQ Implementation Plan where thermocline is defined as greater than 1 degree centigrade per meter with depth. The Study Plan as well as the Water Quality Implementation Plan were previously distributed to the TWG for comment (most recently on Feb 14, 2020). The INF and the SWRCB both provided comments which were addressed; at this point, the methods and level of effort have been established. As provided for in the ILP process, the TWG can discuss whether a change of methods is warranted during Study Report meeting scheduled for fall of 2020. This comment is addressed in Section 8.4 of Exhibit E of the Draft License Application (DLA).
1a	Updated Study Report	December 31, 2021	State Water Board	Section 401 of the Clean Water Act requires any applicant for a federal license or permit for an activity that may result in	As required by 18 CFR 5.23(b), SCE intends to file, no later than 60 days following the date of issuance of the notice

	Meeting Summary			any discharge to navigable waters, to obtain certification from the State that the discharge will comply with the applicable water quality requirements, including the requirements of section 303 of the Clean Water Act for water quality standards and implementation plans. Clean Water Act section 401 directs that certifications shall prescribe effluent limitations and other conditions necessary to ensure compliance with the Clean Water Act and with any other appropriate requirements of state law, such as the Porter-Cologne Water Quality Control Act (Wat. Code, § 13000 et seq.). Conditions of certification shall become a condition of any federal license or permit subject to certification. The Project will continue to result in a discharge to navigable waters and must obtain certification from the State Water Board as part of relicensing for continued operations.	of acceptance and ready for environmental analysis provided for in 18 CFR §5.22: (1) a copy of the water certification; (2) a copy of the request for certification, including proof of the date on which the certifying agency received the request; or (3) evidence of waiver of WQC. This comment is addressed in Section 4.2 of Exhibit E of the Draft License Application.
1b	Updated Study Report Meeting Summary	December 31, 2021	State Water Board	A certification issued by the State Water Board for Project relicensing must ensure compliance with the applicable water quality standards in the Lahontan Regional Water Quality Control Board's Water Quality Control Plan for the Lahontan Region (Lahontan Basin Plan). Water quality control plans designate the beneficial uses of water that are to be protected, water quality objectives for the reasonable protection of the beneficial uses and the prevention of nuisance, and a program of implementation to achieve the water quality objectives. (Cal. Wat. Code, §§ 13170, 13241, 13050, subds. (h), (j).) The beneficial uses, together with the water quality objectives contained in the water quality control plans and applicable	This comment is addressed in Section 8.4 of Exhibit E of the DLA.

				anti-degradation requirements, constitute California's water quality standards for purposes of the Clean Water Act. In issuing water quality certification for a project, the State Water Board must ensure consistency with the designated beneficial uses of waters affected by the project, the water quality objectives developed to protect those uses, and anti-degradation requirements. (PUD No. 1 of Jefferson County v. Washington Dept. of Ecology (1994) 511 U.S. 700, 714-719.)	
1c	Updated Study Report Meeting Summary	December 31, 2021	State Water Board	The Project facilities are located on Bishop Creek, McGee Creek, and Birch Creek. The Lahontan Basin Plan sets forth water quality standards for waterbodies in the region including Project-related waters of Bishop Creek, McGee, and Birch Creek, including Sabrina Lake and South Lake. Beneficial uses established by the Lahontan Basin Plan for these waters include municipal and domestic supply; navigation; hydropower generation; water contact recreation; water non-contact recreation; commercial sportfishing; cold freshwater habitat; warm freshwater habitat; wildlife habitat; spawning, reproduction and/or early development and agricultural supply. Additional beneficial uses listed in the Lahontan Basin Plan include groundwater recharge and freshwater replenishment and industrial service supply uses.	This comment is addressed in Section 8.5 of Exhibit E of the DLA.
1	Updated Study Report Meeting Summary	December 31, 2021	State Water Board	In addition to being the state agency with certification authority for the proposed Project relicensing, it is the State Water Board's understanding that it will also be the California Environmental Quality Act (CEQA) lead agency. CEQA requires the lead agency to evaluate a project's potential	This comment is addressed in Section 4.8 of Exhibit E of the DLA.

				impacts to environmental resources as well as identify mitigation measures and alternatives to reduce project impacts. CEQA also requires public input on identified impacts and mitigation measures. CEQA documentation must analyze and evaluate the proposed Project impacts to all relevant resources, including aquatic biological resources, special status species, water quality standards, and water quality control plans. Information from studies and data gathering during FERC's relicensing process may inform CEQA document development. Please note, the State Water Board's preference is to begin the CEQA process following issuance of a Draft License Application in order to provide adequate time to complete the CEQA process prior to taking a final action on SCE's future water quality certification request. In early 2022, State Water Board staff will reach out to SCE's to discuss the CEQA process.	
2	Updated Study Report Meeting Summary	December 31, 2021	State Water Board	Data provided in the USR appears to indicate annual averages for Total Dissolved Solids (TDS) in Lake Sabrina, South Lake, and Bishop Creek may be above the Lahontan Basin Plan TDS water quality objectives. Lake Sabrina averages for TDS (2020: 21 mg/L and 2021: 16 mg/L) are above the Lahontan Basin Plan water quality objective of 10 mg/L (annual average). South Lake averages for TDS (2020: 18 mg/L and 2021: 21 mg/L) are above the Lahontan Basin Plan water quality objective of 12 mg/L (annual average). Bishop Creek averages (2021: 32 mg/L) are above the Lahontan Basin Plan	The elevated numbers appear to reflect background conditions, and the original basin plan objectives are indicative of limited data used to establish the water quality objectives for Lake Sabrina, South Lake, and Bishop Creek. This comment has been addressed in this Final Technical Report and in Section 8.4 of Exhibit E of the DLA.

				water quality objective of 27 mg/L (annual average). Additionally, USR data indicates Total Nitrogen readings in Bishop Creek (2020: 0.19 mg/L and 2021: 0.12 mg/L) are above the Lahontan Basin Plan water quality objective of 0.1 mg/L. Please provide additional information in the Draft License Application on whether and, if so, how the existing Project may be contributing to TDS and Total Nitrogen concentrations. Additionally, State Water Board staff request that in future reports SCE clearly indicate if any applicable water quality objectives have been exceeded within Project-related waters.	

8.0 REFERENCES

American Public Health Association, American Water Works Association, Water Environment Federation, 2012. Standard Methods for the Examination of Water and Wastewater, 22nd Edition.

Boehrer, B., and M. Schultze, 2008. Stratification of lakes, Rev. Geophys., 46, RG2005, doi:10.1029/2006RG000210

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

California Regional Water Quality Control Board Lahontan Region (LRWQCB). 1995. Water Quality Control Plan for the Lahontan Region (Basin Plan).

Environmental Science and Engineering (ESE). 1975. Wilderness Water Quality: Bishop Creek Baseline Study. Prepared in cooperation with University of California at Los Angeles.

Knapp, R. and Craig, C. 2016. Microbial Source Tracking (MST) at Bacteria –Impaired Waters of the Lahontan Region. Prepared for the California Regional Water Quality Control Board – Lahontan Region. March 2016.

Lund, L.J., n.d. Water Quality of Bishop Creek and Selected Eastern Sierra Nevada Lakes. University of California at Riverside, Department of Soil and Environmental Sciences.

SNARL, 2015. Assessment of Bacterial Water Quality in the Lahontan Region. State Water Resources Control Board Contract Number: 12-067-160. October 2012-March 2015.

SCE, 2021. Final Technical Report – Bishop Creek Reservoirs Fish Distribution (AQ 4). May 2021.

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

USEPA, EMSL-Cincinnati, Method for Chemical Analysis of Waters and Wastes, EPA-600/4-79-020 (Cincinnati, OH, 1983).

U.S. Geological Survey, variously dated, National field manual for the collection of water-quality data: U.S. Geological Survey Techniques of Water-Resources Investigations, book 9, chaps. A1-A10, available online at http://pubs.water.usgs.gov/twri9A.

APPENDIX A

2021 COMPLETED FIELD FORMS

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below LS DATE: 6/14/21 TIME: 9:35am

DRAINAGE: Bishop Creek INVESTIGATORS: JB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 14.1 (ºF or ºC) Dissolved Oxygen: 7.44 (mg/L)

Conductivity: 29 (µmhos/cm@25 ºC) Stream or Lake gage reading: NA

Turbidity: 2.13 (NTUs) Air Temperature 64 (ºF or ºC) Baro. Pressure 21.55 (in Hg)

Winds 8-12 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: – meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ___ Colored ___

Floating Material ___ Other: ___

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-LS Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: North Fork DATE: 6/14/21 TIME: 10:40am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 14.3 (ºF or ºC) Dissolved Oxygen: 8.27 (mg/L)

Conductivity: 32 (µmhos/cm@25 ºC) Stream flow measurement ~~or Lake gage reading~~: 11.3 cfs

Turbidity: 1.96 (NTUs) Air Temperature 70 (ºF or ºC) Baro. Pressure 21.35 (in Hg)

Winds 1-2 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

Average stream flow measured by cross-section and flow meter. Flow = 11.3 cfs. Was 24 cfs in June 2020.

WATER QUALITY SAMPLE DATA

Sample No. BC-NF-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below South Lake DATE: 6/14/21 TIME: 11:25 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 8.4 (ºF or ºC) Dissolved Oxygen: 8.61 (mg/L)

Conductivity: 37 (µmhos/cm@25 ºC) Stream or Lake gage reading: NA

Turbidity: 1.57 (NTUs) Air Temperature 70 (ºF or ºC) Baro. Pressure 21.10 (in Hg)

Winds 4-10 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______meters Depth of Reappearance: ______meters

Secchi Depth: ______meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-SL Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH2 DATE: 6/14/21 TIME: 11:55am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 12.4 (ºF or ºC) Dissolved Oxygen: 8.58 (mg/L)

Conductivity: - (µmhos/cm@25 ºC) Stream or Lake gage reading: NA

Turbidity: - (NTUs) Air Temperature 74 (ºF or ºC) Baro. Pressure 23.05 (in Hg)

from N Winds 2-4 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH2 DATE: 6/14/21 TIME: 12:05 pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: 12.6 (ºF or ºC) Dissolved Oxygen: 8.73 (mg/L)

Conductivity: 42 (μmhos/cm@25 ºC) Stream or Lake gage reading: 1.70'

Turbidity: 2.45 (NTUs) Air Temperature 74 (ºF or ºC) Baro. Pressure ______ (in Hg)

N Winds 2-4 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH2 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH3 DATE: 6/14/21 TIME: 12:20 p

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 13.2 (ºF or ºC) Dissolved Oxygen: 8.65 (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: NA

Turbidity: – (NTUs) Air Temperature 75 (ºF or ºC) Baro. Pressure 23.70 (in Hg)

Winds 0-1 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH3 DATE: 6/14/21 TIME: 12:30pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: 13.9 (ºF or ºC) Dissolved Oxygen: 8.57 (mg/L)

Conductivity: 46 (µmhos/cm@25 ºC) Stream or Lake gage reading: 0.70'

Turbidity: 2.24 (NTUs) Air Temperature 75 (ºF or ºC) Baro. Pressure 23.75 (in Hg)

Winds 1-2 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH3 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH 4 DATE: 6/15/21 TIME: 7:55am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: 12.1 (ºF or ºC) Dissolved Oxygen: 8.99 (mg/L)

Conductivity: – (μmhos/cm@25 ºC) Stream or Lake gage reading: NA

Turbidity: – (NTUs) Air Temperature 73 (ºF or ºC) Baro. Pressure 24.75 (in Hg)

Winds 1 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH4 DATE: 6/15/21 TIME: 8:05am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 12.8 (ºF or ºC) Dissolved Oxygen: 9.14 (mg/L)

Conductivity: 52 (µmhos/cm@25 ºC) Stream or Lake gage reading: NA

Turbidity: 5.6 (NTUs) Air Temperature 74 (ºF or ºC) Baro. Pressure 24.75 (in Hg)

Winds 0-1 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ________ meters Depth of Reappearance: ________ meters

Secchi Depth: ________ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ________ Colored ________
Floating Material ________ Other: ________

Remarks: ____

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH4 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: J Baer REVIEWED BY: ________________

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH5 DATE: 6/15/21 TIME: 8:25am

DRAINAGE: Bishop Creek INVESTIGATORS: JB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 12.3 (ºF or ºC) Dissolved Oxygen: 8.80 (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: NA

Turbidity: – (NTUs) Air Temperature 75 (ºF or ºC) Baro. Pressure 25.15 (in Hg)

Winds 0-1 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ___ Colored ___

Floating Material ___ Other: ___

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ___ Preservatives: ___

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH5 DATE: 6/15/21 TIME: 8:35 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: 13.2 (ºF or ºC) Dissolved Oxygen: 8.80 (mg/L)

Conductivity: 51 (μmhos/cm@25 ºC) Stream or Lake gage reading: NA

Turbidity: 3.31 (NTUs) Air Temperature 75 (ºF or ºC) Baro. Pressure 25.15 (in Hg)

Winds 0 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: _______ meters Depth of Reappearance: _______ meters

Secchi Depth: _______ meters

Visual Condition of Stream (check all that apply):
Clear _______ Cloudy _______ Colored _______
Floating Material x Other: x leaf litter

Remarks: Algae growing on rocks in the streamflow

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH5 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: __________

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH6 DATE: 6/15/21 TIME: 8:55am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 13.2 (ºF or ºC) Dissolved Oxygen: 9.14 (mg/L)

Conductivity: – (μmhos/cm@25 ºC) Stream or Lake gage reading: NA

Turbidity: – (NTUs) Air Temperature 76 (ºF or ºC) Baro. Pressure 25.35 (in Hg)

Winds 0-1 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____meters Depth of Reappearance: ____meters

Secchi Depth: ____meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: ____

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH6 DATE: 6/15/21 TIME: 9:05am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

Water Temperature: 12.8 (ºF or ºC)

Conductivity: 47 (μmhos/cm@25 ºC)

Turbidity: 2.5 (NTUs)

WEATHER CONDITIONS

Dissolved Oxygen: 9.30 (mg/L)

Stream or Lake gage reading: NA

Air Temperature 76 (ºF or ºC) Baro. Pressure 25.35 (in Hg)

Winds 0 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks: ____

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH6 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Lake DATE: 6/16/21 TIME: 10:30am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: See Profile (ºF or ºC) Dissolved Oxygen: See Profile (mg/L)

Conductivity: 37 (μmhos/cm@25 ºC) Stream or Lake gage reading: 9693.2' msl

Turbidity: Secchi (NTUs) Air Temperature 55 (ºF or ºC) Baro. Pressure 21.2 (in Hg)

Winds 5-8 (mph) Cloud cover 30 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: Depth of Disappear: 14.5 meters Depth of Reappearance: 12.5 meters

Secchi Depth: 13.5 meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ___ Colored ___

Floating Material ___ Other: ___

Remarks: Sample taken at 1/2 Secchi depth: = 7 m depth
No thermocline.

Notes

WATER QUALITY SAMPLE DATA

Sample No. SL-DP-7 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Lake DATE: 6/16/21 TIME: 11:00am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: See Profile (ºF or ºC) Dissolved Oxygen: See Profile (mg/L)

Conductivity: 2230 (µmhos/cm@25 ºC) Stream or Lake gage reading: 9693.2' msl

Turbidity: Secchi (NTUs) Air Temperature 55 (ºF or ºC) Baro. Pressure 21.2 (in Hg)

Winds 5-8 (mph) Cloud cover 30 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: Depth of Disappear: 14.5 meters Depth of Reappearance: 12.5 meters

Secchi Depth: 13.5 meters

Visual Condition of Stream (check all that apply):

Clear ___ Cloudy X Colored ___

Floating Material ___ Other: ___

Remarks: Sample taken in anoxic zone at 40m below surface No thermocline.

Notes

WATER QUALITY SAMPLE DATA

Sample No. SL-DP-40 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one.

REMARKS

SIGNED BY: [signature] REVIEWED BY: ___

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Lake Sabrina DATE: 6/17/21 TIME: 9:30am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JP

PHYSICAL WATER QUALITY PARAMETERS **WEATHER CONDITIONS**

Water Temperature: See Profile (ºF or ºC) Dissolved Oxygen: See Profile (mg/L)

Conductivity: 23 (µmhos/cm@25 ºC) Stream or Lake gage reading: 9099.5' msl

Turbidity: Secchi (NTUs) Air Temperature 57 (ºF or ºC) Baro. Pressure 21.60 (in Hg)

Winds 0-3 (mph) Cloud cover 30 (%) Precipitation ___ Fog ___ Rain ___ Sleet ___ Hail ___ Snow

Secchi Disk: Depth of Disappear: 8 meters Depth of Reappearance: 9.5 meters

Secchi Depth: 8.75 meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: Thermocline at ~ 8-10 m depth. Sampled at 5m depth

Site Drawing

WATER QUALITY SAMPLE DATA

Sample No. LS-DP-5 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Lake Sabrina DATE: 6/17/21 TIME: 10:00am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS — **WEATHER CONDITIONS**

Water Temperature: See Profile (ºF or ºC) Dissolved Oxygen: See Profile (mg/L)

Conductivity: 26 (μmhos/cm@25 ºC) Stream or Lake gage reading: 9099.5' msl

Turbidity: Secchi (NTUs) Air Temperature 57 (ºF or ºC) Baro. Pressure 21.60 (in Hg)

Winds 0-3 (mph) Cloud cover 30 (%) Precipitation ___ Fog ___ Rain ___ Sleet ___ Hail ___ Snow

Secchi Disk: Depth of Disappear: 8 meters Depth of Reappearance: 9.5 meters

Secchi Depth: 8.75 meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ___ Colored ___

Floating Material ___ Other: ___

Remarks: Thermocline at ~8-10m. Sampled at 20m depth

Site Drawing

WATER QUALITY SAMPLE DATA

Sample No. LS-DP-20 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ___

WATER TEMPERATURE AND DISSOLVED OXYGEN LAKE PROFILE DATA FORM

Location: South Lake 6/16/21

DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (ºC)	DISSOLVED OXYGEN (mg/L)	DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (ºC)	DISSOLVED OXYGEN (mg/L)	
0.5	11.9	8.13	31	4.2	5.72	
1	11.9	8.10	32	4.3	4.54	R.P.
2	11.8	8.11	33	4.3	3.53	
3	11.7	8.13	34	4.4	2.82	
4	11.6	8.14	35	4.7	0.28	
5	11.6	8.14	36	5.4	0.15	
6	11.6	8.15	37	5.6	0.04	
7	11.5	8.16	38	5.9	0.03	
8	11.4	8.20	39	6.1	0.03	
9	11.3	8.24	40	6.1	0.00	
10	11.1	8.27	41	6.3	-0.00	
11	11.0	8.24	42	6.6	-0.00	
12	10.7	8.35	43	6.7	-0.00	
13	10.4	8.4	44	7.0	-0.00	
14	9.7	8.83	45	7.1	-0.01	
15	9.0	9.12	46	7.4	-0.01	
16	8.7	9.4	47	7.6	-0.02	
17	8.0	9.46	48	7.7	-0.02	
18	7.5	9.53	48.5 ~~49~~	7.7	-0.03	BOTTOM
19	6.9	9.52	50			
20	6.3	9.35	51			
21	5.5	9.18	52			
22	4.9	8.91	53			
23	4.6	8.73	54			
24	4.4	8.48	55			
25	4.3	8.30	56			
26	4.2	8.05	57			
27	4.2	7.73	58			
28	4.2	7.40	59			
29	4.2	7.12	60			
30	4.2	6.60	61			

WATER TEMPERATURE AND DISSOLVED OXYGEN LAKE PROFILE DATA FORM

Location: Lake Sabrina 6/17/21

1
68.7

Thermo-cline

DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (ºC)	DISSOLVED OXYGEN (mg/L)	DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (ºC)	DISSOLVED OXYGEN (mg/L)
0.5	13.4	8.21	31	4.5	8.21
1	13.4	8.23	32	4.5	8.19
2	13.3	8.23	33	4.5	8.17
3	13.3	8.24	34	4.5	8.16
4	13.3	8.24	35	4.4	8.15
5	13.2	8.25	36	4.4	8.12
6	12.8	8.43	37	4.4	8.05
7	12.6	8.50	38	4.4	7.98
8	11.9	8.77	39	4.4	8.00
9	10.6	9.39	40	4.3	8.01
10	9.6	9.78	41	4.3	8.01
11	8.7	10.01	42	4.3	8.02
12	8.3	10.02	43	4.3	8.02
13	7.7	10.09	44	4.3	8.01
14	7.1	10.16	45	4.3	7.97
15	6.6	10.16	46	4.3	7.95
16	6.3	10.05	47	4.3	7.80
17	6.0	9.83	48	4.2	7.82
18	5.6	9.50	49	4.2	7.86
19	5.5	9.35	50	4.2	7.86
20	5~~5~~.2	9.10	51	4.2	7.75
21	5.1	8.84	52	4.2	7.70
22	5.0	8.53	53	4.2	7.64
23	4.9	8.44	54	4.3	7.51
24	4.8	8.35	55	4.3	7.42
25	4.7	8.30	56	4.3	7.36
26	4.6	8.26	57	4.3	7.23
27	4.6	8.25	58	4.2	7.15
28	4.6	8.20	59	4.2	7.02
29	4.6	8.20	60	4.2	6.76
30	4.5	8.21	61	4.2	6.63

WATER TEMPERATURE AND DISSOLVED OXYGEN
LAKE PROFILE DATA FORM

Location: Lake Sabrina

DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (ºC)	DISSOLVED OXYGEN (mg/L)	DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (ºC)	DISSOLVED OXYGEN (mg/L)
62	4.2	6.54	91		
63	4.2	6.06	92		
64	4.2	5.59	93		
65	4.2	5.05	94		
65.3 ~~66~~	4.2	4.70	95		
67			96		
68			97		
69			98		
70			99		
71			100		
72			101		
73			102		
74			103		
75			104		
76			105		
77			106		
78			107		
79			108		
80			109		
81			110		
82			111		
83			112		
84			113		
85			114		
86			115		
87			116		
88			117		
89			118		
90			119		

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: North Fork DATE: 7/12/21 TIME: 7:30am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 16.2 (ºF or ºC) Dissolved Oxygen: 7.92 (mg/L)

Conductivity: - (µmhos/cm@25 ºC) Stream or Lake gage reading: 13.4 cfs

Turbidity: - (NTUs) Air Temperature 63 (ºF or ºC) Baro. Pressure 21.60 (in Hg)

Winds 0-1 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Middle Fork DATE: 7/12/21 TIME: 8:55am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: 17.4 (ºF or ºC) Dissolved Oxygen: 7.46 (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 66 (ºF or ºC) Baro. Pressure 21.74 (in Hg)

Winds 0-1 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ___ Colored ___

Floating Material ___ Other: ___

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ___ Preservatives: ___

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Fork DATE: 7/12/21 TIME: 9:45am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

Water Temperature: 12.7 (ºF or ºC)

Conductivity: - (μmhos/cm@25 ºC)

Turbidity: - (NTUs)

WEATHER CONDITIONS

Dissolved Oxygen: 7.91 (mg/L)

Stream or Lake gage reading: -

Air Temperature 70 (ºF or °C) Baro. Pressure 21.34 (in Hg)

Winds 1-2 (mph) Cloud cover 15 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Lake DATE: 7/12/21 TIME: 11:15am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: – (ºF or ºC) Dissolved Oxygen: – (mg/L)

Conductivity: – (μmhos/cm@25 ºC) Stream or Lake gage reading: 9683.28'

Turbidity: – (NTUs) Air Temperature 72 (ºF or ºC) Baro. Pressure 21.23 (in Hg)

Winds 5-9 (mph) Cloud cover 30 (%) Precipitation __Fog __Rain __Sleet __Hail __Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ___ Colored ___
Floating Material ___ Other: ___

Remarks:

Notes

Lake is very low. Approx. 15' lower than during June trip. Collected sample far below usual boat ramp location. Signs of people using this area (footprints).

WATER QUALITY SAMPLE DATA

Sample No. SL-BR-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 Weck bottle
1 Source Molecular

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Lake Sabrina DATE: 7/12/21 TIME: 11:45am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: – (ºF or ºC) Dissolved Oxygen: – (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: 9098.08

Turbidity: – (NTUs) Air Temperature 76 (ºF or ºC) Baro. Pressure 21.68 (in Hg)

Winds 5-11 (mph) Cloud cover 30 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear ____ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. LS-BR-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 weck bottle
1 source Molecular bottle

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Intake 2 Reservoir DATE: 7/12/21 TIME: 12:05pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS — WEATHER CONDITIONS

Water Temperature: – (ºF or ºC) Dissolved Oxygen: – (mg/L)

Conductivity: – (μmhos/cm@25 ºC) Stream or Lake gage reading: ____

Turbidity: – (NTUs) Air Temperature 79 (ºF or ºC) Baro. Pressure 22.49 (in Hg)

Winds 3-7 (mph) Cloud cover 40 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks: ____

Notes

WATER QUALITY SAMPLE DATA

Sample No. INT2-RES-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 Weck bottle

1 Source Molecular bottle

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH2 DATE: 7/13/21 TIME: 8:30am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 15.4 (ºF or ºC) Dissolved Oxygen: 7.94 (mg/L)

Conductivity: — (μmhos/cm@25 ºC) Stream or Lake gage reading: ____

Turbidity: — (NTUs) Air Temperature 73 (ºF or ºC) Baro. Pressure 23.22 (in Hg)

Winds 2-3 (mph) Cloud cover 10 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: ____

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC Below PH2 DATE: 7/13/21 TIME: 8:45am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 15.1 (ºF or ºC) Dissolved Oxygen: 8.09 (mg/L)

Conductivity: – (μmhos/cm@25 ºC) Stream or Lake gage reading: 1.7'

Turbidity: – (NTUs) Air Temperature 73 (ºF or ºC) Baro. Pressure 23.22 (in Hg)

Winds 0-1 (mph) Cloud cover 10 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH3 DATE: 7/13/21 TIME: 9:15am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: 15.5 (ºF or ºC) Dissolved Oxygen: 8.22 (mg/L)

Conductivity: - (µmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 79 (ºF or ºC) Baro. Pressure 23.90 (in Hg)

Winds 2-4 (mph) Cloud cover 10 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: _____ meters Depth of Reappearance: _____ meters

Secchi Depth: _____ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH3 DATE: 7/13/21 TIME: 9:35am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 15.8 (ºF or ºC) Dissolved Oxygen: 8.21 (mg/L)

Conductivity: - (μmhos/cm@25 ºC) Stream or Lake gage reading: 0.7'

Turbidity: - (NTUs) Air Temperature 79 (ºF or ºC) Baro. Pressure 23,90 (in Hg)

Winds 0 (mph) Cloud cover 10 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH 4 DATE: 7/13/21 TIME: 10:00 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS — WEATHER CONDITIONS

Water Temperature: 16.0 (ºF or ºC) Dissolved Oxygen: 8.43 (mg/L)

Conductivity: — (µmhos/cm@25 ºC) Stream or Lake gage reading: —

Turbidity: — (NTUs) Air Temperature 84 (°F or °C) Baro. Pressure 24.85 (in Hg)

Winds 2-4 (mph) Cloud cover 10 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH 4 DATE: 7/13/21 TIME: 10:20am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 16.0 (ºF or ºC) Dissolved Oxygen: 8.53 (mg/L)

Conductivity: – (μmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 85 (ºF or ºC) Baro. Pressure 24.89 (in Hg)

Winds 0 - 1 (mph) Cloud cover 10 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ________meters Depth of Reappearance: ________meters

Secchi Depth: ________meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH5 DATE: 7/13/21 TIME: 10:40 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 16.3 (ºF or ºC) Dissolved Oxygen: 8.21 (mg/L)

Conductivity: - (μmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 87 (ºF or ºC) Baro. Pressure 25.21 (in Hg)

Winds 3-7 (mph) Cloud cover 10 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: _____ meters Depth of Reappearance: _____ meters

Secchi Depth: _____ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy _____ Colored _____

Floating Material _____ Other: _____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles _____ Preservatives: _____

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH5 DATE: 7/13/21 TIME: 10:55am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: 17.1 (ºF or ºC) Dissolved Oxygen: 8.32 (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 87 (ºF or ºC) Baro. Pressure 25.21 (in Hg)

Winds 0-1 (mph) Cloud cover 10 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ___ Colored ___

Floating Material ___ Other: ___

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ___ Preservatives: ___

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH 6 DATE: 7/13/21 TIME: 11:10 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 16.6 (ºF or ºC) Dissolved Oxygen: 8.59 (mg/L)

Conductivity: - (µmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 88 (ºF or ºC) Baro. Pressure 25.44 (in Hg)

Winds 4-14 (mph) Cloud cover 15 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: _____ meters Depth of Reappearance: _____ meters

Secchi Depth: _____ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy _____ Colored _____
Floating Material _____ Other: _____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles _____ Preservatives: _____

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH6 DATE: 7/13/21 TIME: 11:20am

DRAINAGE: Bishop Creek INVESTIGATORS: +B

PHYSICAL WATER QUALITY PARAMETERS

Water Temperature: 16.8 (ºF or ºC)

Conductivity: – (µmhos/cm@25 ºC)

Turbidity: – (NTUs)

WEATHER CONDITIONS

Dissolved Oxygen: 8.61 (mg/L)

Stream or Lake gage reading: –

Air Temperature 88 (ºF or ºC) Baro. Pressure 25.44 (in Hg)

Winds 0-1 (mph) Cloud cover 15 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Lake DATE: 7/15/21 TIME: 12:05 pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: — (ºF or ºC) Dissolved Oxygen: — (mg/L)

Conductivity: — (µmhos/cm@25 ºC) Stream or Lake gage reading: 9682.18

Turbidity: — (NTUs) Air Temperature 70 (ºF or ºC) Baro. Pressure 21.16 (in Hg)

Winds 8-20 gusts to 25 mph (mph) Cloud cover 15 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ___ Colored ___

Floating Material ___ Other: ___

Remarks: Lake level low, far below original boat ramp

Notes

WATER QUALITY SAMPLE DATA

Sample No. SL-BR-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 Weck

1 Source Molecular

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Lake Sabrina DATE: 7/15/21 TIME: 12:30pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: — (ºF or ºC) Dissolved Oxygen: — (mg/L)

Conductivity: — (µmhos/cm@25 ºC) Stream or Lake gage reading: 9097.69'

Turbidity: — (NTUs) Air Temperature 74 (ºF or ºC) Baro. Pressure 21.62 (in Hg)

Winds 4-10 gusts to 13 (mph) Cloud cover 15 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):
Clear ___ Cloudy ___ Colored ___
Floating Material ___ Other: ___

Remarks: ___

Notes

WATER QUALITY SAMPLE DATA

Sample No. LS-BR-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: ___

REMARKS

1 Weck
1 Source Molecular

SIGNED BY: [signature] REVIEWED BY: ___

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Intake 2 Reservoir DATE: 7/15/21 TIME: 12:50 pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: - (ºF or ºC) Dissolved Oxygen: - (mg/L)

Conductivity: - (µmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 77 (ºF or ºC) Baro. Pressure 22.44 (in Hg)

Winds 2-5 (mph) Cloud cover 15 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ______ Colored ______
Floating Material X Other: ______

Remarks: Algae mats floating on surface

Notes

WATER QUALITY SAMPLE DATA

Sample No. INT2-RES-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 Week
1 Source Molecular

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: North Fork DATE: 7/26/21 TIME: 8:30 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: 15.8 (ºF or ºC) Dissolved Oxygen: 7.41 (mg/L)

Conductivity: 30 (μmhos/cm@25 ºC) Stream or Lake gage reading: 13 cfs

Turbidity: 1.85 (NTUs) Air Temperature 58 (ºF or ºC) Baro. Pressure 21.40 (in Hg)

Winds 0-1 (mph) Cloud cover 30 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks: Some smoke in air

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-NF-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Middle Fork DATE: 7/26/21 TIME: 9:15a

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: 18.4 (ºF or ºC) Dissolved Oxygen: 7.08 (mg/L)

Conductivity: 0.07 (µmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: 1.75 (NTUs) Air Temperature 60 (ºF or ºC) Baro. Pressure 21.55 (in Hg)

Winds 0-1 (mph) Cloud cover 30 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: ____

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-LS Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Fork DATE: 7/26/21 TIME: 10:00 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS — WEATHER CONDITIONS

Water Temperature: 14.1 (ºF or ºC) Dissolved Oxygen: 7.46 (mg/L)

Conductivity: 33 (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: 2.03 (NTUs) Air Temperature 61 (ºF or ºC) Baro. Pressure 21.15 (in Hg)

Winds 1-3 (mph) Cloud cover 25 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: Depth of Disappear: ______meters Depth of Reappearance: ______meters

Secchi Depth: ______meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-SL Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Lake DATE: 7/26/21 TIME: 12:00pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: – (ºF or ºC) Dissolved Oxygen: – (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: ______

Turbidity: – (NTUs) Air Temperature 62 (ºF or ºC) Baro. Pressure 21.10 (in Hg)

Winds 4-9 (mph) Cloud cover 25 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks: Lake lower than mid-July visit

Notes

WATER QUALITY SAMPLE DATA

Sample No. SL-BR-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 Week
1 Source Molecular

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Lake Sabrina DATE: 7/24/21 TIME: 12:40pm

DRAINAGE: Bishop Creek INVESTIGATORS: JB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: — (ºF or ºC) Dissolved Oxygen: — (mg/L)

Conductivity: — (µmhos/cm@25 ºC) Stream or Lake gage reading: ____

Turbidity: — (NTUs) Air Temperature 66 (ºF or °C) Baro. Pressure 21.55 (in Hg)

Winds 4-7 (mph) Cloud cover 40 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: ____

Notes

WATER QUALITY SAMPLE DATA

Sample No. LS-BR-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 Week
1 Source Molecule

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Intake 2 Reservoir DATE: 7/26/21 TIME: 1:00pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: – (ºF or ºC) Dissolved Oxygen: – (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 67 (ºF or ºC) Baro. Pressure 22.15 (in Hg)

Winds 3-8 (mph) Cloud cover 40 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear x Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. INT-RES-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: Non

REMARKS

1 Week
1 Source Member

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Lake DATE: 7/27/21 TIME: 9:45am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: See profile (ºF or ºC) Dissolved Oxygen: See profile (mg/L)

Conductivity: 31 (µmhos/cm@25 ºC) Stream or Lake gage reading: 9676'

Turbidity: Secchi (NTUs) Air Temperature 58 (ºF or ºC) Baro. Pressure 21.10 (in Hg)

Winds 4-6 gusts to 16 (mph) Cloud cover 10 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: Y Depth of Disappear: 9.5 meters Depth of Reappearance: 8 meters

Secchi Depth: 8.75 meters

Visual Condition of Stream (check all that apply):
Clear ______ Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks: ______

Notes

Sampled at 10m depth

WATER QUALITY SAMPLE DATA

Sample No. SL-DP-10 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Lake DATE: 7/27/21 TIME: 10:15am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: See profile (ºF or ºC) Dissolved Oxygen: See profile (mg/L)

Conductivity: 73 (μmhos/cm@25 ºC) Stream or Lake gage reading: 9676'

Turbidity: Secchi (NTUs) Air Temperature 55 (ºF or ºC) Baro. Pressure 21.10 (in Hg)

gust to 16

Winds 4-6 (mph) Cloud cover 10 (%) Precipitation __Fog __Rain __Sleet __Hail __Snow

Secchi Disk: Y Depth of Disappear: 9.5 meters Depth of Reappearance: 8 meters

Secchi Depth: 8.75 meters

Visual Condition of Stream (check all that apply):

Clear ___ Cloudy ___ Colored ___

Floating Material ___ Other: ___

Remarks:

Notes

Sampled at 24m depth

WATER QUALITY SAMPLE DATA

Sample No. SL-DP-24 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Lake Sabrina DATE: 7/28/21 TIME: 9:45am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: See profile (ºF or ºC) Dissolved Oxygen: See profile (mg/L)

Conductivity: 26 (μmhos/cm@25 ºC) Stream or Lake gage reading: 9098.58'

Turbidity: Secchi (NTUs) Air Temperature 58 (ºF or ºC) Baro. Pressure 21.70 (in Hg)

Winds 3-6 (mph) Cloud cover 50 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: Y Depth of Disappear: 13 meters Depth of Reappearance: 11.5 meters

Secchi Depth: 12.25 meters

Visual Condition of Stream (check all that apply):
Clear ____ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

Sampled at 5m depth

WATER QUALITY SAMPLE DATA

Sample No. LS-DP-5 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Lake Sabrina DATE: 7/28/21 TIME: 10:05am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: see profile (ºF or ºC) Dissolved Oxygen: see profile (mg/L)

Conductivity: 27 (µmhos/cm@25 ºC) Stream or Lake gage reading: 9098.58'

Turbidity: Secchi (NTUs) Air Temperature 58 (ºF or ºC) Baro. Pressure 21.70 (in Hg)

Winds 3-6 (mph) Cloud cover 50 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: Y Depth of Disappear: 13 meters Depth of Reappearance: 11.5 meters

Secchi Depth: 12.25 meters

Visual Condition of Stream (check all that apply):
Clear ____ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

Sampled at 22m depth

WATER QUALITY SAMPLE DATA

Sample No. LS-DP-22 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Lake Sabrina DATE: 7/28/21 TIME: 12:05pm

DRAINAGE: Bishop Creek INVESTIGATORS: JB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: – (ºF or ºC) Dissolved Oxygen: – (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: 9098.58'

Turbidity: – (NTUs) Air Temperature 65 (ºF or ºC) Baro. Pressure 21.56 (in Hg)

Winds 3-6 (mph) Cloud cover 50 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):
Clear ___ Cloudy ___ Colored ___
Floating Material ___ Other: ___

Remarks: ___

Notes

WATER QUALITY SAMPLE DATA

Sample No. LS-BR-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 Week
1 Source Molecular

SIGNED BY: [signature] REVIEWED BY: ___

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Intake 2 Reservoir DATE: 7/28/21 TIME: 12:15 pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: - (ºF or ºC) Dissolved Oxygen: - (mg/L)

Conductivity: - (µmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 65 (ºF or ºC) Baro. Pressure 22.15 (in Hg)

Winds 0-1 (mph) Cloud cover 40 (%) Precipitation __Fog __Rain __Sleet __Hail __Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):
Clear ___ Cloudy ___ Colored ___
Floating Material ___ Other: ___

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. INT2-RES-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 Weck
1 Source Molecular

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Lake DATE: 7/20/21 TIME: 12:40pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: – (ºF or ºC) Dissolved Oxygen: – (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: 9676.54'

Turbidity: – (NTUs) Air Temperature 66 (ºF or ºC) Baro. Pressure 21.10 (in Hg)

Winds 1-3 (mph) Cloud cover 60 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: _____ meters Depth of Reappearance: _____ meters

Secchi Depth: _____ meters

Visual Condition of Stream (check all that apply):
Clear _____ Cloudy _____ Colored _____
Floating Material _____ Other: _____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. SL-BR-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 Weck
1 Source Molecular

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH6 DATE: 7/29/21 TIME: 7:50 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: 15.3 (ºF or ºC) Dissolved Oxygen: 8.54 (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 70 (ºF or ºC) Baro. Pressure 25.45 (in Hg)

Winds 0 (mph) Cloud cover 70 (%) Precipitation __Fog __Rain __Sleet __Hail __Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ___ Colored ___

Floating Material ___ Other: ___

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ___ Preservatives: ___

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC-blw-PH6 DATE: 7/29/21 TIME: 8:05 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: 15.2 (ºF or ºC) Dissolved Oxygen: 8.65 (mg/L)

Conductivity: 51 (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: 2.89 (NTUs) Air Temperature 70 (ºF or ºC) Baro. Pressure 25.45 (in Hg)

Winds 0 (mph) Cloud cover 70 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: _____meters Depth of Reappearance: _____meters

Secchi Depth: _____meters

Visual Condition of Stream (check all that apply):
Clear x Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH6 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH5 DATE: 7/29/21 TIME: 8:25am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: 14.9 (ºF or ºC) Dissolved Oxygen: 8.44 (mg/L)

Conductivity: - (μmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 70 (ºF or ºC) Baro. Pressure 25.20 (in Hg)

Winds 0 - 1 (mph) Cloud cover 80 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC b\w PH5 DATE: 7/29/21 TIME: 8:35am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: 15.3 (ºF or ºC) Dissolved Oxygen: 8.42 (mg/L)

Conductivity: 52 (μmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: 6.26 (NTUs) Air Temperature 70 (ºF or ºC) Baro. Pressure 25.20 (in Hg)

Winds 0-1 (mph) Cloud cover 80 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks: some algae on creek bottom

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-b\w-PH5 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH4 DATE: 7/29/21 TIME: 9:00 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 14.7 (ºF or ºC) Dissolved Oxygen: 8.57 (mg/L)

Conductivity: - (μmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 70 (ºF or ºC) Baro. Pressure 24.85 (in Hg)

Winds 0-2 (mph) Cloud cover 70 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear:_______meters Depth of Reappearance: _______meters

Secchi Depth: _______meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC-blw-PH4 DATE: 7/29/21 TIME: 9:10 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 15.0 (ºF or ºC) Dissolved Oxygen: 8.60 (mg/L)

Conductivity: 51 (µmhos/cm@25 ºC) Stream or Lake gage reading: —

Turbidity: 2.61 (NTUs) Air Temperature 70 (ºF or ºC) Baro. Pressure 24.85 (in Hg)

Winds 0-2 (mph) Cloud cover 70 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ___ Colored ___
Floating Material ___ Other: ___

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH4 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH3 DATE: 7/29/21 TIME: 9:30 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS — WEATHER CONDITIONS

Water Temperature: 14.4 (ºF or ºC) Dissolved Oxygen: 8.33 (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 70 (ºF or ºC) Baro. Pressure 23.90 (in Hg)

Winds 0-1 (mph) Cloud cover 70 (%) Precipitation __Fog __Rain __Sleet __Hail __Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC-blw-PH3 DATE: 7/29/21 TIME: 9:45am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 14.6 (ºF or ºC) Dissolved Oxygen: 8.30 (mg/L)

Conductivity: 50 (µmhos/cm@25 ºC) Stream or Lake gage reading: 0.72

Turbidity: 2.55 (NTUs) Air Temperature 70 (ºF or °C) Baro. Pressure 23.90 (in Hg)

Winds 0-1 (mph) Cloud cover 70 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH3 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH2 DATE: 7/29/21 TIME: 10:15am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 14.4 (ºF or ºC) Dissolved Oxygen: 8.06 (mg/L)

Conductivity: - (μmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 69 (ºF or ºC) Baro. Pressure 23.20 (in Hg)

Winds 1-3 (mph) Cloud cover 70 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ___ Colored ___
Floating Material ___ Other: ___

Remarks: ___

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ___ Preservatives: ___

REMARKS

SIGNED BY: [signature] REVIEWED BY: ___

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC-blw-PH2 DATE: 7/29/21 TIME: 10:25am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 14.2 (ºF or ºC) Dissolved Oxygen: 8.21 (mg/L)

Conductivity: 47 (µmhos/cm@25 ºC) Stream or Lake gage reading: 1.74'

Turbidity: 3.23 (NTUs) Air Temperature 69 (ºF or ºC) Baro. Pressure 23.20 (in Hg)

Winds 0-1 (mph) Cloud cover 70 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH2 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Lake DATE: 7/29/21 TIME: 11:45am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: – (ºF or ºC) Dissolved Oxygen: – (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: 9676'

Turbidity: – (NTUs) Air Temperature 64 (ºF or ºC) Baro. Pressure 21.10 (in Hg)

Winds 2-4 (mph) Cloud cover 80 (%) Precipitation __Fog __Rain __Sleet __Hail __Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):
Clear ___ Cloudy ___ Colored ___
Floating Material ___ Other: ___

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. SL-BR-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 Week

1 Serve Ndeinla

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Lake Sabrina DATE: 7/29/21 TIME: 12:10pm

DRAINAGE: Bishop Creek INVESTIGATORS: JB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: – (ºF or ºC) Dissolved Oxygen: – (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: 9098.5'

Turbidity: – (NTUs) Air Temperature 67 (ºF or ºC) Baro. Pressure 21.60 (in Hg)

Winds 0-1 (mph) Cloud cover 90 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear ______ Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. LS-BR-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 Week
1 Source Molecular

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Intake 2 Reservoir DATE: 7/29/21 TIME: 12:20 pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: — (ºF or ºC) Dissolved Oxygen: — (mg/L)

Conductivity: — (µmhos/cm@25 ºC) Stream or Lake gage reading: —

Turbidity: — (NTUs) Air Temperature 68 (ºF or ºC) Baro. Pressure 22.40 (in Hg)

Winds 0-1 (mph) Cloud cover 90 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______meters Depth of Reappearance: ______meters

Secchi Depth: ______meters

Visual Condition of Stream (check all that apply):
Clear ______ Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. INT2-RES-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 Week
1 Source Molecular

SIGNED BY: [signature] REVIEWED BY: ______

SURFACE Temp
17.4 °C

TD ~ 46m

WATER TEMPERATURE AND DISSOLVED OXYGEN
LAKE PROFILE DATA FORM

Location: South Lake 7/27/21

	DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	
	0.5	17.4	7.31	31	5.4	0.03	
	1	17.4	7.33	32	5.7	0.01	
	2	17.4	7.34	33	5.9	0.00	DEPTH =39m
	3	17.4	7.34	34	6.1	0.09	* NL →
	4	17.3	7.35	35	6.3	0.06	
	5	17.1	7.44	36	6.5	0.03	
	6	16.9	7.48	37	6.7	0.02	
	7	16.8	7.60	38	6.9	0.01	
	8	16.5	7.53	39	7.1	-0.01	
	9	16.4	7.57	40	7.3	-0.01	
*	10	16.1	7.68	41	7.5	-0.02	
	11	16.0	7.85	42	7.6	-0.02	
	12	15.4	8.13	43	7.7	-0.03	
	13	14.8	8.27	44	7.7	-0.04	
T	14	14.2	8.26	~~45~~ 44.75	7.8	-0.04	
	15	13.5	8.16	46			
15.5m →		11.6	8.08				
	16	10.6	8.27	47			
16.5m ⇒	16.5	8.4	8.64				
	17	7.1	8.80	48			
	18	5.8	8.80	49			
	19	5.1	8.65	50			
	20	4.8	8.40	51			
	21	4.7	8.15	52			
	22	4.5	7.80	53			
	23	4.4	7.42	54			
*	24	4.4	6.91	55			
	25	4.4	6.29	56			
	26	4.4	5.32	57			
	27	4.4	4.46	58			
	28	4.5	2.55	59			
	29	4.6	1.03	60			
	30	4.8	0.13	61			

SURFACE T
18°C
7.10 ppm (DO)

DEPTH
64.8m
67.4m

WATER TEMPERATURE AND DISSOLVED OXYGEN LAKE PROFILE DATA FORM

Location: Lake Sabrina 7/28/21

DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)
0.5	18.1	7.08	31	4.5	7.54
1	18.1	7.06	32	4.5	7.53
2	18.1	7.05	33	4.5	7.52
3	18.1	7.04	34	4.5	7.51
4	18.1	7.04	35	4.4	7.49
5	18.0	7.14	36	4.4	7.48
6	17.4	7.32	37	4.4	7.44
7	16.8	7.58	38	4.4	7.43
7.5m	15.5	8.45			
8	14.5	8.75	39	4.3	7.40
8.5m	13.4	9.00			
9	12.5	9.20	40	4.3	7.38
10	11.2	9.42	41	4.3	7.38
11	10.2	9.62	42	4.3	7.38
12	9.3	9.7	43	4.3	7.38
13	8.5	9.77	44	4.3	7.34
14	7.9	9.76	45	4.2	7.32
15	7.3	9.75	46	4.3	7.20
16	6.7	9.56	47	4.3	7.10
17	6.3	9.30	48	4.3	6.95
18	6.0	9.13	49	4.3	6.85
19	5.8	8.95	50	4.3	6.74
20	5.5	8.61	51	4.3	6.60
21	5.3	8.38	52	4.3	6.40
22	5.2	8.10	53	4.3	6.32
23	5.1	7.85	54	4.3	6.29
24	4.9	7.83	55	4.3	6.28
25	4.8	7.77	56	4.3	5.99
26	4.8	7.71	57	4.3	5.91
27	4.7	7.62	58	4.3	5.75
28	4.6	7.61	59	4.3	5.25
29	4.6	7.57	60	4.3	5.02
30	4.6	7.56	61	4.3	4.67

CLOUDY WATER @ 30m CAMERA

(61.8 BOT)

WATER TEMPERATURE AND DISSOLVED OXYGEN LAKE PROFILE DATA FORM

Location: SABRINA – 7/28/21

DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)
62	4.3	4.43	91		
63	4.3	4.33	92		
64			93		
65			94		
66			95		
67			96		
68			97		
69			98		
70			99		
71			100		
72			101		
73			102		
74			103		
75			104		
76			105		
77			106		
78			107		
79			108		
80			109		
81			110		
82			111		
83			112		
84			113		
85			114		
86			115		
87			116		
88			117		
89			118		
90			119		

(67.2m)

(67.2) m
N 37.20327
W 118.62099

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Lake DATE: 8/2/21 TIME: 11:50 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: — (ºF or ºC) Dissolved Oxygen: — (mg/L)

Conductivity: — (µmhos/cm@25 ºC) Stream or Lake gage reading: ____

Turbidity: — (NTUs) Air Temperature 64 (ºF or ºC) Baro. Pressure 21.20 (in Hg)

Winds 3-4 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear ____ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: ____

Notes

WATER QUALITY SAMPLE DATA

Sample No. SL-BR-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 Weck
1 Source Molecular

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Lake Sabrina DATE: 8/2/21 TIME: 12:15pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: - (ºF or ºC) Dissolved Oxygen: - (mg/L)

Conductivity: - (μmhos/cm@25 ºC) Stream or Lake gage reading: ______

Turbidity: - (NTUs) Air Temperature 69 (ºF or ºC) Baro. Pressure 21.65 (in Hg)

Winds 3-4 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear ______ Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. LS-BR-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 Week
1 Source Molecular

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Intake 2 Reservoir DATE: 8/2/21 TIME: 12:30pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: – (ºF or ºC) Dissolved Oxygen: – (mg/L)

Conductivity: – (μmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 74 (ºF or ºC) Baro. Pressure 22.50 (in Hg)

Winds 1-2 (mph) Cloud cover 5 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear ____ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. INT2-RES-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 Week

1 Source Molecular

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC Below PH-6 DATE: 9/5/21 TIME: 8:45AM

DRAINAGE: Bishop Creek INVESTIGATORS: KD & TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 16.6 (ºF or ºC) Dissolved Oxygen: 8.30 (mg/L)

Conductivity: — (μmhos/cm@25 ºC) Stream or Lake gage reading: —

Turbidity: — (NTUs) Air Temperature 81 (ºF or ºC) Baro. Pressure 25.44 (in Hg)

Winds 0 (mph) Cloud cover 0 (%) Precipitation __Fog __Rain __Sleet __Hail __Snow

Secchi Disk: N/A Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. N/A Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH-6 DATE: 8/5/21 TIME: 8:55AM

DRAINAGE: Bishop Creek INVESTIGATORS: KD - TB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: 16.6 (ºF or ºC) Dissolved Oxygen: 8.40 (mg/L)

Conductivity: — (µmhos/cm@25 ºC) Stream or Lake gage reading: —

Turbidity: — (NTUs) Air Temperature 81 (ºF or ºC) Baro. Pressure 25.44 (in Hg)

Winds 0 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH-5 DATE: 8/5/21 TIME: 9:15 am

DRAINAGE: Bishop Creek INVESTIGATORS: KO & TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 16.8 (ºF or ºC) Dissolved Oxygen: 8.26 (mg/L)

Conductivity: — (µmhos/cm@25 ºC) Stream or Lake gage reading: —

Turbidity: — (NTUs) Air Temperature 81 (ºF or ºC) Baro. Pressure 25.20 (in Hg)

Winds 0 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ___ Colored ___

Floating Material ___ Other: ___

Remarks: ___

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ___ Preservatives: ___

REMARKS

SIGNED BY: [signature] REVIEWED BY: ___

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC Below PH-5 DATE: 8/5/21 TIME: 9:25AM

DRAINAGE: Bishop Creek INVESTIGATORS: KD TB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: 17 (ºF or ºC) Dissolved Oxygen: 8.15 (mg/L)

Conductivity: — (µmhos/cm@25 ºC) Stream or Lake gage reading: —

Turbidity: — (NTUs) Air Temperature 81 (ºF or ºC) Baro. Pressure 25.20 (in Hg)

Winds 0 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

NA

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH-4 DATE: 8/5/21 TIME: 9:35

DRAINAGE: Bishop Creek INVESTIGATORS: KD TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 16.3 (ºF or ºC) Dissolved Oxygen: 8.16 (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 83 (ºF or ºC) Baro. Pressure 24.83 (in Hg)

Winds 1 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

NA

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks: ____

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC Below PH-4 DATE: 8/5/21 TIME: 9:45

DRAINAGE: Bishop Creek INVESTIGATORS: TB KD

PHYSICAL WATER QUALITY PARAMETERS — WEATHER CONDITIONS

Water Temperature: 16.4 (ºF or ºC) Dissolved Oxygen: 8.33 (mg/L)

Conductivity: — (μmhos/cm@25 ºC) Stream or Lake gage reading: —

Turbidity: — (NTUs) Air Temperature 83 (ºF or ºC) Baro. Pressure 24.86 (in Hg)

Winds 1-2 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: Depth of Disappear: ______ meters Depth of Reappearance: ______ meters
NA
Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH-3 DATE: 8/5/21 TIME: 10:00 AM

DRAINAGE: Bishop Creek INVESTIGATORS: KD & TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 16.2 (ºF or ºC) Dissolved Oxygen: 8.00 (mg/L)

Conductivity: — (μmhos/cm@25 ºC) Stream or Lake gage reading: —

Turbidity: — (NTUs) Air Temperature 83 (ºF or ºC) Baro. Pressure 23.88 (in Hg)

Winds 1-2 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC Below PH - 3 DATE: 8/5/21 TIME: 10:10AM

DRAINAGE: Bishop Creek INVESTIGATORS: KD & TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 16.5 (ºF or ºC)

Dissolved Oxygen: 7.95 (mg/L)

Conductivity: — (µmhos/cm@25 ºC)

Stream or Lake gage reading: 0.7 ft

Turbidity: — (NTUs)

Air Temperature 84 (ºF or ºC) Baro. Pressure 23.88 (in Hg)

Winds 1 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH-2 DATE: 8/5/21 TIME: 10:30AM

DRAINAGE: Bishop Creek INVESTIGATORS: KD TB

PHYSICAL WATER QUALITY PARAMETERS — WEATHER CONDITIONS

Water Temperature: 16.0 (ºF or ºC) Dissolved Oxygen: 7.77 (mg/L)

Conductivity: — (μmhos/cm@25 ºC) Stream or Lake gage reading: —

Turbidity: — (NTUs) Air Temperature 83 (ºF or ºC) Baro. Pressure 23.2 (in Hg)

Winds 2-4 (mph) Cloud cover 0 (%) Precipitation ___ Fog ___ Rain ___ Sleet ___ Hail ___ Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks: ______

Site Drawing

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH-2 DATE: 8/5/21 TIME: 10:45AM

DRAINAGE: Bishop Creek INVESTIGATORS: KD TB

PHYSICAL WATER QUALITY PARAMETERS | **WEATHER CONDITIONS**

Water Temperature: 15.3 (ºF or ºC) Dissolved Oxygen: 7.94 (mg/L)

Conductivity: - (μmhos/cm@25 ºC) Stream or Lake gage reading: 1.72 ft

Turbidity: - (NTUs) Air Temperature 83 (ºF or ºC) Baro. Pressure 23.2 (in Hg)

Winds 1 (mph) Cloud cover 0 (%) Precipitation ___ Fog ___ Rain ___ Sleet ___ Hail ___ Snow

Secchi Disk: Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

NA

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks: ____

Site Drawing

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: North Fork DATE: 8/5/21 TIME: 11:15AM

DRAINAGE: Bishop Creek INVESTIGATORS: KD TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 16.6 (ºF or ºC) Dissolved Oxygen: 7.86 (mg/L)

Conductivity: — (μmhos/cm@25 ºC) Stream or Lake gage reading: 12.3 cfs

Turbidity: — (NTUs) Air Temperature 71 (ºF or ºC) Baro. Pressure 21.55 (in Hg)

Winds 2-11 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear:_______meters Depth of Reappearance: _______meters

Secchi Depth: _______meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Middle Fork DATE: 8/5/21 TIME: 11:30AM

DRAINAGE: Bishop Creek INVESTIGATORS: TB KD

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 17.4 (ºF or ºC) Dissolved Oxygen: 7.37 (mg/L)

Conductivity: — (μmhos/cm@25 ºC) Stream or Lake gage reading: —

Turbidity: — (NTUs) Air Temperature 71 (ºF or ºC) Baro. Pressure 21.69 (in Hg)

Winds 8-12 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ________ meters Depth of Reappearance: ________ meters

Secchi Depth: ________ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ________ Colored ________
Floating Material ________ Other: ________

Remarks: ________

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ________ Preservatives: ________

REMARKS

SIGNED BY: [signature] REVIEWED BY: ________

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Lake Sabrina DATE: 8/5/21 TIME: 11:40 AM

DRAINAGE: Bishop Creek INVESTIGATORS: KD TB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: — (ºF or ºC) Dissolved Oxygen: — (mg/L)

Conductivity: — (µmhos/cm@25 ºC) Stream or Lake gage reading: 9099.69 ft

Turbidity: — (NTUs) Air Temperature 71 (ºF or ºC) Baro. Pressure 21.65 (in Hg)

Winds 9-16 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

O

WATER QUALITY SAMPLE DATA

Sample No. LS-BR-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: No

REMARKS

1 Weck

1 source molecular

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Intake 2 reservoir DATE: 8/5/21 TIME: 12:10PM

DRAINAGE: Bishop Creek INVESTIGATORS: KD TB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: — (ºF or ºC) Dissolved Oxygen: — (mg/L)

Conductivity: — (μmhos/cm@25 ºC) Stream or Lake gage reading: —

Turbidity: — (NTUs) Air Temperature 76 (ºF or ºC) Baro. Pressure 22.44 (in Hg)

Winds 4-12 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: N/A Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks: Algal mats floating reservoir surface

Notes

WATER QUALITY SAMPLE DATA

Sample No. INT2-RES-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 week

1 source molecular

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Fork DATE: 8/5/21 TIME: 12:23PM

DRAINAGE: Bishop Creek INVESTIGATORS: KD TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 15.8 (ºF or ºC) Dissolved Oxygen: 7.26 (mg/L)

Conductivity: — (µmhos/cm@25 ºC) Stream or Lake gage reading: —

Turbidity: — (NTUs) Air Temperature 71 (ºF or ºC) Baro. Pressure 21.27 (in Hg)

Winds 4-8 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

N/A

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):

Clear √ Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Lake DATE: 8/5/21 TIME: 12:35PM

DRAINAGE: Bishop Creek INVESTIGATORS: KP TB

PHYSICAL WATER QUALITY PARAMETERS — WEATHER CONDITIONS

Water Temperature: – (ºF or ºC) Dissolved Oxygen: – (mg/L)

Conductivity: – (μmhos/cm@25 ºC) Stream or Lake gage reading: 9673.73 ft

Turbidity: – (NTUs) Air Temperature 68 (ºF or ºC) Baro. Pressure 21.17 (in Hg)

Winds 12-24 (mph) Cloud cover 0 (%) Precipitation __Fog __Rain __Sleet __Hail __Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ___ Colored ___
Floating Material ___ Other: ___

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. SL-BR-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 2 Preservatives: None

REMARKS

1 Weck
1 source molecular

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Lake DATE: 8/23/21 TIME: 10:30am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JTB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: see profile (ºF or ºC) Dissolved Oxygen: see profile (mg/L)

Conductivity: 40 (µmhos/cm@25 ºC) Stream or Lake gage reading: 9664.6' msl

Turbidity: Secchi (NTUs) Air Temperature 65 (ºF or ºC) Baro. Pressure 20.95 (in Hg)

Winds 4-8 (mph) Cloud cover 10 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: Y Depth of Disappear: 9.5 meters Depth of Reappearance: 8 meters

Secchi Depth: 8.75 meters

Visual Condition of Stream (check all that apply):
Clear ______ Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks: Smokey conditions

Notes

Sampled at 8m depth

WATER QUALITY SAMPLE DATA

Sample No. SL-DP-8 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Lake DATE: 8/23/21 TIME: 11:05am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: see profile (ºF or ºC) Dissolved Oxygen: see profile (mg/L)

Conductivity: 68 (µmhos/cm@25 ºC) Stream or Lake gage reading: 9664.61' msl

Turbidity: Secchi (NTUs) Air Temperature 65 (ºF or ºC) Baro. Pressure 20.95 (in Hg)

Winds 4-8 (mph) Cloud cover 10 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: Y Depth of Disappear: 9.5 meters Depth of Reappearance: 8 meters

Secchi Depth: 8.75 meters

Visual Condition of Stream (check all that apply):
Clear ____ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: Smokey

Notes

Sampled at 20m depth

WATER QUALITY SAMPLE DATA

Sample No. SL-DP-20 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

SURFACE @ 16.1 °C DO=7.47 ppm
GARMIN = 44M

WATER TEMPERATURE AND DISSOLVED OXYGEN
LAKE PROFILE DATA FORM

Location: South Lake 8/23/21

DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (ºC)	DISSOLVED OXYGEN (mg/L)	DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (ºC)	DISSOLVED OXYGEN (mg/L)
0.5	16.1	7.43	31	6.2	0.01
1	16.0	7.41	32	6.3	0.01
2	16.0	7.40	33	6.6	0.00
3	16.0	7.40	34	6.9	0.00
4	16.0	7.39	35	7.1	0.00
5	16.0	7.39	36	7.3	0.00
6	16.0	7.38	37	7.5	0.00
7	16.0	7.38	38	7.6	0.00
8	16.0	7.38	39	7.7	0.00
9	16.0	7.37	39.8 ~~40~~	7.7	0.00
10	15.7	7.38	41		
11	15.6	7.36	42		
12	14.2	7.30	43		
12.5	11.8	7.56			
13	9.3	8.30	44		
13.5	7.1	8.61			
14	6.1	8.57	45		
14.5	5.5	8.46			
15	5.3	8.31	46		
16	4.8	8.06	47		
17	4.6	7.88	48		
18	4.5	7.55	49		
19	4.5	7.26	50		
20	4.5	6.95	51		
21	4.5	6.30	52		
22	4.5	5.50	53		
23	4.4	4.87	54		
24	4.5	3.27	55		
25	4.6	1.40	56		
26	5.0	0.15	57		
27	5.4	0.06	58		
28	5.7	0.05	59		
29	5.9	0.03	60		
30	6.0	0.02	61		

thermo:
<=>
@ 12.5m 11.8 7.56
GARMIN → = 43m
GARMIN = 42m → moved
GARMIN = 43m →
GARMIN 43.8

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Lake Sabrina DATE: 8/24/21 TIME: 10:15am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: see profile (ºF or ºC) Dissolved Oxygen: see profile (mg/L)

Conductivity: 23 (µmhos/cm@25 ºC) Stream or Lake gage reading: 9099.31' msl

Turbidity: Secchi (NTUs) Air Temperature 65 (ºF or ºC) Baro. Pressure 21.50 (in Hg)

Winds 2-8 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: ✓ Depth of Disappear: 12.5 meters Depth of Reappearance: 11 meters

Secchi Depth: 11.75 meters

Visual Condition of Stream (check all that apply):

Clear ____ Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks: ____

Notes

Sampled at 5m depth

WATER QUALITY SAMPLE DATA

Sample No. LS-DP-5 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Lake Sabrina DATE: 8/24/21 TIME: 10:40am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: see profile (ºF or ºC) Dissolved Oxygen: see profile (mg/L)

Conductivity: 26 (μmhos/cm@25 ºC) Stream or Lake gage reading: 9099.31' msl

Turbidity: Secchi (NTUs) Air Temperature 65 (ºF or ºC) Baro. Pressure 21.50 (in Hg)

Winds 2-8 (mph) Cloud cover 0 (%) Precipitation ___ Fog ___ Rain ___ Sleet ___ Hail ___ Snow

Secchi Disk: Y Depth of Disappear: 12.5 meters Depth of Reappearance: 11 meters

Secchi Depth: 11.75 meters

Visual Condition of Stream (check all that apply):
Clear ___ Cloudy ___ Colored ___
Floating Material ___ Other: ___

Remarks: clear, very little smoke in air

Notes

Sampled at 25 m

WATER QUALITY SAMPLE DATA

Sample No. LS-DP-25 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ___

SURFACE
16.3 C
7.63 ppm

WATER TEMPERATURE AND DISSOLVED OXYGEN
LAKE PROFILE DATA FORM

Location: Lake Sabrina 8/24/21

GARMIN

thermo:

DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (ºC)	DISSOLVED OXYGEN (mg/L)	DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (ºC)	DISSOLVED OXYGEN (mg/L)
0.5	16.4	7.62	31	4.6	7.09
1	16.4	7.61	32	4.6	7.08
2	16.4	7.61	33	4.6	6.98
3	16.4	7.60	34	4.5	6.95
4	16.4	7.59	35	4.5	6.97
5	16.4	7.59	36	4.5	6.96
6	16.4	7.58	37	4.5	6.93
7	16.4	7.61	38	4.5	6.93
8	16.4	7.63	39	4.4	6.97
9	15.5	8.76	40	4.4	6.98
9.5 10	14.6 13.4	9.65 10.29	41	4.4	7.10
10.5 11	11.9 11.0	10.39 10.39	42	4.4	6.90
12	10.1	10.41	43	4.4	6.88
13	9.3	10.38	44	4.3	6.83
14	8.5	10.38	45	4.3	6.72
15	7.6	10.26	46	4.3	6.69
16	7.1	10.01	47	4.3	6.45
17	6.5	9.63	48	4.3	6.28
18	6.1	9.40	49	4.3	6.26
19	5.8	8.95	50	4.5	6.46
20	5.7	8.65	51	4.4	6.46
21	5.3	8.10	52	4.4	6.38
22	5.2	7.93	53	4.4	6.23
23	5.1	7.75	54	4.4	6.16
24	5.0	7.59	55	4.4	6.00
25	4.8	7.49	56	4.4	5.98
26	4.8	7.46	57	4.3	5.92
27	4.7	7.37	58	4.3	5.84
28	4.7	7.22	59	4.3	5.76
29	4.7	7.07	60	4.3	5.65
30	4.6	7.08	61	4.3	5.40

move ⇒ (beside depth 26)

⇐ MOVE (beside depth 50)

WATER TEMPERATURE AND DISSOLVED OXYGEN
LAKE PROFILE DATA FORM

Location: SABRINA 8/24/21

GARMIN = 66.5

DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (ºC)	DISSOLVED OXYGEN (mg/L)	DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (ºC)	DISSOLVED OXYGEN (mg/L)
62	4.3	4.45	91		
~~63~~ 62.2	4.3	4.23	92		
64			93		
65			94		
66			95		
67			96		
68			97		
69			98		
70			99		
71			100		
72			101		
73			102		
74			103		
75			104		
76			105		
77			106		
78			107		
79			108		
80			109		
81			110		
82			111		
83			112		
84			113		
85			114		
86			115		
87			116		
88			117		
89			118		
90			119		

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH 6 DATE: 8/25/21 TIME: 7:05am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: 13.7 (ºF or ºC) Dissolved Oxygen: 8.89 (mg/L)

Conductivity: - (µmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 68 (ºF or ºC) Baro. Pressure 25.40 (in Hg)

Winds 1-2 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ________ meters Depth of Reappearance: ________ meters

Secchi Depth: ________ meters

Visual Condition of Stream (check all that apply):
Clear x Cloudy ________ Colored ________
Floating Material ________ Other: ________

Remarks: slight musty smell

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ________ Preservatives: ________

REMARKS

SIGNED BY: [signature] REVIEWED BY: ________

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH6 DATE: 8/25/21 TIME: 7:15am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: 13.6 (ºF or ºC) Dissolved Oxygen: 8.94 (mg/L)

Conductivity: 56 (µmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: 2.28 (NTUs) Air Temperature 68 (ºF or °C) Baro. Pressure 25.40 (in Hg)

Winds 1-2 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear:________meters Depth of Reappearance: ________meters

Secchi Depth: ________meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH6 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH5 DATE: 8/25/21 TIME: 7:30 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 13.7 (ºF or ºC) Dissolved Oxygen: 8.54 (mg/L)

Conductivity: - (µmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 70 (ºF or ºC) Baro. Pressure 25.15 (in Hg)

Winds 0 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ___ Colored ___
Floating Material ___ Other: ___

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ___ Preservatives: ___

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH5 DATE: 8/25/21 TIME: 7:40 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 14.0 (ºF or ºC) Dissolved Oxygen: 8.65 (mg/L)

Conductivity: 54 (μmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: 2.86 (NTUs) Air Temperature 70 (ºF or ºC) Baro. Pressure 25.15 (in Hg)

Winds 0 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH5 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH 4 DATE: 8/25/21 TIME: 8:00 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 13.6 (ºF or ºC) Dissolved Oxygen: 8.69 (mg/L)

Conductivity: - (μmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 66 (°F or °C) Baro. Pressure 24.80 (in Hg)

Winds 0-1 (mph) Cloud cover 0 (%) Precipitation __Fog __Rain __Sleet __Hail __Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH 4 DATE: 8/25/21 TIME: 8:15 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 13.5 (ºF or ºC) Dissolved Oxygen: 8.87 (mg/L)

Conductivity: 55 (μmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: 2.64 (NTUs) Air Temperature 67 (ºF or ºC) Baro. Pressure 24.80 (in Hg)

Winds 0 - 1 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: ____

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH4 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH3 DATE: 8/25/21 TIME: 8:35am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: 13.7 (ºF or ºC) Dissolved Oxygen: 8.46 (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 68 (ºF or ºC) Baro. Pressure 23.80 (in Hg)

Winds 1-2 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: ____

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH3 DATE: 8/25/21 TIME: 8:50 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 13.5 (ºF or ºC) Dissolved Oxygen: 8.51 (mg/L)

Conductivity: 52 (μmhos/cm@25 ºC) Stream or Lake gage reading: 0.7 feet

Turbidity: 2.12 (NTUs) Air Temperature 68 (ºF or ºC) Baro. Pressure 23.85 (in Hg)

Winds 1 - 2 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear:________meters Depth of Reappearance: ________meters

Secchi Depth: ________ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ________ Colored ________
Floating Material ________ Other: ________

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH3 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH2 DATE: 8/25/21 TIME: 9:10 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 13.7 (ºF or ºC) Dissolved Oxygen: 8.22 (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 67 (ºF or ºC) Baro. Pressure 23.15 (in Hg)

Winds 1 - 3 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH 2 DATE: 8/25/21 TIME: 9:20 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 13.0 (ºF or ºC) Dissolved Oxygen: 8.47 (mg/L)

Conductivity: 50 (µmhos/cm@25 ºC) Stream or Lake gage reading: 1.75'

Turbidity: 3.11 (NTUs) Air Temperature 67 (ºF or ºC) Baro. Pressure ___ (in Hg)

Winds 0-1 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ___ Colored ___
Floating Material ___ Other: ___

Remarks: ___

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH2 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ___

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: North Fork DATE: 8/25/21 TIME: 10:20 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 13.8 (ºF or ºC) Dissolved Oxygen: 8.30 (mg/L)

Conductivity: 32 (μmhos/cm@25 ºC) Stream or Lake gage reading: 8.95 cfs

Turbidity: 2.78 (NTUs) Air Temperature 68 (ºF or ºC) Baro. Pressure 21.40 (in Hg)

Winds 1-2 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ________meters Depth of Reappearance: ________meters

Secchi Depth: ________meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks: ______

Notes

Stream flow field measured at 8.95 cfs.

WATER QUALITY SAMPLE DATA

Sample No. BC-NF-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Middle Fork DATE: 8/25/21 TIME: 10:35am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: 16.2 (ºF or ºC) Dissolved Oxygen: 7.22 (mg/L)

Conductivity: 23 (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: 2.94 (NTUs) Air Temperature 68 (ºF or ºC) Baro. Pressure 21.55 (in Hg)

Winds 5-15 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-LS Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Fork DATE: 8/25/21 TIME: 11:05am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 15.6 (ºF or ºC) Dissolved Oxygen: 7.24 (mg/L)

Conductivity: 31 (μmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: 2.95 (NTUs) Air Temperature 65 (ºF or ºC) Baro. Pressure 21.25 (in Hg)

Winds 5-12 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-SL Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH6 DATE: 9/9/21 TIME: 8:15 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 15.8 (ºF or ºC) Dissolved Oxygen: 8.53 (mg/L)

Conductivity: - (μmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 76 (ºF or °C) Baro. Pressure 25.41 (in Hg)

Winds 1-2 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: ____

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH6 DATE: 9/9/21 TIME: 8:25am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

Water Temperature: 15.4 (ºF or ºC)

Conductivity: - (µmhos/cm@25 ºC)

Turbidity: - (NTUs)

WEATHER CONDITIONS

Dissolved Oxygen: 8.70 (mg/L)

Stream or Lake gage reading: -

Air Temperature 76 (ºF or ºC) Baro. Pressure 25.41 (in Hg)

Winds 1-2 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks: ____

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH5 DATE: 9/9/21 TIME: 8:45am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

Water Temperature: 15.3 (ºF or ºC)

Conductivity: - (µmhos/cm@25 ºC)

Turbidity: - (NTUs)

WEATHER CONDITIONS

Dissolved Oxygen: 8.61 (mg/L)

Stream or Lake gage reading: -

Air Temperature 77 (ºF or ºC) Baro. Pressure 25.17 (in Hg)

Winds 2-3 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH5 DATE: 9/9/21 TIME: 8:55am

DRAINAGE: Bishop Creek INVESTIGATORS: JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 15.6 (ºF or ºC) Dissolved Oxygen: 8.58 (mg/L)

Conductivity: - (µmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 77 (ºF or ºC) Baro. Pressure 25.17 (in Hg)

Winds 0-1 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ________meters Depth of Reappearance: ________meters

Secchi Depth: ________meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ________ Colored ________
Floating Material ________ Other: ________

Remarks: ________

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ________ Preservatives: ________

REMARKS

SIGNED BY: [signature] REVIEWED BY: ________

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH 4 DATE: 9/9/21 TIME: 9:20 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS — WEATHER CONDITIONS

Water Temperature: 15.0 (ºF or ºC) Dissolved Oxygen: 8.48 (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 80 (°F or °C) Baro. Pressure 24.80 (in Hg)

Winds 2-4 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH4 DATE: 9/9/21 TIME: 9:35am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 15.0 (ºF or ºC) Dissolved Oxygen: 8.62 (mg/L)

Conductivity: – (μmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 80 (ºF or ºC) Baro. Pressure 24.82 (in Hg)

Winds 1 - 2 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH3 DATE: 9/9/21 TIME: 10:00 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: 14.9 (ºF or ºC) Dissolved Oxygen: 8.25 (mg/L)

Conductivity: — (µmhos/cm@25 ºC) Stream or Lake gage reading: —

Turbidity: — (NTUs) Air Temperature 80 (ºF or ºC) Baro. Pressure 23.84 (in Hg)

Winds 1-3 (mph) Cloud cover 10 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear:_______meters Depth of Reappearance: _______meters

Secchi Depth: _______meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy _______ Colored _______
Floating Material _______ Other: _______

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles _______ Preservatives: _______

REMARKS

SIGNED BY: [signature] REVIEWED BY: _______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH3 DATE: 9/9/21 TIME: 10:20am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 15.2 (ºF or ºC) Dissolved Oxygen: 8.19 (mg/L)

Conductivity: - (µmhos/cm@25 ºC) Stream or Lake gage reading: 0.69'

Turbidity: - (NTUs) Air Temperature 80 (ºF or ºC) Baro. Pressure 23.88 (in Hg)

Winds 1-2 (mph) Cloud cover 10 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH2 DATE: 9/9/21 TIME: 10:45am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 15.3 (ºF or ºC) Dissolved Oxygen: 7.95 (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 80 (ºF or ºC) Baro. Pressure 23.15 (in Hg)

Winds 3-6 (mph) Cloud cover 15 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks: PH2 reservoir about 2-3 lower than usual

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH2 DATE: 9/9/21 TIME: 10:55 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 14.7 (ºF or ºC) Dissolved Oxygen: 8.10 (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: 1.62'

Turbidity: – (NTUs) Air Temperature 78.5 (ºF or ºC) Baro. Pressure 23.18 (in Hg)

Winds 1-2 (mph) Cloud cover 15 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: North Fork DATE: 9/9/21 TIME: 11:30 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 16.1 (ºF or ºC) Dissolved Oxygen: 8.17 (mg/L)

Conductivity: — (µmhos/cm@25 ºC) Stream or Lake gage reading: 6.4 cfs

Turbidity: — (NTUs) Air Temperature 72 (ºF or ºC) Baro. Pressure 21.47 (in Hg)

Winds 1-3 (mph) Cloud cover 20 (%) Precipitation __Fog __Rain __Sleet __Hail __Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ___ Colored ___
Floating Material ___ Other: ___

Remarks:

Notes

Flow field measured at 6.4 cfs

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ___ Preservatives: ___

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Middle Fork DATE: 9/9/21 TIME: 12:20pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: 16.7 (ºF or ºC) Dissolved Oxygen: 7.25 (mg/L)

Conductivity: – (μmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 72 (°F or °C) Baro. Pressure 21.61 (in Hg)

Winds 3-9 (mph) Cloud cover 20 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Fork DATE: 9/9/21 TIME: 12:45 pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB

PHYSICAL WATER QUALITY PARAMETERS

Water Temperature: 15.2 (ºF or ºC)

Conductivity: — (µmhos/cm@25 ºC)

Turbidity: — (NTUs)

WEATHER CONDITIONS

Dissolved Oxygen: 7.40 (mg/L)

Stream or Lake gage reading: —

Air Temperature 71 (ºF or ºC) Baro. Pressure 21.19 (in Hg)

Winds 2-4 (mph) Cloud cover 20 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Lake Sabrina DATE: 9/20/21 TIME: 10:20am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: see profile (ºF or ºC) Dissolved Oxygen: see profile (mg/L)

Conductivity: 34 (µmhos/cm@25 ºC) Stream or Lake gage reading: 9096.74' msl

Turbidity: Secchi (NTUs) Air Temperature 52 (ºF or ºC) Baro. Pressure 21.55 (in Hg)

Winds 4-8 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: Y Depth of Disappear: 11 meters Depth of Reappearance: 9.5 meters

Secchi Depth: 10.25 meters

Visual Condition of Stream (check all that apply):

Clear ______ Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. LS-DP-8 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Lake Sabrina DATE: 9/20/21 TIME: 10:45am

DRAINAGE: Bishop Creek INVESTIGATORS: TB, JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: See profile (ºF or ºC) Dissolved Oxygen: see profile (mg/L)

Conductivity: 30 (μmhos/cm@25 ºC) Stream or Lake gage reading: 9096.74' msl

Turbidity: Secchi (NTUs) Air Temperature 52 (ºF or ºC) Baro. Pressure 21.55 (in Hg)

Winds 4-8 (mph) Cloud cover 0 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: Y Depth of Disappear: 11 meters Depth of Reappearance: 9.5 meters

Secchi Depth: 10.25 meters

Visual Condition of Stream (check all that apply):
Clear ___ Cloudy ___ Colored ___
Floating Material ___ Other: ___

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. LS-DP-20 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Lake DATE: 9/21/21 TIME: 10:25 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: See profile (ºF or ºC) Dissolved Oxygen: see profile (mg/L)

Conductivity: 30 (µmhos/cm@25 ºC) Stream or Lake gage reading: 9648.37' msl

Turbidity: Secchi (NTUs) Air Temperature 61 (ºF or ºC) Baro. Pressure 21.25 (in Hg)

Winds 1-3 (mph) Cloud cover 0 but smokey (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: Y Depth of Disappear: 7 meters Depth of Reappearance: 5.5 meters

Secchi Depth: 6.25 meters

Visual Condition of Stream (check all that apply):

Clear ______ Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks: smokey

Notes

WATER QUALITY SAMPLE DATA

Sample No. SL-DP-4 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Lake DATE: 9/21/21 TIME: 10:50am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: see profile (ºF or ºC) Dissolved Oxygen: see profile (mg/L)

Conductivity: 90 (µmhos/cm@25 ºC) Stream or Lake gage reading: 9648.37' msl

Turbidity: Secchi (NTUs) Air Temperature 61 (ºF or ºC) Baro. Pressure 21.25 (in Hg)

Winds 1-3 (mph) Cloud cover ϕ but smokey (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: Y Depth of Disappear: 7 meters Depth of Reappearance: 5.5 meters

Secchi Depth: 6.25 meters

Visual Condition of Stream (check all that apply):
Clear ____ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: smokey

Notes

WATER QUALITY SAMPLE DATA

Sample No. SL-DP-16 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH6 DATE: 9/22/21 TIME: 7:30 am

DRAINAGE: Bishop Creek INVESTIGATORS: JB TB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: 12.1 (ºF or ºC) Dissolved Oxygen: 9.07 (mg/L)

Conductivity: - (µmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 66 (ºF or ºC) Baro. Pressure 25.60 (in Hg)

Winds ϕ (mph) Cloud cover ϕ (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: ____

Notes

SMOKE FILLED AIR - HAZY

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH6 DATE: 9/22/21 TIME: 7:45am

DRAINAGE: Bishop Creek INVESTIGATORS: JB TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 11.9 (ºF or ºC) Dissolved Oxygen: 9.36 (mg/L)

Conductivity: 60 (μmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: 2.61 (NTUs) Air Temperature 66.5 (°F or °C) Baro. Pressure 25.60 (in Hg)

Winds 0-1 (mph) Cloud cover Ø (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear:______meters Depth of Reappearance: ______meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks:

Notes

SMOKE FILLED AIR - HAZY

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH6 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH5 DATE: 9/22/21 TIME: 8:00 am

DRAINAGE: Bishop Creek INVESTIGATORS: JB TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 12.0 (ºF or ºC) Dissolved Oxygen: 8.88 (mg/L)

Conductivity: - (μmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 66.2 (ºF or ºC) Baro. Pressure 25.35 (in Hg)

Winds 0-1 (mph) Cloud cover Ø (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: _____ meters Depth of Reappearance: _____ meters

Secchi Depth: _____ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks:

Notes

SMOKE FILLED AIR

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH5 DATE: 9/22/21 TIME: 8:15 am

DRAINAGE: Bishop Creek INVESTIGATORS: JB TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 12.3 (ºF or ºC) Dissolved Oxygen: 9.11 (mg/L)

Conductivity: 62 (μmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: 3.15 (NTUs) Air Temperature 68.3 (ºF or ºC) Baro. Pressure 25.35 (in Hg)

Winds 0-1 (mph) Cloud cover Ø (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks:

Notes

SMOKEY HAZY AIR

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH5 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 iron

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH 4 DATE: 9/22/21 TIME: 8:35 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: 11.7 (ºF or ºC) Dissolved Oxygen: 9.18 (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 66.7 (ºF or ºC) Baro. Pressure 24.95 (in Hg)

Winds Ø (mph) Cloud cover Ø (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

SMOKEY HAZY

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH 4 DATE: 9/22/21 TIME: 8:45 am

DRAINAGE: Bishop Creek INVESTIGATORS: JB TB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: 12.2 (ºF or ºC) Dissolved Oxygen: 9.27 (mg/L)

Conductivity: 62 (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: 2.69 (NTUs) Air Temperature 72.0 (ºF or ºC) Baro. Pressure 24.95 (in Hg)

Winds Ø (mph) Cloud cover Ø (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks: ______

Notes

SMOKEY AIR

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH4 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH3 DATE: 9/22/21 TIME: 9:10 am

DRAINAGE: Bishop Creek INVESTIGATORS: JB TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 13.0 (ºF or ºC) Dissolved Oxygen: 8.64 (mg/L)

Conductivity: - (μmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 70.5 (ºF or ºC) Baro. Pressure 23.95 (in Hg)

Winds 0 (mph) Cloud cover ∅ (%) Precipitation ___ Fog ___ Rain ___ Sleet ___ Hail ___ Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ___ Colored ___

Floating Material ___ Other: ___

Remarks: FLUME #3

Notes

VERY SMOKEY

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ___ Preservatives: ___

REMARKS

SIGNED BY: [signature] REVIEWED BY: ___

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH3 DATE: 9/22/21 TIME: 9:30 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: 12.4 (ºF or ºC) Dissolved Oxygen: 8.80 (mg/L)

Conductivity: 58 (µmhos/cm@25 ºC) Stream or Lake gage reading: 0.70'

Turbidity: 3.97 (NTUs) Air Temperature 69.7 (ºF or ºC) Baro. Pressure 23.95 (in Hg)

Winds 0-1 (mph) Cloud cover Ø (%) Precipitation __Fog __Rain __Sleet __Hail __Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: SEE USGS READING ABOVE

Notes

VERY HEAVY SMOKE

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH3 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one.

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH 2 DATE: 9/22/21 TIME: 9:50 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

Water Temperature: 1[illegible].3 (ºF or ºC)

Conductivity: – (µmhos/cm@25 ºC)

Turbidity: – (NTUs)

WEATHER CONDITIONS

Dissolved Oxygen: 8.72 (mg/L)

Stream or Lake gage reading: –

Air Temperature 68.5 (ºF or ºC) Baro. Pressure 23.25 (in Hg)

Winds Ø (mph) Cloud cover Ø (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks: LOWER THAN "NORMAL" FLOW

Notes

HEAVY SMOKE FILLED AIR

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH2 DATE: 9/22/21 TIME: 10:00 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 11.5 (ºF or ºC) Dissolved Oxygen: 8.68 (mg/L)

Conductivity: 54 (µmhos/cm@25 ºC) Stream or Lake gage reading: 1.82'

Turbidity: 3.42 (NTUs) Air Temperature 69.1 (ºF or °C) Baro. Pressure 23.30 (in Hg)

Winds Ø (mph) Cloud cover Ø (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear:______meters Depth of Reappearance: ______meters

Secchi Depth: ______meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ______ Colored ______
Floating Material ______ Other: ______

Remarks: SEE USGS READING ABOVE

Notes

VERY SMOKEY

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-PH2 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Middle Fork DATE: 9/22/21 TIME: 10:20 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: 14.2 (ºF or ºC) Dissolved Oxygen: 7.60 (mg/L)

Conductivity: 27 (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: 3.09 (NTUs) Air Temperature 68 (ºF or ºC) Baro. Pressure 21.70 (in Hg)

Winds 4-6 (mph) Cloud cover Ø (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: LOWER FLOW THAN "NORMAL"

Notes

THICK SMOKE

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-LS Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: North Fork DATE: 9/22/21 TIME: 10:55 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 12.4 (ºF or ºC) Dissolved Oxygen: 8.35 (mg/L)

Conductivity: 38 (μmhos/cm@25 ºC) Stream or Lake gage reading: 5.8 cfs

Turbidity: 2.23 (NTUs) Air Temperature 65 (ºF or ºC) Baro. Pressure 21.55 (in Hg)

Winds 0-1 (mph) Cloud cover Ø (%) Precipitation __Fog __Rain __Sleet __Hail __Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks:

Notes

SMOKEY
Flow field measured at ~5.8 cfs

WATER QUALITY SAMPLE DATA

Sample No. BC-NF-1 Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Fork DATE: 9/22/21 TIME: 11:45 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 14.3 (ºF or ºC) Dissolved Oxygen: 7.51 (mg/L)

Conductivity: 40 (µmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: 4.68 (NTUs) Air Temperature 64.6 (ºF or ºC) Baro. Pressure 21.25 (in Hg)

Winds 4-8 (mph) Cloud cover Ø (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ___ Colored ___
Floating Material ___ Other: ___

Remarks: ALGAE ON ROCKS IN CREEK

Notes

THICK SMOKE VISIBILITY < 1/4 mile

WATER QUALITY SAMPLE DATA

Sample No. BC-blw-SL Sample Method: Grab Preservatives: Ice

No. of Sample Bottles 4 Preservatives: H_2SO_4 in one

REMARKS

SIGNED BY: [signature] REVIEWED BY: ___

GPS
DEPTH = 66m
SURFACE T = 13.9 °C
DO = 8.15

WATER TEMPERATURE AND DISSOLVED OXYGEN
LAKE PROFILE DATA FORM

Location: Lake Sabring 9/20/21

	DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)
	0.5	14.0	8.08	31	4.6	7.20
	1	14.0	8.05	32	4.6	7.30
	2	14.1	8.02	33	4.5	7.18
	3	14.1	8.00	34	4.5	7.19
	4	14.1	7.99	35	4.5	7.33
	5	14.1	7.98	36	4.5	7.02
	6	14.1	7.97	37	4.4	7.07
	7	14.1	7.96	38	4.4	7.14
Sample	8	14.1	7.96	39	4.4	7.19
	9	14.1	7.95	40	4.4	7.25
	10	14.1	7.95	41	4.4	7.02
T	11	13.3	8.44	42	4.4	6.83
Approx thermo.	11.5	12.0	9.41			
	12	10.0	10.18	43	4.3	6.85
	12.5	9.4	10.29			
	13	9.0	10.31	44	4.3	6.89
	14	8.3	10.26	45	4.4	6.63
	15	7.7	10.15	46	4.3	6.62
⊥	16	7.1	10.04	47	4.4	6.44
	17	6.7	9.80	48	4.4	6.30
	18	6.4	9.50	49	4.4	6.15
	19	6.0	9.16	50	4.3	6.07
sample	20	5.7	8.74	51	4.4	5.85
	21	5.5	8.38	52	4.3	5.50
	22	5.4	8.15	53	4.3	5.40
	23	5.2	7.95	54	4.3	5.02
	24	5.0	8.00	55	4.3	4.75
	25	5.0	7.53	56	4.3	4.45
	26	4.8	7.47	57	4.3	4.20
	27	4.8	7.35	58	4.3	3.50
	28	4.7	7.44	59	4.3	3.45
	29	4.7	7.37	60	4.3	3.37
	30	4.6	7.36	61	4.3	3.31

WATER TEMPERATURE AND DISSOLVED OXYGEN
LAKE PROFILE DATA FORM

Location: LAKE SABRINA

BOT→

GPS 65.8m

DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)
62	4.3	2.89	91		
~~63~~ 62.9	4.4	2.17	92		
64			93		
65			94		
66			95		
67			96		
68			97		
69			98		
70			99		
71			100		
72			101		
73			102		
74			103		
75			104		
76			105		
77			106		
78			107		
79			108		
80			109		
81			110		
82			111		
83			112		
84			113		
85			114		
86			115		
87			116		
88			117		
89			118		
90			119		

SURFACE
GARMIN
@37.4 m
TEMP @ 13.5 °C
DO @ 7.75

WATER TEMPERATURE AND DISSOLVED OXYGEN LAKE PROFILE DATA FORM

Location: South Lake 9/21/21

Sampl — 4
Approx. thermo — 8
*8.75 m T = 9.6°C DO = 8.71
9.25 m T = 7.4°C DO = 8.94
Sampl — 16

DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)
0.5	13.3	7.70	31	7.4	Ø.Ø3
1	13.3	7.69	32	7.5	Ø.Ø1
2	13.3	7.67	33	7.6	Ø.ØØ
3	13.2	7.67	34	7.7	Ø.Ø1
Ø 4	13.2	7.67	$\boxed{35.1 m}$	7.7	Ø.ØØ BOTTOM
5	13.2	7.67	36		
6	13.2	7.66	37		
7	13.1	7.65	38		
8	12.3	7.83	39		
8.5 9	11.1 8.4	8.15 8.91	40		
9.5 10	6.9 5.9	8.82 8.84	41		
11	5.4	8.43	42		
12	5.1	8.10	43		
13	4.9	7.76	44		
14	4.8	7.40	45		
15	4.7	6.80	46		
16	4.6	5.66	47		
17	4.6	4.95	48		
18	4.6	4.02	49		
19	4.7	2.50	50		
20	4.8	Ø.23	51		
21	5.1	Ø.13	52		
22	5.5	Ø.Ø8	53		
23	5.8	Ø.Ø6	54		
24	5.9	Ø.Ø5	55		
25	6.1	Ø.Ø5	56		
26	6.3	Ø.Ø4	57		
27	6.5	Ø.Ø3	58		
28	6.7	Ø.Ø2	59		
29	6.9	Ø.Ø2	60		
30	7.2	Ø.Ø2	61		

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: North Fork DATE: 10/4/21 TIME: 11:20 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 8.5 (ºF or ºC) Dissolved Oxygen: 8.70 (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: 5.8 cfs

Turbidity: – (NTUs) Air Temperature 46 (ºF or ºC) Baro. Pressure 21.43 (in Hg)

Winds 0 (mph) Cloud cover 100 - clouds + smoke (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: Very smokey

Notes

Flow field measured at 5.8 cfs.

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Middle Fork DATE: 10/4/21 TIME: 12:15pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 11.5 (ºF or ºC)

Dissolved Oxygen: 7.93 (mg/L)

Conductivity: - (µmhos/cm@25 ºC)

Stream or Lake gage reading: -

Turbidity: - (NTUs)

Air Temperature 46 (ºF or ºC)

Baro. Pressure 21.56 (in Hg)

clouds + smoke

Winds 0 (mph) Cloud cover 100 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ___ Colored ___

Floating Material ___ Other: ___

Remarks: Very smoky

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ___ Preservatives: ___

REMARKS

SIGNED BY: [signature] REVIEWED BY: ___

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: South Fork DATE: 10/4/21 TIME: 12:50pm

DRAINAGE: Bishop Creek INVESTIGATORS: JB TB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 11.0 (ºF or ºC) Dissolved Oxygen: 7.96 (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 52 (ºF or ºC) Baro. Pressure 21.13 (in Hg)

Winds 1-2 (mph) Cloud cover 100 (%) Precipitation ___ Fog ___ Rain ___ Sleet ___ Hail ___ Snow clouds + smokey

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: Heavy smoke

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH2 DATE: 10/14/21 TIME: 1:30pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: 9.1 (ºF or ºC) Dissolved Oxygen: 9.17 (mg/L)

Conductivity: – (μmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 61 (ºF or ºC) Baro. Pressure 23.11 (in Hg)

Winds 0-1 (mph) Cloud cover 100 clouds & smoke (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks: very smokey

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH2 DATE: 10/4/21 TIME: 1:45pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 9.1 (ºF or ºC)

Dissolved Oxygen: 9.25 (mg/L)

Conductivity: – (μmhos/cm@25 ºC)

Stream or Lake gage reading: 1.8'

Turbidity: – (NTUs)

Air Temperature 61 (ºF or ºC)

Baro. Pressure 23.15 (in Hg)

Winds 0 (mph) Cloud cover 100 (%) clouds & smoke Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):

Clear ✓ Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks:

Notes

stream weir gage at 1.8 feet.

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH3 DATE: 10/4/21 TIME: 2:00pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 9.6 (ºF or ºC) Dissolved Oxygen: 9.25 (mg/L)

Conductivity: - (μmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 65 (ºF or °C) Baro. Pressure 23.80 (in Hg)

Winds 0-1 (mph) Cloud cover 100 clouds + smoke (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ________ meters Depth of Reappearance: ________ meters

Secchi Depth: ________ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ________ Colored ________
Floating Material ________ Other: ________

Remarks: ________

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ________ Preservatives: ________

REMARKS

SIGNED BY: [signature] REVIEWED BY: ________

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH3 DATE: 10/4/21 TIME: 2:10pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

Water Temperature: 9.7 (ºF or ºC)

Conductivity: – (µmhos/cm@25 ºC)

Turbidity: – (NTUs)

WEATHER CONDITIONS

Dissolved Oxygen: 9.36 (mg/L)

Stream or Lake gage reading: 0.7'

Air Temperature 65 (ºF or ºC) Baro. Pressure 23.84 (in Hg)

Winds 0-1 (mph) Cloud cover 100 clouds/smoke (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: ____

Notes

stream weir gage at 0.7 feet.

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH4 DATE: 10/4/21 TIME: 2:30 pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 9.9 (ºF or ºC) Dissolved Oxygen: 9.57 (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 67 (ºF or ºC) Baro. Pressure 24.76 (in Hg)

clouds/smoke

Winds 0 (mph) Cloud cover 90 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ___ meters Depth of Reappearance: ___ meters

Secchi Depth: ___ meters

Visual Condition of Stream (check all that apply):
Clear ✓ Cloudy ___ Colored ___
Floating Material ___ Other: ___

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ___ Preservatives: ___

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH4 DATE: 10/4/21 TIME: 2:35pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 9.8 (ºF or ºC)

Dissolved Oxygen: 9.69 (mg/L)

Conductivity: – (μmhos/cm@25 ºC)

Stream or Lake gage reading: –

Turbidity: – (NTUs)

Air Temperature 67 (ºF or ºC)

Baro. Pressure 24.79 (in Hg)

clouds + smoke

Winds 0 (mph) Cloud cover 90 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ______ meters Depth of Reappearance: ______ meters

Secchi Depth: ______ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks: ______

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH5 DATE: 10/4/21 TIME: 2:45pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS WEATHER CONDITIONS

Water Temperature: 10.0 (ºF or ºC) Dissolved Oxygen: 9.45 (mg/L)

Conductivity: - (µmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 71 (ºF or ºC) Baro. Pressure 25.14 (in Hg)

Winds 0-2 (mph) Cloud cover 90 (%) clouds + smoke Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: _____ meters Depth of Reappearance: _____ meters

Secchi Depth: _____ meters

Visual Condition of Stream (check all that apply):
Clear X Cloudy _____ Colored _____
Floating Material _____ Other: _____

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles _____ Preservatives: _____

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH5 DATE: 10/4/21 TIME: 2:55pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 10.7 (ºF or ºC) Dissolved Oxygen: 9.55 (mg/L)

Conductivity: - (µmhos/cm@25 ºC) Stream or Lake gage reading: -

Turbidity: - (NTUs) Air Temperature 71 (ºF or ºC) Baro. Pressure 25.15 (in Hg)

Winds 0-1 (mph) Cloud cover 90 (%) clouds & smoke Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear:______meters Depth of Reappearance: ______meters

Secchi Depth: ______meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY: ______

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Tailwater PH6 DATE: 10/4/21 TIME: 3:05pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JJB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 10.4 (ºF or ºC) Dissolved Oxygen: 9.72 (mg/L)

Conductivity: — (μmhos/cm@25 ºC) Stream or Lake gage reading: —

Turbidity: — (NTUs) Air Temperature 71 (ºF or °C) Baro. Pressure 25.37 (in Hg)

clouds + smoke

Winds 2-3 (mph) Cloud cover 80 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ____ Colored ____

Floating Material ____ Other: ____

Remarks: ____

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: BC below PH6 DATE: 10/4/21 TIME: 3:15pm

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: 10.5 (ºF or ºC)

Dissolved Oxygen: 9.74 (mg/L)

Conductivity: – (μmhos/cm@25 ºC) Stream or Lake gage reading: –

Turbidity: – (NTUs) Air Temperature 71 (ºF or ºC) Baro. Pressure 25.37 (in Hg)

clouds + smoke

Winds 1-3 (mph) Cloud cover 80 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail _____Snow

Secchi Disk: NA Depth of Disappear:________meters Depth of Reappearance: ________meters

Secchi Depth: _________meters

Visual Condition of Stream (check all that apply):

Clear X Cloudy ______ Colored ______

Floating Material ______ Other: ______

Remarks:

Notes

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ______ Preservatives: ______

REMARKS

SIGNED BY: [signature] REVIEWED BY:

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: Lake Sabrina DATE: 10/5/21 TIME: 9:00 am

DRAINAGE: Bishop Creek INVESTIGATORS: TB JB DM

PHYSICAL WATER QUALITY PARAMETERS

WEATHER CONDITIONS

Water Temperature: see profile (ºF or ºC) Dissolved Oxygen: see profile (mg/L)

Conductivity: – (µmhos/cm@25 ºC) Stream or Lake gage reading: 9095.09

Turbidity: – (NTUs) Air Temperature 49 (ºF or ºC) Baro. Pressure 21.45 (in Hg)

Winds Ø (mph) Cloud cover Ø (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):

Clear ____ Cloudy ____ Colored ____

Floating Material X Other: ____

Remarks: ASH ON LAKE SURFACE

Notes

THICK HEAVY SMOKE VISABILITY
u < 1/4 mile
Lake level elev. @ 9095.09 ft msl

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

BISHOP CREEK WATER QUALITY STUDY
FIELD FORM

SITE NAME: SOUTH LAKE DATE: 10/5/21 TIME: 11:45 am

DRAINAGE: Bishop Creek INVESTIGATORS: JB/TB/DM

PHYSICAL WATER QUALITY PARAMETERS | WEATHER CONDITIONS

Water Temperature: see prof. 6 (ºF or ºC) Dissolved Oxygen: see prof. 6 (mg/L)

Conductivity: — (μmhos/cm@25 ºC) Stream or Lake gage reading: 9641.70'

Turbidity: — (NTUs) Air Temperature 55.5 (ºF or ºC) Baro. Pressure 21.00 (in Hg)

Winds 6-12 (mph) Cloud cover 50 (%) Precipitation ___Fog ___Rain ___Sleet ___Hail ___Snow

Secchi Disk: NA Depth of Disappear: ____ meters Depth of Reappearance: ____ meters

Secchi Depth: ____ meters

Visual Condition of Stream (check all that apply):
Clear ____ Cloudy ____ Colored ____
Floating Material ____ Other: ____

Remarks: HEAVY SMOKE POOR VISABILITY

Notes

Lake level Elev. @ 9641.70' msl

WATER QUALITY SAMPLE DATA

Sample No. NA Sample Method: Grab Preservatives: Ice

No. of Sample Bottles ____ Preservatives: ____

REMARKS

SIGNED BY: [signature] REVIEWED BY: ____

GARMIN
66.7 M
10.8 C

SURFACE
12.1°C
DO=8.1

WATER TEMPERATURE AND DISSOLVED OXYGEN
LAKE PROFILE DATA FORM

Location: LAKE SABRINA 10/5/21

DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)
0.5	12.1	8.09	31	4.6	7.35
1	12.2	8.09	32	4.5	7.37
2	12.2	8.08	33	4.5	7.35
3	12.2	8.08	34	4.5	7.40
4	12.2	8.08	35	4.5	7.40
5	12.2	8.07	36	4.4	7.41
6	12.2	8.07	37	4.4	7.41
7	12.2	8.07	38	4.3	7.41
8	12.2	8.07	39	4.3	7.40
9	12.2	8.07	40	4.3	7.39
10	12.2	8.07	41	4.3	7.40
11	12.1	8.09	42	4.3	6.90
12	11.9	8.28	43	4.3	6.89
12.5	11.3	8.75			
13	10.0	9.62	44	4.3	6.70
13.5	8.6	10.06			
14	8.3	10.14	45	4.3	6.72
15	7.6	10.08	46	4.3	6.55
16	7.1	9.87	47	4.3	6.52
17	6.6	9.71	48	4.3	6.46
18	6.3	9.54	49	4.3	6.23
19	6.0	9.27	50	4.3	6.06
20	5.7	8.84	51	4.3	5.80
21	5.5	8.20	52	4.3	5.58
22	5.2	7.90	53	4.4	5.26
23	5.1	7.70	54	4.4	4.70
24	5.0	7.32	55	4.4	4.44
25	4.9	7.30	56	4.4	4.19
26	4.7	7.50	57	4.4	3.54
27	4.7	7.47	58	4.4	3.25
28	4.6	7.45	59	4.4	2.95
29	4.6	7.42	60	4.4	2.37
30	4.6	7.38	61	4.4	1.90

WATER TEMPERATURE AND DISSOLVED OXYGEN LAKE PROFILE DATA FORM

Location: LAKE SABRINA 10/5/21

DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)
62	4.4	1.55	91		
63	4.4	Ø.25	92		
BOTTOM ~~64~~ 63.5	4.4	Ø.11	93		
65			94		
66			95		
67			96		
68			97		
69			98		
70			99		
71			100		
72			101		
73			102		
74			103		
75			104		
76			105		
77			106		
78			107		
79			108		
80			109		
81			110		
82			111		
83			112		
84			113		
85			114		
86			115		
87			116		
88			117		
89			118		
90			119		

SURFACE
10.6 °C
8.03

WATER TEMPERATURE AND DISSOLVED OXYGEN
LAKE PROFILE DATA FORM

Location: SOUTH LAKE 10/5/21

DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)	DEPTH FROM WATER SURFACE (meters)	WATER TEMPERATURE (°C)	DISSOLVED OXYGEN (mg/L)
0.5	10.7	8.03	31	7.6	Ø.06
1	10.7	8.02	32	7.7	Ø.05
2	10.6	8.02	~~33~~ 32.5	7.7	Ø.04 ← BOTTOM
3	10.5	8.02	34		
4	10.5	8.01	35		
5	10.5	8.01	36		
6	10.4	8.02	37		
7	10.2	8.01	38		
8	9.0	8.25	39		
8.5 / 9	7.3 / 6.6	8.49 / 8.39	40		
9.5 / 10	5.9 / 5.6	8.51 / 8.31	41		
11	5.2	7.92	42		
12	4.9	7.40	43		
13	4.8	6.80	44		
14	4.7	5.57	45		
15	4.7	4.70	46		
16	4.7	3.30	47		
17	4.7	2.10	48		
18	4.9	Ø.25	49		
19	5.1	Ø.19	50		
20	5.5	Ø.14	51		
21	5.7	Ø.11	52		
22	5.9	Ø.09	53		
23	6.0	Ø.08	54		
24	6.2	Ø.07	55		
25	6.5	Ø.06	56		
26	6.7	Ø.05	57		
27	6.9	Ø.15	58		
28	7.2	Ø.10	59		
29	7.3	Ø.09	60		
30	7.5	Ø.07	61		

@ 8.25M 8.3 °C 8.41 = DO →

MOVED *

APPENDIX B

2021 LABORATORY REPORTS

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders:	1F15018	**Report Date:**	6/29/2021
		Received Date:	6/15/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

Dear Michael P. Donovan,

Enclosed are the results of analyses for samples received 6/15/21 with the Chain-of-Custody document. The samples were received in good condition, at 2.4 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Sample Results

Sample: BC-blw-LS 1F15018-01 (Water) — Sampled: 06/14/21 9:35 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 06/21/21 15:38				**Analyst:** YMT
Nitrogen, Total	**0.16**	0.10	mg/l	1	06/23/21	
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1F0948 — **Preparation:** _NONE (LC)		**Prepared:** 06/15/21 12:00				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	06/16/21 03:10	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1F1220 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/21/21 15:38				**Analyst:** YMT
TKN	**0.16**	0.10	mg/l	1	06/23/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1F0910 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/15/21 14:24				**Analyst:** sar
NO2+NO3 as N	ND	200	ug/l	1	06/15/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1F0912 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/15/21 14:33				**Analyst:** ssi
o-Phosphate as P	ND	0.010	mg/l	1	06/15/21 15:23	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1F1005 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/16/21 12:27				**Analyst:** ism
Total Dissolved Solids	**26**	10	mg/l	1	06/17/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Sample Results

(Continued)

Sample: BC-NF-1 — 1F15018-02 (Water) — Sampled: 06/14/21 10:40 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 06/21/21 15:38				**Analyst:** YMT
Nitrogen, Total	ND	0.10	mg/l	1	06/23/21	
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1F0948 **Preparation:** _NONE (LC)		**Prepared:** 06/15/21 12:00				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	06/16/21 03:28	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1F1220 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/21/21 15:38				**Analyst:** YMT
TKN	ND	0.10	mg/l	1	06/23/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1F0910 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/15/21 14:24				**Analyst:** sar
NO2+NO3 as N	ND	200	ug/l	1	06/15/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1F0912 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/15/21 14:33				**Analyst:** ssi
o-Phosphate as P	ND	0.010	mg/l	1	06/15/21 15:23	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1F1005 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/16/21 12:27				**Analyst:** ism
Total Dissolved Solids	**32**	10	mg/l	1	06/17/21	

Sample: BC-blw-SL — 1F15018-03 (Water) — Sampled: 06/14/21 11:25 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 06/21/21 15:38				**Analyst:** YMT
Nitrogen, Total	**0.15**	0.10	mg/l	1	06/23/21	
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1F0948 **Preparation:** _NONE (LC)		**Prepared:** 06/15/21 12:00				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	06/16/21 04:22	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1F1220 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/21/21 15:38				**Analyst:** YMT
TKN	**0.15**	0.10	mg/l	1	06/23/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1F0910 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/15/21 14:24				**Analyst:** sar
NO2+NO3 as N	ND	200	ug/l	1	06/15/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1F0912 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/15/21 14:33				**Analyst:** ssi
o-Phosphate as P	ND	0.010	mg/l	1	06/15/21 15:24	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1F1005 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/16/21 12:27				**Analyst:** ism
Total Dissolved Solids	**37**	10	mg/l	1	06/17/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Sample Results

(Continued)

Sample: BC-blw-PH2 — 1F15018-04 (Water) — Sampled: 06/14/21 12:05 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 06/21/21 15:38				**Analyst:** YMT
Nitrogen, Total	**0.19**	0.10	mg/l	1	06/23/21	
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1F0948 — **Preparation:** _NONE (LC)		**Prepared:** 06/15/21 12:00				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	06/16/21 04:40	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1F1220 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/21/21 15:38				**Analyst:** YMT
TKN	**0.19**	0.10	mg/l	1	06/23/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1F0910 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/15/21 14:24				**Analyst:** sar
NO2+NO3 as N	ND	200	ug/l	1	06/15/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1F0912 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/15/21 14:33				**Analyst:** ssi
o-Phosphate as P	ND	0.010	mg/l	1	06/15/21 15:24	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1F1005 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/16/21 12:27				**Analyst:** ism
Total Dissolved Solids	**34**	10	mg/l	1	06/17/21	

Sample: BC-blw-PH3 — 1F15018-05 (Water) — Sampled: 06/14/21 12:30 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 06/21/21 15:38				**Analyst:** YMT
Nitrogen, Total	**0.11**	0.10	mg/l	1	06/23/21	
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1F0948 — **Preparation:** _NONE (LC)		**Prepared:** 06/15/21 12:00				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	06/16/21 04:58	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1F1220 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/21/21 15:38				**Analyst:** YMT
TKN	**0.11**	0.10	mg/l	1	06/23/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1F0910 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/15/21 14:24				**Analyst:** sar
NO2+NO3 as N	ND	200	ug/l	1	06/15/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1F0912 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/15/21 14:33				**Analyst:** ssi
o-Phosphate as P	ND	0.010	mg/l	1	06/15/21 15:25	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1F1005 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/16/21 12:27				**Analyst:** ism
Total Dissolved Solids	**43**	10	mg/l	1	06/17/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Quality Control Results

Anions by IC, EPA Method 300.0

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1F0948 - _NONE (LC)										
Blank (W1F0948-BLK1)				**Prepared & Analyzed: 06/15/21**						
Nitrate as N	ND	110	ug/l							
LCS (W1F0948-BS1)				**Prepared & Analyzed: 06/15/21**						
Nitrate as N	998	110	ug/l	1000		100	90-110			
Matrix Spike (W1F0948-MS1)	**Source: 1F07013-01**			**Prepared: 06/15/21 Analyzed: 06/16/21**						
Nitrate as N	17700	1100	ug/l	10000	*7790*	99	84-115			
Matrix Spike (W1F0948-MS2)	**Source: 1F07013-03**			**Prepared: 06/15/21 Analyzed: 06/16/21**						
Nitrate as N	11100	1100	ug/l	10000	*1160*	100	84-115			
Matrix Spike Dup (W1F0948-MSD1)	**Source: 1F07013-01**			**Prepared: 06/15/21 Analyzed: 06/16/21**						
Nitrate as N	17800	1100	ug/l	10000	*7790*	100	84-115	0.4	20	
Matrix Spike Dup (W1F0948-MSD2)	**Source: 1F07013-03**			**Prepared: 06/15/21 Analyzed: 06/16/21**						
Nitrate as N	11100	1100	ug/l	10000	*1160*	100	84-115	0.09	20	

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1F0910 - _NONE (WETCHEM)										
Blank (W1F0910-BLK1)				**Prepared & Analyzed: 06/15/21**						
NO2+NO3 as N	ND	200	ug/l							
LCS (W1F0910-BS1)				**Prepared & Analyzed: 06/15/21**						
NO2+NO3 as N	989	200	ug/l	1000		99	90-110			
Matrix Spike (W1F0910-MS1)	**Source: 1F07004-07**			**Prepared & Analyzed: 06/15/21**						
NO2+NO3 as N	7340	200	ug/l	2000	*5310*	102	90-110			
Matrix Spike (W1F0910-MS2)	**Source: 1F07013-07**			**Prepared & Analyzed: 06/15/21**						
NO2+NO3 as N	7510	200	ug/l	2000	*5310*	110	90-110			
Matrix Spike Dup (W1F0910-MSD1)	**Source: 1F07004-07**			**Prepared & Analyzed: 06/15/21**						
NO2+NO3 as N	7310	200	ug/l	2000	*5310*	100	90-110	0.4	20	
Matrix Spike Dup (W1F0910-MSD2)	**Source: 1F07013-07**			**Prepared & Analyzed: 06/15/21**						
NO2+NO3 as N	7470	200	ug/l	2000	*5310*	108	90-110	0.5	20	
Batch: W1F0912 - _NONE (WETCHEM)										
Blank (W1F0912-BLK1)				**Prepared & Analyzed: 06/15/21**						
o-Phosphate as P	ND	0.010	mg/l							
LCS (W1F0912-BS1)				**Prepared & Analyzed: 06/15/21**						
o-Phosphate as P	0.206	0.010	mg/l	0.200		103	88-111			
Matrix Spike (W1F0912-MS1)	**Source: 1F15032-01**			**Prepared & Analyzed: 06/15/21**						
o-Phosphate as P	0.305	0.010	mg/l	0.200	*0.110*	98	85-112			
Matrix Spike Dup (W1F0912-MSD1)	**Source: 1F15032-01**			**Prepared & Analyzed: 06/15/21**						
o-Phosphate as P	0.301	0.010	mg/l	0.200	*0.110*	96	85-112	1	20	
Batch: W1F1005 - _NONE (WETCHEM)										
Blank (W1F1005-BLK1)				**Prepared: 06/16/21 Analyzed: 06/17/21**						
Total Dissolved Solids	ND	10	mg/l							
LCS (W1F1005-BS1)				**Prepared: 06/16/21 Analyzed: 06/17/21**						
Total Dissolved Solids	810	10	mg/l	824		98	96-102			

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Quality Control Results

(Continued)

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1F1005 - _NONE (WETCHEM) (Continued)										
Duplicate (W1F1005-DUP1)	**Source: 1E24085-01**			**Prepared: 06/16/21**	**Analyzed: 06/17/21**					
Total Dissolved Solids	893	10	mg/l		*892*			0.1	10	
Duplicate (W1F1005-DUP2)	**Source: 1F15037-01**			**Prepared: 06/16/21**	**Analyzed: 06/17/21**					
Total Dissolved Solids	975	10	mg/l		*959*			2	10	
Batch: W1F1220 - _NONE (WETCHEM)										
Blank (W1F1220-BLK1)				**Prepared: 06/21/21**	**Analyzed: 06/23/21**					
TKN	ND	0.10	mg/l							
Blank (W1F1220-BLK2)				**Prepared: 06/21/21**	**Analyzed: 06/23/21**					
TKN	ND	0.10	mg/l							
LCS (W1F1220-BS1)				**Prepared: 06/21/21**	**Analyzed: 06/23/21**					
TKN	0.955	0.10	mg/l	1.00		95	90-110			
LCS (W1F1220-BS2)				**Prepared: 06/21/21**	**Analyzed: 06/23/21**					
TKN	0.950	0.10	mg/l	1.00		95	90-110			
Matrix Spike (W1F1220-MS1)	**Source: 1F10020-07**			**Prepared: 06/21/21**	**Analyzed: 06/23/21**					
TKN	1.22	0.10	mg/l	1.00	*0.285*	94	90-110			
Matrix Spike (W1F1220-MS2)	**Source: 1F15018-04**			**Prepared: 06/21/21**	**Analyzed: 06/23/21**					
TKN	1.08	0.10	mg/l	1.00	*0.185*	90	90-110			
Matrix Spike Dup (W1F1220-MSD1)	**Source: 1F10020-07**			**Prepared: 06/21/21**	**Analyzed: 06/23/21**					
TKN	1.24	0.10	mg/l	1.00	*0.285*	96	90-110	1	10	
Matrix Spike Dup (W1F1220-MSD2)	**Source: 1F15018-04**			**Prepared: 06/21/21**	**Analyzed: 06/23/21**					
TKN	1.09	0.10	mg/l	1.00	*0.185*	91	90-110	0.6	10	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Notes and Definitions

Item	Definition
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Reviewed by:

Chris Samatmanakit
Project Manager

DoD-ELAP ANAB #L2457 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH # • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • NV-DEP #NAC 445A • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

CHAIN OF CUSTODY FORM

1F15018

Page 1 of 1

Client Name/Address: PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	Project/PO Number: 2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Nitrate-N EPA Method 300.0	Orthophosphae-OPO4 EPA Method 365.3	Total Dissolved Solids SM2540C	Total Kjeldahl Nitrogenby EPA Method 351.2	NO2+NO3 as N - EPA Method 353.2	Total Nitrogen by calculation						Special Instructions
BC-blw-LS	water	60 ml Poly	1	6/14/21	9:35am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-NF-1	water	60 ml Poly	1	6/14/21	10:40am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-blw-SL	water	60 ml Poly	1	6/14/21	11:25am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-blw-PH2	water	60 ml Poly	1	6/14/21	12:05pm	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-blw-PH3	water	60 ml Poly	1	6/14/21	12:30pm	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						

Relinquished By: [signature]	Date /Time: 6/14/21 1:30pm	Received by:	Date /Time:	Turnaround Time: (Check) Same Day ___ 72 Hours ___ 24 Hours ___ 5 Days ___ 48 Hours ___ Normal X
Relinquished By: FedEx	Date /Time: 6/15/21	Received by: [signature]	Date /Time: 10:25	
Relinquished By:	Date /Time:	Received in Lab by:	Date /Time:	Sample Integrity: (Check) Intact ___ On Ice X 2.4°

RR 54

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders:	1F16006	**Report Date:**	7/01/2021
		Received Date:	6/16/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

Dear Michael P. Donovan,

Enclosed are the results of analyses for samples received 6/16/21 with the Chain-of-Custody document. The samples were received in good condition, at 3.4 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Sample Results

Sample: BC-blw-PH4 — Sampled: 06/15/21 8:05 by Jim Burton, Todd Bear

1F16006-01 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 06/25/21 17:30				**Analyst:** YMT
Nitrogen, Total	ND	0.10	mg/l	1	06/29/21	
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1F0976 **Preparation:** _NONE (LC)		**Prepared:** 06/16/21 10:53				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	06/16/21 22:18	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1F1512 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/25/21 17:30				**Analyst:** YMT
TKN	ND	0.10	mg/l	1	06/29/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1F1059 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/17/21 10:22				**Analyst:** sar
NO2+NO3 as N	ND	200	ug/l	1	06/17/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1F1019 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/16/21 17:02				**Analyst:** ssi
o-Phosphate as P	ND	0.010	mg/l	1	06/16/21 17:44	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1F1005 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/16/21 12:27				**Analyst:** ism
Total Dissolved Solids	**41**	10	mg/l	1	06/17/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Sample Results

(Continued)

Sample: BC-blw-PH5 — Sampled: 06/15/21 8:35 by Jim Burton, Todd Bear

1F16006-02 (Water)

Analyte		Result	MRL	Units	Dil	Analyzed	Qualifier
Method: [CALC]			**Instr:** [CALC]				
Batch ID: [CALC]	**Preparation:** [CALC]		**Prepared:** 06/25/21 17:30				**Analyst:** YMT
Nitrogen, Total		**0.13**	0.10	mg/l	1	06/29/21	
Method: EPA 300.0			**Instr:** LC12				
Batch ID: W1F0976	**Preparation:** _NONE (LC)		**Prepared:** 06/16/21 10:53				**Analyst:** jan
Nitrate as N		ND	110	ug/l	1	06/16/21 22:36	
Method: EPA 351.2			**Instr:** AA06				
Batch ID: W1F1512	**Preparation:** _NONE (WETCHEM)		**Prepared:** 06/25/21 17:30				**Analyst:** YMT
TKN		**0.13**	0.10	mg/l	1	06/29/21	
Method: EPA 353.2			**Instr:** AA01				
Batch ID: W1F1059	**Preparation:** _NONE (WETCHEM)		**Prepared:** 06/17/21 10:22				**Analyst:** sar
NO2+NO3 as N		ND	200	ug/l	1	06/17/21	
Method: EPA 365.3			**Instr:** UVVIS04				
Batch ID: W1F1019	**Preparation:** _NONE (WETCHEM)		**Prepared:** 06/16/21 17:02				**Analyst:** ssi
o-Phosphate as P		ND	0.010	mg/l	1	06/16/21 17:44	
Method: SM 2540C			**Instr:** OVEN01				
Batch ID: W1F1005	**Preparation:** _NONE (WETCHEM)		**Prepared:** 06/16/21 12:27				**Analyst:** ism
Total Dissolved Solids		**33**	10	mg/l	1	06/17/21	

Sample: BC-blw-PH6 — Sampled: 06/15/21 9:05 by Jim Burton, Todd Bear

1F16006-03 (Water)

Analyte		Result	MRL	Units	Dil	Analyzed	Qualifier
Method: [CALC]			**Instr:** [CALC]				
Batch ID: [CALC]	**Preparation:** [CALC]		**Prepared:** 06/25/21 17:30				**Analyst:** YMT
Nitrogen, Total		ND	0.10	mg/l	1	06/29/21	
Method: EPA 300.0			**Instr:** LC12				
Batch ID: W1F0976	**Preparation:** _NONE (LC)		**Prepared:** 06/16/21 10:53				**Analyst:** jan
Nitrate as N		ND	110	ug/l	1	06/16/21 22:54	
Method: EPA 351.2			**Instr:** AA06				
Batch ID: W1F1512	**Preparation:** _NONE (WETCHEM)		**Prepared:** 06/25/21 17:30				**Analyst:** YMT
TKN		ND	0.10	mg/l	1	06/29/21	
Method: EPA 353.2			**Instr:** AA01				
Batch ID: W1F1059	**Preparation:** _NONE (WETCHEM)		**Prepared:** 06/17/21 10:22				**Analyst:** sar
NO2+NO3 as N		ND	200	ug/l	1	06/17/21	
Method: EPA 365.3			**Instr:** UVVIS04				
Batch ID: W1F1019	**Preparation:** _NONE (WETCHEM)		**Prepared:** 06/16/21 17:02				**Analyst:** ssi
o-Phosphate as P		ND	0.010	mg/l	1	06/16/21 17:45	
Method: SM 2540C			**Instr:** OVEN01				
Batch ID: W1F1005	**Preparation:** _NONE (WETCHEM)		**Prepared:** 06/16/21 12:27				**Analyst:** ism
Total Dissolved Solids		**38**	10	mg/l	1	06/17/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Quality Control Results

Anions by IC, EPA Method 300.0

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1F0976 - _NONE (LC)										
Blank (W1F0976-BLK1)				**Prepared & Analyzed: 06/16/21**						
Nitrate as N	ND	110	ug/l							
LCS (W1F0976-BS1)				**Prepared & Analyzed: 06/16/21**						
Nitrate as N	1000	110	ug/l	1000		100	90-110			
Matrix Spike (W1F0976-MS1)	**Source: 1F14042-04**			**Prepared & Analyzed: 06/16/21**						
Nitrate as N	10700	1100	ug/l	10000	*450*	102	84-115			
Matrix Spike (W1F0976-MS2)	**Source: 1F15033-04**			**Prepared: 06/16/21 Analyzed: 06/17/21**						
Nitrate as N	10600	1100	ug/l	10000	*440*	102	84-115			
Matrix Spike Dup (W1F0976-MSD1)	**Source: 1F14042-04**			**Prepared & Analyzed: 06/16/21**						
Nitrate as N	10700	1100	ug/l	10000	*450*	102	84-115	0.2	20	
Matrix Spike Dup (W1F0976-MSD2)	**Source: 1F15033-04**			**Prepared: 06/16/21 Analyzed: 06/17/21**						
Nitrate as N	10600	1100	ug/l	10000	*440*	101	84-115	0.2	20	

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1F1005 - _NONE (WETCHEM)										
Blank (W1F1005-BLK1)				**Prepared: 06/16/21 Analyzed: 06/17/21**						
Total Dissolved Solids	ND	10	mg/l							
LCS (W1F1005-BS1)				**Prepared: 06/16/21 Analyzed: 06/17/21**						
Total Dissolved Solids	810	10	mg/l	824		98	96-102			
Duplicate (W1F1005-DUP1)	**Source: 1E24085-01**			**Prepared: 06/16/21 Analyzed: 06/17/21**						
Total Dissolved Solids	893	10	mg/l		*892*			0.1	10	
Duplicate (W1F1005-DUP2)	**Source: 1F15037-01**			**Prepared: 06/16/21 Analyzed: 06/17/21**						
Total Dissolved Solids	975	10	mg/l		*959*			2	10	
Batch: W1F1019 - _NONE (WETCHEM)										
Blank (W1F1019-BLK1)				**Prepared & Analyzed: 06/16/21**						
o-Phosphate as P	ND	0.010	mg/l							
LCS (W1F1019-BS1)				**Prepared & Analyzed: 06/16/21**						
o-Phosphate as P	0.202	0.010	mg/l	0.200		101	88-111			
Matrix Spike (W1F1019-MS1)	**Source: 1D04002-01**			**Prepared & Analyzed: 06/16/21**						
o-Phosphate as P	0.365	0.010	mg/l	0.200	*0.170*	98	85-112			
Matrix Spike Dup (W1F1019-MSD1)	**Source: 1D04002-01**			**Prepared & Analyzed: 06/16/21**						
o-Phosphate as P	0.369	0.010	mg/l	0.200	*0.170*	99	85-112	1	20	
Batch: W1F1059 - _NONE (WETCHEM)										
Blank (W1F1059-BLK1)				**Prepared & Analyzed: 06/17/21**						
NO2+NO3 as N	ND	200	ug/l							
LCS (W1F1059-BS1)				**Prepared & Analyzed: 06/17/21**						
NO2+NO3 as N	1030	200	ug/l	1000		103	90-110			
Duplicate (W1F1059-DUP1)	**Source: 1F17005-01**			**Prepared & Analyzed: 06/17/21**						
NO2+NO3 as N	304	200	ug/l		*298*			2	20	
Matrix Spike (W1F1059-MS1)	**Source: 1F17005-01**			**Prepared & Analyzed: 06/17/21**						
NO2+NO3 as N	2390	200	ug/l	2000	*298*	105	90-110			

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Quality Control Results

(Continued)

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1F1059 - _NONE (WETCHEM) (Continued)										
Matrix Spike (W1F1059-MS2)	**Source: 1F16005-01**			**Prepared & Analyzed: 06/17/21**						
NO2+NO3 as N	7210	200	ug/l	2000	*5210*	100	90-110			
Matrix Spike Dup (W1F1059-MSD1)	**Source: 1F17005-01**			**Prepared & Analyzed: 06/17/21**						
NO2+NO3 as N	2400	200	ug/l	2000	*298*	105	90-110	0.4	20	
Matrix Spike Dup (W1F1059-MSD2)	**Source: 1F16005-01**			**Prepared & Analyzed: 06/17/21**						
NO2+NO3 as N	7190	200	ug/l	2000	*5210*	99	90-110	0.3	20	
Batch: W1F1512 - _NONE (WETCHEM)										
Blank (W1F1512-BLK1)				**Prepared: 06/25/21 Analyzed: 06/29/21**						
TKN	ND	0.10	mg/l							
Blank (W1F1512-BLK2)				**Prepared: 06/25/21 Analyzed: 06/29/21**						
TKN	ND	0.10	mg/l							
LCS (W1F1512-BS1)				**Prepared: 06/25/21 Analyzed: 06/29/21**						
TKN	1.02	0.10	mg/l	1.00		102	90-110			
LCS (W1F1512-BS2)				**Prepared: 06/25/21 Analyzed: 06/29/21**						
TKN	1.01	0.10	mg/l	1.00		101	90-110			
Matrix Spike (W1F1512-MS1)	**Source: 1F15051-09**			**Prepared: 06/25/21 Analyzed: 06/29/21**						
TKN	1.15	0.10	mg/l	1.00	*0.123*	103	90-110			
Matrix Spike (W1F1512-MS2)	**Source: 1F15096-03**			**Prepared: 06/25/21 Analyzed: 06/29/21**						
TKN	1.36	0.10	mg/l	1.00	*0.488*	88	90-110			MS-01
Matrix Spike Dup (W1F1512-MSD1)	**Source: 1F15051-09**			**Prepared: 06/25/21 Analyzed: 06/29/21**						
TKN	1.09	0.10	mg/l	1.00	*0.123*	97	90-110	5	10	
Matrix Spike Dup (W1F1512-MSD2)	**Source: 1F15096-03**			**Prepared: 06/25/21 Analyzed: 06/29/21**						
TKN	1.50	0.10	mg/l	1.00	*0.488*	101	90-110	10	10	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Notes and Definitions

Item	Definition
MS-01	The spike recovery for this QC sample is outside of established control limits possibly due to sample matrix interference.
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Reviewed by:

Chris Samatmanakit
Project Manager

DoD-ELAP ANAB #L2457 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH # • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • NV-DEP #NAC 445A • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

1F16006

CHAIN OF CUSTODY FORM

Page 1 of 1

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Nitrate-N EPA Method 300.0	Orthophosphae-OPO4 EPA Method 365.3	Total Dissolved Solids SM2540C	Total Kjeldahl Nitrogenby EPA Method 351.2	NO2+NO3 as N - EPA Method 353.2	Total Nitrogen by calculation						Special Instructions
BC-blw-PH4	water	60 ml Poly	1	6/15/21	8:05am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-blw-PH5	water	60 ml Poly	1	6/15/21	8:35am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-blw-PH6	water	60 ml Poly	1	6/15/21	9:05am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						

Relinquished By:	Date /Time:	Received by:	Date /Time:
[signature]	6/15/21 11:30am	FedEx	
FedEx	6/16/21 928	[signature]	
		Received in Lab by:	

Turnaround Time: (Check)
Same Day ______ 72 Hours ______
24 Hours ______ 5 Days ______
48 Hours ______ Normal X

Sample Integrity: (Check)
Intact ______ On Ice ✓

3.4c T-0234

Certificate of Analysis

FINAL REPORT

WECK LABORATORIES, INC.

Work Orders:	1F17034	**Report Date:**	7/01/2021
		Received Date:	6/17/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

Dear Michael P. Donovan,

Enclosed are the results of analyses for samples received 6/17/21 with the Chain-of-Custody document. The samples were received in good condition, at 1.8 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Sample Results

Sample: SL-DP-7 — Sampled: 06/16/21 10:30 by Jim Burton, Todd Bear

1F17034-01 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 06/25/21 17:30				**Analyst:** YMT
Nitrogen, Total	ND	0.10	mg/l	1	06/29/21	
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1F1046 **Preparation:** _NONE (LC)		**Prepared:** 06/17/21 09:19				**Analyst:** jan
Nitrate as N	ND	230	ug/l	2	06/17/21 15:19	A-01
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1F1512 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/25/21 17:30				**Analyst:** YMT
TKN	ND	0.10	mg/l	1	06/29/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1F1075 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/18/21 08:01				**Analyst:** sar
NO2+NO3 as N	ND	200	ug/l	1	06/18/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1F1087 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/17/21 17:10				**Analyst:** ssi
o-Phosphate as P	ND	0.010	mg/l	1	06/17/21 17:48	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1F1235 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/21/21 17:32				**Analyst:** blg
Total Dissolved Solids	**40**	10	mg/l	1	06/22/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Sample Results

(Continued)

Sample: SL-DP-40 — 1F17034-02 (Water)

Sampled: 06/16/21 11:00 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 06/25/21 17:30				**Analyst:** YMT
Nitrogen, Total	**5.5**	0.20	mg/l	1	06/29/21	
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1F1046 **Preparation:** _NONE (LC)		**Prepared:** 06/17/21 09:19				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	06/17/21 15:37	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1F1512 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/25/21 17:30				**Analyst:** YMT
TKN	**5.5**	2.0	mg/l	1	06/29/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1F1075 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/18/21 08:01				**Analyst:** sar
NO2+NO3 as N	ND	200	ug/l	1	06/18/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1F1087 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/17/21 17:10				**Analyst:** ssi
o-Phosphate as P	**0.12**	0.010	mg/l	1	06/17/21 17:49	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1F1235 **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/21/21 17:32				**Analyst:** blg
Total Dissolved Solids	**1300**	10	mg/l	1	06/22/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Quality Control Results

Anions by IC, EPA Method 300.0

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1F1046 - _NONE (LC)										
Blank (W1F1046-BLK1)				Prepared & Analyzed: 06/17/21						
Nitrate as N	ND	110	ug/l							
LCS (W1F1046-BS1)				Prepared & Analyzed: 06/17/21						
Nitrate as N	980	110	ug/l	1000		98	90-110			
Matrix Spike (W1F1046-MS1)	Source: 1F16080-03			Prepared & Analyzed: 06/17/21						
Nitrate as N	15700	1100	ug/l	10000	*5660*	100	84-115			
Matrix Spike (W1F1046-MS2)	Source: 1F16080-04			Prepared & Analyzed: 06/17/21						
Nitrate as N	15300	1100	ug/l	10000	*5670*	97	84-115			
Matrix Spike Dup (W1F1046-MSD1)	Source: 1F16080-03			Prepared & Analyzed: 06/17/21						
Nitrate as N	15600	1100	ug/l	10000	*5660*	100	84-115	0.3	20	
Matrix Spike Dup (W1F1046-MSD2)	Source: 1F16080-04			Prepared & Analyzed: 06/17/21						
Nitrate as N	15300	1100	ug/l	10000	*5670*	96	84-115	0.4	20	

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1F1075 - _NONE (WETCHEM)										
Blank (W1F1075-BLK1)				Prepared: 06/17/21 Analyzed: 06/18/21						
NO2+NO3 as N	ND	200	ug/l							
LCS (W1F1075-BS1)				Prepared: 06/17/21 Analyzed: 06/18/21						
NO2+NO3 as N	1030	200	ug/l	1000		103	90-110			
Matrix Spike (W1F1075-MS1)	Source: 1C02003-02			Prepared: 06/17/21 Analyzed: 06/18/21						
NO2+NO3 as N	8250	200	ug/l	2000	*6240*	100	90-110			
Matrix Spike (W1F1075-MS2)	Source: 1F11086-01			Prepared: 06/17/21 Analyzed: 06/18/21						
NO2+NO3 as N	26000	800	ug/l	8000	*17300*	109	90-110			
Matrix Spike Dup (W1F1075-MSD1)	Source: 1C02003-02			Prepared: 06/17/21 Analyzed: 06/18/21						
NO2+NO3 as N	8240	200	ug/l	2000	*6240*	100	90-110	0.1	20	
Matrix Spike Dup (W1F1075-MSD2)	Source: 1F11086-01			Prepared: 06/17/21 Analyzed: 06/18/21						
NO2+NO3 as N	26000	800	ug/l	8000	*17300*	109	90-110	0	20	
Batch: W1F1087 - _NONE (WETCHEM)										
Blank (W1F1087-BLK1)				Prepared & Analyzed: 06/17/21						
o-Phosphate as P	ND	0.010	mg/l							
LCS (W1F1087-BS1)				Prepared & Analyzed: 06/17/21						
o-Phosphate as P	0.202	0.010	mg/l	0.200		101	88-111			
Matrix Spike (W1F1087-MS1)	Source: 1F17034-01			Prepared & Analyzed: 06/17/21						
o-Phosphate as P	0.199	0.010	mg/l	0.200	*ND*	100	85-112			
Matrix Spike Dup (W1F1087-MSD1)	Source: 1F17034-01			Prepared & Analyzed: 06/17/21						
o-Phosphate as P	0.192	0.010	mg/l	0.200	*ND*	96	85-112	4	20	
Batch: W1F1235 - _NONE (WETCHEM)										
Blank (W1F1235-BLK1)				Prepared: 06/21/21 Analyzed: 06/22/21						
Total Dissolved Solids	ND	10	mg/l							
LCS (W1F1235-BS1)				Prepared: 06/21/21 Analyzed: 06/22/21						
Total Dissolved Solids	834	10	mg/l	824		101	96-102			

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Quality Control Results

(Continued)

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1F1235 - _NONE (WETCHEM) (Continued)										
Duplicate (W1F1235-DUP1)	**Source: 1C02003-02**			**Prepared: 06/21/21**	**Analyzed: 06/22/21**					
Total Dissolved Solids	2010	10	mg/l		*1980*			2	10	
Duplicate (W1F1235-DUP2)	**Source: 1C02003-03**			**Prepared: 06/21/21**	**Analyzed: 06/22/21**					
Total Dissolved Solids	2210	10	mg/l		*2260*			2	10	
Batch: W1F1512 - _NONE (WETCHEM)										
Blank (W1F1512-BLK1)				**Prepared: 06/25/21**	**Analyzed: 06/29/21**					
TKN	ND	0.10	mg/l							
Blank (W1F1512-BLK2)				**Prepared: 06/25/21**	**Analyzed: 06/29/21**					
TKN	ND	0.10	mg/l							
LCS (W1F1512-BS1)				**Prepared: 06/25/21**	**Analyzed: 06/29/21**					
TKN	1.02	0.10	mg/l	1.00		102	90-110			
LCS (W1F1512-BS2)				**Prepared: 06/25/21**	**Analyzed: 06/29/21**					
TKN	1.01	0.10	mg/l	1.00		101	90-110			
Matrix Spike (W1F1512-MS1)	**Source: 1F15051-09**			**Prepared: 06/25/21**	**Analyzed: 06/29/21**					
TKN	1.15	0.10	mg/l	1.00	*0.123*	103	90-110			
Matrix Spike (W1F1512-MS2)	**Source: 1F15096-03**			**Prepared: 06/25/21**	**Analyzed: 06/29/21**					
TKN	1.36	0.10	mg/l	1.00	*0.488*	88	90-110			MS-01
Matrix Spike Dup (W1F1512-MSD1)	**Source: 1F15051-09**			**Prepared: 06/25/21**	**Analyzed: 06/29/21**					
TKN	1.09	0.10	mg/l	1.00	*0.123*	97	90-110	5	10	
Matrix Spike Dup (W1F1512-MSD2)	**Source: 1F15096-03**			**Prepared: 06/25/21**	**Analyzed: 06/29/21**					
TKN	1.50	0.10	mg/l	1.00	*0.488*	101	90-110	10	10	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Notes and Definitions

Item	Definition
A-01	Sample ran at 2x dilution by mistake. The MDL and MRL were raised due to such error.
MS-01	The spike recovery for this QC sample is outside of established control limits possibly due to sample matrix interference.
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Reviewed by:

Chris Samatmanakit
Project Manager

DoD-ELAP ANAB #L2457 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH # • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • NV-DEP #NAC 445A • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

1F17034

CHAIN OF CUSTODY FORM

Page 1 of 1

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Nitrate-N EPA Method 300.0	Orthophosphae-OPO4 EPA Method 365.3	Total Dissolved Solids SM2540C	Total Kjeldahl Nitrogenby EPA Method 351.2	NO2+NO3 as N - EPA Method 353.2	Total Nitrogen by calculation						Special Instructions
SL-DP-7	water	60 ml Poly	1	6/16/21	10:30am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
SL-DP-40	water	60 ml Poly	1	6/16/21	11:00am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						

Relinquished By:	Date /Time:	Received by:	Date /Time:
[signature]	6/16/21 1:45pm	FedEx	
FedEx		Jamhun	06/17/21 1022
		Received in Lab by:	

Turnaround Time: (Check)
Same Day ______ 72 Hours ______
24 Hours ______ 5 Days ______
48 Hours ______ Normal X

Sample Integrity: (Check)
Intact ______ On Ice ______

1.8°C T0254

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders:	1F18035	**Report Date:**	7/09/2021
		Received Date:	6/18/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

DoD-ELAP ANAB #ADE-2882 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH #4047 • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • NV-DEP #NAC 445A • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

Dear Michael P. Donovan,

Enclosed are the results of analyses for samples received 6/18/21 with the Chain-of-Custody document. The samples were received in good condition, at 3.8 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Reviewed by:

Chris Samatmanakit
Project Manager

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 07/09/2021 12:12

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
LS-DP-5	Jim Burton, Todd Bear	1F18035-01	Water	06/17/21 09:30	
LS-DP-20	Jim Burton, Todd Bear	1F18035-02	Water	06/17/21 10:00	

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 07/09/2021 12:12

Sample Results

Sample: LS-DP-5 — 1F18035-01 (Water)

Sampled: 06/17/21 9:30 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1F1116 — **Preparation:** _NONE (LC)		**Prepared:** 06/18/21 11:51				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	06/18/21 16:32	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 06/28/21 18:34				**Analyst:** ymt
Nitrogen, Total	ND	0.10	mg/l	1	07/08/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1F1616 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/28/21 18:34				**Analyst:** ymt
TKN	ND	0.10	mg/l	1	07/08/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1F1119 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/18/21 12:27				**Analyst:** SAR
NO2+NO3 as N	ND	200	ug/l	1	06/18/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1F1121 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/18/21 13:19				**Analyst:** ssi
o-Phosphate as P	ND	0.010	mg/l	1	06/18/21 13:38	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1F1235 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/21/21 17:32				**Analyst:** blg
Total Dissolved Solids	**19**	10	mg/l	1	06/22/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Certificate of Analysis
FINAL REPORT

WECK LABORATORIES, INC.

Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Project Number:** 2KLE010102 **Project Manager:** Michael P. Donovan	**Reported:** 07/09/2021 12:12

Sample Results

(Continued)

Sample: LS-DP-20 — Sampled: 06/17/21 10:00 by Jim Burton, Todd Bear

1F18035-02 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1F1116 — **Preparation:** _NONE (LC)		**Prepared:** 06/18/21 11:51				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	06/18/21 16:50	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 06/28/21 18:34				**Analyst:** ymt
Nitrogen, Total	**0.11**	0.10	mg/l	1	07/08/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1F1616 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/28/21 18:34				**Analyst:** ymt
TKN	**0.11**	0.10	mg/l	1	07/08/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1F1119 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/18/21 12:27				**Analyst:** SAR
NO2+NO3 as N	ND	200	ug/l	1	06/18/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1F1121 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/18/21 13:19				**Analyst:** ssi
o-Phosphate as P	ND	0.010	mg/l	1	06/18/21 13:39	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1F1235 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 06/21/21 17:32				**Analyst:** blg
Total Dissolved Solids	**24**	10	mg/l	1	06/22/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 07/09/2021 12:12

Quality Control Results

Anions by IC, EPA Method 300.0

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1F1116 - EPA 300.0										
Blank (W1F1116-BLK1)				**Prepared & Analyzed: 06/18/21**						
Nitrate as N	ND	110	ug/l							
Blank (W1F1116-BLK2)				**Prepared: 06/18/21 Analyzed: 06/21/21**						
Nitrate as N	ND	110	ug/l							QC-2
LCS (W1F1116-BS1)				**Prepared & Analyzed: 06/18/21**						
Nitrate as N	985	110	ug/l	1000		98	90-110			
LCS (W1F1116-BS2)				**Prepared: 06/18/21 Analyzed: 06/21/21**						
Nitrate as N	903	110	ug/l	1000		90	90-110			QC-2
Matrix Spike (W1F1116-MS1)	**Source: 1F16050-02**			**Prepared: 06/18/21 Analyzed: 06/21/21**						
Nitrate as N	19100	1100	ug/l	10000	10300	88	84-115			
Matrix Spike Dup (W1F1116-MSD1)	**Source: 1F16050-02**			**Prepared: 06/18/21 Analyzed: 06/21/21**						
Nitrate as N	18800	1100	ug/l	10000	10300	85	84-115	2	20	

Quality Control Results

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1F1119 - EPA 353.2										
Blank (W1F1119-BLK1)				**Prepared & Analyzed: 06/18/21**						
NO2+NO3 as N	ND	200	ug/l							
LCS (W1F1119-BS1)				**Prepared & Analyzed: 06/18/21**						
NO2+NO3 as N	1000	200	ug/l	1000		100	90-110			
Duplicate (W1F1119-DUP1)	**Source: 1F18033-01**			**Prepared & Analyzed: 06/18/21**						
NO2+NO3 as N	4890	200	ug/l		4840			1	20	
Matrix Spike (W1F1119-MS1)	**Source: 1F18033-01**			**Prepared & Analyzed: 06/18/21**						
NO2+NO3 as N	6910	200	ug/l	2000	4840	104	90-110			
Matrix Spike Dup (W1F1119-MSD1)	**Source: 1F18033-01**			**Prepared & Analyzed: 06/18/21**						
NO2+NO3 as N	6880	200	ug/l	2000	4840	102	90-110	0.4	20	
Batch: W1F1121 - EPA 365.3										
Blank (W1F1121-BLK1)				**Prepared & Analyzed: 06/18/21**						
o-Phosphate as P	ND	0.010	mg/l							
LCS (W1F1121-BS1)				**Prepared & Analyzed: 06/18/21**						
o-Phosphate as P	0.206	0.010	mg/l	0.200		103	88-111			
Matrix Spike (W1F1121-MS1)	**Source: 1F18035-01**			**Prepared & Analyzed: 06/18/21**						
o-Phosphate as P	0.202	0.010	mg/l	0.200	ND	101	85-112			
Matrix Spike Dup (W1F1121-MSD1)	**Source: 1F18035-01**			**Prepared & Analyzed: 06/18/21**						
o-Phosphate as P	0.201	0.010	mg/l	0.200	ND	100	85-112	0.5	20	
Batch: W1F1235 - SM 2540C										
Blank (W1F1235-BLK1)				**Prepared: 06/21/21 Analyzed: 06/22/21**						

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Quality Control Results

(Continued)

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1F1235 - SM 2540C (Continued)										
Blank (W1F1235-BLK1)				**Prepared: 06/21/21**	**Analyzed: 06/22/21**					
Total Dissolved Solids	ND	10	mg/l							
LCS (W1F1235-BS1)				**Prepared: 06/21/21**	**Analyzed: 06/22/21**					
Total Dissolved Solids	834	10	mg/l	824		101	96-102			
Duplicate (W1F1235-DUP1)	**Source: 1C02003-02**			**Prepared: 06/21/21**	**Analyzed: 06/22/21**					
Total Dissolved Solids	2010	10	mg/l		1980			2	10	
Duplicate (W1F1235-DUP2)	**Source: 1C02003-03**			**Prepared: 06/21/21**	**Analyzed: 06/22/21**					
Total Dissolved Solids	2210	10	mg/l		2260			2	10	
Batch: W1F1616 - EPA 351.2										
Blank (W1F1616-BLK1)				**Prepared: 06/28/21**	**Analyzed: 07/08/21**					
TKN	ND	0.10	mg/l							
Blank (W1F1616-BLK2)				**Prepared: 06/28/21**	**Analyzed: 07/08/21**					
TKN	ND	0.10	mg/l							
LCS (W1F1616-BS1)				**Prepared: 06/28/21**	**Analyzed: 07/08/21**					
TKN	1.06	0.10	mg/l	1.00		106	90-110			
LCS (W1F1616-BS2)				**Prepared: 06/28/21**	**Analyzed: 07/08/21**					
TKN	1.08	0.10	mg/l	1.00		108	90-110			
Matrix Spike (W1F1616-MS1)	**Source: 1F16025-01**			**Prepared: 06/28/21**	**Analyzed: 07/08/21**					
TKN	1.37	0.10	mg/l	1.00	0.566	81	90-110			MS-01
Matrix Spike (W1F1616-MS2)	**Source: 1F23032-04**			**Prepared: 06/28/21**	**Analyzed: 07/08/21**					
TKN	1.53	0.10	mg/l	1.00	0.355	118	90-110			MS-01
Matrix Spike Dup (W1F1616-MSD1)	**Source: 1F16025-01**			**Prepared: 06/28/21**	**Analyzed: 07/08/21**					
TKN	0.857	0.10	mg/l	1.00	0.566	29	90-110	46	10	MS-01
Matrix Spike Dup (W1F1616-MSD2)	**Source: 1F23032-04**			**Prepared: 06/28/21**	**Analyzed: 07/08/21**					
TKN	1.56	0.10	mg/l	1.00	0.355	121	90-110	2	10	MS-01

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 07/09/2021 12:12

Notes and Definitions

Item	Definition
MS-01	The spike recovery for this QC sample is outside of established control limits possibly due to sample matrix interference.
QC-2	This QC sample was reanalyzed to complement samples that require re-analysis on different date. See analysis date.
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

CHAIN OF CUSTODY FORM

1F18035

Page 1 of 1

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Nitrate-N EPA Method 300.0	Orthophosphae-OPO4 EPA Method 365.3	Total Dissolved Solids SM2540C	Total Kjeldahl Nitrogenby EPA Method 351.2	NO2+NO3 as N - EPA Method 353.2	Total Nitrogen by calculation	Special Instructions
LS-DP-5	water	60 ml Poly	1	6/17/21	9:30am	None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
LS-DP-20	water	60 ml Poly	1	6/17/21	10:00am	None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
	water	60 ml Poly	1			None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
	water	60 ml Poly	1			None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
	water	60 ml Poly	1			None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	

Relinquished By:	Date /Time:	Received by:	Date /Time:
[signature]	6/17/21 11:15am		
FedEx	6/18/21	[signature]	10:15
		Received in Lab by:	

Turnaround Time: (Check)
Same Day ______ 72 Hours ______
24 Hours ______ 5 Days ______
48 Hours ______ Normal X

Sample Integrity: (Check)
Intact ______ On Ice 3.8°C

T023Y

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders:	1G14015	**Report Date:**	7/22/2021
		Received Date:	7/14/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

Dear Michael P. Donovan :

Enclosed are the results of analyses for samples received 7/14/2021 with the Chain-of-Custody document. The samples were received in good condition, at 4.7 °C and on ice. All analysis met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Sample Results

Sample: SL-BR-1 — 1G14015-01 (Water) — Sampled: 07/12/21 11:15 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: SM 9223B		**Instr:** INC12				
Batch ID: W1G0973	**Preparation:** _NONE (MICROBIOLOGY)	**Prepared:** 07/14/21 18:20				**Analyst:** slh
E. coli	ND	1.0	MPN/100ml	1	07/15/21	O-09

Sample: LS-BR-1 — 1G14015-02 (Water) — Sampled: 07/12/21 11:45 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: SM 9223B		**Instr:** INC12				
Batch ID: W1G0973	**Preparation:** _NONE (MICROBIOLOGY)	**Prepared:** 07/14/21 18:20				**Analyst:** slh
E. coli	ND	1.0	MPN/100ml	1	07/15/21	O-09

Sample: INT-RES-1 — 1G14015-03 (Water) — Sampled: 07/12/21 12:05 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: SM 9223B		**Instr:** INC12				
Batch ID: W1G0973	**Preparation:** _NONE (MICROBIOLOGY)	**Prepared:** 07/14/21 18:20				**Analyst:** slh
E. coli	**28**	1.0	MPN/100ml	1	07/15/21	O-09

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Notes and Definitions

Item	Definition
O-09	This sample was received with the EPA recommended holding time expired.
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Analyses Accreditation Summary

Analyte	CAS #	Not By NELAP	ANAB ISO 17025
SM 9223B in Water			
E. coli		✓	

Reviewed by:

Chris Samatmanakit
Project Manager

DoD-ELAP ANAB #ADE-2882 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH #4047 • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • NV-DEP #NAC 445A • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

CHAIN OF CUSTODY FORM

1G14015

Page 1 of 1

Client Name/Address:
PSOMAS
3 HUTTON CENTRE DRIVE, SUITE 200
SANTA ANA, CA 92707

Project/PO Number: 2KLE010102

Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)

Phone Number: (714) 328-5234

Sampler: Jim Burton, Todd Bear

Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Escherichia coli (E. coli) by SM 9223B	Special Instructions
SL-BR-1	water	125 ml poly	1	7/12/21	11:15a	Sterile- None	X	24-Hour Hold time*
LS-BR-1	water	125 ml poly	1	7/12/21	11:45a	Sterile- None	X	24-Hour Hold time*
INT-RES-1	water	125 ml poly	1	7/12/21	12:05p	Sterile- None	X	24-Hour Hold time*

Relinquished By:	Date /Time:	Received by:	Date /Time:
[signature]	7/12/21 12:45pm		
Fedex	7/14/21	[signature]	10:30
		Received in Lab by:	

Turnaround Time: (Check)
Same Day ______ 72 Hours ______
24 Hours ______ 5 Days ______
48 Hours ______ Normal X

Sample Integrity: (Check)
Intact ______ On Ice ______

T0234 4.7°C

* Per Lohantan Surface Water Ambient Monitoring Program (SWAMP) for ambient water

Certificate of Analysis

FINAL REPORT

WECK LABORATORIES, INC.

Work Orders:	1G16026	**Report Date:**	7/22/2021
		Received Date:	7/16/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

Dear Michael P. Donovan :

Enclosed are the results of analyses for samples received 7/16/2021 with the Chain-of-Custody document. The samples were received in good condition, at 3.8 °C and on ice. All analysis met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Sample Results

Sample: SL-BR-1 — Sampled: 07/15/21 12:05 by Client

1G16026-01 (Water)

Method: SM 9223B — **Instr:** INC12

Batch ID: W1G0973 — **Preparation:** _NONE (MICROBIOLOGY) — **Prepared:** 07/16/21 11:58 — **Analyst:** atd

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
E. coli	ND	1.0	MPN/100ml	1	07/17/21	

Sample: LS-BR-1 — Sampled: 07/15/21 12:30 by Client

1G16026-02 (Water)

Method: SM 9223B — **Instr:** INC12

Batch ID: W1G0973 — **Preparation:** _NONE (MICROBIOLOGY) — **Prepared:** 07/16/21 11:58 — **Analyst:** atd

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
E. coli	ND	1.0	MPN/100ml	1	07/17/21	

Sample: INT2-RES-1 — Sampled: 07/15/21 12:50 by Client

1G16026-03 (Water)

Method: SM 9223B — **Instr:** INC12

Batch ID: W1G0973 — **Preparation:** _NONE (MICROBIOLOGY) — **Prepared:** 07/16/21 11:58 — **Analyst:** atd

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
E. coli	**8.6**	1.0	MPN/100ml	1	07/17/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Notes and Definitions

Item	Definition
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Analyses Accreditation Summary

Analyte	CAS #	Not By NELAP	ANAB ISO 17025
SM 9223B in Water			
E. coli		✓	

Reviewed by:

Chris Samatmanakit
Project Manager

DoD-ELAP ANAB #ADE-2882 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH #4047 • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • NV-DEP #NAC 445A • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

CHAIN OF CUSTODY FORM 1G16026

Page 1 of 1

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Escherichia coli (E. coli) by SM 9223B	Special Instructions
SL-BR-1	water	125 ml poly	1	7/15/21	12:05p	Sterile- None	X	24-Hour Hold time*
LS-BR-1	water	125 ml poly	1	7/15/21	12:30p	Sterile- None	X	24-Hour Hold time*
INT2-RES-1	water	125 ml poly	1	7/15/21	12:50p	Sterile- None	X	24-Hour Hold time*

Relinquished By:	Date /Time:	Received by:	Date /Time:
[signature]	7/15/21 1:30pm	FedEx	
FedEx		[signature]	07/16/21 10:30
		Received in Lab by:	

Turnaround Time: (Check)
Same Day ______ 72 Hours ______
24 Hours ______ 5 Days ______
48 Hours ______ Normal X

Sample Integrity: (Check)
Intact ______ On Ice ______

* Per Lohantan Surface Water Ambient Monitoring Program (SWAMP) for ambient water

3.8°C T0254

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders: 1G27020

Project: 2KLE010102

Attn: Michael P. Donovan

Client: Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Report Date: 8/10/2021
Received Date: 7/27/2021
Turnaround Time: Normal
Phones: (714) 751-7373
Fax: (714) 545-8883
P.O. #:
Billing Code:

Dear Michael P. Donovan :

Enclosed are the results of analyses for samples received 7/27/2021 with the Chain-of-Custody document. The samples were received in good condition, at 2.0 °C and on ice. All analysis met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Sample Results

Sample: SL-BR-1 — 1G27020-01 (Water) — Sampled: 07/26/21 12:00 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: SM 9223B		**Instr:** INC12				
Batch ID: W1H0520	**Preparation:** _NONE (MICROBIOLOGY)	**Prepared:** 07/27/21 11:54				**Analyst:** rea
E. coli	ND	1.0	MPN/100ml	1	07/28/21	

Sample: LS-BR-1 — 1G27020-02 (Water) — Sampled: 07/26/21 12:40 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: SM 9223B		**Instr:** INC12				
Batch ID: W1H0520	**Preparation:** _NONE (MICROBIOLOGY)	**Prepared:** 07/27/21 11:54				**Analyst:** rea
E. coli	**310**	1.0	MPN/100ml	1	07/28/21	

Sample: INT2-RES-1 — 1G27020-03 (Water) — Sampled: 07/26/21 13:00 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: SM 9223B		**Instr:** INC12				
Batch ID: W1H0520	**Preparation:** _NONE (MICROBIOLOGY)	**Prepared:** 07/27/21 11:54				**Analyst:** rea
E. coli	**2.0**	1.0	MPN/100ml	1	07/28/21	

Notes and Definitions

Item	Definition
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Analyses Accreditation Summary

Analyte	CAS #	Not By NELAP	ANAB ISO 17025
SM 9223B in Water			
E. coli		✓	

Reviewed by:

Chris Samatmanakit
Project Manager

DoD-ELAP ANAB #ADE-2882 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH #4047 • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

CHAIN OF CUSTODY FORM 1G27020 Page 1 of 1

Client Name/Address: PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	Project/PO Number: 2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

* Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Escherichia coli (E. coli) by SM 9223B											Special Instructions
SL-BR-1	water	125 ml poly	1	7/26/21	12:00p	Sterile- None	X											24-Hour Hold time*
LS-BR-1	water	125 ml poly	1		12:40p	Sterile- None	X											24-Hour Hold time*
INT2-RES-1	water	125 ml poly	1		1:00p	Sterile- None	X											24-Hour Hold time*

Relinquished By: [signature]	Date /Time: 7/26/21 1:45pm	Received by:	Date /Time:
Relinquished By: [signature]	Date /Time: 7/27/21	Received by: [signature]	Date /Time: 10:05
Relinquished By:	Date /Time:	Received in Lab by:	Date /Time:

Turnaround Time: (Check)
Same Day ______ 72 Hours ______
24 Hours ______ 5 Days ______
48 Hours ______ Normal X

Sample Integrity: (Check)
Intact ______ On Ice ______

* Per Lohantan Surface Water Ambient Monitoring Program (SWAMP) for ambient water

T0230 2°

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders:	1G27021	**Report Date:**	8/17/2021
		Received Date:	7/27/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

DoD-ELAP ANAB #ADE-2882 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH #4047 • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

Dear Michael P. Donovan,

Enclosed are the results of analyses for samples received 7/27/21 with the Chain-of-Custody document. The samples were received in good condition, at 2.0 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Reviewed by:

Chris Samatmanakit
Project Manager

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported:
08/17/2021 11:48

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
BC-NF-1	Jim Burton, Todd Bear	1G27021-01	Water	07/26/21 08:30	
BC-blw-LS	Jim Burton, Todd Bear	1G27021-02	Water	07/26/21 09:15	
BC-blw-SL	Jim Burton, Todd Bear	1G27021-03	Water	07/26/21 10:00	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Certificate of Analysis

FINAL REPORT

WECK LABORATORIES, INC.

Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Project Number:** 2KLE010102 **Project Manager:** Michael P. Donovan	**Reported:** 08/17/2021 11:48

Sample Results

Sample: BC-NF-1 Sampled: 07/26/21 8:30 by Jim Burton, Todd Bear

1G27021-01 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1G1369 **Preparation:** _NONE (LC)		**Prepared:** 07/27/21 11:23				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	07/28/21 00:43	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 08/06/21 17:42				**Analyst:** YMT
Nitrogen, Total	**0.13**	0.10	mg/l	1	08/10/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1H0454 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/06/21 17:42				**Analyst:** YMT
TKN	**0.13**	0.10	mg/l	1	08/10/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1G1532 **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/28/21 17:44				**Analyst:** ISM
NO2+NO3 as N	ND	200	ug/l	1	07/29/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1G1443 **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/27/21 16:28				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	07/27/21 17:06	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1G1670 **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/30/21 17:30				**Analyst:** blg
Total Dissolved Solids	**29**	10	mg/l	1	08/02/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Certificate of Analysis

FINAL REPORT

WECK LABORATORIES, INC.

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported:
08/17/2021 11:48

Sample Results

(Continued)

Sample: BC-blw-LS
1G27021-02 (Water)

Sampled: 07/26/21 9:15 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1G1369 **Preparation:** _NONE (LC)		**Prepared:** 07/27/21 11:23				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	07/28/21 01:01	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 08/09/21 19:20				**Analyst:** YMT
Nitrogen, Total	**0.12**	0.10	mg/l	1	08/11/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1H0569 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/09/21 19:20				**Analyst:** YMT
TKN	**0.12**	0.10	mg/l	1	08/11/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1G1532 **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/28/21 17:44				**Analyst:** ISM
NO2+NO3 as N	ND	200	ug/l	1	07/29/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1G1443 **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/27/21 16:28				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	07/27/21 17:08	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1G1670 **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/30/21 17:30				**Analyst:** blg
Total Dissolved Solids	**28**	10	mg/l	1	08/02/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 08/17/2021 11:48

Sample Results

(Continued)

Sample: BC-blw-SL — 1G27021-03 (Water)

Sampled: 07/26/21 10:00 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1G1369 **Preparation:** _NONE (LC)		**Prepared:** 07/27/21 11:23				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	07/28/21 01:19	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 08/09/21 19:20				**Analyst:** YMT
Nitrogen, Total	**0.12**	0.10	mg/l	1	08/11/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1H0569 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/09/21 19:20				**Analyst:** YMT
TKN	**0.12**	0.10	mg/l	1	08/11/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1G1532 **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/28/21 17:44				**Analyst:** ISM
NO2+NO3 as N	ND	200	ug/l	1	07/29/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1G1443 **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/27/21 16:28				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	07/27/21 17:09	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1G1670 **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/30/21 17:30				**Analyst:** blg
Total Dissolved Solids	**24**	10	mg/l	1	08/02/21	

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 08/17/2021 11:48

Quality Control Results

Anions by IC, EPA Method 300.0

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1G1369 - EPA 300.0										
Blank (W1G1369-BLK1)				**Prepared & Analyzed: 07/27/21**						
Nitrate as N	ND	110	ug/l							
LCS (W1G1369-BS1)				**Prepared & Analyzed: 07/27/21**						
Nitrate as N	1040	110	ug/l	1000		104	90-110			
Matrix Spike (W1G1369-MS1)	**Source: 1G21005-01**			**Prepared: 07/27/21 Analyzed: 07/28/21**						
Nitrate as N	12800	1100	ug/l	10000	3090	97	84-115			
Matrix Spike Dup (W1G1369-MSD1)	**Source: 1G21005-01**			**Prepared: 07/27/21 Analyzed: 07/28/21**						
Nitrate as N	12700	1100	ug/l	10000	3090	96	84-115	0.7	20	

Quality Control Results

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1G1443 - EPA 365.3										
Blank (W1G1443-BLK1)				**Prepared & Analyzed: 07/27/21**						
o-Phosphate as P	ND	0.010	mg/l							
LCS (W1G1443-BS1)				**Prepared & Analyzed: 07/27/21**						
o-Phosphate as P	0.200	0.010	mg/l	0.200		100	88-111			
Matrix Spike (W1G1443-MS1)	**Source: 1G27021-01**			**Prepared & Analyzed: 07/27/21**						
o-Phosphate as P	0.198	0.010	mg/l	0.200	ND	99	85-112			
Matrix Spike Dup (W1G1443-MSD1)	**Source: 1G27021-01**			**Prepared & Analyzed: 07/27/21**						
o-Phosphate as P	0.200	0.010	mg/l	0.200	ND	100	85-112	1	20	
Batch: W1G1532 - EPA 353.2										
Blank (W1G1532-BLK1)				**Prepared: 07/28/21 Analyzed: 07/29/21**						
NO2+NO3 as N	ND	200	ug/l							
LCS (W1G1532-BS1)				**Prepared: 07/28/21 Analyzed: 07/29/21**						
NO2+NO3 as N	1010	200	ug/l	1000		101	90-110			
Matrix Spike (W1G1532-MS1)	**Source: 1G27003-06**			**Prepared: 07/28/21 Analyzed: 07/29/21**						
NO2+NO3 as N	2900	200	ug/l	2000	1010	94	90-110			
Matrix Spike (W1G1532-MS2)	**Source: 1G28064-04**			**Prepared: 07/28/21 Analyzed: 07/29/21**						
NO2+NO3 as N	2230	200	ug/l	2000	219	101	90-110			
Matrix Spike Dup (W1G1532-MSD1)	**Source: 1G27003-06**			**Prepared: 07/28/21 Analyzed: 07/29/21**						
NO2+NO3 as N	2910	200	ug/l	2000	1010	95	90-110	0.3	20	
Matrix Spike Dup (W1G1532-MSD2)	**Source: 1G28064-04**			**Prepared: 07/28/21 Analyzed: 07/29/21**						
NO2+NO3 as N	2190	200	ug/l	2000	219	99	90-110	2	20	
Batch: W1G1670 - SM 2540C										
Blank (W1G1670-BLK1)				**Prepared: 07/30/21 Analyzed: 08/02/21**						
Total Dissolved Solids	ND	10	mg/l							
Blank (W1G1670-BLK2)				**Prepared: 07/30/21 Analyzed: 08/02/21**						

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 08/17/2021 11:48

Quality Control Results

(Continued)

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1G1670 - SM 2540C (Continued)										
Blank (W1G1670-BLK2)				**Prepared: 07/30/21**	**Analyzed: 08/02/21**					
Total Dissolved Solids	ND	10	mg/l							
LCS (W1G1670-BS1)				**Prepared: 07/30/21**	**Analyzed: 08/02/21**					
Total Dissolved Solids	823	10	mg/l				96-102			
LCS (W1G1670-BS2)				**Prepared: 07/30/21**	**Analyzed: 08/02/21**					
Total Dissolved Solids	807	10	mg/l	824		98	96-102			
Duplicate (W1G1670-DUP1)	**Source: 1G27053-01**			**Prepared: 07/30/21**	**Analyzed: 08/02/21**					
Total Dissolved Solids	983	10	mg/l		957			3	10	
Duplicate (W1G1670-DUP2)	**Source: 1G27064-01**			**Prepared: 07/30/21**	**Analyzed: 08/02/21**					
Total Dissolved Solids	572	10	mg/l		593			4	10	
Duplicate (W1G1670-DUP3)	**Source: 1G26047-08RE1**			**Prepared: 07/30/21**	**Analyzed: 08/02/21**					
Total Dissolved Solids	6160	10	mg/l		6210			0.8	10	
Batch: W1H0454 - EPA 351.2										
Blank (W1H0454-BLK1)				**Prepared: 08/06/21**	**Analyzed: 08/10/21**					
TKN	ND	0.10	mg/l							
LCS (W1H0454-BS1)				**Prepared: 08/06/21**	**Analyzed: 08/10/21**					
TKN	1.01	0.10	mg/l	1.00		101	90-110			
Matrix Spike (W1H0454-MS1)	**Source: 1G27017-05**			**Prepared: 08/06/21**	**Analyzed: 08/10/21**					
TKN	1.34	0.10	mg/l	1.00	0.344	100	90-110			
Matrix Spike Dup (W1H0454-MSD1)	**Source: 1G27017-05**			**Prepared: 08/06/21**	**Analyzed: 08/10/21**					
TKN	1.36	0.10	mg/l	1.00	0.344	102	90-110	2	10	
Batch: W1H0569 - EPA 351.2										
Blank (W1H0569-BLK1)				**Prepared: 08/09/21**	**Analyzed: 08/11/21**					
TKN	ND	0.10	mg/l							
LCS (W1H0569-BS1)				**Prepared: 08/09/21**	**Analyzed: 08/11/21**					
TKN	0.969	0.10	mg/l	1.00		97	90-110			
Matrix Spike (W1H0569-MS1)	**Source: 1G27017-02**			**Prepared: 08/09/21**	**Analyzed: 08/11/21**					
TKN	1.23	0.10	mg/l	1.00	0.238	99	90-110			
Matrix Spike Dup (W1H0569-MSD1)	**Source: 1G27017-02**			**Prepared: 08/09/21**	**Analyzed: 08/11/21**					
TKN	1.25	0.10	mg/l	1.00	0.238	101	90-110	1	10	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Notes and Definitions

Item	Definition
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

CHAIN OF CUSTODY FORM 1G27021

Page 1 of 1

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Nitrate-N EPA Method 300.0	Orthophosphae-OPO4 EPA Method 365.3	Total Dissolved Solids SM2540C	Total Kjeldahl Nitrogenby EPA Method 351.2	NO2+NO3 as N - EPA Method 353.2	Total Nitrogen by calculation						Special Instructions
BC-NF-1	water	60 ml Poly	1	7/26/21	8:30am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-b/w-LS	water	60 ml Poly	1	7/26/21	9:15a	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-b/w-SL	water	60 ml Poly	1	7/26/21	10:00am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						

Relinquished By: [signature]	Date /Time: 7/26/21 1:40pm	Received by:	Date /Time:
Relinquished By: FedEx	Date /Time: 7/27/21	Received by: [signature]	Date /Time: 10:05
Relinquished By:	Date /Time:	Received in Lab by:	Date /Time:

Turnaround Time: (Check)
Same Day ____ 72 Hours ____
24 Hours ____ 5 Days ____
48 Hours ____ Normal X

Sample Integrity: (Check)
Intact ____ On Ice ____

T230 2°

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders:	1G28049	**Report Date:**	8/24/2021
		Received Date:	7/28/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

DoD-ELAP ANAB #ADE-2882 ● DoD-ISO ANAB # ● ELAP-CA #1132 ● EPA-UCMR #CA00211 ● Guam-EPA #17-008R ● HW-DOH #4047 ● ISO17025 ANAB #L2457.01 ● LACSD #10143 ● NELAP-OR #4047 ● NJ-DEP #CA015 ● SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

Dear Michael P. Donovan,

Enclosed are the results of analyses for samples received 7/28/21 with the Chain-of-Custody document. The samples were received in good condition, at 3.4 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Reviewed by:

Chris Samatmanakit
Project Manager

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 08/24/2021 17:03

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
SL-DP-10	Jim Burton, Todd Bear	1G28049-01	Water	07/27/21 09:45	
SL-DP-24	Jim Burton, Todd Bear	1G28049-02	Water	07/27/21 10:15	

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 08/24/2021 17:03

Sample Results

Sample: SL-DP-10 — Sampled: 07/27/21 9:45 by Jim Burton, Todd Bear

1G28049-01 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1G1476 — **Preparation:** _NONE (LC)		**Prepared:** 07/28/21 09:33				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	07/28/21 19:27	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 08/11/21 13:32				**Analyst:** ymt
Nitrogen, Total	**0.17**	0.10	mg/l	1	08/17/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1H0763 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/11/21 13:32				**Analyst:** ymt
TKN	**0.17**	0.10	mg/l	1	08/17/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1G1532 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/28/21 17:44				**Analyst:** ISM
NO2+NO3 as N	ND	200	ug/l	1	07/29/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1G1529 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/28/21 16:53				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	07/28/21 18:16	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H0056 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/02/21 17:06				**Analyst:** blg
Total Dissolved Solids	**23**	10	mg/l	1	08/03/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Sample Results

(Continued)

Sample: SL-DP-24 — 1G28049-02 (Water)

Sampled: 07/27/21 10:15 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1G1476 **Preparation:** _NONE (LC)		**Prepared:** 07/28/21 09:33				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	07/28/21 19:45	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 08/11/21 13:32				**Analyst:** YMT
Nitrogen, Total	**0.15**	0.10	mg/l	1	08/13/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1H0763 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/11/21 13:32				**Analyst:** YMT
TKN	**0.15**	0.10	mg/l	1	08/13/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1G1532 **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/28/21 17:44				**Analyst:** ISM
NO2+NO3 as N	ND	200	ug/l	1	07/29/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1G1529 **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/28/21 16:53				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	07/28/21 18:19	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H0056 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/02/21 17:06				**Analyst:** blg
Total Dissolved Solids	**36**	10	mg/l	1	08/03/21	

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 08/24/2021 17:03

Quality Control Results

Anions by IC, EPA Method 300.0

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1G1476 - EPA 300.0										
Blank (W1G1476-BLK1)				**Prepared & Analyzed: 07/28/21**						
Nitrate as N	ND	110	ug/l							
LCS (W1G1476-BS1)				**Prepared & Analyzed: 07/28/21**						
Nitrate as N	1070	110	ug/l	1000		107	90-110			
Matrix Spike (W1G1476-MS1)	**Source: 1G19015-01**			**Prepared & Analyzed: 07/28/21**						
Nitrate as N	19000	1100	ug/l	10000	8810	102	84-115			
Matrix Spike (W1G1476-MS2)	**Source: 1G19015-03**			**Prepared & Analyzed: 07/28/21**						
Nitrate as N	15100	1100	ug/l	10000	5890	92	84-115			
Matrix Spike Dup (W1G1476-MSD1)	**Source: 1G19015-01**			**Prepared & Analyzed: 07/28/21**						
Nitrate as N	18900	1100	ug/l	10000	8810	101	84-115	0.4	20	
Matrix Spike Dup (W1G1476-MSD2)	**Source: 1G19015-03**			**Prepared & Analyzed: 07/28/21**						
Nitrate as N	15100	1100	ug/l	10000	5890	92	84-115	0.1	20	

Quality Control Results

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1G1529 - EPA 365.3										
Blank (W1G1529-BLK1)				**Prepared & Analyzed: 07/28/21**						
o-Phosphate as P	ND	0.010	mg/l							
LCS (W1G1529-BS1)				**Prepared & Analyzed: 07/28/21**						
o-Phosphate as P	0.202	0.010	mg/l	0.200		101	88-111			
Matrix Spike (W1G1529-MS1)	**Source: 1G28049-01**			**Prepared & Analyzed: 07/28/21**						
o-Phosphate as P	0.207	0.010	mg/l	0.200	ND	104	85-112			
Matrix Spike Dup (W1G1529-MSD1)	**Source: 1G28049-01**			**Prepared & Analyzed: 07/28/21**						
o-Phosphate as P	0.206	0.010	mg/l	0.200	ND	103	85-112	0.5	20	
Batch: W1G1532 - EPA 353.2										
Blank (W1G1532-BLK1)				**Prepared: 07/28/21 Analyzed: 07/29/21**						
NO2+NO3 as N	ND	200	ug/l							
LCS (W1G1532-BS1)				**Prepared: 07/28/21 Analyzed: 07/29/21**						
NO2+NO3 as N	1010	200	ug/l	1000		101	90-110			
Matrix Spike (W1G1532-MS1)	**Source: 1G27003-06**			**Prepared: 07/28/21 Analyzed: 07/29/21**						
NO2+NO3 as N	2900	200	ug/l	2000	1010	94	90-110			
Matrix Spike (W1G1532-MS2)	**Source: 1G28064-04**			**Prepared: 07/28/21 Analyzed: 07/29/21**						
NO2+NO3 as N	2230	200	ug/l	2000	219	101	90-110			
Matrix Spike Dup (W1G1532-MSD1)	**Source: 1G27003-06**			**Prepared: 07/28/21 Analyzed: 07/29/21**						
NO2+NO3 as N	2910	200	ug/l	2000	1010	95	90-110	0.3	20	
Matrix Spike Dup (W1G1532-MSD2)	**Source: 1G28064-04**			**Prepared: 07/28/21 Analyzed: 07/29/21**						
NO2+NO3 as N	2190	200	ug/l	2000	219	99	90-110	2	20	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 08/24/2021 17:03

Quality Control Results

(Continued)

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1H0056 - SM 2540C										
Blank (W1H0056-BLK1)				**Prepared: 08/02/21**	**Analyzed: 08/03/21**					
Total Dissolved Solids	ND	10	mg/l							
LCS (W1H0056-BS1)				**Prepared: 08/02/21**	**Analyzed: 08/03/21**					
Total Dissolved Solids	797	10	mg/l	824		97	96-102			
Duplicate (W1H0056-DUP1)	**Source: 1G28049-02**			**Prepared: 08/02/21**	**Analyzed: 08/03/21**					
Total Dissolved Solids	37.0	10	mg/l		36.0			3	10	
Batch: W1H0763 - EPA 351.2										
Blank (W1H0763-BLK1)				**Prepared: 08/11/21**	**Analyzed: 08/13/21**					
TKN	ND	0.10	mg/l							
Blank (W1H0763-BLK2)				**Prepared: 08/11/21**	**Analyzed: 08/17/21**					
TKN	ND	0.10	mg/l							
LCS (W1H0763-BS1)				**Prepared: 08/11/21**	**Analyzed: 08/13/21**					
TKN	0.988	0.10	mg/l	1.00		99	90-110			
LCS (W1H0763-BS2)				**Prepared: 08/11/21**	**Analyzed: 08/17/21**					
TKN	1.04	0.10	mg/l	1.00		104	90-110			
Matrix Spike (W1H0763-MS1)	**Source: 1G28049-01**			**Prepared: 08/11/21**	**Analyzed: 08/13/21**					
TKN	1.21	0.10	mg/l	1.00	0.166	105	90-110			
Matrix Spike (W1H0763-MS2)	**Source: 1G28049-01**			**Prepared: 08/11/21**	**Analyzed: 08/17/21**					
TKN	1.20	0.10	mg/l	1.00	0.166	103	90-110			
Matrix Spike Dup (W1H0763-MSD1)	**Source: 1G28049-01**			**Prepared: 08/11/21**	**Analyzed: 08/13/21**					
TKN	1.24	0.10	mg/l	1.00	0.166	107	90-110	2	10	
Matrix Spike Dup (W1H0763-MSD2)	**Source: 1G28049-01**			**Prepared: 08/11/21**	**Analyzed: 08/17/21**					
TKN	1.22	0.10	mg/l	1.00	0.166	105	90-110	1	10	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 08/24/2021 17:03

Notes and Definitions

Item	Definition
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

CHAIN OF CUSTODY FORM

1G28049 Page 1 of 1

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Nitrate-N EPA Method 300.0	Orthophosphae-OPO4 EPA Method 365.3	Total Dissolved Solids SM2540C	Total Kjeldahl Nitrogenby EPA Method 351.2	NO2+NO3 as N - EPA Method 353.2	Total Nitrogen by calculation						Special Instructions
SL-DP-10	water	60 ml Poly	1	7/27/21	9:45am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
SL-DP-24	water	60 ml Poly	1	7/27/21	10:15am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						

Relinquished By:	Date /Time:	Received by:	Date /Time:
[signature] 7/27/21	1:35pm		
Relinquished By: [signature]	Date /Time: 7/28/21	Received by: [signature]	Date /Time: 10:30
Relinquished By:	Date /Time:	Received in Lab by:	Date /Time:

Turnaround Time: (Check)
Same Day ______ 72 Hours ______
24 Hours ______ 5 Days ______
48 Hours ______ Normal X

Sample Integrity: (Check)
Intact X On Ice X

TD270 3.4°

Certificate of Analysis

FINAL REPORT

Work Orders:	1G29036	**Report Date:**	8/27/2021
		Received Date:	7/29/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

DoD-ELAP ANAB #ADE-2882 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH #4047 • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

Dear Michael P. Donovan,

Enclosed are the results of analyses for samples received 7/29/21 with the Chain-of-Custody document. The samples were received in good condition, at 5.0 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Reviewed by:

Chris Samatmanakit
Project Manager

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported:
08/27/2021 14:57

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
LS-DP-5	Jim Burton, Todd Bear	1G29036-01	Water	07/28/21 09:45	
LS-DP-22	Jim Burton, Todd Bear	1G29036-02	Water	07/28/21 10:05	

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 08/27/2021 14:57

Sample Results

Sample: LS-DP-5 — 1G29036-01 (Water)

Sampled: 07/28/21 9:45 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1G1554 — **Preparation:** _NONE (LC)		**Prepared:** 07/29/21 10:40				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	07/29/21 19:20	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 08/13/21 14:30				**Analyst:** YMT
Nitrogen, Total	**0.11**	0.10	mg/l	1	08/17/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1H0962 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/13/21 14:30				**Analyst:** YMT
TKN	**0.11**	0.10	mg/l	1	08/17/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1H0312 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/04/21 21:09				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	08/05/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1G1594 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/29/21 17:15				**Analyst:** UVVIS04
o-Phosphate as P	ND	0.010	mg/l	1	07/30/21 09:02	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H0190 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/03/21 18:30				**Analyst:** blg
Total Dissolved Solids	**12**	10	mg/l	1	08/04/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 08/27/2021 14:57

Sample Results

(Continued)

Sample: LS-DP-22 — 1G29036-02 (Water) — Sampled: 07/28/21 10:05 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1G1554 — **Preparation:** _NONE (LC)		**Prepared:** 07/29/21 10:40				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	07/29/21 20:14	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 08/13/21 14:30				**Analyst:** YMT
Nitrogen, Total	**0.15**	0.10	mg/l	1	08/17/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1H0962 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/13/21 14:30				**Analyst:** YMT
TKN	**0.15**	0.10	mg/l	1	08/17/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1H0312 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/04/21 21:09				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	08/05/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1G1594 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/29/21 17:15				**Analyst:** UVVIS04
o-Phosphate as P	ND	0.010	mg/l	1	07/30/21 09:04	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H0190 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/03/21 18:30				**Analyst:** blg
Total Dissolved Solids	**20**	10	mg/l	1	08/04/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Certificate of Analysis

FINAL REPORT

WECK LABORATORIES, INC.

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 08/27/2021 14:57

Quality Control Results

Anions by IC, EPA Method 300.0

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1G1554 - EPA 300.0										
Blank (W1G1554-BLK1)				**Prepared & Analyzed: 07/29/21**						
Nitrate as N	ND	110	ug/l							
LCS (W1G1554-BS1)				**Prepared & Analyzed: 07/29/21**						
Nitrate as N	1020	110	ug/l	1000		102	90-110			
Matrix Spike (W1G1554-MS1)	**Source: 1G09009-05**			**Prepared & Analyzed: 07/29/21**						
Nitrate as N	9580	1100	ug/l	10000	ND	96	84-115			
Matrix Spike (W1G1554-MS2)	**Source: 1G09009-06**			**Prepared & Analyzed: 07/29/21**						
Nitrate as N	9500	1100	ug/l	10000	ND	95	84-115			
Matrix Spike Dup (W1G1554-MSD1)	**Source: 1G09009-05**			**Prepared & Analyzed: 07/29/21**						
Nitrate as N	9550	1100	ug/l	10000	ND	96	84-115	0.3	20	
Matrix Spike Dup (W1G1554-MSD2)	**Source: 1G09009-06**			**Prepared & Analyzed: 07/29/21**						
Nitrate as N	9510	1100	ug/l	10000	ND	95	84-115	0.1	20	

Quality Control Results

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1G1594 - EPA 365.3										
Blank (W1G1594-BLK1)				**Prepared: 07/29/21 Analyzed: 07/30/21**						
o-Phosphate as P	ND	0.010	mg/l							
LCS (W1G1594-BS1)				**Prepared: 07/29/21 Analyzed: 07/30/21**						
o-Phosphate as P	0.202	0.010	mg/l	0.200		101	88-111			
Matrix Spike (W1G1594-MS1)	**Source: 1G29036-01**			**Prepared: 07/29/21 Analyzed: 07/30/21**						
o-Phosphate as P	0.201	0.010	mg/l	0.200	ND	100	85-112			
Matrix Spike Dup (W1G1594-MSD1)	**Source: 1G29036-01**			**Prepared: 07/29/21 Analyzed: 07/30/21**						
o-Phosphate as P	0.201	0.010	mg/l	0.200	ND	100	85-112	0	20	
Batch: W1H0190 - SM 2540C										
Blank (W1H0190-BLK1)				**Prepared: 08/03/21 Analyzed: 08/04/21**						
Total Dissolved Solids	ND	10	mg/l							
LCS (W1H0190-BS1)				**Prepared: 08/03/21 Analyzed: 08/04/21**						
Total Dissolved Solids	816	10	mg/l	824		99	96-102			
Duplicate (W1H0190-DUP1)	**Source: 1G29055-01**			**Prepared: 08/03/21 Analyzed: 08/04/21**						
Total Dissolved Solids	2280	10	mg/l		2290			0.4	10	
Duplicate (W1H0190-DUP2)	**Source: 1G29055-02**			**Prepared: 08/03/21 Analyzed: 08/04/21**						
Total Dissolved Solids	4390	10	mg/l		4410			0.5	10	
Batch: W1H0312 - EPA 353.2										
Blank (W1H0312-BLK1)				**Prepared: 08/04/21 Analyzed: 08/05/21**						
NO2+NO3 as N	ND	200	ug/l							
LCS (W1H0312-BS1)				**Prepared: 08/04/21 Analyzed: 08/05/21**						

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 08/27/2021 14:57

Quality Control Results

(Continued)

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1H0312 - EPA 353.2 (Continued)										
LCS (W1H0312-BS1)				**Prepared: 08/04/21**	**Analyzed: 08/05/21**					
NO2+NO3 as N	1020	200	ug/l	1000		102	90-110			
Matrix Spike (W1H0312-MS1)	**Source: 1H04067-03**			**Prepared: 08/04/21**	**Analyzed: 08/05/21**					
NO2+NO3 as N	29600	1000	ug/l	10000		296	90-110			
Matrix Spike (W1H0312-MS2)	**Source: 1H04068-01**			**Prepared: 08/04/21**	**Analyzed: 08/05/21**					
NO2+NO3 as N	6640	200	ug/l	2000	4650	100	90-110			
Matrix Spike Dup (W1H0312-MSD1)	**Source: 1H04067-03**			**Prepared: 08/04/21**	**Analyzed: 08/05/21**					
NO2+NO3 as N	29600	1000	ug/l	10000		296	90-110	0	20	
Matrix Spike Dup (W1H0312-MSD2)	**Source: 1H04068-01**			**Prepared: 08/04/21**	**Analyzed: 08/05/21**					
NO2+NO3 as N	6610	200	ug/l	2000	4650	98	90-110	0.5	20	
Batch: W1H0962 - EPA 351.2										
Blank (W1H0962-BLK1)				**Prepared: 08/13/21**	**Analyzed: 08/17/21**					
TKN	ND	0.10	mg/l							
LCS (W1H0962-BS1)				**Prepared: 08/13/21**	**Analyzed: 08/17/21**					
TKN	1.04	0.10	mg/l	1.00		104	90-110			
Matrix Spike (W1H0962-MS1)	**Source: 1G30092-01**			**Prepared: 08/13/21**	**Analyzed: 08/17/21**					
TKN	1.01	0.10	mg/l	1.00	ND	101	90-110			
Matrix Spike Dup (W1H0962-MSD1)	**Source: 1G30092-01**			**Prepared: 08/13/21**	**Analyzed: 08/17/21**					
TKN	0.991	0.10	mg/l	1.00	ND	99	90-110	2	10	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Notes and Definitions

Item	Definition
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

1G29036

CHAIN OF COUSTODY FORM ~~1G280~~ UKA

Page 1 of 1

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Nitrate-N EPA Method 300.0	Orthophosphae-OPO4 EPA Method 365.3	Total Dissolved Solids SM2540C	Total Kjeldahl Nitrogenby EPA Method 351.2	NO2+NO3 as N - EPA Method 353.2	Total Nitrogen by calculation						Special Instructions
LS-DP-5	water	60 ml Poly	1	7/28/21	9:45a	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
LS-DP-22	water	60 ml Poly	1	7/28/21	10:05a	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						

Relinquished By:	Date /Time:	Received by:	Date /Time:	Turnaround Time: (Check)
[signature]	7/28/21 1:25pm			Same Day ____ 72 Hours ____
Relinquished By: FedEx	Date /Time: 7/29/21	Received by: [signature] 5° T0234	Date /Time: 10:30	24 Hours ____ 5 Days ____ 48 Hours ____ Normal X
Relinquished By:	Date /Time:	Received in Lab by:	Date /Time:	Sample Integrity: (Check) Intact ____ On Ice ____

Certificate of Analysis

FINAL REPORT

WECK LABORATORIES, INC.

Work Orders:	1G29038	**Report Date:**	8/10/2021
		Received Date:	7/29/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

Dear Michael P. Donovan :

Enclosed are the results of analyses for samples received 7/29/2021 with the Chain-of-Custody document. The samples were received in good condition, at 5.0 °C and on ice. All analysis met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Sample Results

Sample: LS-BR-1 — 1G29038-01 (Water) — Sampled: 07/28/21 12:05 by Client

Method: SM 9223B — Instr: INC12

Batch ID: W1H0520 — Preparation: _NONE (MICROBIOLOGY) — Prepared: 07/29/21 12:03 — Analyst: slh

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
E. coli	**6.3**	1.0	MPN/100ml	1	07/30/21	

Sample: SL-BR-1 — 1G29038-02 (Water) — Sampled: 07/28/21 12:40 by Client

Method: SM 9223B — Instr: INC12

Batch ID: W1H0520 — Preparation: _NONE (MICROBIOLOGY) — Prepared: 07/29/21 12:03 — Analyst: slh

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
E. coli	ND	1.0	MPN/100ml	1	07/30/21	

Sample: INT2-RES-1 — 1G29038-03 (Water) — Sampled: 07/28/21 12:15 by Client

Method: SM 9223B — Instr: INC12

Batch ID: W1H0520 — Preparation: _NONE (MICROBIOLOGY) — Prepared: 07/29/21 12:03 — Analyst: slh

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
E. coli	**4.1**	1.0	MPN/100ml	1	07/30/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Notes and Definitions

Item	Definition
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Analyses Accreditation Summary

Analyte	CAS #	Not By NELAP	ANAB ISO 17025
SM 9223B in Water			
E. coli		✓	

Reviewed by:

Chris Samatmanakit
Project Manager

DoD-ELAP ANAB #ADE-2882 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH #4047 • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

CHAIN OF CUSTODY FORM 1G29038

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Escherichia coli (E. coli) by SM 9223B	Special Instructions
LS-BR-1	water	125 ml poly	1	7/28/21	12:05p	Sterile- None	X	24-Hour Hold time*
SL-BR-1	water	125 ml poly	1	7/28/21	12:40p	Sterile- None	X	24-Hour Hold time*
INT2-RES-1	water	125 ml poly	1	7/28/21	12:15p	Sterile- None	X	24-Hour Hold time*

Relinquished By:	Date /Time:	Received by:	Date /Time:
[signature]	7/28/21 1:25pm		
Fedex	7/29/21	[signature] 5°C T0234	10:30
		Received in Lab by:	

Turnaround Time: (Check)
Same Day ____ 72 Hours ____
24 Hours ____ 5 Days ____
48 Hours ____ Normal X

Sample Integrity: (Check)
Intact ____ On Ice ____

* Per Lohantan Surface Water Ambient Monitoring Program (SWAMP) for ambient water

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders:	1G30022	**Report Date:**	8/27/2021
		Received Date:	7/30/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

DoD-ELAP ANAB #ADE-2882 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH #4047 • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

Dear Michael P. Donovan,

Enclosed are the results of analyses for samples received 7/30/21 with the Chain-of-Custody document. The samples were received in good condition, at 2.8 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Reviewed by:

Chris Samatmanakit
Project Manager

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported:
08/27/2021 14:59

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
BC-BLW-PH6	Jim Burton, Todd Bear	1G30022-01	Water	07/29/21 08:05	
BC-BLW-PH5	Jim Burton, Todd Bear	1G30022-02	Water	07/29/21 08:35	
BC-BLW-PH4	Jim Burton, Todd Bear	1G30022-03	Water	07/29/21 09:10	
BC-BLW-PH3	Jim Burton, Todd Bear	1G30022-04	Water	07/29/21 09:45	
BC-BLW-PH2	Jim Burton, Todd Bear	1G30022-05	Water	07/29/21 10:25	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 08/27/2021 14:59

Sample Results

Sample: BC-BLW-PH6 Sampled: 07/29/21 8:05 by Jim Burton, Todd Bear

1G30022-01 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1G1628 **Preparation:** _NONE (LC)		**Prepared:** 07/30/21 10:53				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	07/30/21 18:17	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 08/13/21 14:30				**Analyst:** YMT
Nitrogen, Total	**0.12**	0.10	mg/l	1	08/17/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1H0962 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/13/21 14:30				**Analyst:** YMT
TKN	**0.12**	0.10	mg/l	1	08/17/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1H0865 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/12/21 14:31				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	08/13/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1G1655 **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/30/21 15:22				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	07/30/21 15:49	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H0280 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/04/21 15:28				**Analyst:** blg
Total Dissolved Solids	**44**	10	mg/l	1	08/05/21	

Sample Results

(Continued)

Sample: BC-BLW-PH5 — Sampled: 07/29/21 8:35 by Jim Burton, Todd Bear

1G30022-02 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1G1628 — **Preparation:** _NONE (LC)		**Prepared:** 07/30/21 10:53				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	07/30/21 18:34	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 08/13/21 14:30				**Analyst:** YMT
Nitrogen, Total	**0.12**	0.10	mg/l	1	08/17/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1H0962 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/13/21 14:30				**Analyst:** YMT
TKN	**0.12**	0.10	mg/l	1	08/17/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1H0865 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/12/21 14:31				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	08/13/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1G1655 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/30/21 15:22				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	07/30/21 15:51	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H0280 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/04/21 15:28				**Analyst:** blg
Total Dissolved Solids	**44**	10	mg/l	1	08/05/21	

Sample Results

(Continued)

Sample: BC-BLW-PH4 — Sampled: 07/29/21 9:10 by Jim Burton, Todd Bear

1G30022-03 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0 — **Instr:** LC12						
Batch ID: W1G1628 — **Preparation:** _NONE (LC) — **Prepared:** 07/30/21 10:53 — **Analyst:** jan						
Nitrate as N	ND	110	ug/l	1	07/30/21 18:52	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC] — **Instr:** [CALC]						
Batch ID: [CALC] — **Preparation:** [CALC] — **Prepared:** 08/13/21 14:30 — **Analyst:** YMT						
Nitrogen, Total	**0.13**	0.10	mg/l	1	08/17/21	
Method: EPA 351.2 — **Instr:** AA06						
Batch ID: W1H0962 — **Preparation:** _NONE (WETCHEM) — **Prepared:** 08/13/21 14:30 — **Analyst:** YMT						
TKN	**0.13**	0.10	mg/l	1	08/17/21	
Method: EPA 353.2 — **Instr:** AA01						
Batch ID: W1H0865 — **Preparation:** _NONE (WETCHEM) — **Prepared:** 08/12/21 14:31 — **Analyst:** ism						
NO2+NO3 as N	ND	200	ug/l	1	08/13/21	
Method: EPA 365.3 — **Instr:** UVVIS04						
Batch ID: W1G1655 — **Preparation:** _NONE (WETCHEM) — **Prepared:** 07/30/21 15:22 — **Analyst:** sbn						
o-Phosphate as P	ND	0.010	mg/l	1	07/30/21 15:52	
Method: SM 2540C — **Instr:** OVEN01						
Batch ID: W1H0280 — **Preparation:** _NONE (WETCHEM) — **Prepared:** 08/04/21 15:28 — **Analyst:** blg						
Total Dissolved Solids	**43**	10	mg/l	1	08/05/21	

Sample Results

(Continued)

Sample: BC-BLW-PH3 — 1G30022-04 (Water) — Sampled: 07/29/21 9:45 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1G1628 — **Preparation:** _NONE (LC)		**Prepared:** 07/30/21 10:53				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	07/30/21 19:10	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 08/13/21 14:30				**Analyst:** YMT
Nitrogen, Total	**0.19**	0.10	mg/l	1	08/17/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1H0962 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/13/21 14:30				**Analyst:** YMT
TKN	**0.19**	0.10	mg/l	1	08/17/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1H0865 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/12/21 14:31				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	08/13/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1G1655 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/30/21 15:22				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	07/30/21 15:52	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H0280 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/04/21 15:28				**Analyst:** blg
Total Dissolved Solids	**40**	10	mg/l	1	08/05/21	

Certificate of Analysis

FINAL REPORT

WECK LABORATORIES, INC.

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 08/27/2021 14:59

Sample Results

(Continued)

Sample: BC-BLW-PH2 — Sampled: 07/29/21 10:25 by Jim Burton, Todd Bear

1G30022-05 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1G1628 — **Preparation:** _NONE (LC)		**Prepared:** 07/30/21 10:53				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	07/30/21 19:28	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 08/13/21 14:30				**Analyst:** YMT
Nitrogen, Total	ND	0.10	mg/l	1	08/17/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1H0962 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/13/21 14:30				**Analyst:** YMT
TKN	ND	0.10	mg/l	1	08/17/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1H0865 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/12/21 14:31				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	08/13/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1G1655 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 07/30/21 15:22				**Analyst:** sbn
o-Phosphate as P	**0.018**	0.010	mg/l	1	07/30/21 15:53	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H0280 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/04/21 15:28				**Analyst:** blg
Total Dissolved Solids	**45**	10	mg/l	1	08/05/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 08/27/2021 14:59

Quality Control Results

Anions by IC, EPA Method 300.0

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1G1628 - EPA 300.0										
Blank (W1G1628-BLK1)				**Prepared & Analyzed: 07/30/21**						
Nitrate as N	ND	110	ug/l							
LCS (W1G1628-BS1)				**Prepared & Analyzed: 07/30/21**						
Nitrate as N	1030	110	ug/l	1000		103	90-110			
Matrix Spike (W1G1628-MS1)	**Source: 1G29050-01**			**Prepared & Analyzed: 07/30/21**						
Nitrate as N	14800	1100	ug/l	10000	5460	93	84-115			
Matrix Spike (W1G1628-MS2)	**Source: 1G29050-02**			**Prepared & Analyzed: 07/30/21**						
Nitrate as N	14500	1100	ug/l	10000	5040	94	84-115			
Matrix Spike Dup (W1G1628-MSD1)	**Source: 1G29050-01**			**Prepared & Analyzed: 07/30/21**						
Nitrate as N	14900	1100	ug/l	10000	5460	95	84-115	1	20	
Matrix Spike Dup (W1G1628-MSD2)	**Source: 1G29050-02**			**Prepared & Analyzed: 07/30/21**						
Nitrate as N	14500	1100	ug/l	10000	5040	95	84-115	0.5	20	

Quality Control Results

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1G1655 - EPA 365.3										
Blank (W1G1655-BLK1)				**Prepared & Analyzed: 07/30/21**						
o-Phosphate as P	ND	0.010	mg/l							
LCS (W1G1655-BS1)				**Prepared & Analyzed: 07/30/21**						
o-Phosphate as P	0.206	0.010	mg/l	0.200		103	88-111			
Matrix Spike (W1G1655-MS1)	**Source: 1G30022-01**			**Prepared & Analyzed: 07/30/21**						
o-Phosphate as P	0.206	0.010	mg/l	0.200	0.00300	102	85-112			
Matrix Spike Dup (W1G1655-MSD1)	**Source: 1G30022-01**			**Prepared & Analyzed: 07/30/21**						
o-Phosphate as P	0.206	0.010	mg/l	0.200	0.00300	102	85-112	0	20	
Batch: W1H0280 - SM 2540C										
Blank (W1H0280-BLK1)				**Prepared: 08/04/21 Analyzed: 08/05/21**						
Total Dissolved Solids	ND	10	mg/l							
LCS (W1H0280-BS1)				**Prepared: 08/04/21 Analyzed: 08/05/21**						
Total Dissolved Solids	822	10	mg/l	824		100	96-102			
Duplicate (W1H0280-DUP1)	**Source: 1H02101-03**			**Prepared: 08/04/21 Analyzed: 08/05/21**						
Total Dissolved Solids	38500	10	mg/l		38400			0.3	10	
Duplicate (W1H0280-DUP2)	**Source: 1H02101-04**			**Prepared: 08/04/21 Analyzed: 08/05/21**						
Total Dissolved Solids	2890	10	mg/l		2890			0.1	10	
Batch: W1H0865 - EPA 353.2										
Blank (W1H0865-BLK1)				**Prepared: 08/12/21 Analyzed: 08/13/21**						
NO2+NO3 as N	ND	200	ug/l							
LCS (W1H0865-BS1)				**Prepared: 08/12/21 Analyzed: 08/13/21**						

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 08/27/2021 14:59

Quality Control Results

(Continued)

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1H0865 - EPA 353.2 (Continued)										
LCS (W1H0865-BS1)				**Prepared: 08/12/21**	**Analyzed: 08/13/21**					
NO2+NO3 as N	1010	200	ug/l	1000		101	90-110			
Matrix Spike (W1H0865-MS1)	**Source: 1G29055-01**			**Prepared: 08/12/21**	**Analyzed: 08/13/21**					
NO2+NO3 as N	2210	200	ug/l	2000	202	100	90-110			
Matrix Spike (W1H0865-MS2)	**Source: 1G29055-02**			**Prepared: 08/12/21**	**Analyzed: 08/13/21**					
NO2+NO3 as N	2050	200	ug/l	2000	54.5	100	90-110			
Matrix Spike Dup (W1H0865-MSD1)	**Source: 1G29055-01**			**Prepared: 08/12/21**	**Analyzed: 08/13/21**					
NO2+NO3 as N	2230	200	ug/l	2000	202	101	90-110	0.9	20	
Matrix Spike Dup (W1H0865-MSD2)	**Source: 1G29055-02**			**Prepared: 08/12/21**	**Analyzed: 08/13/21**					
NO2+NO3 as N	2060	200	ug/l	2000	54.5	100	90-110	0.5	20	
Batch: W1H0962 - EPA 351.2										
Blank (W1H0962-BLK1)				**Prepared: 08/13/21**	**Analyzed: 08/17/21**					
TKN	ND	0.10	mg/l							
LCS (W1H0962-BS1)				**Prepared: 08/13/21**	**Analyzed: 08/17/21**					
TKN	1.04	0.10	mg/l	1.00		104	90-110			
Matrix Spike (W1H0962-MS1)	**Source: 1G30092-01**			**Prepared: 08/13/21**	**Analyzed: 08/17/21**					
TKN	1.01	0.10	mg/l	1.00	ND	101	90-110			
Matrix Spike Dup (W1H0962-MSD1)	**Source: 1G30092-01**			**Prepared: 08/13/21**	**Analyzed: 08/17/21**					
TKN	0.991	0.10	mg/l	1.00	ND	99	90-110	2	10	

Notes and Definitions

Item	Definition
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

1630022

CHAIN OF CUSTODY FORM

Client Name/Address:
PSOMAS
3 HUTTON CENTRE DRIVE, SUITE 200
SANTA ANA, CA 92707

Project/PO Number: 2KLE010102

Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)

Phone Number: (714) 328-5234

Sampler: Jim Burton, Todd Bear

Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Nitrate-N EPA Method 300.0	Orthophosphae-OPO4 EPA Method 365.3	Total Dissolved Solids SM2540C	Total Kjeldahl Nitrogenby EPA Method 351.2	NO2+NO3 as N - EPA Method 353.2	Total Nitrogen by calculation						Special Instructions
BC-blw-PH6	water	60 ml Poly	1	7/29/21	8:05 am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-blw-PH5	water	60 ml Poly	1	7/29/21	8:35 am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-blw-PH4	water	60 ml Poly	1	7/29/21	9:10a	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-blw-PH3	water	60 ml Poly	1	7/29/21	9:45am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-blw-PH2	water	60 ml Poly	1	7/29/21	10:25am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						

Relinquished By:	Date /Time:	Received by:	Date /Time:
[signature] 7/29/21	1:40 pm	FedEx	
FedEx		Jonathan	07/30/21 10:10
		Received in Lab by:	

Turnaround Time: (Check)
Same Day ______ 72 Hours ______
24 Hours ______ 5 Days ______
48 Hours ______ Normal X

Sample Integrity: (Check)
Intact ______ On Ice ______

2.9°C J0234

Certificate of Analysis

FINAL REPORT

WECK LABORATORIES, INC.

Work Orders: 1G30023

Project: 2KLE010102

Attn: Michael P. Donovan

Client: Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Report Date: 8/10/2021
Received Date: 7/30/2021
Turnaround Time: Normal
Phones: (714) 751-7373
Fax: (714) 545-8883
P.O. #:
Billing Code:

Dear Michael P. Donovan :

Enclosed are the results of analyses for samples received 7/30/2021 with the Chain-of-Custody document. The samples were received in good condition, at 2.8 °C and on ice. All analysis met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Sample Results

Sample: LS-BR-1 — 1G30023-01 (Water) — Sampled: 07/29/21 11:45 by Jim Burton, Todd Bear

Method: SM 9223B **Instr:** INC12
Batch ID: W1H0520 **Preparation:** _NONE (MICROBIOLOGY) **Prepared:** 07/30/21 11:17 **Analyst:** slh

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
E. coli	**180**	1.0	MPN/100ml	1	07/31/21	

Sample: SL-BR-1 — 1G30023-02 (Water) — Sampled: 07/29/21 12:10 by Jim Burton, Todd Bear

Method: SM 9223B **Instr:** INC12
Batch ID: W1H0520 **Preparation:** _NONE (MICROBIOLOGY) **Prepared:** 07/30/21 11:17 **Analyst:** slh

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
E. coli	ND	1.0	MPN/100ml	1	07/31/21	

Sample: INT2-RES-1 — 1G30023-03 (Water) — Sampled: 07/29/21 12:20 by Jim Burton, Todd Bear

Method: SM 9223B **Instr:** INC12
Batch ID: W1H0520 **Preparation:** _NONE (MICROBIOLOGY) **Prepared:** 07/30/21 11:17 **Analyst:** slh

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
E. coli	**210**	1.0	MPN/100ml	1	07/31/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Notes and Definitions

Item	Definition
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Analyses Accreditation Summary

Analyte	CAS #	Not By NELAP	ANAB ISO 17025
SM 9223B in Water			
E. coli		✓	

Reviewed by:

Chris Samatmanakit
Project Manager

DoD-ELAP ANAB #ADE-2882 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH #4047 • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

1630023

CHAIN OF CUSTODY FORM

Page 1 of 1

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Escherichia coli (E. coli) by SM 9223B	Special Instructions
SL-BR-1	water	125 ml poly	1	7/29/21	11:45a	Sterile- None	X	24-Hour Hold time*
LS-BR-1	water	125 ml poly	1	7/29/21	12:10p	Sterile- None	X	24-Hour Hold time*
INT2-RES-1	water	125 ml poly	1	7/29/21	12:20p	Sterile- None	X	24-Hour Hold time*

Relinquished By:	Date /Time:	Received by:	Date /Time:
[signature] 7/29/21	1:20 pm	FedEx	
FedEx		[signature]	07/30/21 10:10
		Received in Lab by:	

Turnaround Time: (Check)
Same Day ____ 72 Hours ____
24 Hours ____ 5 Days ____
48 Hours ____ Normal X

Sample Integrity: (Check)
Intact ____ On Ice ____

2.8°C T0 234

* Per Lohantan Surface Water Ambient Monitoring Program (SWAMP) for ambient water

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders:	1H03039	**Report Date:**	8/18/2021
		Received Date:	8/3/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

Dear Michael P. Donovan :

Enclosed are the results of analyses for samples received 8/3/2021 with the Chain-of-Custody document. The samples were received in good condition, at 3.1 °C and on ice. All analysis met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Sample Results

Sample: SL-BR-1 — Sampled: 08/02/21 11:50 by Jim Burton, Todd Bear

1H03039-01 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: SM 9223B		**Instr:** INC12				
Batch ID: W1H0289	**Preparation:** _NONE (MICROBIOLOGY)	**Prepared:** 08/03/21 11:48				**Analyst:** slh
E. coli	ND	1.0	MPN/100ml	1	08/04/21	

Sample: LS-BR-1 — Sampled: 08/02/21 12:15 by Jim Burton, Todd Bear

1H03039-02 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: SM 9223B		**Instr:** INC12				
Batch ID: W1H0289	**Preparation:** _NONE (MICROBIOLOGY)	**Prepared:** 08/03/21 11:48				**Analyst:** slh
E. coli	**17**	1.0	MPN/100ml	1	08/04/21	

Sample: INT2-RES-1 — Sampled: 08/02/21 12:30 by Jim Burton, Todd Bear

1H03039-03 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: SM 9223B		**Instr:** INC12				
Batch ID: W1H0289	**Preparation:** _NONE (MICROBIOLOGY)	**Prepared:** 08/03/21 11:48				**Analyst:** slh
E. coli	**6.3**	1.0	MPN/100ml	1	08/04/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Notes and Definitions

Item	Definition
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Analyses Accreditation Summary

Analyte	CAS #	Not By NELAP	ANAB ISO 17025
SM 9223B in Water			
E. coli		✓	

Reviewed by:

Chris Samatmanakit
Project Manager

DoD-ELAP ANAB #ADE-2882 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH #4047 • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

CHAIN OF CUSTODY FORM 1H03039

Page 1 of 1

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Escherichia coli (E. coli) by SM 9223B											Special Instructions
SL-BR-1	water	125 ml poly	1	8/2/21	11:50a	Sterile- None	X											24-Hour Hold time*
LS-BR-1	water	125 ml poly	1		12:15p	Sterile- None	X											24-Hour Hold time*
DNT2-RES-1	water	125 ml poly	1		12:30p	Sterile- None	X											24-Hour Hold time*

Relinquished By:	Date /Time:	Received by:	Date /Time:
[signature] 8/2/21	1:25 pm		
Relinquished By: FedEx	Date /Time: 8/3/21	Received by: [signature]	Date /Time: 9:50
Relinquished By:	Date /Time:	Received in Lab by:	Date /Time:

Turnaround Time: (Check)
Same Day ____ 72 Hours ____
24 Hours ____ 5 Days ____
48 Hours ____ Normal X

Sample Integrity: (Check)
Intact ____ On Ice ____

3.1° T0254

* Per Lohantan Surface Water Ambient Monitoring Program (SWAMP) for ambient water

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders:	1H06031	**Report Date:**	8/19/2021
		Received Date:	8/6/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

Dear Michael P. Donovan :

Enclosed are the results of analyses for samples received 8/6/2021 with the Chain-of-Custody document. The samples were received in good condition, at 4.0 °C and on ice. All analysis met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Sample Results

Sample: LS-BR-1 — 1H06031-01 (Water) — Sampled: 08/05/21 11:40 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: SM 9223B		**Instr:** INC12				
Batch ID: W1H0947 — **Preparation:** _NONE (MICROBIOLOGY)		**Prepared:** 08/06/21 11:55				**Analyst:** atd
E. coli	**3.1**	1.0	MPN/100ml	1	08/07/21	O-15

Sample: INT2-RES-1 — 1H06031-02 (Water) — Sampled: 08/05/21 12:10 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: SM 9223B		**Instr:** INC12				
Batch ID: W1H0947 — **Preparation:** _NONE (MICROBIOLOGY)		**Prepared:** 08/06/21 11:55				**Analyst:** atd
E. coli	**5.2**	1.0	MPN/100ml	1	08/07/21	

Sample: SL-BR-1 — 1H06031-03 (Water) — Sampled: 08/05/21 12:35 by Client

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Method: SM 9223B		**Instr:** INC12				
Batch ID: W1H0947 — **Preparation:** _NONE (MICROBIOLOGY)		**Prepared:** 08/06/21 11:55				**Analyst:** atd
E. coli	ND	1.0	MPN/100ml	1	08/07/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Notes and Definitions

Item	Definition
O-15	The sample was received with the recommended holding time nearly expired. It was analyzed as soon as possible but the maximum holding time was slightly exceeded.
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Analyses Accreditation Summary

Analyte	CAS #	Not By NELAP	ANAB ISO 17025
SM 9223B in Water			
E. coli		✓	

Reviewed by:

Chris Samatmanakit
Project Manager

DoD-ELAP ANAB #ADE-2882 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH #4047 • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

1H06031

CHAIN OF CUSTODY FORM

Page 1 of 1

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: ~~Jim Burton,~~ Todd Bear KD	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Escherichia coli (E. coli) by SM 9223B											Special Instructions
LS-BR-1	water	125 ml poly	1	8/5/21	11:40AM	Sterile- None	X											24-Hour Hold time*
INT2-RES-1	water	125 ml poly	1	8/5/21	12:10PM	Sterile- None	X											24-Hour Hold time*
SL-BR-1	water	125 ml poly	1	8/5/21	12:35PM	Sterile- None	X											24-Hour Hold time*

Relinquished By: Kimberly Deldos	Date /Time: 8/5/21 / 1:45PM	Received by: [signature]	Date /Time: 8/6/21 1034	Turnaround Time: (Check) Same Day ___ 72 Hours ___ 24 Hours ___ 5 Days ___ 48 Hours ___ Normal X
Relinquished By:	Date /Time:	Received by:	Date /Time:	
Relinquished By:	Date /Time:	Received in Lab by:	Date /Time:	Sample Integrity: (Check) Intact ___ On Ice ___

* Per Lohantan Surface Water Ambient Monitoring Program (SWAMP) for ambient water

4.0°C T-0230

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders:	1H24033	**Report Date:**	9/20/2021
		Received Date:	8/24/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

DoD-ELAP ANAB #ADE-2882 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH #4047 • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

Dear Michael P. Donovan,

Enclosed are the results of analyses for samples received 8/24/21 with the Chain-of-Custody document. The samples were received in good condition, at 2.9 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Reviewed by:

Chris Samatmanakit
Project Manager

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 09/20/2021 16:13

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
SL-DP-8	Jim Burton, Todd Bear	1H24033-01	Water	08/23/21 10:30	
SL-DP-20	Jim Burton, Todd Bear	1H24033-02	Water	08/23/21 11:05	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Certificate of Analysis
FINAL REPORT

WECK LABORATORIES, INC.

Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Project Number:** 2KLE010102 **Project Manager:** Michael P. Donovan	**Reported:** 09/20/2021 16:13

Sample Results

Sample: SL-DP-8 — Sampled: 08/23/21 10:30 by Jim Burton, Todd Bear

1H24033-01 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1H1589 — **Preparation:** _NONE (LC)		**Prepared:** 08/24/21 09:14				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	08/24/21 17:52	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 09/16/21 15:57				**Analyst:** YMT
Nitrogen, Total	**0.16**	0.10	mg/l	1	09/16/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1H1638 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/24/21 12:44				**Analyst:** YMT
TKN	**0.16**	0.10	mg/l	1	08/26/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I1086 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/16/21 15:57				**Analyst:** ISM
NO2+NO3 as N	ND	200	ug/l	1	09/16/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1H1663 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/24/21 13:59				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	08/24/21 15:46	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H1862 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/26/21 13:03				**Analyst:** blg
Total Dissolved Solids	**18**	10	mg/l	1	08/26/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Certificate of Analysis

FINAL REPORT

WECK LABORATORIES, INC.

Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Project Number:** 2KLE010102 **Project Manager:** Michael P. Donovan	**Reported:** 09/20/2021 16:13

Sample Results

(Continued)

Sample: SL-DP-20 — Sampled: 08/23/21 11:05 by Jim Burton, Todd Bear

1H24033-02 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1H1589 — **Preparation:** _NONE (LC)		**Prepared:** 08/24/21 09:14				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	08/24/21 18:46	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 09/16/21 15:57				**Analyst:** YMT
Nitrogen, Total	ND	0.10	mg/l	1	09/16/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1H1638 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/24/21 12:44				**Analyst:** YMT
TKN	ND	0.10	mg/l	1	08/26/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I1086 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/16/21 15:57				**Analyst:** ISM
NO2+NO3 as N	ND	200	ug/l	1	09/16/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1H1663 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/24/21 13:59				**Analyst:** sbn
o-Phosphate as P	**0.029**	0.010	mg/l	1	08/24/21 15:48	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H1862 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/26/21 13:03				**Analyst:** blg
Total Dissolved Solids	**46**	10	mg/l	1	08/26/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 09/20/2021 16:13

Quality Control Results

Anions by IC, EPA Method 300.0

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1H1589 - EPA 300.0										
Blank (W1H1589-BLK1)				**Prepared & Analyzed: 08/24/21**						
Nitrate as N	ND	110	ug/l							
LCS (W1H1589-BS1)				**Prepared & Analyzed: 08/24/21**						
Nitrate as N	2150	110	ug/l	2000		107	90-110			
Matrix Spike (W1H1589-MS1)	**Source: 1H23045-07**			**Prepared & Analyzed: 08/24/21**						
Nitrate as N	26700	1100	ug/l	20000	5330	107	84-115			
Matrix Spike (W1H1589-MS2)	**Source: 1H23045-08**			**Prepared & Analyzed: 08/24/21**						
Nitrate as N	26700	1100	ug/l	20000	5300	107	84-115			
Matrix Spike Dup (W1H1589-MSD1)	**Source: 1H23045-07**			**Prepared & Analyzed: 08/24/21**						
Nitrate as N	26600	1100	ug/l	20000	5330	106	84-115	0.2	20	
Matrix Spike Dup (W1H1589-MSD2)	**Source: 1H23045-08**			**Prepared & Analyzed: 08/24/21**						
Nitrate as N	26700	1100	ug/l	20000	5300	107	84-115	0.1	20	

Quality Control Results

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1H1638 - EPA 351.2										
Blank (W1H1638-BLK1)				**Prepared: 08/24/21 Analyzed: 08/26/21**						
TKN	ND	0.10	mg/l							
LCS (W1H1638-BS1)				**Prepared: 08/24/21 Analyzed: 08/26/21**						
TKN	1.01	0.10	mg/l	1.00		101	90-110			
Matrix Spike (W1H1638-MS1)	**Source: 1H24046-02**			**Prepared: 08/24/21 Analyzed: 08/26/21**						
TKN	1.28	0.10	mg/l	1.00	0.230	105	90-110			
Matrix Spike Dup (W1H1638-MSD1)	**Source: 1H24046-02**			**Prepared: 08/24/21 Analyzed: 08/26/21**						
TKN	1.27	0.10	mg/l	1.00	0.230	104	90-110	0.3	10	
Batch: W1H1663 - EPA 365.3										
Blank (W1H1663-BLK1)				**Prepared & Analyzed: 08/24/21**						
o-Phosphate as P	ND	0.010	mg/l							
LCS (W1H1663-BS1)				**Prepared & Analyzed: 08/24/21**						
o-Phosphate as P	0.206	0.010	mg/l	0.200		103	88-111			
Matrix Spike (W1H1663-MS1)	**Source: 1H24033-01**			**Prepared & Analyzed: 08/24/21**						
o-Phosphate as P	0.215	0.010	mg/l	0.200	0.00300	106	85-112			
Matrix Spike Dup (W1H1663-MSD1)	**Source: 1H24033-01**			**Prepared & Analyzed: 08/24/21**						
o-Phosphate as P	0.214	0.010	mg/l	0.200	0.00300	106	85-112	0.5	20	
Batch: W1H1862 - SM 2540C										
Blank (W1H1862-BLK1)				**Prepared & Analyzed: 08/26/21**						
Total Dissolved Solids	ND	10	mg/l							
LCS (W1H1862-BS1)				**Prepared & Analyzed: 08/26/21**						

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 09/20/2021 16:13

Quality Control Results

(Continued)

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1H1862 - SM 2540C (Continued)										
LCS (W1H1862-BS1)				**Prepared & Analyzed: 08/26/21**						
Total Dissolved Solids	831	10	mg/l	824		101	96-102			
Duplicate (W1H1862-DUP1)	**Source: 1H25001-01**			**Prepared & Analyzed: 08/26/21**						
Total Dissolved Solids	84000	10	mg/l		83700			0.4	10	
Duplicate (W1H1862-DUP2)	**Source: 1H25092-01**			**Prepared & Analyzed: 08/26/21**						
Total Dissolved Solids	9950	10	mg/l		10100			1	10	
Batch: W1I1086 - EPA 353.2										
Blank (W1I1086-BLK1)				**Prepared & Analyzed: 09/16/21**						
NO2+NO3 as N	ND	200	ug/l							
LCS (W1I1086-BS1)				**Prepared & Analyzed: 09/16/21**						
NO2+NO3 as N	991	200	ug/l	1000		99	90-110			
Matrix Spike (W1I1086-MS1)	**Source: 1I07039-03**			**Prepared & Analyzed: 09/16/21**						
NO2+NO3 as N	2400	200	ug/l	2000	320	104	90-110			
Matrix Spike (W1I1086-MS2)	**Source: 1I07039-05**			**Prepared & Analyzed: 09/16/21**						
NO2+NO3 as N	2460	200	ug/l	2000	426	102	90-110			
Matrix Spike Dup (W1I1086-MSD1)	**Source: 1I07039-03**			**Prepared & Analyzed: 09/16/21**						
NO2+NO3 as N	2360	200	ug/l	2000	320	102	90-110	2	20	
Matrix Spike Dup (W1I1086-MSD2)	**Source: 1I07039-05**			**Prepared & Analyzed: 09/16/21**						
NO2+NO3 as N	2470	200	ug/l	2000	426	102	90-110	0.4	20	

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 09/20/2021 16:13

Notes and Definitions

Item	Definition
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

CHAIN OF CUSTODY FORM

1H24033

Page 1 of 1

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Nitrate-N EPA Method 300.0	Orthophosphae-OPO4 EPA Method 365.3	Total Dissolved Solids SM2540C	Total Kjeldahl Nitrogenby EPA Method 351.2	NO2+NO3 as N - EPA Method 353.2	Total Nitrogen by calculation						Special Instructions
SL-DP-8	water	60 ml Poly	1	8/23/21	10:30am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
SL-DP-20	water	60 ml Poly	1	8/23/21	11:05am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						

Relinquished By:	Date /Time:	Received by:	Date /Time:
Relinquished By: [signature]	8/23/21 1:25pm	Received by:	Date /Time:
Relinquished By: FedEx	Date /Time: 8/24/21	Received by: [signature]	Date /Time: 10:10
Relinquished By:	Date /Time:	Received in Lab by:	Date /Time:

Turnaround Time: (Check)
Same Day ______ 72 Hours ______
24 Hours ______ 5 Days ______
48 Hours ______ Normal X

Sample Integrity: (Check)
Intact ______ On Ice ______

Tozzu 2.9°c

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders:	1H25027	**Report Date:**	9/22/2021
		Received Date:	8/25/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH #4047 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

Dear Michael P. Donovan,

Enclosed are the results of analyses for samples received 8/25/21 with the Chain-of-Custody document. The samples were received in good condition, at 1.2 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Reviewed by:

Chris Samatmanakit
Project Manager

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 09/22/2021 11:05

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
LS-DP-5	Jim Burton, Todd Bear	1H25027-01	Water	08/24/21 10:15	
LS-DP-25	Jim Burton, Todd Bear	1H25027-02	Water	08/24/21 10:40	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 09/22/2021 11:05

Sample Results

Sample: LS-DP-5 — Sampled: 08/24/21 10:15 by Jim Burton, Todd Bear

1H25027-01 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0 — **Instr:** LC12						
Batch ID: W1H1719 — **Preparation:** _NONE (LC) — **Prepared:** 08/25/21 09:34 — **Analyst:** jan						
Nitrate as N	ND	110	ug/l	1	08/25/21 17:14	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC] — **Instr:** [CALC]						
Batch ID: [CALC] — **Preparation:** [CALC] — **Prepared:** 09/16/21 15:57 — **Analyst:** YMT						
Nitrogen, Total	ND	0.10	mg/l	1	09/16/21	
Method: EPA 351.2 — **Instr:** AA06						
Batch ID: W1H2152 — **Preparation:** _NONE (WETCHEM) — **Prepared:** 08/31/21 13:18 — **Analyst:** YMT						
TKN	ND	0.10	mg/l	1	09/02/21	
Method: EPA 353.2 — **Instr:** AA01						
Batch ID: W1I1086 — **Preparation:** _NONE (WETCHEM) — **Prepared:** 09/16/21 15:57 — **Analyst:** ISM						
NO2+NO3 as N	ND	200	ug/l	1	09/16/21	
Method: EPA 365.3 — **Instr:** UVVIS04						
Batch ID: W1H1762 — **Preparation:** _NONE (WETCHEM) — **Prepared:** 08/25/21 14:01 — **Analyst:** sbn						
o-Phosphate as P	ND	0.010	mg/l	1	08/25/21 15:49	
Method: SM 2540C — **Instr:** OVEN01						
Batch ID: W1H1970 — **Preparation:** _NONE (WETCHEM) — **Prepared:** 08/27/21 16:53 — **Analyst:** blg						
Total Dissolved Solids	**15**	10	mg/l	1	08/30/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported:
09/22/2021 11:05

Sample Results

(Continued)

Sample: LS-DP-25 — 1H25027-02 (Water) — Sampled: 08/24/21 10:40 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1H1719 — **Preparation:** _NONE (LC)		**Prepared:** 08/25/21 09:34				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	08/25/21 17:32	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 09/16/21 15:57				**Analyst:** YMT
Nitrogen, Total	ND	0.10	mg/l	1	09/16/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1H2152 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/31/21 13:18				**Analyst:** YMT
TKN	ND	0.10	mg/l	1	09/02/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I1086 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/16/21 15:57				**Analyst:** ISM
NO2+NO3 as N	ND	200	ug/l	1	09/16/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1H1762 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/25/21 14:01				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	08/25/21 15:53	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H1970 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/27/21 16:53				**Analyst:** blg
Total Dissolved Solids	**14**	10	mg/l	1	08/30/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 09/22/2021 11:05

Quality Control Results

Anions by IC, EPA Method 300.0

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1H1719 - EPA 300.0										
Blank (W1H1719-BLK1)				**Prepared & Analyzed: 08/25/21**						
Nitrate as N	ND	110	ug/l							
LCS (W1H1719-BS1)				**Prepared & Analyzed: 08/25/21**						
Nitrate as N	2130	110	ug/l	2000		107	90-110			
Matrix Spike (W1H1719-MS1)	**Source: 1H18003-03**			**Prepared & Analyzed: 08/25/21**						
Nitrate as N	23300	1100	ug/l	20000	1320	110	84-115			
Matrix Spike (W1H1719-MS2)	**Source: 1H18003-05**			**Prepared & Analyzed: 08/25/21**						
Nitrate as N	27900	1100	ug/l	20000	6240	108	84-115			
Matrix Spike Dup (W1H1719-MSD1)	**Source: 1H18003-03**			**Prepared & Analyzed: 08/25/21**						
Nitrate as N	23300	1100	ug/l	20000	1320	110	84-115	0.04	20	
Matrix Spike Dup (W1H1719-MSD2)	**Source: 1H18003-05**			**Prepared & Analyzed: 08/25/21**						
Nitrate as N	27800	1100	ug/l	20000	6240	108	84-115	0.2	20	

Quality Control Results

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1H1762 - EPA 365.3										
Blank (W1H1762-BLK1)				**Prepared & Analyzed: 08/25/21**						
o-Phosphate as P	ND	0.010	mg/l							
LCS (W1H1762-BS1)				**Prepared & Analyzed: 08/25/21**						
o-Phosphate as P	0.200	0.010	mg/l	0.200		100	88-111			
Matrix Spike (W1H1762-MS1)	**Source: 1H25027-01**			**Prepared & Analyzed: 08/25/21**						
o-Phosphate as P	0.195	0.010	mg/l	0.200	ND	97	85-112			
Matrix Spike Dup (W1H1762-MSD1)	**Source: 1H25027-01**			**Prepared & Analyzed: 08/25/21**						
o-Phosphate as P	0.196	0.010	mg/l	0.200	ND	98	85-112	0.5	20	
Batch: W1H1970 - SM 2540C										
Blank (W1H1970-BLK1)				**Prepared: 08/27/21 Analyzed: 08/30/21**						
Total Dissolved Solids	ND	10	mg/l							
LCS (W1H1970-BS1)				**Prepared: 08/27/21 Analyzed: 08/30/21**						
Total Dissolved Solids	804	10	mg/l	824		98	96-102			
Duplicate (W1H1970-DUP1)	**Source: 1H06002-12**			**Prepared: 08/27/21 Analyzed: 08/30/21**						
Total Dissolved Solids	584	10	mg/l		608			4	10	
Duplicate (W1H1970-DUP2)	**Source: 1H11007-01**			**Prepared: 08/27/21 Analyzed: 08/30/21**						
Total Dissolved Solids	1450	10	mg/l		1400			4	10	
Batch: W1H2152 - EPA 351.2										
Blank (W1H2152-BLK1)				**Prepared: 08/31/21 Analyzed: 09/02/21**						
TKN	ND	0.10	mg/l							
Blank (W1H2152-BLK2)				**Prepared: 08/31/21 Analyzed: 09/02/21**						

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 09/22/2021 11:05

Quality Control Results

(Continued)

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1H2152 - EPA 351.2 (Continued)										
Blank (W1H2152-BLK2)				**Prepared: 08/31/21 Analyzed: 09/02/21**						
TKN	ND	0.10	mg/l							
LCS (W1H2152-BS1)				**Prepared: 08/31/21 Analyzed: 09/02/21**						
TKN	0.986	0.10	mg/l	1.00		99	90-110			
LCS (W1H2152-BS2)				**Prepared: 08/31/21 Analyzed: 09/02/21**						
TKN	0.968	0.10	mg/l	1.00		97	90-110			
Matrix Spike (W1H2152-MS1)	**Source: 1H25027-01**			**Prepared: 08/31/21 Analyzed: 09/02/21**						
TKN	1.07	0.10	mg/l	1.00	ND	107	90-110			
Matrix Spike (W1H2152-MS2)	**Source: 1H25102-01**			**Prepared: 08/31/21 Analyzed: 09/02/21**						
TKN	1.03	0.10	mg/l	1.00	ND	103	90-110			
Matrix Spike Dup (W1H2152-MSD1)	**Source: 1H25027-01**			**Prepared: 08/31/21 Analyzed: 09/02/21**						
TKN	1.06	0.10	mg/l	1.00	ND	106	90-110	0.3	10	
Matrix Spike Dup (W1H2152-MSD2)	**Source: 1H25102-01**			**Prepared: 08/31/21 Analyzed: 09/02/21**						
TKN	1.03	0.10	mg/l	1.00	ND	103	90-110	0.8	10	
Batch: W1I1086 - EPA 353.2										
Blank (W1I1086-BLK1)				**Prepared & Analyzed: 09/16/21**						
NO2+NO3 as N	ND	200	ug/l							
LCS (W1I1086-BS1)				**Prepared & Analyzed: 09/16/21**						
NO2+NO3 as N	991	200	ug/l	1000		99	90-110			
Matrix Spike (W1I1086-MS1)	**Source: 1I07039-03**			**Prepared & Analyzed: 09/16/21**						
NO2+NO3 as N	2400	200	ug/l	2000	320	104	90-110			
Matrix Spike (W1I1086-MS2)	**Source: 1I07039-05**			**Prepared & Analyzed: 09/16/21**						
NO2+NO3 as N	2460	200	ug/l	2000	426	102	90-110			
Matrix Spike Dup (W1I1086-MSD1)	**Source: 1I07039-03**			**Prepared & Analyzed: 09/16/21**						
NO2+NO3 as N	2360	200	ug/l	2000	320	102	90-110	2	20	
Matrix Spike Dup (W1I1086-MSD2)	**Source: 1I07039-05**			**Prepared & Analyzed: 09/16/21**						
NO2+NO3 as N	2470	200	ug/l	2000	426	102	90-110	0.4	20	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 09/22/2021 11:05

Notes and Definitions

Item	Definition
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

CHAIN OF CUSTODY FORM

1H25027

Page 1 of 1

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Nitrate-N EPA Method 300.0	Orthophosphae-OPO4 EPA Method 365.3	Total Dissolved Solids SM2540C	Total Kjeldahl Nitrogenby EPA Method 351.2	NO2+NO3 as N - EPA Method 353.2	Total Nitrogen by calculation	Special Instructions
LS-DP-5	water	60 ml Poly	1	8/24/21	10:15am	None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
LS-DP-25	water	60 ml Poly	1	8/24/21	10:40am	None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
	water	60 ml Poly	1			None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
	water	60 ml Poly	1			None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
	water	60 ml Poly	1			None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	

Relinquished By:	Date /Time:	Received by:	Date /Time:
[signature]	8/24/21 12:15pm		
Relinquished By: Fedex	Date /Time: 8/25/21	Received by: [signature]	Date /Time: 10:25
Relinquished By:	Date /Time:	Received in Lab by:	Date /Time:

Turnaround Time: (Check)
Same Day ______ 72 Hours ______
24 Hours ______ 5 Days ______
48 Hours ______ Normal X

Sample Integrity: (Check)
Intact ______ On Ice ______

1.2° TOZ

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders:	1H26021	**Report Date:**	9/20/2021
		Received Date:	8/26/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

DoD-ELAP ANAB #ADE-2882 • DoD-ISO ANAB # • ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH #4047 • ISO17025 ANAB #L2457.01 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

Dear Michael P. Donovan,

Enclosed are the results of analyses for samples received 8/26/21 with the Chain-of-Custody document. The samples were received in good condition, at 1.4 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Reviewed by:

Chris Samatmanakit
Project Manager

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported:
09/20/2021 16:15

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
BC-blw-PH6	Jim Burton, Todd Bear	1H26021-01	Water	08/25/21 07:15	
BC-blw-PH5	Jim Burton, Todd Bear	1H26021-02	Water	08/25/21 07:40	
BC-blw-PH4	Jim Burton, Todd Bear	1H26021-03	Water	08/25/21 08:15	
BC-blw-PH3	Jim Burton, Todd Bear	1H26021-04	Water	08/25/21 08:50	
BC-blw-PH2	Jim Burton, Todd Bear	1H26021-05	Water	08/25/21 09:20	
BC-NF-1	Jim Burton, Todd Bear	1H26021-06	Water	08/25/21 10:20	
BC-blw-LS	Jim Burton, Todd Bear	1H26021-07	Water	08/25/21 10:35	
BC-blw-SL	Jim Burton, Todd Bear	1H26021-08	Water	08/25/21 11:05	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 09/20/2021 16:15

Sample Results

Sample: BC-blw-PH6 — Sampled: 08/25/21 7:15 by Jim Burton, Todd Bear

1H26021-01 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1H1830 — **Preparation:** _NONE (LC)		**Prepared:** 08/26/21 09:23				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	08/26/21 16:41	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 09/14/21 19:49				**Analyst:** SBN
Nitrogen, Total	**0.10**	0.10	mg/l	1	09/17/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I0024 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/01/21 09:50				**Analyst:** SBN
TKN	**0.10**	0.10	mg/l	1	09/03/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I0903 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/14/21 19:49				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/17/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1H1864 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/26/21 13:06				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	08/26/21 14:07	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H1971 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/27/21 16:56				**Analyst:** blg
Total Dissolved Solids	**26**	10	mg/l	1	08/31/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 09/20/2021 16:15

Sample Results

(Continued)

Sample: BC-blw-PH5 — 1H26021-02 (Water)

Sampled: 08/25/21 7:40 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1H1830 **Preparation:** _NONE (LC)		**Prepared:** 08/26/21 09:23				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	08/26/21 16:59	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 09/14/21 19:49				**Analyst:** SBN
Nitrogen, Total	ND	0.10	mg/l	1	09/17/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I0024 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/01/21 09:50				**Analyst:** SBN
TKN	ND	0.10	mg/l	1	09/03/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I0903 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/14/21 19:49				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/17/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1H1864 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/26/21 13:06				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	08/26/21 14:08	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H1971 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/27/21 16:56				**Analyst:** blg
Total Dissolved Solids	**35**	10	mg/l	1	08/31/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 09/20/2021 16:15

Sample Results

(Continued)

Sample: BC-blw-PH4 — 1H26021-03 (Water) — Sampled: 08/25/21 8:15 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0 — **Instr:** LC12						
Batch ID: W1H1830 — **Preparation:** _NONE (LC) — **Prepared:** 08/26/21 09:23 — **Analyst:** jan						
Nitrate as N	ND	110	ug/l	1	08/26/21 17:17	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC] — **Instr:** [CALC]						
Batch ID: [CALC] — **Preparation:** [CALC] — **Prepared:** 09/14/21 19:49 — **Analyst:** SBN						
Nitrogen, Total	**0.11**	0.10	mg/l	1	09/17/21	
Method: EPA 351.2 — **Instr:** AA06						
Batch ID: W1I0024 — **Preparation:** _NONE (WETCHEM) — **Prepared:** 09/01/21 09:50 — **Analyst:** SBN						
TKN	**0.11**	0.10	mg/l	1	09/03/21	
Method: EPA 353.2 — **Instr:** AA01						
Batch ID: W1I0903 — **Preparation:** _NONE (WETCHEM) — **Prepared:** 09/14/21 19:49 — **Analyst:** ism						
NO2+NO3 as N	ND	200	ug/l	1	09/17/21	
Method: EPA 365.3 — **Instr:** UVVIS04						
Batch ID: W1H1864 — **Preparation:** _NONE (WETCHEM) — **Prepared:** 08/26/21 13:06 — **Analyst:** sbn						
o-Phosphate as P	ND	0.010	mg/l	1	08/26/21 14:09	
Method: SM 2540C — **Instr:** OVEN01						
Batch ID: W1H1971 — **Preparation:** _NONE (WETCHEM) — **Prepared:** 08/27/21 16:56 — **Analyst:** blg						
Total Dissolved Solids	**46**	10	mg/l	1	08/31/21	

Sample Results

(Continued)

Sample: BC-blw-PH3
1H26021-04 (Water)

Sampled: 08/25/21 8:50 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1H1830 **Preparation:** _NONE (LC)		**Prepared:** 08/26/21 09:23				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	08/26/21 17:34	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 09/14/21 19:49				**Analyst:** SBN
Nitrogen, Total	**0.19**	0.10	mg/l	1	09/17/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I0024 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/01/21 09:50				**Analyst:** SBN
TKN	**0.19**	0.10	mg/l	1	09/03/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I0903 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/14/21 19:49				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/17/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1H1864 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/26/21 13:06				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	08/26/21 14:09	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H1971 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/27/21 16:56				**Analyst:** blg
Total Dissolved Solids	**23**	10	mg/l	1	08/31/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 09/20/2021 16:15

Sample Results

(Continued)

Sample: BC-blw-PH2 — 1H26021-05 (Water)

Sampled: 08/25/21 9:20 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1H1830 — **Preparation:** _NONE (LC)		**Prepared:** 08/26/21 09:23				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	08/26/21 17:52	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 09/14/21 19:49				**Analyst:** SBN
Nitrogen, Total	**0.12**	0.10	mg/l	1	09/17/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I0024 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/01/21 09:50				**Analyst:** SBN
TKN	**0.12**	0.10	mg/l	1	09/03/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I0903 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/14/21 19:49				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/17/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1H1864 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/26/21 13:06				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	08/26/21 14:10	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H1971 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/27/21 16:56				**Analyst:** blg
Total Dissolved Solids	**27**	10	mg/l	1	08/31/21	

Sample Results

(Continued)

Sample: BC-NF-1
1H26021-06 (Water)

Sampled: 08/25/21 10:20 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1H1830 **Preparation:** _NONE (LC)		**Prepared:** 08/26/21 09:23				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	08/26/21 18:10	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 09/14/21 19:49				**Analyst:** SBN
Nitrogen, Total	**0.12**	0.10	mg/l	1	09/17/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I0024 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/01/21 09:50				**Analyst:** SBN
TKN	**0.12**	0.10	mg/l	1	09/03/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I0903 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/14/21 19:49				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/17/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1H1864 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/26/21 13:06				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	08/26/21 14:10	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H1971 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/27/21 16:56				**Analyst:** blg
Total Dissolved Solids	**25**	10	mg/l	1	08/31/21	

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 09/20/2021 16:15

Sample Results

(Continued)

Sample: BC-blw-LS
1H26021-07 (Water)

Sampled: 08/25/21 10:35 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1H1830 **Preparation:** _NONE (LC)		**Prepared:** 08/26/21 09:23				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	08/26/21 18:28	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 09/14/21 19:49				**Analyst:** SBN
Nitrogen, Total	**0.12**	0.10	mg/l	1	09/17/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I0024 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/01/21 09:50				**Analyst:** SBN
TKN	**0.12**	0.10	mg/l	1	09/03/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I0903 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/14/21 19:49				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/17/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1H1866 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/26/21 13:08				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	08/26/21 14:18	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H1971 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/27/21 16:56				**Analyst:** blg
Total Dissolved Solids	**14**	10	mg/l	1	08/31/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 09/20/2021 16:15

Sample Results

(Continued)

Sample: BC-blw-SL — 1H26021-08 (Water)

Sampled: 08/25/21 11:05 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1H1830 **Preparation:** _NONE (LC)		**Prepared:** 08/26/21 09:23				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	08/26/21 19:22	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: [CALC]		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 09/14/21 19:49				**Analyst:** SBN
Nitrogen, Total	**0.11**	0.10	mg/l	1	09/17/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I0024 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/01/21 09:50				**Analyst:** SBN
TKN	**0.11**	0.10	mg/l	1	09/03/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I0903 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/14/21 19:49				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/17/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1H1866 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/26/21 13:08				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	08/26/21 14:19	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1H1971 **Preparation:** _NONE (WETCHEM)		**Prepared:** 08/27/21 16:56				**Analyst:** blg
Total Dissolved Solids	**14**	10	mg/l	1	08/31/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102
Project Manager: Michael P. Donovan
Reported: 09/20/2021 16:15

Quality Control Results

Anions by IC, EPA Method 300.0

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1H1830 - EPA 300.0										
Blank (W1H1830-BLK1)				**Prepared & Analyzed: 08/26/21**						
Nitrate as N	ND	110	ug/l							
LCS (W1H1830-BS1)				**Prepared & Analyzed: 08/26/21**						
Nitrate as N	2200	110	ug/l	2000		110	90-110			
Matrix Spike (W1H1830-MS1)	**Source: 1H16015-01**			**Prepared & Analyzed: 08/26/21**						
Nitrate as N	21200	1100	ug/l	20000	ND	106	84-115			
Matrix Spike (W1H1830-MS2)	**Source: 1H16015-02**			**Prepared & Analyzed: 08/26/21**						
Nitrate as N	20900	1100	ug/l	20000	ND	104	84-115			
Matrix Spike Dup (W1H1830-MSD1)	**Source: 1H16015-01**			**Prepared & Analyzed: 08/26/21**						
Nitrate as N	21200	1100	ug/l	20000	ND	106	84-115	0.3	20	
Matrix Spike Dup (W1H1830-MSD2)	**Source: 1H16015-02**			**Prepared & Analyzed: 08/26/21**						
Nitrate as N	20800	1100	ug/l	20000	ND	104	84-115	0.2	20	

Quality Control Results

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1H1864 - EPA 365.3										
Blank (W1H1864-BLK1)				**Prepared & Analyzed: 08/26/21**						
o-Phosphate as P	ND	0.010	mg/l							
LCS (W1H1864-BS1)				**Prepared & Analyzed: 08/26/21**						
o-Phosphate as P	0.207	0.010	mg/l	0.200		104	88-111			
Matrix Spike (W1H1864-MS1)	**Source: 1H25072-01**			**Prepared & Analyzed: 08/26/21**						
o-Phosphate as P	0.230	0.010	mg/l	0.200	0.0210	104	85-112			
Matrix Spike Dup (W1H1864-MSD1)	**Source: 1H25072-01**			**Prepared & Analyzed: 08/26/21**						
o-Phosphate as P	0.230	0.010	mg/l	0.200	0.0210	104	85-112	0	20	
Batch: W1H1866 - EPA 365.3										
Blank (W1H1866-BLK1)				**Prepared & Analyzed: 08/26/21**						
o-Phosphate as P	ND	0.010	mg/l							
LCS (W1H1866-BS1)				**Prepared & Analyzed: 08/26/21**						
o-Phosphate as P	0.212	0.010	mg/l	0.200		106	88-111			
Matrix Spike (W1H1866-MS1)	**Source: 1H26021-07**			**Prepared & Analyzed: 08/26/21**						
o-Phosphate as P	0.212	0.010	mg/l	0.200	0.00900	102	85-112			
Matrix Spike Dup (W1H1866-MSD1)	**Source: 1H26021-07**			**Prepared & Analyzed: 08/26/21**						
o-Phosphate as P	0.210	0.010	mg/l	0.200	0.00900	100	85-112	0.9	20	
Batch: W1H1971 - SM 2540C										
Blank (W1H1971-BLK1)				**Prepared: 08/27/21 Analyzed: 08/31/21**						
Total Dissolved Solids	ND	10	mg/l							
LCS (W1H1971-BS1)				**Prepared: 08/27/21 Analyzed: 08/31/21**						

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 09/20/2021 16:15

(Continued)

Quality Control Results

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1H1971 - SM 2540C (Continued)										
LCS (W1H1971-BS1)				**Prepared: 08/27/21**	**Analyzed: 08/31/21**					
Total Dissolved Solids	838	10	mg/l	824		102	96-102			
Duplicate (W1H1971-DUP1)	**Source: 1H16018-01**			**Prepared: 08/27/21**	**Analyzed: 08/31/21**					
Total Dissolved Solids	4510	10	mg/l		4390			3	10	
Duplicate (W1H1971-DUP2)	**Source: 1H16018-02**			**Prepared: 08/27/21**	**Analyzed: 08/31/21**					
Total Dissolved Solids	1680	10	mg/l		1630			3	10	
Batch: W1I0024 - EPA 351.2										
Blank (W1I0024-BLK1)				**Prepared: 09/01/21**	**Analyzed: 09/03/21**					
TKN	ND	0.10	mg/l							
Blank (W1I0024-BLK2)				**Prepared: 09/01/21**	**Analyzed: 09/03/21**					
TKN	ND	0.10	mg/l							
LCS (W1I0024-BS1)				**Prepared: 09/01/21**	**Analyzed: 09/03/21**					
TKN	1.04	0.10	mg/l	1.00		104	90-110			
LCS (W1I0024-BS2)				**Prepared: 09/01/21**	**Analyzed: 09/03/21**					
TKN	1.03	0.10	mg/l	1.00		103	90-110			
Matrix Spike (W1I0024-MS1)	**Source: 1H26021-01**			**Prepared: 09/01/21**	**Analyzed: 09/03/21**					
TKN	1.14	0.10	mg/l	1.00	0.102	103	90-110			
Matrix Spike (W1I0024-MS2)	**Source: 1H26021-05**			**Prepared: 09/01/21**	**Analyzed: 09/03/21**					
TKN	1.13	0.10	mg/l	1.00	0.119	101	90-110			
Matrix Spike Dup (W1I0024-MSD1)	**Source: 1H26021-01**			**Prepared: 09/01/21**	**Analyzed: 09/03/21**					
TKN	1.11	0.10	mg/l	1.00	0.102	101	90-110	2	10	
Matrix Spike Dup (W1I0024-MSD2)	**Source: 1H26021-05**			**Prepared: 09/01/21**	**Analyzed: 09/03/21**					
TKN	1.14	0.10	mg/l	1.00	0.119	102	90-110	0.9	10	
Batch: W1I0903 - EPA 353.2										
Blank (W1I0903-BLK1)				**Prepared: 09/14/21**	**Analyzed: 09/17/21**					
NO2+NO3 as N	ND	200	ug/l							
LCS (W1I0903-BS1)				**Prepared: 09/14/21**	**Analyzed: 09/17/21**					
NO2+NO3 as N	1010	200	ug/l	1000		101	90-110			
Matrix Spike (W1I0903-MS1)	**Source: 1I01057-01**			**Prepared: 09/14/21**	**Analyzed: 09/17/21**					
NO2+NO3 as N	17900	800	ug/l	8000	9680	102	90-110			
Matrix Spike (W1I0903-MS2)	**Source: 1I08061-01**			**Prepared: 09/14/21**	**Analyzed: 09/17/21**					
NO2+NO3 as N	7350	200	ug/l	2000	5280	104	90-110			
Matrix Spike Dup (W1I0903-MSD1)	**Source: 1I01057-01**			**Prepared: 09/14/21**	**Analyzed: 09/17/21**					
NO2+NO3 as N	17900	800	ug/l	8000	9680	102	90-110	0	20	
Matrix Spike Dup (W1I0903-MSD2)	**Source: 1I08061-01**			**Prepared: 09/14/21**	**Analyzed: 09/17/21**					
NO2+NO3 as N	7340	200	ug/l	2000	5280	103	90-110	0.1	20	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Notes and Definitions

Item	Definition
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

CHAIN OF CUSTODY FORM 1H26021

Page 1 of 2

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Nitrate-N EPA Method 300.0	Orthophosphae-OPO4 EPA Method 365.3	Total Dissolved Solids SM2540C	Total Kjeldahl Nitrogenby EPA Method 351.2	NO2+NO3 as N - EPA Method 353.2	Total Nitrogen by calculation						Special Instructions
BC-blw-PH6	water	60 ml Poly	1	8/25/21	7:15am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-blw-PH5	water	60 ml Poly	1	8/25/21	7:40am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-blw-PH4	water	60 ml Poly	1	8/25/21	8:15am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-blw-PH3	water	60 ml Poly	1	8/25/21	8:50am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-blw-PH2	water	60 ml Poly	1	8/25/21	9:20am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						

Relinquished By:	Date /Time:	Received by:	Date /Time:
[signature]	8/25/21 12:30pm		
Relinquished By: Fed ex	Date /Time: 8/26/21	Received by: [signature]	Date /Time: 10:30
Relinquished By:	Date /Time:	Received in Lab by:	Date /Time:

Turnaround Time: (Check)
Same Day ______ 72 Hours ______
24 Hours ______ 5 Days ______
48 Hours ______ Normal X

Sample Integrity: (Check)
Intact ✓ On Ice ✓

1.4c T02821

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

CHAIN OF COUSTODY FORM 1H26021

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Nitrate-N EPA Method 300.0	Orthophosphae-OPO4 EPA Method 365.3	Total Dissolved Solids SM2540C	Total Kjeldahl Nitrogenby EPA Method 351.2	NO2+NO3 as N - EPA Method 353.2	Total Nitrogen by calculation						Special Instructions
BC-NF-1	water	60 ml Poly	1	8/25/21	10:20am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-blw-LS	water	60 ml Poly	1	8/25/21	10:35am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
BC-blw-SL	water	60 ml Poly	1	8/25/21	11:05am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						

Relinquished By:	Date /Time:	Received by:	Date /Time:
[signature] 8/25/21	12:30pm		
Fedex	8/26/21	[signature]	10:30
		Received in Lab by:	

Turnaround Time: (Check)
Same Day ______ 72 Hours ______
24 Hours ______ 5 Days ______
48 Hours ______ Normal X

Sample Integrity: (Check)
Intact ______ On Ice ✓

1.4°C JUZZY

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Work Orders:	1I21015	**Report Date:**	10/08/2021
		Received Date:	9/21/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH #4047 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

Dear Michael P. Donovan,

Enclosed are the results of analyses for samples received 9/21/21 with the Chain-of-Custody document. The samples were received in good condition, at 2.7 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Reviewed by:

Chris Samatmanakit
Project Manager

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:13

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
LS-DP-8	Jim Burton, Todd Bear	1I21015-01	Water	09/20/21 10:20	
LS-DP-20	Jim Burton, Todd Bear	1I21015-02	Water	09/20/21 10:45	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Certificate of Analysis

FINAL REPORT

WECK LABORATORIES, INC.

Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Project Number:** 2KLE010102 **Project Manager:** Michael P. Donovan	**Reported:** 10/08/2021 16:13

Sample Results

Sample: LS-DP-8 — 1I21015-01 (Water)

Sampled: 09/20/21 10:20 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1I1329 **Preparation:** _NONE (LC)		**Prepared:** 09/21/21 10:07				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	09/21/21 19:34	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: *** DEFAULT SPECIFIC METHOD ***		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 09/23/21 13:21				**Analyst:** YMT
Nitrogen, Total	ND	0.10	mg/l	1	09/23/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I1348 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/22/21 18:00				**Analyst:** YMT
TKN	ND	0.10	mg/l	1	09/23/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I1560 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 13:21				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/23/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1I1371 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/21/21 15:17				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	09/21/21 17:38	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1I1726 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/27/21 12:11				**Analyst:** blg
Total Dissolved Solids	**16**	10	mg/l	1	09/27/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported:
10/08/2021 16:13

Sample Results

(Continued)

Sample: LS-DP-20 — Sampled: 09/20/21 10:45 by Jim Burton, Todd Bear

1I21015-02 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1I1329 **Preparation:** _NONE (LC)		**Prepared:** 09/21/21 10:07				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	09/21/21 20:46	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: *** DEFAULT SPECIFIC METHOD ***		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 09/23/21 13:21				**Analyst:** YMT
Nitrogen, Total	ND	0.10	mg/l	1	09/23/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I1348 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/22/21 18:00				**Analyst:** YMT
TKN	ND	0.10	mg/l	1	09/23/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I1560 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 13:21				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/23/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1I1371 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/21/21 15:17				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	09/21/21 17:39	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1I1726 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/27/21 12:11				**Analyst:** blg
Total Dissolved Solids	**20**	10	mg/l	1	09/27/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:13

Quality Control Results

Anions by IC, EPA Method 300.0

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1I1329 - EPA 300.0										
Blank (W1I1329-BLK1)				**Prepared & Analyzed: 09/21/21**						
Nitrate as N	ND	110	ug/l							
LCS (W1I1329-BS1)				**Prepared & Analyzed: 09/21/21**						
Nitrate as N	2020	110	ug/l	2000		101	90-110			
Matrix Spike (W1I1329-MS1)	**Source: 1I02003-01**			**Prepared & Analyzed: 09/21/21**						
Nitrate as N	19400	1100	ug/l	20000	ND	97	84-115			
Matrix Spike (W1I1329-MS2)	**Source: 1I02003-02**			**Prepared & Analyzed: 09/21/21**						
Nitrate as N	19600	1100	ug/l	20000	ND	98	84-115			
Matrix Spike Dup (W1I1329-MSD1)	**Source: 1I02003-01**			**Prepared & Analyzed: 09/21/21**						
Nitrate as N	19200	1100	ug/l	20000	ND	96	84-115	0.7	20	
Matrix Spike Dup (W1I1329-MSD2)	**Source: 1I02003-02**			**Prepared & Analyzed: 09/21/21**						
Nitrate as N	19700	1100	ug/l	20000	ND	98	84-115	0.3	20	

Quality Control Results

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1I1348 - EPA 351.2										
Blank (W1I1348-BLK1)				**Prepared: 09/22/21 Analyzed: 09/23/21**						
TKN	ND	0.10	mg/l							
Blank (W1I1348-BLK2)				**Prepared: 09/22/21 Analyzed: 09/23/21**						
TKN	ND	0.10	mg/l							
LCS (W1I1348-BS1)				**Prepared: 09/22/21 Analyzed: 09/23/21**						
TKN	0.981	0.10	mg/l	1.00		98	90-110			
LCS (W1I1348-BS2)				**Prepared: 09/22/21 Analyzed: 09/23/21**						
TKN	0.934	0.10	mg/l	1.00		93	90-110			
Matrix Spike (W1I1348-MS1)	**Source: 1I21027-01**			**Prepared: 09/22/21 Analyzed: 09/23/21**						
TKN	1.23	0.10	mg/l	1.00	0.246	99	90-110			
Matrix Spike (W1I1348-MS2)	**Source: 1I21027-02**			**Prepared: 09/22/21 Analyzed: 09/23/21**						
TKN	1.10	0.10	mg/l	1.00	0.152	95	90-110			
Matrix Spike Dup (W1I1348-MSD1)	**Source: 1I21027-01**			**Prepared: 09/22/21 Analyzed: 09/23/21**						
TKN	1.19	0.10	mg/l	1.00	0.246	94	90-110	4	10	
Matrix Spike Dup (W1I1348-MSD2)	**Source: 1I21027-02**			**Prepared: 09/22/21 Analyzed: 09/23/21**						
TKN	1.11	0.10	mg/l	1.00	0.152	96	90-110	0.6	10	
Batch: W1I1371 - EPA 365.3										
Blank (W1I1371-BLK1)				**Prepared & Analyzed: 09/21/21**						
o-Phosphate as P	ND	0.010	mg/l							
LCS (W1I1371-BS1)				**Prepared & Analyzed: 09/21/21**						
o-Phosphate as P	0.197	0.010	mg/l	0.200		98	88-111			

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102
Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:13

Quality Control Results

(Continued)

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1I1371 - EPA 365.3 (Continued)										
Matrix Spike (W1I1371-MS1)	**Source: 1I21015-01**			**Prepared & Analyzed: 09/21/21**						
o-Phosphate as P	0.197	0.010	mg/l	0.200	0.00600	96	85-112			
Matrix Spike Dup (W1I1371-MSD1)	**Source: 1I21015-01**			**Prepared & Analyzed: 09/21/21**						
o-Phosphate as P	0.205	0.010	mg/l	0.200	0.00600	100	85-112	4	20	
Batch: W1I1560 - EPA 353.2										
Blank (W1I1560-BLK1)				**Prepared & Analyzed: 09/23/21**						
NO2+NO3 as N	ND	200	ug/l							
LCS (W1I1560-BS1)				**Prepared & Analyzed: 09/23/21**						
NO2+NO3 as N	1010	200	ug/l	1000		101	90-110			
Matrix Spike (W1I1560-MS1)	**Source: 1I22055-01**			**Prepared & Analyzed: 09/23/21**						
NO2+NO3 as N	4940	200	ug/l	2000	3020	96	90-110			
Matrix Spike (W1I1560-MS2)	**Source: 1I23023-01**			**Prepared & Analyzed: 09/23/21**						
NO2+NO3 as N	2100	200	ug/l	2000	ND	105	90-110			
Matrix Spike Dup (W1I1560-MSD1)	**Source: 1I22055-01**			**Prepared & Analyzed: 09/23/21**						
NO2+NO3 as N	4950	200	ug/l	2000	3020	96	90-110	0.2	20	
Matrix Spike Dup (W1I1560-MSD2)	**Source: 1I23023-01**			**Prepared & Analyzed: 09/23/21**						
NO2+NO3 as N	2120	200	ug/l	2000	ND	106	90-110	0.9	20	
Batch: W1I1726 - SM 2540C										
Blank (W1I1726-BLK1)				**Prepared & Analyzed: 09/27/21**						
Total Dissolved Solids	ND	10	mg/l							
LCS (W1I1726-BS1)				**Prepared & Analyzed: 09/27/21**						
Total Dissolved Solids	810	10	mg/l	824		98	96-102			
Duplicate (W1I1726-DUP1)	**Source: 1F08004-02**			**Prepared & Analyzed: 09/27/21**						
Total Dissolved Solids	2200	10	mg/l		2150			3	10	
Duplicate (W1I1726-DUP2)	**Source: 1F08004-03**			**Prepared & Analyzed: 09/27/21**						
Total Dissolved Solids	1760	10	mg/l		1720			2	10	

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:13

Notes and Definitions

Item	Definition
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

1I21015

CHAIN OF CUSTODY FORM

Page 1 of 1

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Nitrate-N EPA Method 300.0	Orthophosphae-OPO4 EPA Method 365.3	Total Dissolved Solids SM2540C	Total Kjeldahl Nitrogenby EPA Method 351.2	NO2+NO3 as N - EPA Method 353.2	Total Nitrogen by calculation	Special Instructions
LS-DP-8	water	60 ml Poly	1	9/20/21	10:20am	None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
LS-DP-20	water	60 ml Poly	1	9/20/21	10:45am	None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
	water	60 ml Poly	1			None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
	water	60 ml Poly	1			None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
	water	60 ml Poly	1			None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	

Relinquished By:	Date /Time:	Received by:	Date /Time:
[signature] 1:15pm	9/20/21		
FedEx	9/21/21 918	[signature]	
		Received in Lab by:	

Turnaround Time: (Check)
Same Day ______ 72 Hours ______
24 Hours ______ 5 Days ______
48 Hours ______ Normal X

Sample Integrity: (Check)
Intact ______ On Ice ______

2.7°C T-0270

Certificate of Analysis

FINAL REPORT

Work Orders:	1I22034	**Report Date:**	10/08/2021
		Received Date:	9/22/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH #4047 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

Dear Michael P. Donovan,

Enclosed are the results of analyses for samples received 9/22/21 with the Chain-of-Custody document. The samples were received in good condition, at 2.1 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Reviewed by:

Chris Samatmanakit
Project Manager

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported:
10/08/2021 16:14

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
SL-DP-4	Jim Burton, Todd Bear	1I22034-01	Water	09/21/21 10:25	
SL-DP-16	Jim Burton, Todd Bear	1I22034-02	Water	09/21/21 10:50	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:14

Sample Results

Sample: SL-DP-4 — Sampled: 09/21/21 10:25 by Jim Burton, Todd Bear

1I22034-01 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1I1452 **Preparation:** _NONE (LC)		**Prepared:** 09/22/21 10:39				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	09/23/21 03:34	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: *** DEFAULT SPECIFIC METHOD ***		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 09/23/21 13:21				**Analyst:** YMT
Nitrogen, Total	ND	0.10	mg/l	1	09/23/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I1348 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/22/21 18:00				**Analyst:** YMT
TKN	ND	0.10	mg/l	1	09/23/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I1560 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 13:21				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/23/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1I1482 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/22/21 15:17				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	09/22/21 16:00	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1I1768 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/27/21 16:27				**Analyst:** blg
Total Dissolved Solids	ND	10	mg/l	1	09/28/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Certificate of Analysis

FINAL REPORT

WECK LABORATORIES, INC.

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:14

Sample Results

(Continued)

Sample: SL-DP-16 — 1I22034-02 (Water)

Sampled: 09/21/21 10:50 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1I1452 **Preparation:** _NONE (LC)		**Prepared:** 09/22/21 10:39				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	09/23/21 04:28	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: *** DEFAULT SPECIFIC METHOD ***		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 09/23/21 13:21				**Analyst:** YMT
Nitrogen, Total	ND	0.10	mg/l	1	09/23/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I1348 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/22/21 18:00				**Analyst:** YMT
TKN	ND	0.10	mg/l	1	09/23/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I1560 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 13:21				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/23/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1I1482 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/22/21 15:17				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	09/22/21 16:03	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1I1768 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/27/21 16:27				**Analyst:** blg
Total Dissolved Solids	**42**	10	mg/l	1	09/28/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:14

Quality Control Results

Anions by IC, EPA Method 300.0

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1I1452 - EPA 300.0										
Blank (W1I1452-BLK1)				**Prepared & Analyzed: 09/22/21**						
Nitrate as N	ND	110	ug/l							
LCS (W1I1452-BS1)				**Prepared & Analyzed: 09/22/21**						
Nitrate as N	2040	110	ug/l	2000		102	90-110			
Matrix Spike (W1I1452-MS1)	**Source: 1I10015-01**			**Prepared: 09/22/21**	**Analyzed: 09/23/21**					
Nitrate as N	22800	1100	ug/l	20000	2570	101	84-115			
Matrix Spike (W1I1452-MS2)	**Source: 1I20080-01**			**Prepared: 09/22/21**	**Analyzed: 09/23/21**					
Nitrate as N	26000	1100	ug/l	20000	5940	100	84-115			
Matrix Spike Dup (W1I1452-MSD1)	**Source: 1I10015-01**			**Prepared: 09/22/21**	**Analyzed: 09/23/21**					
Nitrate as N	22900	1100	ug/l	20000	2570	102	84-115	0.5	20	
Matrix Spike Dup (W1I1452-MSD2)	**Source: 1I20080-01**			**Prepared: 09/22/21**	**Analyzed: 09/23/21**					
Nitrate as N	25900	1100	ug/l	20000	5940	100	84-115	0.3	20	

Quality Control Results

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1I1348 - EPA 351.2										
Blank (W1I1348-BLK1)				**Prepared: 09/22/21**	**Analyzed: 09/23/21**					
TKN	ND	0.10	mg/l							
Blank (W1I1348-BLK2)				**Prepared: 09/22/21**	**Analyzed: 09/23/21**					
TKN	ND	0.10	mg/l							
LCS (W1I1348-BS1)				**Prepared: 09/22/21**	**Analyzed: 09/23/21**					
TKN	0.981	0.10	mg/l	1.00		98	90-110			
LCS (W1I1348-BS2)				**Prepared: 09/22/21**	**Analyzed: 09/23/21**					
TKN	0.934	0.10	mg/l	1.00		93	90-110			
Matrix Spike (W1I1348-MS1)	**Source: 1I21027-01**			**Prepared: 09/22/21**	**Analyzed: 09/23/21**					
TKN	1.23	0.10	mg/l	1.00	0.246	99	90-110			
Matrix Spike (W1I1348-MS2)	**Source: 1I21027-02**			**Prepared: 09/22/21**	**Analyzed: 09/23/21**					
TKN	1.10	0.10	mg/l	1.00	0.152	95	90-110			
Matrix Spike Dup (W1I1348-MSD1)	**Source: 1I21027-01**			**Prepared: 09/22/21**	**Analyzed: 09/23/21**					
TKN	1.19	0.10	mg/l	1.00	0.246	94	90-110	4	10	
Matrix Spike Dup (W1I1348-MSD2)	**Source: 1I21027-02**			**Prepared: 09/22/21**	**Analyzed: 09/23/21**					
TKN	1.11	0.10	mg/l	1.00	0.152	96	90-110	0.6	10	
Batch: W1I1482 - EPA 365.3										
Blank (W1I1482-BLK1)				**Prepared & Analyzed: 09/22/21**						
o-Phosphate as P	ND	0.010	mg/l							
LCS (W1I1482-BS1)				**Prepared & Analyzed: 09/22/21**						
o-Phosphate as P	0.199	0.010	mg/l	0.200		100	88-111			

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:14

Quality Control Results

(Continued)

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1I1482 - EPA 365.3 (Continued)										
Matrix Spike (W1I1482-MS1)	**Source: 1I22034-01**			**Prepared & Analyzed: 09/22/21**						
o-Phosphate as P	0.196	0.010	mg/l	0.200	ND	98	85-112			
Matrix Spike Dup (W1I1482-MSD1)	**Source: 1I22034-01**			**Prepared & Analyzed: 09/22/21**						
o-Phosphate as P	0.199	0.010	mg/l	0.200	ND	100	85-112	2	20	
Batch: W1I1560 - EPA 353.2										
Blank (W1I1560-BLK1)				**Prepared & Analyzed: 09/23/21**						
NO2+NO3 as N	ND	200	ug/l							
LCS (W1I1560-BS1)				**Prepared & Analyzed: 09/23/21**						
NO2+NO3 as N	1010	200	ug/l	1000		101	90-110			
Matrix Spike (W1I1560-MS1)	**Source: 1I22055-01**			**Prepared & Analyzed: 09/23/21**						
NO2+NO3 as N	4940	200	ug/l	2000	3020	96	90-110			
Matrix Spike (W1I1560-MS2)	**Source: 1I23023-01**			**Prepared & Analyzed: 09/23/21**						
NO2+NO3 as N	2100	200	ug/l	2000	ND	105	90-110			
Matrix Spike Dup (W1I1560-MSD1)	**Source: 1I22055-01**			**Prepared & Analyzed: 09/23/21**						
NO2+NO3 as N	4950	200	ug/l	2000	3020	96	90-110	0.2	20	
Matrix Spike Dup (W1I1560-MSD2)	**Source: 1I23023-01**			**Prepared & Analyzed: 09/23/21**						
NO2+NO3 as N	2120	200	ug/l	2000	ND	106	90-110	0.9	20	
Batch: W1I1768 - SM 2540C										
Blank (W1I1768-BLK1)				**Prepared: 09/27/21 Analyzed: 09/28/21**						
Total Dissolved Solids	ND	10	mg/l							
LCS (W1I1768-BS1)				**Prepared: 09/27/21 Analyzed: 09/28/21**						
Total Dissolved Solids	814	10	mg/l	824		99	96-102			
Duplicate (W1I1768-DUP1)	**Source: 1I21059-01**			**Prepared: 09/27/21 Analyzed: 09/28/21**						
Total Dissolved Solids	890	10	mg/l		916			3	10	
Duplicate (W1I1768-DUP2)	**Source: 1I21094-01**			**Prepared: 09/27/21 Analyzed: 09/28/21**						
Total Dissolved Solids	1880	10	mg/l		1880			0.1	10	

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:14

Notes and Definitions

Item	Definition
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

CHAIN OF CUSTODY FORM

1I22034

Page 1 of 1

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Nitrate-N EPA Method 300.0	Orthophosphae-OPO4 EPA Method 365.3	Total Dissolved Solids SM2540C	Total Kjeldahl Nitrogenby EPA Method 351.2	NO2+NO3 as N - EPA Method 353.2	Total Nitrogen by calculation						Special Instructions
SL-DP-4	water	60 ml Poly	1	9/21/21	10:25am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
SL-DP-16	water	60 ml Poly	1	9/21/21	10:50am	None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						
	water	60 ml Poly	1			None	X											
	water	250 ml Poly	1			None		X										Filtered with 0.45µ
	water	500 ml Poly	1			None			X									
	water	250 ml Poly	1			H2SO4				X	X	X						

Relinquished By:	Date /Time:	Received by:	Date /Time:	Turnaround Time: (Check)
[signature]	9/21/21 1:30 pm			Same Day ____ 72 Hours ____
Relinquished By: Fedex	Date /Time: 9/22/21	Received by: [signature]	Date /Time: 11:04	24 Hours ____ 5 Days ____ 48 Hours ____ Normal X
Relinquished By:	Date /Time:	Received in Lab by:	Date /Time:	Sample Integrity: (Check) Intact ____ On ice ____

2.1° T0254

Certificate of Analysis

FINAL REPORT

WECK LABORATORIES, INC.

Work Orders:	1I23020	**Report Date:**	10/08/2021
		Received Date:	9/23/2021
Project:	2KLE010102	**Turnaround Time:**	Normal
		Phones:	(714) 751-7373
		Fax:	(714) 545-8883
Attn:	Michael P. Donovan	**P.O. #:**	
Client:	Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Billing Code:**	

ELAP-CA #1132 • EPA-UCMR #CA00211 • Guam-EPA #17-008R • HW-DOH #4047 • LACSD #10143 • NELAP-OR #4047 • NJ-DEP #CA015 • SCAQMD #93LA1006

This is a complete final report. The information in this report applies to the samples analyzed in accordance with the chain-of-custody document. Weck Laboratories certifies that the test results meet all requirements of TNI unless noted by qualifiers or written in the Case Narrative. This analytical report must be reproduced in its entirety.

Dear Michael P. Donovan,

Enclosed are the results of analyses for samples received 9/23/21 with the Chain-of-Custody document. The samples were received in good condition, at 4.3 °C and on ice. All analyses met the method criteria except as noted in the case narrative or in the report with data qualifiers.

Reviewed by:

Chris Samatmanakit
Project Manager

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported:
10/08/2021 16:16

Sample Summary

Sample Name	Sampled By	Lab ID	Matrix	Sampled	Qualifiers
BC-BLW-PH6	Jim Burton, Todd Bear	1I23020-01	Water	09/22/21 07:45	
BC-BLW-PH5	Jim Burton, Todd Bear	1I23020-02	Water	09/22/21 08:15	
BC-BLW-PH4	Jim Burton, Todd Bear	1I23020-03	Water	09/22/21 08:45	
BC-BLW-PH3	Jim Burton, Todd Bear	1I23020-04	Water	09/22/21 09:30	
BC-BLW-PH2	Jim Burton, Todd Bear	1I23020-05	Water	09/22/21 10:00	
BC-BLW-LS	Jim Burton, Todd Bear	1I23020-06	Water	09/22/21 10:20	
BC-NF-1	Jim Burton, Todd Bear	1I23020-07	Water	09/22/21 10:55	
BC-BLW-SL	Jim Burton, Todd Bear	1I23020-08	Water	09/22/21 11:45	

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:16

Sample Results

Sample: BC-BLW-PH6 — 1I23020-01 (Water)

Sampled: 09/22/21 7:45 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1I1524 **Preparation:** _NONE (LC)		**Prepared:** 09/23/21 09:42				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	09/23/21 17:02	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: *** DEFAULT SPECIFIC METHOD ***		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 09/23/21 16:31				**Analyst:** SBN
Nitrogen, Total	ND	0.10	mg/l	1	09/29/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I1543 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 11:44				**Analyst:** SBN
TKN	ND	0.10	mg/l	1	09/29/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I1581 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 16:31				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/23/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1I1578 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 16:13				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	09/23/21 17:38	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1I1835 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/28/21 10:46				**Analyst:** blg
Total Dissolved Solids	**35**	10	mg/l	1	09/29/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:16

Sample Results

(Continued)

Sample: BC-BLW-PH5 — 1I23020-02 (Water)

Sampled: 09/22/21 8:15 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1I1524 **Preparation:** _NONE (LC)		**Prepared:** 09/23/21 09:42				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	09/23/21 17:20	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: *** DEFAULT SPECIFIC METHOD ***		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 09/23/21 16:31				**Analyst:** SBN
Nitrogen, Total	ND	0.10	mg/l	1	09/29/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I1543 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 11:44				**Analyst:** SBN
TKN	ND	0.10	mg/l	1	09/29/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I1581 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 16:31				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/23/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1I1578 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 16:13				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	09/23/21 17:39	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1I1835 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/28/21 10:46				**Analyst:** blg
Total Dissolved Solids	**19**	10	mg/l	1	09/29/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Certificate of Analysis

FINAL REPORT

WECK LABORATORIES, INC.

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:16

Sample Results

(Continued)

Sample: BC-BLW-PH4 Sampled: 09/22/21 8:45 by Jim Burton, Todd Bear

1I23020-03 (Water)

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1I1524 **Preparation:** _NONE (LC)		**Prepared:** 09/23/21 09:42				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	09/23/21 17:38	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: *** DEFAULT SPECIFIC METHOD ***		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 09/23/21 16:31				**Analyst:** SBN
Nitrogen, Total	ND	0.10	mg/l	1	09/29/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I1543 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 11:44				**Analyst:** SBN
TKN	ND	0.10	mg/l	1	09/29/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I1581 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 16:31				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/23/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1I1578 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 16:13				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	09/23/21 17:39	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1I1835 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/28/21 10:46				**Analyst:** blg
Total Dissolved Solids	**35**	10	mg/l	1	09/29/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:16

Sample Results

(Continued)

Sample: BC-BLW-PH3 — 1I23020-04 (Water)

Sampled: 09/22/21 9:30 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1I1524 — **Preparation:** _NONE (LC)		**Prepared:** 09/23/21 09:42				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	09/23/21 17:56	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: *** DEFAULT SPECIFIC METHOD ***		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 09/28/21 18:30				**Analyst:** YMT
Nitrogen, Total	ND	0.10	mg/l	1	09/30/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I1732 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/28/21 18:30				**Analyst:** YMT
TKN	ND	0.10	mg/l	1	09/30/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I1581 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 16:31				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/23/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1I1578 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 16:13				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	09/23/21 17:40	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1I1835 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/28/21 10:46				**Analyst:** blg
Total Dissolved Solids	**40**	10	mg/l	1	09/29/21	

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:16

Sample Results

(Continued)

Sample: BC-BLW-PH2 — 1I23020-05 (Water)

Sampled: 09/22/21 10:00 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1I1524 — **Preparation:** _NONE (LC)		**Prepared:** 09/23/21 09:42				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	09/23/21 18:14	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: *** DEFAULT SPECIFIC METHOD ***		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 09/28/21 18:30				**Analyst:** YMT
Nitrogen, Total	ND	0.10	mg/l	1	09/30/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I1732 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/28/21 18:30				**Analyst:** YMT
TKN	ND	0.10	mg/l	1	09/30/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I1581 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 16:31				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/23/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1I1578 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 16:13				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	09/23/21 17:41	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1I1835 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/28/21 10:46				**Analyst:** blg
Total Dissolved Solids	**31**	10	mg/l	1	09/29/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:16

Sample Results

(Continued)

Sample: BC-BLW-LS
1I23020-06 (Water)

Sampled: 09/22/21 10:20 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1I1524 **Preparation:** _NONE (LC)		**Prepared:** 09/23/21 09:42				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	09/23/21 18:32	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: *** DEFAULT SPECIFIC METHOD ***		**Instr:** [CALC]				
Batch ID: [CALC] **Preparation:** [CALC]		**Prepared:** 09/28/21 18:30				**Analyst:** YMT
Nitrogen, Total	**0.11**	0.10	mg/l	1	09/30/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I1732 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/28/21 18:30				**Analyst:** YMT
TKN	**0.11**	0.10	mg/l	1	09/30/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I1581 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 16:31				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/23/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1I1578 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 16:13				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	09/23/21 17:42	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1I1835 **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/28/21 10:46				**Analyst:** blg
Total Dissolved Solids	**23**	10	mg/l	1	09/29/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Certificate of Analysis

FINAL REPORT

WECK LABORATORIES, INC.

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:16

Sample Results

(Continued)

Sample: BC-NF-1 — 1I23020-07 (Water) — Sampled: 09/22/21 10:55 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1I1524 — **Preparation:** _NONE (LC)		**Prepared:** 09/23/21 09:42				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	09/23/21 18:50	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: *** DEFAULT SPECIFIC METHOD ***		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 09/28/21 18:30				**Analyst:** YMT
Nitrogen, Total	**0.17**	0.10	mg/l	1	09/30/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I1732 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/28/21 18:30				**Analyst:** YMT
TKN	**0.17**	0.10	mg/l	1	09/30/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I1581 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 16:31				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/23/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1I1578 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 16:13				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	09/23/21 17:43	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1I1835 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/28/21 10:46				**Analyst:** blg
Total Dissolved Solids	**28**	10	mg/l	1	09/29/21	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:16

Sample Results

(Continued)

Sample: BC-BLW-SL — 1I23020-08 (Water)

Sampled: 09/22/21 11:45 by Jim Burton, Todd Bear

Analyte	Result	MRL	Units	Dil	Analyzed	Qualifier
Anions by IC, EPA Method 300.0						
Method: EPA 300.0		**Instr:** LC12				
Batch ID: W1I1524 — **Preparation:** _NONE (LC)		**Prepared:** 09/23/21 09:42				**Analyst:** jan
Nitrate as N	ND	110	ug/l	1	09/23/21 19:44	
Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods						
Method: *** DEFAULT SPECIFIC METHOD ***		**Instr:** [CALC]				
Batch ID: [CALC] — **Preparation:** [CALC]		**Prepared:** 09/28/21 18:30				**Analyst:** YMT
Nitrogen, Total	**0.37**	0.10	mg/l	1	09/30/21	
Method: EPA 351.2		**Instr:** AA06				
Batch ID: W1I1732 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/28/21 18:30				**Analyst:** YMT
TKN	**0.37**	0.10	mg/l	1	09/30/21	
Method: EPA 353.2		**Instr:** AA01				
Batch ID: W1I1581 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 16:31				**Analyst:** ism
NO2+NO3 as N	ND	200	ug/l	1	09/23/21	
Method: EPA 365.3		**Instr:** UVVIS04				
Batch ID: W1I1578 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/23/21 16:13				**Analyst:** sbn
o-Phosphate as P	ND	0.010	mg/l	1	09/23/21 17:43	
Method: SM 2540C		**Instr:** OVEN01				
Batch ID: W1I1835 — **Preparation:** _NONE (WETCHEM)		**Prepared:** 09/28/21 10:46				**Analyst:** blg
Total Dissolved Solids	**29**	10	mg/l	1	09/29/21	

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:16

Quality Control Results

Anions by IC, EPA Method 300.0

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1I1524 - EPA 300.0										
Blank (W1I1524-BLK1)				**Prepared & Analyzed: 09/23/21**						
Nitrate as N	ND	110	ug/l							
LCS (W1I1524-BS1)				**Prepared & Analyzed: 09/23/21**						
Nitrate as N	2020	110	ug/l	2000		101	90-110			
Matrix Spike (W1I1524-MS1)	**Source: 1I17004-02**			**Prepared & Analyzed: 09/23/21**						
Nitrate as N	29200	1100	ug/l	20000	8630	103	84-115			
Matrix Spike (W1I1524-MS2)	**Source: 1I20070-01**			**Prepared & Analyzed: 09/23/21**						
Nitrate as N	20300	1100	ug/l	20000	406	100	84-115			
Matrix Spike Dup (W1I1524-MSD1)	**Source: 1I17004-02**			**Prepared & Analyzed: 09/23/21**						
Nitrate as N	29100	1100	ug/l	20000	8630	103	84-115	0.3	20	
Matrix Spike Dup (W1I1524-MSD2)	**Source: 1I20070-01**			**Prepared & Analyzed: 09/23/21**						
Nitrate as N	20200	1100	ug/l	20000	406	99	84-115	0.4	20	

Quality Control Results

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1I1543 - EPA 351.2										
Blank (W1I1543-BLK1)				**Prepared: 09/23/21 Analyzed: 09/29/21**						
TKN	ND	0.10	mg/l							
Blank (W1I1543-BLK2)				**Prepared: 09/23/21 Analyzed: 09/29/21**						
TKN	ND	0.10	mg/l							
Blank (W1I1543-BLK3)				**Prepared: 09/23/21 Analyzed: 10/06/21**						
TKN	ND	0.10	mg/l							
LCS (W1I1543-BS1)				**Prepared: 09/23/21 Analyzed: 09/29/21**						
TKN	1.10	0.10	mg/l	1.00		110	90-110			
LCS (W1I1543-BS2)				**Prepared: 09/23/21 Analyzed: 09/29/21**						
TKN	1.10	0.10	mg/l	1.00		110	90-110			
LCS (W1I1543-BS3)				**Prepared: 09/23/21 Analyzed: 10/06/21**						
TKN	1.03	0.10	mg/l	1.00		103	90-110			
Matrix Spike (W1I1543-MS1)	**Source: 1I22090-16**			**Prepared: 09/23/21 Analyzed: 09/29/21**						
TKN	1.02	0.10	mg/l	1.00	ND	102	90-110			
Matrix Spike (W1I1543-MS2)	**Source: 1I23020-02**			**Prepared: 09/23/21 Analyzed: 09/29/21**						
TKN	1.17	0.10	mg/l	1.00	ND	117	90-110			MS-01
Matrix Spike (W1I1543-MS3)	**Source: 1I23020-02RE1**			**Prepared: 09/23/21 Analyzed: 10/06/21**						
TKN	1.06	0.10	mg/l	1.00	0.0654	99	90-110			
Matrix Spike Dup (W1I1543-MSD1)	**Source: 1I22090-16**			**Prepared: 09/23/21 Analyzed: 09/29/21**						
TKN	1.01	0.10	mg/l	1.00	ND	101	90-110	0.8	10	
Matrix Spike Dup (W1I1543-MSD2)	**Source: 1I23020-02**			**Prepared: 09/23/21 Analyzed: 09/29/21**						

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102
Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:16

Quality Control Results

(Continued)

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1I1543 - EPA 351.2 (Continued)										
Matrix Spike Dup (W1I1543-MSD2)	**Source: 1I23020-02**			**Prepared: 09/23/21**	**Analyzed: 09/29/21**					
TKN	1.14	0.10	mg/l	1.00	ND	114	90-110	3	10	MS-01
Matrix Spike Dup (W1I1543-MSD3)	**Source: 1I23020-02RE1**			**Prepared: 09/23/21**	**Analyzed: 10/06/21**					
TKN	1.17	0.10	mg/l	1.00	0.0654	110	90-110	10	10	
Batch: W1I1578 - EPA 365.3										
Blank (W1I1578-BLK1)				**Prepared & Analyzed: 09/23/21**						
o-Phosphate as P	ND	0.010	mg/l							
LCS (W1I1578-BS1)				**Prepared & Analyzed: 09/23/21**						
o-Phosphate as P	0.210	0.010	mg/l	0.200		105	88-111			
Matrix Spike (W1I1578-MS1)	**Source: 1I22090-01**			**Prepared & Analyzed: 09/23/21**						
o-Phosphate as P	0.233	0.010	mg/l	0.200	0.0310	101	85-112			
Matrix Spike Dup (W1I1578-MSD1)	**Source: 1I22090-01**			**Prepared & Analyzed: 09/23/21**						
o-Phosphate as P	0.232	0.010	mg/l	0.200	0.0310	100	85-112	0.4	20	
Batch: W1I1581 - EPA 353.2										
Blank (W1I1581-BLK1)				**Prepared & Analyzed: 09/23/21**						
NO2+NO3 as N	ND	200	ug/l							
LCS (W1I1581-BS1)				**Prepared & Analyzed: 09/23/21**						
NO2+NO3 as N	1020	200	ug/l	1000		102	90-110			
Matrix Spike (W1I1581-MS1)	**Source: 1I01005-01**			**Prepared & Analyzed: 09/23/21**						
NO2+NO3 as N	4950	200	ug/l	2000	2910	102	90-110			
Matrix Spike Dup (W1I1581-MSD1)	**Source: 1I01005-01**			**Prepared & Analyzed: 09/23/21**						
NO2+NO3 as N	4980	200	ug/l	2000	2910	104	90-110	0.6	20	
Batch: W1I1732 - EPA 351.2										
Blank (W1I1732-BLK1)				**Prepared: 09/28/21**	**Analyzed: 09/30/21**					
TKN	ND	0.10	mg/l							
Blank (W1I1732-BLK2)				**Prepared: 09/28/21**	**Analyzed: 09/30/21**					
TKN	ND	0.10	mg/l							
LCS (W1I1732-BS1)				**Prepared: 09/28/21**	**Analyzed: 09/30/21**					
TKN	1.05	0.10	mg/l	1.00		105	90-110			
LCS (W1I1732-BS2)				**Prepared: 09/28/21**	**Analyzed: 09/30/21**					
TKN	1.02	0.10	mg/l	1.00		102	90-110			
Matrix Spike (W1I1732-MS1)	**Source: 1I23020-04**			**Prepared: 09/28/21**	**Analyzed: 09/30/21**					
TKN	1.07	0.10	mg/l	1.00	0.0765	99	90-110			
Matrix Spike (W1I1732-MS2)	**Source: 1I23020-05**			**Prepared: 09/28/21**	**Analyzed: 09/30/21**					
TKN	1.04	0.10	mg/l	1.00	0.0897	95	90-110			
Matrix Spike Dup (W1I1732-MSD1)	**Source: 1I23020-04**			**Prepared: 09/28/21**	**Analyzed: 09/30/21**					
TKN	1.07	0.10	mg/l	1.00	0.0765	99	90-110	0.1	10	
Matrix Spike Dup (W1I1732-MSD2)	**Source: 1I23020-05**			**Prepared: 09/28/21**	**Analyzed: 09/30/21**					

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

WECK LABORATORIES, INC.

Certificate of Analysis

FINAL REPORT

Psomas - Santa Ana, CA
3 Hutton Centre Dr., Ste. 200
Santa Ana, CA 92707

Project Number: 2KLE010102

Project Manager: Michael P. Donovan

Reported: 10/08/2021 16:16

Quality Control Results

(Continued)

Conventional Chemistry/Physical Parameters by APHA/EPA/ASTM Methods (Continued)

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch: W1I1732 - EPA 351.2 (Continued)										
Matrix Spike Dup (W1I1732-MSD2)	**Source: 1I23020-05**			**Prepared: 09/28/21**	**Analyzed: 09/30/21**					
TKN	1.07	0.10	mg/l	1.00	0.0897	98	90-110	3	10	
Batch: W1I1835 - SM 2540C										
Blank (W1I1835-BLK1)				**Prepared: 09/28/21**	**Analyzed: 09/29/21**					
Total Dissolved Solids	ND	10	mg/l							
LCS (W1I1835-BS1)				**Prepared: 09/28/21**	**Analyzed: 09/29/21**					
Total Dissolved Solids	829	10	mg/l	824		101	96-102			
Duplicate (W1I1835-DUP1)	**Source: 1I22043-01**			**Prepared: 09/28/21**	**Analyzed: 09/29/21**					
Total Dissolved Solids	2760	10	mg/l		2880			4	10	
Duplicate (W1I1835-DUP2)	**Source: 1I22095-01**			**Prepared: 09/28/21**	**Analyzed: 09/29/21**					
Total Dissolved Solids	1060	10	mg/l		1040			2	10	

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634
www.wecklabs.com

Psomas - Santa Ana, CA 3 Hutton Centre Dr., Ste. 200 Santa Ana, CA 92707	**Project Number:** 2KLE010102 **Project Manager:** Michael P. Donovan	**Reported:** 10/08/2021 16:16

Notes and Definitions

Item	Definition
MS-01	The spike recovery for this QC sample is outside of established control limits possibly due to sample matrix interference.
%REC	Percent Recovery
Dil	Dilution
MRL	The minimum levels, concentrations, or quantities of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. The MRL is also known as Limit of Quantitation (LOQ)
ND	NOT DETECTED at or above the Method Reporting Limit (MRL). If Method Detection Limit (MDL) is reported, then ND means not detected at or above the MDL.
RPD	Relative Percent Difference
Source	Sample that was matrix spiked or duplicated.

Any remaining sample(s) will be disposed of one month from the final report date unless other arrangements are made in advance.

All results are expressed on wet weight basis unless otherwise specified.

All samples collected by Weck Laboratories have been sampled in accordance to laboratory SOP Number MIS002.

14859 Clark Avenue,City of Industry CA, 91745 | Phone: (626) 336-2139 | Fax: (626) 336-2634

www.wecklabs.com

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

1I23020

CHAIN OF CUSTODY FORM

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Nitrate-N EPA Method 300.0	Orthophosphae-OPO4 EPA Method 365.3	Total Dissolved Solids SM2540C	Total Kjeldahl Nitrogenby EPA Method 351.2	NO2+NO3 as N - EPA Method 353.2	Total Nitrogen by calculation	Special Instructions
BC-b\w-PH6	water	60 ml Poly	1	9/22/21	7:45am	None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
BC-b\w-PH5	water	60 ml Poly	1	9/22/21	8:15am	None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
BC-b\w-PH4	water	60 ml Poly	1	9/22/21	8:45am	None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
BC-b\w-PH3	water	60 ml Poly	1	9/22/21	9:30am	None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
BC-b\w-PH2	water	60 ml Poly	1	9/22/21	10:00am	None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	

Relinquished By:	Date /Time:	Received by:	Date /Time:
[signature]	9/22/21 13:30		
Relinquished By: FedEx	Date /Time: 9/23/21 1015	Received by: [signature]	Date /Time:
Relinquished By:	Date /Time:	Received in Lab by:	Date /Time:

Turnaround Time: (Check)
Same Day ______ 72 Hours ______
24 Hours ______ 5 Days ______
48 Hours ______ Normal X

Sample Integrity: (Check)
Intact ______ On Ice 4.3°
T-0254

Weck Laboratories
14859 Clark Avenue
City of Industry, CA 91745
(626) 336-2139

1I23020

CHAIN OF CUSTODY FORM

Client Name/Address:	Project/PO Number:
PSOMAS 3 HUTTON CENTRE DRIVE, SUITE 200 SANTA ANA, CA 92707	2KLE010102
Project Manager: MICHAEL P. DONOVAN (mpdonovn@cox.net)	Phone Number: (714) 328-5234
Sampler: Jim Burton, Todd Bear	Fax Number: 714.545.8883

Analysis Required

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Time	Preservation	Nitrate-N EPA Method 300.0	Orthophosphae-OPO4 EPA Method 365.3	Total Dissolved Solids SM2540C	Total Kjeldahl Nitrogenby EPA Method 351.2	NO2+NO3 as N - EPA Method 353.2	Total Nitrogen by calculation	Special Instructions
BC-blw-LS	water	60 ml Poly	1	9/22/21	10:20	None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
BC-NF-1	water	60 ml Poly	1	9/22/21	10:55 am	None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
BC-blw-SL	water	60 ml Poly	1	9/22/21	11:45 am	None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
	water	60 ml Poly	1			None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	
	water	60 ml Poly	1			None	X						
	water	250 ml Poly	1			None		X					Filtered with 0.45µ
	water	500 ml Poly	1			None			X				
	water	250 ml Poly	1			H2SO4				X	X	X	

Relinquished By:	Date /Time:	Received by:	Date /Time:	
	9/22/21 13:30			Turnaround Time: (Check) Same Day ___ 72 Hours ___ 24 Hours ___ 5 Days ___ 48 Hours ___ Normal X
Relinquished By: FedEx	Date /Time: 9/23/21 1015	Received by:	Date /Time:	
Relinquished By:	Date /Time:	Received in Lab by:	Date /Time:	Sample Integrity: (Check) Intact ___ On Ice 4.3°C

T-0254

LUMINULTRA

15280 NW 79th Court, Suite 107 Miami Lakes, Florida 33016

ACCREDITED CERT # 4126.01

Fecal Host

Fecal Host Quantification ID Test Results Report

Detection and quantification of the fecal host associated gene biomarker by quantitative Polymerase Chain Reaction (qPCR) DNA analytical technology

ND: Not Det DNQ: Detected, Not Quantifiable ROQ: Detected, Quantifiable

Submitter: Psomas
Report Generated: December 22, 2021

SM #	Sample ID	Date Collected	Time Collected	Analysis Requested	Ct, Rep1	Ct, Rep2	Marker Quantified	Results Qualifier	LOD (Limit of detection)	LOQ (Limit of Quantification)	Result Unit
SM21L13019	LS-BR-1	7/26/2021	12:40 PM	Human_HF183	ND	ND	0.00E+00	ND	1.50E+02	5.00E+02	copies per 100ml
SM21L13020	LS-BR-1	7/29/2021	12:10 PM	Human_HF183	ND	ND	0.00E+00	ND	1.50E+02	5.00E+02	copies per 100ml
SM21L13021	INT2-RES-1	7/29/2021	12:20 PM	Human_HF183	ND	ND	0.00E+00	ND	1.50E+02	5.00E+02	copies per 100ml

Reported Results Authorized By: Anda Quintero, Quality Manager

Results reported herein apply only to the sample matrices as received.
Results reported herein relate to the genetic material extracted from the sample matrix processed and included in the analysis.

Revision 2.2
Effective Date: 11/11/2021

15280 NW 79th Court, Suite 107 Miami Lakes, Florida 33016

Fecal Host Quantification ID Test Results Report

Sample Processing and Analysis Information

Submitter: Psomas
Report Generated: December 22, 2021

SM #	Sample ID	Analysis Requested	Sample Type	Processed Date	Extraction Date	Analysis Date	Amount Processed	Amount Processed Unit	Extracted DNA/RNA Volume (ul)	PCR Input Volume (ul)	PCR Plate ID	Sample Comments
SM21L13019	LS-BR-1	Human_HF183	Water	7/28/2021	12/20/2021	12/20/2021	100	ml	100	2	20211220_q01	
SM21L13020	LS-BR-1	Human_HF183	Water	8/2/2021	12/20/2021	12/20/2021	100	ml	100	2	20211220_q01	
SM21L13021	INT2-RES-1	Human_HF183	Water	8/2/2021	12/20/2021	12/20/2021	100	ml	100	2	20211220_q01	

Reported Results Authorized By: Anda Quintero, Quality Manager

Results reported herein apply only to the sample matrices as received.
Results reported herein relate to the genetic material extracted from the sample matrix processed and included in the analysis.

Revision 2.2
Effective Date: 11/11/2021

15280 NW 79th Court, Suite 107 Miami Lakes, Florida 33016

Fecal Host Quantification ID Test Results Report

qPCR Analysis QAQC information

Submitter: Psomas
Report Generated: December 22, 2021

Analysis Requested	PCR Plate ID	Y-intercept	Slope	R^2	Efficiency %	NTC1 (no template control)	NTC2 (no template control)	NTC3 (no template control)	Positive control Ct (if applicable)	Comments
Human_HF183	20211220_q01	36.285	-3.361	1	98.395	ND	ND	ND		

Reported Results Authorized By: Anda Quintero, Quality Manager

Results reported herein apply only to the sample matrices as received.
Results reported herein relate to the genetic material extracted from the sample matrix processed and included in the analysis.

Revision 2.2
Effective Date: 11/11/2021

Laboratory Comments

Submitter: Psomas
Report Generated: December 22, 2021

Non-Detect (ND) Results
In sample(s) classified as non-detect, the host-associated fecal gene biomarker(s) was either not detected in test replicates, one replicate was detected at a cycle threshold greater than 35 and the other was not, or one replicate was detected at a cycle threshold less than 35 and the other was not after repeated analysis.

Detected Not Quantified (DNQ) Results
In sample(s) classified as Detected Not Quantified (DNQ), the host-associated fecal biomarker was detected in both test replicates but in quantities below the limit of quantification (LOQ, see below). This result indicates that fecal indicators associated with the respective host was present in the sample(s) but in low concentrations, and the confidence of such quantification will be lower than that declared by the definition of LOQ.

Quantifiable Results (ROQ)
Sample results are within the range of quantification of calibration curves (standard curves) of a validation qPCR method. For most qPCR assays, the range is 1E1 to 1E5 copies/reaction. Copy number measurements reported are relative, not absolute, quantification.

LOD (Limit of Detection, lower)
A general consensus was reached around the definition of the LOD as the lowest amount of analyte, which can be detected with more than a stated percentage of confidence (95%), but, not necessarily quantified as an exact value. It must be noted that LOD is not a limiting value and therefore, that Ct vlaues below the LOD cannot automatically be considered as negative. From the definition of LOD, it is evident that values below LOD are absolutely valid in terms of microornanism prescence. However, the probabality of their repeated detection is lower than 95%.

LOQ (Limit of Quantification, lower)
The LOQ was defined as the smallest amount of analyte, which can be measured and quantified with defined precision and accuracy under the experimental conditions by the method under validation. Numerically, the LOQ is defined as the lowest concentration of analyte, which gives a predefined variability (coeffecient of variation, CV) of under 25%.

Inhibition check
A 1:10 dilution of the original sample is analyzed togther each time with the undiluted sample to evaluate the effect of PCR inhibition. If the sample is inhibited, where 1:10 dilution produces a high signal than undiluted sample, the 1:10 dilution results will be used for quantification. The use of 1:10 dilution sample results will be reflected in Analytical Volume(ul). For example, if the analytical volume for undiluted sample is 2ul, the analytical volume for 1:10 dilution will be 0.2ul.

Fecal Reference Samples
The client is encouraged to submit fecal samples from suspected sources in the surrounding area in order to gain a better understanding of the concentration of the host-associated biomarker with the regional population. A more precise interpretation would be available to the client with the submittal of such baseline samples.

Result Interpretations
The presence of the biomarker does not signify the presence or absence of that form of fecal pollution conclusively. The most reliable way to accurately test for contamination is to combine genetic testing with scientifically sound and adequate study design appropriate for the environmental quality questions to be answered or issues to be resolved.

Additional Testing
A portion of all samples has been frozen and will be archived for 3 months. The client is encouraged to perform additional tests on the sample(s) for other hosts suspected of contributing to the fecal contamination.

Qualitification Assay Results (Detected/Non-Detected only)
Such results are only reported as Detected or Non-Detected without quantification. Non-Detected results are defined as stated above, and Detected results are defined as detected Ct in both replicate qPCR reactions.

DNA Analytical Method Explanation
Water Samples: Each submitted water sample is filtered through 0.45 micron membrane filter(s). Each filter is placed in a separate, sterile 2ml disposable tube containing a unique mix of beads and lysis buffer. The sample is homogenized for and the DNA extracted per kit manufacturer's protocol. Devitations to these procedures may occur at the client's request.

Non-Water Samples: Each non-water sample submitted by the client is processed as per internal laboratory extraction procedures. An extracted DNA sample is proceed directly to PCR analysis. Details available upon request.

Amplifications to detect the target gene biomarker were run in a final reaction volume of 20ul sample extract, forward primer, reverse primer, probe and an optimized buffer. All assays are run in duplicate. Quantification is achieved by extrapolating target gene copy numbers from a standard curve generated from serial dilutions of known gene copy numbers.

For quality control purposes, a positive control and a negative control, were run alongside the sample(s) to ensure a properly functioning reaction and reveal any false negatives or false positives.

APPENDIX C

2021 LAKE VERTICAL PROFILE DATA SHEETS

TABLE C-1

SOUTH LAKE DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 6/16/2021
Lake Surface Elevation: 9693.20
Outlet Pipe Elevation (ft/msl): 9621

Estimated Barometric Pressure (in Hg) 21.20

Water Surface Elevation (ft msl)	Depth of Measurement		Water Temperature (deg C)	Change in Water Temperature (deg C)	Dissolved Oxygen (mg/L)	% O_2 Saturation*	
	Feet	Meters					
9693.2	0.0	0	---	---	---	---	
9691.6	1.6	0.5	11.9	---	8.13	115.8%	
9689.9	3.3	1	11.9	0.0	8.10	115.4%	
9686.6	6.6	2	11.8	0.1	8.11	115.5%	
9683.4	9.8	3	11.7	0.1	8.13	115.8%	
9680.1	13.1	4	11.6	0.1	8.14	116.0%	
9676.8	16.4	5	11.6	0.0	8.14	116.0%	
9673.5	19.7	6	11.6	0.0	8.15	116.1%	
9670.2	23.0	7	11.5	0.1	8.16	116.3%	
9667.0	26.2	8	11.4	0.1	8.20	116.8%	
9663.7	29.5	9	11.3	0.1	8.24	117.4%	
9660.4	32.8	10	11.1	0.2	8.27	117.8%	
9657.1	36.1	11	11.0	0.1	8.24	117.4%	
9653.8	39.4	12	10.7	0.3	8.35	105.7%	
9650.5	42.7	13	10.4	0.3	8.40	106.3%	
9647.3	45.9	14	9.7	0.7	8.83	109.1%	
9644.0	49.2	15	9.0	0.7	9.12	112.7%	
9640.7	52.5	16	8.7	0.3	9.40	113.4%	
9637.4	55.8	17	8.0	0.7	9.46	114.1%	
9634.1	59.1	18	7.5	0.5	9.53	112.2%	
9630.9	62.3	19	6.9	0.6	9.52	109.3%	
9627.6	65.6	20	6.3	0.6	9.35	107.3%	
9624.3	68.9	21	5.5	0.8	9.18	102.7%	
9621.0	72.2	22	4.9	0.6	8.91	97.1%	<<Outlet
9617.7	75.5	23	4.6	0.3	8.73	95.2%	
9614.5	78.7	24	4.4	0.2	8.48	92.4%	
9611.2	82.0	25	4.3	0.1	8.30	90.5%	
9607.9	85.3	26	4.2	0.1	8.05	87.7%	
9604.6	88.6	27	4.2	0.0	7.73	84.3%	
9601.3	91.9	28	4.2	0.0	7.40	80.7%	
9598.1	95.1	29	4.2	0.0	7.12	77.6%	
9594.8	98.4	30	4.2	0.0	6.60	71.9%	
9591.5	101.7	31	4.2	0.0	5.72	62.3%	
9588.2	105.0	32	4.3	-0.1	4.54	49.5%	
9584.9	108.3	33	4.3	0.0	3.53	38.5%	
9581.7	111.5	34	4.4	-0.1	2.82	30.7%	
9578.4	114.8	35	4.7	-0.3	0.28	3.1%	
9575.1	118.1	36	5.4	-0.7	0.15	1.7%	

TABLE C-1

SOUTH LAKE DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 6/16/2021
Lake Surface Elevation: 9693.20
Outlet Pipe Elevation (ft/msl): 9621

Estimated Barometric Pressure (in Hg) 21.20

Water Surface Elevation (ft msl)	Depth of Measurement		Water Temperature (deg C)	Change in Water Temperature (deg C)	Dissolved Oxygen (mg/L)	% O_2 Saturation*
	Feet	Meters				
9571.8	121.4	37	5.6	-0.2	0.04	0.4%
9568.5	124.7	38	5.9	-0.3	0.03	0.3%
9565.2	128.0	39	6.1	-0.2	0.03	0.3%
9562.0	131.2	40	6.1	0.0	0.00	0.0%
9558.7	134.5	41	6.3	-0.2	0.00	0.0%
9555.4	137.8	42	6.6	-0.3	0.00	0.0%
9552.1	141.1	43	6.7	-0.1	0.00	0.0%
9548.8	144.4	44	7.0	-0.3	0.00	0.0%
9545.6	147.6	45	7.1	-0.1	-0.01	-0.1%
9542.3	150.9	46	7.4	-0.3	-0.01	-0.1%
9539.0	154.2	47	7.6	-0.2	-0.02	-0.2%
9535.7	157.5	48	7.7	-0.1	-0.02	-0.2%
9534.1	159.1	48.5	7.7	0.0	-0.03	-0.4%
		Maximum	**11.9**	**---**	**9.53**	**117.8%**
		Minimum	**4.2**	**---**	**-0.03**	**-0.4%**

* - Saturation based on calculated DO saturation at reported water temperature and ambient barometric pressure.

TABLE C-2

SOUTH LAKE DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 7/27/2021
Lake Surface Elevation: 9676.00
Outlet Pipe Elevation (ft/msl): 9621

Barometric Pressure (in Hg) 21.18

Water Surface Elevation (ft msl)	Depth of Measurement		Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **	
	Feet	Meters					
9676	---	---	---	---	---	---	
9674.4	1.6	0.5	17.4	---	7.31	108.0%	
9672.7	3.3	1	17.4	0.0	7.33	108.3%	
9669.4	6.6	2	17.4	0.0	7.34	108.5%	
9666.2	9.8	3	17.4	0.0	7.34	108.5%	
9662.9	13.1	4	17.3	0.1	7.35	108.6%	
9659.6	16.4	5	17.1	0.2	7.44	110.0%	
9656.3	19.7	6	16.9	0.2	7.48	108.3%	
9653.0	23.0	7	16.8	0.1	7.60	110.0%	
9649.8	26.2	8	16.5	0.3	7.53	109.0%	
9646.5	29.5	9	16.4	0.1	7.57	109.6%	
9643.2	32.8	10	16.1	0.3	7.68	111.2%	
9639.9	36.1	11	16.0	0.1	7.85	113.6%	
9636.6	39.4	12	15.4	0.6	8.13	115.2%	
9633.3	42.7	13	14.8	0.6	8.27	114.6%	
9630.1	45.9	14	14.2	0.6	8.26	114.5%	
9626.8	49.2	15	13.5	0.7	8.16	110.6%	
9625.1	50.9	15.5	11.6	---	8.08	115.1%	
9623.5	52.5	16	10.6	**2.9**	8.27	104.7%	
9621.9	54.1	16.5	8.4	**3.2**	8.64	104.2%	
9620.2	55.8	17	7.1	**3.5**	8.80	103.6%	<<Outlet
9616.9	59.1	18	5.8	**1.3**	8.80	98.4%	
9613.7	62.3	19	5.1	0.7	8.65	96.8%	
9610.4	65.6	20	4.8	0.3	8.40	91.6%	
9607.1	68.9	21	4.7	0.1	8.15	88.8%	
9603.8	72.2	22	4.5	0.2	7.80	85.0%	
9600.5	75.5	23	4.4	0.1	7.42	80.9%	
9597.3	78.7	24	4.4	0.0	6.91	75.3%	
9594.0	82.0	25	4.4	0.0	6.29	68.6%	
9590.7	85.3	26	4.4	0.0	5.32	58.0%	
9587.4	88.6	27	4.4	0.0	4.46	48.6%	
9584.1	91.9	28	4.5	-0.1	2.55	27.8%	
9580.9	95.1	29	4.6	-0.1	1.03	11.2%	
9577.6	98.4	30	4.8	-0.2	0.13	1.4%	
9574.3	101.7	31	5.4	-0.6	0.03	0.3%	
9571.0	105.0	32	5.7	-0.3	0.01	0.1%	

TABLE C-2

SOUTH LAKE DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 7/27/2021
Lake Surface Elevation: 9676.00
Outlet Pipe Elevation (ft/msl): 9621

Barometric Pressure (in Hg) 21.18

Water Surface Elevation (ft msl)	Depth of Measurement: Feet	Depth of Measurement: Meters	Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **
9567.7	108.3	33	5.9	-0.2	0.00	0.0%
9564.5	111.5	34	6.1	-0.2	0.09	1.0%
9561.2	114.8	35	6.3	-0.2	0.06	0.7%
9557.9	118.1	36	6.5	-0.2	0.03	0.3%
9554.6	121.4	37	6.7	-0.2	0.02	0.2%
9551.3	124.7	38	6.9	-0.2	0.01	0.1%
9548.0	128.0	39	7.1	-0.2	-0.01	-0.1%
9544.8	131.2	40	7.3	-0.2	-0.01	-0.1%
9541.5	134.5	41	7.5	-0.2	-0.02	-0.2%
9538.2	137.8	42	7.6	-0.1	-0.02	-0.2%
9534.9	141.1	43	7.7	-0.1	-0.03	-0.4%
9531.6	144.4	44	7.7	0.0	-0.04	-0.5%
9529.0	147.0	44.8	7.8	-0.1	-0.04	-0.5%
		Maximum	**17.4**	---	**8.80**	**115.2%**
		Minimum	**4.4**	---	**-0.04**	**-0.5%**

* - **Bold** values indicate thermocline (1 deg change in one meter).

** - Saturation based on calculated DO saturation at reported water temperature and ambient barometric pressure.

TABLE C-3

SOUTH LAKE DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 8/23/2021
Lake Surface Elevation: 9664.61
Outlet Pipe Elevation (ft/msl): 9621

Barometric Pressure (in Hg) 20.95

Water Surface Elevation (ft msl)	Depth of Measurement		Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **	
	Feet	Meters					
9664.61	0.0	0	16.1	---	7.47	108.1%	
9663.0	1.6	0.5	16.1	---	7.43	107.5%	
9661.3	3.3	1	16.0	0.1	7.41	107.3%	
9658.0	6.6	2	16.0	0.0	7.40	107.1%	
9654.8	9.8	3	16.0	0.0	7.40	107.1%	
9651.5	13.1	4	16.0	0.0	7.39	107.0%	
9648.2	16.4	5	16.0	0.0	7.39	107.0%	
9644.9	19.7	6	16.0	0.0	7.38	106.8%	
9641.6	23.0	7	16.0	0.0	7.38	106.8%	
9638.4	26.2	8	16.0	0.0	7.38	106.8%	
9635.1	29.5	9	16.0	0.0	7.37	106.7%	
9631.8	32.8	10	15.7	0.3	7.38	104.6%	
9628.5	36.1	11	15.6	0.1	7.36	104.3%	
9625.2	39.4	12	14.2	**1.4**	7.30	101.2%	
9623.6	41.0	12.5	11.8	**2.4**	7.56	107.7%	
9622.0	42.7	13	9.3	**2.5**	8.30	102.6%	
9620.3	44.3	13.5	7.1	**2.2**	8.61	101.3%	<<Outlet
9618.7	45.9	14	6.1	**1.0**	8.57	98.4%	
9617.0	47.6	14.5	5.5	0.6	8.46	94.6%	
9615.4	49.2	15	5.3	0.2	8.31	93.0%	
9612.1	52.5	16	4.8	0.5	8.06	87.8%	
9608.8	55.8	17	4.6	0.2	7.88	85.9%	
9605.6	59.1	18	4.5	0.1	7.55	82.3%	
9602.3	62.3	19	4.5	0.0	7.26	79.1%	
9599.0	65.6	20	4.5	0.0	6.95	75.8%	
9595.7	68.9	21	4.5	0.0	6.30	68.7%	
9592.4	72.2	22	4.5	0.0	5.50	59.9%	
9589.2	75.5	23	4.4	0.1	4.87	53.1%	
9585.9	78.7	24	4.5	-0.1	3.27	35.6%	
9582.6	82.0	25	4.6	-0.1	1.40	15.3%	
9579.3	85.3	26	5.0	-0.4	0.15	1.7%	
9576.0	88.6	27	5.4	-0.4	0.06	0.7%	
9572.7	91.9	28	5.7	-0.3	0.05	0.6%	
9569.5	95.1	29	5.9	-0.2	0.03	0.3%	
9566.2	98.4	30	6.0	-0.1	0.02	0.2%	
9562.9	101.7	31	6.2	-0.2	0.01	0.1%	
9559.6	105.0	32	6.3	-0.1	0.01	0.1%	
9556.3	108.3	33	6.6	-0.3	0.00	0.0%	

TABLE C-3

SOUTH LAKE DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 8/23/2021
Lake Surface Elevation: 9664.61
Outlet Pipe Elevation (ft/msl): 9621

Barometric Pressure (in Hg) 20.95

Water Surface Elevation (ft msl)	Depth of Measurement Feet	Meters	Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **
9553.1	111.5	34	6.9	-0.3	0.00	0.0%
9549.8	114.8	35	7.1	-0.2	0.00	0.0%
9546.5	118.1	36	7.3	-0.2	0.00	0.0%
9543.2	121.4	37	7.5	-0.2	0.00	0.0%
9539.9	124.7	38	7.6	-0.1	0.00	0.0%
9536.7	128.0	39	7.7	-0.1	0.00	0.0%
9534.0	130.6	39.8	7.7	0.0	-0.01	-0.1%
		Maximum	**16.1**	---	**8.61**	**107.7%**
		Minimum	**4.4**	---	**-0.01**	**-0.1%**

* - **Bold** values indicate thermocline (1 deg change in one meter).

** - Saturation based on calculated DO saturation at reported water temperature and ambient barometric pressure.

TABLE C-4

SOUTH LAKE DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 9/21/2021
Lake Surface Elevation: 9648.37
Outlet Pipe Elevation (ft/msl): 9621

Barometric Pressure (in Hg) 21.25

Water Surface Elevation (ft msl)	Depth of Measurement		Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **	
	Feet	Meters					
9648.37	0.0	0	13.5	---	7.75	---	
9646.7	1.6	0.5	13.3	---	7.70	104.4%	
9645.1	3.3	1	13.3	0.0	7.69	104.3%	
9641.8	6.6	2	13.3	0.0	7.67	104.0%	
9638.5	9.8	3	13.2	0.1	7.67	104.0%	
9635.2	13.1	4	13.2	0.0	7.67	104.0%	
9632.0	16.4	5	13.2	0.0	7.67	104.0%	
9628.7	19.7	6	13.2	0.0	7.66	103.9%	
9625.4	23.0	7	13.1	0.1	7.65	103.7%	
9622.1	26.2	8	12.3	0.8	7.83	103.8%	
9620.5	27.9	8.5	11.1	---	8.15	116.1%	<<Outlet
9619.7	28.7	8.75	9.6	---	8.71	107.6%	
9618.8	29.5	9	8.4	**3.9**	8.91	107.5%	
9618.0	30.3	9.25	7.4	---	8.94	105.2%	
9617.2	31.2	9.5	6.9	**4.2**	8.82	101.2%	
9615.6	32.8	10	5.9	**2.5**	8.84	98.9%	
9612.3	36.1	11	5.4	0.5	8.43	94.3%	
9609.0	39.4	12	5.1	0.3	8.10	90.6%	
9605.7	42.7	13	4.9	0.2	7.76	84.6%	
9602.4	45.9	14	4.8	0.1	7.40	80.7%	
9599.2	49.2	15	4.7	0.1	6.80	74.1%	
9595.9	52.5	16	4.6	0.1	5.66	61.7%	
9592.6	55.8	17	4.6	0.0	4.95	54.0%	
9589.3	59.1	18	4.6	0.0	4.02	43.8%	
9586.0	62.3	19	4.7	-0.1	2.50	27.2%	
9582.8	65.6	20	4.8	-0.1	0.23	2.5%	
9579.5	68.9	21	5.1	-0.3	0.13	1.5%	
9576.2	72.2	22	5.5	-0.4	0.08	0.9%	
9572.9	75.5	23	5.8	-0.3	0.06	0.7%	
9569.6	78.7	24	5.9	-0.1	0.05	0.6%	
9566.3	82.0	25	6.1	-0.2	0.05	0.6%	
9563.1	85.3	26	6.3	-0.2	0.04	0.5%	
9559.8	88.6	27	6.5	-0.2	0.03	0.3%	
9556.5	91.9	28	6.7	-0.2	0.02	0.2%	
9553.2	95.1	29	6.9	-0.2	0.02	0.2%	
9549.9	98.4	30	7.2	-0.3	0.02	0.2%	
9546.7	101.7	31	7.4	-0.2	0.03	0.4%	
9543.4	105.0	32	7.5	-0.1	0.01	0.1%	
9540.1	108.3	33	7.6	-0.1	0.00	0.0%	

TABLE C-4

SOUTH LAKE DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 9/21/2021
Lake Surface Elevation: 9648.37
Outlet Pipe Elevation (ft/msl): 9621

Barometric Pressure (in Hg) 21.25

Water Surface Elevation (ft msl)	Depth of Measurement		Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **
	Feet	Meters				
9536.8	111.5	34	7.7	-0.1	0.01	0.1%
9533.2	115.2	35.1	7.7	0.0	0.00	0.0%
		Maximum	**13.5**	---	**8.94**	**116.1%**
		Minimum	**4.6**	---	**0.00**	**0.0%**

* - **Bold** values indicate thermocline (1 deg change in one meter).

** - Saturation based on calculated DO saturation at reported water temperature and ambient barometric pressure.

TABLE C-5

SOUTH LAKE DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 10/5/2021
Lake Surface Elevation: 9641.70
Outlet Pipe Elevation (ft/msl): 9621

Barometric Pressure (in Hg) 21.00

Water Surface Elevation (ft msl)	Depth of Measurement		Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **	
	Feet	Meters					
9641.7	0.0	0	10.6	---	8.03	---	
9640.1	1.6	0.5	10.7	---	8.03	101.6%	
9638.4	3.3	1	10.7	0.0	8.02	101.5%	
9635.1	6.6	2	10.6	0.1	8.02	101.5%	
9631.9	9.8	3	10.5	0.1	8.02	101.5%	
9628.6	13.1	4	10.5	0.0	8.01	101.4%	
9625.3	16.4	5	10.5	0.0	8.01	101.4%	
9622.0	19.7	6	10.4	0.1	8.02	101.5%	<<Outlet
9618.7	23.0	7	10.2	0.2	8.01	101.4%	
9615.5	26.2	8	9.0	**1.2**	8.25	102.0%	
9614.6	27.1	8.25	8.3	**---**	8.41	101.4%	
9613.8	27.9	8.5	7.3	**---**	8.49	99.9%	
9612.2	29.5	9	6.6	**2.4**	8.39	96.3%	
9610.5	31.2	9.5	5.9	**---**	8.51	95.2%	
9608.9	32.8	10	5.6	**1.0**	8.31	93.0%	
9605.6	36.1	11	5.2	0.4	7.92	88.6%	
9602.3	39.4	12	4.9	0.3	7.40	80.7%	
9599.0	42.7	13	4.8	0.1	6.80	74.1%	
9595.8	45.9	14	4.7	0.1	5.57	60.7%	
9592.5	49.2	15	4.7	0.0	4.70	51.2%	
9589.2	52.5	16	4.7	0.0	3.30	36.0%	
9585.9	55.8	17	4.7	0.0	2.10	22.9%	
9582.6	59.1	18	4.9	-0.2	0.25	2.7%	
9579.4	62.3	19	5.1	-0.2	0.19	2.1%	
9576.1	65.6	20	5.5	-0.4	0.14	1.6%	
9572.8	68.9	21	5.7	-0.2	0.11	1.2%	
9569.5	72.2	22	5.9	-0.2	0.09	1.0%	
9566.2	75.5	23	6.0	-0.1	0.08	0.9%	
9563.0	78.7	24	6.2	-0.2	0.07	0.8%	
9559.7	82.0	25	6.5	-0.3	0.06	0.7%	
9556.4	85.3	26	6.7	-0.2	0.05	0.6%	
9553.1	88.6	27	6.9	-0.2	0.15	1.7%	
9549.8	91.9	28	7.2	-0.3	0.10	1.2%	
9546.6	95.1	29	7.3	-0.1	0.09	1.1%	
9543.3	98.4	30	7.5	-0.2	0.07	0.8%	
9540.0	101.7	31	7.6	-0.1	0.06	0.7%	

TABLE C-5

SOUTH LAKE DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 10/5/2021

Lake Surface Elevation: 9641.70

Outlet Pipe Elevation (ft/msl): 9621

Barometric Pressure (in Hg) 21.00

Water Surface Elevation (ft msl)	Depth of Measurement		Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **
	Feet	Meters				
9536.7	105.0	32	7.7	-0.1	0.05	0.6%
9535.1	106.6	32.5	7.7	0.0	0.04	0.5%
		Maximum	**10.7**	**---**	**8.51**	**102.0%**
		Minimum	**4.7**	**---**	**0.04**	**0.5%**

* - **Bold** values indicate thermocline (1 deg change in one meter).

** - Saturation based on calculated DO saturation at reported water temperature and ambient barometric pressure.

TABLE C-6

LAKE SABRINA DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 6/17/2021
Lake Surface Elevation: 9099.50
Outlet Pipe Elevation (ft/msl): 9068

Estimated Barometric Pressure (in Hg) 21.60

Water Surface Elevation (ft msl)	Depth of Measurement Feet	Meters	Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **	
9099.5	0.0	0	---	---	---	---	
9097.9	1.6	0.5	13.4	---	8.21	108.2%	
9096.2	3.3	1	13.4	0.0	8.23	108.5%	
9092.9	6.6	2	13.3	0.1	8.23	108.5%	
9089.7	9.8	3	13.3	0.0	8.24	108.6%	
9086.4	13.1	4	13.3	0.0	8.24	108.6%	
9083.1	16.4	5	13.2	0.1	8.25	108.7%	
9079.8	19.7	6	12.8	0.4	8.43	108.6%	
9076.5	23.0	7	12.6	0.2	8.50	109.5%	
9073.3	26.2	8	11.9	0.7	8.77	121.5%	
9070.0	29.5	9	10.6	**1.3**	9.39	115.5%	
9066.7	32.8	10	9.6	**1.0**	9.78	117.5%	<<Outlet
9063.4	36.1	11	8.7	0.9	10.01	117.4%	
9060.1	39.4	12	8.3	0.4	10.02	117.5%	
9056.8	42.7	13	7.7	0.6	10.09	115.4%	
9053.6	45.9	14	7.1	0.6	10.16	116.2%	
9050.3	49.2	15	6.6	0.5	10.16	113.4%	
9047.0	52.5	16	6.3	0.3	10.05	112.1%	
9043.7	55.8	17	6.0	0.3	9.83	109.7%	
9040.4	59.1	18	5.6	0.4	9.50	103.3%	
9037.2	62.3	19	5.5	0.1	9.35	101.7%	
9033.9	65.6	20	5.2	0.3	9.10	99.0%	
9030.6	68.9	21	5.1	0.1	8.84	96.1%	
9027.3	72.2	22	5.0	0.1	8.53	92.8%	
9024.0	75.5	23	4.9	0.1	8.44	89.4%	
9020.8	78.7	24	4.8	0.1	8.35	88.5%	
9017.5	82.0	25	4.7	0.1	8.30	88.0%	
9014.2	85.3	26	4.6	0.1	8.26	87.5%	
9010.9	88.6	27	4.6	0.0	8.25	87.4%	
9007.6	91.9	28	4.6	0.0	8.20	86.9%	
9004.4	95.1	29	4.6	0.0	8.20	86.9%	
9001.1	98.4	30	4.5	0.1	8.21	87.0%	
8997.8	101.7	31	4.5	0.0	8.21	87.0%	
8994.5	105.0	32	4.5	0.0	8.19	86.8%	
8991.2	108.3	33	4.5	0.0	8.17	86.6%	
8988.0	111.5	34	4.5	0.0	8.16	86.5%	
8984.7	114.8	35	4.4	0.1	8.15	86.4%	
8981.4	118.1	36	4.4	0.0	8.12	86.0%	

TABLE C-6

LAKE SABRINA DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 6/17/2021
Lake Surface Elevation: 9099.50
Outlet Pipe Elevation (ft/msl): 9068
Estimated Barometric Pressure (in Hg): 21.60

Water Surface Elevation (ft msl)	Depth of Measurement Feet	Depth of Measurement Meters	Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **
8978.1	121.4	37	4.4	0.0	8.05	85.3%
8974.8	124.7	38	4.4	0.0	7.98	84.6%
8971.5	128.0	39	4.4	0.0	8.00	84.8%
8968.3	131.2	40	4.3	0.1	8.01	84.9%
8965.0	134.5	41	4.3	0.0	8.01	84.9%
8961.7	137.8	42	4.3	0.0	8.02	85.0%
8958.4	141.1	43	4.3	0.0	8.02	85.0%
8955.1	144.4	44	4.3	0.0	8.01	84.9%
8951.9	147.6	45	4.3	0.0	7.97	84.5%
8948.6	150.9	46	4.3	0.0	7.95	84.2%
8945.3	154.2	47	4.3	0.0	7.80	82.7%
8942.0	157.5	48	4.2	0.1	7.82	82.9%
8938.7	160.8	49	4.2	0.0	7.86	83.3%
8935.5	164.0	50	4.2	0.0	7.86	83.3%
8932.2	167.3	51	4.2	0.0	7.75	82.1%
8928.9	170.6	52	4.2	0.0	7.70	81.6%
8925.6	173.9	53	4.2	0.0	7.64	81.0%
8922.3	177.2	54	4.3	-0.1	7.51	79.6%
8919.1	180.4	55	4.3	0.0	7.42	78.6%
8915.8	183.7	56	4.3	0.0	7.36	78.0%
8912.5	187.0	57	4.3	0.0	7.23	76.6%
8909.2	190.3	58	4.2	0.1	7.15	75.8%
8905.9	193.6	59	4.2	0.0	7.02	74.4%
8902.7	196.8	60	4.2	0.0	6.76	71.6%
8899.4	200.1	61	4.2	0.0	6.63	70.3%
8896.1	203.4	62	4.2	0.0	6.54	69.3%
8892.8	206.7	63	4.2	0.0	6.06	64.2%
8889.5	210.0	64	4.2	0.0	5.59	59.2%
8886.2	213.3	65	4.2	0.0	5.05	53.5%
8885.3	214.2	65.3	4.2	0.0	4.70	49.8%
		Maximum	**13.4**	---	**10.16**	**121.5%**
		Minimum	**4.2**	---	**4.70**	**49.8%**

* - **Bold** values indicate thermocline (1 deg change in one meter).

** - Saturation based on calculated DO saturation at reported water temperature and ambient barometric pressure.

TABLE C-7

LAKE SABRINA DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 7/28/2021
Lake Surface Elevation: 9098.58
Outlet Pipe Elevation (ft/msl): 9068

Barometric Pressure (in Hg) 21.70

Water Surface Elevation (ft msl)	Depth of Measurement		Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **	
	Feet	Meters					
9098.58	0.0	0	---	---	---	---	
9096.9	1.6	0.5	18.1	---	7.08	103.9%	
9095.3	3.3	1	18.1	0.0	7.06	103.6%	
9092.0	6.6	2	18.1	0.0	7.05	103.4%	
9088.7	9.8	3	18.1	0.0	7.04	103.3%	
9085.5	13.1	4	18.1	0.0	7.04	103.3%	
9082.2	16.4	5	18.0	0.1	7.14	104.7%	
9078.9	19.7	6	17.4	0.6	7.32	105.2%	
9075.6	23.0	7	16.8	0.6	7.58	106.7%	
9074.0	24.6	7.5	15.5	---	8.45	116.4%	
9072.3	26.2	8	14.5	**2.3**	8.75	117.9%	
9070.7	27.9	8.5	13.4	**2.1**	9.00	118.6%	
9069.1	29.5	9	12.5	**2.0**	9.20	118.6%	<<Outlet
9065.8	32.8	10	11.2	**1.3**	9.42	130.5%	
9062.5	36.1	11	10.2	**1.0**	9.62	118.4%	
9059.2	39.4	12	9.3	0.9	9.70	116.6%	
9055.9	42.7	13	8.5	0.8	9.77	114.6%	
9052.6	45.9	14	7.9	0.6	9.76	111.7%	
9049.4	49.2	15	7.3	0.6	9.75	111.6%	
9046.1	52.5	16	6.7	0.6	9.56	106.7%	
9042.8	55.8	17	6.3	0.4	9.30	103.8%	
9039.5	59.1	18	6.0	0.3	9.13	101.9%	
9036.2	62.3	19	5.8	0.2	8.95	97.3%	
9033.0	65.6	20	5.5	0.3	8.61	93.6%	
9029.7	68.9	21	5.3	0.2	8.38	91.1%	
9026.4	72.2	22	5.2	0.1	8.10	88.1%	
9023.1	75.5	23	5.1	0.1	7.85	85.4%	
9019.8	78.7	24	4.9	0.2	7.83	83.0%	
9016.6	82.0	25	4.8	0.1	7.77	82.3%	
9013.3	85.3	26	4.8	0.0	7.71	81.7%	
9010.0	88.6	27	4.7	0.1	7.62	80.7%	
9006.7	91.9	28	4.6	0.1	7.61	80.6%	
9003.4	95.1	29	4.6	0.0	7.57	80.2%	
9000.2	98.4	30	4.6	0.0	7.56	80.1%	
8996.9	101.7	31	4.5	0.1	7.54	79.9%	
8993.6	105.0	32	4.5	0.0	7.53	79.8%	
8990.3	108.3	33	4.5	0.0	7.52	79.7%	
8987.0	111.5	34	4.5	0.0	7.51	79.6%	
8983.8	114.8	35	4.4	0.1	7.49	79.4%	
8980.5	118.1	36	4.4	0.0	7.48	79.3%	
8977.2	121.4	37	4.4	0.0	7.44	78.8%	

TABLE C-7

LAKE SABRINA DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 7/28/2021
Lake Surface Elevation: 9098.58
Outlet Pipe Elevation (ft/msl): 9068

Barometric Pressure (in Hg) 21.70

Water Surface Elevation (ft msl)	Depth of Measurement Feet	Meters	Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **
8973.9	124.7	38	4.4	0.0	7.43	78.7%
8970.6	128.0	39	4.3	0.1	7.40	78.4%
8967.3	131.2	40	4.3	0.0	7.38	78.2%
8964.1	134.5	41	4.3	0.0	7.38	78.2%
8960.8	137.8	42	4.3	0.0	7.38	78.2%
8957.5	141.1	43	4.3	0.0	7.38	78.2%
8954.2	144.4	44	4.3	0.0	7.34	77.8%
8950.9	147.6	45	4.2	0.1	7.32	77.6%
8947.7	150.9	46	4.3	-0.1	7.20	76.3%
8944.4	154.2	47	4.3	0.0	7.10	75.2%
8941.1	157.5	48	4.3	0.0	6.95	73.6%
8937.8	160.8	49	4.3	0.0	6.85	72.6%
8934.5	164.0	50	4.3	0.0	6.74	71.4%
8931.3	167.3	51	4.3	0.0	6.60	69.9%
8928.0	170.6	52	4.3	0.0	6.40	67.8%
8924.7	173.9	53	4.3	0.0	6.32	67.0%
8921.4	177.2	54	4.3	0.0	6.29	66.7%
8918.1	180.4	55	4.3	0.0	6.28	66.5%
8914.9	183.7	56	4.3	0.0	5.99	63.5%
8911.6	187.0	57	4.3	0.0	5.91	62.6%
8908.3	190.3	58	4.3	0.0	5.75	60.9%
8905.0	193.6	59	4.3	0.0	5.25	55.6%
8901.7	196.8	60	4.3	0.0	5.02	53.2%
8898.4	200.1	61	4.3	0.0	4.67	49.5%
8895.2	203.4	62	4.3	0.0	4.43	46.9%
8891.9	206.7	63	4.3	0.0	4.33	45.9%
		Maximum	**18.1**	---	**9.77**	**130.5%**
		Minimum	**4.2**	---	**4.33**	**45.9%**

* - **Bold** values indicate thermocline (1 deg change in one meter).

** - Saturation based on calculated DO saturation at reported water temperature and ambient barometric pressure.

TABLE C-8

LAKE SABRINA DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 8/24/2021
Lake Surface Elevation: 9099.31
Outlet Pipe Elevation (ft msl): 9068

Barometric Pressure (in Hg) 21.50

Water Surface Elevation (ft msl)	Depth of Measurement Feet	Meters	Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **	
9099.31	0.0	0	16.3	---	7.63	108.9%	
9097.7	1.6	0.5	16.4	---	7.62	108.7%	
9096.0	3.3	1	16.4	0.0	7.61	108.6%	
9092.7	6.6	2	16.4	0.0	7.61	108.6%	
9089.5	9.8	3	16.4	0.0	7.60	108.5%	
9086.2	13.1	4	16.4	0.0	7.59	108.3%	
9082.9	16.4	5	16.4	0.0	7.59	108.3%	
9079.6	19.7	6	16.4	0.0	7.58	108.2%	
9076.3	23.0	7	16.4	0.0	7.61	108.6%	
9073.1	26.2	8	16.4	0.0	7.63	108.9%	
9069.8	29.5	9	15.5	0.9	8.76	122.4%	
9068.1	31.2	9.5	14.6	---	9.65	131.9%	<<Outlet
9066.5	32.8	10	13.4	**2.1**	10.29	137.5%	
9064.9	34.4	10.5	11.9	**2.7**	10.39	145.9%	
9063.2	36.1	11	11.0	**2.4**	10.39	145.9%	
9059.9	39.4	12	10.1	0.9	10.41	129.9%	
9056.7	42.7	13	9.3	0.8	10.38	126.5%	
9053.4	45.9	14	8.5	0.8	10.38	123.4%	
9050.1	49.2	15	7.6	0.9	10.26	119.0%	
9046.8	52.5	16	7.1	0.5	10.01	116.1%	
9043.5	55.8	17	6.5	0.6	9.63	109.0%	
9040.3	59.1	18	6.1	0.4	9.40	106.4%	
9037.0	62.3	19	5.8	0.3	8.95	98.7%	
9033.7	65.6	20	5.7	0.1	8.65	95.4%	
9030.4	68.9	21	5.3	0.4	8.10	89.3%	
9027.1	72.2	22	5.2	0.1	7.93	87.5%	
9023.9	75.5	23	5.1	0.1	7.75	85.5%	
9020.6	78.7	24	5.0	0.1	7.59	83.7%	
9017.3	82.0	25	4.8	0.2	7.49	80.5%	
9014.0	85.3	26	4.8	0.0	7.46	80.2%	
9010.7	88.6	27	4.7	0.1	7.37	79.2%	
9007.4	91.9	28	4.7	0.0	7.22	77.6%	
9004.2	95.1	29	4.7	0.0	7.07	76.0%	
9000.9	98.4	30	4.6	0.1	7.08	76.1%	
8997.6	101.7	31	4.6	0.0	7.09	76.2%	
8994.3	105.0	32	4.6	0.0	7.08	76.1%	
8991.0	108.3	33	4.6	0.0	6.98	75.0%	
8987.8	111.5	34	4.5	0.1	6.95	74.7%	
8984.5	114.8	35	4.5	0.0	6.97	74.9%	
8981.2	118.1	36	4.5	0.0	6.96	74.8%	

TABLE C-8

LAKE SABRINA DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 8/24/2021
Lake Surface Elevation: 9099.31
Outlet Pipe Elevation (ft msl): 9068

Barometric Pressure (in Hg) 21.50

Water Surface Elevation (ft msl)	Depth of Measurement Feet	Depth of Measurement Meters	Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **
8977.9	121.4	37	4.5	0.0	6.93	74.5%
8974.6	124.7	38	4.5	0.0	6.93	74.5%
8971.4	128.0	39	4.4	0.1	6.97	74.9%
8968.1	131.2	40	4.4	0.0	6.98	75.0%
8964.8	134.5	41	4.4	0.0	7.10	76.3%
8961.5	137.8	42	4.4	0.0	6.90	74.1%
8958.2	141.1	43	4.4	0.0	6.88	73.9%
8955.0	144.4	44	4.3	0.1	6.83	73.4%
8951.7	147.6	45	4.3	0.0	6.72	72.2%
8948.4	150.9	46	4.3	0.0	6.69	71.9%
8945.1	154.2	47	4.3	0.0	6.45	69.3%
8941.8	157.5	48	4.3	0.0	6.28	67.5%
8938.5	160.8	49	4.3	0.0	6.26	67.3%
8935.3	164.0	50	4.5	-0.2	6.46	69.4%
8932.0	167.3	51	4.4	0.1	6.46	69.4%
8928.7	170.6	52	4.4	0.0	6.38	68.6%
8925.4	173.9	53	4.4	0.0	6.23	66.9%
8922.1	177.2	54	4.4	0.0	6.16	66.2%
8918.9	180.4	55	4.4	0.0	6.00	64.5%
8915.6	183.7	56	4.4	0.0	5.98	64.3%
8912.3	187.0	57	4.3	0.1	5.92	63.6%
8909.0	190.3	58	4.3	0.0	5.84	62.8%
8905.7	193.6	59	4.3	0.0	5.76	61.9%
8902.5	196.8	60	4.3	0.0	5.65	60.7%
8899.2	200.1	61	4.3	0.0	5.40	58.0%
8895.9	203.4	62	4.3	0.0	4.45	47.8%
8895.2	204.1	62.2	4.3	0.0	4.23	45.5%
		Maximum	**16.4**	**---**	**10.41**	**145.9%**
		Minimum	**4.3**	**---**	**4.23**	**45.5%**

* - **Bold** values indicate thermocline (1 deg change in one meter).

** - Saturation based on calculated DO saturation at reported water temperature and ambient barometric pressure.

TABLE C-9

LAKE SABRINA DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 9/20/2021
Lake Surface Elevation: 9096.74
Outlet Pipe Elevation (ft msl): 9068

Barometric Pressure (in Hg) 21.55

Water Surface Elevation (ft msl)	Depth of Measurement Feet	Meters	Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **	
9096.74	0.0	0	13.9	---	8.15	---	
9095.1	1.6	0.5	14.0	---	8.08	108.9%	
9093.5	3.3	1	14.0	0.0	8.05	108.5%	
9090.2	6.6	2	14.1	-0.1	8.02	108.1%	
9086.9	9.8	3	14.1	0.0	8.00	107.8%	
9083.6	13.1	4	14.1	0.0	7.99	107.7%	
9080.3	16.4	5	14.1	0.0	7.98	107.5%	
9077.1	19.7	6	14.1	0.0	7.97	107.4%	
9073.8	23.0	7	14.1	0.0	7.96	107.3%	
9070.5	26.2	8	14.1	0.0	7.96	107.3%	
9067.2	29.5	9	14.1	0.0	7.95	107.1%	<<Outlet
9063.9	32.8	10	14.1	0.0	7.95	107.1%	
9060.7	36.1	11	13.3	0.8	8.44	111.2%	
9059.0	37.7	11.5	12.0	---	9.41	121.3%	
9057.4	39.4	12	10.0	**3.3**	10.18	125.3%	
9055.7	41.0	12.5	9.4	**2.6**	10.29	123.6%	
9054.1	42.7	13	9.0	**1.0**	10.31	123.9%	
9050.8	45.9	14	8.3	0.7	10.26	120.3%	
9047.5	49.2	15	7.7	0.6	10.15	116.1%	
9044.2	52.5	16	7.1	0.6	10.04	114.9%	
9041.0	55.8	17	6.7	0.4	9.80	109.4%	
9037.7	59.1	18	6.4	0.3	9.50	106.0%	
9034.4	62.3	19	6.0	0.4	9.16	102.2%	
9031.1	65.6	20	5.7	0.3	8.74	95.1%	
9027.8	68.9	21	5.5	0.2	8.38	91.1%	
9024.6	72.2	22	5.4	0.1	8.15	88.6%	
9021.3	75.5	23	5.2	0.2	7.95	86.5%	
9018.0	78.7	24	5.0	0.2	8.00	87.0%	
9014.7	82.0	25	5.0	0.0	7.53	81.9%	
9011.4	85.3	26	4.8	0.2	7.47	79.2%	
9008.2	88.6	27	4.8	0.0	7.35	77.9%	
9004.9	91.9	28	4.7	0.1	7.44	78.8%	
9001.6	95.1	29	4.7	0.0	7.37	78.1%	
8998.3	98.4	30	4.6	0.1	7.36	78.0%	
8995.0	101.7	31	4.6	0.0	7.20	76.3%	
8991.8	105.0	32	4.6	0.0	7.30	77.4%	
8988.5	108.3	33	4.5	0.1	7.18	76.1%	
8985.2	111.5	34	4.5	0.0	7.19	76.2%	
8981.9	114.8	35	4.5	0.0	7.33	77.7%	
8978.6	118.1	36	4.5	0.0	7.02	74.4%	
8975.3	121.4	37	4.4	0.1	7.07	74.9%	

TABLE C-9

LAKE SABRINA DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 9/20/2021
Lake Surface Elevation: 9096.74
Outlet Pipe Elevation (ft msl): 9068

Barometric Pressure (in Hg) 21.55

Water Surface Elevation (ft msl)	Depth of Measurement Feet	Depth of Measurement Meters	Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **
8972.1	124.7	38	4.4	0.0	7.14	75.7%
8968.8	128.0	39	4.4	0.0	7.19	76.2%
8965.5	131.2	40	4.4	0.0	7.25	76.8%
8962.2	134.5	41	4.4	0.0	7.02	74.4%
8958.9	137.8	42	4.4	0.0	6.83	72.4%
8955.7	141.1	43	4.3	0.1	6.85	72.6%
8952.4	144.4	44	4.3	0.0	6.89	73.0%
8949.1	147.6	45	4.4	-0.1	6.63	70.3%
8945.8	150.9	46	4.3	0.1	6.62	70.1%
8942.5	154.2	47	4.4	-0.1	6.44	68.2%
8939.3	157.5	48	4.4	0.0	6.30	66.8%
8936.0	160.8	49	4.4	0.0	6.15	65.2%
8932.7	164.0	50	4.3	0.1	6.07	64.3%
8929.4	167.3	51	4.4	-0.1	5.85	62.0%
8926.1	170.6	52	4.3	0.1	5.50	58.3%
8922.9	173.9	53	4.3	0.0	5.40	57.2%
8919.6	177.2	54	4.3	0.0	5.02	53.2%
8916.3	180.4	55	4.3	0.0	4.75	50.3%
8913.0	183.7	56	4.3	0.0	4.45	47.2%
8909.7	187.0	57	4.3	0.0	4.20	44.5%
8906.5	190.3	58	4.3	0.0	3.50	37.1%
8903.2	193.6	59	4.3	0.0	3.45	36.6%
8899.9	196.8	60	4.3	0.0	3.37	35.7%
8896.6	200.1	61	4.3	0.0	3.31	35.1%
8893.3	203.4	62	4.3	0.0	2.89	30.6%
8890.4	206.4	62.9	4.4	-0.1	2.17	23.0%
		Maximum	**14.1**	---	**10.31**	**125.3%**
		Minimum	**4.3**	---	**2.17**	**23.0%**

* - **Bold** values indicate thermocline (1 deg change in one meter).

** - Saturation based on calculated DO saturation at reported water temperature and ambient barometric pressure.

TABLE C-10

LAKE SABRINA DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 10/5/2021
Lake Surface Elevation: 9095.09
Outlet Pipe Elevation (ft/msl): 9068

Barometric Pressure (in Hg) 21.45

Water Surface Elevation (ft msl)	Depth of Measurement Feet	Depth of Measurement Meters	Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **	
9095.09	0.0	0	12.1	---	8.09	---	
9093.4	1.6	0.5	12.1	---	8.09	105.7%	
9091.8	3.3	1	12.2	-0.1	8.08	105.6%	
9088.5	6.6	2	12.2	0.0	8.08	105.6%	
9085.2	9.8	3	12.2	0.0	8.08	105.6%	
9082.0	13.1	4	12.2	0.0	8.08	105.6%	
9078.7	16.4	5	12.2	0.0	8.07	105.5%	
9075.4	19.7	6	12.2	0.0	8.07	105.5%	
9072.1	23.0	7	12.2	0.0	8.07	105.5%	
9068.8	26.2	8	12.2	0.0	8.07	105.5%	<<Outlet
9065.6	29.5	9	12.2	0.0	8.07	105.5%	
9062.3	32.8	10	12.2	0.0	8.07	105.5%	
9059.0	36.1	11	12.1	0.1	8.09	105.7%	
9055.7	39.4	12	11.9	0.2	8.28	116.3%	
9054.1	41.0	12.5	11.3	---	8.75	122.9%	
9052.4	42.7	13	10.0	**1.9**	9.62	120.0%	
9050.8	44.3	13.5	8.6	**2.7**	10.06	119.6%	
9049.2	45.9	14	8.3	**1.7**	10.14	120.6%	
9045.9	49.2	15	7.6	0.7	10.08	117.0%	
9042.6	52.5	16	7.1	0.5	9.87	114.5%	
9039.3	55.8	17	6.6	0.5	9.71	109.9%	
9036.0	59.1	18	6.3	0.3	9.54	108.0%	
9032.8	62.3	19	6.0	0.3	9.27	104.9%	
9029.5	65.6	20	5.7	0.3	8.84	97.5%	
9026.2	68.9	21	5.5	0.2	8.20	90.4%	
9022.9	72.2	22	5.2	0.3	7.90	87.1%	
9019.6	75.5	23	5.1	0.1	7.70	84.9%	
9016.4	78.7	24	5.0	0.1	7.32	80.7%	
9013.1	82.0	25	4.9	0.1	7.30	78.4%	
9009.8	85.3	26	4.7	0.2	7.50	80.6%	
9006.5	88.6	27	4.7	0.0	7.47	80.3%	
9003.2	91.9	28	4.6	0.1	7.45	80.1%	
8999.9	95.1	29	4.6	0.0	7.42	79.7%	
8996.7	98.4	30	4.6	0.0	7.38	79.3%	
8993.4	101.7	31	4.6	0.0	7.35	79.0%	
8990.1	105.0	32	4.5	0.1	7.37	79.2%	
8986.8	108.3	33	4.5	0.0	7.35	79.0%	
8983.5	111.5	34	4.5	0.0	7.40	79.5%	
8980.3	114.8	35	4.5	0.0	7.40	79.5%	
8977.0	118.1	36	4.4	0.1	7.41	79.6%	
8973.7	121.4	37	4.4	0.0	7.41	79.6%	

TABLE C-10

LAKE SABRINA DISSOLVED OXYGEN AND WATER TEMPERATURE PROFILE

Date of Profile: 10/5/2021

Lake Surface Elevation: 9095.09

Outlet Pipe Elevation (ft/msl): 9068

Barometric Pressure (in Hg) 21.45

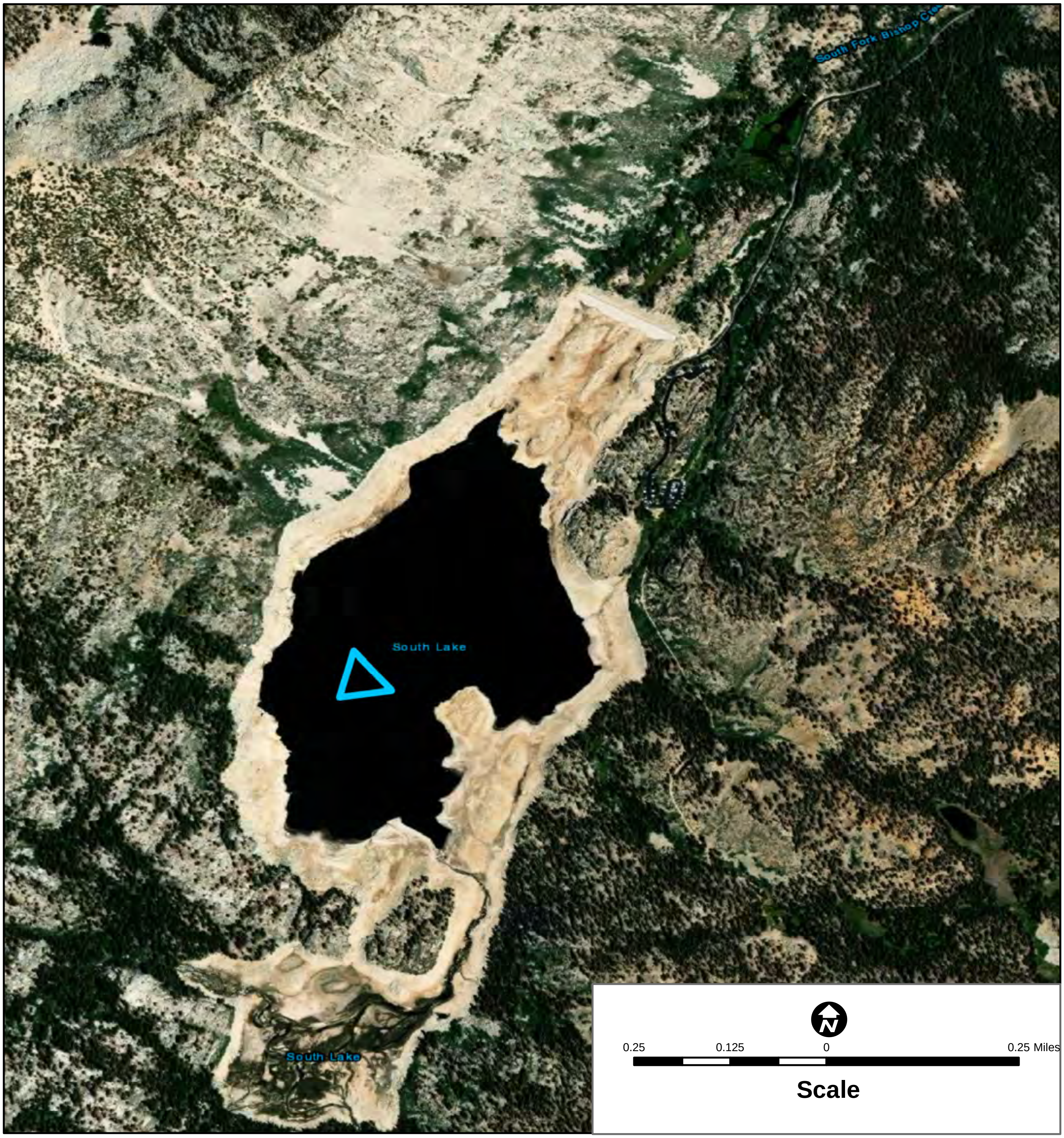
Water Surface Elevation (ft msl)	Depth of Measurement Feet	Meters	Water Temperature (deg C)	Change in Water Temperature (deg C)*	Dissolved Oxygen (mg/L)	% O_2 Saturation **
8970.4	124.7	38	4.3	0.1	7.41	79.6%
8967.1	128.0	39	4.3	0.0	7.40	79.5%
8963.9	131.2	40	4.3	0.0	7.39	79.4%
8960.6	134.5	41	4.3	0.0	7.40	79.5%
8957.3	137.8	42	4.3	0.0	6.90	74.1%
8954.0	141.1	43	4.3	0.0	6.89	74.0%
8950.7	144.4	44	4.3	0.0	6.70	72.0%
8947.5	147.6	45	4.3	0.0	6.72	72.2%
8944.2	150.9	46	4.3	0.0	6.55	70.4%
8940.9	154.2	47	4.3	0.0	6.52	70.1%
8937.6	157.5	48	4.3	0.0	6.46	69.4%
8934.3	160.8	49	4.3	0.0	6.23	66.9%
8931.0	164.0	50	4.3	0.0	6.06	65.1%
8927.8	167.3	51	4.3	0.0	5.80	62.3%
8924.5	170.6	52	4.3	0.0	5.58	60.0%
8921.2	173.9	53	4.4	-0.1	5.26	56.5%
8917.9	177.2	54	4.4	0.0	4.70	50.5%
8914.6	180.4	55	4.4	0.0	4.44	47.7%
8911.4	183.7	56	4.4	0.0	4.19	45.0%
8908.1	187.0	57	4.4	0.0	3.54	38.0%
8904.8	190.3	58	4.4	0.0	3.25	34.9%
8901.5	193.6	59	4.4	0.0	2.95	31.7%
8898.2	196.8	60	4.4	0.0	2.37	25.5%
8895.0	200.1	61	4.4	0.0	1.90	20.4%
8891.7	203.4	62	4.4	0.0	1.55	16.7%
8888.4	206.7	63	4.4	0.0	0.25	2.7%
8886.8	208.3	63.5	4.4	0.0	0.11	1.2%
		Maximum	**12.2**	**---**	**10.14**	**122.9%**
		Minimum	**4.3**	**---**	**0.11**	**1.2%**

* - **Bold** values indicate thermocline (1 deg change in one meter).

** - Saturation based on calculated DO saturation at reported water temperature and ambient barometric pressure.

APPENDIX D

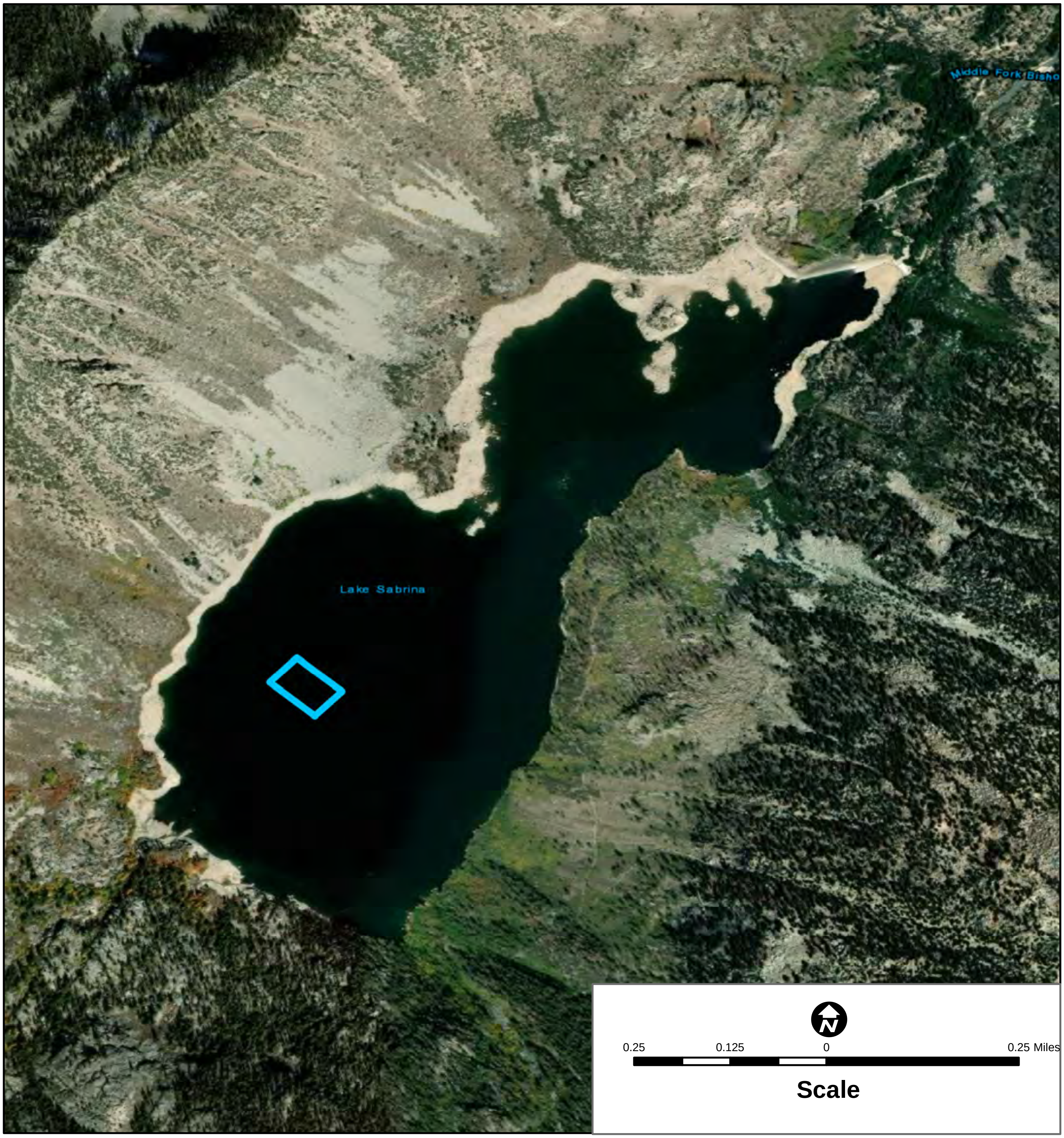
LAKE VERTICAL PROFILE LOCATIONS AND BATHYMETRY



Legend

South Lake Vertical Profile Area

Figure D-1 South Lake Vertical Profile Area



Legend

Lake Sabrina Vertical Profile Area

Figure D-2 Lake Sabrina Vertical Profile Area

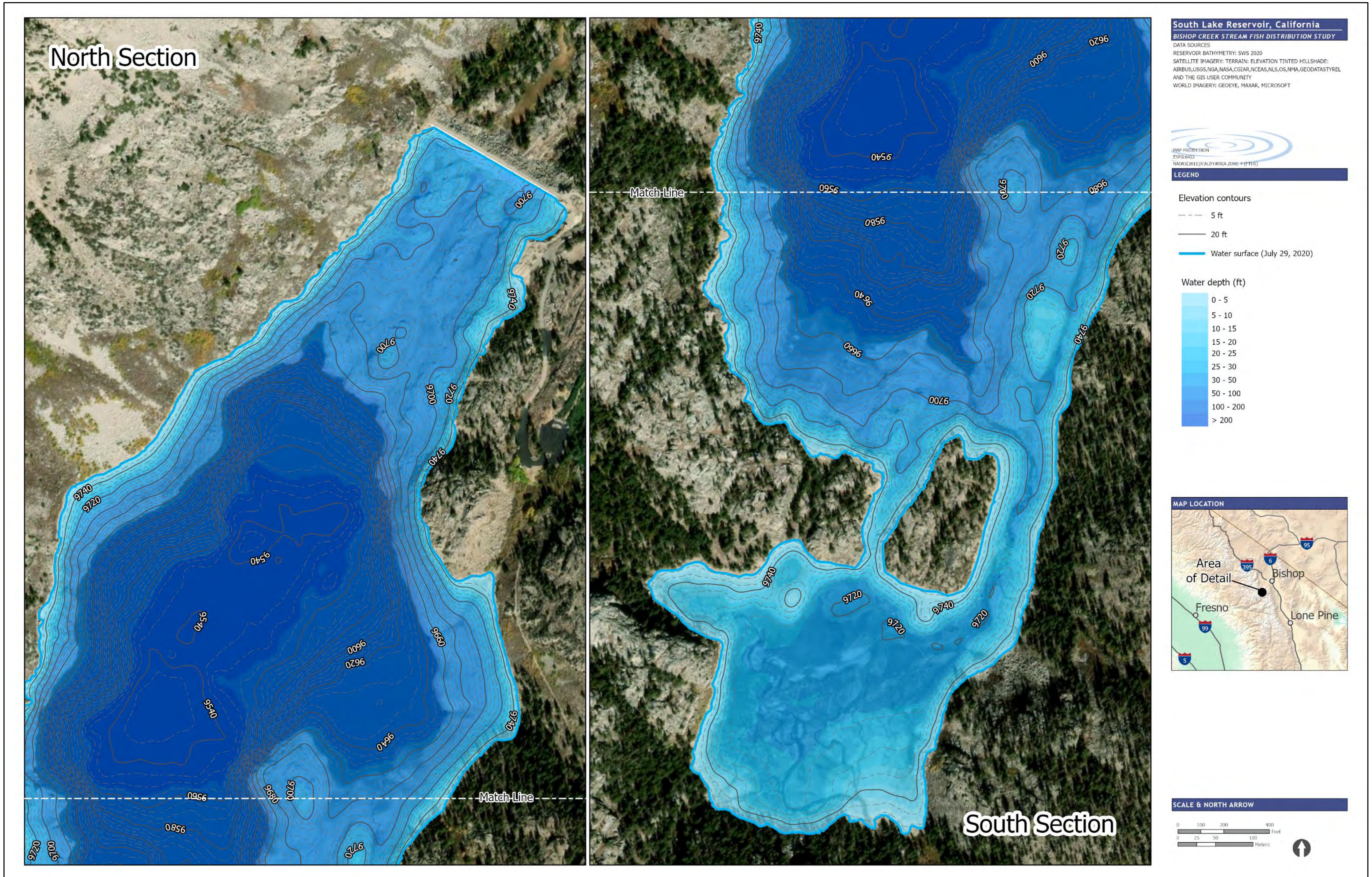


Figure 7.5-1 Bathymetry Map for South Lake

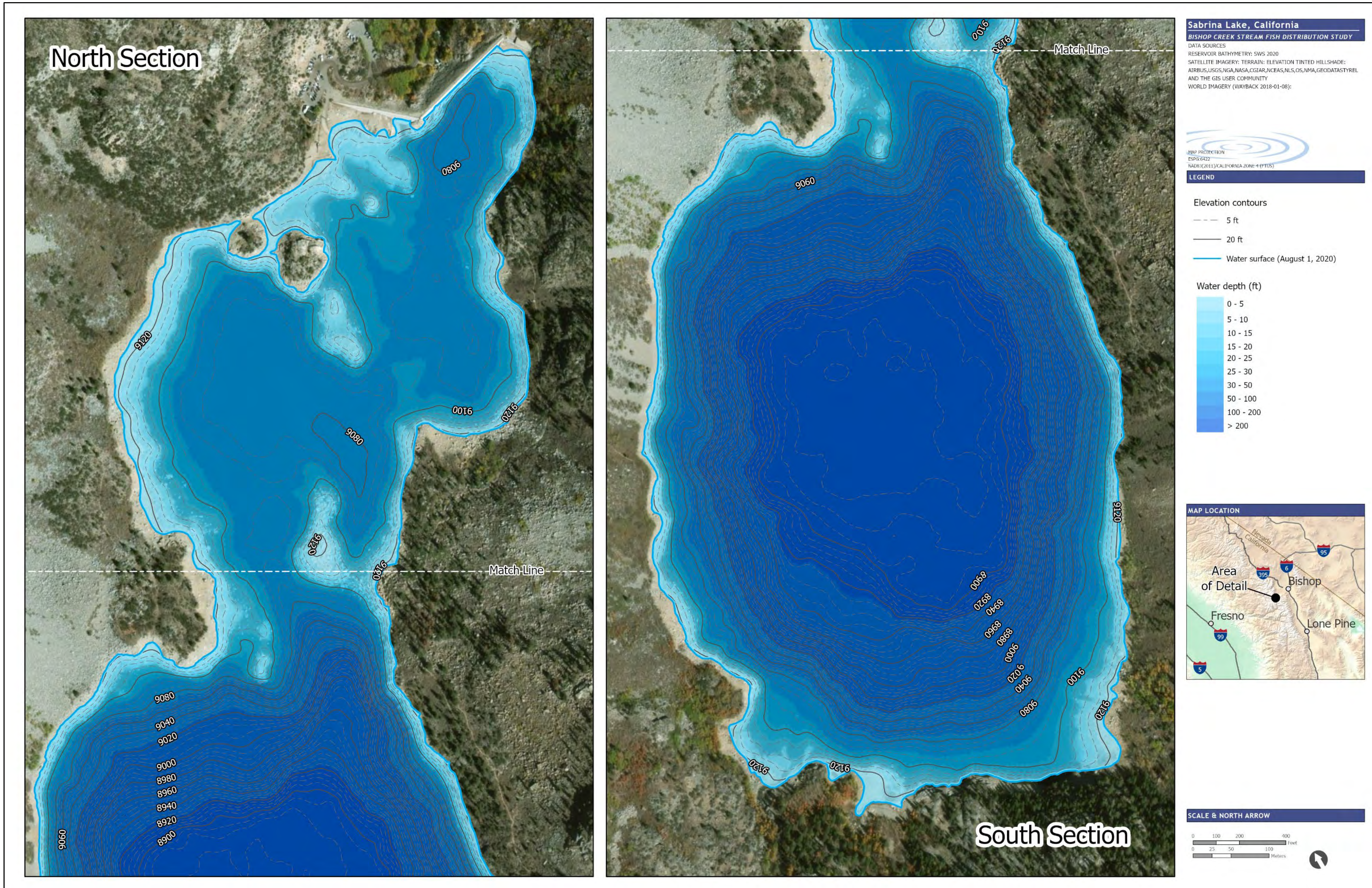


Figure 7.5-2 Bathymetry Map for Lake Sabrina

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project
(FERC Project No. 1394)

DRAFT LICENSE APPLICATION

FINAL TECHNICAL REPORT
SEDIMENT & GEOMORPHOLOGY STUDY
(AQ6)

Southern California Edison
1515 Walnut Grove Ave
Rosemead, CA 91770

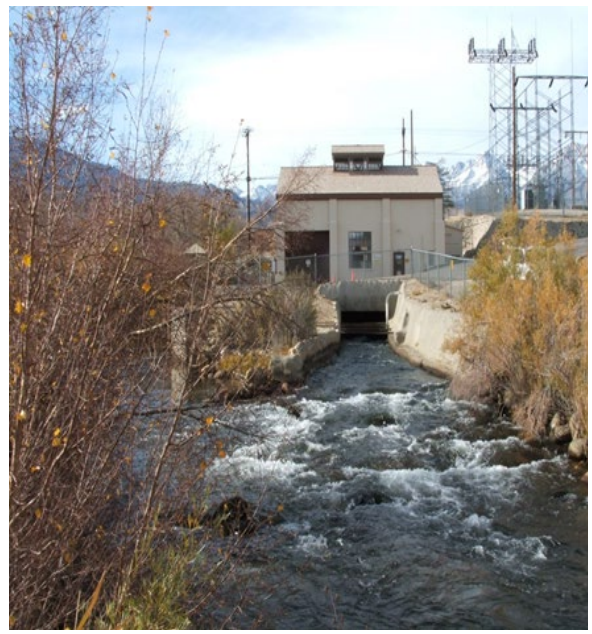
January 2022

Support from:

Kleinschmidt

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project (FERC Project No. 1394)



FINAL TECHNICAL REPORT SEDIMENT & GEOMORPHOLOGY STUDY (AQ6)

SOUTHERN CALIFORNIA EDISON

An EDISON INTERNATIONAL® Company

JANUARY 2022

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF PHOTOS

APPENDICES

ACRONYMS

Bishop Creek Project	Bishop Creek Hydroelectric Project
BKF	bankfull elevation
CDFW	California Department of Fish and Game
cfs	cubic feet per second
cm	centimeters
CY	cubic yards
FERC	Federal Energy Regulatory Commission
FLD	an approximate elevation of twice the bankfull depth
FLPMA	Federal Land Policy and Management Act
GPS	global positioning system
ISR	Initial Study Report
LADWP	Los Angeles Department of Water and Power
LWM	large woody material
mm	millimeters
NGS OPUS	National Geodetic Survey Online Positioning User Service
O&M	operations and maintenance
PIT	passive integrated transponder
Project	Bishop Creek Hydroelectric Project
RIP	riparian within floodplain
RTK GNSS	Real-Time Kinematic Global navigation satellite system
RTS	Real Time Service
SCE	Southern California Edison
SLA	Simons, Li, & Associates
SWRCB	State Water Resources Control Board

TWG	Technical Working Group
USFS	U.S. Forestry Service
USGS	U.S. Geological Survey
WET	Wetted Channel

1.0 INTRODUCTION

During the Technical Working Group (TWG) meetings, stakeholders identified the need to understand the sediment dynamics in Bishop Creek, including understanding what flows mobilize sediment and what Bishop Creek Hydroelectric Project (Bishop Creek Project, or Project) operations could be modified to mobilize sediments (assumed to be gravels suitable for spawning/rearing habitat) and large woody material (LWM) from forebays above the diversion dams into reaches that have a low sediment supply. This study focused on the reaches between Powerhouse No. 2 and 6, to provide additional information pertaining to riparian and fisheries habitat assessments, and to report the development of operations and maintenance (O&M) plans that have the potential to reduce maintenance needs of the Bishop Creek Project by limiting the accumulation of sediment in the forebays.

This Sediment and Geomorphology Report summarizes the objectives, methods, results, and discussion of findings of the study.

2.0 REVIEW OF EXISTING INFORMATION

The analysis for this study relied on existing data gathered as part of the existing Bishop Creek Project license, and 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 Bishop Creek Project.

2.1 GEOMORPHOLOGICAL DATA

As part of the study investigating stream geomorphology and riparian vegetation, the Simons, Li, & Associates (SLA) Report (Simons 1990) evaluated stream channel processes in the Bishop Creek Project area. This report included a review of the Bishop Creek 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 to Powerhouse No. 6. The reader is referenced to the SLA Report (Simons 1990) for a summary of geology and hydrology near the Bishop Creek Project. This Sediment and Geomorphology Report covers 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 (Read 2015; Read and Sada 2013; Psomas 2005) and aquatic habitat monitoring (Read and Sada 2013; Psomas 2005) have occurred approximately every 5 years at the Bishop Creek Project as part of the current license. These reports, described in Sections 2.1.1 and 2.1.2 below, provide good historical data spanning an approximate 30-year period.

2.1.1 RIPARIAN MONITORING

- Baseline (1991 to 1993) and repeat surveys (field surveys in 2004, 2009, 2014, and 2019)
- 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

2.1.2 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

After the SLA Report, Sites 3, 4, 5, and 6 were located and served as the basis for the study reaches in this report. 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 a sediment release, and after a 200 cubic feet per second (cfs), 24-hour flushing flow for these areas. Sada and Hawkins (1997) determined 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 to the next intake impoundment by the flushing flow. The study determined that the substrate in the pools was 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 releases and post-flushing flow conditions, regardless of the transport of the sediment 1300 meters and 2500 meters downstream of Intakes 3 and 4, respectively. The substrate in the pools post sediment release and prior to flushing flows was generally smaller than 1.5-inches gravel and larger than medium sand 0.012 inch, with sand being most frequently encountered. 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, Southern California Edison (SCE) periodically removed sediment from the intake impoundments to maintain storage capacity and minimize the potential for sediment to be pulled 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 1,720 cfs in Bishop Creek (Sierra Hydrotech 1983). Shortly after this flood, sediment was removed from Intakes 3, 4, 5 and 6 to restore storage capacity (Simon 1990). Sediment was removed from Intake 2 in the late 1980s or early 1990s; Intake 2 had adequate capacity up until that time. The Intake 2 sediment removal effort resulted in the excavation of approximately 50,000 cubic yards (CY) of sediment from the impoundment (sediment that was primarily generated from the dam failure; Charles Partridge, SCE Project Staff, *personal communication*)). Since these removal efforts, periodic drawdowns of the intake impoundments have occurred, primarily for maintenance of necessary structures. However there has been 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 1,200 CY, 1,500 CY and 2,000 CY of material, respectively (Charles Partridge, SCE Project Staff, *personal communication)*. Assuming approximately 25 years between sediment removals and excavation to similar extents during both excavations, the estimated sediment loading (bed load) at Intakes 6, 4, and 5 may average approximately of 50 to 80 CY per year. According to Bishop Creek Project staff, there is minimal LWM that drops into the sediment of the impoundments (based on the recently excavated sediment). Bishop Creek Project staff indicated that while some LWM may sink, most washes over the spillway and there were no issues with large LWM flows clogging the intake structures. SCE staff did state that a larger LWM and sediment load could occur if a higher runoff year follows a few years of lower flows; blown out and the accumulated sediment and beaver dam materials were released.

Just downstream of the Bishop Creek Project Powerhouse No. 6 outlet, the Los Angeles Department of Water and Power (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 Bishop Creek Project impoundments (Charles Partridge, SCE Project Staff, *personal communication*).

2.2 PROJECT HYDROLOGY AND FLOW MANAGEMENT

The Bishop Creek Project's relatively extensive Bishop Creek daily stream discharge (i.e., flow) dataset was utilized to evaluate channel geomorphology and sediment transport in this reach. The Operations Model Study Report (completed as part of this relicensing effort) can be used in parallel with this study to evaluate potential flow releases to mobilize sediment throughout the Bishop Creek Project. In addition, annual hydrographs and peak annual flows for the study reaches, developed by SCE, were used to evaluate sediment transport in the study reach.

As described in the Operations Model Study Report, flow at the site varies, depending on the amount of runoff and the SCE release schedule, which is dictated by snowpack, snow melt, spring rain events, drought, power demand, and irrigation. In Bishop Creek above

Powerhouse No. 6 (U.S. Geological Survey [USGS] Gauge 10271200), calculated daily mean flows (water years 1994 to 2020) range from 0.1 cfs to 453 cfs, with peak runoff generally occurring from June to August, as the snow melts in the higher mountain elevations. Over a recent 27 year period (1994-2020), annual peak daily runoff values ranged from 15 cfs to 453 cfs in Bishop Creek (Table 2-1) most of which have more than 20 years of data available. These gauges were 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. These peak flows may be the channel-forming flow in Bishop Creek and thereby an important flow to evaluate as part of this study.

The Bishop Creek 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 2.3. Other sources of water input between the junction of the South Fork and Middle Fork to Powerhouse No. 6 include three tributaries, of which the largest is Coyote Creek, which enters Bishop Creek upstream of Powerhouse No. 4. SCE has stream gauges installed at many locations in the watershed (Figure 2-1) most of which have more than 20 years of data available. These gauges were 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 2-1 Annual Peak Stream Flows in Bishop Creek above Powerhouse No. 6 since the Occurrence of Bypass Flows

Water Year	Date	Daily Mean 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
2018	July 24, 2018	334
2019	June 16, 2019	230
2020	November 21, 2019	74
27-year Annual Peak Stream Flow Average:		**202**

Source: USGS 2022

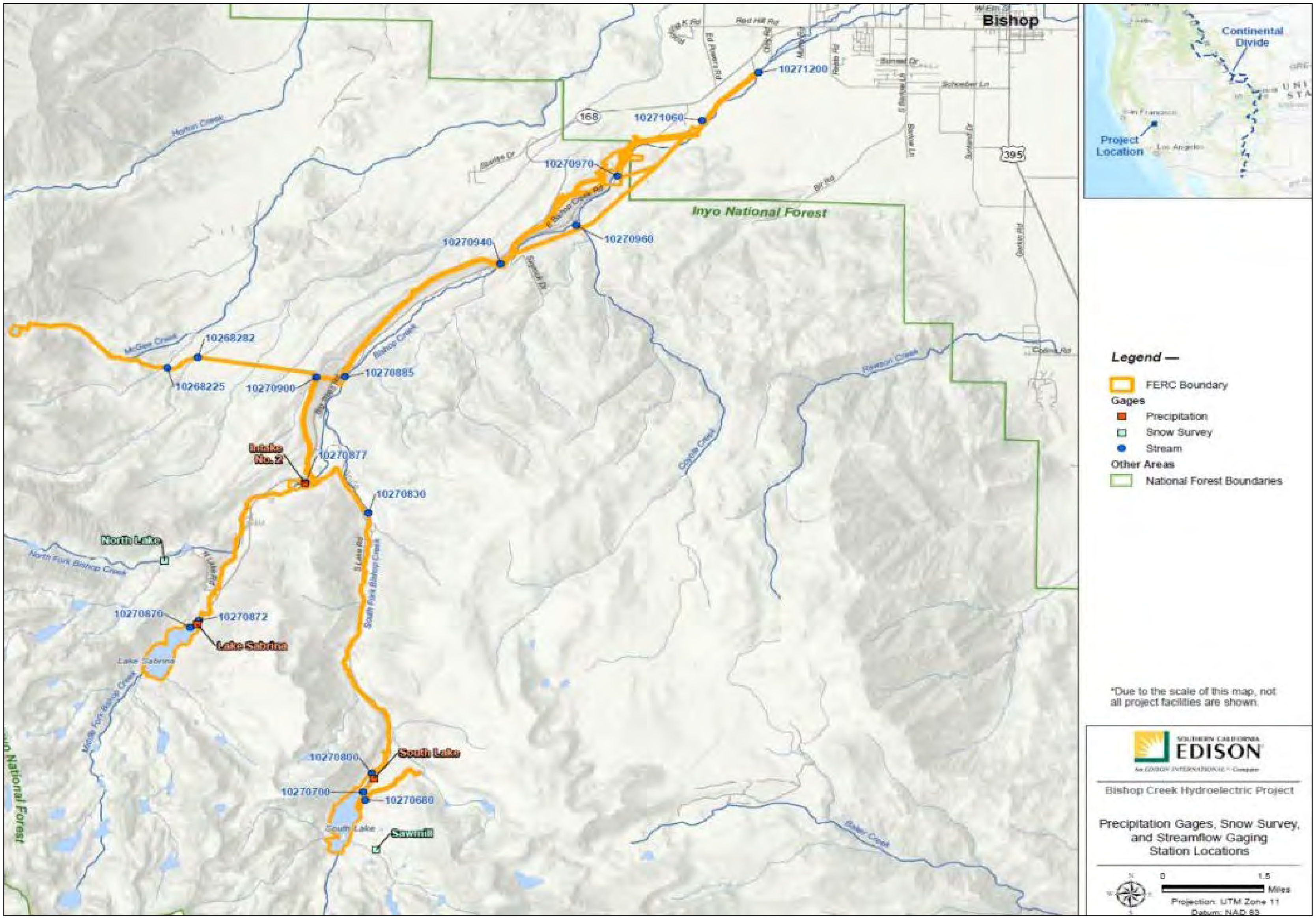


Figure 2-1 Stream Flow Gauging Stations along Bishop Creek.

2.3 REGULATORY AND LEGAL CONSTRAINTS

Bishop Creek 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 2,147 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. SCE meets with the U.S. Forestry Service (USFS) annually to determine seasonal minimum storage requirements for recreation purposes; and annual flushing flows.

The Chandler Decree and State Water Resources Control Board (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 Bishop Creek Project capacity), including an annual limit of 1,400-acre feet from Green Creek

- Instantaneous diversion limit at all locations not to exceed historically measured use (i.e., not to exceed current Bishop Creek Project capacity), including a daily average limit of one cfs for domestic use

- Minimum Bishop Creek Project flow-through (downstream delivery) requirements, for senior downstream water rights holders, are measured below Powerhouse No. 6, as required by the Chandler Decree (Table 2-2)

- 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 2-2 Daily Average Flow Requirements for Flow below Powerhouse No. 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 Bishop Creek Project that are mandated by 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 Powerhouse No. 2: no less than 10 cfs from Friday of the last weekend in April thru October 31; no less than 7 cfs for the remainder of the year; or no less than 5 cfs in all months of dry years
- Southfork Diversion: no less than 10 cfs from Friday of the last weekend in April thru October 31; no less than 7 cfs for the remainder of the year
- Powerhouse No. 2 to Powerhouse No. 3: no less than 13 cfs year-round
- Powerhouse No. 3 to Powerhouse No. 4: no less than 5 cfs year-round
- Powerhouse No. 4 to Powerhouse No. 5: no less than 18 cfs year-round (Article 105)[1]
- Release from Powerhouse No. 6: per Chandler Decree (Table 2-2)

[1] 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 California Department of Fish and Game (CDFW). Historically SCE has released 18 cfs.

3.0 STUDY OBJECTIVES

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

- Determine flow conditions that mobilize sediment and LWM in the stream channel and from forebays
- Characterize the particle size distribution of mobile sediment
- Evaluate how flow operations (flow release timing, magnitude, and duration) affect sediment transport
- Better understand how sediment flushing flows could impact reaches below Powerhouse No. 6

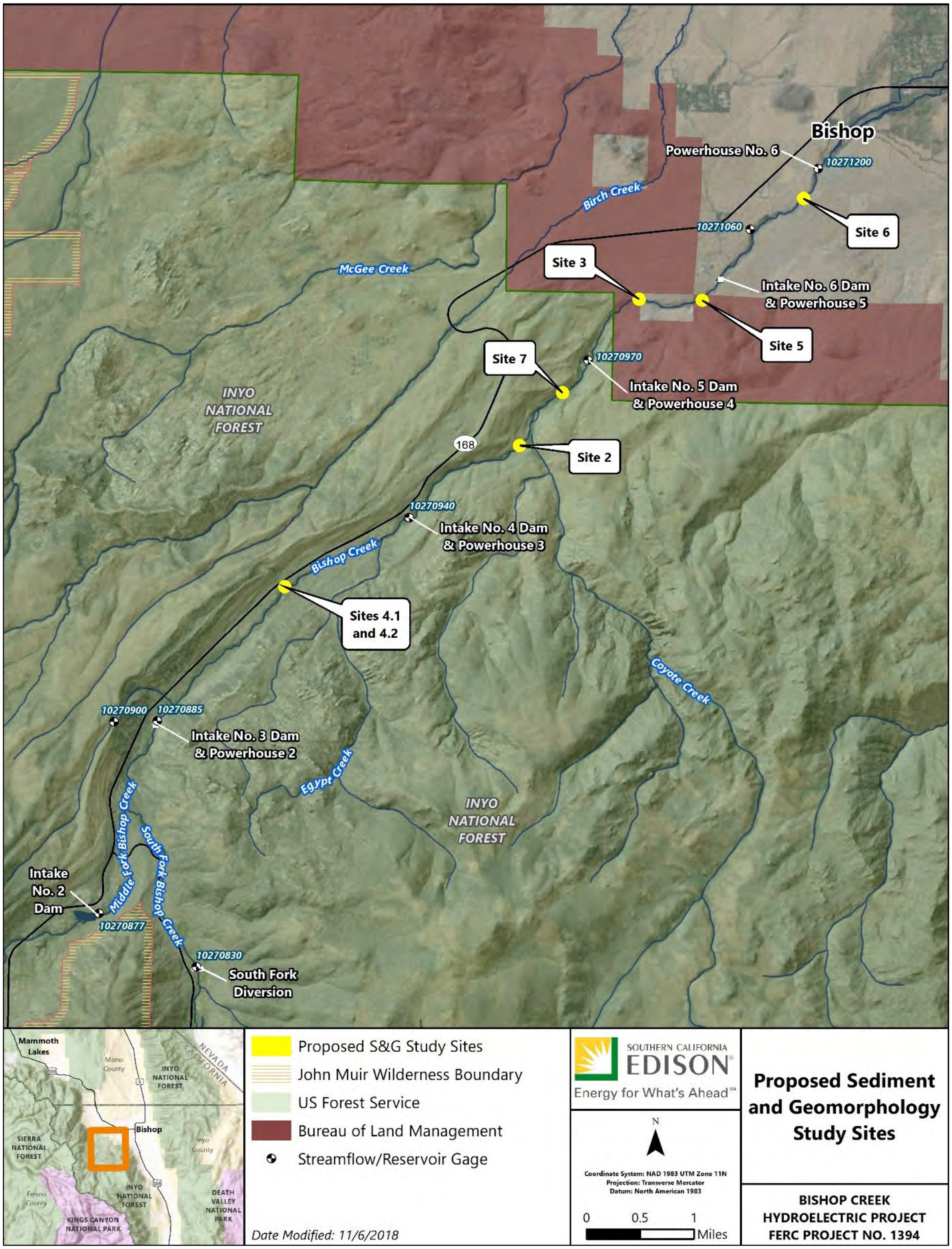
3.1 STUDY AREA

Figure 3-1 presents the study area for the Bishop Creek Sediment and Geomorphology Study. The study area focused on the areas of Bishop Creek that could potentially be modified by changes in Bishop Creek Project operation; Lake Sabrina, South Lake, and sections of Bishop Creek down to the Intake for Powerhouse No. 3 were not included in this study. The study area focused on the six of the seven[2] proposed monitoring sites identified in Figure 3-1. This included five monitoring sites (monitoring Sites 3 through 6, including a split site at Site 4.1 and Site 4.2) that align with the monitoring sites established by SLA (1990), as well as one new monitoring site (Site 7) to characterize channel substrates and dimensions downstream of the junction with Coyote Creek.

Monitoring Sites 3 through 6 were selected because of their inclusion in earlier stream monitoring studies (Read 2015; Simons 1990). These sites were 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. Monitoring Site 1 referenced in the SLA Report was 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. 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 to the chronological order in which the sites were established prior to 1991, not their relative location along the stream. In order from upstream to downstream on Bishop Creek, the monitoring sites were numbered, Sites 4.2, 4.1, 7, 3, 5, and 6. Of these, Site 3 was originally selected because it represents one of the two

[2] Seven sites were originally proposed, but Site 2 was excluded based on site conditions, as described in Section 5 of this report.

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; Sada 2010). 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 was retained to maintain continuity between monitoring activities. It should be noted that Sites 4.2, 4.1, 2, and 7 were in the study reach that was evaluated for sediment flushing flow as part of the Sada and Hawkins study (1997).



Note: Site 2 was excluded based on field conditions; refer to Section 5

Figure 3-1 Sediment and Geomorphology Study Sites.

4.0 METHODS

The Bishop Creek Sediment and Geomorphology Study, as outlined in the Revised Study Plan approved by the TWG, included 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 serve to clarify the objectives of this study by increasing SCE's understanding of sediment and LWM dynamics in Bishop Creek. The general sequence of steps to complete these tasks, with additional detail, is provided below:

1. Perform preliminary field reconnaissance to confirm SLA Report sites (Sites 2 through 6), recover cross-sections, and select a location for monitoring Site 7. Confirm "typical" sediment size by sampling bulk piles of sediment previously excavated from impoundments throughout the Bishop Creek Project (to identify the typical sizing of sediment found in the impoundments)
2. Compile and review data from the in-stream flow period (1994 to 2018) for peak annual flows and flow duration curves for the gauge nearest each site
3. Perform cross-section survey, substrate characterization, bankfull flow evaluation, and LWM assessment at each monitoring site
4. Perform bedload sediment transport measurements during estimated bankfull flows at the most upstream (monitoring Site 4.2) and most downstream (monitoring Site 6) sites
5. Utilize the FlowSed sediment transport model to estimate annual sediment loads at monitoring Site 4.2 and 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 Bishop Creek Project
8. Develop a summary report that outlines the methods, field work, conclusions, and recommendations as they pertain to sediment and LWM in the Bishop Creek study reach

Methods for this Study Plan Steps 4 and 5 have been modified, per the revisions described in Section 5, with steps 6 through 8 being completed in 2021.

4.1 TASK1: FIELD SURVEYS

The first part of Task 1 (Task 1A) was a field reconnaissance visit, in July 2019, to recover the eight cross-sections at each of the monitoring Sites 2 through 6 (from the SLA Report Sites 2 through 6), establish a new Site 7, and evaluate nearby locations at each for sediment sampling. The prior cross-sections were marked in the field in 1989 with rebar and aluminum tags marked S1 through S8 from downstream to upstream. Some of the sites were recoverable after approximately 30 years. For this study, field staff surveyed 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 was calculated in riffles; therefore, any cross-sections in a pool, run or glide would not adequately represent the sediment transport capacity of the reach. If the SLA Report cross-sections were not in suitable locations, new cross-sections were 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 was evaluated and modified, based on field conditions. After this visit, the sites each had three cross-sections identified in a riffle reach suitable for evaluation of sediment transport with additional survey and data collection.

To inform sediment sampler size selection and support the evaluation of sediment transport, a sieve analysis of previously excavated sediment was performed during this initial site visit. Field staff consulted 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. The particle size of sediments previously excavated from the impoundments was determined by sieve analysis in the field for three composite samples at identified piles of excavated sediment, including samples from removed sediment from Intakes 2, 4, 5, 6, and the LADWP impoundment directly downstream of Powerhouse No. 6. The composite samples included a sample from approximately 6-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) was to collect additional field data, including cross-section and longitudinal surveys, bed substrate characterization, and bankfull bed sediment transport measurements needed to support subsequent analytical tasks.

Fieldwork for Task 1B was conducted in September 2019. For each of the 18 cross-sections in the SLA Report, the survey utilized the same local datum as the SLA Report to the extent possible. Three new cross-sections were established at monitoring Site 7. Each cross-section used the same cross-section endpoints (rebar), if they were recovered; otherwise, new rebar monuments were established well outside the bankfull channel. Each monument (recovered and new) was recorded with a sub-meter global positioning system (GPS). The survey captured major breaks in topography along the cross-section, the bankfull elevation (if a defined feature could be identified in the field), and the water level; generally based on the USFS protocol (Harrelson et al. 1994). Photos of each cross-section were taken facing upstream, downstream, and the left and right banks (relative to the downstream direction) to document the conditions at the time of the survey. Additionally, representative photos of the bed substrate as well as a photo of active bars in the site reach were captured. To inform bed substrate mobility, a Wolman pebble count[3] (minimum 100 samples) was performed within the active riffles at each site, as well as a bar sediment sample (grab sample to determine D_{84} particle size), if any bars were present in the site reach. This generally aligned with the methods and approach utilized in the SLA Report, which allows for comparisons with the prior study. To characterize the slopes at each site, a longitudinal profile was established through the monitoring site cross-sections with a length of approximately 20 times the bankfull width or through three riffle-pool sequences, whichever was less. This visit included a modified Pfankuch Channel Stability Rating (Rosgen 2014) to evaluate the condition of the channel and inform sediment transport calculations.

The cross-section survey was conducted in sufficient detail to capture any change in grade and characterize channel geometry, following standard survey procedures established by the USFS (Harrelson et al. 1994). This included capturing the bankfull elevation on both banks, the edge of water during the surveys, and the thalweg elevation. The survey approach ensured that all topographic breaks across the channel cross-section and all cross-section elevations within a given site were measured. Photos of each cross-section were taken facing upstream, downstream, towards left bank, and towards the right bank to document site conditions during the time of survey.

A longitudinal profile of the channel thalweg was surveyed through the length and extended upstream and downstream of the cross-sections for a minimum total length of 20 times the bankfull width or a minimum of three pool riffle sequences, whichever was shorter. The longitudinal profile survey followed procedures established by the USFS (Harrelson et al.1994), including surveying a sufficient number of points with which to capture the topography of pools, riffles, and other habitat features, as well as other significant breaks in channel gradient.

A Wolman style pebble count (Wolman 1954) was performed to characterize channel bed particle size distribution on the full width of the stream bed along cross-sections and representative channel locations. Pebble counts entailed measuring the intermediate axis (b-axis) of 100 particles in the immediate vicinity of a cross-section transect. All silt- and sand-sized particles were classified as less than 2 millimeters (mm). At Sites 4.1 and 4.2, a number of the established cross-sections were primarily composed of large immobile framework boulders and mobility or adequately characterize overall particle size distribution; therefore, the area

[3] The pebble count procedure (Wolman, 1954) is the measurement of 100 randomly selected stones from a homogeneous population on a riverbed 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,

over which pebble counts were conducted was expanded to better inform sediment dynamics. Representative photos of channel bed substrate were collected throughout the study sites.

Additional cross-section and longitudinal profile surveys were conducted as part of the Tracer Rock Study (Appendix A) at Sites 4.1, 4.2, and 6 (Figure 3-1) July 27–August 6, 2020 utilizing Trimble S7 Real Time Service (RTS) and Trimble R12 Real-Time Kinematic Global navigation satellite system (RTK GNSS) survey equipment. Two semi-permanent benchmarks were installed near each study site to facilitate future monitoring efforts. The benchmarks consisted of a small magnetic nail and shiner set in large boulders or bedrock near ground level. Coordinates for one benchmark (primary benchmark) were obtained at each site by submitting static RTK GNSS observations to the National Geodetic Survey Online Positioning User Service (NGS OPUS). Coordinates for the secondary benchmark (backup), existing cross-section endpins, and all cross-section and longitudinal profile points were measured using standard RTK GNSS and RTS survey techniques and tied into the primary benchmark.

The proposed third part of Task 1 (Task 1C) was to measure bed sediment transport, which was to occur after Task 1B was completed and during a higher flow period (natural or man-made). Note that this subtask was modified as described in Section 5.0, based on field conditions, and as described in the Revised Study Plan to evaluate tracer rock mobility rather than to measure sediment transport loading. The selection of a bankfull flow to evaluate sediment mobility is one of the key drivers of the sediment transport capacity in the system. Due to this sensitivity, bankfull discharge identified in the field during the cross-section surveys was utilized, as in this regulated system, the regional curves and traditional statistical analysis were not as applicable.

The outcome of these field efforts resulted in the following information for use in subsequent analysis of sediment transport in Bishop Creek:

Site-wide Data

- Pfankuch channel stability rating
- Channel slope (elevation change divided by stream length)
- Riffle Substrate D_{50} and D_{84}
- D_{50}, D_{84}, and D_{100} for excavated sediments from previously excavated intake sediment disposal piles

Cross-section Specific Data

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

4.2 Task 2: Assessment of Large Wood Material

To evaluate the presence and potential mobility of LWM at each monitoring site, field staff recorded the size, quantity and likelihood of mobility of LWM in three zones;

1. Wetted channel (WET)
2. Above the waterline to bankfull elevation (BKF)
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 was considered as any wood larger than 3-inches in diameter and 4-feet-long that was not reasonably well anchored (e.g. well rooted, live vegetation, or mostly buried material). If substantial LWM existed in an area, the average size, length, and approximate quantity were noted. The study length for this assessment was the same as the stream length utilized to measure stream slope. The Bishop Creek Project operators provided regarding the frequency of LWM mobilization and presence in the system, as described in the existing conditions of the Project.

4.3 Task 3: Annual Sediment Loading Estimation

Based on field conditions and site safety constraints, this task was modified as described in Section 5, to focus on mobility of individual tracer rocks, rather than annual sediment loading, as such measurements were not feasible during this study. Refer to the Sediment & Geomorphology Study Plan for a review of what was proposed prior to the modified approach.

4.4 Task 4: Substrate Mobility Evaluation

Note that this task was modified as described in Section 5.0, based on field conditions; the methods summarized in this section are for the modified methodology, with additional detail provided in Appendix A.

Passive integrated transponder (PIT) tagged tracer rocks were deployed to inform sediment transport dynamics at study Sites 4.1, 4.2, and 6 (Figure 3-1, same sites as studied in 1990 baseline surveys). Tracer rocks bracketed the range of D_{10} to D_{84} particle sizes (32 to 350 mm) present at each site, determined by 2019 pebble counts. Table 4-1 describes the particle size classes and total quantity of tracer rocks installed in 2020.

Table 4-1 Tracer Rock Size Classes and Quantities Deployed

Size Class	B-axis Range (mm)	Quantity
A	32–45	30
B	45–60	30
C	60–90	33
D	90–128	31
E	128–180	31
F	180–256	19
G	256–350	9
	Total:	183

Tracer rock size classes A–F were obtained from an out of area aggregate source prior to the start of fieldwork. The out of area tracer rocks had similar lithology (igneous) and physical properties (e.g., specific gravity, sphericity, hardness, mineralogy) to native particles found at the Bishop Creek study sites. Tracer rocks in size class G were obtained on-site. The out of area tracer rocks were decontaminated with Virkon® aquatic disinfectant prior to deployment in Bishop Creek. The intermediate axis (B-axis) and mass were recorded for each particle in size classes A-F, but only the B-axis parameter was recorded for size class G particles. PIT tags were inserted into the tracers by drilling a 3/16-inch hole into each particle, cleaning out residual detritus and then sealing the PIT tag in place with a quick cure, high strength concrete and masonry anchoring adhesive. The adhesive was smoothed over to try and mimic natural particle surface texture. The tracer particles were painted a bright, high contrast color with concrete marking paint once the adhesive was dry.

Tracer rocks were deployed along study site cross sections and at other representative geomorphic units at the three study sites. Various geomorphic units were chosen for tracer rock placement to test rock particle mobility in a range of environments. Geomorphic units included riffles, cascades, flat-water sections (runs and glides), and plunge pools. Prior to placement of individual tracer rocks, a rock of similar shape and size was removed from the streambed to create a void space and a similarly sized tracer rock was gently pressed down and worked into the void space to simulate natural streambed particle emplacement. The location of each tracer rock was surveyed with RTS or RTK GNSS equipment, and representative photographs were taken of the tracer locations.

As part of identifying the mobility of sediment in the study reach, an evaluation of sediment mobility was completed, based on the data collected during the field effort. This included an incipient motion calculation using the Shields equation (as used in the SLA Report). In addition to the Shields equation, particle mobility was 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 were compared to the mobility anticipated in the SLA Report for the D_{65} and D_{84} particle size, as well as to the tracer rocks mobilization results (although not exactly at bankfull flows).

5.0 MODIFICATION TO METHODS

As described in the Initial Study Report (ISR) filed October 30, 2020, and subsequent progress reports, modifications were made to the approved study, based on safety and field conditions. These changes were implemented after consultation with the TWGs. A summary of these modifications follows:

- Task 1-Field Studies and Task 3-Annual Sediment Loading Estimation: Omitted the bed sediment sampling field effort and annual sediment loading estimate due to safety concerns and higher than anticipated bankfull conditions identified in this previously that prohibit this data collection.

- Task 4-Substrate Mobility Evaluation: Added a tracer rock study to supplement the previously proposed bed substrate mobility calculations utilizing data available from 2019 field efforts. This tracer rock study was expected to meet the objectives for this study by: confirming that the observations of coarse substrate in the riffles indicate that smaller (less than 60 mm) substrates were mobilized through the Bishop Creek Project during bankfull flows; and providing a better understanding of substrate mobility during a period of normal summer flows and a period of higher spring flows in Bishop Creek. This tracer rock study occurred at previously surveyed riffles at Site 4 (most upstream, steep site) and Site 6 (most downstream, lower gradient) over a period of high flows (near bankfull) and lower flows. This study involved tagging (paint and PIT tag) rocks of desired size classes (32 to 360 mm, capturing most of the surveyed riffle D50 rock sizes), placing the tagged rocks in target riffles, and then locating the tagged rocks after a high-flow event to determine if they were mobilized. The schedule was dependent on anticipated flows in Bishop Creek; the placement of tracer rocks occurred July 27–August 6, 2020, with recovery in May 2021 (after an approximately 60-70 cfs pulse flow) and in July 2021 (after an approximately 120 cfs pulse flow).

- Task 5-Flushing Flow Evaluation: This task essentially remained unchanged. SCE relied on previous studies at the site, field data collected during 2019, and the tracer rock study (proposed Task 4) to consider the impacts of utilizing flushing flows to mobilize sediment and large woody material in Bishop Creek, including a qualitative assessment of potential impacts to macroinvertebrates.

6.0 RESULTS

The results of the field study are presented in four sections to describe the findings associated with the Bishop Creek channel, substrate, and bankfull flows; the dredged sediment gradations; large woody material in Bishop Creek; and the tracer rock study.

6.1 CHANNEL CROSS SECTIONS, SUBSTRATE, AND BANKFULL FLOWS

As part of the 2019 field survey, three cross-sections were surveyed at each monitoring site. During the reconnaissance trip and field survey trip, the historic SLA cross-sections (eight cross-sections at each site) were evaluated to determine which were in the active portion of a riffle (to better inform sediment transport/mobility assessments). The three most ideal cross-sections for evaluating sediment transport in riffles were surveyed in 2019. For the purposes of analysis, a representative riffle cross-Table 6-1 summarizes the geometry of each representative cross-section.

Table 6-1 Representative Cross Section

Site	Cross Section ID	Bankfull Width (ft)	Bankfull Depth (ft)	Bankfull Area (ft^2)	2019 Estimated Bankfull Discharge (cfs)	1990 Estimated Bankfull Discharge (cfs)*
4.1	4.9	30.1	1.1	31.5	128.9	270
4.2	4.4	28.2	1.2	33.2	86.2	100
7	7.1	28.4	1.6	44.2	162.8	N/A
3	3.2	26.7	1.6	42.6	147.3	110-1,500
5	5.3	37.1	1.0	37.0	91.4	800-1,500
6	6.5	16.1	1.3	21.6	59.3	50-165

Notes: Sites were ordered from upstream to downstream and bankfull was estimated based on geomorphic characteristics observed during the 2019 field survey.

*Simon 1990; Table 8.3.

The variability in bankfull area across sites is expected as each of the reaches has different flows and hydro generation capacities, tributary inputs, and local slopes that dictate this dimension. Further, selecting bankfull elevation in the field can vary between observers, so while bankfull was called by the same crew on these sites, comparison to historic data may introduce another potential difference. A comparison of these values with historic data from the 1990 study is presented in Table 6-1.

A Wolman pebble count was conducted in the active riffles at each site to characterize the riffle substrate size. This pebble count was a composite sampling of the active riffles surveyed by the cross-section survey at each site. The riffle substrate D_{50} (meaning that 50 percent of the particles measured by the pebble count were equal to or less than this value) for the study sites ranged from 139 mm (large cobble) to 597 mm (medium boulder). The riffle substrate D_{84} for the study sites ranged from 342 mm (small boulder) to 1622 mm (large to very large boulder). The riffle substrate particle size distribution is provided in Figure 6-1 with a representative photo of the riffle substrate provided in Photo

6.1-1. A comparison with historic survey data from the 1990 SLA report shows relatively strong agreement on the D_{50} particle size found during the 2019 field effort, with the historic data indicating that the D_{50} particle sizes for Sites 1 to 6 ranging from approximately 200 to 600 mm.

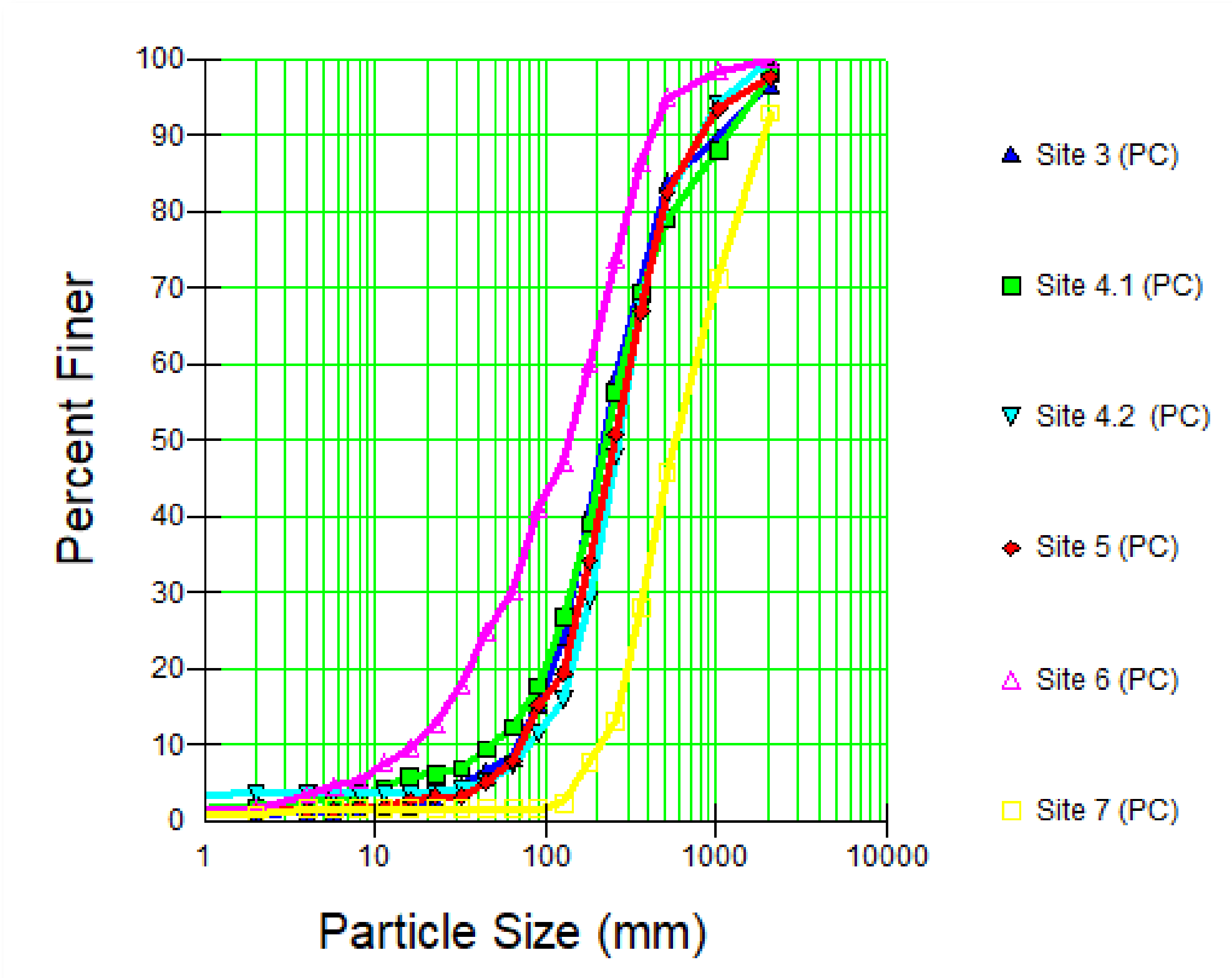


Figure 6-1 Riffle Substrate Particle Sizes.

Note: For reference the gravelometer in the creek is approximately 380 mm by 200 mm

Photo 6.1-1 Riffle Substrate at Site 6

The representative riffle cross-section geometry, riffle substrate D_{50}, and bankfull slope were utilized to classify the Rosgen stream type at each site. Bankfull slope was measured in RIVERMorph (publicly available program from RIVERMorph, LLC for storing and analyzing river data) based on the bankfull indicators surveyed in the long profile survey of each site, conducted during 2019. At sites where it was very difficult to find “typical” bankfull indicators (Sites 4.1, 4.2, and 7), head of riffle bed and water surface elevations were utilized to determine channel slope for classification and analysis. The Rosgen Stream Types are provided in Table 6-2.

Table 6-2 Rosgen Stream Classification

Site	Width / Depth Ratio (W_{bkf}/d_{bkf})	Maximum Depth (d_{mbkf}, ft)	Entrenchment Ratio (ER)	Riffle Substrate D_{50} (mm)	Slope (S, ft/ft)	Rosgen Stream Type
4.1	28.7	2.8	1.7	228	0.048	B3a
4.2	23.9	2.6	2.0	267	0.039	B2
7	18.2	3.5	1.8	597	0.080	B2
3	16.7	3.0	2.5	220	0.041	B3a
5	36.9	1.7	1.1	252	0.050	B3a
6	12.0	2.0	2.0	139	0.029	B3

At each site, channel stability was evaluated qualitatively during the field survey. These evaluations were documented using the modified Pfankuch Channel Stability Rating (Rosgen 2014) form. Stability ratings for the study sites ranged from fair to good; however, this rating was for free-flowing streams, thus it may not be directly applicable to the more-regulated Bishop Creek. The completed Pfankuch forms are included as Appendix B of this Final Technical Report.

Based upon a representative cross-section of each site's geometry, bankfull slope, and riffle substrate particle size distribution, the bankfull velocity, discharge, and shear stress were calculated in RIVERMorph. Jarrett's Equation[4] was utilized to calculate the Manning's n coefficient at each site for the estimated bankfull velocity and discharge. The estimated bankfull shear stress was utilized along with the Shields Curve and Colorado Curve to predict the largest movable particle size. The results from the Shield Curve ranged from mobilizing a 198 mm (large cobble) to 660 mm (medium boulder) bed particle for the estimated bankfull discharges. The results from the Colorado Curve resulted in slightly larger particles being mobilized under the same estimated bankfull discharges at each site (ranged from 293 mm/small boulder to 686 mm/medium boulder). Table 6-3 shows the predicted largest movable particle size for each study site and provides the historic data (critical particle size and bar sample D_{84}) from the earlier 1990 SLA report for comparison, although the earlier study looked at largest movable particle on a bar sample, so it is not a direct comparison.

[4] Jarretts equation is: n = 0.39*(S^0.38)*(R^-0.16), where S is the energy slope and R is the hydraulic radius of the stream. n-values in steep streams - Kleinschmidt (kleinschmidtgroup.com) accessed January 29, 2022.

Table 6-3 Predicted Largest Movable Particle under Estimated Bankfull Flow Conditions

Site	Cross-Section ID	Estimated Bankfull Velocity (ft/sec)	Estimated Bankfull Discharge (ft^3/sec)	Bankfull Shear Stress (lbs/ft^2)	Site D_{50} Riffle Particle Size (mm)	Predict Largest Movable Particle (mm)		1990 SLA Report	
						Shields Curve	Colorado Curve	Site D_{50} / D_{84} Substate Size (mm)	Critical Bar Substrate Particle Size * (mm)
4.1	4.9	2.8	128.9	3.6	228	298	392	*Not part of study*	
4.2	4.4	2.6	86.2	2.8	267	231	328	230 / 645	25-50
7	7.1	3.7	162.8	7.8	597	660	686	*Not part of study*	
3	3.2	3.5	147.3	4.1	220	341	431	300 / 870	60-135**
5	5.3	2.5	91.4	3.1	252	252	348	300 / 700	85-170
6	6.5	2.7	59.3	2.4	139	198	293	207 / 563	63-126 **

* Estimated for the stated bankfull flow from critical particle diameters near observed bars as reported in Appendix J of the SLA Report (1990) for a range of F* values and is provided for high-level comparison only, as this study evaluated bar sample mobility, while the current study evaluated bed substrate mobility in a riffle.

** Estimated from nearest cross sections, as this cross section was not reported in this study.

6.2 DREDGED SEDIMENT SIZE CLASSIFICATION

Sieve analyses of the sediment piles dredge from the Bishop Creek Project intakes and the LADWP intake, just below Powerhouse No. 6, were conducted during the 2019 reconnaissance and field survey trips. Generally, the dredge sediment would be a mixture of sand and gravel with some cobble. The dredge sediment D_{84} ranged from 6 mm (fine gravel) to 129 mm (large cobble) in the sieved sample; however, there were some larger rocks in the vicinity of the sample that were documented, but not included in the limited sample volume used in this study. The previously dredged sediment particle size distribution (Figure 6-3, Photo 6.2-1 and Photo 6.2-2) provided examples of the dredged sediment from Intake 2 and 5 sediment piles, respectively. The results of the dredged sediment sieving and largest observed particles near the sample site are provided in Table 6-4. However, it should be noted that due to dredging and relocating of sediments from these intakes, and the uncertainty if the dredged material was all sediment deposited by the channel (or if it was over-excavation of native soils), there is a small level of uncertainty in this data. Despite this uncertainty, field observations generally supported the evidence that most sediment in the intakes was sand and small gravel, with limited cobbles and boulders.

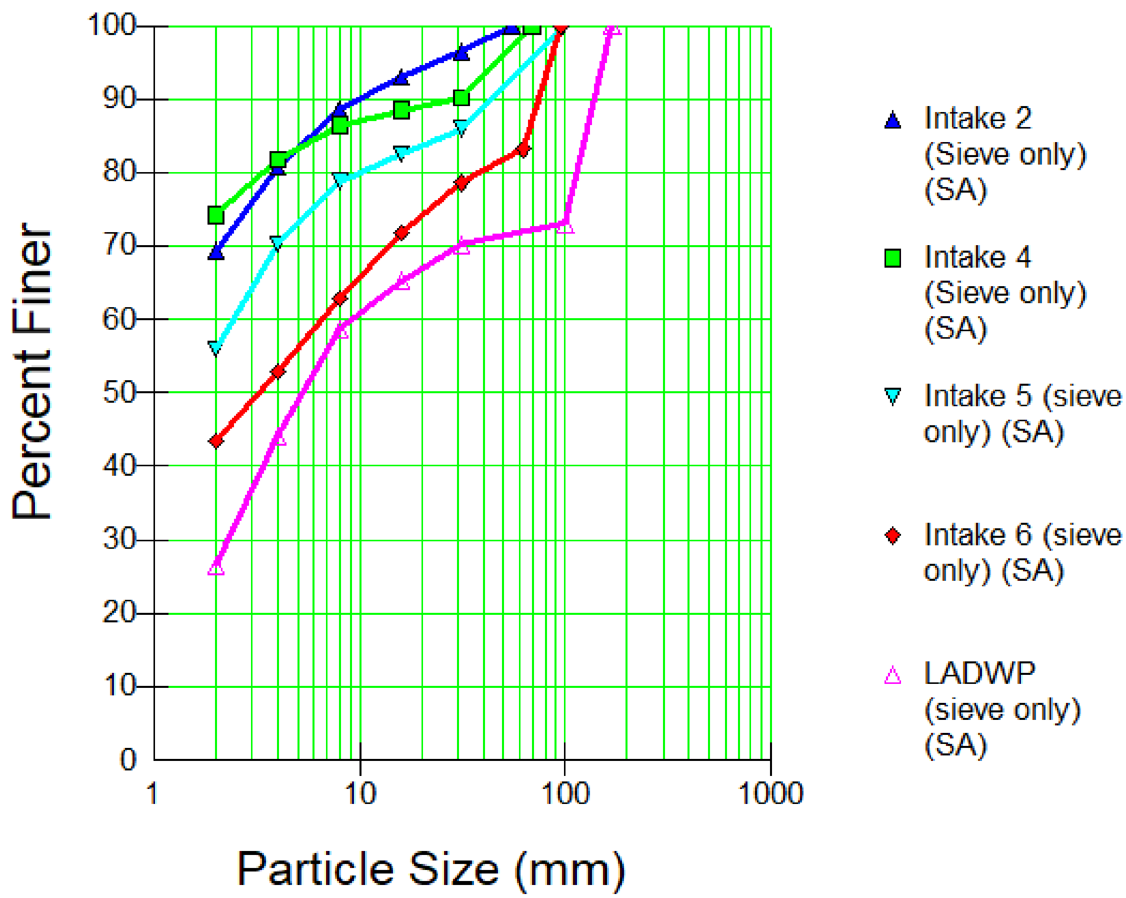


Figure 6-2 Dredged Sediment (Intake Impoundment) Particle Sizes

Photo 6.2-1 Sediment Pile from Intake 2

Photo 6.2-2 Sediment Pile from Intake 5

Table 6-4 Dredged Sediment Grain Sizes

Intake Number	Sieve Analysis			Largest Nearby Particle* (mm)
	% Sand/Silt (<2mm)	D_{50} (mm)	D_{84} (mm)	
2	69	<2	5.7	300
4	74	<2	6.0	220
5	56	<2	22.6	280
6	43	3.4	64.6	250
LADWP	26	5.6	128	270

* within ~5 feet of sampling sites, nearby particles not included in D_{50}/D_{84} calculations, as it is not clear if this is material mobilized during natural fluvial processes or included due to over-excavation of the sediment.

6.3 LARGE WOODY MATERIAL

During the 2019 field survey, LWM at each site was documented. Only dead wood larger than 4-inches in diameter and longer than 4.5-feet that could be mobilized by flow was documented. The stream channel was divided into three different zones and the location of LWM was categorized into five different zones/combinations of zone; some LWM was only categorized in two different zones. Thus, the location of the LWM was documented as a combination of those two zones. The three zones were WET (in baseflow), BKF, and RIP (riparian within floodplain). Table 6-5 summarizes the amount of LWM at each monitoring site and Photo 6.3-1 and Photo 6.3-2 provide the presence/absence of LWM at Sites 3 and 7, respectively. Additional information regarding large wood is provided Section 2.1.

Table 6-5 Large Woody Material

Site	Site Length (ft)	Zones										Total	
		WET		WET/BKF		BKF		BKF/RIP		RIP			
		# of pieces	pieces /100 LF	# of pieces	pieces /100 LF	# of pieces	pieces /100 LF	# of pieces	pieces /100 LF	# of pieces	pieces /100 LF	# of pieces	pieces /100 LF
4.1	258	1	0.4	8	3.1	2	0.8	7	2.7	1	0.4	19	7.4
4.2	231	1	0.4	0	0.0	8	3.5	0	0.0	16	6.9	25	10.8
7	290	5	1.7	3	1.0	21	7.2	0	0.0	235	81.0	264	91.0
3	278	0	0.0	5	1.8	0	0.0	0	0.0	3	1.1	8	2.9
5	285	2	0.7	0	0.0	8	2.8	0	0.0	15	5.3	25	8.8
6	249	0	0.0	0	0.0	1	0.4	0	0.0	12	4.8	13	5.2

Photo 6.3-1 Minimal LWM within and Along the Site 3 Channel

Note: Location is below the outlet of Coyote Creek Tributary

Photo 6.3-2 Substantial LWM in Riparian Zone of Site 7 Channel

6.4 SUBSTRATE MOBILITY EVALUATION

As detailed in Sections 4.4 and 5, a Substrate Mobility Evaluation Study was completed to further characterize the particle size distribution of sediments mobilized at or near bankfull flow conditions. PIT tagged rocks were deployed to inform sediment transport dynamics at Sites 4 (comprised on Sites 4.1 and 4.2) and 6 on Bishop Creek (Figure 6-8) The tagged tracer rocks were deployed along cross sections, and at other representative geomorphic units between the cross sections, at each study site. Field measurements taken during the study included cross section surveys, longitudinal profile surveys of the channel bed and water surface, surface measurements of bed particle size distribution, deployment and recovery of PIT tagged tracer rocks, and photo documentation. The full report on substrate mobility in Bishop Creek is included as Appendix A to this report, with a summary of the results provided in Section 6.4.1.

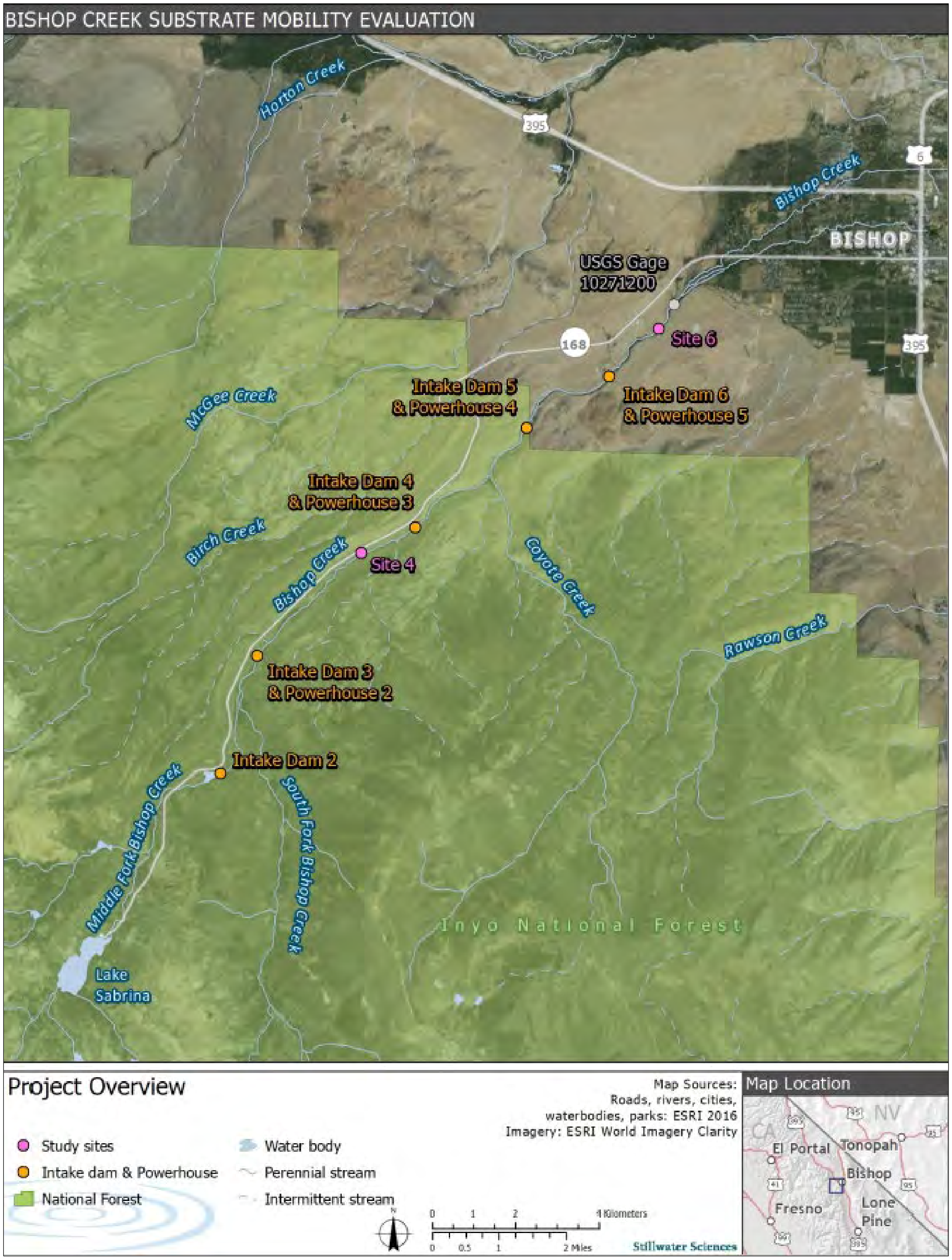


Figure 6-3 Bishop Creek Tracer Rock Evaluation Study Sites

6.4.1 Site 4 Results

Longitudinal profiles at Site 4 were approximately 550-feet-long during sampling events in 2020 and 2021. The average slope of the reach was calculated at 0.04 ft/ft (4 percent) during both years. No significant changes were apparent between the 2019 and 2020 longitudinal profiles. The cross-section geometry was similar between the two monitoring years, as was when recent cross sections were compared to riparian monitoring effort cross sections surveys since 1990. The bed at all three cross sections was predominantly cobbles, with gravel comprising less than 37 percent and boulders comprising less than 21 percent of the grain size distribution at each cross section. Sand content (less than 2 mm) from the 2020 pebble counts was 4, 16, and 1 percent of the measured particles at cross sections 4.9, 4.7, and 4.2, respectively. A summary of the pebble count data is provided in Table 6-6.

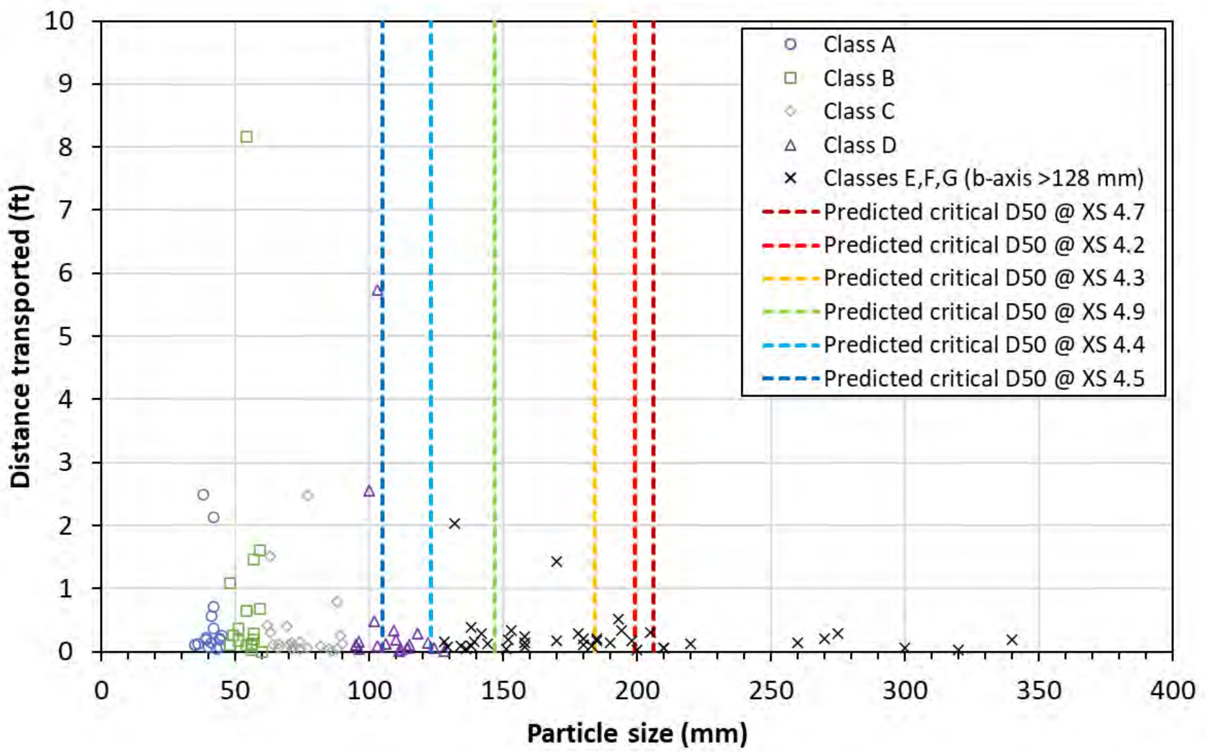
Table 6-6 Summary of Pebble Count Data From 2020 for Site 4

Cross Section (XS) ID	Year[1]	D_{16} (mm)	D_{50} (mm)	D_{84} (mm)
4.9	2020	25	78	239
4.7	2020	3	91	323
4.2	2020	43	117	226

[1]Pebble counts were not conducted at Site 4 in 2021 due to limited tracer mobility after the initial flushing flows.

One hundred and sixteen (100 percent) tracer rocks deployed on August 2, 2020, were recovered on May 26, 2021 after a pulse flow of approximately 70 cfs for a period of approximately 1 hour. Tracer rocks displacement calculations between the deployment and first recovery effort revealed that 114 (98 percent) of the recovered tracer rocks at Site 4 had not mobilized. The remaining 2 percent of tracers showed negligible transport distances, with a maximum displacement of 1.75 feet, indicating that short peak flows of 70 cfs do not substantially mobilize particles larger than 32 mm at this site.

A pulse flow of approximately 120 cfs was released to the study reach shortly after the first recovery effort to determine what size particles would mobilize during a higher flow. One hundred and fifteen (98 percent) of the deployed tracer rocks were recovered during the second recovery effort on July 21, 2021. A 24-hour pulse flow of approximately 120 cfs resulted in mobilization of 12 tracers (11 percent) and 17 percent of tracers with diameters less than 60 mm. Ninety-three percent of tracers with diameters greater than 60 mm had no mobilization. The largest mobilized particle had a diameter of 170 mm, although it was only transported 1.5 feet. Tracer movement by particle size is summarized in Figure 6-9, but this indicates that particles in the 32-60 mm size classes begin to mobilize more frequently at flows of 120 cfs, but most (over 80 percent) of the tracers less than 60 mm remained in place.



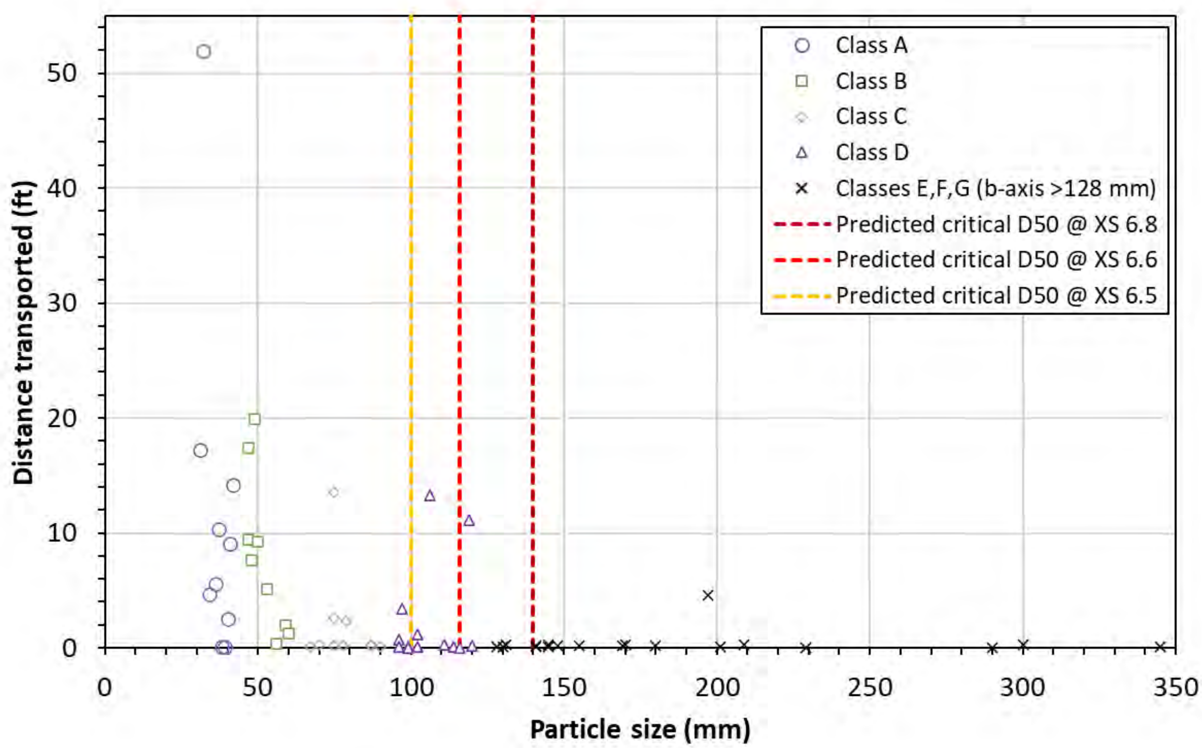
Note: Grain Size Classes Follow Conventions Used in Table 4-1.

Figure 6-4 Transport Distance of Tracer Rocks by Particle Size at Site 4 for a flow of 120 cfs in this reach of Bishop Creek

6.4.2 Site 6 Results

Longitudinal profiles at Site 6 were approximately 420-feet-long during sampling events in 2020 and 2021. The average slope of the reach was calculated at 0.02 ft/ft (2 percent) during both years. Cross section profiles were similar across previous years as was recent cross sections were compared to riparian monitoring effort cross sections surveys since 1990. The stream beds at all three cross sections primarily consisted of cobbles and gravel, with boulders comprising less than 21 percent of the pebble counts at each cross section during 2020 and 2021.

The 36 tracers (54 percent of all tracers deployed) that were recovered in the stream channel after a 24-hour flow of approximately 60 cfs were undisturbed and showed no movement from their initial placement locations (31 tracers were disturbed by non-fluvial processes and were not included in these results but were present for the higher flow). Non-fluvial disturbance was determined by observations of lateral and upstream movement of tracer rocks, presumably from anglers or other recreating individuals. This necessitated resetting approximately half of the tracers at Site 6 in May 2021, which resulted in shorter residence times for approximately half of the tracers at Site 6 prior to the second, larger pulse flow. Sixty (90 percent) of the deployed tracer rocks at Site 6 were recovered during the second recovery effort on July 21, 2021. The pulse flow resulted in mobilization of 40 percent (n = 24) of all recovered tracer rocks and 84 percent (n = 16) of tracers less than 60 mm. Eighty percent (n = 34) of tracers greater than 60 mm showed no mobilization. The largest mobilized particle was 197 mm and was transported 4.5 feet. This was the only mobile particle larger than the highest predicted critical D_{50} at the site and may have been due to the shorter period of time for the tracer to settle into the surrounding substrate prior to the high flow. Tracer movement by particle size is summarized in Figure 6-10. Since no tracers were mobilized at flows of 60 cfs, it was concluded that flows of this magnitude would not typically mobilize substrate particles larger than 32 mm in this reach of Bishop Creek, but at flows of 120 cfs, the majority (84 percent) of particles smaller than 60 mm mobilized at least 1-foot downstream (however, this is also with minimal settling time for the tracers prior to the high flow event).



Note: Grain Size Classes Follow Conventions Used in Table 4-1.

Figure 6-5 Transport Distance of Tracer Rock by Particle Size at Site 6 for Flow of 120 cfs in this Reach of Bishop Creek

7.0 DISCUSSION

The objective of the study was to better understand sediment dynamics in Bishop Creek. Specifically, the study was designed to understand what size particles were typically mobile in Bishop Creek, evaluate flow conditions under which mobilization of sediment and LWM occurs within the channel, evaluate how Bishop Creek Project operations may affect sediment transport flows, and understand how higher in-stream flows and sediment flushing may affect downstream reaches below Powerhouse No. 6.

7.1 SEDIMENT MOBILIZING FLOWS

One study was to evaluate bankfull flow to better understand sediment mobilizing flows in Bishop Creek. Bankfull flow is generally considered the channel forming flow and the point at which the flow just begins to utilize the floodplain and is often determined by review of field conditions and can vary based on site topography, site vegetation, the historic flow regime, and the observer. Since each reach of the study area of Bishop Creek has a different flow, minimum flow requirements, and upland/tributary inputs, the bankfull channel geometry, and bankfull flow of each reach were expected to differ, as shown in Table 6-3. Discharge at conditions that in an unregulated system would be equated with a bankfull discharge were estimated to range from approximately 60 cfs (Site 6) to 160 cfs (Site 7) for the Bishop Creek bypass study reaches.

At Site 6, a pulse of 60 cfs, approximately equal to the estimated bankfull discharge, did not mobilize particles greater than 32 mm; however, a pulse of 120 cfs mobilized a majority of particles less than 60 mm at least 1 foot. At Site 4, a pulse flow of 70 cfs did not substantially mobilize particles larger than 32 mm while a pulse flow of 120 cfs (approximately equal to the estimated bankfull discharge) mobilized particles between 32-60 mm more frequently (17 percent of particles mobilized); the pulse flow of 70 cfs did not mobilize any particles approaching the bed 2019 survey D_{50} greater than 220 mm, but showed limited (only 4) mobility of particles near the D_{50} of 78-117 mm for the substrate surveyed in 2020.

This substrate mobility study, when combined with the analysis of intake sediment and channel substrate sizes, indicates that for higher (bankfull and beyond) flows most of the sand and small gravel size particles flush downstream into the next impoundment, while coarse gravel, cobble, and boulders generally remain stable and in place in the stream channel. The establishment of vegetation along the stream banks further helps to limit the bank erosion and subsequent sediment inputs, thus reducing the overall sediment load in Bishop Creek as compared to unvegetated stream banks.

It is anticipated that a magnitude of flow greater than 60 cfs would be required to mobilize sediment in the 32-60 mm range in the Bishop Creek reaches, with some reaches requiring more than 120 cfs to mobilize most particles in this size range. However, the sand-size particles that dominate the dredged sediment were anticipated to be mobilized at lower flows, but an exact estimate of those threshold flows is not available from the information provided in this study. However, from the Sada and Hawkins study (1997), it is clear that a flushing flow of 200 cfs is capable of moving sand and gravel through the bypass reaches with minimal changes in gradation of the existing substrates. Thus, depending on the objective, a flushing flow of between 60 and 200 cfs could be considered to either distribute or flush a desired size class of sediment through the system.

Without lowering the intake headpond level, only sediment immediately adjacent to the low-level outlet inlets was anticipated to be mobilized during flushing flows. Lowering the headpond was anticipated to be required to produce adequate shear stress to mobilize sediment from the intake impoundments, where it currently settles under the current operation regime. Thus, any plans to mobilize sediment from the impoundments should include lowering of the water surface elevation to much closer to the invert elevations of the low level outlet(s).

7.2 MOBILE SEDIMENT PARTICLE DISTRIBUTION

It appears that Bishop Creek is relatively stable, even after a summer of near and beyond-bankfull flows (140 to 230 cfs) (e.g., such as 2019), as no substantial recent erosion was observed in the vicinity of the monitoring sites. This was further confirmed by limited differences between the cross sections surveys completed in 2020 and 2021, as well as when the 2019 surveys were compared to the early 1990 cross sections. The D_{50} of channel substrate observed in the riffles of Bishop Creek during the 2019 field investigation was generally cobbles and boulders (139 to 600 mm, Figure 6-1), which aligned relatively well with D_{50} particle sizes found at these sites in the SLA Report (1990). This supports the concept that this Bishop Creek channel has reached an equilibrium state with the current flow regime and there is only minor flushing of smaller sediment through the system as small sections of stream bank collapse, or surface runoff carries sediment into the channel from outside the primary Bishop Creek channel (such as Coyote Creek). The bed is well-armored and the substrate of cobbles and small boulders resists additional erosion, with a channel of adequate capacity and vegetated bank condition suitable for efficiently passing the smaller (less than 60 mm) size particles that enter into the system during episodic flows that happen during major runoff events (e.g., greater than 200 cfs) without any substantial changes to channel geometry or bed form.

The estimated bankfull shear stress at each study site was utilized along with the Shields Curve and Colorado Curve to estimate the largest movable particle at bankfull flow. The Shields and Colorado Curves produced largest movable particle sizes from approximately 200 to 660 mm and approximately 300 to 690 mm, respectively. These particle sizes were larger than the riffle substrate D_{50}, but less than the riffle substrate D_{84} (325 to 1050 mm, Figure 6-1).

The Substrate Mobility Evaluation results confirmed the largest mobilized tracer particle sizes were 170 mm (Site 4) and 197 mm (Site 6, with low “adjustment time” prior to pulse flow), during the 120 cfs pulse flow. These tracer particle sizes were between the D_{50} and D_{84} of the respective site riffle substrates and were only mobilized a short distance (shorter than 5 feet). At the lower gradient site (Site 6) with a bankfull estimate flow of 59 cfs, a majority of tracer particles less than 60 mm were mobilized at a flow of 120 cfs, with one particle traveling over 50 feet. While at the higher gradient site (Site 4) with a bankfull estimate flow of 86 to 129 cfs, tracers less 60 mm only began to mobilize during a 120 cfs pulse flow and the furthest tracer in this class traveled approximately 8 feet.

The sediment found in the dredge piles from past dredging at Intakes 2, 4, 5, 6, and the LADWP intake confirm that while there are some large particles that are deposited in the impoundments, the majority of the material is sand and fine gravel (all D_{50} values less than 6 mm, most less than 2 mm; Figure 6-3). The expected transport of sand-grained material through the system aligns generally with the findings of the Sada and Hawkins (1997) study that examined the pulse of sediment that was released when the low level outlet was opened at Intakes 3 and 4. That study concluded that the intake sediment (fines, sand, gravel, but predominantly sand) was generally deposited within 1.6 miles of the intake and was equally distributed across pools and riffles (Sada and Hawkins 1997). After a flushing flow of 200 cfs for 24 hours was applied, most of the intake sediment in the pools was removed by the flushing flow. In all except 3 of the 30 pools surveyed, there was no substantial change to substrate composition due to the sediment release (Sada and Hawkins 1997).. Based on the Sada & Hawkins study (1997), the smaller size classes of sediment (sand and gravel), such as those in the intake impoundments, are flushed entirely through the system with a pulse flow of 200 cfs. Therefore, it is possible to conclude that the average annual maximum flow over the past 27 years of 202 cfs most of which have more than 20 years of data available. These gauges were 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 would effectively flush the size classes of sediment found in the intake impoundments through the bypass reaches, but that particles in the range of the current riffle substrate (D_{50} from 140 to 600 mm) were not anticipated to frequently mobilize at this flow.

7.3 FLOW OPERATIONS IMPACT ON SEDIMENT TRANSPORT

The timing of higher flow releases is anticipated to have little effect on sediment tranport, but could have substantial effect on aquatic organisms if spawning beds were washed out. Further if sediment has more time to become more embedded in the substrate, it may be harder to mobilize, as compared to freshly deposited sediment, as was observed with some of he larger tracer rocks after replacement at Site 6 just prior to the larger flushing flow. The magnitude of flows was anticipated to have a susbtantial impact on sediment transport, with larger flows typically mobilizing larger sizes of substrate. The Substrate Mobility Evaluation revealed no substantial impact to channel substrate at bankfull flow for the two sites evaluted in this study. Low magnitude flows (e.g., less than bankful flow) were not anticipated to provide sediment tranport of the existing bed substate, but may mobilize the size classes of sediment found in the intake impoundments. The duration of flow releases can have a substantial impact on sediment transport, although that impact is reduced as the duration of small flows increases, the sediment supply was limited, and/or the bed becomes armored. In this system with limited sediment availability in the sand and fine gravel size classes of the riffle substrate, the sediment transport was primarily supply limited, thus adding additional flows was not anticipated to mobilize substantially more sediment, unless the flows become large enough to initiate bank erosion or mobilization of the bed substrate. Should sediment transport from the intake impoundments be desired, a flushing flow could be selected to either distribute that sediment throughout the downstream bypass reach or flush it to the next impoundment downstream. If implemented, the selection of any sediment transport flows should be made in consideration of the existing long-term agreement with CDFW (CDFW 2008), available water resources, seasonal spawning periods, and objectives of the sediment transport.

7.4 SEDIMENT AND FLUSHING FLOWS BEYOND PROJECT BOUNDARY

As Bishop Creek leaves the Project boundary, it is managed to meet the minimum flow requirements, but for larger flows, once the reservoirs are full and plant capacity is exceeded (e.g., during spring snowmelt in a wet year), the flow is unregulated. This snowmelt period is often when Bishop Creek experiences its annual peak flow, with flows in the bypass reach exceeding 200 cfs on average. The peak flows in the bypass reach exceed 300 cfs approximately every 5 years. When this peak flow in the bypass reach (within Bishop Creek) joins with any powerhouse discharge at that time, the downstream receiving water bodies could reasonably experience flows in excess of 200 cfs annually, on average. Thus, any combination of a flushing flow in Bishop Creek immediately above Plant 6 and a generation of less than 300 cfs would be within a reasonably anticipated 5-year return period peak flow experienced by downstream reaches.

Under the existing operating scenario, most of the sediment larger than silt that is transported by the bypass reaches of Bishop Creek settles in the next downstream Project intake impoundment, with the exception of the bypass reach between Intake 6 and Powerhouse No. 6, which tends to capture coarser material than the other intake impoundments (Figure 6-). This lowest bypass reach discharges directly to a very small (3 to 5-feet-deep) impoundment managed by LADWP for use in their water management. This intake was reported to be dredged more frequently than the Bishop Creek Project impoundments (Charles Partridge, SCE Project Staff, *personal communication*).

Powerhouse No. 6 and Bishop Creek (bypass reach between Intake 6 and Powerhouse No. 6) discharge directly into the LADWP Intake. Based on the LADWP Intake's small impoundment size, the intake would not be anticipated to attenuate flushing flows in the bypass reach of Bishop Creek between Intake 6 and Powerhouse No.6. Depending on the storage capacity of the impoundment, the size of sediment particles in transport, the sediment volume released, and the magnitude of flow, the impoundment may capture very little to most of the sediment coming down the bypass reach. Thus, mobilizing sediment from Intake 6 impoundment periodically could reasonably be anticipated to decrease the timespan between necessary dredging of the LADWP Intake.

Bishop Creek has a high gradient while in the mountains and begins to become lower gradient as it reaches the valley floor. As is typical of these types of streams, a downstream fining of the sediment on the substrate typically develops as the gradient is reduced, with larger sediment dropping out first, then the smaller material dropping out as the stream no longer has sediment transport capacity for that size particle. This is evident in the bed substrates, which show that the steepest site (Site 7) has the coarsest bed substrate, while the lowest gradient site (and most downstream site) has the finest bed substrate. As Bishop Creek exits the Project site, it is at a moderate to low gradient, and while the area downstream of Plant 6 was not part of the Project area, it is understood that the lower-gradient slope continues to the Owens River given the valley topography. The fate of sediment released from Bishop Creek beyond the Project would depend on the downstream channel dimensions and slopes; sediment volume and particle size range; flushing flow magnitude, timing, and duration; and downstream water withdrawal operations. The behavior of the sediment will be highly reliant on concurrent operations of water infrastructure between Plant 6 and the Owens River. SCE anticipates that the Sediment Management Plan will include measures for coordination and communication with downstream operators in order to minimize this potential effect.

Flushing flows larger than bankfull flows may cause an increase in LWM entering the downstream impoundment based on the presence of moderate amounts of LWM above the bankfull elevation. However, the magnitude of flushing flows that are likely to be considered (e.g., less than 200 cfs) are not substantially different than the average peak annual flow. Thus, while LWM may mobilize with the flushing flow, the site infrastructure was likely already set up to handle such inputs.

7.5 LARGE WOODY MATERIAL MOBILIZATION FLOWS

For most of the study sites, the LWM present was located within the riparian zone (Table 6-5), which was generally inaccessible for transport; except for flows that substantially exceed bankfull flows in the channel. This was not surprising, given the sustained near-bankfull flow in the summer of 2019 prior to that field survey. During that time, LWM in the WET and BKF zones was likely mobilized and deposited in the downstream riparian zone or passed through Project reaches of Bishop Creek. The amount of LWM documented at Site 7 (91 pieces per 100-linear-feet, Table 6-5) was disproportionally higher than the amount of LWM documented at the other study sites (3 to 11 pieces per 100-linear-foot,Table 6-5). Site 7 was a newly established site to better understand the sediment and LWM transport dynamics in Bishop Creek below an unimpeded major tributary (Coyote Creek), and the results show that this unregulated tributary does tend to carry more LWM than the bypass reaches of Bishop Creek.

As detailed in Section 6.2, a minimal amount of LWM is found on the bottom of the intake impoundments and most LWM washes over the intake impoundment spillways. According to Bishop Creek Project staff, there have been minimal issues with large LWM flows clogging the intake structures. Bishop Creek Project staff did note that larger LWM loads could occur if a higher runoff year follows a few years of lower flows, and/or when the upstream beaver dams were blown out and beaver dam materials were released. Based on this information, it appears that there is minimal ability to capture additional LWM for redistribution in the channel, unless flows substantially exceed bankfull flows or there is an extended period of extremely low flow in the bypass reaches.

8.0 CONSULTATION SUMMARY

SCE distributed periodic progress reports on the following schedule:

- Progress Report 1: December 19, 2019
- Progress Report 2: April 14, 2020
- Progress Report 3: July 24, 2020
- Initial Study Report (Progress Report 4): October 30, 2020
- Initial Study Meeting: November 10, 2020
- Progress Report 1: March 2, 2021
- Progress Report 2: May 28, 2021
- Progress Report 3: August 27, 2021
- Updated Study Report Filing: November 4, 2021
- Updated Study Report Meeting: November 18, 2021

Eight technical memoranda (including one for the sediment and geomorphology study) summarizing the 2019 study implementations were submitted with Progress Report 2. Following Progress Report 2, SCE hosted a TWG meeting on May 7, 2020 to discuss the 2019 study season, work completed to date and the technical memoranda. After the meeting, TWG members submitted comments on the technical memoranda and SCE provided a general response to those comments as part of Progress Report 3.

The Initial Study Report (ISR) was filed with FERC on October 30, 2020 and a virtual ISR Meeting was held on November 10, 2020. No additional comments were received from TWG members or stakeholders on the Sediment ISR materials or on the previously provided responses to comments. Three progress reports were filed in 2021 after the ISR, as identified above. The Updated Study Report (USR) was filed with FERC on November 4, 2021, and a USR Meeting was held on November 18, 2021.

Table 8-1 provides a summary of comments received to date for this study and responses to those comments.

Table 8-1 Comment Response Table

Comment Number	Study	Date of Comment	Entity	Comments	SCE Response
1	Sediment and Geomorphology Technical Memorandum	May 21, 2020	CDFW	The technical memorandum states that an assessment of LWM was completed in July and September of 2019 but no results were included in the technical memorandum. The technical memorandum should include estimates of instream LWM, discuss historical removal practices, and discuss the feasibility of passing LWM over or around the intake dams, to reduce impact to this component of fish habitat.	The technical reports, provided as a supplement to the progress reports, are interim work-products intended to summarize work to date and help the team prepare for additional field work and were not intended to be full “Study Reports.” LWM is discussed in Section 7.5.
2	Sediment and Geomorphology Technical Memorandum	May 21, 2020	CDFW	The technical memorandum states that an assessment of LWM was completed in July and September of 2019 but no results were included.	The technical reports, provided as a supplement to the progress reports, are interim work-products intended to summarize work to date and help the team prepare for additional field work and were not intended to be full “Study Reports. Section 6.3 discusses findings from LWM assessments in this Final Technical Report.
3	Sediment and Geomorphology Technical Memorandum	May 21, 2020	CDFW	This goal/objective was not addressed in the Technical Study Plan but should be addressed after 2020 surveys. [Referring to *Evaluate how operations (flow release timing, magnitude, and duration) could be modified to provide sediment transport flows.*]	SCE notes CDFW’s comment and notes that this comment is discussed in Section 7.3 of this Final Study Report.

Comment Number	Study	Date of Comment	Entity	Comments	SCE Response
4	Sediment and Geomorphology Technical Memorandum	May 21, 2020	CDFW	This goal/objective was not addressed in the Technical Study Plan but should be addressed after 2020 surveys. [Referring to *Understand potential sediment inputs and impacts from higher flows to reaches below Powerhouse No. 6 from changes in flow/operations.*]	SCE notes CDFW's observation and notes that this comment is discussed in Section 7.4 of this Final Study Report.
5	Updated Study Report Meeting Summary	December 3, 2021	USFS	Are the sites referred to as Sites 4.1 and 4.2 in your results the same as the riparian study sites with the same names?	SCE confirmed that these sites align with the riparian study sites. The sites were established in approximately 1990 as part of monitoring required through the existing license.

Comment Number	Study	Date of Comment	Entity	Comments	SCE Response
6	Sediment and Geomorphology	December 29, 2021	CDFW	The results from the cross-sectional measurements and bed particle size distribution of Bishop Creek in the study area suggest the banks of Bishop Creek are stable and armored within the study area. The Preliminary Application Document also mentions that there is a general armoring of the stream bed due to the presence of glacially deposited stones larger than the stream sediment transport capacity during annual snow-melt runoff. While pre-project conditions are relatively unknown, as the Project has been in operation since 1917, streambed armoring under relatively constant bypass flows is a well-documented phenomenon, suggesting the high degree of stream armoring may be a result of Project effects. Enhanced bank stability of Bishop Creek due to low minimum flows released by Project operations may not be beneficial to CDFW trustee resources (e.g., lack of establishment of woody riparian species that depend on scour and decreases in benthic macroinvertebrate diversity).	SCE appreciates this comment and notes that the current minimum flow requirements were developed to consider a variety of resources, such as riparian vegetation, visual resources, as well as CDFW trustee resources. SCE looks forward to continued discussion around minimum flows after the DLA has been filed.
7	Sediment and Geomorphology	December 29, 2021	CDFW	Results from the bed particle size distribution assessment/study of Bishop Creek show that the bed of Bishop Creek in the study area is primarily made up of cobbles and gravels with sand content...	SCE appreciates this comment, we agree that there is a flow value that could effectively flush sediment. Thresholds will be developed in the forthcoming Sediment Management Plan to be filed with the FLA.

Comment Number	Study	Date of Comment	Entity	Comments	SCE Response
8	Sediment and Geomorphology	December 29, 2021	CDFW	CDFW recommends that SCE consider a sediment management plan for Bishop Creek that uses reintroduction of sediment into Bishop Creek below the forebays and intakes, in conjunction with O&M procedures (i.e., flushing flows) as a tool to benefit public trust resources. CDFW suggests that FERC base the protection mitigation and enhancement (PME) measures for Bishop Creek on the results of recent studies conducted in the FERC Relicensing Process, and not on existing operations.	SCE intends to draft a Sediment Management Plan for the Bishop Creek Project. An overview of this plan is included in an appendix to the DLA. A draft plan will be reviewed with stakeholders prior to finalization to be filed with the FLA. SCE has no comment on how FERC will evaluate PME measures; environmental studies conducted as part of this relicensing and proposed PME measures in the Draft License Application were developed in response to FERC's Scoping Document 1 to assist FERC with its National Environmental Policy Act (NEPA) analysis.

9.0 REFERENCES

California Department of Fish and Game (CDFW). 2008. Long Term Agreement Regarding Proposed Routine Maintenance Activities For Hydroelectric Projects In Inyo And Mono Counties. Notification No. 1600-2008-0099-R6. October 6, 2008.

Chandler Decree 1922. 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).

Harrelson, C.C., Rawlins, C.L., and Potyondy, J.P. 1994. Stream Channel Reference Sites: An Illustrated Guide to Field Technique. General Technical Report RM-245. U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.

Psomas. 2005. Bishop Hydroelectric Project Phase 2 Year 2 Monitoring of Riparian and Aquatic Habitat. Unpubl. Tech. rept. prepared for Southern California Edison (results of monitoring in 2004).

Read, E. 2015. Bishop Hydroelectric Project (FERC No. 1394): Riparian Monitoring Results for 2014 and Comparison to Previous Years. Unpubl. Tech. rept. prepared for Southern California Edison (results of monitoring in 2014).

Read, E. and Sada, D. 2013. Bishop Hydroelectric Project (FERC No. 1394): Analysis of Riparian Vegetation, Aquatic Habitat, and Fish Populations, Phase 2 (Year 3) and Comparison to Baseline. (results of monitoring in 2009).

Rosgen, D. 2014. River Stability Field Guide, 2nd Edition. Wildlands Hydrology. Fort Collins, CO.

Sada, D.W. and Hawkins, H.G. 1997. Effects of Intake Pond Sediment Releases on Bishop Creek Turbidity and Pool Quality; Inyo County, California. Unpubl. Tech. rept. prepared for Southern California Edison, Rosemead, CA. Dated March 20, 1997.

Sierra Hydrotech. 1983. Technical Report, Septemeber 1982 Storm and Flood Bishop Creek Basin. Prepared for Southern California Edison Company, California. February, 1983.

Simons, Li & Associates (Simons). 1990. Evaluation of stream channel processes and the growth of riparian vegetation, Bishop Creek, California. Unpubl. Tech. rept. prepared for Southern California Edison, Rosemead, CA.

U.S. Geologic Survey (USGS). 2022. National Water Information System: Web Interface. USGS Gauge 10271200, Daily Statistics. https://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=10271200. Accessed January 17, 2022.

Wolman, M.G. 1954. A Method of Sampling Coarse River-Bed Material. Transactions—American Geophysical Union, 35, 951-956. http://dx.doi.org/10.1029/TR035i006p00951

APPENDIX A

TRACER ROCK SUBSTRATE MOBILITY EVALUATION

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project

(FERC Project No. 1394)

TECHNICAL MEMORANDUM

BISHOP CREEK SUBSTRATE MOBILITY EVALUATION

SOUTHERN CALIFORNIA EDISON

An EDISON INTERNATIONAL Company

December 2021

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project

(FERC Project No. 1394)

TECHNICAL MEMORANDUM
BISHOP CREEK SUBSTRATE MOBILITY EVALUATION

Southern California Edison
1515 Walnut Grove Ave
Rosemead, CA 91770

December 2021

Support from:

Stillwater Sciences

and

Kleinschmidt

TABLE OF CONTENTS

List of Figures

List of Tables

List of Appendices

1.0 INTRODUCTION

This Technical Memorandum summarizes results from supplemental field investigations conducted as part of Task 4 – Substrate Mobility Evaluation from the Sediment and Geomorphology Study, as described in the Modification to Methods of the Initial Study Report (section 12.5). The primary goals of Task 4 are to (1) characterize the particle size distribution of sediments mobilized at or near bankfull flow condition, and (2) evaluate hydraulic conditions required to mobilize D_{65} and D_{84} particle sizes. This tracer study primarily looks at the first goal, as based on estimated bankfull conditions for these sites.

2.0 STUDY AREA AND BACKGROUND

The Study Area included two study sites in the Bishop Creek watershed, Site 4 and Site 6. Site 4 is comprised of two contiguous sub-sites, 4.1 and 4.2, which are treated as one site for this Technical Memorandum. Both sites are downstream of Project reservoirs (i.e., South Lake and Lake Sabrina) (Figure 1) and located on natural stream reaches between a powerhouse intake impoundment and the associated powerhouse (a penstock carries flow parallel to the creek).

Bishop Creek is approximately 10 miles long and has a drainage area of approximately 70 square miles from its headwaters to its confluence with the Owens River. The Bishop Creek watershed drains the eastern side of the Sierra Nevada Range and joins Owens River near Bishop, California. This section of the watershed ranges in elevation from approximately 4,900 feet (ft) to 8,500 ft. Bishop Creek is separated into multiple segments by a series of powerhouses and intakes (Figure 1). The channel form is characterized by high gradient, coarse-grained, cascade and step-pool morphology.

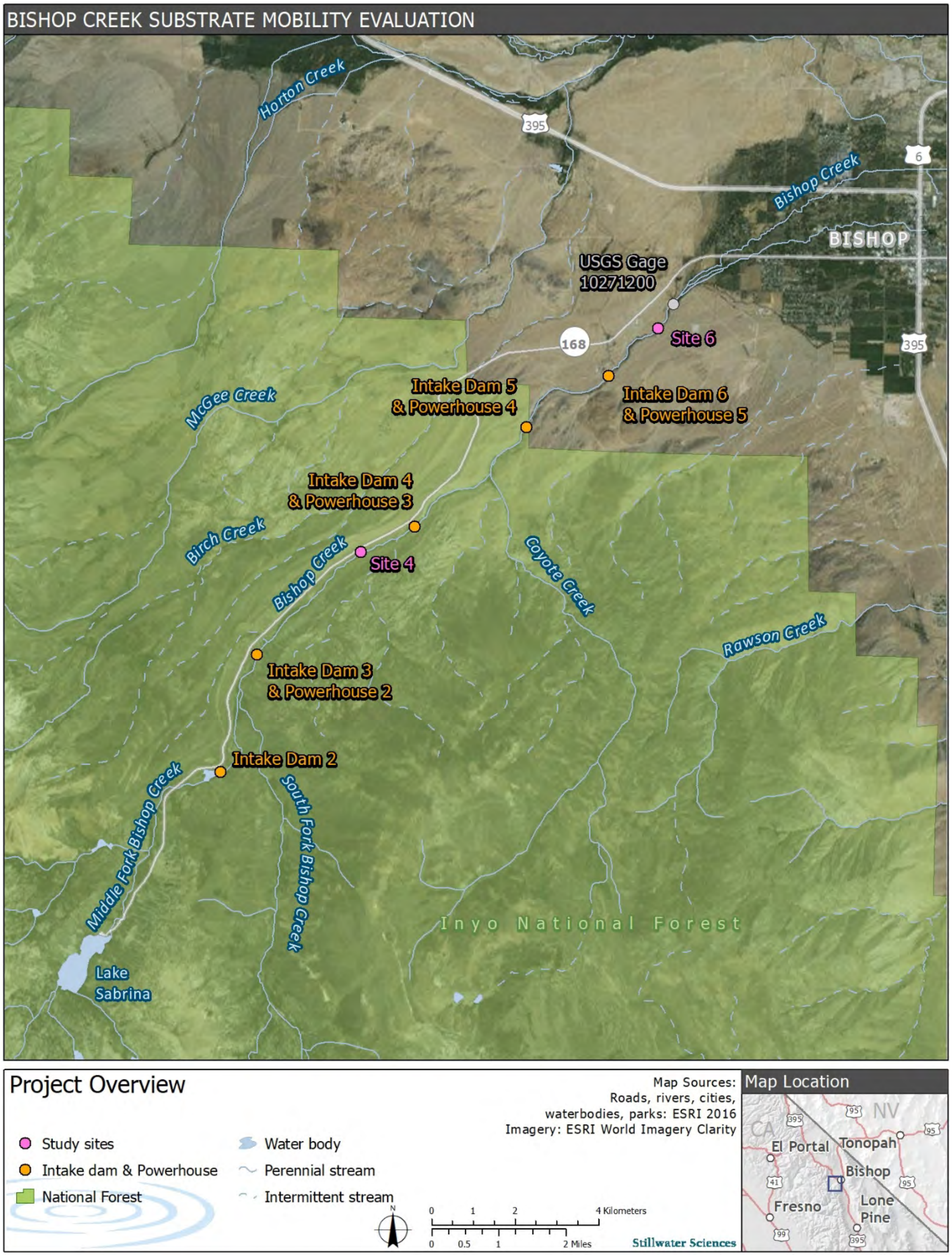


Figure 1. Bishop Creek Tracer Rock Study Site Overview

2.1 HYDROLOGY

Annual peak and 15-minute flow data were used to evaluate hydrology driving sediment transport at Sites 4 and 6. Daily flow data were obtained from Southern California Edison (SCE) for Bishop Creek below Intake 6 and Intake 3, which correspond to the flow in Bishop Creek at Sites 6 and 4, respectively. Fifteen-minute flow data were evaluated for the period of March 2020 to September 2021 to determine the magnitude and duration of high flow events that occurred over the duration of the tracer rock study. Annual peak flow data were obtained from U.S. Geological Survey (USGS) Gage ID 10271200, which is approximately 0.3 miles downstream of Site 6 (on Bishop Creek above Plant 6) and has a total record of 27 years under current in-stream flow requirements. Annual peak flow data are not available for Site 4. Because of this, Site 6 peak flow data were prorated using a standard flow transference formula based on drainage area ratios (Waananen and Crippen 1977):

$$Q_u = Q_g(A_u/A_g) \tag{1}$$

Q_u = Ungaged discharge

Q_g = Gaged discharge

A_u = Ungaged drainage area

A_g = Gaged drainage area.

A flood frequency analysis was performed in accordance with Bulletin 17C (USGS 2019) for USGS Gage ID 10271200 using the Hydrologic Engineering Center's statistical software package (HEC-SSP) (USACE 2019). Table 1 presents peak discharges up to the 20-year recurrence interval (5% annual exceedance probability). Annual peak flows in Bishop Creek ranged from 15 cubic feet per second (cfs) to 453 cfs over the last 27 years (water years 1994 to 2020) (Figure 2). The largest flow on record (453 cfs) had a return period of approximately 20 years (Figure 3).

Table 1. Flood frequency flows for USGS Gage ID 10271200

Annual Exceedance Probability (%)	Site 6 Instantaneous Peak Flow (cfs)	Site 4 Instantaneous Peak Flow (cfs)[1]
5	487	342
10	403	283
20	313	220
50	176	124

[1] Discharge values were prorated by drainage area using equation 1. A_g =104 mi^2, A_u =73 mi^2.

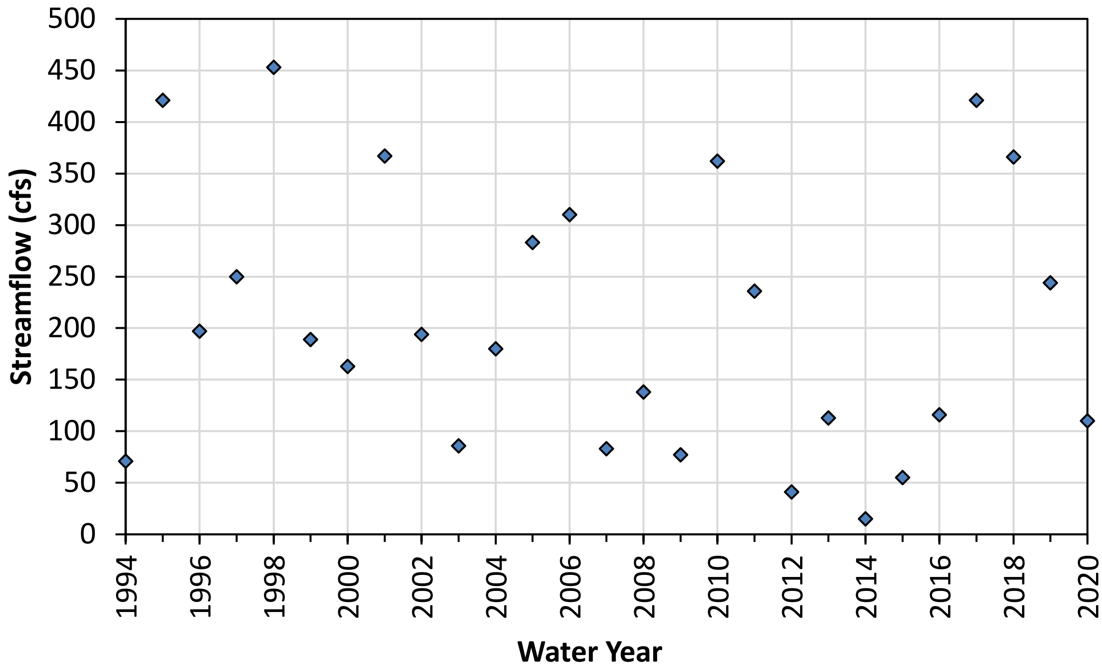


Figure 2. Instantaneous maximum annual peak flow record for water years 1994–2020 at USGS Gage ID 10271200 (Site 6)

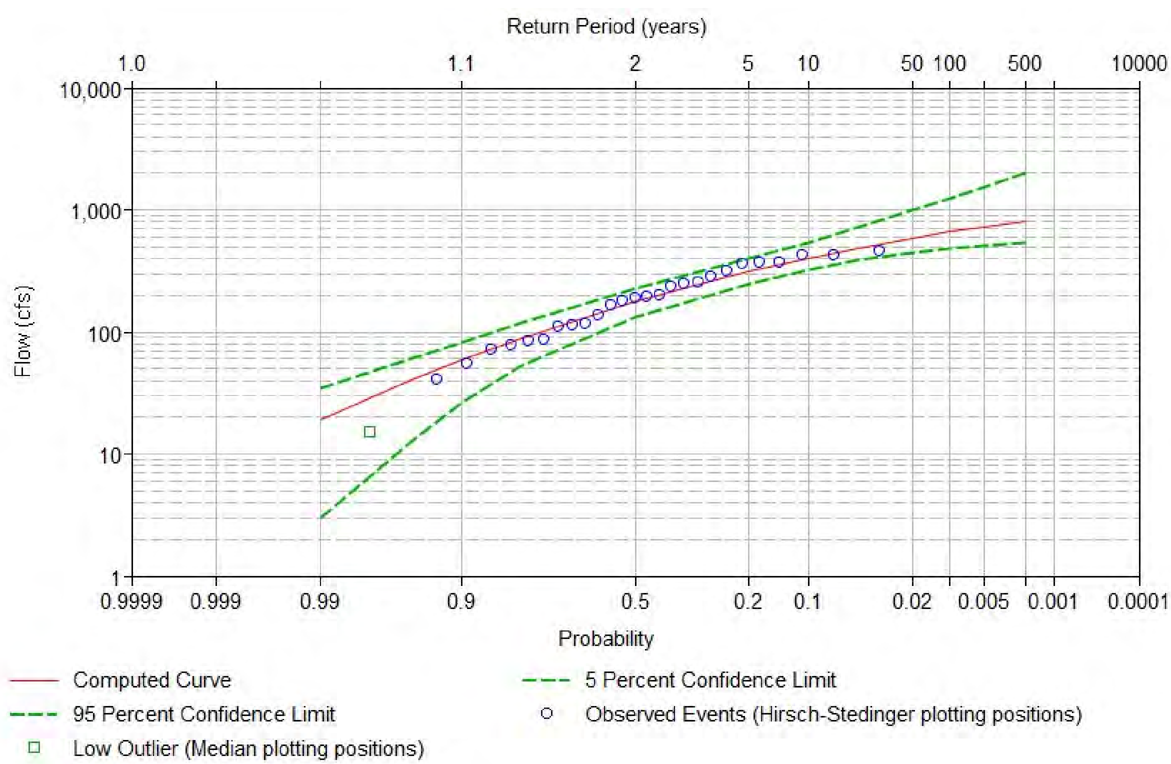


Figure 3. Flood frequency analysis for USGS Gage ID 10271200 (Site 6)

The Project utilizes water from Bishop Creek to generate electricity. Instream flow releases are made within bypass reaches as described in Section 12.2.3 of the PAD (Southern California Edison 2019). Other sources of water input between the junction of South Fork Bishop Creek and Middle Fork Bishop Creek and Powerhouse No. 6 include limited inter-basin transfers from Birch and McGee Creeks (directly into the penstocks) and three tributaries. The largest tributary, Coyote Creek, is unregulated and enters Bishop Creek upstream of Powerhouse No. 4, between Sites 4 and 6.

As described in the Operations Model Study Plan, flow at the site varies depending on the amount of runoff, instream minimum flow requirements, and SCE's release schedule, which is dictated by snowpack, snow melt, spring rain events, drought, power demand, and irrigation. In Bishop Creek, peak runoff generally occurs from June to August, as the snow melts in the higher mountain elevations. A discussion of general project hydrology and operations is available in SCE (2019).

3.0 METHODS

3.1 FIELD MEASUREMENTS

Field measurements at Study Sites 4 and 6 included cross section surveys, longitudinal profile surveys of the channel bed and water surface, surface measurements of bed particle size distribution, deployment, and recovery of Passive Integrated Transponder (PIT) tagged tracer rocks, and photo documentation.

Tracer rock deployments were conducted at Sites 4 and 6 between August 2 and August 6, 2020. Tracer rock recovery efforts 1 and 2 were conducted on May 26 and July 20, 2021, respectively.

3.1.1 LONGITUDINAL PROFILES AND CROSS SECTIONS

Cross section and longitudinal profile surveys were conducted at the study sites utilizing Trimble S7 robotic total station (RTS) and Trimble R10-2 Real-time kinematic Global Navigation Satellite System (RTK GNSS) survey equipment. Temporary control points were installed near each study site, and coordinates were established by submitting static GNSS observations to the National Geodetic Survey Online Positioning User Service (NGS OPUS).

Cross section surveys were conducted in sufficient detail to capture significant changes in grade and characterize channel geometry generally following standard survey procedures as described by the U.S. Dept. of Agriculture, Forest Service (Forest Service) (Harrelson et al. 1994). The cross section surveys extended above bankfull on both banks and included measurements of the edge of water and thalweg. Indicators of bankfull flow elevation, including water stain lines, vegetation transitions, and channel bank slope breaks were noted, and the approximate bankfull locations were recorded. Photos of each cross section were taken facing upstream, downstream, towards left bank, and towards the right bank to document site conditions during the time of survey.

A longitudinal profile of the channel thalweg was surveyed through the length of the site and extended upstream and downstream of the cross sections for a minimum total length of 20 times the bankfull width. Survey point spacing averaged 3 ft, with denser spacing in topographically complex areas. The longitudinal profile survey followed procedures described by the Forest Service (Harrelson et al.1994), including surveying enough points to capture the topography of pools, riffles, and other habitat features, as well as other significant breaks in channel gradient.

3.1.2 SUBSTRATE CHARACTERIZATION

Wolman pebble counts (Wolman 1954) were conducted to characterize channel bed particle size distribution along cross sections and representative channel locations. Pebble counts were conducted in 2020 and 2021 at Site 6 and 2020 at Site 4. Pebble counts entailed measuring the intermediate axis (b-axis) of 100 particles in the immediate vicinity of a cross section transect. All silt- and sand-sized particles were classified as <2 millimeters (mm).

3.1.3 TRACER ROCKS

Passive Integrated Transponder (PIT)-tagged tracer rocks were deployed to inform sediment transport dynamics at sites 4 (consisting of sites 4.1 4.2) and 6. Tracer rocks bracketed the average range of D10 to D84 particle sizes (32 to 350 mm) based on 2019 pebble counts for these sites (Kleinschmidt 2020). Table 2 describes the particle size classes and total quantity of tracer rocks installed in 2020.

Table 2. Tracer rock size classes and quantities by site

Size Class	B-axis Range (mm)	Site[1]	Quantity
A	32–45	4	18
		6	12
B	45–64	4	18
		6	12
C	64–90	4	22
		6	11
D	90–128	4	19
		6	12
E	128–180	4	19
		6	12
F	180–256	4	14
		6	5
G	256–350	4	6
		6	3
Total		4	116
		6	67

[1] Sites 4.1 and 4.2 were treated as a single site (Site 4) for the tracer rock study because the sites are contiguous and tracer rocks were deployed between the two sites as well as at the cross sections.

Tracer rock size classes A–F were obtained from an out-of-area aggregate source prior to the start of fieldwork. The out-of-area tracer rocks had similar lithology (igneous) and physical properties (e.g., specific gravity, sphericity, hardness, mineralogy) to native particles found at the Bishop Creek study sites. Tracer rocks in size class G were obtained on site. The out-of-area tracer rocks were decontaminated with Virkon® aquatic disinfectant prior to deployment in Bishop Creek. The intermediate axis (B-axis) and mass were recorded for each particle in size classes A-F, but only the B-axis parameter was recorded for size class G particles. PIT tags were inserted into the tracers by drilling a 3/16-inch hole into each particle and sealing the PIT tag in place with a quick cure, high strength concrete and masonry anchoring adhesive. The adhesive was smoothed over to mimic natural particle surface texture. The tracer particles were painted a bright, high-contrast color with concrete marking paint once the adhesive was dry.

Tracer rocks were deployed along cross sections and at other representative geomorphic units between the cross sections at each study site. Various geomorphic units were chosen for tracer rock placement to test rock particle mobility in a range of environments. Geomorphic units included riffles, cascades, flat-water sections (runs and glides), and plunge pools. Prior to placement of individual tracer rocks, a rock of similar shape and size was removed from the streambed to create a void space and a similarly sized tracer rock was gently pressed down and worked into the void space to simulate natural streambed particle emplacement. The location of each tracer rock was surveyed with RTS or RTK GNSS equipment, and representative photographs were taken of the tracer locations.

3.2 Analysis

3.2.1 Longitudinal Profiles and Cross Sections

Results from the 2021 cross section and longitudinal profile surveys during tracer recovery were compared with surveys from 2019 and 2020 to assess geomorphic change (e.g., aggradation or incision). The 2019 profiles and cross sections were completed as part of the larger Sediment & Geomorphology Study using local benchmarks and laser level surveying, so there may be some differences in precision between the 2019 and 2020/2021 surveys. Because the longitudinal profiles do not start and stop at endpins, there is likely some uncertainty in aligning the 2019, 2020, and 2021 surveys. Despite differences in longitudinal profile alignments, changes were quantified by comparing reach-average slope between monitoring years. Cross sections were evaluated for instances of aggradation or incision.

3.2.2 Bed Particle Size Distributions

Bed particle size distribution data were used to calculate commonly used bed particle size metrics: the particle size for which 16% of the distribution is finer (D_{16}), the particle size for which 50% of the distribution is finer (D_{50}, or the median size), and the particle size for which 84% of the distribution is finer (D_{84}). Particle sizes were binned by size class using half-phi intervals and plotted using cumulative distribution functions (Bunte and Abt 2001).

3.2.3 Sediment Mobility

Tracer rock displacement lengths were quantified between deployment and recovery effort 1, and recovery effort 1 and recovery effort 2. Tracer rocks with a displacement greater than 1 ft were considered mobilized. Sediment mobility was assessed at each study site using the channel shear stresses estimated from a Hydrologic Engineering Center's River Analysis System (HEC-RAS) hydraulic model for the largest pulse flow during tracer deployment, particle size data from the pebble counts, and the Shields relationship (equation 2) to compute the critical shear stresses acting on the channel bed during specific flows.

$$\tau^*_{crit} = \frac{\tau_b}{(\rho_s - \rho) g D_{50}} \quad (2)$$

Where:

τ^*_{crit} is the critical Shields number (unitless)

τ_b is basal shear stress (pascals)

ρ is the density of water (kilograms per square meter [kg/m^3])

ρ_s is the particle density, (assumed 2,650 [kg/m^3])

g is acceleration due to gravity (meters per second squared [m/s^2])

D_{50} is the median particle size (mm)

Equation 2 can then be rearranged to solve for critical D_{50} (i.e., the median particle size likely to be mobilized for a given shear stress) under a given flow at each cross section.

$$D_{50_{crit}} = \frac{\tau_b}{(\rho_s - \rho) g \tau^*_{crit}} \quad (3)$$

To estimate shear stresses (τ_b) acting on the channel bed at each study site, flow hydraulics were modeled using the U.S. Army Corps of Engineers' (USACE) HEC-RAS. HEC-RAS is a one-dimensional hydraulic model that is widely used for estimating general flow characteristics. This was a simple HEC-RAS model, constructed for the purpose of estimating shear stress. This one-dimensional model assumes a uniform velocity across the channel but can partition flow into channel and overbank sections. Flow is modeled based on cross sections and topography between the cross sections is assumed to be uniform. The geometry used in the HEC-RAS model was derived from the channel cross section surveys and the discharge was set equal to the largest pulse flows released by SCE during each tracer deployment. Manning's n roughness values ranging between 0.05 and 0.055 were applied in the main channel and overbanks, respectively. The roughness values were estimated based on dominant substrate cover in the channel and vegetation density in overbank areas, using a combination of field observations and professional judgement.

4.0 RESULTS

4.1 SITE 4

The following sections provide results from the 2020 surveys (during tracer installation) at Site 4 and a comparison with data collected in 2019 during separate study elements. Due to the limited mobility of the tracers observed during the tracer recovery efforts in 2021 at this site, the profile and cross section were not resurveyed. An overview of Site 4 and the survey extents are provided in Figure 4.

Figure 4. Site 4 overview

4.1.1 Longitudinal Profile and Cross Sections

The 2020 longitudinal profile was 550 ft long and extended 75 ft upstream of cross section 4.9 and 110 ft downstream of cross section 4.2 (Figure 4 and Figure 5). The reach average slope, calculated as a best-fit line to the long profile, was 0.04 (4%) in 2019 and 2020. No significant changes were apparent between the 2019 and 2020 longitudinal profiles, and minor variability in elevations between the two profiles is likely a result of profile alignment and/or survey point density.

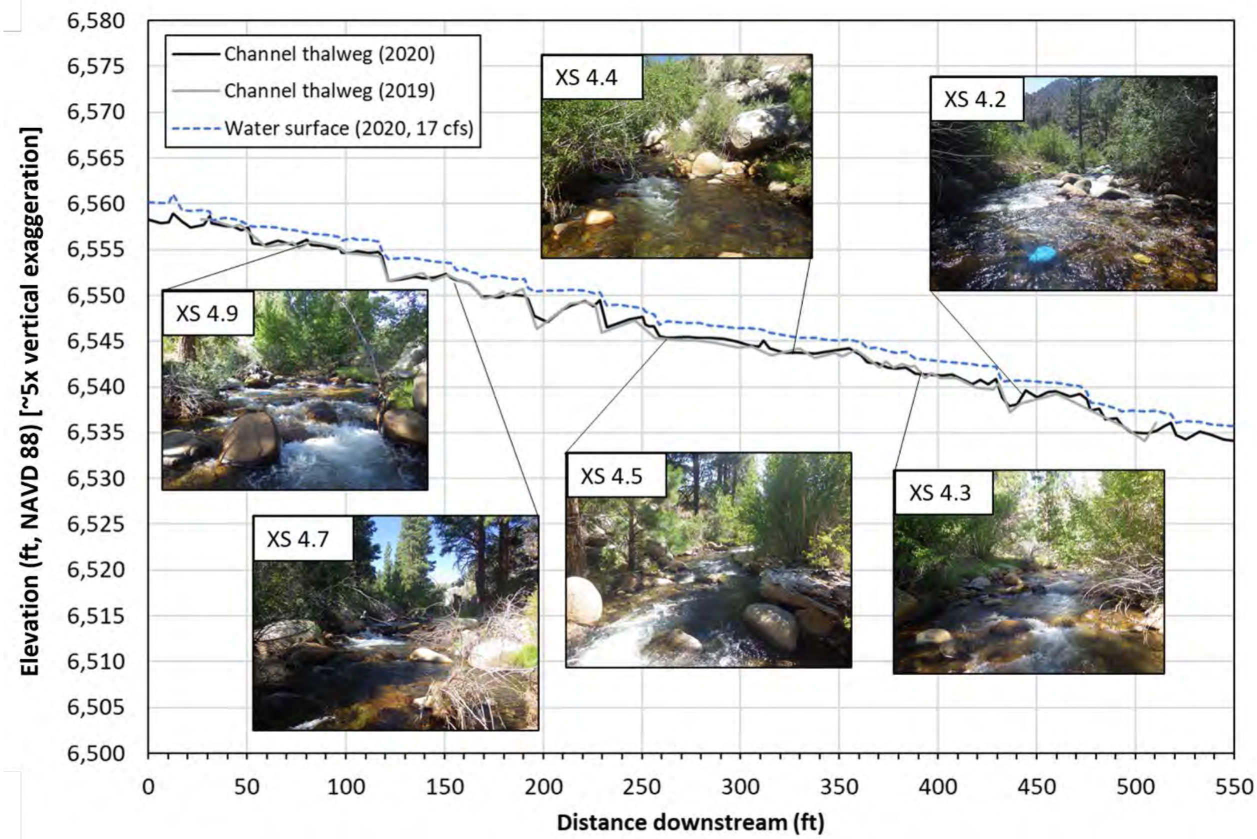
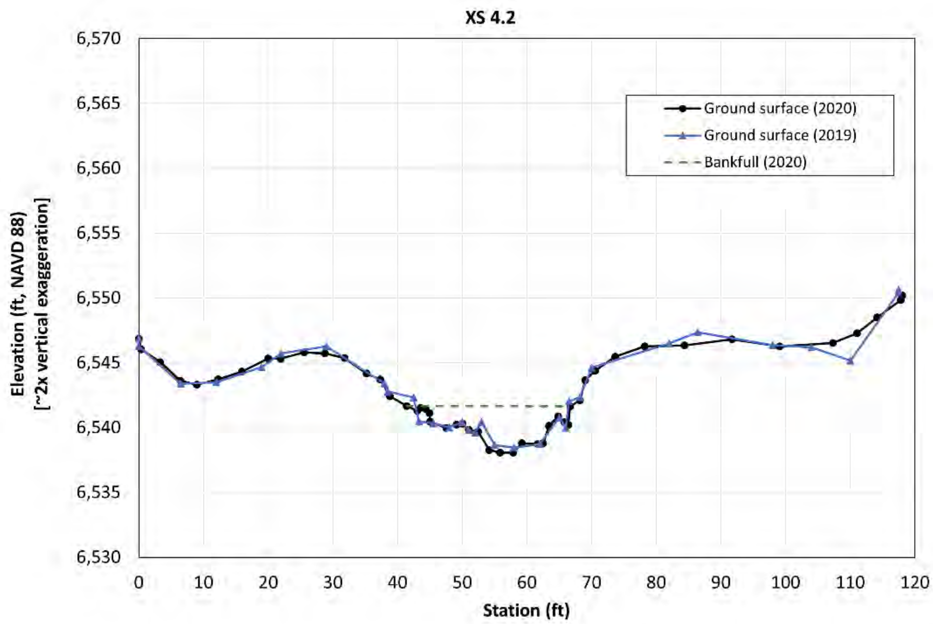


Figure 5. Longitudinal profile for Site 4. Leader lines indicate cross section locations along longitudinal profile. Inset photos show representative conditions of each cross section during 2020 surveys.

Cross sections from 2019 and 2020 are provided in Figure 6 through Figure 8. The cross section geometry was generally similar between the two monitoring years. Differences in bed elevation (e.g., cross section 4.4 between stations 35 and 45) between the monitoring years likely reflect variation in survey point locations rather than topographic changes. Apparent differences in cross section 4.5 are due to the 2019 cross section including survey points on large wood, where the 2020 cross section did not.



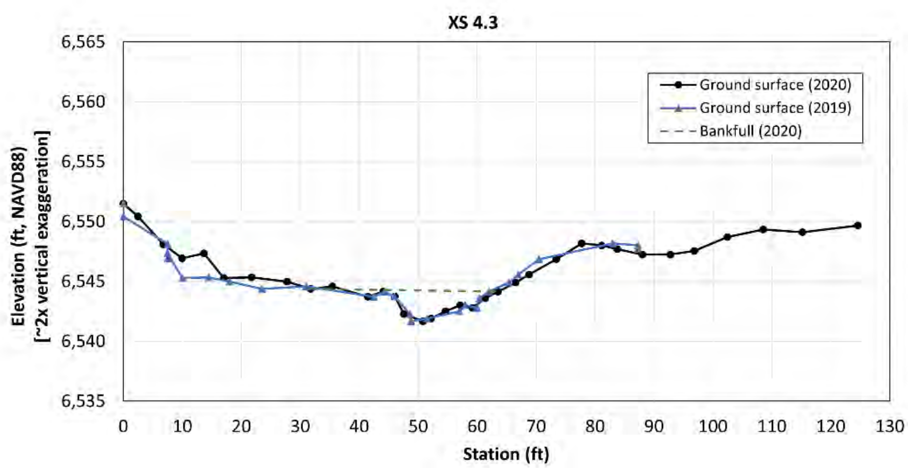
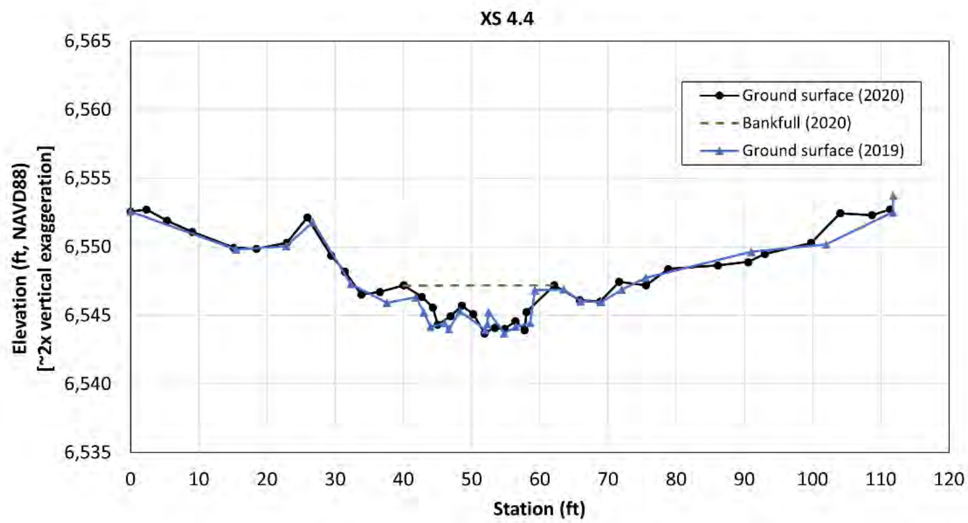


Figure 6. Cross sections 4.2 and 4.3. Stationing is from left to right bank looking downstream.



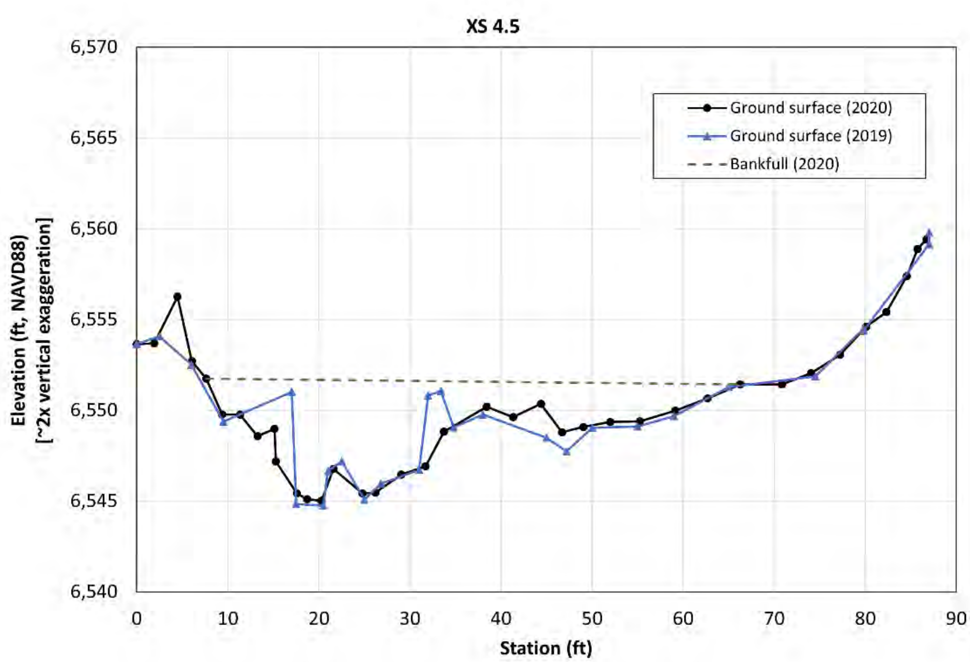
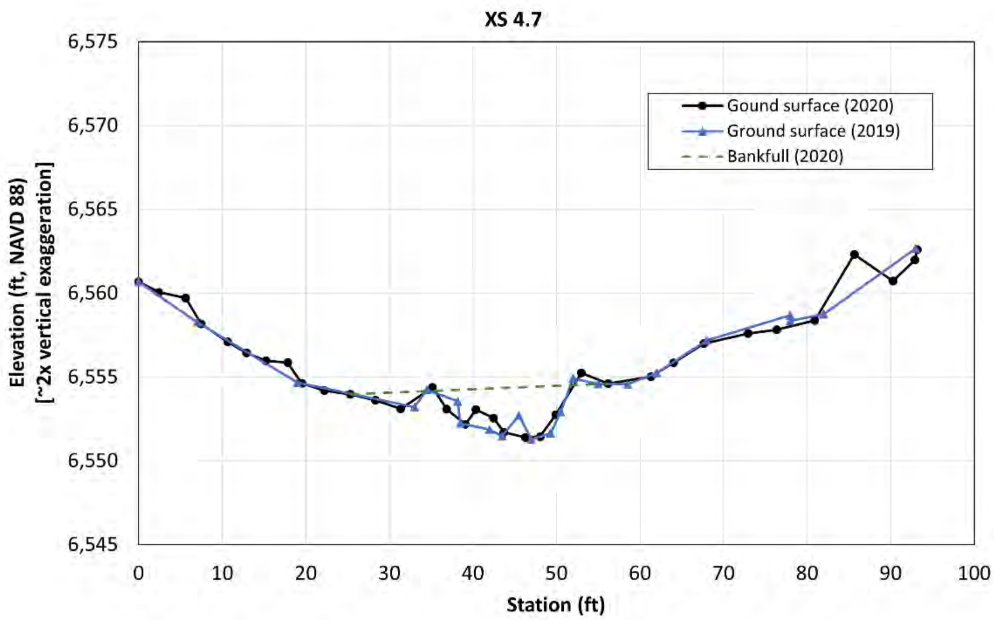


Figure 7. Cross sections 4.4 and 4.5. Stationing is from left to right bank looking downstream.



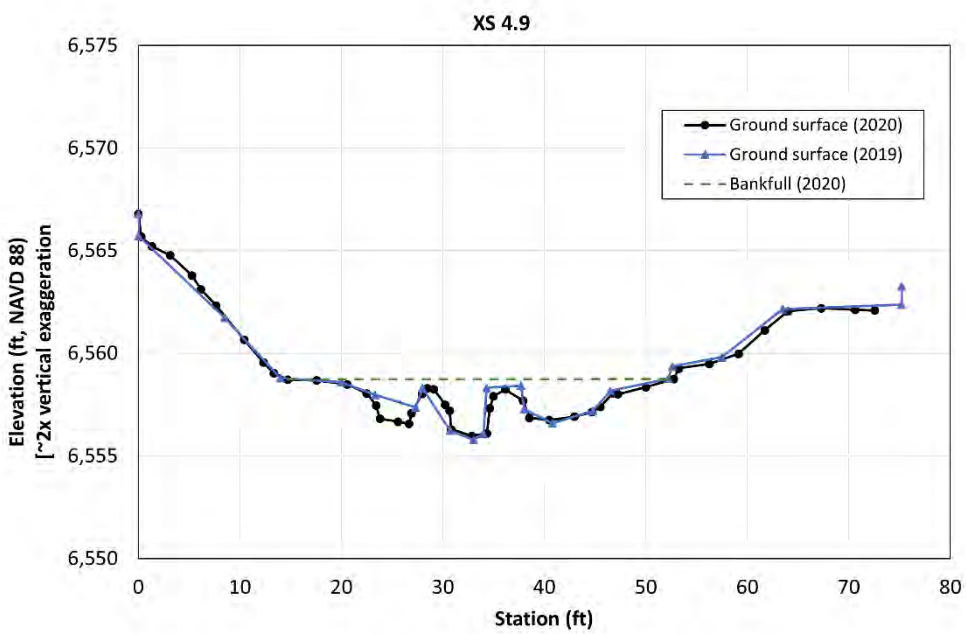


Figure 8. Cross sections 4.7 and 4.9. Stationing is from left to right bank looking downstream.

4.1.2 Bed Particle Size Distributions

Pebble counts were conducted at three cross section locations selected to best represent the variety of channel geometry and bed sediment conditions at Site 4. The bed at all three cross sections was predominantly made up of cobbles, with gravel comprising less than 37% and boulders comprising less than 21% of the grain size distribution at each cross section. Sand content (<2 mm) from the 2020 pebble counts was 4, 16, and 1% of the measured particles at cross sections 4.9, 4.7, and 4.2, respectively. A summary of the pebble count data is provided in Table 3 and a plot of the particle size distributions at each cross section is provided in Figure 9.

Pebble counts conducted during 2019 pooled multiple locations within Sites 4.1 and 4.2 as one count and therefore are not directly comparable to the cross section-specific pebble counts conducted in 2020. Although there was spatial variability in the pebble count locations between monitoring years, the 2019 and 2020 particle size distributions were plotted together to evaluate changes. The 2019 particle size distributions were coarser than the 2020 distributions (Figure 9). Differences between the 2019 and 2020 particle size distributions suggest that the bed fined between monitoring years. These differences may be due to measurement bias, variability in collection methods, and pebble count locations.

Table 3.Summary of pebble count data from 2020 for Site 4

Cross Section (XS) ID	Year[1]	D16 (mm)	D50 (mm)	D84 (mm)
4.9	2020	25	78	239
4.7	2020	3	91	323
4.2	2020	43	117	226

[1] Pebble counts were not conducted at Site 4 in 2021 due to limited tracer mobility after flushing flows.

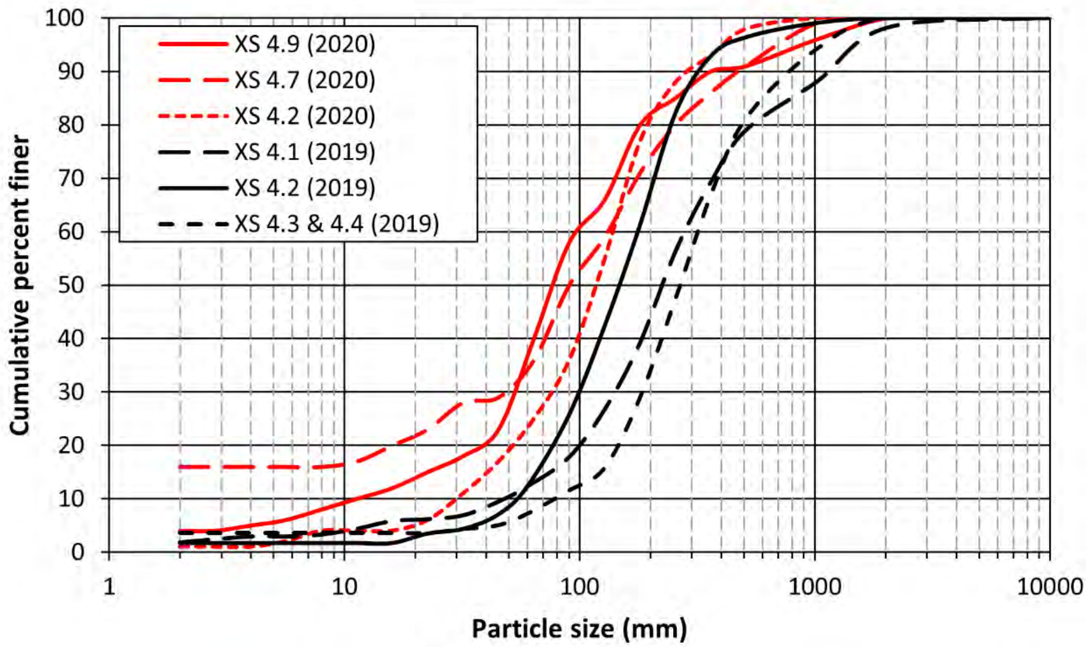


Figure 9. 2020 and 2019 particle size distributions at Site 4. 2020 pebble counts were conducted along cross sections. 2019 pebble counts were conducted at multiple riffles throughout the site.

4.1.3 TRACER ROCKS

One hundred and seventeen tracer rocks were deployed at Site 4 between August 2 and August 6, 2020. Tracer rock recovery surveys were conducted on May 26 and July 20, 2021. Pulse flows of approximately 70 cfs (recurrence interval of ~1.2 years) and 120 cfs (recurrence interval of ~1.6 years) were released to the study reach before recovery effort 1 and recovery effort 2, respectively (Figure 10).

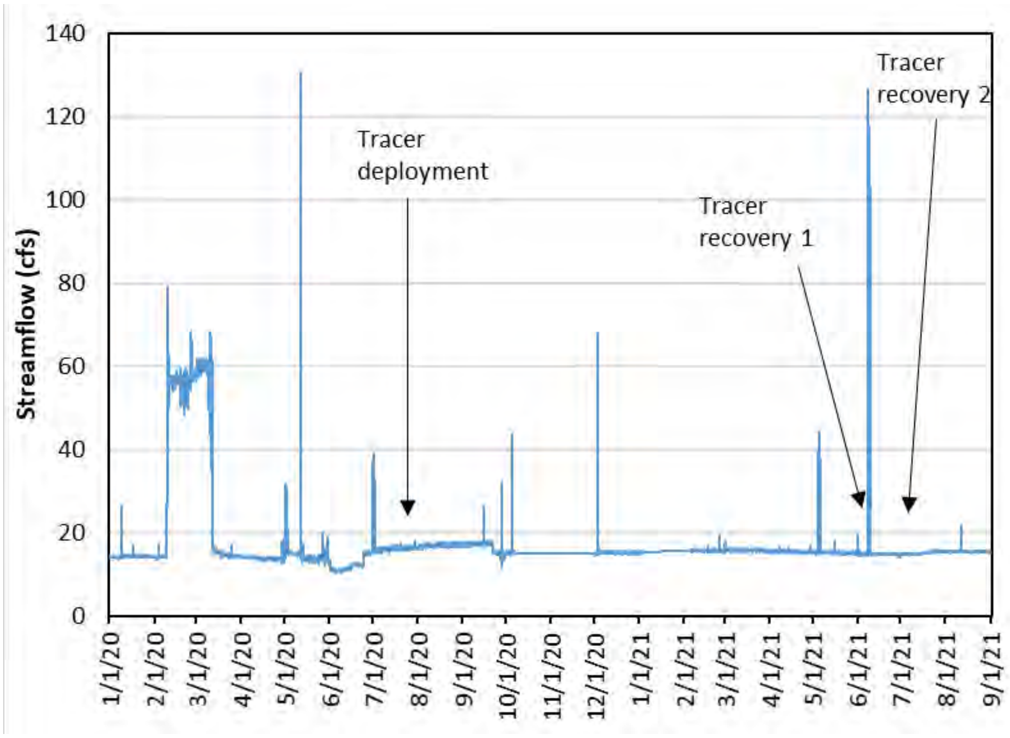


Figure 10. Hydrograph for Bishop Creek below Intake 3 (Site 4). Tracer deployment and recovery survey dates are annotated with arrows.

One hundred and seventeen (100%) of the tracer rocks deployed on August 2, 2020, were recovered on May 26, 2021 after a pulse flow of approximately 70 cfs for a period of approximately 1 hour. Tracer rocks displacement calculations between the deployment and first recovery effort showed that 114 (98%) of the recovered tracer rocks at Site 4 had not mobilized. The remaining 2% of mobile tracers showed negligible transport distances, with a maximum displacement of 1.75 ft. A pulse flow of approximately 120 cfs was released to the study reach shortly after the first recovery effort (Figure 11).

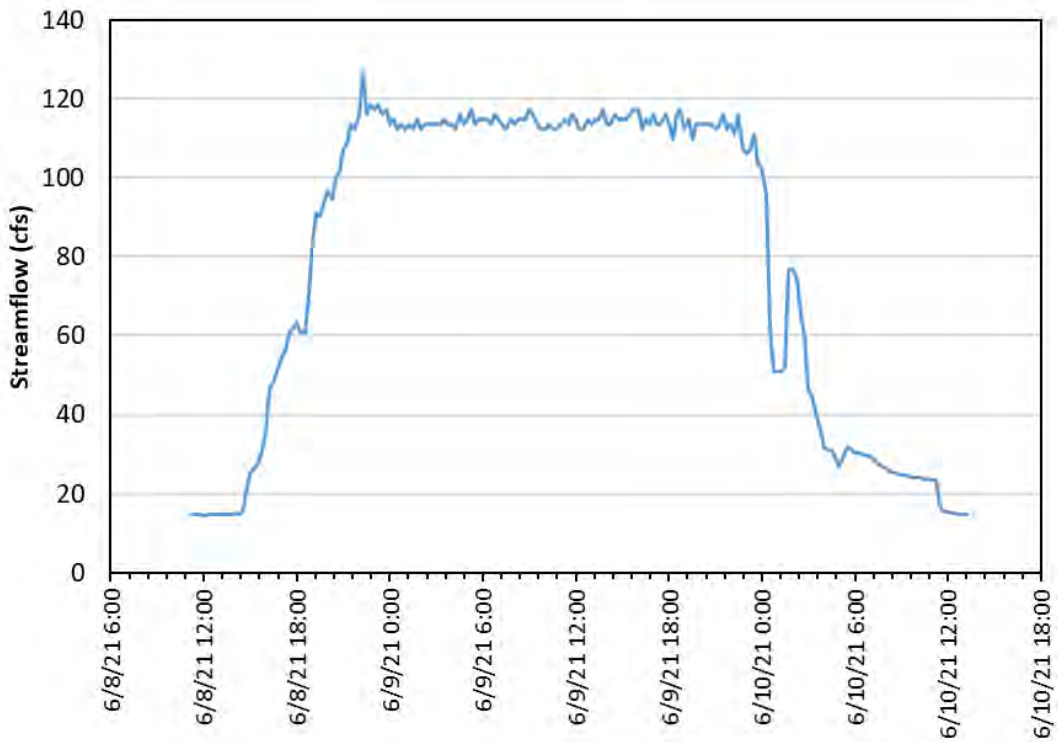


Figure 11. Hydrograph of pulse flow at Site 4 that occurred prior to the second tracer recovery effort.

One hundred and fifteen (98%) of the deployed tracer rocks were recovered during the second recovery effort on July 21, 2021. The pulse flow shown in Figure 11 had a magnitude of approximately 120 cfs and a duration of approximately 24 hours. This flow resulted in mobilization of twelve tracers (11%) and 17% of tracers with diameters <60 mm. Ninety-three percent of tracers with diameters >60 mm showed no mobilization. The largest mobilized particle had a diameter 170 mm, although it was only transported 1.5 ft. There were no mobile particles larger than highest predicted critical D50 at the site ($D50_{crit}$ = 206 mm at XS 4.7). Table 4 provides the channel shear stresses from HEC-RAS and the critical D50 at each cross section location. Tracer movement by particle size is summarized in Figure 12.

Table 4. Predicted critical D50 and modeled channel shear stress at Site 4 cross sections during a discharge of 120 cfs

Cross section	Channel shear stress (pascals)	Predicted critical D50 (mm)
4.9	105	147
4.7	148	206
4.5	77	105
4.4	91	123
4.3	134	184
4.2	144	199

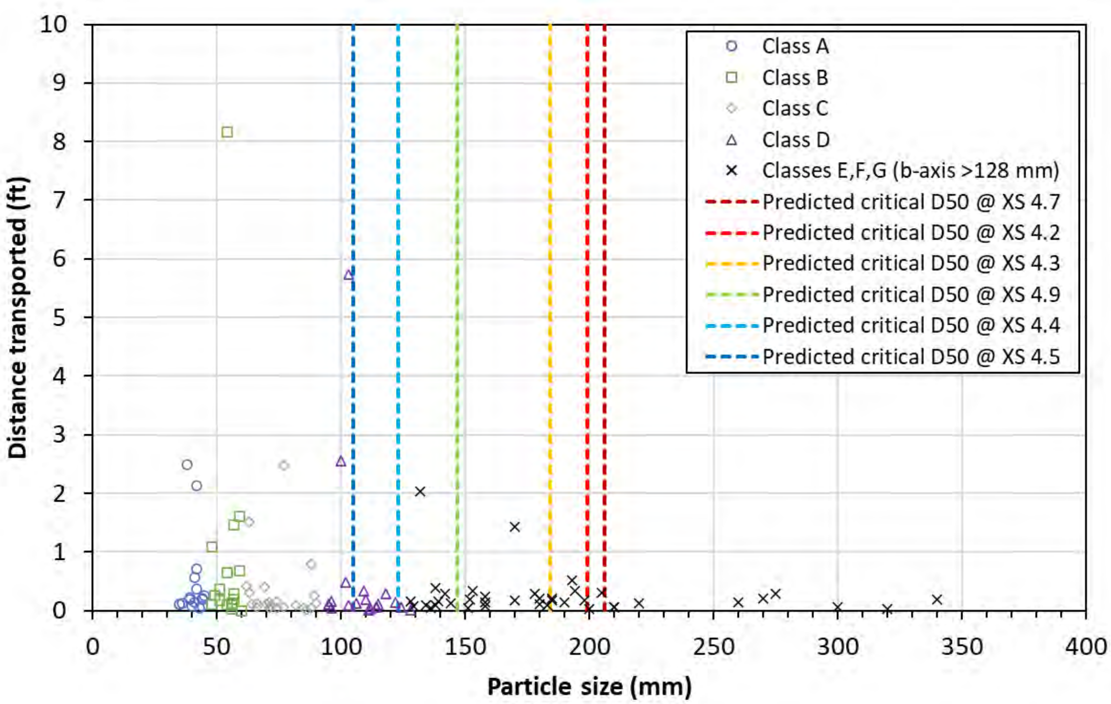


Figure 12. Transport distance of tracer rocks by particle size at Site 4 between recovery effort 1 and recovery effort 2 (after 120 cfs flushing flow). Grain size classes follow conventions used in Table 2.

4.2 Site 6

The following sections provide results from the 2020 (tracer deployment) and 2021 (tracer recovery 1 and 2) surveys at Site 6, and a comparison with data collected in 2019 during a separate study element. An overview of Site 6 and the survey extents are provided in Figure 13. Cross sections are numbered sequentially from downstream to upstream.

Figure 13. Site 6 overview.

4.2.1 Longitudinal Profile and Cross Sections

The 2020 and 2021 longitudinal profiles were approximately 420 ft long and extended 100 ft upstream of cross section 6.8 and 160 ft downstream of cross section 6.5 (Figure 14). The 2019 long profile was 250 ft long and extended 35 ft upstream of cross section 6.8 and 60 ft downstream of cross section 6.5. The reach average slope, calculated as a best-fit line to the long profile, was 0.02 (2%) during all three monitoring years. The 2020 and 2021 longitudinal profiles are generally similar, and apparent differences in the two profiles are likely a result of slight misalignment or variability in survey point locations rather than changes in channel morphology. Apparent changes between the 2019 and the 2020 long profiles, particularly between stations 75 and 125, suggest channel aggradation but may be a result of misalignment and/or different survey point spacing.

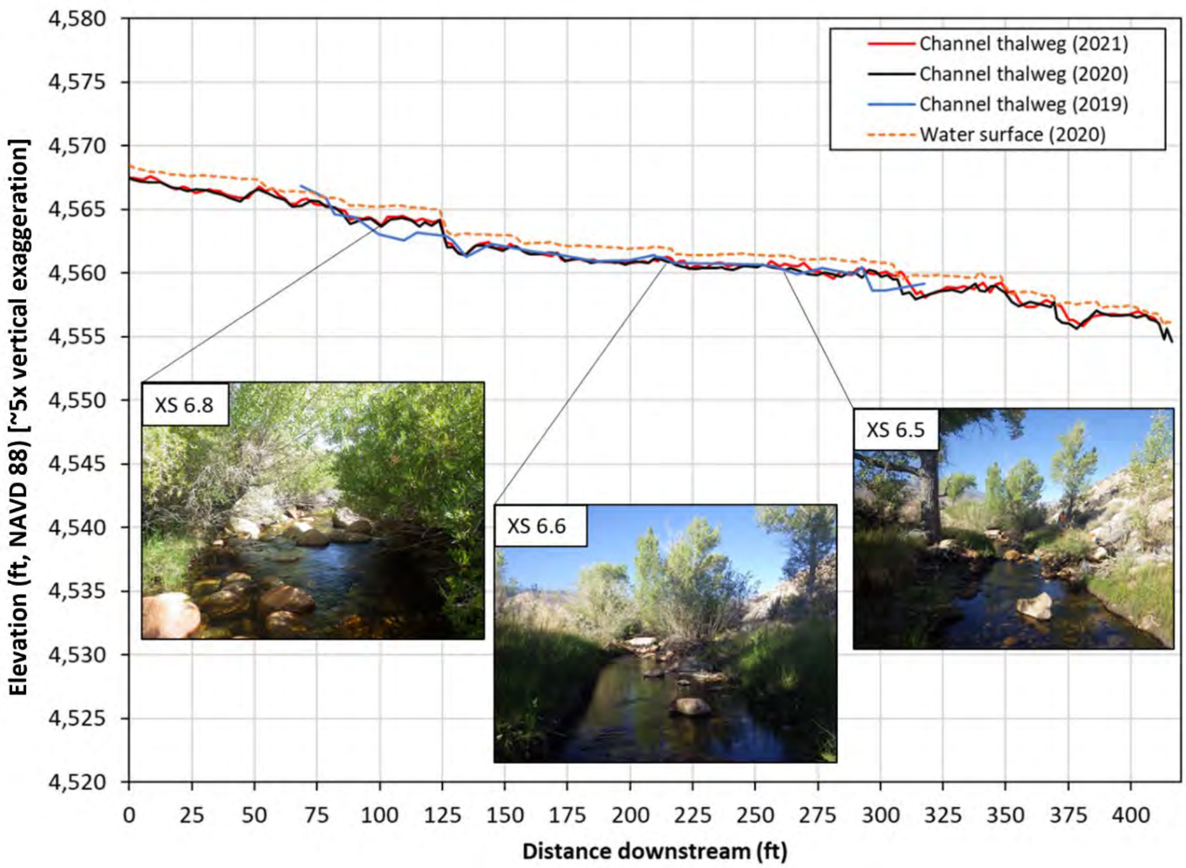


Figure 14. Site 6 longitudinal profiles from 2019, 2020, and 2021. Leader lines indicate cross section locations along longitudinal profile. Inset photos show representative conditions of each cross section during 2020 surveys.

Cross sections from 2019 through 2021 are provided in Figure 15 through Figure 17. The cross section geometry was generally similar between the three monitoring years. Minor differences in bed elevation (e.g., cross section 6.5 at station 35) between the monitoring years likely reflect variation in survey point locations rather than topographic changes.

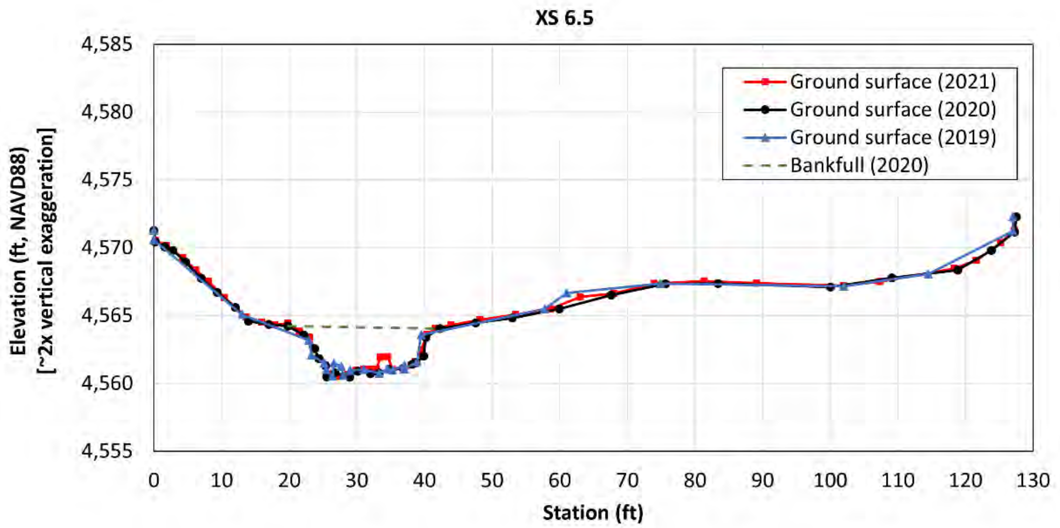


Figure 15. Cross section 6.5 during 2019, 2020, and 2021. Stationing is from left to right bank looking downstream

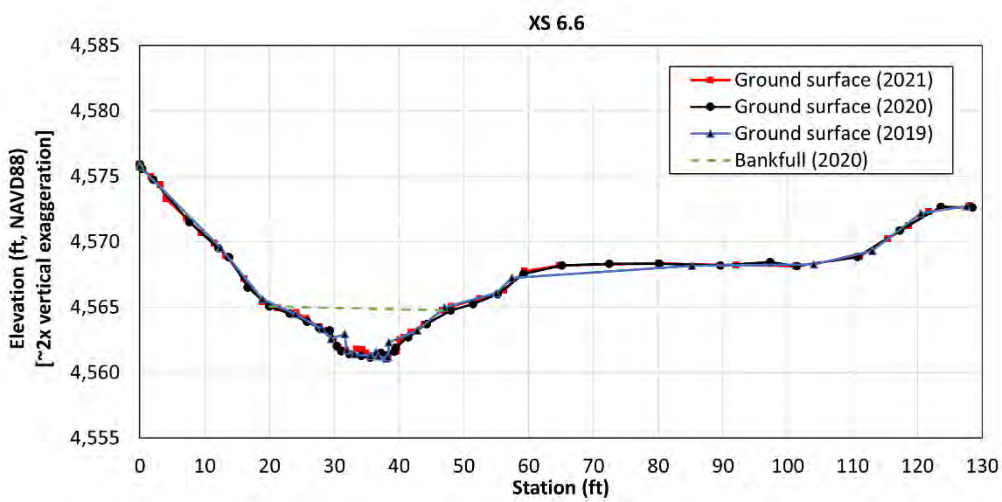


Figure 16. Cross section 6.6 during 2019, 2020, and 2021. Stationing is from left to right bank looking downstream.

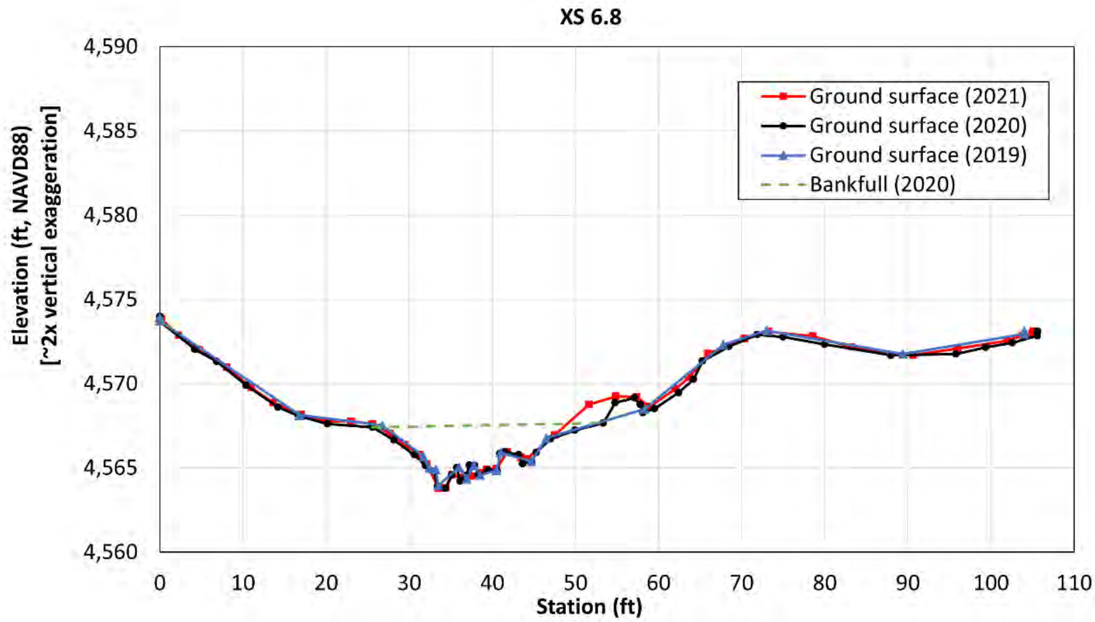


Figure 17. Cross section 6.8 during 2019, 2020, and 2021. Stationing is from left to right bank looking downstream.

4.2.2 Bed Particle Size Distributions

The bed at all three cross sections at this site was primarily made up of cobbles and gravel, with boulders comprising less than 21% of the pebble counts at each cross section in 2020 and 2021. Relative to the 2020 measurements, the bed coarsened at cross sections 6.6 and 6.5 (Figure 18 and Figure 19), with increases of cobble-sized material. The bed at cross section 6.8 remained mostly stable between 2020 and 2021 but showed a slight decrease in the coarse fraction of the particle size distribution (Figure 20). The amount of gravel decreased by 15% between 2020 and 2021 at cross sections 6.8 and 6.5 and decreased by 26% at cross section 6.6. A summary of the pebble count data from 2020 and 2021 is provided in Table 5 and plots of the particle size distributions at each cross section are provided in Figure 18 through Figure 20.

Pebble counts conducted during 2019 grouped the entire site as one count and therefore are not directly comparable to the cross section-specific pebble counts conducted in 2020. To compare the 2019 and 2020 particle size distributions, all three cross sectional pebble counts conducted during 2020 were grouped into a single distribution and plotted with the 2019 data. The 2019 distribution was coarser overall (Figure 21). Differences in the particle size distributions may be due to measurement bias and variability in collection methods.

Table 5. Summary of pebble count data from 2020 and 2021 for Site 6

Cross Section	6.8		6.6		6.5	
Year	2020	2021	2020	2021	2020	2021
D16 (mm)	17	18	23	60	4	23
D50 (mm)	76	74	69	130	58	137
D84 (mm)	283	177	58	137	199	256

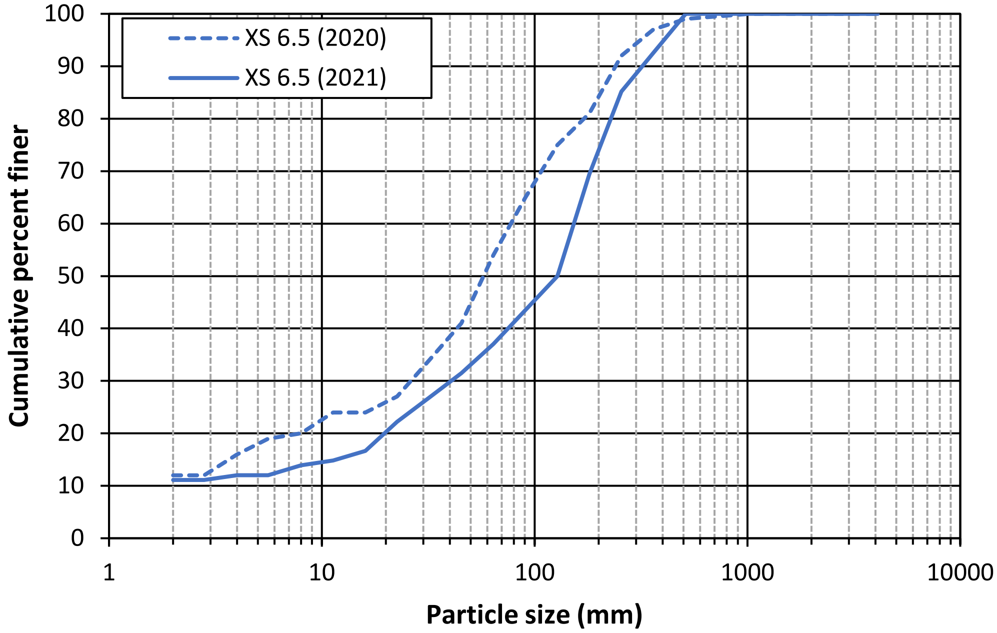


Figure 18. Particle size distributions at cross section 6.5 during 2020 and 2021

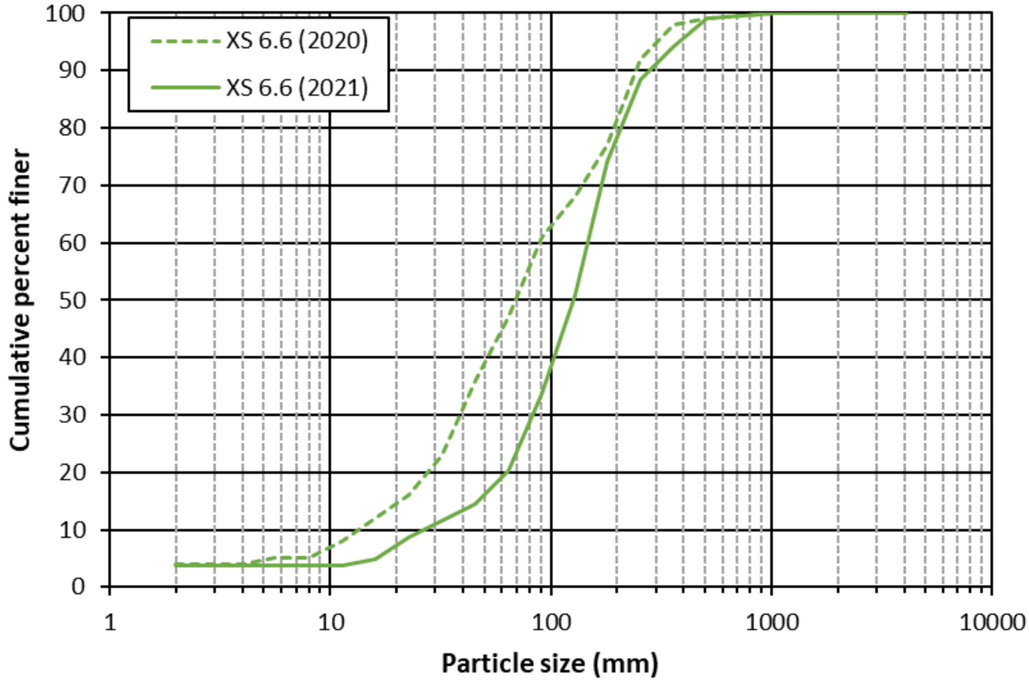


Figure 19. Particle size distributions at cross section 6.6 during 2020 and 2021

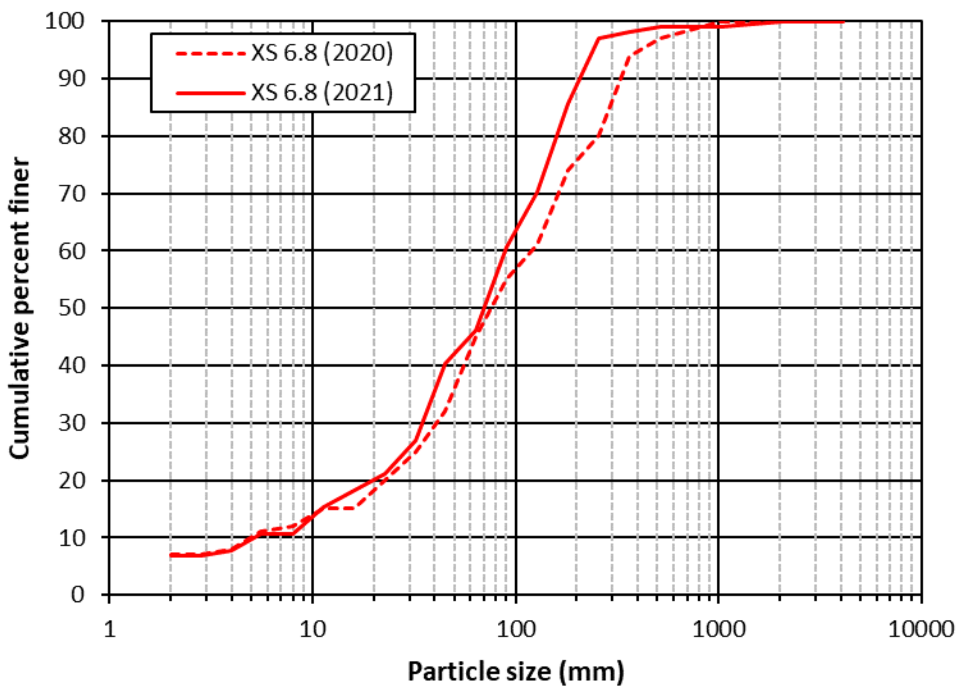


Figure 20. Particle size distributions at cross section 6.8 during 2020 and 2021

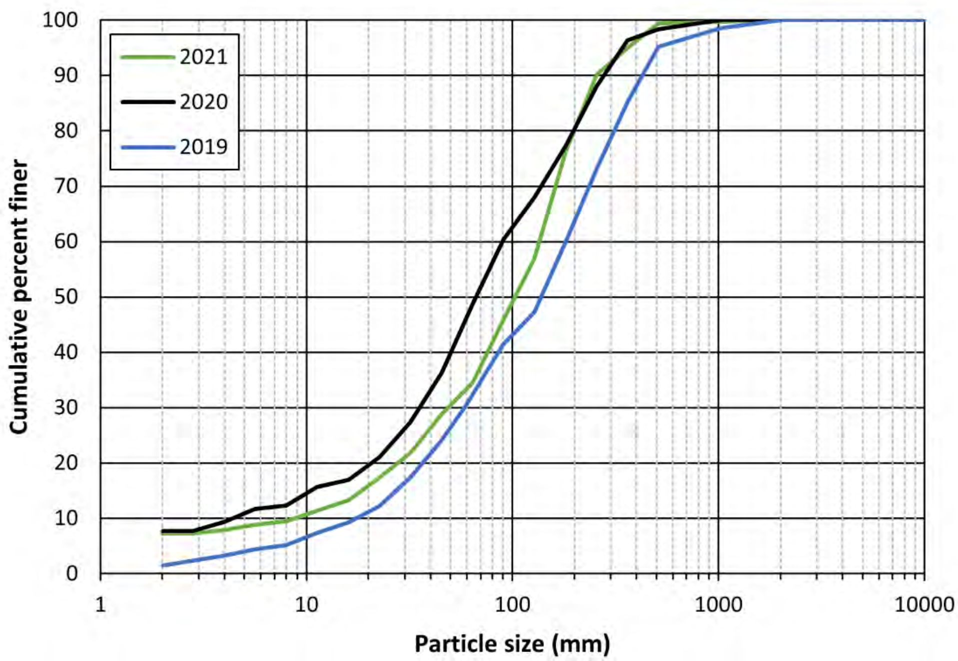


Figure 21. Particle size distributions at Site 6 during 2019 and 2020. Particle size data from 2019 was conducted throughout Site 6 riffles. Particle size data from 2020 was conducted at cross sections and grouped into a single distribution.

4.2.3 Tracer Rocks

Sixty-seven tracer rocks were deployed at Site 6 between July 29 and August 1, 2020. Tracer rock recovery surveys were conducted on May 26 and July 20, 2021. Pulse flows of approximately 60 cfs and 120 cfs were released to the Project reach before recovery effort 1 and recovery effort 2, respectively (Figure 22).

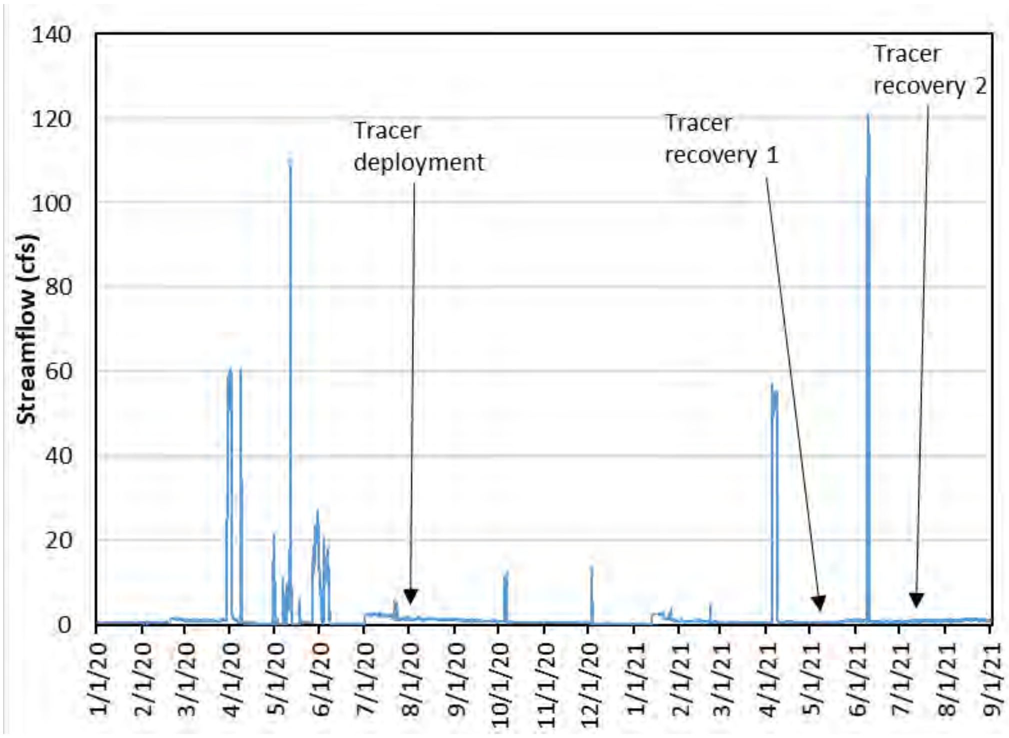


Figure 22. Hydrograph for Bishop Creek below Intake 6 (Site 6). Tracer deployment and recovery survey dates are annotated with arrows.

Sixty-two (93%) of the deployed tracer rocks were recovered during the first recovery effort on May 26, 2021. However, 31 (46%) of the total tracer rocks deployed at Site 6 had been heavily disturbed by non-fluvial processes prior to the recovery effort. The remaining 36 (54%) tracers that were recovered in the stream channel were undisturbed and showed no movement from their initial placement locations. Non-fluvial disturbance was determined by observations of lateral and upstream movement of tracer rocks, presumably from anglers or other recreating individuals. This necessitated resetting approximately half of the tracers at Site 6 in May 2021, which resulted in shorter residence times for approximately half of the tracers at Site 6 prior to the second, larger pulse flow. The pulse flow on June 9, 2021 had a peak discharge of 120 cfs and a duration of approximately 24 hours (Figure 23).

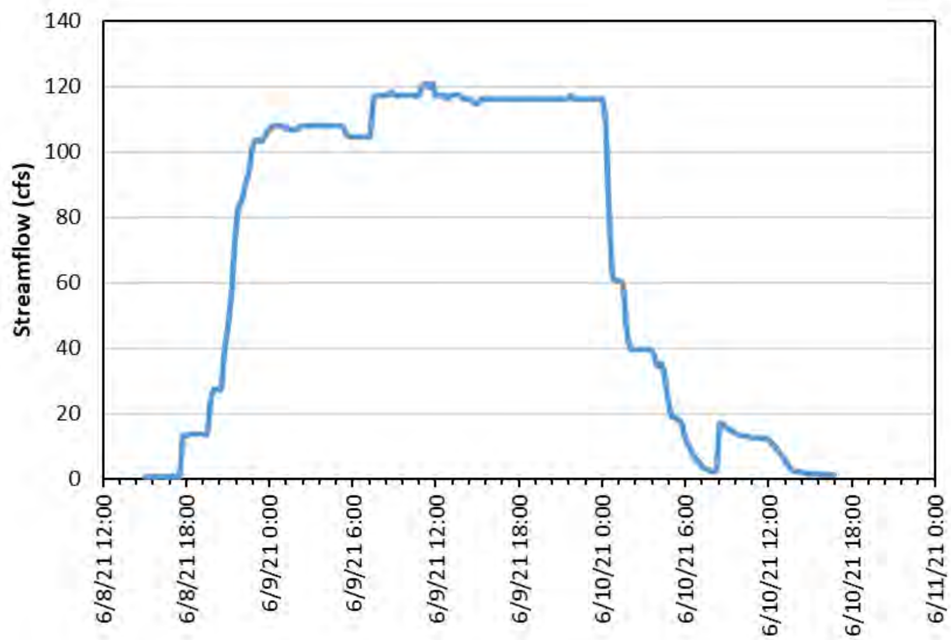


Figure 23. Magnitude and duration of pulse flow that occurred prior to the second tracer recovery effort

Sixty (90%) of the deployed tracer rocks were recovered during the second recovery effort on July 21, 2021. The pulse flow shown in Figure 23 resulted in mobilization of 40% (n = 24) of all recovered tracer rocks and 84% (n = 16) of tracers <60 mm. Eighty percent (n = 34) of tracers >60 mm showed no mobilization. The largest mobilized particle was 197 mm and was transported 4.5 ft. This was the only mobile particle larger than the highest predicted critical D_{50} at the site. Table 4 provides the channel shear stresses from HEC-RAS and associated critical D_{50} at each cross section location based on the pulse flow of 120 cfs. Tracer movement by particle size is summarized in Figure 24.

<u>Table 6. Predicted critical D50 and modeled channel shear stress at Site 6 cross sections during a discharge of 120 cfs.</u>

Cross section	Channel shear stress (pascals)	Predicted critical D50 (mm)
6.8	101	141
6.6	81	116
6.5	72	100

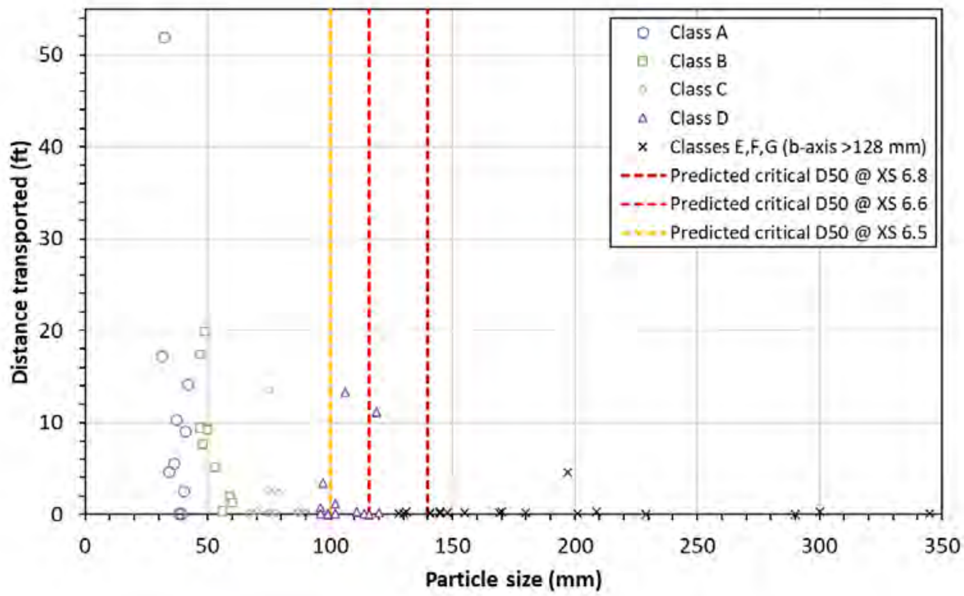


Figure 24. Transport distance of tracer rocks by particle size at Site 6 between recovery effort 1 and recovery effort 2. Grain size classes follow conventions used in Table 2.

5.0 DISCUSSION

Tracer rock disturbance by non-fluvial processes and associated lower particle residence time in the streambed prior to the larger pulse flow may partially explain higher transport distances observed at Site 6. Resetting the tracers at Site 6 on May 26, 2021 resulted in the tracer rocks having less than two weeks in the streambed prior to the larger pulse flow, where the tracer rocks at Site 4 had approximately 10 months in the streambed prior to the larger pulse flow. Shorter residence times of tracers in the streambed are likely associated with smaller degrees of embeddedness, which can affect the mobility of streambed particles (Parker 2008).

The smaller transport distances observed at Site 4 are likely a more accurate depiction of sediment mobility in these reaches because the tracer rocks had longer residence times in the streambed, which is a more accurate representation of native particles.

6.0 REFERENCES

Harrelson, Cheryl C; Rawlins, C. L.; Potyondy, John P. 1994. Stream channel reference sites: an illustrated guide to field technique. Gen. Tech. Rep. RM-245. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 61 p.

Bunte, A., and Abt, S.T. 2001. Sampling Surface and Subsurface Particle-Size Distributions in Wadable Gravel- and cobble-Bed Streams for Analyses in Sediment Transport, Hydraulics, and Streambed Monitoring. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, Colorado.

Kleinschmidt 2020. Sediment & Geomorphology Study Progress Report Technical Memorandum. Submitted to Southern California Edison to support the Bishop Creek Hydroelectric Project No. 1394. Filed with FERC April 14, 2020 as Appendix H of Progress Report 2.

Parker, G. 2008. Sedimentation Engineering: Processes, Measurements, Modeling, and Practice. Chapter 3. Transport of Gravel and Sediment Mixtures.

SCE (Southern California Edison). 2019. Bishop Creek Hydroelectric Project, FERC Project No. 1394. Pre-Application Document.

USACE (United States Army Corps of Engineer). 2019. HEC-SSP Statistical Software Package User's Manual Version 2.2. June.

USGS. 2019. Guidelines for Determining Flood Flow Frequency Bulletin 17C. Techniques and Methods 4-B5. Version 1.1. May.

Waananen, A. O., and J. R. Crippen. 1977. Magnitude and frequency of floods in California. U.S. Geological Survey. Water Resources Investigation 77-21.

Wolman, M.G., 1954. A method of sampling coarse river-bed material. EOS, Transactions American Geophysical Union, 35(6), pp. 951–956.

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project

(FERC Project No. 1394)

APPENDIX A
Photo Log

Figure A-1. Cross section 4.9 in August 2020, view upstream from mid channel.

Figure A-2. Cross section 4.9 in August 2020, view downstream from mid channel.

Figure A-3. Cross section 4.9 in August 2020, view of left bank from right bank.

Figure A-4. Cross section 4.9 in August 2020, view of right bank from left bank.

Figure A-5. Cross section 4.9 in August 2020, view of tracers from right bank.

Figure A-6. Cross section 4.9 in August 2020, view of tracers from left bank.

Figure A-7. Cross section 4.9 in August 2020, close up view of right bank pin.

Figure A-8. Cross section 4.9 in August 2020, landscape view of right bank pin.

Figure A-9. Cross section 4.9 in August 2020, close up view of left bank pin.

Figure A-10. Cross section 4.9 in August 2020, landscape view of left bank pin.

Figure A-11. Cross section 4.7 in August 2020, view upstream from mid channel.

Figure A-12. Cross section 4.7 in August 2020, view downstream from mid channel.

Figure A-13. Cross section 4.7 in August 2020, view of left bank from right bank.

Figure A-14. Cross section 4.7 in August 2020, view of right bank from left bank.

Figure A-15. Cross section 4.7 in August 2020, view of tracers from right bank.

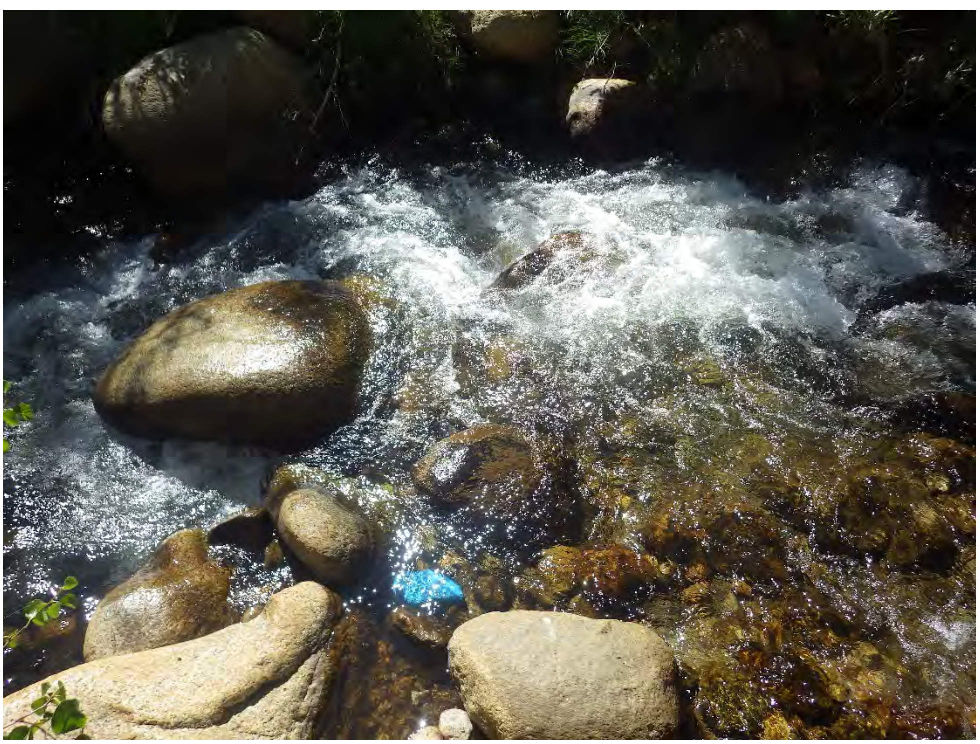


Figure A-16. Cross section 4.7 in August 2020, view of tracers from left bank.

Figure A-17. Cross section 4.7 in August 2020, close up view of right bank pin.

Figure A-18. Cross section 4.7 in August 2020, landscape view of right bank pin.

Figure A-19. Cross section 4.7 in August 2020, close up view of left bank pin.

Figure A-20. Cross section 4.7 in August 2020, landscape view of left bank pin.

Figure A-21. Cross section 4.5 in August 2020, view upstream from mid channel.

Figure A-22. Cross section 4.5 in August 2020, view downstream from mid channel.

Figure A-23. Cross section 4.5 in August 2020, view of left bank from right bank.

Figure A-24. Cross section 4.5 in August 2020, view of right bank from left bank.

Figure A-25. Cross section 4.5 in August 2020, view of tracers from left bank.

Figure A-26. Cross section 4.5 in August 2020, landscape view of right bank pin.

Figure A-27. Cross section 4.5 in August 2020, close up view of left bank pin.

Figure A-28. Cross section 4.5 in August 2020, landscape view of left bank pin.

Figure A-29. Cross section 4.4 in August 2020, view upstream from mid channel.

Figure A-30. Cross section 4.4 in August 2020, view downstream from mid channel.

Figure A-31. Cross section 4.4 in August 2020, view of left bank from right bank.

Figure A-32. Cross section 4.4 in August 2020, view of right bank from left bank.

Figure A-33. Cross section 4.4 in August 2020, view of tracers from right bank.

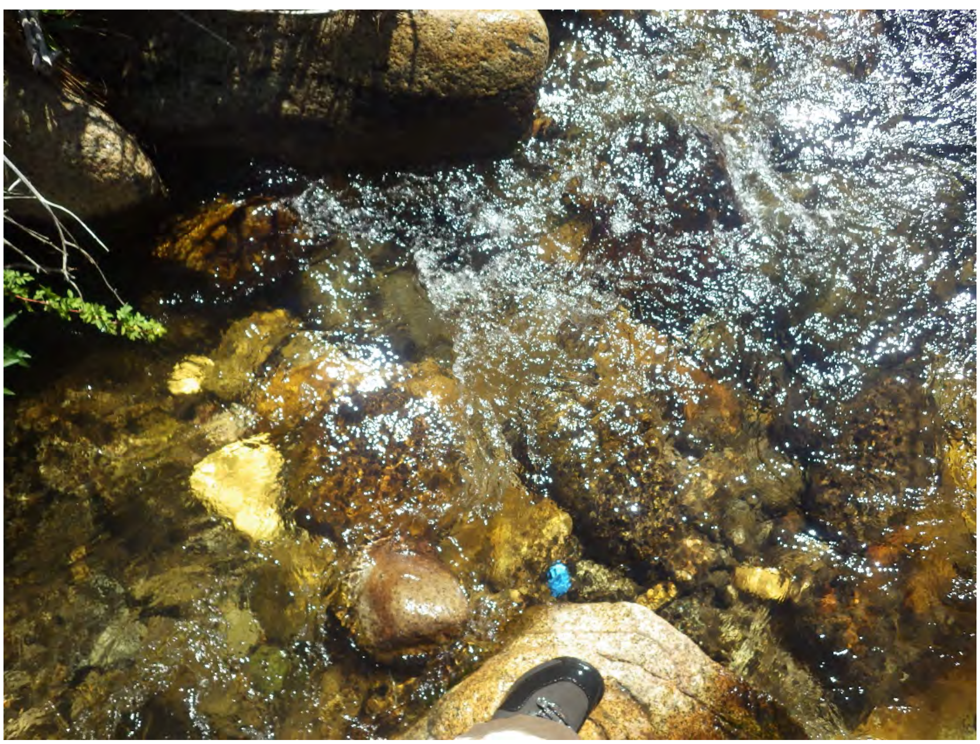


Figure A-34. Cross section 4.4 in August 2020, view of tracers from left bank.

Figure A-35. Cross section 4.4 in August 2020, close up view of right bank pin.

Figure A-36. Cross section 4.4 in August 2020, landscape view of right bank pin.

Figure A-37. Cross section 4.4 in August 2020, close up view of left bank pin.

Figure A-38. Cross section 4.4 in August 2020, landscape view of left bank pin.

Figure A-39. Cross section 4.3 in August 2020, view upstream from mid channel.

Figure A-40. Cross section 4.3 in August 2020, view downstream from mid channel.

Figure A-41. Cross section 4.3 in August 2020, view of left bank from right bank.

Figure A-42. Cross section 4.3 in August 2020, view of right bank from left bank.

Figure A-43. Cross section 4.3 in August 2020, view of tracers from right bank.

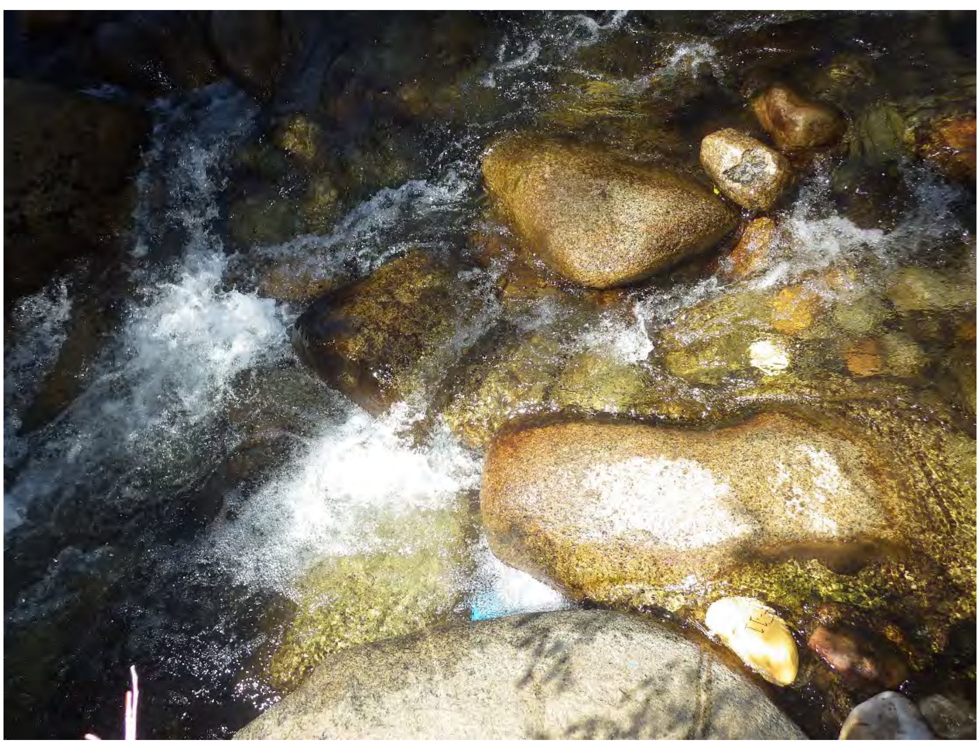


Figure A-44. Cross section 4.3 in August 2020, view of tracers from left bank.

Figure A-45. Cross section 4.3 in August 2020, close up view of right bank pin.

Figure A-46. Cross section 4.3 in August 2020, landscape view of right bank pin.

Figure A-47. Cross section 4.3 in August 2020, close up view of left bank pin.

Figure A-48. Cross section 4.3 in August 2020, landscape view of left bank pin.

Figure A-49. Cross section 4.2 in August 2020, view upstream from mid channel.

Figure A-50. Cross section 4.2 in August 2020, view downstream from mid channel.

Figure A-51. Cross section 4.2 in August 2020, view of left bank from right bank.

Figure A-52. Cross section 4.2 in August 2020, view of right bank from left bank.

Figure A-53. Cross section 4.2 in August 2020, view of tracers from right bank.

Figure A-54. Cross section 4.2 in August 2020, view of tracers from left bank.

Figure A-55. Cross section 4.2 in August 2020, close up view of right bank pin.

Figure A-56. Cross section 4.2 in August 2020, landscape view of right bank pin.

Figure A-57. Cross section 4.2 in August 2020, close up view of left bank pin.

Figure A-58. Cross section 4.2 in August 2020, landscape view of left bank pin.

Figure A-61. Cross section 6.8 in August 2020, view upstream from mid channel.

Figure A-62. Cross section 6.8 in August 2020, view downstream from mid channel.

Figure A-63. Cross section 6.8 in August 2020, view of left bank from right bank.

Figure A-64. Cross section 6.8 in August 2020, view of right bank from left bank.

Figure A-65. Cross section 6.8 in August 2020, view of tracers from right bank.

Figure A-66. Cross section 6.8 in August 2020, view of tracers from left bank.

Figure A-67. Cross section 6.8 in August 2020, close up view of right bank pin.

Figure A-68. Cross section 6.8 in August 2020, landscape view of right bank pin.

Figure A-69. Cross section 6.8 in August 2020, close up view of left bank pin.

Figure A-70. Cross section 6.8 in August 2020, landscape view of left bank pin.

Figure A-71. Cross section 6.6 in August 2020, view upstream from mid channel.

Figure A-72. Cross section 6.6 in August 2020, view downstream from mid channel.

Figure A-73. Cross section 6.6 in August 2020, view of left bank from right bank.

Figure A-74. Cross section 6.6 in August 2020, view of right bank from left bank.

Figure A-75. Cross section 6.6 in August 2020, view of tracers from right bank.

Figure A-76. Cross section 6.6 in August 2020, view of tracers from left bank.

Figure A-77. Cross section 6.6 in August 2020, close up view of right bank pin.

Figure A-78. Cross section 6.6 in August 2020, landscape view of right bank pin.

Figure A-79. Cross section 6.6 in August 2020, close up view of left bank pin.

Figure A-80. Cross section 6.6 in August 2020, landscape view of left bank pin.

Figure A-81. Cross section 6.5 in August 2020, view upstream from mid channel.

Figure A-82. Cross section 6.5 in August 2020, view downstream from mid channel.

Figure A-83. Cross section 6.5 in August 2020, view of left bank from right bank.

Figure A-84. Cross section 6.5 in August 2020, view of right bank from left bank.

Figure A-87. Cross section 6.5 in August 2020, view of tracers from right bank.

Figure A-88. Cross section 6.5 in August 2020, view of tracers from left bank.

Figure A-89. Cross section 6.5 in August 2020, close up view of right bank pin.

Figure A-90. Cross section 6.5 in August 2020, landscape view of right bank pin.

Figure A-91. Cross section 6.5 in August 2020, close up view of left bank pin.

Figure A-92. Cross section 6.5 in August 2020, landscape view of left bank pin.

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project

(FERC Project No. 1394)

APPENDIX B
Tracer Coordinates

Site 4 Tracers

Tracer ID	Paint Color	B-AXIS (mm)	PIT Tag Code	Original Placement			Last Found Location (July 2021)		
				Northing (ft)	Easting (ft)	Elevation (ft)	Northing (ft)	Easting (ft)	Elevation (ft)
A-3	yellow	45	986112100280859	2,355,331.20	6,693,999.28	6,544.42	2,355,331.47	6,694,001.72	6,543.96
A-5	yellow	42	986112100298737	2,355,301.92	6,693,897.15	6,549.29	2,355,301.54	6,693,897.11	6,549.22
A-11	yellow	41	986112100298043	2,355,192.31	6,693,812.88	6,558.04	2,355,190.66	6,693,813.05	6,558.20
A-12	yellow	42	986112100283940	2,355,301.85	6,694,049.66	6,542.99	2,355,302.73	6,694,049.79	6,542.95
A-13	yellow	43	986112100279682	2,355,299.53	6,693,906.35	6,549.52	2,355,299.62	6,693,906.27	6,549.67
A-14	yellow	36	986112100288814	2,355,296.31	6,693,908.50	6,549.94	2,355,296.31	6,693,908.41	6,549.85
A-16	yellow	40	986112100290299	2,355,197.07	6,693,805.23	6,556.86	2,355,197.13	6,693,805.17	6,556.86
A-18	yellow	35	986112100288773	2,355,263.34	6,693,865.94	6,551.82	not recovered		
A-19	yellow	39	986112100290596	2,355,313.83	6,693,942.48	6,546.95	2,355,313.26	6,693,942.40	6,547.09
A-21	yellow	39	986112100280202	2,355,203.79	6,693,811.34	6,556.37	2,355,203.58	6,693,811.37	6,556.26
A-22	yellow	35	986112100279748	2,355,297.36	6,694,102.79	6,539.92	2,355,297.33	6,694,102.62	6,539.89
A-23	yellow	45	986112100298437	2,355,214.02	6,693,835.94	6,557.01	2,355,213.97	6,693,835.85	6,557.12
A-24	yellow	42	986112100279994	2,355,300.82	6,694,102.39	6,540.08	2,355,300.57	6,694,102.24	6,539.94
A-25	yellow	41	986112100284194	2,355,300.36	6,694,102.62	6,540.22	2,355,244.34	6,693,849.13	6,552.91
A-26	yellow	44	986112100291935	2,355,242.32	6,693,848.82	6,552.92	2,355,299.51	6,693,897.88	6,548.98
A-27	yellow	44	986112100280372	2,355,299.44	6,693,898.34	6,549.01	2,355,285.12	6,694,102.73	6,540.10
A-28	yellow	44	986112100280072	2,355,285.24	6,694,102.96	6,540.05	2,355,243.58	6,694,137.92	6,537.23
A-29	yellow	38	986112100278894	2,355,243.83	6,694,137.01	6,537.25	2,355,316.68	6,694,006.05	6,544.67
B-2	blue	60	986112100289313	2,355,295.99	6,693,900.87	6,549.06	not recovered		
B-4	blue	48	986112100294959	2,355,301.98	6,694,103.17	6,540.31	2,355,301.73	6,694,104.29	6,540.29
B-5	blue	54	986112100283978	2,355,297.92	6,694,102.83	6,540.01	2,355,297.78	6,694,101.99	6,540.14
B-6	blue	51	986112100279932	2,355,297.49	6,693,906.96	6,549.93	2,355,298.41	6,693,907.47	6,549.99
B-8	blue	59	986112100290868	2,355,308.29	6,694,051.52	6,541.96	2,355,308.71	6,694,053.66	6,541.52
B-9	blue	57	986112100280365	2,355,306.32	6,693,900.79	6,549.77	2,355,306.12	6,693,900.53	6,549.71
B-15	blue	54	986112100296419	2,355,284.27	6,694,101.95	6,540.05	2,355,279.79	6,694,108.73	6,539.89
B-16	blue	51	986112100295944	2,355,219.95	6,693,810.55	6,556.43	2,355,219.88	6,693,810.44	6,556.24

Tracer ID	Paint Color	B-AXIS (mm)	PIT Tag Code	Original Placement			Last Found Location (July 2021)		
				Northing (ft)	Easting (ft)	Elevation (ft)	Northing (ft)	Easting (ft)	Elevation (ft)
B-17	blue	56	986112100281350	2,355,195.06	6,693,809.64	6,556.80	2,355,195.15	6,693,809.61	6,556.84
B-18	blue	56	986112100293290	2,355,244.54	6,694,137.75	6,537.02	2,355,244.42	6,694,137.75	6,536.87
B-22	blue	57	986112100291392	2,355,321.24	6,694,009.29	6,543.80	2,355,321.48	6,694,009.46	6,543.71
B-23	blue	54	986112100297929	2,355,246.64	6,694,140.04	6,536.77	2,355,246.37	6,694,139.85	6,536.75
B-24	blue	56	986112100293303	2,355,200.85	6,693,800.92	6,555.80	2,355,200.63	6,693,800.85	6,556.07
B-26	blue	57	986112100281625	2,355,333.41	6,693,999.98	6,544.89	2,355,332.37	6,694,000.53	6,544.75
B-27	blue	49	986112100282879	2,355,259.29	6,693,871.60	6,551.39	2,355,259.37	6,693,871.67	6,551.40
B-28	blue	56	986112100282939	2,355,304.82	6,693,894.97	6,549.56	2,355,304.85	6,693,895.13	6,549.64
B-29	blue	59	986112100297430	2,355,219.12	6,693,830.77	6,554.55	2,355,220.22	6,693,829.63	6,554.67
B-30	blue	48	986112100279077	2,355,316.12	6,693,941.63	6,546.27	2,355,315.71	6,693,941.58	6,546.41
C-1	orange	69	986112100258401	2,355,284.25	6,694,100.29	6,540.04	2,355,284.66	6,694,100.11	6,539.94
C-2	orange	62	986112100258387	2,355,337.21	6,694,000.76	6,544.53	2,355,337.07	6,694,001.11	6,544.54
C-3	orange	71	986112100281585	2,355,178.02	6,693,787.55	6,557.77	2,355,178.18	6,693,787.50	6,557.81
C-5	orange	85	986112100258432	2,355,297.83	6,693,899.64	6,548.83	2,355,297.78	6,693,899.60	6,548.92
C-7	orange	74	986112100258541	2,355,289.93	6,694,106.21	6,539.29	2,355,289.87	6,694,106.17	6,539.27
C-8	orange	86	986112100258525	2,355,304.49	6,693,902.21	6,549.48	2,355,304.47	6,693,902.19	6,549.51
C-9	orange	72	986112100258443	2,355,207.00	6,693,805.74	6,555.93	2,355,207.04	6,693,805.91	6,556.11
C-10	orange	74	986112100258416	2,355,303.77	6,693,895.82	6,549.36	2,355,303.73	6,693,895.91	6,549.46
C-11	orange	82	986112100258478	2,355,280.56	6,694,105.73	6,539.97	2,355,280.46	6,694,105.47	6,540.04
C-12	orange	77	986112100258459	2,355,283.38	6,694,105.62	6,540.26	2,355,283.63	6,694,108.03	6,540.05
C-13	orange	66	986112100258435	2,355,304.13	6,694,049.92	6,542.94	2,355,304.40	6,694,049.82	6,542.94
C-15	orange	71	986112100258499	2,355,299.05	6,693,906.64	6,549.99	2,355,298.99	6,693,906.66	6,550.00
C-16	orange	88	986112100258394	2,355,258.25	6,693,873.39	6,552.81	2,355,258.11	6,693,872.64	6,552.81
C-17	orange	63	986112100258377	2,355,197.81	6,693,802.35	6,556.41	2,355,199.47	6,693,801.30	6,556.17
C-18	orange	63	986112100258479	2,355,332.03	6,694,000.57	6,544.68	2,355,332.42	6,694,000.28	6,544.56
C-19	orange	77	986112100258487	2,355,191.17	6,693,802.11	6,556.76	2,355,191.06	6,693,802.18	6,556.79
C-21	orange	89	986112100258452	2,355,229.75	6,693,820.75	6,555.19	2,355,229.84	6,693,820.86	6,555.07
C-22	orange	64	986112100258393	2,355,289.66	6,694,102.33	6,539.64	2,355,289.96	6,694,102.38	6,539.59

Tracer ID	Paint Color	B-AXIS (mm)	PIT Tag Code	Original Placement			Last Found Location (July 2021)		
				Northing (ft)	Easting (ft)	Elevation (ft)	Northing (ft)	Easting (ft)	Elevation (ft)
C-23	orange	90	986112100258528	2,355,327.84	6,694,015.55	6,543.68	2,355,327.91	6,694,015.28	6,543.65
C-24	orange	88	986112100290195	2,355,211.02	6,693,791.88	6,558.86	2,355,211.12	6,693,791.67	6,558.86
C-25	orange	66	986112100289218	2,355,314.17	6,693,941.67	6,547.06	2,355,313.86	6,693,941.88	6,547.15
C-26	orange	70	986112100283594	2,355,244.96	6,694,138.10	6,536.93	2,355,244.76	6,694,137.93	6,537.03
D-2	yellow	100	986112100258379	2,355,249.80	6,694,143.49	6,535.17	2,355,247.18	6,694,144.47	6,535.85
D-3	yellow	115	986112100258371	2,355,310.07	6,694,051.74	6,542.11	2,355,310.28	6,694,051.27	6,542.04
D-5	yellow	109	986112100258509	2,355,278.70	6,694,100.14	6,541.76	2,355,278.11	6,694,100.04	6,541.64
D-7	yellow	102	986112100258560	2,355,262.17	6,693,867.50	6,551.92	2,355,261.86	6,693,867.73	6,551.81
D-13	yellow	111	986112100258472	2,355,288.14	6,694,101.28	6,539.85	2,355,288.28	6,694,101.33	6,540.00
D-14	yellow	103	986112100258425	2,355,320.14	6,693,938.64	6,545.72	2,355,321.83	6,693,944.36	6,545.67
D-18	yellow	106	986112100258493	2,355,292.18	6,694,104.57	6,539.24	2,355,292.01	6,694,104.52	6,539.30
D-19	yellow	112	986112100283712	2,355,177.06	6,693,781.66	6,557.76	2,355,177.02	6,693,781.64	6,557.81
D-20	yellow	95	986112100258500	2,355,306.86	6,693,899.55	6,550.16	2,355,306.94	6,693,899.47	6,550.15
D-21	yellow	96	986112100258442	2,355,302.73	6,693,903.47	6,549.56	2,355,302.85	6,693,903.45	6,549.54
D-22	yellow	124	986112100258533	2,355,206.33	6,693,795.71	6,556.96	2,355,205.76	6,693,795.79	6,557.04
D-24	yellow	128	986112100258410	2,355,212.23	6,693,838.52	6,557.13	2,355,212.23	6,693,838.40	6,557.33
D-25	yellow	96	986112100298504	2,355,245.34	6,694,139.27	6,536.78	2,355,245.10	6,694,139.18	6,536.79
D-26	yellow	122	986112100298555	2,355,281.87	6,694,104.23	6,540.32	2,355,281.68	6,694,104.04	6,540.18
D-27	yellow	110	986112100258399	2,355,293.26	6,693,903.58	6,549.88	2,355,293.14	6,693,903.26	6,549.86
D-28	yellow	103	986112100258458	2,355,201.51	6,693,799.38	6,555.97	2,355,201.27	6,693,799.65	6,556.19
D-29	yellow	114	986112100258388	2,355,296.77	6,693,900.20	6,548.96	2,355,296.62	6,693,900.22	6,548.93
D-30	yellow	114	986112100258513	2,355,318.66	6,694,007.89	6,544.50	2,355,318.76	6,694,007.39	6,544.57
D-31	yellow	118	986112199258409	2,355,327.83	6,693,996.64	6,544.07	2,355,328.15	6,693,996.21	6,544.11
E-4	blue	138	986112100258414	2,355,247.53	6,694,142.21	6,535.64	2,355,247.39	6,694,142.17	6,535.62
E-5	blue	134	986112100280016	2,355,180.52	6,693,790.31	6,557.93	2,355,180.50	6,693,790.09	6,557.89
E-6	blue	138	986112100258422	2,355,324.37	6,694,011.57	6,544.17	2,355,324.33	6,694,011.34	6,544.20
E-7	blue	158	986112100258543	2,355,294.82	6,693,901.02	6,549.28	2,355,294.88	6,693,900.83	6,549.29
E-9	blue	142	986112100258440	2,355,321.54	6,693,944.72	6,545.56	2,355,321.82	6,693,944.68	6,545.57

Tracer ID	Paint Color	B-AXIS (mm)	PIT Tag Code	Original Placement			Last Found Location (July 2021)		
				Northing (ft)	Easting (ft)	Elevation (ft)	Northing (ft)	Easting (ft)	Elevation (ft)
E-11	blue	170	986112100258538	2,355,291.67	6,694,094.97	6,538.93	2,355,290.45	6,694,096.05	6,538.82
E-12	blue	139	986112100258392	2,355,265.84	6,693,865.73	6,552.56	2,355,265.67	6,693,865.72	6,552.53
E-13	blue	132	986112100258531	2,355,280.46	6,694,103.45	6,540.45	2,355,278.90	6,694,104.95	6,540.15
E-14	blue	128	986112100258521	2,355,301.22	6,693,897.29	6,549.24	2,355,301.27	6,693,897.28	6,549.32
E-16	blue	136	986112100258390	2,355,205.68	6,693,796.03	6,556.94	2,355,205.88	6,693,796.19	6,556.98
E-19	blue	158	986112100258455	2,355,222.63	6,693,827.04	6,555.29	2,355,222.60	6,693,826.95	6,555.20
E-20	blue	178	986112100258434	2,355,188.19	6,693,806.99	6,558.06	2,355,188.48	6,693,806.96	6,558.22
E-21	blue	170	986112100258398	2,355,325.11	6,693,995.29	6,544.77	2,355,325.32	6,693,995.20	6,544.80
E-22	blue	151	986112100291983	2,355,172.91	6,693,782.79	6,558.10	2,355,172.95	6,693,782.56	6,558.16
E-25	blue	152	986112100258363	2,355,298.73	6,693,908.02	6,550.23	2,355,298.89	6,693,908.02	6,550.22
E-27	blue	158	986112100258431	2,355,313.70	6,694,053.51	6,542.48	2,355,313.98	6,694,053.52	6,542.17
E-28	blue	144	986112100258381	2,355,197.09	6,693,803.84	6,557.15	2,355,197.00	6,693,803.54	6,557.07
E-29	blue	129	986112100258474	2,355,300.82	6,693,905.16	6,549.97	2,355,300.90	6,693,905.08	6,549.97
E-31	blue	153	986112100258524	2,355,253.45	6,694,147.19	6,536.55	2,355,253.72	6,694,147.11	6,536.61
F-1	orange	198	986112100258476	2,355,299.34	6,694,100.48	6,540.90	2,355,299.27	6,694,100.16	6,540.88
F-3	orange	181	986112100258556	2,355,223.32	6,693,832.37	6,555.46	2,355,223.12	6,693,832.00	6,555.44
F-9	orange	180	986112100258482	2,355,306.51	6,693,894.05	6,549.96	2,355,306.57	6,693,893.90	6,550.09
F-10	orange	193	986112100258445	2,355,294.57	6,694,096.98	6,538.16	2,355,294.43	6,694,096.57	6,538.19
F-11	orange	180	986112100258549	2,355,315.43	6,694,052.79	6,543.68	2,355,315.51	6,694,052.77	6,543.79
F-12	orange	200	986112100258546	2,355,329.61	6,693,998.84	6,544.36	2,355,330.07	6,693,998.89	6,544.31
F-13	orange	220	986112100258429	2,355,219.71	6,693,816.68	6,556.26	2,355,219.87	6,693,816.71	6,556.09
F-14	orange	185	986112100258413	2,355,194.37	6,693,808.43	6,557.32	2,355,194.42	6,693,808.18	6,557.43
F-15	orange	210	986112100258536	2,355,286.62	6,694,107.00	6,540.07	2,355,286.50	6,694,106.71	6,539.98
F-16	orange	205	986112100258375	2,355,335.93	6,693,999.81	6,544.72	2,355,336.30	6,694,000.21	6,544.74
F-17	orange	210	896112100258427	2,355,260.53	6,693,870.22	6,552.16	2,355,260.45	6,693,870.12	6,552.05
F-18	orange	190	986112100258514	2,355,260.53	6,693,870.22	6,552.16	2,355,248.70	6,693,845.68	6,554.50
F-19	orange	194	986112100258447	2,355,293.43	6,693,901.66	6,549.80	2,355,293.40	6,693,901.46	6,549.79
F-20	orange	183	986112100258522	2,355,321.76	6,693,937.51	6,545.69	2,355,321.24	6,693,938.83	6,545.58

Tracer ID	Paint Color	B-AXIS (mm)	PIT Tag Code	Original Placement			Last Found Location (July 2021)		
				Northing (ft)	Easting (ft)	Elevation (ft)	Northing (ft)	Easting (ft)	Elevation (ft)
F-21	orange	185	986112100258436	2,355,199.98	6,693,798.93	6,556.14	2,355,199.73	6,693,798.74	6,556.18
G-4	blue	320	986112100283920	2,355,198.99	6,693,800.59	6,556.63	2,355,198.71	6,693,800.64	6,556.66
G-5	blue	260	986112100289274	2,355,195.11	6,693,806.59	6,557.33	2,355,194.96	6,693,806.61	6,557.26
G-6	blue	270	986112100280431	2,355,175.59	6,693,789.00	6,558.55	2,355,175.49	6,693,789.07	6,558.51
G-8	blue	275	986112100289864	2,355,294.92	6,693,895.98	6,549.06	2,355,294.81	6,693,895.85	6,548.85
G-9	blue	258	986112100283565	2,355,298.96	6,694,049.76	6,544.59	2,355,299.00	6,694,049.49	6,544.67
G-10	blue	300	98611210093614	2,355,289.34	6,694,110.11	6,539.88	2,355,289.26	6,694,109.83	6,539.96

Site 6 Tracers

Tracer ID	Paint Color	B-AXIS (mm)	PIT Tag Code	Original Placement			Last Found Location (July 2021)		
				Northing (ft)	Easting (ft)	Elevation (ft)	Northing (ft)	Easting (ft)	Elevation (ft)
A-1	yellow	34	986112100283912	2,373,427.60	6,717,006.99	4,560.89	2,373,431.69	6,717,009.46	4,560.01
A-2	yellow	36	986112100298399	2,373,412.15	6,716,989.45	4,560.77	2,373,413.79	6,716,994.19	4,561.16
A-4	yellow	37	986112100280396	2,373,447.03	6,717,035.78	4,559.82	not recovered		
A-6	yellow	38	986112100278885	2,373,348.72	6,716,948.58	4,563.24	2,373,348.70	6,716,948.58	4,563.16
A-7	yellow	42	986112100295408	2,373,292.76	6,716,914.35	4,565.44	2,373,305.37	6,716,920.89	4,564.30
A-8	yellow	40	986112100280516	2,373,309.42	6,716,923.37	4,564.38	2,373,310.97	6,716,921.15	4,564.12
A-9	yellow	32	986112100278928	2,373,329.86	6,716,926.41	4,564.42	2,373,381.89	6,716,959.64	4,562.13
A-10	yellow	31	986112100278987	2,373,431.26	6,717,004.19	4,560.70	2,373,432.76	6,717,013.11	4,560.08
A-15	yellow	39	986112100294813	2,373,353.51	6,716,940.65	4,561.96	2,373,352.51	6,716,940.72	4,561.99
A-17	yellow	40	986112100278966	2,373,306.88	6,716,925.66	4,564.80	not recovered		
A-20	yellow	39	986112100283422	2,373,398.60	6,716,973.12	4,561.76	not recovered		
A-30	yellow	41	986112100283400	2,373,395.89	6,716,977.14	4,561.27	2,373,401.86	6,716,983.90	4,560.44
B-1	blue	53	986112100284748	2,373,426.24	6,717,008.05	4,561.29	2,373,434.95	6,717,011.59	4,560.12
B-3	blue	47	986112100298328	2,373,393.74	6,716,977.81	4,561.48	2,373,409.26	6,716,986.82	4,561.05
B-7	blue	49	986112100289497	2,373,352.04	6,716,940.84	4,561.99	2,373,369.21	6,716,950.74	4,562.04
B-10	blue	56	986112100298316	2,373,398.17	6,716,975.97	4,561.32	not recovered		
B-11	blue	56	986112100298135	2,373,307.09	6,716,929.47	4,565.53	2,373,307.14	6,716,925.97	4,564.72
B-12	blue	47	986112100298759	2,373,325.45	6,716,927.22	4,564.49	2,373,339.16	6,716,929.85	4,561.98
B-13	blue	56	986112100297656	2,373,442.49	6,717,040.25	4,560.57	not recovered		
B-14	blue	50	986112100279549	2,373,285.64	6,716,914.12	4,566.08	2,373,294.85	6,716,912.58	4,565.42
B-19	blue	54	986112100278832	2,373,292.74	6,716,913.96	4,565.43	not recovered		
B-20	blue	60	986112100279159	2,373,433.69	6,717,002.75	4,560.27	2,373,430.22	6,717,011.22	4,560.68
B-21	blue	59	986112100291205	2,373,371.38	6,716,959.89	4,561.35	2,373,371.03	6,716,961.78	4,561.38
B-25	blue	48	986112100284474	2,373,309.95	6,716,922.70	4,564.35	2,373,317.08	6,716,924.74	4,564.42
C-4	orange	70	986112100258557	2,373,311.21	6,716,920.72	4,564.11	2,373,311.75	6,716,920.87	4,563.98
C-6	orange	67	986112100258527	2,373,349.98	6,716,938.37	4,561.97	2,373,349.97	6,716,938.37	4,561.95

Tracer ID	Paint Color	B-AXIS (mm)	PIT Tag Code	Original Placement			Last Found Location (July 2021)		
				Northing (ft)	Easting (ft)	Elevation (ft)	Northing (ft)	Easting (ft)	Elevation (ft)
C-14	orange	75	986112100258418	2,373,293.21	6,716,914.46	4,565.55	2,373,304.60	6,716,922.45	4,564.42
C-20	orange	75	986112100258373	2,373,425.75	6,717,009.17	4,561.43	2,373,425.31	6,717,007.91	4,561.24
C-27	orange	87	986112100279350	2,373,373.46	6,716,960.67	4,561.19	2,373,373.53	6,716,960.68	4,561.27
C-28	orange	87	986112100289366	2,373,395.27	6,716,975.45	4,561.41	2,373,395.28	6,716,975.21	4,561.31
C-29	orange	99	986112100281375	2,373,414.69	6,716,987.67	4,560.58	2,373,414.68	6,716,991.08	4,560.87
C-30	orange	90	986112100279987	2,373,309.16	6,716,923.91	4,564.63	2,373,309.06	6,716,924.16	4,564.80
C-31	orange	79	986112100289071	2,373,402.32	6,716,974.18	4,561.82	2,373,398.14	6,716,973.45	4,561.68
C-32	orange	78	986112100295473	2,373,301.80	6,716,920.95	4,564.38	2,373,301.99	6,716,920.77	4,564.42
C-33	orange	75	986112100289760	2,373,427.86	6,717,007.40	4,561.01	2,373,429.64	6,717,009.35	4,560.85
D-1	yellow	106	986112100258481	2,373,282.83	6,716,923.46	4,566.62	2,373,282.85	6,716,923.38	4,566.67
D-4	yellow	120	986112100258469	2,373,310.98	6,716,923.17	4,564.57	2,373,310.69	6,716,923.46	4,564.53
D-6	yellow	102	986112100258491	2,373,433.68	6,717,004.09	4,560.28	2,373,429.89	6,717,001.58	4,560.76
D-8	yellow	114	986112100258384	2,373,412.34	6,716,987.58	4,560.66	2,373,420.92	6,716,990.59	4,561.01
D-9	yellow	96	986112100258480	2,373,424.98	6,717,009.42	4,561.57	2,373,426.69	6,717,010.16	4,561.47
D-10	yellow	119	986112100258380	2,373,397.70	6,716,974.68	4,561.48	2,373,397.01	6,716,976.26	4,561.67
D-11	yellow	96	986112100281712	2,373,326.23	6,716,927.26	4,564.56	2,373,325.83	6,716,927.76	4,564.28
D-12	yellow	102	986112100258370	2,373,360.00	6,716,950.72	4,561.58	2,373,359.99	6,716,950.83	4,561.59
D-15	yellow	97	986112100258488	2,373,351.30	6,716,943.79	4,562.73	2,373,350.49	6,716,947.39	4,563.16
D-16	yellow	111	986112100258554	2,373,394.61	6,716,976.23	4,561.37	2,373,394.71	6,716,976.27	4,561.52
D-17	yellow	116	986112100258451	2,373,309.18	6,716,926.33	4,564.94	2,373,309.46	6,716,926.53	4,564.92
D-23	yellow	99	986112100258376	2,373,439.49	6,717,040.52	4,561.00	2,373,441.69	6,717,041.99	4,560.58
E-1	blue	128	986112100258510	2,373,319.64	6,716,931.65	4,564.63	2,373,320.89	6,716,931.63	4,564.48
E-2	blue	145	986112100258364	2,373,428.04	6,717,006.12	4,561.11	2,373,428.06	6,716,998.84	4,560.88
E-3	blue	155	986112100258534	2,373,430.18	6,717,006.34	4,560.62	2,373,431.02	6,717,001.40	4,560.76
E-8	blue	142	986112100258420	2,373,292.40	6,716,913.14	4,565.86	not recovered		
E-10	blue	130	986112100258504	2,373,374.51	6,716,961.71	4,561.41	2,373,374.39	6,716,961.69	4,561.49
E-15	blue	148	986112100258365	2,373,444.23	6,717,034.15	4,560.29	2,373,444.62	6,717,034.41	4,560.13
E-17	blue	141	986112100258403	2,373,347.03	6,716,952.46	4,564.03	2,373,347.06	6,716,952.41	4,563.89

Tracer ID	Paint Color	B-AXIS (mm)	PIT Tag Code	Original Placement			Last Found Location (July 2021)		
				Northing (ft)	Easting (ft)	Elevation (ft)	Northing (ft)	Easting (ft)	Elevation (ft)
E-18	blue	141	pit tag stopped	2,373,308.00	6,716,922.00	4,564.00	2,373,310.15	6,716,922.86	4,564.90
E-23	blue	141	986112100258502	2,373,397.37	6,716,978.82	4,560.97	2,373,395.86	6,716,978.97	4,561.61
E-24	blue	169	986112100258378	2,373,287.45	6,716,911.74	4,565.95	2,373,287.53	6,716,911.99	4,565.97
E-26	blue	170	986112100298383	2,373,309.62	6,716,928.96	4,564.77	2,373,309.79	6,716,928.70	4,564.77
E-30	blue	131	986112100258453	2,373,400.26	6,716,975.17	4,561.48	2,373,391.13	6,716,971.67	4,561.37
F-2	orange	201	986112100258415	2,373,432.68	6,717,004.34	4,560.54	2,373,432.71	6,717,004.17	4,560.81
F-5	orange	209	986112100258419	2,373,327.39	6,716,930.18	4,564.57	2,373,326.92	6,716,929.93	4,564.54
F-6	orange	229	986112100258558	2,373,309.75	6,716,925.60	4,565.25	2,373,309.82	6,716,925.36	4,565.30
F-7	orange	197	986112100258426	2,373,397.21	6,716,975.99	4,561.80	2,373,405.01	6,716,978.86	4,561.21
F-8	orange	180	986112100258503	2,373,404.40	6,716,973.75	4,562.88	2,373,397.24	6,716,974.72	4,561.75
G-1	blue	290	986112100258477	2,373,402.44	6,716,975.70	4,562.30	2,373,402.47	6,716,975.73	4,562.31
G-2	blue	300	986112100258382	2,373,424.97	6,717,008.58	4,561.66	2,373,425.16	6,717,008.75	4,561.74
G-3	blue	345	986112100258395	2,373,308.69	6,716,924.90	4,565.63	2,373,308.67	6,716,924.90	4,565.69

APPENDIX B

2019 PFANKUCH FORMS

Worksheet 3-10. Pfankuch (1975) channel stability rating procedure, as modified by Rosgen (1996, 2001c, 2006b).

Stream: Bishop Creek **Location:** Site 4.1 **Valley Type:** **Observers:** **Date:** 8/26/2020

Location	Key	Category	Excellent Description	Excellent Rating	Good Description	Good Rating	Fair Description	Fair Rating	Poor Description	Poor Rating
Upper banks	1	Landform slope	Bank slope gradient <30%.	2	Bank slope gradient 30–40%.	**4**	Bank slope gradient 40–60%.	6	Bank slope gradient > 60%.	8
Upper banks	2	Mass erosion	No evidence of past or future mass erosion.	**3**	Infrequent. Mostly healed over. Low future potential.	6	Frequent or large, causing sediment nearly yearlong.	9	Frequent or large, causing sediment nearly yearlong OR imminent danger of same.	12
Upper banks	3	Debris jam potential	Essentially absent from immediate channel area.	2	Present, but mostly small twigs and limbs.	**4**	Moderate to heavy amounts, mostly larger sizes.	6	Moderate to heavy amounts, predominantly larger sizes.	8
Upper banks	4	Vegetative bank protection	> 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass.	**3**	70–90% density. Fewer species or less vigor suggest less dense or deep root mass.	6	50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass.	9	<50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass.	12
Lower banks	5	Channel capacity	Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0.	1	Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1.	**2**	Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3.	3	Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3.	4
Lower banks	6	Bank rock content	> 65% with large angular boulders. 12"+ common.	**2**	40–65%. Mostly boulders and small cobbles 6–12".	4	20–40%. Most in the 3–6" diameter class.	6	<20% rock fragments of gravel sizes, 1–3" or less.	8
Lower banks	7	Obstructions to flow	Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed.	**2**	Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm.	4	Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling.	6	Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring.	8
Lower banks	8	Cutting	Little or none. Infrequent raw banks <6".	**4**	Some, intermittently at outcurves and constrictions. Raw banks may be up to 12".	6	Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident.	12	Almost continuous cuts, some over 24" high. Failure of overhangs frequent.	16
Lower banks	9	Deposition	Little or no enlargement of channel or point bars.	**4**	Some new bar increase, mostly from coarse gravel.	8	Moderate depostion of new gravel and coarse sand on old and some new bars.	12	Extensive deposit of predominantly fine particles. Accelerated bar development.	16
Bottom	10	Rock angularity	Sharp edges and corners. Plane surfaces rough.	1	Rounded corners and edges. Surfaces smooth and flat.	2	Corners and edges well rounded in 2 dimensions.	3	Well rounded in all dimensions, surfaces smooth.	**4**
Bottom	11	Brightness	Surfaces dull, dark or stained. Generally not bright.	1	Mostly dull, but may have <35% bright surfaces.	2	Mixture dull and bright, i.e., 35–65% mixture range.	**3**	Predominantly bright, > 65%, exposed or scoured surfaces.	4
Bottom	12	Consolidation of particles	Assorted sizes tightly packed or overlapping.	2	Moderately packed with some overlapping.	**4**	Mostly loose assortment with no apparent overlap.	6	No packing evident. Loose assortment, easily moved.	8
Bottom	13	Bottom size distribution	No size change evident. Stable material 80–100%.	**4**	Distribution shift light. Stable material 50–80%.	8	Moderate change in sizes. Stable materials 20–50%.	12	Marked distribution change. Stable materials 0–20%.	16
Bottom	14	Scouring and deposition	<5% of bottom affected by scour or deposition.	**6**	5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools.	12	30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools.	18	More than 50% of the bottom in a state of flux or change nearly yearlong.	24
Bottom	15	Aquatic vegetation	Abundant growth moss-like, dark green perennial. In swift water too.	1	Common. Algae forms in low velocity and pool areas. Moss here too.	**2**	Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick.	3	Perennial types scarce or absent. Yellow-green, short-term bloom may be present.	4
			Excellent total =	**28**	Good total =	**16**	Fair total =	**3**	Poor total =	**4**

Stream type	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	C6	D3	D4	D5	D6
Good (Stable)	38-43	38-43	54-90	60-95	60-95	50-80	38-45	38-45	40-60	40-64	48-68	40-60	38-50	38-50	60-85	70-90	70-90	60-85	85-107	85-107	85-107	67-98
Fair (Mod. unstable	44-47	44-47	91-129	96-132	96-142	81-110	46-58	46-58	61-78	65-84	69-88	61-78	51-61	51-61	86-105	91-110	91-110	86-105	108-132	108-132	108-132	99-125
Poor (Unstable)	48+	48+	130+	133+	143+	111+	59+	59+	79+	85+	89+	79+	62+	62+	106+	111+	111+	106+	133+	133+	133+	126+

Stream type	DA3	DA4	DA5	DA6	E3	E4	E5	E6	F1	F2	F3	F4	F5	F6	G1	G2	G3	G4	G5	G6
Good (Stable)	40-63	40-63	40-63	40-63	40-63	50-75	50-75	40-63	60-85	60-85	85-110	85-110	90-115	80-95	40-60	40-60	85-107	85-107	90-112	85-107
Fair (Mod. unstable	64-86	64-86	64-86	64-86	64-86	76-96	76-96	64-86	86-105	86-105	111-125	111-125	116-130	96-110	61-78	61-78	108-120	108-120	113-125	108-120
Poor (Unstable)	87+	87+	87+	87+	87+	97+	97+	87+	106+	106+	126+	126+	131+	111+	79+	79+	121+	121+	126+	121+

Grand total =	51
Existing stream type =	B 3a
*Potential stream type =	B3A
Modified channel stability rating =	Good

*Rating is adjusted to potential stream type, not existing.

Worksheet 3-10. Pfankuch (1975) channel stability rating procedure, as modified by Rosgen (1996, 2001c, 2006b).

Stream: Bishop Creek **Location:** Site 4.2 **Valley Type:** **Observers:** GSM, TAK **Date:** 9/13/2019

Location	Key	Category	Excellent Description	Excellent Rating	Good Description	Good Rating	Fair Description	Fair Rating	Poor Description	Poor Rating
Upper banks	1	Landform slope	Bank slope gradient <30%.	2	Bank slope gradient 30–40%.	4	Bank slope gradient 40–60%.	6	Bank slope gradient > 60%.	8
Upper banks	2	Mass erosion	No evidence of past or future mass erosion.	3	Infrequent. Mostly healed over. Low future potential.	6	Frequent or large, causing sediment nearly yearlong.	9	Frequent or large, causing sediment nearly yearlong OR imminent danger of same.	12
Upper banks	3	Debris jam potential	Essentially absent from immediate channel area.	2	Present, but mostly small twigs and limbs.	4	Moderate to heavy amounts, mostly larger sizes.	6	Moderate to heavy amounts, predominantly larger sizes.	8
Upper banks	4	Vegetative bank protection	> 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass.	3	70–90% density. Fewer species or less vigor suggest less dense or deep root mass.	6	50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass.	9	<50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass.	12
Lower banks	5	Channel capacity	Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0.	1	Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1.	2	Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3.	3	Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3.	4
Lower banks	6	Bank rock content	> 65% with large angular boulders. 12"+ common.	2	40–65%. Mostly boulders and small cobbles 6–12".	4	20–40%. Most in the 3–6" diameter class.	6	<20% rock fragments of gravel sizes, 1–3" or less.	8
Lower banks	7	Obstructions to flow	Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed.	2	Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm.	4	Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling.	6	Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring.	8
Lower banks	8	Cutting	Little or none. Infrequent raw banks <6".	4	Some, intermittently at outcurves and constrictions. Raw banks may be up to 12".	6	Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident.	12	Almost continuous cuts, some over 24" high. Failure of overhangs frequent.	16
Lower banks	9	Deposition	Little or no enlargement of channel or point bars.	*3*	Some new bar increase, mostly from coarse gravel.	8	Moderate depostion of new gravel and coarse sand on old and some new bars.	12	Extensive deposit of predominantly fine particles. Accelerated bar development.	16
Bottom	10	Rock angularity	Sharp edges and corners. Plane surfaces rough.	1	Rounded corners and edges. Surfaces smooth and flat.	2	Corners and edges well rounded in 2 dimensions.	3	Well rounded in all dimensions, surfaces smooth.	4
Bottom	11	Brightness	Surfaces dull, dark or stained. Generally not bright.	1	Mostly dull, but may have <35% bright surfaces.	2	Mixture dull and bright, i.e., 35–65% mixture range.	3	Predominantly bright, > 65%, exposed or scoured surfaces.	4
Bottom	12	Consolidation of particles	Assorted sizes tightly packed or overlapping.	2	Moderately packed with some overlapping.	4	Mostly loose assortment with no apparent overlap.	6	No packing evident. Loose assortment, easily moved.	8
Bottom	13	Bottom size distribution	No size change evident. Stable material 80–100%.	4	Distribution shift light. Stable material 50–80%.	8	Moderate change in sizes. Stable materials 20–50%.	12	Marked distribution change. Stable materials 0–20%.	16
Bottom	14	Scouring and deposition	<5% of bottom affected by scour or deposition.	6	5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools.	12	30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools.	18	More than 50% of the bottom in a state of flux or change nearly yearlong.	24
Bottom	15	Aquatic vegetation	Abundant growth moss-like, dark green perennial. In swift water too.	1	Common. Algae forms in low velocity and pool areas. Moss here too.	2	Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick.	3	Perennial types scarce or absent. Yellow-green, short-term bloom may be present.	4
			Excellent total =	**27**	**Good total =**	**14**	**Fair total =**	**6**	**Poor total =**	**4**

Stream type	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	C6	D3	D4	D5	D6
Good (Stable)	38-43	38-43	54-90	60-95	60-95	50-80	38-45	38-45	40-60	40-64	48-68	40-60	38-50	38-50	60-85	70-90	70-90	60-85	85-107	85-107	85-107	67-98
Fair (Mod. unstable	44-47	44-47	91-129	96-132	96-142	81-110	46-58	46-58	61-78	65-84	69-88	61-78	51-61	51-61	86-105	91-110	91-110	86-105	108-132	108-132	108-132	99-125
Poor (Unstable)	48+	48+	130+	133+	143+	111+	59+	59+	79+	85+	89+	79+	62+	62+	106+	111+	111+	106+	133+	133+	133+	126+

Stream type	DA3	DA4	DA5	DA6	E3	E4	E5	E6	F1	F2	F3	F4	F5	F6	G1	G2	G3	G4	G5	G6
Good (Stable)	40-63	40-63	40-63	40-63	40-63	50-75	50-75	40-63	60-85	60-85	85-110	85-110	90-115	80-95	40-60	40-60	85-107	85-107	90-112	85-107
Fair (Mod. unstable	64-86	64-86	64-86	64-86	64-86	76-96	76-96	64-86	86-105	86-105	111-125	111-125	116-130	96-110	61-78	61-78	108-120	108-120	113-125	108-120
Poor (Unstable)	87+	87+	87+	87+	87+	97+	97+	87+	106+	106+	126+	126+	131+	111+	79+	79+	121+	121+	126+	121+

Grand total =	**51**
Existing stream type =	**B 2**
***Potential stream type =**	**B2**
Modified channel stability rating =	**Fair**

*Rating is adjusted to potential stream type, not existing.

Worksheet 3-10. Pfankuch (1975) channel stability rating procedure, as modified by Rosgen (1996, 2001c, 2006b).

Stream: Bishop Creek **Location:** Site 7 **Valley Type:** **Observers:** GSM,TAK **Date:** 9/11/2019

Location	Key	Category	Excellent Description	Rating	Good Description	Rating	Fair Description	Rating	Poor Description	Rating
Upper banks	1	Landform slope	Bank slope gradient <30%.	2	Bank slope gradient 30–40%.	4	Bank slope gradient 40–60%.	6	Bank slope gradient > 60%.	8
Upper banks	2	Mass erosion	No evidence of past or future mass erosion.	3	Infrequent. Mostly healed over. Low future potential.	6	Frequent or large, causing sediment nearly yearlong.	9	Frequent or large, causing sediment nearly yearlong OR imminent danger of same.	12
Upper banks	3	Debris jam potential	Essentially absent from immediate channel area.	2	Present, but mostly small twigs and limbs.	4	Moderate to heavy amounts, mostly larger sizes.	6	Moderate to heavy amounts, predominantly larger sizes.	8
Upper banks	4	Vegetative bank protection	> 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass.	3	70–90% density. Fewer species or less vigor suggest less dense or deep root mass.	6	50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass.	9	<50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass.	12
Lower banks	5	Channel capacity	Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0.	1	Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1.	2	Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3.	3	Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3.	4
Lower banks	6	Bank rock content	> 65% with large angular boulders. 12"+ common.	2	40–65%. Mostly boulders and small cobbles 6–12".	4	20–40%. Most in the 3–6" diameter class.	6	<20% rock fragments of gravel sizes, 1–3" or less.	8
Lower banks	7	Obstructions to flow	Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed.	2	Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm.	4	Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling.	6	Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring.	8
Lower banks	8	Cutting	Little or none. Infrequent raw banks <6".	4	Some, intermittently at outcurves and constrictions. Raw banks may be up to 12".	6	Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident.	12	Almost continuous cuts, some over 24" high. Failure of overhangs frequent.	16
Lower banks	9	Deposition	Little or no enlargement of channel or point bars.	4	Some new bar increase, mostly from coarse gravel.	8	Moderate depostion of new gravel and coarse sand on old and some new bars.	12	Extensive deposit of predominantly fine particles. Accelerated bar development.	16
Bottom	10	Rock angularity	Sharp edges and corners. Plane surfaces rough.	1	Rounded corners and edges. Surfaces smooth and flat.	2	Corners and edges well rounded in 2 dimensions.	3	Well rounded in all dimensions, surfaces smooth.	4
Bottom	11	Brightness	Surfaces dull, dark or stained. Generally not bright.	1	Mostly dull, but may have <35% bright surfaces.	2	Mixture dull and bright, i.e., 35–65% mixture range.	3	Predominantly bright, > 65%, exposed or scoured surfaces.	4
Bottom	12	Consolidation of particles	Assorted sizes tightly packed or overlapping.	2	Moderately packed with some overlapping.	4	Mostly loose assortment with no apparent overlap.	6	No packing evident. Loose assortment, easily moved.	8
Bottom	13	Bottom size distribution	No size change evident. Stable material 80–100%.	4	Distribution shift light. Stable material 50–80%.	8	Moderate change in sizes. Stable materials 20–50%.	12	Marked distribution change. Stable materials 0–20%.	16
Bottom	14	Scouring and deposition	<5% of bottom affected by scour or deposition.	6	5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools.	12	30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools.	18	More than 50% of the bottom in a state of flux or change nearly yearlong.	24
Bottom	15	Aquatic vegetation	Abundant growth moss-like, dark green perennial. In swift water too.	1	Common. Algae forms in low velocity and pool areas. Moss here too.	2	Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick.	3	Perennial types scarce or absent. Yellow-green, short-term bloom may be present.	4
			Excellent total =	**30**	**Good total =**	**8**	**Fair total =**	**6**	**Poor total =**	**8**

Stream type	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	C6	D3	D4	D5	D6
Good (Stable)	38-43	38-43	54-90	60-95	60-95	50-80	38-45	38-45	40-60	40-64	48-68	40-60	38-50	38-50	60-85	70-90	70-90	60-85	85-107	85-107	85-107	67-98
Fair (Mod. unstable	44-47	44-47	91-129	96-132	96-142	81-110	46-58	46-58	61-78	65-84	69-88	61-78	51-61	51-61	86-105	91-110	91-110	86-105	108-132	108-132	108-132	99-125
Poor (Unstable)	48+	48+	130+	133+	143+	111+	59+	59+	79+	85+	89+	79+	62+	62+	106+	111+	111+	106+	133+	133+	133+	126+

Stream type	DA3	DA4	DA5	DA6	E3	E4	E5	E6	F1	F2	F3	F4	F5	F6	G1	G2	G3	G4	G5	G6
Good (Stable)	40-63	40-63	40-63	40-63	40-63	50-75	50-75	40-63	60-85	60-85	85-110	85-110	90-115	80-95	40-60	40-60	85-107	85-107	90-112	85-107
Fair (Mod. unstable	64-86	64-86	64-86	64-86	64-86	76-96	76-96	64-86	86-105	86-105	111-125	111-125	116-130	96-110	61-78	61-78	108-120	108-120	113-125	108-120
Poor (Unstable)	87+	87+	87+	87+	87+	97+	97+	87+	106+	106+	126+	126+	131+	111+	79+	79+	121+	121+	126+	121+

Grand total =	**52**
Existing stream type =	**B2**
***Potential stream type =**	**B2**
Modified channel stability rating =	**Fair**

*Rating is adjusted to potential stream type, not existing.

Worksheet 3-10. Pfankuch (1975) channel stability rating procedure, as modified by Rosgen (1996, 2001c, 2006b).

Stream: Bishop Creek | **Location:** Site 3 | **Valley Type:** | **Observers:** GSM,TAK | **Date:** 9/10/2019

Location	Key	Category	Excellent – Description	Rating	Good – Description	Rating	Fair – Description	Rating	Poor – Description	Rating
Upper banks	1	Landform slope	Bank slope gradient <30%.	2	Bank slope gradient 30–40%.	**4**	Bank slope gradient 40–60%.	6	Bank slope gradient > 60%.	8
Upper banks	2	Mass erosion	No evidence of past or future mass erosion.	**3**	Infrequent. Mostly healed over. Low future potential.	6	Frequent or large, causing sediment nearly yearlong.	9	Frequent or large, causing sediment nearly yearlong OR imminent danger of same.	12
Upper banks	3	Debris jam potential	Essentially absent from immediate channel area.	**2**	Present, but mostly small twigs and limbs.	4	Moderate to heavy amounts, mostly larger sizes.	6	Moderate to heavy amounts, predominantly larger sizes.	8
Upper banks	4	Vegetative bank protection	> 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass.	**3**	70–90% density. Fewer species or less vigor suggest less dense or deep root mass.	6	50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass.	9	<50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass.	12
Lower banks	5	Channel capacity	Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0.	1	Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1.	**2**	Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3.	3	Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3.	4
Lower banks	6	Bank rock content	> 65% with large angular boulders. 12"+ common.	**2**	40–65%. Mostly boulders and small cobbles 6–12".	4	20–40%. Most in the 3–6" diameter class.	6	<20% rock fragments of gravel sizes, 1–3" or less.	8
Lower banks	7	Obstructions to flow	Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed.	**2**	Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm.	4	Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling.	6	Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring.	8
Lower banks	8	Cutting	Little or none. Infrequent raw banks <6".	**4**	Some, intermittently at outcurves and constrictions. Raw banks may be up to 12".	6	Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident.	12	Almost continuous cuts, some over 24" high. Failure of overhangs frequent.	16
Lower banks	9	Deposition	Little or no enlargement of channel or point bars.	**4**	Some new bar increase, mostly from coarse gravel.	8	Moderate depostion of new gravel and coarse sand on old and some new bars.	12	Extensive deposit of predominantly fine particles. Accelerated bar development.	16
Bottom	10	Rock angularity	Sharp edges and corners. Plane surfaces rough.	1	Rounded corners and edges. Surfaces smooth and flat.	2	Corners and edges well rounded in 2 dimensions.	3	Well rounded in all dimensions, surfaces smooth.	**4**
Bottom	11	Brightness	Surfaces dull, dark or stained. Generally not bright.	1	Mostly dull, but may have <35% bright surfaces.	2	Mixture dull and bright, i.e., 35–65% mixture range.	**3**	Predominantly bright, > 65%, exposed or scoured surfaces.	4
Bottom	12	Consolidation of particles	Assorted sizes tightly packed or overlapping.	2	Moderately packed with some overlapping.	**4**	Mostly loose assortment with no apparent overlap.	6	No packing evident. Loose assortment, easily moved.	8
Bottom	13	Bottom size distribution	No size change evident. Stable material 80–100%.	**4**	Distribution shift light. Stable material 50–80%.	8	Moderate change in sizes. Stable materials 20–50%.	12	Marked distribution change. Stable materials 0–20%.	16
Bottom	14	Scouring and deposition	<5% of bottom affected by scour or deposition.	**6**	5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools.	12	30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools.	18	More than 50% of the bottom in a state of flux or change nearly yearlong.	24
Bottom	15	Aquatic vegetation	Abundant growth moss-like, dark green perennial. In swift water too.	1	Common. Algae forms in low velocity and pool areas. Moss here too.	**2**	Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick.	3	Perennial types scarce or absent. Yellow-green, short-term bloom may be present.	4
			Excellent total =	**30**	**Good total =**	**12**	**Fair total =**	**3**	**Poor total =**	**4**

Stream type	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	C6	D3	D4	D5	D6
Good (Stable)	38-43	38-43	54-90	60-95	60-95	50-80	38-45	38-45	40-60	40-64	48-68	40-60	38-50	38-50	60-85	70-90	70-90	60-85	85-107	85-107	85-107	67-98
Fair (Mod. unstable)	44-47	44-47	91-129	96-132	96-142	81-110	46-58	46-58	61-78	65-84	69-88	61-78	51-61	51-61	86-105	91-110	91-110	86-105	108-132	108-132	108-132	99-125
Poor (Unstable)	48+	48+	130+	133+	143+	111+	59+	59+	79+	85+	89+	79+	62+	62+	106+	111+	111+	106+	133+	133+	133+	126+

Stream type	DA3	DA4	DA5	DA6	E3	E4	E5	E6	F1	F2	F3	F4	F5	F6	G1	G2	G3	G4	G5	G6
Good (Stable)	40-63	40-63	40-63	40-63	40-63	50-75	50-75	40-63	60-85	60-85	85-110	85-110	90-115	80-95	40-60	40-60	85-107	85-107	90-112	85-107
Fair (Mod. unstable)	64-86	64-86	64-86	64-86	64-86	76-96	76-96	64-86	86-105	86-105	111-125	111-125	116-130	96-110	61-78	61-78	108-120	108-120	113-125	108-120
Poor (Unstable)	87+	87+	87+	87+	87+	97+	97+	87+	106+	106+	126+	126+	131+	111+	79+	79+	121+	121+	126+	121+

Grand total =	49
Existing stream type =	B3a
*Potential stream type =	B3A
Modified channel stability rating =	Good

*Rating is adjusted to potential stream type, not existing.

Worksheet 3-10. Pfankuch (1975) channel stability rating procedure, as modified by Rosgen (1996, 2001c, 2006b).

Stream: Bishop Creek **Location:** Site 5 **Valley Type:** **Observers:** GSM, TAK **Date:** 9/10/2019

Location	Key	Category	Excellent – Description	Excellent – Rating	Good – Description	Good – Rating	Fair – Description	Fair – Rating	Poor – Description	Poor – Rating
Upper banks	1	Landform slope	Bank slope gradient <30%.	2	Bank slope gradient 30–40%.	4	Bank slope gradient 40–60%.	**6**	Bank slope gradient > 60%.	8
Upper banks	2	Mass erosion	No evidence of past or future mass erosion.	**3**	Infrequent. Mostly healed over. Low future potential.	6	Frequent or large, causing sediment nearly yearlong.	9	Frequent or large, causing sediment nearly yearlong OR imminent danger of same.	12
Upper banks	3	Debris jam potential	Essentially absent from immediate channel area.	**2**	Present, but mostly small twigs and limbs.	4	Moderate to heavy amounts, mostly larger sizes.	6	Moderate to heavy amounts, predominantly larger sizes.	8
Upper banks	4	Vegetative bank protection	> 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass.	3	70–90% density. Fewer species or less vigor suggest less dense or deep root mass.	**6**	50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass.	9	<50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass.	12
Lower banks	5	Channel capacity	Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0.	1	Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1.	**2**	Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3.	3	Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3.	4
Lower banks	6	Bank rock content	> 65% with large angular boulders. 12"+ common.	**2**	40–65%. Mostly boulders and small cobbles 6–12".	4	20–40%. Most in the 3–6" diameter class.	6	<20% rock fragments of gravel sizes, 1–3" or less.	8
Lower banks	7	Obstructions to flow	Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed.	**2**	Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm.	4	Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling.	6	Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring.	8
Lower banks	8	Cutting	Little or none. Infrequent raw banks <6".	**4**	Some, intermittently at outcurves and constrictions. Raw banks may be up to 12".	6	Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident.	12	Almost continuous cuts, some over 24" high. Failure of overhangs frequent.	16
Lower banks	9	Deposition	Little or no enlargement of channel or point bars.	**4**	Some new bar increase, mostly from coarse gravel.	8	Moderate depostion of new gravel and coarse sand on old and some new bars.	12	Extensive deposit of predominantly fine particles. Accelerated bar development.	16
Bottom	10	Rock angularity	Sharp edges and corners. Plane surfaces rough.	1	Rounded corners and edges. Surfaces smooth and flat.	2	Corners and edges well rounded in 2 dimensions.	3	Well rounded in all dimensions, surfaces smooth.	**4**
Bottom	11	Brightness	Surfaces dull, dark or stained. Generally not bright.	1	Mostly dull, but may have <35% bright surfaces.	2	Mixture dull and bright, i.e., 35–65% mixture range.	3	Predominantly bright, > 65%, exposed or scoured surfaces.	**4**
Bottom	12	Consolidation of particles	Assorted sizes tightly packed or overlapping.	**2**	Moderately packed with some overlapping.	4	Mostly loose assortment with no apparent overlap.	6	No packing evident. Loose assortment, easily moved.	8
Bottom	13	Bottom size distribution	No size change evident. Stable material 80–100%.	**4**	Distribution shift light. Stable material 50–80%.	8	Moderate change in sizes. Stable materials 20–50%.	12	Marked distribution change. Stable materials 0–20%.	16
Bottom	14	Scouring and deposition	<5% of bottom affected by scour or deposition.	**6**	5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools.	12	30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools.	18	More than 50% of the bottom in a state of flux or change nearly yearlong.	24
Bottom	15	Aquatic vegetation	Abundant growth moss-like, dark green perennial. In swift water too.	1	Common. Algae forms in low velocity and pool areas. Moss here too.	2	Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick.	**3**	Perennial types scarce or absent. Yellow-green, short-term bloom may be present.	4
			Excellent total =	**29**	**Good total =**	**8**	**Fair total =**	**9**	**Poor total =**	**8**

Stream type	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	C6	D3	D4	D5	D6
Good (Stable)	38-43	38-43	54-90	60-95	60-95	50-80	38-45	38-45	40-60	40-64	48-68	40-60	38-50	38-50	60-85	70-90	70-90	60-85	85-107	85-107	85-107	67-98
Fair (Mod. unstable	44-47	44-47	91-129	96-132	96-142	81-110	46-58	46-58	61-78	65-84	69-88	61-78	51-61	51-61	86-105	91-110	91-110	86-105	108-132	108-132	108-132	99-125
Poor (Unstable)	48+	48+	130+	133+	143+	111+	59+	59+	79+	85+	89+	79+	62+	62+	106+	111+	111+	106+	133+	133+	133+	126+

Stream type	DA3	DA4	DA5	DA6	E3	E4	E5	E6	F1	F2	F3	F4	F5	F6	G1	G2	G3	G4	G5	G6
Good (Stable)	40-63	40-63	40-63	40-63	40-63	50-75	50-75	40-63	60-85	60-85	85-110	85-110	90-115	80-95	40-60	40-60	85-107	85-107	90-112	85-107
Fair (Mod. unstable	64-86	64-86	64-86	64-86	64-86	76-96	76-96	64-86	86-105	86-105	111-125	111-125	116-130	96-110	61-78	61-78	108-120	108-120	113-125	108-120
Poor (Unstable)	87+	87+	87+	87+	87+	97+	97+	87+	106+	106+	126+	126+	131+	111+	79+	79+	121+	121+	126+	121+

Grand total =	**54**
Existing stream type =	**B3a**
***Potential stream type =**	**B3A**
Modified channel stability rating =	**Good**

*Rating is adjusted to potential stream type, not existing.

Worksheet 3-10. Pfankuch (1975) channel stability rating procedure, as modified by Rosgen (1996, 2001c, 2006b).

Stream: Bishop Creek | **Location:** Site 6 | **Valley Type:** | **Observers:** GSM, TAK | **Date:** 9/9/2019

Location	Key	Category	Excellent Description	Rating	Good Description	Rating	Fair Description	Rating	Poor Description	Rating
Upper banks	1	Landform slope	Bank slope gradient <30%.	2	Bank slope gradient 30–40%.	**4**	Bank slope gradient 40–60%.	6	Bank slope gradient > 60%.	8
	2	Mass erosion	No evidence of past or future mass erosion.	3	Infrequent. Mostly healed over. Low future potential.	**6**	Frequent or large, causing sediment nearly yearlong.	9	Frequent or large, causing sediment nearly yearlong OR imminent danger of same.	12
	3	Debris jam potential	Essentially absent from immediate channel area.	2	Present, but mostly small twigs and limbs.	**4**	Moderate to heavy amounts, mostly larger sizes.	6	Moderate to heavy amounts, predominantly larger sizes.	8
	4	Vegetative bank protection	> 90% plant density. Vigor and variety suggest a deep, dense soil-binding root mass.	3	70–90% density. Fewer species or less vigor suggest less dense or deep root mass.	**6**	50–70% density. Lower vigor and fewer species from a shallow, discontinuous root mass.	9	<50% density plus fewer species and less vigor indicating poor, discontinuous and shallow root mass.	12
Lower banks	5	Channel capacity	Bank heights sufficient to contain the bankfull stage. Width/depth ratio departure from reference width/depth ratio = 1.0. Bank-Height Ratio (BHR) = 1.0.	1	Bankfull stage is contained within banks. Width/depth ratio departure from reference width/depth ratio = 1.0–1.2. Bank-Height Ratio (BHR) = 1.0–1.1.	**2**	Bankfull stage is not contained. Width/depth ratio departure from reference width/depth ratio = 1.2–1.4. Bank-Height Ratio (BHR) = 1.1–1.3.	3	Bankfull stage is not contained; over-bank flows are common with flows less than bankfull. Width/depth ratio departure from reference width/depth ratio > 1.4. Bank-Height Ratio (BHR) > 1.3.	4
	6	Bank rock content	> 65% with large angular boulders. 12"+ common.	2	40–65%. Mostly boulders and small cobbles 6–12".	**4**	20–40%. Most in the 3–6" diameter class.	6	<20% rock fragments of gravel sizes, 1–3" or less.	8
	7	Obstructions to flow	Rocks and logs firmly imbedded. Flow pattern w/o cutting or deposition. Stable bed.	**2**	Some present causing erosive cross currents and minor pool filling. Obstructions fewer and less firm.	4	Moderately frequent, unstable obstructions move with high flows causing bank cutting and pool filling.	6	Frequent obstructions and deflectors cause bank erosion yearlong. Sediment traps full, channel migration occurring.	8
	8	Cutting	Little or none. Infrequent raw banks <6".	4	Some, intermittently at outcurves and constrictions. Raw banks may be up to 12".	**6**	Significant. Cuts 12–24" high. Root mat overhangs and sloughing evident.	12	Almost continuous cuts, some over 24" high. Failure of overhangs frequent.	16
	9	Deposition	Little or no enlargement of channel or point bars.	**4**	Some new bar increase, mostly from coarse gravel.	8	Moderate depostion of new gravel and coarse sand on old and some new bars.	12	Extensive deposit of predominantly fine particles. Accelerated bar development.	16
Bottom	10	Rock angularity	Sharp edges and corners. Plane surfaces rough.	1	Rounded corners and edges. Surfaces smooth and flat.	2	Corners and edges well rounded in 2 dimensions.	3	Well rounded in all dimensions, surfaces smooth.	**4**
	11	Brightness	Surfaces dull, dark or stained. Generally not bright.	1	Mostly dull, but may have <35% bright surfaces.	2	Mixture dull and bright, i.e., 35–65% mixture range.	3	Predominantly bright, > 65%, exposed or scoured surfaces.	**4**
	12	Consolidation of particles	Assorted sizes tightly packed or overlapping.	2	Moderately packed with some overlapping.	**4**	Mostly loose assortment with no apparent overlap.	6	No packing evident. Loose assortment, easily moved.	8
	13	Bottom size distribution	No size change evident. Stable material 80–100%.	**4**	Distribution shift light. Stable material 50–80%.	8	Moderate change in sizes. Stable materials 20–50%.	12	Marked distribution change. Stable materials 0–20%.	16
	14	Scouring and deposition	<5% of bottom affected by scour or deposition.	**6**	5–30% affected. Scour at constrictions and where grades steepen. Some deposition in pools.	12	30–50% affected. Deposits and scour at obstructions, constrictions and bends. Some filling of pools.	18	More than 50% of the bottom in a state of flux or change nearly yearlong.	24
	15	Aquatic vegetation	Abundant growth moss-like, dark green perennial. In swift water too.	1	Common. Algae forms in low velocity and pool areas. Moss here too.	2	Present but spotty, mostly in backwater. Seasonal algae growth makes rocks slick.	3	Perennial types scarce or absent. Yellow-green, short-term bloom may be present.	**4**
			Excellent total =	**16**	Good total =	**36**	Fair total =	**0**	Poor total =	**12**

Stream type	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	C6	D3	D4	D5	D6
Good (Stable)	38-43	38-43	54-90	60-95	60-95	50-80	38-45	38-45	40-60	40-64	48-68	40-60	38-50	38-50	60-85	70-90	70-90	60-85	85-107	85-107	85-107	67-98
Fair (Mod. unstable	44-47	44-47	91-129	96-132	96-142	81-110	46-58	46-58	61-78	65-84	69-88	61-78	51-61	51-61	86-105	91-110	91-110	86-105	108-132	108-132	108-132	99-125
Poor (Unstable)	48+	48+	130+	133+	143+	111+	59+	59+	79+	85+	89+	79+	62+	62+	106+	111+	111+	106+	133+	133+	133+	126+

Stream type	DA3	DA4	DA5	DA6	E3	E4	E5	E6	F1	F2	F3	F4	F5	F6	G1	G2	G3	G4	G5	G6
Good (Stable)	40-63	40-63	40-63	40-63	40-63	50-75	50-75	40-63	60-85	60-85	85-110	85-110	90-115	80-95	40-60	40-60	85-107	85-107	90-112	85-107
Fair (Mod. unstable	64-86	64-86	64-86	64-86	64-86	76-96	76-96	64-86	86-105	86-105	111-125	111-125	116-130	96-110	61-78	61-78	108-120	108-120	113-125	108-120
Poor (Unstable)	87+	87+	87+	87+	87+	97+	97+	87+	106+	106+	126+	126+	131+	111+	79+	79+	121+	121+	126+	121+

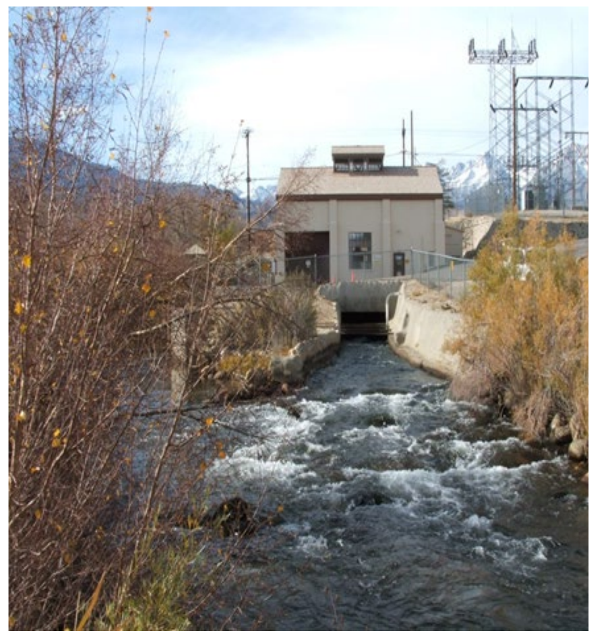
Grand total =	**64**
Existing stream type =	**B 3**
*Potential stream type =	**B3**
Modified channel stability rating =	**Fair**

*Rating is adjusted to potential stream type, not existing.

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project

(FERC Project No. 1394)



DRAFT LICENSE APPLICATION

FINAL TECHNICAL REPORTS

VOLUME III (4 OF 4)

SOUTHERN CALIFORNIA EDISON

An EDISON INTERNATIONAL® Company

JANUARY 2022

List of Technical Reports in this File

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project
(FERC Project No. 1394)

DRAFT LICENSE APPLICATION

DRAFT TECHNICAL REPORT
RECREATION USE & NEEDS STUDY
(REC1)

Southern California Edison
1515 Walnut Grove Ave
Rosemead, CA 91770

January 2022

Support from:

Kleinschmidt

TABLE OF CONTENTS

LIST OF FIGURES

List of Tables

APPENDICES

ACRONYMS

Bishop Creek Project	Bishop Creek Hydroelectric Project
CDFW	California Department of Fish and Wildlife
CDPR	California Department of Parks and Recreation
Coronavirus Disease	COVID-19
FERC	Federal Energy Regulatory Authority
INF	Inyo National Forest
ISR	Initial Study Report
N/A	not applicable
NVUM	National Visitor Use Monitoring
QR codes	quick response codes
REC 1	Recreation Use and Needs Study
REC 2	Recreation Facilities Condition Assessment
RUN	Recreation Use and Needs
SCE	Southern California Edison
SCORP	Statewide Comprehensive Outdoor Recreation Plan
TSP	Technical Study Plan
TWG	Technical Working Group
URL	uniform resource locators
USR	Updated Study Report
USFS	U.S. Forest Service

1.0 INTRODUCTION

During Technical Working Group (TWG) meetings, Southern California Edison (SCE) and stakeholders identified the need to conduct a Recreation Use and Needs (RUN) Study (REC 1) to evaluate current recreational use and future recreational needs for the Bishop Creek Hydroelectric Project (Bishop Creek Project). Accordingly, on May 1, 2019, SCE filed proposed Technical Study Plans (TSPs) for the Bishop Creek Project. On July 18, 2019, the U.S. Forest Service (USFS) filed a letter commenting, in part, on the REC 1 study plan.

On August 29, 2019, SCE filed updated TSPs to address comments received from stakeholders and FERC staff during the scoping process. As part of the response to the USFS July 18, 2019 comments, SCE committed to continue to collaborate with USFS prior to the 2020 field season 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. Based on these conversations in late 2019, study methods were updated during conference calls and captured in various memorandums to the USFS.

In January 2020, due to unanticipated construction activity along South Lake Road, SCE and the USFS concluded that any surveys conducted under the REC 1 study plan during the 2020 recreation season would not provide a representative sample of use and should thus be postponed. Ensuing complications from the Coronavirus Disease (COVID-19) pandemic and historic wildfires in the area further confirmed this decision. As a result, in-person surveys and spot, traffic, and trail counts were rescheduled for the 2021 recreation season with the expectation that conditions would improve. During these same discussions, the USFS further articulated their preference to develop off-site surveys that, while more general in nature than the on-site surveys, would target questions directly related to use, avoidance of use, or for use in the Bishop Creek area. Although SCE maintained that off-site surveys to accomplish goals that had no direct nexus to the Bishop Creek Project, SCE agreed to take a lead role in the implementation, collection, and analysis of off-site surveys. Through a series of conference calls from January through July 2020, SCE and the USFS finalized an off-site, web-based Bishop Creek Reservoirs Recreation Use Survey that was placed on both SCE's relicensing website and the Inyo National Forest (INF) website.

In preparation for the 2021 recreation season, SCE and the USFS held a conference call on January 19, 2021, to discuss the status of REC 1 activities. With REC 1 field work scheduled to begin April 2021 and significant unknowns associated with the COVID-19 pandemic, various options to delay scheduling or alter methods were discussed. Based on a subsequent call with the USFS on February 9, 2021, conversations with FERC staff, and internal discussions, SCE proposed to move forward with data collection during the 2021 recreation season, intending to meet the same goals and objectives outlined in the REC 1 study plan. This was accomplished largely by modifying methods of collecting qualitative data for recreation use and needs at the Bishop Creek Project that were originally to be administered on-site. A summary of the proposed changes was provided to the TWG in a March 12, 2021 memorandum and discussed during the March 15, 2021

TWG meeting. During the March 15, 2021 TWG meeting and ensuing emails with the TWG, changes to methods were agreed upon and implemented shortly after, as described in the May 28, 2021 Progress Report filed with FERC. The following sections describe the ultimate study goals and objectives, study areas, and methods employed and an analysis and discussion of relevant results for the REC 1 study.

2.0 STUDY GOALS AND OBJECTIVES

The REC 1 study included 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 the Bishop Creek Project features
- Estimate future Bishop Creek 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 Bishop Creek Project facilities and operations are consistent with the desired conditions, goals, standards, and guidelines described in the Land Management Plan for INF (USDA 2019)

3.0 REVIEW OF EXISTING INFORMATION

The REC 1 study reviewed and incorporated existing information related to RUNs identified at the Bishop Creek Project. The following is a list of studies and reports analyzed as part of this study:

- 2015 Licensed Hydropower Development Recreation Report, FERC Form No. 80 (SCE 2015a)
- 2014 Southern California Edison (SCE) Recreation Use Study Report for Eastern Hydro Division (SCE 2015a)
- 2021 California Statewide Comprehensive Outdoor Recreation Plan (SCORP) (CDPR 2021)
- National Visitor Use Monitoring (NVUM) Reports for INF (USFS 2006; 2011; 2018d)
- INF Alternative Transportation System Study (USDA 2013)
- California Department of Fish and Wildlife (CDFW) Stocking and Historic Creel Survey Data

The study also analyzed relevant management plans for the area, including Inyo County General Plan (IC 2001), Land Management Plan for the INF (USDA 2019), and the Bureau of Land Management's Bishop Resource Management Plan Record of Decision (BLM 1993).

4.0 STUDY AREAS

Based on discussions with the INF in late 2019 and SCE's December 19 Progress Report to FERC, study areas associated with REC 1 activities were revised, most notably to focus most activities (user surveys, traffic counters, spot counts, and angler surveys) on the three main recreation areas adjacent to the Bishop Creek Project: Lake Sabrina, South Lake, and Intake No. 2 recreation areas. In addition to the three main recreation areas, angler surveys and related spot counts were also conducted at Forks, Big Trees, and Four Jeffrey Campgrounds at the request of the CDFW. Trail counters were stationed along Inlet Trail, Green Creek diversion pipeline, and the informal access to the Little Egypt climbing area.

As discussed in Section 1.0, on-site surveys were replaced with an expanded effort to obtain responses through a web-based survey to reduce person-to-person contact during the 2021 recreation season due to ongoing concerns with the COVID-19 pandemic. Quick Response (QR) codes and Uniform Resource Locators (URLs) of the web-based survey were posted and distributed as fliers on car windshields at the three main recreation areas and at INF kiosks, bathrooms, and marinas near the reservoirs. Figure 4.1-1 depicts the location of the REC 1 study areas.

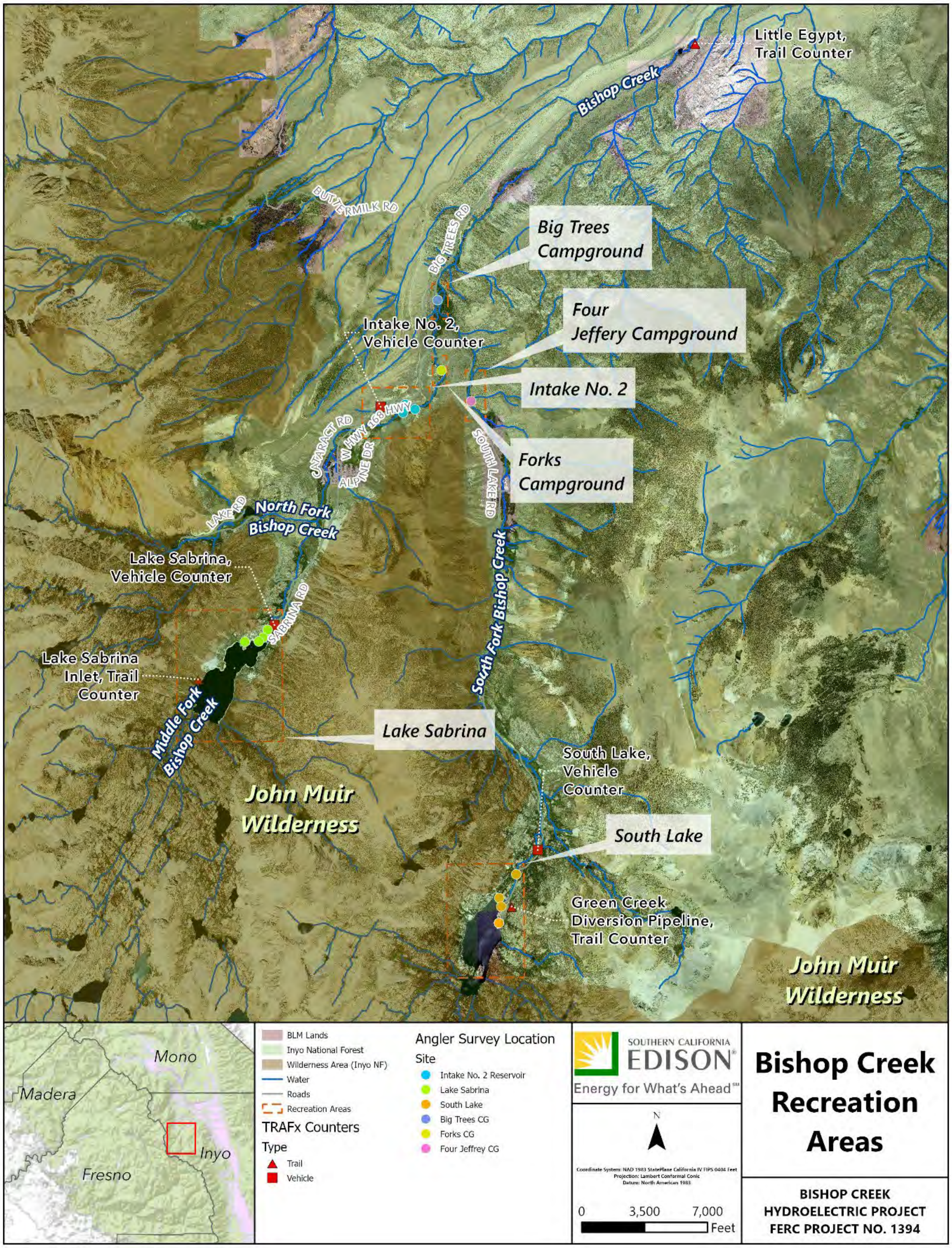


Figure 5.1-1 REC 1 Study Locations

5.0 METHODS

To accomplish the goals and objectives of the REC 1 study, SCE implemented a variety of data collection techniques to compile both historic and current recreation use and needs patterns for the Bishop Creek Project. Historic use patterns were determined by analyzing the studies, reports, and management plans described in Section 3.0. Current use and needs information were collected through a general recreation site inventory, web-based recreation surveys, traffic/trail counter data, spot counts, and angler surveys. This section provides a general description of each collection technique implemented.

5.1 GENERAL RECREATION SITE INVENTORY

A basic inventory of recreation facilities was conducted for the three main recreation areas (South Lake, Lake Sabrina, and Intake No. 2), that included the type, number, size, and/or estimated capacities of facilities such as restrooms, parking areas, boat ramps, piers, and picnic tables.

5.2 WEB-BASED RECREATION SURVEYS

As discussed in Section 1.0, recreation surveys were originally scheduled to be conducted on-site during the 2020 field season, but due to ongoing complications posed by the COVID-19 pandemic, SCE consulted with the USFS in early 2021 and agreed to move forward with REC 1 activities in the 2021 recreation season, although with slightly altered methods and an understanding that implementation may require flexibility and adaptability. To reduce person-to-person contact during the 2021 recreation season, on-site surveys were replaced with an expanded effort to obtain responses through the previously designed web-based survey. The web-based survey was altered to parse survey responses based on the source of the survey taker (onsite, website, email blast, etc.). QR codes and URLs of the web-based survey were posted and distributed as fliers on car windshields at the three main recreation areas and select campgrounds near the reservoirs.

5.3 TRAFFIC COUNTERS

As depicted on Figure 4.1-1, TRAFx traffic counters were installed at strategic access points that would record all vehicles (e.g., total vehicles, average vehicles per month/day/hour) entering and leaving South Lake, Lake Sabrina, and Intake No. 2 recreation areas. Traffic counters were installed and began collecting data on April 25[1], 2021; interim traffic data was downloaded from the field on May 5, June 29, September

[1] Counters were intended to begin collecting data on April 24, 2021. However, each counter recorded erroneous data the morning of April 24, including at South Lake, which was closed to the public for road construction at the time. For this reason, April 24 data was excluded from the analysis and begins with April 25 data.

29, and November 11, 2021[2]. Each traffic counter was installed at an access point that would collect all vehicles both entering and leaving the site for the day. The estimate of total and average number of users was based on the USFS' estimate of an average of 2.5 people per vehicle provided in their 2016 National Visitor Use Monitoring Results for the INF.

5.4 TRAIL COUNTERS

As depicted on Figure 4.1-1, TRAFx trail counters were installed to record informal use (e.g., total users, average users per month/day/hour) at the following locations:

- Inlet Trail: an informal trail extending from the Sabrina Boat Landing along the western shore of Lake Sabrina to the Bishop Creek inlet.
- Green Creek diversion pipeline: a corridor created by the presence of the Green Creek diversion pipeline where users are informally using the pipeline right-of-way as a trail.
- Little Egypt climbing area: informal use of available parking at SCE's Plant 3 to access the Little Egypt climbing area.

Trail counters were installed and began collecting data on April 25, 2021; interim traffic data was downloaded from the field on May 5, June 29, September 29, and November 11. 2021[3]. Since each "trail" is essentially an out-and-back, meaning the user has to turn around to return to the trailhead, each trail counter was installed at an appropriate access point that would collect all hikers both entering and leaving the site for the day. Therefore, to arrive at a total number of hikers present during a specific period, the data was divided by two to account for both the arrival and exit of each hiker. For Green Creek diversion pipeline, however, while it is expected that most users return the way they came, users may also choose to alter course once the pipeline intersects USFS system trails. Therefore, they may not choose to return the same way they came, and it is assumed that these counts may be slightly underestimated.

5.5 SPOT COUNTS

Spot counts were conducted at each recreation area (South Lake, Lake Sabrina, and Intake No. 2) and campgrounds used for angler surveys (Forks, Big Trees, and Four Jeffrey campgrounds). Spot counts at the main recreation areas were further subdivided to differentiate between distinct amenities or uses; these subdivisions are discussed in more detail in Section 6.5. During angler surveys, spot counts were collected for anglers

[2] Though originally scheduled to be collected through the end of November 2021, a final data download occurred on November 11, 2021 in response to gate closures and inclement weather conditions at the study sites.

[3] Though originally scheduled to be collected through the end of November 2021, a final data download occurred on November 11, 2021 in response to gate closures and inclement weather conditions at the study sites.

adjacent to the creek that runs alongside that campground. For each user spot count, an attempt was made to distinguish between general recreators (day users), anglers, and any on-water activities. For each vehicle spot count, a distinction was made between trailered and non-trailered vehicles. Ancillary information related to date, time of day, weather conditions, and other general observations at the time of the count was recorded. Spot counts were collected from April 25 through November 11, 2021.[4]

5.6 ANGLER SURVEYS

Angler surveys were conducted using a field data sheet at each main recreation area (South Lake, Lake Sabrina, and Intake No. 2) and campground identified by CDFW for inclusion in the study (Forks, Big Trees, and Four Jeffrey campgrounds). Surveys were designed to collect angler characteristics (e.g., origin and group size); determine current angler timing, effort, harvest, composition, success; and estimate catch-per-unit effort by species. Angler surveys were conducted Memorial Day weekend through Labor Day weekend in 2021.

[4] Though originally scheduled to be collected through the end of November 2021, a final data download occurred on November 11, 2021 in response to gate closures and inclement weather conditions at the study sites.

6.0 IMPLEMENTATION AND RESULTS

REC 1 field activities were initiated in late April 2021 prior to "Fishmas" weekend (the beginning of bona fide catch-and-keep trout fishing season, beginning the last Saturday in April [approximately April 24-25, 2021] through November 15 annually). Traffic and trail counters were installed and laminated fliers with URLs and QR codes for the web-based survey were posted at recreation sites and at INF kiosks, bathrooms, and marinas near the reservoirs. On April 25, traffic and trail counters began, the first spot counts were conducted, and non-laminated fliers were placed on vehicles at each recreation area where spot counts were taken.[5] Beginning on Memorial Day weekend, angler surveys were initiated at the three recreation areas (Lake Sabrina, South Lake, and Intake No. 2) as well as three campgrounds requested for inclusion by CDFW (Forks, Four Jeffery, and Big Trees).

On August 31, 2021, the USFS temporarily closed all California National Forests – including the INF where the Bishop Creek Project is partially located – due to public safety concerns over extreme fire conditions and strained firefighting resources. The closure was scheduled to be effective from August 31, 2021, at 11:59 p.m. until September 17, 2021 at 11:59 p.m. Due to this closure, no angler surveys or spot counts were conducted at their designated locations within the INF as scheduled during Labor Day weekend. Vehicle and trail counters, along with the web-based survey remained online during the closure, though postings for the online survey were located within the closed area. The INF re-opened at 11:59 p.m. on September 15, 2021, two days prior to the original end date. A single day (during Labor Day weekend) was missed on the spot count and angler survey schedule.

Traffic and vehicle counters were previously scheduled to collect data and spot counts to be conducted through November 2021. Due to anticipation of heavy snowfall and a notification of gate closures to both Lake Sabrina and South Lake from the USFS at the end of the collection window, staff conducted one final day of spot counts and retrieved all traffic and trail counter equipment on November 11, 2021. This resulted in the loss of one day of spot counts (November 20, 2021) and any traffic or trail counts through the remainder of November, which would likely be minimal at locations where access would have been restricted for the season.

Drought conditions in the watershed led to extremely low lake levels at Lake Sabrina and South Lake throughout the 2021 recreation season. These low levels affected not only the number of visitors for general day use but most notably access for boaters and anglers. Specifically, the boat launch at South Lake was unusable for most, if not all, of the 2021 recreation season. This resulted in a shift of some boating use to other reservoirs, including Lake Sabrina, but largely precluded use at both Lake Sabrina and

[5] The potential for complaints related to placement of fliers on vehicles was previously discussed with USFS staff. Per this understanding and due to complaints from concessionaires, staff ceased placing fliers on vehicles in August 2021, though laminated postings remained visible throughout the recreation areas.

South Lake. Table 6.1-1 provides a list of notable events that occurred during the 2021 recreation season that may affect the data collected. Table 6.1-2 provides the randomly generated schedule according to the parameters agreed upon in the study methods, along with a status update for each scheduled day.

Table 6.1-1 Notable Events During 2021 Field Season

Date	Field Notes
April 24 – May 4, 2021	South Lake Road closed due to road damage and repairs. Re-opened on May 4.
May 5, 2021	TRAFx trail and traffic counter data collection.
May 16 – 22, 2021	CDFW Hatchery Trout planting week of May 16 (Lake Sabrina and South Lake). Date of planting uncertain.
May 29 – 31, 2021	Memorial Day Weekend.
June 20 – 26, 2021	CDFW Hatchery Trout planting week of June 20 (Lake Sabrina, South Lake, and Intake No. 2). Date of planting uncertain.
June 29, 2021	TRAFx trail and traffic counter data collection.
July 2 – 4, 2021	Independence Day Weekend.
July 11 – 17, 2021	CDFW Hatchery Trout planting week of July 11 (South Lake and Intake No. 2). Date of planting uncertain.
August 31 – September 15, 2021	INF temporary closure (Originally planned to be closed through September 17, 2021).
September 4 – 6, 2021	Labor Day Weekend (INF temporarily closed).
September 29, 2021	TRAFx trail and traffic counter data collection.
September 26 – October 2, 2021	CDFW Hatchery Trout planting week of September 26 (Lake Sabrina). Date of planting uncertain.
October 23 – 28, 2021	Gate at Aspendell, and thus access to Lake Sabrina, closed by CalTrans due to a storm in the area.
October 25 – November 10, 2021	Gate to South Lake closed due to inclement weather.
November 11, 2021	Veteran’s Day. Date of final TRAFx trail and traffic counter data. Equipment collection due to expected inclement weather and gate closures.
Entire 2021 recreation season	Drought conditions in the watershed led to extremely low lake levels at Lake Sabrina and South Lake. These low levels affected not only the number of visitors for general day use but most notably access for boaters and anglers. Specifically, the boat launch at South Lake was unusable for most, if not all of the 2021 recreation season. This resulted in boating use migrating to other reservoirs, including Lake Sabrina, but largely precluded the use both lakes.

Table 6.1-2 Randomly Generated Field Schedule and Implementation Result

Date	Type	Scheduled Tasks	Result
Sunday, April 25, 2021	PEAK (Fish2)	Spot counts, vehicle fliers, installation of TRAFx counters	Complete (No spot counts at South Lake due to road closure)
Wednesday, April 28, 2021	Weekday	Spot counts, vehicle fliers	Complete
Tuesday, May 4, 2021	Weekday	Spot counts, vehicle fliers	Complete
Monday, May 24, 2021	Weekday	Spot counts, vehicle fliers	Complete
Saturday, May 29, 2021	PEAK (Mem1)	Angler surveys, spot counts, vehicle fliers	Complete
Saturday, June 5, 2021	Weekend	Angler surveys, spot counts, vehicle fliers	Complete
Monday, June 7, 2021	Weekday	Angler surveys, spot counts, vehicle fliers	Complete
Sunday, June 13, 2021	Weekend	Angler surveys, spot counts, vehicle fliers	Complete
Sunday, June 20, 2021	Weekend	Angler surveys, spot counts, vehicle fliers	Cancelled (Sick Staff)
Saturday, June 26, 2021	Weekend	Angler surveys, spot counts, vehicle fliers	Complete
Saturday, July 3, 2021	PEAK (Ind1)	Angler surveys, spot counts, vehicle fliers	Complete
Thursday, July 8, 2021	Weekday	Angler surveys, spot counts, vehicle fliers	Complete
Sunday, July 11, 2021	Weekend	Angler surveys, spot counts, vehicle fliers	Complete
Sunday, August 1, 2021	Weekend	Angler surveys, spot counts, vehicle fliers	Complete
Wednesday, August 4, 2021	Weekday	Angler surveys, spot counts, vehicle fliers	Complete
Friday, August 6, 2021	Weekday	Angler surveys, spot counts, vehicle fliers	Complete
Tuesday, August 10, 2021	Weekday	Angler surveys, spot counts, vehicle fliers	Complete
Thursday, August 12, 2021	Weekday	Angler surveys, spot counts, vehicle fliers	Complete
Saturday, August 14, 2021	Weekend	Angler surveys, spot counts, vehicle fliers	Complete

Date	Type	Scheduled Tasks	Result
Sunday, August 15, 2021	Weekend	Angler surveys, spot counts, vehicle fliers	Complete
Tuesday, August 24, 2021	Weekday	Angler surveys, spot counts, vehicle fliers	Complete (vehicle fliers not placed)
Wednesday, August 25, 2021	Weekday	Angler surveys, spot counts, vehicle fliers	Complete (vehicle fliers not placed)
Thursday, August 26, 2021	Weekday	Angler surveys, spot counts, vehicle fliers	Complete (vehicle fliers not placed)
Sunday, August 29, 2021	Weekend	Angler surveys, spot counts, vehicle fliers	Complete (vehicle fliers not placed)
Sunday, September 5, 2021	PEAK (Lab2)	Angler surveys, spot counts, vehicle fliers	Cancelled (USFS Closure)
Saturday, October 2, 2021	Weekend	Spot counts, vehicle fliers	Complete (vehicle fliers not placed)
Saturday, October 23, 2021	Weekend	Spot counts, vehicle fliers	Complete (vehicle fliers not placed; spot counts not conducted at Lake Sabrina due to gate closure)
Thursday, November 11, 2021	Weekday (Veteran's Day)	Spot counts, vehicle fliers	Complete (vehicle fliers not placed)
Saturday, November 20, 2021	Weekend	Spot counts, vehicle fliers, removal of TRAFx equipment	Cancelled – Gate Closures; Final data collected November 11

6.1 General Recreation Site Inventory

An inventory of recreation site amenities, condition, accessibility, and dispersed use was conducted under the Recreation Facilities Condition Assessment (REC 2), and a more detailed inventory may be found in that report. Table 6.1-3, Table 6.1-4, and Table 6.1-5 provide a summary of inventory data, most notably as it relates to general recreation features and associated capacities for use.

Table 6.1-3 General Inventory of Recreation Features

Recreation Area	Parking Spaces (Approximate)	Boat Launches	Launching Piers/ Gangways	Fishing Piers	Restrooms	BBQ Grills	Dumpsters	Recycling Receptacles	Trash Receptacles	Picnic Tables	Food Lockers	Fish Cleaning Stations	Trailheads	Marina/ Store
South Lake	111	1	1	0	2	0	1	1	1	5	6	0	2	1
Lake Sabrina	87[a]	1	4	0	1	0	2	1	3	0	0	1	1	1
Intake No. 2	68	0	0	1	2	2	1	1	1	2	0	0	0	0

[a] Total does not include the estimated 70 parking spaces for overnight wilderness users located approximately 1-mile down CA Highway 168 at the entrance of North Lake Road.

Table 6.1-4 Approximate Parking Spaces By Location and Type

Recreation Area	Sub-site	Parking with Striping [a]	Parking without Striping [b] (Estimated)
Lake Sabrina	Lot A (Upper Lot)	36	n/a
	Lot B (Lower Lot)	24	n/a
	Roadside Parking	n/a	30
	North Lake Road Overnight Parking[c]	*n/a*	*70*
South Lake	Lot A (Overnight Wilderness Users at Trailheads)	50	n/a
	Lot B (Day Use at Trailheads)	36	n/a
	Lot C (Launching Pier)	8	n/a
	Lot D (Boat Ramp; Trailer Parking)	15	n/a
	Staff Parking at Marina	n/a	2
Intake No. 2 Reservoir	Lot A (Fishing Access)	n/a	20
	Lot B (Lower Intake 2 Campground)	n/a	12

[a] Asphalt material
[b] Earthen, gravel, or crushed rock material
[c] Overnight wilderness users are instructed to park at the lot located approximately one-mile down CA Highway 168 at the entrance of North Lake Road.

Table 6.1-5 Informal Use Observations (REC 2 Report)

Recreation Area	Area	Name	Potential Campsite	Fire Pit	User Created Trails	Visible Bank Access Point	Shoreline Generally Used for Boat/Bank Fishing (ft)
Lake Sabrina	A	Weir below Sabrina Dam	n/a	n/a	777 ft	20	n/a
	B	Northwest Shoreline & Sabrina Dam	n/a	n/a	182 ft	n/a	4,140
	C	Inlet Trail	n/a	n/a	6,488 ft	n/a	n/a
	D	Mid Lake Sabrina Peninsula	16	2	2,004 ft	n/a	n/a
	E	Middle Fork Bishop Creek Inlet	31	4	1,086 ft	n/a	2,941
South Lake	A	Hillside Dam and Spillway	n/a	n/a	n/a	n/a	1,101
	B	Green Creek Diversion	n/a	??	5,667 ft	n/a	n/a
	C	Main Recreation Area	14	1	4,373 ft	n/a	480
	D	Southern Shorelines of South Lake	8	2	n/a	n/a	n/a
	E	Southern Shorelines of South Lake	13	4	n/a	n/a	n/a
	F	Southern Shorelines of South Lake	8	1	n/a	n/a	n/a
	G	Island	36	11	n/a	n/a	n/a
	H	Southern Shorelines of South Lake	3	1	n/a	n/a	3,832
Intake No. 2	A	Northern Shoreline & Intake No. 2 Dam	n/a	n/a	n/a	22	1,344
	B	Day Use Area	n/a	n/a	1,201	7	446
	C	Middle Fork Bishop Creek	5	1	3,222	25	1,244
	D	Southeastern Shoreline	n/a	n/a	1,062	7	690

6.2 WEB-BASED RECREATION SURVEYS

The Bishop Creek Reservoirs Recreational Use Survey was first implemented as a web-based survey in December 2020 to gather general information from recreation users in the area. As discussed above, in early 2021, the decision was made to rely more heavily on this web-based survey, with a few minor adjustments, rather than implement an in-person survey due to risk associated with the COVID-19 pandemic. Between December 16, 2020, and April 21, 2021, 59 surveys were completed, largely through postings on the USFS and SCE websites, as well as a USFS post on Facebook.

Laminated fliers were posted at kiosks in all recreation areas (South Lake, Lake Sabrina, and Intake No. 2) associated with this study, as well nearby campgrounds in the Bishop Creek Project area beginning on Fishmas weekend (April 24-25, 2021). These fliers briefly described the survey and requested that recreation users access the survey via URL or QR code as shown in Figure 6.2-1. As cellular service is very limited at these locations, and to increase participation, flier handouts were initially placed on car windshields. In late August 2021, due to concerns from concessionaires, staff ceased the placing of fliers on car windshields. The survey remained open through November 2021.

From April 24, 2021 through November 30, 2021, a total of 302 survey responses were received. Of those survey responses (Figure 6.2-2) 39 percent indicated that they heard about the survey from a flier or posting in the INF; 22 percent from social media; 17 percent from the USFS website; 1 percent from the SCE website; and 20 percent other (mostly word of mouth or incorrectly did not indicate “flier on windshield”). In total, 361 surveys were completed between December 2020 and November 2021. The survey was designed to solicit information on seven distinct categories (visitor demographics/trip characteristics, day use, fishing, boating, campgrounds, hiking/wilderness access, and general feedback). Appendix A provides a printout of all possible questions within the survey, keeping in mind that logic was built into survey so that answers to certain questions dictate whether additional questions related to that topic were asked. Section 6.2 summarizes responses collected for each of those categories.

BISHOP CREEK RESERVOIRS RECREATION SURVEY

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

The Inyo National Forest Service and Southern California Edison are gathering information about recreation opportunities related to the Bishop Creek Hydroelectric Project – specifically at Lake Sabrina, South Lake, and Intake No. 2 Reservoir – and are interested in your feedback. The information you provide will help guide current and future management of recreation opportunities, sites, and facilities for visitors to the Bishop Creek Reservoirs.

Please take a moment to access the online survey and provide your thoughts by visiting the following website (either by url or QR code) once you are in cell service or have access to a computer. Thank you for your time and input!

https://www.surveymonkey.com/r/BishopCreekReservoirs

Directions for access via QR code:

1. *Open the camera app or QR Code reader on your phone.*
2. *Focus the camera on the QR code by gently tapping the code.*
3. *Follow the instructions on the screen to complete the action.*

Figure 6.2-1 Example Flier Posted at Recreation Sites

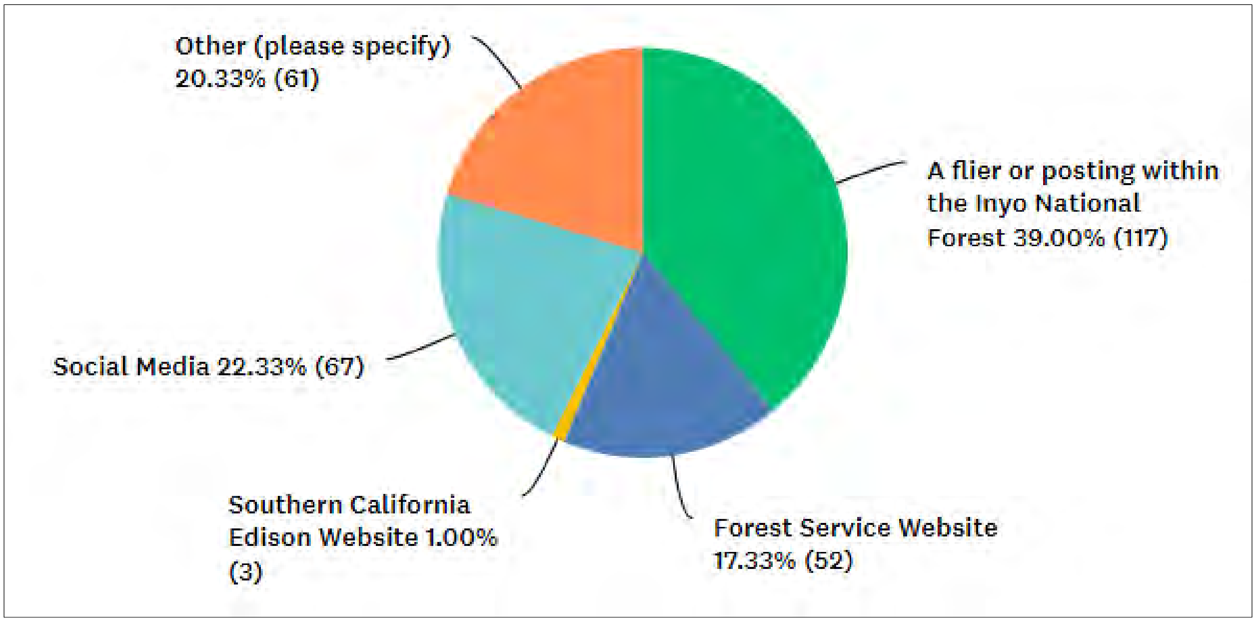


Figure 6.2-2 Respondent Source

6.2.1 Visitor Demographics and Trip Characteristics

As shown in the visitor demographics and trip characteristics of the respondents below (Figure 6.2-3), due to the unorthodox methods that were implemented this study season, response data is likely not representative of a typical visitor base and activities that would have been obtained through intercept surveys and during a more normal recreation season (COVID-19, wildfires, gate closures). However, the data obtained, especially the qualitative feedback provided, is valuable for indicating trends and highlights areas for discussion. Visitor demographics show that the majority of respondents are from California (94.1 percent), Nevada 2.6 percent, and less than 1 percent from each of Arizona, Colorado, Idaho, Missouri, New Hampshire, Oregon, Texas, Utah, and Washington. More specifically, most respondents are from Southern California (42.4 percent from Bakersfield to San Diego) or the immediate Bishop area (40.0 percent in Bishop/Mammoth Lakes/Lone Pine), with a smaller percentage from the San Francisco/Sacramento (9.4 percent) or Reno (3.5 percent) areas.

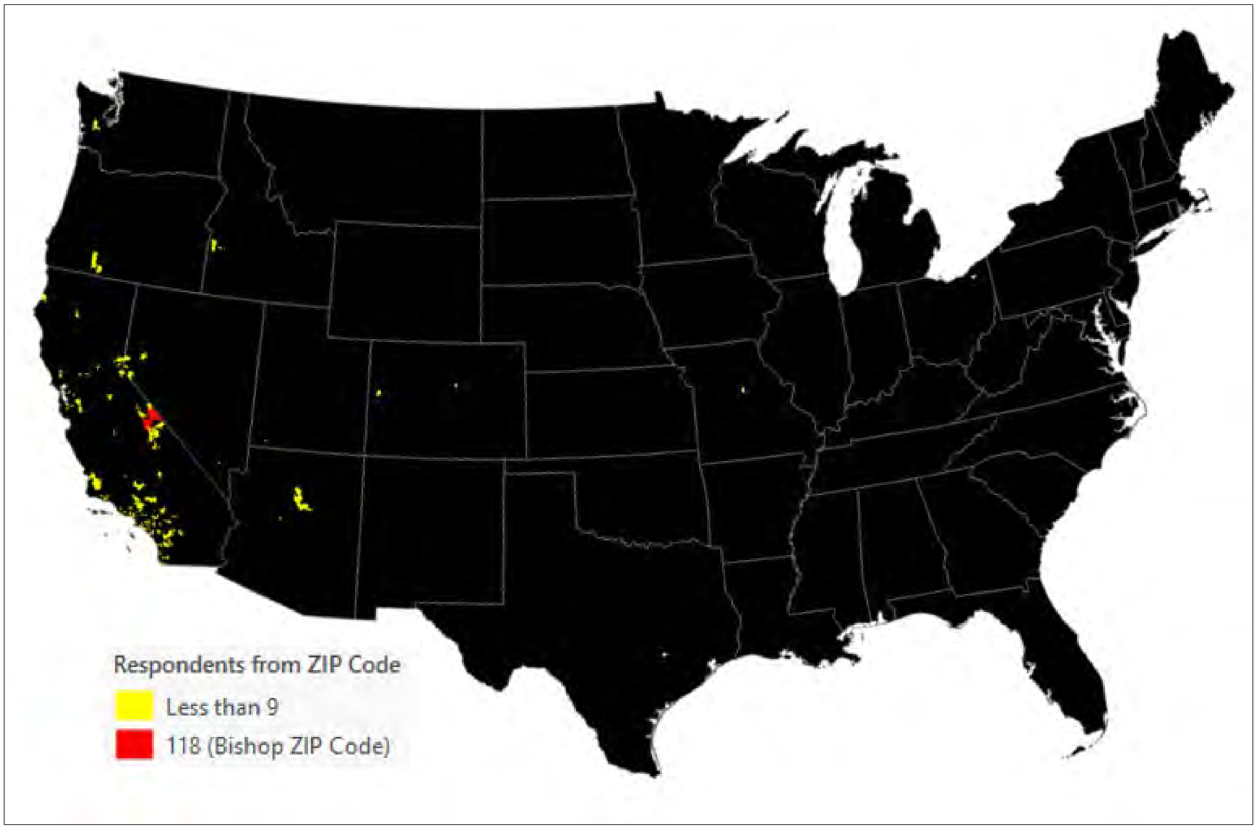


Figure 6.2-3 Respondents by ZIP Code

More than half of the respondents (54.3 percent) are over the age of 55 and have visited the area for an average of 23 years (Figure 6.2-4). Most respondents spend 2 to 5 days (31.9 percent), 6 to 10 days (21.1 percent), or 11 to 20 days (25.9 percent) per year visiting the area (Figure 6.2-5). Respondents typically visit the area most heavily in the months of May through October, with a peak in July and August, where 82.0 percent and 83.5 percent, respectively, of respondents typically visit (Figure 6.2-6). Usage by day of the week is relatively arbitrary (Figure 6.2-7), although there is a slight uptick in typical use for the weekend (Friday, Saturday, and Sunday). Respondents typically visit the area between the hours of 8 a.m. and noon (83.9 percent) or noon and 4 p.m. (64.8 percent) and for a duration of 4 to 8 hours (36.3 percent), as seen in Figures 6.2-8 and 6.2-9 below.

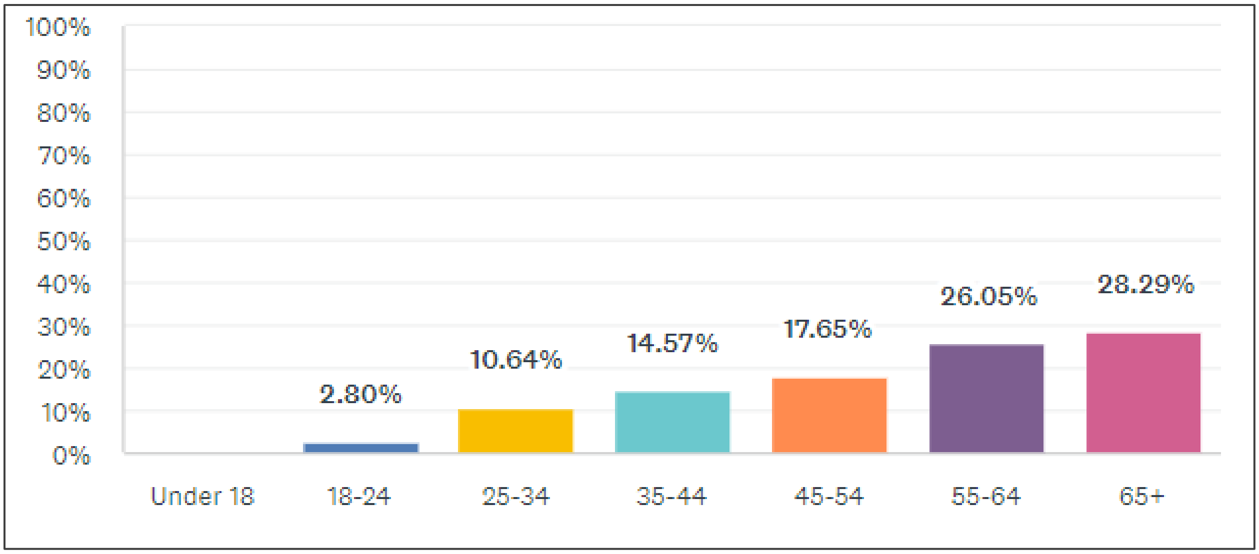


Figure 6.2-4 Age Range of Respondents

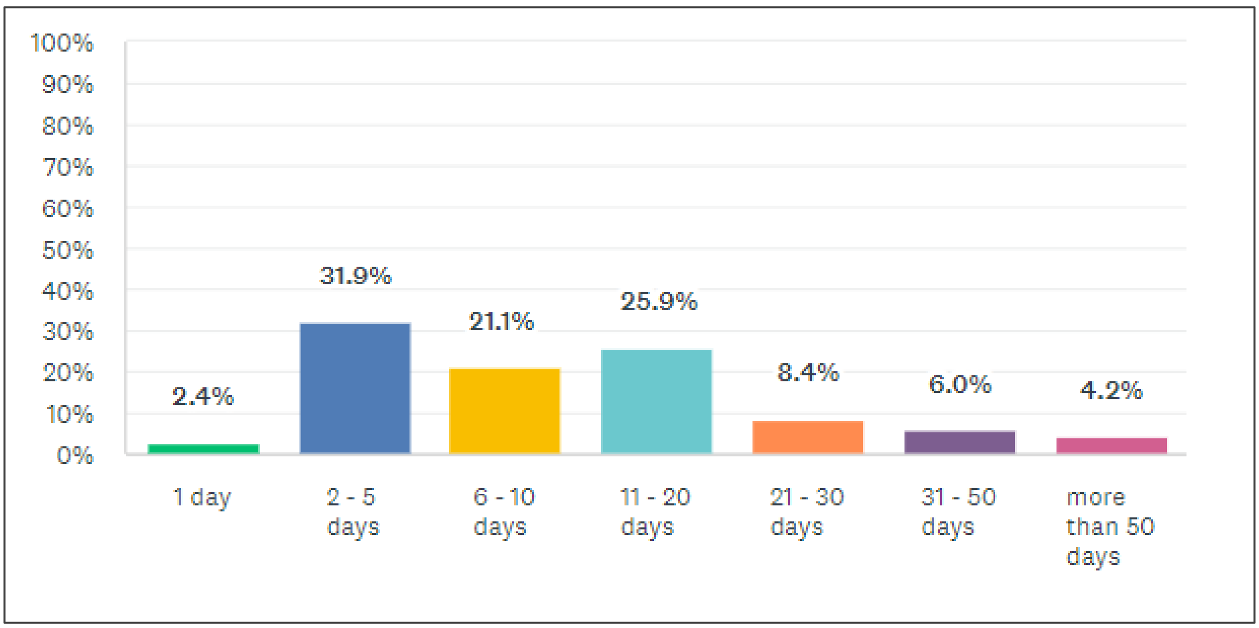


Figure 6.2-5 Days per Year Recreating at Bishop Creek Area

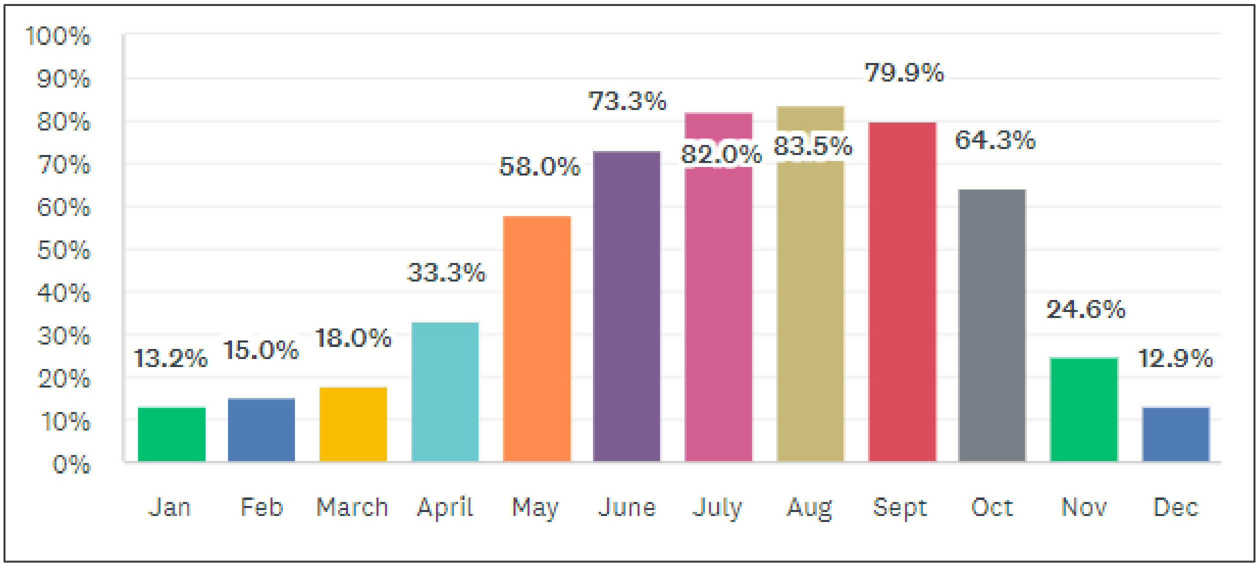


Figure 6.2-6 Months Respondents Typically Visit the Bishop Creek Area

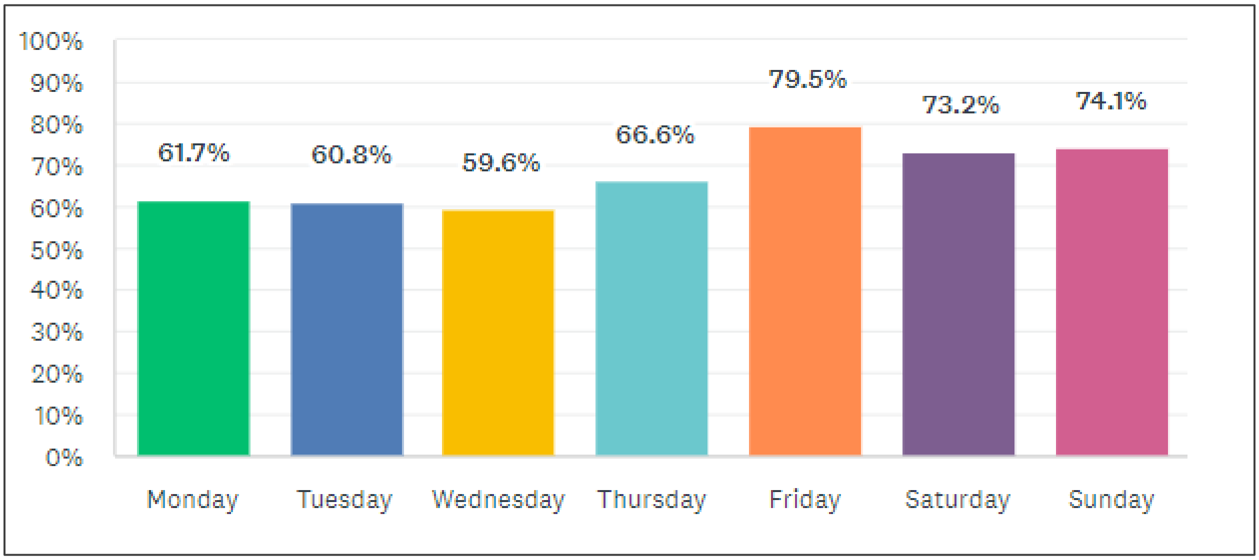


Figure 6.2-7 Days Respondents Typically Visit the Bishop Creek Area

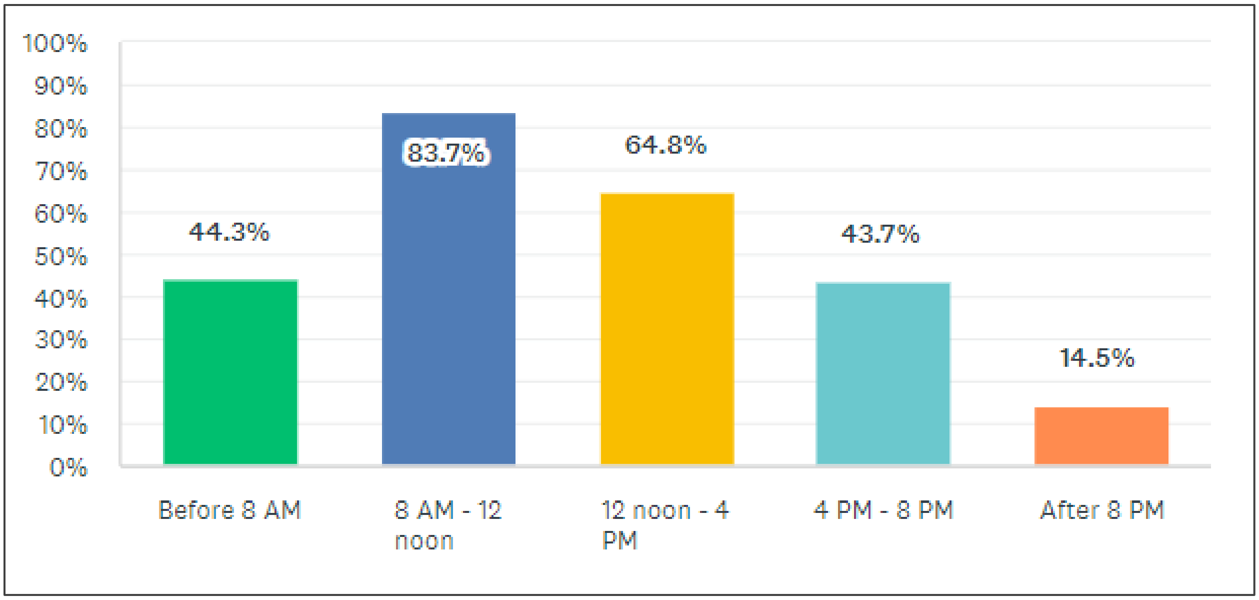


Figure 6.2-8 Time of Day Respondents Typically Visit

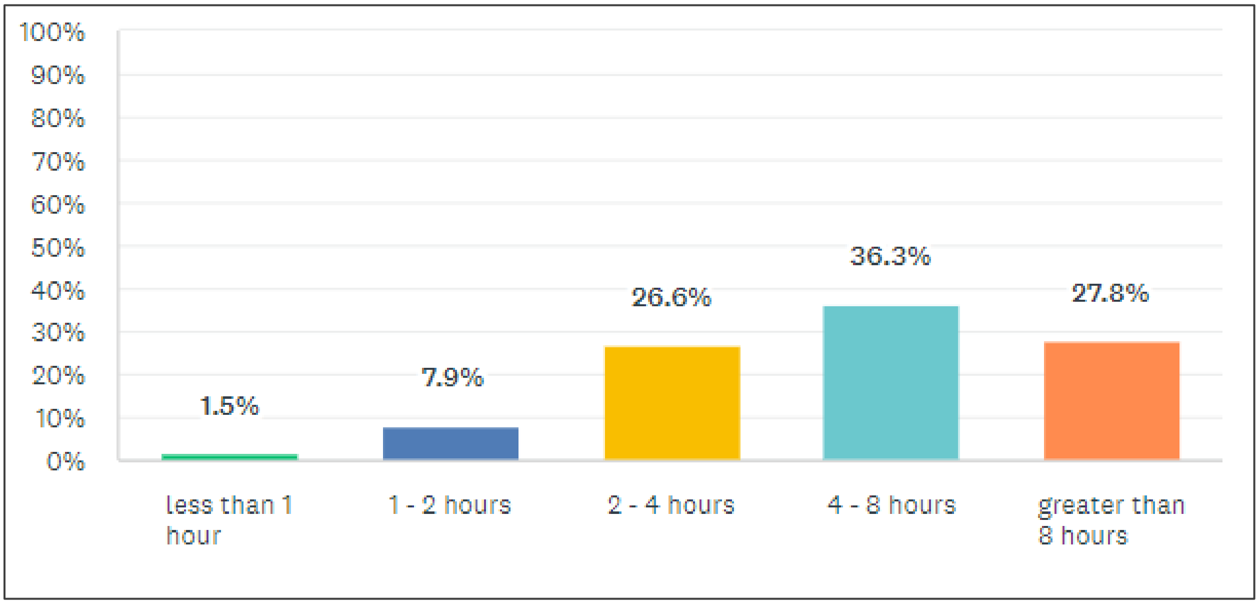


Figure 6.2-9 Typical Duration of Respondents' Visits

6.2.2 General Day Use

Based on user responses (Figure 6.2-10), most users have recreated at Lake Sabrina (89.5 percent) and South Lake (90.7 percent) recreation areas, and a little more than half (54.8 percent) of the respondents have recreated at Intake No. 2 Recreation Area. The most popular recreational activities at the Bishop Creek reservoirs are hiking/trail use (88.1 percent), viewing scenery (61.6 percent), fishing (56.1 percent), photography (55.2 percent), relaxing (54.3 percent), Camping (53.4 percent), and viewing wildlife (48.8 percent).

Overall satisfaction with day use facilities at all reservoirs was predominantly neutral or very Satisfied (Table 6.2-6, Figure 6.2-11)). Weighted averages for satisfaction resulted in neutral to very satisfied scores for South Lake (3.6), Lake Sabrina (3.4), and Intake No. 2 Reservoir (3.2).

Overall condition of day use facilities at all reservoirs was predominantly average to excellent at Lake Sabrina and South Lake and Average at Intake No. 2 (Table 6.2-7, Figure 6.2-12). Weighted averages for condition resulted in slightly above average scores for South Lake (3.5), Lake Sabrina (3.2), and Intake No. 2 Reservoir (3.1).

Perception of crowdedness of day use facilities at all reservoirs predominantly ranges from sometimes crowded to always crowded (Table 6.2-8, Figure 6.2-13). Weighted averages for perception of crowdedness resulted in sometimes crowded to always crowded scores for South Lake (3.6), Lake Sabrina (3.5), and Intake No. 2 Reservoir (3.7).

Respondents were asked to rate the adequacy of the number of day use facilities at the reservoirs on a scale of 1 to 5, where 1 is too few, 3 is about right, and 5 is too many. Table 6.2-9 (and Figure 6.2-14) summarizes the results. While the most common answer for nine of the ten categories was about right, the weighted averages for all ten categories was below 3 (about right), meaning that respondents leaned towards there being too few of these facilities. A high number of responses indicated that vehicle parking facilities were too few (38.2 percent). Table 6.2-9 notes in parenthesis the percentage of actual ratings given, meaning that answers marked as not applicable (N/A) were removed from the total and percentages recalculated. Categories with a high number of N/A responses (trailer parking, boat launches, public docks, swim areas, and fish cleaning stations) are indicators of specialized facilities or uses that not all recreation users participate in, such as fishing and motorized boating. Fine tuning these numbers will reveal what those specialized users feel about the number of facilities. Within this focused data, there are a few notable responses:

- Trailer parking: 40.5 percent indicated too few
- Boat launches: 81.4 percent indicated about right
- Public docks: 62.1 percent indicated about right
- Swim areas: 56.0 percent indicated about right
- Fish cleaning stations: 35.2 percent indicated too few

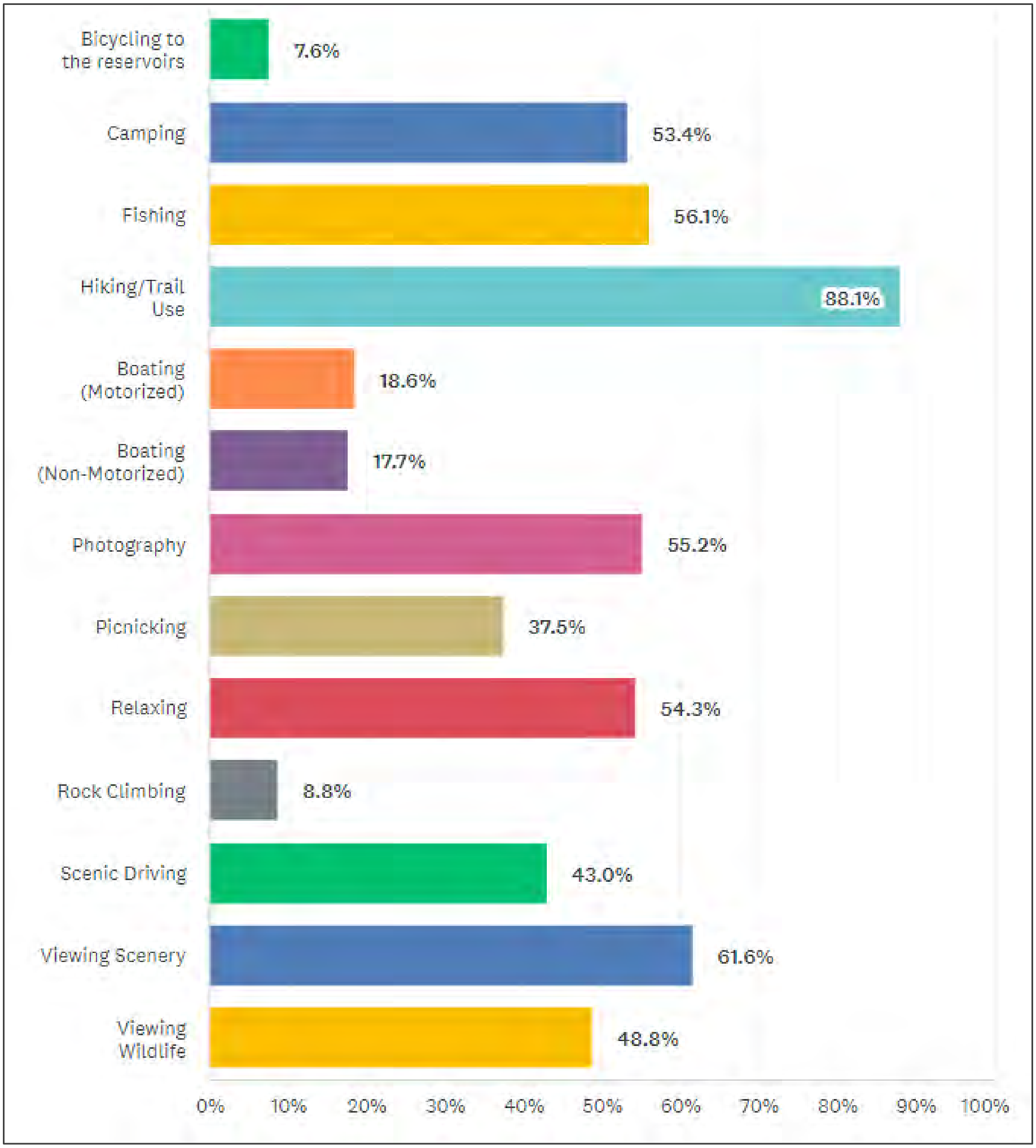


Figure 6.2-10 Respondents' Recreational Activities

Table 6.2-6 Overall Satisfaction with Day Use Facilities (Rating 1 to 5)

Recreation Area	1	2	3	4	5	N/A	Weighted Average
	Not at All Satisfied	Slightly Satisfied	Neutral	Very Satisfied	Extremely Satisfied		
Lake Sabrina	3.7% (3.9%)[a]	14.5% (15.4%)	27.4% (29.0%)	37.8% (40.1%)	10.8% (11.5%)	5.7%	*3.4*
South Lake	4.4% (4.6%)	10.1% (10.5%)	25.8% (27.0%)	39.6% (41.4%)	15.8% (16.5%)	4.4%	*3.6*
Intake No. 2 Reservoir	3.5% (5.1%)	9.5% (13.6%)	27.6% (39.4%)	25.4% (36.4%)	3.9% (5.6%)	30.0%	*3.2*

[a] Data within parentheses represent percentage of actual ratings given, excluding those that marked an answer as not applicable.

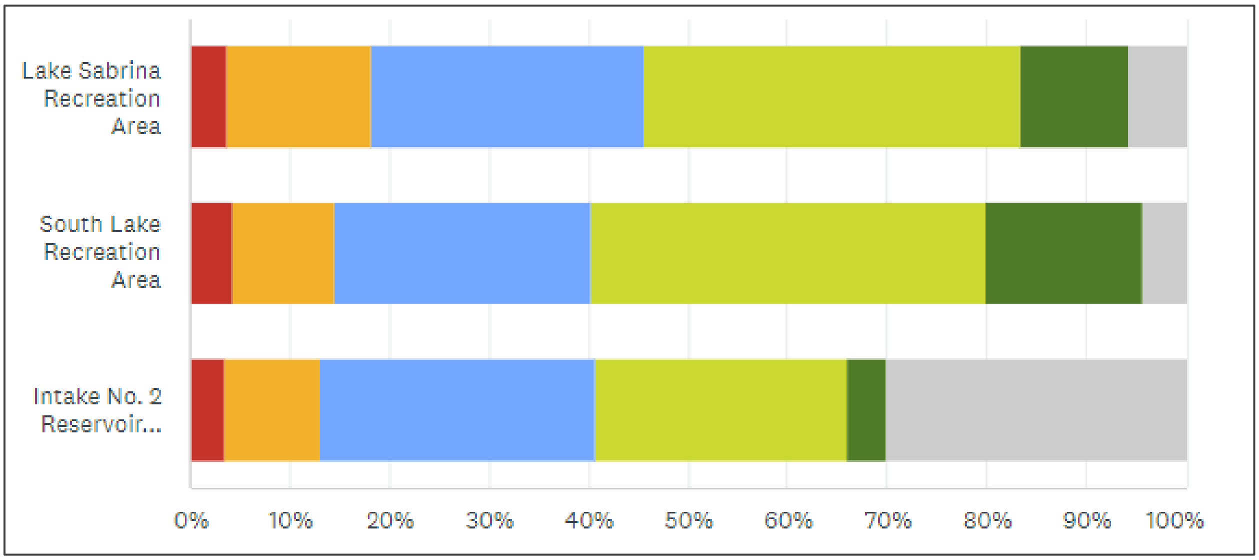


Figure 6.2-11 Overall Satisfaction with Day Use Facilities

Note: See Table for Color Legend

Table 6.2-7 Overall Condition of Day Use Facilities[a]

Recreation Area	1 Poor	2	3 Average	4	5 Excellent	N/A	Weighted Average
Lake Sabrina	5.8% (6.1%)[b]	9.5% (10.1%)	48.5% (51.6%)	18.6% (19.9%)	11.5% (12.3%)	6.1%	*3.2*
South Lake	5.7% (6.0%)	5.7% (6.0%)	41.8% (43.9%)	22.7% (23.9%)	19.4% (20.3%)	4.7%	*3.5*
Intake No. 2 Reservoir	6.2% (8.8%)	6.9% (9.8%)	39.6% (56.2%)	9.1% (12.9%)	8.7% (12.4%)	29.5%	*3.1*

[a]Rating scale of 1 to 5
[b] Data within parentheses represent percentage of actual ratings given, excluding those that marked an answer as not applicable.

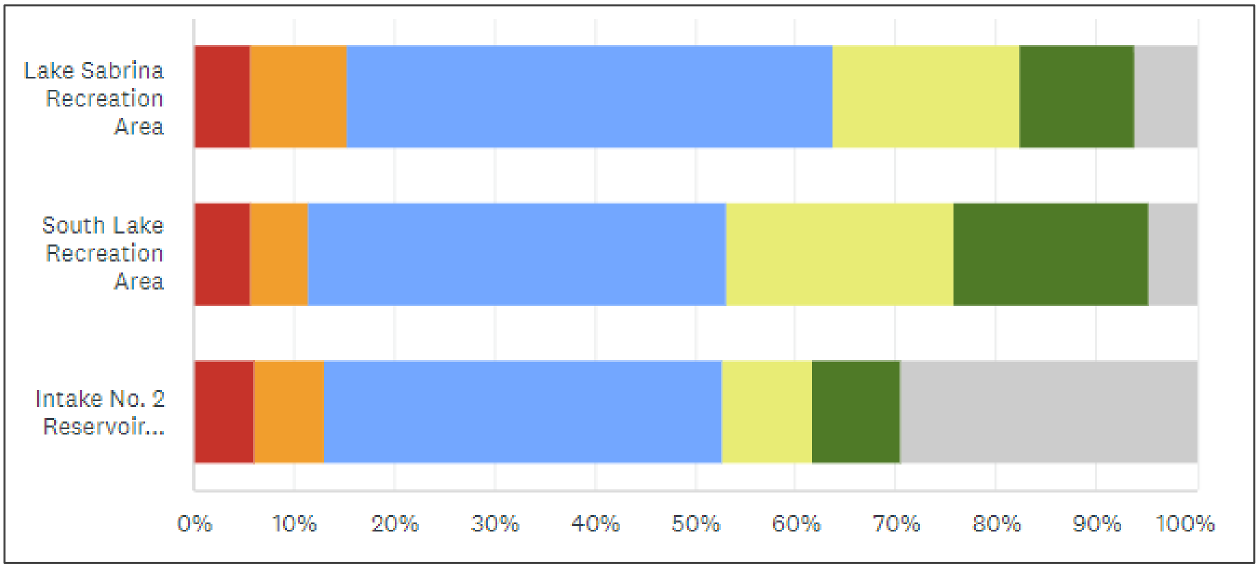


Figure 6.2-12 Overall Condition of Day Use Facilities
Note: See Table for Color Legend

Table 6.2-8 Perception of Crowdedness

Recreation Area	1 Never Crowded	2	3 Sometimes Crowded	4	5 Always Crowded	N/A	Weighted Average
Lake Sabrina	3.0% (3.3%)[a]	4.1% (4.4%)	48.0% (51.8%)	20.3% (21.9%)	17.2% (18.6%)	7.4 %	*3.5*
South Lake	2.3% (2.5%)	6.3% (6.7%)	44.0% (46.8%)	16.3% (17.4%)	25.0% (26.6%)	6.0 %	*3.6*
Intake No. 2 Reservoir	0.0% (0.0%)	5.6% (8.2%)	26.7% (39.2%)	16.5% (24.2%)	19.3% (28.4%)	31. 9%	*3.7*

[a] Data within parentheses represent percentage of actual ratings given, excluding those that marked an answer as not applicable.

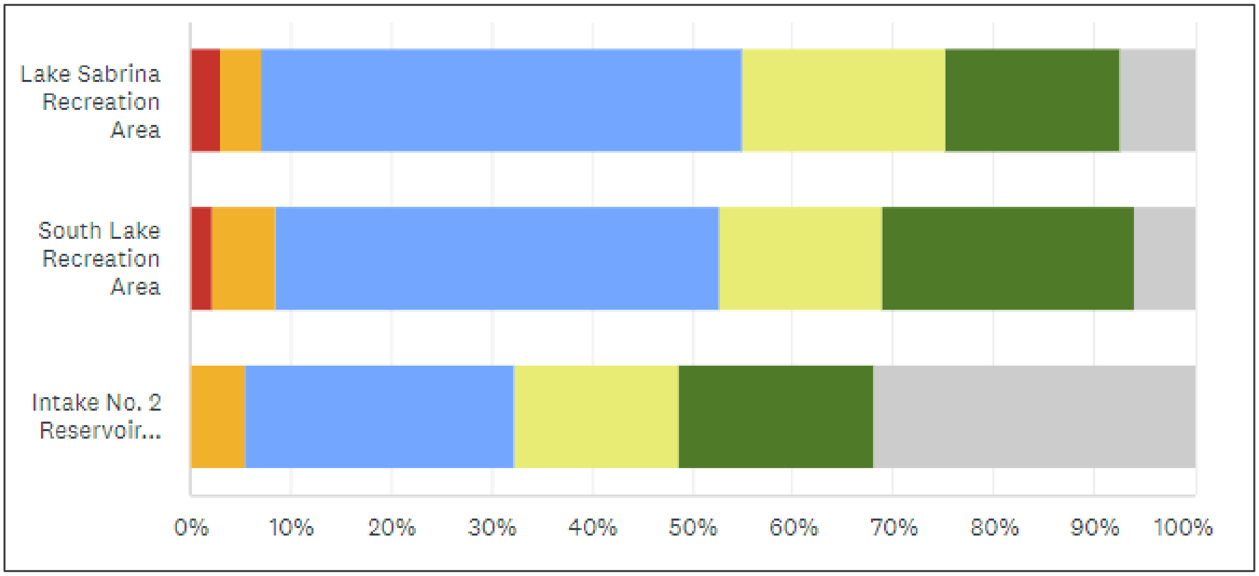


Figure 6.2-13 Perception of Crowdedness
Note: See Table for Color Legend

Table 6.2-9 Number of Day Use Facilities

Facility	1 Too Few	2	3 About Right	4	5 Too Many	N/A	Weighted Average
Restrooms	20.4% (20.9%)[a]	16.8% (17.2%)	59.5% (61.1%)	0.7% (0.7%)	0.0% (0.0%)	2.6%	*2.4*
Vehicle Parking	38.2% (38.6%)	20.6% (20.8%)	38.6% (38.9%)	1.0% (1.0%)	0.7% (0.7%)	1.0%	*2.0*
Trailer Parking	21.0% (40.5%)	5.2% (10.1%)	21.0% (40.5%)	1.1% (2.0%)	3.5% (6.8%)	48.3%	*2.2*
Picnic or Day Use Areas	15.8% (18.4%)	18.2% (21.2%)	50.8% (59.2%)	0.7% (0.8%)	0.3% (0.4%)	14.1%	*2.4*
Boat Launches	3.4% (5.6%)	3.8% (6.2%)	49.3% (81.4%)	2.4% (4.0%)	1.7% (2.8%)	39.4%	*2.9*
Public Docks	10.9% (18.3%)	9.5% (16.0%)	37.0% (62.1%)	0.4% (0.6%)	1.8% (3.0%)	40.5%	*2.5*
Hiking Trails	7.3% (7.5%)	11.2% (11.6%)	72.9% (75.4%)	4.0% (4.1%)	1.3% (1.4%)	3.3%	*2.8*
Swim Areas	16.9% (29.2%)	6.6% (11.3%)	32.4% (56.0%)	0.3% (0.6%)	1.7% (3.0%)	42.1%	*2.4*
Signage	8.8% (9.6%)	10.1% (11.1%)	67.7% (74.4%)	2.7% (3.0%)	1.7% (1.9%)	9.1%	*2.8*
Fish Cleaning Stations	19.7% (35.2%)	8.0% (14.2%)	24.9% (44.4%)	1.4% (2.5%)	2.1% (3.7%)	43.9%	*2.3*

[a] Data within parentheses represent percentage of actual ratings given, excluding those that marked an answer as not applicable.

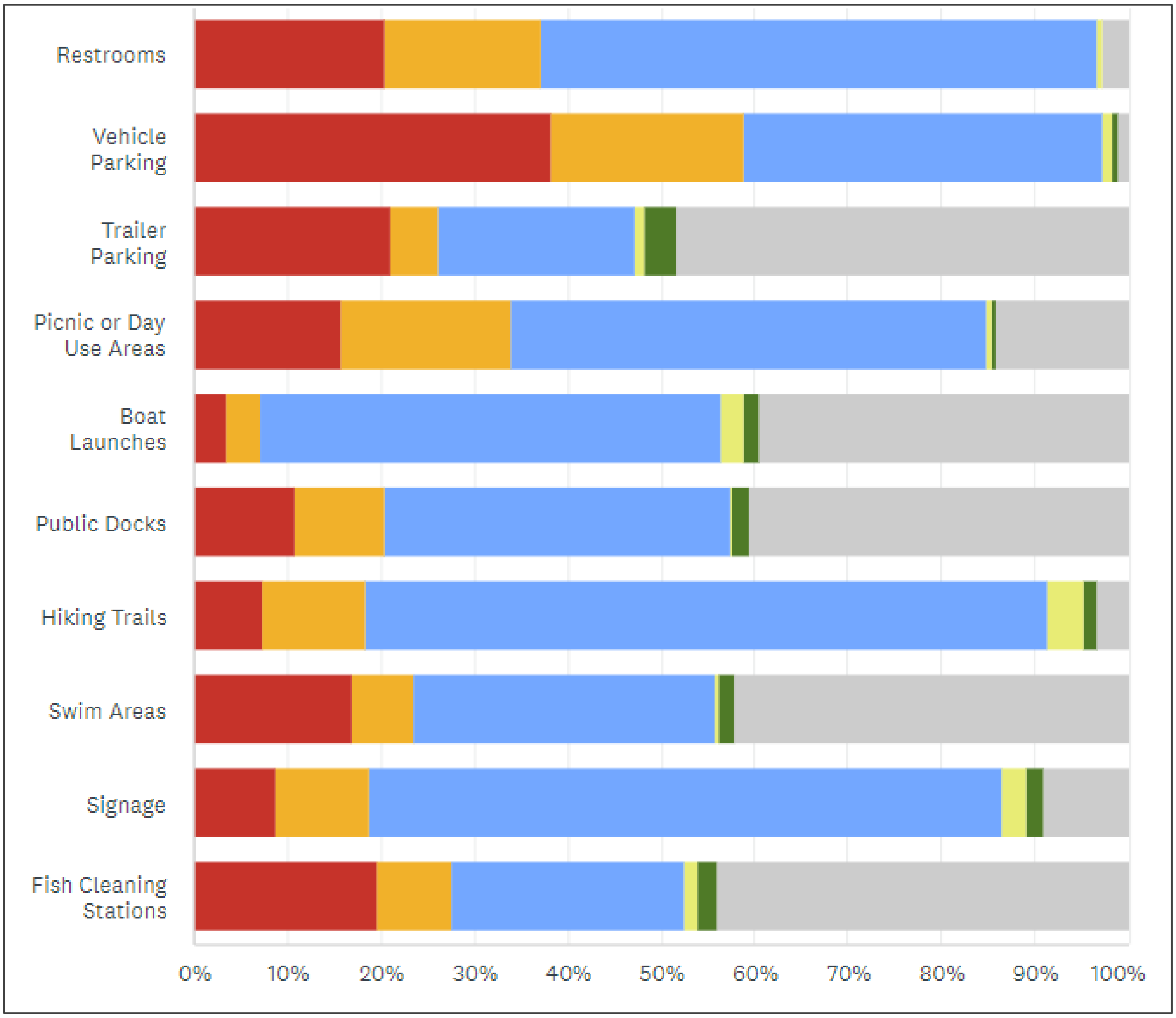


Figure 6.2-14 Number of Day Use Facilities

At the conclusion of questions related to day use facilities, the survey also asked that respondents provide any additional detail on how day use opportunities may be improved at the Bishop Creek Reservoirs. A total of 140 open-ended answers were received for this question. A word cloud for this question is provided in Figure 6.2-15 word clouds are a method for displaying large amounts of qualitative data to highlight trends and key phrases. For each word cloud, the size of the word directly correlates to the number of times it was used in responses. The larger the word, the more often it appears in answers to that specific question. A complete printout of responses to this question may be found in Appendix B.

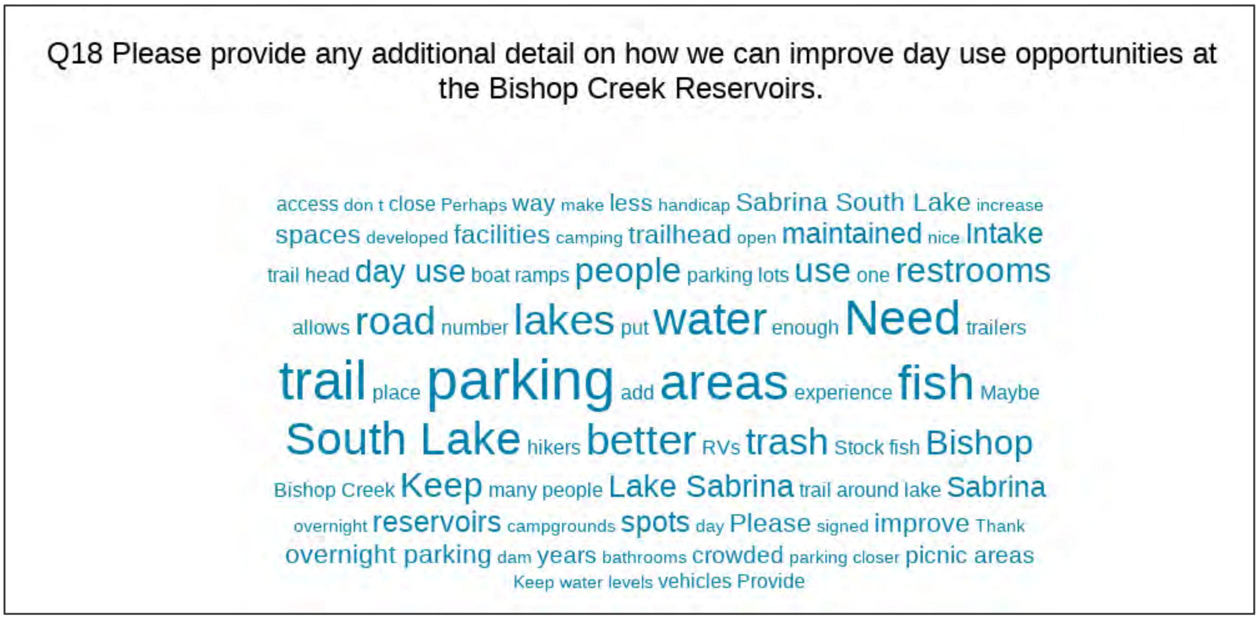


Figure 6.2-15 Word Cloud for Question 18 Open-Ended Responses

6.2.3 Fishing

Users were asked whether they have fished or are interested in fishing at the Bishop Creek reservoirs, Weir Lake, or North Fork or South Fork Bishop Creek. Based on user responses, 56.7 percent of users have fished at these locations; 36.8 percent have no desire to fish at these locations; and 6.5 percent have wanted to fish at these locations but were prevented from doing so. Of those that were prevented from fishing *(n=21)*, the most common responses were that either the facilities were too crowded (27.8 percent) or there were insufficient opportunities and accessibility (27.8 percent). Additional questions were asked of those that indicated they have fished at these locations.

Fishermen at the reservoirs appear to frequent a variety of locations (reservoirs and creeks) in the Bishop Creek Project area, as more than half of all respondents have fished at all locations except Weir Lake, where only 22.1 percent of respondents typically fish. Perception of crowdedness of fishing areas varies depending on location. Along North Fork and South Fork Bishop Creek, the most common responses were sometimes crowded with many responses leaning towards never crowded (Table 6.1-1). At Lake Sabrina and South Lake, the most common responses were sometimes crowded, although many responses leaned towards always crowded. At Intake No. 2 Reservoir, the most common response was always crowded (33.6 percent), with 96.8 percent of all responses between sometimes crowded and always crowded. Weighted averages for perception of crowdedness resulted in sometimes crowded to always crowded scores at Intake No. 2 Reservoir (4.0), Weir Lake (3.5), Lake Sabrina (3.5), South Lake (3.3), and North Fork Bishop Creek (3.1); South Fork Bishop Creek, which scored between sometimes crowded and never crowded (2.9).

Table 6.2-10 notes in parenthesis the percentage of actual ratings given, meaning that answers marked as not applicable were removed from the total and percentages recalculated. This is of note for Weir Lake since many respondents that do not fish here chose N/A for that question. Fine tuning these numbers increase the perception of always crowded from 19.0 percent to 30 percent, although the most common response is still sometimes crowded at 38.9 percent.

At the conclusion of the questions related to fishing, the survey asked that respondents provide any additional detail on how fishing opportunities may be improved at the Bishop Creek reservoirs. A total of 59 open-ended answers were received for this question. A word cloud for this question is provided in Figure 6.2-17. For each word cloud, the size of the word directly correlates to the number of times it was used in responses. The larger the word, the more often it appears in answers to that specific question. A complete printout of responses to this question is provided in Appendix B.

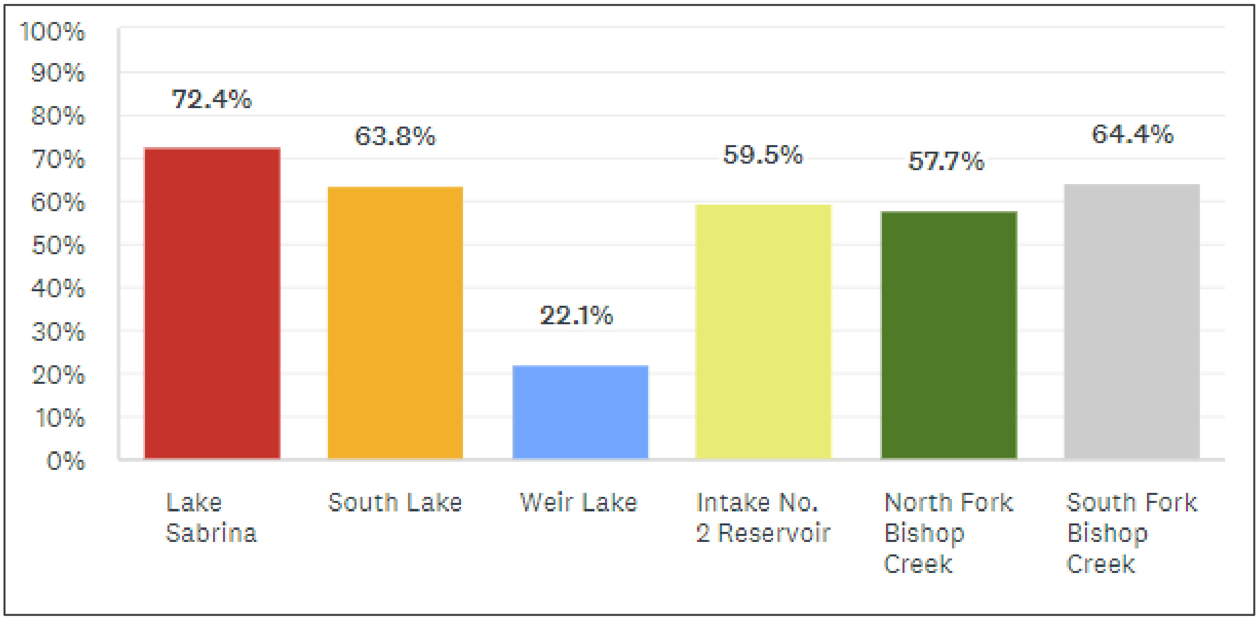


Figure 6.2-16 Where Respondents Typically Spend Time Fishing

Figure 6.2-17 Word Cloud for Question 24 Open-Ended Responses

Table 6.2-10 Perception of Crowdedness

Recreation Area	1 Never Crowded	2	3 Sometimes Crowded	4	5 Always Crowded	N/A	Weighted Average
Lake Sabrina	0.0% (0.0%)[a]	5.7% (5.8%)	60.5% (61.7%)	13.4% (13.6%)	18.5% (18.8%)	1.9 %	*3.5*
South Lake	2.5% (2.7%)	14.6% (15.4%)	47.5% (50.3%)	13.9% (14.8%)	15.8% (16.8%)	5.7 %	*3.3*
Weir Lake	3.5% (5.6%)	7.8% (12.2%)	24.7% (38.9%)	8.5% (13.3%)	19.0% (30%)	36.6%	*3.5*
Intake No. 2 Reservoir	0.0% (0.0%)	3.2% (3.8%)	26.5% (31.1%)	21.9% (25.8%)	33.6% (39.4%)	14.8%	*4.0*
North Fork Bishop Creek	2.6% (3.1%)	16.2% (19.2%)	45.5% (53.9%)	9.1% (10.8%)	11.0% (13.1%)	15.6%	*3.1*
South Fork Bishop Creek	7.0% (8.1%)	16.5% (19.1%)	45.6% (52.9%)	8.9% (10.3%)	8.2% (9.6%)	13.9%	*2.9*

[a] Data within parentheses represent percentage of actual ratings given, excluding those that marked an answer as not applicable.
Note: Rating 1 to 5

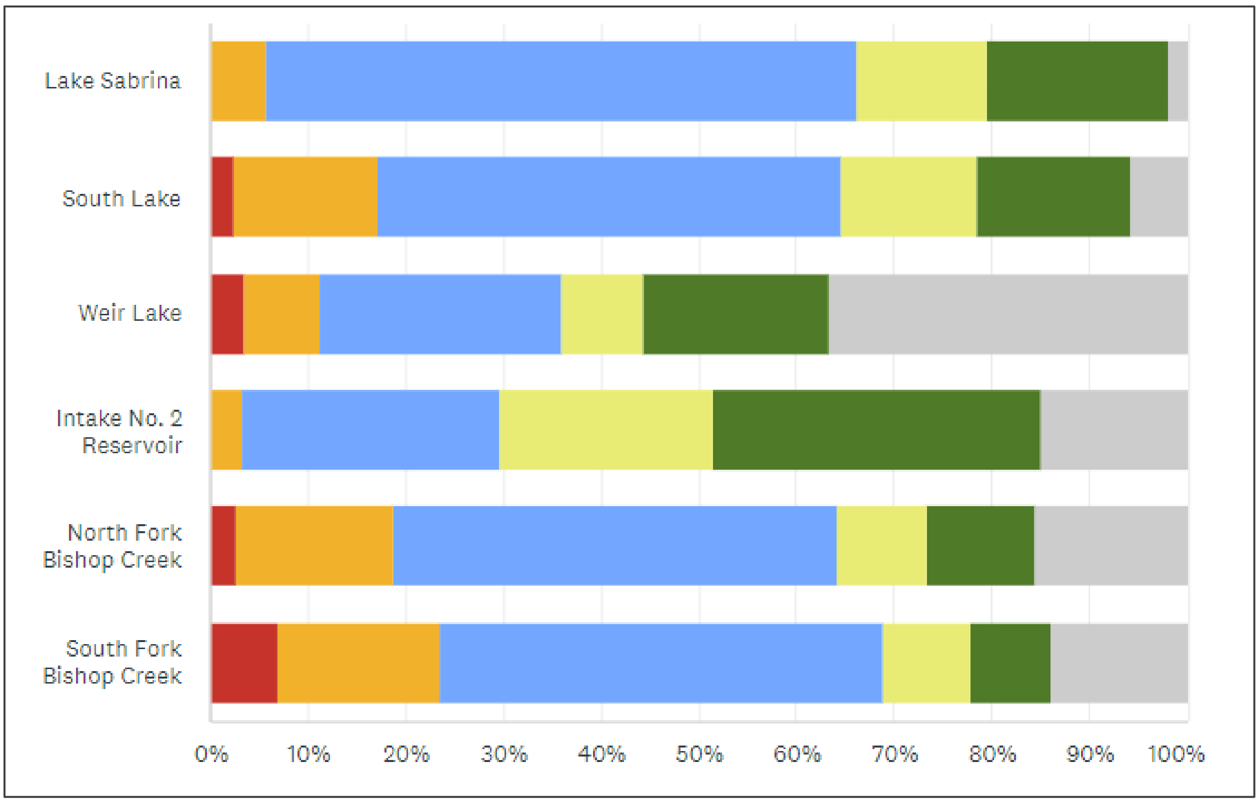


Figure 6.2-18 Perception of Crowdedness

6.2.4 BOATING

Users were asked whether they have boated or are interested in fishing at the Bishop Creek reservoirs. Based on user responses, 47.1 percent of users have no desire to boat at the reservoirs; 41.1 percent have boated at the reservoirs; and 11.8 percent have wanted to boat at the reservoirs but were prevented from doing so. Of those that were prevented from boating, for which only 21 users responded, the most common responses were that either there were too many motorized boats on the reservoirs (38.1 percent), there were no boat rentals available (27.8 percent), or boat rental fees were too high (19.5 percent). Additional questions were asked of those that indicated they have boated at the reservoirs.

Boaters typically spend their time at Lake Sabrina (52.1 percent) and South Lake (39.5 percent) with lesser use at Intake No. 2 Reservoir (8.4 percent) where motorized boating is not allowed. The preferred type of watercraft for boaters at the Bishop Creek reservoirs is motorized (rental) at 51.7 percent, non-motorized (personal) at 40.7 percent, motorized (personal) at 28.8 percent, and non-motorized (rental) at 5.9 percent; 4.2 percent of respondents indicated other with responses that included kayaks, sailboats, float tubes, and paddleboards.

Boating activity at the reservoirs is predominantly for pleasure/paddling (69.5 percent) or fishing (30.5 percent). Overall satisfaction with boating access varies by feature. Respondents were predominantly neutral or very satisfied with the number of launching facilities, condition of launching facilities, boating size/speed restrictions, and fees for boat rentals (Figure 6.2-19). Respondents were predominantly neutral to not at all satisfied with parking for boat trailers and lake levels. In 2021 when the drought limited access, 50.4 percent of respondents were not at all satisfied with Lake Levels.

Weighted averages for satisfaction resulted in neutral to very satisfied scores for number of launching facilities (3.3), condition of launching facilities (3.0), boating size/speed restrictions 3.5), and fees for boat rentals (3.3); weighted averages for lake levels (1.8) and parking for boat trailers (2.3) range closer to not at all satisfied or slightly satisfied.

At the conclusion of the boating-related questions, the survey asked that respondents provide any additional detail on how boating opportunities may be improved at the Bishop Creek reservoirs. A total of 47 open-ended answers were received for this question. A word cloud for this question is provided in Figure 6.2-20. For each word cloud, the size of the word directly correlates to the number of times it was used in responses. The larger the word, the more often it appears in answers to that specific question. A complete printout of responses to this question is provided in Appendix B.

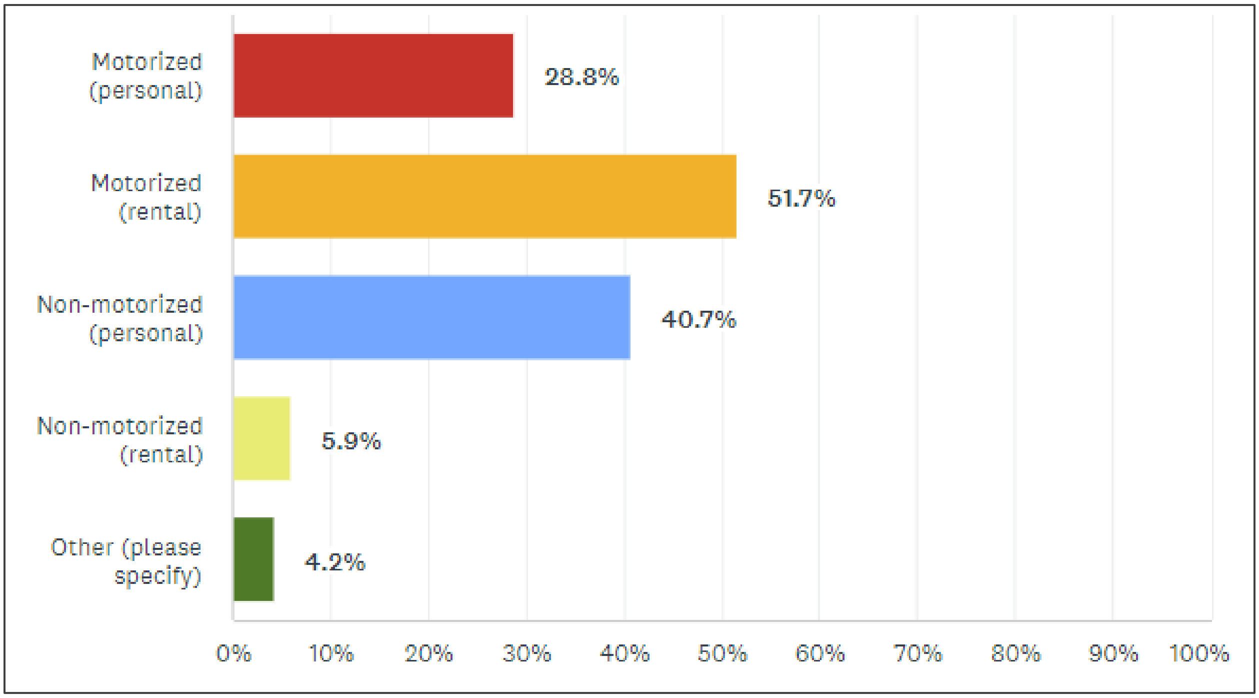


Figure 6.2-19 Preferred Watercraft

Figure 6.2-20 Word Cloud for Question 35 Open-Ended Responses

Table 6.2-11 Perception of Crowdedness

Recreation Area	1 Never Crowded	2	3 Sometimes Crowded	4	5 Always Crowded	N/A	Weighted Average
Lake Sabrina	7.8% (8.3%)[a]	18.3% (19.3%)	49.6% (52.3%)	10.4% (11.0%)	8.7% (9.2%)	5.2 %	*2.9*
South Lake	12.1% (13.3%)	21.6% (23.8%)	44.0% (48.6%)	6.0% (6.7%)	6.9% (7.6%)	9.5 %	*2.7*
Intake No. 2 Reservoir	4.7% (6.4%)	8.5% (11.5%)	36.8% (50.0%)	10.4% (14.1%)	13.2% (17.9%)	26. 4%	*3.3*

[a] Data within parentheses represent percentage of actual ratings given, excluding those that marked an answer as not applicable.

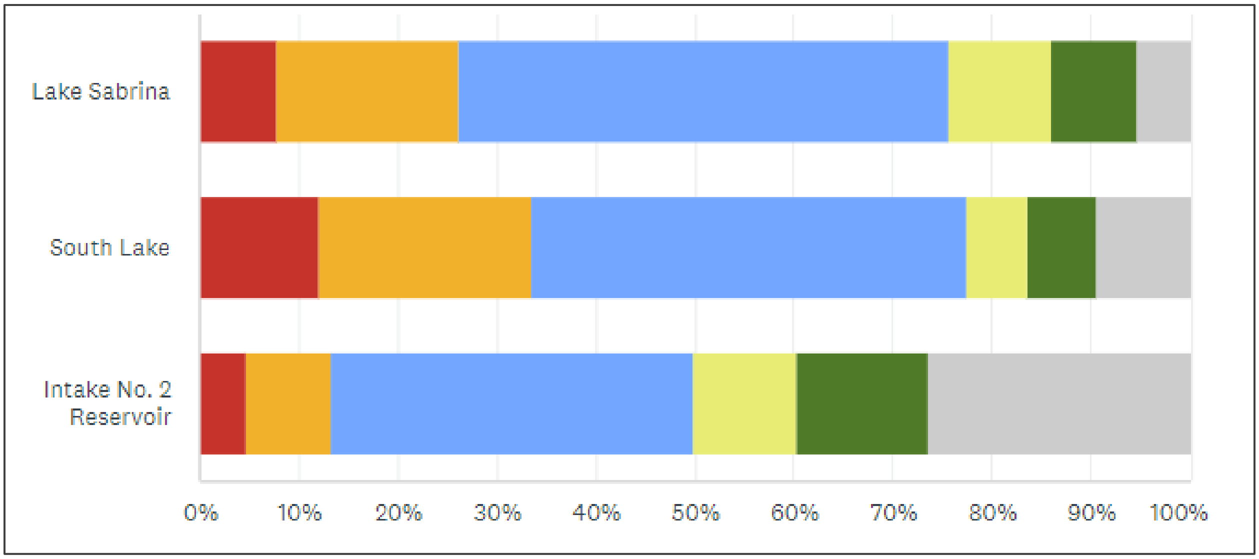


Figure 6.2-21 Perception of Crowdedness

Table 6.2-12 Overall Satisfaction with Boating Access

Boating Feature	1 Not at All Satisfied	2 Slightly Satisfied	3 Neutral	4 Very Satisfied	5 Extremely Satisfied	N/A	Weighted Average
Number of launching facilities	3.4% (3.5%)[a]	10.2% (10.6%)	45.8% (47.8%)	28.8% (30.1%)	7.6% (8.0%)	4.2 %	*3.3*
Condition of launching facilities	6.8% (7.0%)	23.7% (24.6%)	36.4% (37.7%)	25.4% (26.3%)	4.2% (4.4%)	3.4 %	*3.0*
Lake levels	50.4% (51.3%)	21.0% (21.4%)	22.7% (23.1%)	3.4% (3.4%)	0.8% (0.9%)	1.7 %	*1.8*
Parking for boat trailers	18.8% (6.7%)	21.4% (30.9%)	23.1% (33.3%)	4.3% (6.2%)	1.7% (2.5%)	30. 8%	*2.3*
Boating size/speed restrictions	5.9% (6.7%)	3.4% (3.8%)	37.3% (42.3%)	28.0% (31.7%)	13.6% (15.4%)	11. 9%	*3.5*
Fee for boat rentals	3.4% (5.6%)	10.2% (11.1%)	45.8% (61.1%)	28.8% (18.9%)	7.6% (3.3%)	4.2 %	*3.3*

[a] Data within parentheses represent percentage of actual ratings given, excluding those that marked an answer as not applicable.

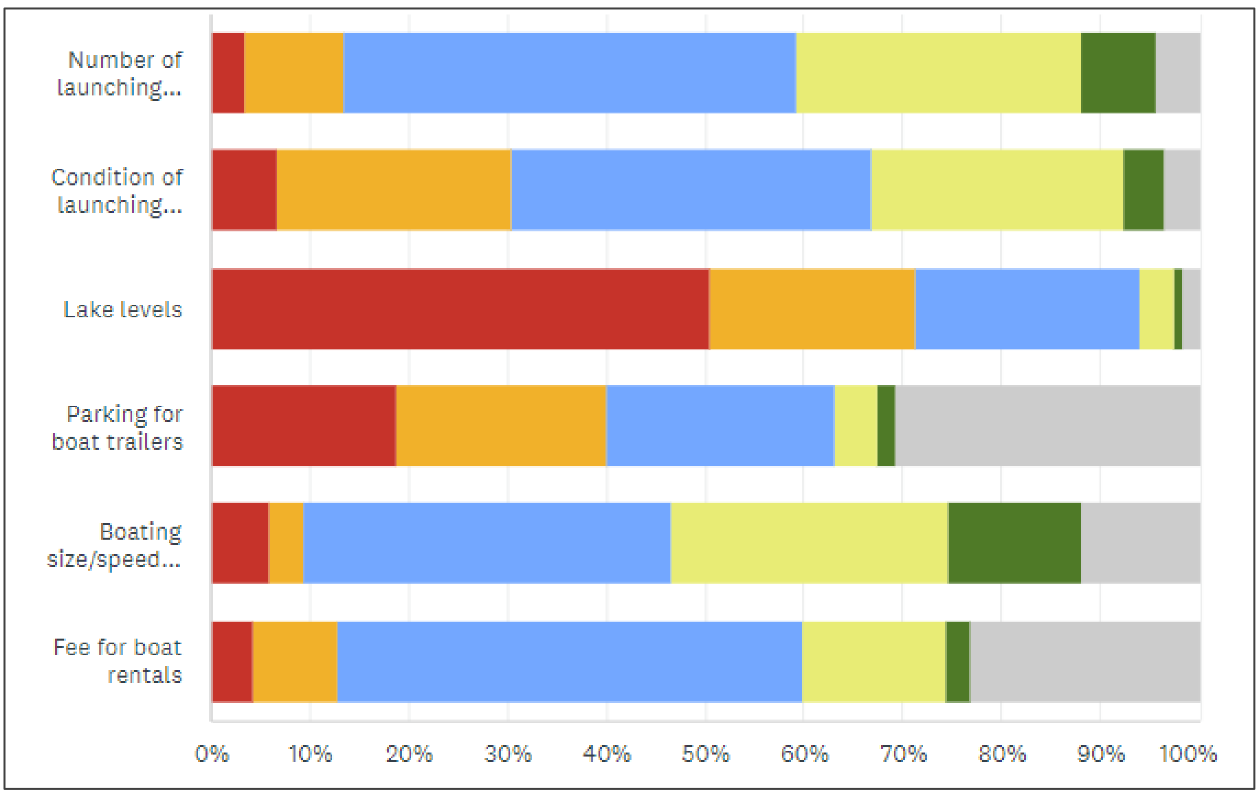


Figure 6.2-22 Overall Satisfaction with Boating Access

6.2.5 CAMPGROUNDS

Based on user responses, 64.9 percent expressed that they would utilize overnight facilities at the Bishop Creek reservoirs if they were available, and 37.1 percent indicated that they would not. Users were asked whether they have previously stayed or wanted to stay at a developed campground near the Bishop Creek reservoirs. Based on user responses, 62.5 percent of users have stayed at one of the developed campgrounds; 20.8 percent expressed no desire to stay at a developed campground near the Bishop Creek reservoirs; and 16.7 percent wanted to stay at one of the developed campgrounds but something prevented me from doing so. Of those that were prevented from camping at a developed campground, for which 38 users responded, the most common responses were that all reservations were booked (36.8 percent) or the campgrounds were too crowded (44.7 percent). Additional questions were asked of those that indicated they have stayed at developed campgrounds near the reservoirs.

Overall satisfaction with developed campgrounds ranked as follows: very satisfied (50.6 percent), neutral (21.3 percent), extremely satisfied (12.9 percent), slightly satisfied (12.9 percent), and not at all satisfied (1.7 percent). The weighted average of these responses was 3.6. The condition, management, and cleanliness of developed campgrounds was predominantly ranked from average to excellent with a weighted average of 3.7.

Most respondents indicated that the number of campgrounds near the Bishop Creek reservoirs was about right (61.4 percent) with the majority of the remainder of responses leaning towards too few (Table 6.2-15). Perception of crowdedness at the campgrounds was predominantly noted as sometimes crowded (49.2 percent) with the remainder of responses leaning towards always crowded (Table 6.2-16); 91.1 percent of respondents noted that if campgrounds were more crowded, it would diminish their experience. Fees at the campgrounds were predominantly noted as about right (59.2 percent) with the remainder of responses leaning towards too high (Table 6.2-17). The importance of the proximity of campgrounds to preferred recreational activities was predominantly noted as very important (36.9 percent), somewhat important (31.8 percent), and extremely important (22.3 percent).

At the conclusion of questions related to developed campgrounds near the reservoirs, the survey asked that respondents provide any additional detail on how camping opportunities may be improved at the Bishop Creek reservoirs. A total of 61 open-ended answers were received for this question. A word cloud for this question is provided in Figure 6.2-23. For each word cloud, the size of the word directly correlates to the number of times it was used in responses. The larger the word, the more often it appears in answers to that specific question. A complete printout of responses to this question is provided in Appendix B.

Table 6.2-13 Overall Satisfaction with Developed Campgrounds

	1 Not at All Satisfied	2 Slightly Satisfied	3 Neutral	4 Very Satisfied	5 Extremely Satisfied	N/A	Weighted Average
Responses	1.7%	12.9%	21.3%	50.6%	12.9%	0.6%	3.6

Table 6.2-14 Condition, Management, and Cleanliness of Developed Campgrounds

	1 Poor	2	3 Average	4	5 Excellent	N/A	Weighted Average
Responses	3.9%	3.4%	36.9%	26.3%	29.1%	0.6%	*3.7*

Table 6.2-15 Rating of Number of Campgrounds Near Bishop Creek Reservoirs

	1 Too Few	2	3 About Right	4	5 Too Many	Weighted Average
Responses	14.2%	18.2%	61.4%	4.5%	1.7%	*2.61*

Table 6.2-16 Perception of Crowdedness at Campgrounds

	1 Never Crowded	2	3 Sometimes Crowded	4	5 Always Crowded	N/A	Weighted Average
Responses	0.6%	10.7%	49.2%	17.5%	21.5%	0.6%	3.5

Table 6.2-17 Rating of Fees at Campgrounds

	1 Too High	2	3 About Right	4	5 Too High	N/A	Weighted Average
Responses	1.1%	1.7%	59.2%	20.7%	16.8%	0.6%	*2.5*

Table 6.2-18 Importance of Proximity of Campgrounds to Preferred Recreational Activity

	1 Extremely Important	2 Very Important	3 Somewhat Important	4 Not So Important	5 Not at All Important
Responses	22.3%	36.9%	31.8%	6.7%	2.2%

Figure 6.2-23 Word Cloud for Question 47 Open-Ended Responses

6.2.6 Hiking/Wilderness Access

Based on user response, 88.5 percent of respondents indicated they previously used trailheads at the Bishop Creek reservoirs (e.g., Sabrina Basin Trailhead; Bishop Pass Trailhead) to access the John Muir Wilderness. Of those that have used the trails, 84.6 percent have used the trailheads for day use and 62.5 percent have used the trailheads for overnight use in the wilderness. Users were asked to briefly describe where and how they parked their vehicle before access the John Muir Wilderness. A total of 215 open-ended answers were received for this question. A word cloud for this question is provided in Figure 6.2-24. For each word cloud, the size of the word directly correlates to the number of times it was used in responses. The larger the word, the more often it appears in answers to that specific question. The survey asked that respondents provide any additional detail on how accessibility to the John Muir Wilderness at the reservoirs may be improved. A total of 97 open-ended answers were received for this question. A word cloud for this question is provided in Figure 6.2-25. A complete printout of responses to both questions is provided in Appendix B.

Figure 6.2-24 Word Cloud for Question 50 Open-Ended Responses

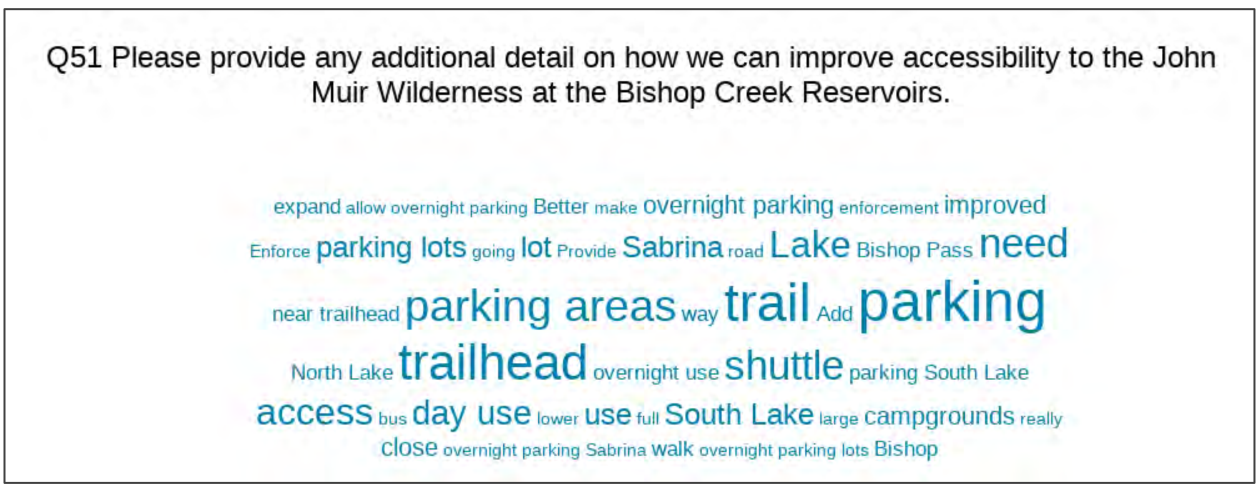


Figure 6.2-25 Word Cloud for Question 51 Open-Ended Responses

6.2.7 General Feedback

At the end of the survey, users were asked to share any additional comments they may have related to their visits and recreation activities at the Bishop Creek reservoirs. A total of 89 open-ended answers were received for this question. A word cloud for this question is provided in Figure 6.2-26. For each word cloud, the size of the word directly correlates to the number of times it was used in responses. The larger the word, the more often it appears in answers to that specific question. A complete printout of responses to this question is provided in Appendix B.

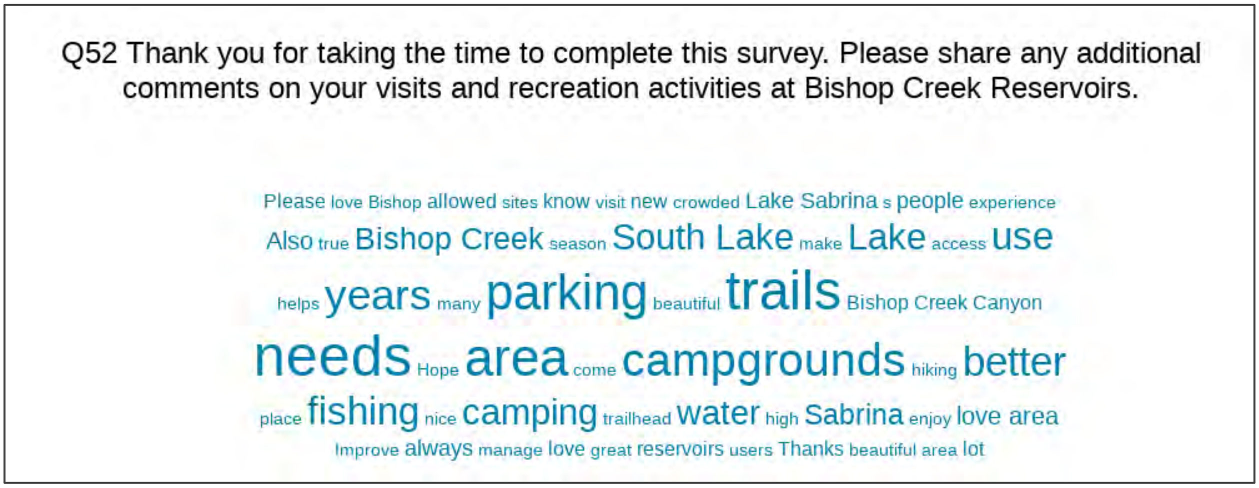


Figure 6.2-26 Word Cloud for Question 52 Open-Ended Responses

6.3 Traffic Counters

As noted in Table 6.1-1 above, many notable events occurred during the study season that resulted in restricted access to the study area. Most notably, gate and forest closures due to weather, fire activity, and road construction led to multiple days where South Lake, Lake Sabrina, and Intake No. 2 were closed to the public. To characterize typical use of these sites throughout the study season, all averages have excluded those days where access to a site was unavailable. In the discussion and data below, user estimates were based on USFS estimate of an average of 2.5 people per vehicle provided in their 2016 National Visitor Use Monitoring Results for the INF (USFS 2019).

Figure 6.3-1 provides a graphical representation of the total daily vehicle counts and notable events that occurred during the study season that may have influenced user activity. Consistent peaks are associated with weekend use throughout the study season, with more pronounced peak use during holiday weekends and the weeks of CDFW trout plantings. Very high usage is noted during October compared to the prior months, presumably in response to prolonged closure of the area and CDFW trout plantings. Usage troughs are associated with weekend days, as well as periods of no user activity where access was precluded by forest and gate closures due to fire response, inclement weather, and road damage, as noted above.

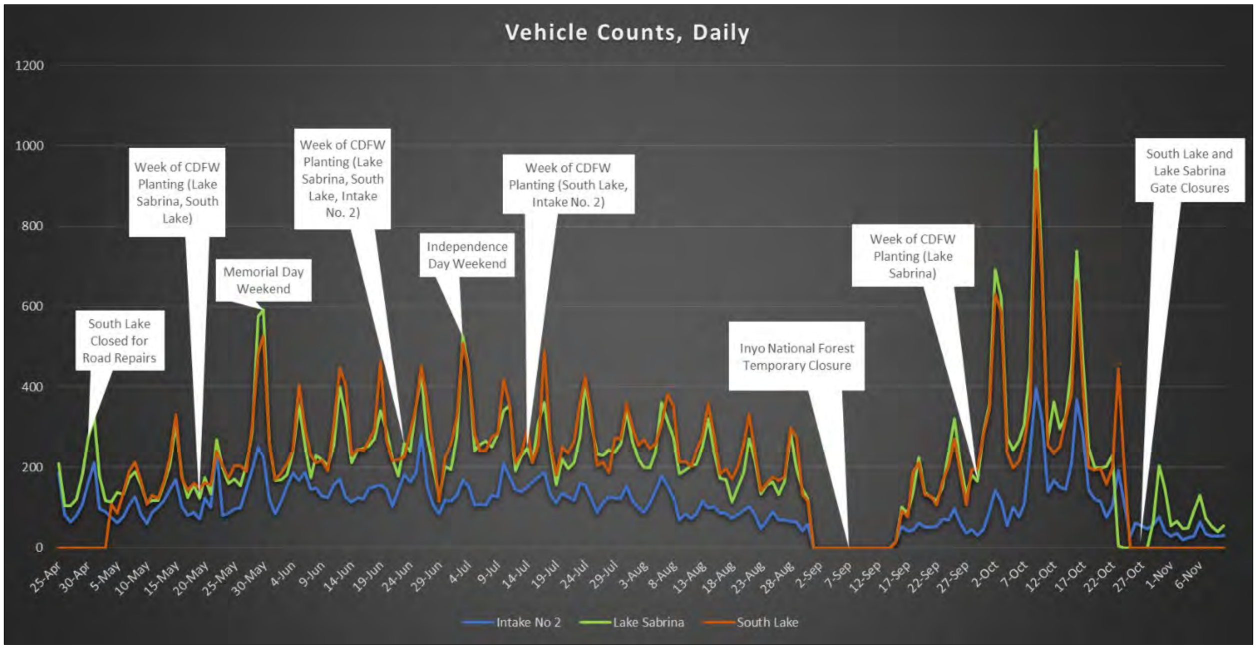


Figure 6.3-1 Total Vehicle Counts, Daily

On average, an estimated 9,327 users visited the three recreation areas ***each week*** during the study season (1,905 at Intake No. 2; 3,630 at Lake Sabrina; and 3,792 at South Lake). The highest average use was on weekend days (Friday daily average of 1,437 users; Saturday daily average of 1,961 users; and Sunday average of 1,523 users) with the lowest usage Monday to Wednesday (Monday averaged 1,029 users and Wednesday averaged 1,052 users). Table 6.3-19 describes the average at each site by day of the week.

As shown on Table 6.3-20, daily averages tend to increase beginning in June as peak recreation season ramps up and taper off in August/September. Figure 6.3-4 provides total vehicle counts by hour of the day. These counts include all activity, both incoming and outgoing, to provide a representative view of traffic throughout the day. As expected, for all sites, traffic increases during the morning as early users arrive, peaks midday, and decreases throughout the evening as users leave the site.

Table 6.3-19 Daily Average Vehicle Counts and Estimated Users by Day of the Week

Day of Week	Intake No 2.		Lake Sabrina		South Lake	
	Daily Avg. (Vehicles)	Daily Avg. (Users)	Daily Avg. (Vehicles)	Daily Avg. (Users)	Daily Avg. (Vehicles)	Daily Avg. (Users)
Sunday	134.0	335.0	333.2	832.9	325.9	814.7
Monday	84.9	212.3	197.5	493.8	189.0	472.4
Tuesday	92.0	230.1	209.4	523.5	201.0	502.4
Wednesday	91.7	229.4	198.1	495.2	191.1	477.8
Thursday	102.2	255.4	217.2	542.9	218.8	547.0
Friday	131.3	328.2	284.0	710.1	267.0	667.6
Saturday	171.4	428.5	418.7	1046.7	423.3	1058.2

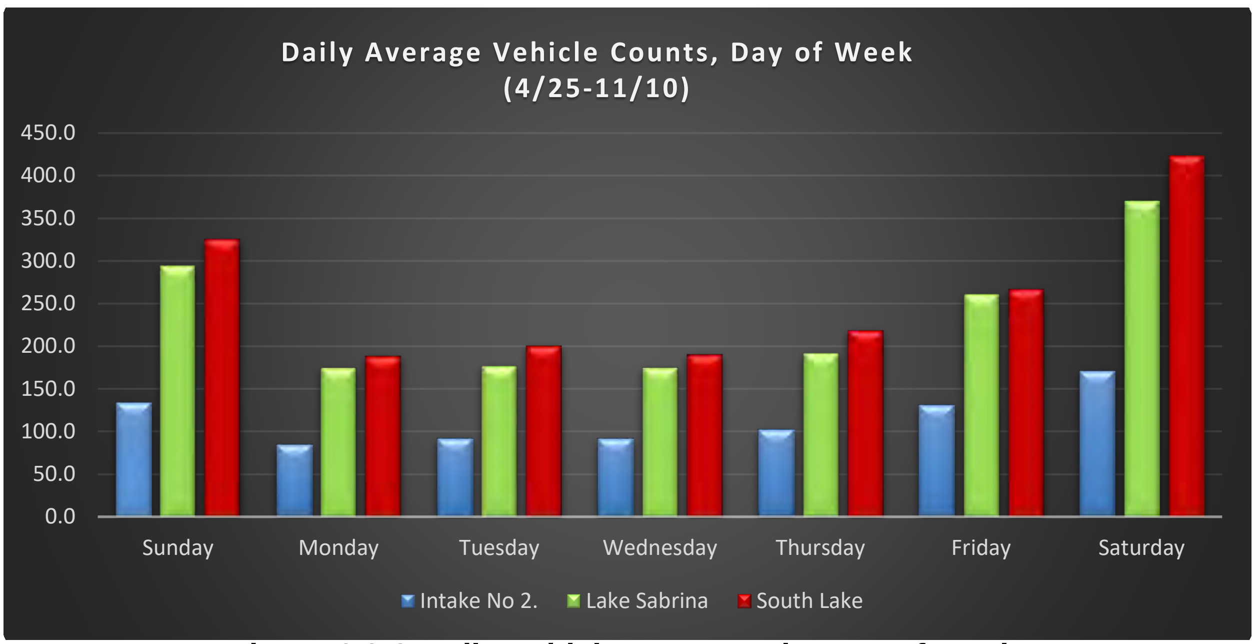


Figure 6.3-2 Daily Vehicle Averages by Day of Week

Table 6.3-20 Daily Average Vehicle Counts and Estimated Users by Month

Month	Intake No 2.		Lake Sabrina		South Lake	
	Monthly Avg. (Vehicles)	Daily Avg. (Users)	Daily Avg. (Vehicles)	Daily Avg. (Users)	Daily Avg. (Vehicles)	Daily Avg. (Users)
April[a]	114.0	285.0	166.1	415.2	0.0[c]	0.0
May	120.1	300.3	203.5	508.8	204.1	510.2
June	145.8	364.4	251.1	627.8	274.3	685.8
July	138.0	345.1	276.3	690.6	295.0	737.5
August	90.9	227.1	208.2	520.6	237.7	594.4
September	51.5	128.8	164.4	410.9	159.3	398.3
October	140.0	350.1	360.3	900.8	356.0	890.1
November[b]	32.4	81.0	66.2	165.5	0.0[d]	0.0

[a] Traffic counters only recorded data for the last six days of April 2021.
[b] Traffic counters only recorded data through November 10, 2021.
[c] South Lake Road was closed from April 24 to May 4, 2021, due to road damage and repairs.
[d] South Lake Road was closed from October 25 to November 10, 2021, due to inclement weather.

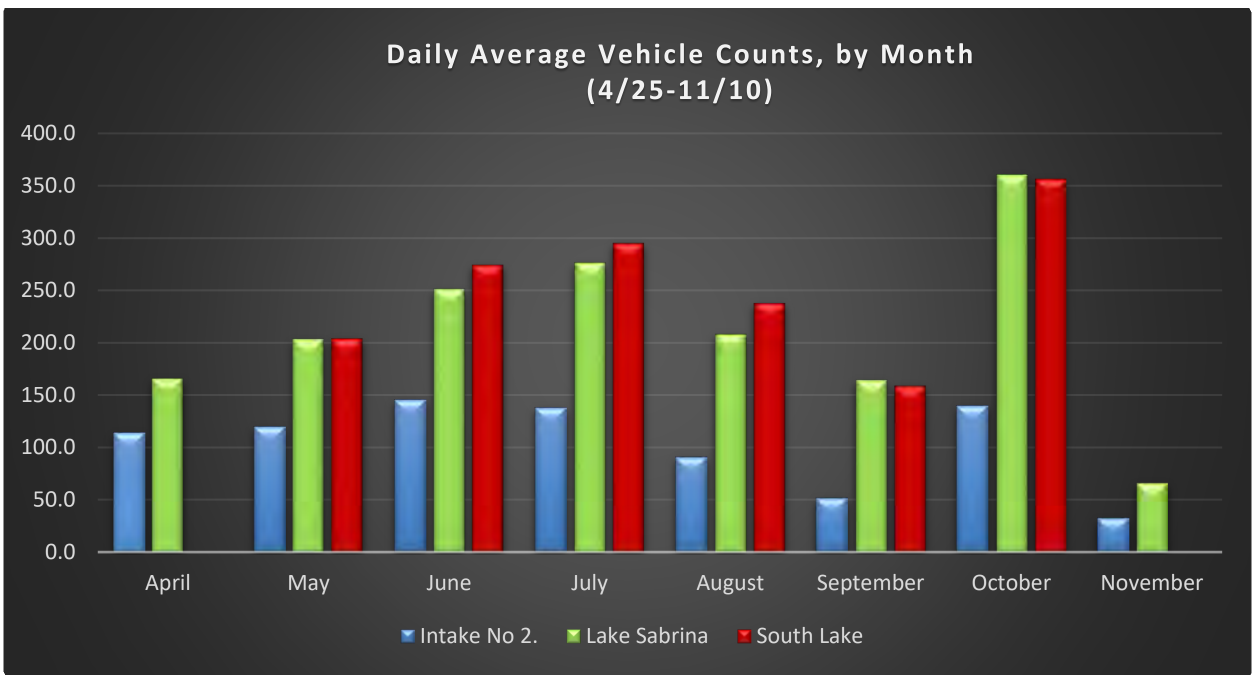


Figure 6.3-3 Daily Vehicle Averages by Month

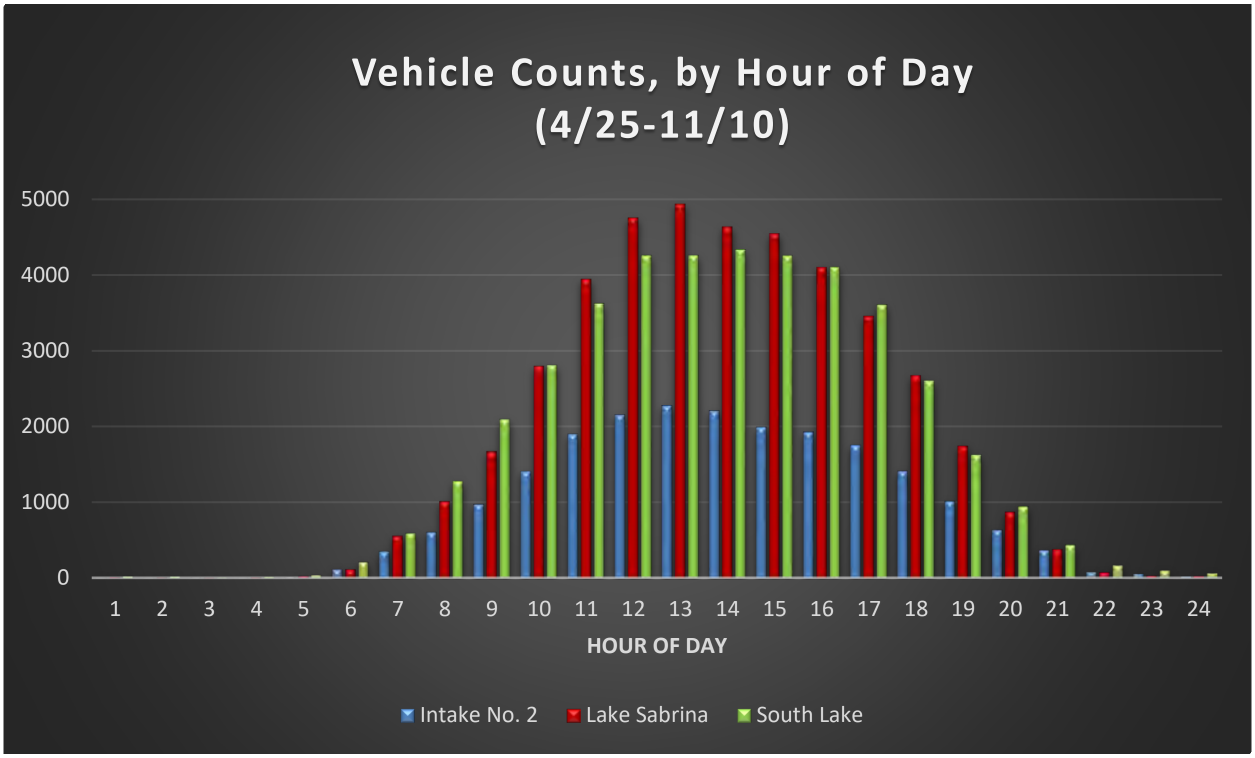


Figure 6.3-4 Total Vehicle Counts, by Hour of Day

6.4 Trail Counters

As noted in Table 6.1-1, many notable events occurred during the study season that resulted in restricted access to the study area. Most notably, gate and forest closures due to weather, fire activity, and road construction led to multiple days where South Lake, Lake Sabrina, and Intake No. 2 were closed to the public. Figure 6.4-1 provides a graphical representation of the total daily trail counts and notable events that occurred during the study season that may have influenced user activity. Since each of the installed trail counters captured different types of users – climbers for Little Egypt, anglers for Inlet Trail, and hikers for Green Creek diversion pipeline – the data does not always align and is affected differently by the events noted. For example, during the INF temporary closure, use at Inlet Trail and Green Creek diversion pipeline dropped, although both could still be accessed by walking from the gate or accessing the pipeline from other USFS trails, respectively. Use at Little Egypt climbing area, however, increased, since access to this area is outside of the INF, and presumably the area was used as an alternative to climbing areas within the forest where access was prohibited.

Somewhat consistent peaks are associated with weekend use throughout the study season, with more pronounced peak use during holiday weekends. Very high usage – slightly higher than Memorial Day Weekend – is noted along Green Creek diversion pipeline during October compared to the months prior, presumably in response to prolonged closure of the area. Usage troughs are largely associated with weekend days, as well as periods of no user activity where access was precluded by forest and gate closures due to fire response, inclement weather, and road damage.

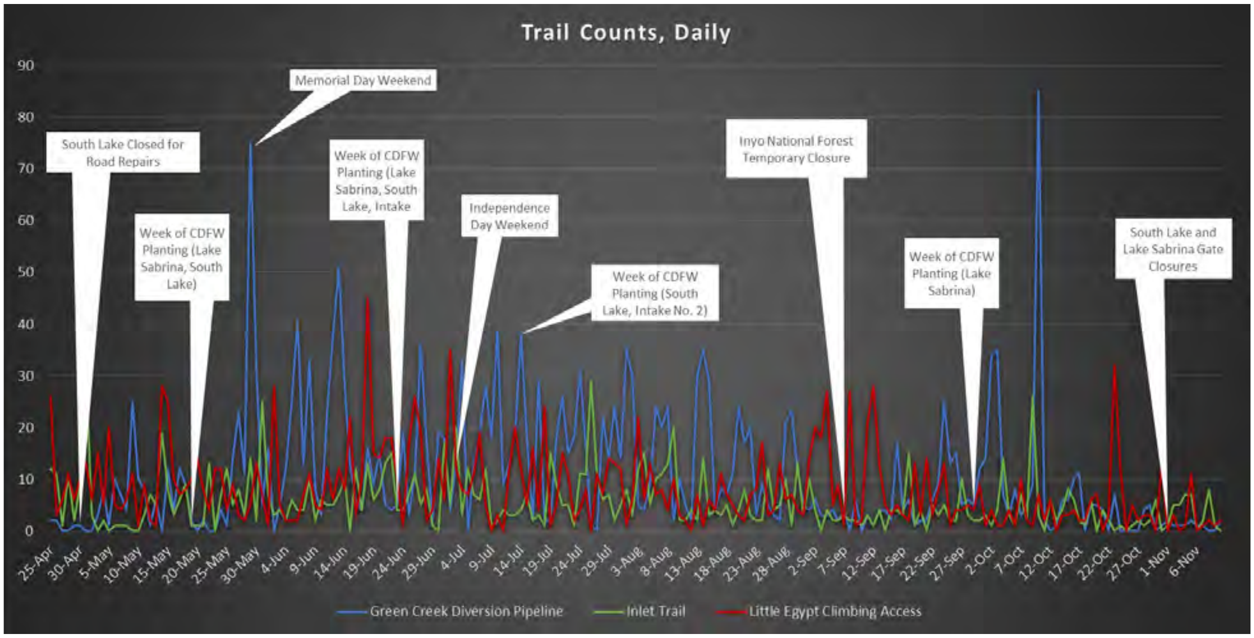


Figure 6.4-1 Total Trail Counts, Daily

Table 6.4-21 describes the average number of hikers detected on each trail by day of the week. On average, an estimated 38.2 (Green Creek diversion pipeline), 19.5 (inlet trail), and 28.6 (Little Egypt) hikers used the trails ***each week*** during this period. Use along Green Creek diversion pipeline appears to be most active on the weekend days of Saturday (17.1 average users) and Sundays (19.0 average users). Use of the inlet trail, which is largely used to hike to the inlet at the south end of the lake for fishing, is a bit more sporadic, showing highest average daily usage on Mondays (7.9 average users) and Saturdays (8.6 average users). Access to Little Egypt climbing area is busiest on weekends, specifically Fridays (10.1 average users), and Sundays (9.8 average users).

As shown in Table 6.4-22, daily averages along the Green Creek diversion pipeline tend to increase during summer months and taper off in September. Unlike Green Creek diversion pipeline, use of which is largely driven by hiking conditions, use at both inlet trail (anglers) and Little Egypt climbing access (climbers) are relatively consistent throughout the recreation season.

Figure 6.4-4 provides total hiker counts by hour of the day. These counts include all activity, both incoming and outgoing, to provide a representative view of traffic throughout the day. Green Creek diversion pipeline and inlet trail show steady use increasing in the morning, peaking mid-day, and receding late afternoon. Access to Little Egypt climbing area is more sporadic, with use during late night and early morning hours, most likely due to climbers either attempting to set up early to climb before the day heats up, or climbing in the evening until the sun goes down before leaving the site.

Table 6.4-21 Average Trail Users by Day of the Week

Day of Week	Green Creek Diversion Pipeline	Inlet Trail	Little Egypt Climbing Access
Sunday	19.0	1.9	4.8
Monday	6.6	3.9	2.9
Tuesday	7.1	2.4	4.2
Wednesday	7.4	2.3	4.2
Thursday	9.2	2.4	3.1
Friday	10.2	2.2	5.1
Saturday	17.1	4.3	4.4

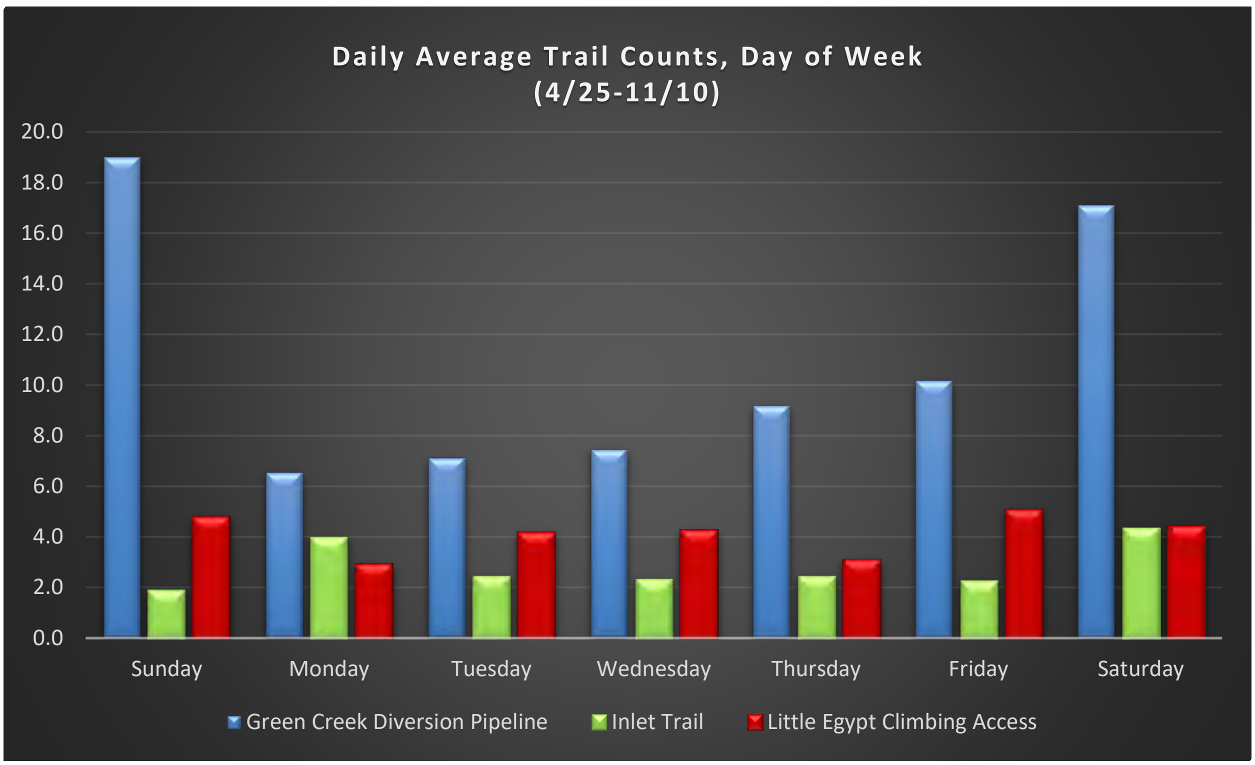


Figure 6.4-2 Daily Average Trail Counts by Day of the Week

Table 6.4-22 Daily Average Trail Counts and Estimated Users, by Month

Month	Green Creek Diversion Pipeline	Inlet Trail	Little Egypt Climbing Access
April[a]	0.5	3.8	5.2
May	4.7	3.1	4.5
June	8.0	3.1	5.7
July	8.3	3.7	4.9
August	7.1	3.3	3.2
September	2.9	1.7	4.8
October	4.4	1.9	2.3
November	0.6	1.8	1.1

[a] Traffic counters only recorded data for the last six days of April 2021.
[b] Traffic counters only recorded data through November 10, 2021.

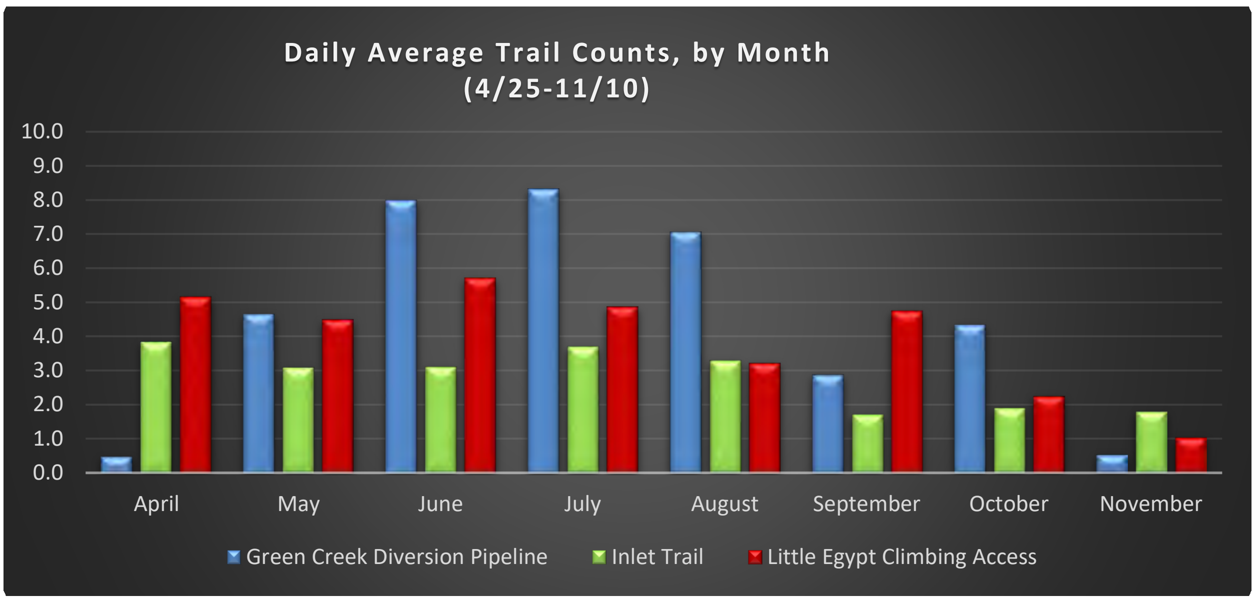


Figure 6.4-3 Daily Average Trail Counts by Month

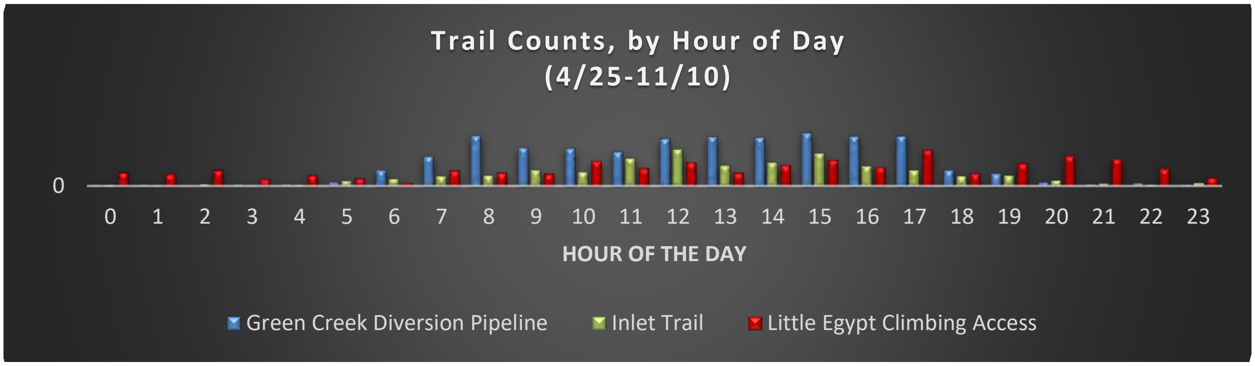


Figure 6.4-4 Total Trail Counts by Hour of Day

6.5 Spot Counts

Spot counts were conducted at each recreation area (South Lake, Lake Sabrina, and Intake No. 2) according to the survey areas delineated on Figure 6.5-1 through Figure 6.5-4. During angler surveys, spot counts were collected for anglers adjacent to the creek that runs alongside that campground (Figure 6.5-4). For each spot count, an attempt was made to distinguish between general recreators (day users), anglers, and any on-water activities. More importantly, the number of vehicles and vehicles with trailers were noted for each parking lot at the time of the spot count, which will be compared to the total number of parking spots available to estimate capacity utilization at each site.

Table 6.5-23 summarizes average spot counts for vehicles, vehicles with trailers, day users, and anglers for each of the identified sub locations. For each category, averages for the entire study season as well as averages for peak weekend days were provided. Due to forest closures during Labor Day weekend, spot counts on peak weekend days consisted only of May 29 (Memorial Day weekend) and July 3 (Independence Day weekend). Table 6.5-24 analyzes spot count data in relation to parking lot capacities at the Bishop Creek reservoirs, as well as the overnight parking lot for Sabrina wilderness users located along CA 168 at the intersection of North Lake Road. When comparing spot counts throughout the entire study season, all parking areas are under capacity, although South Lake's upper parking lot, used mostly for overnight parking for wilderness users, averages 88 percent capacity. North Lake Road overnight parking, intended to be used by overnight wilderness users at Lake Sabrina, is far under capacity at an average of 8 percent throughout the study season. When analyzing peak weekend days, four parking areas exceed their capacity, often meaning that recreators are parking in areas not intended for vehicle parking. These four are Lake Sabrina roadside parking (123 percent), South Lake upper parking lot (103 percent), South Lake launching pier/restroom parking lot (119 percent), and South Lake boat launch parking (127 percent).

Table 6.5-23 Spot Count Averages

Location	Observation Site		Vehicle Counts		Trailer Counts		Day User Counts		Angler Counts	
	Sub Group	Description	All	Peak	All	Peak	All	Peak	All	Peak
Intake No. 2	A	Day use parking lot	8.6	16.0	0.0	0.0	n/a	n/a	n/a	n/a
Intake No. 2	B	Lower Intake 2 parking lot	2.8	5.5	0.0	0.0	n/a	n/a	n/a	n/a
Intake No. 2	C	Eastern Shoreline	n/a	n/a	n/a	n/a	n/a	n/a	10.7	19.0
Intake No. 2	D	Northern shoreline	n/a	n/a	n/a	n/a	0.7	2.5	1.4	3.5
Intake No. 2	E	Western shoreline	n/a	n/a	n/a	n/a	n/a	n/a	3.1	11.5
Intake No. 2	G	Intake No. 2 Dam	n/a	n/a	n/a	n/a	n/a	n/a	3.7	9.0
Lake Sabrina	A	Roadside parking	11.9	37.0	0.0	0.0	n/a	n/a	n/a	n/a
Lake Sabrina	B	Lower parking lot	5.1	11.5	0.0	0.0	n/a	n/a	n/a	n/a
Lake Sabrina	C	Upper parking lot	16.5	25.0	0.3	0.5	n/a	n/a	n/a	n/a
Lake Sabrina	D	Shoreline west of dam	n/a	n/a	n/a	n/a	6.3	7.5	10.6	40.0
Lake Sabrina	E	Sabrina Dam	n/a	n/a	n/a	n/a	3.7	6.5	1.8	5.5
Lake Sabrina	F	Creek below Sabrina Dam	n/a	n/a	n/a	n/a	n/a	n/a	1.7	6.5
Lake Sabrina	G	Weir	n/a	n/a	n/a	n/a	1.3	1.0	2.3	10.0
North Lake Road Overnight Parking		Overnight parking for Sabrina TH	5.6	9.0	0.0	0.0	n/a	n/a	n/a	n/a
South Lake	A	Upper parking lot	75.4	89.0	0.1	0.5	n/a	n/a	n/a	n/a
South Lake	B	Launching pier/restroom parking lot	5.8	9.5	0.0	0.0	n/a	n/a	n/a	n/a
South Lake	C	Boat launch parking	7.6	19.0	0.1	0.0	n/a	n/a	n/a	n/a
South Lake	D	Hillside Dam/Spillway	n/a	n/a	n/a	n/a	0.8	5.0	0.5	0.0
South Lake	E	Eastern shoreline/boat ramp	n/a	n/a	n/a	n/a	0.6	1.0	1.1	1.5

Location	Observation Site		Vehicle Counts		Trailer Counts		Day User Counts		Angler Counts	
	Sub Group	Description	All	Peak	All	Peak	All	Peak	All	Peak
South Lake	F	Picnic tables at upper parking lot	n/a	n/a	n/a	n/a	0.2	0.0	n/a	n/a
South Lake	G	Cove near Bishop Pass Trailhead	n/a	n/a	n/a	n/a	1.5	10.5	1.7	3.0
South Lake	H/I	Weir Lake & parking lot	1.8	3.0	0.0	0.0	1.4	3.0	0.5	0.0
Big Trees Campground	A	Along creek	n/a	n/a	n/a	n/a	n/a	n/a	0.5	0.5
Forks Campground	A	Along creek	n/a	n/a	n/a	n/a	n/a	n/a	0.1	0.5
Four Jeffrey Campground	A	Along creek	n/a	n/a	n/a	n/a	n/a	n/a	0.4	2.5

[a]Due to forest closures during Labor Day weekend, spot counts on peak days consisted only of May 29 (Memorial Day Weekend) and July 3 (Independence Day weekend).

Table 6.5-24 Capacity Utilization at Parking Areas

Location	Observation Site		Vehicle Counts		Parking Capacity	Capacity Utilization	
	Sub Group	Description	All	Peak		All	Peak
Intake No. 2	A	Day use parking lot	8.6	16.0	20.0	43%	80%
Intake No. 2	B	Lower Intake 2 parking lot	2.8	5.5	12.0	24%	46%
Lake Sabrina	A	Roadside parking	11.9	37.0	30.0	40%	123%
Lake Sabrina	B	Lower parking lot	5.1	11.5	24.0	21%	48%
Lake Sabrina	C	Upper parking lot	16.5	25.0	36.0	46%	69%
North Lake Road Overnight Parking	n/a	Overnight parking for Sabrina TH	5.6	9.0	70.0	8%	13%
South Lake	A	Upper parking lot	75.4	89.0	86.0	88%	103%
South Lake	B	Launching pier/restroom parking lot	5.8	9.5	8.0	73%	119%
South Lake	C	Boat launch parking	7.6	19.0	15.0	50%	127%
South Lake	H/I	Weir Lake & parking lot	1.8	3.0	5.0	37%	60%

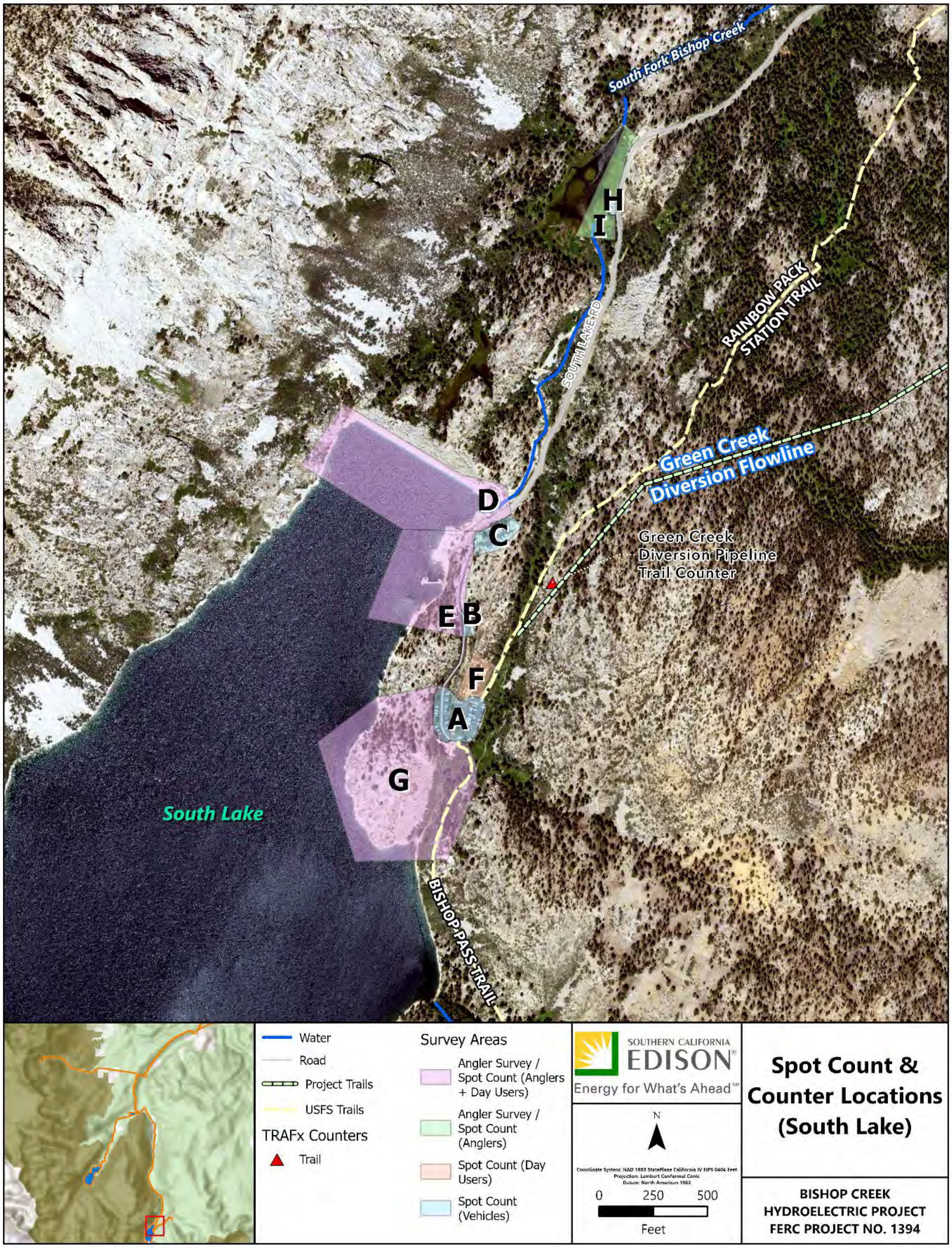


Figure 6.5-1 Spot Count and Counter Locations at South Lake

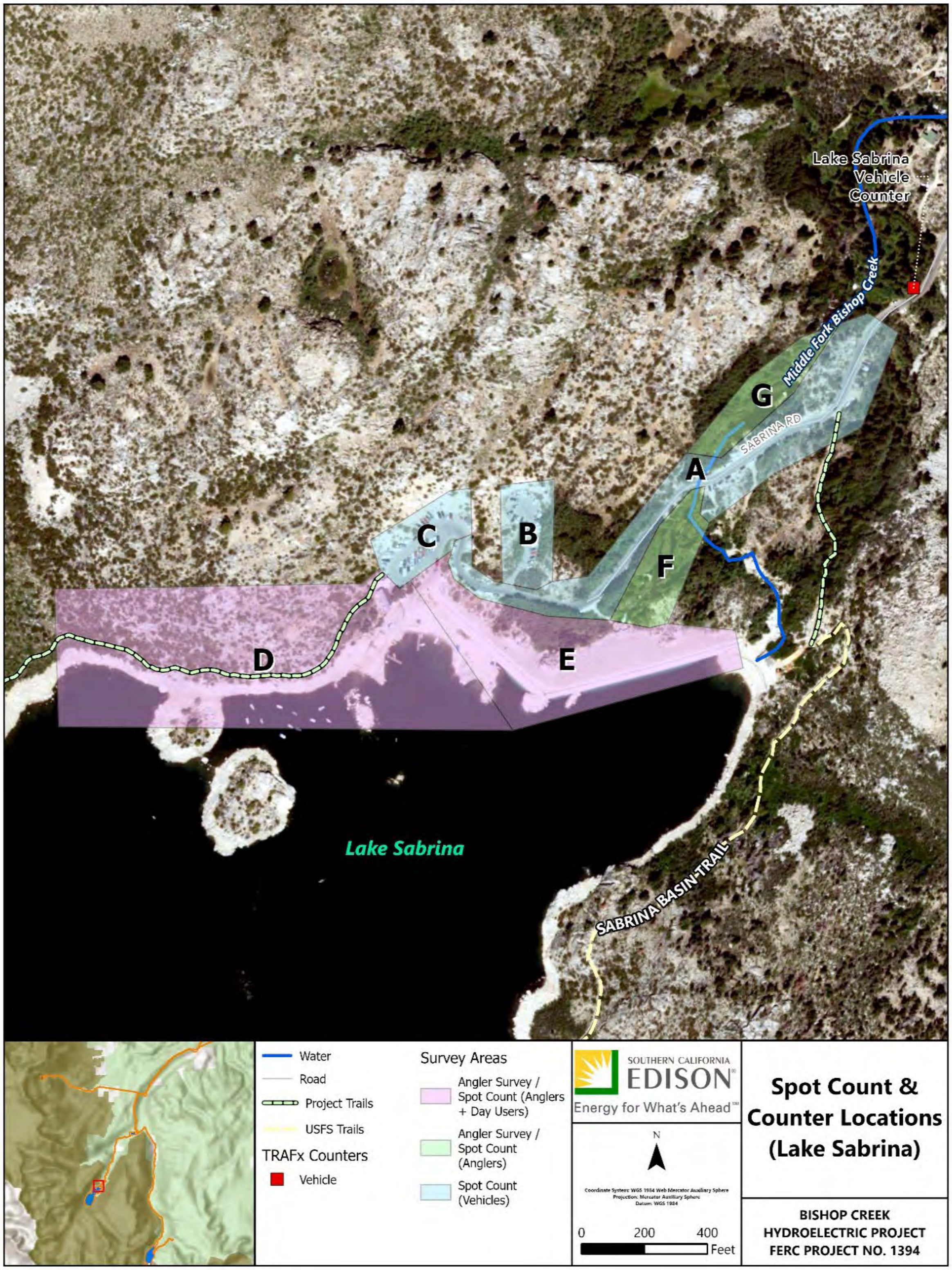


Figure 6.5-2 Spot Count and Counter Locations at Lake Sabrina

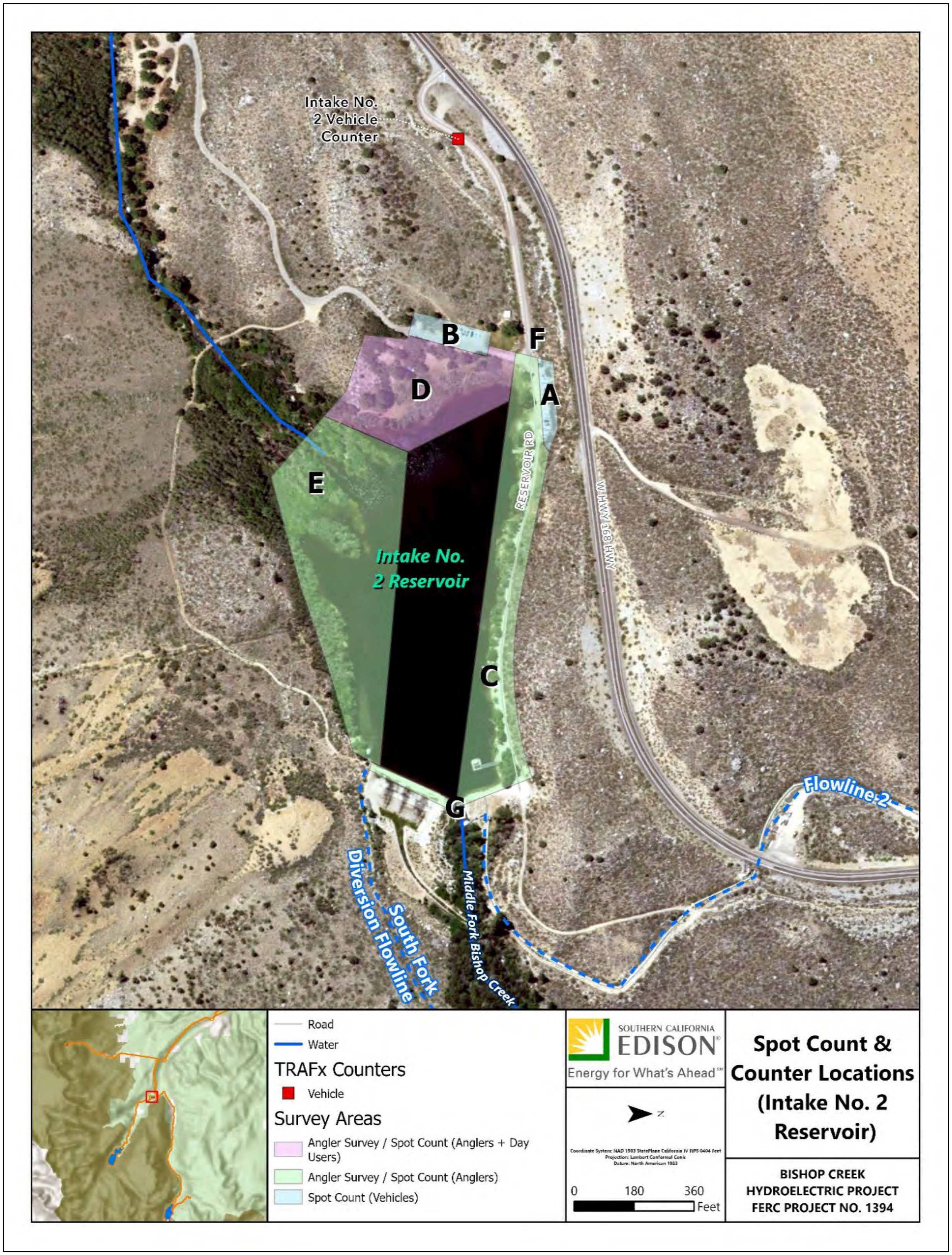


Figure 6.5-3 Spot Count and Counter Locations at Intake No. 2 Reservoir

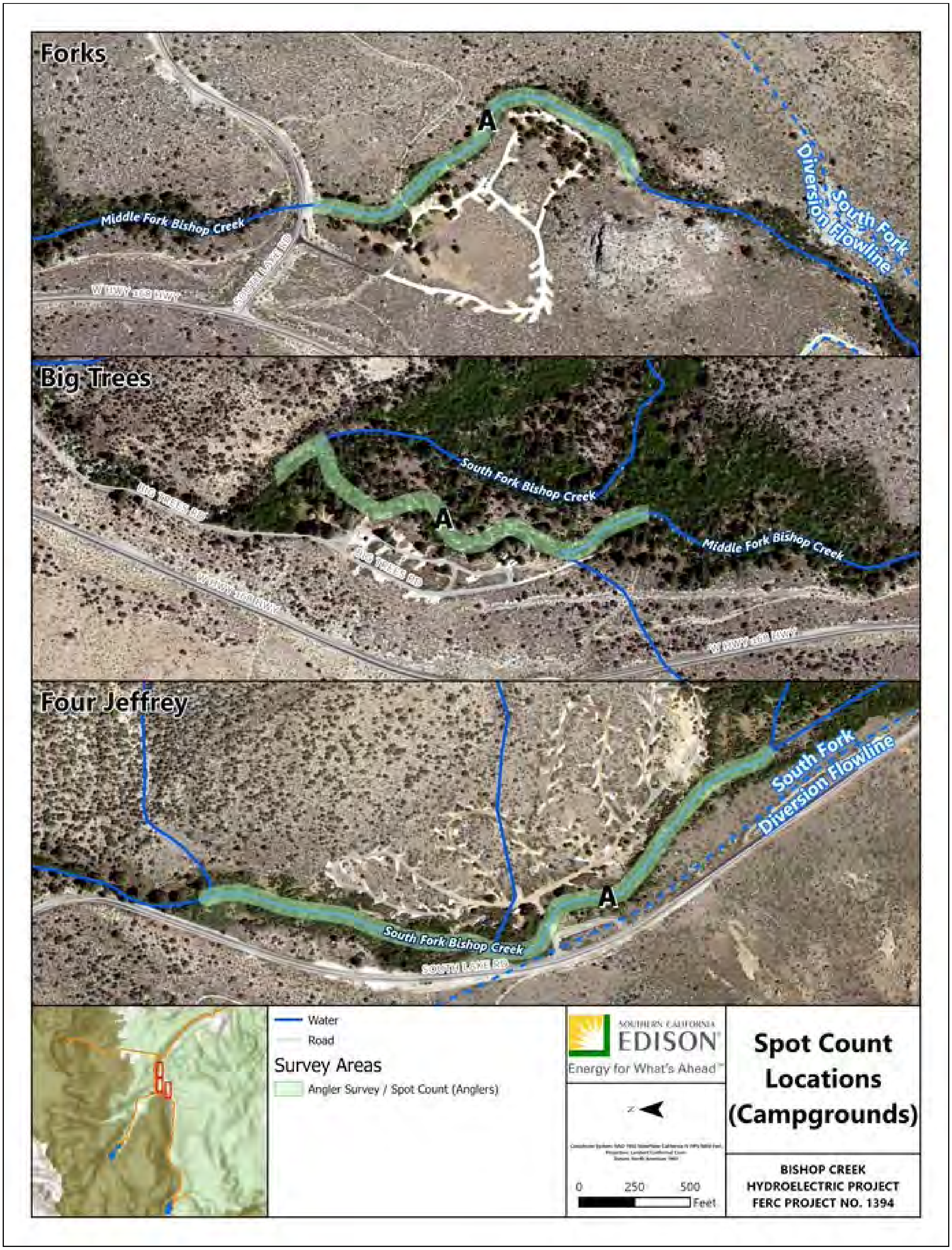


Figure 6.5-4 Angler Survey Locations at Campgrounds

6.6 Angler Surveys

Beginning Memorial Day weekend, angler surveys were initiated at the three recreation areas (Lake Sabrina, South Lake, and Intake No. 2) as well as three campgrounds at the request of CDFW (Forks, Four Jeffrey, and Big Trees). The data discussed below compiles all angler surveys from Memorial Day 2021 weekend through August 29, 2021 a total of 19 survey days[6]. During this time, 178 in-person angler surveys were completed (0 at Forks Campground; 1 at Four Jeffrey Campground; 2 at Big Trees Campground; 79 at Intake No. 2; 75 at Lake Sabrina; and 21 at South Lake). The tables and figures below provide a summary of self-reported angler survey data collected during the field season. Of the 178 surveys conducted, the average number of anglers in each group was 3.7. Surveys conducted and average group size by location are provided in Table 6.6-25.

Table 6.6-25 Surveys by Location and Average Anglers per Group

	Forks	Four Jeffrey	Big Trees	Intake No. 2	Lake Sabrina	South Lake
Surveys Conducted	0	1.0	2.0	79.0	75.0	21.0
Average Anglers Per Group	0	3.0	2.0	3.7	3.7	3.6

Of the anglers surveyed, 78 percent of respondents indicated they were recreating in the area with the primary purpose of fishing, and 86.5 percent of the respondents noted they also fished other nearby locations. The nearby locations noted by those anglers is listed in Table 6.6-26.

[6] One survey day (June 20, 2021) was missed during this period due to staff illness, and a second survey day (September 5, 2021) was missed due to temporary closure of the Inyo National Forest.

Table 6.6-26 Nearby Locations also Fished by Angler Survey Respondents

Aspendell	Forks Campground	North Lake
Bakers Creek	Four Jeffrey Campground	Owens River
Big Creek	Indian Creek	Pleasant valley Reservoir
Big Pine Lakes	Intake No. 2	Power Plants
Bishop Canals	June Lake	Rock Creek
Bishop Creeks	Kodiak Lake	Rock Lake
Bishop River	Lake Mary	Saunders Pond
Bitterbrush Campground	Lake Sabrina	South Lake
Bridgeport	Lee Vining	Summer Lake
Buckley Lake	Lone Pine Creek	Taboose Creek
Campgrounds	Long Lake	Tahoe
Cardinal Valley	Lower / Upper Hot Creek	Treasure Lake
Convict Lake	Lower Owens	Tuttle Creek
Creeks	Mammoth Lakes	Twin Lake
Crowley	Mosquito flats	Weir Lake

Anglers were asked how frequently they fished in the Bishop Creek reservoirs area; responses are summarized in Figure 6.6-1. Most respondents indicated that they either fish the area once a year (28 percent), twice a year (20 percent), this is the first time they have fished the area (16 percent), three times a year (12 percent), or 10+ times a year (11 percent). Frequencies of less than once a year captures those that visit the area every other year or at other irregular intervals. Anglers fishing the area 10 or more times in a year include those who reported visiting multiple times a week for the fishing season.

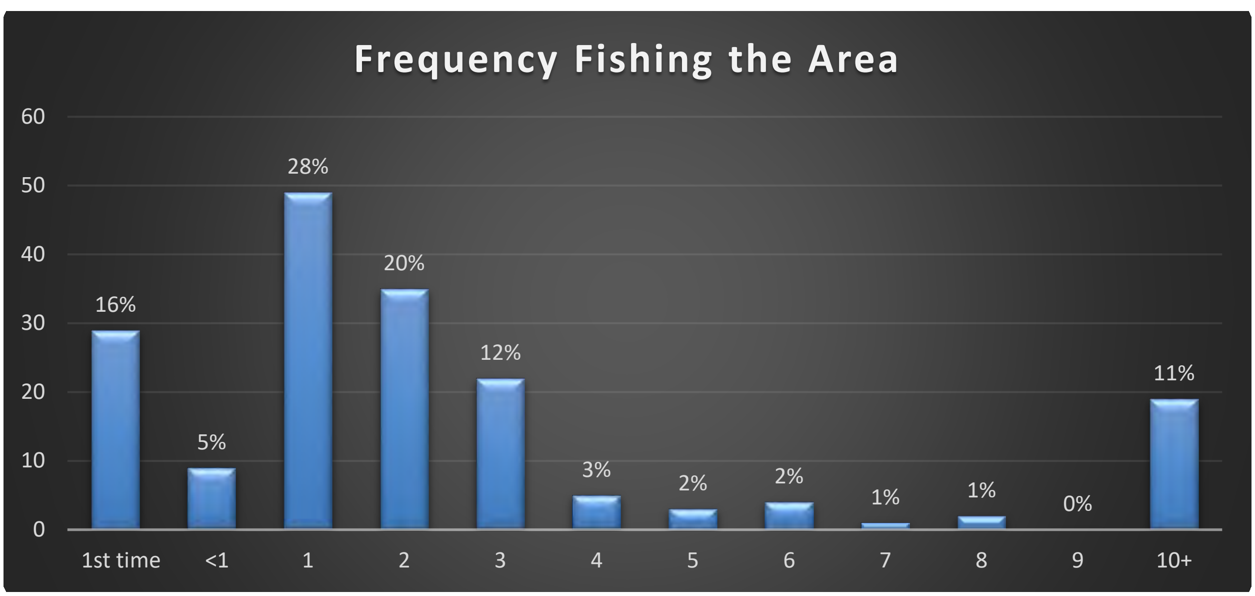
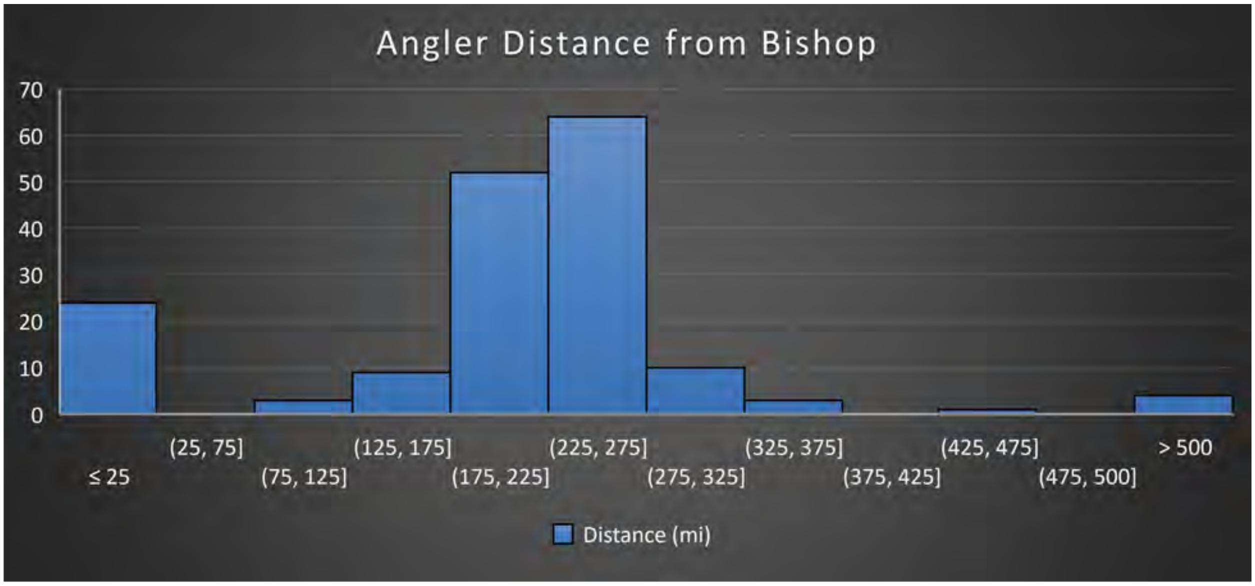


Figure 6.6-1 Annual Frequency of Anglers Fishing in the Area

Anglers surveyed provided their home ZIP code to understand the primary residence and how far the anglers were traveling to get to the recreation area. Of those surveyed, 160 anglers provided California ZIP codes (90.0 percent). As shown in Figure 6.6-2, most respondents live between 175 and 275 miles from Bishop, California, in areas such as Los Angeles, Lake Tahoe/Reno, San Francisco, or Sacramento.



Note: Distances are based on angler's zip codes

Figure 6.6-2 Distance of Angler's Home from Bishop, CA

Anglers self-reported counts and lengths of fish caught during the time of the interview, as summarized in Table 6.6-27 and Figure 6.6-3 below. Most fish reported by respondents were 10 inches or smaller in total length.

Table 6.6-27 Total Counts of Reported Length of Fish

Location	<8"[a]	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	>19"
Intake No. 2	64	21	24	32	13	5	2	0	0	1	0	0	1
Sabrina	38	15	18	27	23	12	5	3	3	2	0	0	0
South Lake	14	5	5	3	6	9	6	2	0	0	0	0	0
Big Trees	4	1	1	3	0	0	0	0	0	0	0	0	0
Four Jeffrey	2	0	0	0	0	0	0	0	0	0	0	0	0

[a] Lengths are self-reported by anglers in the field. Assumption for this data is total length of fish.

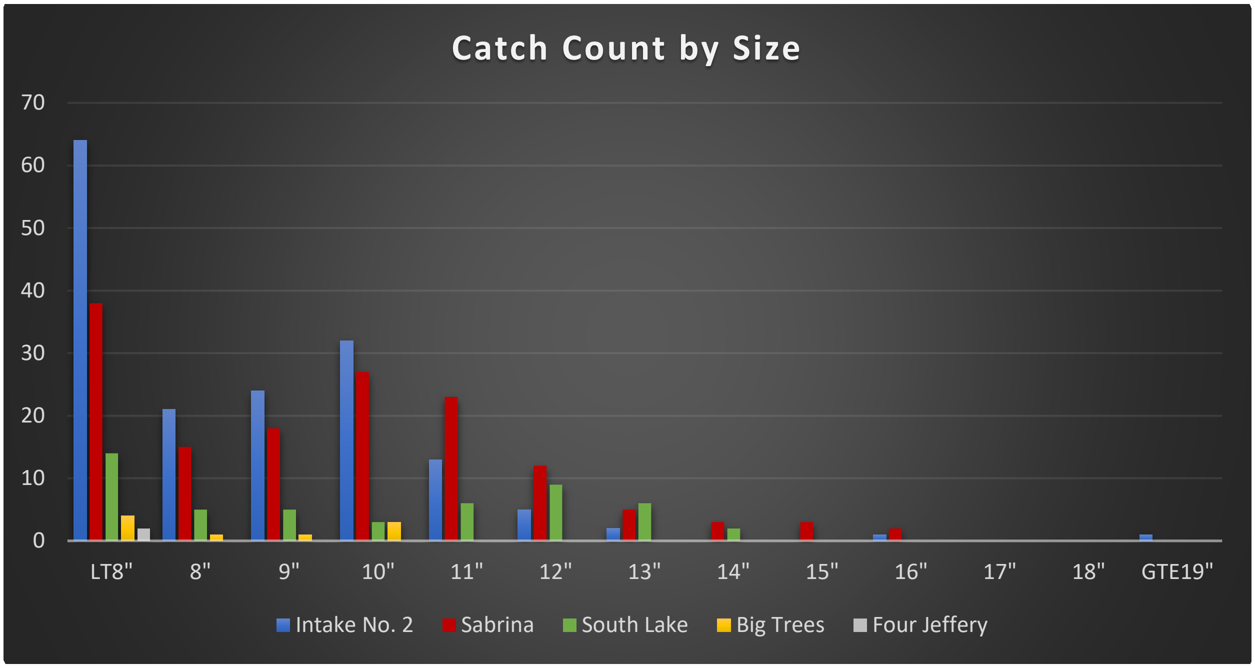


Figure 6.6-3 Catch Count by Size

Respondents were asked to estimate the total amount of time they have or would spend fishing that day. Using these values, a metric of fish per effort-hour was calculated to be approximately 0.5 fish per hour of effort spent fishing or catching one fish every other hour.

Table 6.6-28 Estimate of Fish per Effort-Hour

Location	Hours Spent Fishing[a]	Total Fish Caught	Fish Per Effort-Hour
Four Jeffrey	3.25	2	0.62
Big Trees	16.00	9	0.56
Forks[b]	n/a	n/a	n/a
Intake No. 2	316.78	163	0.51
Lake Sabrina	302.10	146	0.48
South Lake	91.25	50	0.55

[a] Time represents self-reported time spent fishing by anglers interviewed. As such, times were reported to be inaccurate (e.g., reporting total time at recreation site rather than time spent only fishing).
[b] No anglers were available for survey during site visits.

Anglers were surveyed on how the overall quality of fishing at these locations compared to past experiences at same location and how they defined the quality of fishing. Responses were grouped by common responses and are visualized as Word clouds in Figure 6.6-4 and Figure 6.6-5. Note that the size of the response word indicates the frequency of response.

Figure 6.6-4 Word Cloud for Responses to the Question: How does overall fishing quality here compare to past experiences here?

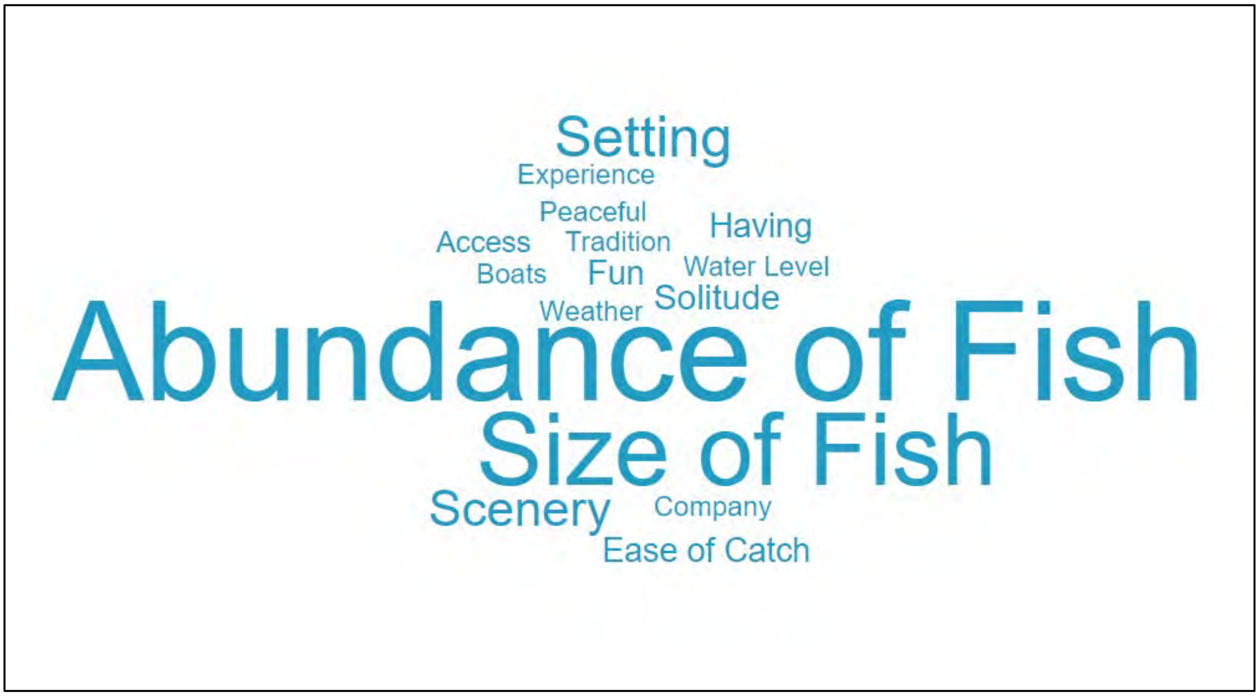


Figure 6.6-5 Word Cloud for Responses to the Question: How do you define quality of fishing?

7.0 INYO NATIONAL FOREST – NATIONAL VISITOR USE MONITORING REPORT (FISCAL YEAR 2016 DATA)

The NVUM 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 2018). The most recent visitor use report for the INF was updated on January 21, 2018, and summarizes data collected during fiscal year 2016. The following is a summary of results of that report.

Total visits to the INF[7] in fiscal year 2016 are estimated at 2,309,000 individuals. Many people frequent more than one site during their visit, so estimates are further broken down by site visits, totaling 4,624,000 visits[8]. The most frequented site or area associated with the INF is day use developed (2,608,000 visits), followed by overnight use developed (876,000 visits), general forest area (850,000 visits), and designated wilderness (290,000 visits). Site visits are further broken down by each activity in which the individual participated during that visit. The most common activities selected by survey participants were viewing natural features, hiking/walking, relaxing, downhill skiing, viewing wildlife, and driving for pleasure. The most commonly chosen main activity by survey participants was downhill skiing, followed by hiking/walking, viewing natural features and bicycling. A complete list of activity participation results is provided in Table 7.1-1.

Demographic data indicates that that 89.3 percent of visitors are White, followed Hispanic/Latino (9.5 percent), Asian (9.1 percent), Black/African American (2.6 percent), American Indian/Alaska Native (2.5 percent), and Hawaiian/Pacific Islander (1.7 percent)[9]. Age distribution estimates 17 percent of visitors are children under the age of 16, and 23 percent are over the age of 60. Most visitors, an estimated 74.4 percent, live more than 200 miles from the forest, and only 18 percent live within a 50-mile proximity.

[7] The 2018 NVUM Report defines a National Forest Visit as the entry of one person upon a national forest to participate in recreation activities for an unspecified time. A national forest visit can be composed of multiple site visits. The visit ends when the person leaves the national forest to spend the night somewhere else.

[8] The 2018 NVUM Report defines a site visit as the entry of one person onto a National Forest site or area to participate in recreation activities for an unspecified period of time. The site visit ends when the person leaves the site or area for the last time on that day.

[9] Respondents could choose more than one racial group, so the total may be more than 100%.

Table 7.1-1 Activity Participation Results

Activity	% Participation	% Main Activity
Viewing Natural Features	45.3	8.5
Hiking / Walking	44.2	16.3
Relaxing	34.8	4.6
Downhill Skiing	34.1	32.3
Viewing Wildlife	30.3	0.6
Driving for Pleasure	23.6	1.8
Bicycling	11.9	8.2
Visiting Historic Sites	11.7	0.6
Developed Camping	11.6	3.6
Nature Center Activities	11.2	0.7
Fishing	11	5.8
Picnicking	8.6	0.4
Nature Study	7.8	0.3
Resort Use	7.8	0
Cross-country Skiing	6.8	5.5
Some Other Activity	6.6	4.9
Backpacking	4.9	2.2
Other Non-motorized	3.8	0.3
OHV Use	2.9	0.4
Primitive Camping	2.9	0.2
Motorized Trail Activity	2.7	0.4
Non-motorized Water	2.1	0.5
Gathering Forest Products	1.7	0
Other Motorized Activity	1	0.8
Hunting	0.6	0.5
Horseback Riding	0.6	0.2
Motorized Water Activities	0.4	0.1
No Activity Reported	0.3	0.6

Activity	% Participation	% Main Activity
Snowmobiling	0.3	0

Source: USFS 2018

8.0 FUTURE RECREATION USE

The Land Management Plan for the INF (USDA 2020) outlined proposed and possible actions to help maintain existing conditions or achieve desired conditions in the INF over the next 10 to 15 years (although some goals may not be achieved for several decades), including a discussion on sustainable recreation. Currently, the desired conditions and management approaches include considering changes in visitor use levels, patterns of use, and generally ensuring that the available infrastructure and amenities are consistent with user capacity and needs.

The Land Management Plan specifies that a goal for the INF is to "modify existing recreation facilities and develop new facilities to accommodate a diversity of…preferred activities of current populations who would benefit from recreational opportunities" (USDA 2019). Additionally, several of the proposed and possible actions listed for the INF involve the completion of deferred maintenance, and/or improvement of existing amenities, which could increase use of recreation amenities (USDA 2020).

The California Department of Finance's Demographic Research Unit produces projections of population through the year 2060 with components of change, births, and public school enrollment at the state and county level (CDF 2021). Since, according to web-based survey results, the majority of recreators at the Bishop Creek reservoirs are from Inyo and Los Angeles counties, projections of population increase for these two counties are examined below. As shown in Table 8.1-2, projections into 2060 for Inyo and Los Angeles counties estimate population loss in both counties. However, there is an expected population increase of 8.4 percent within California state.

Table 8.1-1 Population Estimates Through 2060

		California	Inyo County	Los Angeles County
2025	Population	40,808,001	18,055	10,258,572
2030	Population	41,860,549	18,020	10,322,678
	% Change	*2.6%*	*-0.2%*	*0.6%*
2035	Population	42,718,403	17,864	10,331,803
	% Change	*4.7%*	*-1.1%*	*0.7%*
2040	Population	43,353,414	17,552	10,286,350
	% Change	*6.2%*	*-2.8%*	*0.3%*
2045	Population	43,785,947	17,204	10,193,978
	% Change	*7.3%*	*-4.7%*	*-0.6%*
2050	Population	44,049,015	16,671	10,061,774
	% Change	*7.9%*	*-7.7%*	*-1.9%*
2055	Population	44,176,739	16,112	9,891,603
	% Change	*8.3%*	*-10.8%*	*-3.6%*
2060	Population	44,228,057	15,653	9,697,634
	% Change	*8.4%*	*-13.3%*	*-5.5%*

SOURCE: CDF 2021

8.1 CALIFORNIA STATEWIDE COMPREHENSIVE OUTDOOR RECREATION PLAN AND RELATED REPORTS

According to the California Department of Parks and Recreation (CDPR), the California SCORP "sets grant priorities for outdoor recreation access in California for the next five years" and the 2021-2025 edition "empowers local communities to create, expand, and improve close-to-home parks for all Californians" (CDPR 2021). While the 2021-2025 California SCORP does not offer specific data regarding current and future recreation needs, it did identify five priorities based on key findings from 37 focus groups who shared their vision for parks and recreation:

- New park access
- Multi-use parks designed for all age groups in new or existing parks
- Health design goals for new or existing parks
- Safety and beautification for new or existing parks
- Preservation (place outdoor open space land under protection for public recreation)

As well as identified four keys to increase healthy park use:

- Provide access to a park
- Consider design
- Offer programs
- Market to the community

The following reports were essential elements used in the 2021-2025 SCORP development that may provide information relevant to the Bishop Creek area:

- Vision for Park Equity 2000-2020: Transforming Park Access with Data and Technology (CDPR 2020a)
- Designing Parks Using Community-Based Planning – Methods from California's Statewide Park Development and Community Revitalization Program Outdoor Recreation in California's Regions (CDPR 2020b)

The following general findings may be important in addressing current and future recreation needs in the Bishop Creek Area (CDPR 2020a):

- By number, parks in California are mostly owned by city (9000), special district (1700) and county agencies (1200).
- By acres, parks and open spaces in California are mainly owned by federal (43,700,000) and state agencies (1,990,000).
- Over 61 percent of Californians live in census tracts with less than 3 acres of parkland per 1,000 residents.
- Nearly 8 million people, 21 percent of Californians, have no park within a half mile of their homes.
- Land acquisition and construction prices have increased by approximately $1,500,000 per project site over the past decade from 2010 to 2020.
- Based on current projections, for each $600 million investment, an additional 1 million Californians would have new or expanded park access within a half mile of their neighborhoods.

9.0 RECREATION NEEDS ASSESSMENT

Based on the results of the REC 1 study, a few major themes have emerged related to recreation needs at the Bishop Creek Project:

- Survey respondents indicated that existing facilities were generally in average condition, which aligns with the REC 2 report that found most site elements at the reservoirs to be in working condition but in need of maintenance, repair, or upgrade.
- Day use facilities at the reservoirs were generally perceived to be crowded, especially at Intake No. 2 Reservoir with the most common survey response of Always Crowded (33.6 percent), with 96.8 percent of all responses between Sometimes Crowded and Always Crowded.
- While the number of most existing facilities was found to be about right, respondents indicated that parking facilities, trailer parking, and fish cleaning stations are too few. Respondents were also very unsatisfied with existing boat trailer parking.
- Besides boat trailer parking, general parking is an issue throughout the study area. According to spot counts throughout the entire study season, all parking areas are under capacity except South Lake's upper parking lot, which is reserved mostly for overnight parking for wilderness users and averaged 88 percent capacity. When analyzing peak weekend days, however, four parking areas exceed their capacity. As a result, recreators are frequently parking in areas not intended for vehicle parking. These four include: Lake Sabrina roadside parking (123 percent capacity), South Lake upper parking lot (103 percent), South Lake launching pier/restroom parking lot (119 percent), and South Lake boat launch parking (127 percent). Exceedance of capacity at Sabrina roadside parking, as indicated by many open-ended responses, may be a result of overnight wilderness users parking as close to the Sabrina Basin Trailhead rather than parking further down the road at the designated overnight parking area (North Lake Road overnight parking) where capacity utilization only reached 13 percent on peak weekend days. Users specifically noted that conflicting overnight/day use/trailer parking at South Lake and Lake Sabrina was an issue.
- 64.9 percent of survey respondents expressed that they would utilize overnight facilities at the Bishop Creek reservoirs if they were available.
- As also noted in the REC 2 report and corroborated with trail counter data in this REC 1 report, informal use of certain trails – Green Creek Diversion Pipeline, Inlet Trail, and access to Little Egypt climbing area – is commonplace and may warrant action to either preclude or formalize the use, depending on management objectives.

10.0 CONSULTATION SUMMARY

SCE distributed periodic progress reports on the following schedule:

- Progress Report 1: December 19, 2019
- Progress Report 2: April 14, 2020
- Progress Report 3: July 24, 2020
- Initial Study Report (Progress Report 4): October 30, 2020
- Initial Study Meeting: November 10, 2020
- Progress Report 1: March 2, 2021
- Progress Report 2: May 28, 2021
- Progress Report 3: August 27, 2021
- Updated Study Report Filing: November 4, 2021
- Updated Study Report Meeting: November 18, 2021

The Initial Study Report (ISR) was filed with FERC on October 30, 2020 and a virtual ISR meeting was held on November 10, 2020. Three progress reports were filed in 2021 after the October 2020 ISR, as noted above.

SCE held a Bishop Creek Project Effects meeting on October 28, 2021 for all stakeholders and agencies to discuss the possible project effects (if any) were identified through the implementation of each of the approved study plans.

The Updated Study Report (USR) was filed with FERC on November 4, 2021, and a USR meeting was held on November 18, 2021. At this meeting, SCE only discussed those studies which were still in progress at the time of the ISR (Water Quality, Sediment and Geomorphology, Operations Model, Recreation Use and Needs, Recreation Facilities Condition Assessment, Project Lands and Boundary, and Cultural and Tribal Studies). Comments received at this meeting regarding the Recreation Use and Needs Study are included in Table 10.1-1. A brief memo on results to date was submitted to agencies and stakeholders for a 60-day review period on November 5, 2021, following filing of the USR.

A meeting was held with USFS on December 7, 2021, to discuss comments received on the REC 1 report as well as SCE's draft responses.

A summary of correspondence since the Revised Study Plans were filed for REC 1 and REC 2 study plans are provided in Table 10-1.2.

Table 10.1-1 Comment Response Table

Comment No.	Study	Date of Comment	Entity	Comments	SCE Response
1	REC 1, Updated Study Report/Meeting Comments	December 3, 2021	SWRCB	I know climbing is one of the recreation uses; are there other climbing areas within the Project area besides Little Egypt	There are no climbing areas within the Project boundary, as most of the climbing near the Project is at higher elevations and within the John Muir Wilderness. Access to Little Egypt climbing area was included in recreation studies because SCE's Plant 3 parking facilities have been used by climbers to informally access the area. Data collected will be used to determine how to potentially manage or preclude this issue.
2	REC 1, Updated Study Report/Meeting Comments	December 3, 2021	SWRCB	Why didn't you break out climbing specifically in your recreation analysis?	A summary of climbing activity in the Project area was included in the PAD, though there were no data gaps identified that warranted a more detailed study of climbing use in the area.
3	REC 1, Updated Study Report/Meeting Comments	December 3, 2021	USFS	Was there a decision not to include off-highway vehicles (OHVs) as part of the study? **Updated Response from USFS**: USFS considers all Level 2 roads for OHV use. Sand Canyon and Coyote Road receive a lot of OHV use.	No data gaps related to OHV use were identified in the development of study plans. Once the initial inventory of Project Roads is provided for discussion, we would appreciate USFS feedback on which of those roads have issues with OHV use. Further discussion around OHV use will be incorporated into the Recreation Resource Management Plan being developed for the Final License Application.

Table 10-1.2 Consultation Since Filing of Revised Study Plans (REC 1 and REC 2)

Date of Consultation	Entities Involved	Description
09/30/2019 (Email to USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Email in preparation of an October 30 conference call providing a tentative agenda to discuss two goals of continued consultation: (1) develop and finalize both on-site and off-site survey instruments and methods; and (2) 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.
10/28/2019 (Email and Memo to USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Email in preparation of a November 7 conference call (moved from October 30). Memo proposing 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.
11/07/2019 (Conference Call with USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Conference call to discuss 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. Many changes to study plans discussed as detailed in a 12/10/2019 memo.
12/10/2019 (Email, Memo, Survey Instrument, and Meeting Notes to USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt	Email to schedule an upcoming call and provide a draft revised recreation survey instrument, meeting notes from 11/7/2019, and a memo regarding survey frequency, schedule, and instruments based on the previous conversation.

Date of Consultation	Entities Involved	Description
	Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	
01/08/2020 (Email, Survey, and Conference Call with USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Email providing revised general recreation survey instrument for discussion. Conference call to discuss survey frequency, schedule, and instruments based on the previous conversation. USFS provided news of a recent development in the Bishop Creek area – construction activity along South Lake Road – that would negatively affect the scheduled activities for the 2020 recreation season, most notably user counts and surveys.
01/14/2020 (Email and Memo to USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Phillip Desenze, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Email providing memo regarding 1/8/2020 conference call. General recreation survey instrument finalized. Revisions to survey frequency and implementation schedule based on discussion, including altering of schedule based on news of South Lake Road construction that would negatively affect the scheduled activities for the 2020 recreation season, most notably user counts and surveys.
01/15/2020 (Conference Call with USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Phillip Desenzo, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Conference call discussing whether, despite road construction, both on-site and off-site surveys should be considered for both the 2020 and 2021 recreation seasons. SCE believed that on-site recreation use surveys and counts in 2020 would not provide a representative sample of use, given this major disruption to recreational access to one of the three major recreation areas (South Lake, Lake Sabrina, and Intake No. 2 recreation areas). The likelihood of skewed data would make determination of Project-related effects and identification of appropriate protection, mitigation, and enhancement measures difficult. Therefore, SCE proposed to move the relicensing recreation use surveys and counts to 2021 and will assist the USFS in the development off-site surveys (supplemental data) requested by the USFS in late 2019.

Date of Consultation	Entities Involved	Description
01/15/2020 (Email and Survey to USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Phillip Desenzo, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Follow up to conference call providing Word version of the provided survey instrument so that the USFS may mark it up in tracked changes.
01/22/2020 (Email and Memo to USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Phillip Desenzo, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Email providing a memo discussing a revised implementation schedule and proposed roles and responsibilities regarding off-site surveys, which will then be discussed on an upcoming January 23, 2020 conference call.
01/23/2020 (Conference Call with USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Phillip Desenzo, USFS Nora Gamino, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Conference call discussing 1/22/2020 memo.
01/23/2020 (Follow-Up Email with USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Phillip Desenzo, USFS Matthew Woodhall, SCE	Follow up email providing a Word version of the same survey instrument so that USFS could provide edits in tracked changes.

Date of Consultation	Entities Involved	Description
	Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	
02/06/2020 (Email and Memo to USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Phillip Desenzo, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Email providing memo regarding 1/23/2020 discussion.
02/06/2020 (Email and Survey to USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Phillip Desenzo, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Email providing a Spanish version of the approved on-site recreation survey instrument.
03/13/2020 (Conference Call with USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Phillip Desenzo, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Email
03/25/2020	Tristan Leong, USFS	Email from USFS regarding staff unavailability due to COVID-19 response.

Date of Consultation	Entities Involved	Description
(Email from USFS)	Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Phillip Desenzo, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	
04/04/2020 (Conference Call with USFS and Survey Comments from USFS)	Tristan Leong, USFS Sheila Irons, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Call to discuss off-site recreation survey and comments provided by the USFS.
05/13/2020 (Email and Survey to USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Phillip Desenzo, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Incorporation of USFS comments and porting of off-site survey into a web-based format.
05/13/2020 (Conference Call with USFS)	Tristan Leong, USFS Sheila Irons, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Discussion of web-based survey to be used off-site.

Date of Consultation	Entities Involved	Description
05/13/2020 (Follow-Up Email and Survey to USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Phillip Desenzo, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Incorporation of USFS comments during 5/13/2020 call and redistribution.
05/13/2020 (Email to USFS)	Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Matthew Harper, Kleinschmidt	Email regarding upcoming REC 2 fieldwork.
05/26/2020 (Email to USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Phillip Desenzo, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Follow-up with revised link to most recent web-based, off-site survey.
05/27/2020 (Conference Call and Survey with USFS)	Tristan Leong, USFS Sheila Irons, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Discussion of most recent version of web-based, off-site survey.
07/07/2020 (Email to USFS)	Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Matthew Harper, Kleinschmidt	Email regarding upcoming REC 2 fieldwork and requesting conference call.

Date of Consultation	Entities Involved	Description
	Bryan Cole, MacKay Sposito	
07/09/2020 (Conference Call with USFS)	Tristan Leong, USFS Sheila Irons, USFS Matthew Harper, Kleinschmidt	Discussion of most recent version of web-based, off-site survey.
07/21/2020 (Emails with USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Phillip Desenzo, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Follow-up with revised link to most recent web-based, off-site survey. Concurrence emails from Tristan Leong, Diana Peitrasanta, and Phillip Desenzo. Follow up with final link to live survey to be embedded on USFS and SCE websites.
07/07/2020 (Emails with USFS)	Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Matthew Harper, Kleinschmidt	Emails regarding upcoming REC 2 fieldwork.
01/19/2021 (Conference Call with USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Phillip Desenzo, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Discussion regarding the status of REC 1 activities. With REC 1 field work scheduled to begin April 2021 and significant unknowns associated with the COVID-19 pandemic, various options to delay scheduling or alter methods were discussed.
01/27/2021 (Email to USFS)	Nora Gamino, USFS Matthew Harper, Kleinschmidt	Email requesting past operation and maintenance cost data for use in an O&M Economics Assessment of the facilities associated with the three recreation areas.

Date of Consultation	Entities Involved	Description
01/28/2021 (Email from USFS)	Nora Gamino, USFS Matthew Harper, Kleinschmidt	Email suggesting reaching out to Adam Barnett stating that what past operation and maintenance data exists would not truly reflect actual costs due to a lack of funding in the area.
02/01/2021 (Emails with USFS)	Nora Gamino, USFS Adam Barnett, USFS Matthew Harper, Kleinschmidt	Emails discussing general breakdown of operational costs and identifying areas where detailed information may be provided.
02/09/2021 (Conference Call with USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Phillip Desenzo, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	SCE proposed to move forward with data collection during the 2021 recreation season, intending to meet the same goals and objectives outlined in the REC 1 study plan. This would be accomplished largely by modifying methods of collecting qualitative data for recreation use and needs at the Project that were originally to be administered on-site.
03/12/2021 (Email to USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Phillip Desenzo, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt Matthew Harper, Kleinschmidt	Email providing a memo with a summary of the proposed changes to REC 1 study methods.
03/15/2021 (Conference Call with USFS)	Tristan Leong, USFS Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Phillip Desenzo, USFS Matthew Woodhall, SCE Kelly Larimer, Kleinschmidt Finlay Anderson, Kleinschmidt	Discussion of 3/12/2021 proposal of changes to methods and agreement to move forward.

Date of Consultation	Entities Involved	Description
	Matthew Harper, Kleinschmidt	
07/09/2021 (Email to USFS)	Nora Gamino, USFS Adam Barnett, USFS Matthew Harper, Kleinschmidt	Follow up email regarding past operation and maintenance cost data.
09/30/2021 (Email to USFS)	Nora Gamino, USFS Adam Barnett, USFS Matthew Harper, Kleinschmidt	Follow up email regarding past operation and maintenance cost data.

11.0 REFERENCES

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

California Department of Parks and Recreation (CDPR) 2020a. Vision for Park Equity 2000-2020: Transforming Park Access with Data and Technology. California Department of Parks and Recreation, Sacramento, CA.

California Department of Parks and Recreation (CDPR) 2020b. Designing Parks Using Community-Based Planning – Methods from California's Statewide Park Development and Community Revitalization Program Outdoor Recreation in California's Regions. California Department of Parks and Recreation, Sacramento, CA.

California Department of Finance (CDF). 2021. Demographic Research Unit. Report P-2A: Total Population Projections, California Counties, 2010-2060 (Baseline 2019 Population Projections; Vintage 2020 Release). Sacramento: California. July 2021.

California Department of Parks and Recreation (CDPR). 2021. 2021-2015 Statewide Comprehensive Outdoor Recreation Plan. California Department of Parks and Recreation, Sacramento, CA.

California Department of Finance (CDF). 2021. Demographic Research Unit. Report P-2A: Total Population Projections, California Counties, 2010-2060 (Baseline 2019 Population Projections; Vintage 2020 Release). Sacramento: California. July 2021.

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. Department of Agriculture (USDA). 2019. Land Management Plan for the Inyo National Forest. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd589652.pdf.

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

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

U.S. Forest Service (USFS). 2011. Visitor Use Report, Inyo National Forest, USDA Forest Service, Region 5, National Visitor Use Monitoring Data collected FY 2011. United States Department of Agriculture.

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

APPENDIX A

SURVEY QUESTIONS

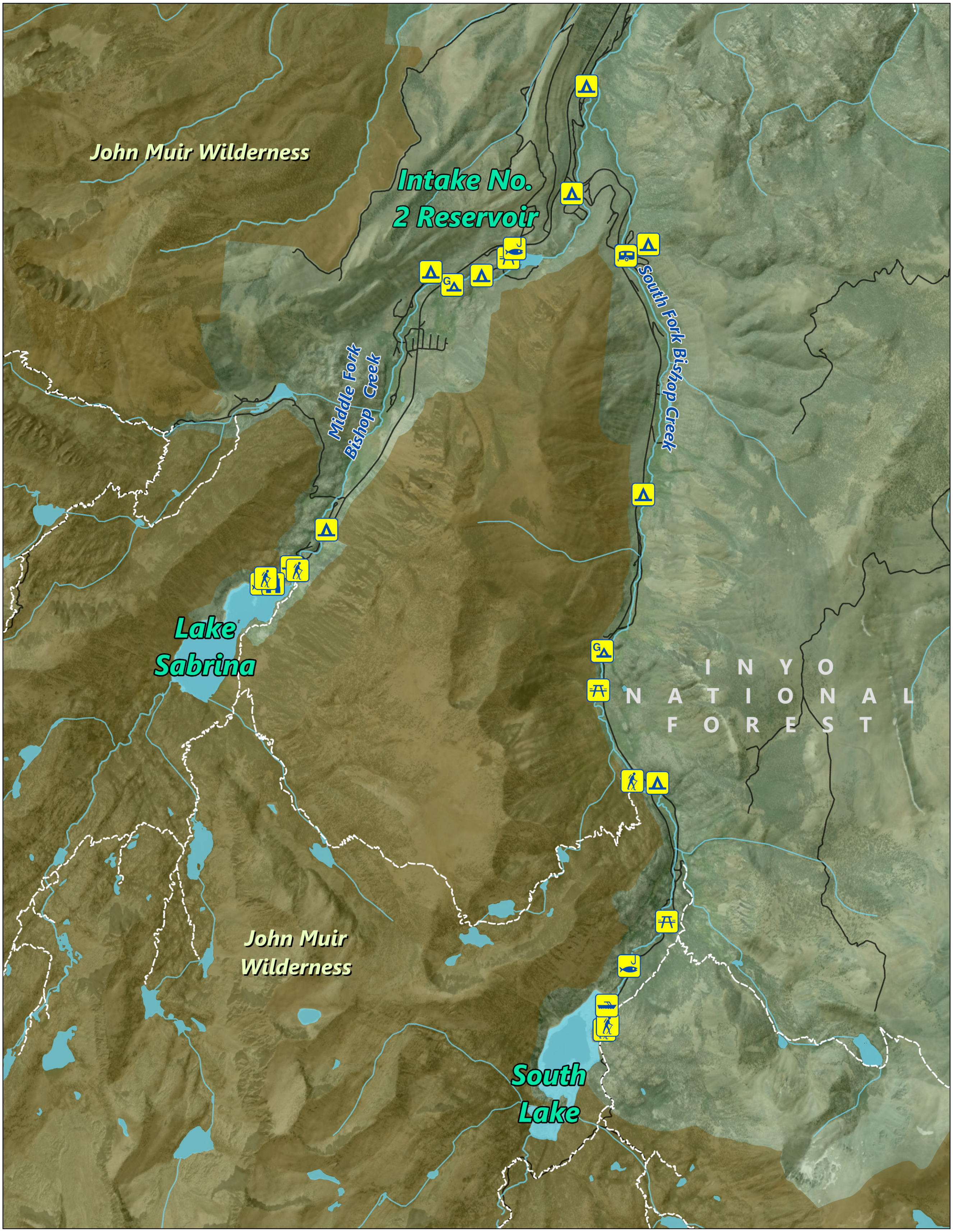
Bishop Creek Reservoirs: Recreational Use Survey

Welcome to the recreational use survey for the Bishop Creek Hydroelectric Project.

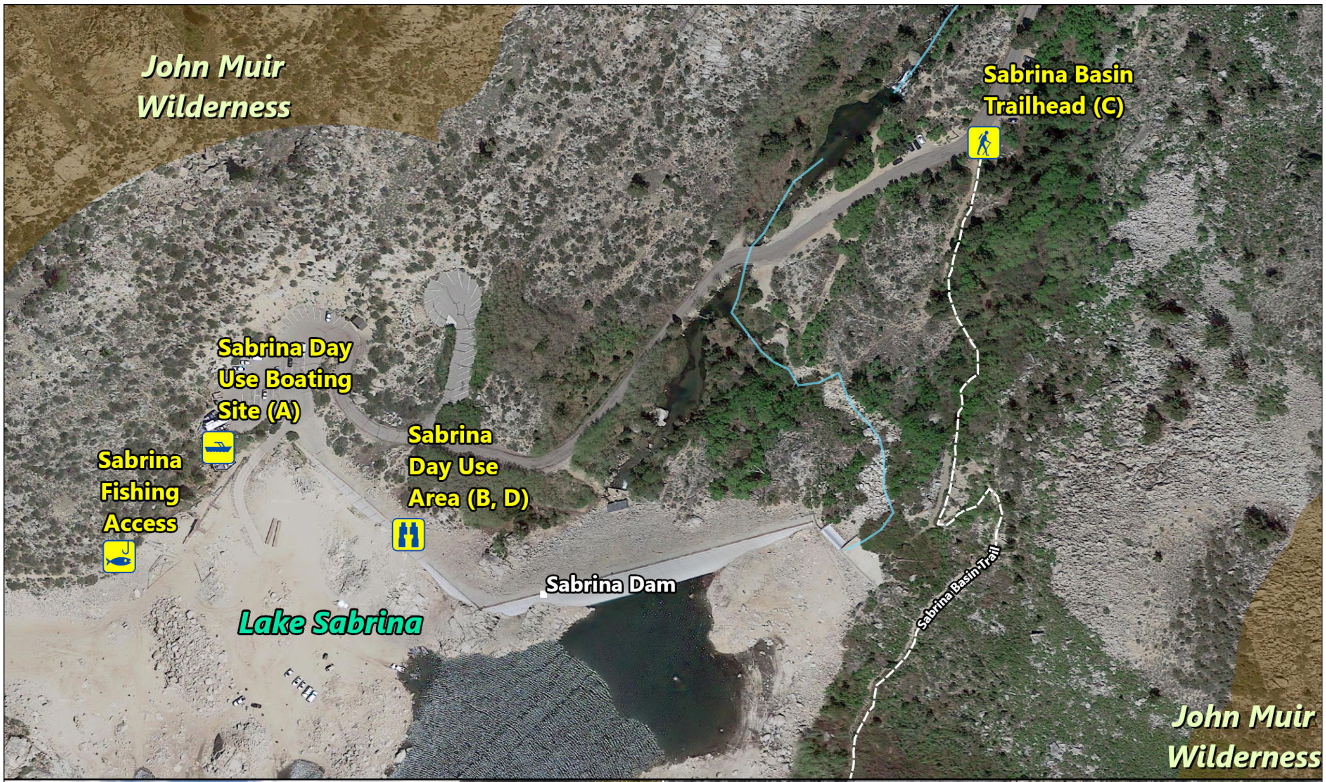
The purpose of this survey is to gather information about recreation opportunities related to the Bishop Creek Hydroelectric Project, specifically Lake Sabrina, South Lake, and Intake No. 2 Reservoir. Collectively, we will call these the "Bishop Creek Reservoirs". The information you provide will help guide current and future management of recreation opportunities, sites, and facilities for visitors to the Bishop Creek Reservoirs.

Please use the map and photos below to re-familiarize yourself with the each general recreation area before answering the survey questions, and feel free to encourage others to participate in this survey.

Bishop Creek Reservoirs



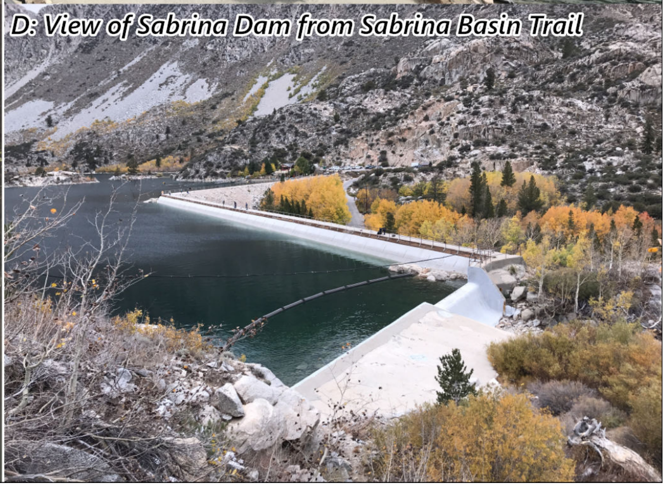
Lake Sabrina



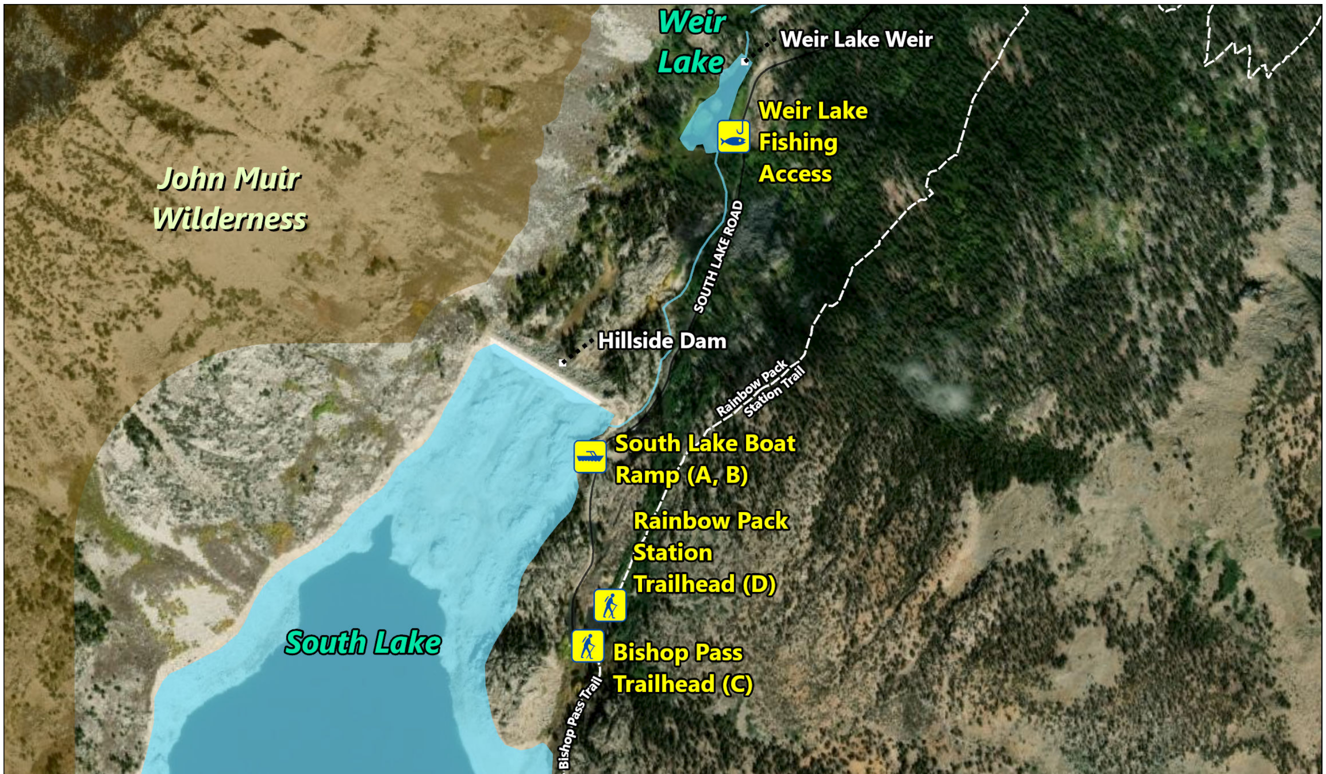

A: Boat Launch & Marina


B: Sabrina Dam & Day Use Area


C: Sabrina Basin Trailhead


D: View of Sabrina Dam from Sabrina Basin Trail

South Lake




A: Parking for Boat Launch


B: Boat Launch & Marina


C: Restroom at Bishop Pass Trailhead


D: Day Use Area at Rainbow Pack Station Trailhead

Intake No. 2 Reservoir

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey

1. Please let us know how you heard about this survey.

- ◯ A flier or posting within the Inyo National Forest
- ◯ Forest Service Website
- ◯ Southern California Edison Website
- ◯ Social Media
- ◯ Other (please specify)

[ ]

2. Would you please provide only the 5-digit zip-code of your primary residence. ***[Note: No personal information is being sought; rather, SCE is seeking to understand the demographics of its current recreational users.]***

5-digit zip code if residing in the USA [ ]

Country for individuals residing outside the USA [ ]

3. Please provide the age of the individual completing this survey using the ranges provided below.

- ◯ Under 18
- ◯ 18-24
- ◯ 25-34
- ◯ 35-44
- ◯ 45-54
- ◯ 55-64
- ◯ 65+

* 4. Have you ever recreated at the Bishop Creek Reservoirs?

◯ Yes

◯ No

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey

5. When visiting the Bishop Creek Reservoirs, how many ***people*** are typically in your party?

1 People in Party 20+

6. How many ***years*** have you been visiting the Bishop Creek Reservoirs?

1 Years 40+

7. In general, how many ***days per year*** do you visit the Bishop Creek Reservoirs?

- ◯ 1 day
- ◯ 2 - 5 days
- ◯ 6 - 10 days
- ◯ 11 - 20 days
- ◯ 21 - 30 days
- ◯ 31 - 50 days
- ◯ more than 50 days

8. During which *months* do you typically visit the Bishop Creek Reservoirs? (Select all that apply)

- ☐ January
- ☐ February
- ☐ March
- ☐ April
- ☐ May
- ☐ June
- ☐ July
- ☐ August
- ☐ September
- ☐ October
- ☐ November
- ☐ December

9. What *day(s) of the week* do you typically visit the Bishop Creek Reservoirs? (Select all that apply)

- ☐ Monday
- ☐ Tuesday
- ☐ Wednesday
- ☐ Thursday
- ☐ Friday
- ☐ Saturday
- ☐ Sunday

10. What *time(s) of day* do you most like to visit the Bishop Creek Reservoirs? (Select all that apply)

- ☐ Before 8 AM
- ☐ 8 AM - 12 noon
- ☐ 12 noon - 4 PM
- ☐ 4 PM - 8 PM
- ☐ After 8 PM

11. On average, how long *(hours)* is a typical visit?

- ◯ less than 1 hour
- ◯ 1 - 2 hours
- ◯ 2 - 4 hours
- ◯ 4 - 8 hours
- ◯ greater than 8 hours

SOUTHERN CALIFORNIA EDISON

Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey

12. The Inyo National Forest maintains a number of developed day use sites at each Bishop Creek Reservoirs recreation area. Using the map below, please indicate at which recreation area(s) you have recreated. (Select all that apply)

- [ ] Lake Sabrina Recreation Area
- [ ] South Lake Recreation Area
- [ ] Intake No. 2 Reservoir Recreation Area

13. What ***type of recreational activities*** do you pursue at the Bishop Creek Reservoirs? (Select all that apply)

- [ ] Bicycling to the reservoirs
- [ ] Camping
- [ ] Fishing
- [ ] Hiking/Trail Use
- [ ] Boating (Motorized)
- [ ] Boating (Non-Motorized)
- [ ] Photography
- [ ] Picnicking
- [ ] Relaxing
- [ ] Rock Climbing
- [ ] Scenic Driving
- [ ] Viewing Scenery
- [ ] Viewing Wildlife

Other (please specify)

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey

Day Use Facilities

14. For the recreation areas that have you used, how would you rate your overall ***satisfaction*** with the facilities at those day use sites? (Select all that apply)

	Not at All Satisfied	Slightly Satisfied	Neutral	Very Satisfied	Extremely Satisfied	N/A
Lake Sabrina Recreation Area	◯	◯	◯	◯	◯	◯
South Lake Recreation Area	◯	◯	◯	◯	◯	◯
Intake No. 2 Reservoir Recreation Area	◯	◯	◯	◯	◯	◯

15. For the recreation areas that have you used, how would you rate the overall ***condition*** of the facilities at those day use sites? (Select all that apply)

	Poor		Average		Excellent	N/A
Lake Sabrina Recreation Area	◯	◯	◯	◯	◯	◯
South Lake Recreation Area	◯	◯	◯	◯	◯	◯
Intake No. 2 Reservoir Recreation Area	◯	◯	◯	◯	◯	◯

16. In your experience, how would your rate the ***number*** of existing day use facilities at the Bishop Creek Reservoirs? (Select all that apply)

	Too Few		About Right		Too Many	N/A
Restrooms	○	○	○	○	○	○
Vehicle Parking	○	○	○	○	○	○
Trailer Parking	○	○	○	○	○	○
Picnic or Day Use Areas	○	○	○	○	○	○
Boat Launches	○	○	○	○	○	○
Public Docks	○	○	○	○	○	○
Hiking Trails	○	○	○	○	○	○
Swim Areas	○	○	○	○	○	○
Signage	○	○	○	○	○	○
Fish Cleaning Stations	○	○	○	○	○	○

Other (please specify)

17. In general, for your combined trips to ***day use sites*** at the Bishop Creek Reservoirs, how ***crowded*** do you feel at the following locations? (Rate one per row)

	Never Crowded		Sometimes Crowded		Always Crowded	N/A
Lake Sabrina Recreation Area	○	○	○	○	○	○
South Lake Recreation Area	○	○	○	○	○	○
Intake No. 2 Reservoir Recreation Area	○	○	○	○	○	○

18. Please provide any additional detail on how we can improve day use opportunities at the Bishop Creek Reservoirs.

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey

Fishing

* 19. Have you ***fished or are you interested in fishing*** at the Bishop Creek Reservoirs?

- ◯ I have fished at the Bishop Creek Reservoirs
- ◯ I wanted to fish at the Bishop Creek Reservoirs, but something prevented me from doing so
- ◯ I have no desire to fish at the Bishop Creek Reservoirs

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey

Fishing

20. Which of the following describes ***what prevented you*** from fishing at the Bishop Creek Reservoirs? (Select all that apply)

- ☐ Facilities are too crowded
- ☐ Insufficient opportunities and accessibility
- ☐ Condition of facilities or access points are not well maintained
- ☐ Boat rental fees are too high
- ☐ Other (please specify)

21. Please provide any additional detail on how we can improve fishing opportunities at the Bishop Creek Reservoirs.

SOUTHERN CALIFORNIA EDISON

Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey

Fishing

22. Where do you typically spend your time fishing at the Bishop Creek Reservoirs? (Select all that apply)

- ☐ Lake Sabrina
- ☐ South Lake
- ☐ Weir Lake
- ☐ Intake No. 2 Reservoir
- ☐ North Fork Bishop Creek
- ☐ South Fork Bishop Creek

Other (please specify)

____

23. In general, for your combined fishing trips to the Bishop Creek Reservoirs, how ***crowded*** do you feel at the following locations? (Rate one per row)

	Never Crowded		Sometimes Crowded		Always Crowded	N/A
Lake Sabrina	○	○	○	○	○	○
South Lake	○	○	○	○	○	○
Weir Lake	○	○	○	○	○	○
Intake No. 2 Reservoir	○	○	○	○	○	○
North Fork Bishop Creek	○	○	○	○	○	○
South Fork Bishop Creek	○	○	○	○	○	○

24. Please provide any additional detail on how we can improve fishing opportunities at the Bishop Creek Reservoirs.

SOUTHERN CALIFORNIA EDISON

Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey

Boating

* 25. Please select the answer that describes your interest in or experience ***boating*** at the Bishop Creek Reservoirs?

- ◯ I have boated at the Bishop Creek Reservoirs
- ◯ I wanted to boat at at the Bishop Creek Reservoirs, but something prevented me from doing so
- ◯ I have no desire to boat at the Bishop Creek Reservoirs

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey
Boating

26. Which of the following ***types of watercraft*** do you prefer at the Bishop Creek Reservoirs? (Select all that apply)

- ☐ Motorized (personal)
- ☐ Motorized (rental)
- ☐ Non-motorized (personal)
- ☐ Non-motorized (rental)
- ☐ Other (please specify)

27. Which of the following best describes your ***type of boating activity***?

- ◯ Pleasure boating/paddling
- ◯ Fishing
- ◯ Other (please specify)

28. Which of the following best describes ***what prevented you*** from boating at the Bishop Creek Reservoirs?

- ◯ Boat launch facilities are inadequate
- ◯ Boat launch facilities are poorly managed and maintained
- ◯ Too many motorized boats on the reservoirs
- ◯ No boat rentals were available
- ◯ Boat rental fees are too high

Other (please specify)

29. Please provide any additional detail on why you were unable to or chose not to boat at the Bishop Creek Reservoirs?

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey
Boating

30. At which Bishop Creek Reservoir do you typically spend your time ***boating***?

- ◯ Lake Sabrina
- ◯ South Lake
- ◯ Intake No. 2 Reservoir

31. Which of the following types of watercraft do you prefer at the Bishop Creek Reservoirs? (Select all that apply)

- ☐ Motorized (personal)
- ☐ Motorized (rental)
- ☐ Non-motorized (personal)
- ☐ Non-motorized (rental)
- ☐ Other (please specify)

32. In general, for your combined boating activity at the Bishop Creek Reservoirs, how ***crowded*** do you feel at each reservoir? (Rate one per row)

	Never Crowded		Sometimes Crowded		Always Crowded	N/A
Lake Sabrina	◯	◯	◯	◯	◯	◯
South Lake	◯	◯	◯	◯	◯	◯
Intake No. 2 Reservoir	◯	◯	◯	◯	◯	◯

33. How would you rate your overall ***satisfaction*** with boating access at the Bishop Creek Reservoirs? (Select all that apply)

	Not at All Satisfied	Slightly Satisfied	Neutral	Very Satisfied	Extremely Satisfied	N/A
Number of launching facilities	◯	◯	◯	◯	◯	◯
Condition of launching facilities	◯	◯	◯	◯	◯	◯
Lake levels	◯	◯	◯	◯	◯	◯
Parking for boat trailers	◯	◯	◯	◯	◯	◯
Boating size/speed restrictions	◯	◯	◯	◯	◯	◯
Fee for boat rentals	◯	◯	◯	◯	◯	◯

34. Which of the following best describes your ***type of boating activity***?

◯ Pleasure boating/paddling

◯ Fishing

◯ Other (please specify)

35. Please provide any additional detail on how we can improve boating opportunities at the Bishop Creek Reservoirs.

SOUTHERN CALIFORNIA EDISON

Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey

Lodging & Camping

*** 36. If overnight facilities were available at the Bishop Creek Reservoirs, would you utilize them?**

- ◯ Yes
- ◯ No

SOUTHERN CALIFORNIA EDISON

Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey

Developed Campgrounds

* 37. Have you previously ***stayed or wanted to stay*** at a developed campground near the Bishop Creek Reservoirs? *(The following questions will simply refer to these as, "the campgrounds".)*

- ◯ I have stayed at one of the developed campgrounds
- ◯ I wanted to stay at one of the developed campgrounds, but something prevented me from doing so
- ◯ I have no desire to stay at a developed campground near the Bishop Creek Reservoirs

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey

Developed Campgrounds

38. Which of the following best describes ***what prevented you*** from using one of the developed campgrounds in the past?

- ◯ The campgrounds were too crowded
- ◯ The facilities were inadequate
- ◯ The facilities were poorly managed and maintained
- ◯ The campgrounds were not in the location I desired
- ◯ All reservations were booked
- ◯ The fees were too high

Other (please specify)

39. Please provide any additional detail on why you did not stay at one of the developed campgrounds?

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey
Developed Campgrounds

40. How would you rate your overall ***satisfaction*** with the campgrounds you have used?

Not at All Satisfied	Slightly Satisfied	Neutral	Very Satisfied	Extremely Satisfied	N/A
◯	◯	◯	◯	◯	◯

41. How would you rate the ***condition, management, and cleanliness*** of the campgrounds you have used?

Poor		Average		Excellent	N/A
◯	◯	◯	◯	◯	◯

42. How would your rate the ***number of campgrounds*** near the Bishop Creek Reservoirs?

Too Few		About Right		Too Many
◯	◯	◯	◯	◯

43. In general, for your combined trips to the campgrounds, how ***crowded*** do you usually feel?

Never Crowded		Sometimes Crowded		Always Crowded	N/A
◯	◯	◯	◯	◯	◯

44. If the campgrounds were ***more crowded***, would your experience diminish?

- ◯ Yes
- ◯ No
- ◯ N/A

45. How would you rate the ***fees*** associated with the campgrounds?

Too High		About Right		Too Low	N/A
◯	◯	◯	◯	◯	◯

46. How important is the ***location or proximity of campgrounds*** to your preferred recreational activity?

- ◯ Extremely important
- ◯ Very important
- ◯ Somewhat important
- ◯ Not so important
- ◯ Not at all important

47. Please provide any additional detail on how we can improve or expand campground facilities near the Bishop Creek Reservoirs.

SOUTHERN CALIFORNIA EDISON

Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey

Wilderness Access

*** 48. Have you ever used trailheads at the Bishop Creek Reservoirs (e.g., Sabrina Basin Trailhead; Bishop Pass Trailhead) to access the John Muir Wilderness?**

- ◯ Yes
- ◯ No

SOUTHERN CALIFORNIA EDISON

Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey

Wilderness Access

49. Which type of use do you prefer when accessing the John Muir Wilderness? (Select all that apply)

- [ ] Day Use
- [ ] Overnight Use
- [ ] Other (please specify)

50. If driving to the area, please briefly describe where and how you park your vehicle before accessing the John Muir Wilderness.

51. Please provide any additional detail on how we can improve accessibility to the John Muir Wilderness at the Bishop Creek Reservoirs.

SOUTHERN CALIFORNIA EDISON

Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey

52. Thank you for taking the time to complete this survey. Please share any additional comments on your visits and recreation activities at Bishop Creek Reservoirs.

SOUTHERN CALIFORNIA EDISON

Energy for What's Ahead℠

Bishop Creek Reservoirs: Recreational Use Survey

53. Are there any specific reasons why you have not recreated at the Bishop Creek Reservoirs in the past?

54. Are there specific changes or additions to opportunities and/or facilities that would make you want to recreate at the Bishop Creek Reservoirs in the future?

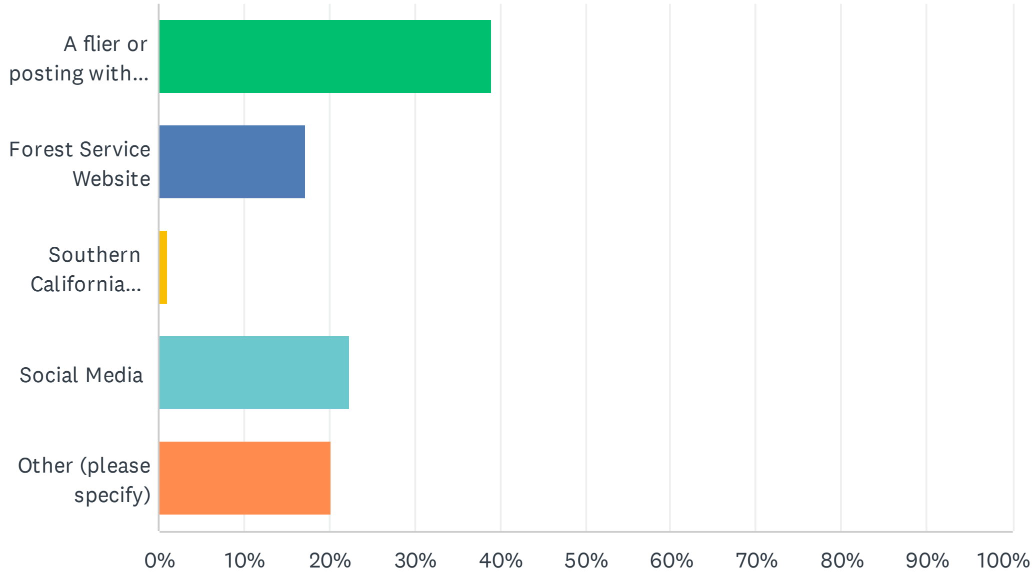
55. Thank you for taking the time to complete this survey. Please share any additional comments on your visits and recreation activities at Bishop Creek Reservoirs.

APPENDIX B

SURVEY RESPONSES

Q1 Please let us know how you heard about this survey.

Answered: 300   Skipped: 61



ANSWER CHOICES	RESPONSES	
A flier or posting within the Inyo National Forest	39.00%	117
Forest Service Website	17.33%	52
Southern California Edison Website	1.00%	3
Social Media	22.33%	67
Other (please specify)	20.33%	61
TOTAL		300

#	OTHER (PLEASE SPECIFY)	DATE
1	Sign neat trail	12/4/2021 1:23 PM
2	Eastern Sierra Land Trust	11/10/2021 9:51 AM
3	Bishop chamber email	11/9/2021 7:00 PM
4	Bishop Chamber of Commerce newsletter	11/9/2021 4:27 PM
5	Bishop Chamber email	11/9/2021 4:12 PM
6	Bishop Chamber Newsletter	11/9/2021 3:44 PM
7	kibs web site	10/8/2021 11:52 AM
8	Inyo Register	10/8/2021 10:32 AM
9	Chamber of Commerce e-newsletter	10/2/2021 9:13 AM
10	Chamber of Commerce Bishop	9/28/2021 1:39 PM
11	ONLINE	9/26/2021 9:40 AM

12	Inyo Register newspaper	9/25/2021 2:31 PM
13	Bishop Chamber of Commerce	9/24/2021 9:17 AM
14	BCOC	9/24/2021 5:15 AM
15	Bishop chamber	9/23/2021 7:01 AM
16	Local news media	9/22/2021 9:44 PM
17	KIBS	9/22/2021 6:53 PM
18	kibs radio	9/22/2021 6:32 PM
19	kibs radio	9/22/2021 6:19 PM
20	bishop chamber newsletter	9/22/2021 3:29 PM
21	Bishop Area Chamber of Commerce	9/22/2021 2:58 PM
22	100.7 FM radio station	9/22/2021 12:26 PM
23	bishop chamber	9/22/2021 11:10 AM
24	Bishop Chamber	9/22/2021 9:01 AM
25	Chamber of Commerce	9/22/2021 8:04 AM
26	Local friends	9/21/2021 9:43 PM
27	Local friends	9/21/2021 9:19 PM
28	Friend	9/21/2021 9:04 PM
29	Bishop Chamber of Commerce	9/21/2021 8:56 PM
30	Chamber of Commerce	9/21/2021 8:20 PM
31	BISHOP AREA CHAMBER OF COMMERCE & VISITORS BUREAU	9/21/2021 6:20 PM
32	Inyo Register	9/21/2021 5:53 PM
33	Chamber of Commerce	9/21/2021 4:29 PM
34	word of mouth	9/21/2021 3:25 PM
35	Inyo Register newspaper	9/20/2021 6:50 PM
36	Inyo Register	9/19/2021 2:33 PM
37	Inyo Register	9/19/2021 8:09 AM
38	Inyo Register	9/19/2021 7:50 AM
39	inyo register	9/19/2021 7:44 AM
40	Inyo Register article	9/18/2021 2:01 PM
41	Inyo Register 9/18/21	9/18/2021 10:32 AM
42	Inyo Register	9/18/2021 10:06 AM
43	The Inyo Register News	9/18/2021 8:21 AM
44	Parchers resort	9/12/2021 12:28 PM
45	Friends and family camping.	9/11/2021 3:36 PM
46	I visit this sight regularly each year	9/11/2021 9:40 AM
47	Troutfitter newsletter	9/10/2021 4:47 AM
48	fowarded by a friend	8/23/2021 8:30 AM
49	Edison survey taker at Lake Sabrina	8/23/2021 7:30 AM

50	friend forwarded it to me.	7/31/2021 6:15 PM
51	Survey notice left on windshield	7/21/2021 7:28 PM
52	Flyer placed on car	7/11/2021 4:58 PM
53	highsierratopix.com	7/2/2021 10:47 AM
54	Used to work for Forest	6/23/2021 3:16 PM
55	High Sierra Topix	6/17/2021 2:04 PM
56	A flier put behind windshield wiper on my car	6/7/2021 5:50 PM
57	Flyer on car window	5/29/2021 10:44 AM
58	Friends	5/26/2021 12:29 PM
59	Friends	5/26/2021 12:06 PM
60	Friend	5/24/2021 5:22 PM
61	Handed the flyer	5/6/2021 11:08 AM

Q2 Would you please provide only the 5-digit zip-code of your primary residence. [Note: No personal information is being sought; rather, SCE is seeking to understand the demographics of its current recreational users.]

Answered: 358 Skipped: 3

ANSWER CHOICES	RESPONSES	
5-digit zip code if residing in the USA	100.00%	358
Country for individuals residing outside the USA	5.87%	21

#	5-DIGIT ZIP CODE IF RESIDING IN THE USA	DATE
1	93005	12/4/2021 1:23 PM
2	92374	11/24/2021 11:46 AM
3	93510	11/12/2021 7:42 PM
4	93514	11/12/2021 1:24 PM
5	93514	11/10/2021 1:42 PM
6	92694	11/10/2021 9:51 AM
7	93514	11/10/2021 9:08 AM
8	93514	11/9/2021 7:00 PM
9	93514	11/9/2021 4:27 PM
10	93514	11/9/2021 4:12 PM
11	93515	11/9/2021 3:44 PM
12	93514	11/9/2021 3:40 PM
13	93514	11/6/2021 7:29 AM
14	92649	10/21/2021 6:10 PM
15	93514	10/8/2021 11:52 AM
16	92586	10/8/2021 10:32 AM
17	98541	10/7/2021 7:44 PM
18	93514	10/3/2021 9:08 AM
19	91765	10/3/2021 8:59 AM
20	93514	10/2/2021 9:13 AM
21	90503	9/28/2021 3:48 PM
22	93513	9/28/2021 1:39 PM
23	93514	9/27/2021 11:10 PM
24	92115	9/26/2021 9:40 AM
25	93514	9/25/2021 2:31 PM
26	93513	9/24/2021 1:34 PM
27	93514	9/24/2021 11:47 AM

28	93514	9/24/2021 9:17 AM
29	93514	9/24/2021 5:15 AM
30	93514	9/23/2021 8:18 PM
31	93514	9/23/2021 4:26 PM
32	93063	9/23/2021 1:44 PM
33	93514	9/23/2021 9:32 AM
34	93514	9/23/2021 7:59 AM
35	93514	9/23/2021 7:01 AM
36	93514	9/22/2021 10:16 PM
37	93514	9/22/2021 9:44 PM
38	93514	9/22/2021 9:32 PM
39	93514	9/22/2021 7:10 PM
40	93514	9/22/2021 6:53 PM
41	93514	9/22/2021 6:32 PM
42	93514	9/22/2021 6:19 PM
43	93514	9/22/2021 3:29 PM
44	93514	9/22/2021 2:58 PM
45	93514	9/22/2021 2:26 PM
46	93514	9/22/2021 12:26 PM
47	95843	9/22/2021 11:50 AM
48	93514	9/22/2021 11:10 AM
49	92592	9/22/2021 9:54 AM
50	93514	9/22/2021 9:01 AM
51	93514	9/22/2021 9:00 AM
52	93514	9/22/2021 8:27 AM
53	93514	9/22/2021 8:04 AM
54	93514	9/21/2021 11:24 PM
55	89410	9/21/2021 9:43 PM
56	89410	9/21/2021 9:19 PM
57	93514	9/21/2021 9:04 PM
58	93514	9/21/2021 8:56 PM
59	93512	9/21/2021 8:20 PM
60	93546	9/21/2021 6:55 PM
61	93514	9/21/2021 6:20 PM
62	92808	9/21/2021 6:00 PM
63	93514	9/21/2021 5:53 PM
64	93514	9/21/2021 5:40 PM
65	93514	9/21/2021 4:29 PM

66	93514	9/21/2021 3:25 PM
67	93514	9/20/2021 6:50 PM
68	93454	9/20/2021 3:49 PM
69	92688	9/20/2021 9:31 AM
70	94611	9/19/2021 3:19 PM
71	93513	9/19/2021 2:33 PM
72	89131	9/19/2021 10:20 AM
73	93514	9/19/2021 8:09 AM
74	93514	9/19/2021 7:50 AM
75	93514	9/19/2021 7:44 AM
76	93514	9/18/2021 3:26 PM
77	93514	9/18/2021 2:01 PM
78	93514	9/18/2021 10:32 AM
79	93514	9/18/2021 10:06 AM
80	93514	9/18/2021 8:21 AM
81	91902	9/17/2021 5:29 PM
82	90016	9/16/2021 1:44 PM
83	93546	9/16/2021 9:19 AM
84	92618	9/15/2021 10:19 PM
85	93514	9/15/2021 1:35 PM
86	93545	9/15/2021 1:10 PM
87	93514	9/15/2021 11:00 AM
88	93514	9/14/2021 2:55 PM
89	92054	9/14/2021 1:24 PM
90	92563	9/14/2021 12:17 PM
91	92870	9/14/2021 11:36 AM
92	93514	9/14/2021 11:07 AM
93	91016	9/14/2021 9:18 AM
94	92506	9/13/2021 10:33 PM
95	91701	9/13/2021 3:51 PM
96	94550	9/13/2021 3:08 PM
97	93514	9/13/2021 1:01 PM
98	90631	9/13/2021 11:42 AM
99	91701	9/13/2021 10:16 AM
100	93514	9/12/2021 8:22 PM
101	97601	9/12/2021 7:08 PM
102	44023	9/12/2021 6:49 PM
103	92677	9/12/2021 4:07 PM

104	92395	9/12/2021 2:35 PM
105	92646	9/12/2021 1:51 PM
106	93555	9/12/2021 1:01 PM
107	92648	9/12/2021 12:36 PM
108	93514	9/12/2021 12:28 PM
109	90272	9/12/2021 10:14 AM
110	92117	9/12/2021 8:34 AM
111	95124	9/12/2021 8:02 AM
112	90630	9/12/2021 7:04 AM
113	93312	9/12/2021 6:45 AM
114	91209	9/12/2021 6:34 AM
115	94960	9/12/2021 6:14 AM
116	92110	9/11/2021 11:47 PM
117	95819	9/11/2021 10:34 PM
118	90603	9/11/2021 9:42 PM
119	90706	9/11/2021 9:34 PM
120	93561	9/11/2021 9:13 PM
121	90064	9/11/2021 9:08 PM
122	92868	9/11/2021 9:04 PM
123	91103	9/11/2021 8:31 PM
124	9210	9/11/2021 8:30 PM
125	92260	9/11/2021 7:47 PM
126	91739	9/11/2021 7:29 PM
127	91739	9/11/2021 7:18 PM
128	92130	9/11/2021 6:07 PM
129	92802	9/11/2021 5:23 PM
130	92880	9/11/2021 5:03 PM
131	92841	9/11/2021 4:49 PM
132	93514	9/11/2021 4:42 PM
133	95519	9/11/2021 3:36 PM
134	93514	9/11/2021 3:30 PM
135	92692	9/11/2021 1:29 PM
136	90064	9/11/2021 1:21 PM
137	91762	9/11/2021 1:02 PM
138	93420	9/11/2021 12:33 PM
139	92677	9/11/2021 9:40 AM
140	93514	9/11/2021 9:11 AM
141	92069	9/10/2021 4:47 AM

142	92345	9/5/2021 1:43 PM
143	92019	9/4/2021 9:12 AM
144	93514	9/1/2021 10:58 AM
145	92508	8/31/2021 4:14 PM
146	95521	8/31/2021 7:43 AM
147	91942	8/31/2021 7:27 AM
148	93515	8/31/2021 4:29 AM
149	93514	8/30/2021 10:17 PM
150	65203	8/27/2021 10:32 AM
151	92399	8/24/2021 10:25 AM
152	91352	8/23/2021 12:44 PM
153	93514	8/23/2021 11:12 AM
154	90266	8/23/2021 8:30 AM
155	92563	8/23/2021 7:30 AM
156	92708	8/22/2021 8:56 PM
157	91387	8/21/2021 10:28 AM
158	94597	8/18/2021 12:48 PM
159	94597	8/18/2021 12:33 PM
160	95404	8/18/2021 9:59 AM
161	91352	8/16/2021 4:31 PM
162	94063	8/16/2021 11:58 AM
163	93546	8/15/2021 4:05 PM
164	83607	8/13/2021 2:26 AM
165	92619	8/12/2021 10:26 AM
166	94301	8/11/2021 6:05 AM
167	90250	8/10/2021 10:14 PM
168	96161	8/8/2021 1:49 PM
169	94043	8/8/2021 12:44 PM
170	91107	8/8/2021 10:58 AM
171	51633	8/8/2021 8:51 AM
172	96161	8/7/2021 9:40 AM
173	95864	8/7/2021 8:47 AM
174	93514	8/6/2021 4:56 PM
175	92882	8/6/2021 2:30 PM
176	92626	8/6/2021 11:20 AM
177	93105	8/5/2021 5:27 PM
178	93514	8/5/2021 3:20 PM
179	89705	8/5/2021 1:44 PM

180	95370	8/5/2021 1:00 PM
181	93105	8/5/2021 9:06 AM
182	78954	8/3/2021 8:14 PM
183	90266	7/31/2021 6:15 PM
184	93514	7/25/2021 2:58 PM
185	81505	7/21/2021 7:28 PM
186	92821	7/18/2021 7:40 PM
187	86001	7/18/2021 4:07 PM
188	90026	7/18/2021 2:13 PM
189	94901	7/16/2021 3:00 PM
190	91701	7/16/2021 2:39 PM
191	95035	7/14/2021 9:59 PM
192	93514	7/14/2021 5:37 PM
193	93555	7/13/2021 6:14 PM
194	95014	7/13/2021 11:27 AM
195	90039	7/13/2021 12:50 AM
196	93514	7/12/2021 5:44 PM
197	96001	7/12/2021 4:46 PM
198	94549	7/12/2021 8:47 AM
199	92060	7/11/2021 9:48 PM
200	96161	7/11/2021 4:58 PM
201	98117	7/11/2021 3:54 PM
202	92314	7/8/2021 5:06 PM
203	91390	7/7/2021 2:50 PM
204	91326	7/6/2021 9:54 PM
205	96161	7/6/2021 8:55 PM
206	92592	7/6/2021 7:30 PM
207	91101	7/6/2021 6:35 PM
208	95603	7/6/2021 4:13 PM
209	92154	7/6/2021 8:08 AM
210	92264	7/6/2021 7:20 AM
211	91356	7/5/2021 4:00 PM
212	84746	7/4/2021 6:49 PM
213	92705	7/4/2021 12:30 PM
214	94131	7/2/2021 10:47 AM
215	83703	7/2/2021 7:41 AM
216	92056	7/1/2021 6:53 PM
217	91105	6/29/2021 9:08 PM

218	93526	6/27/2021 8:13 AM
219	92506	6/27/2021 8:11 AM
220	92344	6/26/2021 2:47 PM
221	93513	6/26/2021 2:28 PM
222	93514	6/23/2021 3:16 PM
223	86301	6/23/2021 1:47 PM
224	93514	6/23/2021 12:45 PM
225	93514	6/21/2021 2:58 PM
226	93514	6/18/2021 6:48 PM
227	90077	6/17/2021 2:04 PM
228	93514	6/16/2021 2:16 PM
229	90808	6/16/2021 12:38 PM
230	93514	6/15/2021 4:22 PM
231	80127	6/15/2021 8:56 AM
232	92563	6/14/2021 10:02 PM
233	93514	6/13/2021 7:02 PM
234	92544	6/13/2021 1:35 PM
235	92604	6/12/2021 10:46 AM
236	92530	6/11/2021 7:41 PM
237	93546	6/11/2021 3:28 PM
238	95834	6/10/2021 8:55 PM
239	91390	6/10/2021 3:41 PM
240	93514	6/10/2021 2:06 PM
241	90717	6/10/2021 12:00 PM
242	93514	6/10/2021 11:05 AM
243	93532	6/9/2021 8:03 PM
244	96145	6/9/2021 5:08 PM
245	94618	6/8/2021 9:04 PM
246	92120	6/8/2021 5:26 PM
247	91403	6/8/2021 5:14 PM
248	93514	6/8/2021 7:10 AM
249	93514	6/8/2021 6:58 AM
250	92549	6/7/2021 9:21 PM
251	94116	6/7/2021 8:07 PM
252	91361	6/7/2021 7:27 PM
253	94963	6/7/2021 7:21 PM
254	94303	6/7/2021 5:50 PM
255	93514	6/7/2021 2:00 PM

256	95834	6/7/2021 1:29 PM
257	90404	6/7/2021 12:31 PM
258	90638	6/7/2021 11:23 AM
259	93561	6/6/2021 7:08 AM
260	93514	6/5/2021 8:29 PM
261	95616	6/4/2021 9:30 PM
262	93514	6/4/2021 10:26 AM
263	89511	6/2/2021 12:19 AM
264	93514	6/1/2021 1:26 PM
265	92397	6/1/2021 11:35 AM
266	91106	6/1/2021 12:16 AM
267	90802	5/31/2021 7:50 PM
268	91302	5/31/2021 6:26 PM
269	93514	5/31/2021 5:33 PM
270	93514	5/30/2021 9:57 AM
271	92822	5/30/2021 8:28 AM
272	93514	5/30/2021 7:55 AM
273	92592	5/29/2021 5:05 PM
274	93514	5/29/2021 4:59 PM
275	91711	5/29/2021 10:44 AM
276	92886	5/29/2021 10:22 AM
277	90815	5/27/2021 10:36 PM
278	92374	5/27/2021 7:14 PM
279	92126	5/26/2021 11:15 PM
280	93555	5/26/2021 12:29 PM
281	93555	5/26/2021 12:06 PM
282	93514	5/25/2021 8:21 PM
283	93514	5/25/2021 12:54 PM
284	93514	5/25/2021 9:28 AM
285	93514	5/25/2021 6:45 AM
286	93514	5/24/2021 7:16 PM
287	93514	5/24/2021 5:22 PM
288	93514	5/24/2021 2:58 PM
289	93514	5/24/2021 2:45 PM
290	93514	5/23/2021 7:19 PM
291	90302	5/20/2021 8:36 PM
292	90064	5/17/2021 2:06 PM
293	92021	5/16/2021 8:45 AM

294	92082	5/11/2021 12:24 PM
295	92679	5/10/2021 3:14 PM
296	91356	5/9/2021 11:20 PM
297	91730	5/6/2021 11:08 AM
298	91784	5/4/2021 8:48 PM
299	90250	5/4/2021 12:28 PM
300	92120	5/3/2021 9:11 PM
301	90670	5/1/2021 7:55 PM
302	90713	4/28/2021 10:45 PM
303	92882	4/21/2021 8:47 AM
304	92591	4/16/2021 9:10 PM
305	93514	4/2/2021 8:52 AM
306	94963	3/11/2021 11:33 AM
307	93514	3/10/2021 4:48 PM
308	93514	3/2/2021 1:42 PM
309	94506	2/26/2021 4:24 PM
310	90505	2/26/2021 9:38 AM
311	90064	2/25/2021 6:24 PM
312	93514	2/19/2021 3:40 PM
313	93722	2/12/2021 6:38 AM
314	83646	2/11/2021 5:13 PM
315	93514	2/5/2021 7:23 AM
316	93514	1/13/2021 8:58 AM
317	93546	1/10/2021 9:39 PM
318	91214	1/10/2021 7:01 PM
319	90503	1/10/2021 6:14 PM
320	93555	1/10/2021 5:30 PM
321	91042	1/10/2021 4:52 PM
322	89408	1/8/2021 7:53 PM
323	93514	1/8/2021 6:16 PM
324	92084	1/8/2021 3:47 PM
325	96150	1/8/2021 11:38 AM
326	93546	1/8/2021 9:52 AM
327	93514	1/8/2021 9:41 AM
328	93513	1/8/2021 7:52 AM
329	91103	1/7/2021 10:57 PM
330	93514	1/7/2021 10:18 PM
331	92880	1/7/2021 8:46 PM

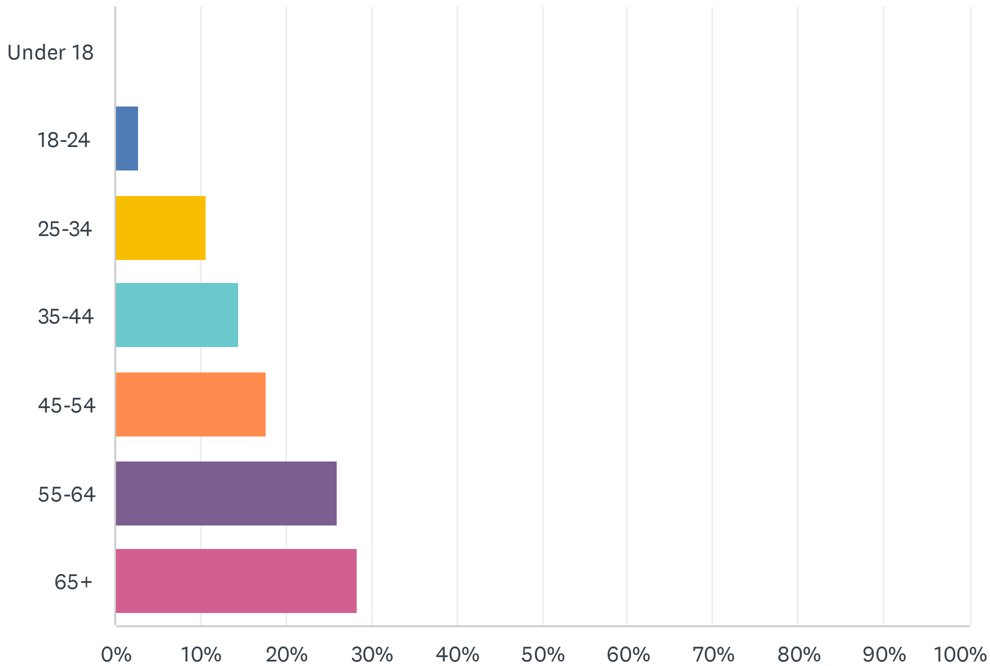
332	93514	1/7/2021 8:28 PM
333	94085	1/7/2021 8:16 PM
334	95616	1/7/2021 8:04 PM
335	92021	1/7/2021 7:51 PM
336	93514	1/7/2021 7:29 PM
337	92880	1/7/2021 7:19 PM
338	92117	1/7/2021 7:19 PM
339	93555	1/7/2021 7:06 PM
340	93514	1/7/2021 6:59 PM
341	93546	1/7/2021 6:56 PM
342	96150	1/7/2021 6:51 PM
343	93529	1/7/2021 6:06 PM
344	93546	1/7/2021 6:00 PM
345	93010	1/7/2021 5:50 PM
346	93514	1/7/2021 4:54 PM
347	93514	1/7/2021 4:53 PM
348	92395	1/7/2021 4:52 PM
349	93514	1/7/2021 4:30 PM
350	93535	1/7/2021 4:26 PM
351	93514	1/7/2021 4:24 PM
352	91784	1/7/2021 4:19 PM
353	92315	1/7/2021 4:18 PM
354	93546	1/7/2021 4:17 PM
355	97211	1/7/2021 4:17 PM
356	94610	12/23/2020 9:46 AM
357	93514	12/19/2020 5:47 PM
358	93514	12/16/2020 3:35 PM

#	COUNTRY FOR INDIVIDUALS RESIDING OUTSIDE THE USA	DATE
1	United States	11/10/2021 9:51 AM
2	United States	10/2/2021 9:13 AM
3	United States	9/24/2021 9:17 AM
4	United States	9/23/2021 4:26 PM
5	United States	9/23/2021 7:59 AM
6	United States	9/22/2021 8:27 AM
7	Inyo	9/18/2021 10:32 AM
8	USA	9/18/2021 10:06 AM
9	United States	9/17/2021 5:29 PM
10	United States	9/14/2021 12:17 PM

11	United States	9/12/2021 10:14 AM
12	United States	8/8/2021 12:44 PM
13	United States	7/6/2021 7:30 PM
14	United States	6/16/2021 12:38 PM
15	United States	6/10/2021 12:00 PM
16	USA	6/7/2021 5:50 PM
17	United States	5/30/2021 9:57 AM
18	United States	5/29/2021 10:22 AM
19	United States	5/27/2021 7:14 PM
20	United States	2/26/2021 4:24 PM
21	United States	1/7/2021 8:16 PM

Q3 Please provide the age of the individual completing this survey using the ranges provided below.

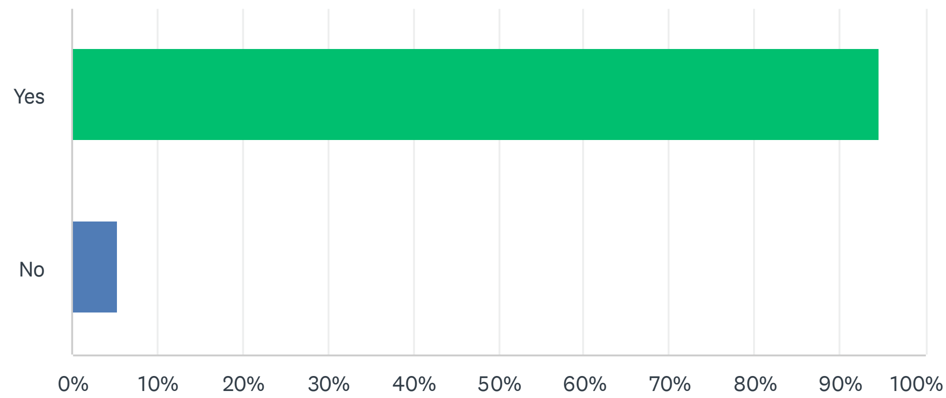
Answered: 357 Skipped: 4



ANSWER CHOICES	RESPONSES	
Under 18	0.00%	0
18-24	2.80%	10
25-34	10.64%	38
35-44	14.57%	52
45-54	17.65%	63
55-64	26.05%	93
65+	28.29%	101
TOTAL		357

Q4 Have you ever recreated at the Bishop Creek Reservoirs?

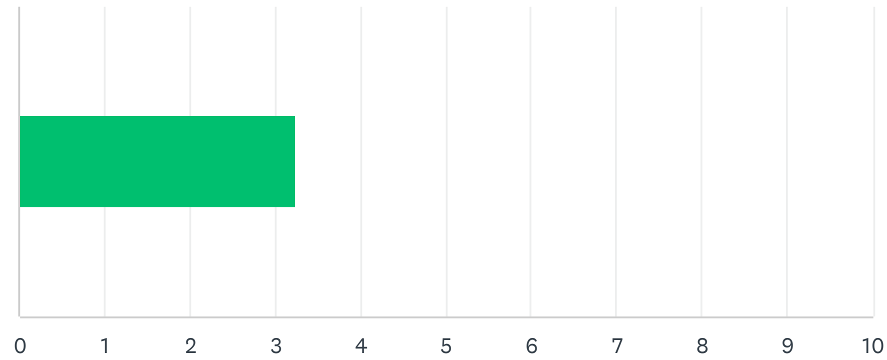
Answered: 361   Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	94.74%	342
No	5.26%	19
TOTAL		361

Q5 When visiting the Bishop Creek Reservoirs, how many people are typically in your party?

Answered: 327 Skipped: 34



ANSWER CHOICES	AVERAGE NUMBER	TOTAL NUMBER	RESPONSES
	3	1,062	327
Total Respondents: 327			

#		DATE
1	2	12/4/2021 1:25 PM
2	1	11/24/2021 11:47 AM
3	2	11/10/2021 1:43 PM
4	4	11/10/2021 9:52 AM
5	3	11/10/2021 9:10 AM
6	2	11/9/2021 7:02 PM
7	4	11/9/2021 4:29 PM
8	2	11/9/2021 4:13 PM
9	4	11/9/2021 3:46 PM
10	3	11/9/2021 3:41 PM
11	2	11/6/2021 7:31 AM
12	2	10/21/2021 6:12 PM
13	1	10/8/2021 11:54 AM
14	2	10/8/2021 10:33 AM
15	2	10/3/2021 9:10 AM
16	2	10/2/2021 9:15 AM
17	2	9/28/2021 3:50 PM
18	5	9/28/2021 1:41 PM
19	4	9/27/2021 11:12 PM

20	1	9/26/2021 9:41 AM
21	2	9/25/2021 2:34 PM
22	2	9/24/2021 1:37 PM
23	2	9/24/2021 11:48 AM
24	2	9/24/2021 9:19 AM
25	1	9/24/2021 5:17 AM
26	4	9/23/2021 8:20 PM
27	1	9/23/2021 1:46 PM
28	5	9/23/2021 9:34 AM
29	4	9/23/2021 8:01 AM
30	7	9/23/2021 7:03 AM
31	6	9/22/2021 10:19 PM
32	3	9/22/2021 9:46 PM
33	4	9/22/2021 9:33 PM
34	2	9/22/2021 7:14 PM
35	2	9/22/2021 6:54 PM
36	7	9/22/2021 6:33 PM
37	7	9/22/2021 6:21 PM
38	8	9/22/2021 3:30 PM
39	3	9/22/2021 3:00 PM
40	3	9/22/2021 2:26 PM
41	3	9/22/2021 12:28 PM
42	4	9/22/2021 11:52 AM
43	6	9/22/2021 11:11 AM
44	6	9/22/2021 9:56 AM
45	4	9/22/2021 9:02 AM
46	2	9/22/2021 9:02 AM
47	2	9/22/2021 8:28 AM
48	3	9/22/2021 8:05 AM
49	4	9/21/2021 11:26 PM
50	7	9/21/2021 9:44 PM
51	7	9/21/2021 9:21 PM
52	4	9/21/2021 9:05 PM
53	8	9/21/2021 8:57 PM
54	5	9/21/2021 6:56 PM
55	3	9/21/2021 6:22 PM
56	2	9/21/2021 6:01 PM
57	2	9/21/2021 5:54 PM

58	3	9/21/2021 5:42 PM
59	2	9/21/2021 4:31 PM
60	4	9/21/2021 3:27 PM
61	2	9/20/2021 6:53 PM
62	2	9/20/2021 3:50 PM
63	2	9/20/2021 9:36 AM
64	8	9/19/2021 3:20 PM
65	2	9/19/2021 2:35 PM
66	2	9/19/2021 10:23 AM
67	2	9/19/2021 8:11 AM
68	2	9/19/2021 7:52 AM
69	2	9/19/2021 7:45 AM
70	5	9/18/2021 3:28 PM
71	2	9/18/2021 2:03 PM
72	2	9/18/2021 10:38 AM
73	3	9/18/2021 10:08 AM
74	2	9/18/2021 8:23 AM
75	4	9/17/2021 5:34 PM
76	2	9/16/2021 1:46 PM
77	1	9/16/2021 9:20 AM
78	5	9/15/2021 10:20 PM
79	2	9/15/2021 1:36 PM
80	5	9/15/2021 1:11 PM
81	2	9/15/2021 11:01 AM
82	2	9/14/2021 2:57 PM
83	1	9/14/2021 1:26 PM
84	2	9/14/2021 12:20 PM
85	5	9/14/2021 11:37 AM
86	4	9/14/2021 11:08 AM
87	3	9/14/2021 9:19 AM
88	1	9/13/2021 10:34 PM
89	6	9/13/2021 3:57 PM
90	2	9/13/2021 3:09 PM
91	1	9/13/2021 1:02 PM
92	7	9/13/2021 11:43 AM
93	4	9/13/2021 10:18 AM
94	1	9/12/2021 8:24 PM
95	5	9/12/2021 7:10 PM

96	8	9/12/2021 6:49 PM
97	8	9/12/2021 4:08 PM
98	2	9/12/2021 2:36 PM
99	3	9/12/2021 1:53 PM
100	1	9/12/2021 1:02 PM
101	4	9/12/2021 12:37 PM
102	4	9/12/2021 12:29 PM
103	2	9/12/2021 10:15 AM
104	4	9/12/2021 8:35 AM
105	3	9/12/2021 8:03 AM
106	4	9/12/2021 7:06 AM
107	2	9/12/2021 6:47 AM
108	4	9/12/2021 6:35 AM
109	2	9/12/2021 6:15 AM
110	7	9/11/2021 11:48 PM
111	2	9/11/2021 10:36 PM
112	3	9/11/2021 9:44 PM
113	4	9/11/2021 9:35 PM
114	2	9/11/2021 9:15 PM
115	2	9/11/2021 9:09 PM
116	20	9/11/2021 9:06 PM
117	4	9/11/2021 8:32 PM
118	5	9/11/2021 8:32 PM
119	1	9/11/2021 7:47 PM
120	5	9/11/2021 7:31 PM
121	4	9/11/2021 7:20 PM
122	2	9/11/2021 6:09 PM
123	4	9/11/2021 5:24 PM
124	8	9/11/2021 5:04 PM
125	5	9/11/2021 4:50 PM
126	4	9/11/2021 4:43 PM
127	4	9/11/2021 3:38 PM
128	4	9/11/2021 3:31 PM
129	2	9/11/2021 1:31 PM
130	2	9/11/2021 1:23 PM
131	5	9/11/2021 1:04 PM
132	2	9/11/2021 12:34 PM
133	4	9/11/2021 9:43 AM

134	1	9/11/2021 9:13 AM
135	2	9/10/2021 4:49 AM
136	2	9/5/2021 1:44 PM
137	6	9/4/2021 9:13 AM
138	2	9/1/2021 11:00 AM
139	2	8/31/2021 4:17 PM
140	2	8/31/2021 7:46 AM
141	5	8/31/2021 7:28 AM
142	1	8/31/2021 4:30 AM
143	1	8/30/2021 10:19 PM
144	10	8/24/2021 10:26 AM
145	6	8/23/2021 12:45 PM
146	3	8/23/2021 11:13 AM
147	5	8/23/2021 8:32 AM
148	12	8/23/2021 7:31 AM
149	5	8/22/2021 8:57 PM
150	4	8/21/2021 10:30 AM
151	2	8/18/2021 12:49 PM
152	2	8/18/2021 12:34 PM
153	3	8/16/2021 4:33 PM
154	2	8/16/2021 11:59 AM
155	2	8/15/2021 4:07 PM
156	15	8/13/2021 2:27 AM
157	1	8/11/2021 6:07 AM
158	2	8/10/2021 10:15 PM
159	3	8/8/2021 1:51 PM
160	4	8/8/2021 12:45 PM
161	2	8/7/2021 9:42 AM
162	4	8/7/2021 8:48 AM
163	2	8/6/2021 4:57 PM
164	2	8/6/2021 2:32 PM
165	3	8/6/2021 11:21 AM
166	8	8/5/2021 3:21 PM
167	6	8/5/2021 1:46 PM
168	2	8/5/2021 1:01 PM
169	2	8/5/2021 9:08 AM
170	2	8/3/2021 8:17 PM
171	3	7/25/2021 2:59 PM

172	2	7/18/2021 7:42 PM
173	2	7/18/2021 4:08 PM
174	3	7/18/2021 2:14 PM
175	5	7/16/2021 2:40 PM
176	2	7/14/2021 10:00 PM
177	2	7/14/2021 5:39 PM
178	1	7/13/2021 6:15 PM
179	1	7/13/2021 11:28 AM
180	2	7/12/2021 5:46 PM
181	2	7/11/2021 9:50 PM
182	1	7/11/2021 3:55 PM
183	2	7/7/2021 2:53 PM
184	3	7/6/2021 9:56 PM
185	4	7/6/2021 8:56 PM
186	6	7/6/2021 7:31 PM
187	2	7/6/2021 6:36 PM
188	2	7/6/2021 4:15 PM
189	1	7/6/2021 7:21 AM
190	2	7/5/2021 4:02 PM
191	1	7/4/2021 6:50 PM
192	2	7/4/2021 12:31 PM
193	6	7/2/2021 7:42 AM
194	2	6/29/2021 9:10 PM
195	1	6/29/2021 8:59 PM
196	4	6/26/2021 2:50 PM
197	2	6/26/2021 2:30 PM
198	2	6/23/2021 3:20 PM
199	2	6/23/2021 1:50 PM
200	2	6/23/2021 12:46 PM
201	2	6/21/2021 2:59 PM
202	1	6/18/2021 6:50 PM
203	2	6/17/2021 2:06 PM
204	3	6/16/2021 2:18 PM
205	16	6/16/2021 12:41 PM
206	4	6/15/2021 4:24 PM
207	1	6/15/2021 8:58 AM
208	2	6/14/2021 10:04 PM
209	4	6/13/2021 7:03 PM

210	3	6/13/2021 1:36 PM
211	2	6/12/2021 10:47 AM
212	5	6/12/2021 6:40 AM
213	4	6/11/2021 3:29 PM
214	2	6/10/2021 3:42 PM
215	4	6/10/2021 2:08 PM
216	1	6/10/2021 12:01 PM
217	3	6/10/2021 11:06 AM
218	3	6/9/2021 8:05 PM
219	1	6/9/2021 5:09 PM
220	2	6/8/2021 9:05 PM
221	2	6/8/2021 5:28 PM
222	4	6/8/2021 5:15 PM
223	2	6/8/2021 7:11 AM
224	2	6/8/2021 6:59 AM
225	2	6/7/2021 9:22 PM
226	2	6/7/2021 8:08 PM
227	2	6/7/2021 7:24 PM
228	2	6/7/2021 5:53 PM
229	2	6/7/2021 2:01 PM
230	2	6/7/2021 1:31 PM
231	6	6/7/2021 12:32 PM
232	4	6/7/2021 11:24 AM
233	7	6/6/2021 7:10 AM
234	2	6/5/2021 8:30 PM
235	2	6/4/2021 9:31 PM
236	4	6/4/2021 10:28 AM
237	1	6/2/2021 12:21 AM
238	4	6/1/2021 1:28 PM
239	3	6/1/2021 11:36 AM
240	2	6/1/2021 12:18 AM
241	8	5/31/2021 6:27 PM
242	4	5/31/2021 5:34 PM
243	2	5/30/2021 8:29 AM
244	3	5/30/2021 7:57 AM
245	4	5/29/2021 5:06 PM
246	2	5/29/2021 5:00 PM
247	2	5/29/2021 10:45 AM

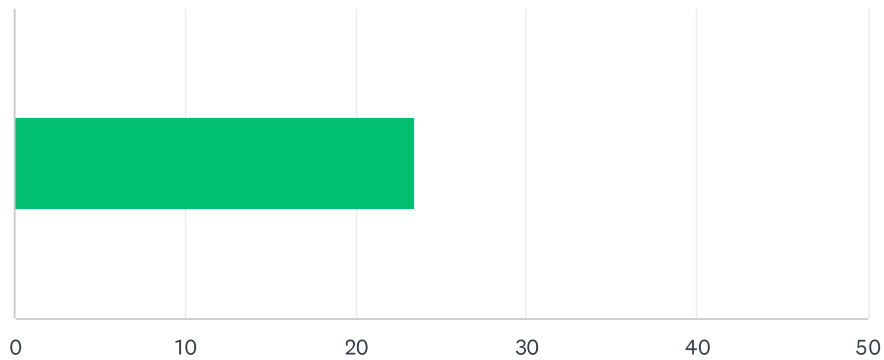
248	5	5/29/2021 10:24 AM
249	10	5/27/2021 10:38 PM
250	2	5/26/2021 11:16 PM
251	3	5/26/2021 12:30 PM
252	3	5/26/2021 12:08 PM
253	7	5/25/2021 8:22 PM
254	2	5/25/2021 12:55 PM
255	2	5/25/2021 9:29 AM
256	4	5/25/2021 6:47 AM
257	4	5/24/2021 7:18 PM
258	2	5/24/2021 5:24 PM
259	2	5/24/2021 2:59 PM
260	2	5/24/2021 2:46 PM
261	4	5/23/2021 7:23 PM
262	3	5/17/2021 2:07 PM
263	4	5/16/2021 8:47 AM
264	3	5/11/2021 12:25 PM
265	2	5/10/2021 3:16 PM
266	2	5/6/2021 11:09 AM
267	2	5/4/2021 8:53 PM
268	4	5/4/2021 12:29 PM
269	2	5/3/2021 9:13 PM
270	2	5/1/2021 7:57 PM
271	3	4/28/2021 10:45 PM
272	2	4/21/2021 8:50 AM
273	2	4/16/2021 9:12 PM
274	2	4/2/2021 8:54 AM
275	2	3/11/2021 11:36 AM
276	2	3/10/2021 4:50 PM
277	2	3/2/2021 1:43 PM
278	2	2/26/2021 4:26 PM
279	2	2/26/2021 9:39 AM
280	3	2/25/2021 6:25 PM
281	1	2/19/2021 3:42 PM
282	2	2/12/2021 6:40 AM
283	4	2/11/2021 5:14 PM
284	2	2/5/2021 7:24 AM
285	2	1/13/2021 9:01 AM

286	4	1/11/2021 2:22 PM
287	2	1/10/2021 9:40 PM
288	2	1/10/2021 7:02 PM
289	2	1/10/2021 6:16 PM
290	1	1/10/2021 5:31 PM
291	4	1/10/2021 4:54 PM
292	2	1/8/2021 6:17 PM
293	2	1/8/2021 3:50 PM
294	2	1/8/2021 11:39 AM
295	2	1/8/2021 9:53 AM
296	2	1/8/2021 9:47 AM
297	1	1/8/2021 7:54 AM
298	4	1/7/2021 10:58 PM
299	4	1/7/2021 10:20 PM
300	5	1/7/2021 8:47 PM
301	3	1/7/2021 8:30 PM
302	2	1/7/2021 8:05 PM
303	5	1/7/2021 7:52 PM
304	2	1/7/2021 7:30 PM
305	6	1/7/2021 7:22 PM
306	7	1/7/2021 7:20 PM
307	8	1/7/2021 7:08 PM
308	2	1/7/2021 7:00 PM
309	4	1/7/2021 6:57 PM
310	2	1/7/2021 6:52 PM
311	4	1/7/2021 6:07 PM
312	5	1/7/2021 6:02 PM
313	2	1/7/2021 6:01 PM
314	3	1/7/2021 4:55 PM
315	4	1/7/2021 4:55 PM
316	3	1/7/2021 4:53 PM
317	2	1/7/2021 4:32 PM
318	2	1/7/2021 4:27 PM
319	2	1/7/2021 4:26 PM
320	3	1/7/2021 4:20 PM
321	4	1/7/2021 4:19 PM
322	2	1/7/2021 4:18 PM
323	4	1/7/2021 4:18 PM

324	4	12/23/2020 9:48 AM
325	4	12/21/2020 4:36 PM
326	2	12/19/2020 5:50 PM
327	1	12/16/2020 3:37 PM

Q6 How many years have you been visiting the Bishop Creek Reservoirs?

Answered: 329 Skipped: 32



ANSWER CHOICES	AVERAGE NUMBER	TOTAL NUMBER	RESPONSES
	23	7,729	329
Total Respondents: 329			

#		DATE
1	4	12/4/2021 1:25 PM
2	30	11/24/2021 11:47 AM
3	39	11/10/2021 1:43 PM
4	20	11/10/2021 9:52 AM
5	25	11/10/2021 9:10 AM
6	15	11/9/2021 7:02 PM
7	40	11/9/2021 4:29 PM
8	16	11/9/2021 4:13 PM
9	20	11/9/2021 3:46 PM
10	40	11/9/2021 3:41 PM
11	21	11/6/2021 7:31 AM
12	40	10/21/2021 6:12 PM
13	40	10/8/2021 10:33 AM
14	40	10/3/2021 9:10 AM
15	1	10/3/2021 9:00 AM
16	35	10/2/2021 9:15 AM
17	40	9/28/2021 3:50 PM
18	31	9/28/2021 1:41 PM
19	33	9/27/2021 11:12 PM
20	13	9/26/2021 9:41 AM

21	20	9/25/2021 2:34 PM
22	40	9/24/2021 1:37 PM
23	35	9/24/2021 11:48 AM
24	40	9/24/2021 9:19 AM
25	40	9/24/2021 5:17 AM
26	40	9/23/2021 8:20 PM
27	35	9/23/2021 1:46 PM
28	35	9/23/2021 9:34 AM
29	40	9/23/2021 8:01 AM
30	39	9/23/2021 7:03 AM
31	40	9/22/2021 10:19 PM
32	22	9/22/2021 9:46 PM
33	40	9/22/2021 9:33 PM
34	25	9/22/2021 7:14 PM
35	40	9/22/2021 6:54 PM
36	40	9/22/2021 6:33 PM
37	40	9/22/2021 6:21 PM
38	9	9/22/2021 3:30 PM
39	40	9/22/2021 3:00 PM
40	18	9/22/2021 2:26 PM
41	15	9/22/2021 12:28 PM
42	40	9/22/2021 11:52 AM
43	30	9/22/2021 11:11 AM
44	40	9/22/2021 9:56 AM
45	30	9/22/2021 9:02 AM
46	40	9/22/2021 9:02 AM
47	39	9/22/2021 8:28 AM
48	40	9/22/2021 8:05 AM
49	31	9/21/2021 11:26 PM
50	18	9/21/2021 9:44 PM
51	16	9/21/2021 9:21 PM
52	8	9/21/2021 9:05 PM
53	6	9/21/2021 8:57 PM
54	7	9/21/2021 8:21 PM
55	36	9/21/2021 6:56 PM
56	35	9/21/2021 6:01 PM
57	17	9/21/2021 5:54 PM
58	10	9/21/2021 5:42 PM

59	40	9/21/2021 4:31 PM
60	25	9/21/2021 3:27 PM
61	35	9/20/2021 6:53 PM
62	40	9/20/2021 3:50 PM
63	35	9/20/2021 9:36 AM
64	20	9/19/2021 3:20 PM
65	26	9/19/2021 2:35 PM
66	39	9/19/2021 10:23 AM
67	20	9/19/2021 8:11 AM
68	40	9/19/2021 7:52 AM
69	20	9/19/2021 7:45 AM
70	8	9/18/2021 3:28 PM
71	40	9/18/2021 2:03 PM
72	40	9/18/2021 10:38 AM
73	36	9/18/2021 10:08 AM
74	40	9/18/2021 8:23 AM
75	40	9/17/2021 5:34 PM
76	35	9/16/2021 1:46 PM
77	10	9/16/2021 9:20 AM
78	33	9/15/2021 10:20 PM
79	32	9/15/2021 1:36 PM
80	12	9/15/2021 1:11 PM
81	21	9/15/2021 11:01 AM
82	40	9/14/2021 2:57 PM
83	20	9/14/2021 1:26 PM
84	40	9/14/2021 12:20 PM
85	25	9/14/2021 11:37 AM
86	33	9/14/2021 11:08 AM
87	5	9/14/2021 9:19 AM
88	8	9/13/2021 10:34 PM
89	25	9/13/2021 3:57 PM
90	20	9/13/2021 3:09 PM
91	17	9/13/2021 1:02 PM
92	30	9/13/2021 11:43 AM
93	26	9/13/2021 10:18 AM
94	28	9/12/2021 8:24 PM
95	38	9/12/2021 7:10 PM
96	35	9/12/2021 6:49 PM

97	38	9/12/2021 4:08 PM
98	17	9/12/2021 2:36 PM
99	40	9/12/2021 1:53 PM
100	10	9/12/2021 12:37 PM
101	40	9/12/2021 12:29 PM
102	40	9/12/2021 10:15 AM
103	40	9/12/2021 8:35 AM
104	9	9/12/2021 8:03 AM
105	25	9/12/2021 7:06 AM
106	40	9/12/2021 6:47 AM
107	14	9/12/2021 6:35 AM
108	1	9/12/2021 6:15 AM
109	40	9/11/2021 11:48 PM
110	12	9/11/2021 10:36 PM
111	20	9/11/2021 9:44 PM
112	15	9/11/2021 9:35 PM
113	40	9/11/2021 9:15 PM
114	40	9/11/2021 9:09 PM
115	29	9/11/2021 9:06 PM
116	19	9/11/2021 8:32 PM
117	40	9/11/2021 8:32 PM
118	7	9/11/2021 7:47 PM
119	30	9/11/2021 7:31 PM
120	30	9/11/2021 7:20 PM
121	8	9/11/2021 6:09 PM
122	6	9/11/2021 5:24 PM
123	12	9/11/2021 5:04 PM
124	40	9/11/2021 4:50 PM
125	40	9/11/2021 4:43 PM
126	20	9/11/2021 3:38 PM
127	13	9/11/2021 3:31 PM
128	40	9/11/2021 1:31 PM
129	40	9/11/2021 1:23 PM
130	33	9/11/2021 1:04 PM
131	39	9/11/2021 12:34 PM
132	40	9/11/2021 9:43 AM
133	40	9/11/2021 9:13 AM
134	37	9/10/2021 4:49 AM

135	20	9/5/2021 1:44 PM
136	35	9/4/2021 9:13 AM
137	11	9/1/2021 11:00 AM
138	26	8/31/2021 4:17 PM
139	40	8/31/2021 7:46 AM
140	20	8/31/2021 7:28 AM
141	16	8/31/2021 4:30 AM
142	40	8/30/2021 10:19 PM
143	20	8/24/2021 10:26 AM
144	7	8/23/2021 12:45 PM
145	40	8/23/2021 11:13 AM
146	7	8/23/2021 8:32 AM
147	32	8/23/2021 7:31 AM
148	23	8/22/2021 8:57 PM
149	40	8/21/2021 10:30 AM
150	12	8/18/2021 12:49 PM
151	10	8/18/2021 12:34 PM
152	4	8/16/2021 4:33 PM
153	10	8/16/2021 11:59 AM
154	2	8/15/2021 4:07 PM
155	6	8/13/2021 2:27 AM
156	30	8/11/2021 6:07 AM
157	3	8/10/2021 10:15 PM
158	6	8/8/2021 1:51 PM
159	1	8/8/2021 12:45 PM
160	14	8/7/2021 9:42 AM
161	20	8/7/2021 8:48 AM
162	30	8/6/2021 4:57 PM
163	40	8/6/2021 2:32 PM
164	20	8/6/2021 11:21 AM
165	40	8/5/2021 3:21 PM
166	15	8/5/2021 1:46 PM
167	1	8/5/2021 1:01 PM
168	40	8/5/2021 9:08 AM
169	12	8/3/2021 8:17 PM
170	40	7/25/2021 2:59 PM
171	22	7/18/2021 7:42 PM
172	28	7/18/2021 4:08 PM

173	7	7/18/2021 2:14 PM
174	3	7/16/2021 3:01 PM
175	40	7/16/2021 2:40 PM
176	1	7/14/2021 10:00 PM
177	20	7/14/2021 5:39 PM
178	8	7/13/2021 6:15 PM
179	40	7/13/2021 11:28 AM
180	4	7/13/2021 12:52 AM
181	5	7/12/2021 5:46 PM
182	6	7/11/2021 9:50 PM
183	40	7/11/2021 3:55 PM
184	9	7/7/2021 2:53 PM
185	6	7/6/2021 9:56 PM
186	15	7/6/2021 8:56 PM
187	19	7/6/2021 7:31 PM
188	7	7/6/2021 6:36 PM
189	35	7/6/2021 4:15 PM
190	7	7/6/2021 7:21 AM
191	14	7/5/2021 4:02 PM
192	20	7/4/2021 6:50 PM
193	10	7/4/2021 12:31 PM
194	5	7/2/2021 7:42 AM
195	4	6/29/2021 9:10 PM
196	4	6/29/2021 8:59 PM
197	33	6/26/2021 2:50 PM
198	9	6/26/2021 2:30 PM
199	38	6/23/2021 3:20 PM
200	40	6/23/2021 1:50 PM
201	40	6/23/2021 12:46 PM
202	25	6/21/2021 2:59 PM
203	15	6/18/2021 6:50 PM
204	40	6/17/2021 2:06 PM
205	11	6/16/2021 2:18 PM
206	24	6/16/2021 12:41 PM
207	10	6/15/2021 4:24 PM
208	15	6/15/2021 8:58 AM
209	24	6/14/2021 10:04 PM
210	15	6/13/2021 7:03 PM

211	1	6/13/2021 1:36 PM
212	9	6/12/2021 10:47 AM
213	30	6/12/2021 6:40 AM
214	15	6/11/2021 3:29 PM
215	15	6/10/2021 3:42 PM
216	15	6/10/2021 2:08 PM
217	30	6/10/2021 12:01 PM
218	20	6/10/2021 11:06 AM
219	16	6/9/2021 8:05 PM
220	40	6/9/2021 5:09 PM
221	15	6/8/2021 9:05 PM
222	36	6/8/2021 5:28 PM
223	40	6/8/2021 5:15 PM
224	6	6/8/2021 7:11 AM
225	38	6/8/2021 6:59 AM
226	5	6/7/2021 8:08 PM
227	30	6/7/2021 7:24 PM
228	10	6/7/2021 5:53 PM
229	15	6/7/2021 2:01 PM
230	10	6/7/2021 1:31 PM
231	20	6/7/2021 12:32 PM
232	7	6/7/2021 11:24 AM
233	21	6/6/2021 7:10 AM
234	5	6/5/2021 8:30 PM
235	1	6/4/2021 9:31 PM
236	4	6/4/2021 10:28 AM
237	40	6/2/2021 12:21 AM
238	29	6/1/2021 1:28 PM
239	25	6/1/2021 11:36 AM
240	9	6/1/2021 12:18 AM
241	3	5/31/2021 6:27 PM
242	25	5/31/2021 5:34 PM
243	1	5/30/2021 8:29 AM
244	22	5/30/2021 7:57 AM
245	23	5/29/2021 5:06 PM
246	3	5/29/2021 5:00 PM
247	40	5/29/2021 10:45 AM
248	40	5/29/2021 10:24 AM

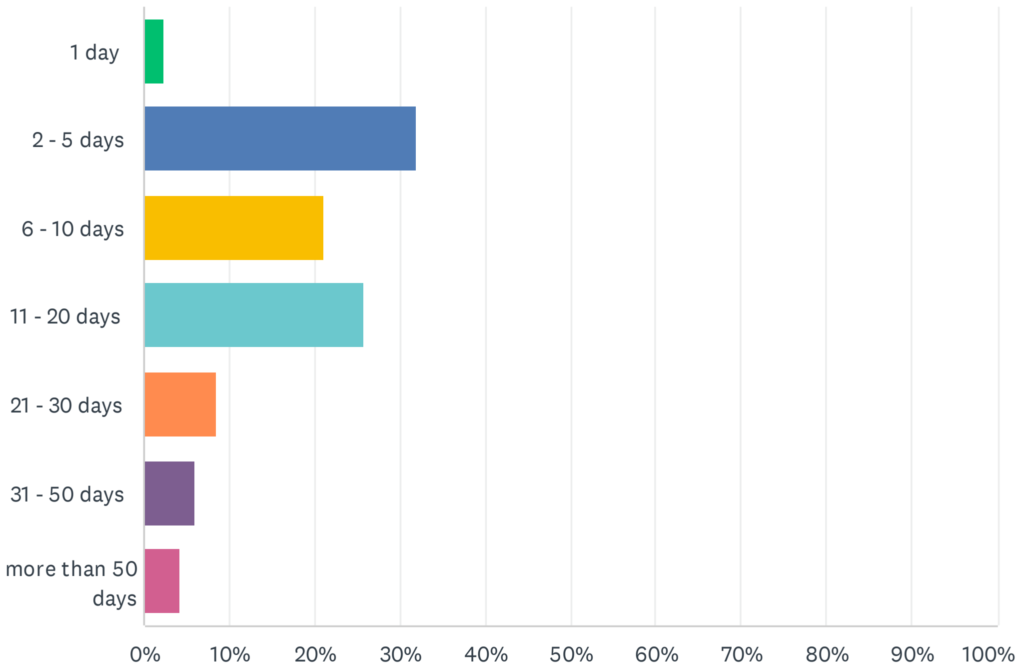
249	17	5/27/2021 10:38 PM
250	1	5/26/2021 11:16 PM
251	10	5/26/2021 12:30 PM
252	10	5/26/2021 12:08 PM
253	36	5/25/2021 8:22 PM
254	30	5/25/2021 12:55 PM
255	2	5/25/2021 9:29 AM
256	38	5/25/2021 6:47 AM
257	30	5/24/2021 7:18 PM
258	40	5/24/2021 5:24 PM
259	40	5/24/2021 2:59 PM
260	30	5/24/2021 2:46 PM
261	15	5/23/2021 7:23 PM
262	3	5/17/2021 2:07 PM
263	20	5/16/2021 8:47 AM
264	8	5/11/2021 12:25 PM
265	40	5/10/2021 3:16 PM
266	30	5/9/2021 11:21 PM
267	2	5/6/2021 11:09 AM
268	40	5/4/2021 8:53 PM
269	2	5/4/2021 12:29 PM
270	40	5/3/2021 9:13 PM
271	10	5/1/2021 7:57 PM
272	14	4/28/2021 10:45 PM
273	35	4/21/2021 8:50 AM
274	17	4/16/2021 9:12 PM
275	5	4/2/2021 8:54 AM
276	20	3/11/2021 11:36 AM
277	35	3/10/2021 4:50 PM
278	12	3/2/2021 1:43 PM
279	12	2/26/2021 4:26 PM
280	27	2/26/2021 9:39 AM
281	24	2/25/2021 6:25 PM
282	15	2/19/2021 3:42 PM
283	40	2/12/2021 6:40 AM
284	20	2/11/2021 5:14 PM
285	40	2/5/2021 7:24 AM
286	40	1/13/2021 9:01 AM

287	30	1/11/2021 2:22 PM
288	35	1/10/2021 9:40 PM
289	15	1/10/2021 7:02 PM
290	40	1/10/2021 6:16 PM
291	25	1/10/2021 5:31 PM
292	40	1/10/2021 4:54 PM
293	5	1/8/2021 7:54 PM
294	40	1/8/2021 6:17 PM
295	40	1/8/2021 3:50 PM
296	9	1/8/2021 11:39 AM
297	2	1/8/2021 9:53 AM
298	8	1/8/2021 9:47 AM
299	25	1/8/2021 7:54 AM
300	30	1/7/2021 10:58 PM
301	3	1/7/2021 10:20 PM
302	40	1/7/2021 8:47 PM
303	19	1/7/2021 8:30 PM
304	6	1/7/2021 8:05 PM
305	30	1/7/2021 7:52 PM
306	32	1/7/2021 7:30 PM
307	20	1/7/2021 7:22 PM
308	10	1/7/2021 7:20 PM
309	19	1/7/2021 7:08 PM
310	3	1/7/2021 7:00 PM
311	8	1/7/2021 6:57 PM
312	6	1/7/2021 6:52 PM
313	6	1/7/2021 6:07 PM
314	30	1/7/2021 6:02 PM
315	25	1/7/2021 6:01 PM
316	21	1/7/2021 4:55 PM
317	37	1/7/2021 4:55 PM
318	16	1/7/2021 4:53 PM
319	12	1/7/2021 4:32 PM
320	40	1/7/2021 4:27 PM
321	3	1/7/2021 4:26 PM
322	5	1/7/2021 4:20 PM
323	36	1/7/2021 4:19 PM
324	13	1/7/2021 4:18 PM

325	40	1/7/2021 4:18 PM
326	16	12/23/2020 9:48 AM
327	30	12/21/2020 4:36 PM
328	4	12/19/2020 5:50 PM
329	40	12/16/2020 3:37 PM

Q7 In general, how many days per year do you visit the Bishop Creek Reservoirs?

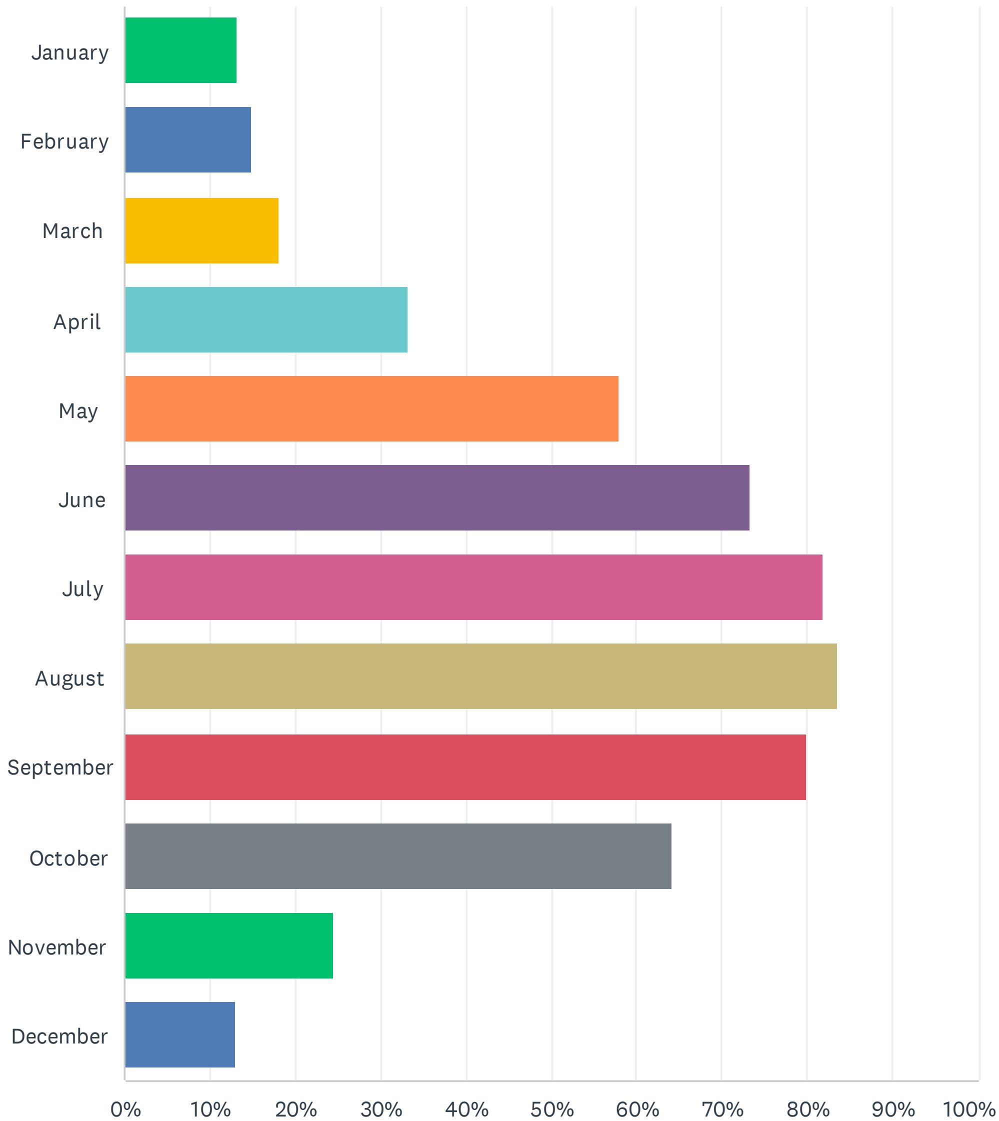
Answered: 332   Skipped: 29



ANSWER CHOICES	RESPONSES	
1 day	2.41%	8
2 - 5 days	31.93%	106
6 - 10 days	21.08%	70
11 - 20 days	25.90%	86
21 - 30 days	8.43%	28
31 - 50 days	6.02%	20
more than 50 days	4.22%	14
TOTAL		332

Q8 During which months do you typically visit the Bishop Creek Reservoirs? (Select all that apply)

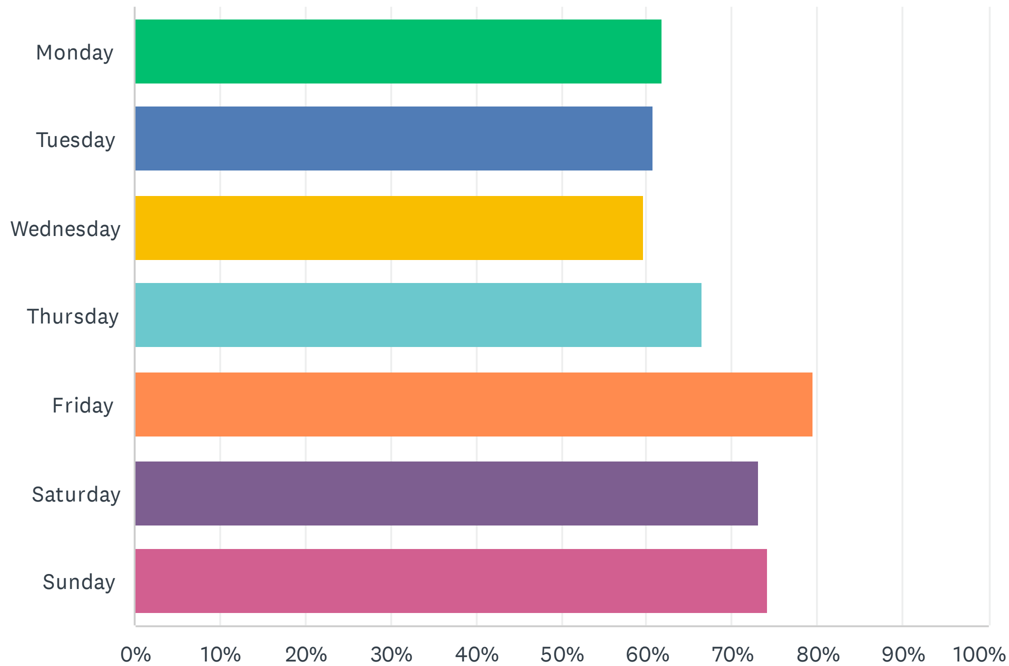
Answered: 333 Skipped: 28



ANSWER CHOICES	RESPONSES	
January	13.21%	44
February	15.02%	50
March	18.02%	60
April	33.33%	111
May	57.96%	193
June	73.27%	244
July	81.98%	273
August	83.48%	278
September	79.88%	266
October	64.26%	214
November	24.62%	82
December	12.91%	43
Total Respondents: 333		

Q9 What day(s) of the week do you typically visit the Bishop Creek Reservoirs? (Select all that apply)

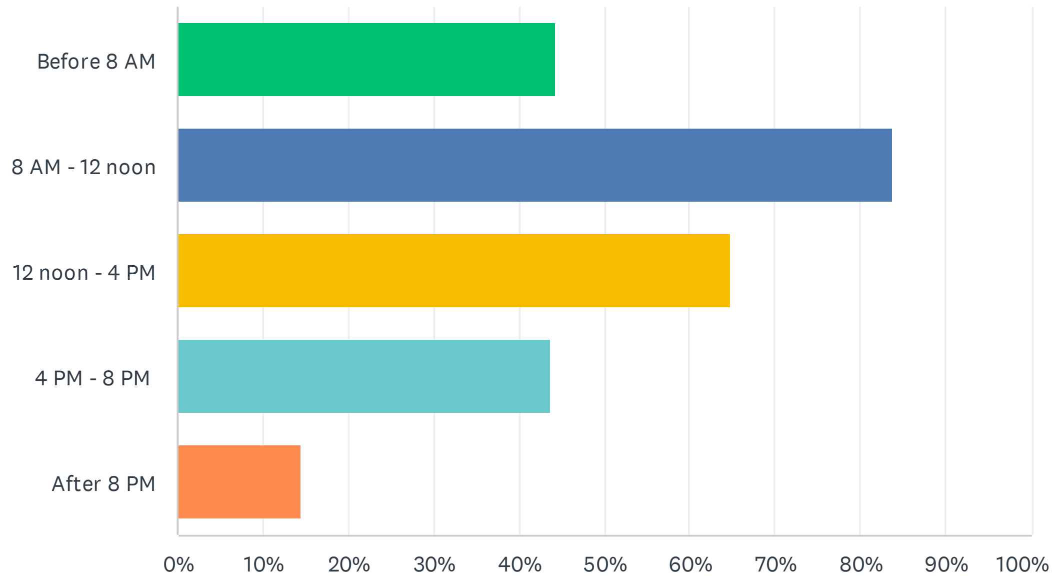
Answered: 332 Skipped: 29



ANSWER CHOICES	RESPONSES	
Monday	61.75%	205
Tuesday	60.84%	202
Wednesday	59.64%	198
Thursday	66.57%	221
Friday	79.52%	264
Saturday	73.19%	243
Sunday	74.10%	246
Total Respondents: 332		

Q10 What time(s) of day do you most like to visit the Bishop Creek Reservoirs? (Select all that apply)

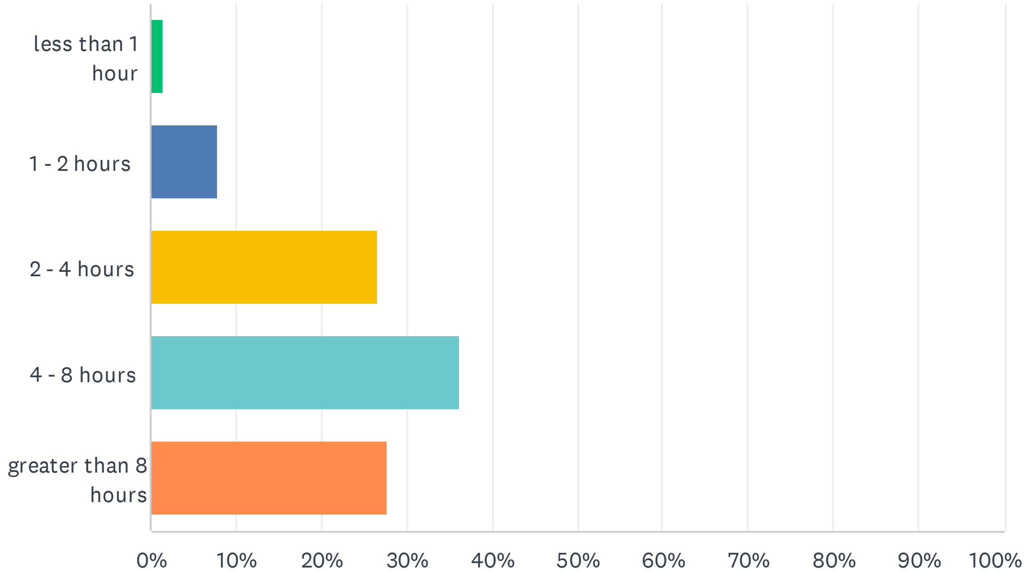
Answered: 332   Skipped: 29



ANSWER CHOICES	RESPONSES	
Before 8 AM	44.28%	147
8 AM - 12 noon	83.73%	278
12 noon - 4 PM	64.76%	215
4 PM - 8 PM	43.67%	145
After 8 PM	14.46%	48
Total Respondents: 332		

Q11 On average, how long (hours) is a typical visit?

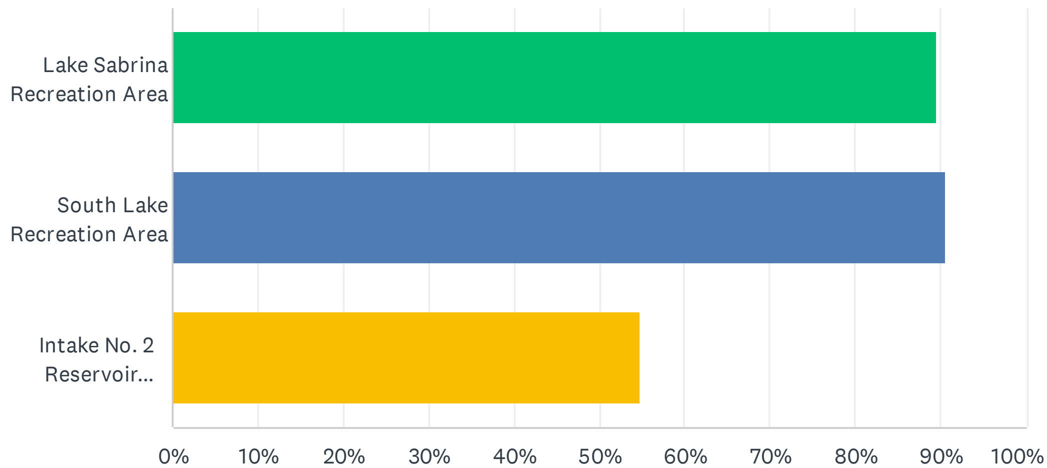
Answered: 331 Skipped: 30



ANSWER CHOICES	RESPONSES	
less than 1 hour	1.51%	5
1 - 2 hours	7.85%	26
2 - 4 hours	26.59%	88
4 - 8 hours	36.25%	120
greater than 8 hours	27.79%	92
TOTAL		331

Q12 The Inyo National Forest maintains a number of developed day use sites at each Bishop Creek Reservoirs recreation area. Using the map below, please indicate at which recreation area(s) you have recreated. (Select all that apply)

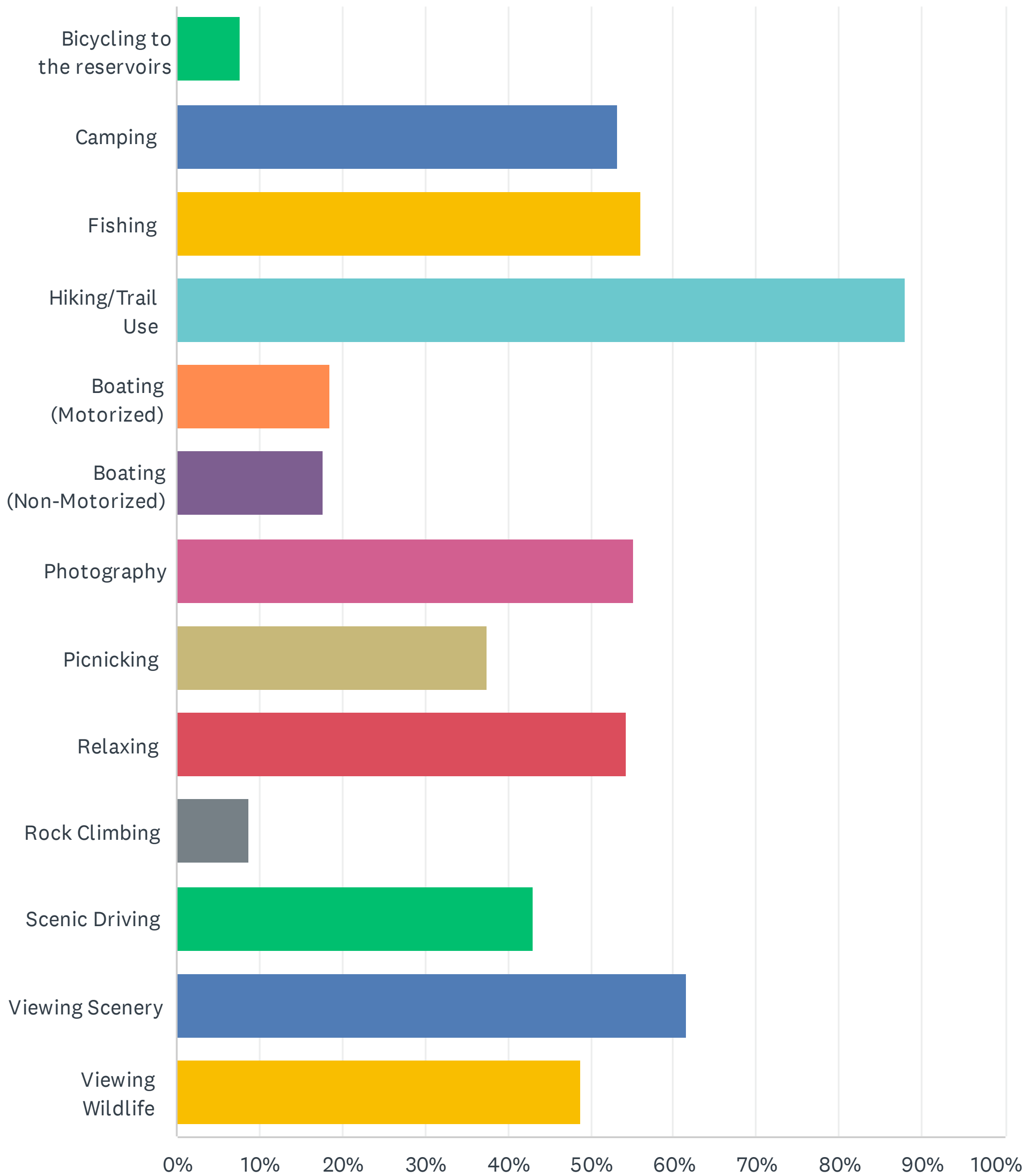
Answered: 323 Skipped: 38



ANSWER CHOICES	RESPONSES	
Lake Sabrina Recreation Area	89.47%	289
South Lake Recreation Area	90.71%	293
Intake No. 2 Reservoir Recreation Area	54.80%	177
Total Respondents: 323		

Q13 What type of recreational activities do you pursue at the Bishop Creek Reservoirs? (Select all that apply)

Answered: 328 Skipped: 33



ANSWER CHOICES	RESPONSES	
Bicycling to the reservoirs	7.62%	25
Camping	53.35%	175
Fishing	56.10%	184
Hiking/Trail Use	88.11%	289
Boating (Motorized)	18.60%	61
Boating (Non-Motorized)	17.68%	58
Photography	55.18%	181
Picnicking	37.50%	123
Relaxing	54.27%	178
Rock Climbing	8.84%	29
Scenic Driving	42.99%	141
Viewing Scenery	61.59%	202
Viewing Wildlife	48.78%	160
Total Respondents: 328		

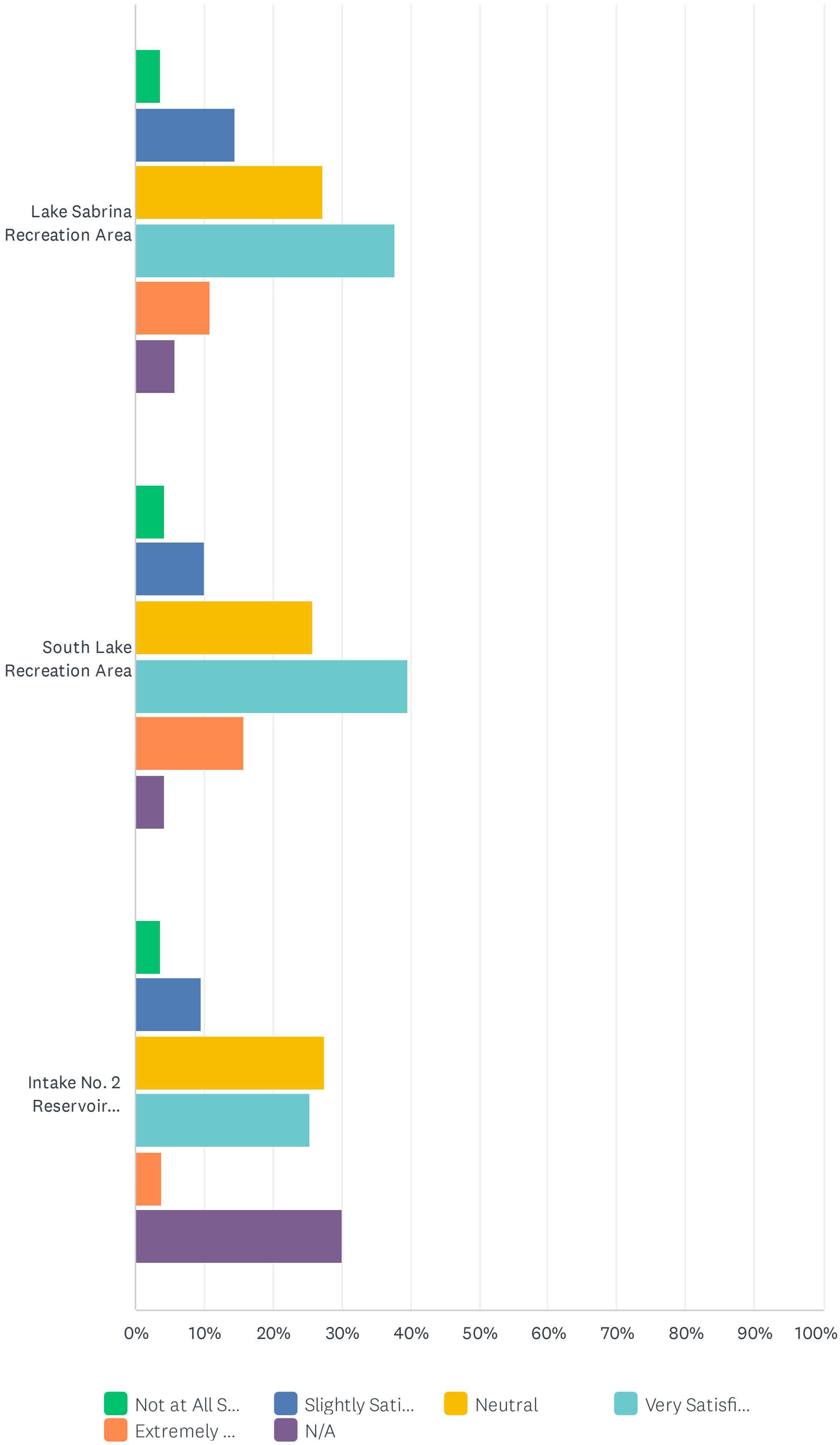
#	OTHER (PLEASE SPECIFY)	DATE
1	Hunting	11/10/2021 9:57 AM
2	Walking dogs	11/9/2021 7:03 PM
3	backcountry skiing, ice skating	9/25/2021 2:35 PM
4	Leaf peeping	9/23/2021 9:35 AM
5	mountain biking	9/23/2021 8:02 AM
6	Traditional gathering	9/22/2021 9:48 PM
7	Dog walks.	9/22/2021 7:15 PM
8	OHV access across from Intake 2	9/22/2021 6:55 PM
9	horseback riding at the pack station	9/22/2021 2:26 PM
10	Sledding	9/21/2021 8:57 PM
11	Walking the dog	9/18/2021 2:04 PM
12	Backpacking	9/18/2021 10:08 AM
13	Float tubes	9/17/2021 5:35 PM
14	We're creek fisherman !	9/14/2021 12:21 PM
15	I only fish the streams, not the lakes	9/13/2021 3:10 PM
16	Shooting	9/12/2021 7:06 AM
17	Hiking with dogs	9/11/2021 7:48 PM
18	skiing across reservoirs when they are frozen	9/1/2021 11:01 AM
19	Cross country skiing	8/23/2021 11:14 AM
20	Swimming	8/13/2021 2:28 AM

21	X-c skiing	7/14/2021 5:40 PM
22	backpacking	7/4/2021 6:51 PM
23	BC ski	6/16/2021 2:18 PM
24	peak climbing, backpacking	6/15/2021 8:59 AM
25	Sledding and cross country skiing	6/10/2021 11:07 AM
26	Skiing	6/8/2021 7:12 AM
27	Multi-day backpacking primarily	6/7/2021 5:54 PM
28	backpacking	6/6/2021 7:10 AM
29	Backpacking	5/31/2021 6:28 PM
30	Accessing the Backcountry	5/30/2021 7:58 AM
31	swimming	5/9/2021 11:22 PM
32	Snow shoe, skiing	4/2/2021 8:55 AM
33	Hunting...bear, deer, upland game	1/13/2021 9:02 AM
34	Geological studies	1/10/2021 4:54 PM
35	Skiing (winter)	1/8/2021 11:39 AM
36	Ice skating and cross country skiing	1/7/2021 8:31 PM
37	Starting point for backpacking trips	1/7/2021 4:58 PM
38	Skiing	1/7/2021 4:19 PM
39	Skiing	12/19/2020 5:50 PM

Q14 For the recreation areas that have you used, how would you rate your overall satisfaction with the facilities at those day use sites? (Select all that apply)

Answered: 306   Skipped: 55

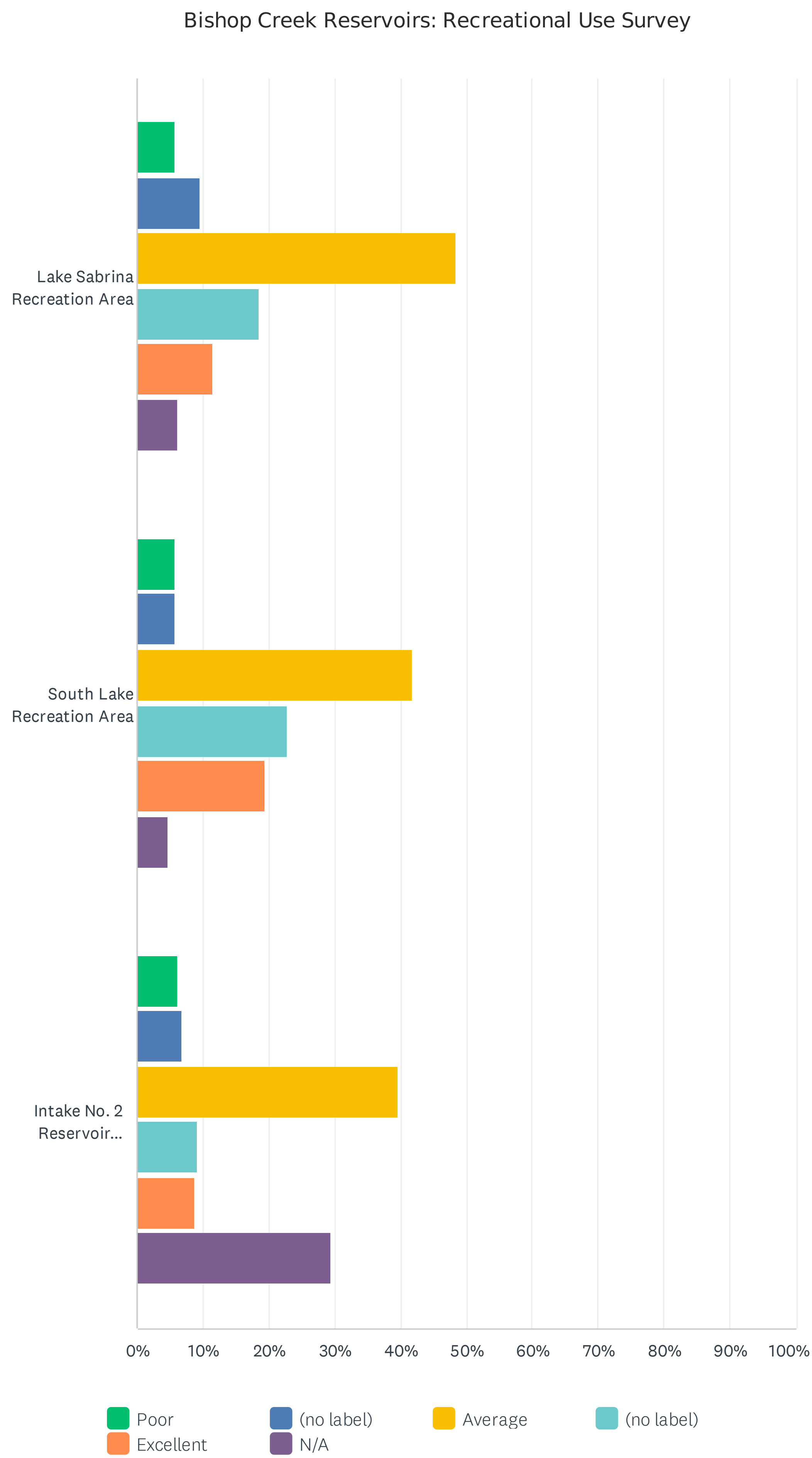
Bishop Creek Reservoirs: Recreational Use Survey



	NOT AT ALL SATISFIED	SLIGHTLY SATISFIED	NEUTRAL	VERY SATISFIED	EXTREMELY SATISFIED	N/A	TOTAL	WEIGHTED AVERAGE
Lake Sabrina Recreation Area	3.72% 11	14.53% 43	27.36% 81	37.84% 112	10.81% 32	5.74% 17	296	3.40
South Lake Recreation Area	4.36% 13	10.07% 30	25.84% 77	39.60% 118	15.77% 47	4.36% 13	298	3.55
Intake No. 2 Reservoir Recreation Area	3.53% 10	9.54% 27	27.56% 78	25.44% 72	3.89% 11	30.04% 85	283	3.24

Q15 For the recreation areas that have you used, how would you rate the overall condition of the facilities at those day use sites? (Select all that apply)

Answered: 306 Skipped: 55

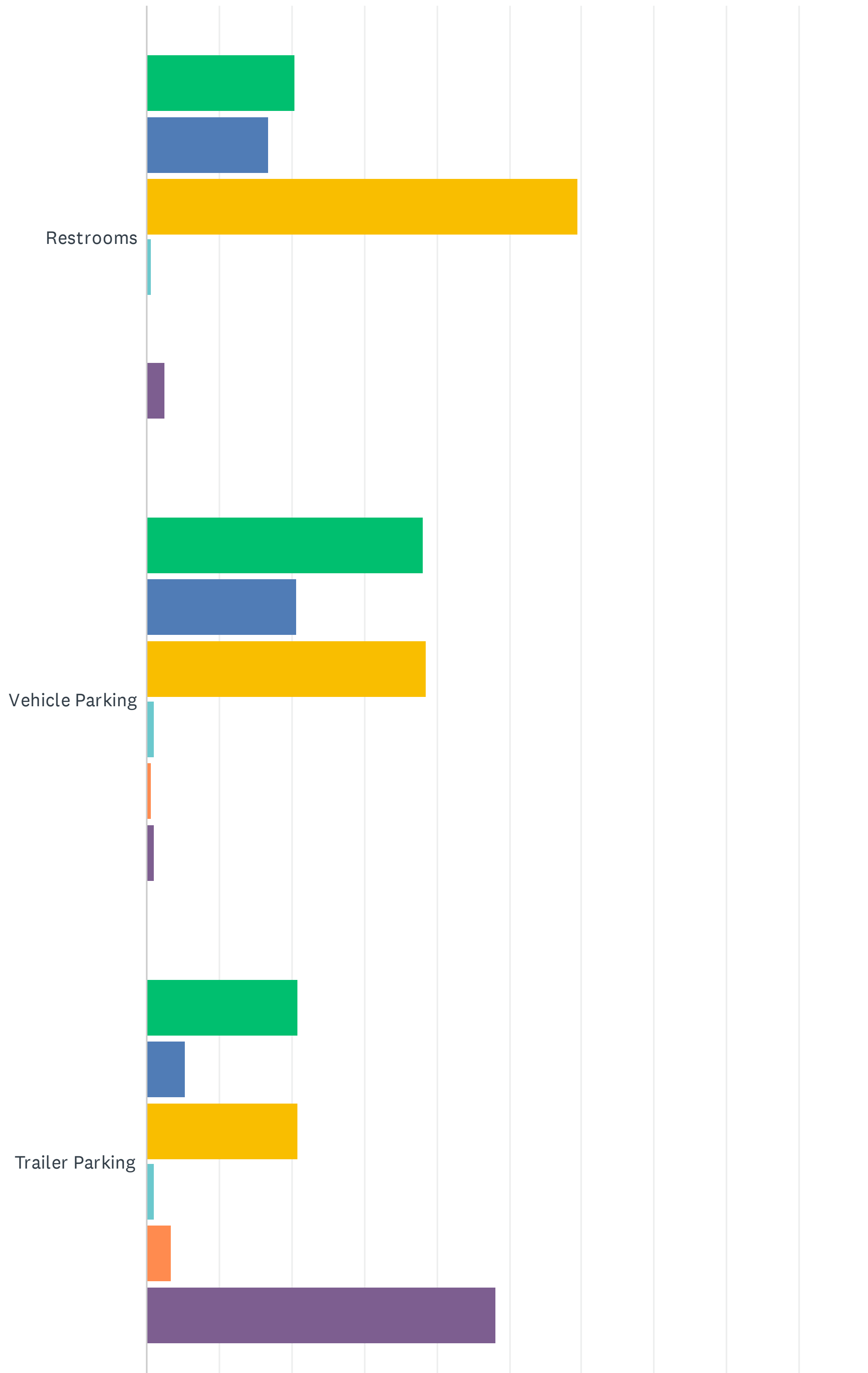


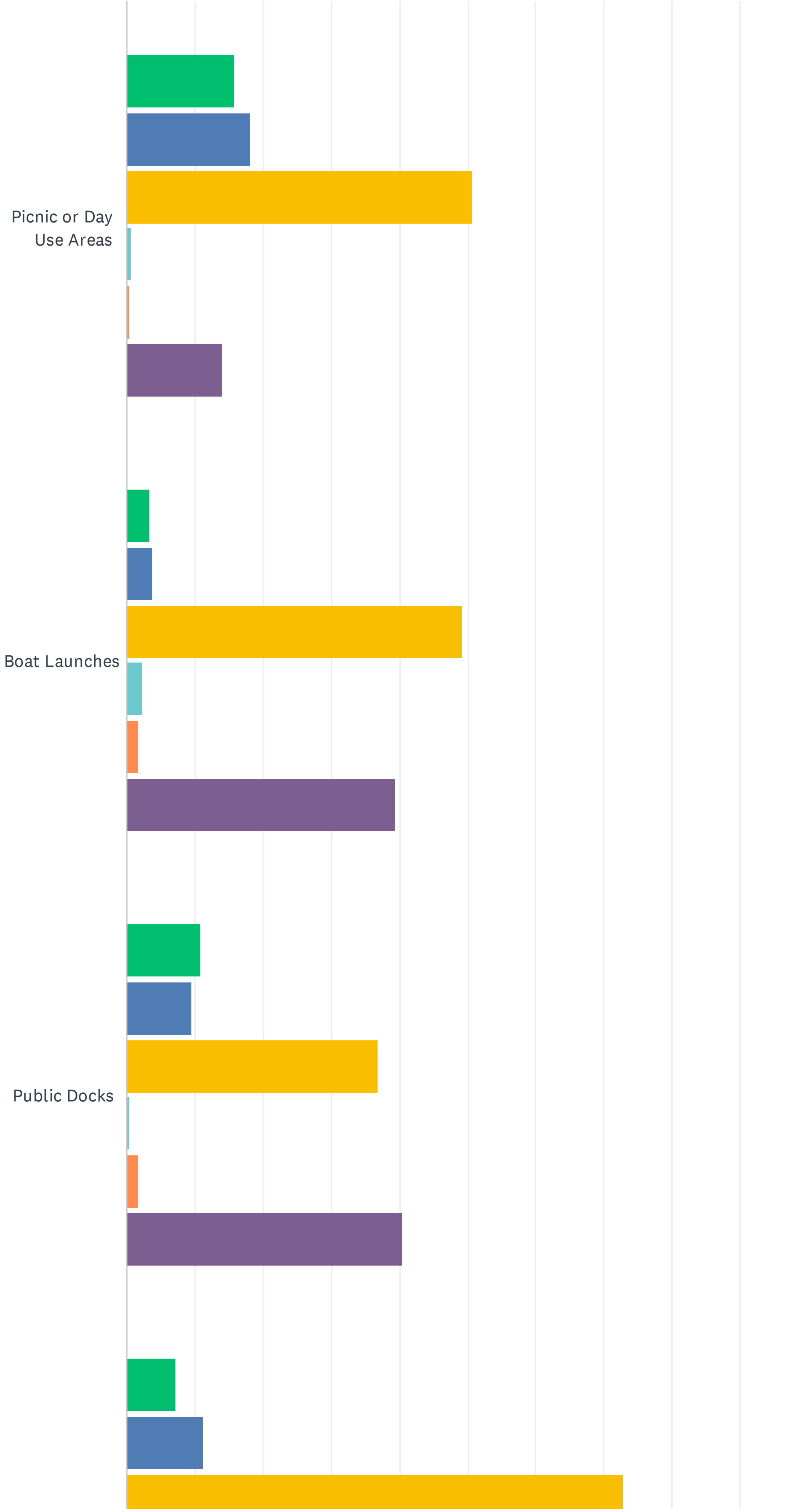
Bishop Creek Reservoirs: Recreational Use Survey
Lake Sabrina Recreation Area
South Lake Recreation Area
Intake No. 2 Reservoir...
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Poor
(no label)
Average
(no label)
Excellent
N/A

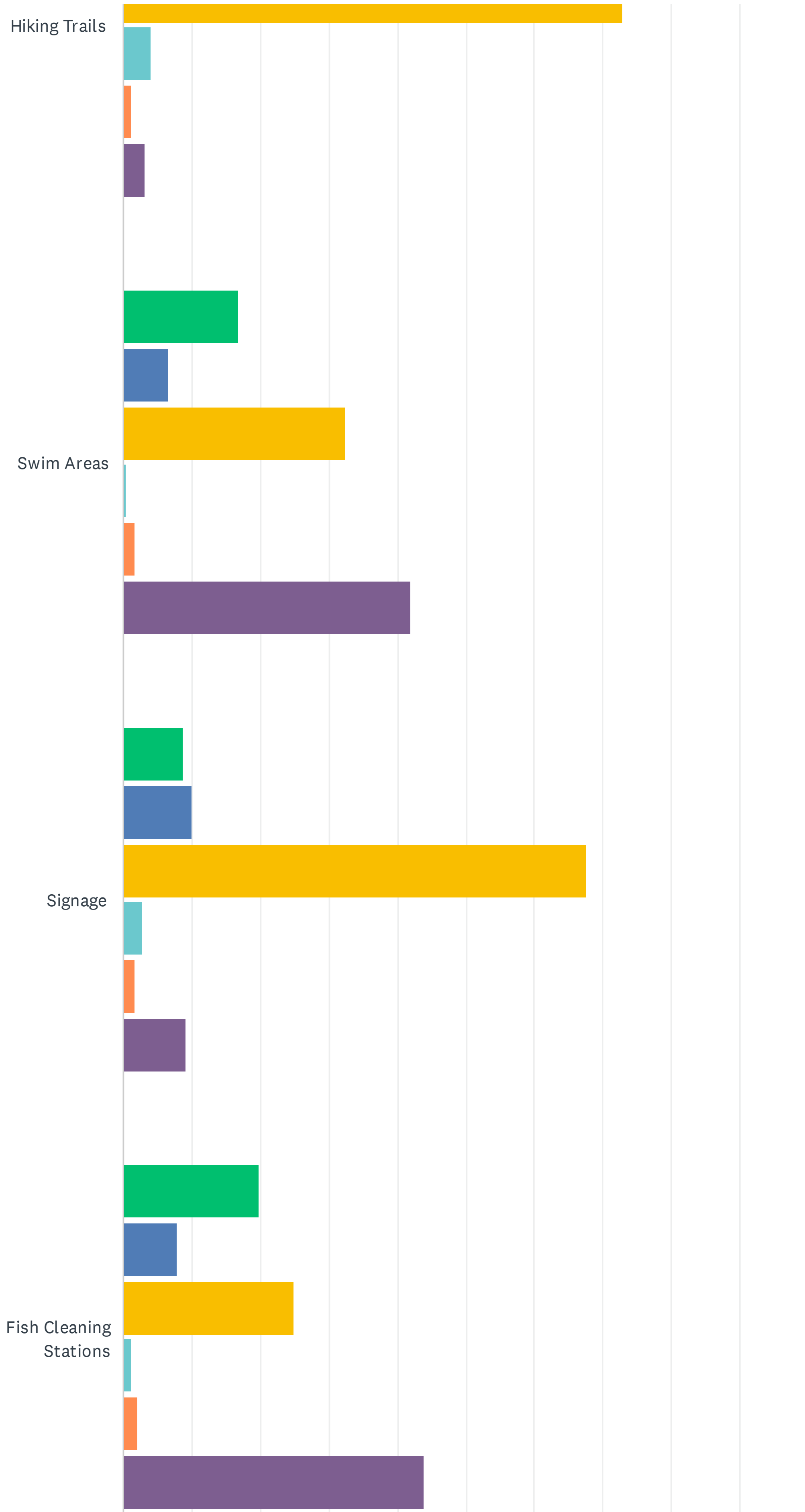
	POOR	(NO LABEL)	AVERAGE	(NO LABEL)	EXCELLENT	N/A	TOTAL	WEIGHTED AVERAGE
Lake Sabrina Recreation Area	5.76% 17	9.49% 28	48.47% 143	18.64% 55	11.53% 34	6.10% 18	295	3.22
South Lake Recreation Area	5.69% 17	5.69% 17	41.81% 125	22.74% 68	19.40% 58	4.68% 14	299	3.47
Intake No. 2 Reservoir Recreation Area	6.18% 17	6.91% 19	39.64% 109	9.09% 25	8.73% 24	29.45% 81	275	3.10

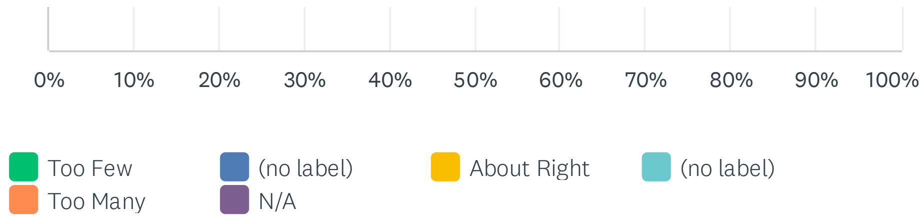
Q16 In your experience, how would your rate the number of existing day use facilities at the Bishop Creek Reservoirs? (Select all that apply)

Answered: 307 Skipped: 54




Picnic or Day Use Areas
Boat Launches
Public Docks


Hiking Trails
Swim Areas
Signage
Fish Cleaning Stations



	TOO FEW	(NO LABEL)	ABOUT RIGHT	(NO LABEL)	TOO MANY	N/A	TOTAL	WEIGHTED AVERAGE
Restrooms	20.39% 62	16.78% 51	59.54% 181	0.66% 2	0.00% 0	2.63% 8	304	2.42
Vehicle Parking	38.24% 117	20.59% 63	38.56% 118	0.98% 3	0.65% 2	0.98% 3	306	2.04
Trailer Parking	20.98% 60	5.24% 15	20.98% 60	1.05% 3	3.50% 10	48.25% 138	286	2.24
Picnic or Day Use Areas	15.82% 47	18.18% 54	50.84% 151	0.67% 2	0.34% 1	14.14% 42	297	2.44
Boat Launches	3.42% 10	3.77% 11	49.32% 144	2.40% 7	1.71% 5	39.38% 115	292	2.92
Public Docks	10.92% 31	9.51% 27	36.97% 105	0.35% 1	1.76% 5	40.49% 115	284	2.54
Hiking Trails	7.26% 22	11.22% 34	72.94% 221	3.96% 12	1.32% 4	3.30% 10	303	2.80
Swim Areas	16.90% 49	6.55% 19	32.41% 94	0.34% 1	1.72% 5	42.07% 122	290	2.37
Signage	8.75% 26	10.10% 30	67.68% 201	2.69% 8	1.68% 5	9.09% 27	297	2.76
Fish Cleaning Stations	19.72% 57	7.96% 23	24.91% 72	1.38% 4	2.08% 6	43.94% 127	289	2.25

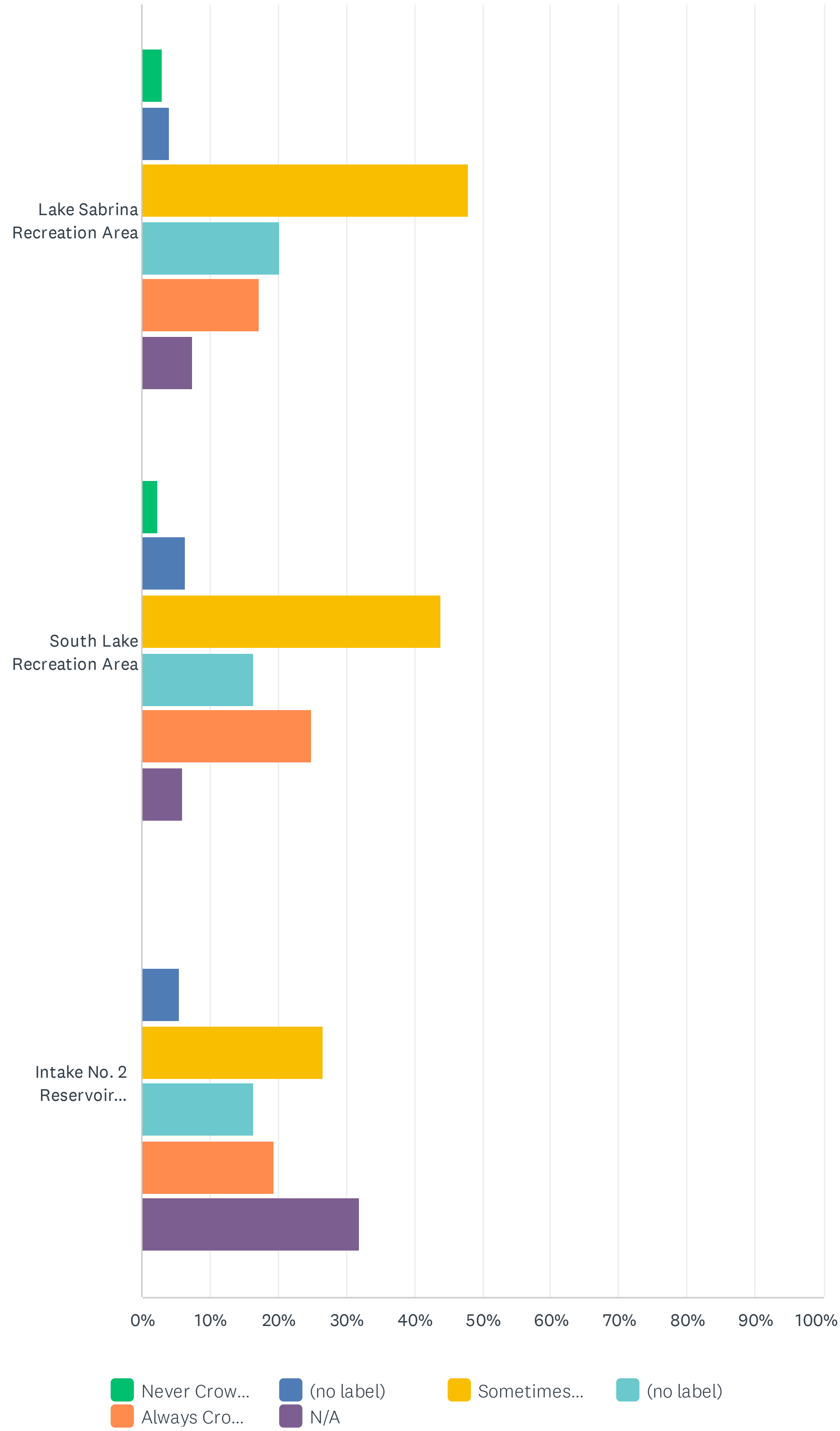
#	OTHER (PLEASE SPECIFY)	DATE
1	The roads need wider shoulders for cycling in some areas.	11/24/2021 11:52 AM
2	Water in all is too low, too much water is being drained	11/9/2021 4:15 PM
3	at peak use times, South Lake and Sabrina could use more parking	11/6/2021 7:37 AM
4	don't build more, it will become (more) over crowed	9/24/2021 9:23 AM
5	South Lake needs more parking	9/23/2021 9:41 AM
6	Mountain biking staging area and continuous trails.	9/23/2021 8:07 AM
7	Need OHV connector to Buttermilk area from campgrounds!!!!	9/22/2021 6:58 PM
8	Can't access boat launches when water is so low	9/19/2021 8:16 AM
9	Water levels at Sabrina drained far too low	9/12/2021 6:52 PM
10	Need more trash cans	9/12/2021 12:40 PM
11	Not enough car parking	9/11/2021 6:11 PM
12	Crowds	8/31/2021 4:37 AM
13	It is hard to quantify the number of facilities needed when the current condition of facilities is so poor. i.e Boat ramps are horrible and have safety issues. Restrooms are in disrepair.	6/23/2021 3:27 PM

14	Stocking has been inadequate for the past few years	6/16/2021 12:50 PM
15	Not enough overnight parking at South Lake. Overflow overnight parking too far from trailhead.	6/7/2021 5:59 PM
16	Bear resistant food storage lockers: not enough of them and they are often broken.	5/27/2021 10:43 PM
17	Sabrina fish cleaning closed	5/4/2021 9:00 PM
18	Please make more trails!	1/8/2021 7:59 PM
19	More parking at south lake for kayakers, fisherman	1/8/2021 3:58 PM
20	No backpacker camping at trailheads.	1/7/2021 4:22 PM

Q17 In general, for your combined trips to day use sites at the Bishop Creek Reservoirs, how crowded do you feel at the following locations? (Rate one per row)

Answered: 307 Skipped: 54

Bishop Creek Reservoirs: Recreational Use Survey



	NEVER CROWDED	(NO LABEL)	SOMETIMES CROWDED	(NO LABEL)	ALWAYS CROWDED	N/A	TOTAL	WEIGHTED AVERAGE
Lake Sabrina Recreation Area	3.04% 9	4.05% 12	47.97% 142	20.27% 60	17.23% 51	7.43% 22	296	3.48
South Lake Recreation Area	2.33% 7	6.33% 19	44.00% 132	16.33% 49	25.00% 75	6.00% 18	300	3.59
Intake No. 2 Reservoir Recreation Area	0.00% 0	5.61% 16	26.67% 76	16.49% 47	19.30% 55	31.93% 91	285	3.73

Q18 Please provide any additional detail on how we can improve day use opportunities at the Bishop Creek Reservoirs.

Answered: 140 Skipped: 221

#	RESPONSES	DATE
1	Extended shuttle hours between South Lake and Lake Sabrina.	11/24/2021 11:52 AM
2	Needs more water	11/9/2021 4:33 PM
3	Leave more water!!	11/9/2021 4:15 PM
4	Repair restrooms, bear lockers.	10/21/2021 6:18 PM
5	Road & parking at intake are terrible…not necessary to pave, but grading and drainage improvement would be nice	10/3/2021 9:14 AM
6	Need more overnight parking closer to trailhead for Sabrina	10/2/2021 9:18 AM
7	Please don't plow the road to south lake in the spring if the road is not going to be open for vehicles. I go up there to backcountry ski and would much rather ski the road than have to walk behind a locked gate/chain to get to the snow.	9/25/2021 2:41 PM
8	Better cared for rest rooms, especially at Sabrina.	9/24/2021 1:40 PM
9	More fire restrictions to reduce human impact on forest lands.	9/24/2021 5:21 AM
10	Overnight backpack parking closer to TH for Lake Sabrina. More options for transportation (more bus routes for example) from Bishop to and from the reservoirs	9/23/2021 8:38 PM
11	Have someone pick up trash at Intake 2 more often. I have to do it myself every time we go.	9/23/2021 9:41 AM
12	Parking is needed for designated day-use and hiking trail access. Provide using existing or provide new, continuous multi-use trail throughout canyons, connecting campgrounds, reservoirs, and facilities.	9/23/2021 8:07 AM
13	Stock more fish!	9/22/2021 9:36 PM
14	Provide legal OHV access to adjoining trail systems, Coyote flats and Buttermilks.	9/22/2021 6:58 PM
15	cut down the reserve camping and enlarge the parking lots at the lakes as well as abolish the hundred year water agreement with dwp so the lakes stay full and useable via boating	9/22/2021 6:25 PM
16	More day use areas, ex…picnic and a place to relax and enjoy the scenery.	9/22/2021 3:06 PM
17	need more places to ride horses, park trailers	9/22/2021 2:28 PM
18	more parking at south lake, more water for longer boat season.	9/22/2021 11:14 AM
19	Keep open.	9/22/2021 10:02 AM
20	Would like to see the area better developed, more accessible with signage that is updated and clear.	9/22/2021 9:05 AM
21	Comparing to other states such as Utah, the facilities on Bishop Creek and Eastern Sierra as a whole are subpar.	9/22/2021 8:10 AM
22	Better parking more restrooms	9/21/2021 9:50 PM
23	Stop attracting more and more people with fussy stuff. It's a goddamn DisneyLand up there now.	9/21/2021 8:23 PM
24	Add more parking.	9/21/2021 6:27 PM
25	Stock more big fish	9/21/2021 6:04 PM
26	Provide first access to locals	9/21/2021 5:57 PM

27	I am not a day user per se but when many come for the Fall Colors, there isn't enough parking at Sabrina. Even with the overflow parking, it can by quite chaotic. Add in the fact that the lakes are incredibly low this year takes away from the experience.	9/20/2021 9:40 AM
28	The main areas to improve are trails, particularly loop and trails from Bishop, and docks at boat ramps. Convict Lake, for example, serves many visitors in part because of the trail around the lake. All three larger Bishop Creek reservoirs should have improved trails around the lakes. At Intake 2, there is a trail in place though it is not maintained or signed. At Lake Sabrina, there is a route around lake near lake level that could be reasonably improved to a maintained trail. This trail would have significantly more ups and downs than the Convict Lake trail but still could serve a similar purpose. In addition to a new trail constructed on the route around Lake Sabrina, there is an existing well-built but not maintained trail that climbs up along the northwest side of the lake up in to the basin. This trail ends near where the outlet of Blue Lake meets the main branch of the Middle Fork of Bishop Creek. This trail should be cleared and extended to meet the current trail between Blue Lake and Emerald Lakes to create another loop and an opportunity for a variety of hiking routes in the Basin. South Lake would also benefit from a trail around the lake though construction here could be more difficult. A "Bishop Creek Canyon Trail" should be established between the community of Bishop and the reservoirs using DWP, SCE, and public lands on existing and new trails, and existing and abandoned roads. Improved crossings (bridges) should be provided across the creek to access the Little Egypt and areas west. Less money should be put into minor rerouting of existing trails (that, I am sorry to say, 90% of the time degrade the trail in terms of efficiency and enjoyment) and that money should be directed to trail maintenance and reestablishing historical trails. A trail should be established on the flow line between the South Fork and Intake 2. A trail should be established between the Forks Campground and the high point in the middle of the canyon. The boat ramps at Lake Sabrina and South Lake could be extended, if feasible, to be usable at low water levels. The boat ramps should have public docks so boats can be safely left while trailers are being parked. (Speaking of Convict Lake, this also applies there)	9/19/2021 8:59 AM
29	Either create a new path to launch boats, or keep water levels higher	9/19/2021 8:16 AM
30	More parking or support more shuttles.	9/19/2021 7:47 AM
31	More day use and overnight parking at Lake Sabrina trailhead. Maybe it doesn't apply here, but an uphill bike lane from Bishop to Lake Sabrina would be awesome, like the Rock Creek road from Tom's Place to Rock Creek Lake. It's very dangerous biking up State Highway 168.	9/18/2021 3:36 PM
32	The last couple of years there has been a huge increase in the number of people in the area, and I am very concerned about natural resource damage. People are sometimes parking by driving off the road and onto the side where there is obviously not a legal parking place, damaging plants and eroding soil. Parking must be enforced, and I hate to say it but it might be time for permitted parking. Also, so many people using paths and trails for day use that it is often no longer enjoyable to be there. And there has been a great increase in trash . There needs to be a tageted prgram to get people to use restrooms, put trash in containers, etc.	9/18/2021 2:12 PM
33	I also have lived in Bishop for 56 years.	9/18/2021 10:43 AM
34	Need more parking for sure	9/18/2021 10:11 AM
35	Improve lake conditions and provide more seasonal water capacity instead of feeding out waters to the City of Los Angeles. Maintain water conditions.	9/18/2021 8:30 AM
36	Better maintain facilities. Ensure water flow is sufficient Do not drain the lakes and continually ruin the fishery	9/15/2021 10:24 PM
37	Restrict cranky old fishermen. ;)	9/15/2021 1:41 PM
38	More parking at South Lake.	9/15/2021 11:03 AM
39	Restrooms often overloaded w trash and have doors that don’t lock. More shade and fish cleaning areas would help. Thanks!	9/14/2021 1:35 PM
40	Manage waterflow in the creeks with a little consideration for the fisherman. I know there's a greater importance. We don't fish at night and white water would be fine at this time. I would hope the gates for the big pipes are not tied into the flow of the creeks. Thanks .....Rob Gove	9/14/2021 12:34 PM
41	More shade spots to fish, more spots just for handicap people	9/14/2021 9:22 AM

42	Greater oversight of areas, more manpower to clean and maintain areas. More financial responsibility to the canyon.	9/13/2021 4:00 PM
43	Hiking trail head parking needs improvement. There is ample space to provide hikers and day fishermen areas to hike and fish to keep cars off the sides of the roads.	9/13/2021 10:21 AM
44	Don't drain the water so low at Sabrina	9/12/2021 6:52 PM
45	Restroom on the dam side of Intake 2. Additional parking near the dam South Lake. There should be no swimming in any of them	9/12/2021 4:13 PM
46	More pick nick tables and BBQ	9/12/2021 1:57 PM
47	Stock fish and quit draining the water	9/12/2021 12:40 PM
48	Great place but the water levels at the Sabrina and South lake are not managed well. What happened to accurately surveying the snow pack? DFG needs to get it together as well. Too many in educated folks are killing of the native trout species due to the lack of put and take hatchery fish. It is sad to see.	9/11/2021 11:55 PM
49	Having enough restrooms, picnic areas and trash receptacles in developed areas helps keep natural areas cleaner and less impacted by visitors.	9/11/2021 10:44 PM
50	More water in the lakes.	9/11/2021 9:37 PM
51	Please create mire trails with good signage. More educational posts also at TH	9/11/2021 7:50 PM
52	Keep the water levels high enough to use the lakes.	9/11/2021 7:33 PM
53	Keep the water levels up! Stock more fish to keep up with the crowds of people.	9/11/2021 7:26 PM
54	Maybe more trails to split up the crowds. More parking between parchers and south lake	9/11/2021 6:11 PM
55	Keep water in lakes to prevent over crowding in other lakes	9/11/2021 5:28 PM
56	Improve camp ground roads	9/11/2021 4:53 PM
57	Trash and speeding and two persistent issues throughout the canyon as well, in the fall travelers are extremely inconsiderate and unsafe on the roads taking pictures.	9/11/2021 3:43 PM
58	More parking for hikers	9/11/2021 3:34 PM
59	Don't close the area every time there is a fire!	9/11/2021 1:35 PM
60	By keeping water in the reservoirs it allows people boating and fishlng	9/11/2021 1:08 PM
61	Keep Reservoir levels more consistent year to year. Plant more fish.	9/11/2021 9:48 AM
62	More showers.	9/4/2021 9:18 AM
63	additional parking, especially at South Lake empty trash at South Lake more often (it stinks of fish), and/or put up signs saying no dumping dead fish in the trash!	9/1/2021 11:20 AM
64	Handicapped parking closer to dam at Sabrina and closer to handicapped fishing area at Intake 2	8/31/2021 4:23 PM
65	There should be more day uses spots with campfire rings, locals like to picnic too .there should be less camp spots for overnight use , making the campground less crowded	8/31/2021 4:37 AM
66	Thank you	8/23/2021 12:53 PM
67	More day use / picnic areas. More campsites for TENTS ONLY. Campgrounds are overrun with huge RVs. RVS don't need the shade or privacy that TENTING needs. Also, most RVs run generators which takes away from a pleasant camping experience for those who like the quiet of the woods and mountains.	8/23/2021 11:21 AM
68	Edison, fill the lakes! Stop your operations and return the wilderness to Californians. Stop fleecing Californians with the nation's highest energy costs.	8/23/2021 7:38 AM
69	More parking	8/18/2021 12:51 PM
70	Signs can direct drivers to nearest additional parking when parking lot is full.	8/13/2021 2:31 AM

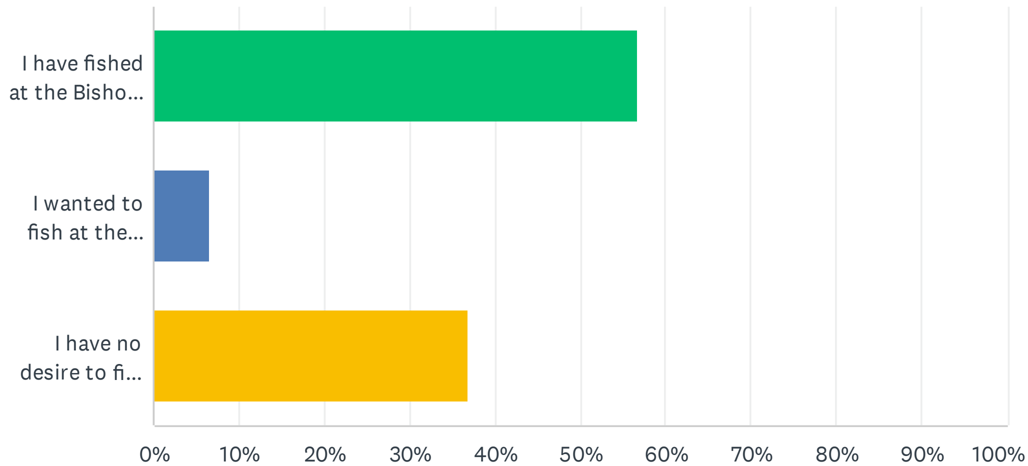
71	Need more overnight parking!	8/7/2021 9:48 AM
72	We avoid the weekends, so our opinion is skewed. Weekends are crowded and there is never enough parking.	8/6/2021 5:00 PM
73	Water management strategy is a problem. In drought years water managers should store water prioritized by recreational value. For instance, South Lake which has a lot of storage capacity is mostly unuseable for recreation in serious drought years. Lake Sabrina on the other hand requires only half the water as South Lake to fill. This means that if additional water is pulled from South Lake, more can be stored at Sabrina where folks can still participate in recreational activites and the impact of the drought is minimized. It is a lot better for one of the two reservoirs to be operational than for both to be empty. This can be done while still meeting mandatory releases at the bottom of the hill.	8/5/2021 3:28 PM
74	I didn't read every sign at the various trail heads but it would be good to add information regarding who has the right of way on trails since so many of them are rather narrow. Also, emphasize the LNT principle of not camping right next to water sources can also be reiterated. Thanks	8/5/2021 1:21 PM
75	Please stop allowing dogs on the trails! They disrupt wildlife, and so many people do not keep their dogs on leash. I have a dog, but would never bring her to an area like this, where she would disrupt wildlife.	7/18/2021 2:17 PM
76	Hold more water	7/16/2021 2:45 PM
77	Parking can be a bit of a mess sometimes, add a few miles to the hikes. I try to visit during the off-season for that reason. (But of course snow season is inadvisable with my 2WD vehicle).	7/13/2021 6:19 PM
78	There is too much horse manure on the trails, particularly the Bishop Pass Trail. Require packers to use Catch it Bags to prevent dropping manure on the trails. I'd much rather smell the flowers tan horse manure and urine! If the packers are not willing to do this either eliminate or drastically reduce the number of packer trips allowed.	7/13/2021 11:35 AM
79	More parking spaces	7/13/2021 12:54 AM
80	Parking is usually the biggest issue, but I think you don't really have any more space to make more parking.	7/7/2021 2:59 PM
81	Incredible area. World class recreation opportunities and beauty. Need more hiking trails built + more parking as weekends are insane.	7/6/2021 10:01 PM
82	Fish are never stocked and its almost not worth the trip if you are going to spend money to fish and dont have good luck	7/6/2021 7:34 PM
83	More/better parking including for overnight hikers, better signage of parking/no parking zones to keep parked vehicles out of the roadways. More/better maintained restroom facilities.	7/5/2021 4:05 PM
84	showers please	6/29/2021 9:12 PM
85	Take out less water	6/26/2021 2:57 PM
86	Facilities Needed: Picnic area with parking, including trash and restrooms. Formalized trails around Sabrina and South Lake to facilitate hiking and fishing as the vegetation is currently being compromised and the use trails that have developed around the reservoirs do not facilitate a good user experience.	6/23/2021 3:27 PM
87	Work with USFS, BLM, DWP, Inyo County, CalTrans, City of Bishop, homeowners, permittees and ESSRP to create a Bishop Creek plan turned into reality that addresses recreation needs going into the future, enhances the residents' and visitor experience, and maintains and improves the health of the environment.	6/23/2021 12:54 PM
88	Bathroom facilities at all three locations, but partulary Intake II and Sabrina, are under maintained and inadequate. They are a mess and need more regular attention.	6/18/2021 6:55 PM
89	A few more parking spaces…….	6/17/2021 2:10 PM
90	More trail heads could disperse parking.	6/16/2021 2:21 PM
91	The water levels are usually too low at Sabrina and South Lake, and the fish stocking has been woefully inadequate while at the same time the license fees continue to increase.	6/16/2021 12:50 PM

92	One more shuttle time	6/10/2021 3:47 PM
93	Greater amount of Trailhead parking to avoid road congestion and blockages on high use days	6/10/2021 12:04 PM
94	Parking is the issue. Plenty of space but so little parking that people park dangerously or we go home due to know parking. Buses would be really helpful	6/10/2021 11:10 AM
95	More trailhead overnight parking. ESP. South lake. Having to park on the edge of the road a mile or more from the trail head is terrible.	6/9/2021 5:13 PM
96	Please don't build more parking. The lots sometimes fill up, but that spreads out visitors to other trailheads/recreation areas!	6/8/2021 7:14 AM
97	Separate and more parking for backpackers. At Sabrina, more backparker parking nearer to the trailhead.	6/7/2021 7:29 PM
98	Please add more overnight parking near the trailhead. Especially at South Lake. Perhaps allow overnight parking in more spaces that are now reserved for day use only.	6/7/2021 5:59 PM
99	trying to enjoy the natural beauty and wilderness but the boat motors are too loud at south lake and sabrina. wish outboard motors could be banned. perhaps south lake could be for non-motorized floats and kayaks and sabrina could be for motors. would be interesting if we could do an experiment for a few years and keep one quiet for the enjoyment of hikers and boaters alike.	6/4/2021 10:34 AM
100	Would be nice to have overnight parking close to the Lake Sabrina trail.	6/2/2021 12:26 AM
101	Sabrina Lake area doesn't seem to have enough picnic areas/places to just relax and enjoy the views. You have an upper parking area that everyone drives to and there is not much there except a bathroom and no where to sit and relax to enjoy the view. There is the store and cafe of course but some people might want to sit outside to be near the lake.	6/1/2021 1:36 PM
102	A trail around the lakes (Sabrina and South) would decongest the beginnings of the current trails as many people who are out of shape attempt and fail to hike the steep main trails. A loop around the lake, similar to convict lake but maybe not quite so absurdly comfortized, would provide access to more people and could even be a nice early morning running trail for locals who want altitude without quite so much elevation gain.	5/30/2021 8:05 AM
103	Please stock more fish! Fishing has been very poor the last few years	5/29/2021 5:08 PM
104	more fish planting	5/29/2021 10:28 AM
105	More restrooms, repair the bear lockers and add a few more, improve parking.	5/27/2021 10:43 PM
106	Put in more fish	5/26/2021 12:32 PM
107	Put in more fish	5/26/2021 12:12 PM
108	intake 2 is compromised by the shooting area across the hwy 168 from intake 2. close that shooting area where sce dumps material dreged from reservoir. shooting is dangerous close to intake 2	5/25/2021 8:27 PM
109	Add more picnic areas and fish cleaning	5/25/2021 9:33 AM
110	Keep the restrooms clean and dumpsters emptied. Love this watershed.	5/25/2021 6:52 AM
111	Enforce camping restrictions. i.e. Ticket and tow illegelly camped vehicles. BAN CAMPFIRES. Period. It is appalling that they are still allowed when millions of dollars and large numbers of lives have been lost in California and elsewhere in the west due to fires. BAN THEM COMPLETELY.	5/24/2021 5:30 PM
112	Tow illegal parked overnight vehicles in day use spaces. Enforce no dispersed camping in the Bishop drainage.	5/24/2021 3:03 PM
113	Tow illegal campers from the parking lots	5/24/2021 2:51 PM
114	Provide more, dedicated/designated and developed vehicle parking areas adjacent to developed campgrounds and other roadside access points to the Bishop Creek	5/10/2021 3:22 PM
115	keep dogs out of the water.	5/9/2021 11:24 PM

116	Do not limit access to recreation.	5/6/2021 11:16 AM
117	I think more bathrooms would be a good investment	4/28/2021 10:46 PM
118	Need Forest Service in the area.	3/10/2021 4:55 PM
119	improve trailhead parking for south lake	3/2/2021 1:48 PM
120	Everything has become run down in the past 10 years, like no one is taking care of the place. Too crowded to enjoy as well.	2/26/2021 9:45 AM
121	Are has been increasing in popularity with many user groups for many years and is to be avoided on weekend, fall colors tours etc. It's nice to visit when you know not many people are up the canyon.	2/5/2021 7:27 AM
122	better plan for USFS emergency closure of Inyo NF.	1/13/2021 9:07 AM
123	More help with fish plants, more trash cans and trash service. More public parking options, Access to the rest of bishop creek canyon.	1/11/2021 2:25 PM
124	More overnight parking	1/10/2021 7:04 PM
125	Increased patrols for vandalism, excessively loud music and other nuisances. NO ADVENTURE PASS!	1/10/2021 4:59 PM
126	a loop trail connecting Sabrina, South Lakes, (looping around the lakes) to Bishop Creed downstream for fishing, hiking would be great to plan for the future, Thank you!	1/8/2021 7:59 PM
127	Additional parking near south lake boat ramp for boaters without losing parking for trailhead users (Bishop Pass, Long Lake, etc.)	1/8/2021 3:58 PM
128	Keep developed facilities limited to not attract more people, but make sure the bathrooms/trash can accommodate visitor numbers.	1/8/2021 11:41 AM
129	Good overall	1/7/2021 11:01 PM
130	Buses! Would be way better with fewer cars and parking issues, would maybe leave more space for picnic tables or some facilities for day use.	1/7/2021 8:35 PM
131	More parking	1/7/2021 7:30 PM
132	Need way more parking!!! I can show up at 5am and not find a parking spot. Better signage would be nice - I frequently see illegal campers. Some USFS enforcement on parking and camping regulations would be helpful.	1/7/2021 7:05 PM
133	Education on LNT , more trash containers , more education yo all the idiots, poo bags for humans and dogs	1/7/2021 7:00 PM
134	Provide 30Amp service/spots for RV and trailers. I would love to park closer to Sabrina with my trailer but there is no full hookup sites available	1/7/2021 6:07 PM
135	Parking at both Sabrina and south lake were overflowing all summer. It felt like 4th of July all summer, (and not in a good way). I don’t think efforts should be made to encourage even more visitation to a place that can’t really handle it, but perhaps signage for appropriate overflow parking spots is needed.	1/7/2021 4:33 PM
136	More fish and game patrolling the area.	1/7/2021 4:24 PM
137	More mountain education is needed.	1/7/2021 4:22 PM
138	Perhaps a weekend shuttle from Bishop will help with the parking issues.	12/23/2020 9:50 AM
139	There is way too much trash, especially fishing lines and hooks. I recommend hiring "Lake Stewards" to educate visitors on Leave No Trace and to help keep these beautiful areas pristine.	12/19/2020 5:55 PM
140	Keep yhe roads open more of the time.	12/16/2020 3:40 PM

Q19 Have you fished or are you interested in fishing at the Bishop Creek Reservoirs?

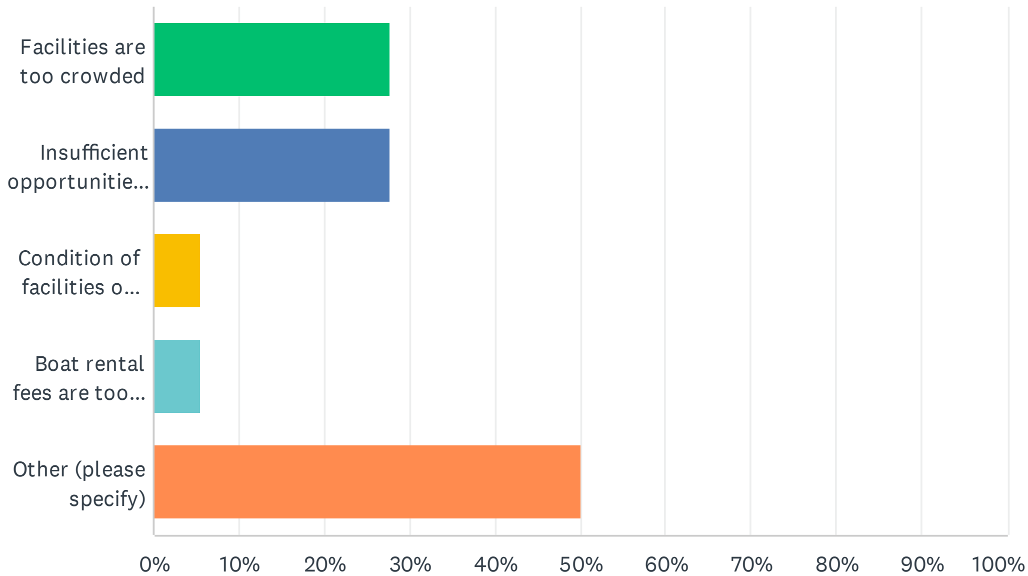
Answered: 307 Skipped: 54



ANSWER CHOICES	RESPONSES	
I have fished at the Bishop Creek Reservoirs	56.68%	174
I wanted to fish at the Bishop Creek Reservoirs, but something prevented me from doing so	6.51%	20
I have no desire to fish at the Bishop Creek Reservoirs	36.81%	113
TOTAL		307

Q20 Which of the following describes what prevented you from fishing at the Bishop Creek Reservoirs? (Select all that apply)

Answered: 18 Skipped: 343



ANSWER CHOICES	RESPONSES	
Facilities are too crowded	27.78%	5
Insufficient opportunities and accessibility	27.78%	5
Condition of facilities or access points are not well maintained	5.56%	1
Boat rental fees are too high	5.56%	1
Other (please specify)	50.00%	9
Total Respondents: 18		

#	OTHER (PLEASE SPECIFY)	DATE
1	Other activities to do	11/9/2021 7:07 PM
2	Nothing at all todo with your facilities. It was an equipment issue on my end.	8/16/2021 4:49 PM
3	I haven't learned how to fish yet	8/15/2021 4:09 PM
4	I’m new to fishing	8/8/2021 12:48 PM
5	I'm new to fishing	7/2/2021 7:43 AM
6	Poor planning	5/31/2021 6:30 PM
7	Gwar	5/30/2021 8:31 AM
8	Decided the chance of catching fish was limited.	2/19/2021 3:45 PM
9	I prefer to fish in the wilderness at the higher lakes. Also i dont have the gear for the bigger fish in the lower lakes	1/7/2021 6:59 PM

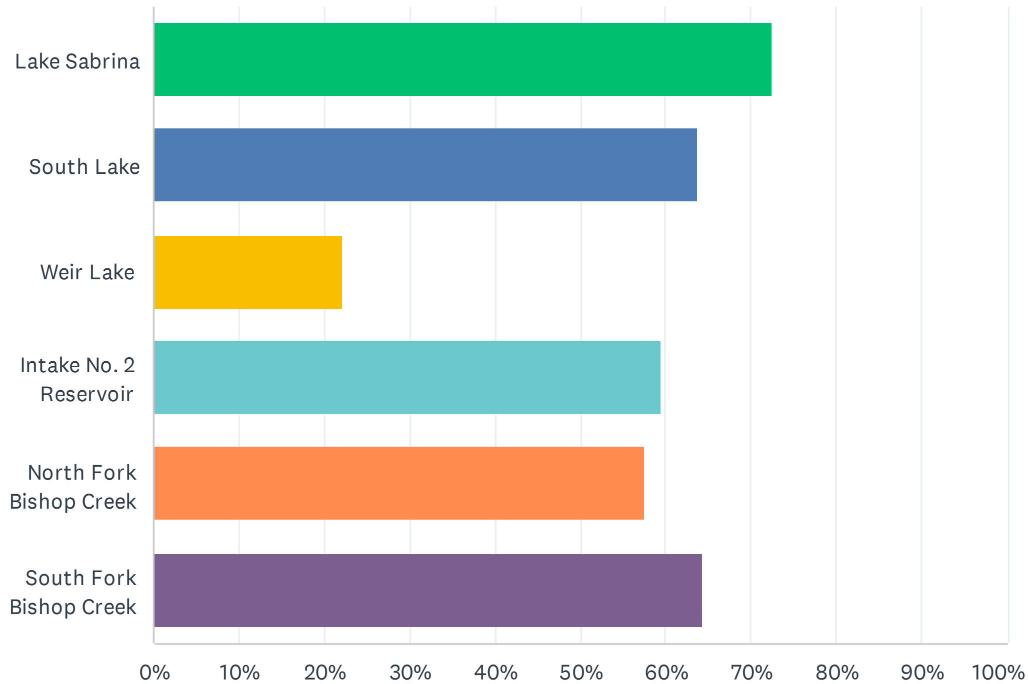
Q21 Please provide any additional detail on how we can improve fishing opportunities at the Bishop Creek Reservoirs.

Answered: 3 Skipped: 358

#	RESPONSES	DATE
1	Have fish and wildlife contribute our license money and stop stealing it. Ramp up local private stocking programs!	9/23/2021 7:08 AM
2	Not sure how places can be less crowded	8/31/2021 4:38 AM
3	beaches with sufficient brush clearance for fly fishing	2/26/2021 4:30 PM

Q22 Where do you typically spend your time fishing at the Bishop Creek Reservoirs? (Select all that apply)

Answered: 163 Skipped: 198



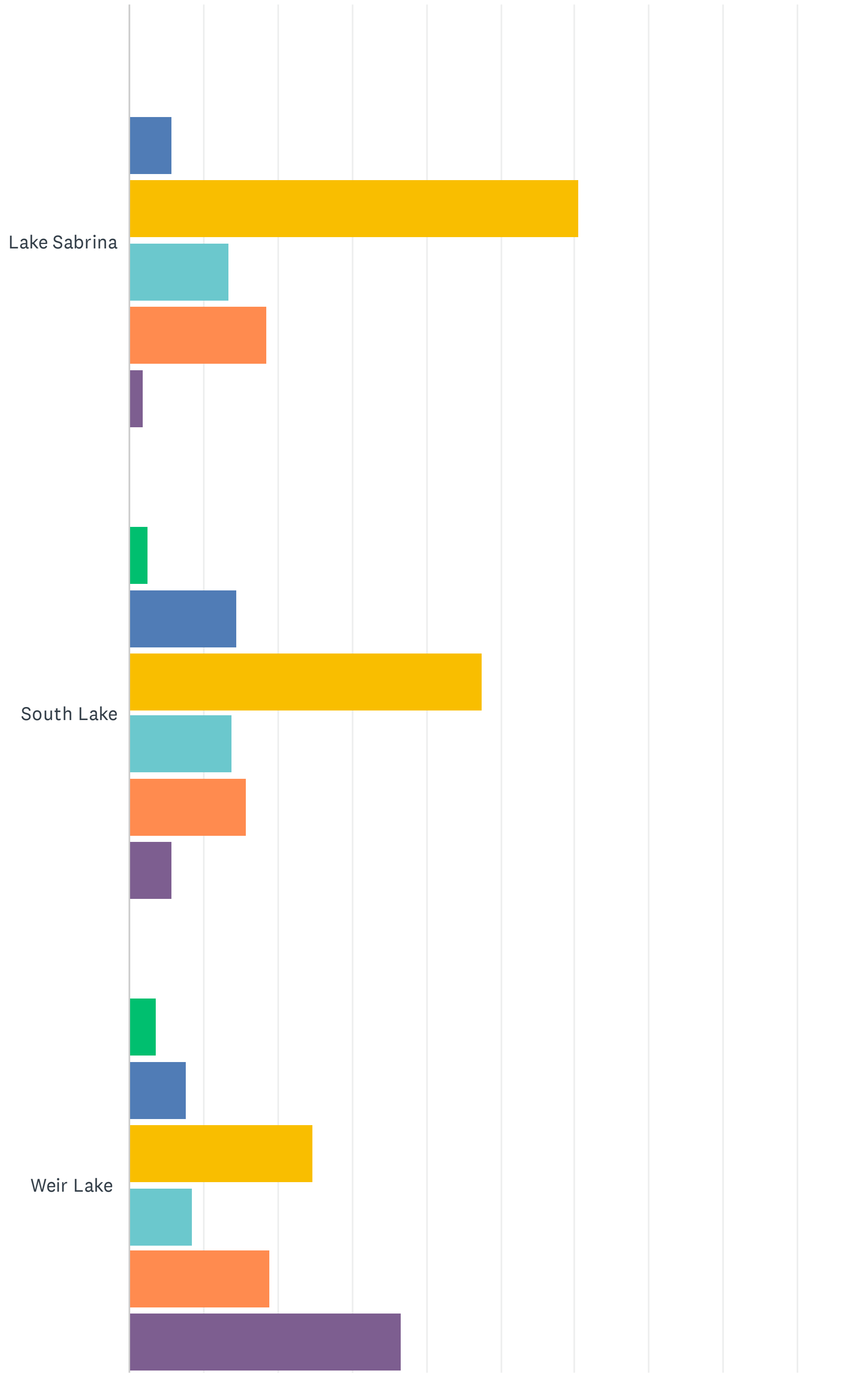
ANSWER CHOICES	RESPONSES	
Lake Sabrina	72.39%	118
South Lake	63.80%	104
Weir Lake	22.09%	36
Intake No. 2 Reservoir	59.51%	97
North Fork Bishop Creek	57.67%	94
South Fork Bishop Creek	64.42%	105
Total Respondents: 163		

#	OTHER (PLEASE SPECIFY)	DATE
1	high country streams	11/9/2021 4:35 PM
2	Lakes above the reservoirs	9/22/2021 9:55 PM
3	North lake	9/22/2021 9:38 PM
4	No longer fish. Your first question left this option out.	9/22/2021 7:25 PM
5	North lake	9/22/2021 11:56 AM
6	creeks	9/22/2021 8:31 AM
7	North Lake	9/20/2021 9:43 AM

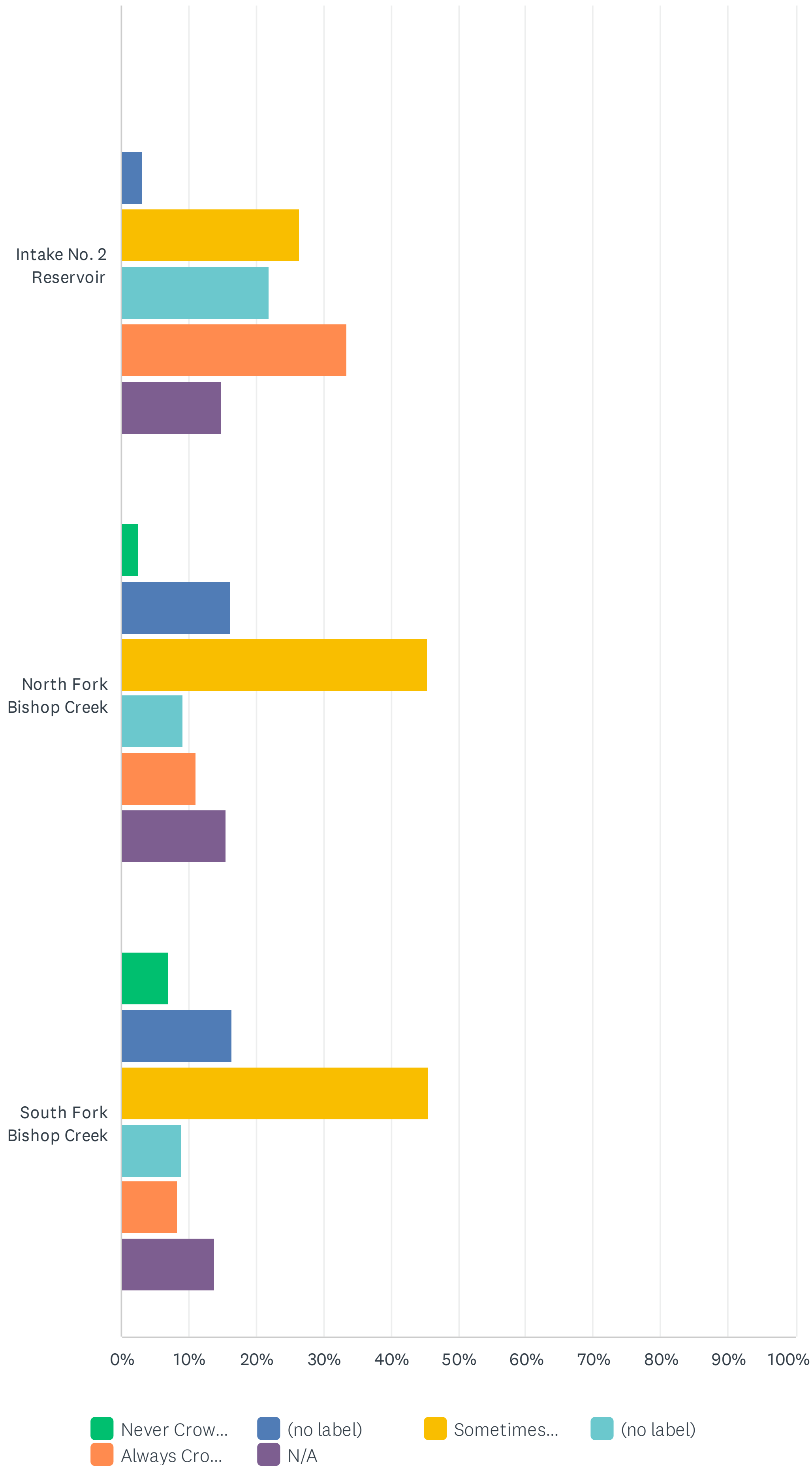
8	North Lake	9/17/2021 5:40 PM
9	Long lake	9/16/2021 1:49 PM
10	Cardinal Lodge Pond and all rivers leading up to Sabrina	9/14/2021 11:41 AM
11	North lake	9/12/2021 12:41 PM
12	North Lake	9/11/2021 11:57 PM
13	North Lake	9/11/2021 9:49 PM
14	Tree lake and green lake	9/11/2021 1:10 PM
15	All the streams	7/6/2021 7:35 PM
16	North lake	6/26/2021 2:59 PM
17	I have not fished for many years there. Not interested in fishing with bait and lots of people around.	5/24/2021 5:31 PM
18	Long Lake, Treasure Lakes	3/10/2021 5:00 PM
19	Secret!	2/5/2021 7:28 AM
20	Backcountry lakes before Sabrina and South Lakes	1/8/2021 8:02 PM
21	North Lake	1/7/2021 8:56 PM

Q23 In general, for your combined fishing trips to the Bishop Creek Reservoirs, how crowded do you feel at the following locations? (Rate one per row)

Answered: 166   Skipped: 195



Bishop Creek Reservoirs: Recreational Use Survey



	NEVER CROWDED	(NO LABEL)	SOMETIMES CROWDED	(NO LABEL)	ALWAYS CROWDED	N/A	TOTAL	WEIGHTED AVERAGE
Lake Sabrina	0.00% 0	5.73% 9	60.51% 95	13.38% 21	18.47% 29	1.91% 3	157	3.45
South Lake	2.53% 4	14.56% 23	47.47% 75	13.92% 22	15.82% 25	5.70% 9	158	3.28
Weir Lake	3.52% 5	7.75% 11	24.65% 35	8.45% 12	19.01% 27	36.62% 52	142	3.50
Intake No. 2 Reservoir	0.00% 0	3.23% 5	26.45% 41	21.94% 34	33.55% 52	14.84% 23	155	4.01
North Fork Bishop Creek	2.60% 4	16.23% 25	45.45% 70	9.09% 14	11.04% 17	15.58% 24	154	3.12
South Fork Bishop Creek	6.96% 11	16.46% 26	45.57% 72	8.86% 14	8.23% 13	13.92% 22	158	2.94

Q24 Please provide any additional detail on how we can improve fishing opportunities at the Bishop Creek Reservoirs.

Answered: 59 Skipped: 302

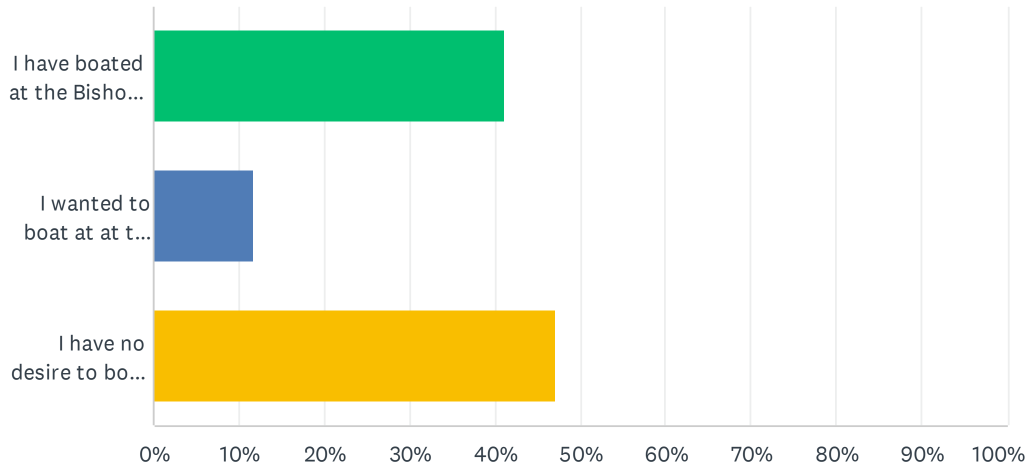
#	RESPONSES	DATE
1	Consistent fish plants would help as many tourists fish the areas out quickly…maybe early week planting would allow locals more opportunities to catch a few fish	10/3/2021 9:17 AM
2	fish stocking	9/24/2021 9:24 AM
3	More day use parking	9/23/2021 9:45 AM
4	Provide off-highway day-use parking and more turn-outs.	9/23/2021 8:08 AM
5	More trail access to otherwise difficult to access shorelines and Creek reaches instead of highly eroded use trails.	9/22/2021 9:55 PM
6	Stock more fish	9/22/2021 9:38 PM
7	again stop the campground reservations and make it first come first serve this will stop the online visitor and make it more challenging to get up in there	9/22/2021 6:27 PM
8	Trailer parking at South lake is difficult	9/22/2021 12:33 PM
9	More fish	9/22/2021 11:56 AM
10	DFW does a terrible job of stocking fish. Licenses cost more but less fish are stocked. Maybe orivate sector should take over hatcheries.	9/22/2021 10:07 AM
11	Fish & Wildlife to plant more fish	9/22/2021 8:11 AM
12	Stock more. Fish	9/21/2021 6:05 PM
13	More water. The lakes as of recent have been quote low. I realize it takes snow but perhaps a better management strategy looking at long term forecasts to decide how much to bring the lakes down at the end of the season would help. This year is as bad as I have ever seen it since 1980.	9/20/2021 9:43 AM
14	More fish stocking and allow for a smaller limit, keeping more fish in the rivers/lakes.	9/19/2021 8:17 AM
15	There were fewer fish planted these past 2 years due to COVID and hatchery diseases	9/18/2021 10:47 AM
16	I miss the old days where Lake Sabrina Campground had more business and better conditions. Started coming there as a child in 1954 with my parents and brother. Returned for visits in 1998. Bought home in Bishop in 2015.	9/18/2021 8:35 AM
17	Plant more often for anglers.	9/15/2021 11:04 AM
18	More catch and release mandates when stocking is disrupted (bacterial outbreaks etc)	9/14/2021 1:41 PM
19	Create and stick to a consistent level of water throughout the same periods of the year. Provide communication if there will be a drastic change, for instance 2 years ago Intake 2 was reduced by around 50+% and no communication ahead of time that was happening.	9/14/2021 11:41 AM
20	Financially support both private and state hatcheries for the canyon on a consistent basis. Prioritize the canyon for family activities such as fishing so that generational heritage and traditions can be passed on from generation to generation. At this time we are in danger of losing the heritage of bishop canyon creeks to be fishable for present and future generations.	9/13/2021 4:03 PM
21	Sponsor and motivate the DFG to stock trout on regular basis. To keep children off their cell phones and into nature for future generations - there has to be fish in the creeks and lakes to provide these generations with the opportunities of generations past. If we lose this generation of children not learning how to be outside and find the joys of fishing, we will lose them forever.	9/13/2021 10:25 AM

22	Keep water levels	9/12/2021 6:53 PM
23	South Lake is my favorite for fishing but in low water years it always seems to be the one to suffer with reduced water flows	9/12/2021 4:15 PM
24	More constant sticking. When the stocking schedule changes (ie. summer of 2020). Change the website to the schedule. Last summer it showed stocking every 2 weeks but actually very little trout stocking occurred	9/12/2021 2:00 PM
25	Stock fish it's ridiculous. We need more trash cans. I have a trash bag full of line and trash people leave behind	9/12/2021 12:41 PM
26	How about the state get their act together and stock fish. 2 years in a row they have not stocked what we have paid for	9/12/2021 7:11 AM
27	DFG needs to get their stocking program back into gear. Too many people are killing off the native trout because there is very minimal put and take fishing opportunities. The stream that once held native trout are now empty.	9/11/2021 11:57 PM
28	Better trout stocking	9/11/2021 9:49 PM
29	Stock more often	9/11/2021 9:17 PM
30	Stock more fish into the water to keep up with the demand.	9/11/2021 7:34 PM
31	Stock more fish to meet the demand.	9/11/2021 7:28 PM
32	Keep water levels up	9/11/2021 5:29 PM
33	??	9/11/2021 4:55 PM
34	Funding fisheries.	9/11/2021 3:45 PM
35	Stock more fish.	9/11/2021 1:37 PM
36	Keep water in the lakes	9/11/2021 1:10 PM
37	More fish planting	9/11/2021 9:50 AM
38	In the 30+ years I've been visiting the area, I've observed a steady increase in the number of people visiting the area with interest in fishing. On my last few trips, it has felt like the trout stocking (especially of the creeks) has not been adequate enough to cover the demand of the people fishing. I have observed and heard about many instances of non-compliant practices of parties visiting the area and enforcement has been non existent.	9/4/2021 9:28 AM
39	Plant more stockers	8/6/2021 11:27 AM
40	Creek access is limited on both forks of Bishop Creek. The South Fork of Bishop Creek especially had several of the more easily accessible day use spots blocked off during road construction in 2020. These areas are some of my favorite places to relax, fish or picnic. On rare occasion some visitors illegally stay overnight along the creek. Instead of enforcement, the soluation was to remove or limit access for the vast majroty of forest visitors. Two or three groups a year breaking the rules should not lead to limited access for thousands of visitors who obey the rules. Stragetic water management to minimize drought impacts would make a huge difference. SCE should contribute more funding for fish stocking.	8/5/2021 3:38 PM
41	Hold more water	7/16/2021 2:47 PM
42	I think the fishing opportunities are good	7/7/2021 3:01 PM
43	Stock fish!!! Stocking the past 3 years has been very poor!	7/6/2021 7:35 PM
44	More fish need to be stocked at all locations	6/26/2021 2:59 PM
45	Improve parking and camping.	6/23/2021 12:56 PM
46	More frequent stocking, higher water level and easier access to shoreline at South Lake and Sabrina.	6/16/2021 12:53 PM
47	Please stock more fish!	5/29/2021 5:09 PM
48	MORE FISHING PLANTS	5/29/2021 10:30 AM

49	More fish	5/26/2021 12:34 PM
50	More fish	5/26/2021 12:13 PM
51	intake 2 is compromised by the shooting area across the hwy 168 from intake 2. close that shooting area where sce dumps material dreged from reservoir. shooting is dangerous close to intake 2	5/25/2021 8:27 PM
52	Fishing line clean up. Intake 2 is usually a trashy mess.	5/24/2021 2:53 PM
53	Stock more fish in certain easily accessible areas and perhaps develop a Catch & Release type Barbless Hook only section on both South & North Bishop Creeks	5/10/2021 3:25 PM
54	Contribute to fish plants, encourage catch and release with signage, create fish habitats along the drainages	1/11/2021 2:27 PM
55	A plan for a trail to follow Bishop Creek as much as possible.	1/8/2021 8:02 PM
56	More parking at south lake	1/8/2021 4:00 PM
57	Add more fish	1/7/2021 7:31 PM
58	More fish, it seems as if you go late in the season during the start of fall that your chance of landing a nice size fish is significantly lower.	1/7/2021 6:09 PM
59	More fish and game patrolling the area. Regulations are ignored by too many.	1/7/2021 4:25 PM

Q25 Please select the answer that describes your interest in or experience boating at the Bishop Creek Reservoirs?

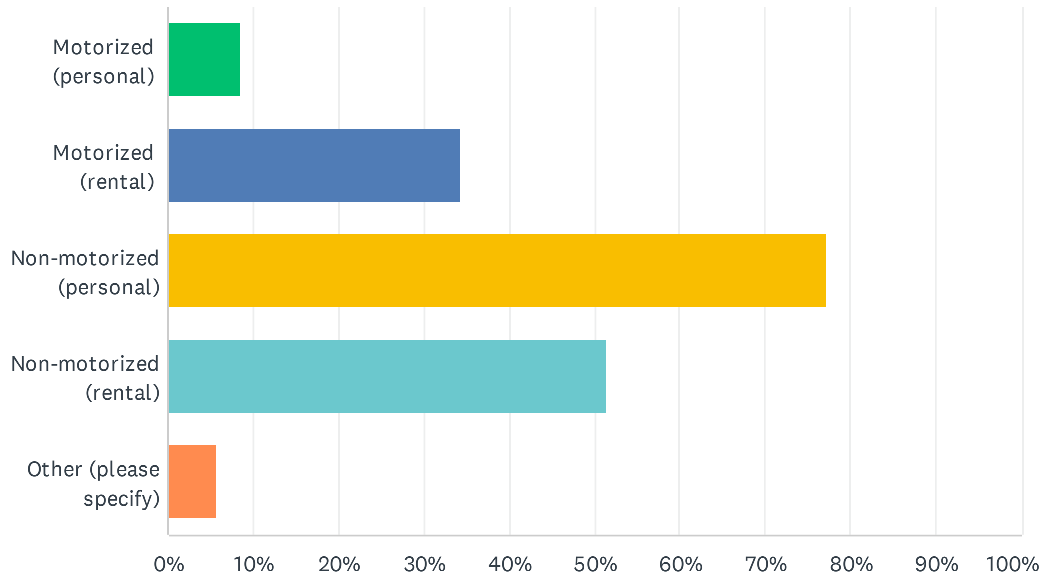
Answered: 297 Skipped: 64



ANSWER CHOICES	RESPONSES	
I have boated at the Bishop Creek Reservoirs	41.08%	122
I wanted to boat at at the Bishop Creek Reservoirs, but something prevented me from doing so	11.78%	35
I have no desire to boat at the Bishop Creek Reservoirs	47.14%	140
TOTAL		297

Q26 Which of the following types of watercraft do you prefer at the Bishop Creek Reservoirs? (Select all that apply)

Answered: 35   Skipped: 326

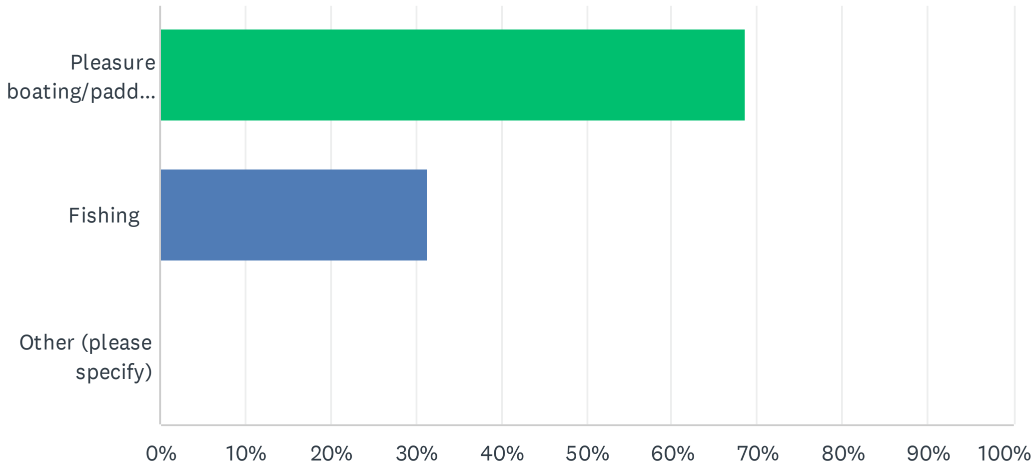


ANSWER CHOICES	RESPONSES	
Motorized (personal)	8.57%	3
Motorized (rental)	34.29%	12
Non-motorized (personal)	77.14%	27
Non-motorized (rental)	51.43%	18
Other (please specify)	5.71%	2
Total Respondents: 35		

#	OTHER (PLEASE SPECIFY)	DATE
1	stand-up paddle board	9/23/2021 8:11 AM
2	Paddleboard	5/27/2021 10:46 PM

Q27 Which of the following best describes your type of boating activity?

Answered: 35   Skipped: 326

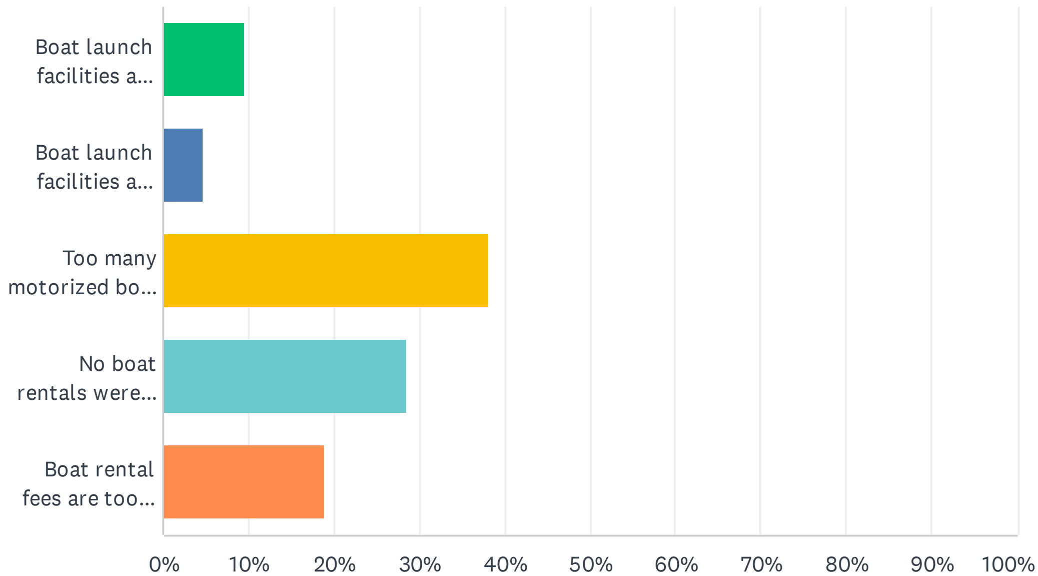


ANSWER CHOICES	RESPONSES	
Pleasure boating/paddling	68.57%	24
Fishing	31.43%	11
Other (please specify)	0.00%	0
TOTAL		35

#	OTHER (PLEASE SPECIFY)	DATE
	There are no responses.	

Q28 Which of the following best describes what prevented you from boating at the Bishop Creek Reservoirs?

Answered: 21 Skipped: 340



ANSWER CHOICES	RESPONSES	
Boat launch facilities are inadequate	9.52%	2
Boat launch facilities are poorly managed and maintained	4.76%	1
Too many motorized boats on the reservoirs	38.10%	8
No boat rentals were available	28.57%	6
Boat rental fees are too high	19.05%	4
TOTAL		21

#	OTHER (PLEASE SPECIFY)	DATE
1	Didn't have a boat with me.	10/21/2021 6:20 PM
2	rather go hiking	9/23/2021 8:11 AM
3	not enough water to launch	9/19/2021 8:18 AM
4	Not a high priority	8/30/2021 10:26 PM
5	Time/effort to organize it	8/16/2021 12:04 PM
6	It was too windy when I came out	8/15/2021 4:11 PM
7	Time	6/10/2021 2:13 PM
8	I'm usually there to hike	5/27/2021 10:46 PM
9	Didn't have enough time	5/26/2021 11:19 PM
10	Not sure	5/25/2021 6:53 AM

11	Inclement weather	4/21/2021 8:55 AM
12	Not enough time	1/7/2021 11:03 PM
13	Not enough time during our trips	12/23/2020 9:52 AM

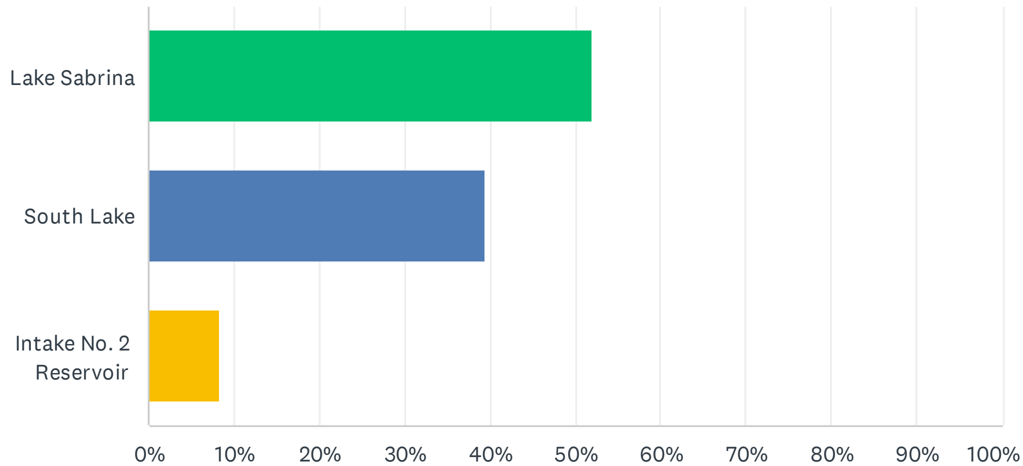
Q29 Please provide any additional detail on why you were unable to or chose not to boat at the Bishop Creek Reservoirs?

Answered: 13 Skipped: 348

#	RESPONSES	DATE
1	steepness of highway in regards to towing	9/23/2021 8:11 AM
2	parking a problem	9/21/2021 7:02 PM
3	Too many people and boats, too much noise.	9/18/2021 2:13 PM
4	For pleasure non motorized boating one needs a more natural environment	9/11/2021 7:52 PM
5	Haven't gotten around to it yet. (We prefer to hike.)	8/30/2021 10:26 PM
6	$$	8/16/2021 4:50 PM
7	Just too many people on the lake this time around. The water level is low and there are a lot of inexperienced boaters. We have our own boat but it is too large for the reservoirs and lakes.	7/7/2021 3:04 PM
8	motorized boats ruin the experience for paddlers, perhaps every other weekend could be restricted to nonmotorized	6/6/2021 7:15 AM
9	motorized boats are too loud and ruin my experience in and enjoyment of the outdoors	6/4/2021 10:36 AM
10	Kayaks are not available to rent and personal kayak is hard to transport	5/27/2021 10:46 PM
11	So much to do in a day.	1/7/2021 11:03 PM
12	Usually spend most of our days hiking	12/23/2020 9:52 AM
13	In the summer months there is too much motorized boat traffic to have a peaceful paddle.	12/19/2020 5:56 PM

Q30 At which Bishop Creek Reservoir do you typically spend your time boating ?

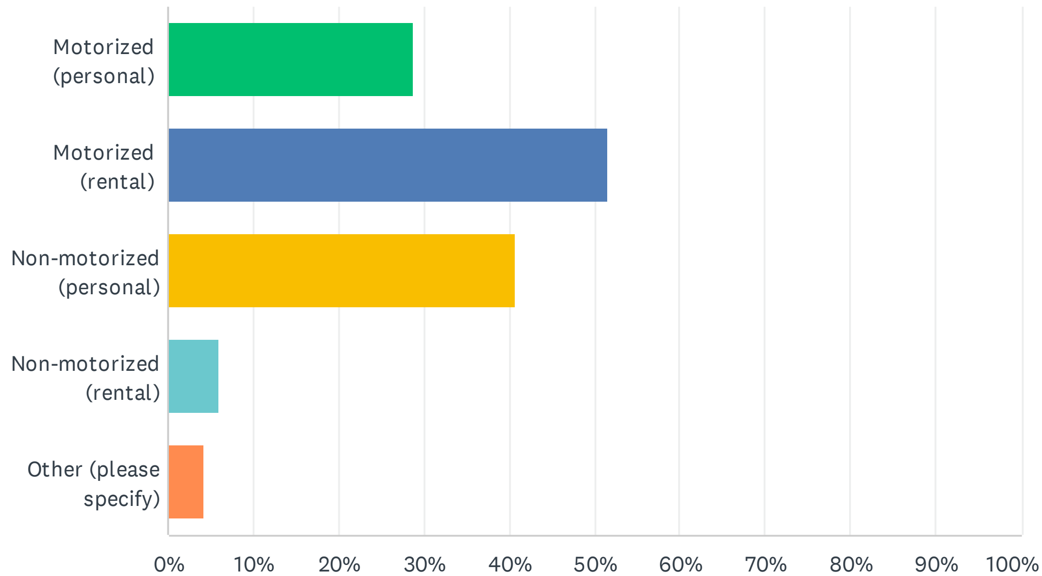
Answered: 119 Skipped: 242



ANSWER CHOICES	RESPONSES	
Lake Sabrina	52.10%	62
South Lake	39.50%	47
Intake No. 2 Reservoir	8.40%	10
TOTAL		119

Q31 Which of the following types of watercraft do you prefer at the Bishop Creek Reservoirs? (Select all that apply)

Answered: 118   Skipped: 243



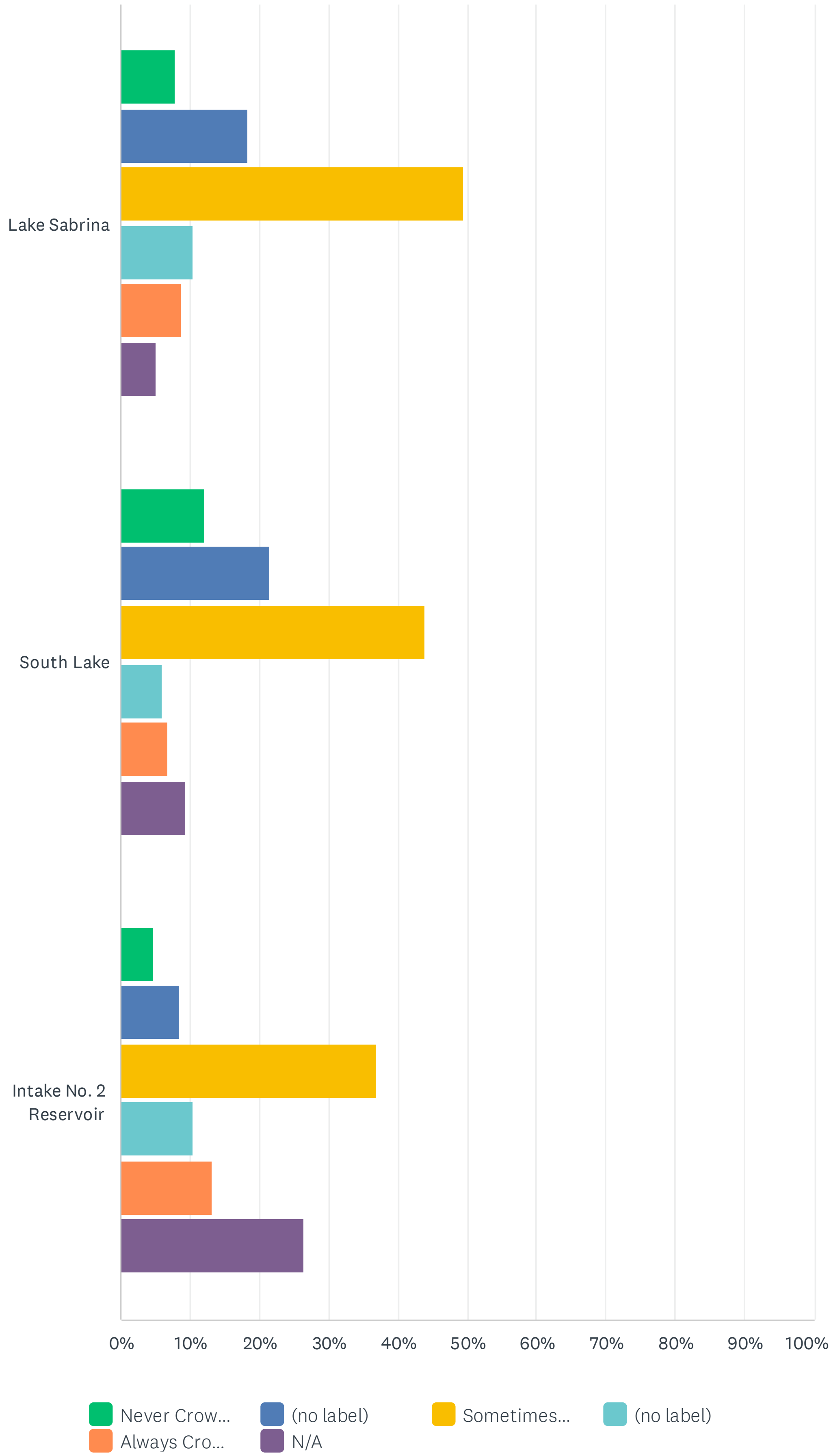
ANSWER CHOICES	RESPONSES	
Motorized (personal)	28.81%	34
Motorized (rental)	51.69%	61
Non-motorized (personal)	40.68%	48
Non-motorized (rental)	5.93%	7
Other (please specify)	4.24%	5
Total Respondents: 118		

#	OTHER (PLEASE SPECIFY)	DATE
1	float tube	11/10/2021 9:16 AM
2	Sailboat	9/19/2021 9:02 AM
3	Kayak	9/15/2021 10:27 PM
4	kayaks	9/14/2021 11:14 AM
5	paddleboard	6/8/2021 7:03 AM

Q32 In general, for your combined boating activity at the Bishop Creek Reservoirs, how crowded do you feel at each reservoir? (Rate one per row)

Answered: 118 Skipped: 243

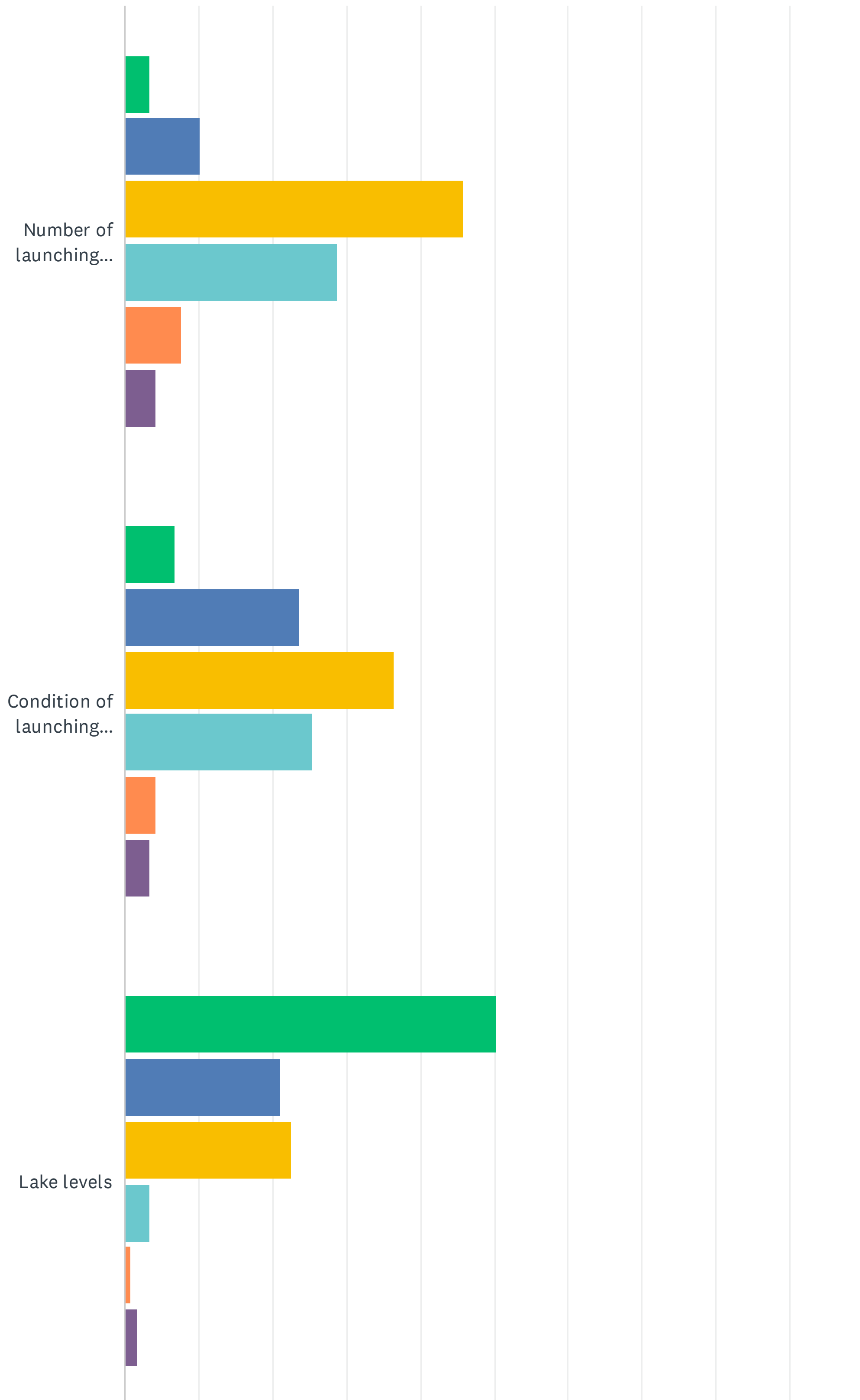
Bishop Creek Reservoirs: Recreational Use Survey



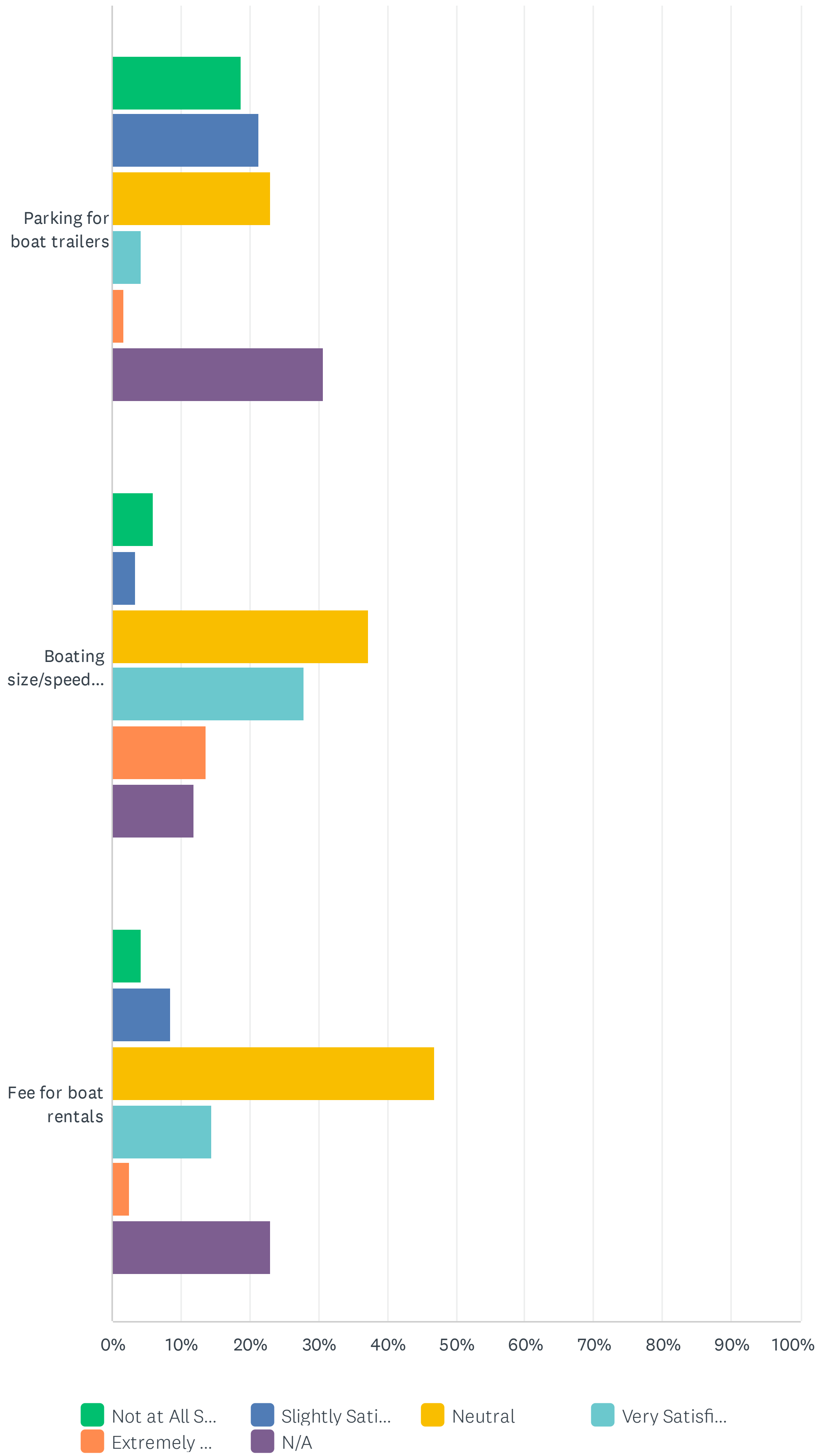
	NEVER CROWDED	(NO LABEL)	SOMETIMES CROWDED	(NO LABEL)	ALWAYS CROWDED	N/A	TOTAL	WEIGHTED AVERAGE
Lake Sabrina	7.83% 9	18.26% 21	49.57% 57	10.43% 12	8.70% 10	5.22% 6	115	2.94
South Lake	12.07% 14	21.55% 25	43.97% 51	6.03% 7	6.90% 8	9.48% 11	116	2.71
Intake No. 2 Reservoir	4.72% 5	8.49% 9	36.79% 39	10.38% 11	13.21% 14	26.42% 28	106	3.26

Q33 How would you rate your overall satisfaction with boating access at the Bishop Creek Reservoirs? (Select all that apply)

Answered: 119 Skipped: 242



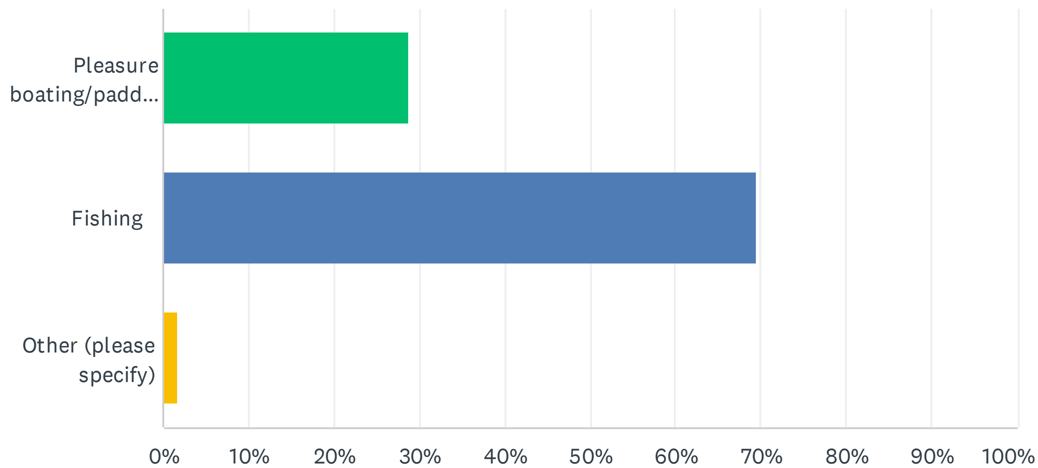
Bishop Creek Reservoirs: Recreational Use Survey



	NOT AT ALL SATISFIED	SLIGHTLY SATISFIED	NEUTRAL	VERY SATISFIED	EXTREMELY SATISFIED	N/A	TOTAL	WEIGHTED AVERAGE
Number of launching facilities	3.39% 4	10.17% 12	45.76% 54	28.81% 34	7.63% 9	4.24% 5	118	3.28
Condition of launching facilities	6.78% 8	23.73% 28	36.44% 43	25.42% 30	4.24% 5	3.39% 4	118	2.96
Lake levels	50.42% 60	21.01% 25	22.69% 27	3.36% 4	0.84% 1	1.68% 2	119	1.81
Parking for boat trailers	18.80% 22	21.37% 25	23.08% 27	4.27% 5	1.71% 2	30.77% 36	117	2.26
Boating size/speed restrictions	5.93% 7	3.39% 4	37.29% 44	27.97% 33	13.56% 16	11.86% 14	118	3.45
Fee for boat rentals	4.27% 5	8.55% 10	47.01% 55	14.53% 17	2.56% 3	23.08% 27	117	3.03

Q34 Which of the following best describes your type of boating activity?

Answered: 118 Skipped: 243



ANSWER CHOICES	RESPONSES	
Pleasure boating/paddling	28.81%	34
Fishing	69.49%	82
Other (please specify)	1.69%	2
TOTAL		118

#	OTHER (PLEASE SPECIFY)	DATE
1	Canoeing	9/24/2021 5:23 AM
2	Sailing and kayaking	9/19/2021 9:02 AM

Q35 Please provide any additional detail on how we can improve boating opportunities at the Bishop Creek Reservoirs.

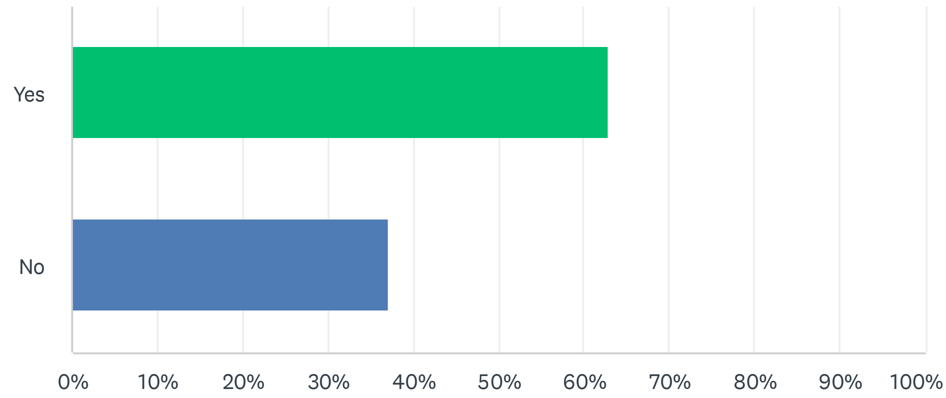
Answered: 47 Skipped: 314

#	RESPONSES	DATE
1	At intake 2, limit size of boat, non-motorized	10/3/2021 9:19 AM
2	Keep motorized boating restricted to slow quiet vessels. No ski-doos, no fast boats.	10/2/2021 9:21 AM
3	Less is more	9/24/2021 5:23 AM
4	Leave water in the Lakes until the end of the season rather than getting all the water out early in the season. I do not understand why they can't leave enough water in the Lakes till the end of the season?	9/23/2021 9:12 AM
5	Wider launch ramp	9/22/2021 9:40 PM
6	there is little parking for boats and trailers at south lake so your limited to rental boats mainly as the backpacker parking has taken all the parking , let them hike thats what they do give us back the parking	9/22/2021 6:31 PM
7	Better launching facilities when the reservoirs are low.	9/22/2021 3:10 PM
8	Fill lakes. They are reservoirs. Too much water going south during fishing season.	9/22/2021 10:12 AM
9	For those with their own boats, it is next to impossible to find a spot to park. It goes without saying with the lake levels so low, I didn't even bother taking the boat up this year.	9/20/2021 9:45 AM
10	The main thing would be having docks. The fact that the exising ramps curve probably makes this much more difficult.	9/19/2021 9:02 AM
11	Paddleboarding on Lake Sabrina twice.	9/18/2021 3:38 PM
12	Good ads and photos of the areas	9/18/2021 10:49 AM
13	Access for mobility impaired people	9/18/2021 10:13 AM
14	Many of the motorized rental boats were on Lake Sabrina Boat Launch when I was a teenager in the 60's. Need new modern boats and motors. The pontoon boats were a nice addition over the years.	9/18/2021 8:41 AM
15	Improve walk-way safety, more guard rails on dams	9/15/2021 1:43 PM
16	Allow more water to stay in the lakes.	9/15/2021 11:06 AM
17	leave lake levels alone from natural snow and rain on drought years	9/14/2021 11:14 AM
18	Please keep the water levels high, so many people rely on the escape to these wonderful waters.	9/14/2021 7:33 AM
19	KEEP THE LAKE LEVELS HIGH!!	9/13/2021 10:27 AM
20	Don't drain the best resource in the Sierras!	9/12/2021 6:54 PM
21	See comments above re South Lake water leveks	9/12/2021 4:17 PM
22	N/a	9/12/2021 2:02 PM
23	Fix and extend boat ramps so boats can be launched when water levels are very low.	9/12/2021 6:55 AM
24	Do not add anymore rental opportunities. They have just the right amount of rentals available. Anymore and it would be out of control. Again, Bishop creek is not what it used to be. I have been going up there for 45 years. The last 5-7 years my family just bypasses Bishop creek and head for Mono county.	9/12/2021 12:02 AM

25	more water in he lake	9/11/2021 9:39 PM
26	Stop draining South Lake or not allowing enough water to be able to boat on it.	9/11/2021 9:22 PM
27	Updated boats.	9/11/2021 7:36 PM
28	South lake wasn't even accessible 2021. I get it was a low snow year but lake level was primarily driven by electric usage	9/11/2021 6:14 PM
29	Please keep water levels up so boating is available	9/11/2021 5:31 PM
30	Minimal motor boats please	9/11/2021 3:47 PM
31	Keep water in the reservoir	9/11/2021 1:11 PM
32	Try and maintain reasonable lake level at South Lake	9/10/2021 4:57 AM
33	The interest in boating is directly proportional to the water levels of the lakes.	9/4/2021 9:31 AM
34	Need to get water levels back up first.	8/31/2021 4:27 PM
35	Having water in the lakes would help alot.	8/6/2021 5:02 PM
36	Proper enforcement of parking regulations would help. Overnight forest users often park for long periods of time in day use spaces. More parking in general. Better signage.	8/5/2021 3:41 PM
37	Open up for rental	7/16/2021 2:49 PM
38	More fish to catch when we use our boat	7/6/2021 7:36 PM
39	Personal boat trailer parking at South Lake is terrible mostly on the weekends and holidays. I don't know how it can be remedied but it needs to be remedied.	6/1/2021 1:42 PM
40	Please fix boat ramps at all lakes. They're very outdated and dangerous to use.	5/29/2021 5:10 PM
41	More fish	5/26/2021 12:37 PM
42	intake 2 is compromised by the shooting area across the hwy 168 from intake 2. close that shooting area where sce dumps material dreged from reservoir. shooting is dangerous close to intake 2	5/25/2021 8:28 PM
43	Institute and enforce speed limits	5/24/2021 2:54 PM
44	All the rental boats in the canyon are extremely old and dangerous it should be required to replace the boats with newer boats that are more safe and reliable	1/11/2021 2:28 PM
45	Parking at south lake	1/8/2021 4:03 PM
46	Mid week discount	1/7/2021 7:34 PM
47	More boats at Sabrina and a lower price would be nice	1/7/2021 6:12 PM

Q36 If overnight facilities were available at the Bishop Creek Reservoirs, would you utilize them?

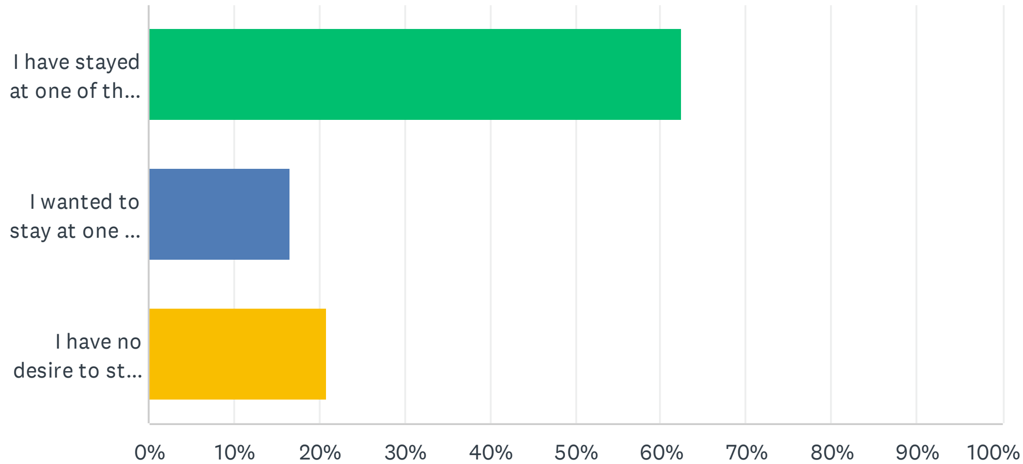
Answered: 294 Skipped: 67



ANSWER CHOICES	RESPONSES	
Yes	62.93%	185
No	37.07%	109
TOTAL		294

Q37 Have you previously stayed or wanted to stay at a developed campground near the Bishop Creek Reservoirs? (The following questions will simply refer to these as, "the campgrounds".)

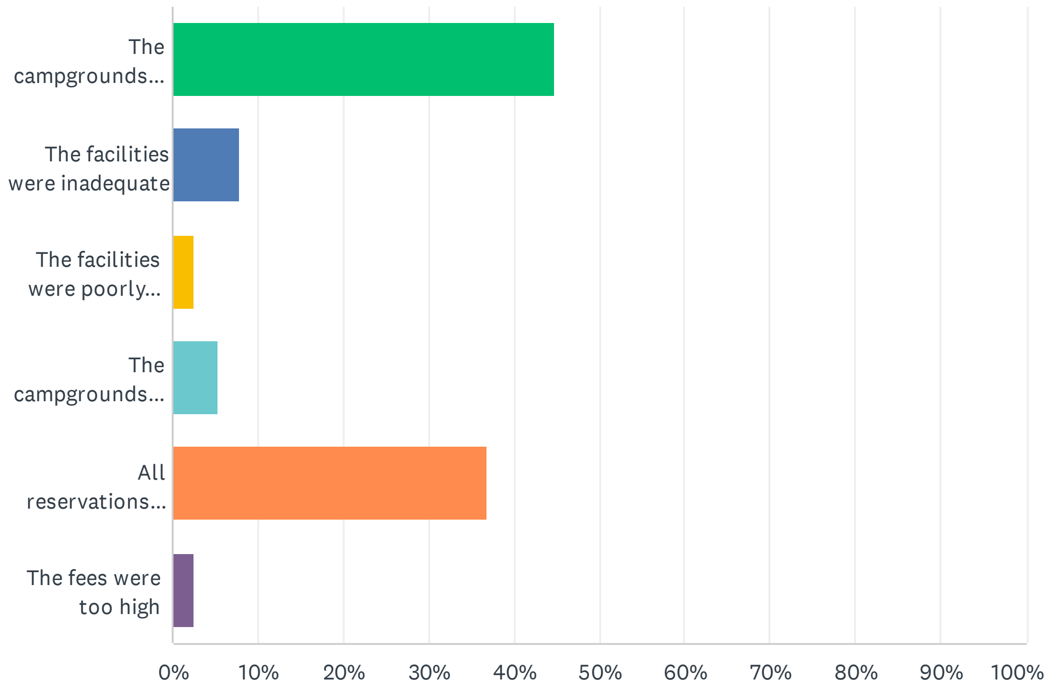
Answered: 293 Skipped: 68



ANSWER CHOICES	RESPONSES	
I have stayed at one of the developed campgrounds	62.46%	183
I wanted to stay at one of the developed campgrounds, but something prevented me from doing so	16.72%	49
I have no desire to stay at a developed campground near the Bishop Creek Reservoirs	20.82%	61
TOTAL		293

Q38 Which of the following best describes what prevented you from using one of the developed campgrounds in the past?

Answered: 38 Skipped: 323



ANSWER CHOICES	RESPONSES	
The campgrounds were too crowded	44.74%	17
The facilities were inadequate	7.89%	3
The facilities were poorly managed and maintained	2.63%	1
The campgrounds were not in the location I desired	5.26%	2
All reservations were booked	36.84%	14
The fees were too high	2.63%	1
TOTAL		38

#	OTHER (PLEASE SPECIFY)	DATE
1	U.s. Forest Service closed the forest for no reason two years in a row.	9/23/2021 9:13 AM
2	Fire	9/12/2021 6:19 AM
3	Fees are too high !!!	8/11/2021 6:12 AM
4	lack of water and not being able to reserve	8/5/2021 1:23 PM
5	Was not prepared to camp	7/14/2021 10:02 PM
6	Unknown area - still learning about it. When we stay in the future, we would want a quiet camping site that is not too crowded.	6/4/2021 9:37 PM

7	Need more reservable spots online since we live 6 hours away and don't want to show up without a site	5/26/2021 11:21 PM
8	No time on my part	1/10/2021 5:34 PM
9	i DON'T LI9KE TO CAMP NEAR MOTOR HOMES	1/10/2021 5:01 PM
10	Just didn't camp. Not yet to facilities.	1/7/2021 7:35 PM

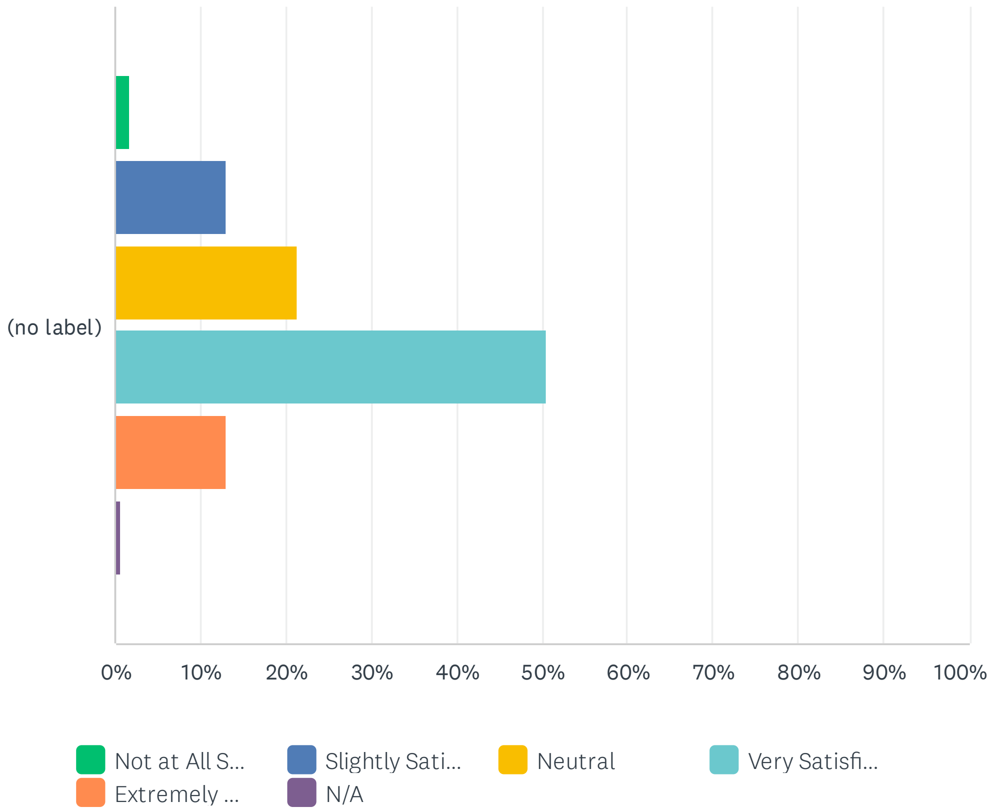
Q39 Please provide any additional detail on why you did not stay at one of the developed campgrounds?

Answered: 17 Skipped: 344

#	RESPONSES	DATE
1	Unfounded forest service closures the last 2 years	9/23/2021 9:13 AM
2	Would like to see camping opportunities at the pack station located by South Lake, and places to board my horses.	9/22/2021 9:08 AM
3	Na	9/21/2021 6:06 PM
4	Because I live in Bishop, it has been better to go home to quiet, even though we would like to camp out.	9/18/2021 2:14 PM
5	No available sites	9/12/2021 6:19 AM
6	Hard to make reservations Sites inadequate	9/11/2021 7:53 PM
7	Always crowded.	9/11/2021 6:15 PM
8	Didn’t want to pull trailer up curvy roads. Too hot for tent camping in the summer.	8/31/2021 4:30 PM
9	Too much demand and not enough available spaces for campers. Fees are too high.	8/11/2021 6:12 AM
10	Was not prepared for camping	7/14/2021 10:02 PM
11	Lack of camp sites on weekends	7/6/2021 10:02 PM
12	no space available	6/10/2021 12:07 PM
13	Prefer higher elevation campgrounds to acclimatize overnight before the backpacking trips.	6/7/2021 6:02 PM
14	Not enough information on the internet to make a decision. Unfamiliar with campgrounds. Internet shows they are large. Need to see in person, to know if there is shade, etc.	6/4/2021 9:37 PM
15	I could not get a reservation	4/16/2021 9:18 PM
16	Too many people and stuff is too booked up.	1/8/2021 11:41 AM
17	Usually not available	12/23/2020 9:52 AM

Q40 How would you rate your overall satisfaction with the campgrounds you have used?

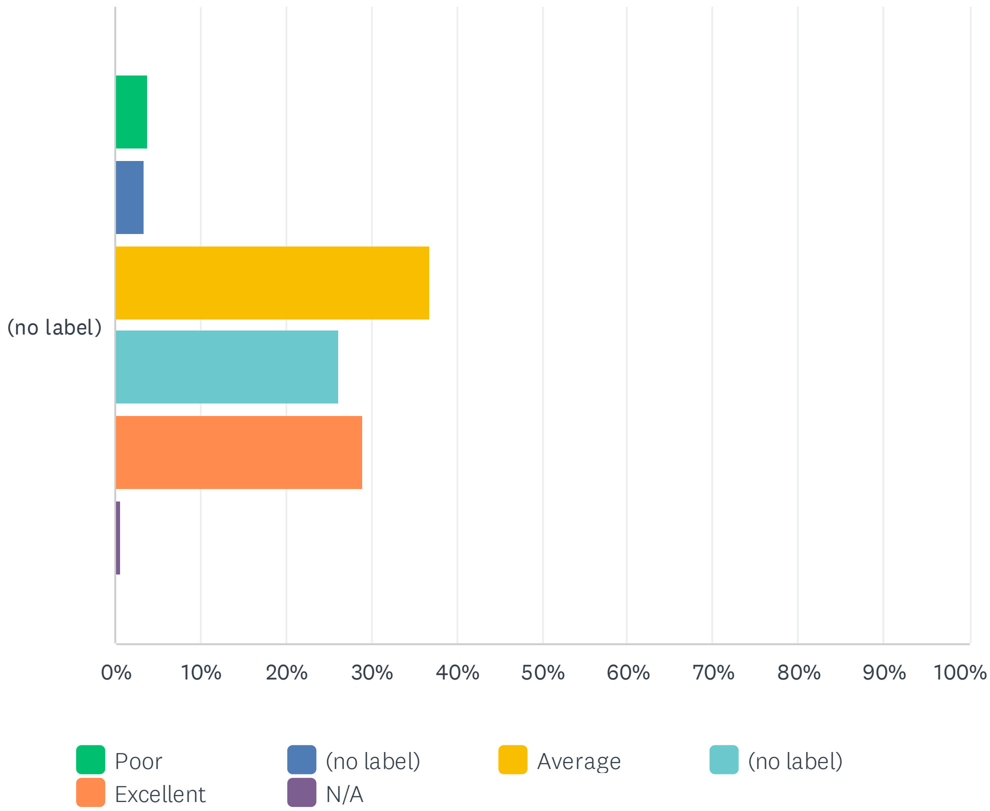
Answered: 178 Skipped: 183



	NOT AT ALL SATISFIED	SLIGHTLY SATISFIED	NEUTRAL	VERY SATISFIED	EXTREMELY SATISFIED	N/A	TOTAL	WEIGHTED AVERAGE
(no label)	1.69% 3	12.92% 23	21.35% 38	50.56% 90	12.92% 23	0.56% 1	178	3.60

Q41 How would you rate the condition, management, and cleanliness of the campgrounds you have used?

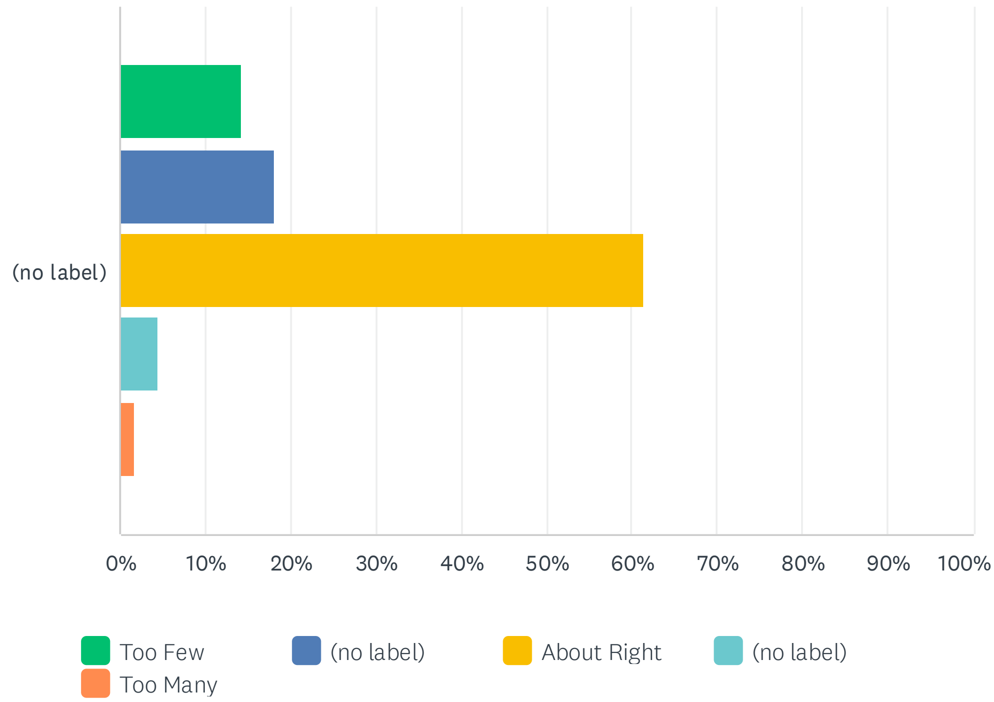
Answered: 179 Skipped: 182



	POOR	(NO LABEL)	AVERAGE	(NO LABEL)	EXCELLENT	N/A	TOTAL	WEIGHTED AVERAGE
(no label)	3.91% 7	3.35% 6	36.87% 66	26.26% 47	29.05% 52	0.56% 1	179	3.74

Q42 How would your rate the number of campgrounds near the Bishop Creek Reservoirs?

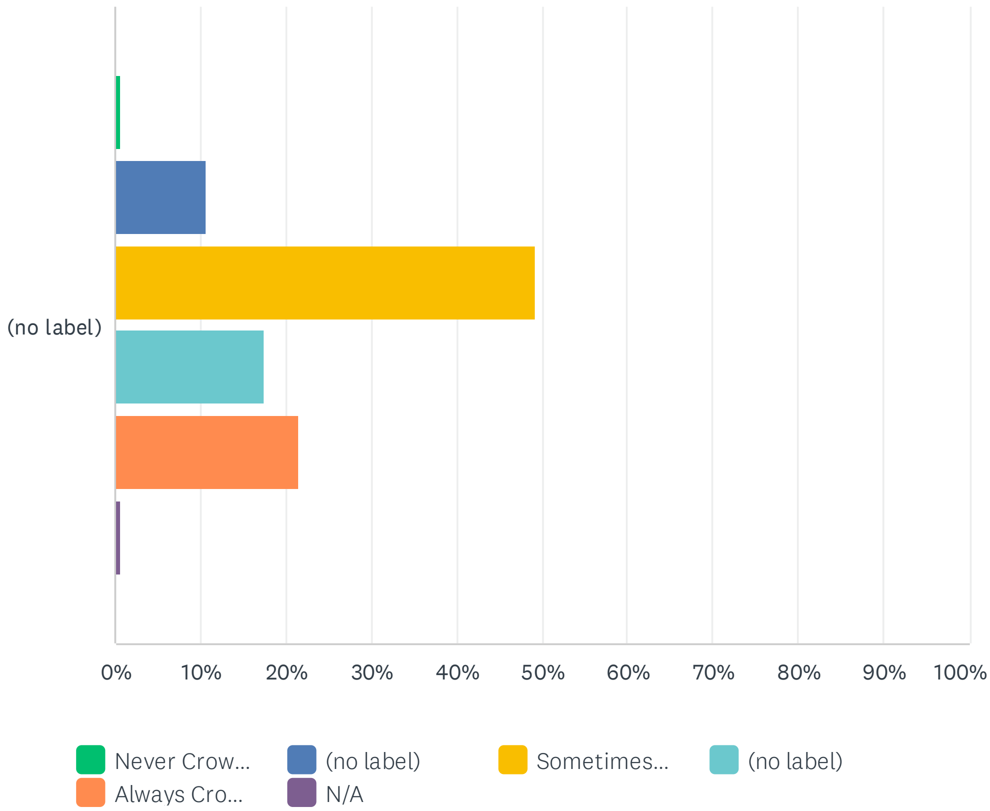
Answered: 176 Skipped: 185



	TOO FEW	(NO LABEL)	ABOUT RIGHT	(NO LABEL)	TOO MANY	TOTAL	WEIGHTED AVERAGE
(no label)	14.20% 25	18.18% 32	61.36% 108	4.55% 8	1.70% 3	176	2.61

Q43 In general, for your combined trips to the campgrounds, how crowded do you usually feel?

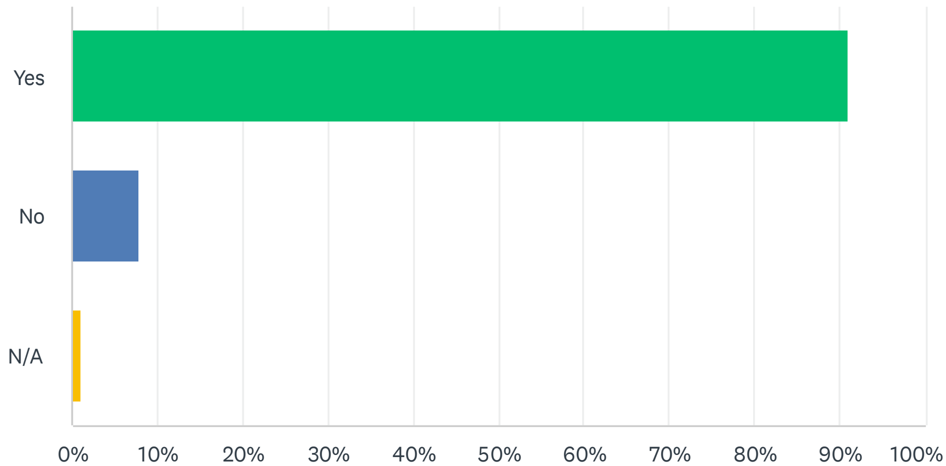
Answered: 177 Skipped: 184



	NEVER CROWDED	(NO LABEL)	SOMETIMES CROWDED	(NO LABEL)	ALWAYS CROWDED	N/A	TOTAL	WEIGHTED AVERAGE
(no label)	0.56% 1	10.73% 19	49.15% 87	17.51% 31	21.47% 38	0.56% 1	177	3.49

Q44 If the campgrounds were more crowded, would your experience diminish?

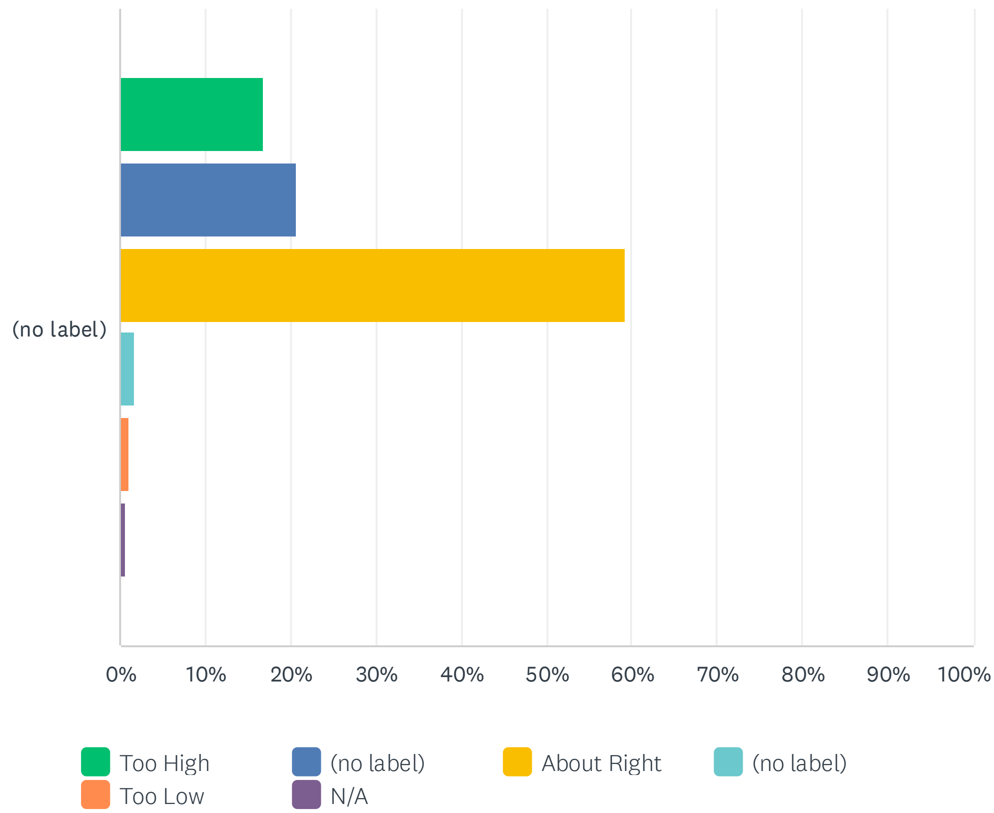
Answered: 179 Skipped: 182



ANSWER CHOICES	RESPONSES	
Yes	91.06%	163
No	7.82%	14
N/A	1.12%	2
TOTAL		179

Q45 How would you rate the fees associated with the campgrounds?

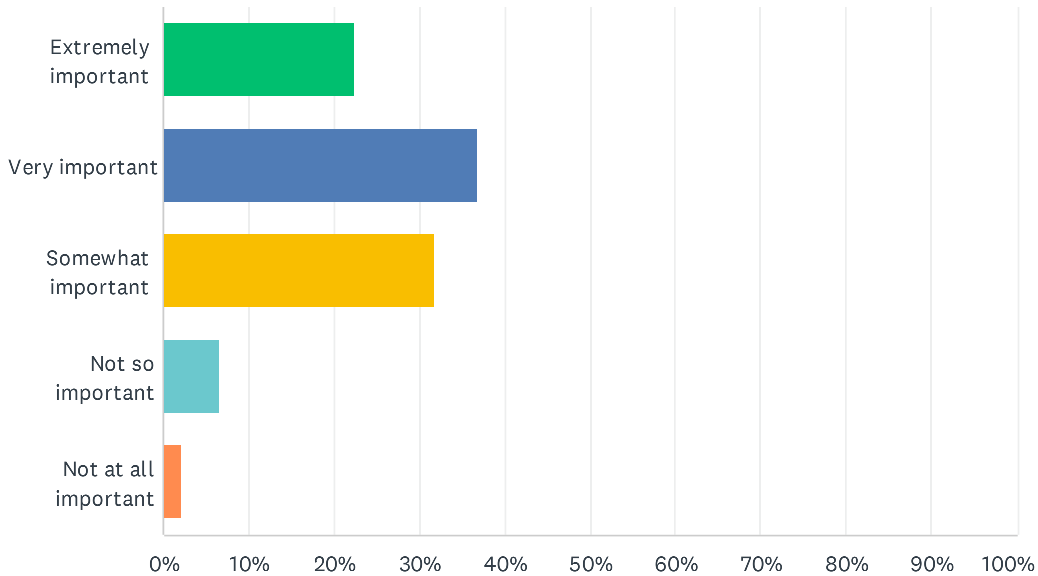
Answered: 179 Skipped: 182



	TOO HIGH	(NO LABEL)	ABOUT RIGHT	(NO LABEL)	TOO LOW	N/A	TOTAL	WEIGHTED AVERAGE
(no label)	16.76% 30	20.67% 37	59.22% 106	1.68% 3	1.12% 2	0.56% 1	179	2.49

Q46 How important is the location or proximity of campgrounds to your preferred recreational activity?

Answered: 179 Skipped: 182



ANSWER CHOICES	RESPONSES	
Extremely important	22.35%	40
Very important	36.87%	66
Somewhat important	31.84%	57
Not so important	6.70%	12
Not at all important	2.23%	4
TOTAL		179

Q47 Please provide any additional detail on how we can improve or expand campground facilities near the Bishop Creek Reservoirs.

Answered: 61 Skipped: 300

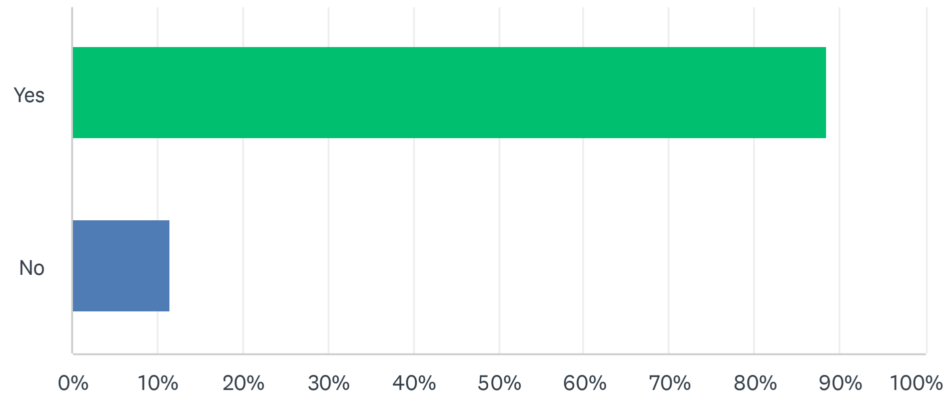
#	RESPONSES	DATE
1	Less RV campsites and more tent campsites.	11/24/2021 11:54 AM
2	As locals, ages over 75, we no longer use the campground facilities…when we do use them we were satisfied	10/3/2021 9:21 AM
3	Allow for day-use parking and recreation during winter season closure. Easiest solution as roads are accessible.	9/23/2021 8:13 AM
4	OHV access to Coyote Flats	9/22/2021 7:01 PM
5	stop the on line reservation and put it back to first come first serve because people reserve these and then never show up and the camp site sits empty because the campground host cant let anybody use it once it has been reserved	9/22/2021 6:40 PM
6	More	9/22/2021 11:58 AM
7	Keep open.	9/22/2021 10:14 AM
8	Most interested in trail head and backpacker facilities like parking and day of arrival camping.	9/20/2021 3:56 PM
9	We generally stay at Four Jeffrey. It is nice that some of the roadways were updated last year but not all for some reason. Might need some more trash bins as big weekends that end up overflowing.	9/20/2021 9:49 AM
10	They seem adequate to me	9/18/2021 10:51 AM
11	Views from campsite are important	9/16/2021 1:51 PM
12	The fees are outrageous. Recreation america fees structure prices people out of camping AND MANY SITES SITE OPEN AND NOT ABLE TO USE BECAUSE THEY ARE RESTRICTED TO RESERVATIONS. WHILE PEOPLE UP THERE ARE UNABLE TO USE ON SITE.	9/15/2021 10:30 PM
13	Give a locals discount!	9/15/2021 1:44 PM
14	Have the sites more level.	9/15/2021 11:07 AM
15	Stop raising prices	9/14/2021 1:44 PM
16	rangers need to monitor campgrounds for folks who build too large of campfires	9/14/2021 11:16 AM
17	More oversight by personnel to clean and maintain	9/14/2021 7:34 AM
18	Provide greater access and oversight to the campgrounds for this and future generations.	9/13/2021 10:28 AM
19	Shower facilities would be a big plus	9/12/2021 4:19 PM
20	Camp site are to small for newer rigs. 4 Jeffery's is almost impossible to find a space large enough to park a 30 plus foot trailer. And roses in campground is narrow	9/12/2021 2:06 PM
21	Need additional restroom and fish cleaning areas. Need cleaning station for dishes.	9/12/2021 7:15 AM
22	Do not change a thing! Do not add more lodging facilities. Bishop creek is already over crowded and being destroyed.	9/12/2021 12:04 AM
23	Improve the roads in the campground	9/11/2021 4:58 PM
24	I like to camp in the winter too, but only lower elevation camping is open.	9/11/2021 3:49 PM
25	Stop closing them every summer	9/11/2021 1:39 PM
26	Don't increase capacity. Keep the sites spaced out. When large parties show up at a	9/4/2021 9:35 AM

	campground, it can ruin the experience for others due to the amount of noise produced.	
27	I would not recommend expanding campgrounds. Use is already very high and overnight use can cause more impacts than day use.	9/1/2021 11:43 AM
28	They should not be expanded. These areas are over crowded as it is . Improve them by making less camp sites per campground so the campground isn't crowded. Stop people from parking anywhere they want	8/31/2021 4:41 AM
29	Please try to keep up with campground maintenance (particularly the interior road pothole/ruts and removal of any graffiti).	8/30/2021 10:33 PM
30	As I mentioned before…the campgrounds are overrun with large RVs. There needs to be MORE campgrounds for TENTS ONLY. it's like all the campsites are so close together that if you are in a tent surrounded by RVs it takes away from the camping experience. It's like living in a neighborhood. RVs take away from the beauty of nature and the quiet because they run generators. I'm 65 and I still love to tent camp, but up Bishop Creek the campgrounds seem to favor RVs leaving no quality spaces for tents only.	8/23/2021 11:29 AM
31	Occasional issues with hosts. Not very often but sometimes.	8/22/2021 9:02 PM
32	Do not expand campground facilities. This will make other uses more crowded.	8/21/2021 10:36 AM
33	Better reservation system	8/16/2021 12:06 PM
34	Since we now live here, we don't camp any more. However, we do drive through to check out the sites we always loved. The campgrounds seem to be in very poor condition.	8/6/2021 5:04 PM
35	Nobody wants to camp out in the open. Do not decomission any of the preferable sites along the streams. There are underutiized day use areas below South Lake that used to be campgrounds and should be reopened. More of the campgrounds and campsitres should be reserveable.	8/5/2021 3:45 PM
36	Open up the flush toilets and turn the water on in upper intake II campground and lower the price	7/16/2021 2:52 PM
37	Campfire smoke detracts from the experience and can be extremely unhealthy. May some of the campgrounds campfire free (remove rings, ban wood fires) similar to what is done in Canada. Do NOT try to have only a section of a campground campfire free, it doesn't work (as Canada has also demonstrated).	7/13/2021 11:38 AM
38	Although usually clean, the restrooms seem very dated, which gives them a dirty feel. For the price you are charging for a campsite, I would expect better facilities. Basically you are getting a piece of dirt with not much else. The picnic tables are in dire need of new paint as well.	7/7/2021 3:08 PM
39	Camp grounds are always best near streams or fishing/hiking locations	7/6/2021 7:38 PM
40	Have less reserved sites	6/26/2021 3:02 PM
41	The facilities are dated and in poor condition. They need to be redesigned to accommodate todays user. There needs to be better parking, nicer facilities and formalized trails that connect the campgrounds to the resource.	6/23/2021 3:31 PM
42	Better parking, improved water systems	6/23/2021 12:59 PM
43	Hosts are generally OK but occasionally have been inattentive to issues such as rude campers, noise, and stay limits. I have cmplained to the PIO of Inyo National Forest with mostly positive results but the management company isn't as responsive until I have filed a formal complaint.	6/18/2021 7:01 PM
44	I normally stay at Cardinal Village cabins	6/16/2021 12:55 PM
45	shuttle to hiking trails, or lakes	6/10/2021 3:51 PM
46	I've have stayed at Four Jeffrey, North Lake and Willow and other campgrounds several times. They are all either in forest or in the canyon so the camp sites get morning sun late. If you build a new campground I'd recommend it be put in a place that gets early light in the morning.	6/8/2021 5:32 PM
47	There need to be more campgrounds and there should be advanced reservations for at least half of the campsites. The having to race to a first-come campsites can get frustrating and unpleasant.	6/7/2021 7:33 PM

48	larger, flatter campsite parking, more campgrounds open, have "no generator" loops or campgrounds. NOT tent only, but no generators would make camping much more pleasant.	6/6/2021 7:18 AM
49	Walk In backpackers campgrounds would be a great addition to the area.	5/27/2021 10:48 PM
50	More fish	5/26/2021 12:39 PM
51	Lighting around restrooms	5/26/2021 12:19 PM
52	intake 2 is compromised by the shooting area across the hwy 168 from intake 2. close that shooting area where sce dumps material dreged from reservoir. shooting is dangerous close to intake 2	5/25/2021 8:29 PM
53	They should not have a private company operating them, Forest Service should do that.	3/10/2021 5:05 PM
54	Don't expand but perhaps upgrade the USFS facilities. Some are "tired."	2/19/2021 3:49 PM
55	There needs to be more care given to the campgrounds and the flora fauna around campgrounds campgrounds	1/11/2021 2:30 PM
56	We like that most campsites are first come first served.	1/8/2021 4:11 PM
57	Level the sites. It appears the sites slowly erode and it goes unnoticed	1/7/2021 7:40 PM
58	There are too many people already. Please dont do anything that would make things more crowded. Please don't do anything that would diminish the outdoor experience (i.e. any more development, anything to attract more crowds)	1/7/2021 7:01 PM
59	Open ALL of them, 2020 was embarrassing how few were Open	1/7/2021 5:02 PM
60	Many Campgrounds were thrashed in 2020. Bitter brush was out of control with campers ignoring all the rules. Fire pits were routinely filled with trash.	1/7/2021 4:31 PM
61	Need one night use campgrounds specifically for backpackers into the wilderness.	1/7/2021 4:23 PM

Q48 Have you ever used trailheads at the Bishop Creek Reservoirs (e.g., Sabrina Basin Trailhead; Bishop Pass Trailhead) to access the John Muir Wilderness?

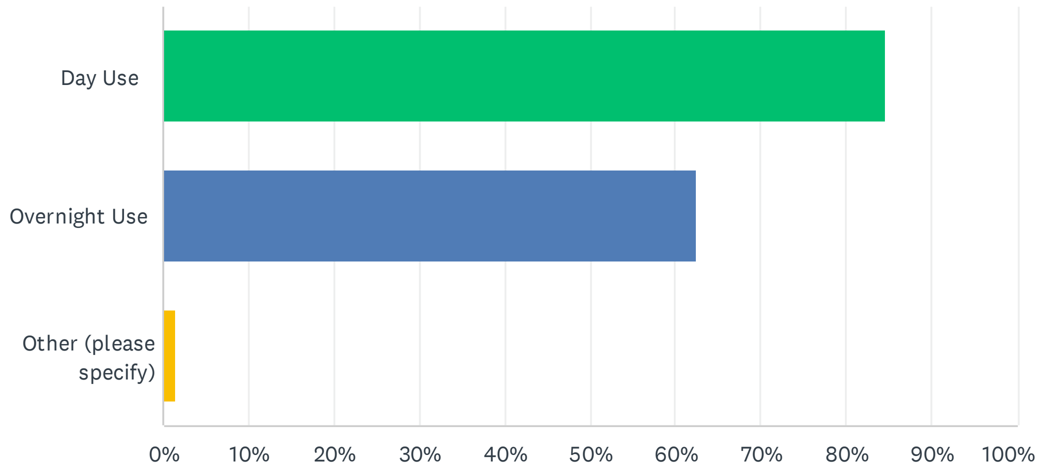
Answered: 288 Skipped: 73



ANSWER CHOICES	RESPONSES	
Yes	88.54%	255
No	11.46%	33
TOTAL		288

Q49 Which type of use do you prefer when accessing the John Muir Wilderness? (Select all that apply)

Answered: 253 Skipped: 108



ANSWER CHOICES	RESPONSES	
Day Use	84.58%	214
Overnight Use	62.45%	158
Other (please specify)	1.58%	4
Total Respondents: 253		

#	OTHER (PLEASE SPECIFY)	DATE
1	Back packing	9/11/2021 8:41 PM
2	For climbing	8/15/2021 4:12 PM
3	Backcountry overnight use.	7/18/2021 2:18 PM
4	Cross Country	7/6/2021 10:06 PM

Q50 If driving to the area, please briefly describe where and how you park your vehicle before accessing the John Muir Wilderness.

Answered: 215 Skipped: 146

#	RESPONSES	DATE
1	I would be dropped off or take a shuttle if available.	12/4/2021 1:29 PM
2	South Lake Trailhead, Lake Sabrina, North Lake	11/24/2021 11:56 AM
3	Trailhead parking	11/10/2021 1:48 PM
4	Park at South Lake or at North Lake.	11/10/2021 9:17 AM
5	At the lake trailheads	11/9/2021 4:39 PM
6	Where ever I can find a space	11/9/2021 3:51 PM
7	backpackers parking	11/6/2021 7:40 AM
8	Trailhead parking.	10/21/2021 6:23 PM
9	Where I can	10/8/2021 12:01 PM
10	In a lot	10/3/2021 9:05 AM
11	Sabrina and South Lake trailheads	10/2/2021 9:22 AM
12	Parking lot or side of road	9/26/2021 9:45 AM
13	In the parking lot closest to the trailhead.	9/25/2021 3:02 PM
14	day use area parking	9/24/2021 9:27 AM
15	At Trailhead parking area	9/23/2021 8:42 PM
16	In The Parking Lot.	9/23/2021 1:51 PM
17	Get there early to find parking spots closer to where I'm going	9/23/2021 9:48 AM
18	At the parking area near the wooden horse Bridge.	9/23/2021 9:14 AM
19	Designated parking lot at trailhead when available.	9/23/2021 8:15 AM
20	Parking only in designated parking areas.	9/22/2021 7:28 PM
21	Any uncrowded trail head with parking	9/22/2021 7:02 PM
22	Parking lots at the reservoirs.	9/22/2021 3:14 PM
23	trailhead	9/22/2021 11:18 AM
24	Pack station, or on the side of the road.	9/22/2021 9:10 AM
25	Trailhead parking	9/22/2021 9:08 AM
26	use parking lot	9/22/2021 8:33 AM
27	Park ok the side of the road	9/21/2021 8:59 PM
28	south lake, north lake	9/21/2021 7:04 PM
29	We park in the day-use parking lot or overnight parking lot, whichever applies to our activity.	9/21/2021 5:59 PM
30	Where ever I can get close to starting point.	9/20/2021 3:58 PM
31	Generally out of South Lake and either up the Bishop Pass or mostly to Brown and Green Lake for fishing.	9/20/2021 9:51 AM

32	In the parking lot at South Lake	9/19/2021 2:41 PM
33	At Lake Sabrina I usually park along the road between the trailhead and the creek crossing below the dam. At South Lake I usually park where I can find a spot.	9/19/2021 9:08 AM
34	south lake trailhead, sabrina trailhead	9/19/2021 7:48 AM
35	Use single car. Try to get to parking areas early to get a parking place, especially at Lake Sabrina, but both lakes have parking issues during summer crowds. Also, the overnight lot at South Lake is almost always full. Lake Sabrina has lots of parking issues for trailhead use.	9/18/2021 3:43 PM
36	Designated hiker parking places.	9/18/2021 2:16 PM
37	There used to be more but lately fewer parking spaces are available	9/18/2021 10:54 AM
38	Arrive early to claim one of few parking spaces	9/18/2021 10:15 AM
39	We look for designated parking areas to leave our vehicle. Roadside and specific parking areas.	9/17/2021 5:46 PM
40	Park at north lake or south lake	9/16/2021 1:52 PM
41	At trailhead if possible, sometimes down by Parchers or the North Lake turn for Sabrina.	9/16/2021 9:25 AM
42	4 miles down the road and hope car isnt stolen	9/15/2021 10:31 PM
43	In an overnight parking spot	9/15/2021 1:45 PM
44	Pack station parking or Sabrina or south lake lot.	9/15/2021 11:08 AM
45	I like to park in the day use are for overnight use.	9/14/2021 3:02 PM
46	South lake, Sabrina	9/14/2021 1:48 PM
47	We day hiked, so parking was not a problem. But those days are long gone !	9/14/2021 12:40 PM
48	Try and park as close to trail head as possible for safety in numbers, others keeping an eye out on vehicles.	9/14/2021 11:44 AM
49	South Lake parking lot if available spots	9/14/2021 11:17 AM
50	South lake parking lot	9/14/2021 9:25 AM
51	As close to the trail head as possible.	9/14/2021 7:35 AM
52	At specified trailheads.	9/13/2021 10:29 AM
53	Park in designated area,	9/12/2021 7:18 PM
54	South Lake West end parking lot	9/12/2021 4:20 PM
55	Parking spot	9/12/2021 12:44 PM
56	Side of road near hiker parking	9/12/2021 10:22 AM
57	In the lots at south lake	9/12/2021 8:43 AM
58	Road side	9/12/2021 7:16 AM
59	Park at South Lake overnight parking	9/12/2021 6:58 AM
60	At the designated parking	9/12/2021 6:20 AM
61	Nowadays, this place is too overcrowded. Too many day use folks. 90% of time have to park in overflow parking off the trailhead.	9/12/2021 12:09 AM
62	I ususally camp at Sabrina campground and walk to the trailhead. We drive to the trailheads at South Lake	9/11/2021 10:53 PM
63	north lake parking lot	9/11/2021 9:40 PM
64	South Lake	9/11/2021 8:41 PM
65	Na	9/11/2021 7:54 PM

66	Bishop pass trailhead	9/11/2021 6:15 PM
67	Trailhead parking	9/11/2021 5:35 PM
68	In the parking lot of trail head	9/11/2021 4:59 PM
69	Public parking	9/11/2021 4:52 PM
70	Trailhead at south lake, along the road near parchers resort, north lake near the horse outfitters, lake Sabrina	9/11/2021 3:52 PM
71	Parking lots	9/11/2021 3:36 PM
72	I park as close as I can get to the trailhead. Parking is usually crowded and stressful.	9/11/2021 12:41 PM
73	I have used the South Lake and North Lake parking lots,along with the road side parking for the Sabrina road side.	9/11/2021 9:55 AM
74	South Lake	9/10/2021 5:00 AM
75	Overnight Parking Areas	9/5/2021 1:49 PM
76	Usually at the dark parking sections at one of the major lakes (Sabrina/South Lake)	9/4/2021 9:36 AM
77	at the trailhead parking	9/1/2021 11:45 AM
78	I arrive early enough to park in a designated parking space, if there is no space I go somewhere else	8/31/2021 4:43 AM
79	As close to the trailhead as possible.	8/30/2021 10:37 PM
80	offsite	8/24/2021 10:36 AM
81	I try to park in overnight area when I’m backpacking, and day use parking when I’m day hiking.	8/23/2021 11:31 AM
82	At the lake/trailhead parking	8/22/2021 9:03 PM
83	I have parked at South Lake, Lake Sabrina, and North Lake.	8/21/2021 10:37 AM
84	At the trailhead	8/18/2021 12:53 PM
85	Parked legally as close to the trailhead as possible. At South Lake, this requires an early arrival.	8/18/2021 12:42 PM
86	Overnight hikers parking lot	8/16/2021 12:06 PM
87	In the day use or the overnight lots at South Lake	8/15/2021 4:12 PM
88	In the available parking areas (if available) otherwise on the access road (roadside parking). There are TOO FEW parking spaces for day hikers and overnight hikers, and the poarking lot get full quickly !!!	8/11/2021 6:15 AM
89	Trailhead	8/10/2021 10:19 PM
90	Day use parking lot	8/8/2021 12:50 PM
91	South lake overnight parking	8/7/2021 9:52 AM
92	At the trailhead parking.	8/6/2021 5:05 PM
93	Long-term parking	8/6/2021 2:40 PM
94	Park at South Lake to hike into lakes near Bishop Pass	8/6/2021 11:30 AM
95	As close to the trailhead as allowed.	8/5/2021 3:49 PM
96	Overnight parking lot.	8/5/2021 1:54 PM
97	I could always find day use parking but overnight parking would be a bit harder especially up at North Lake.	8/5/2021 1:25 PM
98	Use provided parking areas.	8/5/2021 9:13 AM
99	In designated parking lots	8/3/2021 8:21 PM

100	At the trailheads and at private property	7/25/2021 3:05 PM
101	Use designated parking areas/lots.	7/18/2021 4:13 PM
102	I park in the day hiker or overnight hiker sections.	7/18/2021 2:18 PM
103	Side of the road as close to the trailhead as possible	7/16/2021 3:07 PM
104	In the designative spots .	7/16/2021 2:54 PM
105	Drive in from the main road from Bishop, CA. Parked on the side of the road before crossing a bridge to the boat launch docks	7/14/2021 10:03 PM
106	South lake parking	7/14/2021 5:49 PM
107	The Day Use parking spots.	7/13/2021 6:22 PM
108	at the trailhead parking lot	7/13/2021 11:41 AM
109	I usually park in the south lake parking lot	7/13/2021 12:56 AM
110	Any parking lot near the trailhead. The overnight parking at Sabrina is very far from the TH though and it should be allowed to overnight park at the lake, too. Especially the little lot by the dam is almost never full, so why not allow overnighters there, too?	7/12/2021 5:50 PM
111	Any area close to the trail of choice	7/11/2021 9:59 PM
112	South lake	7/11/2021 3:58 PM
113	You hope and pray for a parking spot. Otherwise, you start your hike before you hit the trail.	7/7/2021 3:10 PM
114	As close as I can to the trailhead or cross country access point. Roadside typical for less known trailheads or cross country. Parking lots for more formal and "larger" trailheads	7/6/2021 10:06 PM
115	Overnight parking designated areas	7/6/2021 9:01 PM
116	I want to park in the overnight lot located at the South Lake TH, but it's almost always full - including with day hikers - which means I've often had to park near Parcher's or even further at the dirt lot roughly 3 miles down the road. Not great when solo and with a full pack!!!	7/6/2021 6:41 PM
117	Where available, preferably in spots marked as overnight parking.	7/5/2021 4:07 PM
118	Overnight or day use parking lot depending on the whether I am backpacking. I tend to arrive early for day use, so almost never have to use overflow parking.	7/4/2021 6:55 PM
119	Park at trailhead and usually sleep in my vehicle the night before my hike starts.	7/4/2021 12:35 PM
120	trailhead	6/29/2021 9:14 PM
121	I either get someone to drop me off and pick me up or I use the overnight parking area	6/23/2021 3:34 PM
122	Any available	6/23/2021 1:57 PM
123	I use trailhead parking areas.	6/23/2021 1:00 PM
124	At a trailhead (North Lake, Sabrina, South Lake)	6/21/2021 3:06 PM
125	At designated trailhead parking areas.	6/18/2021 7:02 PM
126	In designated camper parking areas.	6/17/2021 2:12 PM
127	Park at either the parking areas closest to trail head if I can	6/16/2021 2:24 PM
128	Wherever I can find room. Designated parking usually fills up quickly, especially at South Lake.	6/15/2021 4:44 PM
129	overnight parking lots, which should be at the actual trailheads	6/15/2021 9:01 AM
130	I park in the trailhead parking lot, I make sure to get there very early to get a good parking spot	6/14/2021 10:09 PM
131	Sabrina trailhead parking and South Lake trailhead parking - also North Lake trailhead parking.	6/12/2021 10:52 AM
132	I drove from LA, dropped my husband at Kearsage, drove to LA,ten days later drove to Bishop pass trialhead. We would use public transport if available. Sometimes he hitchhikes.	6/10/2021 3:55 PM

133	Available parking areas	6/10/2021 2:14 PM
134	as lose as possible to a chosen trailhead	6/10/2021 12:08 PM
135	I try to get a spot in the parking lot, but sometimes park down the road	6/10/2021 11:13 AM
136	Nearest overnight parking	6/9/2021 8:14 PM
137	Very difficult to find parking because trail head parking lots are full	6/9/2021 5:16 PM
138	I've always found a place to park at the South LAke over night camper's parking, but it is sometimes crowded. I have arranged trips where we park at the North Lake camper's parking, by the pack station, and then shuttle or take trails if our trip ends on the South Lake trail.	6/8/2021 5:38 PM
139	South Lake	6/8/2021 5:35 PM
140	overnight lots	6/8/2021 7:16 AM
141	parking lot or road below sabrina	6/8/2021 7:05 AM
142	South Lake	6/7/2021 9:26 PM
143	South Lake	6/7/2021 8:12 PM
144	Sabrina backpacker parking, which is too far from the trailhead, and the Bishop Pass trailhead, which has two few parking spaces.	6/7/2021 7:35 PM
145	In overnight parking lot near the trailhead.	6/7/2021 6:07 PM
146	Parking lot.	6/7/2021 11:30 AM
147	In the overnight lot or along the side of the road, depending on which trailhead and how busy it is	6/6/2021 7:55 AM
148	depends where there is room, Sabrina lake parking, side of road, north lake dirt parking, etc	6/6/2021 7:21 AM
149	either day use or overnight parking, sometimes all the way down the road.	6/4/2021 10:37 AM
150	Designated overnight trail parking.	6/2/2021 12:30 AM
151	South Lake hiker parking or overnight parking. Sabrina hiker parking or overnight parking.	6/1/2021 1:49 PM
152	Parking area at trailheads	6/1/2021 11:41 AM
153	Overflow overnight parking, as usually the overnight parking is full	6/1/2021 12:22 AM
154	Trailhead parking lot	5/31/2021 6:32 PM
155	North Lake, Sabrina Dam, South Lake	5/31/2021 5:39 PM
156	Car	5/30/2021 8:32 AM
157	For overnight use i park in the overnight parking. For day use i park as high as i can find a space	5/30/2021 8:09 AM
158	Lake Sabrina trail head	5/29/2021 5:12 PM
159	Trailhead parking	5/29/2021 5:03 PM
160	Trailhead parking	5/29/2021 10:50 AM
161	Lake Sabrina Parking	5/29/2021 10:35 AM
162	In the closest available trailhead lot, generally the morning of a backpacking trip.	5/27/2021 10:50 PM
163	At the overnight lot	5/26/2021 11:21 PM
164	in designated area	5/25/2021 8:30 PM
165	We park in the parking lot.	5/25/2021 1:07 PM
166	Closest parking spot for the intended purpose. Day use or overnight parking.	5/25/2021 6:57 AM
167	Current designated hiking and overnight spots	5/24/2021 5:34 PM

168	Trailhead parking	5/24/2021 3:06 PM
169	I park in the lots.	5/24/2021 2:57 PM
170	Day hike we park at the TH parking. Overnight for South Lake we usually park at the TH, overnight at Sabrina we get dropped off by friends or family as the overnight parking is horrible there	5/23/2021 7:32 PM
171	At trailhead	5/11/2021 12:30 PM
172	Designated Backpacker Parking area	5/10/2021 3:29 PM
173	overnight parking	5/9/2021 11:28 PM
174	As close (and as safely) as possible to trailhead	4/21/2021 8:59 AM
175	Park near the trail heads in the parking lots	4/16/2021 9:18 PM
176	Sabrina Trailhead and South Lake Trailhead parking areas	3/11/2021 11:44 AM
177	South Lake trail head if there is parking if not near Rainbow Pack Station.	3/10/2021 5:07 PM
178	trailhead parking area	3/2/2021 1:51 PM
179	Parking at the day use area	2/26/2021 4:33 PM
180	Don't remember.	2/26/2021 9:49 AM
181	Hiker parking lot near South Lake. Roadside near Lake Sabrina and the hiker parking area near North Lake.	2/25/2021 6:56 PM
182	N. Lake parking, South Lake parking, turnouts on S. Lake Road, Highway 168 and N. Lake Road	2/19/2021 3:51 PM
183	Park at Vons in Bishop and ride the Bishop Creek Shuttle when hiking into the wilderness	2/11/2021 5:20 PM
184	Anywhere available	2/5/2021 7:32 AM
185	Trailhead parking	1/13/2021 9:18 AM
186	In the parking lots below lake Sabrina main parking area	1/11/2021 2:31 PM
187	Wherever there's space	1/10/2021 9:44 PM
188	Bishop Creek trailhead, North Lake Trailhead	1/10/2021 7:07 PM
189	in a parking area	1/10/2021 5:35 PM
190	Depends on where I'm going and if there is a safe and secure area to park.	1/10/2021 5:02 PM
191	Trailhead parking if available, otherwise overflow parking	1/8/2021 6:27 PM
192	From campground at Sabrina and parking lots at North Lake and South Lake	1/8/2021 4:19 PM
193	I get there super early so I park as close to the TH as possible	1/8/2021 11:42 AM
194	I park in the designated parking between the white lines	1/8/2021 10:03 AM
195	North lake	1/8/2021 9:56 AM
196	In the parking lot at South Lake, or the dirt parking area before Lake Sabrina	1/8/2021 7:59 AM
197	At the south lake trail head	1/7/2021 11:04 PM
198	Lake parking lots	1/7/2021 9:02 PM
199	At the trailhead where I want to hike from, or if no parking, down the hill on the side of the road. Parking is the major problem in the area	1/7/2021 8:42 PM
200	At thr closest trailhead	1/7/2021 8:09 PM
201	In the lot above South lake	1/7/2021 7:41 PM
202	Overnight parking area.	1/7/2021 7:36 PM

203	I either have a friend shuttle me or I park in the area down the road where signage says overnight parking is allowed. That area can frequently be super packed and hazardous. I've seen overnighters parking in the day-use areas many times as well.	1/7/2021 7:09 PM
204	At the trailhead. North Lake, Sabrina, and Bishop Pass, all of them. Lot usually is not full for me because I show up at 5-6am in summer. Showing up later in the day has been awful on some occassions. so many people for small parking lot (especially south lake). Im not sure if Im remember correct but it seemed like an especially burdensome effort to park a ways down the road (1/2 mile?) and walk up it, when on a tight schedule (i hike distances 15-25 miles on dayhikes) or with a very heavy overnight pack.	1/7/2021 7:06 PM
205	Side of the road which is dangerous	1/7/2021 6:14 PM
206	Whatever we can find	1/7/2021 6:11 PM
207	South lake parking or Sabrina hikers parking	1/7/2021 6:06 PM
208	Parking area	1/7/2021 5:03 PM
209	Nearest available parking to trailhead. Or along the side of the road in a pull off that seems safe to park in if there's no parking left.	1/7/2021 4:36 PM
210	Parking lots of the lake	1/7/2021 4:31 PM
211	South and North Lake parking lots, or side of the road for Sabrina.	1/7/2021 4:25 PM
212	typically in the provided lots, in appropriate parking spaces.	1/7/2021 4:22 PM
213	at trailhead parking spots	12/23/2020 9:53 AM
214	I have parked at the Bishop Pass trailhead parking lot for both day and overnight use, and at the pullouts near the Sabrina Lake trailhead for day use.	12/19/2020 6:00 PM
215	As close to the trailheads as I can.	12/16/2020 3:44 PM

Q51 Please provide any additional detail on how we can improve accessibility to the John Muir Wilderness at the Bishop Creek Reservoirs.

Answered: 97 Skipped: 264

#	RESPONSES	DATE
1	Preserve the natural environment as much as possible.	12/4/2021 1:29 PM
2	More shuttles between trailheads. Wider shoulders on roads for bicycles. Secure bicycle storage boxes that would allow people to safely store their bicycle while hiking or backpacking.	11/24/2021 11:56 AM
3	Restore old system of walk in permits	11/10/2021 1:48 PM
4	the closures related to fires have been the main problem recently	11/6/2021 7:40 AM
5	Better overnight parking for Sabrina.	10/2/2021 9:22 AM
6	Better parking at Sabrina TH. More bus transportation from Bishop area.	9/23/2021 8:42 PM
7	Expand parking areas and allow access to campgrounds for day-use during winter closure (easiest solution).	9/23/2021 8:15 AM
8	Parking and signage	9/22/2021 7:02 PM
9	Add more spaces as most places to park are taken by hikers and/or fishermen.	9/22/2021 3:14 PM
10	Provide more parking, improved road conditions, skirting etc. Work with USFS for increased back and front country access, with more trails that horses can access.	9/22/2021 9:10 AM
11	Provide first access to locals	9/21/2021 5:59 PM
12	Trailhead camping is very helpful for those of us who have to drive a long way.	9/20/2021 3:58 PM
13	Some of the trails have been washed due to the recent rains this summer. Also, Brown Lake is very low as there is no flow coming in the inlet anymore. It appears there is blockage coming from Green and it bypasses the lake and goes to Bluff. Fishing was non-existent this past weekend(9/18) and it use to be full of small rainbows.	9/20/2021 9:51 AM
14	At South Lake there are a lot of people that cut between the trail and the parking lot without following the steps and round about route the trail takes. This is probably an indication the existing route (and the steps) is not optimal. If resource issues weighed on the route of the existing trail, it is worth noting that the cutting of the trail may result in more impacts than a properly constructed trail would.	9/19/2021 9:08 AM
15	Don't provide any more accessibility. No more trailhead parking.	9/18/2021 2:16 PM
16	Through photos and Reading articles	9/18/2021 10:54 AM
17	More parking	9/18/2021 10:15 AM
18	Provide shuttle services	9/15/2021 1:45 PM
19	Have parking at the trail head by North Lake campground	9/15/2021 11:08 AM
20	More water spigots near trailheads and bathrooms	9/14/2021 1:48 PM
21	do not allow overnight parking in lots….require overnight parking to be in bishop and use of shuttle bus only	9/14/2021 11:17 AM
22	Greater access to trail head parking	9/14/2021 7:35 AM
23	Greater access to day use hiking - more parking at all sites.	9/13/2021 10:29 AM
24	Adding more parking area	9/12/2021 6:58 AM
25	Cut down on the day use folks. Regulate day use like they way overnight use is. Again, this	9/12/2021 12:09 AM

	resource is getting destroyed.	
26	Signage and staffing	9/11/2021 7:54 PM
27	Enforce parking rules	9/11/2021 6:15 PM
28	Na	9/11/2021 4:59 PM
29	N/A	9/11/2021 3:52 PM
30	More parking	9/11/2021 3:36 PM
31	More accessible parking near trailhead or manage who can park there.	9/11/2021 12:41 PM
32	Issue more hiking permits and eliminate the online tech red tape nonsense for reserving hiking permits.	9/11/2021 9:55 AM
33	Parking is very limited and often full at South Lake and North Lake. It would be reasonable to expand these parking lots. The daily shuttle is helpful, but would be more helpful if it ran more often. At North Lake, there should be more signage or physical barriers preventing cars from parking along the stretch of road across from the old Grass Lake trail before the turnoff for the main overnight parking area.	9/1/2021 11:45 AM
34	Leave it as it is	8/31/2021 4:43 AM
35	Improve the first mile or so of the Bishop Pass and Sabrina Basin trails so there aren't so many large, knee-killing rock steps.	8/30/2021 10:37 PM
36	Perhaps separate parking areas for day use and overnight use… it there would need to be enforcement of those rules….	8/23/2021 11:31 AM
37	Parking is very challenging. More parking or some sort of weekend shuttle system would be helpful (but shuttles would need to be frequent - the current once-daily shuttle is hard to use).	8/18/2021 12:42 PM
38	Need more parking	8/16/2021 12:06 PM
39	More campgrounds and more parking !!!	8/11/2021 6:15 AM
40	Very easy to access and good hiking. No improvements needed	8/6/2021 11:30 AM
41	Additional parking at South Lake for both overnight and day use. Enforcement is non-existent. Imprpove signage regarding overflow overnight parking on the South Fork of Bishop Creek.	8/5/2021 3:49 PM
42	It would be great to get a connecting trail from the North Lake TH to the parking areas so one doesn't have to deal with the dust and fast moving vehicles coming and going from the campground.	8/5/2021 1:25 PM
43	Please stop allowing dogs! Our trails are crowded enough with humans. Dogs are very bad for such a fragile natural environment.	7/18/2021 2:18 PM
44	Na	7/16/2021 2:54 PM
45	On busy season, I sometimes am parked a distance back, adding a half hour to an hour to my trip (finding parking and walking to the trailhead, getting out of the way of cars when I am walking).	7/13/2021 6:22 PM
46	see previous comment regarding eliminating horse manure from trails by requiring Horse Catch It bags or something similar. Note that packers are also not keeping the horses within the confines of the developed trail, resulting in trampling of the plants next to the trail.	7/13/2021 11:41 AM
47	More parking spaces	7/13/2021 12:56 AM
48	Allow overnight parking everywhere! Why does it matter where cars stay for how long?	7/12/2021 5:50 PM
49	More parking	7/11/2021 9:59 PM
50	There really is not much else you can do. You can't really make any more space than what there is.	7/7/2021 3:10 PM
51	More pull out parking at cross country access points (like canyons/gullies/creek beds) + dirt parking lots in place of restricted points + remove restricted access/land access issues along corridor.	7/6/2021 10:06 PM

52	Please please please consider making the South Lake lot which is labeled as the overnight lot TRULY only for overnight users!!! I sat around for a long time last week waiting for a spot to clear...and eventually several spots did clear...all day hikers who could have parked in one of the MANY available day use slots in the lower lot or in the road pullouts nearby. If you don't want to do that, please expand to allow overnight parking in ALL of the lots to make it more fair for backpackers. This is a perpetual issue that is only getting worse.	7/6/2021 6:41 PM
53	See previous answers re:parking	7/5/2021 4:07 PM
54	Need more overnight parking near Sabrina Lake trailhead.	7/4/2021 12:35 PM
55	Again, the lakes need a formalized recreation plan that includes formalized and maintained trails around the lakes (Intake 2, Sabrina and South Lake). Doesn’t have to be in the wildererness. This effort should include interpretive signs as well as informational signs. Signage in the drainage is poor and sometimes contradictory.	6/23/2021 3:34 PM
56	Parking area need to be improved and expanded to handle increased use. More educational info at kiosks needed.	6/23/2021 1:00 PM
57	Seems about right except parking at South Lake for Bishop Pass trail is often a challenge.	6/18/2021 7:02 PM
58	Again, more overflow parking	6/17/2021 2:12 PM
59	Add more overnight parking closer to the trailheads. Make day users park lower down and walk to trailheads.	6/15/2021 4:44 PM
60	More wilderness permits	6/12/2021 10:52 AM
61	Add a midday shuttle time, during the season.	6/10/2021 3:55 PM
62	expanded near trailhead parking	6/10/2021 12:08 PM
63	More buses	6/10/2021 11:13 AM
64	Closer overnight parking	6/9/2021 8:14 PM
65	More overnight parking at trailhead	6/9/2021 5:16 PM
66	Is there some relationship between trail quotas and parking spaces? I've always been able to park at South Lake, But I don't try to go in on the Bishop Pass trail during peak use times.	6/8/2021 5:38 PM
67	Much more overnight parking at South Lake. Overnight parking user must have wilderness permit and this should be strictly enforced.	6/8/2021 5:35 PM
68	More overnight parking	6/7/2021 9:26 PM
69	Increase the number of parking spaces near the trailhead where it is OK to park overnight. The main overnight parking lot becomes full. The overflow overnight parking is too far from trailhead at South Lake.	6/7/2021 6:07 PM
70	more parking for large vehicles	6/6/2021 7:21 AM
71	Would be nice to have a trail over one high passes (Echo Lake perhaps (old trail there)) from Sabrina Lake.	6/2/2021 12:30 AM
72	The overnight parking for the Sabrina trailhead is quite a long walk. I know there is available parking along the road near the trailhead for overnight but that can fill fast. How about opening some of the boater parking to overnight use. Or expand that lot for overnight use.	6/1/2021 1:49 PM
73	Trash cans	5/31/2021 5:39 PM
74	Parking space sensors could be installed at the upper lots and then people wouldn't drive all the way up from the lower parking areas only to turn around and go back down looking for parking. And more signage and feeder trails from the lower parking would help so you don't have to hike up the road	5/30/2021 8:09 AM
75	Not nearly enough parking	5/29/2021 5:12 PM
76	Shuttle service from Bishop	5/27/2021 10:50 PM
77	intake 2 is compromised by the shooting area across the hwy 168 from intake 2. close that shooting area where sce dumps material dreged from reservoir. shooting is dangerous close to	5/25/2021 8:30 PM

	intake 2	
78	Do not provide any more accessibility. It is too croweded.	5/24/2021 5:34 PM
79	Tow illegal parked overnight vehicles from day use parking areas	5/24/2021 3:06 PM
80	Better overnight parking at Sabrina	5/23/2021 7:32 PM
81	Enforce dog restrictions. Off-leash & untrained dogs consistently detract from the experience because owners are not held accountable. The nuisance is embarrassing & growing.	5/9/2021 11:28 PM
82	create trailhead parking for Bishop Pass trailhead or provide wayfinding signage to/from parking area to trailhead	3/2/2021 1:51 PM
83	Dedicated parking for just the John Muir hikers/backpackers.	2/26/2021 4:33 PM
84	Accessibility is adequate. DON'T add anything more!	2/19/2021 3:51 PM
85	Improve on parking lots by increasing availability and capacity more parking enforcement	1/11/2021 2:31 PM
86	Enforce day-use only parking! Far too many observed instances of vehicles overnight in day-use parking!	1/8/2021 6:27 PM
87	Possibly a shuttle from campgrounds to trailheads during peak months.	1/8/2021 4:19 PM
88	More parking	1/8/2021 11:42 AM
89	Buses. Shuttles. Anything to reduce personal car use and avoid the weird parking down the hill situation which is inconvenient and in the Sabrina drainage, dangerous and causes resource damage.	1/7/2021 8:42 PM
90	Don’t improve access. Already far too many people.	1/7/2021 7:36 PM
91	Larger parking areas. Have you seen the Horseshoe Meadows parking lot. It’s massive. That’s whats needed everywhere in the Inyos. The trailheads/boat access areas are being loved to death and it’s become almost hazardous for the people and lane. Either have a limit on parking (ie: if it’s full, leave) or make larger parking lots.	1/7/2021 7:09 PM
92	nothing that would attract more people. hopefully anything that would improve management of crowds and high demand (I wouldn't mind paying a fee, for example)	1/7/2021 7:06 PM
93	Due to increase of interest and population growth, especially this year, there was not adequate parking for trailheads, along with trash dumpsters etc	1/7/2021 6:06 PM
94	Patrol for non permitted backpackers. There were so many people camped in the back county out of south lake and Sabrina trailheads that it was really hard to believe that they all had permits!!	1/7/2021 4:36 PM
95	N/A	1/7/2021 4:31 PM
96	Parking for Sabrina is inadequate.	1/7/2021 4:25 PM
97	Keep the roads open more (don't close them before the snow starts). Open them when the snow's gone.	12/16/2020 3:44 PM

Q52 Thank you for taking the time to complete this survey. Please share any additional comments on your visits and recreation activities at Bishop Creek Reservoirs.

Answered: 89 Skipped: 272

#	RESPONSES	DATE
1	keep America beautiful	11/6/2021 7:41 AM
2	Just love it up there -- the Bishop area is my favorite recreation spot. I hope that it can continue to be available for many years to come -- keep it from getting overdeveloped!	10/8/2021 10:37 AM
3	Keep the area natural and wild	10/3/2021 9:22 AM
4	Hope this helps!	9/23/2021 1:52 PM
5	Parking is needed for designated day-use and hiking trail access. Provide using existing or provide new, continuous multi-use trail (pedal mountain biking) throughout canyons, connecting campgrounds, reservoirs, and facilities. Parking is needed for designated day-use and hiking trail access. Provide day-use access and parking at campgrounds during winter closure.	9/23/2021 8:18 AM
6	stop the hundred year water agreement so the lakes stay useable thru out the summer then let dwp have the water they so desire , as well as give us here in Bishop the discount on power from the hydro plants generating this power here locally as we do live here we should benefit from it , I know its not free but it sure cost less to generate it than fuels do . Thank you for this survey	9/22/2021 6:43 PM
7	Thanks you for your concern for the Bishop Crk. drainage.	9/22/2021 3:15 PM
8	Need more trails for horseback riding and places to park your trailer, camp with stock etc.	9/22/2021 2:30 PM
9	Bishop Creek is an awesome and beautiful area. Right now access is poor and not allowed to be used to its full potential.	9/22/2021 10:16 AM
10	Would love to see the area better developed and more horse friendly with increased parking and signage of available concessions, businesses etc.	9/22/2021 9:11 AM
11	the reserve camping system has made it were locals can no longer camp and use this area ,there is no longer a lets go camping this weekend because everything is reserved and half the spaces reserved seam to remains empty all weekend	9/22/2021 8:35 AM
12	I don't understand why folks can't just let it be. It's nature not an amusement park and a toilet.	9/21/2021 8:24 PM
13	Stock more fish	9/21/2021 6:07 PM
14	Preference should go to non-motorized activities but not fishing. Most fisherpeople do not have a wilderness ethic and leave garbage behind, including fishing line and hooks.	9/21/2021 6:02 PM
15	Just better water management to help keep the lakes at a decent level. Sad to see Patty and Rick's place all brown because they couldn't water there yards, etc...They use to have such a nice place.	9/20/2021 9:53 AM
16	The Bishop Creek Canyon including the reservoirs is an extremely valuable recreational resource. Recreational facilities in the area should be expanded and adequately funded for operation and maintenance.	9/19/2021 9:10 AM
17	The road to North Lake in the fall season needs some traffic control, or more signage to yield to uphill traffic. The parking at all trailheads needs to be expanded, or ESTA service needs to run more often, at a minimal or free of charge.	9/19/2021 8:21 AM
18	Restrooms are often not clean. There is often trash about. And there are too many people with too much noise.	9/18/2021 2:16 PM
19	You are welcome	9/18/2021 10:54 AM

20	Thank you for doing this survey	9/18/2021 10:15 AM
21	The Lake Sabrina Campground is in shabby condition compared to the years my family camped there. The Bishop Creek Middle Fork is seriously in need of improvements.	9/18/2021 8:46 AM
22	Build a trail to connect from Sabrina to North lake allowing for a true loop through Evolution.	9/16/2021 9:28 AM
23	Tell Pedro Pizzaro to better plan maintenance and water level fluctuations BEFORE DRAINING RESV.	9/15/2021 10:32 PM
24	There usually is a lot of trash in the high-use fishing areas. It would be nice to enforce better cleanup practices. Thanks!	9/15/2021 1:46 PM
25	I love this area and go on hot days to be cooler.	9/15/2021 11:09 AM
26	The middle fork of Bishop Creek is the best fishery in the south-eastern Sierras. Please do what you can to preserve it. With your relationship with NFS see if you can influence them to make THE CREEK a 2 fish limit and no taking of Browns or Brookies.	9/14/2021 12:47 PM
27	You need to speak with Parchers and Lake Sabrina to see what the actual needs are...they are honest hardworking people who know what is and what is not needed!!!	9/14/2021 11:18 AM
28	Please put this canyon as a high priority for budget and manpower priorities.	9/14/2021 7:36 AM
29	The overall presence of USFS workers is far less than when I was a child. Nature presentations, guided nature walks were apart of the camping experience. Also, South Lake lake levels need to stay higher so that children and families can enjoy the lake through Spring and Summer. These memories are priceless and will save our generations to come.	9/13/2021 10:31 AM
30	My grandfather built the boat landing at Lake Sabrina — and I've been traveling up there my entire adult life. It's truly one of the most incredible areas in the world… it's breathtaking. But when it's drained so low, as it has been the last few years, it's a travesty, and robs the public of its beauty. Please do not drain it so low!	9/12/2021 6:57 PM
31	These reservoirs are arelatively unknown gems of the Eastern Sierra. Don't overcommercialize them but please do what you can to improve water levels at South Lake	9/12/2021 4:22 PM
32	I love the area. At 80 years old I sold my rig and stay at Cardinal Village, Bishop Creek lodge or a rental trailer at Creekside.	9/12/2021 2:08 PM
33	Crowds are going be a problem. With such an amazing area. Trash dumpsters and regular pickup would help reduce the mess.	9/12/2021 7:17 AM
34	Whomever manages Sabrina and south lake water levels needs to re-evaluate their practices.	9/12/2021 12:10 AM
35	We have also driven to the North Lake trailhead. More signage would be helpful there as we have mistakely parked far from the actual trailhead.	9/11/2021 10:55 PM
36	Extremely dissapointed in how wayer levels are managed in bishop creek during a low snow year. It hurts local businesses and causes over crowding in surrounding areas. Perfect example is how south lake was manged this year and in the past. Sabrina was extremely low and people livelyhoods are at stake.	9/11/2021 5:37 PM
37	I enjoy the rustic facilities! Improve the roads in the campgrounds. I dont want it to fancy!	9/11/2021 5:00 PM
38	This area is my favorite place to fish in California. You need to find a way to keep it open during fire season. Fishing season there is so short and every fishing day is precious.	9/11/2021 1:41 PM
39	If water is not held in the reservoirs so that the resort operators can make money off the boat rentals in selling fishing supplies it takes away from the whole experience going up there just keep water in them	9/11/2021 1:14 PM
40	Very beautiful area, love to visit during 3 seasons of the year.	9/11/2021 9:56 AM
41	Enjoy the area, know lack of water not your fault, Intake 2 water around handicapped fishing area needs cleaned up.	8/31/2021 4:32 PM
42	Trails are beautiful, but over used. Trash, litter, crowds and the beginnings of graffiti… trails ,reservoirs and campgrounds need to be patrolled and monitored more	8/31/2021 4:45 AM
43	It was great when the parking area at South Lake was redone, and some road bridges were	8/30/2021 10:51 PM

	greatly improved! It probably would be good to put up more signs regarding picking up after your dog, the use of drones, and about illegal front country and backcountry fires. We love the Bishop Creek area! We have been recreating there for almost 50 years!	
44	I've lived here for 47 years and worked as a wilderness ranger in the John Muir Wilderness in the Bishop Creek area, Big Pine, and McGee Creek. Not only do I still backpack, but sometimes it's nice to just go up and camp in a campground for a night or two. But I don't like camping in a campground when it's surrounded or crowded with RVS! It seems like over the years, RVs have taken over most campgrounds leaving less quality campsites for tent campers, thus a lesser grand experience while camping. Instead of hearing birds and sounds of nature one hears generators or other motors from RVs. RVs are self contained and don't need privacy as much as tent campers do. There needs to be more campgrounds up Bishop Creek for TENTS ONLY. Also, some of the campsites need serious rehabilitation.	8/23/2021 11:40 AM
45	Some of the trails in South Lake to Bishop pass are narrow and there are horses on them. Kind of scary to scrambled off the side of steep trails to let the horses pass. Also really gross when it rains and all the horse poop gets moisturised and pungent. Can we get horse owners to manage the waste? Humans and dogs are required to manage their poop. Why are horses allowed to make the trails disgusting? Kids and dogs will touch or eat the poop, it's really unsanitary.	8/15/2021 4:14 PM
46	Get LA DWAP to quit taking the water from the Eastern Sierra Nevada. They have destroyed the environment there.	8/7/2021 9:54 AM
47	We love this area. Please help us keep it less commercialized than Mammoth or Tahoe.	8/6/2021 5:07 PM
48	Please continue to keep this area in great condition. Very beautiful and always fun. Thanks.	8/6/2021 11:30 AM
49	Strategic water management, parking enforcement, more supplmental fish stocking and additional parking spaces would add tremendously to the recreational enjoyment of forest visitors.	8/5/2021 3:50 PM
50	I love this area and all the hiking options. Although there are a lot of people on the trails, I never felt crowded. Probably helps that I get on the trail by 7 am	8/5/2021 1:26 PM
51	Used and love this area for many years. Hope it will continue to be available to the public.	7/18/2021 4:14 PM
52	Every year there are more people! Please try to keep the area as wild as possible. California has many opportunities for boating and car camping and hotels, but not many opportunities for true wilderness backpacking. Preserving the wildness of the area should be the priority.	7/18/2021 2:19 PM
53	Not happy with the current company running the campgrounds RRM. Poor service not helpful and not enough Bear boxes. Thanks	7/16/2021 2:55 PM
54	Constructing a loop trail around each lake would be a dream come true	7/14/2021 5:50 PM
55	The restaurants and bakery (especially Holy Smokes BBQ and Erick Schatt's Bakkery) in Bishop is one of the more motivating reasons for me to do day trip hikes in that area, for after the hike.	7/13/2021 6:26 PM
56	I think packers provide a valuable service to those who lack the mobility to access the backcountry. However, they should not be allowed to degredate the experience of the vast majority of visitors in the process.	7/13/2021 11:43 AM
57	Unfortunately, after years of camping there, we found that you made our favorite site reserve only. We came for several days, only to find out the 2nd day we were there, that we had to move. We had to scramble to find a spot at another campground. Why on earth would you take something that has been working really well and ruin it? Is it about the money? We drove by throughout the weekend and took note of several sites that went unused even though we were told they were reserved. Just really disappointing. Part of the fun for us was knowing we could always find a spot there. I don't get it. Also, lots and lots of dog poop on the trail from Sabrina Lake. Not sure what you can do about it, but we don't feel like we should have to deal with that. The restrooms and picnic tables REALLY need some updating. They are looking pretty worn. You guys raised the camping prices pretty steep, so it would nice of you did something good with that money. On the good side, there was very little trash and the camp hosts are awesome. Please re-consider making the campsites not reserveable. Or, take a cue from some others and make it 50/50.	7/7/2021 3:22 PM
58	Love the place	7/6/2021 10:06 PM

59	Love the bishop area and have been fishing here for 19 years and the stocking for 2021 is the worst ive ever seen it! It needs to improve alot!	7/6/2021 7:40 PM
60	The parking situation truly deserves a better solution for overnight users - please consider my comments about either designating the overnight lot as TRULY for overnight permit users only, OR even better - expand rules so that overnight users can park at any of the lots and pullouts that day users are allowed to park in! Overnight users have heavy packs and when we're solo, there's no way to then avoid having to hike uphill, sometimes for several miles, just to reach the trailhead.	7/6/2021 6:42 PM
61	Thanks for maintaining the trails.	7/4/2021 6:55 PM
62	In general, the area is a world class destination with subpar recreation facilities. The movement of people around the reservoirs (on foot) and the access to the lakes need to be improved. South Lake boat launch is unusable do to the angle/rocks, etc. unless you are a person who likes to take risks. Many of my friends in Bishop will not use the boat launch there. Intake 2 needs a complete redesign: As it exists now it is what appears to be a random collection of of campgrounds, bathrooms, social trails…all of which are in very poor condition. It needs new facilities, redesigns of campgrounds, including moving or consolidation. It is one of the highest use areas for the residents of the Owens Valley. It needs formal trails, accessible bathrooms, drinking water that is clearly marked and accessible to the public.	6/23/2021 3:40 PM
63	With this work and the efforts of ESSRP we are faced with a rare and powerful opportunity to address recreation needs and environmental concerns in the Bishop Creek Canyon. Let’s not pass this opportunity up to address these issues and allow us to sustainability care for Bishop Creek Canyon long into the future.	6/23/2021 1:05 PM
64	The trail near South lake was very well maintained this year. Thank You.	6/10/2021 3:57 PM
65	Public transportation is desperately needed	6/10/2021 11:14 AM
66	Most of my use of this area is backpacking. About every other year we drive up to see the fall foliage. North Lake, Sabrina and South Lake roads have some of the finest fall color displays. Some times the roads are crowded, but I've always gotten a campsite.	6/8/2021 5:40 PM
67	This area leads to some of the most beautiful wilderness not only in the United States, but the entire world. Unfortunately, the experience at the trailhead with the difficulty in parking, tells backpackers they are second class citizens compared to fisher people.	6/7/2021 7:38 PM
68	Perhaps consider a boat shuttle for trails to Bishop Pass and Sabrina Basin, if practical.	6/7/2021 6:08 PM
69	I always enjoy my time spent in these areas. Whether or not this applies, It would be nice to see more Rangers on the trails educating the public. People don't always take the time to read signs and obey the rules. The boat launch ramps at Sabrina Lake and South Lake are not very user friendly especially for a "lone boater". An area should be made adjacent to the ramps where you can pull your boat up, tie it off so you can then drive the tow vehicle and trailer to the parking area. Like at Silver Lake in the June Lake loop.	6/1/2021 1:57 PM
70	Is it possible to complete the trail from Chocolate Lakes to Lake Ruwau? It was easy to navigate except the scramble at the end of Chocolate.	5/31/2021 6:34 PM
71	An inexpensive parking fee (with a pass for local residents) would generate a bit of income	5/30/2021 8:11 AM
72	Beautiful area to visit with family of all ages and generations	5/29/2021 10:36 AM
73	Love the area and want to make a fall trip to see the fall colors.	5/27/2021 10:51 PM
74	intake 2 is compromised by the shooting area across the hwy 168 from intake 2. close that shooting area where sce dumps material dreged from reservoir. shooting is dangerous close to intake 2	5/25/2021 8:30 PM
75	The new South Lake road is great.	5/25/2021 1:07 PM
76	Visitors should be required to watch “how to poop in the woods” video as part of obtaining a permit. Adults need to teach children! The backcountry is getting heavy use and people are not disposing their waste properly.	5/25/2021 6:59 AM
77	Need more Forest Service personal at the TH and/or on the trails to check for permits and misuse of the trails.	5/23/2021 7:34 PM

78	Bishop Creek canyon is a treasure	5/11/2021 12:30 PM
79	It has been my experience that the designated Group Campgrounds are very under utilized in general and suggest that they be converted to normal developed sites more accessible to non-groups	5/10/2021 3:31 PM
80	I know that many potential visitors do not visit the reservoirs and trails because of irresponsible dog owners who are not educated on the environmental impacts of dogs in pristine waters and unleashed dogs chasing wildlife.	5/9/2021 11:30 PM
81	Not enough Forest Service people in these areas.	3/10/2021 5:08 PM
82	Road to North Lake should be wider than a single lane+	2/26/2021 4:35 PM
83	I happen to be the CALTRANS HIGHWAY CLEANUP COORDINATOR FOR highway 168 FROM BISHOP pARK cAMPGROUND TO sABRINA cAMPGROUND. bACKPACKERS ARE THE "PIGS" OF THE HIGHWAY. mAYBE SOME LIMITED SIGNAGE TO GET THEM TO REALIZE THEY SHOULD PICK UP THEIR TRASH RATHER THAN LITTERING THE ROADSIDE. (SORRY FOR THE CAPLOCK)	2/19/2021 3:54 PM
84	SCE needs to do a better job with recreation than they do with their power lines.	1/10/2021 5:04 PM
85	We like that the campgrounds are somewhat primitive. We use a small trailer and I think the absence of hookups keeps a lot of the bigger RVs away allowing for a better experience.	1/8/2021 4:25 PM
86	SoCal Edison should pay to modernize facilities like the shop at Lake Sabrina. They should also pay for new toilets at the campgrounds in the watershed.	1/7/2021 11:05 PM
87	Gorgeous. Would love to have public transportation options.	1/7/2021 8:43 PM
88	Please improve existing sites, add new sites without crowding.	1/7/2021 7:43 PM
89	These areas are beautiful and I hold them close to my heart. Improving access by improving parking options and regulations would make it better for all.	1/7/2021 7:10 PM

Q53 Are there any specific reasons why you have not recreated at the Bishop Creek Reservoirs in the past?

Answered: 18 Skipped: 343

#	RESPONSES	DATE
1	No, just haven't. Would like to do a bit if given the opportunity & time	11/12/2021 7:44 PM
2	The Fishing SUCKS.	9/23/2021 4:30 PM
3	I live 1500 miles away	8/27/2021 10:32 AM
4	Eight hour drive from my primary residence.	8/18/2021 10:01 AM
5	Unaware of it	8/12/2021 10:28 AM
6	No	8/8/2021 12:44 PM
7	Distance	8/8/2021 8:57 AM
8	I use parking area and backpack into wilderness	8/5/2021 5:28 PM
9	Long distance from my home	7/21/2021 7:31 PM
10	No	7/12/2021 4:46 PM
11	I don’t come to this area of California very often	7/12/2021 8:48 AM
12	I don't recreate at reservoirs	7/11/2021 4:59 PM
13	Used parking to hike the North Lake to South Lake Evolution Valley loop.	7/8/2021 5:07 PM
14	No, but planning to go soon	7/1/2021 7:09 PM
15	Distance	6/27/2021 8:12 AM
16	Mountains	6/10/2021 8:55 PM
17	Just haven’t visited here before.	6/7/2021 7:28 PM
18	Never heard of	5/31/2021 7:51 PM

Q54 Are there specific changes or additions to opportunities and/or facilities that would make you want to recreate at the Bishop Creek Reservoirs in the future?

Answered: 18 Skipped: 343

#	RESPONSES	DATE
1	They are fine.	11/12/2021 7:44 PM
2	Be more RV friending, more stocking of fish.	9/23/2021 4:30 PM
3	No	8/27/2021 10:32 AM
4	No	8/18/2021 10:01 AM
5	No	8/12/2021 10:28 AM
6	Yes	8/8/2021 12:44 PM
7	No	8/8/2021 8:57 AM
8	no	8/5/2021 5:28 PM
9	Larger long term parking for long distance multi day hikers	7/21/2021 7:31 PM
10	No	7/12/2021 4:46 PM
11	No	7/12/2021 8:48 AM
12	No	7/11/2021 4:59 PM
13	Looks like parking is frequently full.	7/8/2021 5:07 PM
14	More Camping opportunity	7/1/2021 7:09 PM
15	No	6/27/2021 8:12 AM
16	No	6/10/2021 8:55 PM
17	Flush toilets	6/7/2021 7:28 PM
18	More awareness of the location	5/31/2021 7:51 PM

Q55 Thank you for taking the time to complete this survey. Please share any additional comments on your visits and recreation activities at Bishop Creek Reservoirs.

Answered: 6 Skipped: 355

#	RESPONSES	DATE
1	Dig the area. Hope to visit more often after retirement. Thanks for taking care of the place, John	11/12/2021 7:44 PM
2	Beautiful area: loved my day hike to Treasure Lake, and backpacking trip North Lake thru Evolution Valley to South Lake.	8/18/2021 10:01 AM
3	Wait, I have a complaint. We did the North Lake to South Lake loop, and left food in the South Lake metal bear contraption. My last name and date out 8/7/21, were written in large letters with a black sharpie. Two different Rangers, R Quintana and LK left stickers on our bag saying it had no name or date out. They all but put the stickers right on our unmistakable printing. What’s going on? I have photos of our if you care to see them.	8/8/2021 8:57 AM
4	I do realize that topography limits the ability to provide more long term parking. But it is the only suggestion based on my experience and needs that I can offer	7/21/2021 7:31 PM
5	I want to continue to use and improve public access to these areas, please integrate a strategy of "semi-dispersed" camping, in areas set back from the watershed 200'... where road access, camp site turnouts, and bear boxes ... are located in many planned use 'single site' or 'small group sites' in geographic areas that are to small to support a forest service level campground. The "semi-dispersed" approach is less costly to implement and better for the preservation of the pristine environment, while expanding access to heavily used areas in a manageable and planned approach.	7/1/2021 7:09 PM
6	Beautiful area. Will be back!	6/7/2021 7:28 PM

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project
(FERC Project No. 1394)

DRAFT LICENSE APPLICATION

FINAL TECHNICAL REPORT
RECREATION FACILITIES CONDITION & PUBLIC ACCESSIBILITY STUDY
(REC2)

Southern California Edison
1515 Walnut Grove Ave
Rosemead, CA 91770

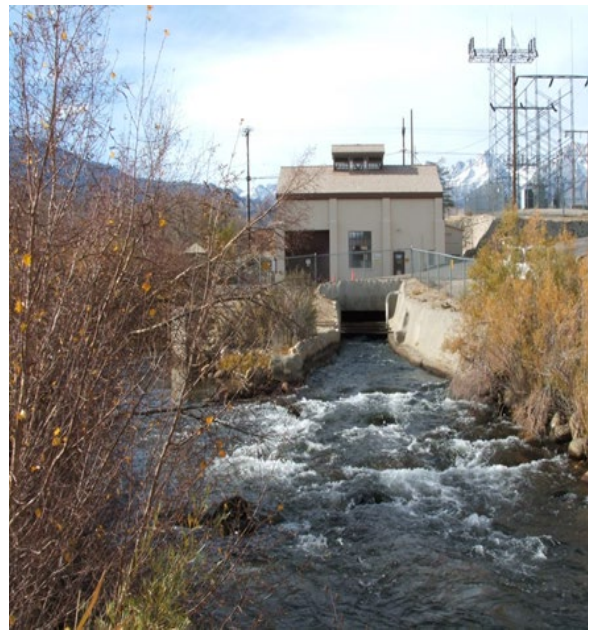
January 2022

Support from:

Kleinschmidt

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project
(FERC Project No. 1394)



FINAL TECHNICAL REPORT
RECREATION FACILITIES CONDITION & PUBLIC ACCESSIBILITY STUDY (REC2)

SOUTHERN CALIFORNIA EDISON

An EDISON INTERNATIONAL® Company

JANUARY 2022

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ACRONYMS

A	
ABAAS	Architectural Barriers Act Accessibility Standards
Access Board	Architectural and Transportation Barriers Compliance Board
ADA	Americans with Disabilities Act
C	
CMU	concrete masonry unit
F	
FERC	Federal Energy Regulatory Commission
FSORAG	Forest Service Outdoor Recreation Accessibility Guidelines
FSTAG	Forest Service Trail Accessibility Guidelines
G	
GIS	geographic information system
O	
O&M	Operation and Maintenance
ODAAG	Outdoor Developed Area Accessibility Guidelines
Q	
QA/QC	quality assessment/quality control
R	
REC 1	Recreation Use and Needs Study
REC 2	Recreation Facilities Condition and Public Accessibility Study
S	
SCE	Southern California Edison
T	
TWG	Technical Working Group
U	
U.S.	United States
USFS	U.S. Forest Service

1.0 INTRODUCTION

During the Technical Working Group Meeting (TWG) meetings, Southern California Edison (SCE) and stakeholders identified the need to conduct a Recreation Facilities Condition and Public Accessibility Study (REC 2) to assess the condition of and accessibility to existing recreation facilities at the SCE Project. For the purposes of the REC 2 Study, Project-related recreation facilities are considered all facilities related to the South Lake, Lake Sabrina, and Intake No. 2 Reservoir recreation areas regardless of ownership or management. An associated Study Plan was developed with the TWGs and adopted through the Federal Energy Regulatory Commissions (FERC) Study Plan Determination, dated November 4, 2019. This report provides findings for the REC 2 Study.

2.0 STUDY OBJECTIVES

This study included the following goals and objectives:

- Assess the condition of existing recreation facilities for Project-related recreation areas
- Facility condition assessment and inventory at existing recreation facilities directly related to the SCE 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
- 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 operation and maintenance (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 consistent with the desired conditions, goals, standards, and guidelines described in the Land Management Plan for the Inyo National Forest Service (USFS, 2019) for Social and Economic Sustainability and Multiple Uses

3.0 STUDY AREA

A facility condition and public accessibility assessment along with a dispersed use assessment were performed at each of the three recreation areas directly related to the Project: Lake Sabrina, South Lake, and Intake No. 2 Reservoir recreation areas. Dispersed use assessments were generally conducted at all developed facilities, reservoir shorelines, and islands within each reservoir, including but not limited to the following locations:

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 outside of Project boundary and in wilderness
- Informal camping, on south shore of reservoir, accessed by Inlet Trail and by boat, much of which is outside the Project boundary and within the John Muir Wilderness

South Lake

- Bishop fishing access, Weir Lake
- Parking, Weir Lake
- Informal parking, along road between dam and Weir Lake
- Boat launch area, South Lake Launching Facility
- Marina, South Lake Landing
- 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 at various locations on the south end of the reservoir
- Informal trail, connecting Pass and Green Creek Diversion trails
- Informal tr ails and fishing access, at Bishop Pass Trailhead

Intake No. 2 Reservoir

- Day use area adjacent to campground, including restroom facility and day use parking
- 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
- Informal trails and camping areas, south side of reservoir between inlet and dam

4.0 METHODS

4.1 FACILITY CONDITION AND PUBLIC ACCESSIBILITY ASSESSMENT

A facility condition and public accessibility assessment was performed by MacKay Sposito from August 4 to 6, 2020, at facilities associated with the recreation areas of Lake Sabrina, South Lake, and Intake No. 2. Generally, the study included 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 proper and effective operation
- Visual and aesthetic quality of facilities
- Americans with Disabilities Act (ADA) accessibility of facilities
- Public safety measures
- Signage and wayfinding
- Access roads, internal circulation roads, campsite spurs and parking areas

The survey documented items in need of correction, repair, replacement, or similar action, noting facility condition according to Table 4.1-2. All inventories were documented with photographs and integrated into a geographic information system (GIS) database with relevant attributes to facilitate future analysis and ongoing assessments.

With the exception of ADA accessibility, the methodology for assessing the facilities included a visual inspection, analysis, and documentation in field notes and photographs. The technical level of assessment represented in this report does not include structural, mechanical, electrical, or geotechnical engineering invesigation and testing.

The methodology utilized to conduct the ADA accessibility assessments consisted of developing a detailed checklist based on the applicable standards, including:

- Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG)
- Forest Service Trail Accessibility Guidelines (FSTAG)

These guidelines, in part, incorporate sections of the Architectural Barriers Act Accessibility Standards (ABAAS) and the Outdoor Developed Area Accessibility Guidelines (ODAAG), developed by the Architectural and Transportation Barriers Compliance Board (U.S. Access Board).

Each facility was assessed for ADA compliance in detail and recorded on the checklist, along with supporting photographs and field notes. The information and description provided in the Universal Accessibility section of this report are general in nature; however, the detailed checklists for each facility are included in Appendices A through E.

The methodology utilized for paving assessments consisted of visual analysis and categorization based on standard levels of pavement distresses and levels of maintenance required to remediate them (Table 4.1-2).

Table 4.1-1 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

Table 4.1-2 Paving Assessment Categories

Category	Description	Action Needed
Good Condition	No significant general cracking or signs of distress, good wear course.	*No maintenance or repairs needed*
General Cracking	Single crack or a series of cracks in seemingly random locations.	*Needs maintenance:* Crack sealing
Block Cracking	Interconnection of several cracks that develop as the pavement ages.	*Needs maintenance:* Crack sealing and/or seal coating
Fatigue Cracking	Series of interconnected cracks typically described as resembling alligator skin. It is a structural distress, caused by overloading thin pavements or a weak aggregate base or subgrade. This distress can occur in small, localized areas or can be widespread.	*Needs Repairs:* Full-depth patching is recommended in areas with localized fatigue cracking; however, reconstruction is required if the fatigue cracking is a widespread problem
Deformations and Depressions	Vertical movements of the asphalt pavement caused by overloading or settlement of a weak subgrade	*Needs Repairs:* Mill patching can be used to repair these deformations and depressions
Potholes	Localized loss of pavement material typically caused by structural failures, poor drainage, or severe raveling.	*Needs Repairs:* Full-depth patching

Category	Description	Action Needed
Pavement Failure	Widespread occurrences of fatigue cracking, deformations and depressions, potholes and obvious structural failures which make the general overall surfacing hazardous to drive.	*Needs Replacement:* Base rock repair and replacement as needed to repair structural damage and new paving

Non-paved roads, parking areas, and trails consisting of compacted, native material and/or crushed aggregate were visually assessed based on the evenness of grade and stability of material. Areas observed that have uneven grades and loose, displaced material are identified as *needs maintenance*. Otherwise, the areas were ranked as *good*.

4.2 Dispersed Use Assessment

A dispersed use assessment was conducted from August 4 to 7, 2020, at all developed facilities, reservoir shorelines, and islands within each reservoir. The study initially consisted of a 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.

These initial indications of dispersed use, along with personal communication with Inyo National Forest Service regarding sites of concern, provided a basis for ground-truthing dispersed use in the study area. For each recreation area, special attention was given to previously identified areas of potential dispersed use while in the field; however, all perimeters of developed facilities were assessed on foot. Any sign of potential foot traffic was investigated until no further evidence of use was detected. In addition to perimeters and natural lands within and surrounding developed areas, special attention was given to the perimeters of Project waters, as feasible. This included hiking along the user-created Inlet Trail along the western shoreline of Lake Sabrina and investigating use at the south end of the lake; walking the perimeter of Intake No. 2 Reservoir; and kayaking to the southern end of South Lake to investigate the island and observe day use and camping areas along the southern shorelines.

As dispersed use was discovered, GIS data, photographs, calculations, and notes were collected at each site, which were subject to a quality assessment/quality control (QA/QC) process to formalize the dataset and relevant attributes (e.g., spatial location, number of fire rings, area affected, or length of roads or trails). During the assessment phase, each observance was compared to underlying ownership or management, most notably its location relevant to SCE or U.S. Forest Service (USFS) ownership, the John Muir Wilderness, and the FERC Project boundary. Observances within the Inyo National Forest or John Muir Wilderness are noted since the Inyo National Forest does not allow dispersed camping outside of a designated campground, and the John Muir Wilderness does not allow overnight camping without a valid wilderness permit nor camping within 100 feet of lakes, streams or trails (terrain permitting), and never less than 50 feet of lakes or streams or within 25 feet of trails.

4.3 OPERATIONS AND MAINTENANCE ECONOMICS ASSESSMENT

A desktop study was originally proposed to analyze the current economics of the O&M of the three recreation areas directly related to the Project: Lake Sabrina, South Lake, and Intake No. 2 recreation areas. Concessionare agreements and past operational and maintenance data were to be collected from Inyo National Forest Service and its concessionaires to perform this economic analysis. To date, SCE is still coordinating with the Inyo National Forest Service to determine what operational and maintenance data may be provided for inclusion in this analysis. Once provided, this study plan will be supplemented with an analysis and summary of the data provided.

5.0 RESULTS

5.1 LAKE SABRINA RECREATION AREA

5.1.1 SITE OVERVIEW

Lake Sabrina Recreation Area is located at the terminus of CA Highway 168 at approximately 9,100-feet above sea level where Sabrina Dam impounds the Middle Fork Bishop Creek to create Lake Sabrina. Developed recreation amenities generally included a boat ramp, piers, marina, fish cleaning station, restroom, and trailhead for Sabrina Basin Trail, all of which are owned and operated by the Inyo National Forest Service or its concessionaires. The following sections provide facility condition assessment of the roads and parking, site elements, site buildings, signage, visual and aesthetic qualities, universal accessibility, and public safety measures associated with those amenities. Figure 5.1-1 provides an overview of all site elements discussed in the following sections.

SignID	Sign Type	Post Material	Sign Material	Condition
LS-01	Trail Marker	Concrete post	Concrete post	Poor
LS-02	Fire Restriction	Wood	Vinyl	Good
LS-03	Facility/Site ID Sign	Wood	Wood	Fair
LS-04	SCE ID Sign	Wood	Wood	Good
LS-05	Sportsman Regulatory Sign	Galv. Pipes	Synthetic	Good
LS-06	Mussels Protection Sign	Wood	Synthetic	Good
LS-07	Warning Signs		Metal	Good
LS-08	Restroom	-	-	-
LS-09	Trailhead Kiosk	Wood	Synthetic	Good
LS-10	Parking / Traffic Regulatory	Wood	Metal	Fair
LS-11	Boat Landing ID	Wood	Wood	Good
LS-12	Parking / Traffic Regulatory	Wood	Metal	Fair

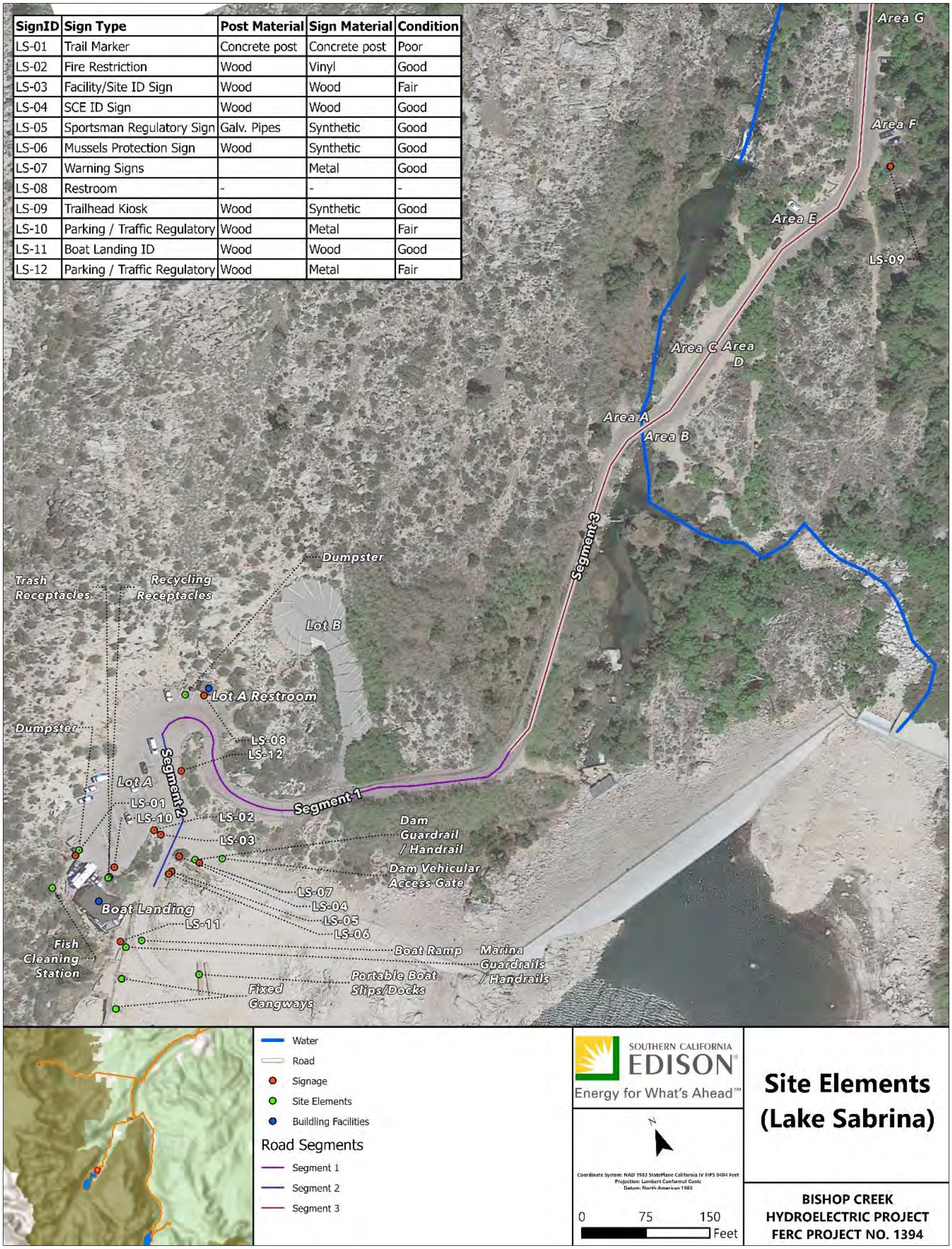


Figure 5.1-1 Lake Sabrina Site Elements

5.1.2 Facility Condition Assessment

5.1.2.1 Roads and Parking

Lake Sabrina Road terminates at Lake Sabrina, providing sole vehicular access to the Lake Sabrina Recreation Area. To facilitate discussion, the access road was divided into three segments (Road Segments 1, 2, and 3), as shown on Table 5.1-1 and described in Table 5.1-2. Parking consists of two paved parking lots (Parking Lot A and B) near the marina and seven non-paved, day use parking areas located along both sides of Road Segment 3. The paved surfaces consist of asphalt paving. Non-paved surfaces consist of compacted native earthen materials that have naturally occuring, decomposed crushed aggregate mixed with soil material. The majority of the paved surfaces are in fair condition with frequent cracks, areas of alligator cracking, eroding edges, and occasional potholes. Both parking lots are in need of re-striping and a minimum of two ADA accessible (with at least one van accessible) parking stalls should be designed and designated in Parking Lot A (Appendix A).

Table 5.1-1 Lake Sabrina Recreation Area Access Roads

Site	Surface Material	Road Width (ft)	Circulation Type	Condition
Road Segment 1 (Lot A and Lot B)	Asphalt	± 20 ft	2-way	Needs Maintenance
Road Segment 2 (Lot A to Boat Launch)	Asphalt	± 14 ft	2-way	Good
Road Segment 3 (Along Day Use Parking Areas)	Asphalt	± 20 ft	2-way	Needs Replacement

Table 5.1-2 Lake Sabrina Recreation Area Parking

Site	Sub-site	Parking with Striping	Parking without Striping (ft)	Surface	
				Material	Condition
Marina	Lot A	36 stalls (no designated ADA stalls)		Asphalt	Needs Maintenance
	Lot B	24 stalls (no designated ADA stalls)		Asphalt	Needs Maintenance
Day Use Parking Areas	Area A		21 ft X 18 ft (Approximately 1-2 Head-in Spaces)	Earthen	Needs Maintenance
	Area B		33 ft X 15 ft (Approximately 1-2 Head-in Spaces)	Earthen	Needs Replacement
	Area C		162 ft X 10 ft (Approximately 8 Parallel Spaces)	Earthen	Needs Maintenance
	Area D		150 ft X 9 ft (Approximately 7-8 Parallel Spaces)	Earthen	Needs Maintenance
	Area E		42 ft X 9 ft (Approximately 2 Parallel Spaces) 40 ft X 23 ft (Approximately 3 Head-in Spaces)	Earthen	Needs Maintenance
	Area F		24 ft X 24 ft (Approximately 2 Head-in Spaces)	Earthen	Needs Maintenance
	Area G		25 ft X 30 ft (Approximately 3 Head-in Spaces)	Earthen	Needs Maintenance

5.1.2.2 Site Elements

Table 5.1-3 provides a detailed inventory of all elements assessed at this site. During the assessment, the reservoir water level was at the low operating level. As such, the gangways were not operable and were not assessed for function. The movable, floating boat docks were in use but were not on an accessible route and, by nature of design, do not meet ADA accessibility compliance. The boat launch ramp was observed in use and was operable; however, the boat launch facility as designed does not provide ADA accessibility. The fish cleaning station was not operable and should be replaced with a facility that meets ADA accessibility criteria and relocated to an area to which an accessible route is provided.

Table 5.1-3 Lake Sabrina Recreation Area Site Elements

Site Element	Parameter	Assessment
Boat Ramp	No. of Lanes	1
	Material(s)	Concrete
	Condition	Good
Portable Boat Slips/Docks	No. of Structures	2
	Type	Floating
	Material(s)	Wood
	Condition	Needs Maintenance
Fixed Gangways	No. of Structures	2
	Type	Hinged / Floating
	Material(s)	Wood / Steel Railings
	Condition	Needs Repairs
Fish Cleaning Station	No. of Stations	1
	Material(s)	Wood
	Condition	Needs Replacement
Trash Receptacles	Quantity	3
	Type	Movable
	Material	Plastic
	Condition	Needs Replacement
Recycling Receptacles	Quantity	1
	Type	Movable
	Material	Plastic
	Condition	Needs Replacement
Dumpster	Quantity	2
	Type	Bear proof
	Material	Metal
	Condition	Good
Marina Guardrails / Handrails	Location	Gangway Platform
	Material	Steel Tubing and Chain
	Condition	Needs Repairs
Dam Guardrail / Handrail	Location	Dam Pathway
	Material	Painted Steel Tubing
	Condition	Good
Dam Vehicular Access Gate	Type	Single Swing
	Material	Galvanized Steel
	Condition	Good

5.1.2.3 Site Buildings

Two buildings were evaluated: the Lake Sabrina Boat Landing building and the restroom building located in Parking Lot A (Table 5.1-4).

The Boat Landing building consists of a wooden structure, with wood siding and a metal roof. Based on the visual assessment of the exterior of the building, there were no significant repairs identified that require immediate maintenance or repairs.

The restroom building consists of a pre-engineered, concrete masonry unit (CMU) structure, on a slab with a standing-seam metal roof and wooden columns supporting the extended roof overhang. Based on general observations, it appeared that the building components were in good condition and structurally sound. A thorough ADA accessibility assessment checklist was completed, which is provided in Appendix B.

Table 5.1-4 Lake Sabrina Site Buildings

Building ID	Exterior		Roof		Interior		
	Material	**Condition**	**Material**	**Condition**	**# Toilets**	**Type**	**Condition**
Lake Sabrina Boat Landing	Wood Siding	Good	Metal	Good	N/A	N/A	N/A
Parking Lot A Restroom	Concrete Masonry Unit	Excellent	Metal	Good	2	Pit	Good

5.1.2.4 Signage and Wayfinding

There is a wide variety of sign types, styles and sizes as depicted in Table 5.1-5. Many are standardized across the various Bishop Creek Facilities such as the facility identification signs and the regulatory signs. Other signs are unique to the specific site where they are located. Another general observation, during the site assessment, is that the placement of the signs are somewhat sprawling throughout the site. See Photos 1 through 8 in Appendix F for representative photos of the items referenced above. Based on the assessment, the following issues were identified for consideration:

- Current sign design standards should be reviewed for ADA compliance (e.g. letter sizes, contrast, color).
- Sign mounting heights require review throughout the site and adjusted as needed to meet the regulatory standards for each type, ADA compliance and general visibility. Several of the parking signs observed are mounted very low to the ground and are in conflict with some surrounding plant material.

- Regulatory signs that have been modified should be replaced. Some signs have graffiti on them with non-retroflective material that will not be visible at night.

- The Lake Sabrina Launch Facility sign is in need of re-painting and maintenance.

- Consider standardizing the sign mounting systems and materials used for the various informational signs to help add continuity to the overall signage system. Some are mounted on round timbers, others on square posts, others on galvanized pipe frame systems; simplifying maintenance and replacement efforts in the long term.

- Consider consolidating the placement of signs to reduce clutter and improve the aesthetic quality of the facility.

Table 5.1-5 Signage at Lake Sabrina Recreation Area

Sign Type	Material		Qty	Condition	Comments
	Posts	Sign			
Marina / Boat Launch Facility					
Facility/Site ID	Wood	Wood	1	Fair	Repaint
SCE ID Sign	Wood	Wood	1	Good	
Boat Landing ID	Wood	Wood	1	Good	Touch-up paint
Fire Restriction	Wood	Vinyl	1	Good	Stapled to post structure
Sportsman Regulatory	Galvanized Pipes	Synthetic	1	Good	
Mussels Protection Sign	Wood	Synthetic	1	Good	
Trail Marker	Painted Concrete Post		1	Poor	Remove and replace
Parking / Traffic Regulatory	Wood	Metal	3	Poor	Replace and verify mounting height
Warning Signs		Metal	2	Good	Mounted on dam guardrail
Restroom	-	-	-	-	Missing ADA plaques
Day Use Parking Areas					
Trailhead Kiosk	Wood	Synthetic	1	Good	Review ADA Sign Standards
Parking / Traffic Regulatory	Wood	Metal	2	Fair	

5.1.2.5 Visual and Aesthetic Quality

The overall visual quality of the site is very nice by virtue of the natural suroundings. Aesthetics of the building facilities are somewhat dated but appear to be well maintained and consistent with current adopted standards. The primary areas that have potential for improving the visual and aestheic quality of the overall facility are:

- Upgrades to the signage system through more standardized graphics, mounting structures, and general placement and organization.
- Upgrades, replacement, and/or organization of site furnishings such as recycling and trash receptacles, dumpsters, and fish cleaning station (See Photo 9 in Appendix F).
- Additional plantings for buffering, screening, and enhancement.

5.1.2.6 Universal Accessibility

A detailed ADA checklist has been completed for the site (Appendix B) which identifies the various non-compliance issues that should be addressed. The purpose of the checklist is to locate and assess site components within existing public outdoor recreation facilities, as compliance with FSORAG and FSTAG are the legally enforceable standards for use on guidelines discussed in Section 4.1.

The most significant non-compliance issues consist of a lack of accessible routes to the following amenities:

- Lake Shoreline / Beach Access
- Boat Launch and Boat Docks
- Recycling / Trash Receptacles
- Viewing Areas/Overlook at Dam
- Fish Cleaning Station
- Trailheads/Trails
- ADA Accessible Parking (no designated spaces)

Aside from improvements to extend accessible routes, there are various site amenities that should be modified, added, or replaced to conform with ADA standards. Among them are:

- Fish Cleaning Station
- Recycling / Trash Receptacles
- ADA Parking Spaces and Signage

- Tactile Signage at the Restroom

5.1.2.7 Public Safety Measures

There were relatively few identified potential public safety concerns, based on a general assessment. Among those identified are the following:

- The pathway along the crest of the dam has very steep slopes on both edges of the pathway. The lake side of the pathway is protected by a continuous guardrail sytem while the opposite edge of the pathway is currently unprotected. There are remnants of a past fence or rail system that was removed. A new edge treatment should be considered (railing, cable fence, curb rail, plantings, boulders or other) to better define the edge and reduce the public risk. See Photo 10 in Appendix F.

- The accessible route from the Marina Parking Lot A to various site amenities is shared use with the access drive and parking lot drive aisles. Future considerations to reduce potential for pedestrian and vehicular conflicts should be considered, including strategic striping at crossings, detectable warning pavement (truncated domes), and/or separated pedestrian access routes.

- Repair eroded edges and sections of pathways, roadways and parking areas to alleviate tripping hazards and potential damage to vehicles. See Photo 11 in Appendix F.

5.1.3 Dispersed Use Assessment

As summarized in Table 5.1-6 and depicted in Figure 5.1-2, five distinct concentrations of dispersed use were observed at the Lake Sabrina Recreation Area:

- Area A: Shallow impoundment upstream of the weir below Sabrina Dam

- Area B: Northwest shoreline of Lake Sabrina and Sabrina Dam

- Area C: Inlet Trail

- Area D: Peninsula on the western shoreline of Lake Sabrina at the approximate midpoint of the lake and along Inlet Trail

- Area E: Middle Fork Bishop Creek inlet and shoreline located at the southern end of Lake Sabrina

Observations resulted in an estimate of approximately 47 potential campsites; 6 fire pits; 2.0 miles of user created trails; 20 visibly evident bank access points; and 1.3 miles of shoreline used for bank fishing or general recreation. Each area is described in more detail in the following sections.

Table 5.1-6 Summary of Dispersed Use at the Lake Sabrina Recreation Area

Area	Name	Potential Campsite	Fire Pit	User Created Trails	Visible Bank Access Point	Shoreline Generally Used for Boat/Bank Fishing (ft)
A	Weir below Sabrina Dam	n/a	n/a	777 ft	20	n/a
B	Northwest Shoreline & Sabrina Dam	n/a	n/a	182 ft	n/a	4,140
C	Inlet Trail	n/a	n/a	6,488 ft	n/a	n/a
D	Mid Lake Sabrina Peninsula	16	2	2,004 ft	n/a	n/a
E	Middle Fork Bishop Creek Inlet	31	4	1,086 ft	n/a	2,941
TOTAL		**47**	**6**	**10,536 ft**	**20**	**7,081**

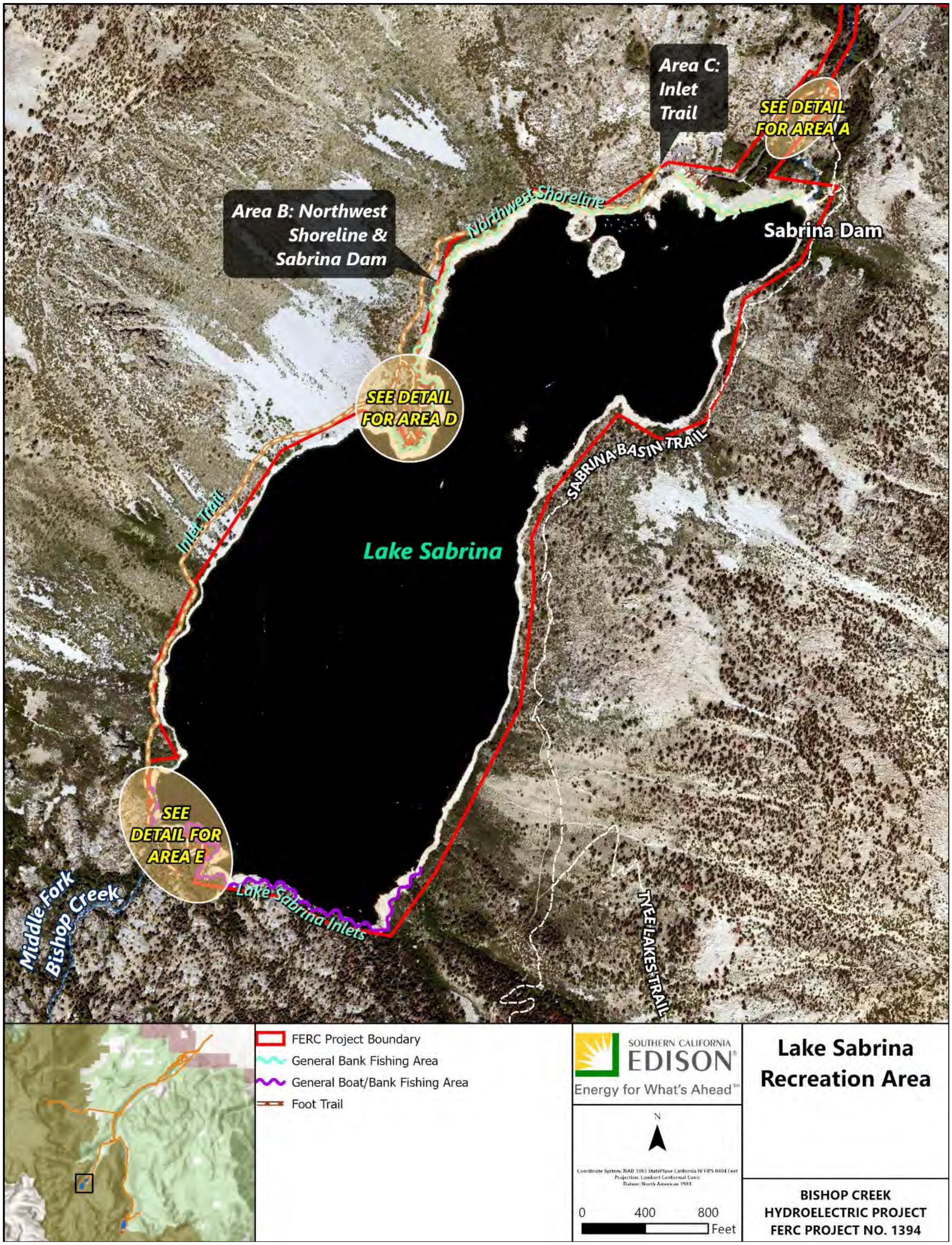


Figure 5.1-2 Overview of Dispersed Use at Lake Sabrina Recreation Area.

5.1.3.1 Area A: Weir below Sabrina Dam

Below Sabrina Dam, a Project weir backs up the flow for the Middle Fork Bishop Creek, creating a popular area for bank fishing. As shown on Figure 5.1-3, approximately 20 visible bank access points were noted along this reach; however, most of the shoreline is accessible for fishing. The more easily accessible sections are those adjacent to the Lake Sabrina Road, however, there is a user created trail on the western bank leading from the bridge to the weir. Other short spurs have been established from the road or parking areas to the eastern bank of the creek. In total, approximately 777 feet of user created trails were observed. Activities observed are wholly within the current FERC Project boundary and Inyo National Forest. See Photos 12 through 17 in Appendix F for representative photos of Area A.

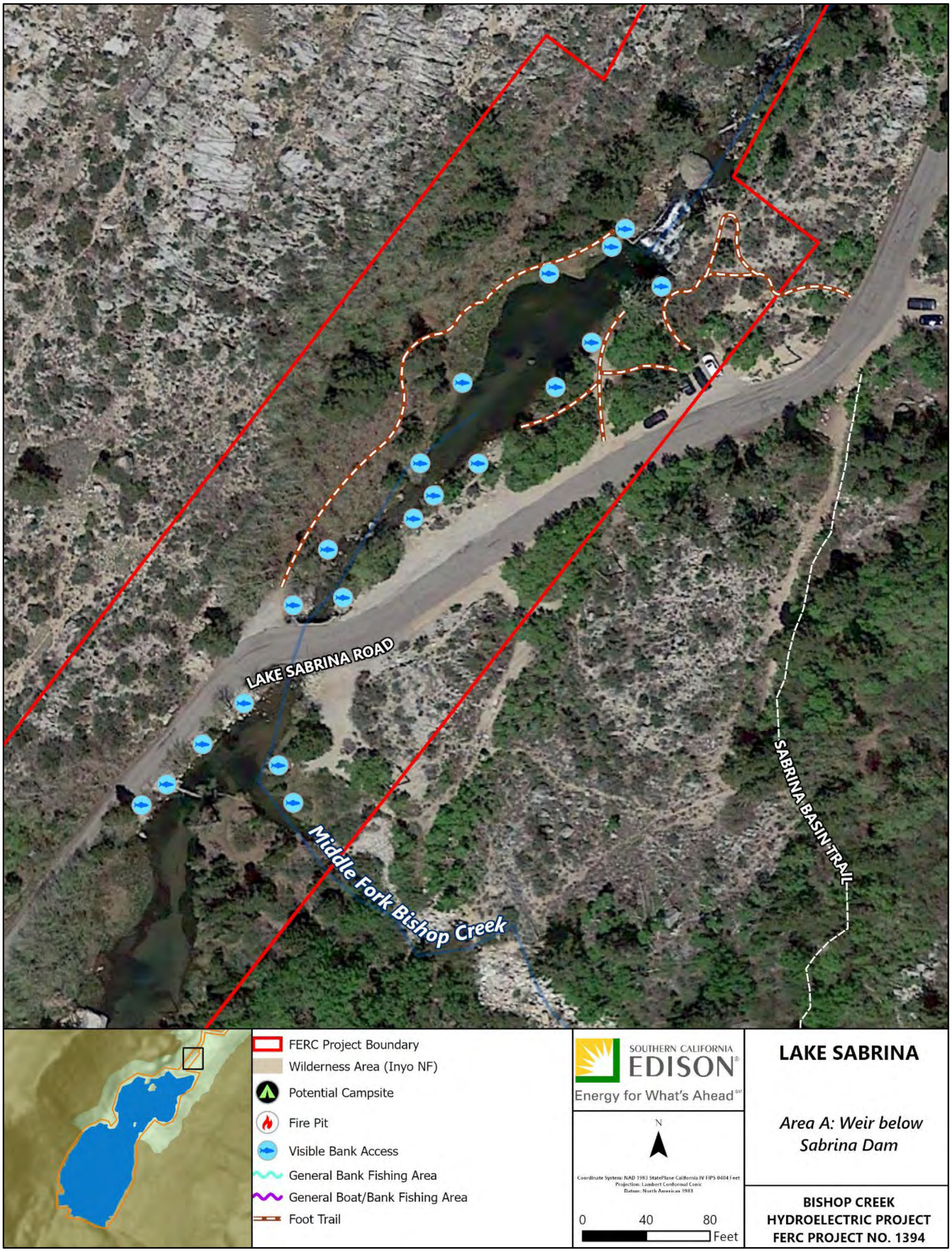


Figure 5.1-3 Detail Figure of Area A

5.1.3.2 Area B: Northwest Shoreline and Sabrina Dam

As illustrated in the overview (Figure 5.1-2), approximately 4,140 feet of shoreline extending from the marina to the talus field just south of the peninsula on the western shoreline of Lake Sabrina is a popular bank fishing area. During periods of low water levels, much of the lakebed is exposed and users walk along the shoreline and lake bed to access the current waterline. Vehicles are commonly observed driving down the boat ramp and onto various portions of the lakebed for fishing and general recreation. During maximum or normal water levels, anglers access the area via the Inlet Trail (discussed in more detail in Section 5.1.3.3). Two short cut-off trails were observed from the Sabrina Dam to the access road leading to parking areas. Activities observed are wholly within the current FERC Project boundary and Inyo National Forest. See Photos 18 through 22 in Appendix F for representative photos of Area B.

5.1.3.3 Area C: Inlet Trail

As depicted in Figure 5.1-2, a user created trail extends approximately 1.2 miles from the marina to the inlet of Middle Fork Bishop Creek at the southeastern corner of Lake Sabrina. A white wooden post located adjacent to the dumpsters behind the marina serves as a trailhead marker for this informal trail. The trail is well worn and defined for the 0.5 mile stretch from the marina to the talus field just south of the peninsula on the western shoreline of Lake Sabrina. From there, a less defined but obviously marked 0.2 mile scramble exists through the talus field prior to reaching a well-defined dirt path that extends another 0.5 miles to the inlet of Middle Fork Bishop Creek, a popular area for fishermen to access both by trail or by foot. The inlet appears to be the obvious destination for the trail, although other activities along the southern shoreline and forest of Lake Sabrina occur and are discussed in Section 3.0 and 5.1.3.4. During this field assessment, and likely throughout most of the year, there is no easy access across the inlet due to strong flows. Activities observed, specifically the final third of the trail from the end of the talus field to the inlet, are wholly within the Inyo National Forest, and partially within the John Muir Wilderness. The trail meanders in and out of the current FERC Project boundary, which is intended to represent the maximum operating level of the reservoir at this location. See Photos 23 through 31 in Appendix F for representative photos of Area C.

5.1.3.4 Area D: Mid Lake Sabrina Peninsula

At the approximate midpoint of the Inlet Trail, a small peninsula extends to the western shoreline of Lake Sabrina (Figure 5.1-4). The peninsula appears to be a popular destination for day use, fishing, and potentially overnight camping with approximately 16 potential campsites; two established fire pits; and 2,004 feet of user created trails on the peninsula. Seven of the potential campsites observed are cleared, flat spaces within the lakebed just east of the peninsula. Activities observed are wholly within the Inyo National Forest, and partially within the current FERC Project boundary, which represents the maximum operating level of the reservoir at this location. See Photos 32 through 36 in Appendix F for representative photos of Area D.

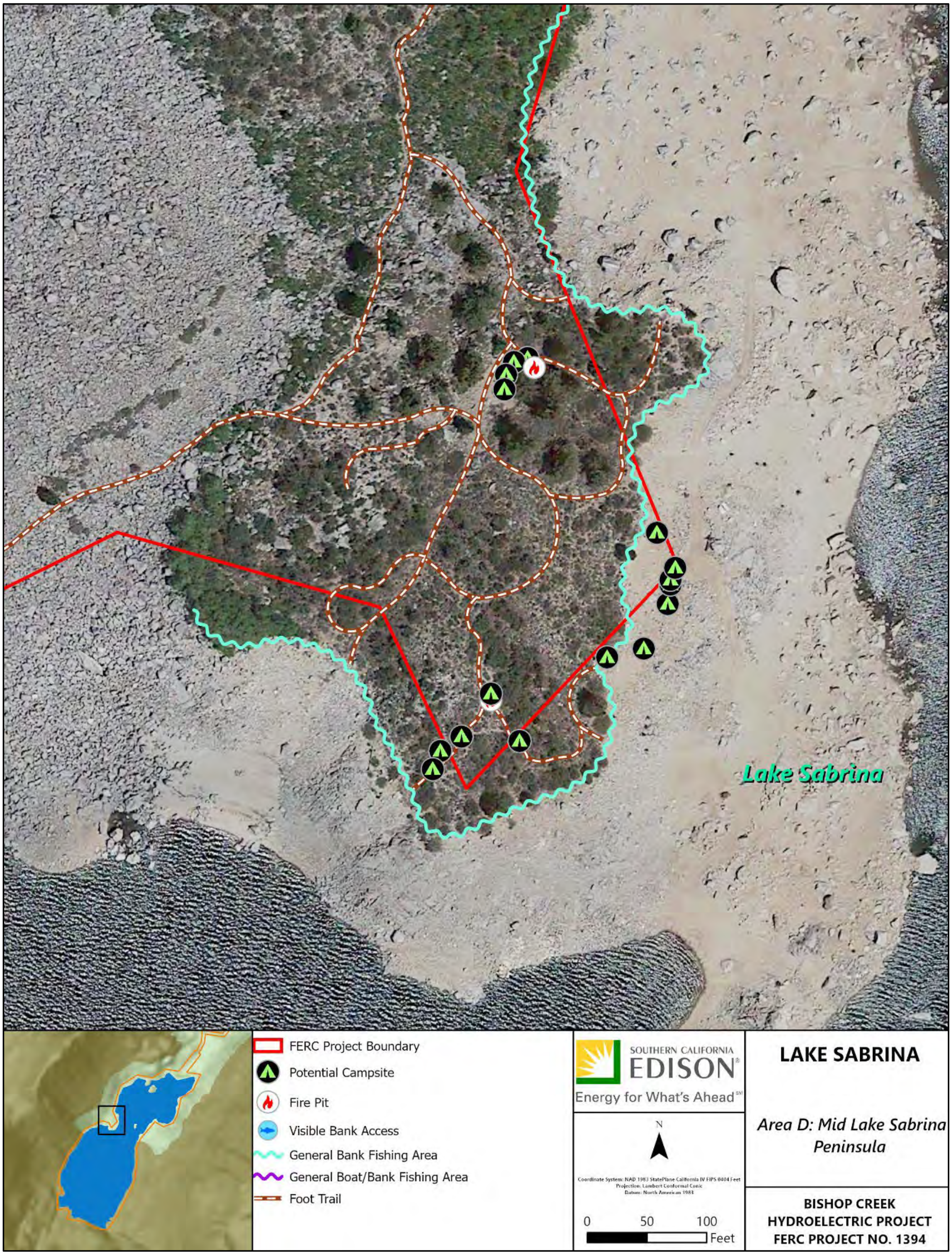


Figure 5.1-4 Detail Figure of Area D

5.1.3.5 Area E: Middle Fork Bishop Creek Inlet

At the southwestern corner of Lake Sabrina, Middle Fork Bishop Creek inlet to the lake is a popular area for bank and boat fishing, general day use, and overnight camping (Figure 5.1-5). Users may access the area either by hiking along the 1.2 mile, informal Inlet Trail and crossing the creek, or by boat or personal watercraft. The shoreline and forest directly west of the inlet shows evidence of heavy use and overnight camping. Approximately 31 potential campsites; 4 fire pits; and 1,086 user created trails were observed in the area. An approximate 2,941 feet of shoreline on the south end of the lake is a popular fishing bank and general day use area for users at the back of the lake that launched from the boat ramp or accessed the area via the informal Inlet Trail. The area is entirely within the Inyo National Forest, and – excluding a handful of potential campsites observed in the lakebed – the activities observed are wholly within the John Muir Wilderness. Activities are partially within the current FERC Project boundary, which represents the maximum operating level of the reservoir in this location. See Photos 37 through 41 in Appendix F for representative photos of Area E.

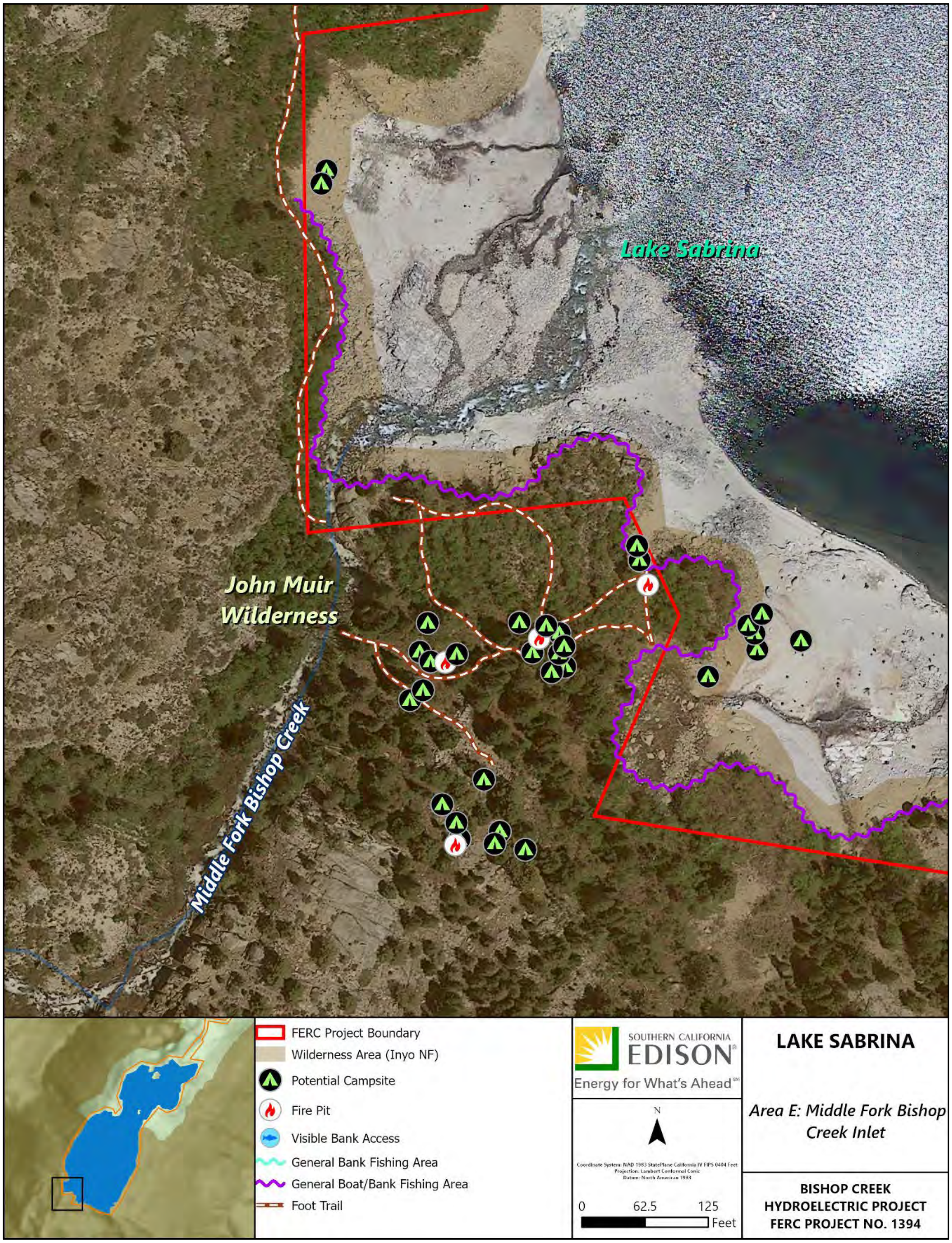


Figure 5.1-5 Detail Figure of Area E

5.2 SOUTH LAKE RECREATION AREA

5.2.1 SITE OVERVIEW

South Lake Recreation Area is located at the terminus of South Lake Road at approximately 9,800-feet above sea level where Hillside Dam impounds the South Fork Bishop Creek to create South Lake. Developed recreation amenities generally include a boat ramp, pier, marina, restrooms, picnic tables, and trailheads for Bishop Pass and Rainbow Pack Station Trails, all of which are owned and operated by the Inyo National Forest Service or its concessionaires. The following sections provide facility condition assessments of the roads and parking, site elements, site buildings, signage, visual and aesthetic qualities, universal accessibility, and public safety measures associated with those amenities. Figure 5.2-1 provides an overview of all site elements discussed in the following sections.

SignID	Sign Type	Post Material	Sign Material	Condition
SL-01	Trailhead Kiosk	Wood	Synthetic	Good
SL-02	Facility/Site ID Sign	Wood	Wood	Good
SL-03	SCE ID Sign	Wood	Wood	Fair
SL-04	Mussels Protection Sign	Wood	Synthetic	Fair
SL-05	Boat Landing ID Sign	Wall Mount	Wood	Good
SL-06	Various Wall Mount Signs on Boat Landing Building	Wall Mount	Wood	Good
SL-07	Road Closed	Gate Mount	Metal	Good
SL-08	Restroom	Wall Mount	Synthetic	Good
SL-09	Trail Marker	Wood	Engraved Plank	Fair
SL-10	Parking / Traffic Regulatory	Wood	Metal	Good
SL-11	Parking / Traffic Regulatory	Wood	Metal	Poor
SL-12	Trailer Parking Prohibited Sign	Wood	Wood	Poor

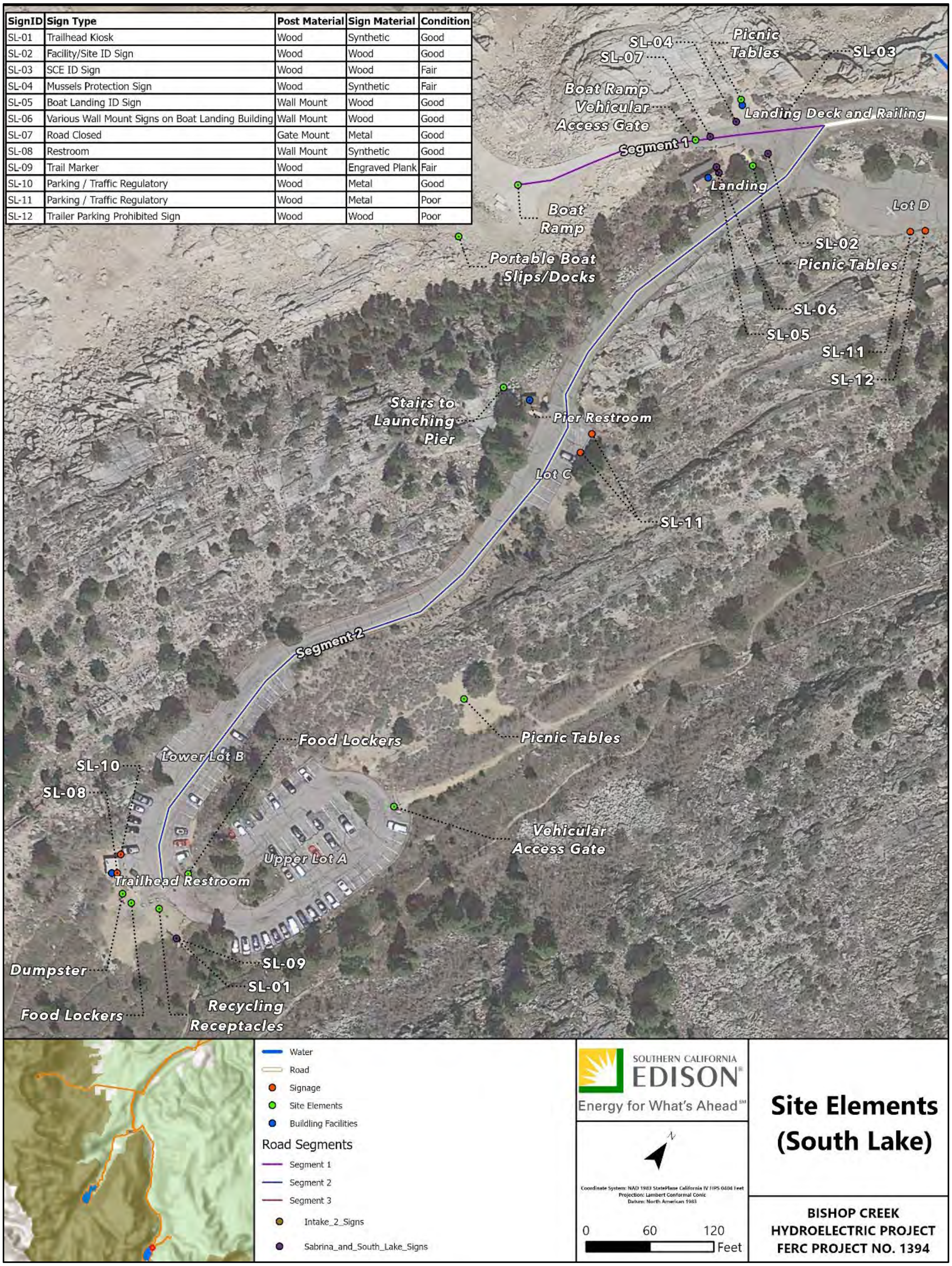


Figure 5.2-1 South Lake Site Elements

5.2.2 Facility Condition Assessment

5.2.2.1 Roads and Parking

South Lake Road terminates at South Lake, providing sole access to the South Lake Recreation Area. To facilitate discussion, the access road has been divided into two segments (Road Segments 1 and 2), as shown on Figure 5.2-1 and described in Figure 5.2-2. Parking consists of four paved parking lots: Parking Lots A, B, C, and D. Parking Lot A and B are associated with the trailhead, while Parking Lot C and D are associated with the launching facility. At the time of the initial assesment in August 2020, Parking Lots A, B, and D had been recently resurfaced but were not yet striped. The Access Road and Lot C were in poor condition. Based upon updated photos received in June 2021, it appears that all paving and striping work is complete and that the roads and parking facilities associated with both the launching facility and the trailhead are in excellent condition. As shown on Photo 42 in Appendix F, paving stopped approximately 30 feet from the boat ramp and the staff parking.

Table 5.2-1 South Lake Recreation Area Access Roads

Site	Surface Material	Road Width (ft)	Circulation Type	Condition
Road Segment 1 (Main Access Road to Boat Launch)	Asphalt	± 20'	2-way	Good[a]
Road Segment 2 (Launch Facility to Trailhead Parking)	Asphalt	± 24'	2-way	Good[a]

[a]Roads were under construction during site assessment originally completed August 2020. Based on photos provided in June 2021, parking lots and access roads have been newly paved.

Table 5.2-2 South Lake Recreation Area Parking

Site	Sub-site	Parking with Striping	Parking w/o Striping	Surface	
				Material	Condition
South Lake Trailhead Parking	Lot A	50 stalls		Asphalt	Good[a]
	Lot B	36 stalls		Asphalt	Good[a]
South Lake Launching Facility Parking	Lot C	8 stalls		Asphalt	Good[a]
	Lot D	15 stalls		Asphalt	Good[a]
	Staff Parking		20' X 25' (Head-in Spaces)	Gravel	Good

[a]Site assessment updated from original August 2020 site visit based on June 2021 photos

5.2.2.2 Site Elements

Table 5.2-3 provides a detailed inventory of all elements assessed at this site. During the assessment site visit, the reservoir water level was at the low operating level. The movable floating boat docks were in use but were not on an accessible route and by nature of design do not meet ADA accessibility compliance. The boat launch ramp was observed in use and was operable; however, the boat launch facility as designed does not provide ADA accessibility. The food lockers located at the trailhead appear to be in good condition. See Photos 43 through 45 in Appendix F for representative photos of the items referenced above.

Table 5.2-3 South Lake Recreation Area Site Elements

Site Element	Parameter	Assessment
South Lake Launching Facility		
Boat Ramp	No. of Lanes	2
	Material(s)	Concrete
	Condition	Good
Portable Boat Slips/Docks	No. of Structures	1
	Type	Floating
	Material(s)	Wood /Synthetic
	Condition	Good
Picnic Tables	No. of Structures	3
	Material(s)	Wood
	Condition	Needs Repair
Stairs to Launching Pier	Location	Near Parking Lot C
	Material	Timber and Earthen
	Condition	Needs Replacement
Boat Ramp Vehicular Access Gate	Type	Single Swing
	Material	Painted Galvanized Steel
	Condition	Needs Replacement
South Lake Trailhead		
Recycling Receptacles	Quantity	1
	Type	Combo (3) compartment
	Material	Metal
	Condition	Good
Dumpster	Quantity	1
	Type	Bear proof
	Material	Metal
	Condition	Good
Food Lockers	Quantity	6
	Material	Painted Metal
	Condition	Good
Picnic Tables	No. of Structures	2

Site Element	Parameter	Assessment
	Material(s)	Wood
	Condition	Need Repair
Vehicular Access Gate	Type	Posts and Chain
	Material	Metal
	Condition	Need Repair

5.2.2.3 Site Buildings

The two restrooms located at the trailhead and across from Parking Lot C were reviewed based on visual condition assessment and as part of the ADA accessibility assessment.

The trailhead restroom, a pit toilet with no supporting utilities, is a relatively new, pre-cast concrete structure which is in excellent condition and ADA compliant.

The Parking Lot C restroom, a pit toilet with no supporting utilities, is a pre-engineered CMU structure on a slab with a standing seam metal roof. The restroom is somewhat dated and, based on the ADA assessment, has deficiencies that require attention. The CMU block and roof appear to be in good condition. The interior is in poor condition and needs repairs and maintenance upgrades.

The South Lake Landing building was reviewed based on visual assessment of the exterior only. The building consists of painted wood panel siding and wood trim, all of which appears to be in good shape. The roof consists of a very flat, sloped shed roof with composite shingles that appears to be at the end or near end of lifespan (Appendix F, Photo 47). It is recommended that it be replaced soon. The partially surrounding deck with built-in seating and railing appears to be in good condition. The ramp that accesses the deck is structurally in good condition; however, the transition from earthen path to the ramp is not flush with the edge of ramp and requires modification to accommodate ADA accessibility (Appendix F, Photo 46).

Table 5.2-4 South Lake Recreation Area Site Buildings

Building ID	Exterior		Roof		Interior		
	Material	Condition	Material	Condition	# Toilets	Type	Condition
South Lake Launching Facility							
South Lake Landing	Wood Siding & Trim	Good	Composite	Needs Replacement	N/A	N/A	N/A
* South Lake Landing Deck and Railing	Wood	Needs Maintenance and Ramp Repair	N/A	N/A	N/A	N/A	N/A
** Restroom Near Stairs to Launching Pier	CMU	Good	Metal	Good	2	Pit	Needs Repairs and Mantenance
South Lake Trailhead							
Trailhead Restroom	Pre-cast Concrete	Good	Pre-cast Concrete	Good	2	Pit	Good

* Deck entry ramp transition is not ADA accessible and should be modified. See ADA Accesibility Checklist for detailed information.

** Interior needs material replacement, door hardware should be upgraded, restrooms are not ADA accessible; a sign should be added to direct patrons to the trailhead restroom. See ADA Accesibility Checklist for detailed information.

5.2.2.4 Signage and Wayfinding

There is a wide variety of sign types, styles and sizes (Table 5.2-5). Many are standardized across the various Bishop Creek facilities such as the facility identification and regulatory signs. Other signs are unique to the specific installation site. Sign placements are somewhat sprawling throughout the site. Based on the assessment, the following issues were identified and should be considered.

- Current sign design standards should be reviewed for ADA compliance (e.g. letter sizes, contrast, color).
- Sign mounting heights should be adjusted as needed to meet the regulatory standards for each type, ADA compliance and general visibility.
- Consider standardizing the sign mounting systems and materials used for the various informational signs to help add continuity to the overall signage system. Some are mounted on round timbers, others on square posts, others on galvanized pipe frame systems. This will also simplify maintenance and replacement efforts in the long term.
- Consider consolidating the placement of signs to reduce visual clutter and improve the aesthetic quality of the facility.

Table 5.2-5 Signage at South Lake Recreation Area

Sign Type	Material		Qty	Condition	Comments
	Posts	Sign			
South Lake Launching Facility					
Facility/Site ID	Wood	Wood	1	Good	
SCE ID Sign	Wood	Wood	1	Fair	Weathered
Boat Landing ID	Wall Mount	Wood	1	Good	
Various Wall Mount Signs on Boat Landing Building	Wall Mount	Wood	3	Good	
Mussels Protection Sign	Wood	Synthetic	1	Fair	Missing mounting bolts
Parking / Traffic Regulatory	Wood	Metal	3	Poor	1 at Parking Lot D and 2 at Parking Lot C
Road Closed	Gate Mount	Metal	1	Good	
Trailer Parking Prohibited Sign	Wood	Wood	1	Poor	Observed torn down and laying on the ground
South Lake Trailhead					
Trailhead Kiosk	Wood	Synthetic	1	Good	Review ADA Sign Standards
Parking / Traffic Regulatory	Wood	Metal	1	Good	
Restroom	Wall Mount	Synthetic	2	Good	
Trail Marker	Wood	Engraved Plank	1	Fair	

5.2.2.5 Visual and Aesthetic Quality

The overall visual quality of the site is very nice by virtue of the natural suroundings. Aesthetics of the building facilities are somewhat dated but appear to be well maintained and consistent with current adopted standards. The main areas that have potential for improving the visual and aestheic quality of the overall facility are:

- Upgrades to the signage system through more standardized graphics, mounting structures, and general placement and organization.
- Upgrades, replacement, and/or organization of site furnishings such as recycling and trash receptacles, dumpsters, food lockers.

- Additional plantings for buffering, screening, and enhancement.

5.2.2.6 Universal Accessibility

A detailed ADA checklist was completed for the site (Appendices C and D) that identifies the various non-compliance issues that should be addressed. The most significant deficiencies consist of a lack of accessible routes to the following amenities:

- Lake Shoreline / Beach Access (Appendix F, Photo 49)
- South Lake Landing Building
- Boat Launch and Boat Docks
- Recycling / Trash Receptacles
- Picnic Tables (Appendix F, Photo 48)
- Trailheads/Trails

5.2.2.7 Public Safety Measures

Based on a general assessment of potential public safety concerns, there were relatively few identified. Of those that should be addressed are:

- The stairs to the launching pier are in poor condition and pose safety hazards. The stairs should be rebuilt. Consider adding a handrail (Appendix F, Photo 50).
- Repair eroded edges and sections of pathways and paved surfaces to alleviate tripping hazards and potential damage to vehicles (Appendix F, Photo 51).

5.2.3 Dispersed Use Assessment

As summarized in Table 5.2-6 and depicted on Figure 5.2-2, nine distinct concentrations of dispersed use were observed at the South Lake Recreation Area:

- Area A: Hillside Dam and Spillway
- Area B: Green Creek Diversion Pipeline
- Area C: Main recreation area
- Area D: Use along the southern shoreline of South Lake
- Area E: General use of the shoreline and areas around the southern inlets to Lake Sabrina
- Area F: Use along the southern shoreline of South Lake

- Area G: Use on the island in the southern portion of South Lake
- Area H: Use along the southern shoreline of South Lake

Observations resulted in an estimate of approximately 82 potential campsites; 20 fire pits; 1.9 miles of user created trails; and 1.0 miles of shoreline used for bank fishing or general recreation. Each area is described in more detail in the following sections.

Table 5.2-6 Summary of Dispersed Use at South Lake Recreation Area

Area	Name	Potential Campsite	Fire Pit	User Created Trails	Visible Bank Access Point	Shoreline Generally Used for Boat/Bank Fishing (ft)
A	Hillside Dam and Spillway	n/a	n/a	n/a	n/a	1,101
B	Green Creek Diversion	n/a	n/a	5,667 ft	n/a	n/a
C	Main Recreation Area	14	1	4,373 ft	n/a	480
D	Southern Shorelines of South Lake	8	2	n/a	n/a	n/a
E	Southern Shorelines of South Lake	13	4	n/a	n/a	n/a
F	Southern Shorelines of South Lake	8	1	n/a	n/a	n/a
G	Island	36	11	n/a	n/a	n/a
H	Southern Shorelines of South Lake	3	1	n/a	n/a	3,832
	TOTAL	**82**	**20**	**10,040**	**0**	**5,413**

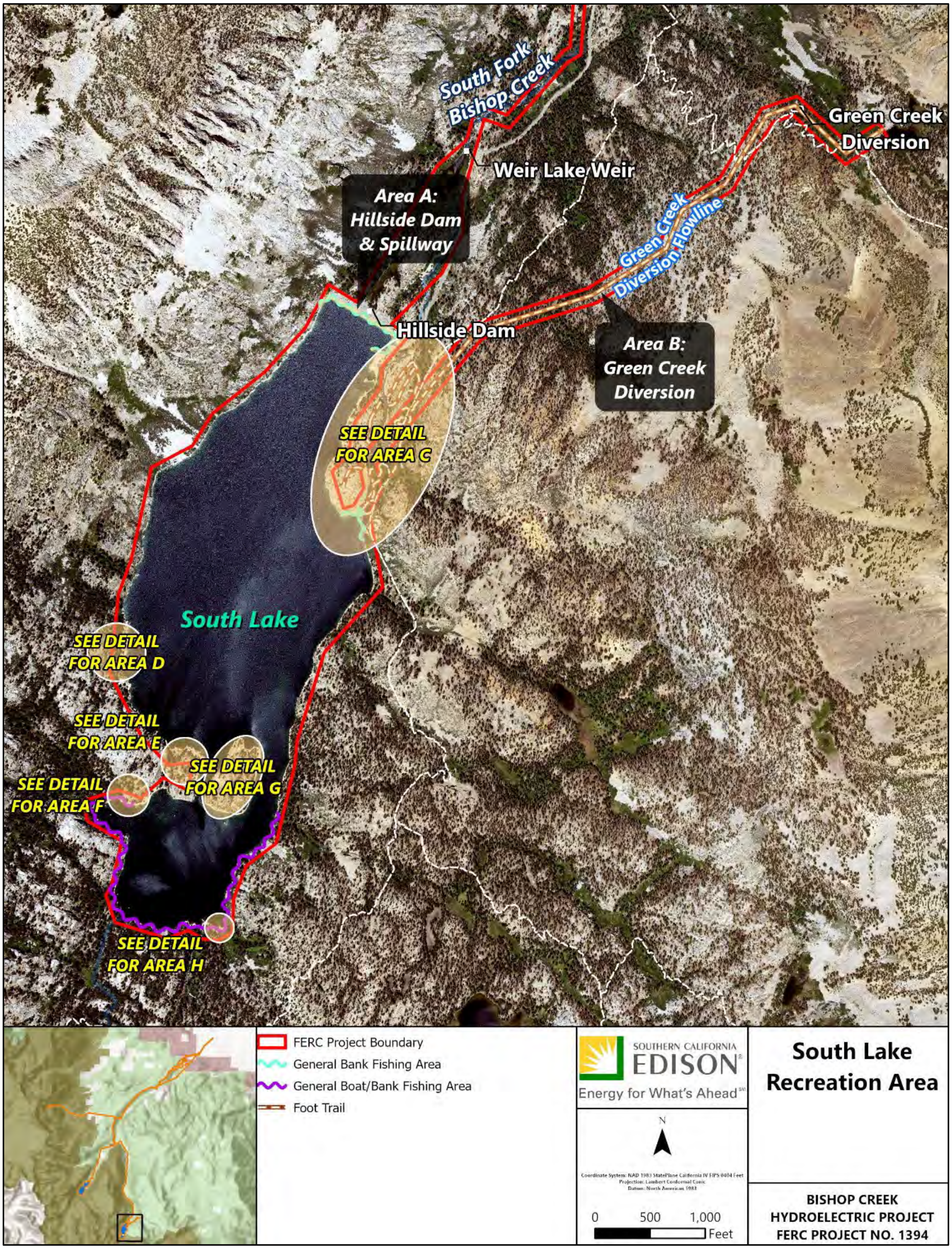


Figure 5.2-2 Overview of Dispersed Use at South Lake Recreation Area

5.2.3.1 Area A: Hillside Dam and Spillway

As shown on Figure 5.2-3, both Hillside Dam and Spillway are commonly used by anglers for fishing. Anglers cross the dam and fish on the western bank of the lake just upstream of the dam. This accounts for approximately 1,101 feet used for bank fishing. These facilities are fully within the FERC Project boundary and on Inyo National Forest lands. See Photos 52 through 54 in Appendix F for representative photos of Area A.

5.2.3.2 Area B: Green Creek Diversion

The Green Creek Diversion Pipeline (Figure 5.2-3) is an out-of-commission Project feature that extends approximately 1.1 miles from the Green Creek Diversion to the South Lake recreation parking area associated with the Bishop Pass and Rainbow Pack Station Trailheads. Based upon conversations with the Inyo National Forest Service, there appears to be hiking activity along the pipeline instead of using the USFS' Baker Summit Trail, further north to access wilderness areas to the east. At the request of the Inyo National Forest Service, a trail counter was installed to collect foot traffic activity that will be presented as part of the Recreation Use and Needs study (REC 1) that is currently underway. Activities observed are wholly within both the Inyo National Forest and the current FERC Project boundary, which is intended to represent a 150-foot buffer (75 feet to each side of centerline) around the Green Creek Diversion Pipeline at this location. See Photos 55 through 61 in Appendix F for representative photos of Area B.

5.2.3.3 Area C: Main Recreation Area

As depicted in Figure 5.2-3, the developed portion of the South Lake Recreation Area is primarily focused in this area, providing a boat ramp, marina, restrooms, picnic area, and trailheads to Bishop Pass and Rainbow Pack Station Trails, as well as an extensive arrangement of parking areas to accommodate the high activity. As expected with a high degree of use in developed areas, dispersed activity outside of those developed sites was observed. Approximately 14 potential campsites; one fire pit; and 4,373 feet of user created trails were observed in the area. Potential campsites were observed largely along the ridges to the east and west of the access road and above the developed facilities; the majority of the user created trails observed were leading to these locations. Just south of the Bishop Pass Trailhead, a small network of trails leads to a small cove that is popular for bank fishing along approximately 480 feet of shoreline. Activities observed are wholly within the Inyo National Forest and partially within the current FERC Project boundary, which represents the maximum operating level of the reservoir and a 150-foot buffer (75 foot to each side of centerline) around the Green Creek Diversion Pipeline at this location. See Photos 62 through 66 in Appendix F for representative photos of Area C.

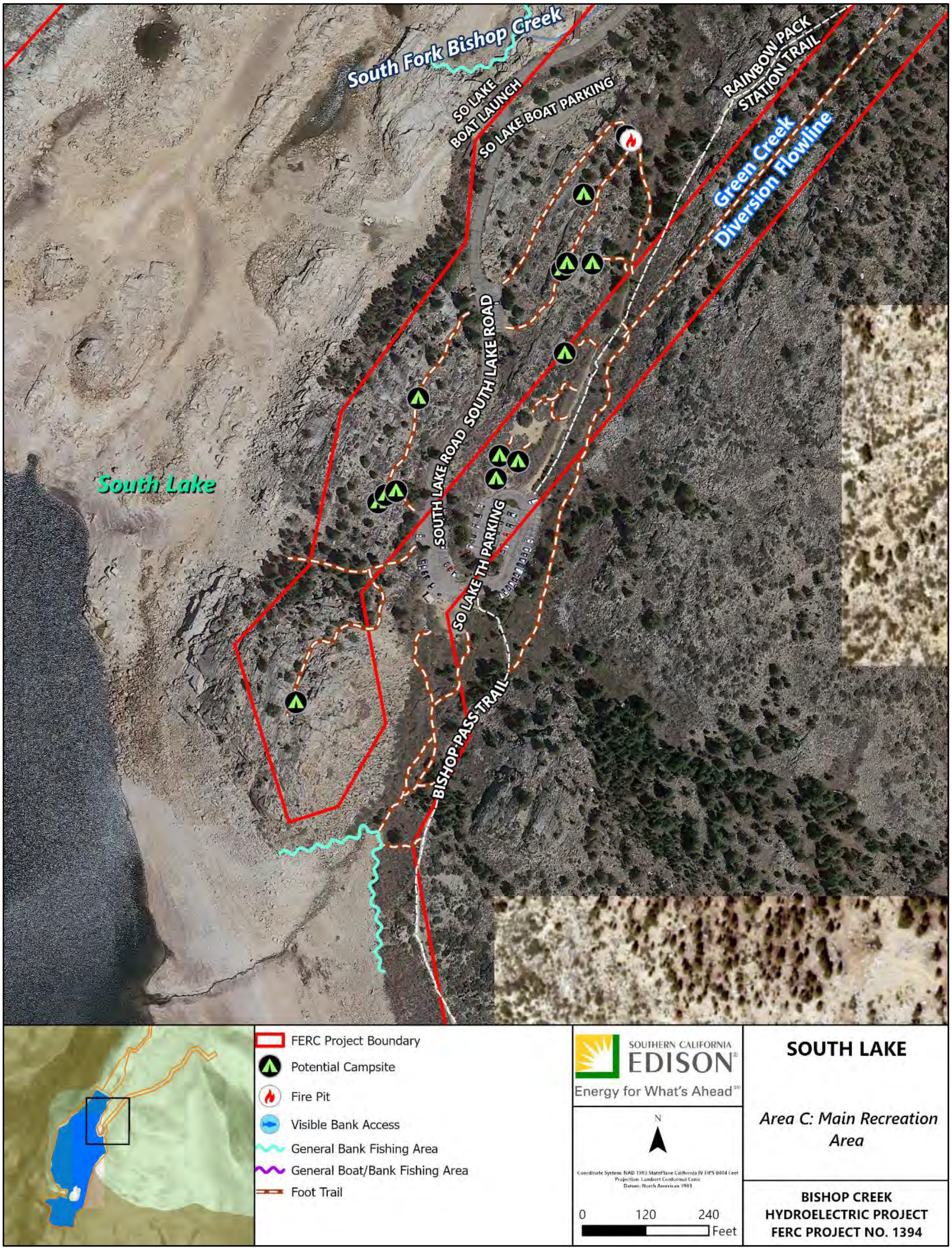


Figure 5.2-3 Overview of Dispersed Use at South Lake Recreation Area

5.2.3.4 Area D: Southern Shorelines of South Lake

Area D (Figure 5.2-4) is one of a handful of areas along the southern shoreline of South Lake where potential camping and other day use activities were observed. Area D is located on the western shoreline of the lake, just upstream of the island. At this location, approximately eight potential campsites and two fire pits were observed. A tarp and nails in trees were also observed, which suggest long term camping activity may have occurred. All but one of the potential campsites appears to be within the current FERC Project boundary as it is currently drawn; however, that boundary represents the maximum operating level of the reservoir at this location. The observed activity is wholly within the Inyo National Forest. Activity is near the boundary of the John Muir Wilderness, and it is unclear whether the boundary in this location is also meant to represent the maximum operating level of South Lake or to provide a buffer on that water line. See Photos 67 through 71 in Appendix F for representative photos of Area D.

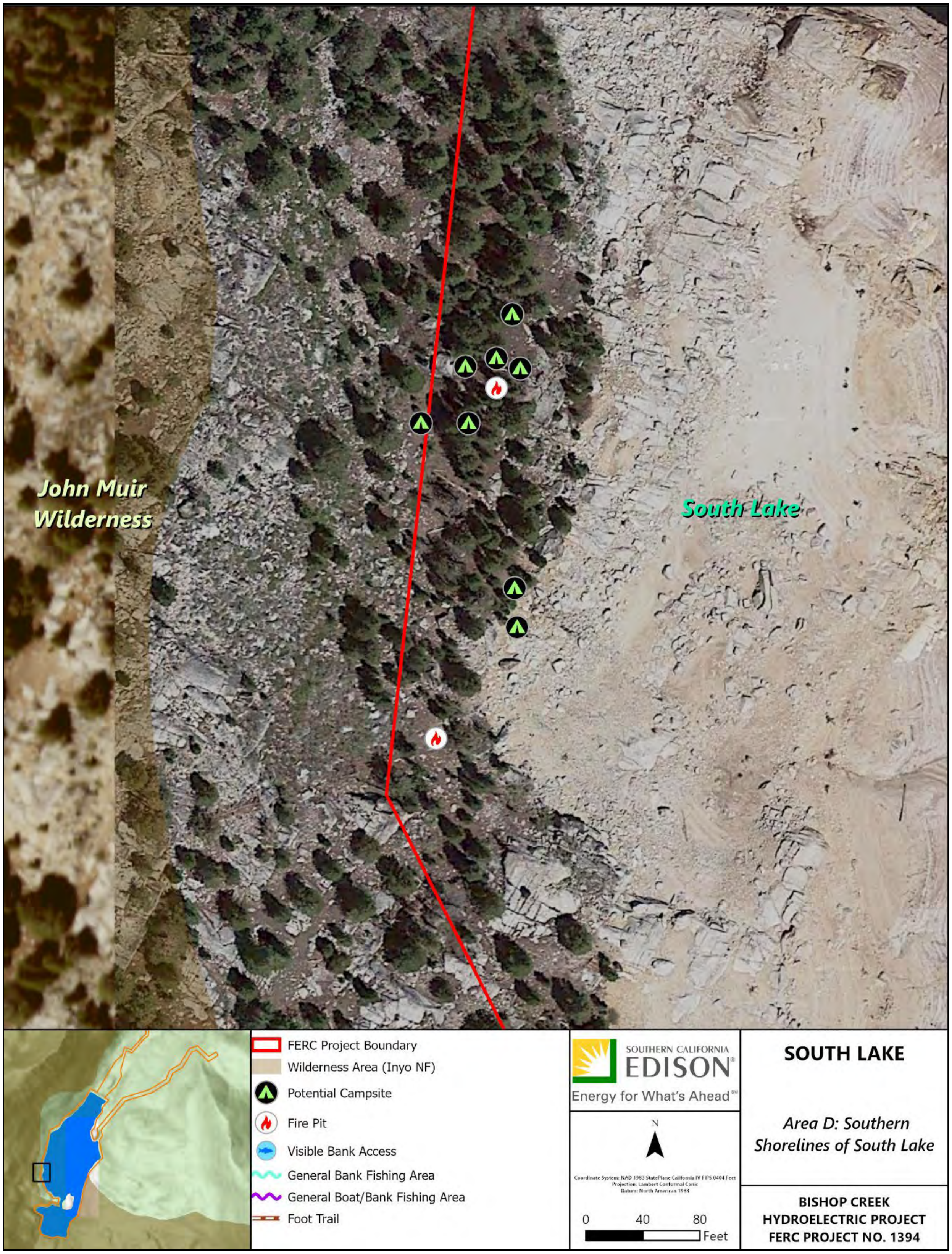


Figure 5.2-4 Detail Figure of Area D

5.2.3.5 Area E: Southern Shorelines of South Lake

Area E is another area along the southern shoreline of South Lake where potential camping and other day use activities were observed (Figure 5.2-5). Area E is located on the western shoreline of the lake, just south of Area D and directly west of the island. At this location, approximately 13 potential campsites and four fire pits were observed. A portion of activity is within the current FERC Project boundary as it is currently drawn; however, that boundary is intended to represent the maximum operating level of the reservoir at this location. The observed activity is within the Inyo National Forest, though a portion of the lands are owned by SCE. Activity is near the boundary of the John Muir Wilderness, and it is unclear whether the boundary in this location is also meant to represent the maximum operating level of South Lake or to provide a buffer on that water line. See Photos 72 through 76 in Appendix F for representative photos of Area E.

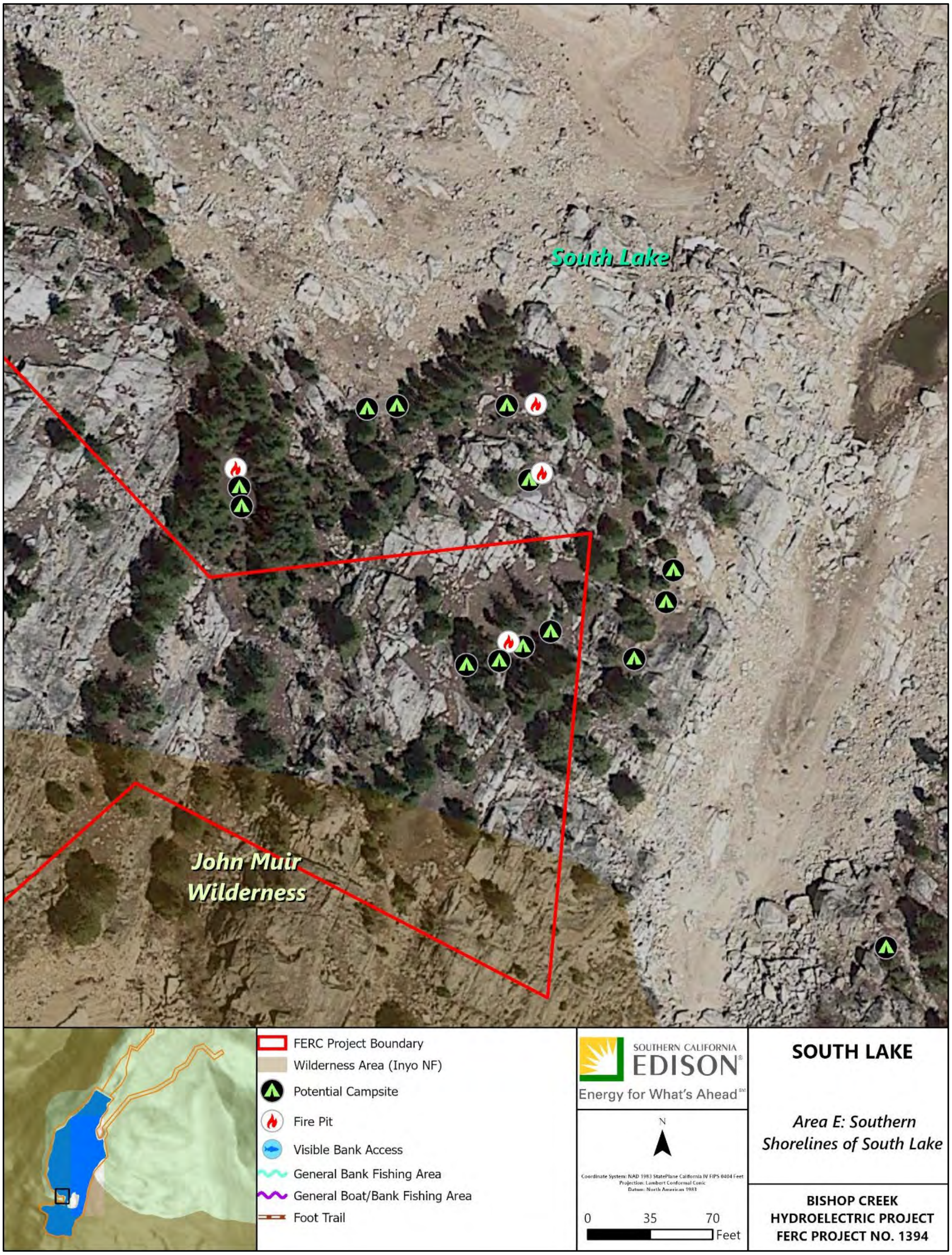


Figure 5.2-5 Detail Figure of Area E

5.2.3.6 Area F: Southern Shorelines of South Lake

Area F (Figure 5.2-6) is area along the southern shoreline of South Lake where potential camping and other day use activities were observed. Area F is located on the western shoreline of the lake, just southwest of Area E and the island. At this location, approximately eight potential campsites and one fire pit were observed. A portion of activity is within the FERC Project boundary as it is currently drawn; however, that boundary is intended to represent the maximum operating level of the reservoir at this location. The observed activity is wholly within the Inyo National Forest and John Muir Wilderness. See Photo 77 in Appendix F for a representative photo of Area F.

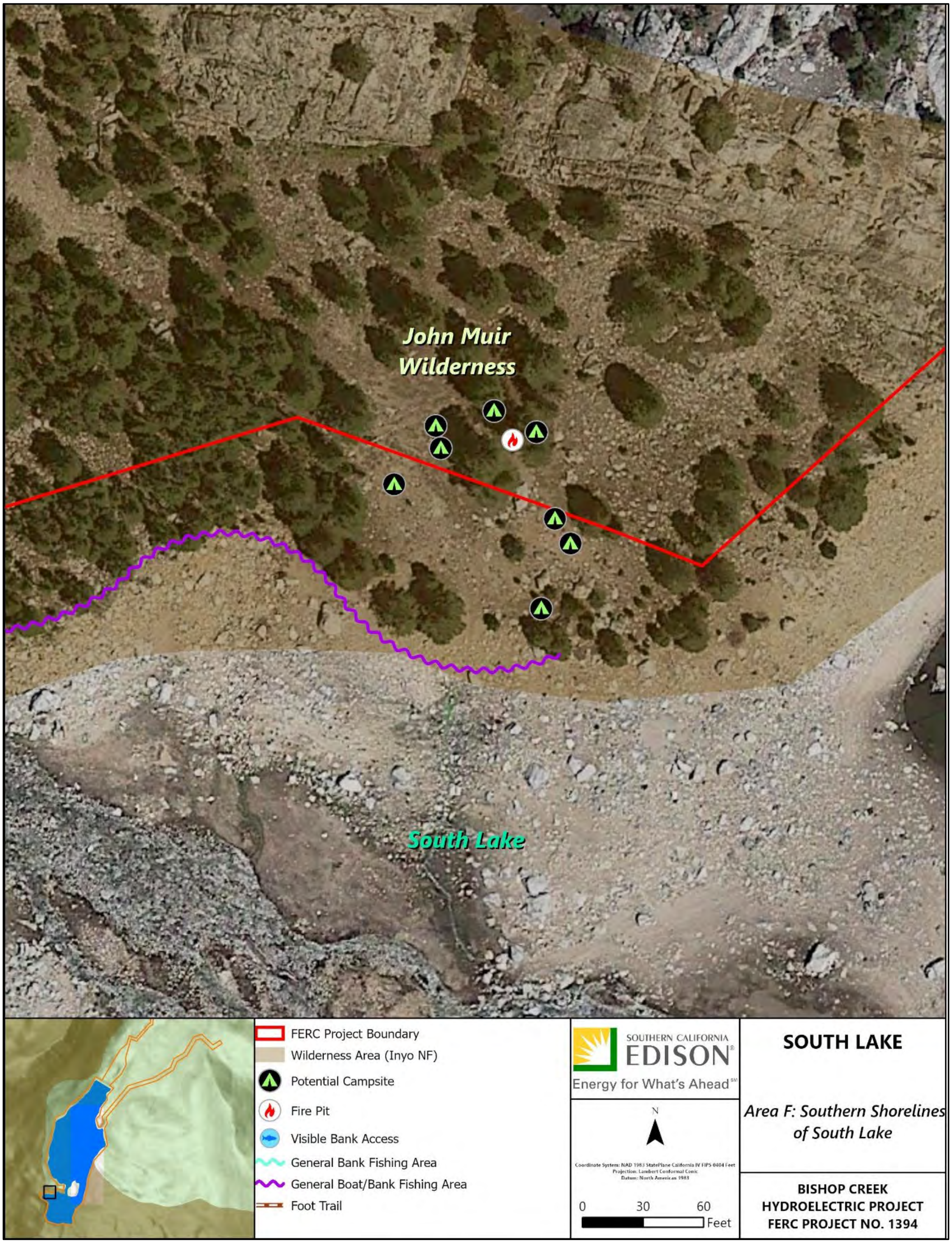


Figure 5.2-6 Detail Figure of Area F

5.2.3.7 Area G: Island

Area G (Figure 5.2-7) is an island located at the southern end of South Lake where a high degree of potential camping and other day use activities were observed. The island is located directly west of Area E and is accessed by boat users, often, it appears, for overnight activities. At this location, approximately 36 potential campsites and 11 fire pits were observed at various locations throughout the island.

All but one of the potential campsites appears to be within the FERC Project boundary as it is currently draw; however, that boundary is intended to represent the maximum operating level of the reservoir at this location. The observed activity is wholly within the Inyo National Forest. Activity is near the boundary of the John Muir Wilderness, and it is unclear whether the boundary in this location is meant to represent the maximum operating level of South Lake or to provide a buffer on that water line. See Photos 78 through 84 in Appendix F for representative photos of Area G.

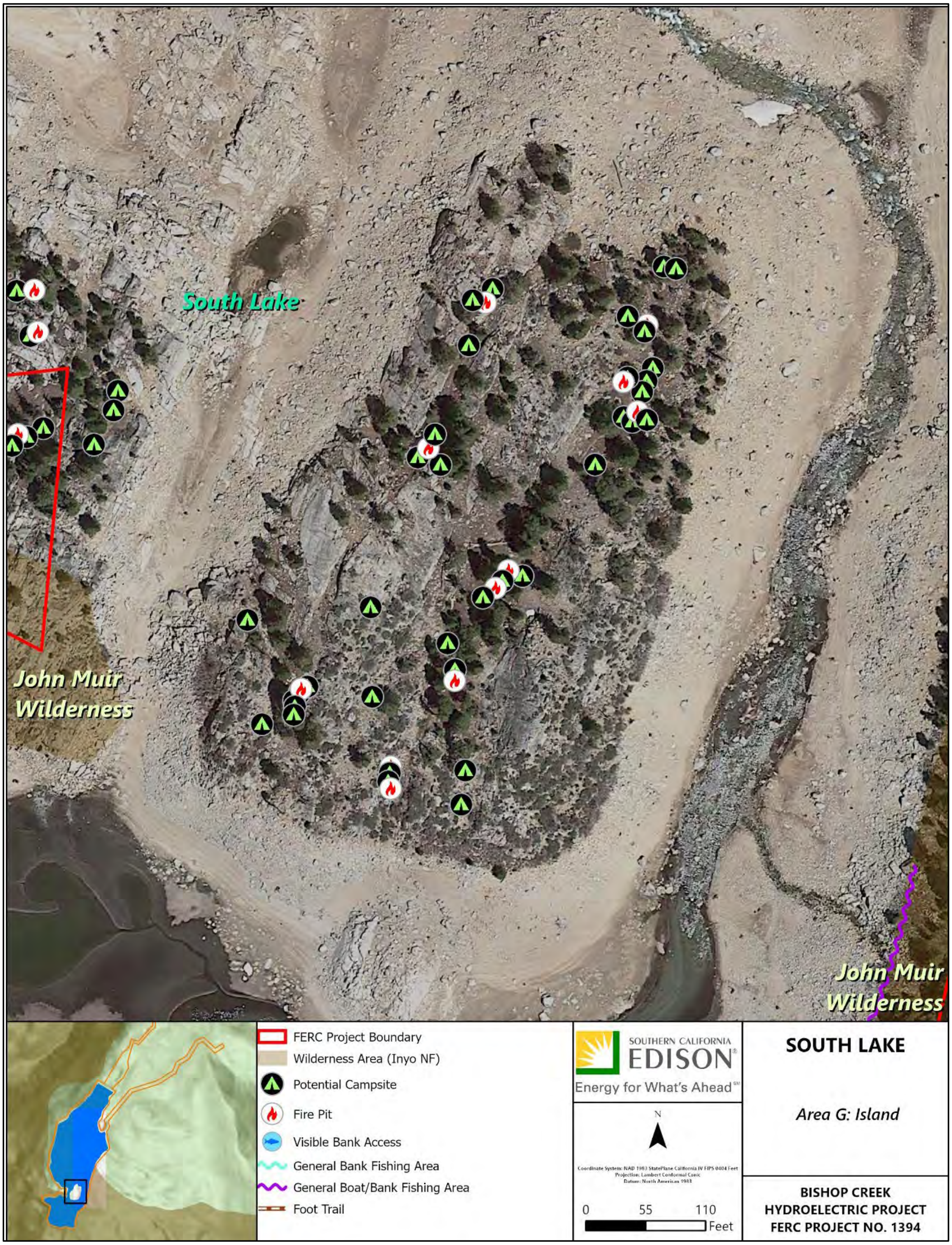


Figure 5.2-7 Detail Figure of Area G

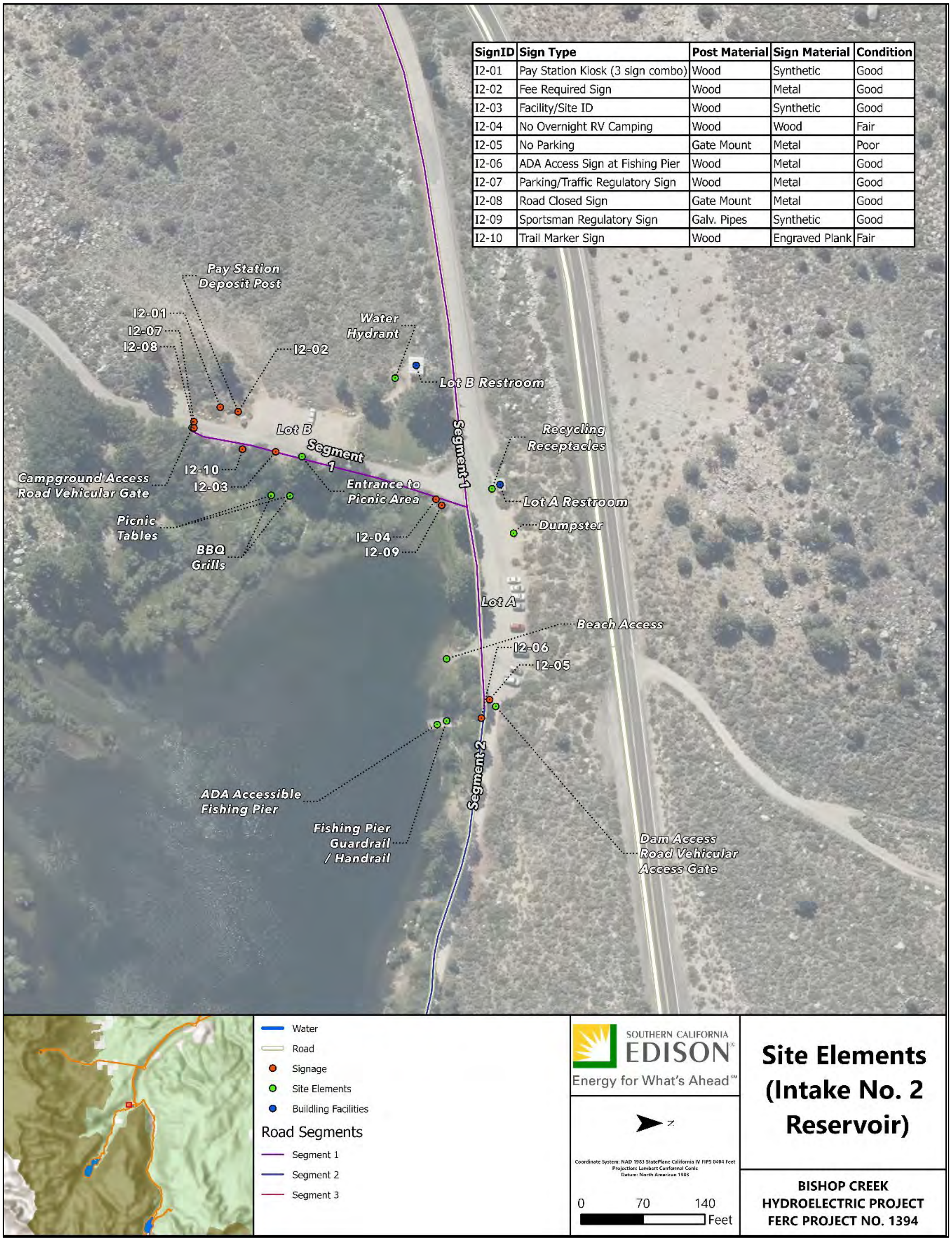
5.2.3.8 Area H: Southern Shorelines of South Lake

Area H is located adjacent to an inlet at the southern end of South Lake where approximately three potential campsites, one fire pit, and other day use activities were observed. All observed activity is located below the high-water mark and thus is within the FERC Project boundary. The observed activity is wholly within the Inyo National Forest; all activity below the high-water mark is outside of John Muir Wilderness, but any activity above that high-water mark would be within the John Muir Wilderness. See Photos 85 through 87 in Appendix F for representative photos of Area H.

5.3 Intake No. 2 Reservoir Recreation Area

5.3.1 Site Overview

Intake No. 2 Reservoir Recreation Area (Figure 5.3-1) is located along CA Highway 168 at approximately 8,100 feet above sea level where Intake No. 2 Dam impounds the Middle Fork Bishop Creek to create Intake No. 2 Reservoir. Developed recreation amenities generally include a fishing pier and picnic tables, all of which are owned and operated by the Inyo National Forest Service or its concessionaires. The following sections provide facility condition assessment of the roads and parking, site elements, site buildings, signage, visual and aesthetic qualities, universal accessibility, and public safety measures associated with those amenities.



SignID	Sign Type	Post Material	Sign Material	Condition
I2-01	Pay Station Kiosk (3 sign combo)	Wood	Synthetic	Good
I2-02	Fee Required Sign	Wood	Metal	Good
I2-03	Facility/Site ID	Wood	Synthetic	Good
I2-04	No Overnight RV Camping	Wood	Wood	Fair
I2-05	No Parking	Gate Mount	Metal	Poor
I2-06	ADA Access Sign at Fishing Pier	Wood	Metal	Good
I2-07	Parking/Traffic Regulatory Sign	Wood	Metal	Good
I2-08	Road Closed Sign	Gate Mount	Metal	Good
I2-09	Sportsman Regulatory Sign	Galv. Pipes	Synthetic	Good
I2-10	Trail Marker Sign	Wood	Engraved Plank	Fair

Figure 5.3-1 Intake No. 2 Reservoir Site Elements

5.3.2 Facility Condition Assessment

5.3.2.1 Roads and Parking

The roads and parking facilities assessed at Intake No. 2 consist of asphalt paved access drives and earthen/gravel paved parking and access. Asphalt paved surfacing has been repaired numerous times with crack sealers and patches. The edges of the asphalt paved surfaces are eroded and irregular. An entire asphalt overlay should be considered when economically feasible.

The earthen/gravel paved surfaces for the access road and parking areas are in good condition overall. There are poor transitions between the asphalt and earthen/gravel paving that should be addressed.

Table 5.3-1 Intake No. 2 Reservoir Recreation Area Access Roads

Site	Surface Material	Road Width (ft)	Circulation Type	Condition
Road Segment 1 (CA-168 to Parking Lots A and B)	Asphalt	± 24 ft	2-way	Needs Replacement
Road Segment 2 (East end of Parking Lot A to Dam [mostly gate restricted access])	Earthen / Crushed Rock	± 20 ft	2-way	Good

Table 5.3-2 Intake No. 2 Reservoir Recreation Area Parking

Site	Sub-site	Parking with Striping	Parking without Striping (ft)	Surface	
				Material	Condition
Intake No. 2 Reservoir	Lot A[a]	n/a	± 24 ft x 200 ft (Room for approx. 20 head-in stalls	Earthen / crushed rock	Needs Maintenance
	Lot B[a]	n/a	± 24 ft x 12 ft' (Room for approx. 12 head-in stalls	Earthen / crushed rock	Needs Maintenance

5.3.2.2 Site Elements

Table 5.3-3 provides a detailed inventory of all elements assessed at this site. The BBQ grills appeared to be in fair/good condition. They were not located along accessible routes and they have been further assessed in the ADA assessment documentation located in Appendix E of this report. The water hydrant was inoperable and is not ADA accessible (Appendix F, Photo 88).

Table 5.3-3 Intake No. 2 Reservoir Recreation Area Site Elements

Site Element	Parameter	Assessment
Intake 2		
ADA Accessible Fishing Pier	Material(s)	Concrete Ramp and Wood Pier
	Condition	Good
Fishing Pier Guardrail / Handrail	Location	Surrounding Pier
	Material	Galv. Steel Tubing
	Condition	Needs Maintenance
Picnic Tables	No. of Structures	2
	Material(s)	Wood
	Condition	Needs Maintenance
Dam Access Road Vehicular Access Gate	Type	Single Swing
	Material	Painted Galvanized Steel
	Condition	Good
Campground Access Road Vehicular Gate	Type	Double Swing
	Material	Painted Galv. Steel
	Condition	Good
Recycling Receptacles	Quantity	1
	Type	Combo (3) compartment
	Material	Metal
	Condition	Good
Dumpster	Quantity	1
	Type	Bear proof
	Material	Metal
	Condition	Good
BBQ Grills	Quantity	2
	Material	Metal
	Condition	Good
Water Hydrant	Quantity	1
	Material	Painted Metal

	Condition	Needs Replacement
Pay Station Deposit Post	Quantity	1
	Material	Painted Metal
	Condition	Good

5.3.2.3 Site Buildings

The restroom located nearest to Parkng Lot A is a pre-cast concrete structure consisting of a single occupancy pit toilet which is in good condition and is ADA compliant. The restroom nearest Parking Lot B was locked and signed as out of order. From visual analysis of the exterior, it consists of CMU block construction with a metal roof supported by wood framing. No formal structural assessment was conducted.

5.3.2.4 Signage and Wayfinding

There is a wide variety of sign types, styles and sizes. Many are standardized across the various Bishop Creek Facilities such as Facility Identification Signs and Regulatory Signs. Other signs are unique to the specific site at which they are installed. Another general observation during the site assessment is that the placement of the signs are somewhat sprawling throughout the site. Based on the assessment the following issues were identified and should be considered:

- Review current sign design standards for ADA compliance (letter sizes, contrast, color).
- Sign mounting heights, throughout the site, should be adjusted to meet the regulatory standards for each type, ADA compliance and general visibility.
- Regulatory signs that have been modified should be replaced. Some signs have had text added to them using non-retroflective material that will not be visible at night.
- Standardized sign mounting systems and materials would add continuity to the overall signage system. Some are mounted on round timbers, others on square posts, and others on galvanized pipe frame systems. This would simplify maintenance and replacement efforts in the long term.
- Consider consolidating the placement of signs to reduce clutter and improve the aesthetic quality of the facility.

Table 5.3-4 Signage at Intake No. 2 Recreation Area

Sign Type	Material		Qty	Condition	Comments
	Posts	Sign			
Facility/Site ID	Wood	Synthetic	1	Good	Lower Intake 2 Campground
No Parking	Gate Mount	Metal	1	Poor	Located on Dam Access Gate
Road Closed	Gate Mount	Metal	1	Good	Located on Campground Access Gate
ADA Access Sign at Fishing Pier	Wood	Metal	1	Good	
Fee Required Sign	Wood	Metal	1	Good	
Pay Station Kiosk (3 sign combo)	Wood	Synthetic	1	Good	Adjacent to Campground Access Gate
Parking / Traffic Regulatory	Wood	Metal	1	Good	Adjacent to Campground Access Gate
Sportsman Regulatory	Galv. Pipes	Synthetic	1	Good	
No Overnight RV Camping	Wood	Wood	1	Fair	Needs to be repainted
Trail Marker	Wood	Engraved Plank	1	Fair	Weathered

5.3.2.5 Visual and Aesthetic Quality

The overall visual quality of the site is very nice by virtue of the natural suroundings. Aesthetics of the building facilities are somewhat dated but appear to be well maintained and consistent with current adopted standards. The main areas that have potential for improving the visual and aesthetic quality of the overall facility are:

- Upgrades to the signage system through more standardized graphics, mounting structures, and general placement and organization.
- Upgrade, replacement, and/or organization of site furnishings to include but limited to recycling and trash receptacles, dumpsters, food lockers.
- Additional plantings for buffering, screening, and enhancement.

5.3.2.6 Universal Accessibility

A detailed ADA accessibility checklist was completed for the site (Appendix E) which identifies the various non-compliance issues that should be addressed. The most significant deficiencies consist of a lack of accessible routes to the following amenities:

- Lake Shoreline / Beach Access
- Picnic Areas (Appendix F, Photo 89)
- Recycling / Trash Receptacles
- Water Hydrant
- Fee Deposit Post
- Restrooms
- Fishing Piers

5.3.2.7 Public Safety Measures

Based on a general assessment of potential public safety concerns, there were relatively few identified. Among them are the following:

- The accessible route from Parking Lots A and B to various site amenities is shared use with the access drive and parking lot drive aisles. Future considerations to reduce potential for pedestrian and vehicular conflicts should be considered, including strategic striping at crossings, detectable warning pavement (truncated domes), and/or separated pedestrian access routes.
- Repair eroded edges and sections of pathways and paved surfaces to alleviate tripping hazards and potential damage to vehicles. (Appendix F, Photo 90)

5.3.3 Dispersed Use Assessment

As summarized in and depicted in Table 5.3-5, four distinct concentrations of dispersed use were observed at the Intake No. 2 Reservoir Recreation Area:

- Area A: Northern shoreline of the reservoir and Intake No. 2 Dam
- Area B: Day use area on western shoreline of the reservoir
- Area C: Use along Middle Fork Bishop Creek just upstream of its confluence with Intake No. 2 Reservoir
- Area D: Southeastern shoreline of the reservoir

Observations resulted in an estimate of approximately 5 potential campsites; 1.0 mile of user created trails; 61 visibly evident bank access points; and 0.7 mile of shoreline used for bank fishing or general recreation. Each area is described in more detail in the following sections.

Table 5.3-5 Summary of Dispersed Use at Intake No. 2 Reservoir Recreation Area

Area	Name	Potential Campsite	Fire Pit	User Created Trails (ft)	Visible Bank Access Point	Shoreline Generally Used for Boat/Bank Fishing (ft)
A	Northern Shoreline & Intake No. 2 Dam	n/a	n/a	n/a	22	1,344
B	Day Use Area	n/a	n/a	1,201	7	446
C	Middle Fork Bishop Creek	5	1	3,222	25	1,244
D	Southeastern Shoreline	n/a	n/a	1,062	7	690
	TOTAL	**5**	**1**	**5,485**	**61**	**3,724**

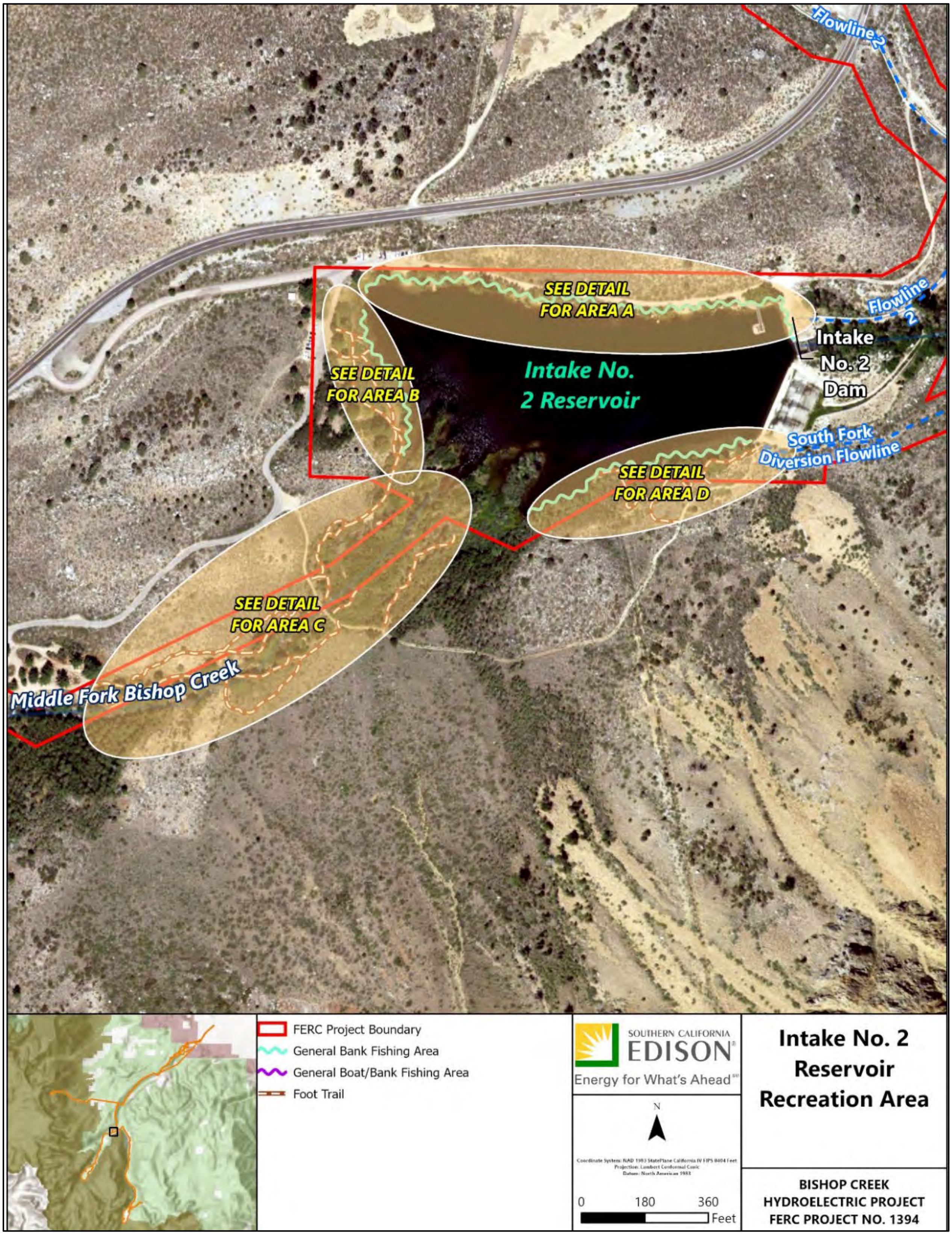


Figure 5.3-2 Overview of Dispersed Use at Intake No. 2 Reservoir Recreation Area

5.3.3.1 Area A: Northern Shoreline and Intake No. 2 Dam

As depicted on Figure 5.3-3, the northern shoreline of Intake No. 2 Reservoir and the Intake No. 2 Dam are popular for bank fishing and general access to the water. While the access road along the northern shoreline is gated to preclude public vehicle access to the dam facilities, the shoreline is open to public access by foot. Along the 1,344-foot stretch of shoreline, approximately 22 visibly worn access points to the reservoir were observed. All observations are wholly within the FERC Project boundary and on SCE lands. See Photos 91 through 97 in Appendix F for representative photos of Area A.

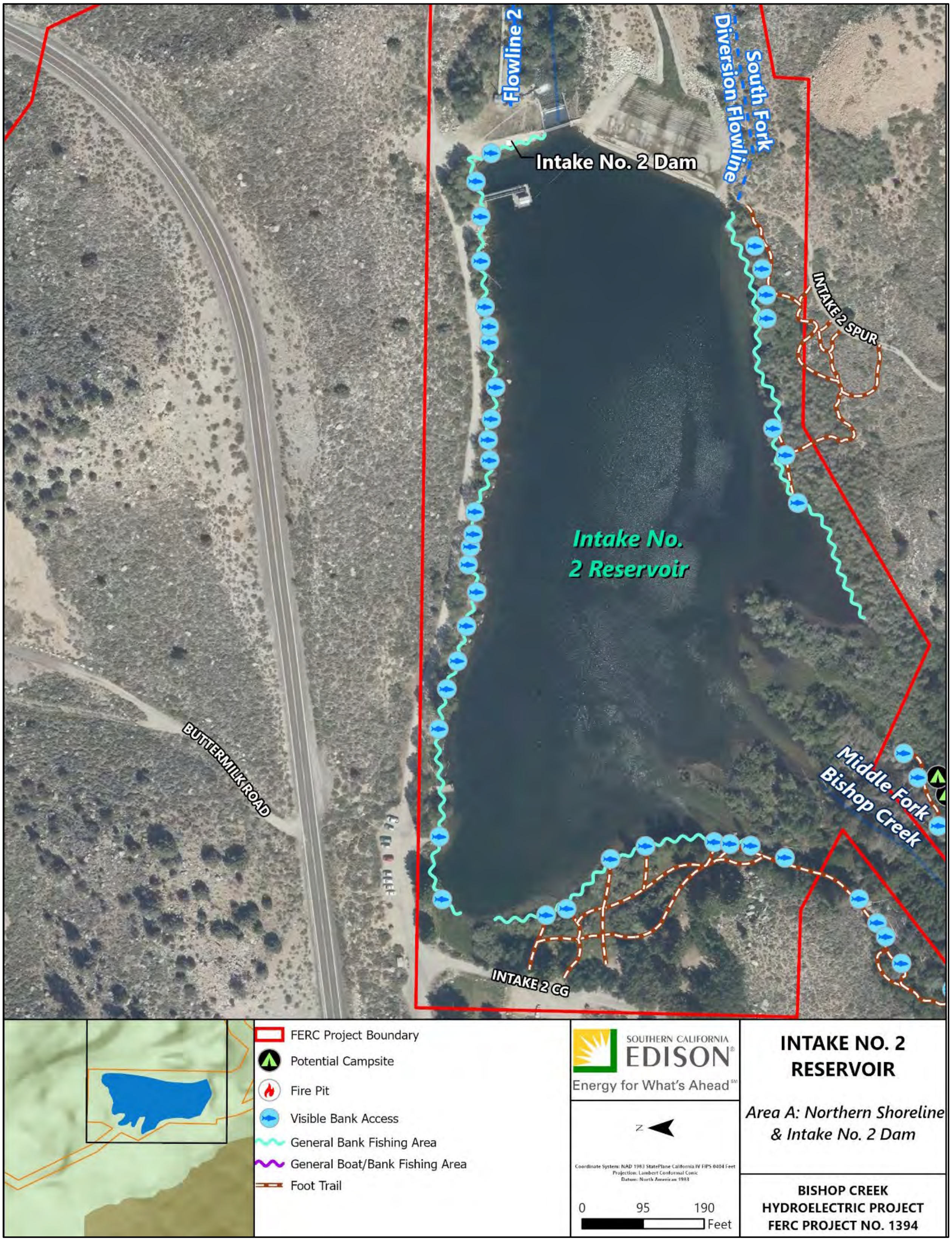


Figure 5.3-3 Detail Figure of Area A

5.3.3.2 Area B: Day Use Area

As depicted in Figure 5.3-4, access to the western shoreline of the reservoir at the day use area is popular for bank fishing and general access to the water. A network of approximately 1,201 feet of user-created foottrails leads between picnic areas and the shoreline, one of which appears to be commonly used as a kayak launching point. Along the 446-foot stretch of shoreline, approximately seven visibly worn access points to the reservoir were observed. All observations are wholly within the FERC Project boundary and on SCE lands. See Photos 98 through 100 in Appendix F for representative photos of Area B.

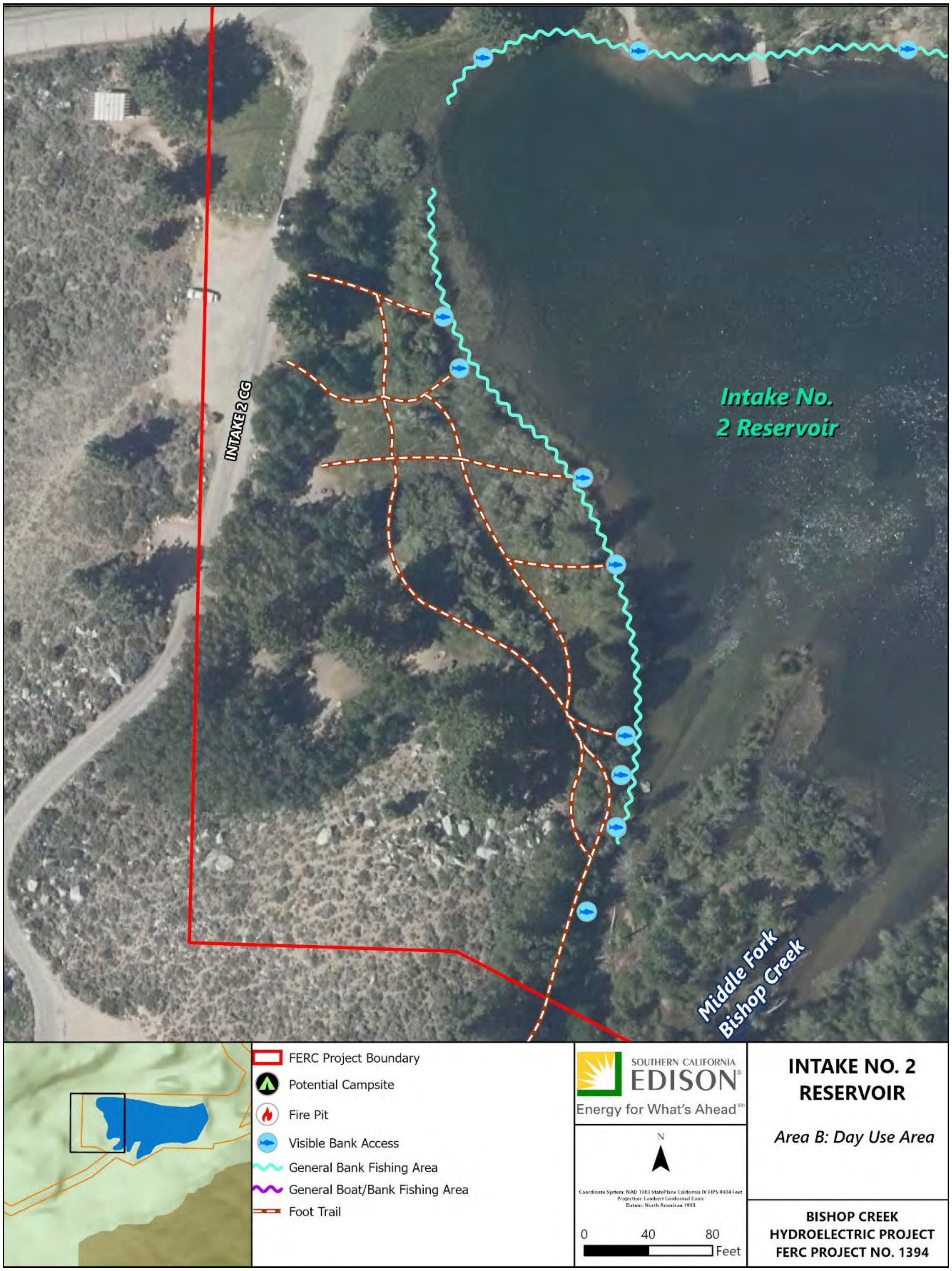


Figure 5.3-4 Detail Figure of Area B

5.3.3.3 Area C: Middle Fork Bishop Creek

As depicted inFigure 5.3-5 the approximately 1,244-foot reach of Middle Fork Bishop Creek between Intake No. 2 Reservoir and Intake No. 2 Campground is heavily used for general bank and fishing access on both sides of the creek. A network of approximately 3,222 feet of user-created foottrails leads along the creek and to approximately 25 access points to the creek. Five potential campsites were observed along this reach, including presumed use of the remnants of a chimney as a fire pit on the southern shore of the creek just before its confluence with the reservoir. All observations are wholly within the FERC Project boundary and on SCE lands. Activities observed are located wholly on the Inyo National Forest lands and partially within the current FERC Project boundary, which is intended to represent a 100-foot buffer (50 feet to each side of centerline) around the creek at this location. See Photos 101 through 107 in Appendix F for representative photos of Area C.

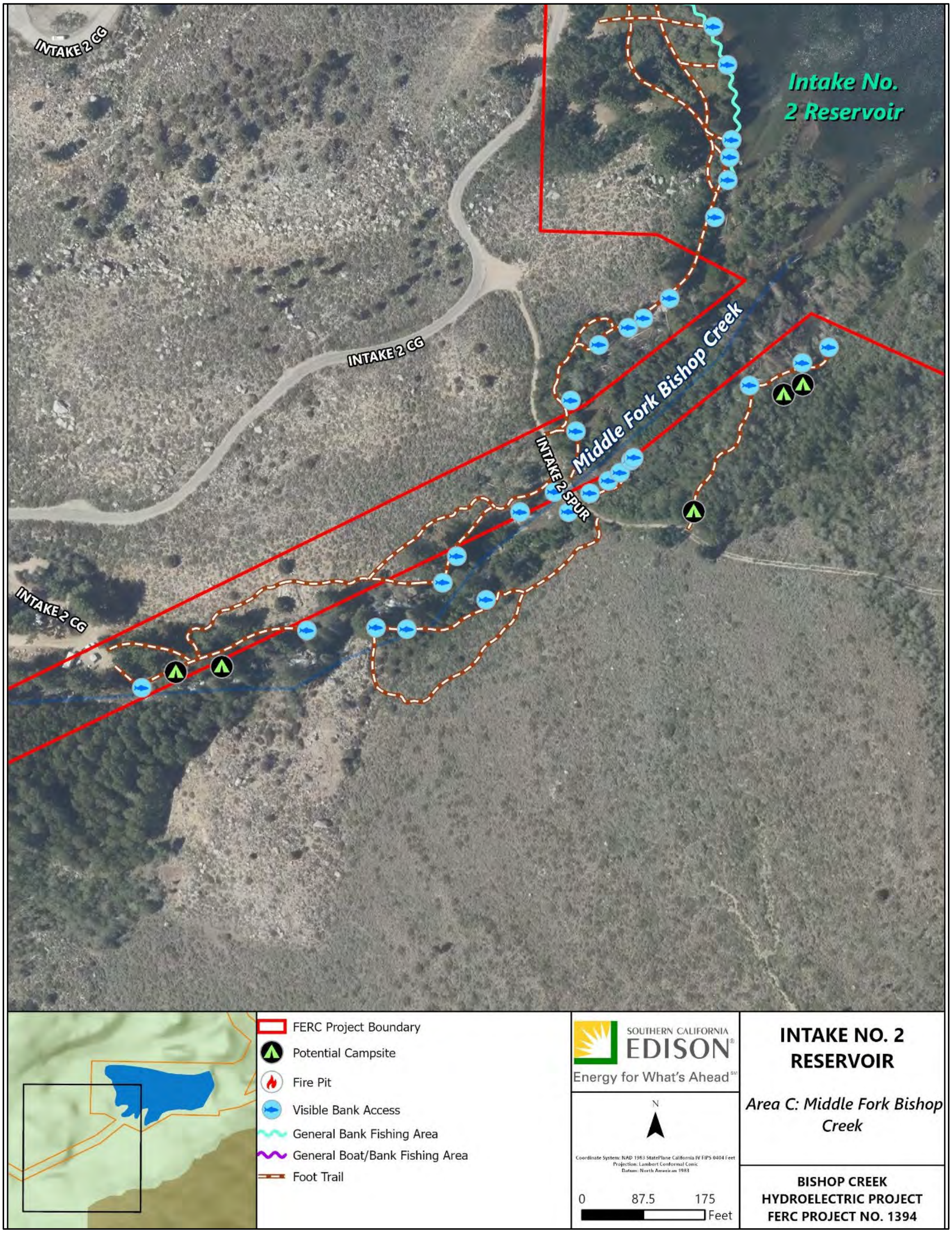


Figure 5.3-5 Detail Figure of Area C

5.3.3.4 Area D: Southeastern Shoreline

As depicted in Figure 5.3-6, the southeastern shoreline of Intake No. 2 Reservoir is popular for bank fishing and general access to the water. The southeastern shoreline is generally accessed through a series of approximately 1,062 feet of user-created trails leading from the spur road that runs east to west to the south of the reservoir. Along the approximately 690-foot stretch of shoreline, approximately seven visibly worn access points to the reservoir were observed. Activities observed are located on both Inyo National Forest and SCE lands and partially within the current FERC Project boundary. See Photos 108 through 112 in Appendix F for representative photos of Area D.

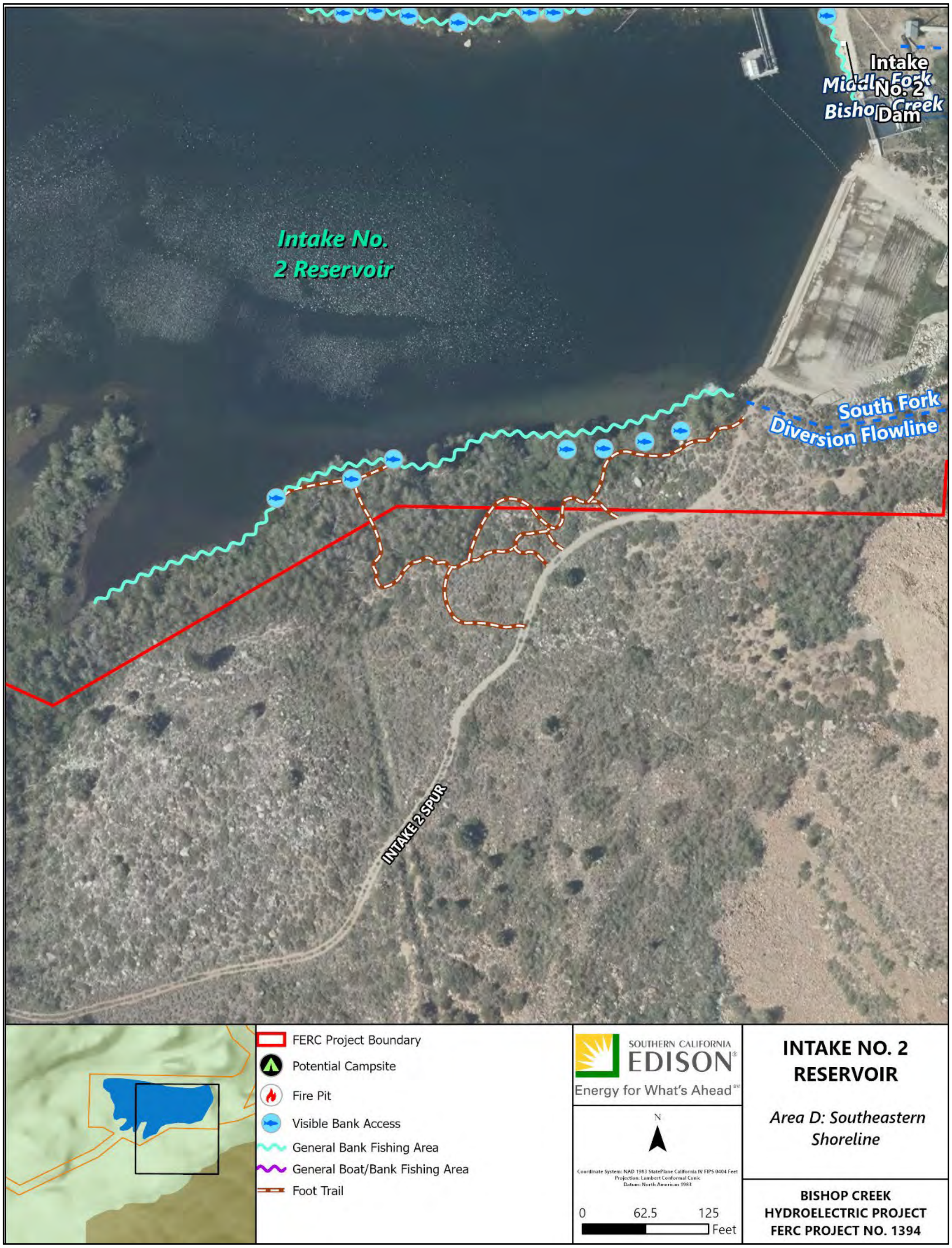


Figure 5.3-6 Detail Figure of Area D

6.0 DISCUSSION

The results of this study will inform where there are new recreation opportunities, new site development, or modification of existing recreation resources to address future Project facilities and operations, consistent with the Desired Conditions described in the Land Management Plan for the Inyo National Forest Service (USDA 2019), and then discussed with the TWG. The degree to which these potential modifications and enhancements (including dispersed use areas) are to be part of the proposed action for the new license will rely, in part, on the results of the Recreation Use and Needs (REC 1) study results, which will help describe the Project's recreation facilities. Table 6.1-1 provides a summary of notable findings within this report.

Table 6.1-1 Summary of Notable Findings

Category	Lake Sabrina	South Lake	Intake No. 2
Roads and Parking	The majority of the paved surfaces were found to be in fair condition, with frequent cracks, areas of alligator cracking, eroding edges and occasional potholes. Both paved parking lots need re-striping and a minimum of two ADA accessible (with at least one van accessible) Parking stalls should be designed and designated in Parking Lot A. Day Use Parking Areas (earthen pull-offs described as Areas A - G) are all generally in need of maintenance.	All access roads and parking have been re-paved and striped since the completion of this field work and should be in good condition.	The roads and parking facilities assessed at Intake No. 2 consist of asphalt paved access drives and earthen/gravel paved parking and access. Asphalt paved surfacing has been repaired numerous times with crack sealers and patches. The edges of the asphalt paved surfaces are eroded and irregular. An entire asphalt overlay should be considered when economically feasible. The earthen/gravel paved surfaces for the access road and parking areas are in good condition overall, however transitions between the asphalt and earthen/gravel paving that should be addressed.
Site Elements	The movable, floating boat docks were in use but were not on an accessible route and, by nature of design, do not meet ADA accessibility compliance. The boat launch ramp was observed in use and was operable; however, the boat launch facility as designed does not provide ADA accessibility. The fish cleaning station was not operable and should be replaced with a facility meeting ADA accessibility criteria and relocated to an area with an accessible route. In summary, the portable boat slips/docks, fixed gangways, fish cleaning station, trash and recycling receptacles, and marina guardrails/handrails were noted as either needing repairs or replacement.	The movable floating boat docks were in use but were not on an accessible route and by nature of design do not meet ADA accessibility compliance. The boat launch facility, as designed, does not provide ADA accessibility. In summary, the picnic tables, stairs to launching pier, boat ramp vehicular access gate, and vehicular access gate at the trailhead were noted as either needing repairs or replacement.	BBQ grills were not located along accessible routes. Water hydrant was inoperable and was not ADA accessible. In summary, the fishing pier guardrail/handrail, picnic tables, and water hydrant were noted as either needing repairs or replacement.

Category	Lake Sabrina	South Lake	Intake No. 2
Site Buildings	Buildings were noted as being in good condition.	The Parking Lot C restroom is a pre-engineered CMU structure, on a slab with a standing seam metal roof. The restroom is somewhat dated and based on the ADA assessment, has deficiencies that should be addressed. The interior is in poor condition and needs repairs and maintenance upgrades. The South Lake Landing building was reviewed based on visual assessment of the exterior only. The roof consists of a very flat, sloped shed roof with composite shingles. It appears to be at the end or near end of lifespan. It is recommended that it be replaced soon. The ramp that accesses the deck is structurally in good condition; however, the transition from earthen path to the ramp is not flush with the edge of ramp and should be modified to accommodate ADA accessibility.	Buildings were noted as being in good condition.
Signage and Wayfinding	Current sign design standards should be reviewed for ADA compliance (letter sizes, contrast, color) Review sign mounting heights throughout the site to meet the regulatory standards for each type, ADA compliance, and general visibility. Several of the parking signs observed are mounted very low to the ground and are in conflict with some surrounding plant material. Regulatory signs that have been modified should be replaced. Some signs have had	Review current sign design standards for ADA compliance (letter sizes, contrast) Review sign mounting heights throughout the site to meet the regulatory standards for each type, ADA compliance and general visibility. Standardize the sign mounting system and materials used for the various informational signs to add continuity to the overall signage system. Some are mounted on round timbers, others on square posts, others on galvanized pipe frame systems.	Current sign design standards should be reviewed for ADA compliance (letter sizes, contrast) Review sign mounting heights throughout the site to meet the regulatory standards for each type, ADA compliance and general visibility. Regulatory signs that have been modified should be replaced. Some signs have had text added to them using non-reflective material that would not be visible at night.

Category	Lake Sabrina	South Lake	Intake No. 2
	text added to them using non-reflective material that is not be visible at night. The Lake Sabrina Launch Facility sign requires re-painting and maintenance. Standardize the sign mounting systems and materials used for the various informational signs for continuity to the overall signage system. Signs are mounted on round timbers, others on square posts, others on galvanized pipe frame systems. This would simplify maintenance and replacement efforts in the long term. Consolidate the placement of signs to reduce clutter and improve the aesthetic quality of the facility.	This will also simplify maintenance and replacement efforts in the long term. Consolidate the placement of signs to reduce clutter and improve the aesthetic quality of the facility.	Standardize the sign mounting systems and materials used for the various informational signs to help add continuity to the overall signage system. Some are mounted on round timbers, others on square posts, others on galvanized pipe frame systems. This will also simplify maintenance and replacement efforts in the long term. Consolidate the placement of signs to reduce clutter and improve the aesthetic quality of the facility.
Visual and Aesthetic Quality	Upgrade signage system to standardized graphics, mounting structures, and general placement and organization. Upgrade, replace, and/or organize site furnishings such as recycling and trash receptacles, dumpsters, and fish cleaning station. Add plantings for buffering, screening, and enhancement.	Upgrade signage system to standardized graphics, mounting structures, and general placement and organization. Upgrade, replace, and/or organize site furnishings such as recycling and trash receptacles, dumpsters, and food lockers. Add plantings for buffering, screening, and enhancement.	Upgrade signage system to standardized graphics, mounting structures, and general placement and organization. Upgrades, replace, and/or organize site furnishings such as recycling and trash receptacles, dumpsters, and food lockers. Add plantings for buffering, screening, and enhancement.
Universal Accessibility	The most significant non-compliance issues consist of a lack of accessible routes to the following amenities: lake shoreline / beach access, boat launch, boat docks, recycling / trash receptacles, viewing areas/overlook at dam, fish cleaning station, trailheads/trails,	The most significant non-compliance issues consist of a lack of accessible routes to the following amenities: lake shoreline / beach access, south lake landing building, boat launch, boat docks, recycling / trash	The most significant non-compliance issues consist of a lack of accessible routes to the following amenities: lake shoreline / beach access, picnic areas, recycling / trash receptacles, water hydrant, fee deposit post, restrooms, and fishing piers.

Category	Lake Sabrina	South Lake	Intake No. 2
	and ADA accessible parking (no designated spaces). Modify other site amenities, added, or replaced to make them ADA compliant, including: fish cleaning station, recycling / trash receptacles, ADA parking spaces and signage, and tactile signage at the restroom.	receptacles, picnic tables, and trailheads/trails.	
Public Safety Measures	The pathway along the crest of the dam has very steep slopes on both edges of the pathway. The lake side of the pathway is protected by a continuous guardrail system. The opposite edge of the pathway is currently unprotected. There are remnants of a past fence or rail system that was removed. A new edge treatment should be considered (railing, cable fence, curb rail, plantings, boulders or other) to better define the edge and reduce the public risk. The accessible route from the Marina Parking Lot A to various site amenities is shared use with the access drive and parking lot drive aisles. Future considerations to reduce potential for pedestrian and vehicular conflicts should be considered, including strategic striping at crossings, detectable warning pavement (truncated domes), and/or separated pedestrian access routes. Repair eroded edges and sections of pathways, roadways and parking areas to alleviate tripping hazards and potential damage to vehicles.	The stairs to the launching pier are in poor condition and pose safety hazards. The stairs should be rebuilt. Handrail is needed. Repair eroded edges and sections of pathways and paved surfaces to alleviate tripping hazards and potential damage to vehicles.	The accessible route from Parking Lots A and B to various site amenities is shared use with the access drive and parking lot drive aisles. Future considerations to reduce potential for pedestrian and vehicular conflicts should be considered, including strategic striping at crossings, detectable warning pavement (truncated domes), and/or separated pedestrian access routes. Repair eroded edges and sections of pathways and paved surfaces to alleviate tripping hazards and potential damage to vehicles.

Category	Lake Sabrina	South Lake	Intake No. 2
Dispersed Use	Observations resulted in an estimate of approximately 47 potential campsites; 6 fire pits; 2.0 miles of user created trails; 20 visibly evident bank access points; and 1.3 miles of shoreline used for bank fishing or general recreation. Notable observations include: • Heavy access for bank fishing to the impounded water upstream of the weir and below the dam. • A user-created trail (Inlet Trail) that extends from the marina to the Middle Fork Bishop Creek Inlet. Bank fishing is very common for much of this trail. Portions of the trail pass through the John Muir Wilderness. • Heavy day use and evidence of overnight camping at the peninsula on the western shores and near the center of the lake. Access to this peninsula is largely by use of the Inlet Trail. • Heavy day use and evidence of overnight camping at the south end of the lake, near the inlet. Activities are within the John Muir Wilderness.	Observations resulted in an estimate of approximately 82 potential campsites; 20 fire pits; 1.9 miles of user created trails; and 1.0 miles of shoreline used for bank fishing or general recreation. Notable observations include: • Apparent use of the Green Creek Diversion pipeline as a hiking trail rather than the USFS Baker Summit Trail located further north to access wilderness areas to the east. A trail counter was installed along the pipeline as part of the ongoing REC 1 study. • Evidence of overnight camping along the ridges above the main recreation area. • Heavy day use and evidence of overnight camping at various locations at the south end of the lake, including the island. Many of these locations are within the John Muir Wilderness.	Observations resulted in an estimate of approximately 5 potential campsites; 1.0 miles of user created trails; 61 visibly evident bank access points; and 0.7 miles of shoreline used for bank fishing or general recreation. Notable observations include: • Heavy day use and bank access for fishing along most of the shoreline. • Heavy day use and potential overnight camping along Middle Fork Bishop Creek before it enters Intake No. 2 Reservoir.

7.0 CONSULTATION SUMMARY

SCE distributed periodic progress reports on the following schedule:

- Progress Report 1: December 19, 2019
- Progress Report 2: April 14, 2020
- Progress Report 3: July 24, 2020
- Initial Study Report (Progress Report 4): October 30, 2020
- Initial Study Meeting: November 10, 2020
- Progress Report 1: March 2, 2021
- Progress Report 2: May 28, 2021
- Progress Report 3: August 27, 2021
- Updated Study Report Filing: November 4, 2021
- Updated Study Report Meeting: November 18, 2021

The Initial Study Report (ISR) was filed with FERC on October 30, 2020 and a virtual ISR Meeting was held on November 10, 2020. Three progress reports were filed in 2021 after the ISR, as identified above. This Final Technical Report was submitted to agencies and stakeholders for a 60-day review period on November 5, 2021. Comments received on this report are shown in Table 7.1-2.

SCE held a Project Effects meeting on October 28, 2021 for all stakeholders and agencies to discuss what project effects (if any) had been identified through the implementation of each of the approved study plans.

The Updated Study Report (USR) was filed with FERC on November 4, 2021, and a USR Meeting was held on November 18, 2021. At this meeting, SCE only discussed those studies which were still in progress at the time of the ISR (Water Quality, Sediment and Geomorphology, Operations Model, Recreation Use and Needs, Recreation Facilities Condition Assessment, Project Lands and Boundary, and Cultural and Tribal Studies). Comments received at this meeting regarding the Recreation Facilities Condition Assessment are included in Table 5.3-2 below.

A meeting was held with USFS on December 7, 2021 to discuss comments received on this report as well as SCE's draft responses to them.

A summary of correspondence since the Revised Study Plans were filed for REC 1 and REC 2 study plans are provided in Table 7.1-1. A summary of all comments received and SCE's responses to those comments are provided in Table 7.1-2.

Table 7.1-1 Consultation Since Filing of REC 2 Revised Study Plan

Date of Consultation	Entities Involved	Description
July 7, 2020 (Email to USFS)	Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Matthew Harper, Kleinschmidt Bryan Cole, MacKay Sposito	Email regarding upcoming REC 2 fieldwork and requesting conference call.
July 7, 2020 (Emails with USFS)	Diana Pietrasanta, USFS Sheila Irons, USFS Nora Gamino, USFS Matthew Harper, Kleinschmidt	Emails regarding upcoming REC 2 fieldwork.
January 27, 2021 (Email to USFS)	Nora Gamino, USFS Matthew Harper, Kleinschmidt	Email requesting past operation and maintenance cost data for use in an O&M Economics Assessment of the facilities associated with the three recreation areas.
January 28, 2021 (Email from USFS)	Nora Gamino, USFS Matthew Harper, Kleinschmidt	Email suggesting we reach out to Adam Barnett and stating that what past operation and maintenance data exists would not truly reflect actual costs due to a lack of funding in the area.
February 1, 2021 (Emails with USFS)	Nora Gamino, USFS Adam Barnett, USFS Matthew Harper, Kleinschmidt	Emails discussing general breakdown of operational costs and identifying areas where detailed information may be provided.
July 9, 2021 (Email to USFS)	Nora Gamino, USFS Adam Barnett, USFS Matthew Harper, Kleinschmidt	Follow up email regarding past operation and maintenance cost data.
September 30, 2021 (Email to USFS)	Nora Gamino, USFS Adam Barnett, USFS Matthew Harper, Kleinschmidt	Follow up email regarding past operation and maintenance cost data.

Table 7.1-2 Comment Response Table

Comment Number	Study	Date of Comment	Entity	Comments	SCE Response
1	REC 2	December 1, 2021	USFS	Still need O&M cost included. Toilet pumping, cleaning, dumpsters, patrol, maintenance, OHV route maintenance, trail maintenance, wilderness ranger patrol, LEO, engineering. AB provided personnel daily rate info to Matt Harper.	Thank you for providing daily rate information for USFS personnel in the area. These data are necessary to meet the intent of the study plan; we have sent by email seperately a suggested course of action for the following: 1. Propose that the FS provide contact information for the vendor and broker an introduction so that we can develop information about activities at the lakes 2. The FS has previously stated that information is aviable on costs for trash service, toilet cleaning contracts, and toilet pumping contract. Please provide a contact at the FS who can provide this information. 3. We also understand that cost/mile esimates for trail maintenance on an annual basis is known. Please provide. 4. For daily operational staffing please provide the estimated number of hours at each facility for each of the staff categories referenced in your November 18 email. 5. Could the FS further describe or quantify the deferred mainteance at each of the facilities in question? 6. Any historic information on costs and period of repairs to structures and roads or maintenance schedule would be useful This comment is addressed in Section 8.9 of Exhibit E of the Draft License Application (DLA).
2	REC 2	December 1, 2021	USFS	What is done with the Rec2 condition assessment findings?	Results of the REC 2 study will be used to facilitate discussions related to potential improvements, repairs, maintenance, and/or management of recreation facilities and activities induced by the Project.

					This comment is addressed in Section 8.9 of Exhibit E of the DLA.
3	REC 2	December 1, 2021	USFS	What is done with dispersed recreation findings? – no dispersed camping allowed outside of wilderness and CGs	An assessment of dispersed use at the Project reservoirs was conducted at the request of the USFS to assess the need to formalize or reclaim/manage (due to environmental concerns) dispersed or informal use areas, namely those in conflict with current Inyo National Forest or wilderness restrictions. This comment is addressed in Section 8.9 of Exhibit E of the DLA.
4	REC 2	December 1, 2021	USFS	Add plantings for buffering, screening, and enhancement – where/what? Needs detail	SCE would like to understand in more detail what is being requested here. If plantings becomes a proposed measure, SCE will develop a cost for this item in the FLA This comment is addressed in Section 8.9 of Exhibit E of the DLA.

8.0 REFERENCES

United States Forest Service (USFS). 2019. Land Management Plan for the Inyo National Forest. Fresno, Inyo, Madera, Mono and Tulare Counties, California; Esmeralda and Mineral Counties, Nevada. R5-MB-323a. Pacific Southwest Region. September. Accessed: August 24, 2020. Available online: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd664404.pdf.

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

APPENDIX A

LAKE SABRINA DAY USE PARKING NODES INVENTORY CHECKLIST

APPENDIX A

LAKE SABRINA DAY USE PARKING NODES INVENTORY CHECKLIST

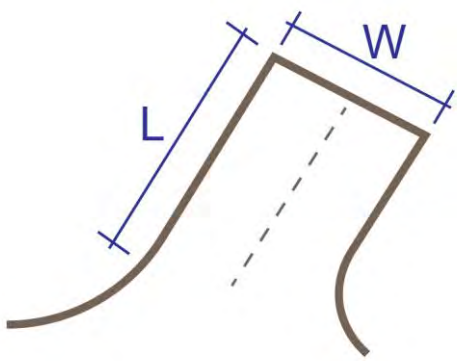
Lake Sabrina Day Use Parking Nodes

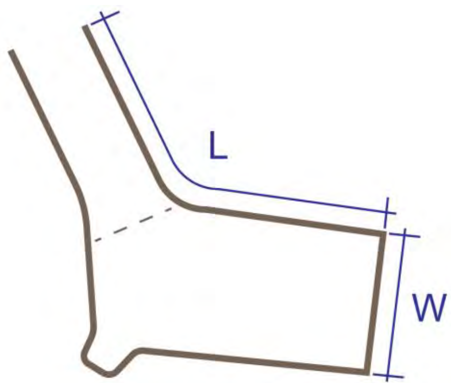
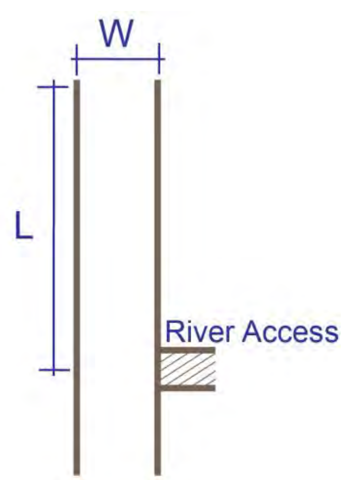
Inventory Checklist

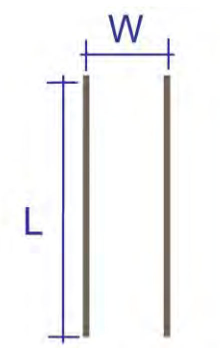
Facility Name: LAKE SABRINA – DAY USE PARKING NODE INVENTORY
Date Surveyed: 08/04/2020
Surveyor(s): E. MILLS; J. SANDLIN

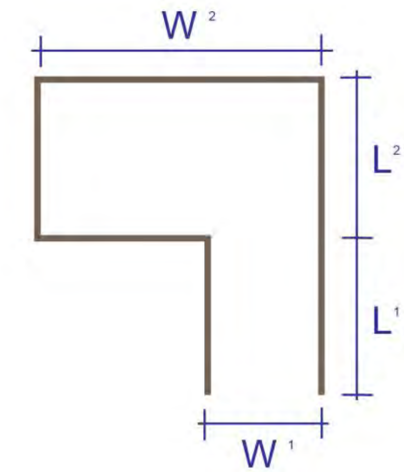
The following information is the result of a request to review and inventory various day use parking areas, not designated for overnight parking, that provide access to nearby trailheads.

The following sites were not assessed for ADA accessibility compliance.

Parking Area 'A'	Field Notes
1. Dimensions and Layout  Approx. shape Not to scale	(L) Length: 21-feet (W) Width: 18-feet 
2. Approx. number of stalls accommodated	1-2(max)
3. Surfacing	Compacted native earthen material
4. Signs	None
5. Amenities	Water access

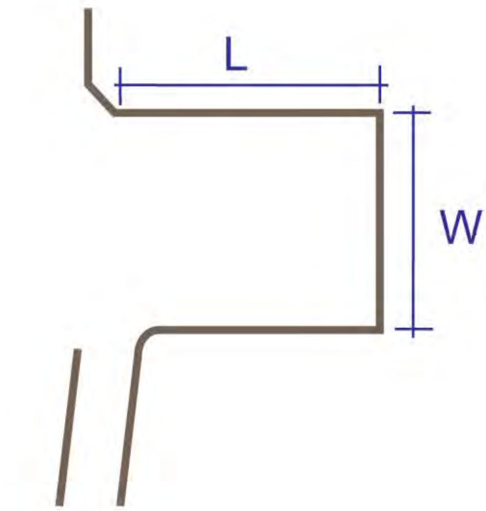
<table>
<tr><th>Parking Area ‘B’</th><th>Field Notes</th></tr>
<tr><td>1. Dimensions and Layout

Approx. shape
Not to scale</td><td>(L) Length: 33-feet
(W) Width: 15-feet
</td></tr>
<tr><td>2. Approx. number of stalls accommodated</td><td>1-2</td></tr>
<tr><td>3. Surfacing</td><td>Compacted native earthen material</td></tr>
<tr><td>4. Signs</td><td>None</td></tr>
<tr><td>5. Amenities</td><td>Water access; not accessible</td></tr>
<tr><th>Parking Area ‘C’</th><th>Field Notes</th></tr>
<tr><td>1. Dimensions and Layout

Approx. shape
Not to scale</td><td>(L) Length: 162-feet
(W) Width: 10-feet
</td></tr>
</table>

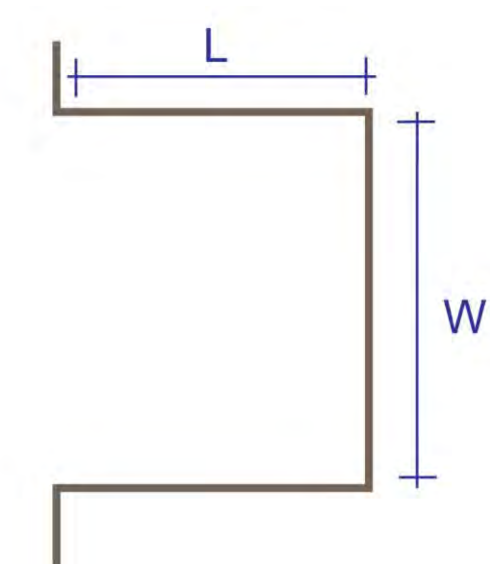
2. Approx. number of stalls accommodated	Approx. 8
3. Surfacing	Compacted native earthen material
4. Signs	Day Use
5. Amenities	River access
Parking Area ‘D’	**Field Notes**
1. Dimensions and Layout  Approx. shape Not to scale	(L) Length: 150-feet (W) Width: 9-feet 
2. Approx. number of stalls accommodated	7-8
3. Surfacing	Compacted native earthen material
4. Signs	Day Use
5. Amenities	none
Parking Area ‘E’	**Field Notes**
1. Dimensions and Layout	(L) Length [1]: 42-feet (L) Length [2]: 40-feet (W) Width [1]: 9-feet (W) Width [2]: 23-feet



Approx. shape
Not to scale

2. Approx. number of stalls accommodated	5
3. Surfacing	Compacted native earthen material
4. Signs	No Overnight Parking
5. Amenities	Water access / Day use

Parking Area 'F'	Field Notes
1. Dimensions and Layout  Approx. shape Not to scale	(L) Length: 24-feet (steep) (W) Width: 24-feet 
2. Approx. number of stalls accommodated	2
3. Surfacing	Compacted native earthen material
4. Signs	Kiosk, No Overnight Parking 
5. Amenities	• Trail Head with Kiosk • Portable toilets (3)

	
Parking Area ‘G’	**Field Notes**
1. Dimensions and Layout  Approx. shape Not to scale	(L) Length: 25-feet (W) Width: 30-feet 
2. Approx. number of stalls accommodated	3
3. Surfacing	Compacted native earthen material
4. Signs	No Overnight Parking
5. Amenities	none

APPENDIX B

LAKE SABRINA ADA COMPLIANCE CHECKLIST

APPENDIX B

LAKE SABRINA ADA COMPLIANCE CHECKLIST

Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG)

Compliance Checklist

The purpose of this checklist is to locate and assess site components within existing public outdoor recreation facilities, for compliance with the Forest Service Outdoor Recreation Accessibility Guidelines (FSORG). The Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG) and the Forest Service Trail Accessibility Guidelines (FSTAG) are the legally enforceable standards for use on the National Forest System for the facilities and features addressed in those guidelines. They, in part, incorporate sections of the Architectural Barriers Act Accessibility Standards (ABAAS), and the Outdoor Developed Area Accessibility Guidelines (ODAAG), developed by the Architectural and Transportation Barriers Compliance Board (U.S. Access Board).

This checklist serves as a planning tool to assist with identifying accessibility deficiencies within a facility and possible actions to be considered for correcting them.

Facility Name: LAKE SABRINA
Date Surveyed: 08/05/2020
Surveyor(s): E. MILLS; J. SANDLIN

<table>
<tr><th colspan="2">Site Component</th><th colspan="3">Compliant</th><th></th></tr>
<tr><th colspan="2">Parking</th><th>n/a</th><th>Yes</th><th>No</th><th>Comments / Possible Action</th></tr>
<tr><td colspan="6">☐ Check here if section does not apply to this site and move to next section.</td></tr>
<tr><td colspan="2">1. Are an adequate number of accessible parking spaces available? The table below gives the ADAAG requirement for new construction and alterations (for lots with more than 100 spaces refer to ADAAG).

Accessible Spaces per Overall spaces</td><td rowspan="2">☐</td><td rowspan="2">☐</td><td rowspan="2">☒</td><td rowspan="2">Comments:
2 separated parking lots assessed separately:
PARKING LOT A (main parking lot)
Pavement quality is in fair condition with some pothole repair needed.
Parking Lot A – has 36 stalls
Needs to be re-striped.
No designated boat trailer spaces.
No accessible boat loading areas.
There are no designated accessible parking spaces.
Minimum of 2 accessible space required, with at least one being Van Accessible.
PARKING LOT B (overflow parking lot)
Pavement quality is in fair condition.
Parking Lot B – has 24 stalls
Needs to be re-striped.
No designated boat trailer spaces.
There are no designated accessible</td></tr>
<tr><td>Total Spaces

1 to 25
26 to 50
51 to 75
76 to 100</td><td>Accessible Spaces Required

1 space
2 spaces
3 spaces
4 spaces</td></tr>
</table>

					parking spaces. ◦ Minimum of 1 accessible space required, with at least one being Van Accessible. **Recommendation**: Parking Lot B does not have any ADA accessible amenities and the route between Lot A and Lot B is not ADA accessible. Therefore, it is recommended that the combined total of 3 ADA Parking Stalls be placed in Parking Lot A. **Possible Action:** • Design and Construct minimum of 3 Accessible Parking spaces (1-minimum Van Accessible), along accessible route to Restroom, Trailhead, Boat Launch area, Lake Sabrina Boat Landing Building any supporting amenities. • Construct ADA Boat Loading and Parking areas. • Upgrade striping to include demarcation of pedestrian access routes / crossings within parking lot.
2.	Are the accessible parking spaces located closest to the accessible route and accessible building entrance?	☒	☐	☐	**Comments:** • No accessible spaces
3.	Are an adequate number of van accessible spaces provided? At least 1 of every 8 accessible spaces must be van-accessible (with a minimum of 1 van-accessible space in all cases.)	☒	☐	☐	**Comments:** • No accessible spaces
4.	Are the access aisles part of the accessible route?	☒	☐	☐	**Comments:** • No accessible spaces
5.	Do the access aisles have a cross slope less than 1:48, and have a firm, stable non-slip surface?	☒	☐	☐	**Comments:** • No accessible spaces
6.	Do the access aisles connect to an accessible pedestrian route with a minimum clear and unobstructed width of 36 inches?	☒	☐	☐	**Comments:** • No accessible spaces
7.	Does the accessible car parking space measure 96 inches wide with an adjoining access aisle 96 inches wide? OR Does the accessible van parking space measure 132 inches wide with an adjoining access aisle 60 inches wide?	☒	☐	☐	**Comments:** • No accessible spaces

	n/a	Yes	No	
8. Are accessible spaces marked with and International Symbol of Accessibility? Are there signs reading “Van Accessible” at van spaces? Is Sign Mounted 60” min. from ground to bottom of sign?	☒	☐	☐	**Comments:** • No accessible spaces
9. Is there an enforcement procedure to ensure that accessible parking is used only by those who need it?	☒	☐	☐	**Comments:** • No accessible spaces
Drop-off / Public Transit Areas	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
10. Is there a passenger pick up and drop off zone? If so, is at least one passenger loading zone accessible which measures 96 inches wide by 20 feet long with a 60-inch-wide access aisle parallel to the vehicle pull up space and at the same level as the roadway?	☐	☐	☐	**Comments:**
11. Do curbs on the accessible route have curb cuts or curb ramps at 1:12 slope? NOTE: If a slope of 1:12 is not possible, a slope between 1:10 and 1:12 is allowed for a MAX RISE of 6 inches. A slope between 1:8 and 1:10 is allowed for a MAX RISE of 3 inches. A slope steeper than 1:8 is not allowed. Flared sides may be 1:10 slope.	☐	☐	☐	**Comments:**
12. Is curb cut/curb ramp flush with surrounding grade?	☐	☐	☐	**Comments:**
13. Is the curb cut/ramp 36 inches wide, exclusive of flared sides?	☐	☐	☐	**Comments:**
14. Are there public transportation stops on site, if so, is an accessible route provided to the building from the stop?	☐	☐	☐	**Comments:**
Outdoor Recreation Access Routes[1]	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				

[1] To meet (FSORAG) Outdoor Recreation Access Routes (ORARs) shall be provided between units and constructed features in campgrounds, picnic areas, trailheads, viewing areas, and other outdoor recreation sites. ORARs shall connect the outdoor constructed features within each recreation site and shall connect to common use features such as toilets, showers, water spouts, trash or recycling receptacles, parking spaces, and beach access routes. Where ORARs are provided within vehicular ways, those ORARs shall not be required to comply with sections 2.4 Slope, 2.5 Resting Intervals, and 2.6 Passing Spaces.

15. Does the park have accessible routes (ORARs) to all accessible facilities within the park? Surface: shall be firm and stable. The type of surface should be appropriate to the setting and level of development. Clear width: 36”, may be reduced to 32” per 1.1 conditions. Slope: 5% or less. Up to 8.33% for 50 feet or 10% for 30 feet with resting intervals that are minimum of 60 inches long, see figure 3. Cross Slope: 3% maximum. Where the surface is paved or elevate above natural ground, cross slope shall not be greater than 2%. Passing spaces: if accessible route is less than 60 inches wide provide passing spaces at intervals of 200’ maximum, see figure 4.	☐	☐	☒	

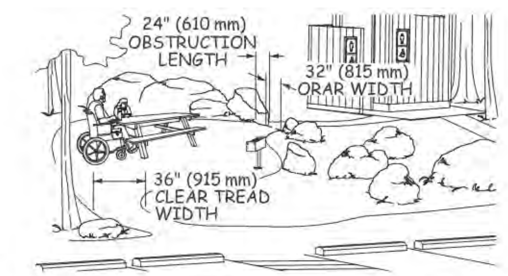


Figure 1—The clear tread width is the unobstructed width of the traveling surfac

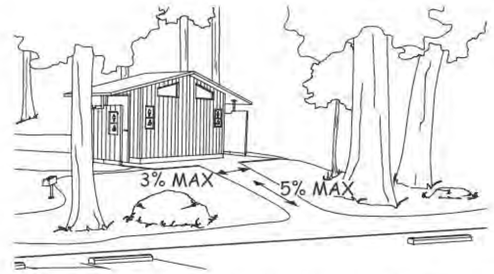


Figure 2—The basic slope requirements for outdoor recreation access routes and beach access routes.

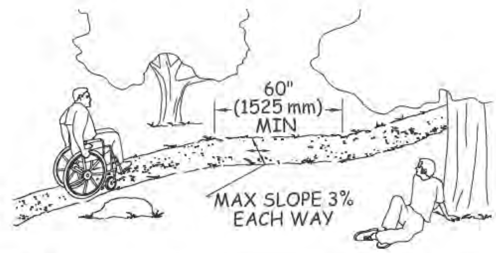


Figure 3—The basic resting interval requirements for outdoor recreation access routes.

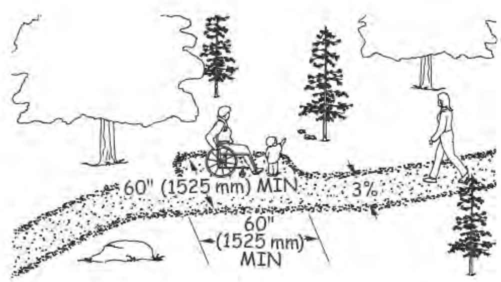


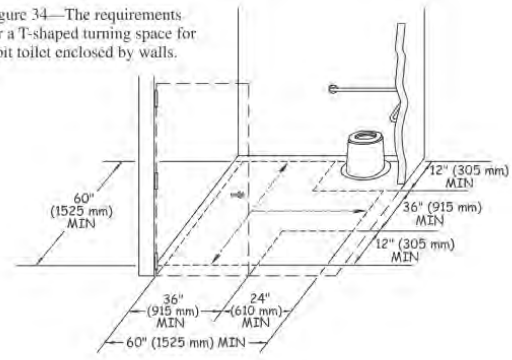
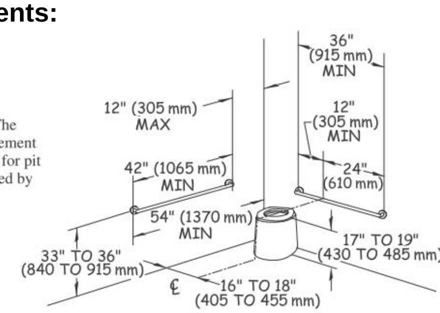
Figure 4—Minimum required dimensions for a passing space for an outdoor recreation access route or a beach access route.

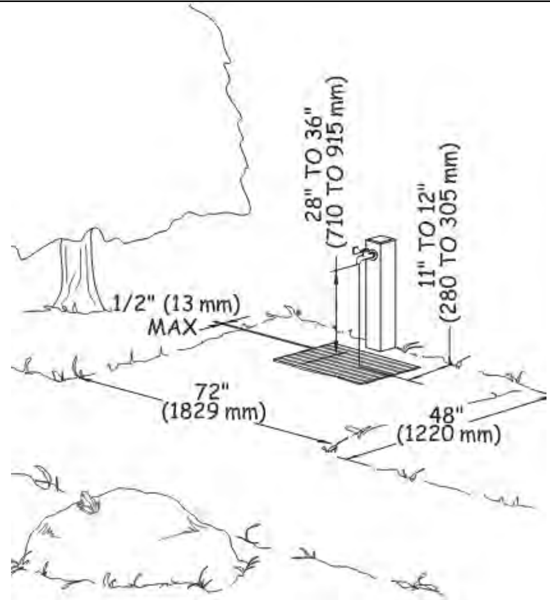
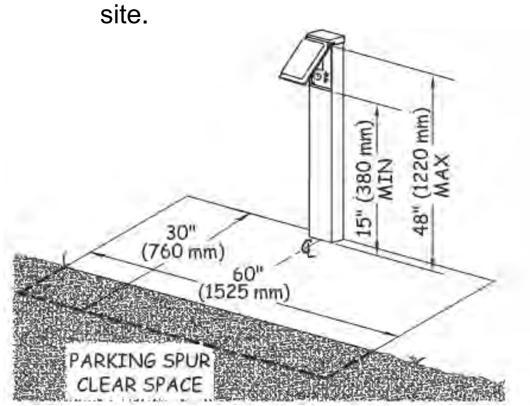
Facility/Amenity:	**Yes**	**No**	
A1 Restroom	☒	☐	Note: **No defined routes, but accessible**
A2 Boating Facilities	☐	☒	Note: **a, c, d**
A3 Fish Cleaning Station	☐	☒	Note: **a, b, c, d**
A4 Recycling/Trash	☐	☒	Note: Accessible routes to amenities, but the maneuvering space and the amenities themselves are not ADA compliant.
A5 Lake Shoreline/Beach Access Points	☐	☒	Note: **a, b, c, d,** There are no compliant beach access routes that allow access to the lake edge.

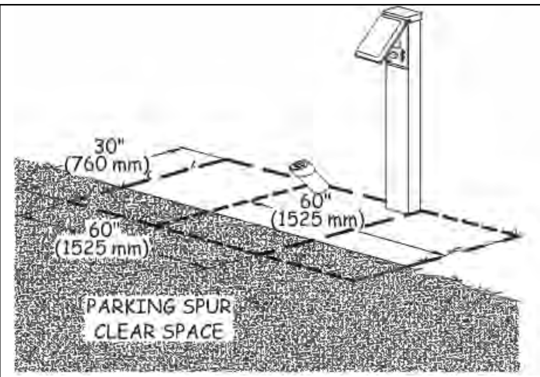
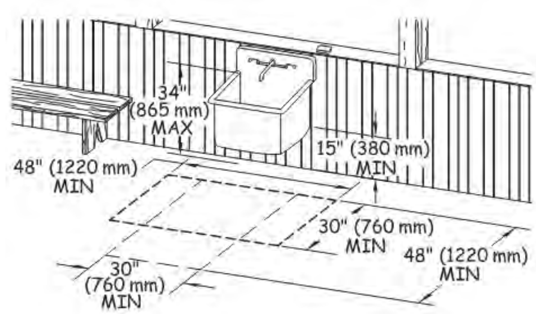
A6 Parking		☐	☒	Note: **c,d,** No ADA stalls identified.
A7 Viewing area (top of dam)		☐	☒	Note: **a, c, d,** Transition from parking to top of dam trail needs minor modifications to address slopes and stable surfacing.
A8 Drive Aisle / (Serves as ORAR)		☒	☐	Note: Paved, needs striping to reduce pedestrian\vehicular conflicts.
A9 Trailhead and Trail		☐	☒	Note: **a, b, c, d, e, f,**
A10 Boat Ramp		☐	☒	Note: **c,** Also no ADA parking, staging and loading areas are available.
(List Items in Notes if Not Compliant) a – Surface b – Clear Width c – Slope d – Cross Slope e – Resting Intervals f – Passing Space				**Comments:** • The drive aisle is partially paved and in fair condition. Needs some spot repairs. Serves as shared ORAR to amenities. • Transitions from paved to non-paved access needs spot repairs. **Possible Action:** • Pave and stripe ADA compliant parking stalls. • Pave and stripe ORAR route from parking to Restroom, Recycling. • Design and develop accessible routes to key Lake Shore Access Points • Design and develop accessible route to boat dock access, gangways and other amenities throughout the site. • Design and implement upgrades to trail to alleviate slope, surface, obstruction and clearance deficiencies. • Design and develop accessible boat/trailer parking, staging and loading area. • Provide accessible route to fish cleaning station or relocate station.
Restrooms	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
16. If restrooms are available to the public, is at least one restroom (either one for each sex, or unisex) fully accessible?	☐	☒	☐	**Comments:** • Single restroom building with 2 restrooms. Both are accessible but no designated routes to the building.
17. Are there signs at inaccessible restrooms	☒	☐	☐	**Comments:**

that give directions to accessible ones?				
18. Is there tactile signage identifying rest rooms? *Note: Mount signs on the wall, on the latch side of the door, complying with the permanent signage.*	☐	☐	☒	**Comments:** • No signs on building **Possible Action:** • Add signs.
19. Are pictograms or symbols used to identify rest rooms, and, if used, are raised characters and braille included below?	☐	☐	☒	**Comments:** • No signs on building **Possible Action:** • Add signs.
20. Is the doorway at least 32 inches clear?	☐	☒	☐	**Comments:**
21. Are doors equipped with accessible handles (operable with a closed fist), 48 inches high or less?	☐	☒	☐	**Comments:**
22. Can doors be opened easily (5 lbf max. force)?	☐	☒	☐	**Comments:**
23. Does the entry configuration provide adequate maneuvering space for a person using a wheelchair? *Note: A person using a wheelchair needs 36 inches of clear width for forward movement, and a 5-foot diameter clear space or a T-shaped space to make turns. A minimum distance of 48 inches clear of the door swing is needed between the two doors of an entry vestibule.*	☐	☒	☐	**Comments:**
24. Is there a 36-inch-wide path to all fixtures?	☐	☒	☐	**Comments:**
25. Is the stall door operable with a closed fist, inside and out?	☒	☐	☐	**Comments:** • Restroom does not have individual stalls
26. Is there a wheelchair-accessible stall that has an area of at least 5 feet by 5 feet, clear of the door swing, OR is there a stall that is less accessible but that provides greater access than a typical stall (either 36 by 69 inches or 48 by 69 inches)?	☐	☒	☐	**Comments:** • Restroom does not have individual partitioned stalls. Single occupancy restroom with compliant clearances.
27. In the accessible stall, are there grab bars behind and on the side wall nearest to the toilet?	☐	☒	☐	**Comments:**
28. Is the toilet seat 17 to 19 inches high?	☐	☒	☐	**Comments:**
29. Does one lavatory have a 30-inch-wide by	☒	☐	☐	**Comments:**

48-inch-deep clear space in front? *Note: A maximum of 19 inches of the required depth may be under the lavatory.*				• Restroom does not have lavatory
30. Is the lavatory rim no higher than 34 inches?	☒	☐	☐	**Comments:** • Restroom does not have lavatory
31. Is there at least 29 inches from the floor to the bottom of the lavatory apron?	☒	☐	☐	**Comments:** • Restroom does not have lavatory
32. Can the faucet be operated with one closed fist?	☒	☐	☐	**Comments:** • Restroom does not have lavatory
33. Are soap and other dispensers and hand dryers within reach ranges and usable with one closed fist?	☒	☐	☐	**Comments:** • Restroom does not have soap dispenser or hand dryer
34. Is the mirror mounted with the bottom edge of the reflecting surface 40 inches high or lower?	☒	☐	☐	**Comments:** • Restroom does not have mirror
35. Is there a clear space of 60 inches by 60 inches adjacent to the toilet?	☐	☒	☐	**Comments:**
36. Is the maneuvering space less than or equal to 1:50? (1:33 maximum allowed for drainage) (2% -3.3%)	☐	☒	☐	**Comments:**
37. If there is an ADA Accessible Portable Restroom, is there an accessible route and entry into the portable unit?	☒	☐	☐	**Comments:** • There were no portable units on site.
FSORAG Pit Toilet Restrooms Only	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
38. Is there an accessible route to the restroom? Where pit toilets are constructed in sites that are not accessed by motor vehicles, the pit toilets and all constructed features in the site shall be connected by trail segments complying with the FSTAG.	☐	☐	☐	**Comments:**
39. The clear floor or ground space shall be 60 inches wide minimum measured parallel with the back of the pit toilet, and 56 inches deep minimum measured parallel to the sides of the pit toilet. A turn-ing space that is at least 60 inches in diameter or T-shaped with a minimum 36 inches wide by 24 inches deep base centered on a minimum 36 inches wide by 60 inches long crossarm shall be provided, as shown in figure. The turning	☐	☐	☐	**Comments:**

space and clear floor or ground space may overlap.				Figure 34—The requirements for a T-shaped turning space for a pit toilet enclosed by walls. 
40. Is the surface of turning and clear floor or ground space firm and stable?	☐	☐	☐	**Comments:**
41. Is the slope of the turning space and clear floor or ground space surface no steeper than 2% in all directions?	☐	☐	☐	**Comments:**
42. Is the toilet seat 17 to 19 inches high?	☐	☐	☐	**Comments:**
43. Where walls or partitions are provided, the seat shall be positioned with a wall or partition to the rear and to one side of the seat for a left-hand or right-hand approach. The back of the riser shall be flush against the back wall. The centerline of the seat shall be 16 inches minimum to 18 inches maximum from the side wall or partition.	☐	☐	☐	**Comments:**
44. Where walls or partitions are provided, grab bars complying with ABAAS shall be provided, the same as for grab bars for toilets in administrative buildings. Required locations are shown in figure.	☐	☐	☐	**Comments:** Figure 36—The grab bar placement requirements for pit toilets enclosed by walls.  have vertical or nearly vertical sides and a flat area on each side of the seat that is about 3 inches (75 millimeters) wide.
45. Doors shall comply with ABAAS, the same as doors for buildings at administrative sites. The door shall not swing into or otherwise obstruct the clear floor or ground space required.	☐	☐	☐	**Comments:**
46. The entrance to the toilet shall be level with the surrounding surface.	☐	☐	☐	**Comments:**
Water Hydrants	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
47. Is the water hydrant clear floor or ground space around the hydrant 48 inches by 72 inches with the long side of the space adjoining an ORAR or another clear ground space (clear space shall not	☐	☐	☐	**Comments:** • No Hydrants observed on site. **Possible Action:**

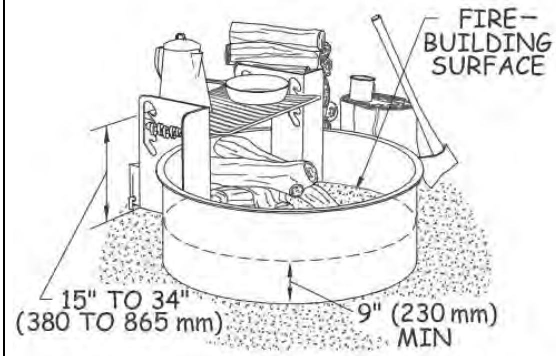
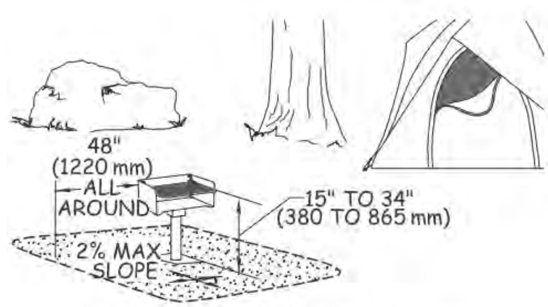
	n/a	Yes	No	
overlap ORAR)? NOTE: Until hand pumps are available that meet the accessibility standards for operating controls while adequately accessing the water supply are available from more than one source, hand pumps are exempt from the requirements for reach ranges and operability in ABAAS 308 and 309.4.				
48. Is water spout located between 28 inches and 36" above the ground?	☐	☐	☐	**Comments:**
49. Is the water spout located 11 inches minimum and 12 inches maximum from the rear center of the long side of the clear space?	☐	☐	☐	**Comments:**
50. If drain grates are provided, are the openings in the grates ½" maximum?	☐	☐	☐	**Comments:**
Utilities at Recreation Sites	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
51. Is there a clear floor or ground space of at least 30 by 60 inches oriented for front or parallel approach to all usable sides of the utilities? 52. Are the utility pedestals installed to adhere to the Reach Ranges and Operability Requirement as shown and/or as specified in 308 and 309 of ABAAS?	☐ ☐	☐ ☐	☐ ☐	**Comments:** • No applicable utilities observed on site. 

<table>
<tr><td></td><td></td><td></td><td></td><td>
</td></tr>
<tr><th>Utility Sinks</th><th>n/a</th><th>Yes</th><th>No</th><th>Comments / Possible Action</th></tr>
<tr><td colspan="5">☐ Check here if section does not apply to this site and move to next section.</td></tr>
<tr><td>53. Is the height of the rim or counter surrounding the sink 34 inches maximum above the ground or floor space?</td><td>☐</td><td>☐</td><td>☒</td><td rowspan="4">Comments:
Fish cleaning station with counter and sink located beyond trail head near Lake Sabrina Boat Landing Building.
No accessible route to location.
Not ADA compliant based on items 53-56.
Possible Action:
Relocate along accessible route possibly near parking lot and waste receptacles.
Design sink and counter to be compliant with items 53-56.

</td></tr>
<tr><td>54. Is the bottom of the bowl at least 15 inches above the ground or floor space?</td><td>☐</td><td>☐</td><td>☒</td></tr>
<tr><td>55. Is Water Spout 28 – 36” above ground or floor space.</td><td>☐</td><td>☐</td><td>☒</td></tr>
<tr><td>56. Do sink controls comply with reach ranges and operability specified in ABAAS?</td><td>☐</td><td>☐</td><td>☒</td></tr>
<tr><th>Drinking Fountain</th><th>n/a</th><th>Yes</th><th>No</th><th>Comments / Possible Action</th></tr>
<tr><td colspan="5">☒ Check here if section does not apply to this site and move to next section.</td></tr>
<tr><td>57. Is there at least one fountain with clear floor space of at least 30 by 48 inches in front?</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:
No drinking fountain observed on site.</td></tr>
<tr><td>58. Is there one fountain with its spout no higher than 36 inches from the ground, and another with a standard height spout (or a single "hi-lo" fountain)?</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
</table>

59. Are controls mounted on the front or on the side near the front edge, and operable with one closed fist?	☐	☐	☐	**Comments:**
60. Is each water fountain cane-detectable (located within 27 inches off the floor or protruding less than 4 inches from the wall, into the circulation path?	☐	☐	☐	**Comments:**

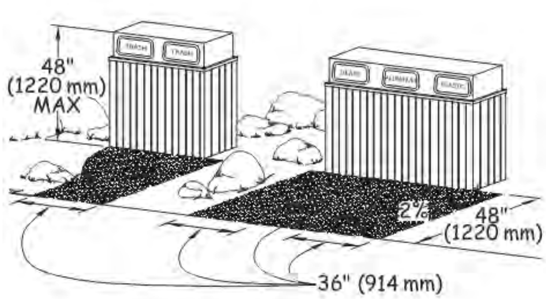
Directional and Informational Signage	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
61. If mounted about 80 inches, do they have letters at least 3 inches high, with high contrast, and non-glare finish?	☐	☐	☒	**Comments:** • Mounting heights need to be adjusted on some of the parking lot signs. Informational signs do not meet contrast requirements. • No signs mounted above 80 inches observed on site. **Possible Action:** • Review adopted sign standards and make sure they are ADA compliant. • Determine if standards need to be revised. • Replace signs based on compliance with adopted standards. • Adjust heights of signs as needed.
62. Do directional and informational signs comply with legibility requirements? (Building directories or temporary signs need not comply.)	☐	☐	☒	**Comments:** • Mounting heights need to be adjusted on some of the parking lot signs. Informational signs do not meet contrast requirements, text size on some size is not compliant. **Possible Action:** • Review adopted sign standards and make sure they are ADA compliant. • Determine if standards need to be revised. • Replace signs based on compliance with adopted standards. • Adjust heights of signs as needed.
63. If materials need to be obtained from or manipulated on a sign or kiosk, the sign or kiosk shall be designed to meet the reach ranges in section 308 of ABAAS and in figures 14 through 19.	☒	☐	☐	**Comments:** • No Kiosks observed at Lake Sabrina Boat Launch facility.

Fire Rings	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				

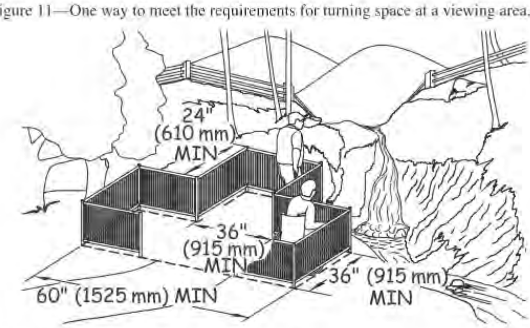
64. Is the fire surface height a minimum of 9" above the ground/floor?	☐	☐	☐	**Comments:** • No fire rings observed  Figure 22—The height requirements for manufactured steel fire rings.
65. Do all fire rings have a clear space extending a minimum 48" deep by 48" wide at all usable portions of the ring? This must be adjacent to ORAR but may not overlap the ORAR	☐	☐	☐	**Comments:**
66. Are the clear spaces around the fire pit on a firm and stable surface?	☐	☐	☐	**Comments:**
67. Are the slopes around fire pits not more than 1:50?	☐	☐	☐	**Comments:**
Cooking Surfaces, Grills, Pedestal Grills[2]	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
68. Are accessible cooking features dispersed throughout the area and among the types provided?	☐	☐	☐	**Comments:** • None observed
69. Are accessible cooking feature surfaces installed between 15 inches and 34 inches above the ground/floor?	☐	☐	☐	**Comments:**  Figure 24—The requirements for height, clear space, and reach range for a pedestal grill.
70. Do operating controls and mechanisms comply with current Clear Floor Space	☐	☐	☐	**Comments:**

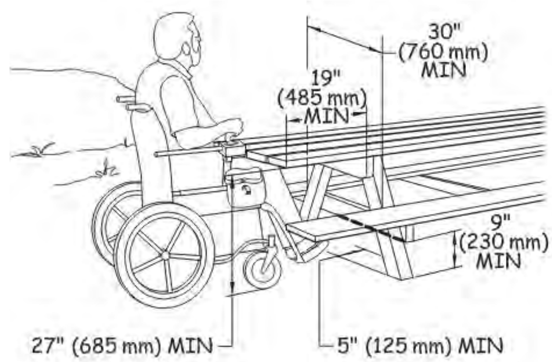
[2] Where there is only one cooking surface, grill or pedestal grill in a provided picnic area, it shall be accessible. Where multiple cooking features are provided in a picnic area, 50 percent, but no less than 2 shall be accessible.

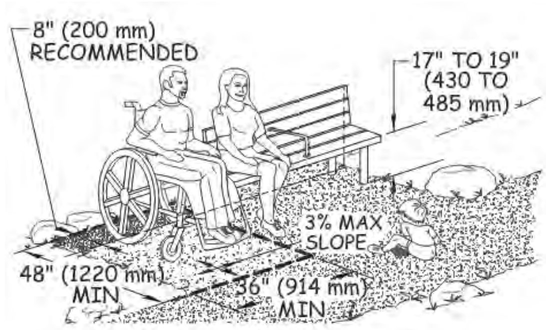
	n/a	Yes	No	
and Height standards?				
Fixed Trash/Recycling Containers	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				

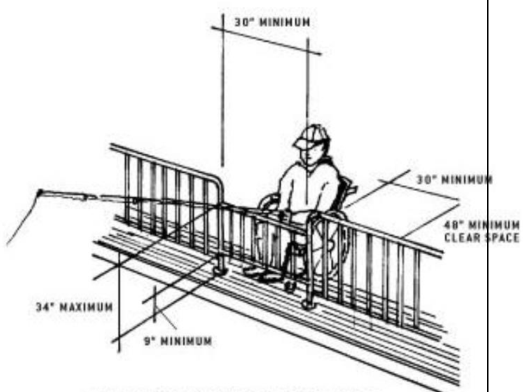
71. Is the clear floor or ground space for a forward approach 36 inches by 48 inches or for side approach 30 inches by 60 inches?

 	
	☐	☐	☒	**Comments:**
				• Movable recycling and trash containers were located near the Lake Sabrina Boat Landing Building.
				  ○ Not located in a designated area with compliant approach and reach.
				  ○ Not compliant furnishing type.
				• 2 dumpsters are located within parking lot.
				Possible Action:
				• Fixed receptacles should be installed in a designated area(s) along an ORAR and adhere to FSORAG standards.

72. Are the Trash / Recycling containers themselves an ADA compliant model?	☐	☐	☒	**Comments:** • Model of containers observed do not meet ADA compliance **Possible Action:** • ADA compliant containers should be installed. 
Overlooks/Viewing Areas	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
73. Where multiple viewing areas at overlooks are provided, at least one of each viewing opportunity for distinct points of interest shall be accessible.	☐	☒	☐	**Comments:** • The entire walk along the top of the dam can be considered a viewing area. • No additional designated viewing areas observed.
74. Are all viewing areas constructed to provide an unobstructed view?	☐	☒	☐	**Comments:** • Railing does not significantly obstruct views.

				
75. Is there at least one 60” x 60” maneuvering space or T-shaped turning space?	☐	☒	☐	**Comments:** • Pathway allows for maneuvering space.  Figure 11—One way to meet the requirements for turning space at a viewing area.  Figure 12—The requirements for a T-shaped turning space at a viewing area.
76. Is the ground surface firm and stable?	☐	☒	☐	**Comments:** • Pathway is surfaced with graded and compacted native earthen material. It appears to meet stability requirements under dry conditions. o Assumes that surface material is deemed acceptable for ORAR standard adopted for this facility.
77. Is the maneuvering space less than or equal to 1:50? (1:33 maximum allowed for drainage)	☐	☒	☐	**Comments:**

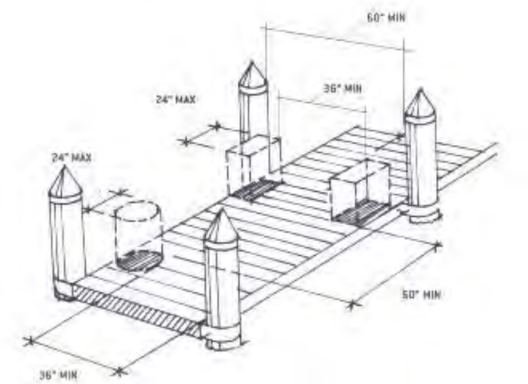
78. Does accessible viewing area of a 36” minimum x 48” minimum and at least one turning space that complies with section 304.3 of ABAAS?	☐	☒	☐	**Comments:**
Picnic Tables (Units)	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
79. Is there an accessible route to and within common use areas that complies with FSORAG? At least 48” of clear floor or ground space shall surround the usable sides of the picnic table measured from back edge of the benches.	☐	☐	☐	**Comments:** • No tables observed on site.
80. Where more than two picnic tables are provided, are at least 20% but not less than two mobility compliant Tables (Compliant Yes/No): C1: Table #1 (List Items in Notes if Not Compliant) a – Knee Space b – Clear Space Around Table c – Slope d – Cross Slope e – Firm and Stable Surface f – Accessible Route	☐	☐ ☐	☐ ☐	**Comments:** Note: 
81. Are knee spaces at accessible picnic tables at least 27 inches high, 30 inches wide, and 19 inches deep?	☐	☐	☐	**Comments:**
82. Information on location of accessible picnic units provided at bulletin boards or information kiosks (otherwise this will need to be provided on web sites or in brochures)? Do not identify at individual picnic units.	☐	☐	☐	**Comments:**
83. Each picnic table shall have at least one wheelchair seating space. Up to 9’ long tables=require 1 space 10-20’ long tables=require 2 spaces See FSORAG figure 4.1.2 for larger tables	☐	☐	☐	**Comments:**
Benches	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
84. Where multiple benches are provided,	☐	☐	☐	**Comments:**

	n/a	Yes	No	Comments
are at least 50% consistent with this section? Benches (Compliant Yes/No): D1________________________________ D2________________________________ D3________________________________ D4________________________________ (List Items in Notes if Not Compliant) a – Back Support b – Front Edge of Bench 17-19" Above Ground/Floor c – 30" x 48" Clear Floor or Ground Space Adjacent to Bench d – Firm and Stable Surface e – Arm Rest f – Accessible Route		☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	• No benches observed on site. Note: Note: Note: Note: 
85. Where multiple benches are provided, are at least 20% connected to an ORAR?	☐	☐	☐	**Comments:**
86. Of the accessible benches that are provided, do at least 50% of those benches have back rests? In addition, one armrest shall be provided at one end or in the middle of at least 50% of the benches with backrests.	☐	☐	☐	**Comments:**
87. Are the front edges of accessible benches between 17 and 19 inches maximum above the ground/floor?	☐	☐	☐	**Comments:**
88. Is there a 36" x 48" Clear Floor or Ground Space adjacent to the bench?	☐	☐	☐	**Comments:**
89. Is the ground/floor surface around the accessible benches firm and stable?	☐	☐	☐	**Comments:**
Accessible Fishing Piers/Platforms	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
90. Is there at least one unobstructed accessible route to the fishing pier or platform? (minimum 36" width, maximum 2% cross slope and maximum 8.33% running slope)	☐	☐	☐	**Comments:** • There are no accessible fishing piers of platforms on site. **Possible Action:** • Construct Accessible Fishing Pier

91. Is there a clear floor or ground space (30 inches by 48 inches minimum) at each location that has a railing height of 34 inches maximum?	☐	☐	☐	**Comments:**
92. Is there edge protection that is a minimum of 2 inches above the ground or deck surface?	☐	☐	☐	**Comments:**
93. Is there at least one tuning area, either a 60-inch turning space or a T-shaped space, to allow a person using a mobility device or wheelchair to make a 180-degree turn?	☐	☐	☐	**Comments:**
94. Where railings are provided on fishing piers or platforms, do they comply with ADAAG provisions?  RAILING HEIGHTS AND CLEAR SPACE	☐	☐	☐	**Comments:**
95. Where railings are provided, are there multiple locations where the railing is 34 inches high maximum to offer a variety of fishing location options?	☐	☐	☐	**Comments:**
Lake Shore / Beach Access	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
96. Is at least one beach access route provided for each one-half mile of shoreline where the following occur? • Where circulation routes such as boardwalks, walkways, or dune crossings are provided along or across developed beach sites to provide pedestrian access to the beach or shoreline. • Where parking facilities are provided at developed beach sites and pedestrian access to the beach is provided near the parking facilities. • Where bathing and toilet facilities are provided at developed beach sites	☐	☐	☒	**Comments:** • There are no compliant beach access routes that allow access to the lake edge. ○ There is no ORAR to the water's edge due to surfacing, slopes and obstructions. **Possible Action:** • Design and construct well-defined accessible routes.

	n/a	Yes	No	
and pedestrian access points to the beach are pro-vided near the bathing and toilet facilities. • Where a beach nourishment project is undertaken.				
97. Does beach access route have a clear width of 60 inches minimum?	☒	☐	☐	**Comments:** • No defined accessible beach access routes.
98. Is the access route 5% or less for any distance?	☒	☐	☐	**Comments:** • No defined accessible beach access routes.
99. Do the segment lengths meet the following requirements: Max. 50 LF @ 5% - 8.33% Max. 30 LF @ 8.33% - 10%	☒	☐	☐	**Comments:** • No defined accessible beach access routes.
100. Where slopes are steeper than 5% for the given runs above, are there resting intervals provided at the top and bottom of the runs (60 inches long x 60 inches wide with maximum slopes of 3% in any direction. If surface is paved or elevated above natural ground, the surface shall not be steeper than 2% in any direction)?	☒	☐	☐	**Comments:** • No defined accessible beach access routes.
101. Are all cross slopes a maximum of 3%, and where surface is paved or elevated above the natural ground, the cross slopes are a maximum of 2%?	☒	☐	☐	**Comments:** • No defined accessible beach access routes.
102. Are there any obstacles on beach access route that exceed 1 inch in height measured vertically to the highest point? Where the surface is concrete, asphalt, or boards, obstacles shall not exceed one-half inch in height measured vertically to the highest point.	☒	☐	☐	**Comments:** • No defined accessible beach access routes.
103. Constructed features, including signs, shall not extend into the space above a beach access route more than 4 inches if they are between 27 inches and 80 inches above the surface of the beach access route.	☒	☐	☐	**Comments:** • No defined accessible beach access routes.
Gates and Barriers	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
104. Gate openings and openings in barriers for pedestrian passage shall provide a clear width of 36" inches, complying with ODAAG section 1017.3 Clear Tread Width.	☐	☒	☐	**Comments:** • There is one vehicular gate at the entrance to the top of the dam. • There is a min. 36: opening between the gate post and the guardrail.

<table>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><th>Boating Facilities</th><th>n/a</th><th>Yes</th><th>No</th><th>Comments / Possible Action</th></tr>
<tr><td colspan="5">☐ Check here if section does not apply to this site and move to next section.</td></tr>
<tr><td>105. Is there an accessible route to the boating facilities?
</td><td>☐</td><td>☐</td><td>☒</td><td>Comments:
There are no accessible routes identified.
Floating docks are designed to be movable and not in permanently fixed locations.
No compliant ORAR to dock locations observed during this assessment.
Depending on the fluctuation of the reservoir water elevation, and with the use of the floating gangways, there may be an opportunity for an accessible route.
Possible Action:
Design and construct an ORAR to the dock locations that allow access during both high and low water conditions.</td></tr>
<tr><td>106. Does the gangway to the dock or floating dock deigned to provide for a maximum 1:12 (8.33%) slope?
Note: Not required to be longer than 80 feet. (Elevators may be used in lieu of gangways) In smaller facilities with less than 25 boat slips, the slope of the gangway may exceed 1:12, if the gangway is at least 30 feet long.
</td><td>☐</td><td>☐</td><td>☒</td><td>Comments:
Conditions observed during site visit were at low water levels. These should be further assessed and evaluated during high water conditions.
</td></tr>
</table>

<table>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>107. Does the gangway have a transition plate to the pier or platform that meets codei?</td><td>☐</td><td>☐</td><td>☒</td><td>Comments:
None observed. But gangways were not setup to be functional at time of assessment.</td></tr>
<tr><td>108. Where boat slips are provided, does the number of accessible slips comply with the table to the right?
Note: If boat slips at a facility are not identified or demarcated by length, each 40 feet of boat slip edge along the perimeter of a pier will be counted as one boat slip</td><td>☐</td><td>☐</td><td>☒</td><td>
<table>
<tr><th colspan="2">Number of Accessible Boat Slips Required</th></tr>
<tr><td>Total Slips in Facility</td><td>Minimum Accessible Slips</td></tr>
<tr><td>1-25</td><td>1</td></tr>
<tr><td>26-50</td><td>2</td></tr>
<tr><td>50-100</td><td>3</td></tr>
<tr><td>101-150</td><td>4</td></tr>
</table>


PIER CLEARANCE SPACE REDUCTION</td></tr>
<tr><td>109. If the facility only has a boarding pier (see footnote # 9) at least 5% but not less than, must comply with these guidelines. The entire length of accessible boarding piers must comply with the same provisions that apply to slips. Does this facility meet this regulation?</td><td>☒</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
<tr><td>110. Is this facility compromised only of a boat launch with no boarding ramp or pier?</td><td>☐</td><td>☒</td><td>☐</td><td>Comments:</td></tr>
</table>

Item Number	Notes


John Muir Wilderness
Roadside Parking
Roadside Parking
Roadside Parking
Trailhead & Information Kiosk
Roadside Parking
Roadside Parking
Roadside Parking
Roadside Parking
Parking Area
PARKING LOT B
Restroom
RESTROOM
Parking Area
PARKING LOT A
FISH CLEANING STATION
Marina
GATE
Boat Launch & Piers
Lake Sabrina
BEACH ACCESS
BOATING FACILITY
BOAT RAMP
OVERLOOK/ VIEWING AREA
Sabrina Dam
Sabrina Basin Trail

APPENDIX C

SOUTH LAKE LAUNCHING FACILITY FSORAG COMPLIANCE CHECKLIST

Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG)

Compliance Checklist

The purpose of this checklist is to locate and assess site components within existing public outdoor recreation facilities, for compliance with the Forest Service Outdoor Recreation Accessibility Guidelines (FSORG). The Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG) and the Forest Service Trail Accessibility Guidelines (FSTAG) are the legally enforceable standards for use on the National Forest System for the facilities and features addressed in those guidelines. They, in part, incorporate sections of the Architectural Barriers Act Accessibility Standards (ABAAS), and the Outdoor Developed Area Accessibility Guidelines (ODAAG), developed by the Architectural and Transportation Barriers Compliance Board (U.S. Access Board).

This checklist serves as a planning tool to assist with identifying accessibility deficiencies within a facility and possible actions to be considered for correcting them.

Facility Name: SOUTH LAKE – LAUNCHING FACILITY
Date Surveyed: 08/04/2020
Surveyor(s): E. MILLS; J. SANDLIN

<table>
<tr><th colspan="2">Site Component</th><th colspan="3">Compliant</th><th></th></tr>
<tr><th colspan="2">Parking</th><th>n/a</th><th>Yes</th><th>No</th><th>Comments / Possible Action</th></tr>
<tr><td colspan="6">☐ Check here if section does not apply to this site and move to next section.</td></tr>
<tr><td colspan="2">1. Are an adequate number of accessible parking spaces available? The table below gives the ADAAG requirement for new construction and alterations (for lots with more than 100 spaces refer to ADAAG).

Accessible Spaces per Overall spaces</td><td rowspan="2">☐</td><td rowspan="2">☐</td><td rowspan="2">☒</td><td rowspan="2">Comments:
2 separated parking lots assessed separately:
PARKING LOT C (near stair access and restrooms)
• Pavement quality is in good condition.
• Parking Lot C – has room for 7 standard stalls and 1 ADA stall will loading area.
  ○ Needs to be re-striped.
  ○ No designated boat trailer spaces.
  ○ No accessible boat loading areas.
  ○ Minimum of 1 accessible space required, with at least one being Van Accessible.

PARKING LOT D (across from boat launch entry)
• Pavement quality is in good condition.
• Parking Lot D – has room for 15 stalls</td></tr>
<tr><td>Total Spaces

1 to 25
26 to 50
51 to 75
76 to 100</td><td>Accessible Spaces Required

1 space
2 spaces
3 spaces
4 spaces</td></tr>
</table>

 				○ Needs to be re-striped. ○ No designated boat trailer spaces. • There are no designated accessible parking spaces. ○ Minimum of 1 accessible space required, with at least one being Van Accessible. ○ No designated boat trailer spaces. ○ No accessible boat loading areas. **Recommendation**: Parking Lot D does not have any ADA accessible amenities and the route between Lot D and the Launch Facility is not ADA compliant. Therefore, it is recommended that 1 ADA Parking Stalls be designed and constructed near the entry to the launch facility where there is currently space dedicated to staff. **Possible Action:** • Construct ADA Boat Loading and Parking areas. • Upgrade striping to include demarcation of pedestrian access routes / crossings within parking lots C and D.
2. Are the accessible parking spaces located closest to the accessible route and accessible building entrance?	☐	☐	☒	**Comments:** • No accessible spaces at launch facility
3. Are an adequate number of van accessible spaces provided? At least 1 of every 8 accessible spaces must be van-accessible (with a minimum of 1 van-accessible space in all cases.)	☐	☐	☒	**Comments:** • No accessible spaces at launch facility
4. Are the access aisles part of the accessible route?	☐	☐	☒	**Comments:** • No accessible spaces at launch facility
5. Do the access aisles have a cross slope less than 1:48, and have a firm, stable non-slip surface?	☐	☐	☒	**Comments:** • No accessible spaces at launch facility
6. Do the access aisles connect to an accessible pedestrian route with a minimum clear and unobstructed width of 36 inches?	☐	☐	☒	**Comments:** • No accessible spaces at launch facility

		n/a	Yes	No	Comments / Possible Action
7.	Does the accessible car parking space measure 96 inches wide with an adjoining access aisle 96 inches wide? OR Does the accessible van parking space measure 132 inches wide with an adjoining access aisle 60 inches wide?	☐	☐	☒	**Comments:** • No accessible spaces at launch facility
8.	Are accessible spaces marked with and International Symbol of Accessibility? Are there signs reading "Van Accessible" at van spaces? Is Sign Mounted 60" min. from ground to bottom of sign?	☐	☐	☒	**Comments:** • No accessible spaces at launch facility
9.	Is there an enforcement procedure to ensure that accessible parking is used only by those who need it?	☐	☐	☒	**Comments:** • No accessible spaces at launch facility
	Drop-off / Public Transit Areas	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒	Check here if section does not apply to this site and move to next section.				
10.	Is there a passenger pick up and drop off zone? If so, is at least one passenger loading zone accessible which measures 96 inches wide by 20 feet long with a 60-inch-wide access aisle parallel to the vehicle pull up space and at the same level as the roadway?	☐	☐	☐	**Comments:**
11.	Do curbs on the accessible route have curb cuts or curb ramps at 1:12 slope? NOTE: If a slope of 1:12 is not possible, a slope between 1:10 and 1:12 is allowed for a MAX RISE of 6 inches. A slope between 1:8 and 1:10 is allowed for a MAX RISE of 3 inches. A slope steeper than 1:8 is not allowed. Flared sides may be 1:10 slope.	☐	☐	☐	**Comments:**
12.	Is curb cut/curb ramp flush with surrounding grade?	☐	☐	☐	**Comments:**
13.	Is the curb cut/ramp 36 inches wide, exclusive of flared sides?	☐	☐	☐	**Comments:**
14.	Are there public transportation stops on site, if so, is an accessible route provided to the building from the stop?	☐	☐	☐	**Comments:**
	Outdoor Recreation Access Routes[1]	**n/a**	**Yes**	**No**	**Comments / Possible Action**

[1] To meet (FSORAG) Outdoor Recreation Access Routes (ORARs) shall be provided between units and constructed features in campgrounds, picnic areas, trailheads, viewing areas, and other outdoor recreation sites. ORARs shall connect the outdoor constructed features within each recreation site and shall connect to common use features such as toilets, showers, water spouts, trash or recycling receptacles, parking spaces, and beach access routes. Where ORARs are provided within vehicular ways, those ORARs shall not be required to comply with sections 2.4 Slope, 2.5 Resting Intervals, and 2.6 Passing Spaces.

☐ Check here if section does not apply to this site and move to next section.

15. Does the park have accessible routes (ORARs) to all accessible facilities within the park?
Surface: shall be firm and stable. The type of surface should be appropriate to the setting and level of development.
Clear width: 36”, may be reduced to 32” per 1.1 conditions.
Slope: 5% or less. Up to 8.33% for 50 feet or 10% for 30 feet with resting intervals that are minimum of 60 inches long, see figure 3.
Cross Slope: 3% maximum. Where the surface is paved or elevate above natural ground, cross slope shall not be greater than 2%.
Passing spaces: if accessible route is less than 60 inches wide provide passing spaces at intervals of 200’ maximum, see figure 4.

☐ ☐ ☒

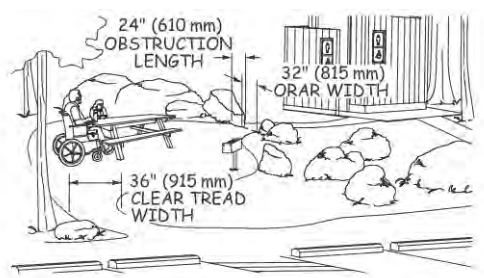


Figure 1—The clear tread width is the unobstructed width of the traveling surfac

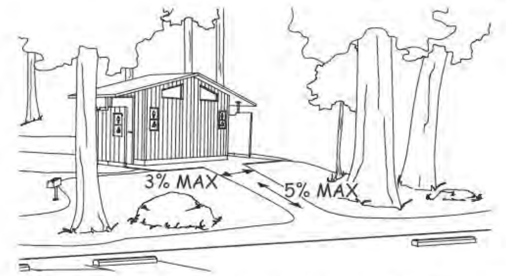


Figure 2—The basic slope requirements for outdoor recreation access routes and beach access routes.

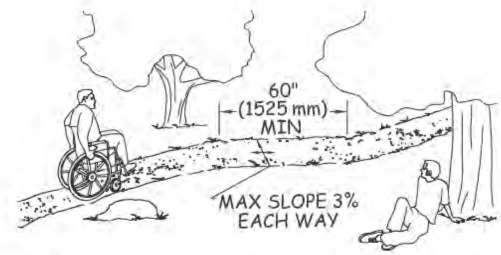


Figure 3—The basic resting interval requirements for outdoor recreation access routes.

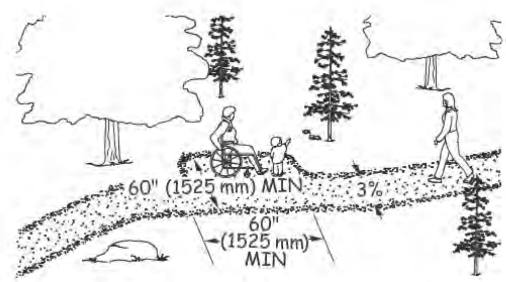


Figure 4—Minimum required dimensions for a passing space for an outdoor recreation access route or a beach access route.

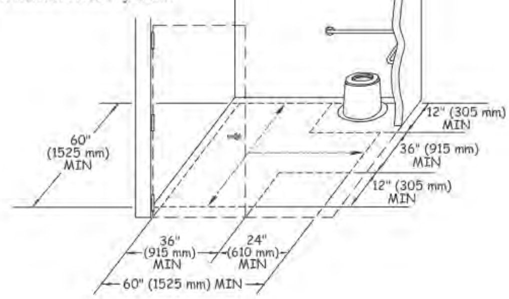
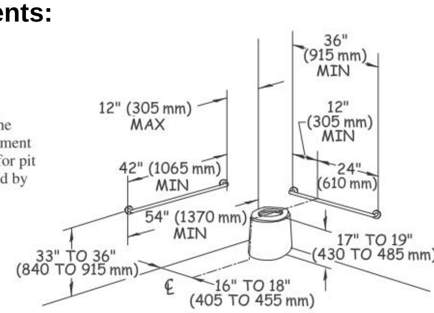
Facility/Amenity:	**Yes**	**No**	
A1 Restroom	☒	☐	Note: There is a paved route to the restroom from the parking lot that crosses the drive aisle.
A2 Boating Facilities	☐	☒	Note: **a, b, c, d** No accessible route to boating facilities. No ADA staging, loading or parking.
A3 Lake Shoreline/Beach Access Points	☐	☒	Note: **a, b, c, d** No accessible routes to shoreline.
A4 Parking	☐	☒	Note: No ADA compliant parking stalls associated with the Launch Facility
A5 Drive Aisle / (Serves as ORAR)	☐	☒	Note: Striping needed to lessen pedestrian

				vs. vehicular conflicts. Abrupt transitions between paved and non-paved surfaces along ORAR.
A6 Boat Ramp		☐	☒	Note: **a, c,** There is a mix of loose earthen material approaching the top of the boat ramp. There is not an ORAR that circumvents the gate when closed.
A7 Picnic tables		☐	☒	Note: **a, b, c, d,** No accessible routes to tables.
A8 Marina Building		☐	☒	Note: **a, b, c, d,** No accessible routes to Marina Building. Abrupt grad change at ramp. 
A9 Stairs and trail from restroom to shoreline / dock ***(Risk Assessment vs ADA Compliance Issue).*** (List Items in Notes if Not Compliant) a – Surface b – Clear Width c – Slope d – Cross Slope e – Resting Intervals f – Passing Space		☐	☒	Note: **a,b,c,d,e,f,** Stairs and route need significant repairs to reduce risk and provide access.  **Possible Action:** • Stripe and sign ADA compliant parking stall and crossing near

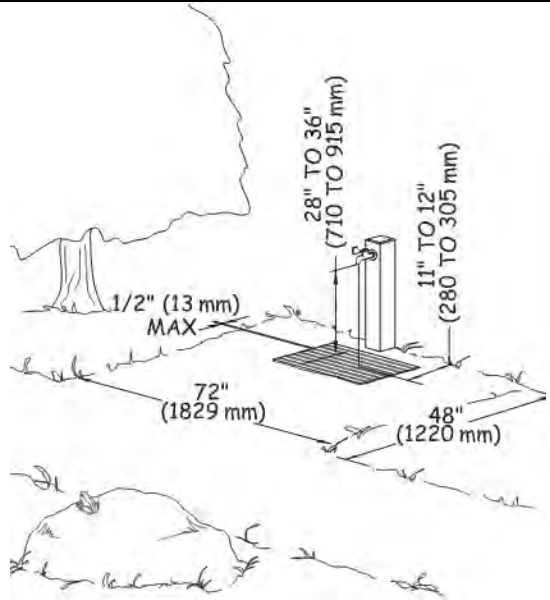
	n/a	Yes	No	
				restroom. • Design and construct ADA parking stall near marina/boat ramp. • Design and construct ORAR route from parking to shoreline, picnic tables, marina building, floating docks and other amenities throughout the site. • Design and construct improvements to ORAR from restroom to shoreline to reduce safety concerns and improve access.
Restrooms	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
16. If restrooms are available to the public, is at least one restroom (either one for each sex, or unisex) fully accessible?	☐	☒	☐	**Comments:** • Single restroom building with 2 restrooms. (1) restroom has potential to be ADA accessible.
17. Are there signs at inaccessible restrooms that give directions to accessible ones?	☐	☐	☒	**Comments:** • No signs **Possible Action:** • In lieu of renovating the restroom, it may be more feasible to direct users to the nearby restroom located at the trailhead parking lot.
18. Is there tactile signage identifying rest rooms? *Note: Mount signs on the wall, on the latch side of the door, complying with the permanent signage.*	☐	☐	☒	**Comments:** • No signs on building
19. Are pictograms or symbols used to identify rest rooms, and, if used, are raised characters and braille included below?	☐	☐	☒	**Comments:** • No signs on building **Possible Action:** • Add signs.
20. Is the doorway at least 32 inches clear?	☐	☒	☐	**Comments:**
21. Are doors equipped with accessible handles (operable with a closed fist), 48 inches high or less?	☐	☐	☒	**Comments:** • Loop style handle • Lock is mounted too high **Possible Action:** • Replace door hardware

				
22. Can doors be opened easily (5 lbf max. force)?	☐	☒	☐	**Comments:**
23. Does the entry configuration provide adequate maneuvering space for a person using a wheelchair? *Note: A person using a wheelchair needs 36 inches of clear width for forward movement, and a 5-foot diameter clear space or a T-shaped space to make turns. A minimum distance of 48 inches clear of the door swing is needed between the two doors of an entry vestibule.*	☐	☒	☐	**Comments:** • Clearances at entrance are at minimum 48" for the door swing. • Masonry privacy partition in front of building makes maneuvering space tight.
24. Is there a 36-inch-wide path to all fixtures?	☐	☒	☐	**Comments:**
25. Is the stall door operable with a closed fist, inside and out?	☒	☐	☐	**Comments:** • Restroom does not have individual stalls
26. Is there a wheelchair-accessible stall that has an area of at least 5 feet by 5 feet, clear of the door swing, OR is there a stall that is less accessible but that provides greater access than a typical stall (either 36 by 69 inches or 48 by 69 inches)?	☐	☒	☐	**Comments:** • Restroom does not have individual partitioned stalls. Single occupancy restroom with compliant clearances.
27. In the accessible stall, are there grab bars behind and on the side wall nearest to the toilet?	☐	☒	☐	**Comments:**
28. Is the toilet seat 17 to 19 inches high?	☐	☒	☐	**Comments:**

	n/a	Yes	No	Comments
29. Does one lavatory have a 30-inch-wide by 48-inch-deep clear space in front? *Note: A maximum of 19 inches of the required depth may be under the lavatory.*	☒	☐	☐	**Comments:** • Restroom does not have lavatory
30. Is the lavatory rim no higher than 34 inches?	☒	☐	☐	**Comments:** • Restroom does not have lavatory
31. Is there at least 29 inches from the floor to the bottom of the lavatory apron?	☒	☐	☐	**Comments:** • Restroom does not have lavatory
32. Can the faucet be operated with one closed fist?	☒	☐	☐	**Comments:** • Restroom does not have lavatory
33. Are soap and other dispensers and hand dryers within reach ranges and usable with one closed fist?	☒	☐	☐	**Comments:** • Restroom does not have soap dispenser or hand dryer
34. Is the mirror mounted with the bottom edge of the reflecting surface 40 inches high or lower?	☒	☐	☐	**Comments:** • Restroom does not have mirror
35. Is there a clear space of 60 inches by 60 inches adjacent to the toilet?	☐	☐	☒	**Comments:** • T-shaped access
36. Is the maneuvering space less than or equal to 1:50? (1:33 maximum allowed for drainage) (2% -3.3%)	☐	☒	☐	**Comments:**
37. If there is a ADA Accessible Portable Restroom, is there an accessible route and entry into the portable unit?	☒	☐	☐	**Comments:** • There were no portable units on site.
FSORAG Pit Toilet Restrooms Only	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
38. Is there an accessible route to the restroom? Where pit toilets are constructed in sites that are not accessed by motor vehicles, the pit toilets and all constructed features in the site shall be connected by trail segments complying with the FSTAG.	☐	☐	☐	**Comments:**
39. The clear floor or ground space shall be 60 inches wide minimum measured parallel with the back of the pit toilet, and 56 inches deep minimum measured parallel to the sides of the pit toilet. A turn-ing space that is at least 60 inches in diameter or T-shaped with a minimum 36 inches wide by 24 inches deep base centered on a minimum 36 inches wide by 60 inches long crossarm shall be	☐	☐	☐	**Comments:**

provided, as shown in figure. The turning space and clear floor or ground space may overlap.				Figure 34—The requirements for a T-shaped turning space for a pit toilet enclosed by walls. 
40. Is the surface of turning and clear floor or ground space firm and stable?	☐	☐	☐	**Comments:**
41. Is the slope of the turning space and clear floor or ground space surface no steeper than 2% in all directions?	☐	☐	☐	**Comments:**
42. Is the toilet seat 17 to 19 inches high?	☐	☐	☐	**Comments:**
43. Where walls or partitions are provided, the seat shall be positioned with a wall or partition to the rear and to one side of the seat for a left-hand or right-hand approach. The back of the riser shall be flush against the back wall. The centerline of the seat shall be 16 inches minimum to 18 inches maximum from the side wall or partition.	☐	☐	☐	**Comments:**
44. Where walls or partitions are provided, grab bars complying with ABAAS shall be provided, the same as for grab bars for toilets in administrative buildings. Required locations are shown in figure.	☐	☐	☐	**Comments:** Figure 36—The grab bar placement requirements for pit toilets enclosed by walls.  have vertical or nearly vertical sides and a flat area on each side of the seat that is about 3 inches (75 millimeters) wide.
45. Doors shall comply with ABAAS, the same as doors for buildings at administrative sites. The door shall not swing into or otherwise obstruct the clear floor or ground space required.	☐	☐	☐	**Comments:**
46. The entrance to the toilet shall be level with the surrounding surface.	☐	☐	☐	**Comments:**
Water Hydrants	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
47. Is the water hydrant clear floor or ground space around the hydrant 48 inches by 72 inches with the long side of the space adjoining an ORAR or another clear ground space (clear space shall not	☐	☐	☐	**Comments:** • No Hydrants observed on site. **Possible Action:**

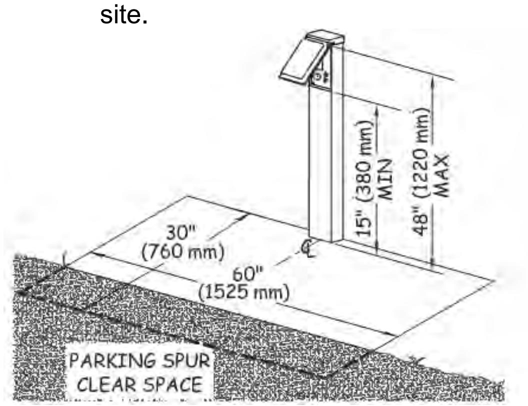
<table>
<tr><td>overlap ORAR)?

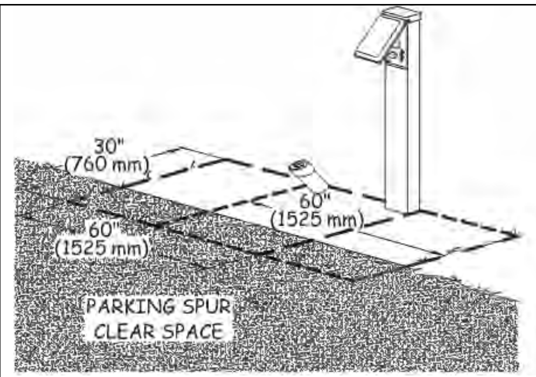
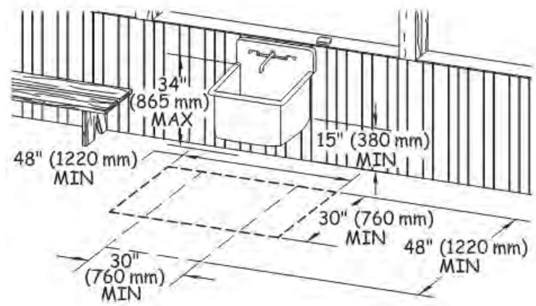
NOTE: Until hand pumps are available that meet the accessibility standards for operating controls while adequately accessing the water supply are available from more than one source, hand pumps are exempt from the requirements for reach ranges and operability in ABAAS 308 and 309.4.</td><td></td><td></td><td></td><td>
</td></tr>
<tr><td>48. Is water spout located between 28 inches and 36” above the ground?</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
<tr><td>49. Is the water spout located 11 inches minimum and 12 inches maximum from the rear center of the long side of the clear space?</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
<tr><td>50. If drain grates are provided, are the openings in the grates ½” maximum?</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
<tr><th>Utilities at Recreation Sites</th><th>n/a</th><th>Yes</th><th>No</th><th>Comments / Possible Action</th></tr>
<tr><td colspan="5">☒ Check here if section does not apply to this site and move to next section.</td></tr>
<tr><td>51. Is there a clear floor or ground space of at least 30 by 60 inches oriented for front or parallel approach to all usable sides of the utilities?

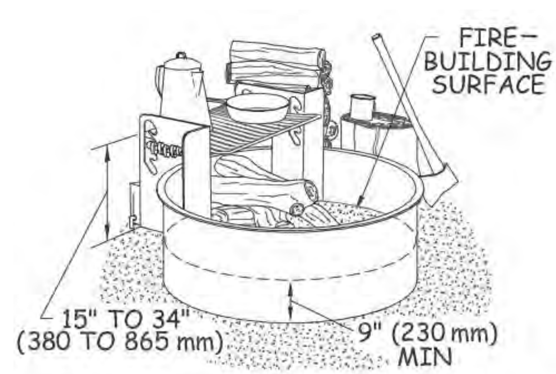
52. Are the utility pedestals installed to adhere to the Reach Ranges and Operability Requirement as shown and/or as specified in 308 and 309 of ABAAS?</td><td>☐

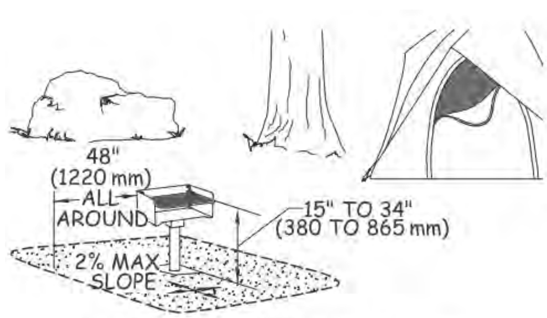
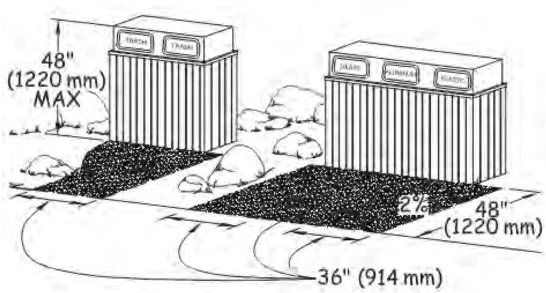
☐</td><td>☐

☐</td><td>☐

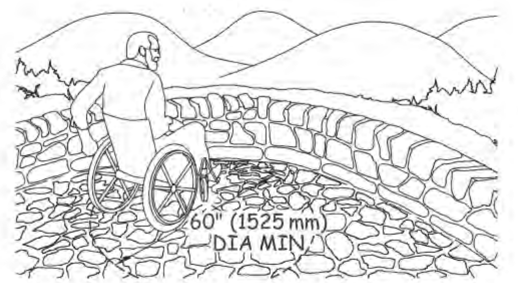
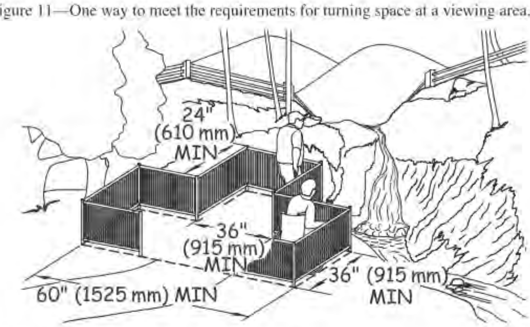
☐</td><td>Comments:
• No applicable utilities observed on site.

</td></tr>
</table>

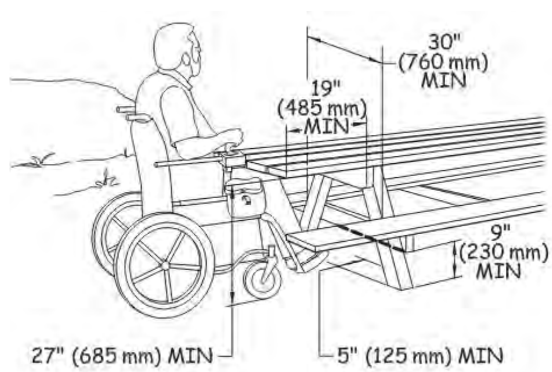
	n/a	Yes	No	Comments / Possible Action
				
Utility Sinks	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
53. Is the height of the rim or counter surrounding the sink 34 inches maximum above the ground or floor space?	☐	☐	☐	**Comments:** • None observed 
54. Is the bottom of the bowl at least 15 inches above the ground or floor space?	☐	☐	☐	
55. Is Water Spout 28 – 36" above ground or floor space.	☐	☐	☐	
56. Do sink controls comply with reach ranges and operability specified in ABAAS?	☐	☐	☐	
Drinking Fountain	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
57. Is there at least one fountain with clear floor space of at least 30 by 48 inches in front?	☐	☐	☐	**Comments:** • No drinking fountain observed on site.
58. Is there one fountain with its spout no higher than 36 inches from the ground, and another with a standard height spout (or a single "hi-lo" fountain)?	☐	☐	☐	**Comments:**
59. Are controls mounted on the front or on the side near the front edge, and operable with one closed fist?	☐	☐	☐	**Comments:**
60. Is each water fountain cane-detectable (located within 27 inches off the floor or protruding less than 4 inches from the wall, into the circulation path?	☐	☐	☐	**Comments:**
Directional and Informational Signage	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
61. If mounted about 80 inches, do they have letters at least 3 inches high, with high	☒	☒	☐	**Comments:** • No signs mounted above 80 inches

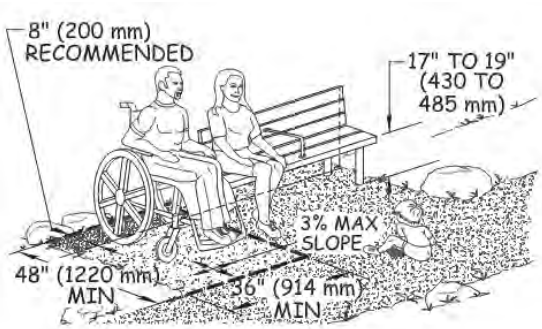
contrast, and non-glare finish?				observed on site. **Possible Action:** • Review adopted sign standards and make sure they are ADA compliant. • Determine if standards need to be revised. • Replace signs based on compliance with adopted standards. Adjust heights of signs as needed.
62. Do directional and informational signs comply with legibility requirements? (Building directories or temporary signs need not comply.)	☐	☒	☐	**Comments:** **Possible Action:** • Review adopted sign standards and make sure they are ADA compliant. • Determine if standards need to be revised. • Replace signs based on compliance with adopted standards. • Adjust heights of signs as needed.
63. If materials need to be obtained from or manipulated on a sign or kiosk, the sign or kiosk shall be designed to meet the reach ranges in section 308 of ABAAS and in figures 14 through 19.	☐	☒	☐	**Comments:** **Possible Action:** • Review adopted sign standards and make sure they are ADA compliant. • Determine if standards need to be revised. • Replace signs based on compliance with adopted standards. • Adjust heights of signs as needed.
Fire Rings	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
64. Is the fire surface height a minimum of 9" above the ground/floor?	☐	☐	☐	**Comments:**  Figure 22—The height requirements for manufactured steel fire rings. • No fire rings observed
65. Do all fire rings have a clear space extending a minimum 48" deep by 48" wide at all usable portions of the ring? This must be adjacent to ORAR but may not overlap the ORAR	☐	☐	☐	**Comments:**
66. Are the clear spaces around the fire pit on a firm and stable surface?	☐	☐	☐	**Comments:**

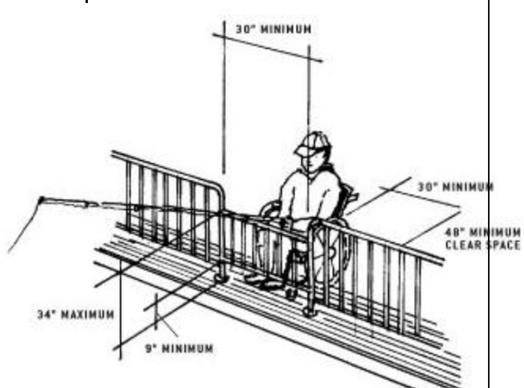
Question	n/a	Yes	No	Comments
67. Are the slopes around fire pits not more than 1:50?	☐	☐	☐	**Comments:**
Cooking Surfaces, Grills, Pedestal Grills[2]	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
68. Are accessible cooking features dispersed throughout the area and among the types provided?	☐	☐	☐	**Comments:** • None observed
69. Are accessible cooking feature surfaces installed between 15 inches and 34 inches above the ground/floor?	☐	☐	☐	**Comments:**  Figure 24—The requirements for height, clear space, and reach range for a pedestal grill.
70. Do operating controls and mechanisms comply with current Clear Floor Space and Height standards?	☐	☐	☐	**Comments:**
Fixed Trash/Recycling Containers	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
71. Is the clear floor or ground space for a forward approach 36 inches by 48 inches or for side approach 30 inches by 60 inches? 	☐	☐	☒	**Comments:** • No trash/recycling containers were observed.
72. Are the Trash / Recycling containers themselves an ADA compliant model?	☐	☐	☒	**Comments:** • Model of containers observed do not meet ADA compliance **Possible Action:** • ADA compliant containers should be

[2] Where there is only one cooking surface, grill or pedestal grill in a provided picnic area, it shall be accessible. Where multiple cooking features are provided in a picnic area, 50 percent, but no less than 2 shall be accessible.

				installed.
Overlooks/Viewing Areas	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
73. Where multiple viewing areas at overlooks are provided, at least one of each viewing opportunity for distinct points of interest shall be accessible.	☐	☐	☐	**Comments:**
74. Are all viewing areas constructed to provide an unobstructed view?	☐	☐	☐	**Comments:**
75. Is there at least one 60" x 60" maneuvering space or T-shaped turning space?	☐	☐	☐	**Comments:**  Figure 11—One way to meet the requirements for turning space at a viewing area.  Figure 12—The requirements for a T-shaped turning space at a viewing area.
76. Is the ground surface firm and stable?	☐	☐	☐	**Comments:**
77. Is the maneuvering space less than or equal to 1:50? (1:33 maximum allowed for drainage)	☐	☐	☐	**Comments:**
78. Does accessible viewing area of a 36" minimum x 48" minimum and at least one turning space that complies with section 304.3 of ABAAS?	☐	☐	☐	**Comments:**
Picnic Tables (Units)	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
79. Is there an accessible route to and within common use areas that complies with FSORAG? At least 48" of clear floor or ground space shall surround the usable	☐	☐	☒	**Comments:** • 3 tables were assessed and none met accessibility compliance. • None had adequate clear space or

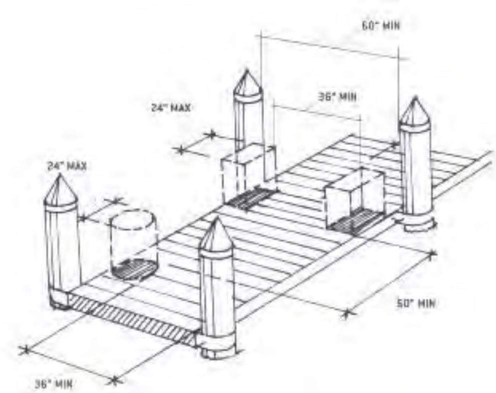
sides of the picnic table measured from back edge of the benches.				were accessible via ORAR.
80. Where more than two picnic tables are provided, are at least 20% but not less than two mobility compliant	☐	☐	☒	**Comments:** • At least 2 of the 3 should be modified to be accessible.
Tables (Compliant Yes/No): C1: Table #1 		☐	☒	Note: **a,b,c,d,e,f**
Tables (Compliant Yes/No): C2: Table #2 		☐	☒	Note: **a,b,c,d,e,f**
Tables (Compliant Yes/No): C3: Table #3  (List Items in Notes if Not Compliant) a – Knee Space b – Clear Space Around Table c – Slope d – Cross Slope e – Firm and Stable Surface f – Accessible Route		☐	☒	Note: **a,b,c,d,e,f** **Possible Action:** • Option – Add at least 2 new picnic tables along accessible route in a manner that meets compliance. • Option – relocate at least 2 of the existing 3 tables to a location along accessible route in a manner that meets compliance. 

81. Are knee spaces at accessible picnic tables at least 27 inches high, 30 inches wide, and 19 inches deep?	☐	☐	☒	**Comments:**
82. Information on location of accessible picnic units provided at bulletin boards or information kiosks (otherwise this will need to be provided on web sites or in brochures)? Do not identify at individual picnic units.	☐	☐	☒	**Comments:**
83. Each picnic table shall have at least one wheelchair seating space. Up to 9' long tables=require 1 space 10-20' long tables=require 2 spaces See FSORAG figure 4.1.2 for larger tables	☐	☐	☒	**Comments:**
Benches	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
84. Where multiple benches are provided, are at least 50% consistent with this section? Benches (Compliant Yes/No): D1______________________________ D2______________________________ D3______________________________ D4______________________________ (List Items in Notes if Not Compliant) a – Back Support b – Front Edge of Bench 17-19" Above Ground/Floor c – 30" x 48" Clear Floor or Ground Space Adjacent to Bench d – Firm and Stable Surface e – Arm Rest f – Accessible Route	☐	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐	**Comments:** • Built-in benches were located on deck surrounding marina building. Marina building was not assessed as part of this effort. Note: Note: Note: Note: 
85. Where multiple benches are provided, are at least 20% connected to an ORAR?	☐	☐	☐	**Comments:**
86. Of the accessible benches that are provided, do at least 50% of those benches have back rests? In addition, one armrest shall be provided at one end	☐	☐	☐	**Comments:**

or in the middle of at least 50% of the benches with backrests.				
87. Are the front edges of accessible benches between 17 and 19 inches maximum above the ground/floor?	☐	☐	☐	**Comments:**
88. Is there a 36” x 48” Clear Floor or Ground Space adjacent to the bench?	☐	☐	☐	**Comments:**
89. Is the ground/floor surface around the accessible benches firm and stable?	☐	☐	☐	**Comments:**
Accessible Fishing Piers/Platforms	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
90. Is there at least one unobstructed accessible route to the fishing pier or platform? (minimum 36” width, maximum 2% cross slope and maximum 8.33% running slope)	☐	☐	☐	**Comments:** • There are no accessible fishing piers of platforms on site. **Possible Action:** • Construct Accessible Fishing Pier
91. Is there a clear floor or ground space (30 inches by 48 inches minimum) at each location that has a railing height of 34 inches maximum?	☐	☐	☐	**Comments:**
92. Is there edge protection that is a minimum of 2 inches above the ground or deck surface?	☐	☐	☐	**Comments:**
93. Is there at least one tuning area, either a 60-inch turning space or a T-shaped space, to allow a person using a mobility device or wheelchair to make a 180-degree turn?	☐	☐	☐	**Comments:**
94. Where railings are provided on fishing piers or platforms, do they comply with ADAAG provisions?  RAILING HEIGHTS AND CLEAR SPACE	☐	☐	☐	**Comments:**
95. Where railings are provided, are there	☐	☐	☐	**Comments:**

multiple locations where the railing is 34 inches high maximum to offer a variety of fishing location options?				
Lake Shoreline / Beach Access	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
96. Is at least one beach access route provided for each one-half mile of shoreline where the following occur? • Where circulation routes such as boardwalks, walkways, or dune crossings are provided along or across developed beach sites to provide pedestrian access to the beach or shoreline. • Where parking facilities are provided at developed beach sites and pedestrian access to the beach is provided near the parking facilities. • Where bathing and toilet facilities are provided at developed beach sites and pedestrian access points to the beach are pro-vided near the bathing and toilet facilities. • Where a beach nourishment project is undertaken. 	☐	☐	☒	**Comments:** • There are no compliant beach access routes that allow access to the lake edge. ○ There is no ORAR to the water's edge due to surfacing, slopes and obstructions. **Possible Action:** • Design and construct well-defined accessible routes.  
97. Does beach access route have a clear width of 60 inches minimum?	☒	☐	☐	**Comments:** • No defined accessible beach access routes.
98. Is the access route 5% or less for any distance?	☒	☐	☐	**Comments:** • No defined accessible beach access routes.
99. Do the segment lengths meet the following requirements: Max. 50 LF @ 5% - 8.33%	☒	☐	☐	**Comments:** • No defined accessible beach access routes.

Max. 30 LF @ 8.33% - 10%				
100. Where slopes are steeper than 5% for the given runs above, are there resting intervals provided at the top and bottom of the runs (60 inches long x 60 inches wide with maximum slopes of 3% in any direction. If surface is paved or elevated above natural ground, the surface shall not be steeper than 2% in any direction)?	☒	☐	☐	**Comments:** • No defined accessible beach access routes.
101. Are all cross slopes a maximum of 3%, and where surface is paved or elevated above the natural ground, the cross slopes are a maximum of 2%?	☒	☐	☐	**Comments:** • No defined accessible beach access routes.
102. Are there any obstacles on beach access route that exceed 1 inch in height measured vertically to the highest point? Where the surface is concrete, asphalt, or boards, obstacles shall not exceed one-half inch in height measured vertically to the highest point.	☒	☐	☐	**Comments:** • No defined accessible beach access routes.
103. Constructed features, including signs, shall not extend into the space above a beach access route more than 4 inches if they are between 27 inches and 80 inches above the surface of the beach access route.	☒	☐	☐	**Comments:** • No defined accessible beach access routes.
Gates and Barriers	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
104. Gate openings and openings in barriers for pedestrian passage shall provide a clear width of 36” inches, complying with ODAAG section 1017.3 Clear Tread Width.	☐	☒	☐	**Comments:** • There is one vehicular gate at the entrance to the top of the boat ramp • There is no ORAR access around either side of gate. 
Boating Facilities	**n/a**	**Yes**	**No**	**Comments / Possible Action**

<table>
<tr><td colspan="5">☐ Check here if section does not apply to this site and move to next section.</td></tr>
<tr><td>105. Is there an accessible route to the boating facilities?</td><td>☐</td><td>☐</td><td>☒</td><td>Comments:
There are no accessible routes identified.
Floating docks are designed to be movable and not in permanently fixed locations.
No compliant ORAR to dock locations observed during this assessment.
Possible Action:
Design and construct an ORAR to the dock locations that allow access during both high and low water conditions.</td></tr>
<tr><td>106. Does the gangway to the dock or floating dock deigned to provide for a maximum 1:12 (8.33%) slope?
Note: Not required to be longer than 80 feet. (Elevators may be used in lieu of gangways) In smaller facilities with less than 25 boat slips, the slope of the gangway may exceed 1:12, if the gangway is at least 30 feet long.</td><td>☐</td><td>☐</td><td>☒</td><td>Comments:
No gangways observed.</td></tr>
<tr><td>107. Does the gangway have a transition plate to the pier or platform that meets codei?</td><td>☐</td><td>☐</td><td>☒</td><td>Comments:
None observed. But gangways were not setup to be functional at time of assessment.</td></tr>
<tr><td>108. Where boat slips are provided, does the number of accessible slips comply with the table to the right?
Note: If boat slips at a facility are not identified or demarcated by length, each 40 feet of boat slip edge along the perimeter of a pier will be counted as one boat slip</td><td>☐</td><td>☐</td><td>☒</td><td><table>
<tr><th colspan="2">Number of Accessible Boat Slips Required</th></tr>
<tr><td>Total Slips in Facility</td><td>Minimum Accessible Slips</td></tr>
<tr><td>1-25</td><td>1</td></tr>
<tr><td>26-50</td><td>2</td></tr>
<tr><td>50-100</td><td>3</td></tr>
<tr><td>101-150</td><td>4</td></tr>
</table>

PIER CLEARANCE SPACE REDUCTION</td></tr>
</table>

109. If the facility only has a boarding pier (see footnote # 9) at least 5% but not less than, must comply with these guidelines. The entire length of accessible boarding piers must comply with the same provisions that apply to slips. Does this facility meet this regulation?	☒	☐	☐	**Comments:**
110. Is this facility compromised only of a boat launch with no boarding ramp or pier?	☐	☐	☒	**Comments:**

Item Number	Notes


South Lake
BOAT RAMP AND FLOATS
BEACH ACCESS
Stairs to Launching Pier
Restroom
RESTROOM
Restroom
Marina
MARINA BUILDING
PICNIC TABLES
PICNIC TABLE
Picnic Tables
Parking Area
PARKING LOT C
Trailhead & Information Kiosk
Parking Area
Bishop Pass Trail
Trailhead
Picnic Tables
Parking Area
PARKING LOT D
Rainbow Pack Station Trail

APPENDIX DSOUTH

LAKE TRAILHEAD COMPLIANCE CHECKLIST

APPENDIX D

SOUTH LAKE TRAILHEAD COMPLIANCE CHECKLIST

Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG)

Compliance Checklist

The purpose of this checklist is to locate and assess site components within existing public outdoor recreation facilities, for compliance with the Forest Service Outdoor Recreation Accessibility Guidelines (FSORG). The Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG) and the Forest Service Trail Accessibility Guidelines (FSTAG) are the legally enforceable standards for use on the National Forest System for the facilities and features addressed in those guidelines. They, in part, incorporate sections of the Architectural Barriers Act Accessibility Standards (ABAAS), and the Outdoor Developed Area Accessibility Guidelines (ODAAG), developed by the Architectural and Transportation Barriers Compliance Board (U.S. Access Board).

This checklist serves as a planning tool to assist with identifying accessibility deficiencies within a facility and possible actions to be considered for correcting them.

Facility Name: SOUTH LAKE – TRAILHEAD
Date Surveyed: 08/04/2020
Surveyor(s): E. MILLS; J. SANDLIN

Site Component Parking	Compliant n/a	 Yes	 No	 Comments / Possible Action
☐ Check here if section does not apply to this site and move to next section.				

1. Are an adequate number of accessible parking spaces available? The table below gives the ADAAG requirement for new construction and alterations (for lots with more than 100 spaces refer to ADAAG).
 	
Accessible Spaces per Overall spaces
 	
Total Spaces / Accessible Spaces Required
1 to 25 / 1 space
26 to 50 / 2 spaces
51 to 75 / 3 spaces
76 to 100 / 4 spaces
	☐	☒	☐	**Comments:**
				2 separated parking lots joined by a short drive aisle.
				UPPER LOT (A)
				• Pavement quality is in good condition recently repaved.
				• Upper Lot – has 50 stalls
				  ○ Needs to be re-striped.
				• ORAR consists of the paved parking lot.
				  ○ Slopes through parking lot are steep
				
				LOWER LOT (B)
				• Pavement quality is in good condition recently repaved.
				• Lower Lot – has 36 stalls
				  ○ Needs to be re-striped.
				• ORAR consists of the paved parking lot.
				• There are 4 spaces for ADA parking.
				  ○ 2 standard, near restroom with signs.

					 ◦ 2 across drive aisle from restroom. 1-standard and 1-Van Accessible.  ◦ All stalls need to be re-striped with loading area and signs need to be updated. ◦ Pedestrian crossing should be added across drive aisle **Possible Action:** • Restripe all 4 ADA stalls and add the loading zones. • Add pedestrian crossing striping and truncated domes across drive aisle or relocate 2 ADA stalls on opposite side of drive aisle closer to restroom. • Modify layout or expand paving at front end of ADA stalls near restroom to provide accessible route to restroom that does not require users to use drive aisle for access. • Replace Parking signs with updated ADA standard signs at appropriate mounting heights.
2.	Are the accessible parking spaces located closest to the accessible route and accessible building entrance?	☐	☒	☐	**Comments:** • The drive aisle is the shared ORAR. • Recommend building a non-shared accessible route to reduce pedestrian / vehicular conflicts.
3.	Are an adequate number of van accessible spaces provided? At least 1 of	☐	☒	☐	**Comments:** • Striping and loading zones need to

		n/a	Yes	No	Comments / Possible Action
	every 8 accessible spaces must be van-accessible (with a minimum of 1 van-accessible space in all cases.)				be identified.
4.	Are the access aisles part of the accessible route?	☐	☐	☒	**Comments:** • No access aisles currently identified.
5.	Do the access aisles have a cross slope less than 1:48, and have a firm, stable non-slip surface?	☐	☐	☒	**Comments:** • Potential to be compliant if striped correctly.
6.	Do the access aisles connect to an accessible pedestrian route with a minimum clear and unobstructed width of 36 inches?	☐	☐	☒	**Comments:** • Not striped
7.	Does the accessible car parking space measure 96 inches wide with an adjoining access aisle 96 inches wide? OR Does the accessible van parking space measure 132 inches wide with an adjoining access aisle 60 inches wide?	☐	☐	☒	**Comments:** • Not striped
8.	Are accessible spaces marked with and International Symbol of Accessibility? Are there signs reading “Van Accessible” at van spaces? Is Sign Mounted 60” min. from ground to bottom of sign?	☐	☒	☐	**Comments:** • Signs need to be updated and mounting height needs to be verified.
9.	Is there an enforcement procedure to ensure that accessible parking is used only by those who need it?	☒	☐	☐	**Comments:** • Unknown
	Drop-off / Public Transit Areas	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒	Check here if section does not apply to this site and move to next section.				
10.	Is there a passenger pick up and drop off zone? If so, is at least one passenger loading zone accessible which measures 96 inches wide by 20 feet long with a 60-inch-wide access aisle parallel to the vehicle pull up space and at the same level as the roadway?	☐	☐	☐	**Comments:**
11.	Do curbs on the accessible route have curb cuts or curb ramps at 1:12 slope? NOTE: If a slope of 1:12 is not possible, a slope between 1:10 and 1:12 is allowed for a MAX RISE of 6 inches. A slope between 1:8 and 1:10 is allowed for a MAX RISE of 3 inches. A slope steeper than 1:8 is not allowed. Flared sides may be 1:10 slope.	☐	☐	☐	**Comments:**
12.	Is curb cut/curb ramp flush with surrounding grade?	☐	☐	☐	**Comments:**

	n/a	Yes	No	
13. Is the curb cut/ramp 36 inches wide, exclusive of flared sides?	☐	☐	☐	**Comments:**
14. Are there public transportation stops on site, if so, is an accessible route provided to the building from the stop?	☐	☐	☐	**Comments:**
Outdoor Recreation Access Routes[1]	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
15. Does the park have accessible routes (ORARs) to all accessible facilities within the park? Surface: shall be firm and stable. The type of surface should be appropriate to the setting and level of development. Clear width: 36”, may be reduced to 32” per 1.1 conditions. Slope: 5% or less. Up to 8.33% for 50 feet or 10% for 30 feet with resting intervals that are minimum of 60 inches long, see figure 3. Cross Slope: 3% maximum. Where the surface is paved or elevate above natural ground, cross slope shall not be greater than 2%. Passing spaces: if accessible route is less than 60 inches wide provide passing spaces at intervals of 200’ maximum, see figure 4.	☐	☐	☒	

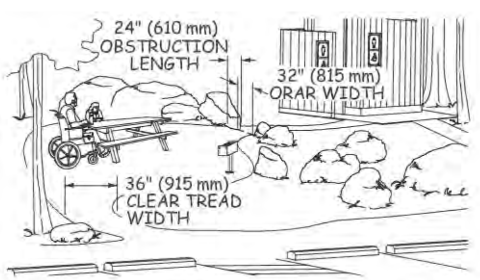


Figure 1—The clear tread width is the unobstructed width of the traveling surfac

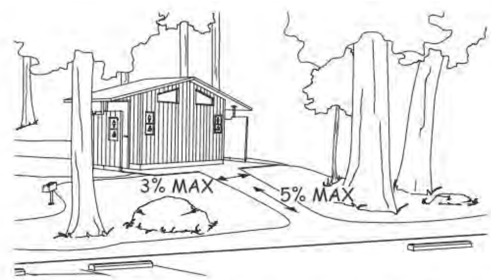


Figure 2—The basic slope requirements for outdoor recreation access routes and beach access routes.

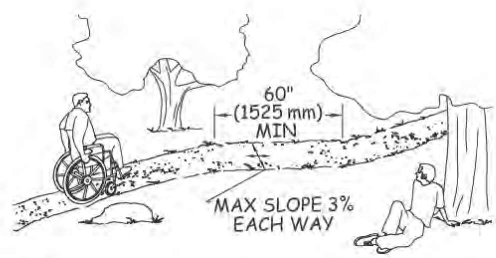


Figure 3—The basic resting interval requirements for outdoor recreation access routes.

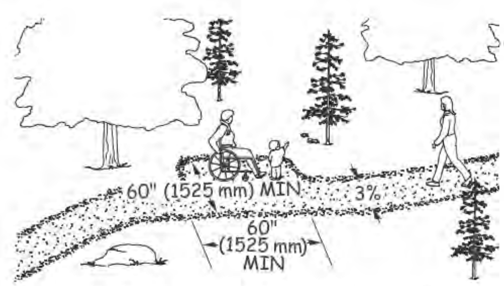
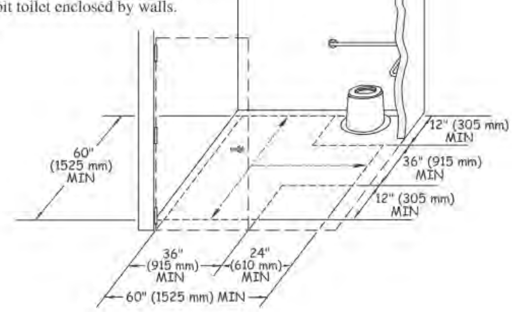


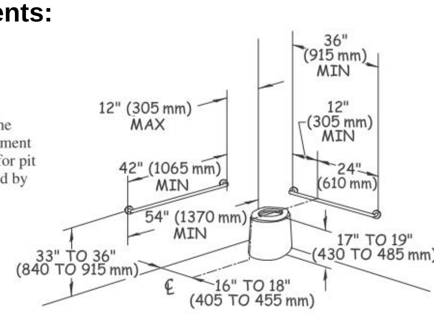
Figure 4—Minimum required dimensions for a passing space for an outdoor recreation access route or a beach access route.

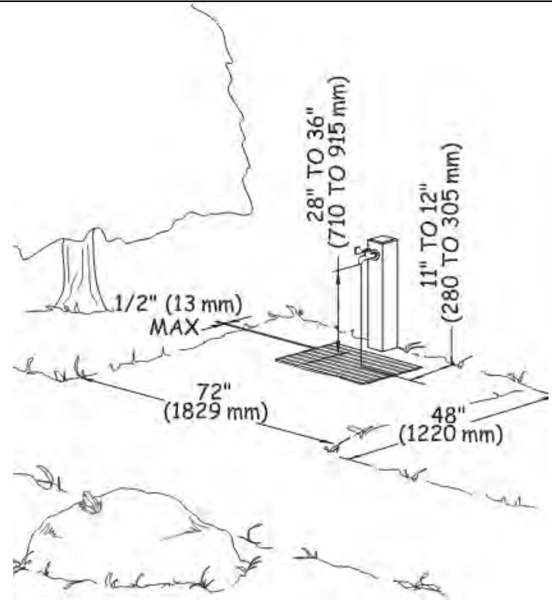
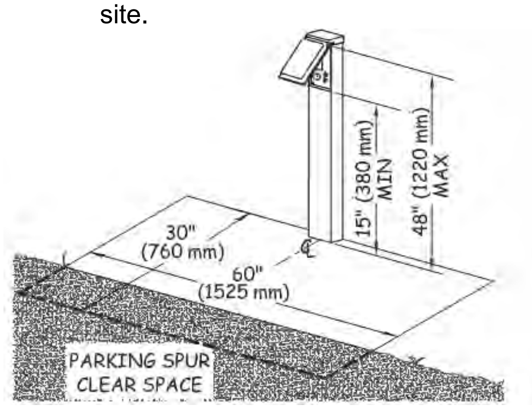
[1] To meet (FSORAG) Outdoor Recreation Access Routes (ORARs) shall be provided between units and constructed features in campgrounds, picnic areas, trailheads, viewing areas, and other outdoor recreation sites. ORARs shall connect the outdoor constructed features within each recreation site and shall connect to common use features such as toilets, showers, water spouts, trash or recycling receptacles, parking spaces, and beach access routes. Where ORARs are provided within vehicular ways, those ORARs shall not be required to comply with sections 2.4 Slope, 2.5 Resting Intervals, and 2.6 Passing Spaces.

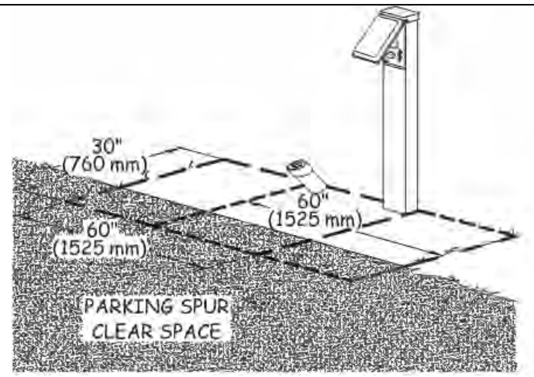
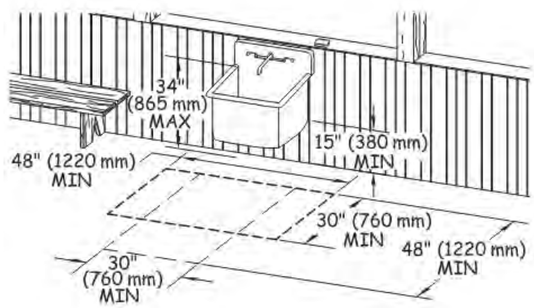
Facility/Amenity:		Yes	No	
A1 Restroom		☒	☐	Note: No defined routes, but accessible via parking and drive aisle
A2 Bishop Pass Trailhead / Kiosk		☐	☒	Note: **a, b.** Transitions between paved and no-paved surfaces are abrupt, boulders impeding access to trail from Kiosk.
A3 Rainbow Pack Station Trailhead\Picnic Area		☐	☒	Note: **a, b, c,**
A4 Recycling/Trash		☐	☒	Note: **a,** Accessible routes to amenities, but the maneuvering space is not ADA compliant.
A5 Food Lockers		☐	☒	Note: **a, b, c, d**
A6 Parking		☐	☒	Note: **c,d,** ADA stalls need adjustment and striping.
A8 Drive Aisle / (Serves as ORAR)		☒	☐	Note:
(List Items in Notes if Not Compliant) a – Surface b – Clear Width c – Slope d – Cross Slope e – Resting Intervals f – Passing Space				**Possible Action:** • Pave, stripe and sign ADA compliant parking stalls. • Pave and stripe ORAR route from parking to Restroom, Recycling, Food Lockers and Kiosk. • Design and develop accessible route to boat dock access, gangways and other amenities throughout the site. • Design and implement upgrades to trail to alleviate slope, surface, obstruction and clearance deficiencies. • Extend ORAR around gate in upper parking lot.
Restrooms	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
16. If restrooms are available to the public, is at least one restroom (either one for each sex, or unisex) fully accessible?	☐	☒	☐	**Comments:** • Single restroom building with 2 restrooms. Both are accessible.
17. Are there signs at inaccessible restrooms that give directions to accessible ones?	☒	☐	☐	**Comments:**
18. Is there tactile signage identifying rest	☐	☒	☐	**Comments:**

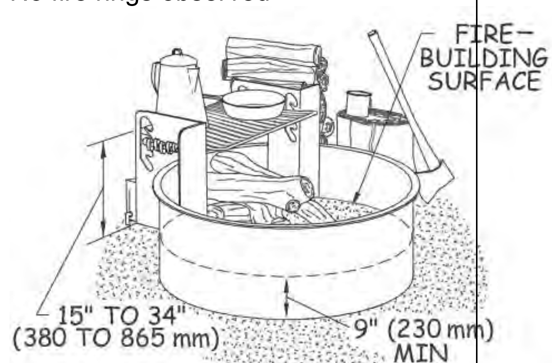
rooms? *Note: Mount signs on the wall, on the latch side of the door, complying with the permanent signage.*				
19. Are pictograms or symbols used to identify rest rooms, and, if used, are raised characters and braille included below?	☐	☒	☐	**Comments:**
20. Is the doorway at least 32 inches clear?	☐	☒	☐	**Comments:**
21. Are doors equipped with accessible handles (operable with a closed fist), 48 inches high or less?	☐	☒	☐	**Comments:**
22. Can doors be opened easily (5 lbf max. force)?	☐	☒	☐	**Comments:**
23. Does the entry configuration provide adequate maneuvering space for a person using a wheelchair? *Note: A person using a wheelchair needs 36 inches of clear width for forward movement, and a 5-foot diameter clear space or a T-shaped space to make turns. A minimum distance of 48 inches clear of the door swing is needed between the two doors of an entry vestibule.*	☐	☒	☐	**Comments:**
24. Is there a 36-inch-wide path to all fixtures?	☐	☒	☐	**Comments:**
25. Is the stall door operable with a closed fist, inside and out?	☒	☐	☐	**Comments:** • Restroom does not have individual stalls
26. Is there a wheelchair-accessible stall that has an area of at least 5 feet by 5 feet, clear of the door swing, OR is there a stall that is less accessible but that provides greater access than a typical stall (either 36 by 69 inches or 48 by 69 inches)?	☒	☐	☐	**Comments:** • No partitioned stalls
27. In the accessible stall, are there grab bars behind and on the side wall nearest to the toilet?	☐	☒	☐	**Comments:**
28. Is the toilet seat 17 to 19 inches high?	☐	☒	☐	**Comments:**
29. Does one lavatory have a 30-inch-wide by 48-inch-deep clear space in front? *Note: A maximum of 19 inches of the required depth may be under the lavatory.*	☒	☐	☐	**Comments:** • Restroom does not have lavatory

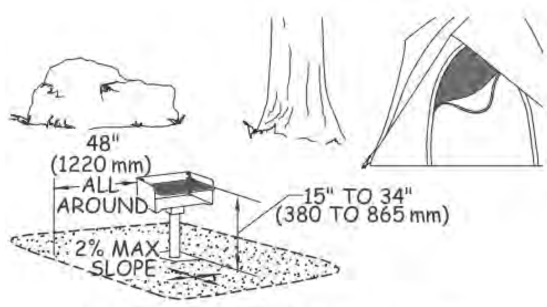
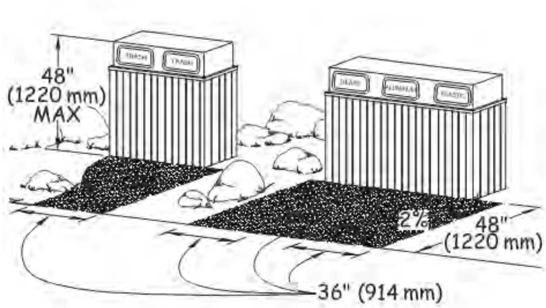
30. Is the lavatory rim no higher than 34 inches?	☒	☐	☐	**Comments:** • Restroom does not have lavatory
31. Is there at least 29 inches from the floor to the bottom of the lavatory apron?	☒	☐	☐	**Comments:** • Restroom does not have lavatory
32. Can the faucet be operated with one closed fist?	☒	☐	☐	**Comments:** • Restroom does not have lavatory
33. Are soap and other dispensers and hand dryers within reach ranges and usable with one closed fist?	☒	☐	☐	**Comments:** • Restroom does not have soap dispenser or hand dryer
34. Is the mirror mounted with the bottom edge of the reflecting surface 40 inches high or lower?	☒	☐	☐	**Comments:** • Restroom does not have mirror
35. Is there a clear space of 60 inches by 60 inches adjacent to the toilet?	☐	☒	☐	**Comments:**
36. Is the maneuvering space less than or equal to 1:50? (1:33 maximum allowed for drainage) (2% -3.3%)	☐	☒	☐	**Comments:**
37. If there is a ADA Accessible Portable Restroom, is there an accessible route and entry into the portable unit?	☒	☐	☐	**Comments:** • There were no portable units on site.
FSORAG Pit Toilet Restrooms Only	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
38. Is there an accessible route to the restroom? Where pit toilets are constructed in sites that are not accessed by motor vehicles, the pit toilets and all constructed features in the site shall be connected by trail segments complying with the FSTAG.	☐	☐	☐	**Comments:**
39. The clear floor or ground space shall be 60 inches wide minimum measured parallel with the back of the pit toilet, and 56 inches deep minimum measured parallel to the sides of the pit toilet. A turning space that is at least 60 inches in diameter or T-shaped with a minimum 36 inches wide by 24 inches deep base centered on a minimum 36 inches wide by 60 inches long crossarm shall be provided, as shown in figure. The turning space and clear floor or ground space may overlap.	☐	☐	☐	**Comments:** Figure 34—The requirements for a T-shaped turning space for a pit toilet enclosed by walls. 
40. Is the surface of turning and clear floor or	☐	☐	☐	**Comments:**

	n/a	Yes	No	Comments
ground space firm and stable?				
41. Is the slope of the turning space and clear floor or ground space surface no steeper than 2% in all directions?	☐	☐	☐	**Comments:**
42. Is the toilet seat 17 to 19 inches high?	☐	☐	☐	**Comments:**
43. Where walls or partitions are provided, the seat shall be positioned with a wall or partition to the rear and to one side of the seat for a left-hand or right-hand approach. The back of the riser shall be flush against the back wall. The centerline of the seat shall be 16 inches minimum to 18 inches maximum from the side wall or partition.	☐	☐	☐	**Comments:**
44. Where walls or partitions are provided, grab bars complying with ABAAS shall be provided, the same as for grab bars for toilets in administrative buildings. Required locations are shown in figure.	☐	☐	☐	**Comments:** Figure 36—The grab bar placement requirements for pit toilets enclosed by walls.  have vertical or nearly vertical sides and a flat area on each side of the seat that is about 3 inches (75 millimeters) wide.
45. Doors shall comply with ABAAS, the same as doors for buildings at administrative sites. The door shall not swing into or otherwise obstruct the clear floor or ground space required.	☐	☐	☐	**Comments:**
46. The entrance to the toilet shall be level with the surrounding surface.	☐	☐	☐	**Comments:**
Water Hydrants	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
47. Is the water hydrant clear floor or ground space around the hydrant 48 inches by 72 inches with the long side of the space adjoining an ORAR or another clear ground space (clear space shall not overlap ORAR)? NOTE: Until hand pumps are available that meet the accessibility standards for operating controls while adequately accessing the water supply are available from more than one source, hand pumps are exempt from the requirements for reach ranges and operability in ABAAS 308 and 309.4.	☐	☐	☐	**Comments:** • No Hydrants observed on site.

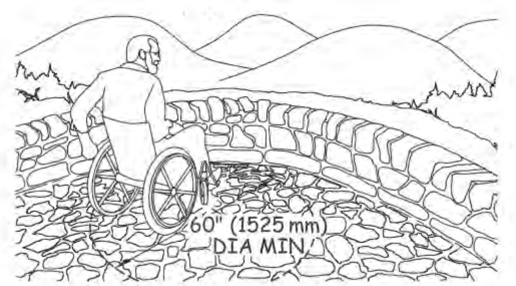
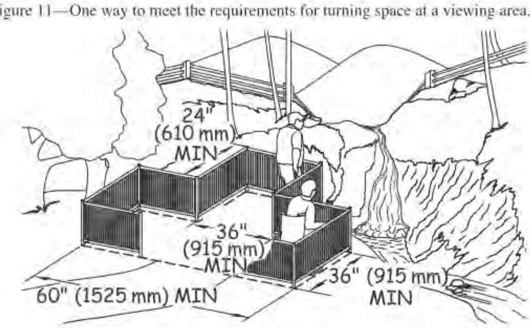
	n/a	Yes	No	
				
48. Is water spout located between 28 inches and 36” above the ground?	☐	☐	☐	**Comments:**
49. Is the water spout located 11 inches minimum and 12 inches maximum from the rear center of the long side of the clear space?	☐	☐	☐	**Comments:**
50. If drain grates are provided, are the openings in the grates ½” maximum?	☐	☐	☐	**Comments:**
Utilities at Recreation Sites	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
51. Is there a clear floor or ground space of at least 30 by 60 inches oriented for front or parallel approach to all usable sides of the utilities?	☐	☐	☐	**Comments:** • No applicable utilities observed on site.
52. Are the utility pedestals installed to adhere to the Reach Ranges and Operability Requirement as shown and/or as specified in 308 and 309 of ABAAS?	☐	☐	☐	

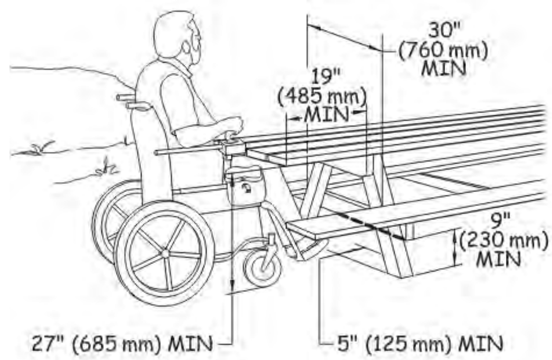
				
Utility Sinks	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
53. Is the height of the rim or counter surrounding the sink 34 inches maximum above the ground or floor space?	☐	☐	☐	**Comments:** • No utility sinks observed
54. Is the bottom of the bowl at least 15 inches above the ground or floor space?	☐	☐	☐	
55. Is Water Spout 28 – 36" above ground or floor space.	☐	☐	☐	
56. Do sink controls comply with reach ranges and operability specified in ABAAS?	☐	☐	☐	
Drinking Fountain	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
57. Is there at least one fountain with clear floor space of at least 30 by 48 inches in front?	☐	☐	☐	**Comments:** • No drinking fountain observed on site.
58. Is there one fountain with its spout no higher than 36 inches from the ground, and another with a standard height spout (or a single "hi-lo" fountain)?	☐	☐	☐	**Comments:**
59. Are controls mounted on the front or on the side near the front edge, and operable with one closed fist?	☐	☐	☐	**Comments:**
60. Is each water fountain cane-detectable (located within 27 inches off the floor or protruding less than 4 inches from the wall, into the circulation path?	☐	☐	☐	**Comments:**
Directional and Informational Signage	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
61. If mounted about 80 inches, do they have	☐	☐	☒	**Comments:**

	n/a	Yes	No	
letters at least 3 inches high, with high contrast, and non-glare finish? 				• Informational signs do not meet contrast requirements, text size on some size is not compliant. **Possible Action:** • Review adopted sign standards and make sure they are ADA compliant. • Determine if standards need to be revised. • Replace signs based on compliance with adopted standards. • Adjust heights of signs as needed.
62. Do directional and informational signs comply with legibility requirements? (Building directories or temporary signs need not comply.)	☐	☐	☒	**Comments:** • Informational signs do not meet contrast requirements, text size on some size is not compliant. **Possible Action:** • Review adopted sign standards and make sure they are ADA compliant. • Determine if standards need to be revised. • Replace signs based on compliance with adopted standards. • Adjust heights of signs as needed.
63. If materials need to be obtained from or manipulated on a sign or kiosk, the sign or kiosk shall be designed to meet the reach ranges in section 308 of ABAAS and in figures 14 through 19.	☒	☐	☐	**Comments:**
Fire Rings	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
64. Is the fire surface height a minimum of 9" above the ground/floor?	☐	☐	☐	**Comments:** • No fire rings observed  Figure 22—The height requirements for manufactured steel fire rings.
65. Do all fire rings have a clear space extending a minimum 48" deep by 48" wide at all usable portions of the ring?	☐	☐	☐	**Comments:**

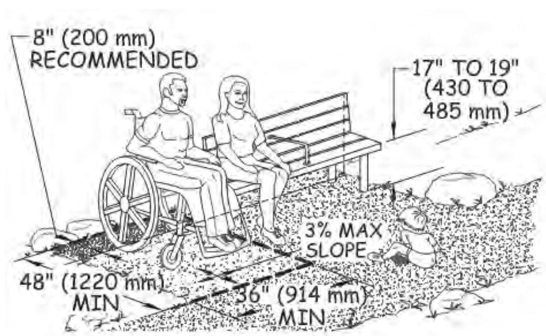
This must be adjacent to ORAR but may not overlap the ORAR				
66. Are the clear spaces around the fire pit on a firm and stable surface?	☐	☐	☐	**Comments:**
67. Are the slopes around fire pits not more than 1:50?	☐	☐	☐	**Comments:**
Cooking Surfaces, Grills, Pedestal Grills[2]	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
68. Are accessible cooking features dispersed throughout the area and among the types provided?	☐	☐	☐	**Comments:** • None observed
69. Are accessible cooking feature surfaces installed between 15 inches and 34 inches above the ground/floor?	☐	☐	☐	**Comments:**  Figure 24—The requirements for height, clear space, and reach range for a pedestal grill.
70. Do operating controls and mechanisms comply with current Clear Floor Space and Height standards?	☐	☐	☐	**Comments:**
Fixed Trash/Recycling Containers	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
71. Is the clear floor or ground space for a forward approach 36 inches by 48 inches or for side approach 30 inches by 60 inches? 	☐	☐	☒	**Comments:** • The space is available, but there is inadequate surfacing. 

2 Where there is only one cooking surface, grill or pedestal grill in a provided picnic area, it shall be accessible. Where multiple cooking features are provided in a picnic area, 50 percent, but no less than 2 shall be accessible.

	n/a	Yes	No	
				Possible Action: • Fixed receptacles should be relocated or a stable surface should be installed that connects to ORAR.
72. Are the Trash / Recycling containers themselves an ADA compliant model?	☐	☒	☐	**Comments:** • The Recycling Containers are compliant. • There were no Trash Receptacles observed • There is a dumpster, but it is not ADA accessible. **Possible Action:** • Add Trash receptacles
Overlooks/Viewing Areas	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
73. Where multiple viewing areas at overlooks are provided, at least one of each viewing opportunity for distinct points of interest shall be accessible.	☐	☐	☐	**Comments:**
74. Are all viewing areas constructed to provide an unobstructed view?	☐	☐	☐	**Comments:**
75. Is there at least one 60" x 60" maneuvering space or T-shaped turning space?	☐	☐	☐	**Comments:**  Figure 11—One way to meet the requirements for turning space at a viewing area.  Figure 12—The requirements for a T-shaped turning space at a viewing area.
76. Is the ground surface firm and stable?	☐	☐	☐	**Comments:**
77. Is the maneuvering space less than or equal to 1:50? (1:33 maximum allowed for drainage)	☐	☐	☐	**Comments:**

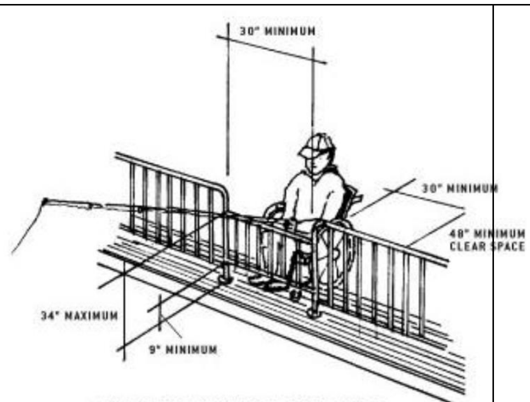
	n/a	Yes	No	
78. Does accessible viewing area of a 36” minimum x 48” minimum and at least one turning space that complies with section 304.3 of ABAAS?	☐	☐	☐	**Comments:**
Picnic Tables (Units)	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
79. Is there an accessible route to and within common use areas that complies with FSORAG? At least 48” of clear floor or ground space shall surround the usable sides of the picnic table measured from back edge of the benches.	☐	☐	☒	**Comments:** • Trail leading to picnic area is not accessible due to slopes and surfacing. (continuous 10%-13% slope) • Area surrounding the tables is not compliant
80. Where more than two picnic tables are provided, are at least 20% but not less than two mobility compliant	☐	☐	☒	**Comments:**
Tables (Compliant Yes/No): C1: Table #1 		☐	☒	Note: **a, b, e, f,** 
Tables (Compliant Yes/No): C2: Table #2 		☐	☒	Note: **a, e, f,** **Possible Action:** • Relocate tables along a ORAR. • Replace non-compliant table with compliant table.
(List Items in Notes if Not Compliant) a – Knee Space				

	n/a	Yes	No	Comments
b – Clear Space Around Table c – Slope d – Cross Slope e – Firm and Stable Surface f – Accessible Route				
81. Are knee spaces at accessible picnic tables at least 27 inches high, 30 inches wide, and 19 inches deep?	☐	☐	☒	**Comments:** • 26” high • 12” – 16” deep
82. Information on location of accessible picnic units provided at bulletin boards or information kiosks (otherwise this will need to be provided on web sites or in brochures)? Do not identify at individual picnic units.	☐	☐	☐	**Comments:** • None observed
83. Each picnic table shall have at least one wheelchair seating space. Up to 9’ long tables=require 1 space 10-20’ long tables=require 2 spaces See FSORAG figure 4.1.2 for larger tables	☐	☐	☒	**Comments:** • Tables are not ADA compliant.
Benches	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
84. Where multiple benches are provided, are at least 50% consistent with this section? Benches (Compliant Yes/No): D1______________________________ D2______________________________ D3______________________________ D4______________________________ (List Items in Notes if Not Compliant) a – Back Support b – Front Edge of Bench 17-19” Above Ground/Floor c – 30” x 48” Clear Floor or Ground Space Adjacent to Bench d – Firm and Stable Surface e – Arm Rest f – Accessible Route	☐	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐	**Comments:** • No benches observed on site. Note: Note: Note: Note:

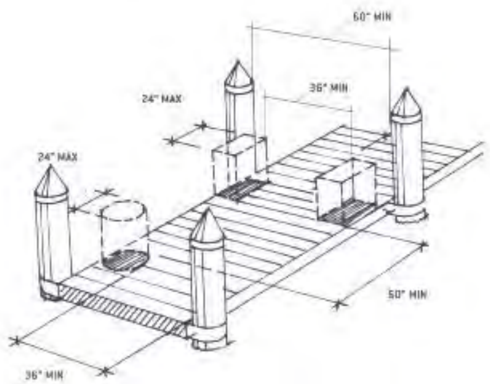


	n/a	Yes	No	Comments
85. Where multiple benches are provided,	☐	☐	☐	**Comments:**

	n/a	Yes	No	
are at least 20% connected to an ORAR?				
86. Of the accessible benches that are provided, do at least 50% of those benches have back rests? In addition, one armrest shall be provided at one end or in the middle of at least 50% of the benches with backrests.	☐	☐	☐	**Comments:**
87. Are the front edges of accessible benches between 17 and 19 inches maximum above the ground/floor?	☐	☐	☐	**Comments:**
88. Is there a 36" x 48" Clear Floor or Ground Space adjacent to the bench?	☐	☐	☐	**Comments:**
89. Is the ground/floor surface around the accessible benches firm and stable?	☐	☐	☐	**Comments:**
Accessible Fishing Piers/Platforms	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
90. Is there at least one unobstructed accessible route to the fishing pier or platform? (minimum 36" width, maximum 2% cross slope and maximum 8.33% running slope)	☐	☐	☐	**Comments:**
91. Is there a clear floor or ground space (30 inches by 48 inches minimum) at each location that has a railing height of 34 inches maximum?	☐	☐	☐	**Comments:**
92. Is there edge protection that is a minimum of 2 inches above the ground or deck surface?	☐	☐	☐	**Comments:**
93. Is there at least one tuning area, either a 60-inch turning space or a T-shaped space, to allow a person using a mobility device or wheelchair to make a 180-degree turn?	☐	☐	☐	**Comments:**
94. Where railings are provided on fishing piers or platforms, do they comply with ADAAG provisions?	☐	☐	☐	**Comments:**

 RAILING HEIGHTS AND CLEAR SPACE				
95. Where railings are provided, are there multiple locations where the railing is 34 inches high maximum to offer a variety of fishing location options?	☐	☐	☐	**Comments:**
Lake Shoreline / Beach Access	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
96. Is at least one beach access route provided for each one-half mile of shoreline where the following occur? • Where circulation routes such as boardwalks, walkways, or dune crossings are provided along or across developed beach sites to provide pedestrian access to the beach or shoreline. • Where parking facilities are provided at developed beach sites and pedestrian access to the beach is provided near the parking facilities. • Where bathing and toilet facilities are provided at developed beach sites and pedestrian access points to the beach are pro-vided near the bathing and toilet facilities. • Where a beach nourishment project is undertaken.	☐	☐	☐	**Comments:**
97. Does beach access route have a clear width of 60 inches minimum?	☐	☐	☐	**Comments:**
98. Is the access route 5% or less for any distance?	☐	☐	☐	**Comments:**
99. Do the segment lengths meet the following requirements: Max. 50 LF @ 5% - 8.33% Max. 30 LF @ 8.33% - 10%	☐	☐	☐	**Comments:**
100. Where slopes are steeper than 5% for	☐	☐	☐	**Comments:**

	n/a	Yes	No	Comments
the given runs above, are there resting intervals provided at the top and bottom of the runs (60 inches long x 60 inches wide with maximum slopes of 3% in any direction. If surface is paved or elevated above natural ground, the surface shall not be steeper than 2% in any direction)?				
101. Are all cross slopes a maximum of 3%, and where surface is paved or elevated above the natural ground, the cross slopes are a maximum of 2%?	☐	☐	☐	**Comments:**
102. Are there any obstacles on beach access route that exceed 1 inch in height measured vertically to the highest point? Where the surface is concrete, asphalt, or boards, obstacles shall not exceed one-half inch in height measured vertically to the highest point.	☐	☐	☐	**Comments:**
103. Constructed features, including signs, shall not extend into the space above a beach access route more than 4 inches if they are between 27 inches and 80 inches above the surface of the beach access route.	☐	☐	☐	**Comments:**
Gates and Barriers	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
104. Gate openings and openings in barriers for pedestrian passage shall provide a clear width of 36” inches, complying with ODAAG section 1017.3 Clear Tread Width.	☐	☒	☒	**Comments:** • There is one chain gate at entry to Rainbow Pack Station Trail from the upper parking lot that also serves as access to the picnic area. • There is no pedestrian access around the gate when it is closed.  **Possible Action:** • Extend the ORAR around the gate post on at least 1 end.
Boating Facilities	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
105. Is there an accessible route to the boating facilities?	☐	☐	☐	**Comments:**

<table>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>106. Does the gangway to the dock or floating dock deigned to provide for a maximum 1:12 (8.33%) slope?
Note: Not required to be longer than 80 feet. (Elevators may be used in lieu of gangways) In smaller facilities with less than 25 boat slips, the slope of the gangway may exceed 1:12, if the gangway is at least 30 feet long.</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
<tr><td>107. Does the gangway have a transition plate to the pier or platform that meets codei?</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
<tr><td>108. Where boat slips are provided, does the number of accessible slips comply with the table to the right?
Note: If boat slips at a facility are not identified or demarcated by length, each 40 feet of boat slip edge along the perimeter of a pier will be counted as one boat slip</td><td>☐</td><td>☐</td><td>☐</td><td>
<table>
<tr><th colspan="2">Number of Accessible Boat Slips Required</th></tr>
<tr><td>Total Slips in Facility</td><td>Minimum Accessible Slips</td></tr>
<tr><td>1-25</td><td>1</td></tr>
<tr><td>26-50</td><td>2</td></tr>
<tr><td>50-100</td><td>3</td></tr>
<tr><td>101-150</td><td>4</td></tr>
</table>


PIER CLEARANCE SPACE REDUCTION</td></tr>
<tr><td>109. If the facility only has a boarding pier (see footnote # 9) at least 5% but not less than, must comply with these guidelines. The entire length of accessible boarding piers must comply with the same provisions that apply to slips. Does this facility meet this regulation?</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
<tr><td>110. Is this facility compromised only of a boat launch with no boarding ramp or pier?</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
</table>

Item Number	Notes


South Lake
RESTROOM
Restroom
FOOD LOCKERS
Trailhead & Information Kiosk
PARKING LOT B
Parking Area
SIGNS
TRAILHEAD
Bishop Pass Trail
PARKING LOT A
Trailhead
TRAILHEAD
Picnic Tables
PICNIC TABLES
GATE
Stairs to Launching Pier
Restroom
Parking Area
Marina
Picnic Tables
Parking Area
Rainbow Pack Station Trail

APPENDIX E

INTAKE NO. 2 COMPLIANCE CHECKLIST

APPENDIX E

INTAKE NO. 2 COMPLIANCE CHECKLIST

Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG)

Compliance Checklist

The purpose of this checklist is to locate and assess site components within existing public outdoor recreation facilities, for compliance with the Forest Service Outdoor Recreation Accessibility Guidelines (FSORG). The Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG) and the Forest Service Trail Accessibility Guidelines (FSTAG) are the legally enforceable standards for use on the National Forest System for the facilities and features addressed in those guidelines. They, in part, incorporate sections of the Architectural Barriers Act Accessibility Standards (ABAAS), and the Outdoor Developed Area Accessibility Guidelines (ODAAG), developed by the Architectural and Transportation Barriers Compliance Board (U.S. Access Board).

This checklist serves as a planning tool to assist with identifying accessibility deficiencies within a facility and possible actions to be considered for correcting them.

Facility Name: INTAKE NO. 2
Date Surveyed: 08/05/2020
Surveyor(s): E. MILLS; J. SANDLIN

Site Component	Compliant			
Parking	n/a	Yes	No	Comments / Possible Action
☐ Check here if section does not apply to this site and move to next section.				
1. Are an adequate number of accessible parking spaces available? The table below gives the ADAAG requirement for new construction and alterations (for lots with more than 100 spaces refer to ADAAG). Accessible Spaces per Overall spaces Total Spaces / Accessible Spaces Required 1 to 25 / 1 space **26 to 50 / 2 spaces** 51 to 75 / 3 spaces 76 to 100 / 4 spaces	☐	☐	☒	**Comments:** 2 separated parking lots along the exterior access aisles. • Parking stalls are not paved or striped. • Parking Lot A – has capacity for approximately 20 stalls • Parking Lot B – has capacity for approximately 12 stalls • There are no designated accessible parking spaces. • Minimum of 2 accessible space required, with at least one being Van Accessible. **Possible Action:** • Design and Construct minimum of 2 Accessible Parking spaces (1-minimum Van Accessible), along accessible route to Restroom Building and Accessible Fishing Pier.
2. Are the accessible parking spaces located closest to the accessible route and accessible building entrance?	☒	☐	☐	**Comments:** • No accessible spaces

	n/a	Yes	No	
3. Are an adequate number of van accessible spaces provided? At least 1 of every 8 accessible spaces must be van-accessible (with a minimum of 1 van-accessible space in all cases.)	☐	☐	☒	• Construct minimum of 2 Accessible Parking spaces (1-minimum Van Accessible), along accessible route to Restroom Building and Accessible Fishing Pier.
4. Are the access aisles part of the accessible route?	☒	☐	☐	**Comments:** • No accessible spaces
5. Do the access aisles have a cross slope less than 1:48, and have a firm, stable non-slip surface?	☒	☐	☐	**Comments:** • No accessible spaces
6. Do the access aisles connect to an accessible pedestrian route with a minimum clear and unobstructed width of 36 inches?	☒	☐	☐	**Comments:** • No accessible spaces
7. Does the accessible car parking space measure 96 inches wide with an adjoining access aisle 96 inches wide? OR Does the accessible van parking space measure 132inches wide with an adjoining access aisle 60 inches wide?	☒	☐	☐	**Comments:** • No accessible spaces
8. Are accessible spaces marked with and International Symbol of Accessibility? Are there signs reading "Van Accessible" at van spaces? Is Sign Mounted 60" min. from ground to bottom of sign?	☒	☐	☐	**Comments:** • No accessible spaces
9. Is there an enforcement procedure to ensure that accessible parking is used only by those who need it?	☒	☐	☐	**Comments:** • No accessible spaces
Drop-off / Public Transit Areas	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
10. Is there a passenger pick up and drop off zone? If so, is at least one passenger loading zone accessible which measures 96 inches wide by 20 feet long with a 60-inch-wide access aisle parallel to the vehicle pull up space and at the same level as the roadway?	☐	☐	☐	**Comments:**
11. Do curbs on the accessible route have curb cuts or curb ramps at 1:12 slope? NOTE: If a slope of 1:12 is not possible, a slope between 1:10 and 1:12 is allowed for a MAX RISE of 6 inches. A slope between 1:8 and 1:10 is allowed for a MAX RISE of 3 inches. A slope steeper than 1:8 is not allowed. Flared sides may be 1:10 slope.	☐	☐	☐	**Comments:**

	n/a	Yes	No	Comments
12. Is curb cut/curb ramp flush with surrounding grade?	☐	☐	☐	**Comments:**
13. Is the curb cut/ramp 36 inches wide, exclusive of flared sides?	☐	☐	☐	**Comments:**
14. Are there public transportation stops on site, if so, is an accessible route provided to the building from the stop?	☐	☐	☐	**Comments:**
Outdoor Recreation Access Routes[1]	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
15. Does the park have accessible routes (ORARs) to all accessible facilities within the park? Surface: shall be firm and stable. The type of surface should be appropriate to the setting and level of development. Clear width: 36", may be reduced to 32" per 1.1 conditions. Slope: 5% or less. Up to 8.33% for 50 feet or 10% for 30 feet with resting intervals that are minimum of 60 inches long, see figure 3. Cross Slope: 3% maximum. Where the surface is paved or elevate above natural ground, cross slope shall not be greater than 2%. Passing spaces: if accessible route is less than 60 inches wide provide passing spaces at intervals of 200' maximum, see figure 4.	☐	☐	☒	

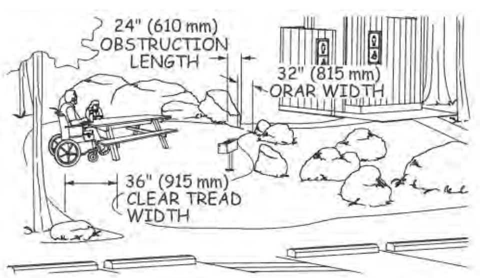


Figure 1—The clear tread width is the unobstructed width of the traveling surfac

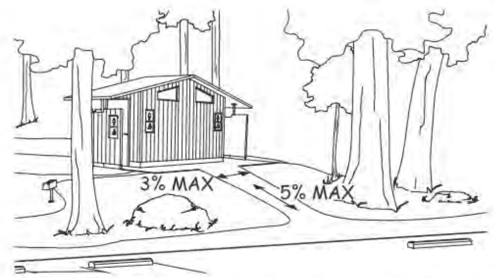


Figure 2—The basic slope requirements for outdoor recreation access routes and beach access routes.

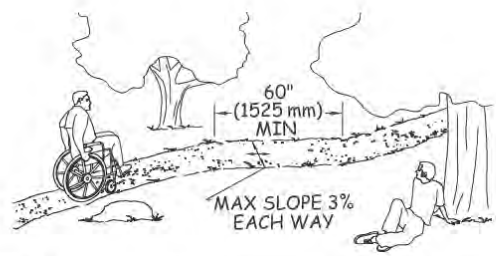


Figure 3—The basic resting interval requirements for outdoor recreation access routes.

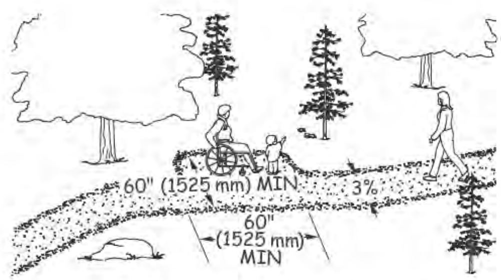


Figure 4—Minimum required dimensions for a passing space for an outdoor recreation access route or a beach access route.

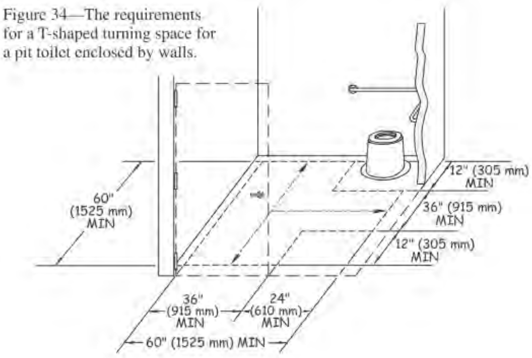
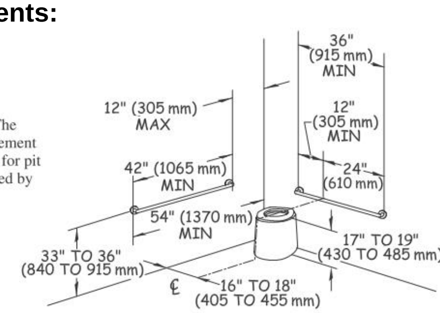
[1] To meet (FSORAG) Outdoor Recreation Access Routes (ORARs) shall be provided between units and constructed features in campgrounds, picnic areas, trailheads, viewing areas, and other outdoor recreation sites. ORARs shall connect the outdoor constructed features within each recreation site and shall connect to common use features such as toilets, showers, water spouts, trash or recycling receptacles, parking spaces, and beach access routes. Where ORARs are provided within vehicular ways, those ORARs shall not be required to comply with sections 2.4 Slope, 2.5 Resting Intervals, and 2.6 Passing Spaces.

Facility/Amenity:		Yes	No	
A1 Restroom		☒	☐	Note:
A2 Fishing Pier		☒	☐	Note:
A3 Picnic Area		☐	☒	Note: **a, b, c, d**
A4 Recycling		☒	☐	Note:
A5 Lake Shoreline/Beach Access Points		☐	☒	Note: **a, b, c, d,**
A6 Parking		☐	☒	Note: **a;** Paving, Stripping, Signage
A7 Water Hydrant		☐	☒	Note: **a, b**
A8 Drive Aisle / (Serves as ORAR)		☐	☒	Note: **a;**
A9 Grills		☐	☒	Note: **a, b,**
(List Items in Notes if Not Compliant) a – Surface b – Clear Width c – Slope d – Cross Slope e – Resting Intervals f – Passing Space				**Comments:** • The drive aisle is partially paved and in fair condition. Needs some spot repairs. Serves as shared ORAR to amenities. • Transitions from paved to non-paved access needs spot repairs. • Several areas that are non-paved ORAR need repair due to being overgrown, or erosion. **Possible Action:** • Pave and stripe ADA compliant parking stalls. • Pave and stripe ORAR route from parking to Restroom, Recycling. • Stripe safe crossings to Fishing Pier, and Picnic Area. • Reconfigure route to and around water hydrant. • Add accessible routes to key Lake Shore Access Points • Provide ORAR to and around picnic areas.

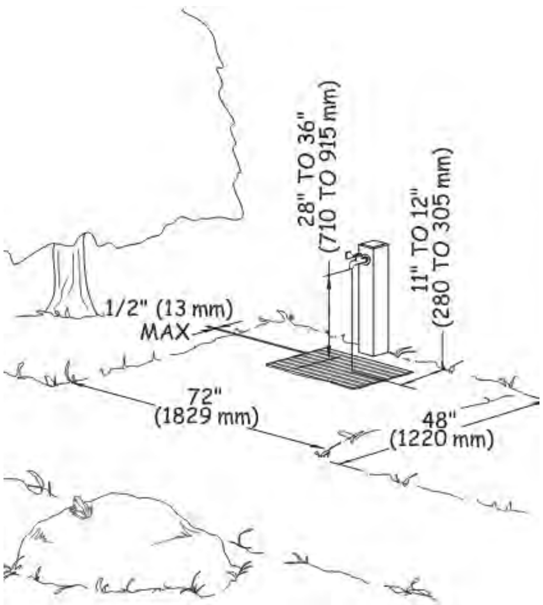
Restrooms	n/a	Yes	No	Comments / Possible Action
☐ Check here if section does not apply to this site and move to next section.				
16. If restrooms are available to the public, is at least one restroom (either one for each sex, or unisex) fully accessible?	☐	☐	☒	**Comments:** • There are 2 restroom buildings on site. Only one of them was open, functional and available for

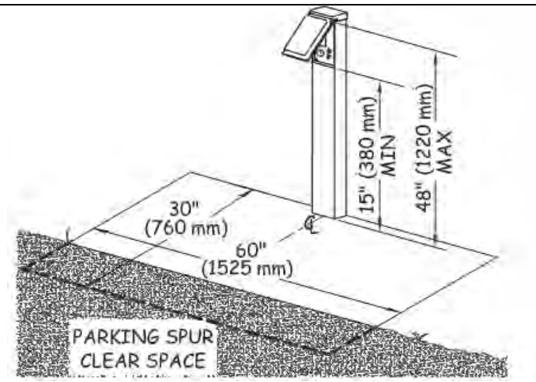
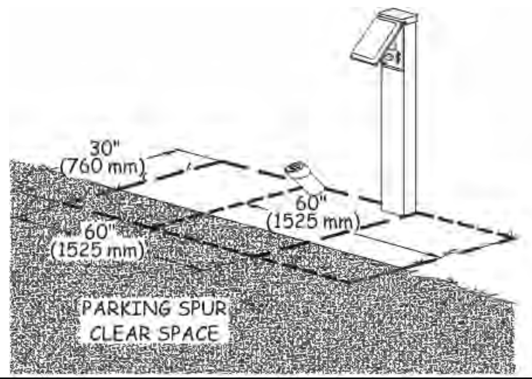
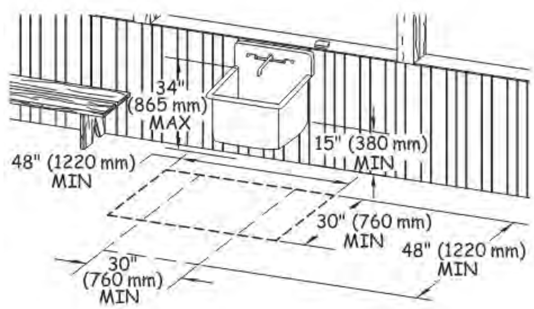
				assessment. It is located adjacent to the parking aisle and spaces.
17. Are there signs at inaccessible restrooms that give directions to accessible ones?	☐	☐	☒	**Comments:** • It is not known if the inoperable restroom is intended to be renovated or not.
18. Is there tactile signage identifying rest rooms? *Note: Mount signs on the wall, on the latch side of the door, complying with the permanent signage.*	☐	☐	☒	**Comments:** • Need replaced **Possible Action:** • Replace with new sign.
19. Are pictograms or symbols used to identify rest rooms, and, if used, are raised characters and braille included below?	☐	☐	☒	**Comments:** • Need replaced **Possible Action:** • Replace with new sign.
20. Is the doorway at least 32 inches clear?	☐	☒	☐	**Comments:**
21. Are doors equipped with accessible handles (operable with a closed fist), 48 inches high or less?	☐	☒	☐	**Comments:**
22. Can doors be opened easily (5 lbf max. force)?	☐	☒	☐	**Comments:**
23. Does the entry configuration provide adequate maneuvering space for a person using a wheelchair? *Note: A person using a wheelchair needs 36 inches of clear width for forward movement, and a 5-foot diameter clear space or a T-shaped space to make turns. A minimum distance of 48 inches clear of the door swing is needed between the two doors of an entry vestibule.*	☐	☒	☐	**Comments:**
24. Is there a 36-inch-wide path to all fixtures?	☐	☒	☐	**Comments:**
25. Is the stall door operable with a closed fist, inside and out?	☒	☐	☐	**Comments:** • Restroom does not have individual stalls
26. Is there a wheelchair-accessible stall that has an area of at least 5 feet by 5 feet, clear of the door swing, OR is there a stall that is less accessible but that provides greater access than a typical stall (either 36 by 69 inches or 48 by 69 inches)?	☐	☒	☐	**Comments:**

27. In the accessible stall, are there grab bars behind and on the side wall nearest to the toilet?	☐	☒	☐	
28. Is the toilet seat 17 to 19 inches high?	☐	☒	☐	**Comments:**
29. Does one lavatory have a 30-inch-wide by 48-inch-deep clear space in front? *Note: A maximum of 19 inches of the required depth may be under the lavatory.*	☒	☐	☐	
30. Is the lavatory rim no higher than 34 inches?	☒	☐	☐	**Comments:**
31. Is there at least 29 inches from the floor to the bottom of the lavatory apron?	☒	☐	☐	**Comments:**
32. Can the faucet be operated with one closed fist?	☒	☐	☐	**Comments:**
33. Are soap and other dispensers and hand dryers within reach ranges and usable with one closed fist?	☒	☐	☐	**Comments:**
34. Is the mirror mounted with the bottom edge of the reflecting surface 40 inches high or lower?	☒	☐	☐	**Comments:**
35. Is there a clear space of 60 inches by 60 inches adjacent to the toilet?	☐	☒	☐	**Comments:**
36. Is the maneuvering space less than or equal to 1:50? (1:33 maximum allowed for drainage) (2% -3.3%)	☐	☒	☐	**Comments:**
37. If there is a ADA Accessible Portable Restroom, is there an accessible route and entry into the portable unit?	☒	☐	☐	**Comments:** • There were no portable units on site.
FSORAG Pit Toilet Restrooms Only	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
38. Is there an accessible route to the restroom? Where pit toilets are constructed in sites that are not accessed by motor vehicles, the pit toilets and all constructed features in the site shall be connected by trail segments complying with the FSTAG.	☐	☐	☐	**Comments:**
39. The clear floor or ground space shall be 60 inches wide minimum measured parallel with the back of the pit toilet, and 56 inches deep minimum measured parallel to the sides of the pit toilet. A turn-ing space that is at least 60 inches in diameter or T-shaped with a minimum 36	☐	☐	☐	**Comments:**

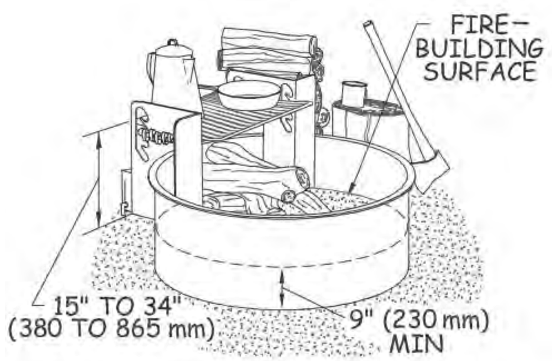
<table>
<tr><td>inches wide by 24 inches deep base centered on a minimum 36 inches wide by 60 inches long crossarm shall be provided, as shown in figure. The turning space and clear floor or ground space may overlap.</td><td></td><td></td><td></td><td>Figure 34—The requirements for a T-shaped turning space for a pit toilet enclosed by walls.

</td></tr>
<tr><td>40. Is the surface of turning and clear floor or ground space firm and stable?</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
<tr><td>41. Is the slope of the turning space and clear floor or ground space surface no steeper than 2% in all directions?</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
<tr><td>42. Is the toilet seat 17 to 19 inches high?</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
<tr><td>43. Where walls or partitions are provided, the seat shall be positioned with a wall or partition to the rear and to one side of the seat for a left-hand or right-hand approach. The back of the riser shall be flush against the back wall. The centerline of the seat shall be 16 inches minimum to 18 inches maximum from the side wall or partition.</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
<tr><td>44. Where walls or partitions are provided, grab bars complying with ABAAS shall be provided, the same as for grab bars for toilets in administrative buildings. Required locations are shown in figure.</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:
Figure 36—The grab bar placement requirements for pit toilets enclosed by walls.


have vertical or nearly vertical sides and a flat area on each side of the seat that is about 3 inches (75 millimeters) wide.</td></tr>
<tr><td>45. Doors shall comply with ABAAS, the same as doors for buildings at administrative sites. The door shall not swing into or otherwise obstruct the clear floor or ground space required.</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
<tr><td>46. The entrance to the toilet shall be level with the surrounding surface.</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
<tr><th>Water Hydrants</th><th>n/a</th><th>Yes</th><th>No</th><th>Comments / Possible Action</th></tr>
<tr><td colspan="5">☐ Check here if section does not apply to this site and move to next section.</td></tr>
<tr><td>47. Is the water hydrant clear floor or ground space around the hydrant 48 inches by 72 inches with the long side of the space adjoining an ORAR or another clear ground space (clear space shall not</td><td>☐</td><td>☐</td><td>☒</td><td>Comments:
The hydrant was not operable during the assessment visit and was covered with black plastic sheeting.
The ground space is not defined and</td></tr>
</table>

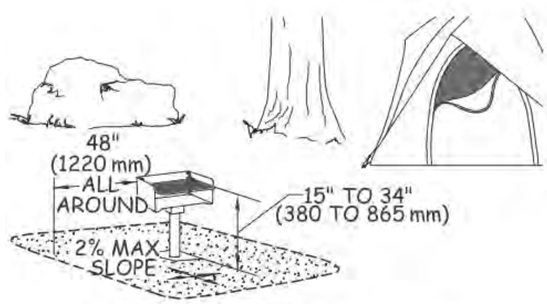
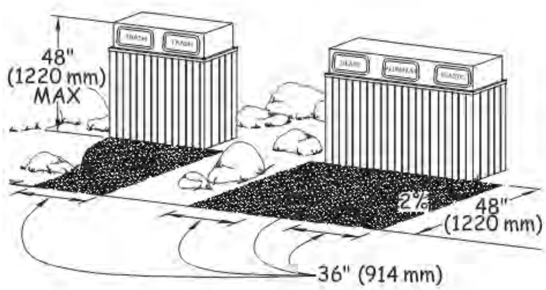
overlap ORAR)? NOTE: Until hand pumps are available that meet the accessibility standards for operating controls while adequately accessing the water supply are available from more than one source, hand pumps are exempt from the requirements for reach ranges and operability in ABAAS 308 and 309.4. 				it does not clearly adjoin the ORAR. • The Water Valve Box and raised, rock-filled drain structure obstruct the ground space. **Possible Action:** • Formalize a defined clear ground space around the hydrant. • Adjust the valve box to be flush with ground. • Replace the drain structure with structure that is flush with ground. 
48. Is water spout located between 28 inches and 36" above the ground?	☐	☒	☐	**Comments:**
49. Is the water spout located 11 inches minimum and 12 inches maximum from the rear center of the long side of the clear space?	☐	☐	☒	**Comments:** • The clear space is not defined.
50. If drain grates are provided, are the openings in the grates ½" maximum?	☐	☐	☐	**Comments:** • Drain structure obstructs clear space. **Possible Action:** • Replace drain structure with structure that is flush with the ground.
Utilities at Recreation Sites	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
51. Is there a clear floor or ground space of at least 30 by 60 inches oriented for front or parallel approach to all usable sides of the utilities?	☐	☐	☐	**Comments:**
52. Are the utility pedestals installed to adhere	☐	☐	☐	

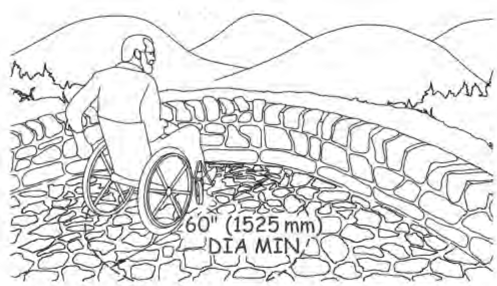
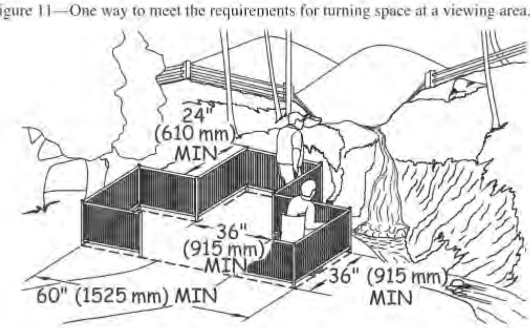
	n/a	Yes	No	Comments / Possible Action
to the Reach Ranges and Operability Requirement as shown and/or as specified in 308 and 309 of ABAAS?				 
Utility Sinks	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
53. Is the height of the rim or counter surrounding the sink 34 inches maximum above the ground or floor space?	☐	☐	☐	**Comments:** 
54. Is the bottom of the bowl at least 15 inches above the ground or floor space?	☐	☐	☐	
55. Is Water Spout 28 – 36" above ground or floor space.	☐	☐	☐	
56. Do sink controls comply with reach ranges and operability specified in ABAAS?	☐	☐	☐	
Drinking Fountain	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
57. Is there at least one fountain with clear floor space of at least 30 by 48 inches in front?	☐	☐	☐	**Comments:**
58. Is there one fountain with its spout no higher than 36 inches from the ground, and another with a standard height spout (or a single "hi-lo" fountain)?	☐	☐	☐	**Comments:**
59. Are controls mounted on the front or on the side near the front edge, and operable with one closed fist?	☐	☐	☐	**Comments:**

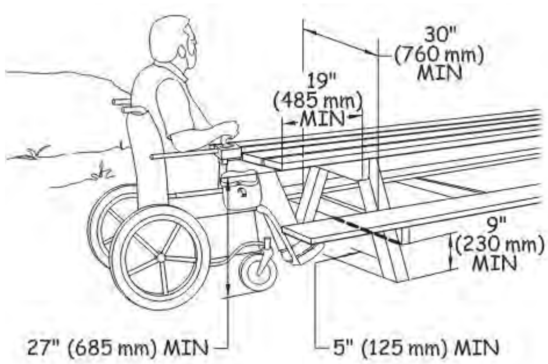
	n/a	Yes	No	
60. Is each water fountain cane-detectable (located within 27 inches off the floor or protruding less than 4 inches from the wall, into the circulation path?	☐	☐	☐	**Comments:**
Directional and Informational Signage	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
61. If mounted about 80 inches, do they have letters at least 3 inches high, with high contrast, and non-glare finish?	☒	☐	☐	**Comments:** • No signs mounted above 80 inches observed on site. **Possible Action:** • Review adopted sign standards and make sure they are ADA compliant. • Determine if standards need to be revised. • Replace signs based on compliance with adopted standards. • Adjust heights of signs as needed.
62. Do directional and informational signs comply with legibility requirements? (Building directories or temporary signs need not comply.)	☐	☐	☐	**Comments:** **Possible Action:** • Review adopted sign standards and make sure they are ADA compliant. • Determine if standards need to be revised. • Replace signs based on compliance with adopted standards. • Adjust heights of signs as needed.
63. If materials need to be obtained from or manipulated on a sign or kiosk, the sign or kiosk shall be designed to meet the reach ranges in section 308 of ABAAS and in figures 14 through 19.	☒	☐	☐	**Comments:** • No Kiosk associated with Day Use area. There is a sign structure associated with campground that was not assessed as part of this effort.
Fire Rings	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
64. Is the fire surface height a minimum of 9" above the ground/floor?	☐	☐	☐	**Comments:** • Fire rings included in campground and not part of this assessment effort.

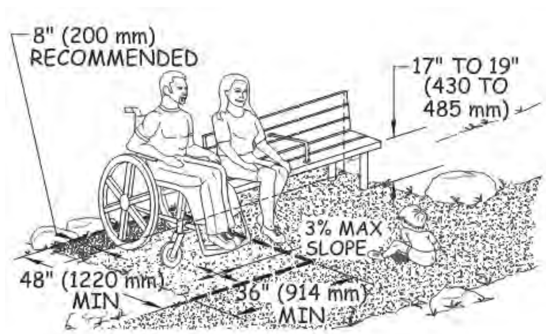
	n/a	Yes	No	
				 Figure 22—The height requirements for manufactured steel fire rings.
65. Do all fire rings have a clear space extending a minimum 48" deep by 48" wide at all usable portions of the ring? This must be adjacent to ORAR but may not overlap the ORAR	☐	☐	☐	**Comments:**
66. Are the clear spaces around the fire pit on a firm and stable surface?	☐	☐	☐	**Comments:**
67. Are the slopes around fire pits not more than 1:50?	☐	☐	☐	**Comments:**
Cooking Surfaces, Grills, Pedestal Grills[2]	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
68. Are accessible cooking features dispersed throughout the area and among the types provided? 	☐	☐	☒	**Comments:** • Observed and assessed 3 grills within the designated picnic area. • There were no defined accessible routes to the grills. • There are inadequate clear ground spaces around the grills. **Possible Action:** • Relocate at least 2 of the grills to areas adjoining the ORAR and with compliant clear ground space. • If grills are within a picnic pad site, assure the picnic table and pad are also compliant with FSORAG and FSTAG.
69. Are accessible cooking feature surfaces installed between 15 inches and 34 inches above the ground/floor?	☐	☒	☐	**Comments:**

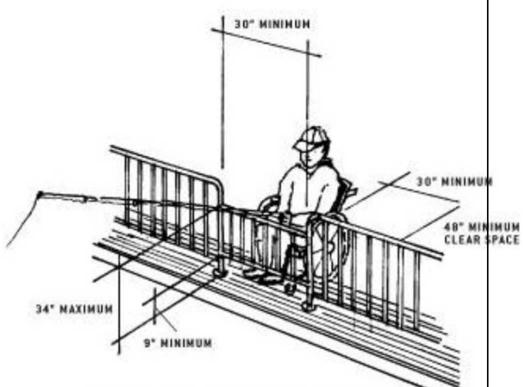
[2] Where there is only one cooking surface, grill or pedestal grill in a provided picnic area, it shall be accessible. Where multiple cooking features are provided in a picnic area, 50 percent, but no less than 2 shall be accessible.

				 Figure 24—The requirements for height, clear space, and reach range for a pedestal grill.
70. Do operating controls and mechanisms comply with current Clear Floor Space and Height standards?	☐	☐	☒	**Comments:** • There were no defined accessible routes to the grills. • There are inadequate clear ground spaces around the grills.
Fixed Trash/Recycling Containers	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
71. Is the clear floor or ground space for a forward approach 36 inches by 48 inches or for side approach 30 inches by 60 inches? 	☐	☒	☐	**Comments:** • One fixed Recycling container is located near restroom building. No fixed trash receptacle was observed. • There is a dumpster located in the corner of the parking lot, but it does not meet the requirements for a Fixed Trash receptacle. **Possible Action:** • Action items depend upon the owner's practice and policies for providing and maintaining fixed trash receptacles. Currently none are provided, however it there is a desire to add any, they should be installed along an ORAR and adhere to FSORAG standards.
72. Are the Trash / Recycling containers themselves an ADA compliant model?	☐	☒	☐	**Comments:** • Recycling container is compliant model. **Possible Action:** • Supplement with ADA compliant trash receptacle.

	n/a	Yes	No	
				
73.				
Overlooks/Viewing Areas	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
74. Where multiple viewing areas at overlooks are provided, at least one of each viewing opportunity for distinct points of interest shall be accessible.	☐	☐	☐	**Comments:**
75. Are all viewing areas constructed to provide an unobstructed view?	☐	☐	☐	**Comments:**
76. Is there at least one 60” x 60” maneuvering space or T-shaped turning space?	☐	☐	☐	**Comments**  Figure 11—One way to meet the requirements for turning space at a viewing area.  Figure 12—The requirements for a T-shaped turning space at a viewing area.
77. Is the ground surface firm and stable?	☐	☐	☐	**Comments:**

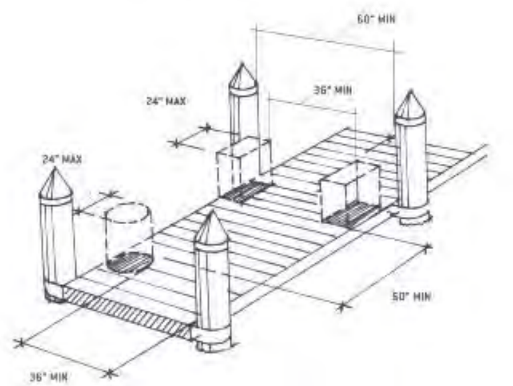
78. Is the maneuvering space less than or equal to 1:50? (1:33 maximum allowed for drainage)	☐	☐	☐	**Comments:**
79. Does accessible viewing area of a 36" minimum x 48" minimum and at least one turning space that complies with section 304.3 of ABAAS?	☐	☐	☐	**Comments:**
Picnic Tables (Units)	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
80. Is there an accessible route to and within common use areas that complies with FSORAG? At least 48" of clear floor or ground space shall surround the usable sides of the picnic table measured from back edge of the benches.	☐	☐	☒	**Comments:** • There are no compliant routes to the 3 picnic areas. • The width of the clear ground space around the tables varies. **Possible Action:** • Construct FORSAG compliant accessible route to each of the 3 picnic area pad sites. • Construct a 48" clear route around each picnic table.
81. Where more than two picnic tables are provided, are at least 20% but not less than two mobility compliant?	☐	☐	☒	**Comments:** • None of the 3 picnic table pad sites are compliant. **Possible Action:** • Construct FORSAG compliant accessible route to each of the 3 picnic area pad sites. • Construct a 48" clear route around each picnic table. • Reinstall Picnic Tables to compliant heights.
Tables (Compliant Yes/No):				
C1: Table #1		☐	☒	Note: **a, b, f (reinstall table)**
C2: Table #2		☐	☒	Note: **a, b, f (reinstall table)**
C3: Table #3		☐	☒	Note: **a, b, f (reinstall table)**
(List Items in Notes if Not Compliant) a – Knee Space b – Clear Space Around Table c – Slope d – Cross Slope e – Firm and Stable Surface f – Accessible Route				
82. Are knee spaces at accessible picnic tables at least 27 inches high, 30 inches	☐	☐	☒	**Comments:**

wide, and 19 inches deep?				
83. Information on location of accessible picnic units provided at bulletin boards or information kiosks (otherwise this will need to be provided on web sites or in brochures)? Do not identify at individual picnic units.	☐	☐	☒	**Comments:**
84. Each picnic table shall have at least one wheelchair seating space. Up to 9' long tables=require 1 space 10-20' long tables=require 2 spaces See FSORAG figure 4.1.2 for larger tables	☐	☒	☐	**Comments:** • All tables have ability to be accessible from either end once they are reinstalled to proper height and accessible routes and clearances are provided.
Benches	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
85. Where multiple benches are provided, are at least 50% consistent with this section? Benches (Compliant Yes/No): D1__________________________ D2__________________________ D3__________________________ D4__________________________ (List Items in Notes if Not Compliant) a – Back Support b – Front Edge of Bench 17-19" Above Ground/Floor c – 30" x 48" Clear Floor or Ground Space Adjacent to Bench d – Firm and Stable Surface e – Arm Rest f – Accessible Route	☐	☐ ☐ ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐	**Comments:** Note: Note: Note: Note: 
86. Where multiple benches are provided, are at least 20% connected to an ORAR?	☐	☐	☐	**Comments:**
87. Of the accessible benches that are provided, do at least 50% of those benches have back rests? In addition, one armrest shall be provided at one end or in the middle of at least 50% of the benches with backrests.	☐	☐	☐	**Comments:**
88. Are the front edges of accessible	☐	☐	☐	**Comments:**

benches between 17 and 19 inches maximum above the ground/floor?				
89. Is there a 36" x 48" Clear Floor or Ground Space adjacent to the bench?	☐	☐	☐	**Comments:**
90. Is the ground/floor surface around the accessible benches firm and stable?	☐	☐	☐	**Comments:**
Accessible Fishing Piers/Platforms	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
91. Is there at least one unobstructed accessible route to the fishing pier or platform? (minimum 36" width, maximum 2% cross slope and maximum 8.33% running slope)	☐	☒	☐	**Comments:**
92. Is there a clear floor or ground space (30 inches by 48 inches minimum) at each location that has a railing height of 34 inches maximum?	☐	☒	☐	**Comments:** • There is one continuous 32 inch high rail.
93. Is there edge protection that is a minimum of 2 inches above the ground or deck surface?	☐	☒	☐	**Comments:**
94. Is there at least one tuning area, either a 60-inch turning space or a T-shaped space, to allow a person using a mobility device or wheelchair to make a 180-degree turn?	☐	☒	☐	**Comments:**
95. Where railings are provided on fishing piers or platforms, do they comply with ADAAG provisions?  RAILING HEIGHTS AND CLEAR SPACE	☐	☒	☐	**Comments:** • There is a railing provided which does not serve as a guard rail. 
96. Where railings are provided, are there multiple locations where the railing is 34 inches high maximum to offer a variety of fishing location options?	☐	☒	☐	**Comments:** • Railing is consistently 32" high around entire pier.

Lake Shore / Beach Access	n/a	Yes	No	Comments / Possible Action
☐ Check here if section does not apply to this site and move to next section.				
97. Is at least one beach access route provided for each one-half mile of shoreline where the following occur? • Where circulation routes such as boardwalks, walkways, or dune crossings are provided along or across developed beach sites to provide pedestrian access to the beach or shoreline. • Where parking facilities are provided at developed beach sites and pedestrian access to the beach is provided near the parking facilities. • Where bathing and toilet facilities are provided at developed beach sites and pedestrian access points to the beach are pro-vided near the bathing and toilet facilities. • Where a beach nourishment project is undertaken. 	☐	☐	☒	**Comments:** • There are no compliant beach access routes that allow access to the lake edge with the exception of the Accessible Fishing Pier. • There are numerous small access points along the ORAR/Parking Access drive, but none of them are accessible due to excessive slopes and/or obstructions such as unstable surface, boulders, width restrictions, etc. **Possible Action:** • Identify existing access points that require the least amount of modifications to make them accessible. • Provide a well-defined accessible route from the picnic area to the lake's edge. 
98. Does beach access route have a clear width of 60 inches minimum?	☐	☐	☒	**Comments:** • No defined accessible beach access routes.
99. Is the access route 5% or less for any distance?	☐	☒	☐	**Comments:** • No defined accessible beach access routes.
100. Do the segment lengths meet the following requirements: Max. 50 LF @ 5% - 8.33% Max. 30 LF @ 8.33% - 10%	☐	☐	☒	**Comments:** • No defined accessible beach access routes. • Some runs are 14% slopes
101. Where slopes are steeper than 5% for the given runs above, are there resting intervals provided at the top and bottom	☐	☐	☒	**Comments:** • No defined accessible beach access

	n/a	Yes	No	Comments
of the runs (60 inches long x 60 inches wide with maximum slopes of 3% in any direction. If surface is paved or elevated above natural ground, the surface shall not be steeper than 2% in any direction)?				routes.
102. Are all cross slopes a maximum of 3%, and where surface is paved or elevated above the natural ground, the cross slopes are a maximum of 2%?	☐	☐	☒	**Comments:** • No defined accessible beach access routes.
103. Are there any obstacles on beach access route that exceed 1 inch in height measured vertically to the highest point? Where the surface is concrete, asphalt, or boards, obstacles shall not exceed one-half inch in height measured vertically to the highest point.	☐	☒	☐	**Comments:** • No defined accessible beach access routes. • Abrupt paving edges in certain areas. • Ruts, boulders, trees, shrubs etc.
104. Constructed features, including signs, shall not extend into the space above a beach access route more than 4 inches if they are between 27 inches and 80 inches above the surface of the beach access route.	☒	☐	☐	**Comments:** • No defined accessible beach access routes.
Gates and Barriers	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☐ Check here if section does not apply to this site and move to next section.				
105. Gate openings and openings in barriers for pedestrian passage shall provide a clear width of 36" inches, complying with ODAAG section 1017.3 Clear Tread Width. 	☐	☐	☒	**Comments:** • There are 2 vehicular gates located on the access drive. Neither specifically serves to restrict pedestrian access, however there are no compliant routes around the ends of the gate. **Possible Action:** • Provide accessible pedestrian route around at least one end of each gate. 
Boating Facilities	**n/a**	**Yes**	**No**	**Comments / Possible Action**
☒ Check here if section does not apply to this site and move to next section.				
106. Is there an accessible route to the boating facilities?	☐	☐	☐	**Comments:**

<table>
<tr><td>107. Does the gangway to the dock or floating dock deigned to provide for a maximum 1:12 (8.33%) slope?
Note: Not required to be longer than 80 feet. (Elevators may be used in lieu of gangways) In smaller facilities with less than 25 boat slips, the slope of the gangway may exceed 1:12, if the gangway is at least 30 feet long.</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
<tr><td>108. Does the gangway have a transition plate to the pier or platform that meets codei?</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
<tr><td>109. Where boat slips are provided, does the number of accessible slips comply with the table to the right?
Note: If boat slips at a facility are not identified or demarcated by length, each 40 feet of boat slip edge along the perimeter of a pier will be counted as one boat slip</td><td>☐</td><td>☐</td><td>☐</td><td>
<table>
<tr><th colspan="2">Number of Accessible Boat Slips Required</th></tr>
<tr><td>Total Slips in Facility</td><td>Minimum Accessible Slips</td></tr>
<tr><td>1-25</td><td>1</td></tr>
<tr><td>26-50</td><td>2</td></tr>
<tr><td>50-100</td><td>3</td></tr>
<tr><td>101-150</td><td>4</td></tr>
</table>


PIER CLEARANCE SPACE REDUCTION</td></tr>
<tr><td>110. If the facility only has a boarding pier (see footnote # 9) at least 5% but not less than, must comply with these guidelines. The entire length of accessible boarding piers must comply with the same provisions that apply to slips. Does this facility meet this regulation?</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
<tr><td>111. Is this facility compromised only of a boat launch with no boarding ramp or pier?</td><td>☐</td><td>☐</td><td>☐</td><td>Comments:</td></tr>
</table>

Item Number	Notes


Parking Area
Restroom
PARKING LOT A
GATE
Fishing Pier
Restroom
RESTROOM
BEACH ACCESS
FISHING PIER
Informal bank fishing along road to intake and dam
WATER HYDRANT
Parking Area
PARKING LOT B
Information Kiosk
GATE
PICNIC TABLES/GRILLS
General day use area before entering campground. I believe no formal structures here, but possibly picnic tables.
Intake No. 2 Da
Intake No. 2 Reservoir

APPENDIX F

LIST OF PHOTOS

APPENDIX F

LIST OF PHOTOS

Appendix F

List of Photos

TABLE OF CONTENTS

LIST OF PHOTOS

Lake Sabrina

South Lake Recreation Area

Intake No. 2 Reservoir Recreation Area

LOCATION: LAKE SABRINA

Signage and Wayfinding

Photo 1 No Parking Sign

Photo 2 No Parking Sign

Photo 3 Standard Facility ID Sign

Photo 4 Standard SCE ID Sign

Photo 5 Standard Boat Landing ID Sign

Photo 6 Sportsman Regulatory Sign

Photo 7 Mussels Protection Regulatory Sign

Photo 8 Signage at Boat Ramp

Visual and Aesthetic Quality

Photo 9 Receptacles at Marina

Public Safety Measures

Photo 10 Crest of Sabrina Dam

Photo 11 Eroding Edge of Roadway

Area A: Weir below Sabrina Dam

Photo 12 Panorama of Weir Area Looking East

Photo 13 Panorama of Weir Area Looking West

Photo 14 Shoreline Access at Weir

Photo 15 Path Along Western Shoreline

Photo 16 Access to Shoreline Upstream of Bridge

Photo 17 Access to Shoreline from Road; Keep Out of Stream Bed Sign

Area B: Northwest Shoreline and Sabrina Dam

Photo 18 Looking South at Northwest Shoreline

Photo 19 Typical Shoreline in Area B

Photo 20 Typical Trail Along Area B

Photo 21 Sabrina Dam

Photo 22 Foot Trails from Sabrina Dam to Parking Area

Area C: Inlet Trail

Photo 23 Trailhead Behind Marina

Photo 24 Typical Trail, Before Talus Field

Photo 25 Typical Trail, Talus Field

Photo 26 Typical Trail, Past Talus Field

Photo 27 View from Trail to Inlet, Looking South

Photo 28 Typical Trail, Near Inlet

Photo 29 Middle Fork Bishop Creek Inlet

Photo 30 Middle Fork Bishop Creek

Photo 31 Middle Fork Bishop Creek Inlet

Area D: Mid Lake Sabrina Peninsula

Photo 32 Typical Foot Trail on Peninsula

Photo 33 Fire Ring

Photo 34 Potential Camping Area

Photo 35 Typical Trail on Southern Portion of Peninsula

Photo 36 Cleared Ares/Potential Camping in Lakebed Below High Water

Area E: Middle Fork Bishop Creek Inlet

Photo 37 Beach Adjacent to Inlet

Photo 38 Fire Pit on Beach

Photo 39 Fire Pit and Camping Area in Woods

Photo 40 Potential Camping Area

Photo 41 Foot Trail Between Potential Camping Areas

LOCATION: SOUTH LAKE RECREATION AREA

Roads and Parking

Photo 42 End of New Paving at South Lake Boat Ramp

Site Elements

Photo 43 Portable Boat Slips/Docks

Photo 44 Boat Launch

Photo 45 Food Lockers

Site Buildings

Photo 46 Ramp Transition

Photo 47 Roof of South Lake Landing

Universal Accessibility

Photo 48 Picnic Table

Photo 49 Shoreline Access

Public Safety Measures

Photo 50 Stairs to Launching Pier

Photo 51 Bathroom Near Stairs

Area A: Hillside Dam and Spillway

Photo 52 Upstream Face of Hillside Dam

Photo 53 Fishing Access on Upstream, Western Side of Hillside Dam

Photo 54 Spillway Area Used for Fishing

Area B: Green Creek Diversion

Photo 55 Green Creek Diversion Pipeline Adjacent to Rainbow Pack Station Trail

Photo 56 Access Along Pipeline

Photo 57 Access Along Pipeline

Photo 58 Access Along Pipeline

Photo 59 Access Along Pipeline

Photo 60 From Pipeline, Looking Back Towards South Lake

Photo 61 Pipeline Crossing USFS' Baker Summit Trail

Area C: Main Recreation Area

Photo 62 Potential Camping on Ridge Above Parking Areas

Photo 63 Foot Trail Along Ridge Above Parking Area

Photo 64 Cove Adjacent to USFS' Bishop Pass Trail

Photo 65 Potential Camping on Ridge Above Cove

Photo 66 Foot Trail to Cove Used for Fishing Access

Area D: Southern Shorelines of South Lake

Photo 67 Fire Pit and Camping Area

Photo 68 Potential Camping Area

Photo 69 Potential Camping Area; Tarp In Background

Photo 70 Tarp in Potential Camping Area

Photo 71 Installation in Tree

Area E: Southern Shorelines of South Lake

Photo 72 Beach with Potential Camping

Photo 73 Potential Camping Area

Photo 74 Fire Pit

Photo 75 Beach Below High Water Mark with Fire Pit and Potential Camping

Photo 76 Fire Pit and Potential Camping

Area F: Southern Shorelines of South Lake

Photo 77 Fire Pit and Potential Camping

Area G: Island

Photo 78 Potential Camping Area

Photo 79 Fire Pit

Photo 80 Fire Pit and Potential Camping Area

Photo 81 Fire Pit and Potential Camping Area

Photo 82 Fire Pit and Potential Camping Area

Photo 83 Fire Pit and Potential Camping Area

Photo 84 Foot Paths on Island

Area H: Southern Shorelines of South Lake

Photo 85 Potential Camping on Beach Below High-Water Mark

Photo 86 Potential Camping on Beach Below High-Water Mark

Photo 87 Fire Pit on Beach Below High-Water Mark

LOCATION: INTAKE NO. 2 RESERVOIR RECREATION AREA

Site Elements

Photo 88 Water Hydrant

Universal Accessibility

Photo 89 Picnic Area

Photo 90 Eroded Edges of Paved Surfaces

Area A: Northern Shoreline and Intake No. 2 Dam

Photo 91 Northern Shoreline of Intake No. 2 Reservoir

Photo 92 Access and Signage in Northwestern Corner of Reservoir

Photo 93 Access to Northern Shoreline

Photo 94 Access to Northern Shoreline

Photo 95 Access to Northern Shoreline

Photo 96 Access Behind Intake

Photo 97 Access Along Intake No. 2 Dam

Area B: Day Use Area

Photo 98 Trails to Shoreline in Day Use Area

Photo 99 Potential Kayak Access to Shoreline

Photo 100 Trails to Shoreline in Day Use Area

Area C: Middle Fork Bishop Creek

Photo 101 Foot Path Along Middle Fork Bishop Creek

Photo 102 Access to Creek

Photo 103 Access to Creek

Photo 104 Foot Trail Above Creek to North

Photo 105 Foot Trail to Southern Bank of Creek Near Inlet

Photo 106 Potential Camping and Fire Pit

Photo 107 Potential Use as Fire Pit

Area D: Southeastern Shoreline

Photo 108 Foot Trail Along Shoreline

Photo 109 Foot Trail to Southeastern Shoreline

Photo 110 Access to Shoreline

Photo 111 Access to Shoreline

Photo 112 Access to Shoreline

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project
(FERC Project No. 1394)

DRAFT LICENSE APPLICATION

FINAL TECHNICAL REPORT
PROJECT BOUNDARY LANDS & ROADS MEMORANDUM
(LANDS1)

Southern California Edison
1515 Walnut Grove Ave
Rosemead, CA 91770

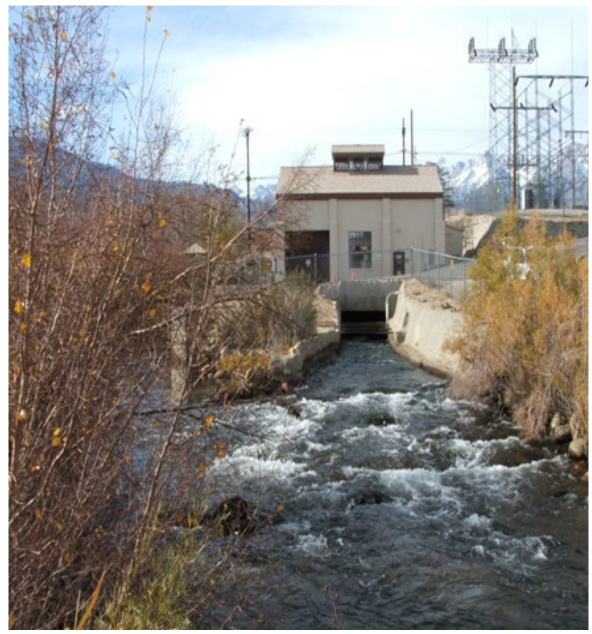
January 2022

Support from:

Kleinschmidt

SOUTHERN CALIFORNIA EDISON

Bishop Creek Hydroelectric Project (FERC Project No. 1394)



DRAFT TECHNICAL MEMORANDUM PROJECT BOUNDARY LANDS & ROADS (LANDS 1)

SOUTHERN CALIFORNIA EDISON

An EDISON INTERNATIONAL® Company

JANUARY 2022

TABLE OF CONTENTS

LIST OF TABLES

APPENDICES

MEMORANDUM

TO: Bishop Creek Technical Working Group

FROM: Matthew Harper

CC: Matthew Woodhall, SCE

DATE: November 4, 2021

RE: Project Boundary and Lands Study

1.0 INTRODUCTION

This memorandum provides an update on the implementation of the Project Boundary Lands and Roads (LAND 1) Study Plan (Study Plan) at the Bishop Creek Hydroelectric Project (Federal Energy Regulatory Commission [FERC] Project No. 1394-080; hereinafter referred to as the “Project”). The Project is located along Bishop Creek southwest of the City of Bishop, Inyo County, California. During Technical Workgroup (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. The Study Plan detailed Southern California Edison’s (SCE) 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 is intended to ensure that an accurate representation of both Project boundary and land classification is presented in a final license application.

The primary intent of this memorandum is to provide an update on the ongoing review of Project lands and potential next steps associated with the LANDS 1 Study. This memo was distributed to stakeholders on October 6, 2021 for a 60-day review period.

2.0 STUDY GOALS AND OBJECTIVES

The goal of the study is to assess potential modifications to the Project boundary to account for future O&M of Project facilities. To meet this goal, this approved study has the following objectives:

- Review the current Project boundary for accuracy and propose adjustments, as appropriate.
- 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).

The detailed scope of this study is outlined in the LANDS 1 Study Plan, approved by FERC as part of the Study Plan Determination on November 4, 2019.

3.0 METHODS

To ensure that the Project boundary conforms with 18 CFR 4.41 (Exhibit G) requirements, the following methods were implemented to assess the current Project:

1. *Assess the current Project boundary for accuracy*
    a. Compile Project boundary GIS data and Exhibit G drawings which have been filed and approved with FERC as part of the current license.
    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 adjacent 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 used 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 used predominantly for Project purposes, such as operation, maintenance, or recreation access within the Project boundary

Methods also include consultation with USFS, BLM, and/or other landowners as needed to determine if other Project-related resource areas should be removed or included in the Project boundary. Results of other studies conducted as part of this relicensing are being monitored for potential modifications to the Project boundary.

4.0 RESULTS

4.1 PROPOSED CHANGES TO PROJECT LANDS

Based on a review of available data and conversations with SCE staff to date, a comprehensive list of proposed changes to the current Project boundary has been developed (Table 4.1-1). Proposed changes are primarily related to ensuring that all current Project operations and facilities are adequately encompassed, including current and proposed Project roads and trails. Minor changes to the Project boundary due to mapping corrections based on improved accuracy of available data can be expected but are not discussed in this memo. Examples of mapping corrections include improved centerlines and buffers for roads, flowlines, creeks, or transmission lines that are contemplated in the Project boundary but not accurately represented in the GIS data. A comprehensive list of mapping corrections will be included with the USR.

This memo focuses on those proposed changes to Project lands for features that are either not currently identified in the Project license (addition) or no longer needed for Project purposes (removal). Table 4.1-1 (Operations/Facilities), Table 4.1-2 (Project roads), and Table 4.1-3 (Project trails) below lists each proposed boundary change currently under consideration by the Relicensing Team. For each proposed change, a unique ID (which corresponds to the title of a map in Appendix A), short description, suggested action, and reason for the proposed change to the Project boundary, if applicable, is provided. It is important to note that there is a Project Roads Inventory associated with the Project description. Where the proposed change includes “adding the road to the roads inventory” in Table 4-2 below, it simply means that road is used primarily for Project-related activities and will be described thusly in the Project description. These roads are often already in the FERC Project boundary, and for those outside the boundary, it has been noted.

We recommend reviewing each table in conjunction with its corresponding figure in Appendix A.

Table 4.1-1 Proposed boundary changes related to operations/facilities

ID	Description	Proposed Action	Reason for Proposed Boundary Change
Operations/ Facilities – 1	Lands adjacent to Intake No. 6 are currently used for spoils/staging and are not included in the Project boundary.	Add lands to the boundary. This addition encompasses lands currently owned by SCE and would not require additional landowner approvals.	Addition of Project lands currently in use by Project Operations
Operations/ Facilities – 2	The current Project boundary does not fully encompass all facilities associated with Plant 4 on USFS lands.	Obtain approval from USFS and add lands to the boundary.	Addition of Project lands (Project operations)
Operations/ Facilities – 3	The current Project boundary does not fully encompass all lands used for spoils in the "donut" between access roads and buffers to penstocks on USFS lands.	Obtain approval from USFS and add lands to the boundary.	Addition of Project lands (Project operations)
Operations/ Facilities - 4	USFS lands adjacent to Flowline 3 are currently used a for spoils/staging and are not included in the Project boundary.	Obtain approval from USFS and add lands to the boundary.	Addition of Project lands (Project operations)

Table 4.1-2 Proposed boundary changes related to Project roads and / or to the Project Roads Inventory

ID	Description	Proposed Action	Reason for Proposed Boundary Change
Road - 1	An access road to the north side of Plant 5 is not currently within the Project boundary or listed as an official Project road.	Add to Project boundary and Project roads inventory. This addition encompasses lands currently owned by SCE and would not require additional landowner approvals.	Addition of Project lands (Project roads)
Road - 2	An access road to the southeastern end of Intake No. 6 is not currently within the Project boundary or listed as an official Project road.	Add to Project boundary and Project roads inventory. This addition encompasses lands currently owned by SCE and would not require additional landowner approvals.	Addition of Project lands (Project roads)
Road - 3	A USFS road providing access to the cell phone repeater is not currently within the Project boundary.	Obtain approval from USFS and add road buffer to the boundary.	Addition of Project lands (Project roads)
Road - 4	An access road providing access along Powerhouse 4 Penstocks is mostly within the Project boundary but not fully encompassed. The road is also not listed as an official Project road.	Add to Project boundary and Project roads inventory. This addition encompasses lands currently owned by SCE and would not require additional landowner approvals.	Addition of Project lands (Project roads)
Road - 5	An access road to the weir below Intake No. 4 is currently mostly within the Project boundary but not officially listed as a Project road.	Add to Project boundary and Project roads inventory. This addition encompasses lands currently owned by SCE and would not require additional landowner approvals.	Addition of Project lands (Project roads)
Road - 6	An access road providing access to the south end of Intake No. 4 is partially within the Project boundary but not fully encompassed. It is also not listed as an official Project road.	Add to Project boundary and Project roads inventory. This addition encompasses lands currently owned by SCE and would not require additional landowner approvals.	Addition of Project lands (Project roads)

Road - 7	An access road to the western end of Plant 3 facilities is not currently within the Project boundary or listed as an official Project road.	Add to Project boundary and Project roads inventory. This addition encompasses lands currently owned by SCE and would not require additional landowner approvals.	Addition of Project lands (Project roads)
Road - 8	An access road from Buttermilk Road to Birch-McGee Diversion is partially within the Project boundary but not fully encompassed. It is also not listed as an official Project road and is located on land owned by LADWP.	Consult with LADWP and add to Project boundary and Project roads inventory.	Addition of Project lands (Project roads)
Road - 9	An access road to the Project gage below McGee Creek Diversion Flowline is partially within the Project boundary but not fully encompassed. It is also not listed as an official Project road and is on land owned by USFS.	Consult with USFS and add to Project boundary and Project roads inventory.	Addition of Project lands (Project roads)
Road - 10	A road on USFS lands providing access from Big Trees Road to Flowline 3 is not currently within the Project boundary.	Consult with USFS and add to Project boundary and Project roads inventory.	Addition of Project lands (Project roads)
Road - 11	A portion of Buttermilk Road on USFS lands is used for access to Birch Creek Diversion Flowline but is not within the Project boundary.	Consult with USFS and add to Project boundary and Project roads inventory.	Addition of Project lands (Project roads)
Road - 12	An access road to the south side of Plant 2 is partially within the Project boundary but not fully encompassed. It is also not listed as an official Project road and partially located on USFS land.	Consult with USFS and add to Project boundary and Project roads inventory.	Addition of Project lands (Project roads)
Road - 13	An access road to the Project gage at the end of Birch Creek Diversion Flowline is partially within the Project boundary but not fully encompassed. It is also not listed as an official Project road and is located on USFS land.	Consult with USFS and add to Project boundary and Project roads inventory.	Addition of Project lands (Project roads)
Road – 14	An access road from Buttermilk Road to Flowline 2 is partially within the Project boundary but not fully encompassed. It is also not listed as	Consult with USFS and add to Project boundary and Project roads inventory.	Addition of Project lands (Project roads)

	an official Project road and is partially located on USFS land.		
Road – 15	An access road from Flowline 2 to the downstream end of Intake No. 2 is currently partially within the Project boundary and not officially listed as a Project road and is partially located on USFS land.	Consult with USFS and add to Project boundary and Project roads inventory.	Addition of Project lands (Project roads)
Road – 16	An access road south of Intake No. 2 Reservoir leading to the south end of the diversion is currently partially within the Project boundary and not officially listed as a Project road and is partially located on USFS land.	Consult with USFS and add to Project boundary and Project roads inventory.	Addition of Project lands (Project roads)
Road – 17	An access road to the South Fork Diversion is not currently fully encompassed within the Project boundary and not listed as an official Project road.	Add to Project boundary and Project roads inventory. This addition encompasses lands currently owned by SCE and would not require additional landowner approvals.	Addition of Project lands (Project roads)

Table 4.1-3 Proposed boundary changes related to Project trails

ID	Description	Proposed Action	Reason for Proposed Boundary Change
Trail - 1	SCE has requested that this portion of the Sabrina Basin Trail - a USFS system trail - be included in the Project boundary and listed as a Project trail to facilitate access for maintenance to the Sabrina Dam spillway. This is on USFS property.	Consult with USFS and add to Project boundary and Project trails inventory.	Addition of Project lands (Project trails)

4.2 WILDERNESS

A review of the current Project boundary in relation to the current boundary of the John Muir Wilderness revealed four areas where the two intersect. Three of these areas appear to be mapping incongruencies where both boundaries appear to attempt to represent the same boundary, such as the maximum operating level of a reservoir or the banks of a creek. The fourth area are facilities and waters associated with Longley Dam, Longley Lake, Longley Reservoir Trail, and McGee Creek, which are all within the John Muir Wilderness. Below is a brief description of each area with accompanying maps provided in Appendix B.

- Longley Lake, Longley Dam, Longley Reservoir Trail, and a portion of McGee Creek are all located within the John Muir Wilderness. The minor mapping corrections discussed above, such as an improved centerline and buffer for McGee Creek, will also be applied to this area.
- Near Tyee Day Use Area, much of the current wilderness boundary overlaps the current Project boundary. Most likely, both are intended to represent the exclusion of South Fork Bishop Creek, so the resolution may be to sync GIS data between Project boundary and the USFS' representation of the John Muir Wilderness boundary.
- At Lake Sabrina, much of the current wilderness boundary overlaps the current Project boundary. Most likely, both are intended to represent the same contour elevation for the maximum operating level of the reservoir, so the resolution may be to sync GIS data between Project boundary and the USFS' representation of the John Muir Wilderness boundary.
- At South Lake, much of the current wilderness boundary overlaps the current Project boundary. Most likely, both are intended to represent the same contour elevation for the maximum operating level of the reservoir, so the resolution may be to sync GIS data between Project boundary and the USFS' representation of the John Muir Wilderness boundary.

5.0 ONGOING ANALYSIS

The proposed changes discussed in this memo are a result of initial review of Project lands, features, operations, maintenance activity, and underlying land ownership. As intended, this study is an ongoing process that will continue until a proposed Project boundary and inventory of Project features is established and submitted as part of SCE's Draft License Application in January 2022. Part of the ongoing process will be to discuss this initial proposal with the Recreation & Land Use TWG, where results from ongoing recreation related studies can be discussed relative to the current boundary. Methods may also include outside consultation with USFS, BLM, and/or other landowners, as needed, to determine if other Project-related resource areas should be removed or included in the Project boundary.

While all public data related to land ownership has been obtained in GIS format, SCE is currently further documenting areas that require more detailed research to determine whether lands are correctly distinguished between federal and non-federal, as relevant to the GIS data to be filed with FERC as part of Exhibit G. SCE is in the initial stages of inventorying potential Project roads and trails, which will be further defined based on many of the proposed additions to Project lands above.

6.0 CONSULTATION

SCE distributed periodic progress reports on the following schedule:

- Progress Report 1: December 19, 2019
- Progress Report 2: April 14, 2020
- Progress Report 3: July 24, 2020
- Initial Study Report (Progress Report 4): October 30, 2020
- Initial Study Meeting: November 10, 2020
- Progress Report 1: March 2, 2021
- Progress Report 2: May 28, 2021
- Progress Report 3: August 27, 2021
- Updated Study Report Filing: November 4, 2021
- Updated Study Report Meeting: November 18, 2021

The Initial Study Report (ISR) was filed with FERC on October 30, 2020 and a virtual ISR Meeting was held on November 10, 2020. Three progress reports were filed in 2021 after the ISR, as identified above. This Final Technical Report was submitted to agencies and stakeholders for a 60-day review period on November 5, 2021. Comments received on this report are shown in Table 6-1.

SCE held a Project Effects meeting on October 28, 2021 for all stakeholders and agencies to discuss what project effects (if any) had been identified through the implementation of each of the approved study plans.

The Updated Study Report (USR) was filed with FERC on November 4, 2021, and a USR Meeting was held on November 18, 2021. At this meeting, SCE only discussed those studies which were still in progress at the time of the ISR (Water Quality, Sediment and Geomorphology, Operations Model, Recreation Use and Needs, Recreation Facilities Condition Assessment, Project Lands and Boundary, and Cultural and Tribal Studies).

A meeting was held with USFS on December 7, 2021 to discuss comments received on this report as well as SCE's draft responses to them. A summary of all comments received and SCE's responses to those comments are provided in Table 6-1 below.

Table 6-1 Comment Response Table

Response to Agency Comments on Final Technical Reports for the Bishop Creek Hydroelectric Project				
Comment No.	**Agency**	**Source**	**Agency Comment**	**Response**
Project Boundary and Land Study (LAND 1) – USR Memo				
1	USFS	Page 5, Operations/Facilities – 1	Not FS Land	Comment noted.
2	USFS	Page 5, Operations/Facilities – 2	Yes, should be part of the FERC	Comment noted.
3	USFS	Page 5, Operations/Facilities – 3	How is this used by the public? Will this effect access?	No changes are being proposed to current public access or use of the lands.
4	USFS	Page 5, Operations/Facilities – 4	Yes, should be part of the FERC	Comment noted.
5	USFS	Page 6, Road – 1	Yes, should be part of the FERC	Comment noted.
6	USFS	Page 6, Road – 2	How is this road used by the public? Will this effect access?	No changes are being proposed to current public access or use of the road.
7	USFS	Page 6, Road – 3	How is this road used by the public? Will this effect access?	No changes are being proposed to current public access or use of the road.
8	USFS	Page 6, Road – 4	How is this road used by the public? Will this effect access?	No changes are being proposed to current public access or use of the road.
9	USFS	Page 6, Road – 5	Yes, should be part of the FERC	Comment noted.
10	USFS	Page 6, Road – 6	This road is partially overgrown and looks like it is in a riparian zone/wetland and should be considered for decommissioning if it is. How would they access this road, there is no open road to the	The current road has been historically used to provide infrequent access to Intake No. 4 facilities for dam safety and maintenance activities; small portions of the access road fall outside the existing FERC boundary. As described in Exhibit E, where stream entry is necessary,

Response to Agency Comments on Final Technical Reports for the Bishop Creek Hydroelectric Project				
Comment No.	**Agency**	**Source**	**Agency Comment**	**Response**
			site and no bridges to the road? How would they use it?	rubber matts are used to minimize impacts.
11	USFS	Page 7, Road – 7	How is this road used by the public? Will this effect access?	No changes are being proposed to current public access or use of the road.
12	USFS	Page 7, Road – 8	Yes, should be part of the FERC	Comment noted.
13	USFS	Page 7, Road – 9	Where is this? The map is not clear	This road segment provides access to a gage below the McGee Creek Diversion flowline and prior to the Birch-McGee Diversion.
14	USFS	Page 7, Road – 10	Yes, should be part of the FERC	Comment noted.
15	USFS	Page 7, Road – 11	How is this road used by the public? Will this effect access?	No changes are being proposed to current public access or use of the road.
16	USFS	Page 7, Road – 12	How is this road used by the public? Will this effect access?	No changes are being proposed to current public access or use of the road.
17	USFS	Page 7, Road – 13	How is this road used by the public? Will this effect access?	No changes are being proposed to current public access or use of the road.
18	USFS	Page 8, Road – 14	This description or the map is not accurate. The map shows Big Trees road, the description is for Buttermilk road	Memo descriptions of roads 12, 13, and 14 are out of order. Descriptions and identification of these roads will be corrected in the update to the ongoing LAND 1 study provided in the DLA.
19	USFS	Page 8, Road – 15	How is this road used by the public? Will this effect access?	No changes are being proposed to current public access or use of the road.

Response to Agency Comments on Final Technical Reports for the Bishop Creek Hydroelectric Project				
Comment No.	**Agency**	**Source**	**Agency Comment**	**Response**
20	USFS	Page 8, Road – 16	How is this road used by the public? Will this effect access?	No changes are being proposed to current public access or use of the road.
21	USFS	Page 8, Road – 17	How is this road used by the public? Will this effect access?	No changes are being proposed to current public access or use of the road.
22	USFS	Page 8, Trail – 1	How will this change trail use? Will it be widened? Will public use be restricted?	No changes are being proposed to the current width and public use of this portion of trail. Having this portion of the trail within the Project boundary will facilitate future maintenance of the trail for spillway access. Management of parking at the trailhead is currently being discussed with the USFS.
23	USFS	Page 9, Wilderness – Longley	What are you asking for here? I don't see a question or management recommendation.	An assessment of wilderness boundaries in relation to the current Project boundary was included as part of the ongoing LAND 1 study. SCE does not propose any changes to project facilities or operations. Minor mapping corrections to verify improved centerlines/buffers for McGee Creek and the high-water mark for Longley Lake will be applied to these areas where the current Project boundary does not accurately reflect the intent of the existing Exhibit G to include all Project features.
24	USFS	Page 9, Wilderness – Tyee Day Use	If this is a wilderness boundary, changing it is problematic and the same laws/regulations will apply as long as it is wilderness	An assessment of wilderness boundaries in relation to the current Project boundary was included as part of the ongoing LAND 1 study. SCE does not propose any changes to project facilities or operations. Minor mapping corrections – improved

Response to Agency Comments on Final Technical Reports for the Bishop Creek Hydroelectric Project				
Comment No.	**Agency**	**Source**	**Agency Comment**	**Response**
			regardless of management agency	centerline/buffer for South Fork Bishop Creek – will be applied to these areas where the current Project boundary does not accurately reflect the intent of the existing Exhibit G to include all Project features.
25	USFS	Page 9, Wilderness – Lake Sabrina	If this is a wilderness boundary, changing it is problematic and the same laws/regulations will apply as long as it is wilderness regardless of management agency	An assessment of wilderness boundaries in relation to the current Project boundary was included as part of the ongoing LAND 1 study. SCE does not propose any changes to project facilities or operations. Minor mapping corrections – improved high-water mark for Lake Sabrina – will be applied to these areas where the current Project boundary does not accurately reflect the intent of the existing Exhibit G to include all Project features.
26	USFS	Page 9, Wilderness – South Lake	If this is a wilderness boundary, changing it is problematic and the same laws/regulations will apply as long as it is wilderness regardless of management agency	An assessment of wilderness boundaries in relation to the current Project boundary was included as part of the ongoing LAND 1 study. SCE does not propose any changes to project facilities or operations. Minor mapping corrections – improved high-water mark for South Lake – will be applied to these areas where the current Project boundary does not accurately reflect the intent of the existing Exhibit G to include all Project features.
27	USFS	General Comment	Intake#2-include fishing access, access road from CA168, intake 2 CG and access roads? These	Comment noted. The segment of access road from CA168 to Intake No. 2 Reservoir is not currently proposed as a Project road in the DLA but will be added to the list of

Response to Agency Comments on Final Technical Reports for the Bishop Creek Hydroelectric Project				
Comment No.	**Agency**	**Source**	**Agency Comment**	**Response**
			features are connected to the presence of the forebay as a recreation destination. The primary purpose of the access road from CA168 is to reach the Intake#2 facilities. The road would exist independently of the presence of the nearby campground.	shared use roads and trails for ongoing discussion with the USFS. Lower Intake No. 2 and Upper Intake No. 2 Campgrounds are also currently being discussed with the USFS as to potential Project nexus.
28	USFS	General Comment	The relicensing of Longley/McGee are not addressed in relation to the lack of language allowing these improvements in the enabling wilderness designation.	The Project was licensed, constructed, and developed prior to Congress' enactment of the Wilderness Act of 1964 and designation of the John Muir Wilderness Area. As such, SCE's license and the associated power site reservation are "existing private rights" under section 4(c) of the Wilderness Act. FERC has held that it is not prohibited from relicensing an existing project within such an area for projects that pre-date the designation of the wilderness area. Additionally, SCE does not propose any new or expanded facilities within the John Muir Wilderness as part of the relicensing effort. See Exhibit E, section 4.8.
29	USFS	General Comment	McGee Cr diversion/Longley Lake trail. Include entire trail in project area. The trail is the access route to the diversion facility. The trail would exist independently of recreational	Comment noted. The addition of Longley Lake Trail as a Project trail is not being proposed in the DLA but will be added to the list of shared use roads and trails for ongoing discussion with the USFS.

Response to Agency Comments on Final Technical Reports for the Bishop Creek Hydroelectric Project				
Comment No.	**Agency**	**Source**	**Agency Comment**	**Response**
			hiking activity and must be maintained to provide access to project infrastructure.	
30	USFS	General Comment	Green Lake pipeline. This is used as a trail by the public and is listed as such in local hiking guidebooks. People walk on the exposed pipeline because there is no formal trail. Presents a potential public safety hazard.	Comment noted. Public use of the pipeline and related management decisions are currently being discussed with the USFS in relation to recreation issues identified at the Project.

APPENDIX A
PROPOSED
BOUNDARY CHANGES

Default Folder: Q:\Client_Data\FERC_Projects\P1394\KA3202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM

Potential Project Boundary Changes
FERC Project Boundary
Stream/Reservoir Gage
Diversion
Dam
Flowline
Penstock
Transmission Lines
Wilderness Area (Inyo NF)
Inyo National Forest
BLM Lands
USFS Trails

Inyo NF Recreation Sites

Boating - Non-Motorized
Boating - Motorized
Tent Camping
Group Camping
RV Camping
Trailhead
Interpretive Area
Fishing Access
Day Use Area
Viewing Scenery
Visitor Center

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

OPERATIONS/ FACILITIES - 2

BISHOP CREEK HYDROELECTRIC PROJECT FERC PROJECT NO. 1394

N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 25 50 Feet

Default Folder: Q:\Client_Data\FERC_Projects\P1394\X43202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM

Potential Project Boundary Changes
FERC Project Boundary
Stream/Reservoir Gage
Diversion
Dam
Flowline
Penstock
Transmission Lines
Wilderness Area (Inyo NF)
Inyo National Forest
BLM Lands
USFS Trails

Inyo NF Recreation Sites

Boating - Non-Motorized
Boating - Motorized
Tent Camping
Group Camping
RV Camping
Trailhead
Interpretive Area
Fishing Access
Day Use Area
Viewing Scenery
Visitor Center

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

OPERATIONS/ FACILITIES - 3

BISHOP CREEK HYDROELECTRIC PROJECT FERC PROJECT NO. 1394

N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 50 100 Feet

Default Folder: Q:\Client_Data\FERC_Projects\P1394\KA3202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM

Potential Project Boundary Changes
FERC Project Boundary
Stream/Reservoir Gage
Diversion
Dam
Flowline
Penstock
Transmission Lines
Wilderness Area (Inyo NF)
Inyo National Forest
BLM Lands
USFS Trails

Inyo NF Recreation Sites

Boating - Non-Motorized
Boating - Motorized
Tent Camping
Group Camping
RV Camping
Trailhead
Interpretive Area
Fishing Access
Day Use Area
Viewing Scenery
Visitor Center

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

OPERATIONS/ FACILITIES - 4

BISHOP CREEK HYDROELECTRIC PROJECT FERC PROJECT NO. 1394

N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 25 50 Feet

Default Folder: Q:\Client_Data\FERC_Projects\P1394\K43202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM

Potential Project Boundary Changes
FERC Project Boundary
Stream/Reservoir Gage
Diversion
Dam
Flowline
Penstock
Transmission Lines
Wilderness Area (Inyo NF)
Inyo National Forest
BLM Lands
USFS Trails

Inyo NF Recreation Sites

Boating - Non-Motorized
Boating - Motorized
Tent Camping
Group Camping
RV Camping
Trailhead
Interpretive Area
Fishing Access
Day Use Area
Viewing Scenery
Visitor Center

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

ROAD - 1

BISHOP CREEK
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1394

N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 25 50
Feet

Default Folder: Q:\Client_Data\FERC_Projects\P1394\KA3202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM

Potential Project Boundary Changes
FERC Project Boundary
Stream/Reservoir Gage
Diversion
Dam
Flowline
Penstock
Transmission Lines
Wilderness Area (Inyo NF)
Inyo National Forest
BLM Lands
USFS Trails

Inyo NF Recreation Sites

Boating - Non-Motorized
Boating - Motorized
Tent Camping
Group Camping
RV Camping
Trailhead
Interpretive Area
Fishing Access
Day Use Area
Viewing Scenery
Visitor Center

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

ROAD - 2

BISHOP CREEK HYDROELECTRIC PROJECT FERC PROJECT NO. 1394

N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 12.5 25 Feet

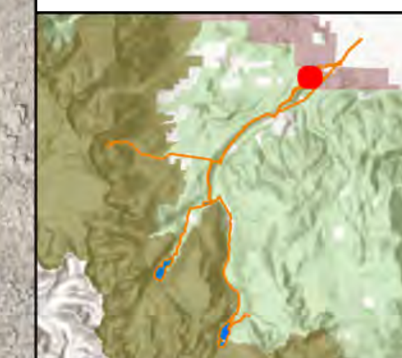
Default Folder: Q:\Client_Data\FERC_Projects\P1394\K43202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM

Potential Project Boundary Changes
FERC Project Boundary
Stream/Reservoir Gage
Diversion
Dam
Flowline
Penstock
Transmission Lines
Wilderness Area (Inyo NF)
Inyo National Forest
BLM Lands
USFS Trails

Inyo NF Recreation Sites

Boating - Non-Motorized
Boating - Motorized
Tent Camping
Group Camping
RV Camping
Trailhead
Interpretive Area
Fishing Access
Day Use Area
Viewing Scenery
Visitor Center



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

ROAD - 3

BISHOP CREEK HYDROELECTRIC PROJECT
FERC PROJECT NO. 1394

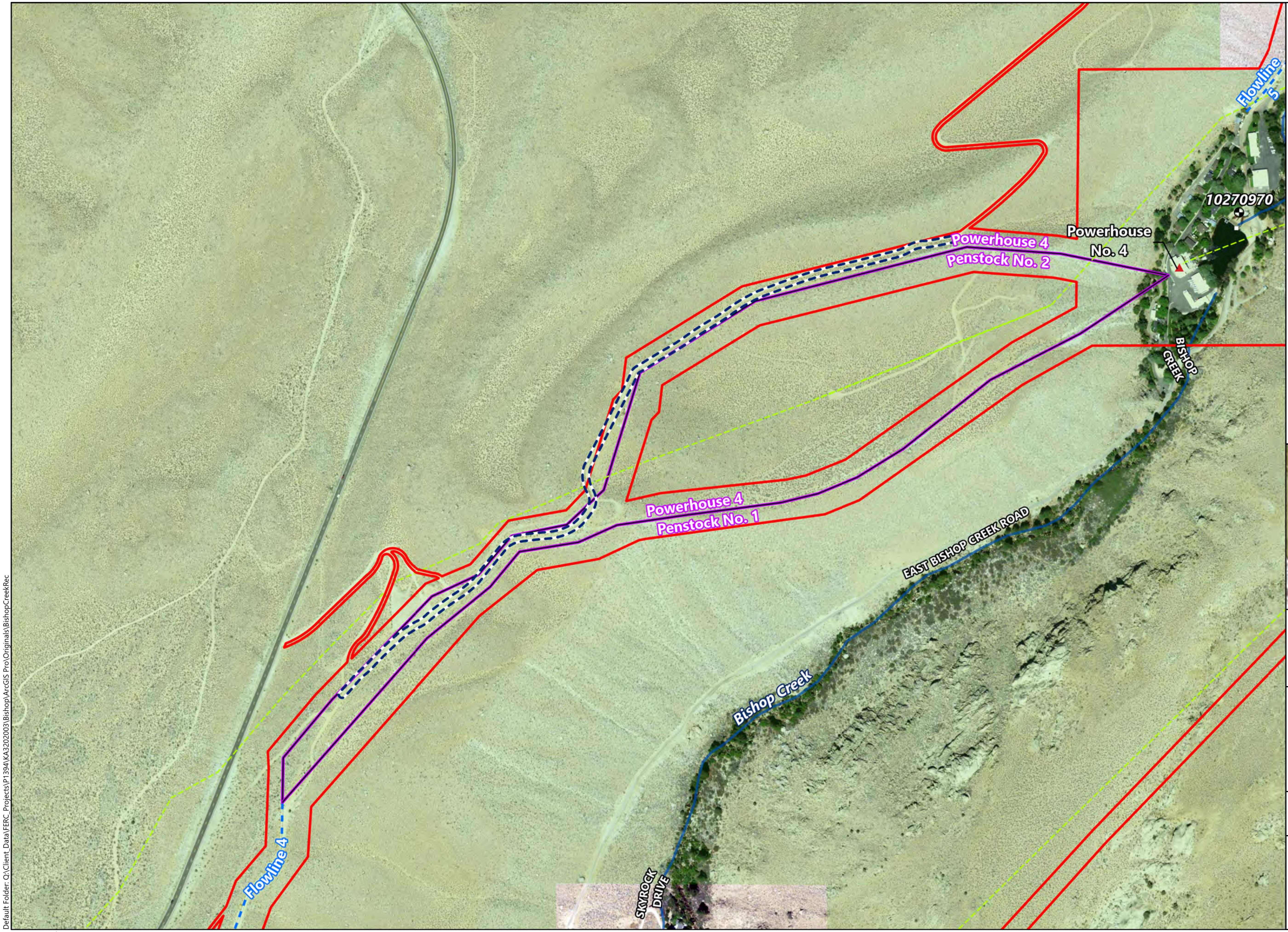
N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 50 100 Feet

Default Folder: Q:\Client_Data\FERC_Projects\P1394\KA3202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM



Potential Project Boundary Changes
FERC Project Boundary
Stream/Reservoir Gage
Diversion
Dam
Flowline
Penstock
Transmission Lines
Wilderness Area (Inyo NF)
Inyo National Forest
BLM Lands
USFS Trails

Inyo NF Recreation Sites

Boating - Non-Motorized
Boating - Motorized
Tent Camping
Group Camping
RV Camping
Trailhead
Interpretive Area
Fishing Access
Day Use Area
Viewing Scenery
Visitor Center

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

ROAD - 4

BISHOP CREEK HYDROELECTRIC PROJECT
FERC PROJECT NO. 1394

N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 220 440 Feet

Default Folder: Q:\Client Data\FERC_Projects\P1394\KA3202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 6:11 PM

- Potential Project Boundary Changes
- FERC Project Boundary
- Stream/Reservoir Gage
- Diversion
- Dam
- Flowline
- Penstock
- Transmission Lines
- Wilderness Area (Inyo NF)
- Inyo National Forest
- BLM Lands
- USFS Trails

Inyo NF Recreation Sites

- Boating - Non-Motorized
- Boating - Motorized
- Tent Camping
- Group Camping
- RV Camping
- Trailhead
- Interpretive Area
- Fishing Access
- Day Use Area
- Viewing Scenery
- Visitor Center

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

ROAD - 5

BISHOP CREEK HYDROELECTRIC PROJECT FERC PROJECT NO. 1394

N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 12.5 25 Feet

Default Folder: Q:\Client_Data\FERC_Projects\P1394\K43202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM

Potential Project Boundary Changes
FERC Project Boundary
Stream/Reservoir Gage
Diversion
Dam
Flowline
Penstock
Transmission Lines
Wilderness Area (Inyo NF)
Inyo National Forest
BLM Lands
USFS Trails

Inyo NF Recreation Sites

Boating - Non-Motorized
Boating - Motorized
Tent Camping
Group Camping
RV Camping
Trailhead
Interpretive Area
Fishing Access
Day Use Area
Viewing Scenery
Visitor Center

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

ROAD - 6

BISHOP CREEK HYDROELECTRIC PROJECT FERC PROJECT NO. 1394

N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 25 50 Feet

Default Folder: Q:\Client_Data\FERC_Projects\P1394\K43202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM

- Potential Project Boundary Changes
- FERC Project Boundary
- Stream/Reservoir Gage
- Diversion
- Dam
- Flowline
- Penstock
- Transmission Lines
- Wilderness Area (Inyo NF)
- Inyo National Forest
- BLM Lands
- USFS Trails

Inyo NF Recreation Sites

- Boating - Non-Motorized
- Boating - Motorized
- Tent Camping
- Group Camping
- RV Camping
- Trailhead
- Interpretive Area
- Fishing Access
- Day Use Area
- Viewing Scenery
- Visitor Center

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

ROAD - 7

BISHOP CREEK HYDROELECTRIC PROJECT FERC PROJECT NO. 1394

N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 50 100 Feet

Default Folder: Q:\Client Data\FERC_Projects\P1394\KA3202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM

Date Exported: 10/5/2021 5:47 PM

Potential Project Boundary Changes
FERC Project Boundary
Stream/Reservoir Gage
Diversion
Dam
Flowline
Penstock
Transmission Lines
Wilderness Area (Inyo NF)
Inyo National Forest
BLM Lands
USFS Trails

Inyo NF Recreation Sites

Boating - Non-Motorized
Boating - Motorized
Tent Camping
Group Camping
RV Camping
Trailhead
Interpretive Area
Fishing Access
Day Use Area
Viewing Scenery
Visitor Center

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

ROAD - 9

BISHOP CREEK HYDROELECTRIC PROJECT FERC PROJECT NO. 1394

N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 12.5 25 Feet

Default Folder: Q:\Client_Data\FERC_Projects\P1394\K43202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM

Potential Project Boundary Changes
FERC Project Boundary
Stream/Reservoir Gage
Diversion
Dam
Flowline
Penstock
Transmission Lines
Wilderness Area (Inyo NF)
Inyo National Forest
BLM Lands
USFS Trails

Inyo NF Recreation Sites

Boating - Non-Motorized
Boating - Motorized
Tent Camping
Group Camping
RV Camping
Trailhead
Interpretive Area
Fishing Access
Day Use Area
Viewing Scenery
Visitor Center

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

ROAD - 10

BISHOP CREEK HYDROELECTRIC PROJECT FERC PROJECT NO. 1394

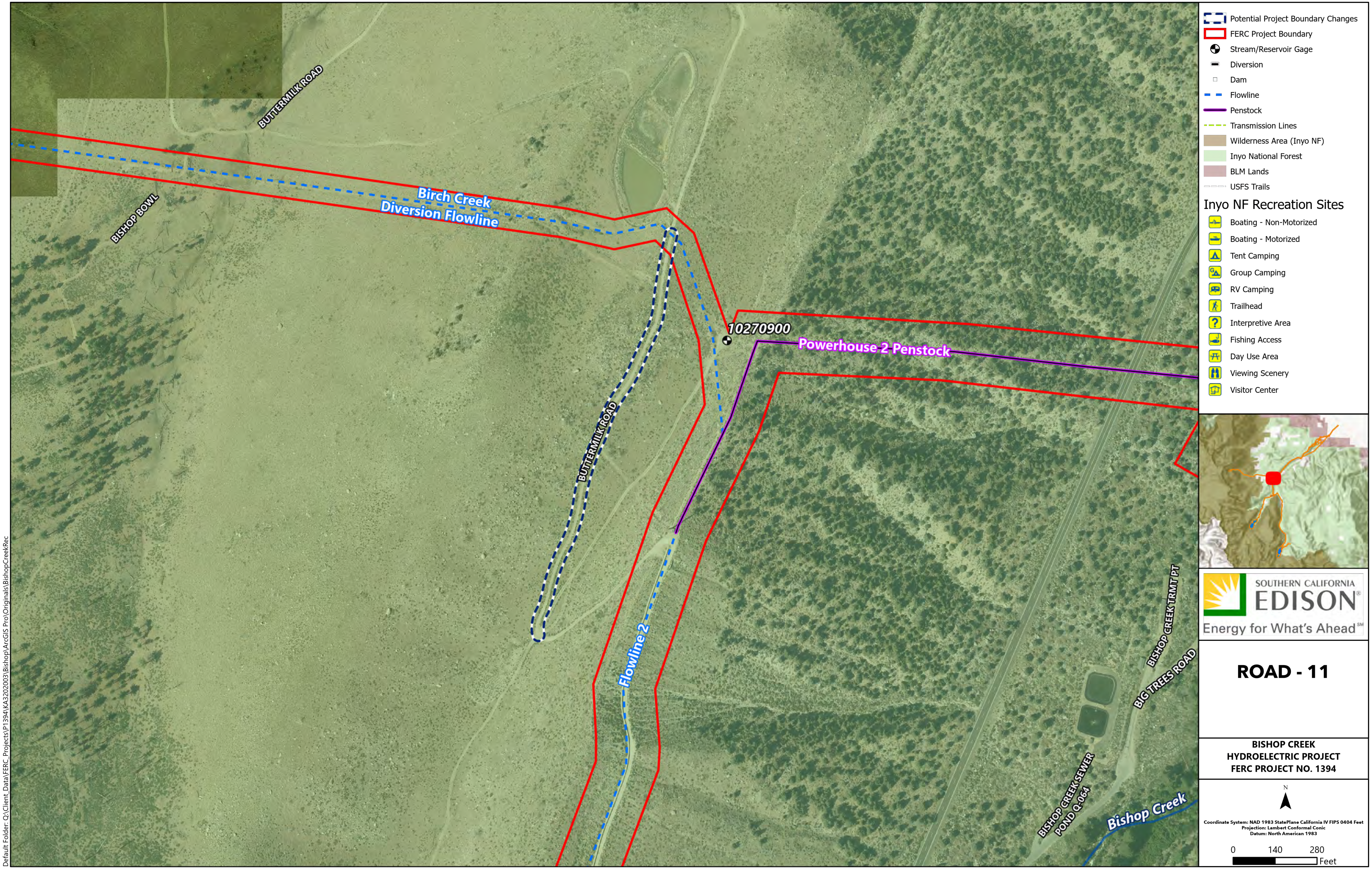
N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 37.5 75 Feet

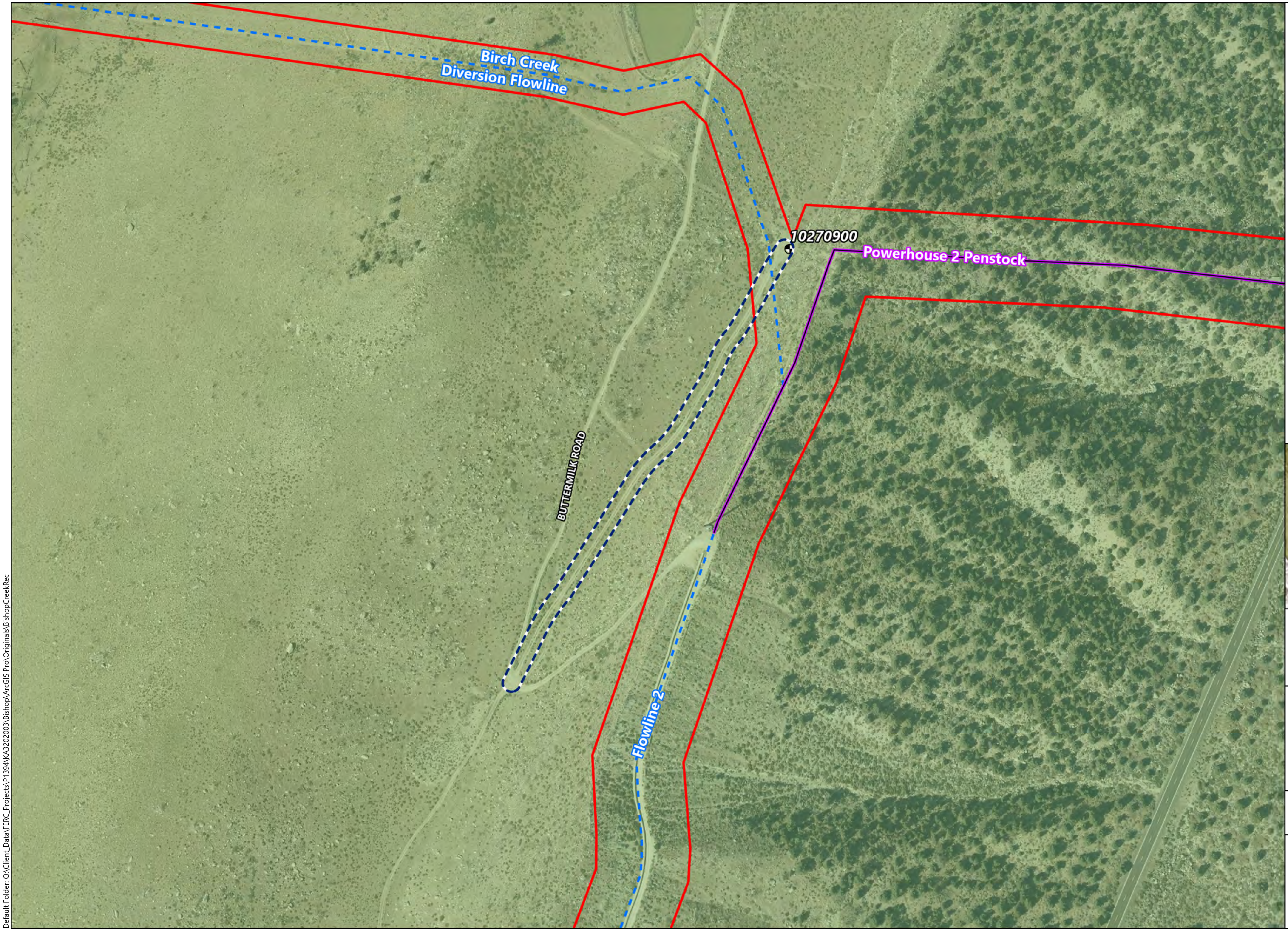
Default Folder: Q:\Client_Data\FERC_Projects\P1394\K43202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM



Date Exported: 10/5/2021 5:47 PM

Default Folder: G:\Client_Data\FERC_Projects\P1394\KA3202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec



Potential Project Boundary Changes
FERC Project Boundary
Stream/Reservoir Gage
Diversion
Dam
Flowline
Penstock
Transmission Lines
Wilderness Area (Inyo NF)
Inyo National Forest
BLM Lands
USFS Trails

Inyo NF Recreation Sites

Boating - Non-Motorized
Boating - Motorized
Tent Camping
Group Camping
RV Camping
Trailhead
Interpretive Area
Fishing Access
Day Use Area
Viewing Scenery
Visitor Center

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

ROAD - 12

**BISHOP CREEK
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1394**

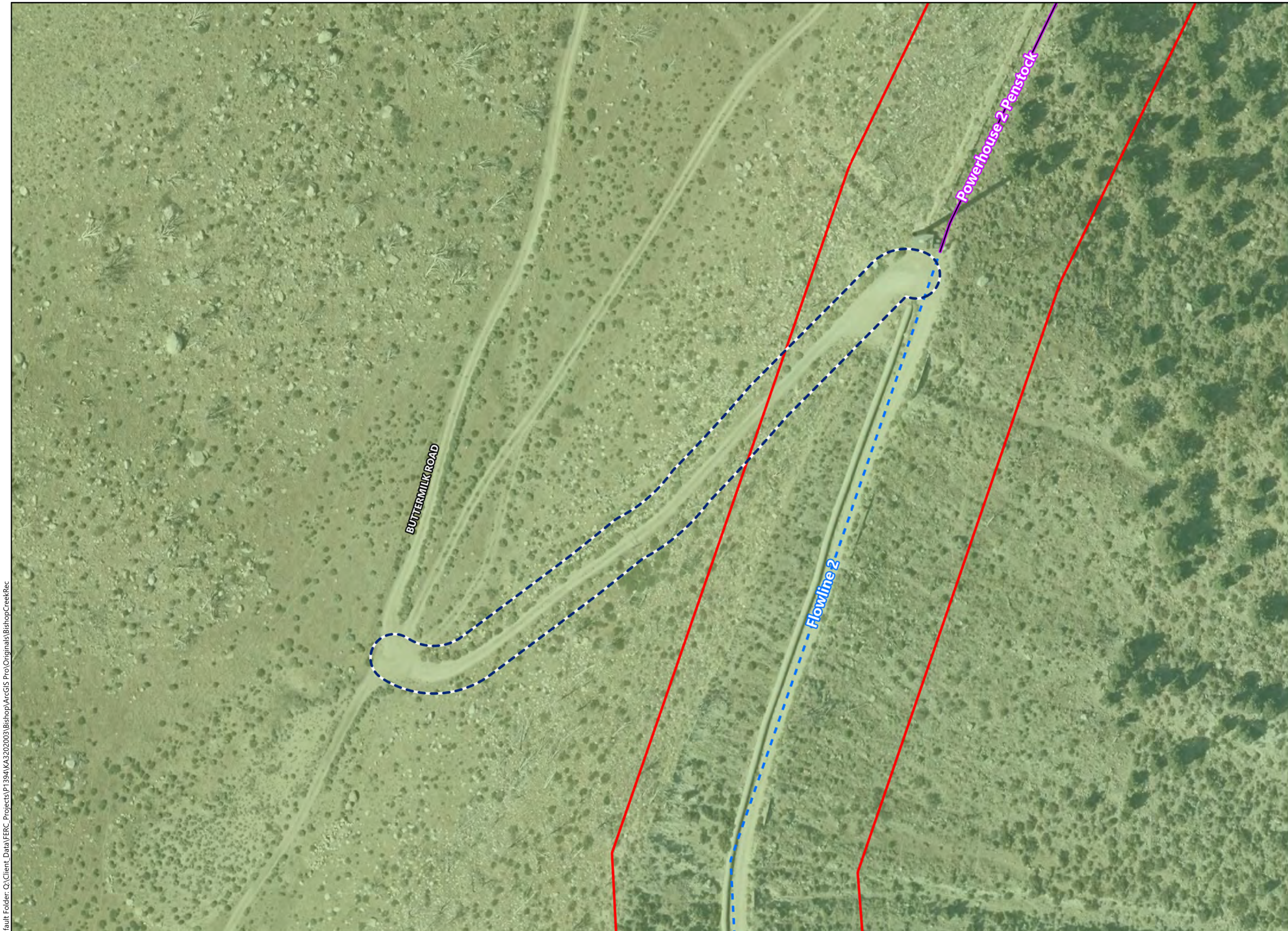
N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 100 200 Feet

Default Folder: Q:\Client_Data\FERC_Projects\P1394\KA3202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM



Potential Project Boundary Changes
FERC Project Boundary
Stream/Reservoir Gage
Diversion
Dam
Flowline
Penstock
Transmission Lines
Wilderness Area (Inyo NF)
Inyo National Forest
BLM Lands
USFS Trails

Inyo NF Recreation Sites

Boating - Non-Motorized
Boating - Motorized
Tent Camping
Group Camping
RV Camping
Trailhead
Interpretive Area
Fishing Access
Day Use Area
Viewing Scenery
Visitor Center

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

ROAD - 13

BISHOP CREEK HYDROELECTRIC PROJECT FERC PROJECT NO. 1394

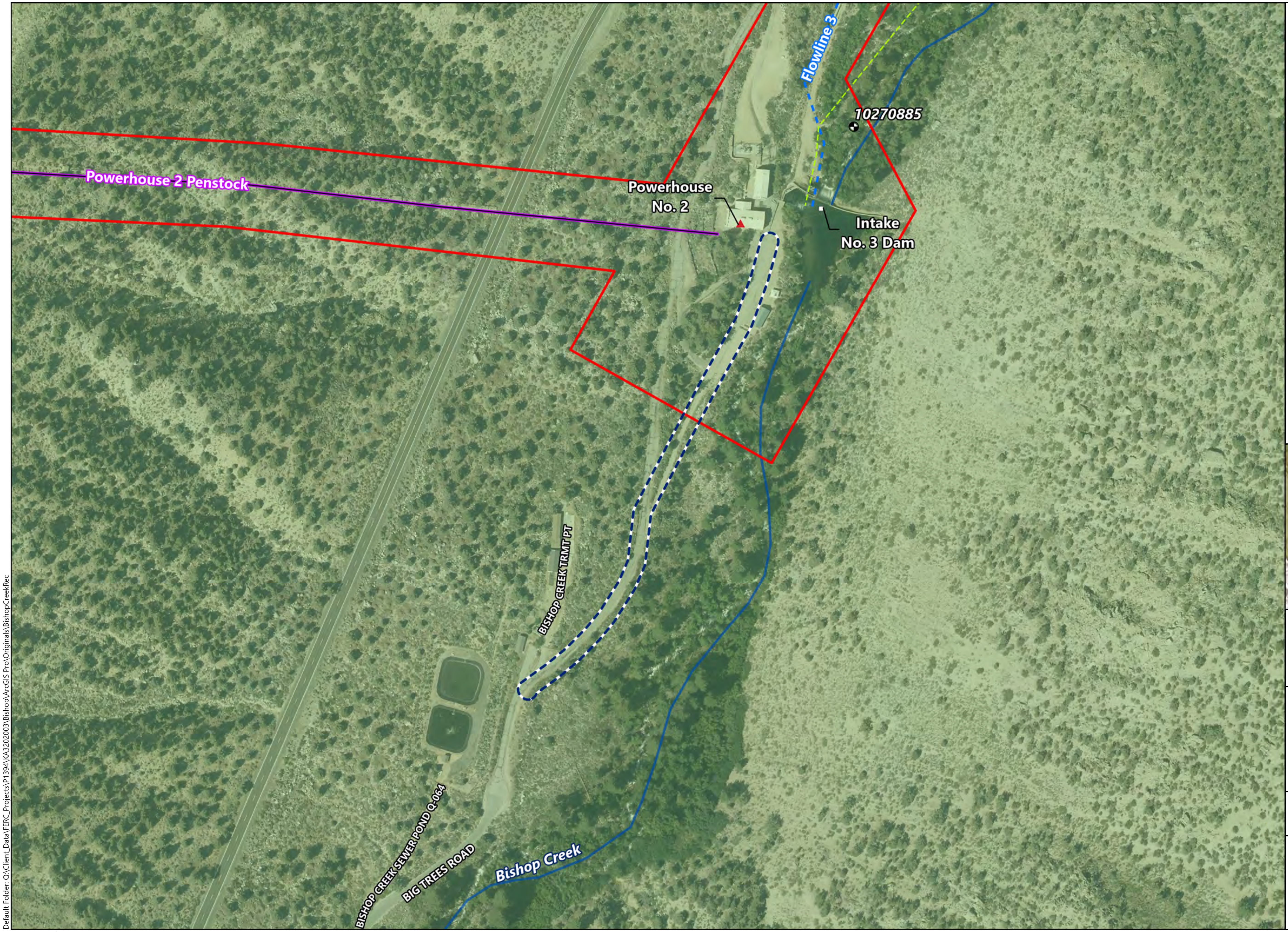
N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 37.5 75 Feet

Default Folder: Q:\Client_Data\FERC_Projects\P1394\KA3202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM



- Potential Project Boundary Changes
- FERC Project Boundary
- Stream/Reservoir Gage
- Diversion
- Dam
- Flowline
- Penstock
- Transmission Lines
- Wilderness Area (Inyo NF)
- Inyo National Forest
- BLM Lands
- USFS Trails

Inyo NF Recreation Sites

- Boating - Non-Motorized
- Boating - Motorized
- Tent Camping
- Group Camping
- RV Camping
- Trailhead
- Interpretive Area
- Fishing Access
- Day Use Area
- Viewing Scenery
- Visitor Center

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

ROAD - 14

**BISHOP CREEK
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1394**

N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 100 200 Feet

Default Folder: Q:\Client_Data\FERC_Projects\P1394\KA3202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM

Potential Project Boundary Changes
FERC Project Boundary
Stream/Reservoir Gage
Diversion
Dam
Flowline
Penstock
Transmission Lines
Wilderness Area (Inyo NF)
Inyo National Forest
BLM Lands
USFS Trails

Inyo NF Recreation Sites

Boating - Non-Motorized
Boating - Motorized
Tent Camping
Group Camping
RV Camping
Trailhead
Interpretive Area
Fishing Access
Day Use Area
Viewing Scenery
Visitor Center

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

ROAD - 15

BISHOP CREEK HYDROELECTRIC PROJECT FERC PROJECT NO. 1394

N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

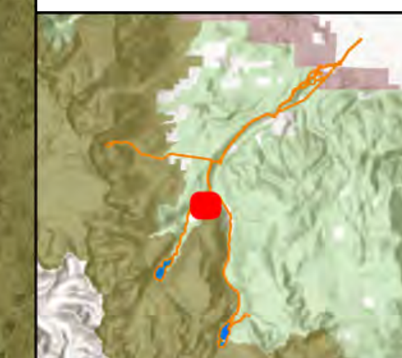
0 50 100 Feet

Default Folder: Q:\Client_Data\FERC_Projects\P1394\K4320203\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM

Potential Project Boundary Changes
FERC Project Boundary
Stream/Reservoir Gage
Diversion
Dam
Flowline
Penstock
Transmission Lines
Wilderness Area (Inyo NF)
Inyo National Forest
BLM Lands
USFS Trails

Inyo NF Recreation Sites
Boating - Non-Motorized
Boating - Motorized
Tent Camping
Group Camping
RV Camping
Trailhead
Interpretive Area
Fishing Access
Day Use Area
Viewing Scenery
Visitor Center



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

ROAD - 16

BISHOP CREEK HYDROELECTRIC PROJECT
FERC PROJECT NO. 1394

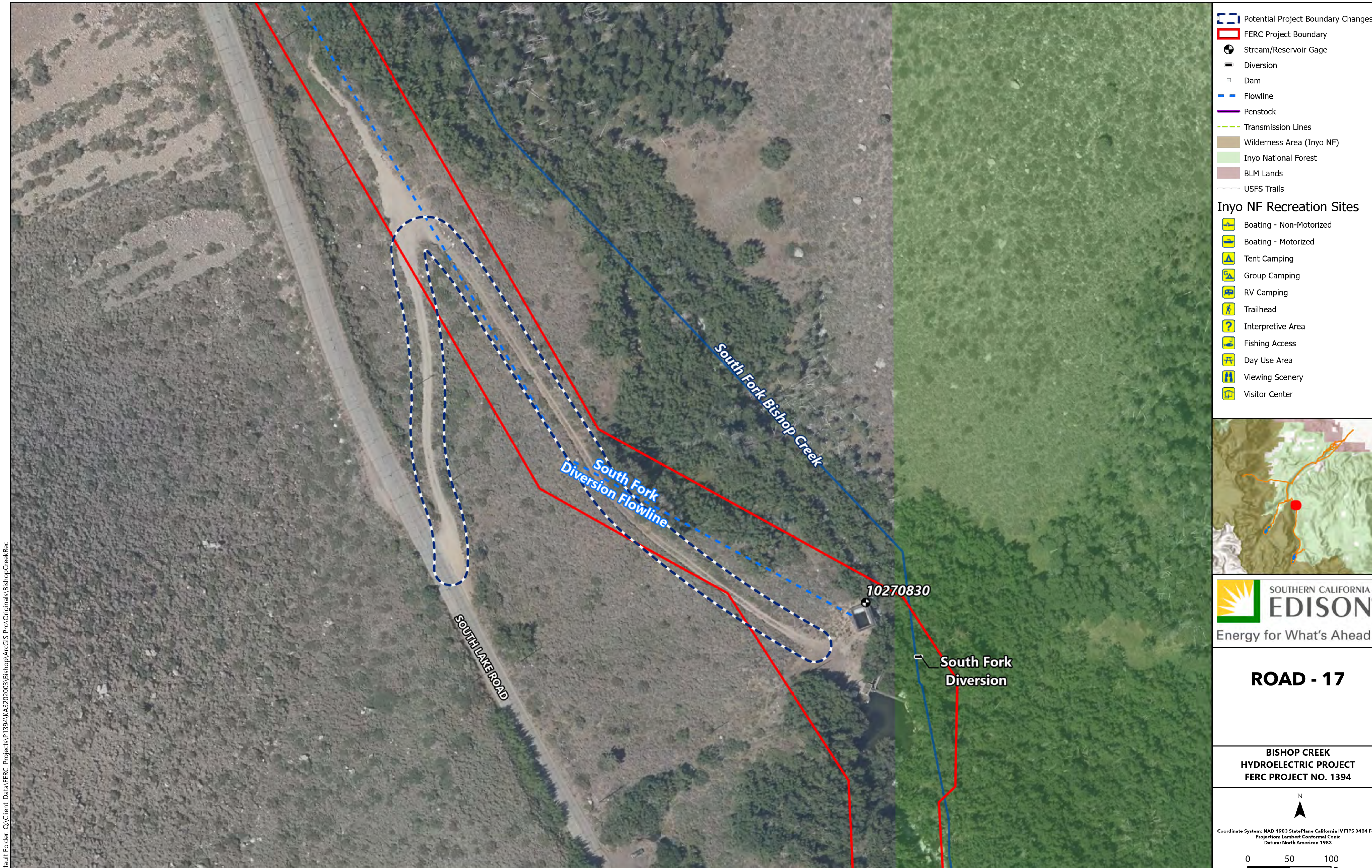
N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 100 200 Feet

Default Folder: Q:\Client_Data\FERC_Projects\P1394\K43202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM



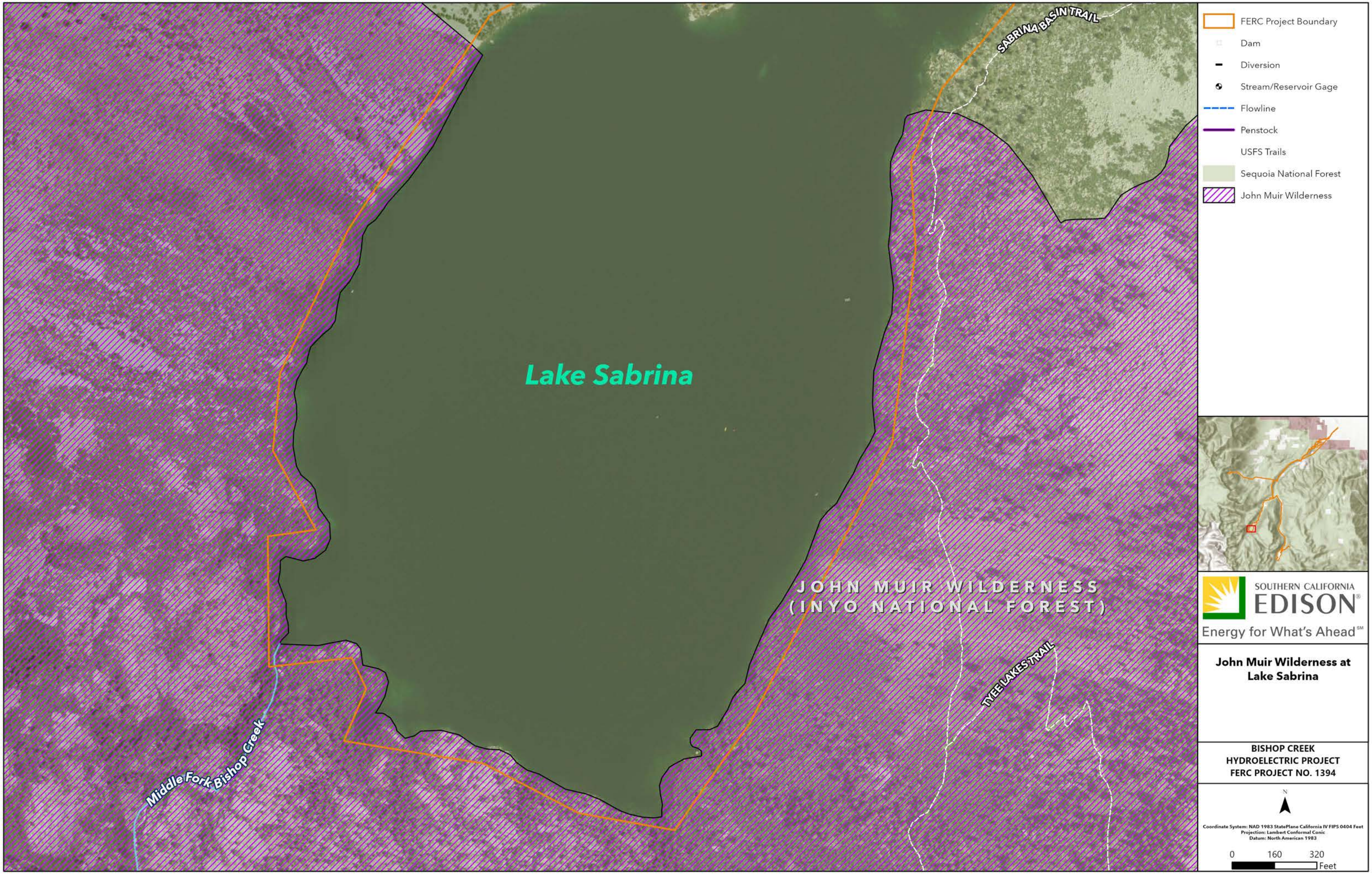
Default Folder: Q:\Client_Data\FERC_Projects\P1394\KA3202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM

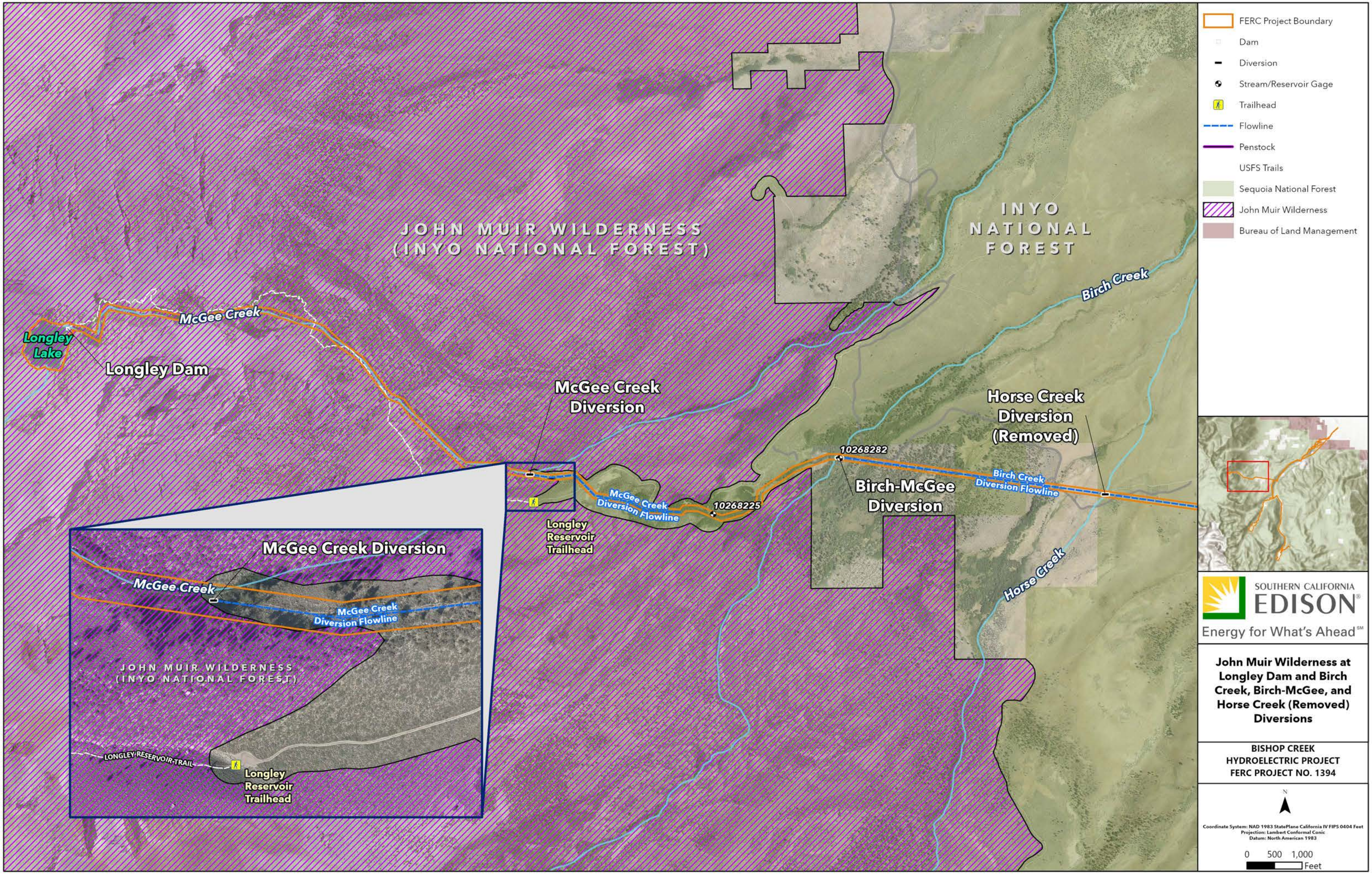
Default Folder: Q:\Client Data\FERC_Projects\P1394\KA3202003\Bishop\ArcGIS Pro\Originals\BishopCreekRec

Date Exported: 10/5/2021 5:47 PM

APPENDIX B
WILDERNESS AREA



FERC Project Boundary
Dam
Diversion
Stream/Reservoir Gage
Flowline
Penstock
USFS Trails
Sequoia National Forest
John Muir Wilderness
Lake Sabrina
SABRINA BASIN TRAIL
TYEE LAKES TRAIL
Middle Fork Bishop Creek
JOHN MUIR WILDERNESS
(INYO NATIONAL FOREST)
SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠
John Muir Wilderness at Lake Sabrina
BISHOP CREEK
HYDROELECTRIC PROJECT
FERC PROJECT NO. 1394
N
Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
0 160 320
Feet



John Muir Wilderness at Longley Dam and Birch Creek, Birch-McGee, and Horse Creek (Removed) Diversions

BISHOP CREEK HYDROELECTRIC PROJECT
FERC PROJECT NO. 1394

FERC Project Boundary
Dam
Diversion
Stream/Reservoir Gage
Flowline
Penstock
USFS Trails
Sequoia National Forest
John Muir Wilderness

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

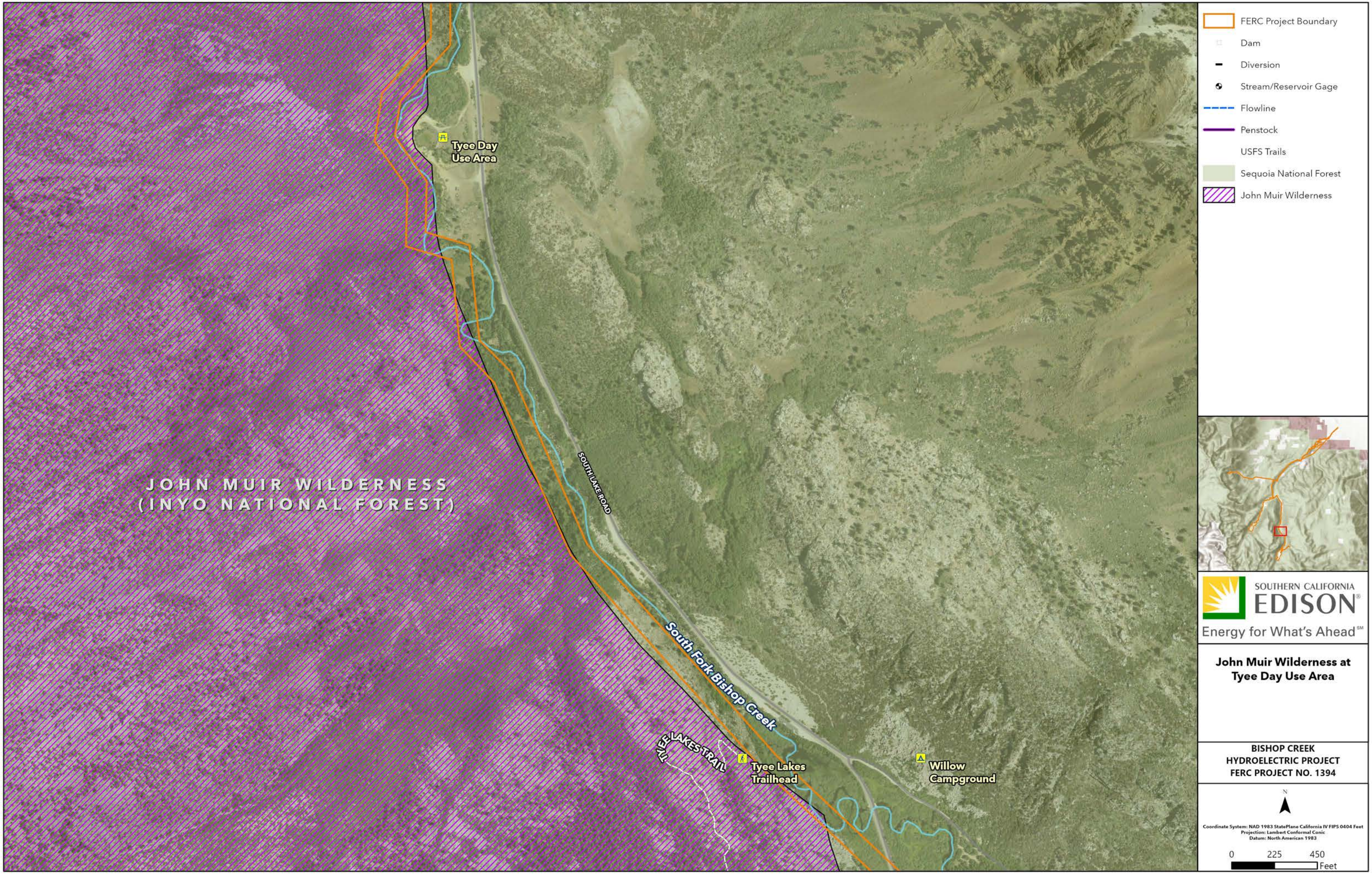
John Muir Wilderness at South Lake

BISHOP CREEK HYDROELECTRIC PROJECT FERC PROJECT NO. 1394

N

Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 140 280 Feet


FERC Project Boundary
Dam
Diversion
Stream/Reservoir Gage
Flowline
Penstock
USFS Trails
Sequoia National Forest
John Muir Wilderness
JOHN MUIR WILDERNESS
(INYO NATIONAL FOREST)
Tyee Day Use Area
SOUTH LAKE ROAD
South Fork Bishop Creek
TYEE LAKES TRAIL
Tyee Lakes Trailhead
Willow Campground
SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠
John Muir Wilderness at Tyee Day Use Area
BISHOP CREEK HYDROELECTRIC PROJECT FERC PROJECT NO. 1394
N
Coordinate System: NAD 1983 StatePlane California IV FIPS 0404 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
0 225 450
Feet