SOUTHERN CALIFORNIA EDISON

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)





FINAL LICENSE APPLICATION
VOLUME II

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November 2024

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Kern River No. 3 Hydroelectric Project
(FERC Project No. 2290)

Final License Application
Volume II

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

November 2024

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LIST OF CONTENTS

Exhibit E Environmental Exhibit

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APPENDIX E.2
RESOURCE TECHNICAL MEMORANDA

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WR-1 WATER QUALITY TECHNICAL MEMORANDUM

KERN RIVER NO. 3 HYDROELECTRIC PROJECT
FERC PROJECT NO. 2290

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KERNVILLE, CALIFORNIA

October 2024

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TABLE OF CONTENTS

Page

1.0 Introduction 1
2.0 Study Goals and Objectives 1
3.0 Study Area and Study Sites 1
4.0 Methods 4
4.1. Water Temperature and Dissolved Oxygen Monitoring 5
4.1.1. Monitoring Periods 5
4.1.2. Quality Assurance Review and Data Validation 5
4.2. Bacterial Sampling 6
5.0 Data Summary 6
5.1. Water Temperature and Dissolved Oxygen 6
5.1.1. North Fork Kern River (Sites 1 through 6) 9
5.1.2. Corral Creek (Sites 7 and 8) 11
5.1.3. Salmon Creek (Sites 9 and 10) 13
5.2. Bacteriological Monitoring Results 15
6.0 Study Specific Consultation 18
7.0 Outstanding Study Plan Elements 18
8.0 References 18

LIST OF TABLES

Table 3-1. Water Quality Sampling Sites 2
Table 5.1-1. Water Temperature Monthly Means, 2021–2024 7
Table 5.1-2. Dissolved Oxygen Monthly Means, 2021–2024 8
Table 5.2-1. Fecal Coliform Sampling Results, 2022–2024 16
Table 5.2-2. *Escherichia coli* Sampling Results, 2022–2024 17

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LIST OF FIGURES

Figure 3-1. Water Quality Monitoring Sites. 3

Figure 5.1-1. Mean Daily Water Temperature (top) and Mean Daily Dissolved Oxygen (bottom) at Six Sites in the North Fork Kern River, October 2023 to September 2024. 10

Figure 5.1-2. Mean Daily Water Temperature (top) and Mean Daily Dissolved Oxygen (bottom) in Corral Creek Upstream (Site 7) and Downstream (Site 8) of Corral Creek Diversion, October 2023 to September 2024. 12

Figure 5.1-3. Mean Daily Water Temperature (top) and Mean Daily Dissolved Oxygen (bottom) in Salmon Creek Upstream (Site 9) and Downstream (Site 10) of Salmon Creek Diversion, November 2023 to September 2024. 14

LIST OF APPENDICES

Appendix A	Water Temperature and Dissolved Oxygen Figures, 2021 to 2023
Appendix B	Water Temperature and Dissolved Oxygen Figures, October 2023 to September 2024
Appendix C	Instantaneous Dissolved Oxygen and Water Temperature Measurements, October 2023 to September 2024

LIST OF ACRONYMS AND ABBREVIATIONS

ºC	degrees Celsius
DO	dissolved oxygen
FERC	Federal Energy Regulatory Commission
ISR	Initial Study Report
KR3	Kern River No. 3
mg/L	milligrams per liter
mL	milliliter
MPN	most probable number
NFKR	North Fork Kern River
Project	Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)
SCE	Southern California Edison
SPD	Study Plan Determination
USR	Updated Study Report

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1.0 INTRODUCTION

This updated Technical Memorandum provides complete methods and findings of the WR-1 Water Quality Study in support of Southern California Edison's (SCE's) Kern River No. 3 (KR3) Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 2290. The WR-1 Study Plan was included in SCE's Revised Study Plan filed on July 1, 2022 (SCE, 2022). In the October 12, 2022, Study Plan Determination (SPD) (FERC, 2022), FERC approved the WR-1 Study Plan with modifications, stipulating that SCE deploy data loggers for 12 months, from June 1, 2022, through May 31, 2023, to capture data throughout the year; originally, data loggers were to be deployed only from June 1, 2022, through September 30, 2022. Because of equipment issues (i.e., loss of loggers and siltation), data collected through May 31, 2023, were insufficient to characterize water quality conditions in the Project reaches. SCE conducted additional sampling to remedy data gaps, including redeploying loggers through September 2024. Additionally, in its *Determination on Requests for Study Modifications and New Studies* (FERC, 2024) issued May 30, 2024, FERC required additional bacteria monitoring to collect samples during two holiday weekends and an evaluation of potential effects on water quality along the North Fork Kern River (NFKR) during periods of spills along the flowline.

This updated Technical Memorandum includes data collected through September 2024 and is being filed with FERC as part of SCE's Updated Study Report.

2.0 STUDY GOALS AND OBJECTIVES

The objectives of the study, as outlined in the WR-1 Study Plan (SCE, 2022) and as amended in the SPD (FERC, 2022), are as follow:

- Collect current stream water temperature data to characterize current water temperatures over the year.
- Collect current dissolved oxygen (DO) monitoring data to characterize current DO concentrations over the year.
- Collect surface water grab samples to characterize indicator bacteria concentrations.

3.0 STUDY AREA AND STUDY SITES

The study area includes stream reaches along the NFKR and Salmon and Corral Creeks for the purposes of characterization and data collection relevant to understanding potential effects of Project operations and maintenance activities on water quality.

Temperature and DO monitoring occurred at 10 sites: 7 locations within Project-affected reaches and 3 comparison (control) sites upstream of the FERC Project Boundary. Bacterial sampling was conducted at a subset of these sites. Exact locations of the monitoring stations were determined in the field based on sampling suitability (i.e., well mixed and deep enough for representative sampling) and accessibility. Site coordinates of sampling sites were documented with a hand-held Global Positioning System (GPS)

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unit. Established station locations were used during subsequent water quality monitoring efforts. Specifically excluded from the study area were areas where access was unsafe (i.e., very steep terrain or high streamflow). Specific study sites are described in Table 3-1 and shown in Figure 3-1.

Table 3-1. Water Quality Sampling Sites

Site #	Site ID	Site Name	Project-Affected Reach (Yes/No)	Monitoring Type	Location [a]	
					Latitude ºN	Longitude ºE
1	WQ-NFKR-19.0	NFKR upstream of Fairview Diversion impoundment pool	No	Temperature, DO, bacterial	35.947210	118.478025
2	WQ-NFKR-18.5	NFKR immediately downstream of Fairview Dam	Yes	Temperature, DO	35.944487	118.479529
3	WQ-NFKR-10.9	NFKR at Gold Ledge Campground	Yes	Temperature, DO, bacterial	35.870767	118.453950
4	WQ-NFKR-3.2	NFKR immediately upstream of the KR3 Powerhouse	Yes	Temperature, DO, bacterial	35.776250	118.436628
5	WQ-NFKR-3.0	NFKR downstream of the KR3 Powerhouse	Yes	Temperature, DO	35.774770	118.435442
6	WQ-NFKR-1.2	NFKR at the existing Kernville USACE gage	Yes	Temperature, DO	35.755301	118.422665
7	WQ-CC-1.4	Corral Creek upstream of the Project diversion	No	Temperature, DO	35.853067	118.430824
8	WQ-CC-0.4	Corral Creek upstream of NFKR confluence [b]	Yes	Temperature, DO, bacterial	35.850922	118.451506
9	WQ-SC-0.55	Salmon Creek upstream of the Project diversion	No	Temperature, DO	35.899562	118.458797
10	WQ-SC-0.05	Salmon Creek upstream of NFKR confluence	Yes	Temperature, DO, bacterial	35.895918	118.466196

ºE = degree east; ºN = degree North; KR3 = Kern River No. 3; NFKR = North Fork Kern River; DO = dissolved oxygen; Project = Kern River No. 3 Hydroelectric Project; USACE = U.S. Army Corps of Engineers

Notes:

[a] Datum: World Geodetic System 84

[b] Segments of Corral Creek were dry during July, August, and September 2024. Temperature and DO loggers were relocated to a wetted stream pool approximately 1.1 miles upstream (35.852740°N, -118.432098°E) on July 16, 2024.

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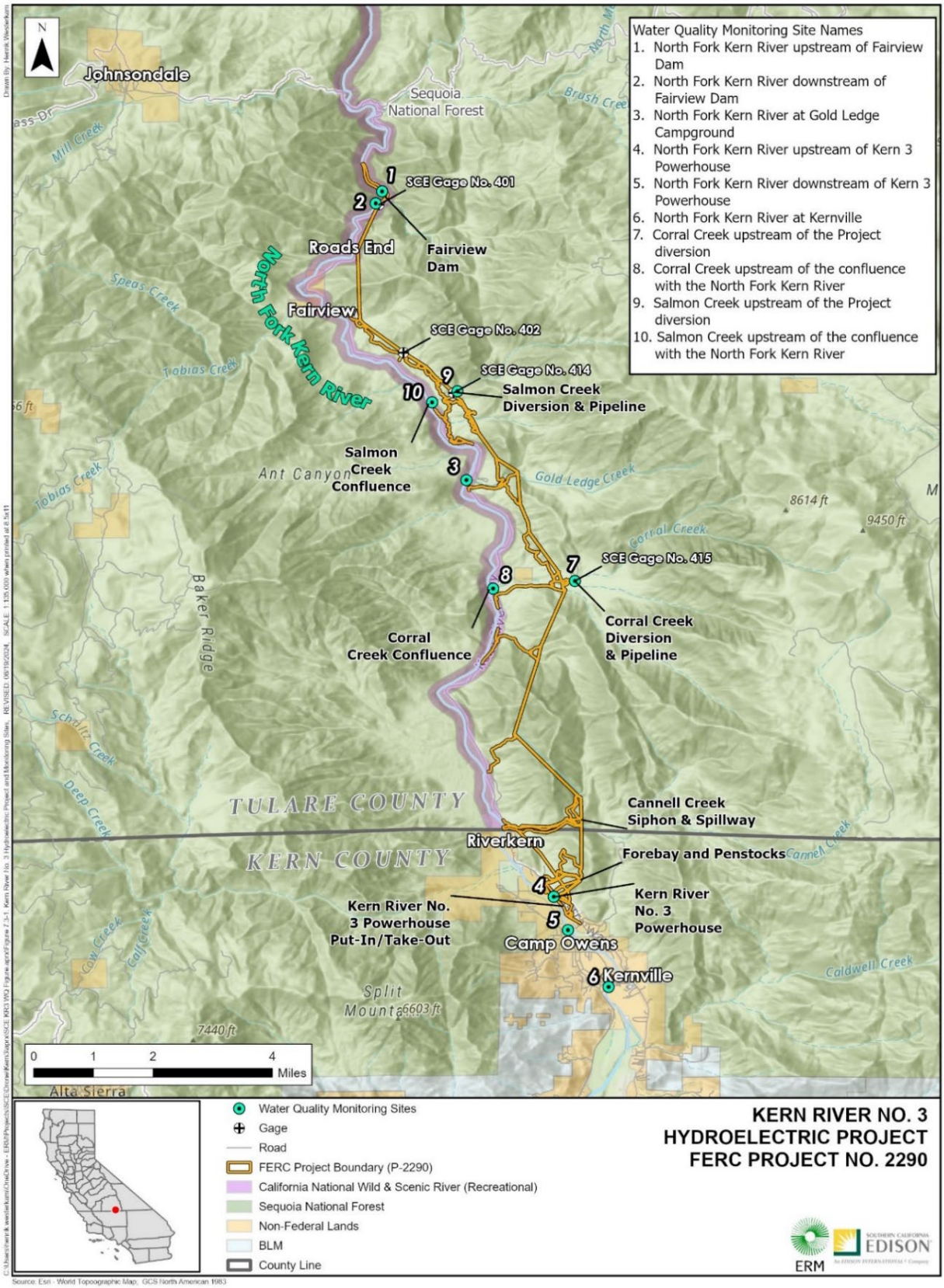


Figure 3-1. Water Quality Monitoring Sites.

4.0 METHODS

Study implementation followed the methods described in SCE's Revised Study Plan (SCE, 2022), as amended by FERC in its SPD (FERC, 2022) and *Determination on Requests for Study Modifications and New Studies* (FERC, 2024), with the following exceptions.

Study Plan Modifications

Based on identified data gaps during initial deployment of water temperature loggers and the FERC (2024) determination, SCE modified the Study Plan and redeployed water temperature and DO loggers to collect an additional year of data through summer 2024.

Study Plan Variances

- Continuous data from water temperature and DO data loggers
  - Data gaps in the continuous data record occurred at some locations during the initial data collection period. High flows affected safe access and resulted in equipment loss.
  - Quality assurance review of the data identified several exclusion periods at some locations due to apparent sensor fouling and siltation or burial.
  - To remedy data gaps, loggers were redeployed from October 2023 through September 2024.
- Bacterial sampling
  - Additional bacterial samples were collected in fall 2022.
  - The bacterial sampling event during the summer 2023 recreation season (including the July 4, 2023, holiday) was postponed due to high flows and potentially unsafe access conditions. This sampling was subsequently completed in July 2024.
  - Additional surface water grab samples for laboratory enumeration of *Escherichia coli* (*E. coli*) bacteria samples were collected during the 2024 summer recreation season to determine compliance with an adopted amendment of the water quality objective for bacteria stipulated in the *Water Quality Control Plan for the Tulare Lake Basin* (Basin Plan; CVRWQCB, 2018).
  - Bacterial samples could not be collected at Corral Creek upstream of the NFKR (Site 8) on sampling dates between July 10 and September 10, 2024, because the stream was dry.

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4.1. WATER TEMPERATURE AND DISSOLVED OXYGEN MONITORING

Factory-calibrated water temperature data loggers (i.e., Onset HOBO U22-001) and pre-calibrated DO data loggers (i.e., Onset HOBO U26-001) were placed inside protective housings and were then installed in each stream segment near thalweg locations representative of the main channel (see Table 3-1 and Figure 3-1 for site locations). DO loggers were calibrated approximately monthly following manufacturer instructions from October 2023 through September 2024. Water temperature and DO readings were recorded at 15-minute intervals.

4.1.1. MONITORING PERIODS

Water temperature loggers were installed at each site from May 11, 2021, through October 18, 2021; May 1, 2022, through May 11, 2023; and October 25, 2023, through September 24, 2024. DO loggers were deployed from May 10, 2021, through October 18, 2021; May 26, 2022, through November 10, 2022; and October 25, 2023, through September 24, 2024. Some DO and temperature loggers were not retrieved or redeployed during these periods because of equipment malfunctions, stream access conditions, and/or theft. Because of high stream flows, all DO loggers were removed from their monitoring locations from November 10, 2022, through October 25, 2023.

Based on identified data gaps and quality assurance issues in data collected prior to October 2023 (see Section 4.1.2, *Quality Assurance Review and Data Validation*), DO loggers were redeployed in October 2023 to collect a more robust dataset. Additional methods for calibrating, collecting, and corroborating DO data were implemented and included monthly site visits to clean sensors, recalibrate the DO loggers, and download data. Furthermore, instantaneous water temperature and DO measurements were collected using a multi-parameter water quality instrument (i.e., YSI EXO or similar model) during most of the monthly site visits to compare to DO logger data.

4.1.2. QUALITY ASSURANCE REVIEW AND DATA VALIDATION

Upon return to the laboratory and prior to analysis of data collected from water temperature and DO loggers, data were downloaded into Microsoft Excel. Data quality reviews included identification of (1) periods when the units were in water, (2) periods of logger siltation, and (3) additional anomalies related to sensor fouling or other equipment issues.

Data quality issues resulting from high flows, sensor fouling, equipment failures, and infrequent calibrations were identified in the DO data collected prior to October 2023. The loggers deployed prior to October 2023 in many cases produced datasets with erroneous values (e.g., abnormally low DO), which were likely not representative of stream conditions; therefore, these data were excluded. Because of these data quality issues, DO data collected prior to October 2023 have been qualified.

The primary data exclusion was applied to periods when the data loggers were not physically deployed in the NFKR or tributary streams within the study area. These records can be roughly determined by comparing the deployment/retrieval times with the data

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record. For water temperatures, large shifts in the daily minimum to maximum range were used to indicate periods when the data loggers were sampling air versus water temperatures. Evidence of sediment accumulation and fouling was recorded on DO loggers deployed at several sites. Data exclusions for these conditions were made based on extreme fluctuations from ambient conditions to zero. Periods of biofouling were identified by observations of decreases in DO between site checks alongside visual evidence of algae growth on sensors. Exclusions were also made based upon erroneous sensor readings in the raw data record (e.g., 0, -999). For data collected after October 2023, instantaneous water temperature and DO measurements were used to confirm data were acceptable. Instantaneous DO measurements were generally within 1 milligram per liter (mg/L) of the continuous DO logger measurements at the time of redeployment. Excluded data periods are identified as data gaps in the figures provided in this report (Appendices A and B).

Following data review, validated water temperature and DO data were used to calculate daily mean values based on the average of all 15-minute readings for a given day, and daily maxima or minima were the maximum or minimum temperature reading for a given day.

4.2. BACTERIAL SAMPLING

Surface water samples were collected at five sites along the NFKR and its tributaries (see Table 3-1 and Figure 3-1 for site locations). Samples were collected in laboratory-supplied sterile bottles, immediately stored on ice at 4 degrees Celsius (ºC), and transported to the Pace Analytical Laboratory (Bakersfield, California) within an 8-hour hold time. In 2022 and 2023, preliminary samples were collected during nine dates; all samples were analyzed for fecal coliform, and four samples were analyzed for *E. coli*. In 2024, six samples were collected within a 30-day period surrounding the Fourth of July holiday (June 6 to July 10), and five samples were collected surrounding the Labor Day holiday (August 13 to September 10); all samples were analyzed for fecal coliform and *E. coli.* Water samples were analyzed for bacteria using standard laboratory methods (SM-9223B and SM-9221E) and reported as the most probable number of bacterial cells per 100 milliliters.

5.0 DATA SUMMARY

5.1. WATER TEMPERATURE AND DISSOLVED OXYGEN

Daily maximum, minimum, and mean water temperatures and DO were plotted by site within the Fairview Dam Bypass Reach[1] (Sites 2 through 4), NFKR comparison sites upstream (Site 1) and downstream of the Fairview Dam Bypass Reach (Sites 5 and 6), Corral Creek (Sites 7 and 8), and Salmon Creek (Sites 9 and 10). The plots are provided in Appendix A and B. Monthly mean water temperatures and DO are provided in Table 5.1-1 and Table 5.1-2, respectively.

[1] The Fairview Dam Bypass Reach is defined as the approximately 16-mile bypass reach of the NFKR between Fairview Dam and the KR3 Powerhouse tailrace.

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Water temperatures were generally lower in upstream reaches and warmer in downstream reaches. Seasonal variations in water temperature—cooler temperatures in the winter and higher temperatures in the summer—were observed. DO concentrations were higher in the winter, when water temperatures were cooler. DO concentrations were consistently greater than the 8 mg/L water quality objective from the Basin Plan (CVRWQCB, 2018) except at a few sites in the summer during periods of warmer water temperatures.

Table 5.1-1. Water Temperature Monthly Means, 2021–2024

Year	Month[a]	Mean Monthly Water Temperature (ºC)									
		Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10
2021	May	14.3	14.4	16.6	18.5	17.1	16.0	14.3	15.6	13.4	14.3
	June	19.2	19.2	20.9	22.6	21.9	21.4	17.2	17.7[b]	16.7	19.7
	July	22.1	22.1	23.7	25.0	24.8	24.8	19.5	26.0	22.2	25.0
	Aug	20.4	20.4	21.9	22.9	22.7	22.9	18.4	25.5	20.5	23.9
	Sept	17.2	17.3	18.8	20.1	20.8[b]	20.0	16.5	25.5	17.4	18.9
	Oct	12.5	12.5	13.5	14.9	N/A	15.0	12.9	23.4	11.1	12.2
2022	May	13.3	13.4	15.3	17.2	15.3	14.9	13.7	14.8	12.6	13.5
	June	17.6	17.7	19.4	21.1	19	19.4	16.6	17.7	17.3	18.2
	July	20.9	21	22.3	23.9	23.4	24.5	18.9	N/A	21.1	21.6
	Aug	21.6[b]	21.7[b]	22.8[b]	23.0	23.1	23.4	19.3	N/A	21.1	22.2
	Sept	18.5	20.7	19.6	21.0	21.2	21.5	17.5	N/A	18.5	19.7
	Oct	12.8	N/A	14.1	15.4	15.5	15.9	14.0	13.7[b]	12.9	14.1
	Nov	4.9	5.0	6.3	7.6	6.8	N/A	8.8	9.6	5.0	N/A
	Dec	2.9	3.0	4.6	6.0	3.7	N/A	7.6	7.0	3.6	N/A
2023	Jan	3.0	3.1	3.8	4.8	3.9	N/A	4.8	6.0	3.1	N/A
	Feb	3.2	3.4	4.3	5.4	3.7	N/A	4.1	5.4	2.0	N/A
	March	10.2	10.4	10.6	11.0	10.5	N/A	3.3[b]	5.5[b]	10.4	N/A
	April	17.2	17.3	17.4	17.3	17.1	N/A	NA	NA	17.5	N/A
	May	18.6	18.5	18.5	18.6	18.7	N/A	11.1	12.2	21.2	N/A
	June	N/A	N/A	N/A	N/A	N/A	N/A	13.4	15.8	24.3	N/A
	Oct	8.1	8.3	9.8	11.6	8.7	8.1	10.9	11.8	6.4	7.0
	Nov	6.0	6.1	7.6	9.3	6.4	7.0	9.4	9.3	4.7	5.2
	Dec	4.5	4.6	6.0	7.4	4.9	5.7	8.4	7.4	3.7	4.1

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Year	Month[a]	Mean Monthly Water Temperature (ºC)									
		Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10
2024	Jan	3.8	5.8	5.3	6.7	4.4	4.9	7.6	6.6	3.0-	3.4
	Feb	4.8	4.8	5.9	7.3	5.4	6.2	7.0	7.4	3.7	4.1
	March	6.7	6.9	7.4	8.5	7.3	8.0	7.5	8.4	4.4	4.8
	April	8.7	8.6	10.3	10.6	9.3	10.0	8.3	10.3	6.8	7.1
	May	10.8	10.1	11.5	12.5	11.6	12.3	11.6	13.6	10.3	10.7
	June	15.7	15.0	16.5	17.6	16.2	17.2	16.8	19.3	15.3	15.9
	July	19.4	19.5	21.4	23.8	19.9	21.1	19.3	20.0	18.9	19.8
	Aug	18.7	18.7	20.3	21.0	19.6	20.7	17.8	18.0	17.8	19.1
	Sept	16.8	16.9	18.7	20.3	N/A	19.0	16.5	16.6	15.9	17.0

ºC = degrees Celsius; N/A = data not available
Notes:
[a] No data were collected from November 2021 through April 2022 and July 2023 through September 2023.
[b] Denotes months with fewer than 10 usable data points for monthly mean.

Table 5.1-2. Dissolved Oxygen Monthly Means, 2021–2024

Year	Month[a]	Mean Monthly Dissolved Oxygen (mg/L)									
		Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10
2021	May[b]	9.1	8.8	8.7	N/A	7.8	N/A	7	6.1	9.2	N/A
	June[b]	8.6	7.6	7.7	N/A	6.8[c]	N/A	4.4	6.8	7.9	N/A
	July[b]	N/A	7.1	7.2	7	N/A	N/A	3.4	7.3	7	N/A
	Aug[b]	7	7.3	7.9	7.5	N/A	N/A	3.5	7.6	7.2	N/A
	Sept[b]	6.9	7.4	7.5	6.9	8.3	N/A	4.9	7.6	8	N/A
	Oct[b]	7.6	N/A	N/A	7.5	9.2	N/A	7.1	7.9	9.6	N/A
2022	May[b]	8.3[c]	8.6[c]	N/A	N/A	N/A	N/A	7.0[c]	N/A	8.3[c]	N/A
	June[b]	7.8	8.1	N/A	N/A	N/A	N/A	6.6	N/A	7.8	N/A
	July[b]	7.1	7.5	7.4[c]	N/A	N/A	N/A	6	N/A	6.9	N/A
	Aug[b]	N/A	N/A	7.3	N/A	N/A	N/A	6.3	N/A	6.9	N/A
	Sept[b]	7.3	8.2	7.7	N/A	N/A	N/A	6.9	N/A	7.4	N/A
	Oct[b]	N/A	8.9	8.7	N/A	N/A	N/A	7.9	N/A	8.6	N/A
	Nov[b]	9.9[c]	10.3	10.2	9.5	N/A	N/A	N/A	N/A	10.1	N/A
2023	Oct	10.6	10.6	10.3	10.0	10.5	10.7	9.7	9.6	11.1	10.8
	Nov	11.1	11.1	10.6	10.3	11.0	11.0	9.7	10.2	11.3	11.2
	Dec	11.7	11.6	11.2	10.8	11.4	11.4	10.2	10.7	11.6	11.6

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Year	Month[a]	Mean Monthly Dissolved Oxygen (mg/L)									
		Site 1	**Site 2**	**Site 3**	**Site 4**	**Site 5**	**Site 6**	**Site 7**	**Site 8**	**Site 9**	**Site 10**
2024	Jan	11.2	11.9	11.5	11.0	11.7	11.7	10.6	10.9	11.9	11.9
	Feb	11.6	11.7	11.4	10.9	11.4	11.4	10.6	10.8	11.8	11.7
	Mar	10.5	11.0	10.7	10.6	11.0	11.0	10.9	10.6	11.7	12.0
	Apr	10.4	10.1	10.4	9.9	10.9	10.7	10.8	10.5	11.2	11.8
	May	10.1	N/A	10.2	9.1	10.2	10.1	9.2	N/A	10.2	10.6
	Jun	9.2	8.8	9.1	8.7	9.1	9.4	8.2	7.8	9.0	9.0
	Jul	8.2	8.3	7.9	7.0	8.2	8.2	7.5	7.7	8.2	7.8
	Aug	8.3	8.5	7.7	8.3	7.8	8.4	7.5	7.8	8.3	7.7
	Sept	8.7	7.7	7.7	8.0	N/A	8.2	7.8	8.3	8.8	8.2

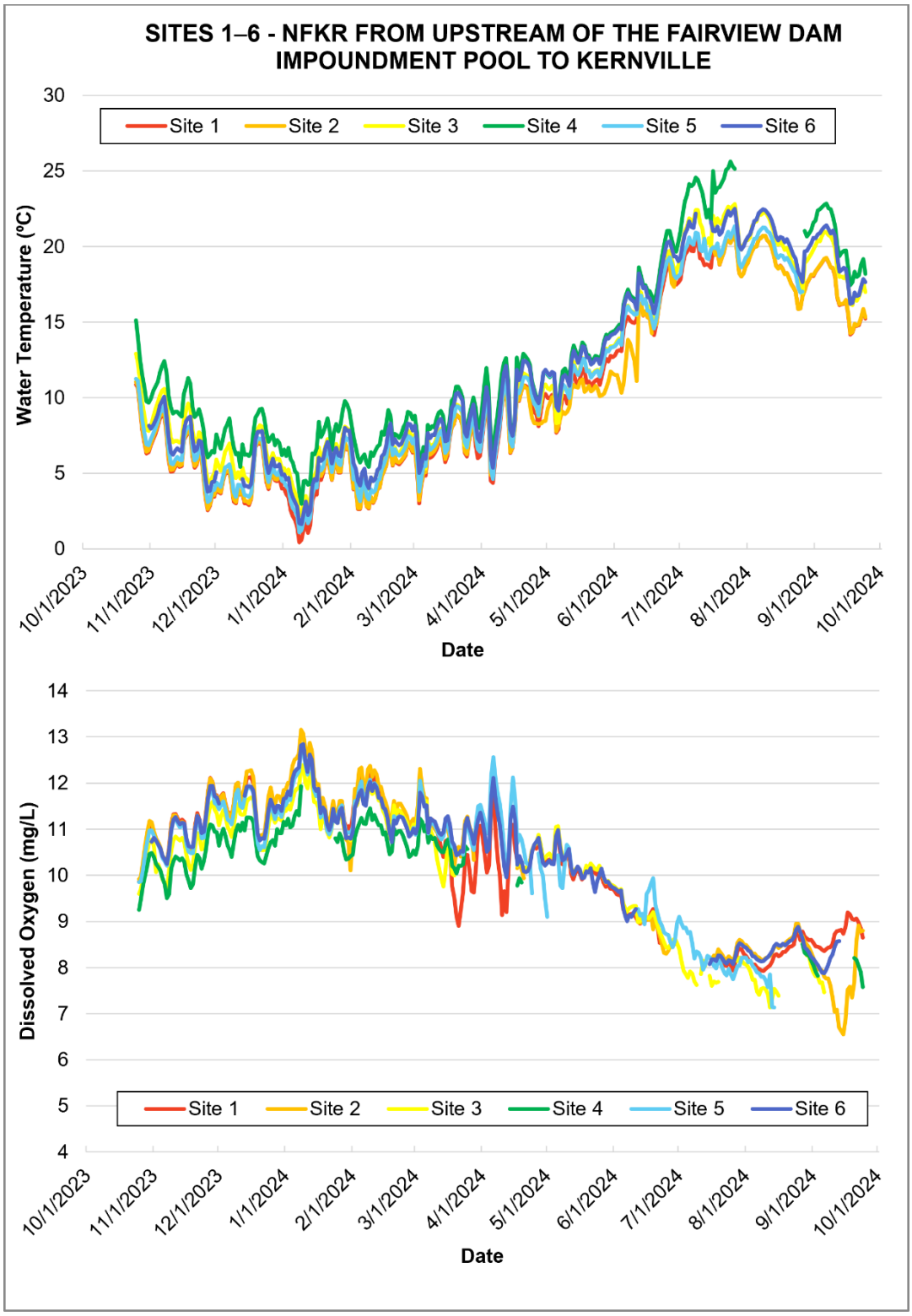
DO = dissolved oxygen; mg/L = milligram per liter; N/A = data not available
Notes:
[a] No data were collected from November 2021 through April 2022 and from December 2022 through September 2023.
[b] DO data from these months have been qualified because of data quality issues identified during analysis.
[c] Denotes months with fewer than 10 data points for monthly mean.

5.1.1. NORTH FORK KERN RIVER (SITES 1 THROUGH 6)

Water temperatures were generally similar across sampling sites in the NFKR and exhibited some seasonal and spatial variation (see Figure 5.1-1, Table 5.1-1, Figures A-1 through A-6 in Appendix A, and Figures B-1 through B-6 in Appendix B). Water temperatures were coldest during the winter and warmest during the summer. Site 1—the comparison site located upstream of Fairview Dam—had similar temperatures to Site 2, located immediately downstream of the dam, during all months (Figure 5.1-1).

DO concentrations were consistently greater than the 8 mg/L water quality objective in the Basin Plan (CVRWQCB, 2018). At some sites during summer, DO concentrations were less than 8 mg/L, but these lower concentrations were generally similar across Project-affected reaches and comparison sites (see Figure 5.1-1 and Table 5.1-2; Figures A-11 through A-15 in Appendix A; and Figures B-1 through B-6 in Appendix B). As expected, due to gas solubility relationships with water temperature, DO concentrations in the NFKR were generally higher in the winter and spring and lower in the summer and fall. All instantaneous DO measurements collected during deployment and retrieval of the loggers were greater than 8 mg/L (Appendix C).

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°C = degrees Celsius; mg/L = milligrams per liter; NFKR = North Fork Kern River

Figure 5.1-1. Mean Daily Water Temperature (top) and Mean Daily Dissolved Oxygen (bottom) at Six Sites in the North Fork Kern River, October 2023 to September 2024.

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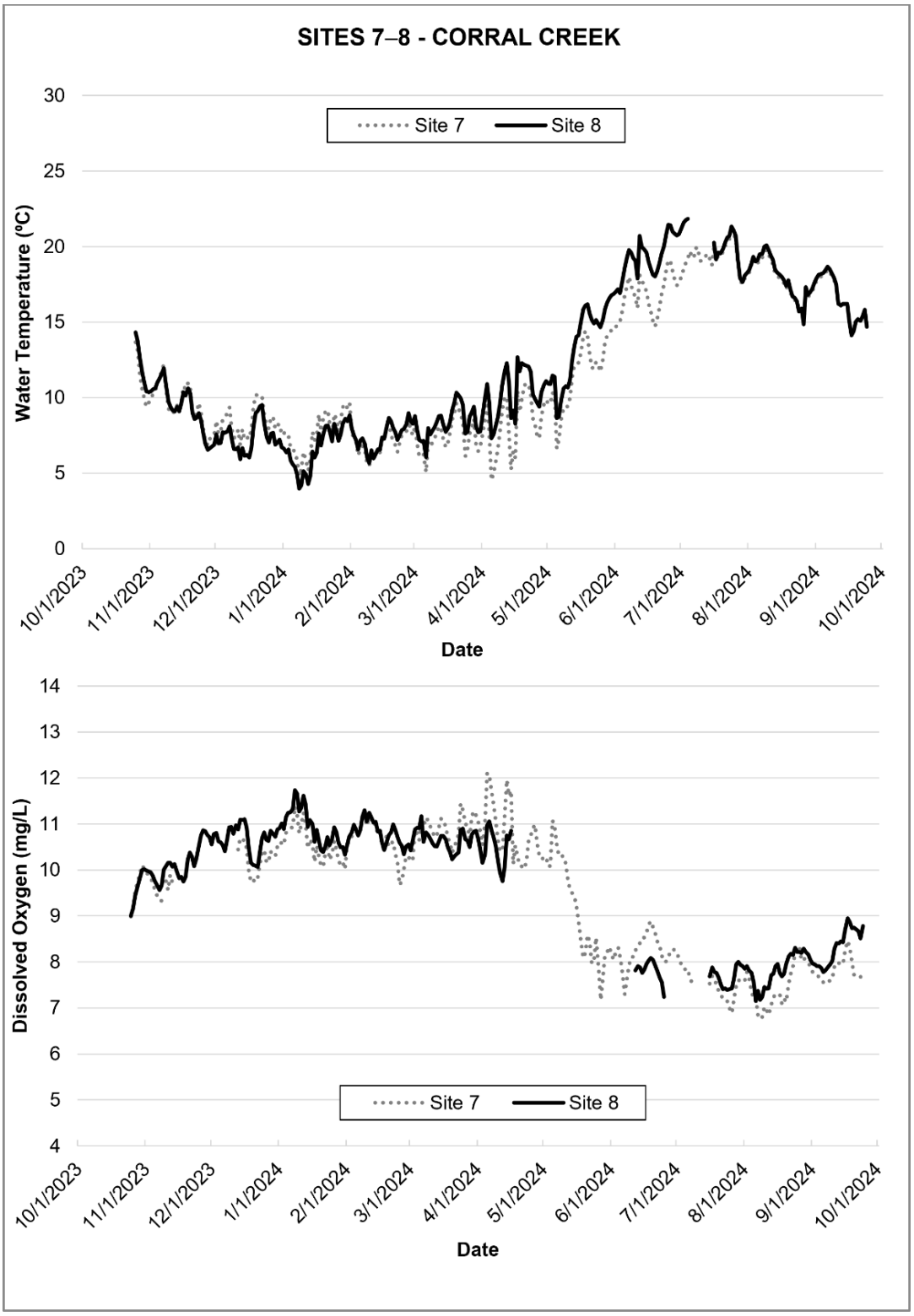
5.1.2. CORRAL CREEK (SITES 7 AND 8)

Water temperatures in Corral Creek exhibited some seasonal variation with the lowest temperatures during the winter and the highest during the summer (see Figure 5.1-2 and Table 5.1-1; Figures A-7 and A-8 in Appendix A; and Figures B-7 and B-8 in Appendix B). Site 8 downstream of the Corral Creek Diversion generally had slightly warmer temperatures in the summer than Site 7, which is upstream of the diversion. This expected temperature variation occurs as a result of solar heating.

Corral Creek near the confluence with the NFKR was dry during an extended period in summer 2024, despite flow in the stream reaches upstream and downstream of the Corral Creek Diversion. The water temperature logger at Site 8 was moved roughly 1.1 miles upstream in July 2024 to ensure the logger remained submerged throughout the monitoring period. As a result of the logger relocation, the water temperatures measured at the two sites between July 2024 through September 2024 were similar because they were closer to one another (Figure 5.1-2).

As found in the NFKR, DO was generally higher in the winter and spring than the summer and fall, primarily due to low water temperatures (see Figure 5.1-2 and Table 5.1-2; Figures A-16 and A-17 in Appendix A; and Figures B-7 and B-8 in Appendix B). DO was lower than the 8 mg/L water quality objective in the Basin Plan (CVRWQCB, 2018) during portions of the summer but was consistent both upstream and downstream of Corral Creek Diversion. All instantaneous DO measurements collected during deployment and retrieval of the loggers were greater than 8 mg/L (Appendix C).

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°C = degrees Celsius; mg/L = milligrams per liter

Figure 5.1-2. Mean Daily Water Temperature (top) and Mean Daily Dissolved Oxygen (bottom) in Corral Creek Upstream (Site 7) and Downstream (Site 8) of Corral Creek Diversion, October 2023 to September 2024.

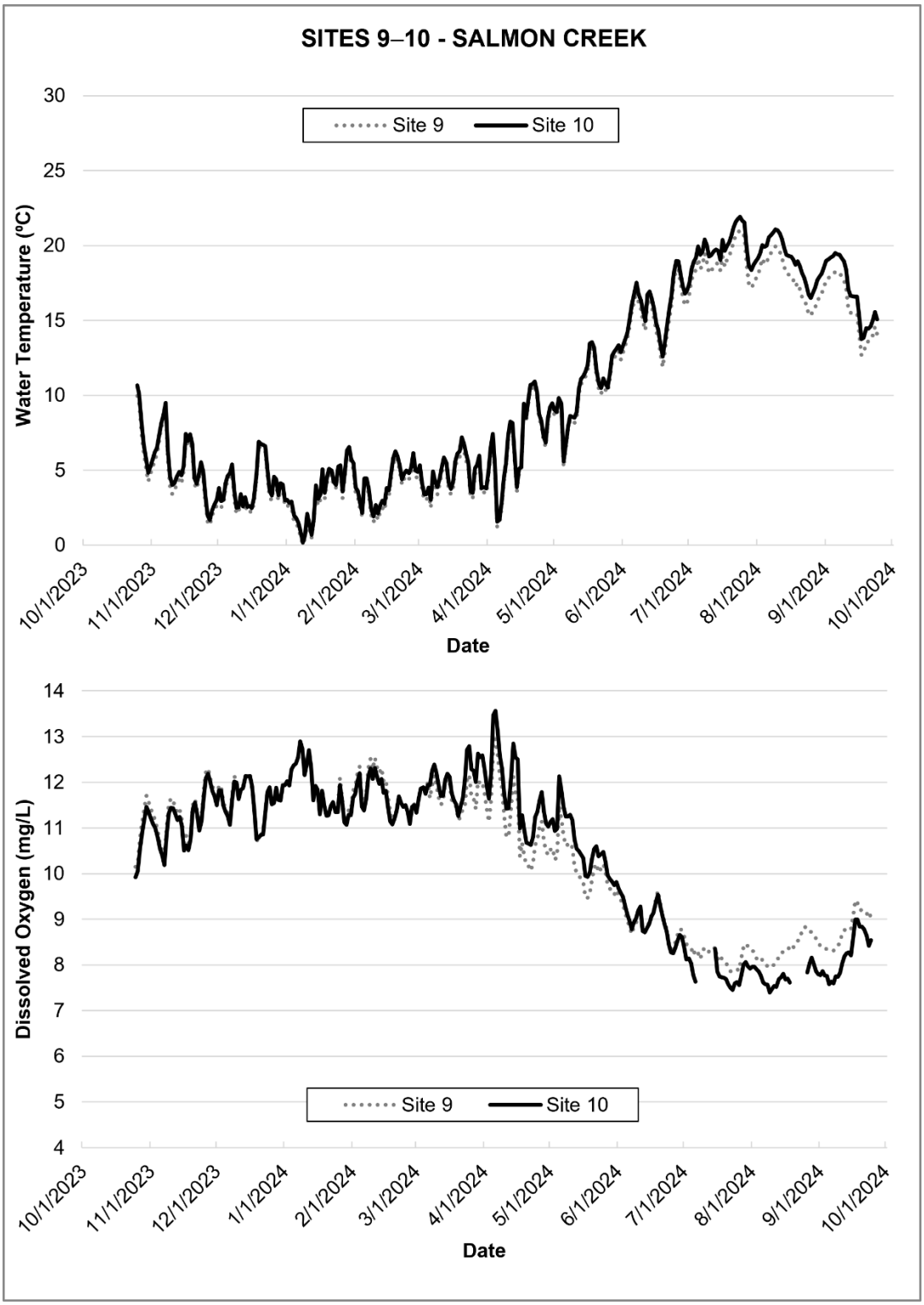
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5.1.3. SALMON CREEK (SITES 9 AND 10)

Water temperature in Salmon Creek exhibited some seasonal variation with the lowest temperatures during the winter and the highest temperatures during the summer (see Figure 5.1-3 and Table 5.1-1; Figures A-9 and A-10 in Appendix A; and Figures B-9 and B-10 in Appendix B). Site 9 upstream of the Salmon Creek Diversion showed slightly lower temperatures during the summer than Site 10 downstream of the diversion, likely the result of solar heating.

DO concentrations in Salmon Creek generally correlate with water temperatures. In the summer, daily minimum DO concentrations were less than the 8 mg/L water quality objective in the Basin Plan (CVRWQCB, 2018) for some periods (see Figure 5.1-3 and Table 5.1-2; Figures A-16 and A-17 in Appendix A; and Figures B-9 and B-10 in Appendix B). All instantaneous DO measurements collected during deployment and retrieval of the loggers were greater than 8 mg/L (Appendix C). Site 9 generally had slightly higher summer DO levels than Site 10.

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°C = degrees Celsius; mg/L = milligrams per liter

Figure 5.1-3. Mean Daily Water Temperature (top) and Mean Daily Dissolved Oxygen (bottom) in Salmon Creek Upstream (Site 9) and Downstream (Site 10) of Salmon Creek Diversion, November 2023 to September 2024.

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5.2. BACTERIOLOGICAL MONITORING RESULTS

Due to the lotic (i.e., flowing) conditions at riverine sites and low hydraulic retention of Fairview Dam and other diversion dams, all sites monitored showed low levels of fecal coliform (Table 5.2-1) and *E.coli* (Table 5.2-2).

Fecal coliform values were low during the 2022, 2023, and 2024 sampling periods (Table 5.2-1). Fecal coliform values were higher at all sites during the September 12, 2022, sampling period likely due to a run-off event following heavy rain on September 10, 2022. During 2024, all fecal coliform results surrounding the Fourth of July (June 6 to July 10) and Labor Day holiday (August 13 to September 10) weekends were less than the laboratory reporting limits (i.e., non-detectable).

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Table 5.2-1. Fecal Coliform Sampling Results, 2022–2024

Year	Date	Fecal Coliform (MPN/100 mL)				
		Site 1	Site 3	Site 4	Site 8	Site 10
2022	9/6	2.2	5.1	16	>23	9.2
	9/12	>23[b]	>23[b]	>23[b]	>23[b]	>23[b]
	9/19	3.6	9.2	6.9	1.1	9.2
	9/26	2.2	2.2	3.6	2.2	1.1
2023	8/8	4.5	2	4.5	13	11
	8/14	34	23	22	4.5	49
	8/23	<18	230	78	20	230
	8/28	7.8	7.8	21	46	23
	9/5	1.8	2	2	4.5	33
2024	6/6	<1	<1	<1	<1	<1
	6/13	<1.8	<1.8	<1.8	<1.8	<1.8
	6/18	<1.8	<1.8	<1.8	<1.8	<1.8
	6/27	<1.8	<1.8	<1.8	<1.8	<1.8
	7/8	<1.8	<1.8	<1.8	<1.8	<1.8
	7/10	<1.8	<1.8	<1.8	--[a]	<1.8
	8/13	<1.8	<1.8	<1.8	--[a]	<1.8
	8/20	<1.8	<1.8	<1.8	--[a]	<1.8
	8/27	<1.8	<1.8	<1.8	--[a]	<1.8
	9/3	<1.8	<1.8	<1.8	--[a]	<1.8
	9/10	<1.8	<1.8	<1.8	--[a]	<1.8

-- = no data available; MPN = most probable number; mL = milliliter; NFKR = North Fork Kern River
Notes:
[a] Water sample not collected Corral Creek upstream of the NFKR (Site 8) on sampling dates between July 10 and September 10, 2024, because the stream was dry.
[b] Values greater than 23 were not analyzed in the fecal coliform standard range and cannot be used to evaluate state objectives. Additional samples will be collected in 2023 and 2024.

E.coli values were low during the 2022, 2023, and 2024 sampling periods (Table 5.2-2). During 2024, all *E.coli* results surrounding the Fourth of July (June 6 to July 10) and Labor Day holiday (August 13 to September 10) weekends were less than the laboratory reporting limits (i.e., non-detectable) except during the June 6, 2024, sampling event.

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Table 5.2-2. *Escherichia coli* Sampling Results, 2022–2024

Year	Date	*Escherichia coli* (MPN/100 mL)				
		Site 1	Site 3	Site 4	Site 8	Site 10
2022	10/6	<1	5.2	3.1	1	2
2023	8/23	28	28	34	40	240
	8/28	7.5	6.3	2	19	6.3
	9/5	7.5	5.2	5.2	7.4	9.7
2024	6/6	12	24	110	12	14
	6/13	<1	<1	<1	<1	<1
	6/18	<1	<1	<1	<1	<1
	6/27	<1	<1	<1	<1	<1
	7/8	<1	<1	<1	<1	<1
	7/10	<1	<1	<1	--[a]	<1
	8/13	<1	<1	<1	--[a]	<1
	8/20	<1	<1	<1	--[a]	<1
	8/27	<1	<1	<1	--[a]	<1
	9/3	<1	<1	<1	--[a]	<1
	9/10	<1	<1	<1	--[a]	<1

< = less than laboratory reporting limits; -- = no data; MPN = most probable number; mL = milliliter

Notes:

[a] Water sample not collected Corral Creek upstream of the NFKR (Site 8) on sampling dates between July 10 and September 10, 2024, because the stream was dry.

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6.0 STUDY SPECIFIC CONSULTATION

No study-specific consultation was conducted for WR-1 Study.

7.0 OUTSTANDING STUDY PLAN ELEMENTS

There are no outstanding Study Plan elements.

8.0 REFERENCES

CVRWQCB (California Valley Regional Water Quality Control Board). 2018. *Water Quality Control Plan for the Tulare Lake Basin*. Third Edition. Revised May 2018 (with Approved Amendments). California Valley Regional Water Quality Control Board, Central Valley Region.

FERC (Federal Energy Regulatory Commission). 2022. *Study Plan Determination for the Kern River No. 3 Hydroelectric Project*. Accession No. 20221012-3024. October 12.

FERC (Federal Energy Regulatory Commission). 2024. *Determination on Requests for Study Modifications and New Studies*. Accession No. 20240530-3030. May 30.

SCE (Southern California Edison). 2022. *Kern River No. 3 Hydroelectric Project, Revised Study Plan*. Filed with FERC July 1. Accession No. 20220705-5032

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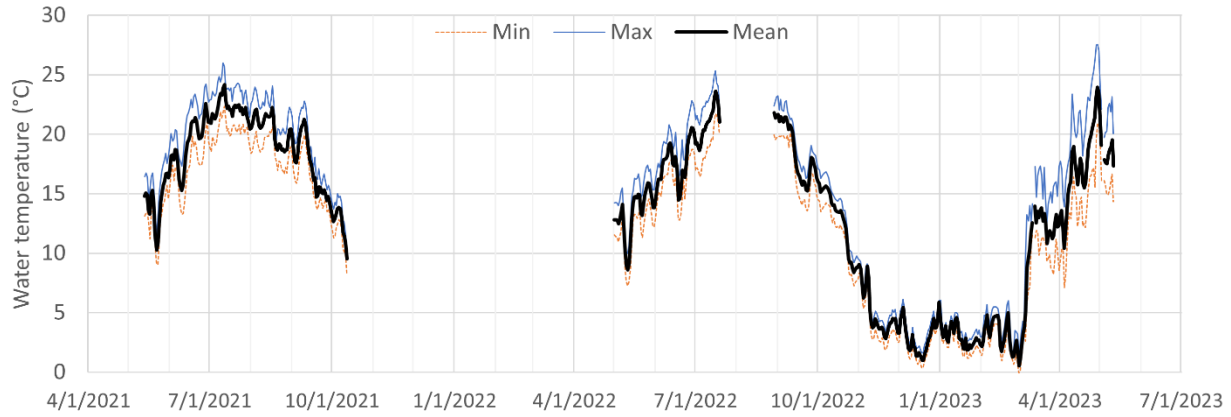
APPENDIX A
WATER TEMPERATURE AND DISSOLVED OXYGEN FIGURES, 2021 TO 2023

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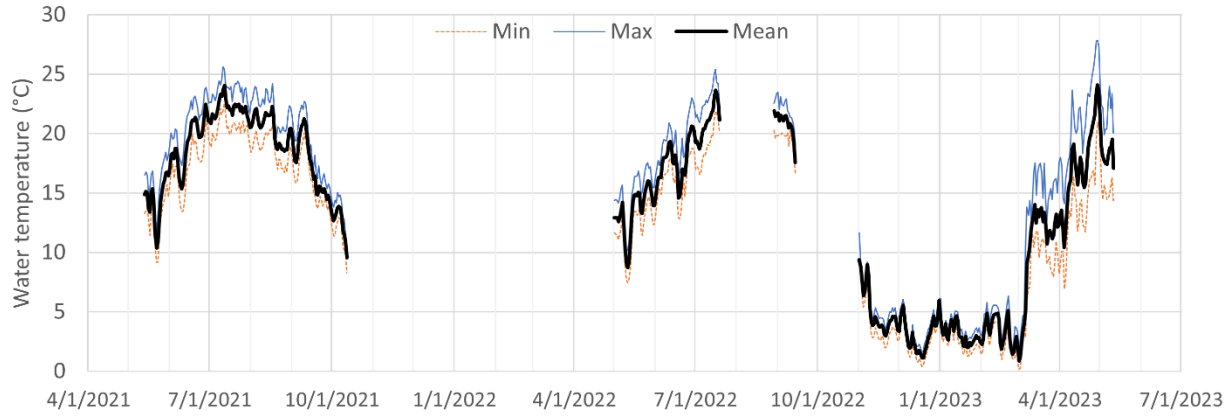
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Water Temperature



°C = degrees Celsius

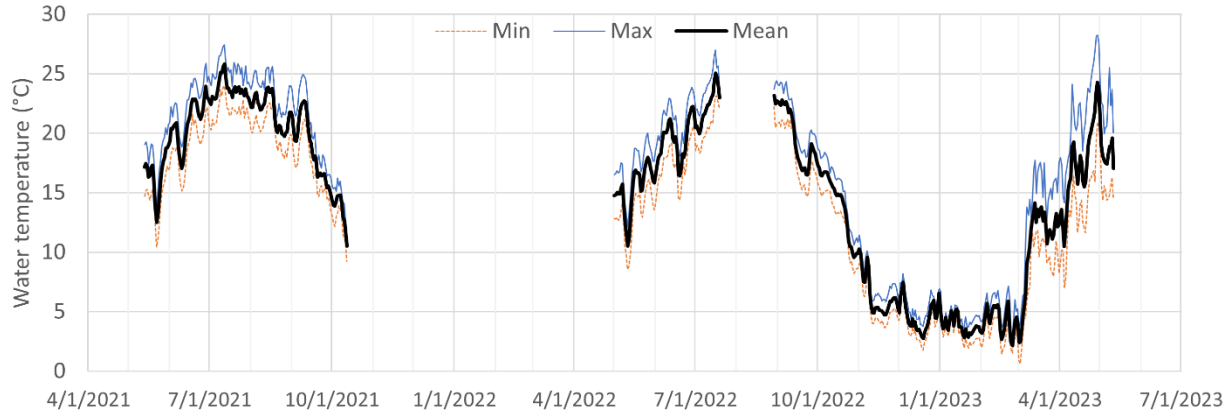
Figure A-1. Daily Mean, Minimum, and Maximum Water Temperature (°C) at Site 1, North Fork Kern River Upstream of the Fairview Dam Impoundment Pool, 2021–2023.



°C = degrees Celsius

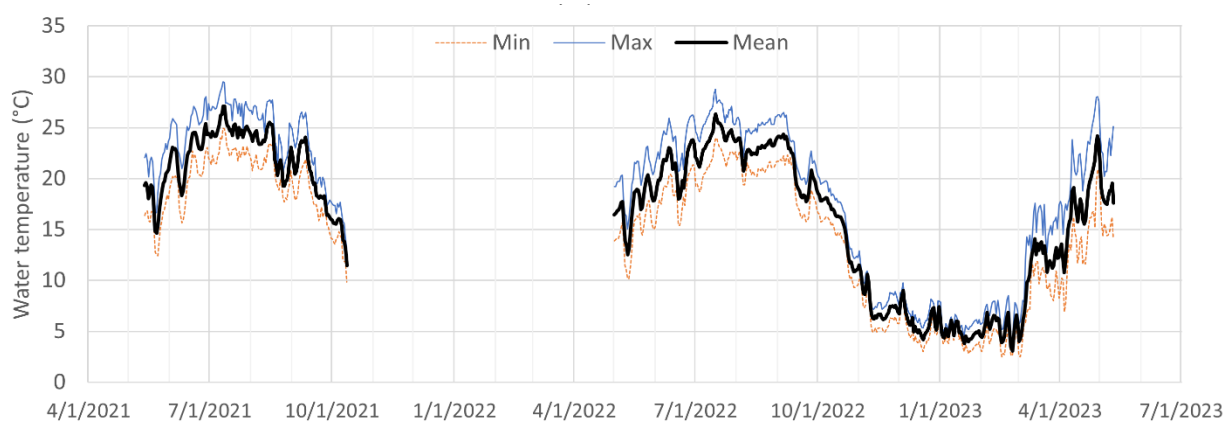
Figure A-2. Daily Mean, Minimum, and Maximum Water Temperature (°C) at Site 2, North Fork Kern River Immediately Downstream of the Fairview Dam, 2021–2023.

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°C = degrees Celsius

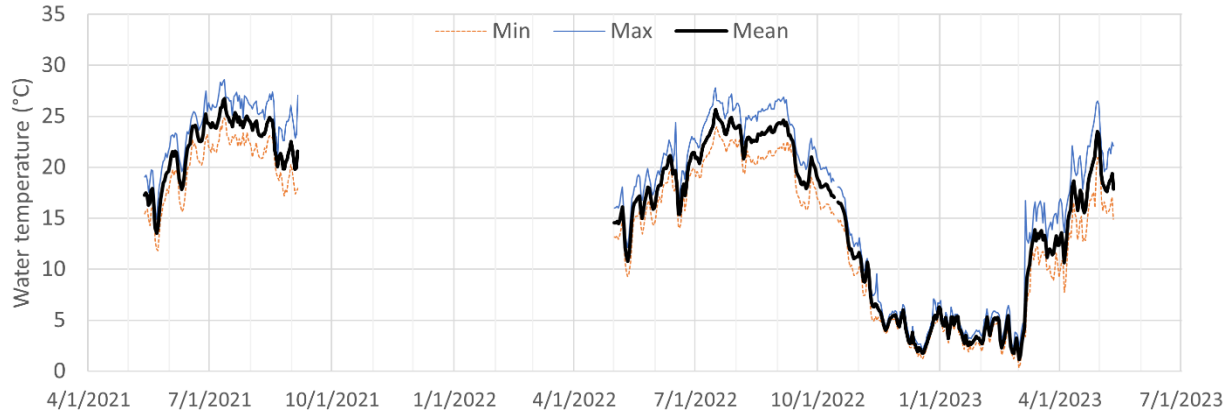
Figure A-3. Daily Mean, Minimum, and Maximum Water Temperature (°C) at Site 3, North Fork Kern River at Gold Ledge Campground, 2021–2023.



°C = degrees Celsius

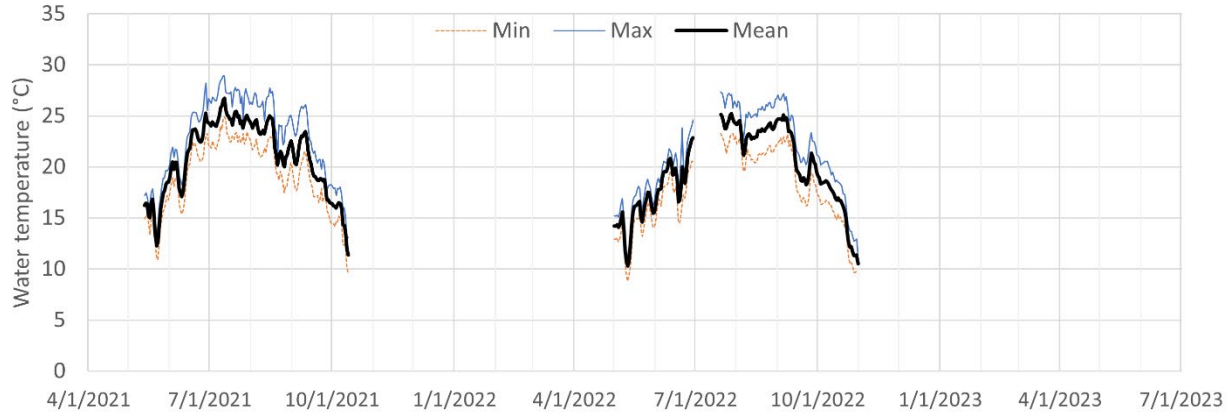
Figure A-4. Daily Mean, Minimum, and Maximum Water Temperature (°C) at Site 4, North Fork Kern River Immediately Upstream of the Kern River No. 3 Powerhouse, 2021–2023.

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°C = degrees Celsius

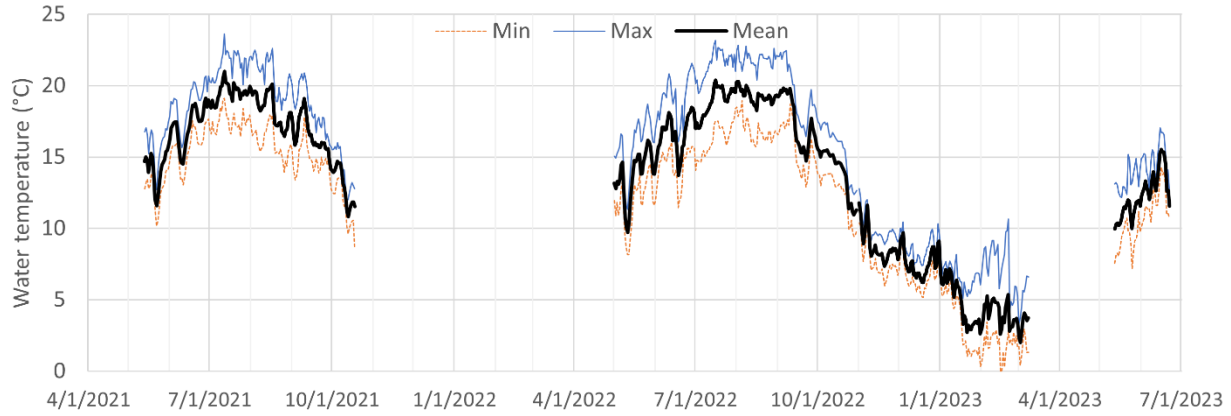
Figure A-5. Daily Mean, Minimum, and Maximum Water Temperature (°C) at Site 5, North Fork Kern River downstream of the Kern River No. 3 Powerhouse, 2021–2023.



°C = degrees Celsius

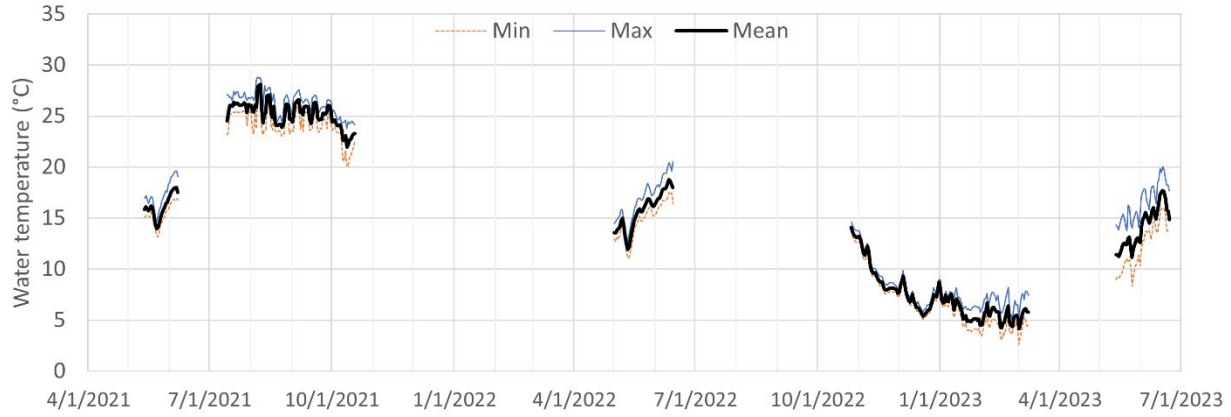
Figure A-6. Daily Mean, Minimum, and Maximum Water Temperature (°C) at Site 6, North Fork Kern River at the Existing Kernville U.S. Army Corps of Engineers Gage, 2021–2023.

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°C = degrees Celsius

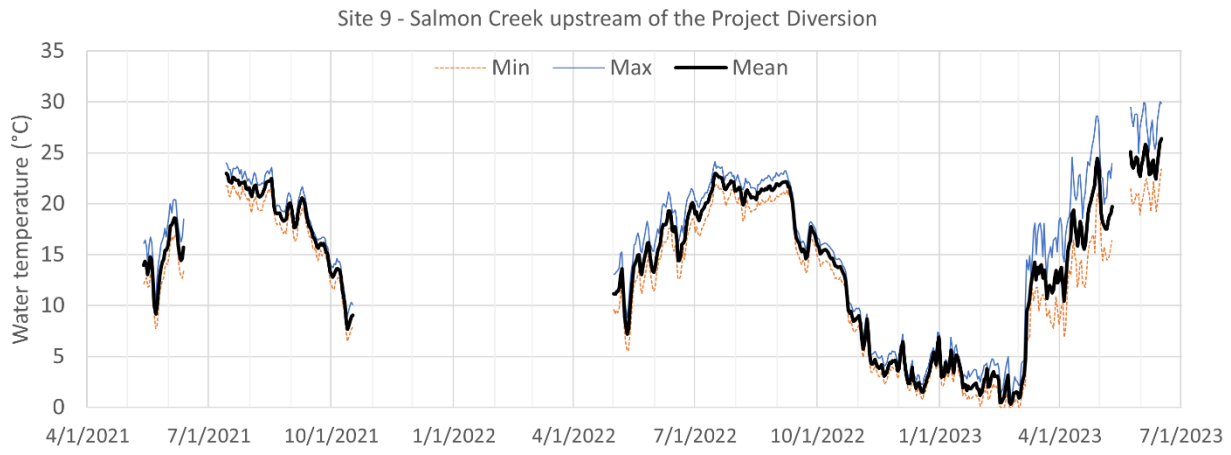
Figure A-7. Daily Mean, Minimum, and Maximum Water Temperature (°C) at Site 7, Corral Creek Upstream of the Project Diversion, 2021–2023.



°C = degrees Celsius

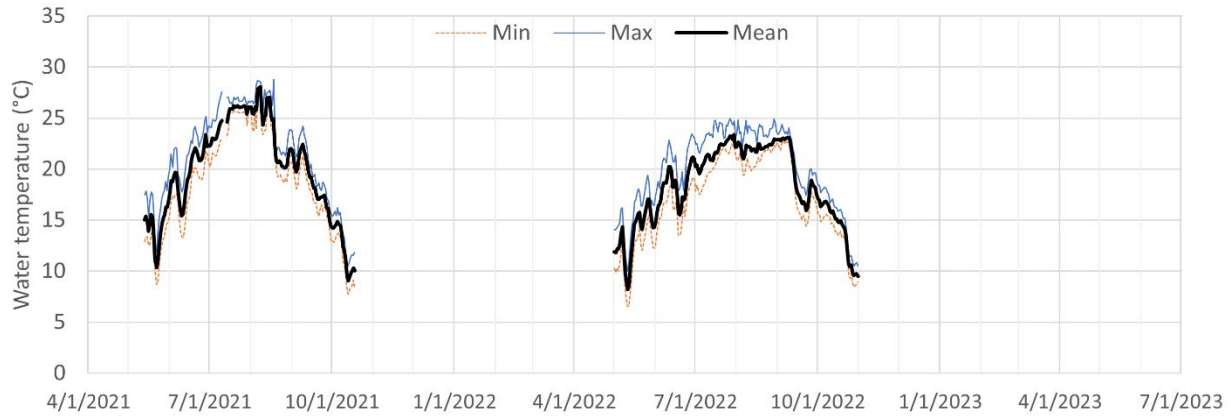
Figure A-8. Daily Mean, Minimum, and Maximum Water Temperature (°C) at Site 8, Corral Creek Upstream of its Confluence with the North Fork of the Kern River, 2021–2023.

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°C = degrees Celsius

Figure A-9. Daily Mean, Minimum, and Maximum Water Temperature (°C) at Site 9, Salmon Creek Upstream of the Project Diversion, 2021–2023.

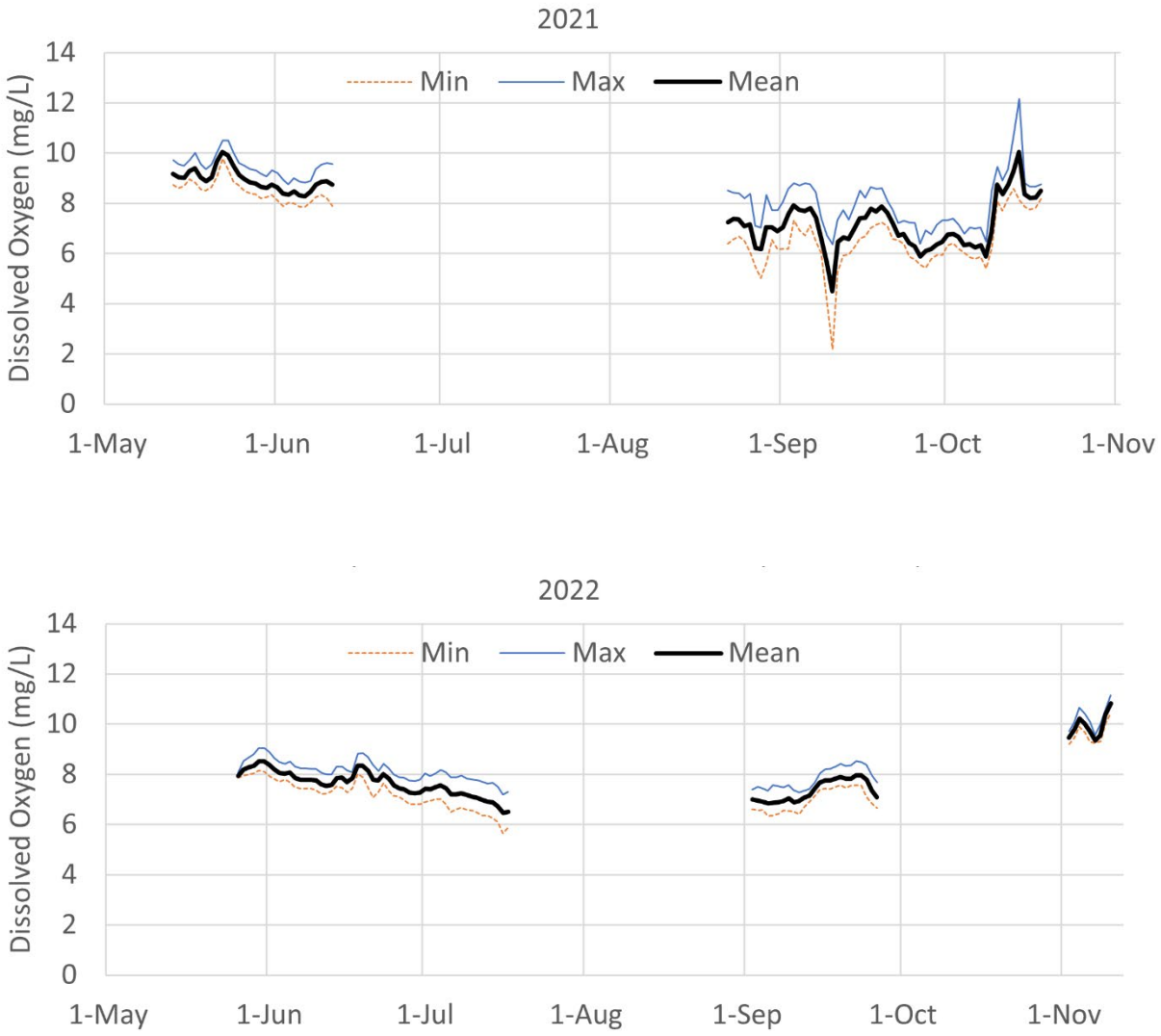


°C = degrees Celsius

Figure A-10. Daily Mean, Minimum, and Maximum Water Temperature (°C) at Site 10, Salmon Creek Upstream of the Confluence with the North Fork Kern River, 2021–2023.

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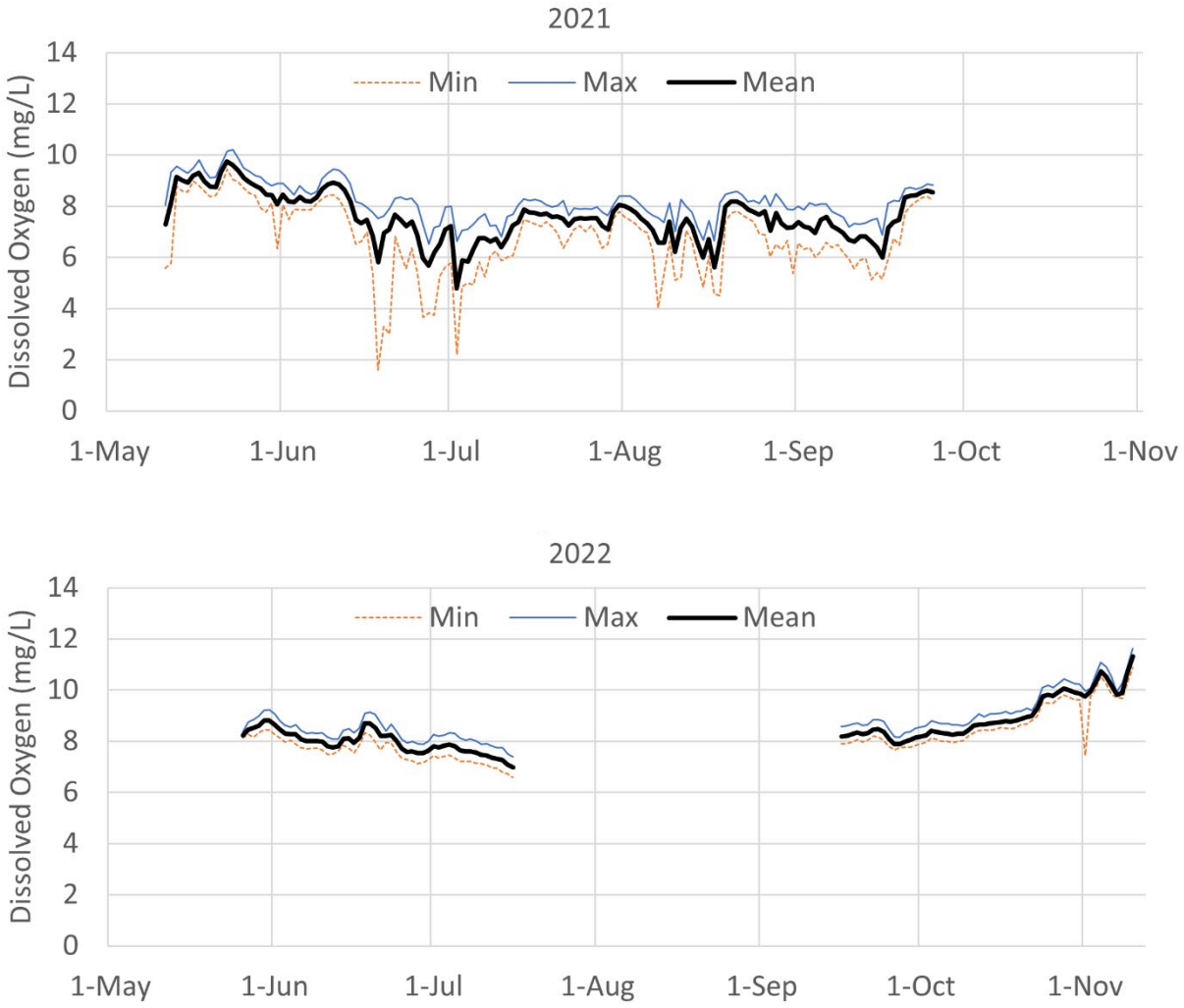
Dissolved Oxygen



mg/L = milligrams per liter
Note: Dissolved oxygen data from these months have been qualified due to data quality issues identified during analysis.

Figure A-11. Daily Mean, Minimum, and Maximum Dissolved Oxygen (mg/L) at Site 1, North Fork Kern River Upstream of the Fairview Dam Impoundment Pool, 2021–2022.

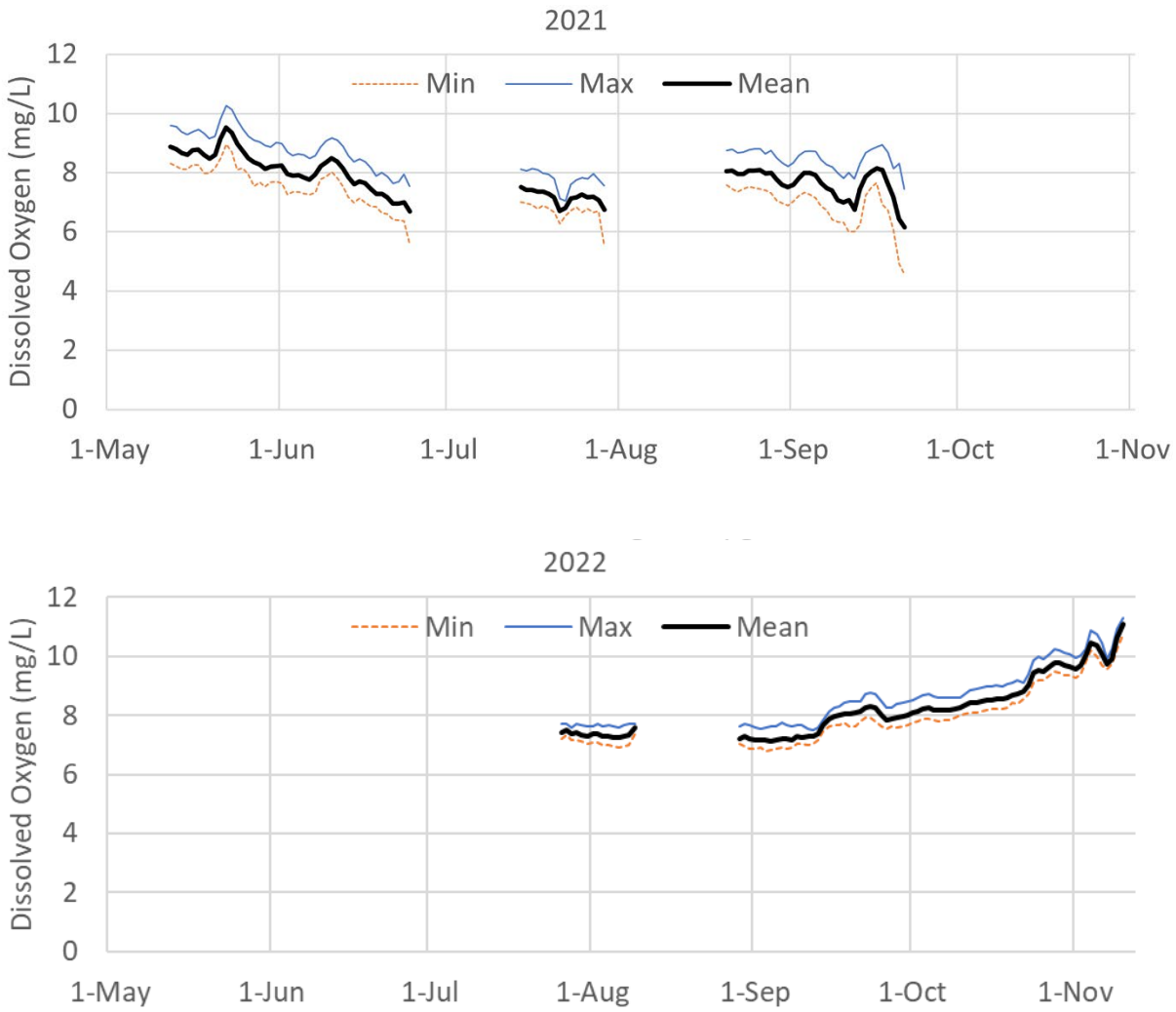
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mg/L = milligrams per liter
Notes: Dissolved oxygen data from these months have been qualified due to data quality issues identified during analysis.

Figure A-12. Daily Mean, Minimum, and Maximum Dissolved Oxygen (mg/L) at Site 2, North Fork Kern River Downstream of the Fairview Dam, 2021–2022.

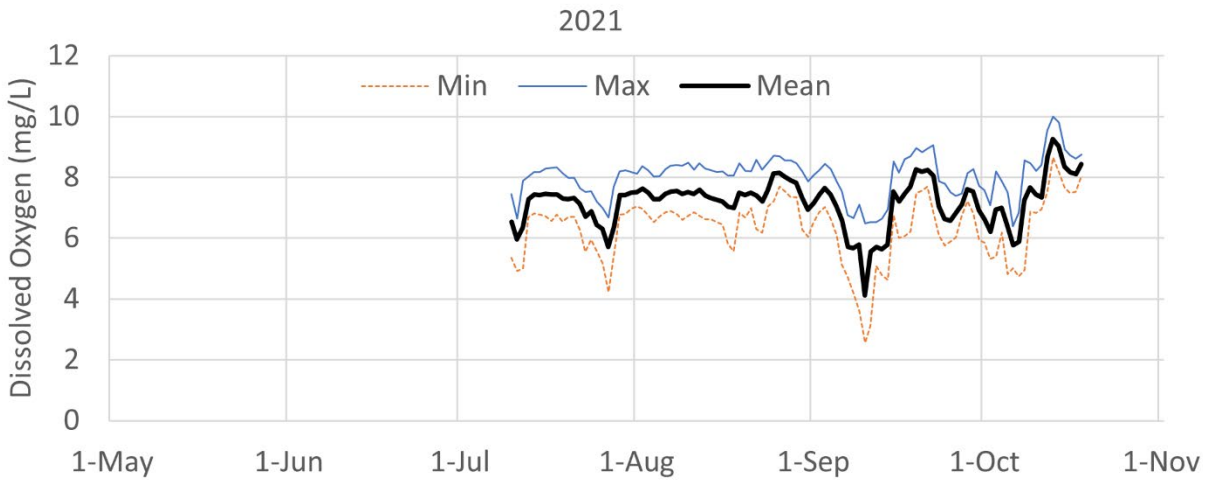
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mg/L = milligrams per liter
Note: Dissolved oxygen data from these months have been qualified due to data quality issues identified during analysis.

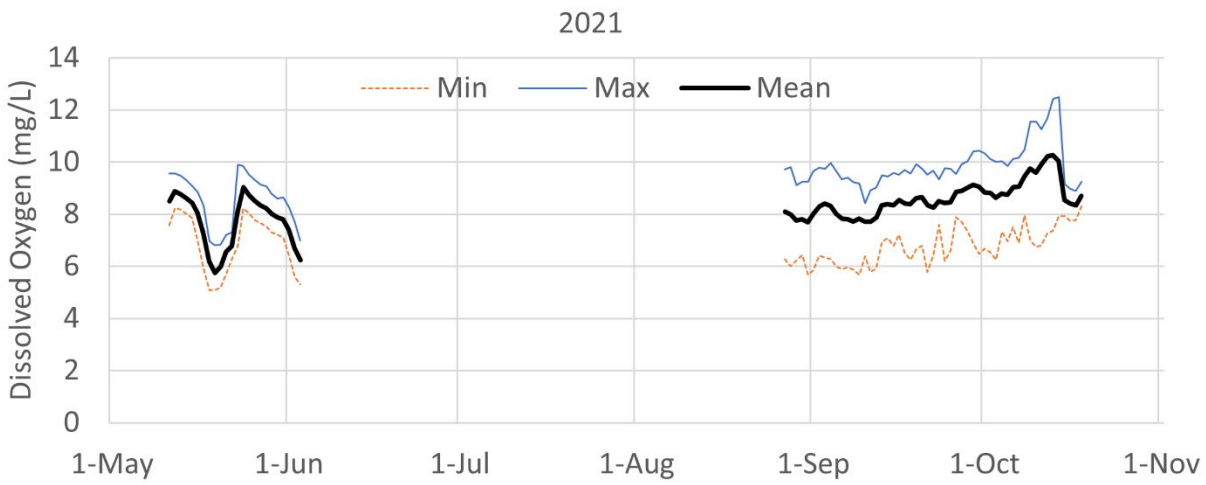
Figure A-13. Daily Mean, Minimum, and Maximum Dissolved Oxygen (mg/L) at Site 3, North Fork Kern River at Gold Ledge Campground, 2021–2022.

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mg/L = milligrams per liter
Note: Dissolved oxygen data from these months have been qualified due to data quality issues identified during analysis.

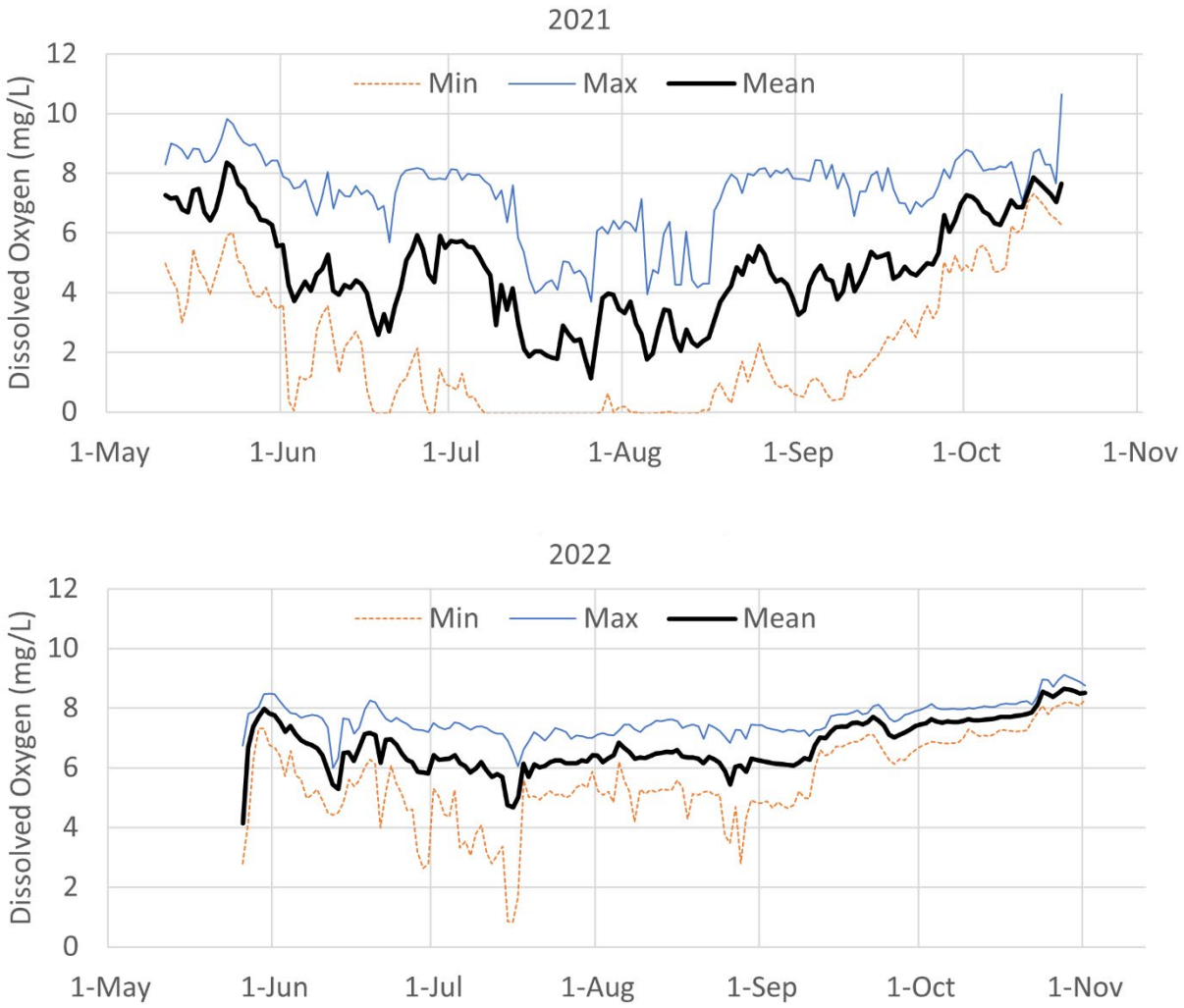
Figure A-14. Daily Mean, Minimum, and Maximum Dissolved Oxygen (mg/L) at Site 4 North Fork Kern River Upstream of the Kern River No. 3 Powerhouse, 2021.



mg/L = milligrams per liter

Figure A-15. Daily Mean, Minimum, and Maximum Dissolved Oxygen (mg/L) at Site 5, North Fork Kern River Downstream of the Kern River No. 3 Powerhouse, 2021.

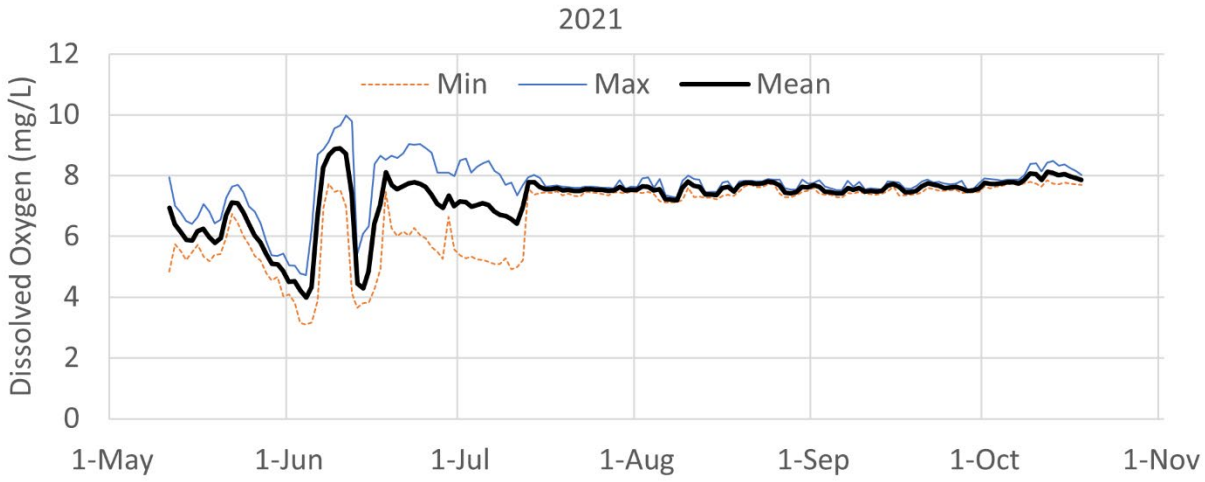
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mg/L = milligrams per liter
Note: Dissolved oxygen data from these months have been qualified due to data quality issues identified during analysis.

Figure A-16. Daily Mean, Minimum, and Maximum Dissolved Oxygen (mg/L) at Site 7, Corral Creek Upstream of the Project Diversion, 2021–2022.

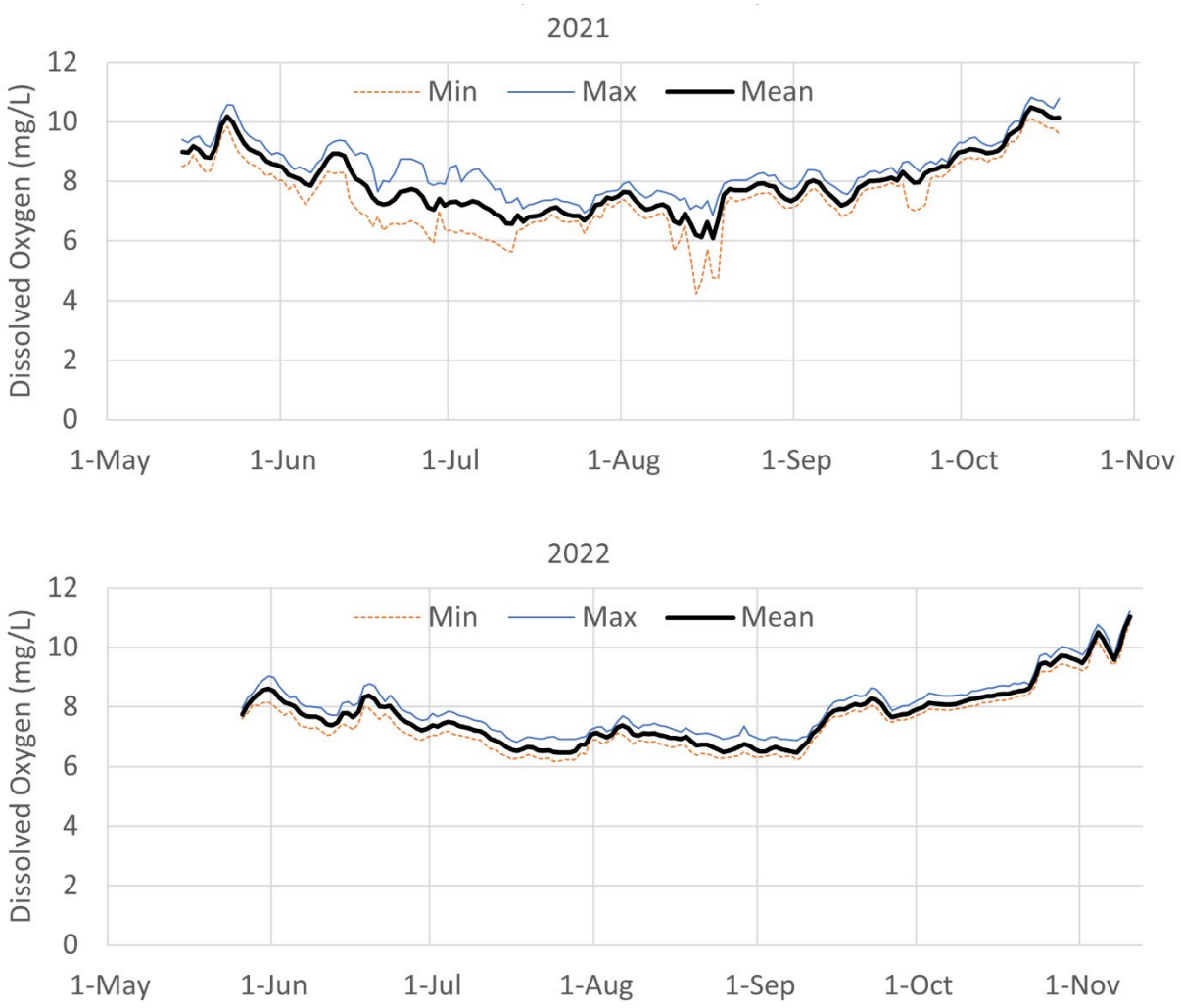
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mg/L = milligrams per liter
Note: Dissolved oxygen data from these months have been qualified due to data quality issues identified during analysis.

Figure A-17. Daily Mean, Minimum, and Maximum Dissolved Oxygen (mg/L) at Site 8, Corral Creek Upstream of its Confluence with the North Fork of the Kern River, 2021.

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mg/L = milligrams per liter
Note: Dissolved oxygen data from these months have been qualified due to data quality issues identified during analysis.

Figure A-18. Daily Mean, Minimum, and Maximum Dissolved Oxygen (mg/L) at Site 9, Salmon Creek Upstream of the Project Diversion, 2021–2022.

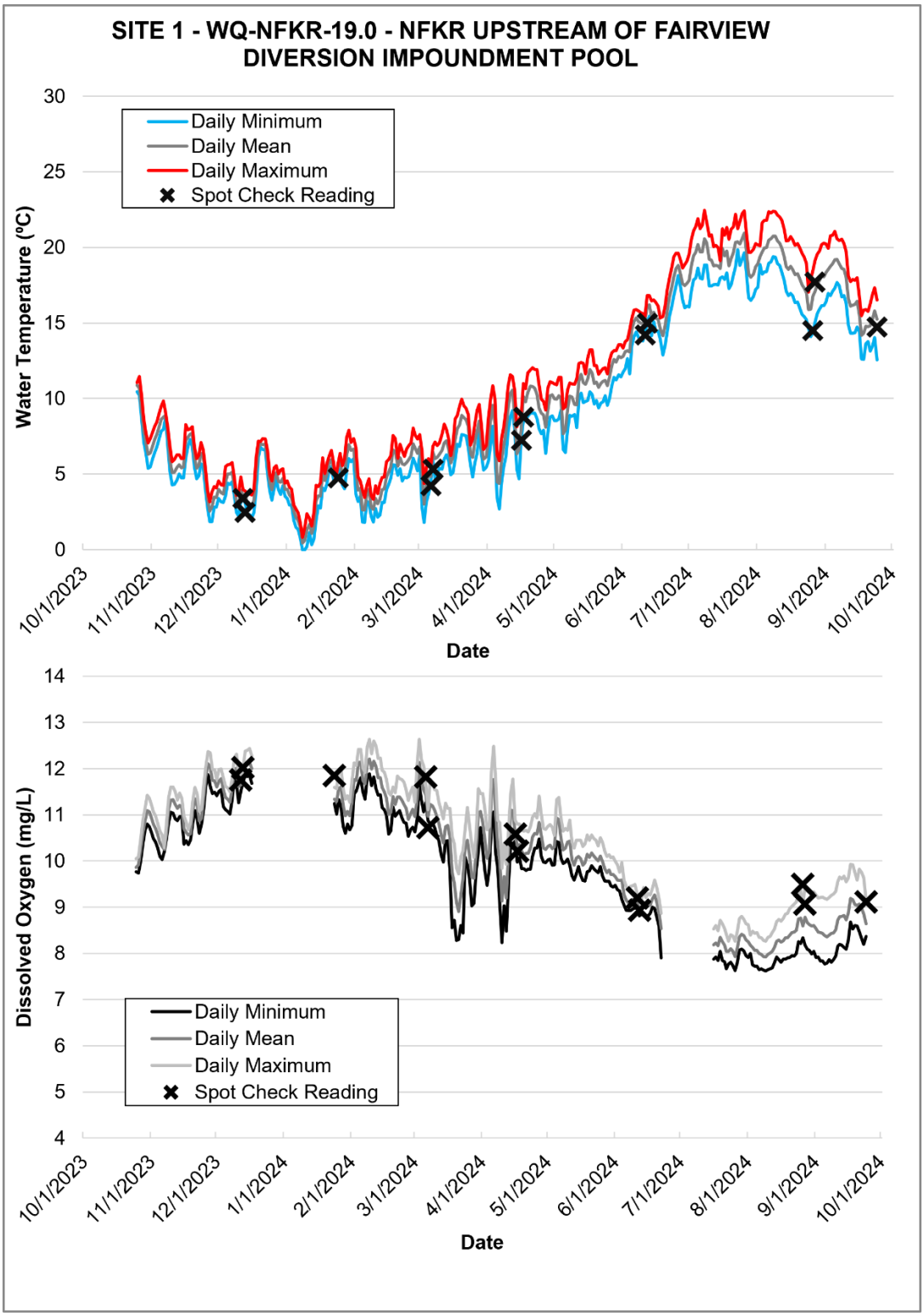
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APPENDIX B
WATER TEMPERATURE AND DISSOLVED OXYGEN FIGURES, OCTOBER 2023 TO SEPTEMBER 2024

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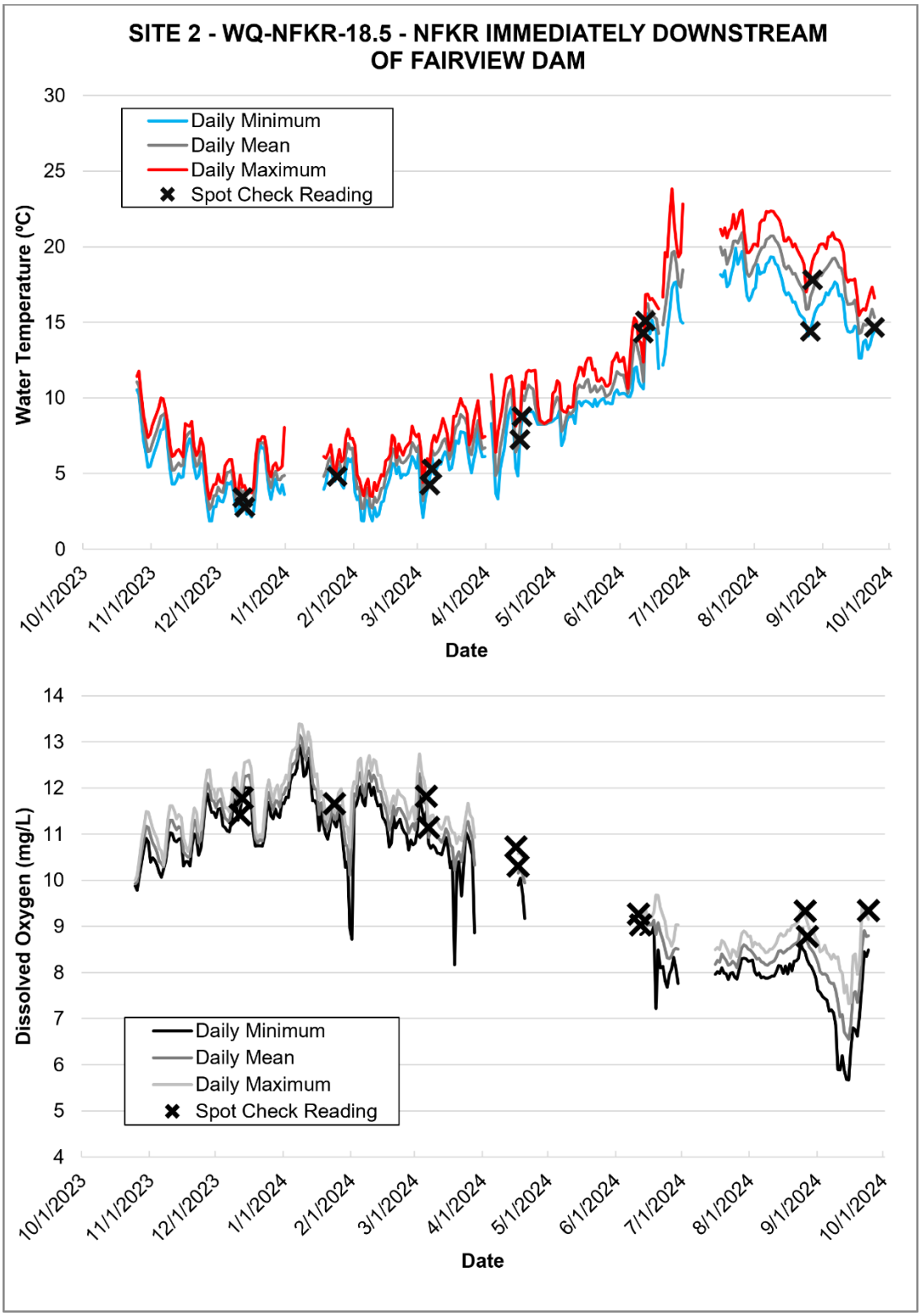
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°C = degrees Celsius; mg/L = milligrams per liter; NFKR = North Fork Kern River

Figure B-1. Daily Mean, Minimum, and Maximum Water Temperature (top) and Dissolved Oxygen (bottom) at Site 1, North Fork Kern River Upstream of the Fairview Dam Impoundment Pool, October 2023 to September 2024.

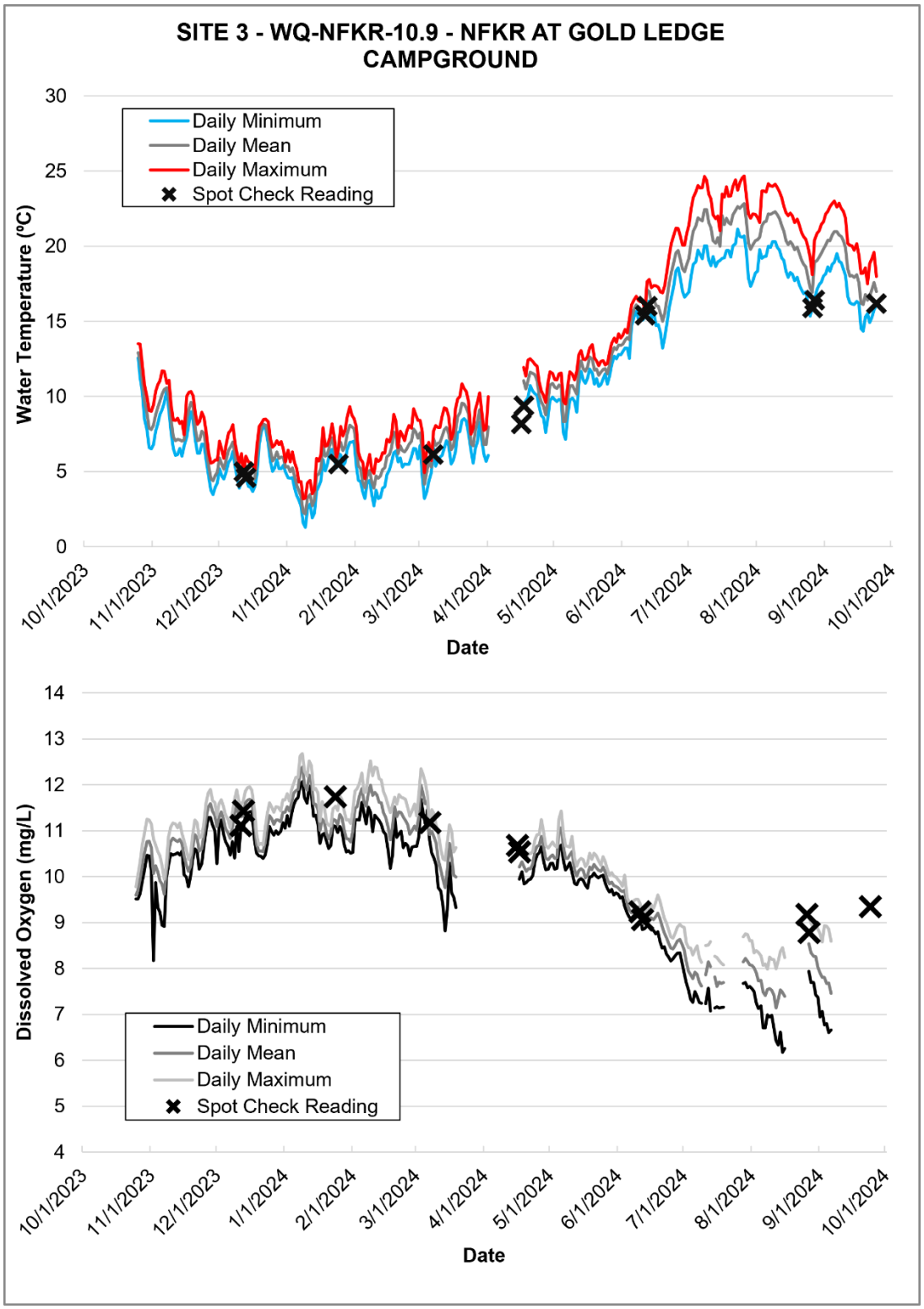
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°C = degrees Celsius; mg/L = milligrams per liter; NFKR = North Fork Kern River

Figure B-2. Daily Mean, Minimum, and Maximum Water Temperature (top) and Dissolved Oxygen (bottom) at Site 2, North Fork Kern River Downstream of the Fairview Dam, October 2023 to September 2024.

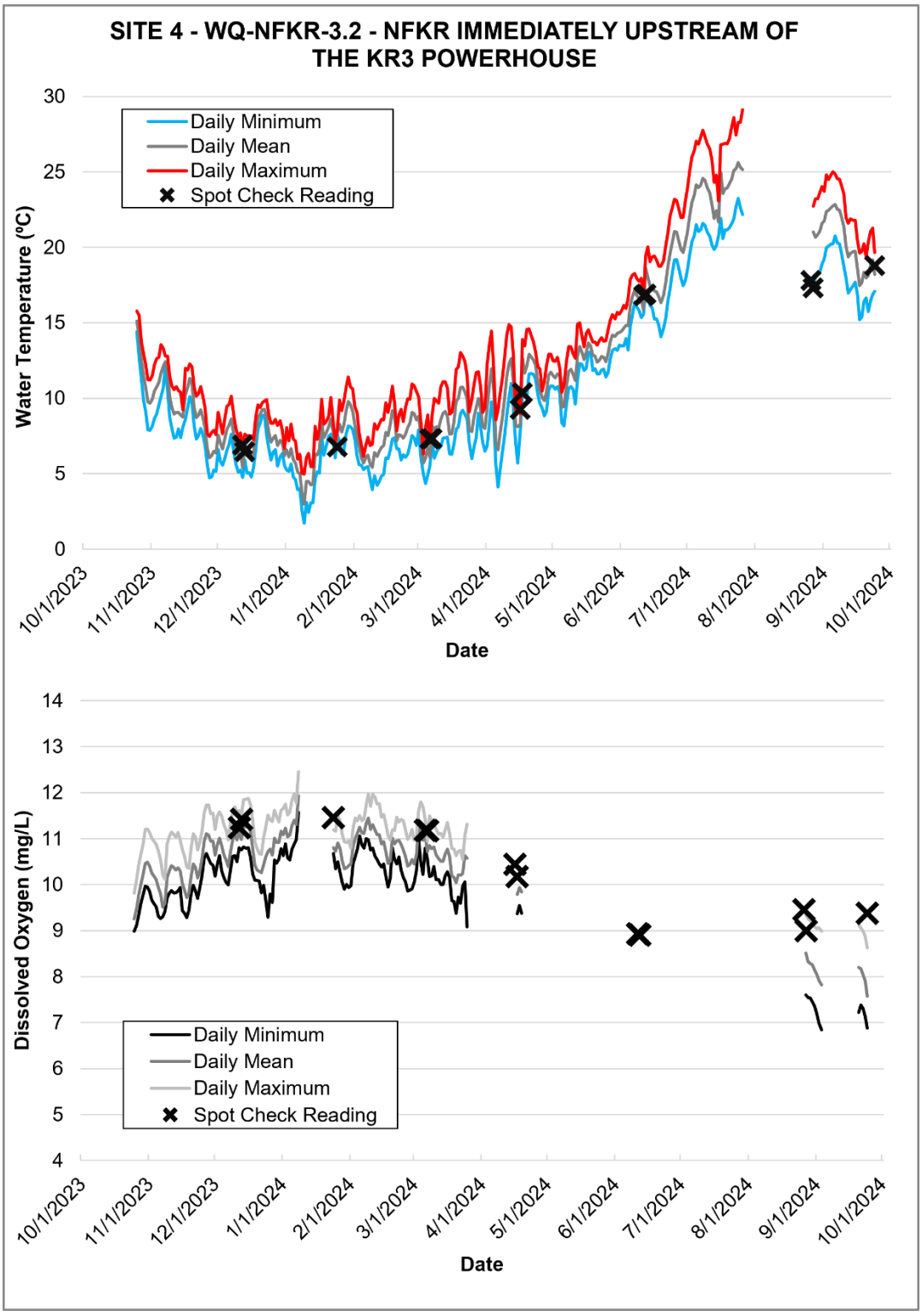
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°C = degrees Celsius; mg/L = milligrams per liter; NFKR = North Fork Kern River

Figure B-3. Daily Mean, Minimum, and Maximum Water Temperature (top) and Dissolved Oxygen (bottom) at Site 3, North Fork Kern River at Gold Ledge Campground, October 2023 to September 2024.

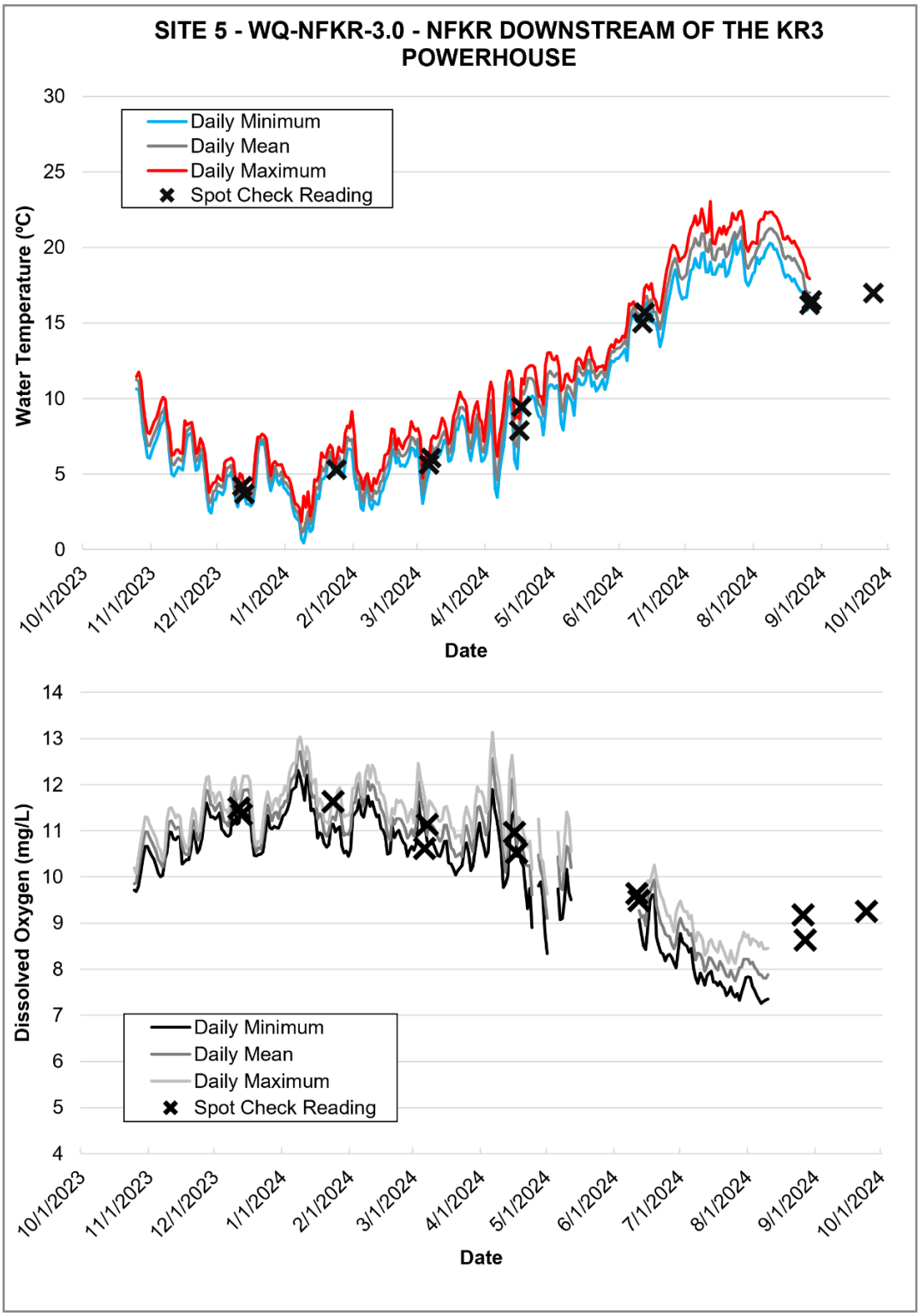
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°C = degrees Celsius; mg/L = milligrams per liter; NFKR = North Fork Kern River

Figure B-4. Daily Mean, Minimum, and Maximum Water Temperature (top) and Dissolved Oxygen (bottom) at Site 4, North Fork Kern River Downstream of the Kern River No. 3 Powerhouse, October 2023 to September 2024.

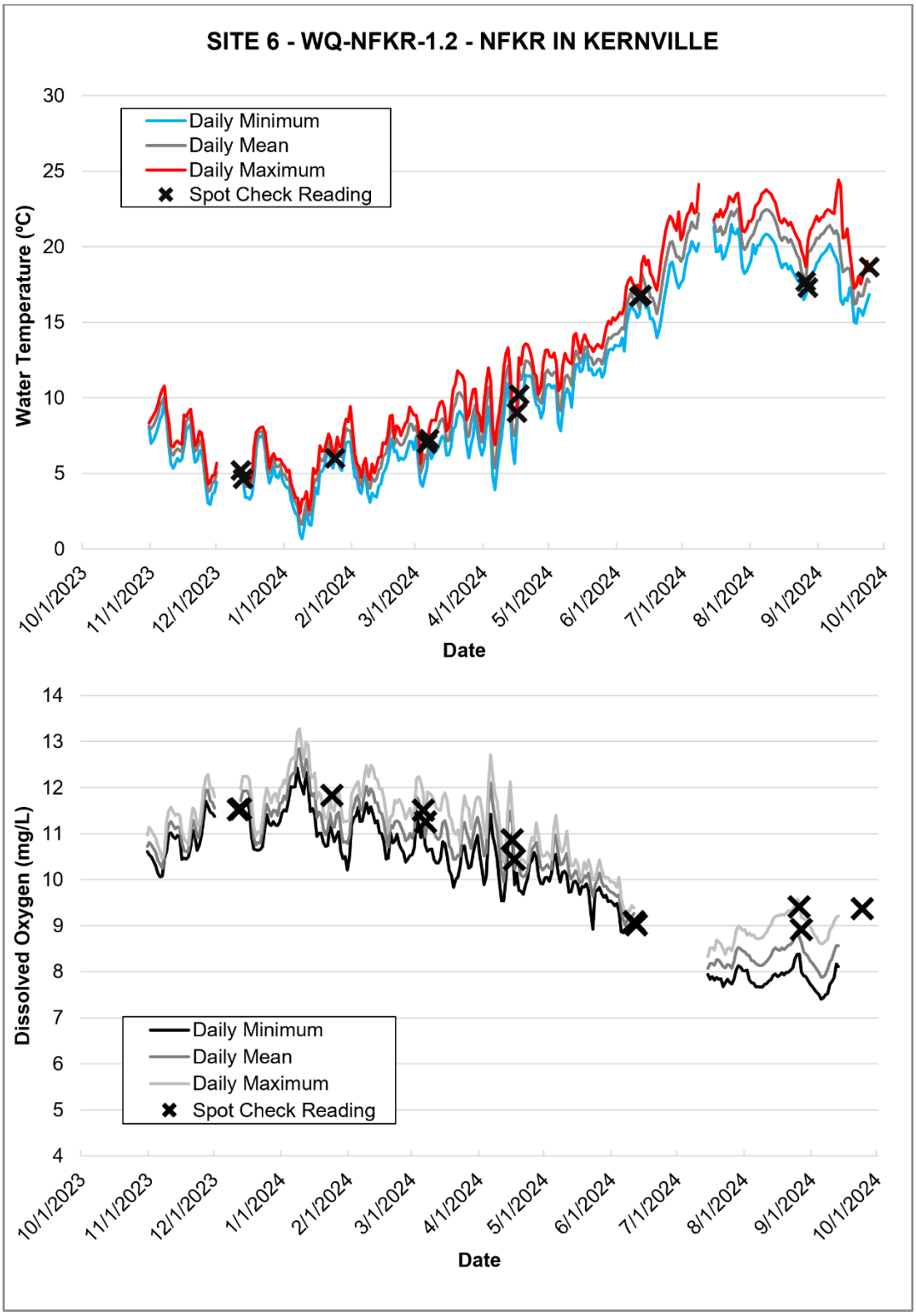
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°C = degrees Celsius; mg/L = milligrams per liter; NFKR = North Fork Kern River

Figure B-5. Daily Mean, Minimum, and Maximum Water Temperature (top) and Dissolved Oxygen (bottom) at Site 5, North Fork Kern River Upstream of the Kern River No. 3 Powerhouse, October 2023 to September 2024.

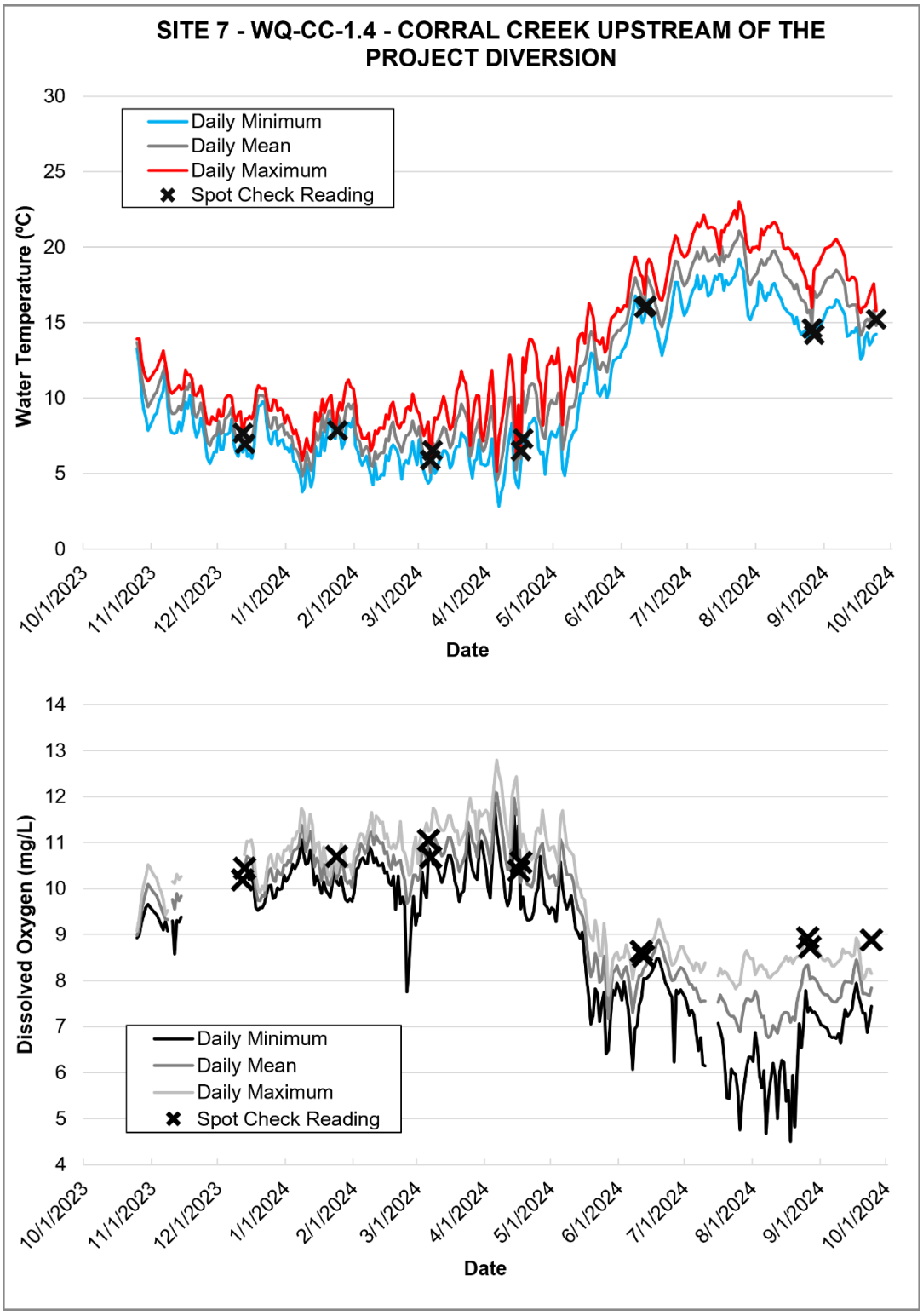
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°C = degrees Celsius; mg/L = milligrams per liter; NFKR = North Fork Kern River

Figure B-6. Daily Mean, Minimum, and Maximum Water Temperature (top) and Dissolved Oxygen (bottom) at Site 6, North Fork Kern River at Kernville, October 2023 to September 2024.

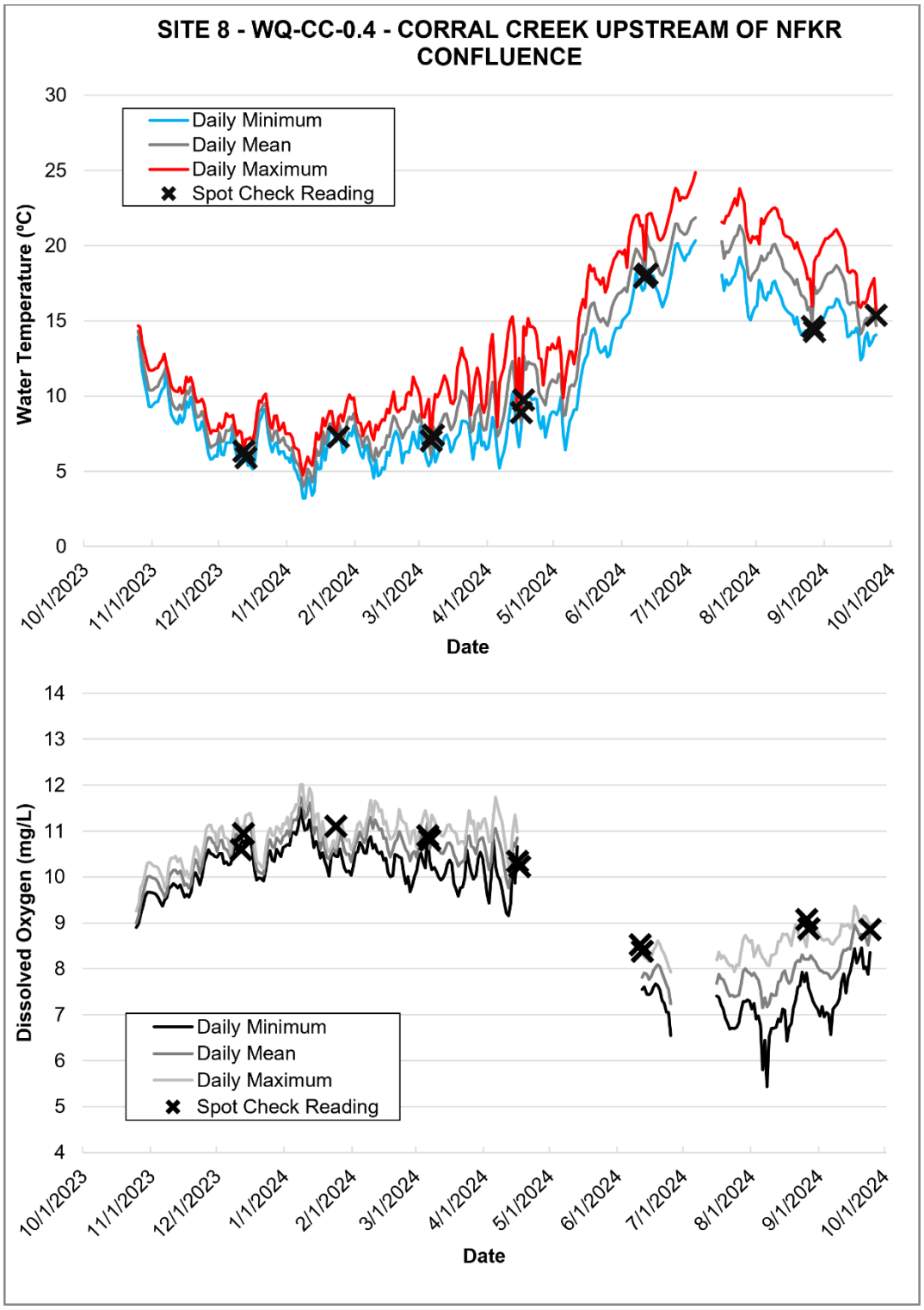
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°C = degrees Celsius; mg/L = milligrams per liter

Figure B-7. Daily Mean, Minimum, and Maximum Water Temperature (top) and Dissolved Oxygen (bottom) at Site 7, Corral Creek Upstream of the Project Diversion, October 2023 to September 2024.

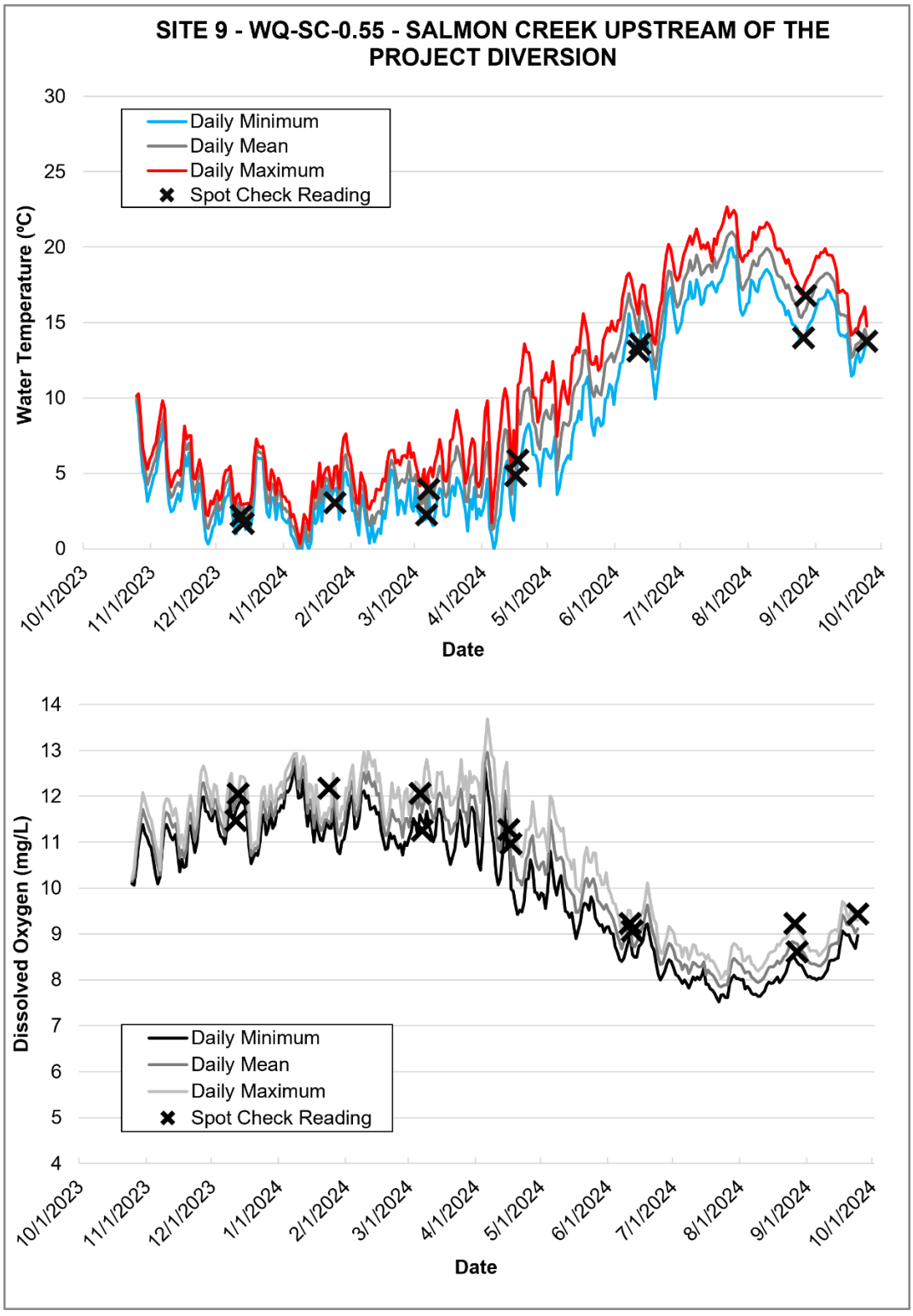
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°C = degrees Celsius; mg/L = milligrams per liter

Figure B-8. Daily Mean, Minimum, and Maximum Water Temperature (top) and Dissolved Oxygen (bottom) at Site 8, Corral Creek Upstream of its Confluence with the North Fork of the Kern River, October 2023 to September 2024.

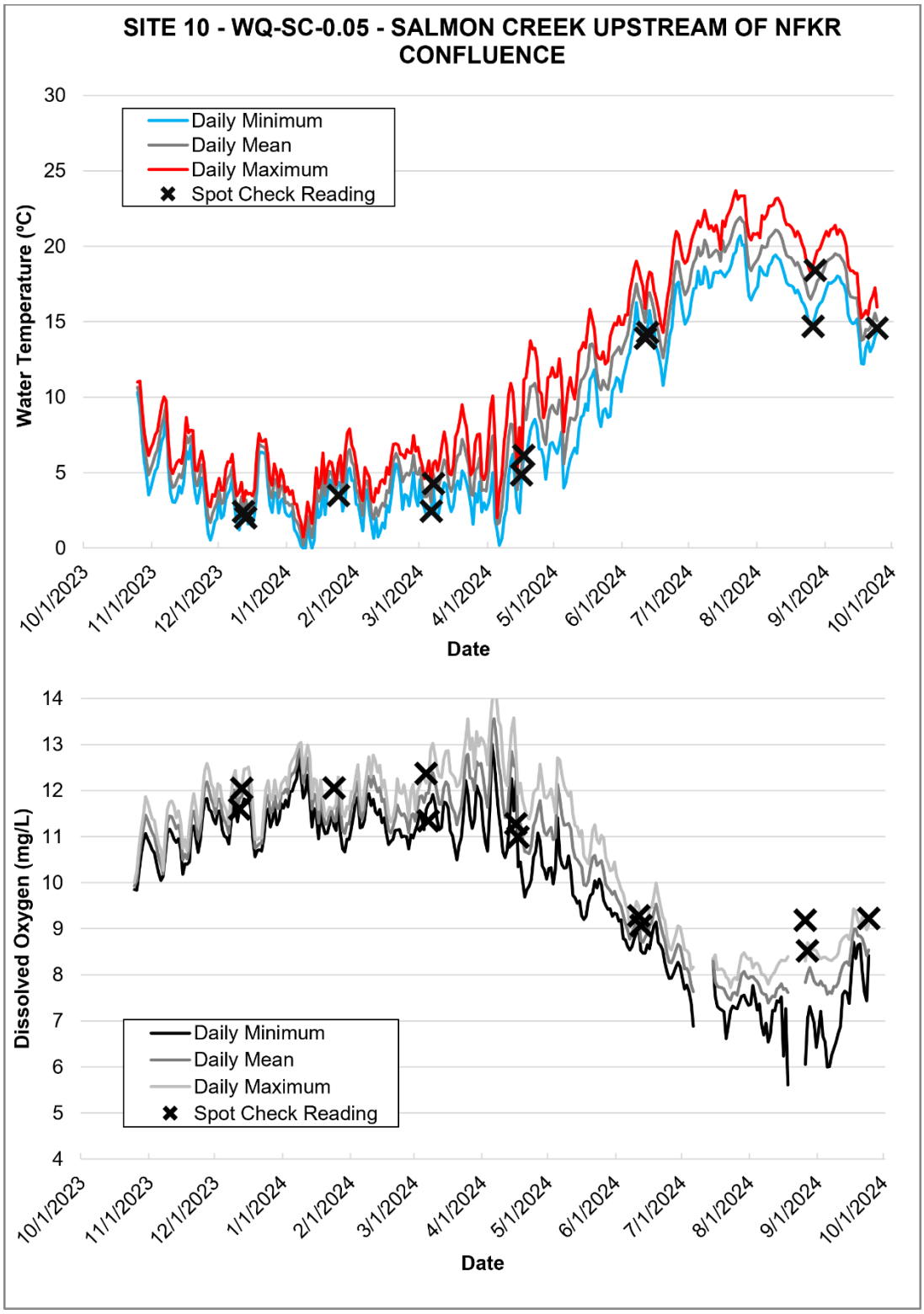
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°C = degrees Celsius; mg/L = milligrams per liter

Figure B-9. Daily Mean, Minimum, and Maximum Water Temperature (top) and Dissolved Oxygen (bottom) at Site 9, Salmon Creek Upstream of the Project Diversion, October 2023 to September 2024.

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°C = degrees Celsius; mg/L = milligrams per liter; NFKR = North Fork Kern River

Figure B-10. Daily Mean, Minimum, and Maximum Water Temperature (top) and Dissolved Oxygen (bottom) at Site 10, Salmon Creek Upstream of the Confluence with the North Fork Kern River, October 2023 to September 2024.

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APPENDIX C
INSTANTANEOUS DISSOLVED OXYGEN AND WATER TEMPERATURE MEASUREMENTS, DECEMBER 2023 TO SEPTEMBER 2024

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Table C-1. Instantaneous Dissolved Oxygen and Water Temperature Measurements Collected During Logger Retrieval and Deployments Between December 2023 and September 2024.

Site 1: WQ-NFKR-19.0 NFKR upstream of Fairview Diversion impoundment pool			Site 2: WQ-NFKR-18.5 NFKR immediately downstream of Fairview Dam			Site 3: WQ-NFKR-10.9 NFKR at Gold Ledge Campground			Site 4: WQ-NFKR-3.2 NFKR immediately upstream of the KR3 Powerhouse			Site 5: WQ-NFKR-3.0 NFKR downstream of the KR3 Powerhouse		
Date	Dissolved Oxygen (mg/L)	Water Temperature (ºC)	Date	Dissolved Oxygen (mg/L)	Water Temperature (ºC)	Date	Dissolved Oxygen (mg/L)	Water Temperature (ºC)	Date	Dissolved Oxygen (mg/L)	Water Temperature (ºC)	Date	Dissolved Oxygen (mg/L)	Water Temperature (ºC)
12/12/2023	11.8	3.4	12/12/2023	11.4	3.4	12/12/2023	11.1	5.0	12/12/2023	11.2	6.9	12/12/2023	11.5	4.2
12/13/2023	12.0	2.5	12/13/2023	11.8	2.8	12/13/2023	11.4	4.6	12/13/2023	11.4	6.5	12/13/2023	11.4	3.7
1/24/2024	11.9	4.7	1/24/2024	11.7	4.8	1/24/2024	11.7	5.5	1/24/2024	11.5	6.8	1/24/2024	11.6	5.3
3/6/2024	11.8	4.2	3/6/2024	11.8	4.2	3/6/2024	--	--	3/6/2024	11.2	7.3	3/6/2024	10.6	5.6
3/7/2024	10.7	5.3	3/7/2024	11.1	5.3	3/7/2024	11.2	6.1	3/7/2024	11.2	7.3	3/7/2024	11.1	6.1
4/16/2024	10.6	7.2	4/16/2024	10.7	7.2	4/16/2024	10.7	8.2	4/16/2024	10.4	9.3	4/16/2024	11.0	7.9
4/17/2024	10.2	8.8	4/17/2024	10.3	8.8	4/17/2024	10.5	9.4	4/17/2024	10.2	10.4	4/17/2024	10.5	9.45
6/11/2024	9.2	14.2	6/11/2024	9.3	14.3	6/11/2024	9.2	15.4	6/11/2024	8.9	16.8	6/11/2024	9.6	15.0
6/12/2024	8.9	15.0	6/12/2024	9.0	15.1	6/12/2024	9.1	16.0	6/12/2024	8.9	16.9	6/12/2024	9.5	15.7
8/26/2024	9.5	14.5	8/26/2024	9.3	14.4	8/26/2024	9.2	15.9	8/26/2024	9.5	17.8	8/26/2024	9.2	16.2
8/26/2024	9.1	17.7	8/26/2024	8.8	17.8	8/27/2024	8.8	16.4	8/27/2024	9.0	17.3	8/27/2024	8.6	16.5
9/24/2024	9.1	14.7	9/24/2024	9.3	14.7	9/24/2024	9.4	16.2	9/24/2024	9.4	18.8	9/24/2024	9.3	17.0

Site 6: WQ-NFKR-1.2 NFKR in Kernville			Site 7: WQ-CC-1.4 Corral Creek upstream of the Project diversion			Site 8: WQ-CC-0.4 Corral Creek upstream of NFKR confluence			Site 9: WQ-SC-0.55 Salmon Creek upstream of the Project diversion			Site 10: WQ-SC-0.05 Salmon Creek upstream of NFKR confluence		
Date	Dissolved Oxygen (mg/L)	Water Temperature (ºC)	Date	Dissolved Oxygen (mg/L)	Water Temperature (ºC)	Date	Dissolved Oxygen (mg/L)	Water Temperature (ºC)	Date	Dissolved Oxygen (mg/L)	Water Temperature (ºC)	Date	Dissolved Oxygen (mg/L)	Water Temperature (ºC)
12/12/2023	11.5	5.2	12/12/2023	10.2	7.7	12/12/2023	10.6	6.3	12/12/2023	11.5	2.2	12/12/2023	11.6	2.4
12/13/2023	11.5	4.6	12/13/2023	10.4	7.0	12/13/2023	10.9	5.9	12/13/2023	12.1	1.7	12/13/2023	12.1	2.0
1/24/2024	11.8	6.0	1/24/2024	10.7	7.9	1/24/2024	11.1	7.3	1/24/2024	12.2	3.1	1/24/2024	12.1	3.5
3/6/2024	11.5	7.0	3/6/2024	11.1	5.9	3/6/2024	10.9	7.0	3/6/2024	12.1	2.3	3/6/2024	12.4	2.4
3/7/2024	11.3	7.3	3/7/2024	10.7	6.5	3/7/2024	10.8	7.4	3/7/2024	11.3	4.0	3/7/2024	11.3	4.3
4/16/2024	10.9	9.0	4/16/2024	10.4	6.5	4/16/2024	10.3	8.9	4/16/2024	11.3	4.9	4/16/2024	11.3	4.9
4/17/2024	10.4	10.2	4/17/2024	10.6	7.3	4/17/2024	10.2	9.7	4/17/2024	11.0	5.9	4/17/2024	11.0	6.1
6/11/2024	9.1	16.7	6/11/2024	8.6	16.0	6/11/2024	8.5	17.9	6/11/2024	9.2	13.1	6/11/2024	9.3	13.9
6/12/2024	9.0	16.8	6/12/2024	8.5	16.1	6/12/2024	8.4	18.1	6/12/2024	9.1	13.6	6/12/2024	9.1	14.3
8/26/2024	9.4	17.7	8/26/2024	8.9	14.6	8/26/2024	9.1	14.6	8/26/2024	9.2	14.0	8/26/2024	9.2	14.7
8/27/2024	8.9	17.3	8/27/2024	8.7	14.2	8/27/2024	8.9	14.3	8/26/2024	8.6	16.8	8/26/2024	8.5	18.4
9/24/2024	9.4	18.6	9/24/2024	8.9	15.2	9/24/2024	8.9	15.4	9/24/2024	9.4	13.8	9/24/2024	9.2	14.6

ºC = degrees Celsius; -- = no data available; mg/L = milligram per liter; NFKR = North Fork Kern River; Project = Kern River No. 3 Hydroelectric Project

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WR-2 HYDROLOGY
TECHNICAL MEMORANDUM

KERN RIVER NO. 3 HYDROELECTRIC PROJECT
FERC PROJECT NO. 2290

PREPARED FOR:

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead®

KERNVILLE, CALIFORNIA

October 2024

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TABLE OF CONTENTS

Page

1.0 Introduction 1
2.0 Study Goals and Objectives 2
3.0 Study Area and Study Sites 2
4.0 Methods 4
4.1. Study Plan Variances 5
4.2. Hydrology 5
4.3. California Environmental Flows Framework 5
4.3.1. Step 1a: Location of Interest 6
4.3.2. Step 1b: Ecological Management Goals 6
4.3.3. Step 1c: Ecosystem Functions to Achieve Ecological Management Goals 6
4.3.4. Step 2: Obtain Natural Ranges of Functional Flow Metrics 6
4.3.5. Step 3: Evaluate whether the Natural Ranges of Functional Flow Metrics Support Ecosystem Functions Needed to Achieve Ecological Management Goals 7
4.3.6. Step 4: Select Ecological Flow Criteria 7
4.4. Flow Travel Time 7
4.5. Salmon and Corral Creeks Diversions 8
4.6. Theoretical Hydrology Excluding Extended Outages 9
4.7. Cannell Creek Siphon Spillway and Forebay Spillway 11
5.0 Data summary 12
5.1. Hydrology 12
5.1.1. Monthly Flow in North Fork Kern River 12
5.1.2. Annual Flow in North Fork Kern River 18

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5.1.3. Flow Duration Curves 22

5.2. California Environmental Flows Framework Results 22

5.2.1. Step 1a: Location of Interest 22

5.2.2. Step 1b: Ecological Management Goals 24

5.2.3. Step 1c: Ecosystem Functions to Achieve Ecological Management Goals 24

5.2.4. Step 2: Obtain Natural Ranges of Functional Flow Metrics 27

5.2.5. Step 3: Evaluate Whether the Natural Ranges of Functional Flow Metrics Supports Ecosystem Functions Needed to Achieve Ecological Management Goals 31

5.2.6. Step 4: Select Ecological Flow Criteria 31

5.3. Flow Travel Time 31

5.4. Salmon and Corral Creeks Diversions 36

5.5. Theoretical Hydrology Excluding Extended Outages 38

5.6. Cannell Creek Siphon Spillway and Forebay Spillway 46

6.0 Study-Specific Consultation 48

7.0 Outstanding Study Plan Elements 48

8.0 References 48

LIST OF TABLES

Table 3-1. Gages Within and Adjacent to Study Area 4

Table 4.5-1. Minimum Instream Flow for Salmon Creek and Corral Creek 8

Table 4.6-1. Extended Outages at Kern River No. 3 Powerhouse from 2005-2013 10

Table 4.6-2. Minimum Instream Flow in North Fork Kern River 11

Table 5.1-1. Monthly Flow in the Fairview Dam Bypass Reach, Water Years 1997–2023 (USGS Gage 11186000) 13

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Table 5.1-2. Monthly Flow in the Project Water Conveyance System, Water Years 1997–2023 (USGS Gage 11185500) 14

Table 5.1-3. Annual Flow for the Fairview Dam Bypass Reach, Water Years 1997–2023 19

Table 5.1-4. Annual Flow for the Project Water Conveyance System, Water Years 1997–2023 20

Table 5.2-1. Summary of North Fork Kern River Location of Interest for California Environmental Flows Framework Section A Analysis 22

Table 5.2-2. Ecological Management Goals for the North Fork Kern River California Environmental Flows Framework Section A Analysis 24

Table 5.2-3. Ecosystem Functions for the North Fork Kern River California Location of Interest 1, Environmental Flows Framework, Section A Analysis 25

Table 5.2-4. Functional Flow Metrics from the California Natural Flows Database for the North Fork Kern River Location of Interest 1, California Environmental Flows Framework, Section A Analysis[a] 28

Table 5.3-1. North Fork Kern River Estimated Travel Time between Fairview Dam and Kern River No. 3 Powerhouse 33

Table 5.4-1. Flow Diversions at Salmon and Corral Creeks 37

Table 5.5-1. Annual Number of Extended Outage Days, Water Years 2005–2023 38

Table 5.5-2. Monthly Number of Extended Outage Days, Water Years 2005–2023 39

Table 5.5-3. Monthly Number of Extended Outage Days, Dry Water Years, 2005–2023 40

Table 5.5-4. Monthly Number of Extended Outage Days, Moderate Water Years, 2005–2023 41

Table 5.5-5. Monthly Number of Extended Outage Days, Wet Water Years, 2005–2023 41

Table 5.5-6. Actual and Theoretical Monthly Mean Flows in North Fork Kern River, Dry Water Years, 2005–2023 42

Table 5.5-7. Actual and Theoretical Monthly Mean Flows in North Fork Kern River, Moderate Water Years, 2005–2023 43

Table 5.5-8. Actual and Theoretical Monthly Mean Flows in North Fork Kern River, Wet Water Years, 2005–2023 43

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Table 5.6-1. Cannell Creek Siphon Spillway Event Summary, January 2023 to June 2024 47

Table 5.6-2. Cannell Creek Siphon and Forebay Spillways Estimated Potential Spill Flow, February 2023 to June 2024 47

LIST OF FIGURES

Figure 3-1. Hydrology Study Area. 3

Figure 5.1-1. Monthly Flow in the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023. 15

Figure 5.1-2. Date of Maximum Flow in the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023. 16

Figure 5.1-3. Monthly Flow in the Project Water Conveyance System, Water Years 1997–2023. 17

Figure 5.1-4. Monthly Mean Flow in the North Fork Kern River Fairview Dam Bypass Reach and the Project Water Conveyance System, Water Years 1997–2023. 18

Figure 5.1-5. Annual Flow for the Fairview Dam Bypass Reach, Water Years 1997–2023. 21

Figure 5.1-6. Annual Flow for the Project Water Conveyance System, Water Years 1997–2023. 21

Figure 5.1-7. Daily Flow for the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023. 22

Figure 5.2-1. North Fork Kern River, California Environmental Flows Framework Location of Interest, Fairview Dam Bypass Reach. 23

Figure 5.3-1. North Fork Kern River Estimated Travel Time between Fairview Dam and Powerhouse, February 2023–August 2024 32

Figure 5.3-2. North Fork Kern River Estimated Travel Time between Fairview Dam and Kern River No. 3 Powerhouse. 34

Figure 5.3-3. Flow Travel Time Analysis, Interval 1 35

Figure 5.3-4. Flow Travel Time Analysis, Interval 2 36

Figure 5.3-5. Flow Travel Time Analysis, Interval 3 36

Figure 5.4-1. Salmon Creek Diversions to the Water Conveyance System, October 2023 through June 2024. 37

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Figure 5.4-2. Corral Creek Diversions to the Water Conveyance System, October 2023 through June 2024. 38

Figure 5.5-1. Water Year Type Tertile Classifications (for Dry, Moderate, and Wet Water Year Types), Water Years 1997–2023. 40

Figure 5.5-2. Measured Compared with Theoretical Mean Monthly Flows, Dry Water Years, 2005–2023. 44

Figure 5.5-3. Measured Compared with Theoretical Mean Monthly Flow, Moderate Water Years, 2005–2023. 45

Figure 5.5-4. Measured Compared with Theoretical Mean Monthly Flow, Wet Water Years, 2005–2023. 46

LIST OF APPENDICES

Appendix A Salmon and Corral Creek Routine Inspection and Annual Flow Reports

Appendix B Flow Duration Curves

LIST OF ACRONYMS AND ABBREVIATIONS

CEFF	California Environmental Flows Framework
cfs	cubic feet per second
CNFD	California Natural Flows Database
COMID	COMmon IDentifier
EMG	ecological management goal
FERC	Federal Energy Regulatory Commission
KR3	Kern River No. 3
LOI	location of interest
MIF	minimum instream flow
NFKR	North Fork Kern River
Project	Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)
RM	River Mile
SCE	Southern California Edison
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
WY	water year

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1.0 INTRODUCTION

Southern California Edison (SCE) filed the *WR-2 Hydrology Interim Technical Memorandum* as part of the Initial Study Report (SCE, 2023a) filed with the Federal Energy Regulatory Commission (FERC) on October 9, 2023, in support of its Kern River No. 3 (KR3) Hydroelectric Project, FERC Project No. 2290 (Project) relicensing. The October 2023 WR-2 Technical Memorandum included a summary of hydrologic flow data for the Fairview Dam Bypass Reach[1] and water conveyance system, the results of the California Environmental Flows Framework (CEFF) (CEFWG, 2021a) Section A assessment, and a summary of variances to the FERC-approved *WR-2 Hydrology Study Plan* (SCE, 2022).

In FERC's May 30, 2024, *Determination on Requests for Study Modifications and New Studies* (FERC, 2024), FERC specified that SCE must also describe flow travel times within the Fairview Dam Bypass Reach using additional methods and required the inclusion of existing flow information from Salmon and Corral Creeks and the diversions.

This updated WR-2 Technical Memorandum supersedes the October 2023 WR-2 Technical Memorandum and provides complete methods and findings of the WR-2 Study. Consistent with the 2023 WR-2 Technical Memorandum (SCE, 2023a), updated hydrologic flow data in the Fairview Dam Bypass Reach and water conveyance system are discussed in Section 5.1, *Hydrology*, and the results of the CEFF (CEFWG, 2021a) Section A assessment are presented in Section 5.2, *California Environmental Flows Framework Results*.

This updated WR-2 Technical Memorandum also includes new data associated with the four additional study components completed since the October 2023 WR-2 Technical Memorandum:

1. Data collected for flow travel time analysis within the Fairview Dam Bypass Reach (Section 5.3, *Flow Travel Time*);

2. Flow and diversion data from Salmon and Corral Creeks (Section 5.4, *Salmon and Corral Creeks Diversions*);

3. Additional compilation and analysis of the theoretical hydrology excluding extended outages pursuant to the FERC *Determination on Requests for Study Modifications and New Studies* (FERC, 2024) (Section 5.5, *Theoretical Hydrology Excluding Extended Outages*); and

4. Data collected from KR3 spillways (Section 5.6, *Cannell Creek Siphon Spillway and Forebay Spillway*).

[1] The Fairview Dam Bypass Reach is defined as the approximately 16-mile bypass reach of the North Fork Kern River between Fairview Dam and the KR3 Powerhouse tailrace.

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2.0 STUDY GOALS AND OBJECTIVES

The objectives of the study, as outlined in *WR-2 Hydrology Study Plan* (SCE, 2022) and as amended by FERC in its Study Plan Determination (FERC, 2022) and *Determination on Requests for Study Modifications and New Studies* (FERC, 2024), include the following:

- Compile and summarize hydrologic gage data for use in other resource assessments.
- Determine, compile, and summarize natural functional flow ranges in wet, moderate, and dry years using existing unimpaired data.
- Calculate flow travel times within the Fairview Dam Bypass Reach for a variety of flows, including minimum bypass reach flows (120 cubic feet per second [cfs]) up to the existing maximum whitewater flow-release target of 1,400 cfs.
- Use available data to describe the Salmon and Corral Creek Diversions.
- Examine the potential extent of effects of the KR3 Project on Fairview Dam Bypass Reach through theoretical hydrology excluding extended outages study.
- Use available data to describe spillway activity from February 2023 to June 2024.

3.0 STUDY AREA AND STUDY SITES

The study area includes Project-affected stream reaches along the North Fork Kern River (NFKR) and Salmon and Corral Creeks for the purposes of characterization and data collection relevant to understanding potential effects of Project operations and maintenance activities on stream hydrology (Figure 3-1).

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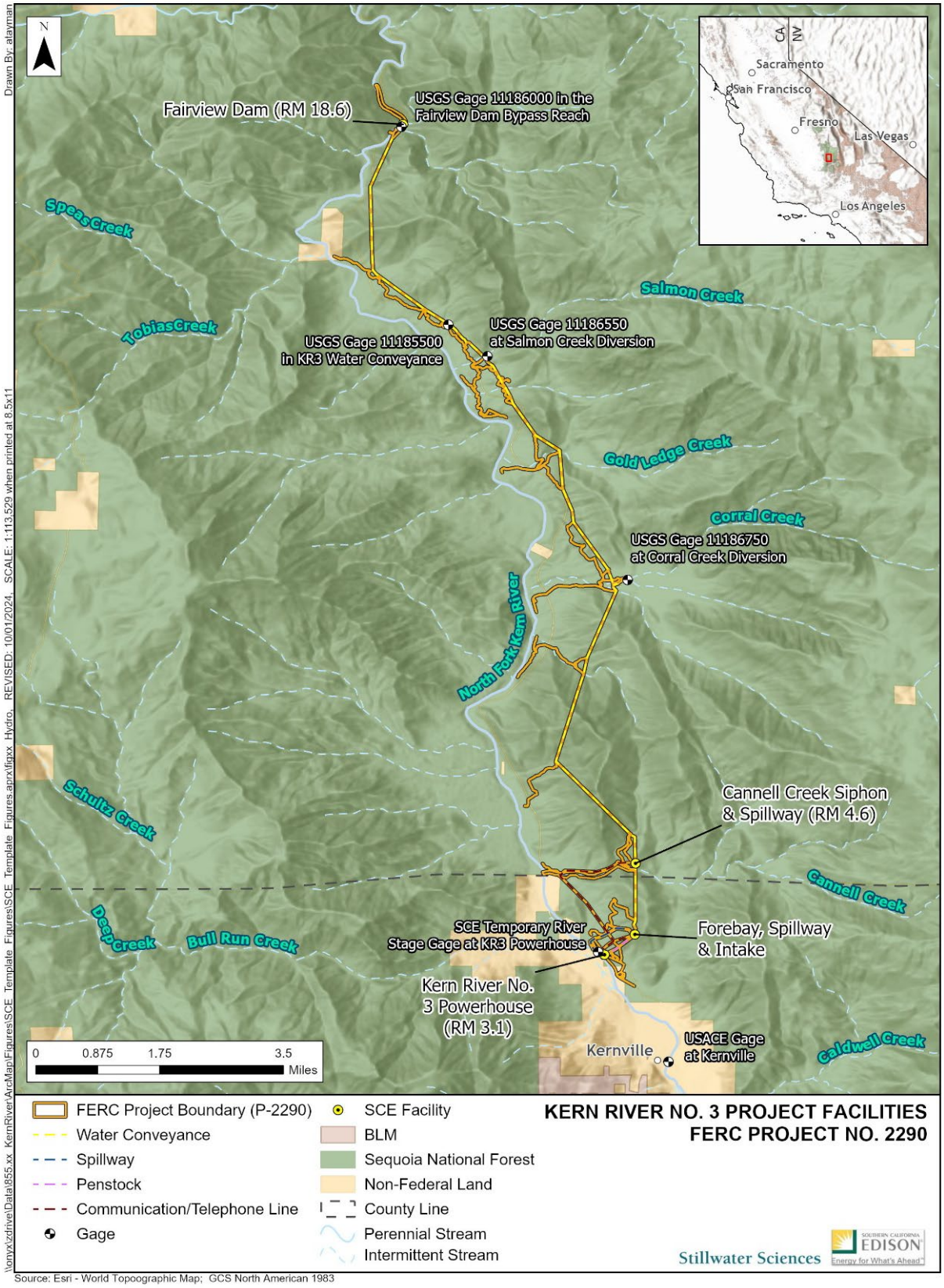


Figure 3-1. Hydrology Study Area.

Five streamflow gages are located within the study area (Table 3-1). SCE maintains two gaging stations that monitor and record water flow for Project compliance, two non-recording gaging stations, and one recently installed temporary river stage gage. The recording gages measure flow in the Fairview Dam Bypass Reach (U.S. Geological Survey [USGS] gage 11186000) and water conveyance system (USGS gage 11185500). The recorded gage data are published as mean daily flow annually on the USGS website (USGS, 2023a). The two non-recording gaging stations are associated with the small diversions in Corral Creek (USGS gage 11186750) and Salmon Creek (USGS gage 11186550). SCE inspects these gages monthly to observe and log flow conditions at a fixed geometry orifice flow-release point (SCE, 2021). The temporary river stage gage was installed in February 2023 immediately upstream of the KR3 Powerhouse tailrace to provide data for the flow travel time study (Section 5.3, *Flow Travel Time*).

Independent from the Project and as part of its water management system, the U.S. Army Corps of Engineers (USACE) has historically maintained one gage on the NFKR at Kernville, approximately 2 river miles downstream of the KR3 Powerhouse. USACE publishes daily flow gage data on its website (USACE, n.d.). Although the Kernville gage is not subject to USGS oversight, the Kernville USACE gage is operated to meet or exceed USGS data standards. USACE conducts monthly calibration inspections and compiles and reviews all streamflow data records prior to publication.

Table 3-1. Gages Within and Adjacent to Study Area

Name/ID	Location	Organization	Recorded Data
Gage 11186000	Fairview Dam Bypass Reach	USGS/SCE	Yes
Gage 11185500	Water conveyance system	USGS/SCE	Yes
Gage 11186550	Salmon Creek Diversion	USGS/SCE	No
Gage 11186750	Corral Creek Diversion	USGS/SCE	No
Temporary stage gage	Upstream of the KR3 Powerhouse tailrace	SCE	Yes
Kernville Gage	Kernville Bridge	USACE	Yes

KR3 = Kern River No. 3; SCE = Southern California Edison; USACE = U.S. Army Corps of Engineers; USGS = U. S. Geological Survey

4.0 METHODS

Study implementation followed the methods described in SCE's Revised Study Plan (SCE, 2022) and as amended by FERC in its Study Plan Determination (FERC, 2022) and *Determination on Requests for Study Modifications and New Studies* (FERC, 2024) with the variance described below.

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4.1. STUDY PLAN VARIANCES

The Revised Study Plan specified that the hydrology analyses would be based on water years (WY) 1997 through 2021. The study also incorporated WY 2022 and WY 2023 hydrology data into the analysis as the additional data became available.

4.2. HYDROLOGY

Flow data are available to assess watershed hydrology from the USGS gages at the Fairview Dam Bypass Reach, water conveyance system, and USACE gage in Kernville over the current license period (i.e., WY 1997, beginning October 1, 1996, through WY 2023, ending September 30, 2023).[2] Although flow data were recorded at USGS gages 11185500 and 11186000 from October 1, 1996, to September 30, 2004, technological data storage limitations in the early portion of the current license period resulted in only daily mean flow data being available for this period. Hourly gage data at both USGS recording gages were compiled for the remainder of the current license period (i.e., WY 2005, beginning October 1, 2004, through WY 2023, ending September 30, 2023). The datasets from USGS gages 11185500 and 11186000 were provided to Relicensing Participants via e-mail on June 30, 2023, with a link to the public website (SCE, 2023b) and comprised WYs 1997 through 2021. The data from WYs 2022 and 2023 were provided to Relicensing Participants on March 29, 2024, and June 14, 2024, respectively.

A preliminary quality assurance / quality control review of the recorded data was performed to identify anomalies (e.g., data gaps, outliers, or gage limitations).

For the purposes of this statistical analysis, hourly flow data were aggregated to daily data using an arithmetic mean calculation. To characterize the hydrology in the NFKR, the daily data were summarized monthly and annually using statistical parameters such as maximum, minimum, mean, and median flows, and are displayed graphically using hydrographs and box-and-whisker plots in this WR-2 Technical Memorandum. Annual and monthly flow duration curves were developed to display the flow characteristics of the NFKR without regard to the sequence of occurrence.

4.3. CALIFORNIA ENVIRONMENTAL FLOWS FRAMEWORK

The WR-2 Study Plan also includes the NFKR application of Section A of the CEFF, as detailed in the 2021 CEFF Technical Report (CEFWG, 2021a). CEFF is a framework that provides technical guidance to aid in the development of scientifically defensible environmental flow recommendations that balance human and ecosystem water needs. CEFF is a 12-step process divided into Sections A, B, and C. The outcome of Section A is a set of ecological flow criteria derived from natural functional flow metrics that characterize the natural variability in flow that supports essential ecosystem functions in the absence of human modification (CEFWG, 2021a). The four steps of CEFF Section A were applied to the NFKR, as described in the following sections.

[2] The USACE gage data are publicly available and are not summarized this WR-2 Technical Memorandum.

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4.3.1. STEP 1A: LOCATION OF INTEREST

The study area includes the section of NFKR between Fairview Diversion Dam and the KR3 Powerhouse. The locations of interest (LOI) were selected based on the location of infrastructure features within the study area.

4.3.2. STEP 1B: ECOLOGICAL MANAGEMENT GOALS

For each LOI, ecological management goals (EMG) associated with flow in the NFKR and applicable to the LOI were defined by conducting a literature review of federal, state, and local policies, programs, and plans.

4.3.3. STEP 1C: ECOSYSTEM FUNCTIONS TO ACHIEVE ECOLOGICAL MANAGEMENT GOALS

The potential ecosystem functions listed in Table 1.2 of the CEFF Technical Report (CEFWG, 2021a) associated with each of the five functional flow components were reviewed (see Section 5.2.2, *Step 1b: Ecological Management Goals,* below, for a list of functional flow components). Next, the corresponding ecosystem functions that must be supported by the ecological flow criteria to achieve the EMGs identified in Step 1b were identified.

4.3.4. STEP 2: OBTAIN NATURAL RANGES OF FUNCTIONAL FLOW METRICS

The CEFF analysis quantifies “natural flows” in streams using the natural functional flow metrics available from the California Natural Flows Database (CNFD) (CEFWG, 2021b), where natural flows are defined as the expected streamflow in the absence of human modification. The CNFD contains the natural functional flow metrics predicted for all stream reaches in California based on data from 1950 to approximately 2014. In the CNFD, predicted natural functional flow metrics were calculated using the functional flow metrics at USGS reference gages on California streams with minimal disturbance to natural hydrology and land cover (Falcone et al., 2010) using algorithms, which were described by Patterson et al. (2020) and based on the natural streamflow classification for California (Lane et al., 2018). Separate statistical models were then developed to predict the natural functional flow metrics at other stream reaches throughout California. Using machine-learning methods, functional flow metric values were related to watersheds and climactic characteristics following the approach described by Zimmerman et al. (2018). Natural functional flow metrics are used as ecological flow criteria in the CEFF based on the assumption that the range of natural functional flows would maintain the physical, chemical, and biological functions needed by native freshwater species (Escobar-Arias and Pasternack, 2010; Yarnell et al. 2015), and these functions would be broadly protective of ecosystem needs and achieve EMGs (Grantham et al., 2022).

CNFD flow metric predictions are provided by stream reaches defined in the National Hydrography Dataset Plus, Version 2, dataset (USGS, 2019); each stream reach is uniquely identified with a COMmon IDentifier (COMID). A single stream reach (COMID) within the LOI was selected as representative of conditions in the LOI. The natural

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functional flows in the LOI were characterized using predicted metrics downloaded from the CNFD for the selected COMID (CEFWG, 2021b).

4.3.5. STEP 3: EVALUATE WHETHER THE NATURAL RANGES OF FUNCTIONAL FLOW METRICS SUPPORT ECOSYSTEM FUNCTIONS NEEDED TO ACHIEVE ECOLOGICAL MANAGEMENT GOALS

Step 3 entailed the identification of potential non-flow limiting factors on the NFKR (i.e., physical channel, biogeochemical/water quality, and biological alterations) that would likely limit whether the natural ranges of the functional flow metrics would support the ecosystem functions and the EMGs identified in Step 1b. The non-flow limiting factors were assessed through an evaluation of high-resolution aerial photographs, Google Earth satellite imagery, and field-based visual inspection of the stream channel. Per the CEFF guidelines (CEFWG, 2021a), this identification of potential non-flow limiting factors is a high-level qualitative appraisal of conditions rather than a rigorous quantification of the physical, biogeochemical, and biological alterations to the streams.

4.3.6. STEP 4: SELECT ECOLOGICAL FLOW CRITERIA

Step 4 is predicated on the results from Step 3; if no non-flow limiting factors were identified for a functional flow component in Step 3, the CNFD-predicted natural functional flow metrics compiled in Step 2 were selected as ecological flow criteria for those functional flow components. If potential non-flow limiting factors were identified for a functional flow component, no ecological flow criteria were selected from the CNFD-predicted natural functional flow metrics and additional analyses were recommended to determine appropriate ecological flow criteria. CNFD-predicted natural functional flow metrics selected as ecological flow criteria values are expected to support the EMGs identified in Step 1b.

4.4. FLOW TRAVEL TIME

For the purposes of informing the instream flow travel time study, SCE installed a temporary river stage gage along the NFKR upstream of the KR3 Powerhouse tailrace in early February 2023. This temporary gage collected river stage data in 15-minute increments (measured in feet) from February 7, 2023, to August 5, 2024. Because river stage is a function of both channel geometry and flow, a direct comparison between stage heights at Fairview Dam and the KR3 Powerhouse may not be indicative of flows. Therefore, this study develops a flow travel time relationship between flow upstream and stage downstream. Flow travel time between Fairview Dam and the KR3 Powerhouse is estimated by comparing flow data at USGS gage 11186000 with the data from the recently installed temporary river stage data at the KR3 Powerhouse, approximately 16 miles downstream. Although the measurement units differ between the two gages (flow in cfs versus stage in feet), distinct flow inflection points in USGS gage 11186000 can be identified and compared with river stage flow inflection points downstream at the KR3 Powerhouse. The time interval between the flow fluctuation and the stage fluctuation approximates travel time at that flow rate.

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Though natural river flow variability may produce noise in the dataset, a distinction between flow fluctuations due to diversions and natural flow variability can be confirmed by comparing flow changes between the two USGS gages (gage 11186000 in the NFKR and gage 11185500 in the water conveyance system). Only diversions would produce commensurate flow changes in the two USGS gages (i.e., an increase at gage 11186000 would produce an identical decrease at gage 11185500). For the purposes of understanding flow travel times, SCE temporarily recorded KR3 penstock flow during the study period.

Comparisons of both flow fluctuations at the USGS gage 11186000 and the temporary river stage gage and flow fluctuations at the USGS gage 11185500 and the penstock flow are used to approximate instream flow travel time between Fairview Dam and the KR3 Powerhouse. Travel time calculations targeted a range of flows between 120 and 1,440 cfs over the 18 months of data available for analysis.

4.5. SALMON AND CORRAL CREEKS DIVERSIONS

For the purposes of informing the baseline conditions and evaluating the flow in Salmon and Corral Creeks, SCE recorded the diversion flow data at the historically non-recording USGS gages 11186550 and 11186750. Flow diversion data were collected at 15-minute increments from October 1, 2022, through July 9, 2024 (i.e., WY 2023) through a portion (77 percent) of WY 2024. Each USGS gage is located in the diversion pipeline to the water conveyance system, downstream of the minimum instream flow (MIF) release valve.

In accordance with the license requirement, the diversions are structured so that each creek's flow first passes through a fixed geometry orifice, where the required MIF is released into the creek and any surplus flow is diverted to the water conveyance system. To preserve natural flow functions within the channel downstream of the diversion, the MIF is specified seasonally as shown in Table 4.5-1. The fixed geometry orifices are sized for each MIF and physically switched seasonally. SCE conducts routine inspections at these diversions to document compliance.

Table 4.5-1. Minimum Instream Flow for Salmon Creek and Corral Creek

Minimum Instream Flows[a]		
Date	**Salmon Creek (cfs)**	**Corral Creek (cfs)**
February 1 through June 30	4	1
July 1 through January 30	1	0.5

cfs = cubic feet per second
Note:
[a] Forest Service 4(e) Condition No. 4

Flow data collected at the diversion structure gages can be used directly to quantify flow diverted to the water conveyance system and indirectly to understand flow in Salmon and

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Corral Creeks. When flows at the diversion structure gages are greater than zero, the creeks' MIF requirements have necessarily been met, thereby allowing flow to be diverted to the water conveyance system. Flow data from the diversion structure gages represent the quantity (in cfs) of that diversion. Although the diverted flow to the water conveyance system is quantified directly, the creek flow is only known to be MIF when the diversion flow is above zero (i.e., when the MIF requirement is met). For example, when diverted flow is zero, creek flow would be at an unspecified level less than MIF (i.e., natural flow into the diversion structure is less than MIF requirements) and when diverted flow is greater than zero, creek flow must equal MIF or greater (i.e., the inflow exceeds the MIF and the diversion structure is spilling).

The diversion data are summarized by frequency of diversion and annual mean diverted flow, where the mean diverted flow calculation includes only the data when diversions occur (i.e., diversions are non-zero). Supplementing the recorded data, routine weekly reports provide measured stage data downstream of the diversion and visual inspections confirm that the diversions are functioning as expected; however, the routine visual inspections do not provide consistent instream flow measurements. The routine inspection data and annual diversion flow reports are submitted to the California State Water Resources Control Board. Appendix A provides all available routine inspection reports from WYs 2005 through 2022, the annual flow reports submitted to the California State Water Resources Control Board from WYs 2009 to 2022, and the recently recorded flow data from WY 2023 and WY 2024.

4.6. THEORETICAL HYDROLOGY EXCLUDING EXTENDED OUTAGES

For the purpose of understanding the potential extent of operational effects of the Project on flows in NFKR, a theoretical hydrology dataset was developed to represent a scenario in which the Project operated without extended outages during the study period of WYs 2005 to 2023. During the study period, the records of Project operations were examined to identify periods of extended outages, defined as facility upgrades and planned maintenance periods when one or both units were offline (Table 4.6-1). Those extended outages resulted in less-than-authorized flows diverted to the water conveyance system and concurrently greater-than-MIFs flows remaining in NFKR.

Based on the hourly hydrology data (provided to Relicensing Participants and described in Section 4.1, *Study Plan Variances*, above), the theoretical hydrology dataset was created by reassigning flows in both the water conveyance system and the bypass reach during extended outages so that the water conveyance system flow is increased to the maximum authorized flows and the river flow is decreased commensurately. The maximum authorized flows to the water conveyance system are calculated by assuming that after the monthly MIF in NFKR (Table 4.6-2) are met (per License Article 406), remaining flow is diverted into the water conveyance system up to capacity at 600 cfs. The methodology used to develop the theoretical hydrology dataset assumes that the

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monthly MIF conditions are met without the inclusion of the hatchery flow requirements.[3] In dry water years, this may result in higher theoretical flows, up to MIF levels. Additionally, seasonal whitewater boating flows (License Article 422) were not incorporated as part of the theoretical hydrology dataset. The original measured gage data were used during typical plant operations including unplanned immediate maintenance, forced outages (i.e., unit unexpectedly trips offline), or unit closures due to low flow.

The analysis compares the mean monthly statistics of the theoretical hydrology dataset with actual measured river hydrology to understand the Project effects without extended outages. To examine monthly variations within relatively wet, moderate, and dry years, the mean annual flow upstream of Fairview Dam in the hydrology dataset from Section 4.1, *Study Plan Variances* (WYs 1997 to 2023), was classified into tertiles (for dry, moderate and wet water year types[4]), and the theoretical dataset was tabulated within those classifications.

Table 4.6-1. Extended Outages at Kern River No. 3 Powerhouse from 2005-2013

Start Date	End Date	Duration (weeks)
March 5, 2005	March 10, 2005	0.7
May 16, 2005	May 24, 2005	1.2
October 14, 2005	November 28, 2005	6.4
September 1, 2006	April 12, 2007	31.9
8/24/2007 7:00	February 13, 2009	77.0
July 26, 2009	May 19, 2011	94.6
August 18, 2012	December 26, 2012	18.6
August 19, 2013	December 24, 2014	70.3
September 4, 2016	October 13, 2016	5.6
August 15, 2022	November 18, 2022	13.6

[3]SCE provides 35 cfs year-round to the California Department of Fish and Wildlife's (CDFW's) Kern River Planting Base Hatchery via the Project water conveyance system and the KR3 Powerhouse tailrace. If the natural flow is not available to meet both the hatchery needs and the MIFs, the hatchery flows take precedence over the instream flow releases at Fairview Dam (License Article 406 and Forest Service 4(e) Condition 4; 77 FERC ¶ 62,313).

[4] There is no existing criterion for determining water year types for the North Fork Kern River, or Kern River Watershed; the state also has no criterion for the Kern and Tule River basins for classifying wet/normal/dry years (A. Burdock, California Department of Water Resources, personal communication, April 24, 2024).

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Table 4.6-2. Minimum Instream Flow in North Fork Kern River

Month	NFKR (cfs)
October	80
November	40
December	40
January	40
February	40
March	70
April	100
May	100
June	100
July	130
August	130
September	100

4.7. CANNELL CREEK SIPHON SPILLWAY AND FOREBAY SPILLWAY

For the purpose of understanding the flow that spills from the water conveyance system into the Fairview Dam Bypass Reach, spill events were documented at the Cannell Creek Siphon Spillway and Forebay Spillway between January 2023 and June 2024. The Cannell Creek Siphon Spillway comprises a 45-foot-long concrete spillway and approximately 470-foot-long rock spillway channel down to Cannell Creek. The confluence of Cannell Creek and the NFKR is approximately 1 mile downstream from the spillway. The Forebay Spillway, located at the intake to the penstocks, is designed to release flow through an energy-dissipating concrete structure that reduces the velocity of the flow before spilling down the bedrock-lined spillway channel. If the water surface elevation in the forebay exceeds the spillway crest (3,505.65 amsl), water is directed into the approximately 2,700-foot-long, bedrock-lined spillway channel. The spillway channel runs west, adjacent to the two penstocks along the hill slope until it rejoins with the NFKR approximately 700 feet upstream from the KR3 Powerhouse. The Cannell Creek Siphon Spillway is designed to accommodate the initial surplus flow following a penstock shutoff, and the Forebay Spillway is designed for the remaining overflow.

The data collected on spill events identified the spill date, start/end times, and the reason for the spill; flow data were not collected within the spill channels. Because the water conveyance system is a gravity system, it is assumed that the event durations and magnitudes were similar for both the spillways. Though flow measurements were not recorded at either spillway, it is possible to estimate the maximum potential discharge of the spills using the conveyance flow and the penstock flow collected for the flow travel

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time study. This estimation was limited by the availability of penstock flow data, which began in February 2023 (to support data collection as part of the travel time study). To estimate the maximum potential spill flow during each spill duration, flow data was examined during each spill event. The highest flow measured in the water conveyance system at USGS gage 11185500 and the lowest penstock discharge measurement were used in the equation below to produce a rough estimate of the maximum potential spill flow during each spill event.

Estimated maximum potential spill flow during each spill event:

$$\frac{(\text{highest flow at spill event}_{\text{USGS gage 11185500}}) - (\text{lowest conveyance discharge}_{\text{penstock}})}{\text{number of spillways}}$$

5.0 DATA SUMMARY

5.1. HYDROLOGY

The available gage datasets for both USGS gages 11185500 and 11186000 were determined as complete with no data gaps. Within the current license period through September 30, 2023, 1,307 zero-flow days in the water conveyance system were recorded by USGS gage 11185500. The zero-flow days resulted from outages for maintenance and repairs to the water conveyance system, which led to extended periods where full flows were released at Fairview Dam into the Fairview Dam Bypass Reach in WYs 2007, 2008, 2010, 2011, and 2014.

5.1.1. MONTHLY FLOW IN NORTH FORK KERN RIVER

The NFKR hydrograph (seasonal streamflow pattern) for the Fairview Dam Bypass Reach and the water conveyance system depicts that the wetter period occurs primarily during spring (April through June) when streamflow typically peaks as snow that accumulated during winter melts. NFKR streamflows begin to decrease in July, and then the NFKR usually enters a drier period for the remainder of the summer through the end of fall in December. Monthly mean, minimum, and maximum daily flows for the Fairview Dam Bypass Reach and water conveyance system are presented in Table 5.1-1 and Table 5.1-2, respectively. Figure 5.1-1 is a box-and-whisker plot summarizing the distribution and variability of the monthly data for the Fairview Dam Bypass Reach. The lower and upper whiskers are annual minimum and maximum flows, respectively, and shaded boxes represent the middle 50 percent of the data (between lower quartile and upper quartile) with the annual median at the center bar in the shaded box. Although flows on the Fairview Dam Bypass Reach are typically relatively low during winter, winter storms can cause temporary and infrequent very high peaks. Flows are most consistently high during spring (May through June), and the maximum annual flow most often occurs during the spring runoff (see Figure 5.1-2). Figure 5.1-3 is a box-and-whisker plot that shows the variability in water conveyance system flows, where higher flows are diverted during spring (May through June). Figure 5.1-4 presents the comparison between the monthly mean flow for both the Fairview Dam Bypass Reach and water conveyance system for the current license period.

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Table 5.1-1. Monthly Flow in the Fairview Dam Bypass Reach, Water Years 1997–2023 (USGS Gage 11186000)

Month	Monthly Mean Daily Flow (cfs)	Monthly Minimum Daily Flow (cfs)	Monthly Maximum Daily Flow (cfs)
October	132	28	1,752
November	131	40	6,030
December	136	40	6,245
January	287	41	25,100[a]
February	211	42	5,997
March	472	72	15,641
April	784	102	7,123
May	1,616	101	8,317
June	1,593	88	8,162
July	752	71	6,896
August	231	29	6,234
September	131	26	635

Source: SCE, 2023c; USGS, 2023a

cfs = cubic feet per second
Notes:
[a] Maximum daily flow recorded on January 3, 1997.

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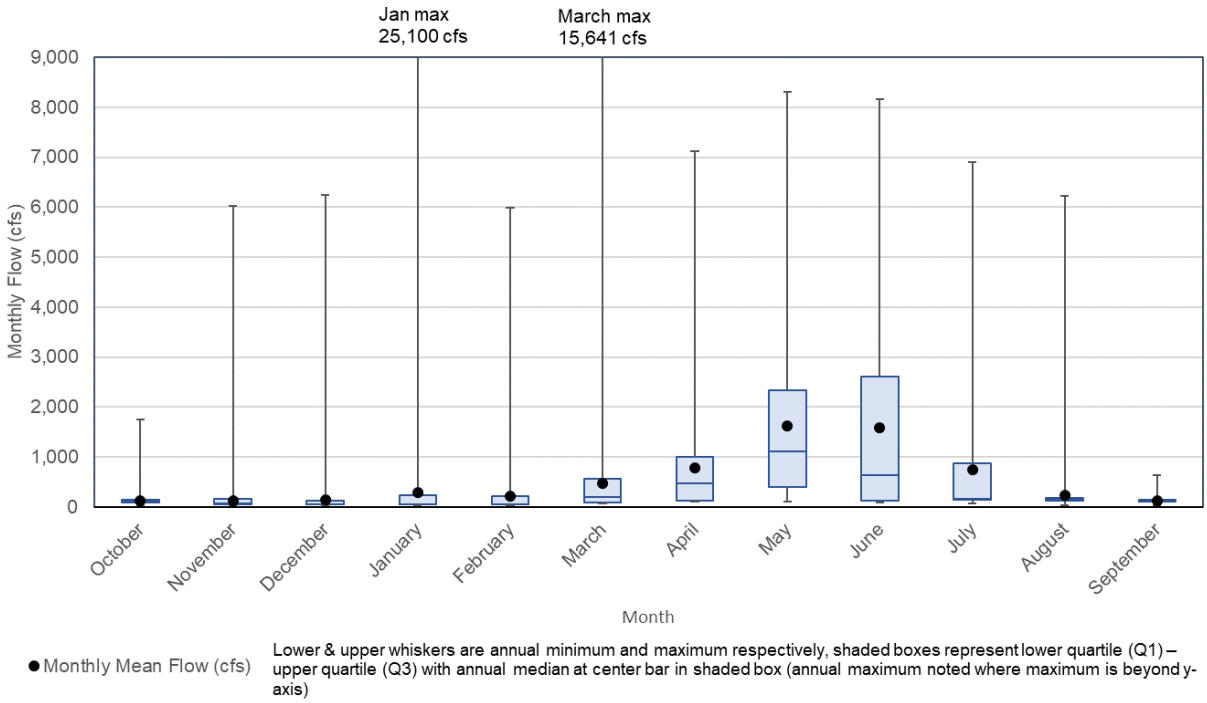
Table 5.1-2. Monthly Flow in the Project Water Conveyance System, Water Years 1997–2023 (USGS Gage 11185500)

Month	Monthly Mean Daily Flow (cfs)	Monthly Minimum Daily Flow (cfs)	Monthly Maximum Daily Flow (cfs)
October	78	00	525
November	117	00	574
December	157	00	591
January	198	00	594
February	264	00	589
March	291	00	593
April	425	00	591
May	447	00	590
June	399	00	588
July	285	00	588
August	179	00	584
September	110	00	586

Source: SCE, 2023c; USGS, 2023b

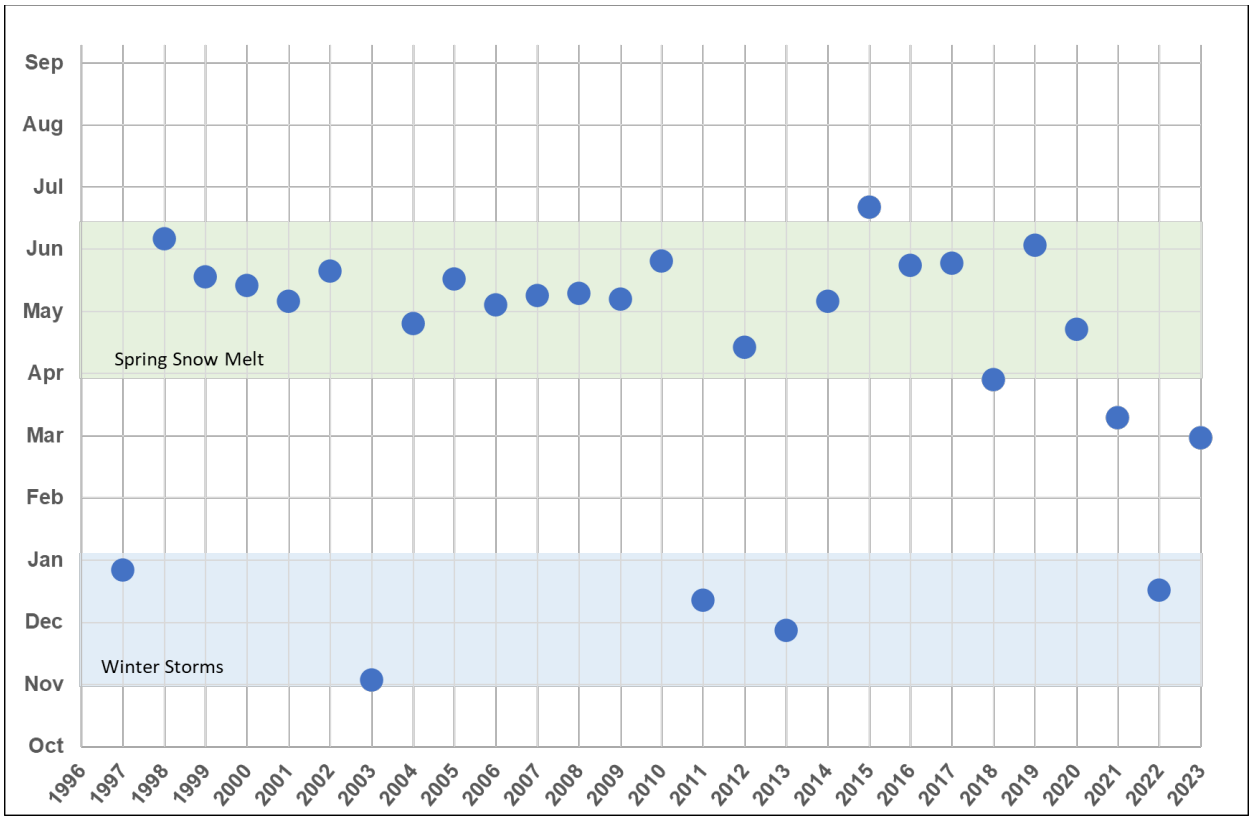
cfs = cubic feet per second

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Source: SCE, 2023c; USGS, 2023a

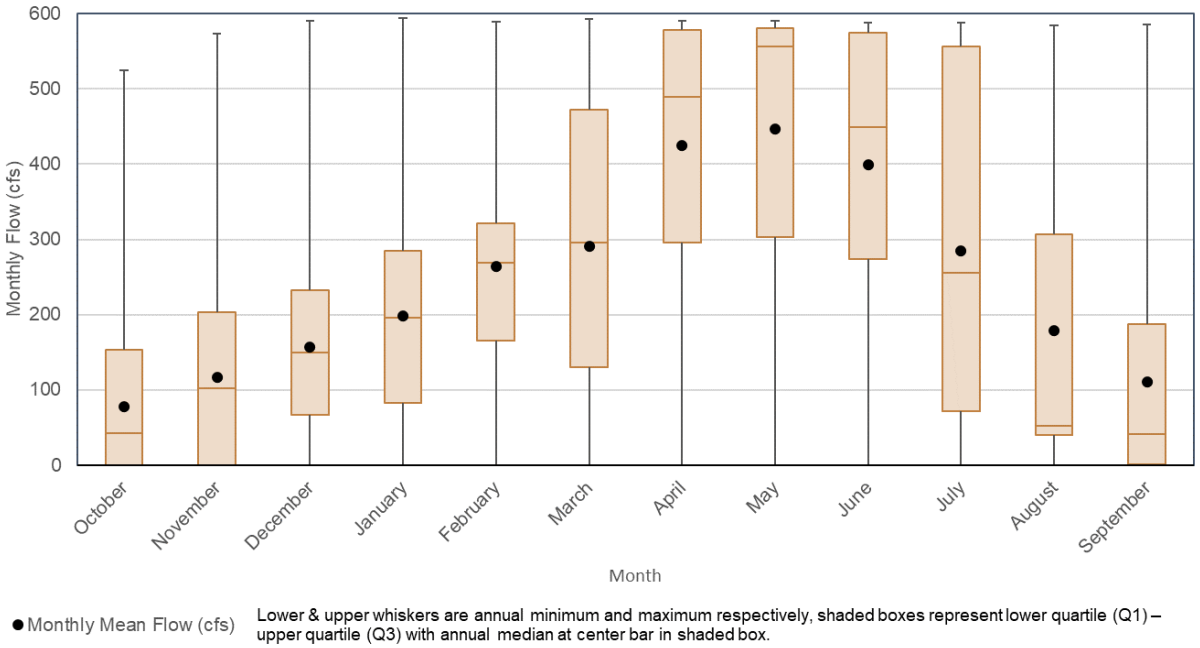
Figure 5.1-1. Monthly Flow in the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023.



Source: SCE, 2023c; USGS, 2023a

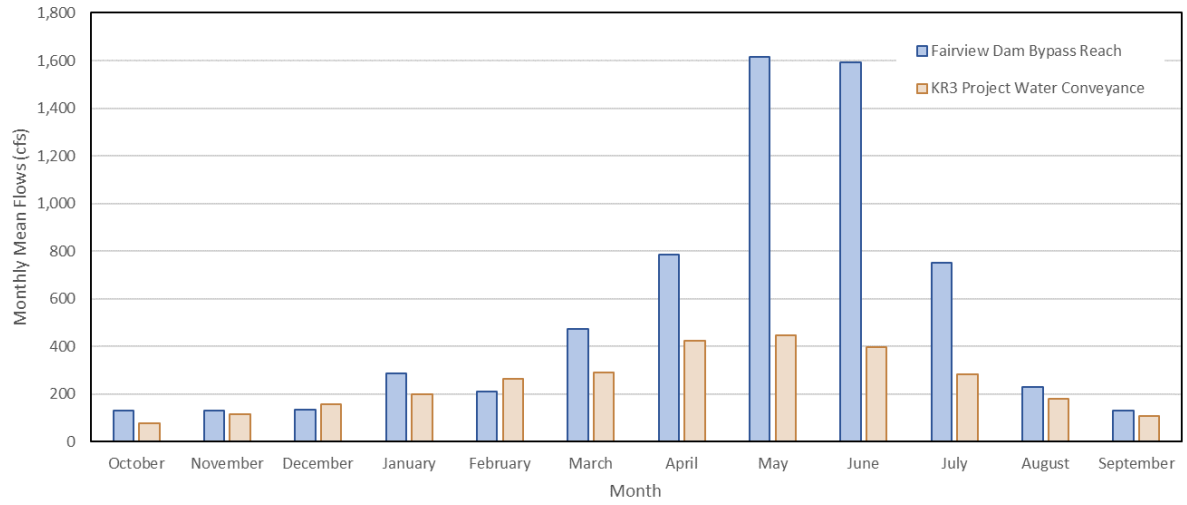
Figure 5.1-2. Date of Maximum Flow in the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023.

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Source: SCE, 2023c; USGS, 2023b

Figure 5.1-3. Monthly Flow in the Project Water Conveyance System, Water Years 1997–2023.



Source: SCE, 2023c; USGS, 2023a,b

Figure 5.1-4. Monthly Mean Flow in the North Fork Kern River Fairview Dam Bypass Reach and the Project Water Conveyance System, Water Years 1997–2023.

5.1.2. Annual Flow in North Fork Kern River

Annual mean, minimum, and maximum daily flows for the Fairview Dam Bypass Reach and water conveyance system are presented in Tables 5.1-3 and 5.1-4, respectively. Figures 5.1-5 and 5.1-6 are box-and-whisker plots summarizing the distribution of the annual data for the Fairview Dam Bypass Reach and water conveyance system, respectively. The lower and upper whiskers in these figures show annual minimum and maximum, respectively, and shaded boxes represent lower quartile through upper quartile, with the annual median at the center bar in the shaded box. Figure 5.1-7 shows the hydrograph of daily flows over the current license period (1997 to 2023). The maximum mean daily flow of 25,100 cfs occurred on January 3, 1997, and the second highest maximum mean daily flow of 15,641 cfs was recorded on March 10, 2023. WY 2023 was the wettest year on record, with a mean annual flow of 2,116 cfs.

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Table 5.1-3. Annual Flow for the Fairview Dam Bypass Reach, Water Years 1997–2023

Water Year	Mean Annual Flow (cfs)	Minimum Mean Daily Flow (cfs)	Maximum Mean Daily Flow (cfs)
1997	930	45	25,100
1998	1,105	47	7,120
1999	188	42	1,300
2000	294	45	2,490
2001	210	43	1,960
2002	179	41	1,230
2003	377	41	6,030
2004	385	44	2,000
2005	945	49	6,041
2006	863	51	5,063
2007	185	47	701
2008	498	108	3,418
2009	305	51	2,403
2010	784	46	6,354
2011	1,236	110	6,245
2012	168	47	1,248
2013	134	49	499
2014	239	89	903
2015	91	26	277
2016	210	27	1,560
2017	1,607	44	6,352
2018	202	44	4,552
2019	1,002	41	5,909
2020	152	46	1,163
2021	96	39	298
2022	108	42	901
2023	2,116	46	15,641

Source: SCE; 2023b; USGS, 2023a

cfs = cubic feet per second

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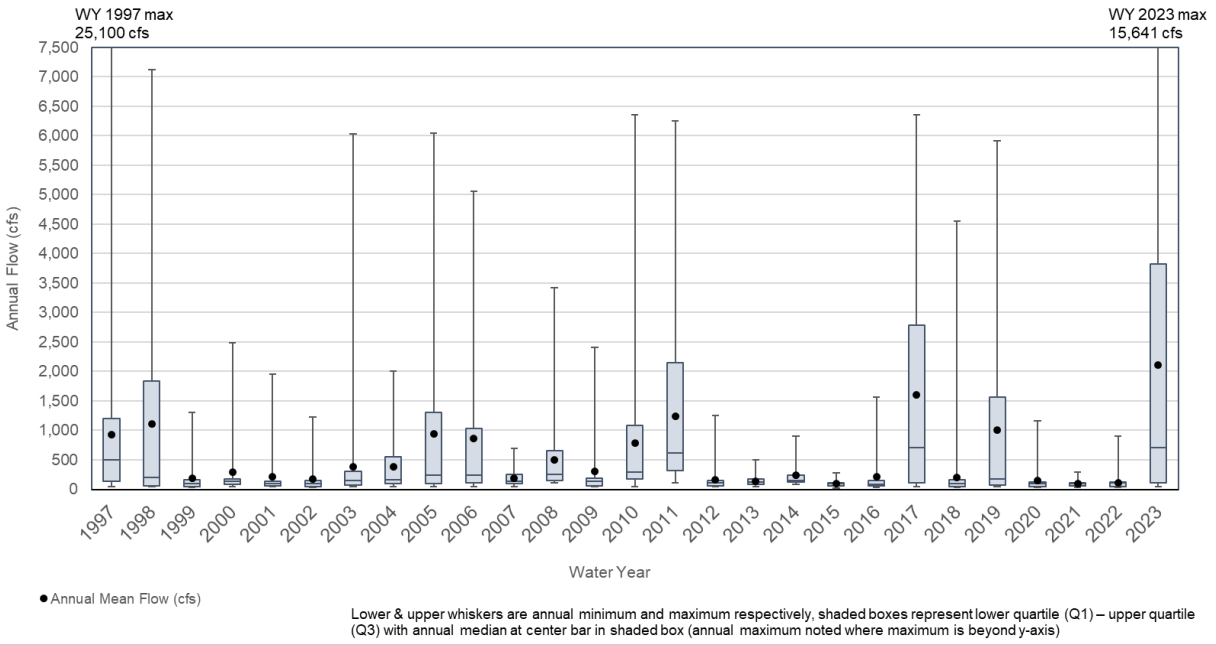
Table 5.1-4. Annual Flow for the Project Water Conveyance System, Water Years 1997–2023

Water Year	Mean Annual Flow (cfs)	Minimum Mean Daily Flow (cfs)	Maximum Mean Daily Flow (cfs)
1997	457	3	594
1998	464	3	591
1999	314	0	587
2000	251	0	589
2001	228	35	590
2002	256	1	588
2003	270	2	590
2004	125	0	553
2005	259	2	590
2006	359	2	593
2007	150	0	585
2008	115	0	313
2009	265	0	590
2010	183	0	324
2011	270	0	587
2012	283	0	591
2013	153	0	584
2014	0	0	0
2015	75	0	280
2016	246	0	587
2017	379	0	586
2018	282	20	580
2019	380	0	583
2020	265	42	582
2021	113	0	570
2022	166	0	561
2023	320	0	583

Source: SCE, 2023c; USGS, 2023b

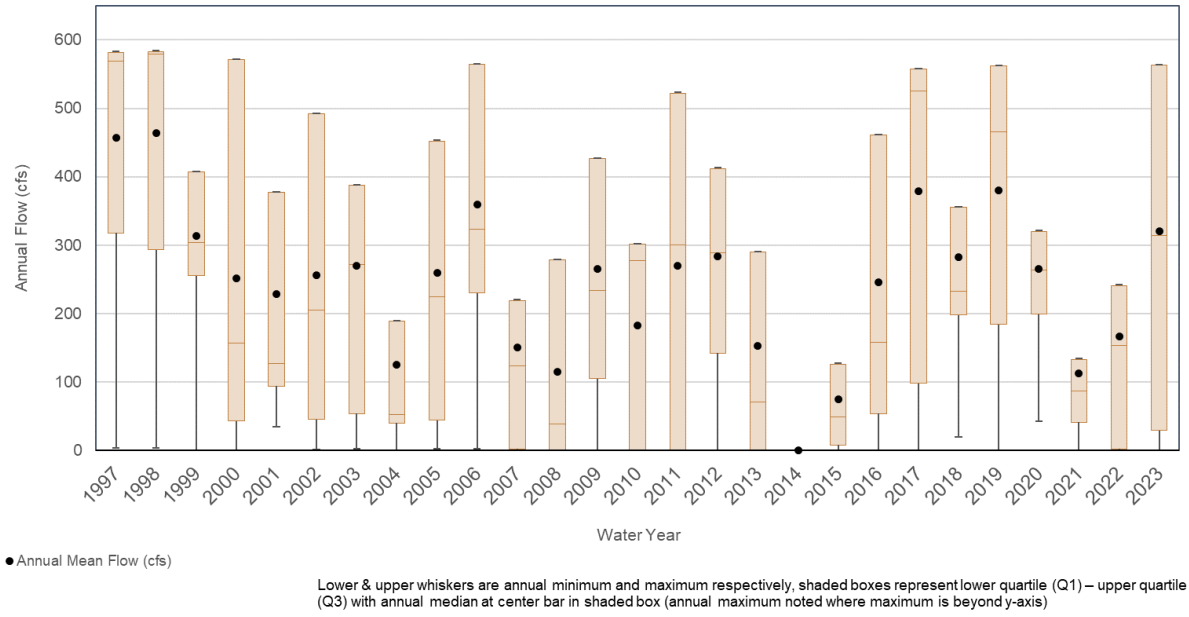
cfs = cubic feet per second

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Source: SCE, 2023c; USGS, 2023a

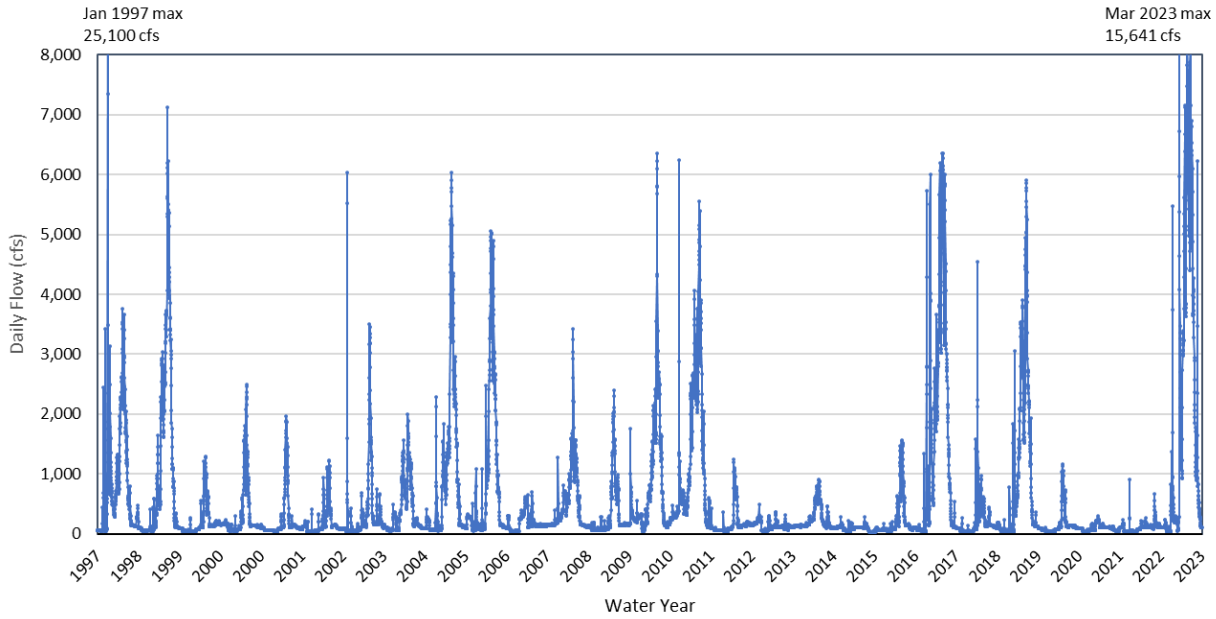
Figure 5.1-5. Annual Flow for the Fairview Dam Bypass Reach, Water Years 1997–2023.



Source: SCE, 2023c; USGS, 2023b

Figure 5.1-6. Annual Flow for the Project Water Conveyance System, Water Years 1997–2023.

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Source: SCE, 2023c; USGS, 2023a

Figure 5.1-7. Daily Flow for the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023.

5.1.3. Flow Duration Curves

Monthly flow duration curves for the Fairview Dam Bypass Reach (USGS gage 11186000) are given in Appendix B, Figures B-1 through B-12. Annual flow duration curves for the Fairview Dam Bypass Reach (USGS gage 11186000) and water conveyance system (USGS gage 11185500) are given in Appendix B, Figures B-13 and B-14.

5.2. California Environmental Flows Framework Results

5.2.1. Step 1a: Location of Interest

Given the intent of the analysis to inform discussions related to instream flow releases downstream of Fairview Dam, a single LOI (NFKR LOI 1) spanning the Fairview Dam Bypass Reach, from immediately downstream of Fairview Dam (River Mile [RM] 18.6) to the KR3 Powerhouse (RM 3.1), was selected for CEFF Section A evaluation (Table 5.2-1 and Figure 5.2-1).

Table 5.2-1. Summary of North Fork Kern River Location of Interest for California Environmental Flows Framework Section A Analysis

Location of Interest	From	To	Description
NFKR LOI 1	RM 3.1	RM 18.6	NFKR immediately downstream of Fairview Dam

LOI = location of interest; NFKR = North Fork Kern River; RM = River Mile

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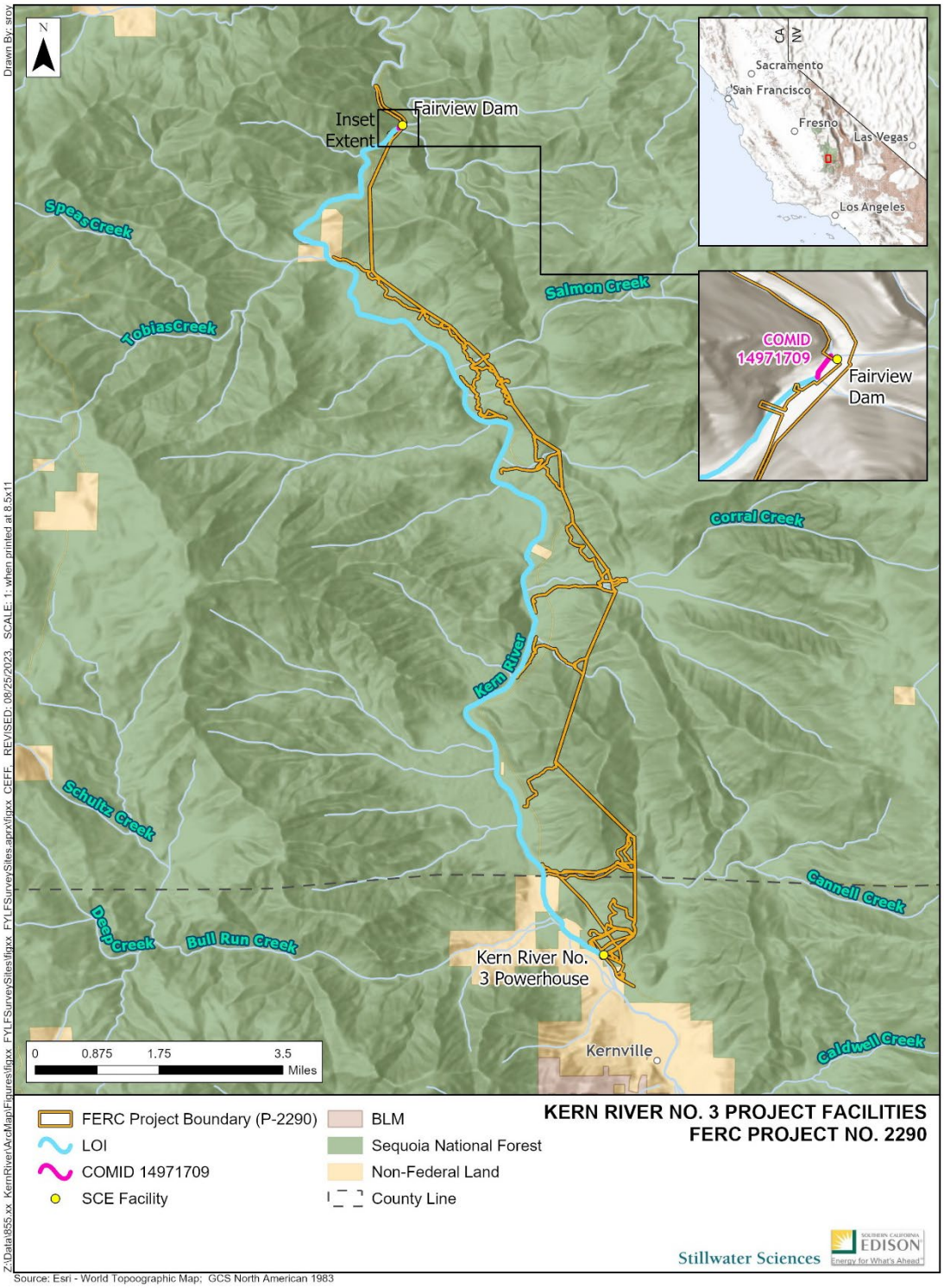


Figure 5.2-1. North Fork Kern River, California Environmental Flows Framework Location of Interest, Fairview Dam Bypass Reach.

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5.2.2. STEP 1B: ECOLOGICAL MANAGEMENT GOALS

Six EMGs were identified for the LOI from a literature review of federal, state, and local policies, programs, and plans. The six EMGs range from very broad to species-specific. Table 5.2-2 summarizes these six EMGs, sorted chronologically by planning source.

Table 5.2-2. Ecological Management Goals for the North Fork Kern River California Environmental Flows Framework Section A Analysis

EMG #	Ecological Management Goal	Planning Document Source
EMG 1	Restore the structure and composition of riparian areas	*Land Management Plan for the Sequoia National Forest* (Forest Service, 2023)
EMG 2	Abundance and Richness: Maintain and increase ecosystem and native species distributions in California, while sustaining and enhancing species abundance and richness	*California State Wildlife Action Plan* (CDFW, 2015)[a]
EMG 3	Enhance Ecosystem Conditions: Maintain and improve ecological conditions vital for sustaining ecosystems in California	
EMG 4	Enhance Ecosystem Functions and Processes: Maintain and improve ecosystem functions and processes vital for sustaining ecosystems in California	
EMG 5	Protect and restore cold-water ecosystems	*Strategic Plan for Trout Management: A Plan for 2004 and Beyond* (CDFW, 2003)[a]
EMG 6	Protect and enhance native fish populations and their habitats	*Upper Kern Basin Fishery Management Plan* (CDFG, 1995)

CDFW = California Department of Fish and Wildlife; EMG = ecological management goal
Notes:
[a] State-wide plan

5.2.3. STEP 1C: ECOSYSTEM FUNCTIONS TO ACHIEVE ECOLOGICAL MANAGEMENT GOALS

Ecosystem functions identified as essential for achieving the six EMGs in NFKR LOI 1 are summarized in Table 5.2-3. Ecosystem functions not identified as essential for NFKR EMGs may still be important for the overall NFKR ecosystem health but were less critical to achieving the NFKR EMGs.

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Table 5.2-3. Ecosystem Functions for the North Fork Kern River California Location of Interest 1, Environmental Flows Framework, Section A Analysis

Functional Flow Component	Ecosystem Function	EMG 1	EMG 2	EMG 3	EMG 4	EMG 5	EMG 6
Fall pulse flow	Flush fine sediment and organic material from substrate		●	●	●	●	●
	Increase longitudinal connectivity						
	Increase riparian soil moisture	●	●	●	●	●	●
	Flush organic material downstream and increase nutrient cycling	●	●	●	●	●	●
	Modify salinity conditions in the estuary/tidally influenced river						
	Reactivate exchanges/connectivity with hyporheic zone	●	●	●	●	●	●
	Decrease water temperature and increase dissolved oxygen	●	●	●	●	●	●
	Support fish migration to spawning areas						
Wet-season baseflow	Increase longitudinal connectivity	●	●	●	●	●	●
	Increase shallow groundwater (riparian)	●	●	●	●	●	
	Support hyporheic exchange	●	●	●	●	●	●
	Support migration, spawning, and residency of aquatic organisms		●	●	●	●	●
	Support channel margin riparian habitat	●	●	●	●	●	●
Wet-season peak flow	Scour and deposit sediments and large wood in channel and floodplains and overbank areas	●	●	●	●	●	●
	Encompasses maintenance and rejuvenation of physical habitat	●	●	●	●	●	●
	Increase lateral connectivity, recharge groundwater (floodplains)	●	●	●	●	●	●
	Increase nutrient cycling on floodplains	●	●	●	●	●	●
	Increase exchange of nutrients and organic matter between floodplains and channel	●	●	●	●	●	●
	Support fish spawning and rearing in floodplains and overbank areas		●	●	●	●	●

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Functional Flow Component	Ecosystem Function	EMG 1	EMG 2	EMG 3	EMG 4	EMG 5	EMG 6
	Support plant biodiversity via disturbance, riparian succession, and extended inundation in floodplains and overbank areas	●	●	●	●	●	●
	Limit vegetation encroachment and non-native aquatic species via disturbance	●	●	●	●	●	●
Spring recession flow	Sorting of sediments via increased sediment transport and size selective deposition	●	●	●	●	●	●
	Recharge groundwater (floodplains)	●	●	●	●	●	●
	Increase lateral and longitudinal connectivity	●	●	●	●	●	●
	Decrease water temperatures and increase turbidity		●	●	●	●	●
	Increase export of nutrients and primary producers from floodplain to channel	●	●	●	●	●	●
	Provide hydrologic cues for fish outmigration and amphibian spawning; support juvenile fish rearing		●	●	●	●	●
	Increase hydraulic habitat diversity and habitat availability resulting in increased algal productivity, macroinvertebrate diversity, arthropod diversity, fish diversity, and general biodiversity	●	●	●	●	●	●
	Provide hydrologic conditions for riparian species recruitment	●	●	●	●	●	●
	Limit riparian vegetation encroachment into channel	●	●	●	●	●	●
Dry-season baseflow	Maintain riparian soil moisture	●	●	●	●	●	
	Limit longitudinal connectivity in ephemeral streams; limit lateral connectivity to disconnect floodplains	●	●	●	●	●	●
	Maintain longitudinal connectivity in perennial streams	●	●	●	●	●	●
	Maintain water temperature and dissolved oxygen	●	●	●	●	●	●
	Maintain habitat availability for native aquatic species (broadly)	●	●	●	●	●	●
	Condense aquatic habitat to limit non-native species and support for native predators	●	●	●	●	●	●
	Support primary and secondary producers	●	●	●	●	●	●

EMG = ecological management goal (see Table 5.2-2)

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5.2.4. STEP 2: OBTAIN NATURAL RANGES OF FUNCTIONAL FLOW METRICS

The National Hydrography Dataset Plus COMID 14971709 was selected as representative of NFKR LOI 1 because it is the upstream-most stream section within the LOI (Table 5.2-1 and Figure 5.2-1) and corresponds with the location of USGS gage 11186000, immediately downstream of Fairview Dam (Figure 3-1). In the CEFF context, the range (10th percentile, median, and 90th percentile) of natural functional flows for each metric at COMID 14971709 characterize the predicted (modeled) flow metrics for the study LOI. The natural functional flow metrics for predicted natural flows, observed flows at Fairview Dam and in the Fairview Dam Bypass Reach are compiled in Table 5.2-4.

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Table 5.2-4. Functional Flow Metrics from the California Natural Flows Database for the North Fork Kern River Location of Interest 1, California Environmental Flows Framework, Section A Analysis[a]

Functional Flow Component	Flow Metric	Unit	Predicted Natural Range at NFKR LOI 1			Observed Range at Fairview Dam Inflow			Observed Range at NFKR		
			COMID 14971709			Sum of USGS Gage 11186000 and USGS Gage 111865500			USGS Gage 11186000		
			10th percentile	Median	90th percentile	10th percentile	Median	90th percentile	10th percentile	Median	90th percentile
Fall pulse flow	Fall pulse magnitude	Cfs	202	506	1,069	267	489	1,040	89	200	435
	Fall pulse start	day of WY	3 (4-Oct)	42 (12-Nov)	64 (4-Dec)	6 (7-Oct)	45 (15-Nov)	69 (9-Dec)	0 (1-Oct)	17 (18-Oct)	50 (20-Nov)
	Fall pulse duration	Days	2 (to 6-Oct)	3 (to 15-Nov)	7 (to 11-Dec)	2 (to 9-Oct)	3 (to 18-Nov)	6 (to 15-Dec)	2 (to 3-Oct)	4 (to 22-Oct)	9 (to 29-Nov)
Wet-season baseflow	Wet-season baseflow	Cfs	177	335	516	214	395	769	48	91	400
	Wet-season median baseflow	Cfs	636	1,001	1,810	468	924	2,487	107	617	2,097
	Wet-season start	day of WY	120 (29-Jan)	158 (8-Mar)	185 (4-Apr)	109 (18-Jan)	149 (27-Feb)	171 (21-Mar)	112 (21-Jan)	166 (16-Mar)	194 (13-Apr)
	Wet-season duration	Days	60 (to 30-Mar)	92 (to 8-Jun)	143 (to 25-Aug)	75 (to 3-Apr)	102 (to 9-Jun)	141 (to 9-Aug)	56 (to 18-Mar)	87 (to 11-Jun)	164 (to 24-Sep)
Wet-season peak flow	2-year flood magnitude	Cfs	2,150	3,890	8,410	3,070	3,070	3,070	2,435	2,435	2,435
	2-year flood duration	Days	1	13	47	1	15	66	2	33	69
	2-year flood frequency	occurrences	1	2	5	1	2	6	1	3	7
	5-year flood magnitude	Cfs	4,580	7,310	16,800	5,640	5,640	5,640	6,038	6,038	6,038

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Functional Flow Component	Flow Metric	Unit	Predicted Natural Range at NFKR LOI 1			Observed Range at Fairview Dam Inflow			Observed Range at NFKR		
			COMID 14971709			Sum of USGS Gage 11186000 and USGS Gage 111865500			USGS Gage 11186000		
			10th percentile	Median	90th percentile	10th percentile	Median	90th percentile	10th percentile	Median	90th percentile
	5-year flood duration	Days	1	2	12	1	5	27	1	3	22
	5-year flood frequency	occurrences	1	1	3	1	1	3	1	1	3
	10-year flood magnitude	Cfs	3,530	11,400	30,000	6,870	6,870	6,870	6,756	6,756	6,756
	10-year flood duration	Days	1	1	4	1	2	23	1	3	23
	10-year flood frequency	occurrences	1	1	1	1	1	2	1	1	2
Spring recession flow	Spring recession magnitude	Cfs	1,375	2,679	4,625	967	2,770	4,950	437	1,840	5,855
	Spring start	day of WY	236 (25-May)	255 (13-Jun)	273 (1-Jul)	233 (22-May)	253 (11-Jun)	269 (27-Jun)	230 (19-May)	252 (10-Jun)	282 (10-Jul)
	Spring duration	Days	49 (to 13-Jul)	73 (to 25-Aug)	104 (to 13-Oct)	60 (to 21-Jul)	79 (to 29-Aug)	100 (to 5-Oct)	28 (to 16-Jun)	53 (to 2-Aug)	94 (to 12-Oct)
	Spring rate of change	%	4.3%	6.1%	8.9%	3.2%	3.9%	4.9%	4.3%	8.7%	13.8%
Dry-season baseflow	Dry-season baseflow	Cfs	66	195	366	139	216	357	29	56	135
	Dry-season high baseflow	Cfs	144	398	930	189	353	595	76	111	324
	Dry-season start	day of WY	296 (24-Jul)	326 (23-Aug)	353 (19-Sep)	309 (6-Aug)	334 (31-Aug)	353 (19-Sep)	276 (4-Jul)	309 (6-Aug)	340 (6-Sep)

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Functional Flow Component	Flow Metric	Unit	Predicted Natural Range at NFKR LOI 1			Observed Range at Fairview Dam Inflow			Observed Range at NFKR		
			COMID 14971709			Sum of USGS Gage 11186000 and USGS Gage 111865500			USGS Gage 11186000		
			10th percentile	Median	90th percentile	10th percentile	Median	90th percentile	10th percentile	Median	90th percentile
	Dry-season duration	Days	150 (to 21-Dec)	198 (to 9-Mar)	236 (to 13-May)	131 (to 15-Dec)	179 (to 26-Feb)	211 (to 18-Apr)	163 (to 14-Dec)	215 (to 9-Mar)	261 (to 25-May)

% = percent; cfs = cubic feet per second; COMID = COMmon IDentifier; LOI = location of interest; NFKR = North Fork Kern River; WY = water year

Note:

[a] WYs extend from October 1 to September 30, so October 1 is day 0 of the WY. Interpolated dates from flow metrics “start” and “duration” assume non-leap years.

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5.2.5. STEP 3: EVALUATE WHETHER THE NATURAL RANGES OF FUNCTIONAL FLOW METRICS SUPPORTS ECOSYSTEM FUNCTIONS NEEDED TO ACHIEVE ECOLOGICAL MANAGEMENT GOALS

There were no modifications identified in the NFKR LOI 1 that would constitute a non-flow limiting factor and influence whether the range of natural functional flows would support the ecosystem functions needed to achieve the established EMGs of the NFKR.

5.2.6. STEP 4: SELECT ECOLOGICAL FLOW CRITERIA

The natural range of functional flow metrics specified in Step 2 (Table 5.2-4) were selected as the ecological flow criteria for NFKR LOI 1 because there were no non-flow limiting factors identified in Step 3 and the range of natural functional flow metrics were expected to support the ecosystem functions required to achieve the six EMGs for NFKR LOI 1 (Table 5.2-2).

5.3. FLOW TRAVEL TIME

Travel time between Fairview Dam and the KR3 Powerhouse was calculated at 52 intervals representing flows from approximately 100 cfs to approximately 26,400 cfs during the study period of February 7, 2023, to August 5, 2024. Figure 5.3-1 shows 48 travel times from approximately 100 cfs to approximately 9,000 cfs in a non-linear, power curve relationship between flows and travel time. This figure represents subset of the total intervals without the four highest flows for the purpose of focusing the graph on the majority of the flows. From the graph, it is evident that the lower flows correlate to longer travel times while the higher flows correspond to shorter travel times between Fairview Dam and KR3 Powerhouse. For example, at approximately 120 cfs, the travel time between Fairview Dam and the KR3 Powerhouse is approximately 8.5 hours, while at approximately 9,000 cfs, the travel time is only 2 hours. Consistent with the FERC study plan determination, the travel times between 120 and 1,440 cfs are shown in Table 5.3-1 and Figure 5.3-2 below.

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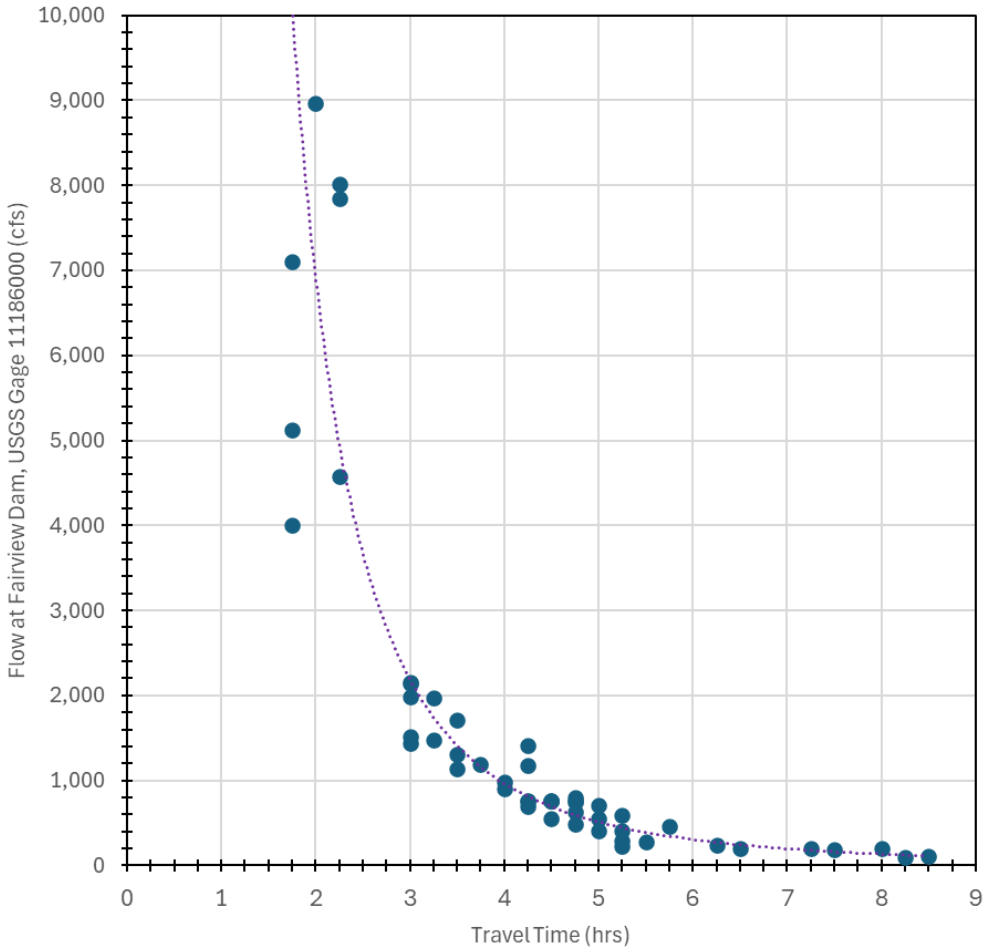


Figure 5.3-1. North Fork Kern River Estimated Travel Time between Fairview Dam and Powerhouse, February 2023–August 2024.

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Table 5.3-1. North Fork Kern River Estimated Travel Time between Fairview Dam and Kern River No. 3 Powerhouse

NFKR Flow (cfs)	Time (hours)
120	8.5
200	7.25
290	5.25
410	5.0
550	4.5
640	4.75
750	4.75
900	4.0
990	4.0
1,140	3.5
1,190	3.75
1,310	3.5
1,440	3.0

cfs = cubic feet per second; NFKR = North Fork Kern River

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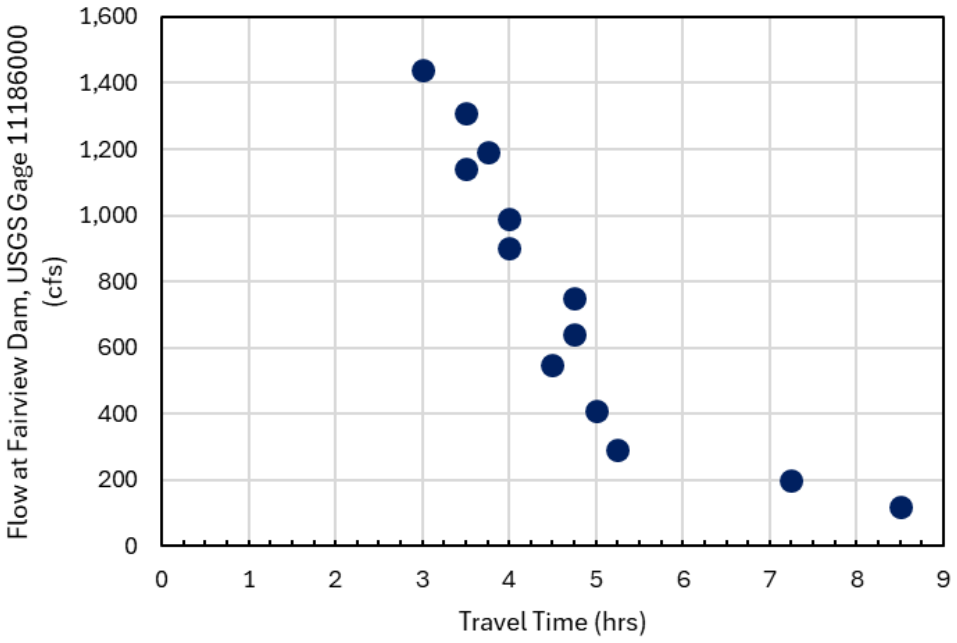


Figure 5.3-2. North Fork Kern River Estimated Travel Time between Fairview Dam and Kern River No. 3 Powerhouse.

Figures 5.3-3 through 5.3-5 show examples of how travel time was estimated from comparing inflection points in flows and river stage. Interval 1 (Figure 5.3-3) occurred while KR3 was not diverting flow from the NFKR, and the water conveyance system and penstock flow are both consistent at 0 cfs. Flow immediately downstream of Fairview Dam (measured at USGS gage 11186000) increased consistently from 6 p.m. on August 20, 2023, until just before noon on August 21, 2023, and a similar increase in stage was measured downstream at the KR3 Powerhouse, with the increase in stage ending just before 2 p.m. on August 21, 2023. Comparing the times of the peaks at both locations (the blue circle and the green circle) provides an estimated time of 2 hours for a flow of 9,000 cfs to travel from Fairview Dam to the KR3 Powerhouse.

Interval 2 (Figure 5.3-4) is an example of estimating travel time when the water conveyance system was flowing at capacity at just under 600 cfs and flows increased in the river during the morning on both April 3 and 4, 2024. Comparing the inflection points on April 3, 2024 (the blue and green circles), provides an estimated travel time of 5.25 hours at 290 cfs, and comparing the inflection points on April 4, 2024 (the blue triangle and the green triangle), provides an estimated travel time of 5 hours at 410 cfs from Fairview Dam to the KR3 Powerhouse.

Interval 3 (Figure 5.3-5) is an example of estimating travel time during whitewater release flow changes, when diversions were decreased during recreation hours on June 21 and 22, 2024. NFKR flows downstream of Fairview Dam increased steadily between 6 a.m. and 10 a.m. on June 21, 2024, to approximately 800 cfs, and increased steadily again between 5 a.m. and 10 a.m. on June 22, 2024, to approximately 760 cfs, while the conveyance flows decreased commensurately during each of those periods. Comparing

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the inflection points on June 21, 2024 (the blue and green circles), and on June 22, 2024 (the blue and green triangles), provides an estimated travel time of 4.75 hours at 760 to 800 cfs from Fairview Dam to the KR3 Powerhouse.

Figure 5.3-5 also highlights changes in flows downstream of the KR3 Powerhouse that can occur due to differences in travel times between the flow in the river channel and flow in the water conveyance system. This difference corresponds to the shorter flow travel time in the 13-mile-long water conveyance system compared with the longer flow travel time in the 16-mile-long river segment. Comparing the inflection points in Figure 5.3-5, it is evident that the time difference for flow to travel from upstream end of the water conveyance system to the KR3 Powerhouse (between the USGS gage 11165500 [orange line] and the KR3 penstock gage [turquoise line]) is shorter than the time difference for flow to travel in the NFKR from Fairview Dam to the KR3 Powerhouse (between the USGS gage 11165000 [blue line] and the KR3 Powerhouse river stage gage [green line]).

When diversion rates at Fairview Dam are decreased and flow is increased in the NFKR downstream of Fairview Dam, the faster travel time in the water conveyance system can cause an initial, brief decrease in flow downstream of the KR3 Powerhouse (noticeable in the river stage gage [green line] around noon on both June 21 and June 22, 2024, in Figure 5.3-5). Similarly, there is a brief increase in flow in the NFKR downstream of KR3 Powerhouse as releases from Fairview Dam are decreased and diversion rates are increased (noticeable in the river stage gage [green line] around 9 p.m. on both June 21 and June 22, 2024, in Figure 5.3-5). The shape of this curve is attenuated by ramping at Fairview Dam and is not always visible due to other factors affecting streamflow in the bypass reach, such as diurnal flow patterns, tributary flow inputs, and stream roughness.

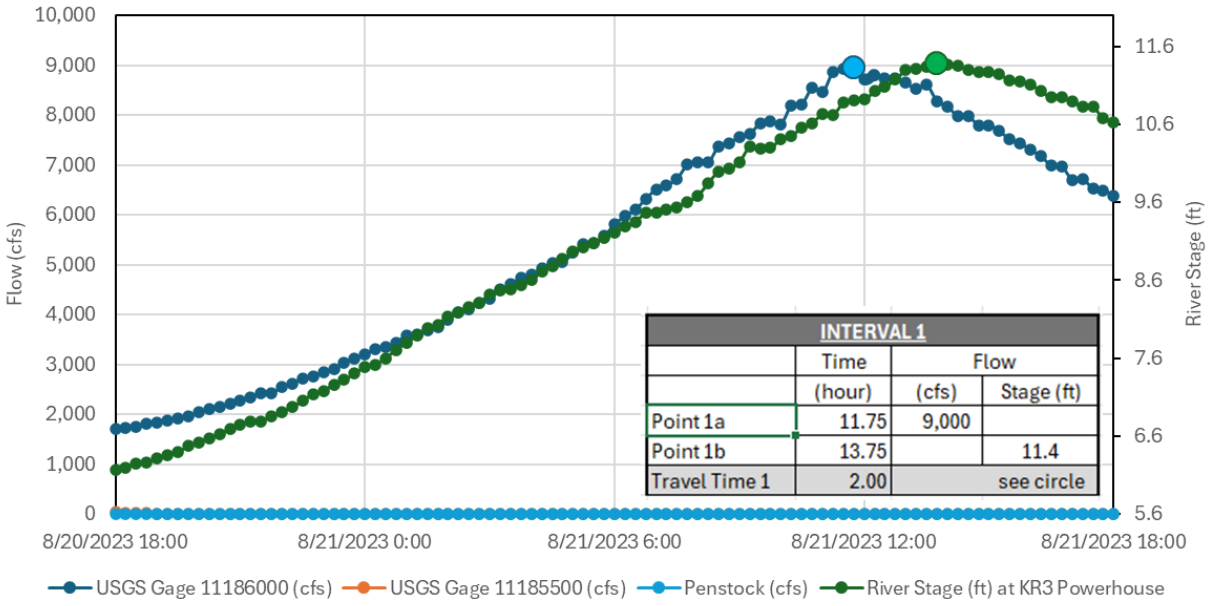


Figure 5.3-3. Flow Travel Time Analysis, Interval 1.

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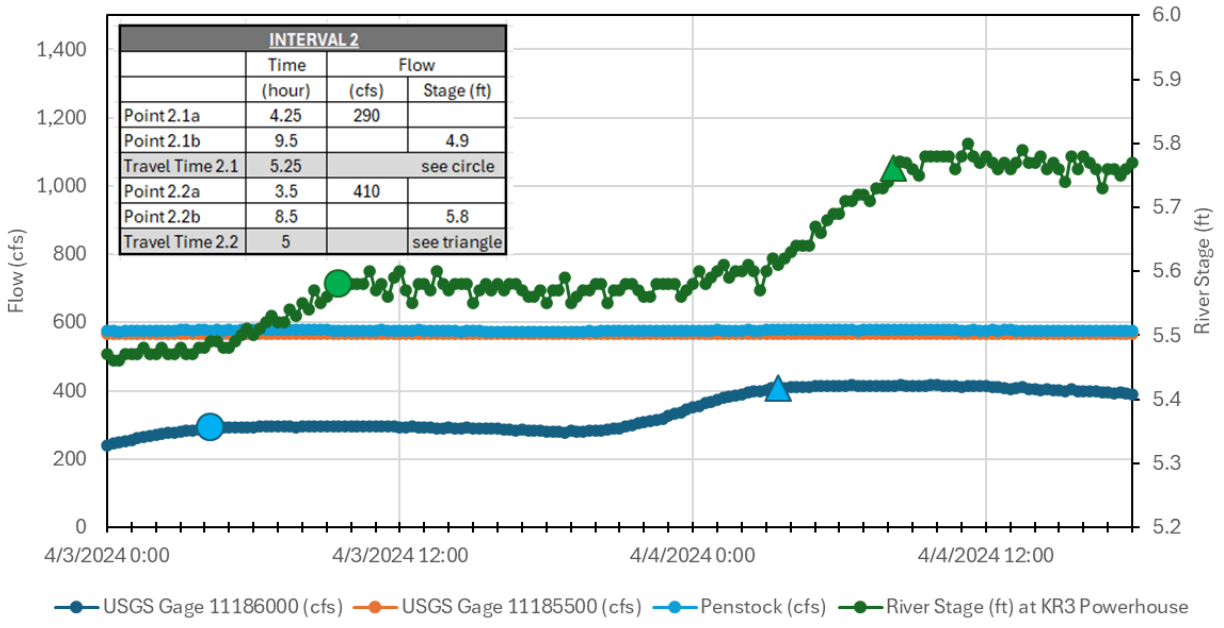


Figure 5.3-4. Flow Travel Time Analysis, Interval 2.

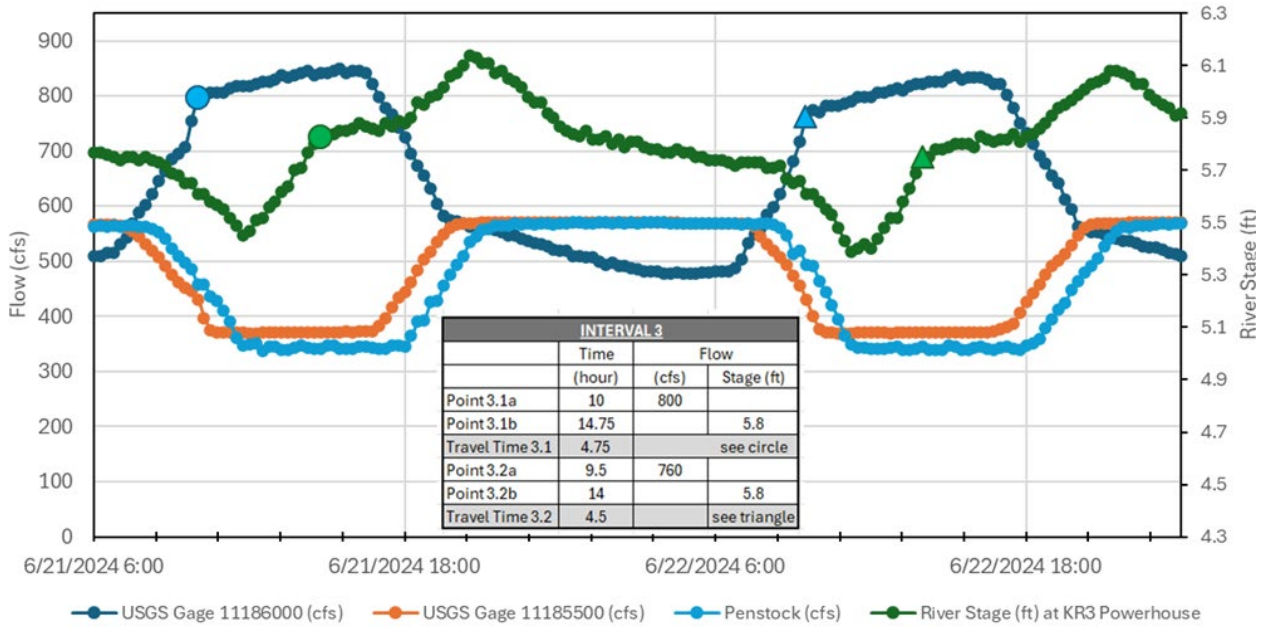


Figure 5.3-5. Flow Travel Time Analysis, Interval 3.

5.4. SALMON AND CORRAL CREEKS DIVERSIONS

Flow diversion data collected within the study period at Salmon and Corral Creeks provide information regarding frequency of diversions and a sense of the natural variability of flow in the creeks, as shown in Table 5.4-1 and Figures 5.4-1 and 5.4-2. In the 21 months that the dataset encompasses, MIF in Salmon and Corral Creeks was met naturally 17 percent and 23 percent of the time, respectively, and the surplus was diverted into the water

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conveyance system. For the remainder of the study period, the natural flow in each creek was less than the MIF. For the wet WY 2023, Salmon and Corral Creeks diverted 30 percent and 27 percent of the time, respectively, with a mean diverted flow of 0.3 cfs in Salmon Creek and 5.1 cfs in Corral Creek. In the drier WY 2024, Salmon Creek did not reach the diversion threshold and Corral Creek diverted 18 percent of the study period, with a mean diverted flow of 3.9 cfs.

Table 5.4-1. Flow Diversions at Salmon and Corral Creeks

Stream	Frequency of Diversion			Mean Diverted Flow (cfs)[a]	
	WY 2023	WY 2024[b]	Total Diversions in Study Period	WY 2023	WY 2024[b]
Salmon Creek	30%	0%	17%	0.3	0.0
Corral Creek	27%	18%	23%	5.1	3.9

% = percent; cfs = cubic feet per second; WY = water year
Notes:
[a] Mean of diversions when minimum instream flow has been met in creek. No diversions occur when creek flow is below minimum instream flow.
[b] Data representative of 77 percent of WY 2024, October 1, 2023-July 9, 2024.

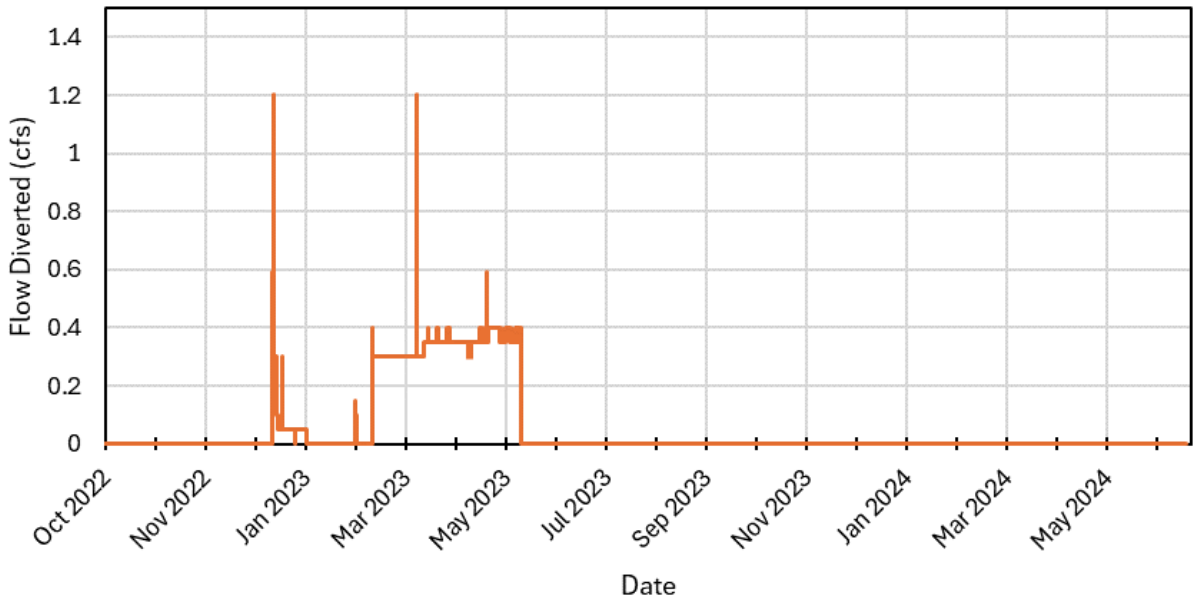


Figure 5.4-1. Salmon Creek Diversions to the Water Conveyance System, October 2023 through June 2024.

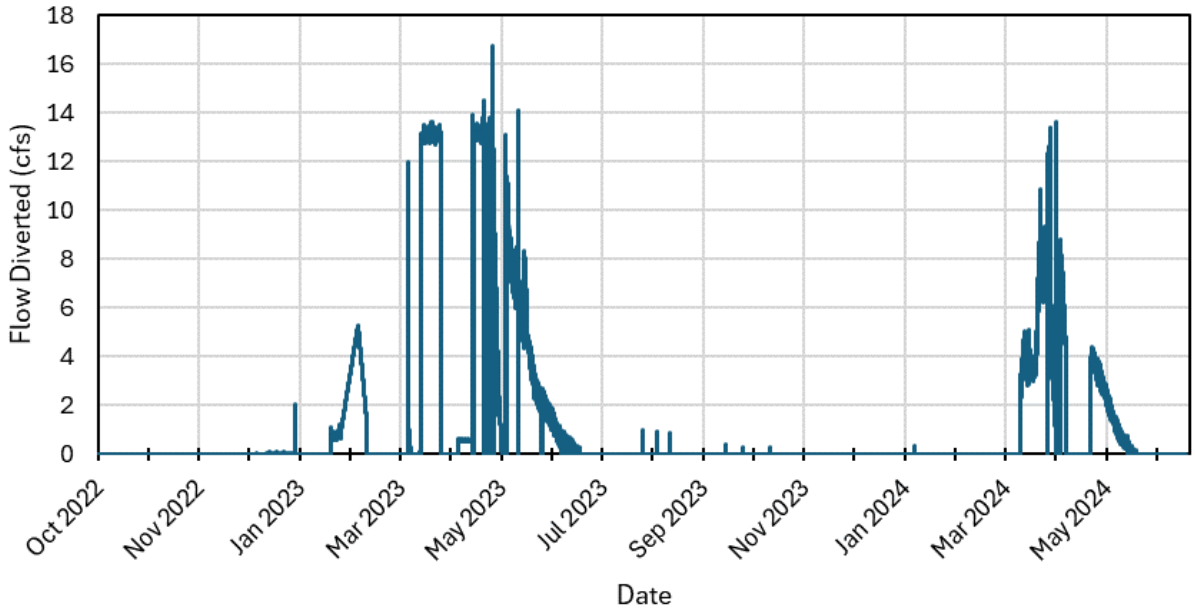


Figure 5.4-2. Corral Creek Diversions to the Water Conveyance System, October 2023 through June 2024.

5.5. THEORETICAL HYDROLOGY EXCLUDING EXTENDED OUTAGES

During WYs 2005 to 2023, there were 2,239 days of extended outages, representing 32 percent of total days in the study period (Table 5.5-1). This includes WYs 2008, 2010, and 2014 when KR3 Powerhouse was offline 100 percent of the year. Overall, these extended outages were primarily scheduled in the fall and winter months when natural inflows to Fairview Dam were at their lowest (Table 5.5-2).

The mean annual flow upstream of Fairview Dam in the hydrology dataset from Section 4.1, *Study Plan Variances* (WYs 1997 to 2023), was classified into tertiles (for dry, moderate, and wet water year types), as shown in Figure 5.5-1. Most extended outage days occurred during dry years (Tables 5.5-3 through 5.5-5). Across all water years, extended outages reduced diversions by the greatest absolute number of days during the spring, when natural flows tend to be highest, whereas extended outages reduced diversions by the greatest percentages during the fall and winter months, when natural flows tend to be lower (Tables 5.5-6 through 5.5-8 and Figures 5.5-2 through 5.5-4).

Table 5.5-1. Annual Number of Extended Outage Days, Water Years 2005–2023

Water Year	Number of Extended Outage Days	Percent Extended Outage Days	Water Year Type
2005	13	4	Wet
2006	75	20	Wet

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Water Year	Number of Extended Outage Days	Percent Extended Outage Days	Water Year Type
2007	231	63	Dry
2008	366	100	Moderate
2009	202	55	Moderate
2010	365	100	Wet
2011	231	63	Wet
2012	44	12	Moderate
2013	129	35	Dry
2014	365	100	Dry
2015	85	23	Dry
2016	27	7	Moderate
2017	13	3	Wet
2018	0	0	Moderate
2019	0	0	Wet
2020	0	0	Dry
2021	0	0	Dry
2022	47	13	Dry
2023	48	13	Wet
Total	**2,239**	**NA**	**NA**

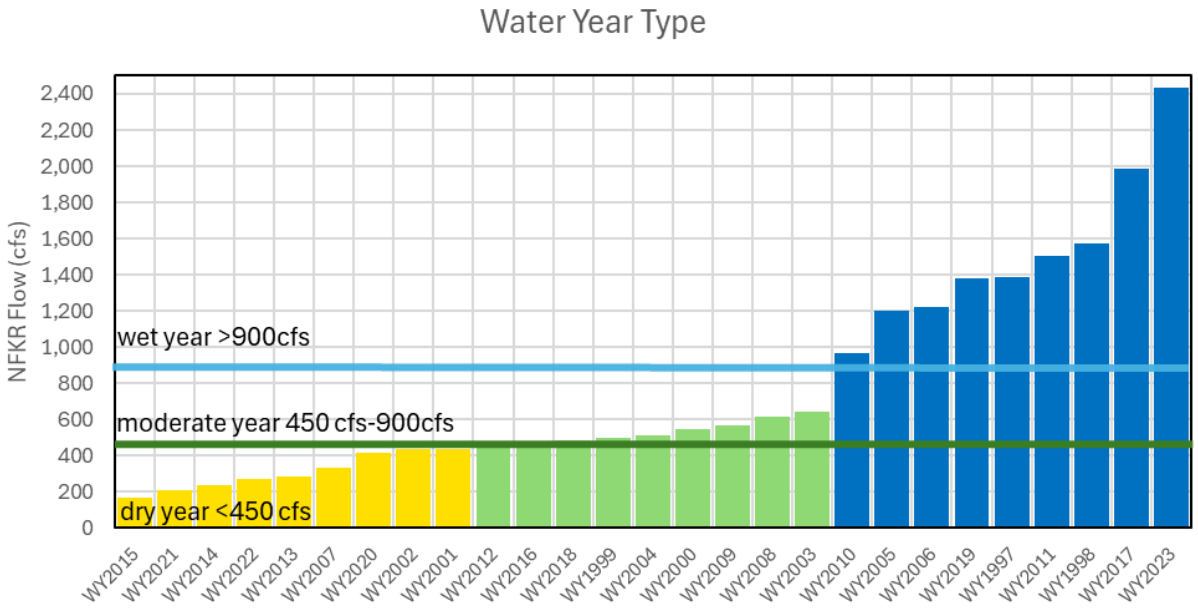
NA = not applicable/no data

Table 5.5-2. Monthly Number of Extended Outage Days, Water Years 2005–2023

Month	Number of Extended Outage Days	Percent Extended Outage Days
October	309	52
November	285	50
December	235	40
January	186	32
February	153	29
March	160	27
April	132	23
May	120	20
June	90	16

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Month	Number of Extended Outage Days	Percent Extended Outage Days
July	98	17
August	175	30
September	296	52
Total	**2,239**	**32**



Note:
The NFKR Flow is the sum of mean annual flows from USGS gages 11186000 and 11185500.

Figure 5.5-1. Water Year Type Tertile Classifications (for Dry, Moderate, and Wet Water Year Types), Water Years 1997–2023.

Table 5.5-3. Monthly Number of Extended Outage Days, Dry Water Years, 2005–2023

Month	Number of Extended Outage Days	Percent Extended Outage Days
October	155	71
November	150	71
December	142	66
January	93	43
February	84	43

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Month	Number of Extended Outage Days	Percent Extended Outage Days
March	93	43
April	72	34
May	62	29
June	60	29
July	62	29
August	99	46
September	150	71
Total	**1,222**	**48**

Table 5.5-4. Monthly Number of Extended Outage Days, Moderate Water Years, 2005–2023

Month	Number of Extended Outage Days	Percent Extended Outage Days
October	62	40
November	60	40
December	62	40
January	62	40
February	41	29
March	31	20
April	30	20
May	31	20
June	30	20
July	36	24
August	76	49
September	117	78
Total	**638**	**35**

Table 5.5-5. Monthly Number of Extended Outage Days, Wet Water Years, 2005–2023

Month	Number of Extended Outage Days	Percent Extended Outage Days
October	123	57
November	105	50

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Month	Number of Extended Outage Days	Percent Extended Outage Days
December	62	29
January	62	29
February	56	29
March	67	31
April	60	29
May	58	27
June	30	14
July	31	14
August	31	14
September	60	28
Total	**744**	**29**

% = percent

Table 5.5-6. Actual and Theoretical Monthly Mean Flows in North Fork Kern River, Dry Water Years, 2005–2023

Month	USGS Gage 11186000 Measured Flow	Theoretical Flow	Differences between Measured and Theoretical Flows	
	cfs	cfs	cfs	percent
October	121	90	31	26
November	93	44	49	52
December	102	51	51	50
January	79	55	24	30
February	112	60	52	47
March	182	107	75	41
April	204	134	71	35
May	312	235	77	25
June	158	120	39	25
July	131	129	2	2
August	135	119	15	11
September	97	84	13	13

cfs = cubic feet per second; USGS = U.S. Geologic Survey

Note:

Theoretical flow was calculated by decreasing the recorded flow measured in the bypass channel (USGS gage 11186000) by the maximum authorized diversion flow into the water conveyance system during periods of identified extended outages at KR3 Powerhouse (described in Section 4.6, *Theoretical Hydrology Excluding Extended Outages*).

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Table 5.5-7. Actual and Theoretical Monthly Mean Flows in North Fork Kern River, Moderate Water Years, 2005–2023

Month	USGS Gage 11186000 Measured Flow	Theoretical Flow	Differences between Measured and Theoretical Flows	
	cfs	cfs	cfs	Percent
October	107	85	22	20
November	85	53	32	38
December	83	50	33	40
January	110	56	54	49
February	132	54	78	59
March	208	126	82	39
April	515	451	64	12
May	996	934	62	6
June	619	554	65	10
July	201	162	39	19
August	135	125	11	8
September	127	100	27	21

cfs = cubic feet per second; USGS = U.S. Geologic Survey

Note:

Theoretical flow was calculated by decreasing the recorded flow measured in the bypass channel (USGS gage 11186000) by the maximum authorized diversion flow into the water conveyance system during periods of identified extended outages at KR3 Powerhouse (described in Section 4.6, *Theoretical Hydrology Excluding Extended Outages*).

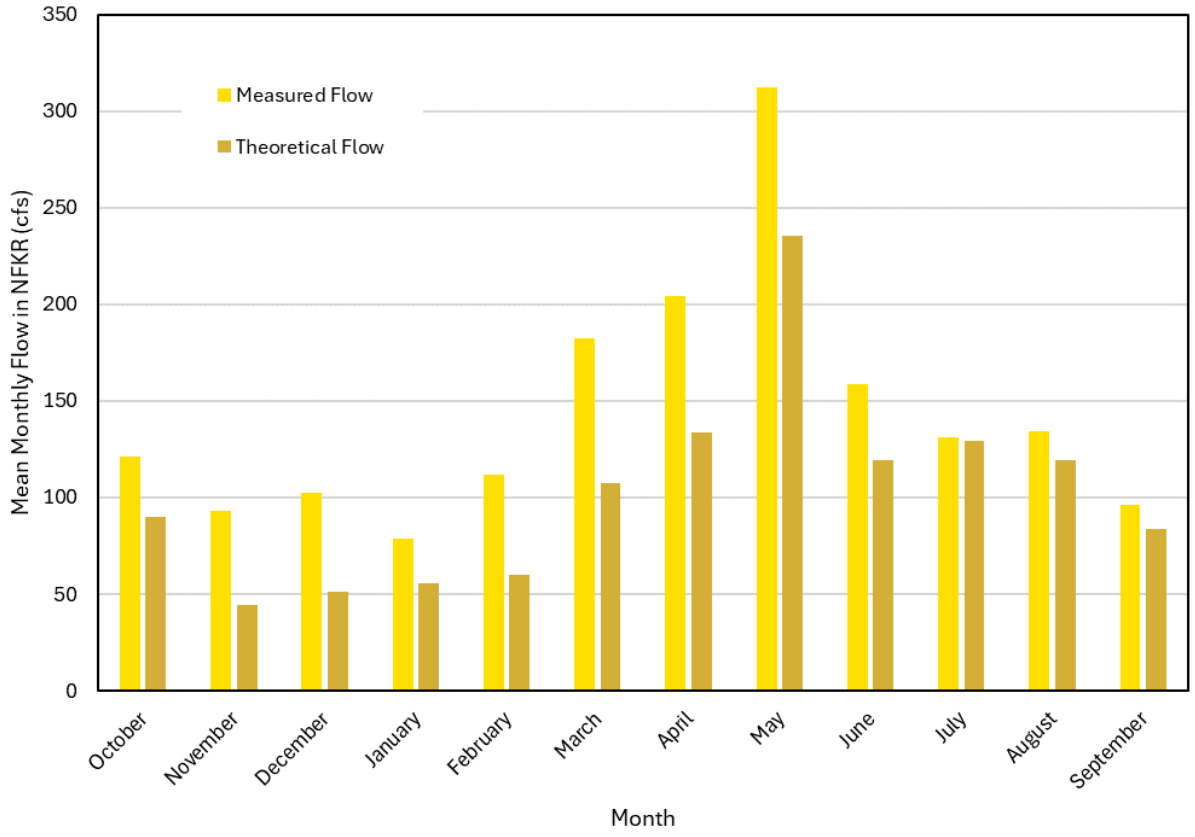
Table 5.5-8. Actual and Theoretical Monthly Mean Flows in North Fork Kern River, Wet Water Years, 2005–2023

Month	USGS Gage 11186000 Measured Flow	Theoretical Flow	Differences Between Measured and Theoretical Flows	
	cfs	cfs	cfs	Percent
October	195	108	88	45
November	165	62	104	63
December	230	133	97	42
January	489	389	101	21
February	439	376	64	14
March	1,085	999	87	8
April	1,846	1,759	87	5
May	3,553	3,460	93	3
June	4,096	4,052	44	1
July	1,954	1,911	42	2
August	416	409	7	2

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Month	USGS Gage 11186000 Measured Flow	Theoretical Flow	Differences Between Measured and Theoretical Flows	
	cfs	cfs	cfs	Percent
September	161	151	10	6

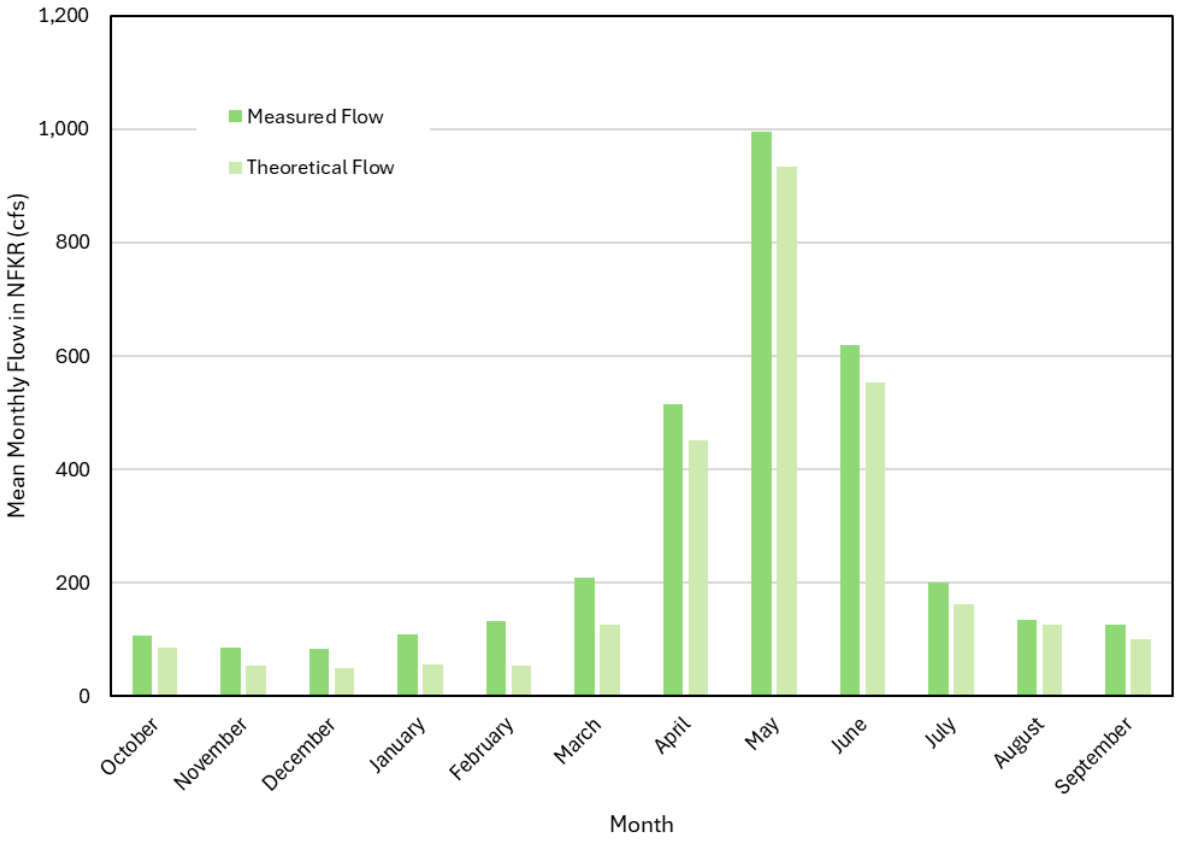
cfs = cubic feet per second; USGS = U.S. Geologic Survey
Note:
Theoretical flow was calculated by decreasing the recorded flow measured in the bypass channel (USGS gage 11186000) by the maximum authorized diversion flow into the water conveyance system during periods of identified extended outages at KR3 Powerhouse (described in Section 4.6, *Theoretical Hydrology Excluding Extended Outages*).



Note:
Theoretical flow was calculated by decreasing the recorded flow measured in the bypass channel (USGS gage 11186000) by the maximum authorized diversion flow into the water conveyance system during periods of identified extended outages at KR3 Powerhouse (described in Section 4.6, *Theoretical Hydrology Excluding Extended Outages*).

Figure 5.5-2. Measured Compared with Theoretical Mean Monthly Flows, Dry Water Years, 2005–2023.

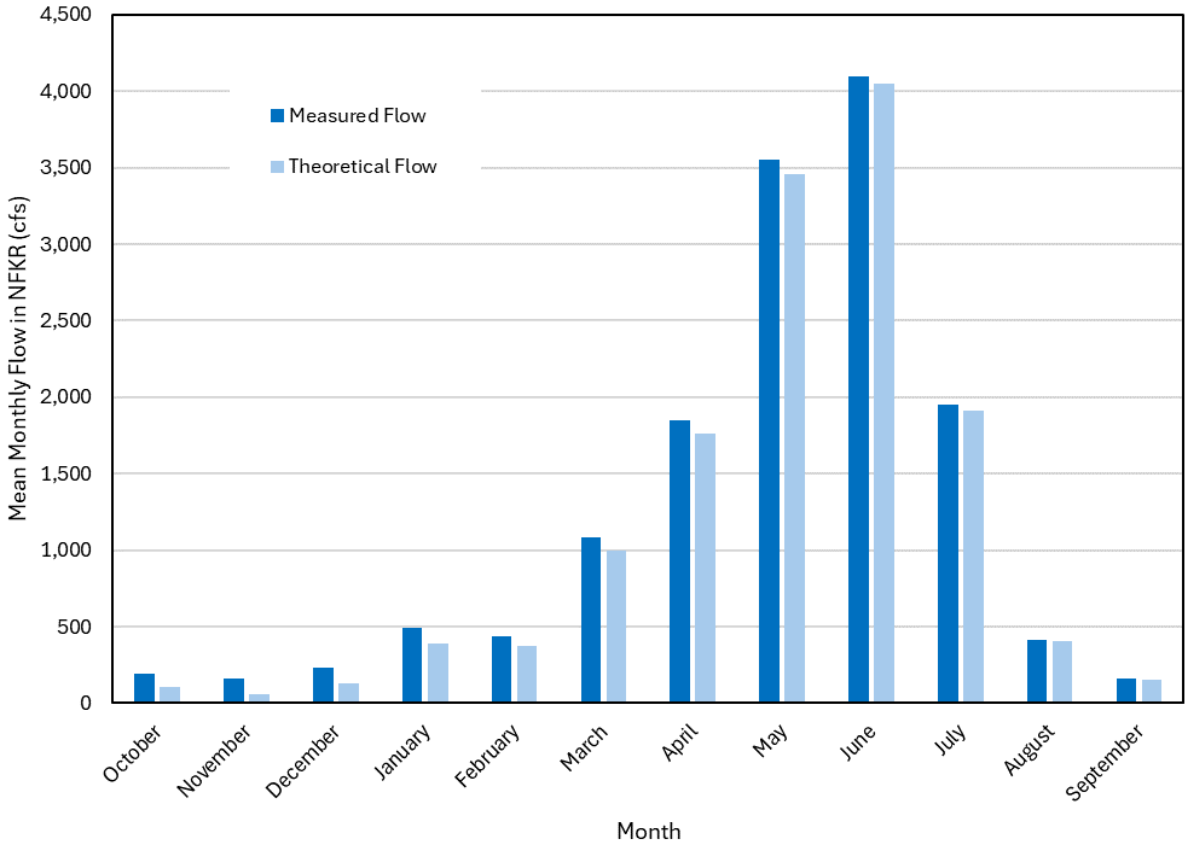
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Note:
Theoretical flow was calculated by decreasing the recorded flow measured in the bypass channel (USGS gage 11186000) by the maximum authorized diversion flow into the water conveyance system during periods of identified extended outages at KR3 Powerhouse (described in Section 4.6, *Theoretical Hydrology Excluding Extended Outages*).

Figure 5.5-3. Measured Compared with Theoretical Mean Monthly Flow, Moderate Water Years, 2005–2023.

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Note:
Theoretical flow was calculated by decreasing the recorded flow measured in the bypass channel (USGS gage 11186000) by the maximum authorized diversion flow into the water conveyance system during periods of identified extended outages at KR3 Powerhouse (described in Section 4.6, *Theoretical Hydrology Excluding Extended Outages*).

Figure 5.5-4. Measured Compared with Theoretical Mean Monthly Flow, Wet Water Years, 2005–2023.

5.6. CANNELL CREEK SIPHON SPILLWAY AND FOREBAY SPILLWAY

Over the 18-month study period, a total of 34 spill events occurred at the Cannell Creek Siphon Spillway lasting a total of 8,808 minutes (147 hours, or 6 days) (Table 5.6-1). Spill events occurred at a rate of 1.89 spills per month during this period. Nearly half of the total spill time occurred during forced outages (e.g., unplanned outages occur as a result of unit malfunction, insufficient flows to run one or both units, or periods of insufficient flows to generate), although these events only accounted for a third of the total number of events. Scheduled outages accounted for 21 percent of the total spill time, followed by suspension of Project operations due to high suspended sediment levels and Penstock service events, each at around 14 percent. Flushing of the tunnel rock (e.g., rock drop) located upstream of the Cannell Creek Siphon Spillway accounted for a fifth of the total number of events, but only 3 percent of the spill time.

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Table 5.6-1. Cannell Creek Siphon Spillway Event Summary, January 2023 to June 2024

Reasons for Spill Event	Count of Events	Sum of Minutes	Percent Sum of Minutes (%)	Average of Minutes per Event
Flushing[a]	7	223	3	32
Pause generation due to turbid water	5	1,260	14	252
Forced outage	11	4,240	48	385
Pause generation for penstock maintenance	5	1,230	14	246
Scheduled Outage	6	1,855	21	309
Total	**34**	**8,808**	**100**	**NA**

% = percent; NA = not applicable/no data
Note:
[a] Flushing only occurs at Cannell Creek Siphon Spillway not Forebay Spillway.

Spill volume was estimated as potential maximum spill using available penstock and conveyance data during the time of the spill. Due to limited availability of the penstock data, only 30 of the 34 points were analyzed. Events causing spills resulted in releases from 5 to 289 cfs in each spillway channel. Spills caused by outages due to suspended sediment levels, scheduled maintenance, and other unplanned forced outages caused the highest spill flows (Table 5.6-2).

Table 5.6-2. Cannell Creek Siphon and Forebay Spillways Estimated Potential Spill Flow, February 2023 to June 2024

Reasons for Spill Event	Count of Events	Estimated Potential Flow at Each Spillway (cfs)		
		Minimum	Mean	Maximum Instantaneous
Flushing[a]	7	17	48	101
Pause generation due to turbid water	4	38	177	289
Forced Outage	9	8	91	161
Pause generation for penstock maintenance	4	32	55	83
Scheduled Outage	6	5	92	269
Total	**30**	**5**	**92**	**289**

cfs = cubic feet per second
Note:
[a] Flushing only occurs at Cannell Creek Siphon Spillway not Forebay Spillway.

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6.0 STUDY-SPECIFIC CONSULTATION

The hydrology dataset from both USGS gages 11185500 and 11186000 beginning October 1, 1996, through September 30, 2021, was provided to Relicensing Participants via email on June 30, 2023, with a link to the Project website. The data from WYs 2022 and 2023 were provided to Relicensing Participants on March 29, 2024, and June 14, 2024, respectively (SCE, 2023b).

7.0 OUTSTANDING STUDY PLAN ELEMENTS

There are no outstanding study plan elements.

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APPENDIX A
SALMON CREEK AND CORRAL CREEK
ROUTINE INSPECTION AND ANNUAL FLOW REPORTS

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[SUMMARY OF FINAL SUBMITTED VERSION]

REPORT OF LICENSEE FOR 2019

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Primary Contact:

Date Submitted: 03/19/2020

Application Number: A000624
License Number: 000148

Source(s) of Water	POD Parcel Number	County
KERN RIVER		Tulare
SALMON CREEK		Tulare

MAX Direct Diversion Rate: 600 CFS
MAX Collection to Storage: 0 AC-FT
Face Value: 434386.5 AC-FT

Permitted Use(s)	Acres	Direct Diversion Season	Storage Season
Power	0	01/01 to 12/31	

1. Compliance with License Terms and Conditions	
I have currently reviewed my water right license and I am complying with all terms and conditions	Yes
Description of noncompliance with terms and conditions	

2. Changes to the Project	
Intake location has been changed	
Description of intake location changes	
Type of use has changed	
Description of type of use changes	
Place of use has changed	
Description of place of use changes	
Other changes	
Description of other changes	

3. Purpose of Use	
Power	40 MW

Special Use Categories	
C1. Are you using any water diverted under this right for the cultivation of cannabis?	No

4. Amount of Water Diverted and Used

Month	Amount directly diverted (Acre-Feet)	Amount diverted or collected to storage (Acre-Feet)	Amount used (Acre-Feet)
January	14654	0	14654
February	25626	0	25626
March	32910	0	32910
April	32850	0	32850
May	34370	0	34370
June	33590	0	33590
July	33420	0	33420

August	31237	0	31237
September	17599	0	17599
October	14012	0	14012
November	14381	0	14381
December	20230	0	20230
Total	304879	0	304879
Type of Diversion	Direct Diversion Only		
Comments			

5. Water Diversion Measurement	
a. Required to measure as of the date this report is submitted	Yes
b. Is diversion measured?	Yes
c. An alternative compliance plan was submitted to the division of water rights on	
d. A request for additional time was submitted to the division of water rights on	

Measurement ID number	M000774
This Device/Method was used to measure water during the current reporting period	Yes
M1. Briefly describe the measurement device or method	Stage DIscharge Rating in flume and Diversion Pipe (2 stations) - USGS reviewed
M2. Nickname	Kern River #3 Conduit near Kernville and Salmon Creek Diversion
M3. Type of device / method	Float
M4. Device make	Waterlog
M5. Serial number	
M6. Model number	H331 SDI12
M7. Approximate date of installation	10/01/2004
M8. Additional info	Method is - two gages which are both reviewed annually by USGS hydrographer's. Main Conduit gage is a stage discharge rating. Added water from Salmon Creek Diversion is a rated flow in a fixed geometry pipeline.
M9. Approximate date the measuring device was last calibrated or the measurement method was updated	10/05/2019
M10. Estimated accuracy of measurement	8%
M11. Description of calibration method	Stream gaging using USGS standards to validate ratings.
M12. Describe the maintenance schedule for the device/method	Monthly inspections to validate recorded levels. minimum of 4 annual current meter measurements in main conduit. For smaller diversion monthly checks for obstructions and validation of indicated level.
Information for the person who last calibrated the device or designed the measurement method	
M13. Name	Derrick Tito
M14. Phone number	760-376-8350
M15. Email	Derrick.Tito@sce.com
M16. Qualifications of the individual	Person working under the supervision of a California Professional Engineer
M17. License number and type for the qualified individual above and/or any other relevant explanation	The individual above works under the supervision of a California-Registered Professional Engineer License # C85109
M18. Type of data recorder	Data logger (digital)

device / method	
M19. Data recorder device make	Design Analysis
M20. Data recorder serial number	2341 & 2320
M21. Data recorder model number	H-500XL
M22. Data recorder units of measurement	Feet
M23. Frequency of data recording	More frequent than hourly
M24. Additional data recorder info	The canal and pipeline stage is recorded at each site in feet. This stage is converted to flow using validated rating tables.
M25. I am required to report my diversion or storage data by telemetry as of the date this report is submitted	Yes
M26. I report my diversion or storage date by telemetry to the following website	https://www.kisters.net/sce-sb88/stations/A000624/Parameter/V/Amount%20Diverted%20-%20year.xls

Measurement Attachments			
Measurement ID Number	**File Name**	**Description**	**Size**
M000774	402 Rtg 12.docx	402 Rating 12.00 (Kern 3 Conduit)	16 KB
M000774	413 Rtg 1.01.docx	413 Rating 1.01 (Salmon Creek Diversion)	13 KB

Measurement Data Files			
Measurement ID Number	**File Name**	**Description**	**Size**
M000774	A000624 Raw Data 2019CY.xlsx	Raw Gage height data for both diversions 2019CY	640 KB

6. Maximum Rate of Diversion	
Month	**Rate of Diversion (Cubic Feet Per Second)**
January	306
February	570
March	583
April	577
May	580
June	577
July	581
August	581
September	539
October	265
November	271
December	467

7. Water Transfers	
7a. Water transfered	No
7b. Quantity transfered (Acre-Feet)	
7c. Dates which transfer occurred	/ to /
7d. Transfer approved by	

Water Supply Contracts	
7e. Water supply contract	No

7f. Contract with	
7g. Other provider	
7h. Contract number	
7i. Source from which contract water was diverted	
7j. Point of diversion same as identified water right	
7k. Amount (Acre-Feet) authorized to divert under this contract	
7l. Amount (Acre-Feet) authorized to be diverted in 2019	
7m. Amount (Acre-Feet) projected for 2020	
7n. Exchange or settlement of prior rights	
7o. All monthly reported diversion claimed under the prior rights	
7p. Amount (Acre-Feet) of reported diversion solely under contract	

8. Storage

Reservoir name	Spilled this year	Feet below spillway at maximum storage	Completely emptied	Feet below spillway at minimum storage	Method used to measure water level

Conservation of Water	
9. Are you now employing water conservation efforts?	No
Description of water conservation efforts	
10. Amount of water conserved	
11. I have data to support use reductions under this water right due to conservation efforts	

Water Quality and Wastewater Reclamation	
12. During the period covered by this Report, did you use reclaimed water from a wastewater treatment facility, water from a desalination facility, or water polluted by waste to a degree which unreasonably affects the water for other beneficial uses?	No
13. Amount of reclaimed, desalinated, or polluted water used	

Conjuctive Use of Groundwater and Surface Water	
14. During the period covered by this Report, were you using groundwater in lieu of available surface water authorized under your license?	No
15. Amounts of groundwater used	

Additional Remarks

Attachments

File Name	Description	Size
402 2019CY.docx	402 Day Qs 2019CY	25 KB
413c 2019CY.docx	413c DayQs 2019CY	24 KB

Contact Information of the Person Submitting the Form	
First Name	Derrick
Last Name	Tito
Relation to Water Right	Primary Owner of Record

Information on Certification and Signatory	
Name of Person Signing and Certifying the Report	Derrick Tito
Date of Signature	03/19/2020

[SUMMARY OF FINAL SUBMITTED VERSION]

REPORT OF LICENSEE FOR 2020

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Primary Contact:

Date Submitted: 03/03/2021

Application Number: A000624
License Number: 000148

Source(s) of Water	POD Parcel Number	County
KERN RIVER		Tulare
SALMON CREEK		Tulare

MAX Direct Diversion Rate: 600 CFS
MAX Collection to Storage: 0 AC-FT
Face Value: 434386.5 AC-FT

Permitted Use(s)	Acres	Direct Diversion Season	Storage Season
Power	0	01/01 to 12/31	

1. Compliance with License Terms and Conditions	
I have currently reviewed my water right license and I am complying with all terms and conditions	Yes
Description of noncompliance with terms and conditions	

2. Changes to the Project	
Intake location has been changed	
Description of intake location changes	
Type of use has changed	
Description of type of use changes	
Place of use has changed	
Description of place of use changes	
Other changes	
Description of other changes	

3. Purpose of Use	
Power	40 MW

Special Use Categories	
C1. Are you using any water diverted under this right for the cultivation of cannabis?	No

4. Amount of Water Diverted and Used			
Month	**Amount directly diverted (Acre-Feet)**	**Amount diverted or collected to storage (Acre-Feet)**	**Amount used (Acre-Feet)**
January	16837	0	16837
February	15961	0	15961
March	16383	0	16383
April	24995	0	24995
May	33903	0	33903
June	24820	0	24820
July	6600	0	6600

August	2690	0	2690
September	2500	0	2500
October	2880	0	2880
November	7080	0	7080
December	6890	0	6890
Total	161539	0	161539
Type of Diversion	Direct Diversion Only		
Comments			

5. Water Diversion Measurement	
a. Required to measure as of the date this report is submitted	Yes
b. Is diversion measured?	Yes
c. An alternative compliance plan was submitted to the division of water rights on	
d. A request for additional time was submitted to the division of water rights on	

Measurement ID number	M000774
This Device/Method was used to measure water during the current reporting period	Yes
M1. Briefly describe the measurement device or method	Stage DIscharge Rating in flume and Diversion Pipe (2 stations) - USGS reviewed
M2. Nickname	Kern River #3 Conduit near Kernville and Salmon Creek Diversion
M3. Type of device / method	Float
M4. Device make	Waterlog
M5. Serial number	
M6. Model number	H331 SDI12
M7. Approximate date of installation	10/01/2004
M8. Additional info	Method is - two gages which are both reviewed annually by USGS hydrographer's. Main Conduit gage is a stage discharge rating. Added water from Salmon Creek Diversion is a rated flow in a fixed geometry pipeline. The seasonal release must be subtracted from 413 to accurately tabulate the diverted amount shown as site 413c. Salmon Seasonal Release: Jul-Jan 1.0cfs, Feb-Jun 4.0cfs.
M9. Approximate date the measuring device was last calibrated or the measurement method was updated	10/05/2019
M10. Estimated accuracy of measurement	8%
M11. Description of calibration method	Stream gaging using USGS standards to validate ratings.
M12. Describe the maintenance schedule for the device/method	Monthly inspections to validate recorded levels. minimum of 4 annual current meter measurements in main conduit. For smaller diversion monthly checks for obstructions and validation of indicated level.
Information for the person who last calibrated the device or designed the measurement method	
M13. Name	Derrick Tito

M14. Phone number	760-376-8350
M15. Email	Derrick.Tito@sce.com
M16. Qualifications of the individual	Person working under the supervision of a California Professional Engineer
M17. License number and type for the qualified individual above and/or any other relevant explanation	The individual above works under the supervision of a California-Registered Professional Engineer License # M29594
M18. Type of data recorder device / method	Data logger (digital)
M19. Data recorder device make	Design Analysis
M20. Data recorder serial number	2341 & 2320
M21. Data recorder model number	H-500XL
M22. Data recorder units of measurement	Feet
M23. Frequency of data recording	More frequent than hourly
M24. Additional data recorder info	The canal and pipeline stage is recorded at each site in feet. This stage is converted to flow using validated rating tables.
M25. I am required to report my diversion or storage data by telemetry as of the date this report is submitted	Yes
M26. I report my diversion or storage date by telemetry to the following website	https://www.kisters.net/sce-sb88/stations/A000624/Parameter/V/Amount%20Diverted%20-%20year.xls

Measurement Attachments			
Measurement ID Number	**File Name**	**Description**	**Size**
M000774	402 rtg 12.00.xlsx	402 Canal Rating Table	18 KB
M000774	413 rating table 1.xlsx	413 Salmon Cr Rating Table	12 KB

Measurement Data Files			
Measurement ID Number	**File Name**	**Description**	**Size**
M000774	402 rtg 12.00.xlsx	402 Rating table	18 KB
M000774	413 rating table 1.xlsx	413 Rating Table	12 KB
M000774	A000624 Raw GHTs 2020CY.xlsx	402 & 413 Raw data 2020CY	630 KB

6. Maximum Rate of Diversion	
Month	**Rate of Diversion (Cubic Feet Per Second)**
January	295
February	290
March	291

April	578
May	582
June	577
July	229
August	58
September	43
October	65
November	133
December	130

7. Water Transfers	
7a. Water transfered	No
7b. Quantity transfered (Acre-Feet)	
7c. Dates which transfer occurred	/ to /
7d. Transfer approved by	

Water Supply Contracts	
7e. Water supply contract	No
7f. Contract with	
7g. Other provider	
7h. Contract number	
7i. Source from which contract water was diverted	
7j. Point of diversion same as identified water right	
7k. Amount (Acre-Feet) authorized to divert under this contract	
7l. Amount (Acre-Feet) authorized to be diverted in 2020	
7m. Amount (Acre-Feet) projected for 2021	
7n. Exchange or settlement of prior rights	
7o. All monthly reported diversion claimed under the prior rights	
7p. Amount (Acre-Feet) of reported diversion solely under contract	

8. Storage					
Reservoir name	**Spilled this year**	**Feet below spillway at maximum storage**	**Completely emptied**	**Feet below spillway at minimum storage**	**Method used to measure water level**

Credits Claimed			
	Conservation	**Reclaimed Water Use**	**Conjunctive Groundwater Use**
Claimed? (Yes/No)	No	No	No
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

Conservation Supporting Information	
Description of conservation methods	
Description of baseline water use and time period	
Description of conservation calculation methods	
Conserved water used?	

Additional Remarks
Data for site 413 (Salmon Creek) must have the seasonal release flow value subtracted to equal the flow diverted to the project. This calculated site is 413c. Salmon Creek Release Schedule July - Jan = 1 cfs Feb - June = 4 cfs

Attachments		
File Name	**Description**	**Size**
413c Day Qs 2020CY.docx	413c Daily Vales and AF Data	25 KB
402 Day Qs 2020CY.docx	402 Daily Values and AF Data	25 KB

Contact Information of the Person Submitting the Form	
First Name	Derrick
Last Name	Tito
Relation to Water Right	Company Representative

Information on Certification and Signatory	
Name of Person Signing and Certifying the Report	Derrick Tito
Date of Signature	03/03/2021

[SUMMARY OF FINAL SUBMITTED VERSION]

REPORT OF LICENSEE FOR REPORTING PERIOD

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Primary Contact:

Date Submitted: 03/08/2022

Application Number: A000624
License Number: 000148

Source(s) of Water	POD Parcel Number	County
KERN RIVER		Tulare
SALMON CREEK		Tulare

MAX Direct Diversion Rate: 600 CFS
MAX Collection to Storage: 0 AC-FT
Face Value: 434386.5 AC-FT

Permitted Use(s)	Acres	Direct Diversion Season	Storage Season
Power	0	01/01 to 12/31	

Compliance with License Terms and Conditions	
I have currently reviewed my water right license and I am complying with all terms and conditions	Yes
Description of noncompliance with terms and conditions	

Changes to the Project	
Intake location has been changed	
Description of intake location changes	
Type of use has changed	
Description of type of use changes	
Place of use has changed	
Description of place of use changes	
Other changes	
Description of other changes	

Purpose of Use	
Power	40 MW

Special Use Categories	
Are you using any water diverted under this right for the cultivation of cannabis?	No

Amount of Water Diverted and Used			
Month	**Amount directly diverted (Acre-Feet)**	**Amount diverted or collected to storage (Acre-Feet)**	**Amount used (Acre-Feet)**
January	4630	0	4630
February	6160	0	6160
March	714	0	714
April	16205	0	16205
May	22800	0	22800
June	7950	0	7950
July	2420	0	2420

August	2540	0	2540
September	1520	0	1520
Total	64939	0	64939
Type of Diversion	Direct Diversion Only		
Comments			

Water Diversion Measurement	
Required to measure as of the date this report is submitted	Yes
Is diversion measured?	Yes
An alternative compliance plan was submitted to the division of water rights on	
A request for additional time was submitted to the division of water rights on	

Measurement ID number	M000774
This Device/Method was used to measure water during the current reporting period	Yes
Briefly describe the measurement device or method	Stage DIscharge Rating in flume and Diversion Pipe (2 stations) - USGS reviewed
Nickname	Kern River #3 Conduit near Kernville and Salmon Creek Diversion
Type of device / method	Float
Device make	Waterlog
Serial number	
Model number	H331 SDI12
Approximate date of installation	10/01/2004
Additional info	Method is - two gages which are both reviewed annually by USGS hydrographer's. Main Conduit gage is a stage discharge rating. Added water from Salmon Creek Diversion is a rated flow in a fixed geometry pipeline. The seasonal release must be subtracted from 413 to accurately tabulate the diverted amount shown as site 413c. Salmon Seasonal Release: Jul-Jan 1.0cfs, Feb-Jun 4.0cfs.
Approximate date the measuring device was last calibrated or the measurement method was updated	11/18/2021
Estimated accuracy of measurement	8%
Description of calibration method	Stream gaging using USGS standards to validate ratings.
Describe the maintenance schedule for the device/method	Monthly inspections to validate recorded levels. minimum of 4 annual current meter measurements in main conduit. For smaller diversion monthly checks for obstructions and validation of indicated level.
Information for the person who last calibrated the device or designed the measurement method	
Name	Derrick Tito
Phone number	760-376-8350
Email	Derrick.Tito@sce.com
Qualifications of the individual	Person working under the supervision of a California Professional Engineer

License number and type for the qualified individual above and/or any other relevant explanation	The individual above works under the supervision of a California-Registered Professional Engineer License # M29594
Type of data recorder device / method	Data logger (digital)
Data recorder device make	Design Analysis
Data recorder serial number	2341 & 2320
Data recorder model number	H-500XL
Data recorder units of measurement	Feet
Frequency of data recording	More frequent than hourly
Additional data recorder info	The canal and pipeline stage is recorded at each site in feet. This stage is converted to flow using validated rating tables.
I am required to report my diversion or storage data by telemetry as of the date this report is submitted	Yes
I report my diversion or storage date by telemetry to the following website	https://www.kisters.net/sce-sb88/stations/A000624/Parameter/V/Amount%20Diverted%20-%20year.xls

Measurement Attachments

Measurement ID Number	File Name	Description	Size
M000774	402 rtg 12.00.xlsx	402 Canal Rating Table	18 KB
M000774	413 rating table 1.xlsx	413 Salmon Cr Rating Table	12 KB

Measurement Data Files

Measurement ID Number	File Name	Description	Size
M000774	A000624 Raw GHTs 2021wy.xlsx	402 & 413c Raw Data 2021WY	719 KB

Maximum Rate of Diversion

Month	Rate of Diversion (Cubic Feet Per Second)
January	111
February	167
March	172
April	320
May	570
June	296
July	43
August	42
September	41

Water Transfers

Water transfered	No
Quantity transfered (Acre-Feet)	
Dates which transfer occurred	/ to /
Transfer approved by	

Water Supply Contracts	
Water supply contract	No
Contract with	
Other provider	
Contract number	
Source from which contract water was diverted	
Point of diversion same as identified water right	
Amount (Acre-Feet) authorized to divert under this contract	
Amount (Acre-Feet) authorized to be diverted in 2021	
Amount (Acre-Feet) projected for 2022	
Exchange or settlement of prior rights	
All monthly reported diversion claimed under the prior rights	
Amount (Acre-Feet) of reported diversion solely under contract	

Storage					
Reservoir name	**Spilled this year**	**Feet below spillway at maximum storage**	**Completely emptied**	**Feet below spillway at minimum storage**	**Method used to measure water level**

Credits Claimed			
	Conservation	**Reclaimed Water Use**	**Conjunctive Groundwater Use**
Claimed? (Yes/No)	No	No	No
January			
February			
March			
April			
May			
June			
July			
August			
September			

Conservation Supporting Information	
Description of conservation methods	
Description of baseline water use and time period	
Description of conservation calculation methods	
Conserved water used?	

Additional Remarks

Attachments		
File Name	**Description**	**Size**
402 Daily Qs 2021wy.docx	402 Day Qs 2021WY	24 KB
413c Daily Qs 2021wy.docx	413c Daily Qs 2021WY	24 KB

Contact Information of the Person Submitting the Form

First Name	Derrick
Last Name	Tito
Relation to Water Right	Company Representative

Information on Certification and Signatory	
Name of Person Signing and Certifying the Report	Derrick Tito
Date of Signature	03/08/2022

[SUMMARY OF FINAL SUBMITTED VERSION]

REPORT OF LICENSEE FOR REPORTING PERIOD

October 1, 2021 to September 30, 2022

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Primary Contact:

Date Submitted: 01/18/2023

Application Number: A000624
License Number: 000148

Source(s) of Water	POD Parcel Number	County
KERN RIVER		Tulare
SALMON CREEK		Tulare

MAX Direct Diversion Rate: 600 CFS
MAX Collection to Storage: 0 AC-FT
Face Value: 434386.5 AC-FT

Permitted Use(s)	Acres	Direct Diversion Season	Storage Season
Power	0	01/01 to 12/31	

Compliance with License Terms and Conditions	
I have currently reviewed my water right license and I am complying with all terms and conditions	Yes
Description of noncompliance with terms and conditions	

Changes to the Project	
Intake location has been changed	
Description of intake location changes	
Type of use has changed	
Description of type of use changes	
Place of use has changed	
Description of place of use changes	
Other changes	
Description of other changes	

Purpose of Use	
Power	40 MW

Special Use Categories	
Are you using any water diverted under this right for the cultivation of cannabis?	No

Amount of Water Diverted and Used			
Month	**Amount directly diverted (Acre-Feet)**	**Amount diverted or collected to storage (Acre-Feet)**	**Amount used (Acre-Feet)**
2021			
October	0	0	0
November	5670	0	5670
December	8120	0	8120
2022			

Amount of Water Diverted and Used			
Month	**Amount directly diverted (Acre-Feet)**	**Amount diverted or collected to storage (Acre-Feet)**	**Amount used (Acre-Feet)**
January	11660	0	11660
February	11020	0	11020
March	14530	0	14530
April	23840	0	23840
May	27980	0	27980
June	14820	0	14820
July	2210	0	2210
August	82	0	82
September	97	0	97
Total	120029	0	120029
Type of Diversion	Direct Diversion Only		
Comments			

Water Diversion Measurement	
Required to measure as of the date this report is submitted	Yes
Is diversion measured?	Yes
An alternative compliance plan was submitted to the division of water rights on	
A request for additional time was submitted to the division of water rights on	

Measurement ID number	M000774
This Device/Method was used to measure water during the current reporting period	Yes
Briefly describe the measurement device or method	Stage DIscharge Rating in flume and Diversion Pipe (2 stations) - USGS reviewed
Nickname	Kern River #3 Conduit near Kernville and Salmon Creek Diversion
Type of device / method	Float
Device make	Waterlog
Serial number	
Model number	H331 SDI12
Approximate date of installation	10/01/2004
Additional info	Method is - two gages which are both reviewed annually by USGS hydrographer's. Main Conduit gage is a stage discharge rating. Added water from Salmon Creek Diversion is a rated flow in a fixed geometry pipeline. The seasonal release must be subtracted from 413 to accurately tabulate the diverted amount shown as site 413c. Salmon Seasonal Release: Jul-Jan 1.0cfs, Feb-Jun 4.0cfs.
Approximate date the measuring device was last calibrated or the measurement method was updated	11/18/2021
Estimated accuracy of measurement	8%
Description of calibration method	Stream gaging using USGS standards to validate ratings.

Describe the maintenance schedule for the device/method	Monthly inspections to validate recorded levels. minimum of 4 annual current meter measurements in main conduit. For smaller diversion monthly checks for obstructions and validation of indicated level.
Information for the person who last calibrated the device or designed the measurement method	
Name	Derrick Tito
Phone number	760-376-8350
Email	Derrick.Tito@sce.com
Qualifications of the individual	Person working under the supervision of a California Professional Engineer
License number and type for the qualified individual above and/or any other relevant explanation	The individual above works under the supervision of a California-Registered Professional Engineer License # M29594
Type of data recorder device / method	Data logger (digital)
Data recorder device make	Design Analysis
Data recorder serial number	2341 & 2320
Data recorder model number	H-500XL
Data recorder units of measurement	Feet
Frequency of data recording	More frequent than hourly
Additional data recorder info	The canal and pipeline stage is recorded at each site in feet. This stage is converted to flow using validated rating tables.
I am required to report my diversion or storage data by telemetry as of the date this report is submitted	Yes
I report my diversion or storage date by telemetry to the following website	https://www.kisters.net/sce-sb88/stations/A000624/Parameter/V/Amount%20Diverted%20-%20year.xls

Measurement Attachments			
Measurement ID Number	**File Name**	**Description**	**Size**
M000774	402 rtg 12.00.xlsx	402 Canal Rating Table	18 KB
M000774	413 rating table 1.xlsx	413 Diversion Rating Table	12 KB

Measurement Data Files			
Measurement ID Number	**File Name**	**Description**	**Size**
M000774	A000624 Raw Ghts 2022wy.xlsx	A000624 Raw Data File	621 KB

Maximum Rate of Diversion	
Month	**Rate of Diversion (Cubic Feet Per Second)**
2021	
October	0

November	123
December	263
2022	
January	217
February	254
March	444
April	561
May	527
June	358
July	83
August	1.8
September	1.9

Water Transfers	
Water transfered	No
Quantity transfered (Acre-Feet)	
Dates which transfer occurred	/ to /
Transfer approved by	

Water Supply Contracts	
Water supply contract	No
Contract with	
Contract number	
Source from which contract water was diverted	
Point of diversion same as identified water right	
Amount (Acre-Feet) authorized to divert under this contract	
Amount (Acre-Feet) authorized to be diverted in 2022	
Amount (Acre-Feet) projected for 2023	
Exchange or settlement of prior rights	
All monthly reported diversion claimed under the prior rights	
Amount (Acre-Feet) of reported diversion solely under contract	

Storage					
Reservoir name	**Spilled this year**	**Feet below spillway at maximum storage**	**Completely emptied**	**Feet below spillway at minimum storage**	**Method used to measure water level**

Credits Claimed			
	Conservation	**Reclaimed Water Use**	**Conjunctive Groundwater Use**
Claimed? (Yes/No)	No	No	No
2021			
October			
November			
December			
2022			
January			
February			
March			
April			
May			

June			
July			
August			
September			

Conservation Supporting Information	
Description of conservation methods	
Description of baseline water use and time period	
Description of conservation calculation methods	
Conserved water used?	

Additional Remarks

Attachments		
File Name	**Description**	**Size**
413c Day Qs 2022wy.docx	413 Day Qs with volumes	25 KB
402 Day Qs 2022wy.docx	402 Day Qs with Volumes	26 KB

Contact Information of the Person Submitting the Form	
First Name	Derrick
Last Name	Tito
Relation to Water Right	Company Representative

Information on Certification and Signatory	
Name of Person Signing and Certifying the Report	Derrick Tito
Date of Signature	01/18/2023

414 SALMON CREEK 2005 WY

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 06901

DATE	TIME	ORIFICE ~~DATE~~ STATUS	DIVERSION FLOW	COMMENTS	MADE BY
9-22-04	1120	CLEAR	Ø	DIVERSION STILL TURNED OUT	D. TITO
9-28-04	0900	Clear	Ø	Turned Out	Kevin
9-30-04	0825	Clear	Zero	Turned out	Brian
10-14-04	1400	CLEAR	Ø	TURNED OUT. DRAIN GATE OPEN	D. TITO
10-17-04	0930	Clear	Ø	Turned out, cleaned Diversion for Flowline Out	RH
10-25-04	1000	clear	Ø	Turned out, Est 1CFS, Flowline BACK in Service	RH
10-26-04	0935	clear	Ø	T.O Diversion cleaned & for Flowline outage	RH
11/7/04	1130	Clear	Ø	Turned out, Turned Back in Service	RH
11/11/04	1060	clear	Ø	Turned out Approx 20CFS in Tunnel.	RH
11-18-04	1130	Clear	Ø	Turned Out	JD/DT
11-23-04	0930	Clear	3	Turned In	DSK
11-27-04	0840	Clear	2	2 CFS Total	JD
12-5-04	1130	Clear	2	Lot of Ice Around Orifice, Cleaned Same	JD
12-8-04	1010	clear	2		RH
12-10-04	0930	CLEAR	2	ORIFICE CLEAR	D. TITO
12-14-04	1030	Clear	2		RH
12-21-04	1015	Clr	4+1	5 total Turned In	RH
12-29-04	0845	Clear	4+1	Turned In	DSK
1/6/05	0955	Clear	4+1	5 Turned In	DSK
1-10-05	0915	CLEAR	CAMOS RUN	HIGH FLOW. RACKING DEBRIS	D. TITO

SCE OD 67-B REV 10/85 (CW)

414 SALMON CREEK 2005 WY

Southern California Edison Company
HYDRO DIVISION LOG SHEET

DATE	TIME	ORIFICE STATUS (DATE)	DIVERTED FLOW	COMMENTS SHEET NO. 07351	MAD BY
1-11-05	0840	CLEAR	5	WILL RAKE GRIDS, VERY HIGH FLOW, DAM SPILLING	D. TVT
1-14-05	1010	Clear	8	Raked Grids	JDown
1-15-05	1000	CLEAR	10	Raked Grids	Fahey
1-17-05	1505	Clear	10	Raked Grids	Kenned
1-20-5	1040	Clear	13	Raked Grids	Hud
1-26-05	1140	1 TO 4 CLEAR	18	ORIFICE CHANGE. FLUME SPILLING. WILL REDUCE DIV. FLOW	S. TVT
2-3-05	1104	Clear	9	4 Diverted	D-K
2-6-05	1125	Clear	11	4	JD
2/8/05	0901	CLR	9	9+4 total 10 CFS	KH
2/10/05	0900	Clear	9	9+4	DSK
2-12-05	1225	Clear	8	8+4 9 total	MH
2-20-05	1300	CLR	14	8 total Flume slight Spill	RH
2-22-05	1130	CR	8	RAKED GRIDS, FLUME SPILLING OVER	D. TVT S. KENNEDY
2-23-05	1435	Pleasant	8	RAKED GRIDS, FLUME SPILLING	VS
2-23-05	1445	RAIN	Ø	TURNED OUT TO STOP SPILLING & to check Flows @ PLANT	VS
2-27	1200	Clear	10	Turned in -	JD
3-1	1150	Clear	8	Grids Cleaned	MH
3-4	0900	Clear	Ø	Turned out for plant outage	DSK
3-29	0740	CLEAR 4 CFS	Ø BEFORE / 25 AFTER	TURNING IN DIVERSION AFTER OUTAGE	DAT
4/1/05	1040	Clear	5+	RAKED GRIDS	RH
4/3/05	1115	Clear	30+	Raked Grids	RH/RP
4/9/05	1000	Clear	20	Reduced to 20 in order to load Tunnel	KH
4-4-05	1430	CLEAR	Ø	TURNED OUT DIVERSION.	RH. D.TVT
4-08-05	1130	Clear	26+4	Dam Still Spilling. TURNED IN.	JD
4/11/05	1205	Clear	21	Reducing Flow to Approx 15 total CFS	RH
4/21/05	1140	CLEAR	33	CLEANED LOGS @ DAM, INCREASED FLOW.	DAT
4/26/05	0910	Clear	FULL PIPE	Raked grids	RP
5/3/05	1320	Clear	Full Pipe	Approx 40-45 CFS in Pipe	RH
5/21/05	1215	Clear	Full Pipe	Dam Spilling Also	RH
5-26-05	1045	CLEAR	5 CFS	DAM SPILL HOKUM - USGS IRISP	DAT/OD
6-16-05	1345	"	20 ~ Ø	TURNING OUT - DRAIN OPEN.	DAT
6-23-05	1250	Clear	T/O	Flume spilling slightly. will notify ops	DSK
6-27-05	1410	Clear	T/O	Bi Weekly Inspection	DSK
7-5-05	1345	CLEAR	T/O	DIVERSION TURNED OUT	DAT
7/14/05	0955	Turned out		Approx 4-5 CFS in Creek (Analyst Thermo)	RH
7/27/05	1300	—	Turned Out	Inspection	DSK

SCE OD 67-B REV 10/85 (CW)

2005 WY

414 SALMON CREEK

Southern California Edison Company

HYDRO DIVISION LOG SHEET

DATE	TIME	ORIFICE STATUS	DIVERTED FLOW	COMMENTS SHEET NO. 07352	MADE BY
8/4/05	1100	CLR	Turned out	Routine check, Approx 2.57 CFS	RCH
8/11/05	1400	clear	Turned out	Weekly Chk	DSK
8/12/05	1000	CLEAR	TURNED IN	HERE TO TURN IN.	SB
8/22/05	1414	clr	T/IN	Turned IN	DSK
8-25-05	0952	clear	T/OUT	TURNED OUT / OPENED DRAIN GATE TO FLUSH	RA
9-6-05	1140	CLEAR	TURNED OUT	" " - HERE TO RUN LEVELS	DAT/AJR
9-12-05	1600	Clear	Turned out		RV
9/21/05	0950	CLR	Turned in	4+4	NH
9/27/05	1040	CLEAR	" "	4 CFS ALL OUT ORIFICE/USGS INSP.	DAT/DB
9/28/05	0910	Clear	TI	4 CFS ALL OUT ORIFICE	SB
10/3/05	1100	CLEAR	TI 2 CFS	ALL FLOW OUT 4 CFS ORIFICE	DAT

Southern California Edison Company

HYDRO DIVISION LOG SHEET

414 SALMON CREEK 2006 WY

SHEET NO. 07353

DATE	TIME	ORIFICE DATE STATUS	DIVERTED FLOW TURNED IN	COMMENTS	MADE BY
10-3-05	1100	CLEAR	2 CFS	ALL FLOW GOING OUT ORIFICE	DAT
10-6-05	1605	clr	Turned in	All flow Going out orifice	DSL
10-11-05	1540	Clear	TURNED IN	RAKED GRIDS	
10-13-05	1100	Clear	TURNED OUT	POND DRAIN gates opened NO DIVERTED FLOW DUE TO upcoming WORK	JRS
10-15-05	1150	CLEAR	TURNED OUT	CONDUIT OUT. 4 CFS PLATE REMAINS ON.	DAT
12-28-05	1930	CLEAR	TURNED OUT	CONDUIT FLOWING - DIVERSION TØ. 4 CFS PLATE ON	DAT
2-13-06	1130	CLEAR	TURNED OUT	" " - " " " " "	DAT
2-25-06	1210	Clear	Turned IN	6 CFS Diverted 4 CFS ORIFICE ON	RA
2-28-06	1240	CLEAR	13	13 CFS Diverted 4 cfs orifice (R+M/2)	
3-1-06	0950	Clear	10	10 CFS DIVERTED 4 CFS Release	
3-3-06	0850	Clear	12	OPENED V/U 10 TURNS.	
3-7-06	0850	Clear	15	RAKED GRIDS OPENED V/U 5 TURNS	
				FLUME HAS 1' FREEBOARD	JRS
3-14-06	0840	Clear	9	Flume has 2' Freeboard	JD/RH
3-30	1310	Clear	4+12	16 CFS Total	JD/RA
3-31	1100	Clear	4 +10	Flume @ slight spill, CUT BACK DIV to 10	JRS
4/6/06	1000	CLR	15	11+4 Dam Spilling Approx 20 CFS	RA
4/10/06	0945	CLR	10	10 + 4 DAM SPILLING. OPENED DRAINS	
—	—	—	—	About 4" more. Flume Right @ spill	JS
4-17-06	1200	CLR	10	DAM SPILLING Flume @ spill	JRS
4-27-06	1100	CLR	10	DAM SPILLING Flume HAS slight spill	JRS
4/30-06	6840	CLR Yeas	11	15 Total Dam Spilling Approx 30 CFS	
5-7-06	1000	Clear	15	Dam spilling About 30-40 CFS	
5-8-06	0945	CLEAR	11	" " " " 4 CFS REL PLATE ON	DAT
5-11-06	1330	Clear	12	Dam Spilling 20-30 CFS	JO
6/2/06	1130	clear	11	Dam Spilling 4 CFS Rel Plate OK	RA
6-6-06	1105	CLEAR	10	4 CFS PLATE REMAINS ON.	DAT
6-8-06	1000	Clear	10	Closed inside Drain Gate to avoid obstructions	DSL
—	—	—	—	Dam Spilling & Flume has minor spill	—
6-20-06	0800	CLEAR	ø	DIV FLOW 10 CFS - TØ @ 0800 All WATER OUT DRAIN GATE - TESTING FLOW	DAT
6-20-06	0940	TO	ø		
6-28-06	0845	TØ/CLEAR	ø	DRAIN OPEN.	DAT
7-17-06	1215	TØ/CLEAR	ø	" "	DAT
7-19-06	1440	TØ/CLEAR	ø	DRAIN OPEN, USGS INSP.	DAT/DB
8-29-06	1020	TO/clear	ø	Drain Open.	
9-7-06	0920	TØ/CLEAR	ø	" "	DAT

Southern California Edison Company

HYDRO DIVISION LOG SHEET

414 SALMON CREEK
2007 WY

DATE	TIME	ORIFICE STATUS	DIVERTED FLOW	COMMENTS — SHEET NO. 07354	MADE BY
10-2-06	1115	CLEAR	ϕ	TURNED OUT. DRAIN GATE OPEN.	DAT
10/25/06	1075	TO	TO	Cleaned Out For Flowline Outage	RLH
10/31/06	1135	TO CLEAR	TO ϕ	TURNED OUT. USGS INSP.	DAT/OB
11/27/06	1040	TO CLEAR	ϕ	TURNED OUT.	DAT
12/18/06	1330	TO Clr	ϕ	TO	DSK
1/2/07	1530	TO CLEAR	ϕ	TURNED OUT.	DAT/LW
1/9/07	0900	TO Clr	ϕ	TO	DSK
2/14/07	1100	TO	ϕ	TURNED OUT.	DAT
3/7/07	1200	TO	ϕ	" "	DAT
3/20/07	0925	CLEAR	24	FLOWLINE READY FOR TURN IN. 4 CFS PLATE ON. ORIFICE CLEAR.	DAT
3-21-07	1400	Turned	out	Flow Line	JD
4-5-07	1100	Clear	10	Turned In Flow Line	JD
4-9-07	1300	CLEAR	8	4 CFS REL.	DAT
4-27-07	1110	Clear	8	4 CFS Rel. RAKED GRIDS	JRS
5-1-07	0954	Clear	15	4 CFS Rel RAKED GRIDS	RA/EB
5-10-07	1330	CLEAR	1	4 CFS REL.	DAT
5-16-07	1135	CLEAR	ϕ	4 CFS ALL OUT RELEASE PIPE - USGS INSP.	DAT/OB
5-22-07	1535	CLEAR		4 CFS ALL out RELEASE	RA/EB
5/31/07	1435	Clear	ϕ	2 CFS all out Release	RA
6/18/07	1445	CLEAR	ϕ	0.5 CFS OUT REL. PIPE.	DAT
6/14/07	1100	Clr	T/O	Turned Out, Drain Gate Broke	DSK
7/23/07	1030	CLEAR	T/O	TURNED OUT. 4 CFS PLATE ON.	DAT
8/4/07	0945	Clr	T/O	Flowline Turned Out Tagger Gates	DSK
8/30/07	1310	CLEAR	TO	TURNED OUT.	DAT
9/19/07	1025	CLEAR	TO	" " , 4 CFS PLATE ON.	DAT
10/8/07	1015	Clr	TO	Turned out.	DSK

SCE OD 67-B REV 10/85 (CW)

414 SALMON CREEK

2008 WY

Southern California Edison Company

HYDRO DIVISION LOG SHEET

COMMENTS SHEET NO. 07355

DATE	TIME	ORIFICE PIPE STATUS	DIVERTED FLOW	COMMENTS	MADE BY
10/8/07	1015	CLEAR	TØ	TURNED OUT.	DSK
10/16/07	1140	CLEAR	TØ	TURNED OUT.	DAT
10/22/07	9101	Clear	Ø	TO	RT
11/7/07	1720	CLEAR	Ø	USGS INSP TØ 4 CFS PLATE REMAINS OUT	DAT/DB
12/17/07	1255	CLEAR	Ø	TURNED OUT.	DAT
1/24/08	0943	Clear	Ø	TO Parker/	
1/29/08	1130	CLEAR	Ø	TØ	DAT
3/10/08	1500	CLEAR	Ø	TØ. WATER TURNED INTO CANAL @ INT @ 1230	DAT
3/18/08	0800	clear	12 IN 4 OUT	Turned in Diversion	PA/RH
3/24/08	0900	clear	10		RT
3/27/08	0730	Clear	10	Raked grids, opened up diversion, now C16	
3/27/08	1430	Clear	16	Raked Grids	
3/31/08	1615	Clear	18	Raked Grids	MP
4/2/08	1820	Clear	18	Raked Grids Cloudy Day	MP
4/3/08	1100	Clear	14	Raked Grids Clear/Warm	
4/14/08	1530	CLEAR	6 IN 4 OUT	4 CFS PLATE IN.	DAT
4/14/08	1540	CLEAR	22 IN 4 OUT	RAKED GRIDS - FLOW INCREASED!	DAT
4/19/08	0900	clear	2 IN 4 OUT	Raked Grids	DSK
4/25/08	1530	clear	TD	Turned out Diversion to Reduce flow @ Plant	DSK
				Diversion intake Closed/ Pond Drain open/ Drain Open	
5/1/08	1415	CLEAR	TØ	DIVERSION TURNED OUT. PIPE DRY.	DAT
5/13/08	1320	CLEAR	TØ	USGS INSP. TURNED OUT. PIPE DRY.	DAT/DB
6/4/08	1215	CLEAR	TØ	DIVERSION TURNED OUT. PIPE DRY	DAT
7/7/08	1250	CLEAR	TØ	" " " " "	DAT
8/4/08	1340	CLEAR	TØ	" " " " "	DAT
9/11/08	1325	CLEAR	TØ	" " " " "	DAT
9/29/08	1125	CLEAR	TØ	" " " " "	DAT
9/30/08	0945	CLEAR	TØ	RAN FULL SET OF LEVELS.	DAT/KB

SCE OD 67-B REV 10/85 (CW)

Southern California Edison Company

HYDRO DIVISION LOG SHEET

2009 WY 414

SALMON CR DIV.

NOTES

SHEET NO. ~~07356~~

DATE	TIME	ORIFICE ~~DATE~~ STATUS	DIVERTED FLOW	REL	VISIT MADE BY
10-9-08	1340	CLEAR	ϕ	TURNED OUT. 4CFS RATE ON.	DAT
10/15/08	1250	clear	ϕ	TO.	RMDD
10/30/08	1100	clear	ϕ	Here to do monthly routines	Tom Humphrey
11/5/08	1300	CLEAR	ϕ	TURNED OUT	DAT
11/18/08	1550	CLEAR	ϕ	TO USGS INSP.	MT/OB
12/4/08	1040	CLEAR	ϕ	TO	DAT
1/13/09	0830	CLEAR	ϕ	TO, 4CFS PLATE ON.	DAT
2/4/09	1320	CLEAR	ϕ	TO	DAT
3/1/09	1029	clear	13-4=9	Turned in 9 cfs into tunnel.	DSL
3/2/09	1140	clear	15-4	Turned in 15 cfs into tunel ?	JLH
3/9/09	0960	CLEAR	8-4	4CFS PLATE ON. RAKED GRIDS	DAT/JLH
3-13-09	1100	Clear	4-4	Raked Grids	JLH
3-16-09	10:30	clear	7-4	Raked Grids 7 cfs into tunel	JLH
3-17-09	10:30	clear	17-4=13	Raked grids 13 cfs into tunel	JLH
3-23-09	10:45	clear	15-4=11	11 cfs into tunel Raked grids	JLH
~~3-25-09~~	~~10:30~~	~~clear~~	~~18-4=14~~	Dam spilling due to leaves	JLH
3-25-09	10:30	clear	18-4=14	Dam spilling 14 cfs into tunel	JLH
3-26-09	10:30	clear	17-4=13	13 cfs into tunel	JLH
3-29-09	08:30	clear	8-4	12-total Reduced Flow to Avon Tunnel to Flow	RH
4-2-09	1035	clear	10-4	Raked Grids Dam spilling	MP
4-7-09	1010	clear	7-4	Raked Grids Dam Spilling	MP
4-9-09	0940	clear	9-4	Raked Grids Dam Spilling	MP
4-13-09	1005	clear	7-4	Raked Grids Dam Spilling	MP
4-15-09	1410	clear	13-4=9	Raked grids 9 cfs into tunel	JLH
4-20-09	1055	Clear	12-4	Raked grids Dam spilling	MP
4-21-09	1345	Clear	11-4	Raked grids Dam spilling	MP
4-22-09	0915	clear	11-4	Raked grids Dam spilling	MP
4-27-09	1020	Clear	11-4	Raked grids Dam Spilling	MP
4-29-09	0855	clear	11-4	Dam spilling	MP
5-4-09	1055	Clear	10-4	Dam Spilling	MP
5-6-09	1115	clear	10-4	Raked grids Dam spilling	MP
5-11-09	1000	Clear	10-4	Raked grids Dam spilling	MP
5-12-09	0840	CLEAR	10-4	FLUME SPILLING.	DAT
5-14-09	1005	Clear	10-4	Dam spilling	MP
5-17-09	0945	Clear	10-4	Dam not Spilling	MP
5-20-09	0855	clear	10-4	Dam not spilling	MP
5-26-09	1530	clear	10-4	Dam not spilling	JLH

SCE OD 67-B REV 10/85 (CW)

414 SALMON CREEK

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 07357

DATE	TIME	ORIFICE ~~DATE~~ STATUS	DIVERTED FLOW	NOTES	VISIT MADE BY:
5-27-09	0900	Clear	6-4=2	Dam not spilling.	D.T.E.
5-28-09	1448	Clear	5½-4=1½	Dam not spilling.	D.T.E.
6-1-09	10:00	clear	5½-4=1½	Dam not spilling	RT
6-3-09	1540	Clear	5-4=1	Dam not spilling ✓	RT
6-8-09	1430	CLEAR	7-4=3	ORIFICE CLEAR	DAT
6-8-09	1440	clear	7-4=3	DAM not spilling	JLA
6-10-09	1400	clear	7-4=3	DAM not spilling ALL OK	JLA
6-15-09	1620	cloudy	4-4=0	"	DTE
6-17-01	1600	cloudy	5-4=1	Routines " 1 cfs into tunel	JLA
6-23-09	1600	clear	3-3=0	Routines / Dam not spilling	DTE
6-25-09	1800	CLEAR	2-4=0	ALL WATER OUT ORIFICE - ZERO DIV. USGS INSP.	DAT/DB
6-29-09	1430	clear	1-4=0	Routines / "	DTE
7-7-09	1625	clear	.5-4=0	Routines "	DTE
7-16-09	1015	clear	.5-4=0	Routines "	DTE
7-27-09	1220	clear	Turned Out	Monthly Patrol	DTE
8-3-09	1500	clear	Turned out	Routines	JLA
8-10-09	1000	CLEAR	TURNED OUT	TO	DAT
8-17-09	1550	clear	Turned out	Routines	JLA
8-24-09	1545	clear	Turned out	Routines All ok	JLA
8/25/09	1068		T.O	Operational check → Need IA Not installed	RR2
8-27-09	1500	Clea	Turned out	All ok /	JLA
9-4-09	1510	CLEAR	TO	ALL WATER IN CREEK.	DAT

SCE OD 67-B REV 10/85 (CW)

2009 SALMON CR. DIV. 2010 WY

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 07358

DATE	TIME	ORIFICE ~~DATE~~ STATUS	DIVERTED FLOW	NOTES	VISIT MADE BY:
10-6-09	1350	CLEAR	Ø	TURNED-OUT. 4cfs PLATE ON	DAT
10-21-09	1340	CLEAR	Ø	TURNED OUT 4cfs " "	DAT
12-21-09	1400			Routines	JCH
1-11-10	1200	CLEAR	Ø	TURNED-OUT. 4CFS PLATE ON	DAT
1/31/10	1230	CLEAR	4+1	TURNED IN - 4CFS PLATE ON	RCH/DK
2/1/10	1055	CLEAR	Ø	4 CFS PLATE ON 2.5CFS TOTAL - ALL OUT RELEASE	DAT
2-1-10	1515	clear	Ø	Routines	JCH
2-6-10	0915	clear	Ø	3cfs total - All Released	DAT
2-8-10	1445	clear	Ø	1 cfs Routines	JCH
2-10-10	1030	clear	Ø	1 cfs Routines	JCH
2-11-10	1022	clear	Ø	1 cfs Monthly Routines	JCH
2-16-10	1524	clear	Ø	1 cfs Weekly routines	JCH
2-18-10	1505	clear	Ø	1 cfs Weekly routines	MP
2-22-10	1530	clear	Ø	1 cfs	MP
2-25-10	1430	clear	Ø	1 CFS Routines	JCH
3-1-10	0900	CLEAR	3 cfs	4CFS OUT RELEASE ORIFICE. 7 CFS TOTAL	DAT
3-4-10	1505	Clear	3cfs	Weekly routines	MP
3-12-10	1020	Clear	3 cfs	monthly routines	MP
3-18-10	1440	Clear	3cfs	Weekly routines	MP
3-19-10	1520	Clear	3cfs	weekly routines	MP
3-15-10	1425	Clear	3cfs	Weekly routines	MP
3-18-10	16000	clear	3 cfs	weekly routines	JCH
3-22-10	1430	Clear	3cfs	Weekly routines	MP
3-24-10	1400	Clear	3cfs	Weekly routines	MP
3-29-10	1410	Clear	3cfs	Weekly routines	MP
3-31-10	1350	clear	3	routines	JCH
4-5-10	1350	clear	4	routines	JCH
4-12-10	1430	clear	6+4	routines	RT
4-13-10	0830	CLEAR	5	4CFS PLATE ON & FREE FLOWING	DAT
4-14	1230	clear	5	routines	JCH
4-20	1400	clear	11	routines 15-4=11	JCH
4-22	1500	clear	15	19-4=15cfs Routines	JCH
4-28	0845	clr	15	Raked Grids 20-5	DK
5-3-10	0830	CLEAR	Ø	GRIDS PLUGGED - ALL FLOW OUT OF PIPE	DAT
5-7-10	0840	CLEAR	16	RAKED GRIDS. 20CFS - 4CFS	DAT
5-13-10	1330	CLEAR	21	RAKED GRIDS & ADDED 5 CFS PER HUGHES	DAT
5-16-10	1615	clear	21	Raked grids 25 cfs - 4=21cfs	JCH

SCE OD 67-B REV 10/85 (CW)

SALMON CR DIV. 2010 WY

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 07359

DATE	TIME	ORIFICE STATUS	DIVERTED FLOW	NOTES	VISIT BY
5/6/10	1020	CLR	20	5 Prior to Cleaning Grids 24 APPX	RH
5/12/10	1230	CLR	27	Increase Flow to Achieve 1650 AMPS	RH
5/13/10	0930	CLR	28	Raked Grids	DAT
5-16-10	0945	CLEAR	28	RAKED GRIDS 32-4 CFS = 28 TO CANAL. 4 CFS BYPASS	DAT
5-12-10	1400	clear	28	Raked grids	JCH
5-17-10	1200	clear	31	Raked grids 35-4 = 31	DAT
5-18-10	1514	clear	31	Raked grids (Broken walk boards)	JCH
5-19-10	1630	clear	31	Raked grids 35-4 = 31 cfs	JCH
5-19-10	1600	clear	31	Raked grids 35-4=31 cfs	JCH
5-20-10	1415	clear	36	Raked grids 40 cfs - 4 = 36	
				Replaced walk boards	JCH
5-24-10	1525	clear	36	Raked grids 40-4 = 36	JCH
5-25-10	1135	clear	36	Raked grids	JCH
5-26-10	1535	clear	36	Routines Raked grids	JCH
5-30-10	1100	clr	36	Raked Grids	DEC
6-2-10	0930	clear	36	Routines Raked Grids	JCH
6-6-10		clr	35	Raked Grids	DEC
6-7-10	1400	clear	35	Raked grids	JCH
6-14-10	1340	clear	35	Routines Raked Grids	MP
6-16-10	1440	clear	15	19 - 4 = 15 CFS Raked grids	JCH
6-17-10	1215	CLEAR	13	17-4=13, ORIFICE 4 CFS OK, USGS INSA.	DAT/DK
6-21-10	1630	clear	13	17-4=13 Routines	JCH
6-24-10	1430	Clear	13	Raked Grids	MP
6-27-10	0930	clear	13	Raked Grids	MP
7-1-10	1005	CLEAR	4	8-4=4 TO TUNNEL.	DAT
7-6-10	1430	" "	5	Routines	JT
7-8-10	1450	" "	5	" "	RT
7-11-10	1520	Clear	5	Raked Grids	MP
7-19-10	1545	Clear	5	Raked Grids	MP
7-21-10	1550	clear	4	Routines	JCH
8-2-10	1550	Clear	2	Routines	MP
8-9-10	1430	Clear	2	Routines	MP
8-11-10	1500	Clear	2	Routines	MP
8-16-10	0905	CLEAR	8	TURNED OUT, DRAIN GATE OPEN	DAT
8-25-10	1500	Clear	8	Routines	JCH
8-26-10	1315	Clear	0	Monthly Routines	JCH
8-30-10	1520	Clear	0	Routines	MP

Southern California Edison Company
HYDRO DIVISION LOG SHEET

SALMON CR. DIV. 2010 WY

SHEET NO. 07361

TIME	DATE
	9-14-10
1015	Humphers, Paul here to do monthly routines
1020	Away to Bryn Canyon Hyphers
	9-22-10
1560	Humphers, Paul here to do routines turned out
1550	Away to Corral Creek Hyphers
	9-27-10
1300	Paul - Here for routines
1310	Away to KR3 Intake WH

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SALMON CR 2011 WY

414

SHEET NO. 07362

DATE	TIME	ORIFICE DIAMETER STATUS	FLOW	NOTES	VISIT MADE BY
10/5/10	0835	CLEAR	Ø	4 CFS PLATE ON - ALL WATER CREEK	DAT/DC
10/18/10	0900	clear	Ø	TURNED OUT	RA
11/4/10	1200	CLEAR	Ø	TURNED OUT	DAT
11/21/10	1350	clear	Ø	Turned out Routines	JLA
12/14/10	1430	CLEAR	Ø	TURNED OUT	DAT
1/3/11	1455	Clear	Ø	Turned Out	DTE
1-11-11	1517	clear	Ø	Routines Monthly	JLA
1-24-11	1100	clear	Ø	Routines, weekly	JLA
1-27-11	-	Clear	Ø	Turned Out	DSC
1-27-11	1400	clear	Ø	Routines	JLA
2-1-11	1050	CLEAR	Ø	TURNED OUT.	DAT
2-2-11	1045	clear	Ø	Routines	JLA
2-7-11	1042	clear	Ø	Routines	JLA
2-9-11	1330	clear	Ø	Routines	JLA
2-14-11	1000	clear	Ø	Routines	JLA
2-16-11	1300	clear	Ø	Routines	JLA
2-22-11	0930	clear	Ø	Routines	JLA
2-24-11	1045	Clear	Ø	Routines	JLA
2-28-11	0950	Clear	Ø	Routine	JLA
3-2-11	1050	CLEAR	Ø	TURNED OUT.	DAT
3-2-11	1445	clear	Ø	Routines	JLA
3-7-11	1540	Clear	Ø	Routines	JLA
3-9-11	1630	clear	Ø	Routines	JLA
3-14-11	1000	CLEAR	Ø	Routines	JLA
3-16-11	1315	clear	Ø	Routines	JLA
3-30-11	1345	Clear	Ø	Routines	JLA
4-6-11	0925	CLEAR	Ø	TURNED OUT. HEAVY SPILL.	DAT
4-7-11	0925	clear	Ø	Routines	JLA
4-11-11	1445	Clear	Ø	Routines	JLA
4-14-11	0955	clear	Ø	Routines	JLA
4-20-11	0900	Clear	Ø	Routine	MD
4-21-11	1545	clear	Ø	Routines	JLA
4-27-11	1005	clear	Ø	Routines	JLA
5-2-11	0920	CLEAR	Ø	TURNED OUT.	DAT
5-2-11	10:20	Clear	Ø	Routine	MP
5-16-11	1500	Clear	Ø	Routines	MD
5-24-11	0945	clear	Ø	Monthly Routine	JLA

SALMON CR 2011 WY 44

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 07363

DATE	TIME	ORIFICE STATUS	ESTIMATED FLOW	NOTES	VISIT MADE BY
5-25-11	0915	clear	∅	Routines	
6-1-11	0850	CLEAR	∅	TURNED-OUT.	DAT
6-12-11	1052	clear	∅	Routines	JLA
6-20-11	1215	clear	∅	Routine Log Box broken into	JLA
6-22-11	1130	clear	∅	Both Locks cut off	JLA
6-23-11	1115	Clear	∅	Routine Patrol	DTE
7-5-11	0905	CLEAR	∅	TURNED OUT.	DAT
7-6-11	0800	clear	∅	Routines	JLA
7-11-11	1020	clear	∅	Routines	JLA
7-14-11	0830	clear	∅	Routines	JLA
7-18-11	1130	clear	∅	Routines	JLA
7-20-11	1530	clear	∅	Routines	JLA
7-27-11	1140	clear	∅	Routines	RT
8-3-11	0930	CLEAR	∅	TURNED OUT.	DAT
8-15-11	1105	clear	∅	Routines	JLA
8-17-11	1056	clear	∅	Routines Turned Out	JLA
8-17-11	1500	CLEAR	∅	TURNED OUT. USGS INSP.	DAT/OB
8-22-11	1030	clear	∅	Routines / Turned out	JLA
9-7-11	0929	CLEAR	∅	TURNED OUT.	DAT
9-8-11	1045	clear	∅	Routines / Turned Out	JLA
9-12-11	1055	clear	∅	Routines / Handrail Damage	JLA
9-20-11	1455	CLEAR	∅	TURNED OUT. USGS INSP.	DAT/MB
10-3-11	1613	Clear	∅	Turned Out / Routine Inspection	DTE

SCE OD 67-B REV 10/85 (CW)

2012 WY

Southern California Edison Company

SALMON CREEK DIVERSION

HYDRO DIVISION LOG SHEET

SHEET NO. 07364

DATE	TIME	ORIFICE STATUS	DIVERTED FLOW	NOTES	MSR READ BY
10-5-11	0845	CLEAR	Ø	TURNED OUT	DAT
10-6-11	1030	clear	Ø	Turned Out	DTE
10-10-11	1530	Clear	0	Turned Out	DTE
10-19-11	1620	"	0	" "	RT
10-24-11	1100	CLR	Ø	TURNED OUT	MC
10-26-11	1525	CLEAR	Ø	TURNED OUT: USGS INSP.	DAT
11-1-11	0840	CLEAR	Ø	TURNED OUT.	DAT
11-2-11	1545	clear	0	Turned out	RT
11-23-11	1430	"	"	" "	RT
11/25/11	0940	CLEAR	Ø	TURNED OUT	MC
12/5/11	1530	clear	Ø	Turned out	RT
12/9	1530	Clear	Ø	" "	RT
1/3/12	1515	clear	Ø	Turned Out	RT
1-9-12	0955	CLEAR	Ø	TURNED OUT. 4 CFS PLATE ON.	DAT
1-11-12	1430	Clear	Ø	Turned out	RT
1-16-12	1640	clear	Ø	Turned Out	DTE
1-23-12	1446	clear	Ø	Turned Out	DTE
1/25/12	1130	clear	4+4	TURNED IN	
1-25-12	1450	clear	1+4	Routines	RT
1/26/12	1035	CLEAR		TURNED IN	MC
1-30	1500	clear	2+4	Routines	RT
1-31	1400	CLEAR	3+4		TN
2-1-12	0820	CLEAR	1	4 CFS OUT RELEASE 5 TOTAL	DAT
2-2-12	1410	clear	2+4	Routines	RT
2-6-12	1500	clear	2+4	Routines	RT
2-8-12	1600	clear	1+4	Routines	RT
2-13-12	1500	clear	2+4	Routines	JLH
2-22-12	1410	clear	1-4	Routines	RT
2-27-12	1600	clear	1-4	Routines	JLH
3/2/12	1330	CLEAR	1-4	ROUTINES	TN
3-5-12	1615	clear	1-4	Routines	JLH
3-12-12	1630	Clear	1-4	Routines	JW
3/19/12	1240	clear	4+6	4+6 inspector (10) total	RH
3/21/12	1310	Clear	10	4+10 = 14 Total (Possion Table)	RH
3/26/12	0850	CLEAR	8	4+8 = 12 total	DAT
3/28/12	0932	CLEAR	10	4+10 = 14	MC
3/29/12	0953	CLEAR	10	4+10 (14)	MC

SCE OD 67-B REV 10/85 (CW)

Southern California Edison Company

HYDRO DIVISION LOG SHEET

2012 MY

DATE 3/27/12 SHEET NO. 07365

TIME		STATUS	Diverted	NOTES	
3/27	1330	CLEAR	16+4		CA
3/27	1600		Routines		JLA
3/28/12	1015	Clear	12+4	Feeder Factor	RM
3/29/12	0915	CLEAR	16+4	Inspection	RA
3/31/12	1205	CLEAR	18+4	Rounds	MC
4/1/12	1310	CLEAR	18+4	Rounds	MC
4-2-12	1000	Clear	18+4	Routines	JLA
4/3/12	0940	CLEAR	17+4	INSPECTION	TV
4/4/12	1000	Clear	17+4	INSPECTION	TV
4/5/12	1100	Clear	17+4	Routines	JLA
4/8/12	1300	Clear	12+4	INSPECTION	TV
4-9-12	1015	Clear	12+4	Routines	JLA
4-9-12	1205	CLEAR	12+4	CHECK	DAT/JRS
4-12-12	1020	Clear	12+4	Routines	CWS/JRS
4/16/12	1130	Clear	17-4	Routins	CS/JH
4-18-12	15:30	Clear	27-4	Routines	CS/JH
4-19-12	0900	CLEAR	24-4	TURNER FULL. TURNING OUT	DAT
4-19-12	0910	CLEAR	Ø	TURNED OUT.	DAT
4-23-12	1145	clear	Ø	Routines	JLA
4-24-12	1045	Clear	Ø	Monthly flowline inspection	CWS
4-30-12	1700	Clear	Ø	Routines / Turned out	CWS
5-2-12	1500	clear	Ø	Routines / turned out	CWS
5-9-12	1100	clear	Ø	Routines / turned out	CWS
5-14-12	1300	clear	Ø	Routines	JLA
5-28-12	1530	Clear	Ø	Routines / Turned Out	DTE
5-30-12	1830	Clear	Ø	Routines	JLA
6-4-12	1500	clear	Ø	Routines	JLA
6-7-12	0930	CLEAR	Ø	TURNED OUT. 4 CFS PLATE ON	DAT/JRS
6-7-12	1030	clear	Ø	Routines	JLA
6-14-12	1330	clear	Ø	Routine	JLA
6-16-12	1720	CLEAR	Ø	Rounds	MC
7-5-12	0900	CLEAR	Ø	TURNED OUT	JRS
7-12-12	1030	Clear	Ø	Routines	JLA
7-19-12	1600	Clear	Ø	Routines	JLA
8-1-12	1435	Clear	Ø	TURNED OUT	JRS
8-21-12	1410	CLEAR	Ø	TURNED OUT. USGS INSP.	DAT/JRS/tm

SALMON CREEK 2012 WY

Southern California Edison Company

DIVERSION

HYDRO DIVISION LOG SHEET

DATE	TIME	STATUS ~~DATE~~	DIVERTED Flow	NOTES SHEET NO. 07366	VISIT BY:
8-21-12	1410	CLEAR	Ø	TURNED OUT. USGS INSP.	DAT/JRS/
8-27-12	1030	clear	Ø	Routines	JCM
9-4-12	1515	CLEAR	Ø	TURNED OUT	JRS
9-11-12	0812	CLEAR	Ø	TØ	DAT
9-19-12	1435	CLEAR	Ø	TØ - FERC INSP.	DAT/BK/KH/AL

SCE OD 67-B REV 10/85 (CW)

414 .. SALMON CR. DIVERSION
2013 WY

Southern California Edison Company

HYDRO DIVISION LOG SHEET

DATE	TIME	ORIFICE ~~DEPT~~ STATUS	DIVERTED FLOW	NOTES SHEET NO. 07367	VISIT BY
10-1-12	0850	CLEAR	∅	TURNED OUT 4 CFS PLATE ON	DAT
11-1-12	0810	CLEAR	∅	TURNED OUT " " " "	DAT
12-3-12	1000	clear	∅	Routines	JLA
12-3-12	1105	CLEAR	∅	TURNED OUT. 4 CFS PLATE ON	DAT
12-4-12	1220	CLEAR	∅	TURNED OUT. USGS INSP.	DAT/JRS/JMS
12-5-12	1155	CLEAR	∅	ROUTINES	ST
12-10-12	1015	CLEAR	∅	ROUTINES	ST
12-17-12	0904	CLEAR	∅	ROUTINES	ST
12-17-12	1145	CLEAR	∅	ROUTINES	ST
12-21-12	915	CLEAR	∅	ROUTINES	SRM
12-31-12	10:15	CLEAR	∅	ROUTINES	SRM
1-2-13	939	CLEAR	∅	ROUTINES	ST
1-2-13	1427	CLEAR	∅	TURNED OUT, 4 CFS PLATE ON	JRS
1-7-13	1004	CLEAR	∅	ROUTINES	ST
1-10-13	0906	CLEAR	∅	ROUTINES	ST
1-14-13	1030	CLEAR	∅	ROUTINES	ST
1-16-13	0944	CLEAR	∅	ROUTINES	ST
1-23-13	0928	CLEAR	∅	RED TAGS NOT ON DIVERSION PARTS ROUTINES	ST
1-28-13	1006	CLEAR	∅	ROUTINES/GOOD FLOW OF WATER IN CREEK	ST
1-30-13	0929	CLEAR	∅	ROUTINES	ST
2-4-13	1015	CLEAR	∅	ROUTINES	ST
2-7-13	1130	CLEAR	∅	TURNED OUT. 4 CFS PLATE ON	DAT
2-7-13	1430	CLEAR	∅	ROUTINES	ST
2-11-13	1057	CLEAR	∅	ROUTINES	ST
2-13-13	1416	CLEAR	∅	ROUTINES	ST
2-19-13	1423	CLEAR	∅	ROUTINES	ST
2-21-13	0905	CLEAR	∅	ROUTINES	ST
2-25-13	1010	CLEAR	∅	ROUTINES	ST
3-3-13	0930	CLEAR	∅	ROUTINES	ST
3-5-13	1630	CLEAR	∅	ROUTINES	ST
3-7-13	0649	CLEAR	∅	TURNED OUT, 4 CFS PLATE ON	JRS
3-11-13	1015	CLEAR	∅	ROUTINES	ST
3-13-13	1010	CLEAR	∅	ROUTINES	ST
3-13-13	1300	4	.5	TURNED IN	TV
3-14-13	1500	CLEAR	.5	RAKE GRIDS/TURNED IN	ST
3/17/13	1200	CLEAR	4+12	Raked grids	DAT
3/18/13	0936	CLEAR	15	ROUTINES/RAKE GRIDS	ST

SCE OD 67-B REV 10/85 (CW)

414 SALTGEN CR. DIVERSION

Southern California Edison Company

HYDRO DIVISION LOG SHEET

2013 WY

07368

DATE	TIME	ORIFICE STATUS	DIVERTED FLOW	NOTES	VISIT BY
3-19-13	0900	CLEAR	18-4	RAKE GRIDS	ST
3-19-13	1530	CLEAR	15-4	RAKE GRIDS	ST
3-20-13	0830	CLEAR	15-4	ROUTINES/RAKE GRIDS	ST
3-20-13	1615	CLEAR	16-4	RAKE GRIDS	ST
3-21-13	0830	CLEAR	13-4	RAKE GRIDS	ST
3/23/13	1100	CLEAR	7-4	RAKE GRIDS	GWO
3/25/13	1016	CLEAR	7-4	ROUTINES/RAKE GRIDS	ST
3/30/13	1420	CLEAR	5-4	INSPECTION	VIETTA
4/1/13	0930	CLEAR	5-4	CHECK. RAKED GRIDS. NO INCREASE.	DAT
4/1/13	1630	CLEAR	5-4	ROUTINES/RAKE GRIDS	ST
4-7-13	1130	CLEAR	1-4	INSPECTION	VIETTA
4-8-13	1003	CLEAR	4-4	ROUTINES	ST
4-10-13	1441	CLEAR	4-4	ROUTINES/RAKE GRIDS	ST
4-18-13	1330	CLEAR	3-4	ZERO DIVERSION.	DAT
4-22-13	1000	CLEAR	3-4	ROUTINES	ST
4-24-13	0940	CLEAR	3-4	ROUTINES	ST
4-29-13	1030	CLEAR	2-4	ROUTINES	ST
5-1-13	1305	CLEAR	1-4	ALL WATER OUT ORIFICE.	DAT
5-13-13	1100	CLEAR	1-4	ROUTINES	ST
5-22-13	1615	CLEAR	1-4	ROUTINES	ST
5-28-13	0845	CLEAR	0.5-4	ALL WATER OUT ORIFICE	DAT
5-29-13	1300	clear	0	Turned out per Arnaldo/Tito	JLM
6-3-13	1145	clear	0	Turned out Routines	JLM
6-6-13	1515	CLEAR	0	TURNED OUT.	DAT/JRS
6-10-13	1038	CLEAR	0	TURNED OUT	SRH.
6-17-13	1045	clear	0	Turned out / Routines	JLM
6-24-13	1120	clear	0	Routines	JLM
6-24-13	1030	clear	0	Routines	JLM
7-1-13	1500	clear	0	Routines	JLM
7-8-13	9:40	Clear	0	Routines / TURNED OUT	SRH
7-9-13	1040	clear	0	Monthly Routines	JLM
7/15/13	10:20	Clear	0	Routines / TURNED OUT	SRH.
7-22-13	1630	clear	0	Routines	JLM
7-29-13	1655	clear	0	Routine/	JLM
8-5-13	1400	clear	0	Routines	JLM
8-7-13	1442	CLEAR	0	TURNED OUT	JRS/DAT
8-13-13	1620	clear	0	Routines	JLM

SCE OD 67-B REV 10/85 (CW)

414 SALMON CR. DIVERSION

Southern California Edison Company 2013 WY

HYDRO DIVISION LOG SHEET

DATE	TIME	ORIFICE ~~PIPE~~ STATUS	DIVERTED FLOW	NOTES ~~SHEET NO.~~ 07369	VISIT BY
8-19-13	1630	Ø	Ø	Turned out Routines	JWA
8-27-13	1440	Ø	Ø	TØ USGS INSP	DAT/JWA
8-29-13	1620	Ø		Routines	JWA
11 SEPT 13	1315	Ø	Ø	PERMISSION WALKDOWN	VILETA
16 SEPT 13	1237	Ø	Ø	INSPECTION	VILETA
9-16-13	1245	Ø	Ø	TØ 5 YEAR ROUTINE LEVELS	JRS/DR

SCE OD 67-B REV 10/85 (CW)

414 SALMON CR DIVERSION

Southern California Edison Company 2014 WY

HYDRO DIVISION LOG SHEET

SHEET NO. 07370

DATE	TIME	ORIFICE ~~DATE~~ STATUS	DIVERTED FLOW	NOTES	VISIT BY
10-1-13	0735	CLEAR	∅	TURNED OUT, 4 CFS PLATE ON	D. TITO
11-5-13	1425	CLEAR	∅	" " " " "	D.TITO/JRS
11-15-13	1220	CLEAR	∅	FLOWLINE INSPECTION	VIETTA
12-2-13	1255	CLEAR	∅	TURNED OUT. 4 CFS PLATE ON	D.TITO / JRS
12-30-13	0915	CLEAR	∅	TURNED OUT, 4 CFS PLATE ON	JRS
1-8-14	1522	CLEAR	∅	TURNED OUT, 4 CFS PLATE ON	JRS
2-4-14	1527	CLEAR	∅	TURNED OUT, 4 CFS PLATE ON	JRS
2-4-14	1600	clear	∅	Weekly routines	SLH
2-10-14	1100	Clear	∅	Weekly routines - turned out	CWS
2-18-14	1200	clear	∅	Routines	JLH
2-25-14	1231	CLEAR	∅	FLOWLINE INSPECTION	TV
3-3-14	1035	CLEAR	∅	TURNED OUT.	DAT
3-5-14	1200	Clear	∅	Routines	JLH
3-12-14	1600	clear	∅	Routines	JLH
3-18-14	1145	clear	∅	Routines	JLH
3-27-14	1045	clear	∅	Routine	JLH
4-1-14	1600	clear	∅	Routines	CWS
4-9-14	1045	CLEAR	∅	Routines	HUG
4-3-14	1340	CLEAR	∅	TURNED OUT.	DAT
4-10-14	1245	clear	∅	Routing	JLH
4-14-14	1130	clear	∅	~~Section~~ Routines	CWS
4-23-14	0820	CLEAR	∅	TP. USGS INSP.	DAT/DRS/FH/SH
4-23-14	1600	CLEAR	∅	Routines	SRH HUG
4-27-14	1145	clear	∅	Routines	JLH
5-5-14	1015	clear	∅	Routines	CWS
5-5-14	1223	CLEAR	∅	TURNED OUT	JRS
5-13-14	1115	CLEAR	∅	Routines	SRH.
5-19-14	1005	CLEAR	∅	ROUTINES	SRH
5-22-14	1500	clear	∅	Routines	JLH
5-27-14	1640	Clear	∅	Routine	JLH
6-2-14	1642	clear	∅	Routine	TB
6-9-14	15 37	clear	∅	Routine	TB
6-16-14	15 30	Clear	∅	Routine	L. Roberts
6-23-14	14:21	clear	∅	routine	TB
6-25-14	0920	CLEAR	∅	TURNED OUT	JRS
6-30-14	16:15	Clear	∅	Routing	JLH
7-7-14	15:20	clear	∅	Routines	TB

SCE OD 67-B REV 10/85 (CW)

414 SALMON CREEK DIVERSION

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 07371

DATE	TIME	ORIFICE STATUS	DIVERTED FLOW	NOTES	VISIT BY
7-14-14	14:31	Clear	0	Routines	T.B.
7-17-14	1321	CLEAR	ø	TURNED OUT	JRS
7-21-14	1630	Clear	ø	Routines	JLA
7-28-14	1630	Clear	ø	Routine	JLA
8-4-14	15:10	Clear	0	Routines	T.B
8-12-14	1100	CLEAR	ø	PERMISSION WALK-DOWN	TV
8-12-14	1530	Clear	ø	Routine	JLA
8-19-14	15:40	Clear	ø	Routine	SRH
8-21-14	1215	CLEAR	ø	TØ	DAT
8-25-14	15:25	Clear	0	Routines	T.B
9-2-14	11:30	CLEAR	ø	TURNED OUT	JRS
9-2-14	14:44	Clear	0	Routines	T.B.
9-9-14	15:30	Clear	ø	TØ Routines	SRH
9-15-14	16:45	Clear	ø	Routine	JLA
9-23-14	15:20	Clear	0	Routines	T.B
9-24-14	8:30	CLEAR	ø	TURNED OUT, USGS INSP	JRS
9-30-14	1600	Clear	ø	Routines	JLA

414 SALMON CREEK DIVERSION

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 07373

DATE	TIME	DATE ORIFICE	DIVERTED FLOW	NOTES	VISIT BY
6-1-15	1200	clear		Routine	
6-3-15	1450	CLEAR	Ø	TURNED IN, NO FLOW PAST RELEASE	JRS
6-8-15	1100	Clear		Routine	
6-16-15	9:23	Clear		Routines	
6-22-15	14:52	Clear		Routines	
6-29-15	1700	Clear		Routine	
7-7-15	1645	Clear		Routine	
7-14-15	1125	CLEAR	Ø	TURNED IN, NO FLOW PAST RELEASE	JRS
7-20-15	14:45	clear		Routines	
7-27-15	1300	clear		Routine	
8-2-15	937	Clear	O	month/7	CR
8-3-15	0945	clear		Routine	
8-5-15	0915	clear		Routine	
8-6-15	1030	CLEAR	Ø	TURNED OUT.	DAT
8-11-15	1300	clear		Routines	
8-19-15	@ 8:20	clear		Routines	
8-24-15	11:30	clear		Routines	
9-1-15	1330	CLEAR	Ø	USGS INSPECTION	JRS, DAT, ERS
9-8-15	1300	clear		Routine	
9-14-15	10:30	Clear		Routine	CR
9-21-15	1100	Clear		Routine	CR

414 SALMON CREEK DIVERSION

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 07372

DATE	TIME	ORIFICE ~~DATE~~	DIVERTED FLOW	NOTES	VISIT BY
10-1-14	0935	CLEAR	∅	TURNED OUT DUE TO TUNNEL WORK	JRS
10-7-14	9:33	clear	∅	weekly Routines	T. Brown
10-14-14	1600	clear	∅	Routines	JUA
10-2014	9:50	clear	∅	Routines	T. Brown
10/28/14	1500	clear	∅	Routins	JUA
11-3-14	1200	CLEAR	∅	TURNED OUT	JRS
11-3-14	13:00	clear	∅	Routines	Brown
11-9-14	15:00	clear	∅	Routines	Brown
11-24-14	9:30	clear	∅	Routines	JUA
11-29-14	1210	CLEAR	∅	ROUNDS	CHOEN
12-1-14	1100	clear	∅	routines	T. Brown
12-1-14	1340	CLEAR	∅	TURNED OUT	JRS
12-8-14	10:43	clear	∅	~~AT~~ Routines	T. Brown
12-16-14	1445	clear	∅	Routines - Lock and chain valve	JUA
12-24-14	9:00	clear	∅	Routines	SRH
12-29-14	15:00	clear	∅	routines	T. Brown
1-7-15	8:20	CLEAR	∅	TURNED OUT	JRS
1-7-15	9:39	clear	∅	Routines	T. Brown
1-26-15	1100	clear	∅	Monthly Routines	JUA
1-27-15	1435	CLEAR	∅	0.25 cfs ABOVE RELEASE. ALL H_2O OUT ORIFICE. (4CFS)	JTV
2/11/15	1100	CLEAR	∅	ROUTINES	CEA
2-17-15	11:00	Clear	∅	INSPECTION	TV
2-23-15	10:48	clear	∅	routines	T. Brown
2-25-15	14:25	CLEAR	∅	TURNED OUT	JRS
3-2-15	10:12	clear	∅	weekly routines	T. Brown
3-4-15	1338	CLEAR	∅	TURNED OUT	JRS/DAT
3-12-15	1145	clear	∅	Routines	JUA
3/15/15	1245	CLEAR	∅	TURNED IN	RA
3-16-15	11:00	clear	∅	monthly Flow-Line Inspection	T. Brown
3-19-15	1600	clear	∅	Routines	JUA
4-1-15	1130	CLEAR	∅	TURNED IN	TV
4-1-15	1440	CLEAR	∅	TURNED IN, FLOW NOT GOING PAST RELEASE	JRS
4-16-15	1215	clear	∅	Routines	JUA
4-23-15	1100	clear	∅	Routines	JUA
5-6-15	14:08	clear	∅	routines	TB
5-18-15	1330	clear	∅	Routines	JLM
5-26-15	1400	CLEAR	∅	TURNED IN, FLOW NOT GOING PAST RELEASE	JRS

SCE OD 67-B REV 10/85 (CW)

414 SALMON CREEK DIVERSION

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 07374

DATE	TIME	ORIFACE DATE	DIVERTED FLOW	NOTES	
10-5-15	1040	CLEAR	<1	RECENT RAIN, TURNED IN, RAKED GRIDS	JRS
10-7-15	1210	clear	0	Routines	JTA
10-15-15	1205	clear	0	Routines put on 1 cfs orfice per Tito	JTA
10-21-15	1300	Clear	<1	Routines	DTE
10-27-15	1400	Clear	0	Routines	LR
11-2-15	1030	Clear	0	Routines	CR
11-2-15	1055	CLEAR	0	CHECK - 1 CFS PLATE ON.	DAT
11-5-15	1442	clear	0	Routines	DTE
11-10-15	1152	Clear	0	Routines	DTE
11-10-15	1350	CLEAR	<1	RECENT RAIN. 1 CFS PLATE ON	JRS
11-16-15	1421	clear	0	Routines	T.B
11-23-15	1215	clear	0	Routines	DTE
12-1-15	0815	CLEAR	0	COLD-ORIFICE CLEAR. ALL WATER IN CREEK	DAT
12-7-15	1515	clear	0	routines	T B
12-15-15	1400	clear	0	Routines	JTA
1-4-16	1400	Clear	0	Routines	JTA
1-5-16	0910	CLEAR	1	RAINING 1 CFS PLATE ON	JRS
1-6-16	1030	clear	3	Routines	JTA
1-11-16	1350	CLEAR	1	CLEARED WOOD FROM ORIFICE PLATE	JRS
1-13-16	1300	clear	1	Routines	JTA
1-21-16	1500	Clear	5	Routines	CR
1-25-16	1020	clear	4	Routines racked grids	T.B.
1-25-16	1345	CLEAR	3	RECENT RAIN	JRS
1-26-16	1400	CLEAR	0	CHANGED ORIFICE PLATE FROM 1 TO 4	JRS
1-27-16	1500	CLEAR	0	ALL H2O OUT RELEASE PIPE	DAT

414 SALMON CREEK DIVERSION
2016 WY

Southern California Edison Company
HYDRO DIVISION LOG SHEET DIVERTED

SHEET NO. 07376

DATE	TIME	G.H. DATE	FLOW	PLATE	FLOW	NOTES	
2-3-16	0920	8.32	3.88	4.0	∅	NEW DL IN PLACE. 12.8V	DAT
2-4-16	1000	8.32	3.88	4.0	∅	Routines	JCA
2-4-16	1130	8.32	4.06	4.0	0.06	FINISH ENCLOSURE. 12.8V	DAT/JRS
2-8-16	1015	8.37	5	4.0	1CFS	Routines	JCA
2-9-16	1330	8.38	5.22	4.0	1.22	CHECKING BATTERY & DATA	JRS
2-10-16	1300	8.40	5.65	4.0	1.65	Routines	
2-11-16	1555	8.41	5.86	4.0	1.86	INSTALLED SOLAR SYSTEM	DAT/OTS
2-16-16	1130	8.44	6.51	4.0	2.51	Routines	JCA
2-16-16	1240	8.44	6.51	4.0	2.51	BATT CHECK. 13.7V CHARGING.	DAT
2-18-16	1045	8.57	9.34	4.0	5.34	Routines	JCA
2-22-16	1145	8.46	6.94	4.0	2.94	Monthly / weekly routine inspection	JCA
2-25-16	1135	8.48	7.37	4.0	3.37	Routines	JCA
2-29-16	1140	8.72	13.5	4.0	9.5	Routine	JCA
3-7-16	1200	8.33	4.25	4.0	.25	Routine	JCA
3-8-16	0955	8.32	4.06	4.0	0.06	FOUND TAPE OFF PINS. RESET. HAYDO GAUGES.	DAT
3-8-16	1030	8.72	13.5	4.0	9.50	CLEANED OUT COMM LINE TO WELL 14.7V	DAT/JT
3-8-16	1430	8.69	13.4	4.0	8.40	ADDED ROCK DROP PIPE - OPENED DRAINGATES	DAT/JRS
3-9-16	1210	8.69	12.6	4.0	8.60	CLEAND ROCK DROP W/ TURN OUT. TB	DAT/JRS DE/CA/TB
3-10-16	1300	8.71	13.2	4.0	9.20	Routines	JCA
3-14-16	1130	8.73	13.8	4.0	9.80	Routines	
3-16-16	0900	8.76	14.0	4.0	10.0	Routines	TB
3-21-16	1130	8.88	18.4	4.	14.4	Routines	JCA
3-23-16	1511	8.85	17.5	4	13.5	Monthley	CBR
3-29-16	1545	8.86	17.8	4	13.8	Routines	JCA
3-30-16	0936	8.78	15.3	4	11.3	Routines	DTE
3-31-16	1220	8.65	11.5	4	7.5	CHECKING OL DATE. ~~NO~~ OK	DAT
4-4-16	1224	8.82	15.6	4	12.6	Routines	JCA
4-4-16	1445	8.79	15.6	4	11.6	CHECK ON GAGE VS. STICK - OK	DAT
4-11-16	1350	8.13	∅			TURNED OUT due to Tunnel max	RA
4-11-16	1125	8.55	8.9	4	4.9	Turned in per Ramon	DAT
5-2-16	1000	8.01	0	0	0	Routines / monthly	JCA
5-5-16	1300	8.01	∅	4.0	∅	TO USGS INSP. EH. 1 HRT.	DAT/JT
5-11-16	1140	8.01	∅	4.0	0	Routine	JCA
5.18.16	1025	8.01	∅	4.0	∅	Routines	T.B
5-24-16	9:40	7.99	∅	4.0	∅	weekly/month/4	CR
5-31-16	1145	7.99	∅	4.0	∅	Routines	JCA
6-2-16	1425	7.99	∅	4.0	∅	Weekly	DTE

SCE OD 67-B REV 10/85 (CW)

414 SALMON CR DIVERSION

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 07377

Date	TIME	DATE G.W	Flow	Plate	Diverted Flow		
Left by J. Hughes	1110	7.99	0	4.0	0	Routine	JCM
6-6-16	1150	7.99	0	4.0	0	DATA COLLECTION	JRS
6-28-16	1100	7.99	0	4.0	0	Routine / monthly	JCM
7-6-16	1145	7.99	0	4.0	0	Routines	JCM
7-18-16	1325	7.99	0	4.0	0	TURNED OUT	DAT
7-20-16	1300	7.98	0	4.0	0	Routine / monthly inspection	JCM
8-1-16	1030	7.99	0	4.0	0	Routine	JCM
8-2-16	1330	7.99	0	4.0	0	TURNED OUT. 13.3V	DAT
8-7-16	1000	7.99	0	4.0	0	INSPECTION	TV
8-9-16	1500	7.99	0	4.0	0	TURNED OUT. USGS INSP. 13.4V	DAT/EH/MM
8-15-16	1028	7.98	0	4.0	0	ROUTINES	DTE
8-22-16	1045	7.98	0	4.0	0	ROUTINES	DTE
9-6-16	1355	7.98	0	4.0	0	TURNED OUT	JRS
9-8-16	1007	7.98	0	4.0	0	ROUTINES	DTE
9-26-16	1330	7.99	0	4.0	0	Routines (monthly	JCM

4H/
4B SALMON CR DIVERSION

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 07378

DATE	TIME	GAGE HT DATUM	FLOW	PLATE	DIVERTED FLOW	COMMENTS	VISIT BY
10/3/16	0945	7.99	ϕ	4.0	ϕ	TURNED OUT.	DAT
10/3/16	1150	7.99	0	4.0	0	Routines	JLA
10/10/16	1440	7.99	0	4.0	0	Routines	DTE
10/17/16	1500	8.16	1.38	1.0	0	CHANGED PLATE, TURNED IN	JRS
10-24-16	1100	8.16	1.38	1.0	0	Routines	JLA
10-31-16	1100	8.25	2.83	1.0	1.83	Routines	JLA
11-7-16	1130	8.21	2.17	1.0	1.17	Routines	JLA
11-7-16	0933	8.21	2.17	1.0	1.17	Routines	TB
11-9-16	1125	8.20	2.0	1.0	1.0	BATT 13.9V, FLUSHED COMM. LINE	DAT
11-14-16	15:02	8.04	0	1.0	0	Routines	CR
11-15-16	1430	8.00	0	1.0	0	TURNED OUT DUE TO OUTAGE USGS INSP.	JRS/MM
11.16.16	1427	8.17	0.5	1.0	.5	weekly routines	TB GR
11-22-16	1047	8.20	2.0	1.0	1.0	weekly - monthly routines	T.B
11-29-16	1139	8.18	1.67	1.0	.67	weekly routines	T.B
12-1-16	1209	8.18	1.67	1.0	.67	Routines	D.E
12-5-16	1200	8.19	1.83	1.0	.83	Routine	JLA
12-6-16	1216	8.19	1.83	1.0	.83	TURNED IN	JRS
12-8-16	1342	8.20	2.	1.0	1.	Routines	DTE
12-12-16	1500	8.29	3.5	1.0	2.5	Routine	JLA
12-14-16	1310	8.27	3.17	1.0	2.17	monthly - weekly routines	TB
12-19-16	1332	8.35	4.63	1.0	3.63	Routines	JLA
12-21-16	1345	8.31	3.88	1.0	2.88	Routines	JLA
12-29-16	1545	8.26	3.0	1.0	2.0	Routines	JLA
1-3-17	1130	8.26	3.0	1.0	2.0	Routine	JLA
1-5-17	1115	8.66	17.8	1.0	16.8	Routing	JLA
1-5-17	1300	8.03	0	1.0	0	Turned out per Ramon	JLA
1-9-17	1300	8.00	0	1.0	0	Cleaned deck/routines	JLA
1-19-17	0970	8.03	0	1.0	0	Routine	JLA
1-30-17	1050	7.99	0	4.0	0	CHANGED PLATE, TURNED OUT	JRS
2-6-17	1030	8.03	0	4.0	0	Routine	JLA
2-14-17	1520	8.01	0	4.0	0	TURNED OUT	JRS
2-15-17	11:00	8.01	0	4	0	Routines	CR
2-23-17	10:00	8.01	0	4	0	Routines	TB
3-1-17	1400	7.99	0	4	0	Routines	T.B
3-6-17	0940	7.99	ϕ	4	ϕ	TURNED OUT 13.0V	DAT
3-13-17	1030	8.01	0	4	0	Routines turned out	JLA
3-20-17	0958	8.01	0	4	0	Routines	T.B

SCE OD 67-B REV 10/85 (CW)

414/413 SALTDON CR. DIVERSION

Southern California Edison Company

HYDRO DIVISION LOG SHEET

07379

DATE	TIME	GHT DATE	FLOW	PLATE	DIVERTED FLOW	NOTES SHEET NO.	VISIT BY
4-13-17	1205	8.02	0	4.0	0	FIXED RAKE MOUNT, RR	JRS
4-17-17	1430	8.02	0	4.0	0	Routines/monthly	JCA
4-24-17	1025	8.01	0	4.0	0	Routines	JCA
5-8-17	1500	8.01	0	4.0	0	Routines	JCA
5-15-17	1055	8.04	0	4.0	0	TURNED OUT. LKG OUT ORIFICE 14.4V	DAT
5-17-17	1100	8.04	0	4.0	0	Routines	JCA
5-31-17	1245	8.91	19.4	9.0	15.4	Turned In per Ramon	JCA
6-1-17	1430	8.83	16.9	4.0	12.9	Routines	JCA
6-5-17	1320	8.85	17.5	4.0	13.5	Routines	JCA
6-7-17	0927	8.79	15.6	4.	11.6	Routines	T.B
6-20-17	0930	8.00	0	4.0	0	VERY HOT	JRS
6-20-17	1100	8.00	0	4.0	0	Routines/monthly	JCA
6-27-17	1355	7.99	0	4.0	0	USGS INSP	DAT
7-5-17	1030	8.36	4.81	1.0	3.81	INSTALLED ICFS PLATE. TURNED IN	JRS
7-5-17	1430	8.37	5	1.0	4.0	Routines	JCA
7-6-17	1145	8.36	4.81	1.0	3.81	RR	JRS
7-10-17	1441	8.35	4.63	1.0	3.63	Routines	TB
7-12-17	1125	8.34	4.44	1.0	3.44	Routines	TB
7-20-17	1140	8.29	3.5	1.0	2.5	Routines	TB
7-24-17	0825	8.27	3.17	1.0	2.17	FLOW CHECK	JRS
8-3-17	0910	8.26	3.00	1.0	2.00	ROUTINE CHECK. ORIFICE CLEAN. 13.5V	DAT
8-21-17	1000	8.22	2.33	1.0	1.33	Routines/monthly	CR
8-28-17	1030	8.20	2	1.0	1.0	Routines	JCA
8-31-17	0945	8.24	2.67	1.0	1.67	FLUSHED WELL & ROCK BOX	JRS
8-31-17	1418	8.24	2.67	1.0	1.67	Routines	T.B
9-5-17	1040	8.21	2.17	1.0	1.17	Routines	JCA
9-9-17	0935	8.20	2.00	1.0	1.0	RR	JRS
9-14-17	1000	8.21	2.17	1.0	1.17	Routines	TB
9-18-17	1521	8.21	2.17	1.0	1.17	Routines	TB
9-21-17	1615	8.27	2.33	1.0	1.33	Routines/monthly inspection	JCA
10-3-17	1505	8.24	2.67	1.0	1.67	RR	JRS
10-9-17	1610	8.24	2.67	1.0	1.67	Routines	JCA

414/413 SALMON CR DIVERSION

2018WY

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 07380

DATE	TIME	GHT DATE	FLOW	PLATE	DIVERTED FLOW	NOTES	VISIT BY
12-3-17	1505	8.24	2.67	1.0	1.67	RR	JRS
10-9-17	1610	8.24	2.67	1.0	1.67	ROUTINES	JRS
10-19-17	1415	8.25	2.83	1.0	1.83	COLLECT LOG SHEETS	JRS
10-23-17	1600	8.25	2.83	1.0	1.83	Routines	TB
10-24-17	1705	8.25	2.83	1.0	1.83	USGS INSP.	DAT/JR
11-7-17	1135	8.27	3.17	1.0	2.17	13.8V ORIFICE CLEAR	DAT
11/14/17	1151	8.28	3.33	1.0	2.33	14.3V WEEKLY INSPECT	RA
11-21-17	1254	8.30	3.69	1.0	2.69	Routines	TB
11/28/17	0942	8.28	3.33	1.0	2.33	WEEKLY INSPECTION	RA
11/28/17	1038	Ø	Ø	Ø	Ø	TURNED OUT	RA
12-11-17	1202	Ø	Ø	Ø	Ø	TURNED OUT	JRS
1-8-18	1205	8.00	Ø	1.0	Ø	TURNED OUT. 13.5V RAIN.	DAT
2-8-18	1530	7.99	Ø	4.0	0.0	INSTALLED 40cfs PLATE, TURNED OUT	JRS
2-26-18	1145	8.03	0	4.0	0	Routine/monthly	JRA
3-5-18	1120	8.21	2.17	4.0	0	TURNED IN AFTER STORM RR	JRS
3-12-18	1001	8.47	7.15	4.0	3.15	Routines/Flushed pond	JRA
3-19-18	1550	8.30	3.69	4.0	1.69	Routines/monthly flushed Pond	JRA
3-26-18	0930	8.80	15.9	4.0	11.9	CLEANED GRIDS & TURNED IN	JRS
3-26-18	1200	8.80	15.9	4.0	11.9	Routine	JRA
4-2-18	1015	8.62	10.6	4.0	6.6	Routines	JRA
4-2-18	1220	8.62	10.6	4.0	6.6	13.9V. ORIFICE FREE FLOWING.	DAT
4-2-18	1235	8.40	5.7	4.0	1.7	LIMITED DIVERSION GATE TO REDUCE SPILL	DAT
4-3-18	1410	8.39	5.4	4.0	1.4	TURNING OUT BY CLOSING DIV. GATE	DAT
4-9-18	1145	8.04	0	4.0	0	Routines	JRA
4-26-18	1400	8.03	0	4.0	0	Routines/monthly	JRA
5-7-18	1357	8.01	Ø	4.0	Ø	Routines	TB
5-8-18	1025	8.01	Ø	4.0	Ø	TURNED OUT, TUNNEL FULL	JRS
5-8-18	1500	8.01	0	4.0	0	Routines/monthly	JRA
5-21-18	1505	8.01	Ø	4.0	0	RR, NOT TURNED OUT LOW WATER	JRS
6-25-18	1420	8.01	0	4.0	0	Routines	JRA
6-26-18	1305	8.01	Ø	4.0	0	Mothly routines	LW
7-2-18	1257	8.01	Ø	4.0	0	Wkly/routine	LW
7-3-18	1020	7.99	0	1.0	0	RR, PUT 1cfs PLATE ON	JRS
7-16-18	0940	8.01	Ø	1.0	0	Wkly routines	LW
8-1-18	1220	8.02	Ø	1.0	0	RR	JRS
8-6-18	1430	8.02	Ø	1.0	0	FULL SET OF LEVELS, DRAINED WELL	JRS
9-12-18	1220	8.03	Ø	1.0	0	USGS INSP	DAT/JRS/EH

4/4/413 SALMON CR. DIVERSION & RELEASE

Southern California Edison Company

HYDRO DIVISION LOG SHEET

DATE	TIME	GAGE READING	FLOW	PLATE	DIVERTED FLOW	NOTES SHEET NO. 07381	
9-26-18	1200	8.03	0	4.0	0	Monthly/weekly	CJA
10-2-18	1355	8.03	0.15	1.0	0	RR, LIGHT RAIN	JRS
10-30-18	1100	8.02	0	1.0	0	Weekly/monthly routines	JRS
11-7-18	1215	8.00	0	1.0	0	RR	JRS

SALMON CR. DIV.

Southern California Edison Company 2019 WY

HYDRO DIVISION LOG SHEET

DATE	TIME	GHT ~~DATE~~	FLOW	PLATE	DIVERTED FLOW	NOTES ~~SHEET NO:~~ 07382	VISIT BY
10-2-18	1355	8.03	0.15	1.0	0	RR, LIGHT RAIN	JRS
10-30-18	1100	8.02	0	1.0	0	WEEKLY/MONTHLY ROUTINES	JH
11-7-18	1215	8.00	0	1.0	0	RR	JRS
11-26-18	0937	8.00	0	1.0	0	Routines	TB
11-28-18	1051	8.00	0	1.0	0	Monthly Routines	LW
12-3-18	1620	8.24	2.67	1.0	1.67	Routines / Turned In	JW
12-10-18	1053	8.23	2.5	1.0	1.5	Routines	LW
12-17-18	0924	8.25	2.83	1.0	1.83	Routines	TB
12-27-18	1400	8.27	2.33	1.0	1.33	Monthly inspection	JW
12-27-18	0945	8.26	3.00	1.0	2.00	RR	
1-7-19	1300	8.32	4.06	1.0	3.06	Routines	JW
1-8-19	1050	8.28	3.33	1.0	2.33	FLUSHED VALVE. 14.5V	TB
1-23-19	1230	8.36	4.81	1.0	3.81	Routines / Monthly	JW
1-28-19	1410	8.36	4.81	4.0	0.81	PUT 4.0 CFS PLATE ON. TURNED IN RR	JRS
1-31-19	1007	8.37	5.00	4.0	1.00	Routines	TB
2-12-19	1045	8.47	7.15	4.0	3.15	Routines	JW
2-20-19	1425	8.44	6.51	4.0	2.51	RR, RAKED GRIDS	JRS
2-27-19	1330	7.98	0	4.0	0	Routines	LW
3-4-19	1208	7.99	0	4.0	0	Routines	LW
3-4-19	1215	7.99	0	4.0	0	TURNED OUT. VALVE & DRAIN CLOSED	JW
3-26-19	1430	7.99	0	4.0	0	Routines / Monthly	JW
4-4-19	1320	7.99	0	4.0	0	TURNED OUT, FLUME FULL, RR	JRS
4-9-19	1400	7.99	0	4.0	0	Routine	JW
4-22-19	0941	7.99	0	4.0	0	Routines, Turned Out	LW
4-30-19	0936	7.99	0	4.0	0	Routines, Turned Out	LW
5-8-19	1135	7.98	0	4.0	0	DATA COLLECTION, 13.7 V	JRS
5-15-19	1342	7.99	0	4.0	0	Monthly routine	LW
6-5-19	1045	7.99	0	4.0	0	DATA	JRS
6-3-19	1445	7.99	0	4.0	0	Routines	JW
6-17-19	1540	7.99	0	4.0	0	USGS 2H8P	JW
6-26-19	1430	7.99	0	4.0	0	Monthly / weekly inspection	JW
7-1-19	1527	7.99	0	4.0	0	Routines	LW
7-8-19	1444	7.99	0	4.0	0	Routines	LW
7-11-19	1430	7.99	0	4.0	0	RR	JRS
8-15-19	1410	7.99	0	1.0	0	RR. INSTALLED 1.0 CFS PLATE	JRS
8-15-19	1440	8.27	3.17	1.0	2.17	TURNED IN	JRS
8-27-19	1100	8.24	2.67	1.0	1.67	Turned in, monthly routines	LW

SALTTON CR. DIV.

2019 WY

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 07383

DATE	TIME	GHT	Flow	Plate	Riveted flow	Notes	
9-3-19	1013	8.25	2.83	1.0	1.83	Routines	LH
9-9-19	0959	8.24	2.67	1.0	1.67	Routines	LH
9-17-19	1220	8.24	2.67	1.0	1.67	USGS INSP.	DAT
9-24-19	1122	8.24	2.67	1.0	1.67	Routines	LH
9-25-19	1330	8.25	2.83	1.0	1.83	INST. GOES	DAT
10							

SALTDON CR. DIV.
2020 WY.

Southern California Edison Company
HYDRO DIVISION LOG SHEET

SHEET NO. 07384

DATE	TIME	GHT ~~GAGE~~	FLOW	PLATE	DIVERTED FLOW	NOTES	VISIT BY
10-1-19	1430	8.27	3.17	1.0	2.17	ORIFICE CLEAR	D. TITO
10-2-19	0844	8.26	3	1.0	2.00	Routines	T. BROWN
10-7-19	1020	8.27	3.17	1.0	2.17	Routines	LW
10-14-19	1201	8.29	3.5	1.0	2.5	Routines.	LW
10-21-19	1113	8.28	3.33	1.0	2.33	Routines	TB - LW
10-28-19	1456	8.28	3.33	1.0	2.33	Routines	LW-TB
11-4-19	1433	8.30	3.69	1.0	2.69	Routines	LW
11-12-19	1030	8.14	1.13	1.0	0.13	CLOW CLEARING LEAVES, RR	JRS
11-12-19	1038	8.14	1.13	1.0	0.13	Routines	LW
12-3-19	1110	8.36	4.81	1.0	3.8	BATT 14.3	DA.TITO
12-9-19	1054	8.17	1.5	1.0	0.5	Routines	LW
12-11-19	0908	8.37	5	1.0	4.0	routine	LW
1-13-20	1030	8.35	4.63	1.0	3.63	Routines Turned in	T.B.
1-21-20	1130	8.36	4.81	1.0	3.81	DATA COLLECTION	JRS
1-23-20	1001	8.36	4.81	1.0	3.81	Routines	LW
1-27-20	1145	8.37	5.00	4.0	1.00	PUT 4 cfs PLATE ON	JRS
2-3-20	1328	8.33	4.25	4.0	.25	Routines	TB
2-10-20	1240	8.39	5.43	4.0	1.43	RAKED GRIDS	JRS
2-12-20	1300	8.40	5.65	4.0	1.65	Routines	JRA
3-3-20	1450	8.55	8.90	4.0	4.90	Routines	JRA
3-9-20	1150	8.45	6.72	4.0	2.72	ORIFICE CLEAD	D. TITO
3-12-20	1007	8.29	3.5	4.0	Ø	Routines	LW
3-16-20	1700	8.56	9.12	4.0	5.12	Monthly	JRA
3/23/20	1221	8.50	7.8	4.0	3.8	INSPECTION	RA
4/9/20	1011	8.13	1.01	4.0	Ø	Routines / Data logger	LW
4/9/20	1011	8.46	6.94	4.0	2.94	Routines / Analog	LW
4-9-20	1105	8.48	7.37	4.0	3.37	MIN BATT 12.4	TITO
4-13-20	0955	8.47	7.15	4.0	3.15	Routines	LW
4-20-20	1005	8.92	19.7	4.0	15.7	routines	LW
4-21-20	1445	8.85	17.5	4.0	13.5	REPLACED DRAW VALVE	JRS
4-22-20	1030	8.87	18.1	4.0	14.1	GMM - ZERO SHIFT	DHJ
4-27-20	1132	8.82	16.6	4.0	12.6	Routines	LW
4-28-20	1030	8.80	15.9	4.0	11.9	CHECK BEFORE TO	RA
4-28-20	1035	8.19	1.8	4.0	Ø	TURNED OUT TO TEST HW	RA
5-4-20	1002	8.17	1.5	4.0	Ø	Turnd. Out	LW
5-11-20	1044	8.16	1.38	4.0	Ø	Turned Out	LW
5-13-20	1410	8.16	1.38	4.0	Ø	TURNED OUT	DAT

SALTON CR. DIVERSION

Southern California Edison Company

HYDRO DIVISION LOG SHEET

DATE	TIME	GHT	FLOW	(10AA) PLATE	DIVERTED FLOW	NOTES SHEET NO. 07285	VISIT BY
5/21	1140	8.40	5.65	4.0	1.65	TURNED in	RA
5-26	1020	8.35	4.63	4.0	0.63	RR	JRS
5-26	1215	8.35	4.63	4.0	0.63	Monthly	DAT
~~6-1~~	~~1454~~	~~8.32~~	—	—	—	—	—
6-1	1458	8.32	4.06	4.0	.06	Routine	~~DAT~~
6-3	1030	8.29	3.50	4.0	-	TURNED OUT USGS INSP.	JRS
6-10-20	1125	8.05	0.25	4.0	ø	TURNED OUT	DAT
7-7-20	0935	8.05	0.25	4.0	ø	TURNED OUT	DAT
7-7-20	1041	7.99	ø	4.0	ø	TURNED OUT	LW
7-27-20	1055	7.99	ø	4.0	ø	Turned out	~~DAT~~
8-4-20	1455	7.99	ø	4.0	ø	TURNED OUT	DAT
8-20-20	1200	7.99	ø	1.0	ø	INSTALLED 1 CFS PLATE	JRS
9-3-20	1530	7.99	0	1.0	0	RR	JRS
9-14-20	1030	7.99	ø	1.0	ø	Routines	~~DAT~~
9-17-20	0910	7.99	ø	1.0	ø	USGS INSP	DAT
9-21-20	1000	7.99	ø	1.0	ø	Routines	~~DAT~~

SCE OD 67-B REV 10/85 (CW)

SAWMON CR. DIV. 413/414
2021 WY

Southern California Edison Company
HYDRO DIVISION LOG SHEET

SHEET NO. 07386

DATE	TIME	G HT	FLOW	PLATE	DIVERTED FLOW	NOTES	VISIT BY
10/5/20	1050	7.99	Ø	1.0	Ø	TURNED OUT	D. TITO
10/7/20	1040	7.99	Ø	1.0	Ø	"	Fisher
10-26-20	1545	7.99	Ø	1.0	Ø	"	Fisher
11-2-20	1535	7.99	Ø	1.0	Ø	DATA	JRS
11-16-20	1230	7.99	Ø	1.0	Ø	Routines	Fisher
11-23-20	1340	7.99	Ø	1.0	Ø	Routines	Fisher
12-10-20	1430	7.99	Ø	1.0	Ø	Routines	Fisher
12-16-20	1406	7.99	Ø	1.0	Ø	DATA RR	JRS
12-29	1615	7.99	Ø	1.0	Ø	Routines	[illegible]
1-11-21	1430	7.99	Ø	1.0	Ø	Routines	[illegible]
1-19-21	1220	7.99	Ø	1.0	Ø	TØ. 13.9V, TUNNEL DRAINING.	D. TITO
1-28-21	1140	7.99	Ø	4.0	Ø	INSTALLED 4 cfs PLATE	JRS
2-8-21	1545	7.99	Ø	4.0	Ø	Routines	[illegible]
2-18-21	1510	7.99	Ø	4.0	Ø	DATA	JRS
3-1-21	1525	7.99	Ø	4.0	Ø	Routines	Fisher
3-2-21	1100	7.99	Ø	4.0	Ø	TØ. TUNNEL OUTAGE	D. TITO
3-29-21	1500	8.44	6.51	4.0	2.51	Turned in monthly/weekly	JLH
4-6-21	0959	8.35	4.63	4.0	.63	Brons Routines	J.B
4-8-21	0940	8.33	4.25	4.0	.25	DATA	JRS
4-8-21	1445	8.32	4.06	4.0	.06	LOWERED INTAKE GATE	JRS
4-19-21	1214	8.26	3	4.0	Ø	cfs Routines	RA
4-26-21	1035	8.24	2.67	4.0	Ø	Weekly/monthly inspection	JLH
5-10-21	1040	8.20	2.0	4.0	Ø	Routines	[illegible]
5-5-21	1535	8.20	2.0	4.0	Ø	USGS INSP. ALL WATER IN CR.	PH
5-12-21	0940	8.00	Ø	4.0	Ø	TURNOUT DIV. INSTALL DO TEMP	DAT
5-17-21	1530	8.00	Ø	4.0	Ø	Routines	[illegible]
6-9-21	900	7.99	Ø	4.0	Ø	DATA	JRS
6-21-21	1045	7.99	Ø	4.0	Ø	Weekly/monthly	[illegible]
7-6-21	1440	7.99	Ø	4.0	Ø	DATA	JRS
7-21-21	1010	7.99	Ø	1.0	Ø	INSTALLED 1 cfs PLATE	JRS
8-2-21	0925	7.99	Ø	1.0	Ø	TØ	DAT
8-30-21	1615	7.99	Ø	1.0	Ø	Monthly	[illegible]
9-2-21	1155	7.99	Ø	1.0	Ø	TØ	DAT
9-14-21	0900	7.99	Ø	1.0	Ø	Monthly/weekly walking permission	[illegible]

SCE OD 67-B REV 10/85 (CW)

414 Salmon Creek Diversion 11186550

2022 WY

Date	Time	GHT	Flow	Plate	Diverted	Notes	Visit by
10-13-21	1415	7.99	ϕ	1.0	ϕ	TURNED OUT. 13.8v	D. TITO
11-9-21	09:45	7.99	ϕ	1.0	ϕ	weekly routines	T. Simmons
11-9-21	14:10	7.99	ϕ	1.0	ϕ	TURNED OUT	JRS
11-15-21	1110	7.99	ϕ	1.0	ϕ	weekly routines	T. Simmons
11-18-21	1040	7.99	ϕ	1.0	ϕ	USGS INSP.	D. TITO
11-29-21	1130	7.99	0	1.0	0	Monthly / weekly insp	DH
12-1-21	1150	7.99	ϕ	1.0	ϕ	TΦ. BATT 14.4v MIN. 12.4v	D. TITO
12-8-21	15:00	7.99	ϕ	1.0	ϕ	weekly routines	T. Simmons
12-20-21	1000	7.99	ϕ	1.0	ϕ	weekly routies	T. Simons
12-29-21	0940	7.99	ϕ	1.0	ϕ	weekly/monthly insp.	T. Simons
1-10-22	1530	7.99	ϕ	1.0	ϕ	weekly routines	T. Simmons
1-18-22	1040	7.99	ϕ	1.0	ϕ	TURNED OUT	D. TITO
1-19-22	1010	7.99	ϕ	4.0	ϕ	CHANGED ORIFICE TO 4	D. TITO
2-1-22	1310	7.99	ϕ	4.0	ϕ	TURNED OUT	JRS
2-8-22	1030	7.99	ϕ	4.0	ϕ	weekly routines	T. Simmons
2-17-22	1250	7.99	0	4.0	0	Routines	JH
2-22-22	0930	7.99	ϕ	4.0	ϕ	weekly routines	T. Simmons
3-1-22	1055	7.99	ϕ	4.0	ϕ	MONTHLY DATA	D. TITO
3-1-22	1115	7.99	ϕ	4.0	ϕ	weekly/monthly inspection	T. Simmons
3-14-22	1008	7.99	ϕ	4.0	ϕ	weekly routines	T. Simmons
3-21-22	1110	7.99	ϕ	4.0	ϕ	weekly routines	T. Simmons
3-24	1040	7.99	ϕ	4.0	ϕ	weekly/monthly inspection	T. Simmons
4-4-22	1150	7.99	ϕ	4.0	ϕ	MONTHLY DATA	JRS
4-21-22	1320	7.99	ϕ	4.0	ϕ	Weekly Routines	T. Simmons
4-25-22	1150	7.99	ϕ	4.0	ϕ	weekly/monthly inspection	T. Simmons
4-28-22	0900	7.99	ϕ	4.0	ϕ	USGS INSP.	D. TITO
5-2-22	0920	7.99	ϕ	4.0	ϕ	weekly routines	T. Simmons
5-4-22	1050	7.99	ϕ	4.0	ϕ	check 14.1v	D. TITO
5-11-22	1420	7.99	ϕ	4.0	ϕ	weekly routies	T. Simmons
5-19-22	1359	7.99	ϕ	4.0	ϕ	weekly routies	T. Simmons
5-31-22	0935	7.99	ϕ	4.0	ϕ	weekly routies	T. Simmons
6-6-22	1330	7.99	ϕ	4.0	ϕ	TURNED OUT 13.8v	D. TITO
6-16-22	1000	7.99	ϕ	4.0	ϕ	DATA PULLED	JRS
6-29-22	0927	7.99	ϕ	4.0	ϕ	weekly/monthly inspection	T. Simmons
7-5-22	0900	7.99	ϕ	[illegible]0	ϕ	weekly routies	T. Simmons

414 Salmon Creek Diversion 11186550 2022 WY

Date	Time	GHT	Flow	Plate	Diverted	Notes	Visit by
7-5-22	1020	7.99	Ø	4.0	Ø	TØ BATT 14.2	D. TITO
7-11-22	1040	7.99	0	4.0	0	weekly routines	T. Simmons
7-18-22	1250	7.99	0	4.0	0	weekly routines	T. Simmons
8-24-22	1105	7.99	Ø	4.0	Ø	DATA	JRS
9-6-22	0850	7.99	0	4.0	0	weekly routines	T. Simmons
9-22-22	1400	7.99	0	4.0	0	Monthly	JWA
10-10-22	1014	7.99	0	4.0	0	weekly routines	T. Simmons
10-13-22	0905	7.99	Ø	1.0	0	USGS INSP. DAT	JRS, NW

[SUMMARY OF FINAL SUBMITTED VERSION]

SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2009

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Statement Number: S001830
Date Submitted: 06/29/2012

1. Water is used under	Other: prescription
2. Year of first use	1921

3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used

Month	Rate of diversion (CFS)	Amount directly diverted or collected to storage (Acre-Feet)	Amount beneficially used (Acre-Feet)
January	0	0	0
February	0	0	0
March	2.3	30	30
April	0	0	0
May	0	0	0
June	0	0	0
July	0	0	0
August	0	0	0
September	0	0	0
October	0	0	0
November	0	0	0
December	0	0	0
Total		30	30

5. Purpose of Use	
Other	Hydroelectric generation

6. Changes in Method of Diversion

7. Conservation of Water		
a.	Are you now employing water conservation efforts?	No
	Describe any water conservation efforts you have initiated	
b.	Amount of water conserved	Acre-Feet
	I have data to support the above surface water use reductions due to conservation efforts.	

8. Water Quality and Wastewater Reclamation		
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
b.	Amount of reduced diversion	
	Type of substitute water supply	
	Amount of substitute water supply used	
	I have data to support the above surface water use reductions due to the use of a substitute water supply	

9. Conjuctive Use of Surface Water and Groundwater		
a.	Are you now using groundwater in lieu of surface water?	No

b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

10a. Additional Remarks

Attachments		
File Name	**Description**	**Size**
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Brian
Last Name	McGurty
Relation to Water Right	Owner
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes

[SUMMARY OF FINAL SUBMITTED VERSION]

SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2010

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Statement Number: S001830
Date Submitted: 06/29/2012

1. Water is used under	Other: prescription
2. Year of first use	1921

3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used			
Month	**Rate of diversion (CFS)**	**Amount directly diverted or collected to storage (Acre-Feet)**	**Amount beneficially used (Acre-Feet)**
January	0	0	0
February	0	0	0
March	0	0	0
April	0.05	0.24	0.24
May	10	190	190
June	0	0	0
July	0	0	0
August	0	0	0
September	0	0	0
October	0	0	0
November	0	0	0
December	0	0	0
Total		190.24	190.24

5. Purpose of Use	
Other	Hydroelectric generation

6. Changes in Method of Diversion

7. Conservation of Water		
a.	Are you now employing water conservation efforts?	No
	Describe any water conservation efforts you have initiated	
b.	Amount of water conserved	Acre-Feet
	I have data to support the above surface water use reductions due to conservation efforts.	

8. Water Quality and Wastewater Reclamation		
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
b.	Amount of reduced diversion	
	Type of substitute water supply	
	Amount of substitute water supply used	
	I have data to support the above surface water use reductions due to the use of a substitute water supply	

9. Conjuctive Use of Surface Water and Groundwater		
a.	Are you now using groundwater in lieu of surface water?	No

b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

10a. Additional Remarks

Attachments		
File Name	**Description**	**Size**
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Brian
Last Name	McGurty
Relation to Water Right	Owner
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes

[SUMMARY OF FINAL SUBMITTED VERSION]

SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2011

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Statement Number: S001830
Date Submitted: 06/29/2012

1. Water is used under	Other: prescription
2. Year of first use	1921

3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used			
Month	**Rate of diversion (CFS)**	**Amount directly diverted or collected to storage (Acre-Feet)**	**Amount beneficially used (Acre-Feet)**
January	0	0	0
February	0	0	0
March	0	0	0
April	0	0	0
May	0	0	0
June	0	0	0
July	0	0	0
August	0	0	0
September	0	0	0
October	0	0	0
November	0	0	0
December	0	0	0
Total		0	0

5. Purpose of Use	
Other	Hydroelectric generation

6. Changes in Method of Diversion

7. Conservation of Water		
a.	Are you now employing water conservation efforts?	No
	Describe any water conservation efforts you have initiated	
b.	Amount of water conserved	Acre-Feet
	I have data to support the above surface water use reductions due to conservation efforts.	

8. Water Quality and Wastewater Reclamation		
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
b.	Amount of reduced diversion	
	Type of substitute water supply	
	Amount of substitute water supply used	
	I have data to support the above surface water use reductions due to the use of a substitute water supply	

9. Conjuctive Use of Surface Water and Groundwater		
a.	Are you now using groundwater in lieu of surface water?	No

b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

10a. Additional Remarks

Attachments		
File Name	**Description**	**Size**
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Brian
Last Name	McGurty
Relation to Water Right	Owner
Has read the form and agrees the information in the report is true to the best of his/her knowledge and belief	Yes

[SUMMARY OF FINAL SUBMITTED VERSION]

SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2012

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Statement Number: S001830
Date Submitted: 06/30/2015

1. Water is used under	Other: Prescription
2. Year diversion commenced	1921

3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used				
Month	**Rate of diversion (CFS)**	**Amount directly diverted (Acre-Feet)**	**Amount diverted or collected to storage (Acre-Feet)**	**Amount beneficially used (Acre-Feet)**
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	0.16	10	10	10
May	1.86	110	110	110
June	0	0	0	0
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
Total		120	120	120
Comments				

Water Transfers	
8e. Water transfered	No
8f. Quantity transfered (Acre-Feet)	
8g. Dates which transfer occurred	/ to /
8h. Transfer approved by	

Water Supply Contracts	
8i. Water supply contract	No
8j. Contract with	
8k. Other provider	
8l. Contract number	
8m. Source from which contract water was diverted	
8n. Point of diversion same as identified water right	
8o. Amount (Acre-Feet) authorized to divert under this contract	
8p. Amount (Acre-Feet) authorized to be diverted in 2012	
8q. Amount (Acre-Feet) projected for 2013	
8r. Exchange or settlement of prior rights	
8s. All monthly reported diversion claimed under the prior rights	
8t. Amount (Acre-Feet) of reported diversion solely under contract	

5. Water Diversion Measurement		
a.	Measurement	Water directly diverted and/or diverted to storage was measured
b.	Types of measuring devices used	Acoustic Meter
c.	Additional technology used	
	Description of additional technology used	
d.	Who installed your measuring device(s)	Hydrographer
e.	Make, model number, and last calibration date of your measuring device(s)	
f.	Why direct measurement using a device listed in Section 1 is "not locally cost effective"	
	Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	
g.	Method(s) used as an alternative to direct measurement	
	Explanation of method(s) used as an alternative to direct measurement	

6. Purpose of Use	
Other	Hydropower

7. Changes in Method of Diversion

8. Conservation of Water		
a.	Are you now employing water conservation efforts?	No
	Describe any water conservation efforts you have initiated	
b.	Amount of water conserved	Acre-Feet
	I have data to support the above surface water use reductions due to conservation efforts.	

9. Water Quality and Wastewater Reclamation		
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
b.	Amount of reduced diversion	
	Type of substitute water supply	
	Amount of substitute water supply used	
	I have data to support the above surface water use reductions due to the use of a substitute water supply	

10. Conjuctive Use of Surface Water and Groundwater		
a.	Are you now using groundwater in lieu of surface water?	No
b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

11a. Additional Remarks

Attachments		
File Name	**Description**	**Size**
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Paul
Last Name	Teensma

Relation to Water Right	Diverter of Record
The information in the report is true to the best of his/her knowledge and belief	Yes

[SUMMARY OF FINAL SUBMITTED VERSION]

SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2013

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Statement Number: S001830
Date Submitted: 06/30/2015

1. Water is used under	
2. Year diversion commenced	1924

3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used				
Month	**Rate of diversion (CFS)**	**Amount directly diverted (Acre-Feet)**	**Amount diverted or collected to storage (Acre-Feet)**	**Amount beneficially used (Acre-Feet)**
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	0	0	0	0
May	0	0	0	0
June	0	0	0	0
July	0	0	0	0
August	0.001	0.06	0.06	0.06
September	0	0	0	0
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
Total		0.06	0.06	0.06
Comments				

Water Transfers	
8e. Water transfered	No
8f. Quantity transfered (Acre-Feet)	
8g. Dates which transfer occurred	/ to /
8h. Transfer approved by	

Water Supply Contracts	
8i. Water supply contract	No
8j. Contract with	
8k. Other provider	
8l. Contract number	
8m. Source from which contract water was diverted	
8n. Point of diversion same as identified water right	
8o. Amount (Acre-Feet) authorized to divert under this contract	
8p. Amount (Acre-Feet) authorized to be diverted in 2013	
8q. Amount (Acre-Feet) projected for 2014	
8r. Exchange or settlement of prior rights	
8s. All monthly reported diversion claimed under the prior rights	
8t. Amount (Acre-Feet) of reported diversion solely under contract	

5. Water Diversion Measurement		
a.	Measurement	Water directly diverted and/or diverted to storage was measured
b.	Types of measuring devices used	Acoustic Meter
c.	Additional technology used	
	Description of additional technology used	
d.	Who installed your measuring device(s)	Hydrographer
e.	Make, model number, and last calibration date of your measuring device(s)	
f.	Why direct measurement using a device listed in Section 1 is "not locally cost effective"	
	Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	
g.	Method(s) used as an alternative to direct measurement	
	Explanation of method(s) used as an alternative to direct measurement	

6. Purpose of Use	
Other	Hydropower

7. Changes in Method of Diversion

8. Conservation of Water		
a.	Are you now employing water conservation efforts?	No
	Describe any water conservation efforts you have initiated	
b.	Amount of water conserved	Acre-Feet
	I have data to support the above surface water use reductions due to conservation efforts.	

9. Water Quality and Wastewater Reclamation		
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
b.	Amount of reduced diversion	
	Type of substitute water supply	
	Amount of substitute water supply used	
	I have data to support the above surface water use reductions due to the use of a substitute water supply	

10. Conjuctive Use of Surface Water and Groundwater		
a.	Are you now using groundwater in lieu of surface water?	No
b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

11a. Additional Remarks

Attachments		
File Name	**Description**	**Size**
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Paul
Last Name	Teensma

Relation to Water Right	Diverter of Record
The information in the report is true to the best of his/her knowledge and belief	Yes

[SUMMARY OF FINAL SUBMITTED VERSION]

SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2014

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Statement Number: S001830
Date Submitted: 06/23/2015

1. Water is used under	Other: Prescription
2. Year diversion commenced	1921

3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used				
Month	**Rate of diversion (CFS)**	**Amount directly diverted (Acre-Feet)**	**Amount diverted or collected to storage (Acre-Feet)**	**Amount beneficially used (Acre-Feet)**
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	0	0	0	0
May	0	0	0	0
June	0	0	0	0
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
Total		0	0	0
Comments	No water used because there was no water in this creek during 2014.			

Water Transfers	
8e. Water transfered	No
8f. Quantity transfered (Acre-Feet)	
8g. Dates which transfer occurred	/ to /
8h. Transfer approved by	

Water Supply Contracts	
8i. Water supply contract	No
8j. Contract with	
8k. Other provider	
8l. Contract number	
8m. Source from which contract water was diverted	
8n. Point of diversion same as identified water right	
8o. Amount (Acre-Feet) authorized to divert under this contract	
8p. Amount (Acre-Feet) authorized to be diverted in 2014	
8q. Amount (Acre-Feet) projected for 2015	
8r. Exchange or settlement of prior rights	
8s. All monthly reported diversion claimed under the prior rights	
8t. Amount (Acre-Feet) of reported diversion solely under contract	

5. Water Diversion Measurement		
a.	Measurement	Water directly diverted and/or diverted to storage was measured
b.	Types of measuring devices used	Other: None - no water in the creek during 2014
c.	Additional technology used	
	Description of additional technology used	
d.	Who installed your measuring device(s)	Hydrographer
e.	Make, model number, and last calibration date of your measuring device(s)	
f.	Why direct measurement using a device listed in Section 1 is "not locally cost effective"	
	Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	
g.	Method(s) used as an alternative to direct measurement	Other
	Explanation of method(s) used as an alternative to direct measurement	None. No water in the creek this year.

6. Purpose of Use	
Other	Hydropower

7. Changes in Method of Diversion

8. Conservation of Water		
a.	Are you now employing water conservation efforts?	No
	Describe any water conservation efforts you have initiated	
b.	Amount of water conserved	Acre-Feet
	I have data to support the above surface water use reductions due to conservation efforts.	

9. Water Quality and Wastewater Reclamation		
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
b.	Amount of reduced diversion	
	Type of substitute water supply	
	Amount of substitute water supply used	
	I have data to support the above surface water use reductions due to the use of a substitute water supply	

10. Conjuctive Use of Surface Water and Groundwater		
a.	Are you now using groundwater in lieu of surface water?	No
b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

11a. Additional Remarks

Attachments		
File Name	**Description**	**Size**
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Paul

Last Name	Teensma
Relation to Water Right	Diverter of Record
The information in the report is true to the best of his/her knowledge and belief	Yes

[SUMMARY OF FINAL SUBMITTED VERSION]

SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2015

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Statement Number: S001830
Date Submitted: 06/28/2016

1. Water is used under	Pending Appropriative Right
2. Year diversion commenced	1924

3-4. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used

Month	Rate of diversion (CFS)	Amount directly diverted (Acre-Feet)	Amount diverted or collected to storage (Acre-Feet)	Amount beneficially used (Acre-Feet)
January	0	0	0	0
February	0.021	1.2	0	1.2
March	0	0	0	0
April	0	0	0	0
May	0	0	0	0
June	0	0	0	0
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
Total		1.2	0	1.2
Type of Diversion	Direct Diversion Only			
Comments				

Water Transfers	
8e. Water transfered	No
8f. Quantity transfered (Acre-Feet)	
8g. Dates which transfer occurred	/ to /
8h. Transfer approved by	

Water Supply Contracts	
8i. Water supply contract	No
8j. Contract with	
8k. Other provider	
8l. Contract number	
8m. Source from which contract water was diverted	
8n. Point of diversion same as identified water right	
8o. Amount (Acre-Feet) authorized to divert under this contract	
8p. Amount (Acre-Feet) authorized to be diverted in 2015	
8q. Amount (Acre-Feet) projected for 2016	
8r. Exchange or settlement of prior rights	

8s. All monthly reported diversion claimed under the prior rights	
8t. Amount (Acre-Feet) of reported diversion solely under contract	

5. Water Diversion Measurement		
a.	Measurement	Water directly diverted and/or diverted to storage was measured
b.	Types of measuring devices used	Acoustic Meter
c.	Additional technology used	Data Logger
	Description of additional technology used	
d.	Who installed your measuring device(s)	Hydrographer Representative using United States Geological Survey (USGS) techniques
e.	Make, model number, and last calibration date of your measuring device(s)	
f.	Why direct measurement using a device listed in Section 1 is "not locally cost effective"	
	Explanation of why use of devices and technologies listed in Section 1 are "not locally cost effective"	
g.	Method(s) used as an alternative to direct measurement	
	Explanation of method(s) used as an alternative to direct measurement	

6. Purpose of Use	
Power	36800 kW

7. Changes in Method of Diversion

8. Conservation of Water		
a.	Are you now employing water conservation efforts?	No
	Describe any water conservation efforts you have initiated	
b.	Amount of water conserved	Acre-Feet
	I have data to support the above surface water use reductions due to conservation efforts.	

9. Water Quality and Wastewater Reclamation		
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
b.	Amount of reduced diversion	
	Type of substitute water supply	
	Amount of substitute water supply used	
	I have data to support the above surface water use reductions due to the use of a substitute water supply	

10. Conjuctive Use of Surface Water and Groundwater		
a.	Are you now using groundwater in lieu of surface water?	No
b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

11a. Additional Remarks

Attachments		
File Name	Description	Size

No Attachments

Contact Information of the Person Submitting the Form	
First Name	Andrew
Last Name	McMillan
Relation to Water Right	Diverter of Record
The information in the report is true to the best of his/her knowledge and belief	Yes

[SUMMARY OF FINAL SUBMITTED VERSION]

SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2016

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Statement Number: S001830
Date Submitted: 10/04/2017

1. Water is used under	Pending Appropriative Right
2. Year diversion commenced	1924

3. Purpose of Use	
Power	10000 kW

4. Changes in Method of Diversion

Special Use Categories	
C1. Are you using any water diverted under this right for the cultivation of cannabis?	No

5-6. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used				
Month	**Rate of diversion (CFS)**	**Amount directly diverted (Acre-Feet)**	**Amount diverted or collected to storage (Acre-Feet)**	**Amount beneficially used (Acre-Feet)**
January	0	0	0	0
February	2	57	0	57
March	3.2	109	0	109
April	1.4	17	0	17
May	0	0	0	0
June	0	0	0	0
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
October	0	0	0	0
November	0.23	0.5	0	0.5
December	1.1	13	0	13
Total		196.5	0	196.5
Type of Diversion	Direct Diversion Only			
Comments				

Water Transfers	
6d. Water transfered	No
6e. Quantity transfered (Acre-Feet)	
6f. Dates which transfer occurred	/ to /
6g. Transfer approved by	

Water Supply Contracts	
6h. Water supply contract	No
6i. Contract with	

6j. Other provider	
6k. Contract number	
6l. Source from which contract water was diverted	
6m. Point of diversion same as identified water right	
6n. Amount (Acre-Feet) authorized to divert under this contract	
6o. Amount (Acre-Feet) authorized to be diverted in 2016	
6p. Amount (Acre-Feet) projected for 2017	
6q. Exchange or settlement of prior rights	
6r. All monthly reported diversion claimed under the prior rights	
6s. Amount (Acre-Feet) of reported diversion solely under contract	

7. Water Diversion Measurement	
a. Required to measure as of the date this report is submitted	Yes
b. Is diversion measured?	Yes
c. An alternative compliance plan was submitted to the division of water rights on	
d. A request for additional time was submitted to the division of water rights on	

Measurement ID number	M004004
This Device/Method was used to measure water during the current reporting period	Yes
M1. Briefly describe the measurement device or method	Fixed Orifice
M2. Nickname	
M3. Type of device / method	Other: Fixed Orifice
M4. Device make	
M5. Serial number	
M6. Model number	
M7. Approximate date of installation	01/01/1978
M8. Additional info	
M9. Approximate date the measuring device was last calibrated or the measurement method was updated	
M10. Estimated accuracy of measurement	
M11. Description of calibration method	Not Applicable.
M12. Describe the maintenance schedule for the device/method	Quarterly
Information for the person who last calibrated the device or designed the measurement method	
M13. Name	Unknown Installer
M14. Phone number	
M15. Email	
M16. Qualifications of the individual	A person under the supervision of a California-registered Professional Engineer and employed to install, operate, and maintain water measurement and reporting devices or methods
M17. License number and type for the qualified individual above and/or any other relevant explanation	The individual above works under the supervision of a California-Registered Professional Engineer License # C85109
M18. Type of data recorder device / method	Data logger (digital)
M19. Data recorder device make	Design Analysis
M20. Data recorder serial number	2340

M21. Data recorder model number	H500XL
M22. Data recorder units of measurement	Cubic Feet
M23. Frequency of data recording	More frequent than hourly
M24. Additional data recorder info	
M25. I am required to report my diversion or storage data by telemetry as of the date this report is submitted	No
M26. I report my diversion or storage date by telemetry to the following website	
M27. I have attached additional information on the method I used to calculate the volume of water	
M28. Describe any documents related to this measurement device or method that are attached to this water use report	

8. Conservation of Water		
a.	Are you now employing water conservation efforts?	No
	Describe any water conservation efforts you have initiated	
b.	Amount of water conserved	
	I have data to support the above surface water use reductions due to conservation efforts.	

9. Water Quality and Wastewater Reclamation		
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
b.	Amount of reduced diversion	
	Type of substitute water supply	
	Amount of substitute water supply used	
	I have data to support the above surface water use reductions due to the use of a substitute water supply	

10. Conjuctive Use of Surface Water and Groundwater		
a.	Are you now using groundwater in lieu of surface water?	No
b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

Additional Remarks

Attachments		
File Name	**Description**	**Size**
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Andrew
Last Name	McMillan
Relation to Water Right	Diverter of Record
The information in the report is true to the best of his/her knowledge and belief	Yes

[SUMMARY OF FINAL SUBMITTED VERSION]

SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2017

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Statement Number: S001830
Date Submitted: 06/21/2018

1. Water is used under	Pending Appropriative Right
2. Year diversion commenced	1924

3. Purpose of Use	
Power	10000 kW

4. Changes in Method of Diversion

Special Use Categories	
C1. Are you using any water diverted under this right for the cultivation of cannabis?	No

5-6. Maximum Rate of Diversion for each Month and Amount of Water Diverted and Used				
Month	**Rate of diversion (CFS)**	**Amount directly diverted (Acre-Feet)**	**Amount diverted or collected to storage (Acre-Feet)**	**Amount beneficially used (Acre-Feet)**
January	1.6	12	0	12
February	4	51	0	51
March	11	488	0	488
April	11	649	0	649
May	11	327	0	327
June	2	38	0	38
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
Total		1565	0	1565
Type of Diversion	Direct Diversion Only			
Comments				

Water Transfers	
6d. Water transfered	No
6e. Quantity transfered (Acre-Feet)	
6f. Dates which transfer occurred	/ to /
6g. Transfer approved by	

Water Supply Contracts	
6h. Water supply contract	No
6i. Contract with	

6j. Other provider	
6k. Contract number	
6l. Source from which contract water was diverted	
6m. Point of diversion same as identified water right	
6n. Amount (Acre-Feet) authorized to divert under this contract	
6o. Amount (Acre-Feet) authorized to be diverted in 2017	
6p. Amount (Acre-Feet) projected for 2018	
6q. Exchange or settlement of prior rights	
6r. All monthly reported diversion claimed under the prior rights	
6s. Amount (Acre-Feet) of reported diversion solely under contract	

7. Water Diversion Measurement	
a. Required to measure as of the date this report is submitted	Yes
b. Is diversion measured?	Yes
c. An alternative compliance plan was submitted to the division of water rights on	
d. A request for additional time was submitted to the division of water rights on	

Measurement ID number	M004004
This Device/Method was used to measure water during the current reporting period	Yes
M1. Briefly describe the measurement device or method	Fixed Orifice
M2. Nickname	
M3. Type of device / method	Other: Fixed Orifice
M4. Device make	
M5. Serial number	
M6. Model number	
M7. Approximate date of installation	01/01/1978
M8. Additional info	
M9. Approximate date the measuring device was last calibrated or the measurement method was updated	
M10. Estimated accuracy of measurement	
M11. Description of calibration method	Not Applicable.
M12. Describe the maintenance schedule for the device/method	Quarterly
Information for the person who last calibrated the device or designed the measurement method	
M13. Name	Unknown Installer
M14. Phone number	
M15. Email	
M16. Qualifications of the individual	A person under the supervision of a California-registered Professional Engineer and employed to install, operate, and maintain water measurement and reporting devices or methods
M17. License number and type for the qualified individual above and/or any other relevant explanation	The individual above works under the supervision of a California-Registered Professional Engineer License # C85109
M18. Type of data recorder device / method	Data logger (digital)
M19. Data recorder device make	Design Analysis
M20. Data recorder serial number	2340

M21. Data recorder model number	H500XL
M22. Data recorder units of measurement	Cubic Feet
M23. Frequency of data recording	More frequent than hourly
M24. Additional data recorder info	
M25. I am required to report my diversion or storage data by telemetry as of the date this report is submitted	No
M26. I report my diversion or storage date by telemetry to the following website	
M27. I have attached additional information on the method I used to calculate the volume of water	
M28. Describe any documents related to this measurement device or method that are attached to this water use report	

8. Conservation of Water		
a.	Are you now employing water conservation efforts?	No
	Describe any water conservation efforts you have initiated	
b.	Amount of water conserved	
	I have data to support the above surface water use reductions due to conservation efforts.	

9. Water Quality and Wastewater Reclamation		
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
b.	Amount of reduced diversion	
	Type of substitute water supply	
	Amount of substitute water supply used	
	I have data to support the above surface water use reductions due to the use of a substitute water supply	

10. Conjuctive Use of Surface Water and Groundwater		
a.	Are you now using groundwater in lieu of surface water?	No
b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

Additional Remarks

Attachments		
File Name	**Description**	**Size**
No Attachments		

Contact Information of the Person Submitting the Form	
First Name	Andrtew
Last Name	McMillan
Relation to Water Right	Diverter of Record
The information in the report is true to the best of his/her knowledge and belief	Yes

[SUMMARY OF FINAL SUBMITTED VERSION]

SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2018

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Statement Number: S001830
Date Submitted: 02/12/2020

1. Water is used under	Pending Appropriative Right
2. Year diversion commenced	1924

2. Purpose of Use	
Power	33 MW

3. Special Use Categories	
C1. Are you using any water diverted under this right for the cultivation of cannabis?	No

4. Amount of Water Diverted and Used			
Month	**Amount directly diverted (Acre-Feet)**	**Amount diverted or collected to storage (Acre-Feet)**	**Amount beneficially used (Acre-Feet)**
January	0	0	0
February	0	0	0
March	25	0	25
April	24	0	24
May	0	0	0
June	0	0	0
July	0	0	0
August	0	0	0
September	0	0	0
October	0	0	0
November	0	0	0
December	0	0	0
Total	49	0	49
Type of Diversion	Direct Diversion Only		
Comments			

5. Water Diversion Measurement	
a. Required to measure as of the date this report is submitted	Yes
b. Is diversion measured?	Yes
c. An alternative compliance plan was submitted to the division of water rights on	
d. A request for additional time was submitted to the division of water rights on	

Measurement ID number	M004004
This Device/Method was used to measure water during the current reporting period	Yes
M1. Briefly describe the measurement device or method	Fixed Orifice
M2. Nickname	
M3. Type of device / method	Other: Fixed Orifice
M4. Device make	

M5. Serial number	
M6. Model number	
M7. Approximate date of installation	01/01/1978
M8. Additional info	
M9. Approximate date the measuring device was last calibrated or the measurement method was updated	
M10. Estimated accuracy of measurement	15
M11. Description of calibration method	Not Applicable.
M12. Describe the maintenance schedule for the device/method	Quarterly
Information for the person who last calibrated the device or designed the measurement method	
M13. Name	Unknown Installer
M14. Phone number	
M15. Email	
M16. Qualifications of the individual	
M17. License number and type for the qualified individual above and/or any other relevant explanation	The individual above works under the supervision of a California-Registered Professional Engineer License # C85109
M18. Type of data recorder device / method	Data logger (digital)
M19. Data recorder device make	Design Analysis
M20. Data recorder serial number	2340
M21. Data recorder model number	H500XL
M22. Data recorder units of measurement	Cubic Feet
M23. Frequency of data recording	More frequent than hourly
M24. Additional data recorder info	
M25. I am required to report my diversion or storage data by telemetry as of the date this report is submitted	No
M26. I report my diversion or storage date by telemetry to the following website	

Measurement Attachments			
Measurement ID Number	**File Name**	**Description**	**Size**
No attachments			

Measurement Data Files			
Measurement ID Number	**File Name**	**Description**	**Size**
No data files			

6. Maximum Rate of Diversion	
Month	**Rate of Diversion (Cubic Feet Per Second)**
January	0
February	0
March	1.40
April	3.10
May	0
June	0
July	0
August	0
September	0

October	0
November	0
December	0

7. Water Transfers	
8a. Water transfered	No
8b. Quantity transfered (Acre-Feet)	
8c. Dates which transfer occurred	/ to /
8d. Transfer approved by	

Water Supply Contracts	
8e. Water supply contract	No
8f. Contract with	
8g. Other provider	
8h. Contract number	
8i. Source from which contract water was diverted	
8j. Point of diversion same as identified water right	
8k. Amount (Acre-Feet) authorized to divert under this contract	
8l. Amount (Acre-Feet) authorized to be diverted in 2018	
8m. Amount (Acre-Feet) projected for 2019	
8n. Exchange or settlement of prior rights	
8o. All monthly reported diversion claimed under the prior rights	
8p. Amount (Acre-Feet) of reported diversion solely under contract	

8. Conservation of Water		
a.	Are you now employing water conservation efforts?	No
	Describe any water conservation efforts you have initiated	
b.	Amount of water conserved	
	I have data to support the above surface water use reductions due to conservation efforts.	

Water Quality and Wastewater Reclamation		
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
b.	Amount of reduced diversion	
	Type of substitute water supply	
	Amount of substitute water supply used	
	I have data to support the above surface water use reductions due to the use of a substitute water supply	

Conjuctive Use of Surface Water and Groundwater		
a.	Are you now using groundwater in lieu of surface water?	No
b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

Additional Remarks

Attachments		
File Name	**Description**	**Size**
No Attachments		

Contact Information of the Person Submitting the Form

First Name	Andrew
Last Name	Mcmillan
Relation to Water Right	Diverter of Record
The information in the report is true to the best of his/her knowledge and belief	Yes

[SUMMARY OF FINAL SUBMITTED VERSION]

SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2019

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Statement Number: S001830
Date Submitted: 06/24/2020

1. Water is used under	Pending Appropriative Right
2. Year diversion commenced	1924

2. Purpose of Use	
Power	40 MW

3. Special Use Categories	
C1. Are you using any water diverted under this right for the cultivation of cannabis?	No

4. Amount of Water Diverted and Used			
Month	**Amount directly diverted (Acre-Feet)**	**Amount diverted or collected to storage (Acre-Feet)**	**Amount beneficially used (Acre-Feet)**
January	12	0	12
February	116	0	116
March	257	0	257
April	571	0	571
May	497	0	497
June	229	0	229
July	7.1	0	7.1
August	0	0	0
September	0	0	0
October	0	0	0
November	0	0	0
December	0	0	0
Total	1689.1	0	1689.1
Type of Diversion	Direct Diversion Only		
Comments			

5. Water Diversion Measurement	
a. Required to measure as of the date this report is submitted	Yes
b. Is diversion measured?	Yes
c. An alternative compliance plan was submitted to the division of water rights on	
d. A request for additional time was submitted to the division of water rights on	

Measurement ID number	M004004
This Device/Method was used to measure water during the current reporting period	Yes
M1. Briefly describe the measurement device or method	Stage Discharge Rating Table in Pipeline
M2. Nickname	
M3. Type of device / method	Float
M4. Device make	Waterlog

M5. Serial number	
M6. Model number	H331 SDI12
M7. Approximate date of installation	10/01/2005
M8. Additional info	The float and tape sense the water in a stilling well adjacent to the pipeline conveying water to the main canal.
M9. Approximate date the measuring device was last calibrated or the measurement method was updated	11/10/2019
M10. Estimated accuracy of measurement	10
M11. Description of calibration method	Monthly Visits to ensure correct level is being recorded by datalogger.
M12. Describe the maintenance schedule for the device/method	Monthly visits to ensure calibration of level, and operation of float tape without obstruction.
Information for the person who last calibrated the device or designed the measurement method	
M13. Name	Derrick Tito
M14. Phone number	760-376-8350
M15. Email	derrick.tito@sce.com
M16. Qualifications of the individual	Person working under the supervision of a California Professional Engineer
M17. License number and type for the qualified individual above and/or any other relevant explanation	The individual above works under the supervision of a California-Registered Professional Engineer License # C85109
M18. Type of data recorder device / method	Data logger (digital)
M19. Data recorder device make	Design Analysis
M20. Data recorder serial number	2340
M21. Data recorder model number	H500XL
M22. Data recorder units of measurement	Feet
M23. Frequency of data recording	More frequent than hourly
M24. Additional data recorder info	
M25. I am required to report my diversion or storage data by telemetry as of the date this report is submitted	No
M26. I report my diversion or storage date by telemetry to the following website	

Measurement Attachments			
Measurement ID Number	**File Name**	**Description**	**Size**
M004004	416 Rtg 3.txt	416 Rating Table	8 KB

Measurement Data Files			
Measurement ID Number	**File Name**	**Description**	**Size**
No data files			

6. Maximum Rate of Diversion	
Month	**Rate of Diversion (Cubic Feet Per Second)**
January	0.63
February	5.70
March	8.90
April	11
May	11
June	8.70

July	0.66
August	0
September	0
October	0
November	0
December	0

7. Water Transfers	
8a. Water transfered	No
8b. Quantity transfered (Acre-Feet)	
8c. Dates which transfer occurred	/ to /
8d. Transfer approved by	

Water Supply Contracts	
8e. Water supply contract	No
8f. Contract with	
8g. Other provider	
8h. Contract number	
8i. Source from which contract water was diverted	
8j. Point of diversion same as identified water right	
8k. Amount (Acre-Feet) authorized to divert under this contract	
8l. Amount (Acre-Feet) authorized to be diverted in 2019	
8m. Amount (Acre-Feet) projected for 2020	
8n. Exchange or settlement of prior rights	
8o. All monthly reported diversion claimed under the prior rights	
8p. Amount (Acre-Feet) of reported diversion solely under contract	

8. Conservation of Water		
a.	Are you now employing water conservation efforts?	No
	Describe any water conservation efforts you have initiated	
b.	Amount of water conserved	
	I have data to support the above surface water use reductions due to conservation efforts.	

Water Quality and Wastewater Reclamation		
a.	Are you now or have you been using reclaimed water from a wastewater treatment facility, desalination facility, or water polluted by waste to a degree which unreasonably affects such water for other beneficial causes?	No
b.	Amount of reduced diversion	
	Type of substitute water supply	
	Amount of substitute water supply used	
	I have data to support the above surface water use reductions due to the use of a substitute water supply	

Conjuctive Use of Surface Water and Groundwater		
a.	Are you now using groundwater in lieu of surface water?	No
b.	Amount of groundwater used	
	I have data to support the above surface water use reductions due to the use of groundwater.	

Additional Remarks

Attachments		

File Name	Description	Size
416 2019CY.docx	416 DayQs 2019CY	25 KB
S001830 Raw Data 2019CY.xlsx	416 raw 15min data 2019CY	618 KB

Contact Information of the Person Submitting the Form	
First Name	Derrick
Last Name	Tito
Relation to Water Right	Company Representative
The information in the report is true to the best of his/her knowledge and belief	Yes

[SUMMARY OF FINAL SUBMITTED VERSION]

SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR 2020

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Statement Number: S001830
Date Submitted: 06/09/2021

1. Water is used under	Pending Appropriative Right
2. Year diversion commenced	1924

2. Purpose of Use	
Power	40 MW

3. Special Use Categories	
C1. Are you using any water diverted under this right for the cultivation of cannabis?	No

4. Amount of Water Diverted and Used			
Month	**Amount directly diverted (Acre-Feet)**	**Amount diverted or collected to storage (Acre-Feet)**	**Amount beneficially used (Acre-Feet)**
January	11	0	11
February	0	0	0
March	13	0	13
April	175	0	175
May	50	0	50
June	0	0	0
July	0.08	0	0.08
August	0.04	0	0.04
September	0.12	0	0.12
October	0	0	0
November	0	0	0
December	0	0	0
Total	249.24	0	249.24
Type of Diversion	Direct Diversion Only		
Comments			

5. Water Diversion Measurement	
a. Required to measure as of the date this report is submitted	Yes
b. Is diversion measured?	Yes
c. An alternative compliance plan was submitted to the division of water rights on	
d. A request for additional time was submitted to the division of water rights on	

Measurement ID number	M004004
This Device/Method was used to measure water during the current reporting period	Yes
M1. Briefly describe the measurement device or method	Acoustic Velocity Meter measures velocity in a fixed geometry Pipeline
M2. Nickname	Corral AVM
M3. Type of device / method	Flow meter (ultrasonic)

M4. Device make	Panametrics
M5. Serial number	M02190039
M6. Model number	AT600
M7. Approximate date of installation	10/01/2019
M8. Additional info	A pair of clamp-on transducers are uised by the AT600 AVM to sense the pipe water velocity. This velocity is used along with the fixed cross-sectional area to compute a direct read CFS output.
M9. Approximate date the measuring device was last calibrated or the measurement method was updated	11/10/2019
M10. Estimated accuracy of measurement	10
M11. Description of calibration method	Monthly Visits to ensure correct sound speed is reported as a function of measured water temperature.
M12. Describe the maintenance schedule for the device/method	Monthly visits to ensure calibration of sound speed and discharge. Battery voltage checks are also performed.
Information for the person who last calibrated the device or designed the measurement method	
M13. Name	Derrick Tito
M14. Phone number	760-376-8350
M15. Email	derrick.tito@sce.com
M16. Qualifications of the individual	Person working under the supervision of a California Professional Engineer
M17. License number and type for the qualified individual above and/or any other relevant explanation	The individual above works under the supervision of a California-Registered Professional Engineer License # C85109
M18. Type of data recorder device / method	Data logger (digital)
M19. Data recorder device make	Design Analysis
M20. Data recorder serial number	2340
M21. Data recorder model number	H500XL
M22. Data recorder units of measurement	Cubic Feet per Second
M23. Frequency of data recording	More frequent than hourly
M24. Additional data recorder info	The previous level system remains in place, and can be used as backup data if the AVM malfunctions. The level data requires the use of a rating table to convert to flow.
M25. I am required to report my diversion or storage data by telemetry as of the date this report is submitted	No
M26. I report my diversion or storage date by telemetry to the following website	

Measurement Attachments

Measurement ID Number	File Name	Description	Size
M004004	S001830 CFS to AF.docx	S001830 Volume Method	11 KB

Measurement Data Files

Measurement ID Number	File Name	Description	Size
M004004	S001830 Raw Data 2020CY.xlsx	S001830 Raw data 2020CY	466 KB

6. Maximum Rate of Diversion

Month	Rate of Diversion (Cubic Feet Per Second)
January	0.41
February	0
March	2
April	6.30
May	3.80
June	0
July	0.01
August	0.01
September	0.03
October	0
November	0
December	0

7. Water Transfers	
8a. Water transfered	No
8b. Quantity transfered (Acre-Feet)	
8c. Dates which transfer occurred	/ to /
8d. Transfer approved by	

Water Supply Contracts	
8e. Water supply contract	No
8f. Contract with	
8g. Other provider	
8h. Contract number	
8i. Source from which contract water was diverted	
8j. Point of diversion same as identified water right	
8k. Amount (Acre-Feet) authorized to divert under this contract	
8l. Amount (Acre-Feet) authorized to be diverted in 2020	
8m. Amount (Acre-Feet) projected for 2021	
8n. Exchange or settlement of prior rights	
8o. All monthly reported diversion claimed under the prior rights	
8p. Amount (Acre-Feet) of reported diversion solely under contract	

Credits Claimed			
	Conservation	**Reclaimed Water Use**	**Conjunctive Groundwater Use**
Claimed? (Yes/No)	No	No	No
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

Conservation Supporting Information	
Description of conservation methods	
Description of baseline water use and time period	
Description of conservation calculation methods	
Conserved water used?	

Additional Remarks
The measuring method was updated to transition to a more accurate acoustic velocity meter. The old measuring system remains in place to provide backup data if necessary.

Attachments		
File Name	**Description**	**Size**
416 2020CY DayQs.xlsx	S001830 Daily values 2020CY	23 KB

Contact Information of the Person Submitting the Form	
First Name	Derrick
Last Name	Tito
Relation to Water Right	Company Representative
The information in the report is true to the best of his/her knowledge and belief	Yes

Contact Information of the Person Submitting the Form	
First Name	Derrick
Last Name	Tito
Relation to Water Right	Company Representative

Information on Certification and Signatory	
Name of Person Signing and Certifying the Report	Derrick Tito
Date of Signature	06/09/2021

[SUMMARY OF FINAL SUBMITTED VERSION]

SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR REPORTING PERIOD

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Statement Number: S001830
Date Submitted: 03/10/2022

Water is used under	Pending Appropriative Right
Year diversion commenced	1924

Purpose of Use	
Power	40 MW

Special Use Categories	
Are you using any water diverted under this right for the cultivation of cannabis?	No

Amount of Water Diverted and Used			
Month	**Amount directly diverted (Acre-Feet)**	**Amount diverted or collected to storage (Acre-Feet)**	**Amount beneficially used (Acre-Feet)**
January	0	0	0
February	0	0	0
March	0	0	0
April	0	0	0
May	0	0	0
June	0	0	0
July	0	0	0
August	0	0	0
September	0.04	0	0.04
Total	0.04	0	0.04
Type of Diversion	Direct Diversion Only		
Comments	The 2020 water year was critically dry. Almost no water was available for diversion at this water right location.		

Water Diversion Measurement	
Required to measure as of the date this report is submitted	Yes
Is diversion measured?	Yes
An alternative compliance plan was submitted to the division of water rights on	
A request for additional time was submitted to the division of water rights on	

Measurement ID number	M004004
This Device/Method was used to measure water during the current reporting period	Yes
Briefly describe the measurement device or method	Acoustic Velocity Meter measures velocity in a fixed geometry Pipeline
Nickname	Corral AVM
Type of device / method	Flow meter (ultrasonic)
Device make	Panametrics

Serial number	M02190039
Model number	AT600
Approximate date of installation	10/01/2019
Additional info	A pair of clamp-on transducers are uised by the AT600 AVM to sense the pipe water velocity. This velocity is used along with the fixed cross-sectional area to compute a direct read CFS output.
Approximate date the measuring device was last calibrated or the measurement method was updated	11/10/2019
Estimated accuracy of measurement	10
Description of calibration method	Monthly Visits to ensure correct sound speed is reported as a function of measured water temperature.
Describe the maintenance schedule for the device/method	Monthly visits to ensure calibration of sound speed and discharge. Battery voltage checks are also performed.
Information for the person who last calibrated the device or designed the measurement method	
Name	Derrick Tito
Phone number	760-376-8350
Email	derrick.tito@sce.com
Qualifications of the individual	Person working under the supervision of a California Professional Engineer
License number and type for the qualified individual above and/or any other relevant explanation	The individual above works under the supervision of a California-Registered Professional Engineer License # C85109
Type of data recorder device / method	Data logger (digital)
Data recorder device make	Design Analysis
Data recorder serial number	2340
Data recorder model number	H500XL
Data recorder units of measurement	Cubic Feet per Second
Frequency of data recording	More frequent than hourly
Additional data recorder info	The previous level system remains in place, and can be used as backup data if the AVM malfunctions. The level data requires the use of a rating table to convert to flow.
I am required to report my diversion or storage data by telemetry as of the date this report is submitted	No
I report my diversion or storage date by telemetry to the following website	

Measurement Attachments

Measurement ID Number	File Name	Description	Size
M004004	S001830 CFS to AF.docx	Conversion Description flow to AF	11 KB

Measurement Data Files

Measurement ID Number	File Name	Description	Size
M004004	416 Raw data 2021WY.xlsx	416 Raw Data 2021WY	334 KB

Maximum Rate of Diversion

Month	Rate of Diversion (Cubic Feet Per Second)
January	0

February	0
March	0
April	0
May	0
June	0
July	0
August	0
September	0.01

Water Transfers	
Water transfered	No
Quantity transfered (Acre-Feet)	
Dates which transfer occurred	/ to /
Transfer approved by	

Water Supply Contracts	
Water supply contract	No
Contract with	
Other provider	
Contract number	
Source from which contract water was diverted	
Point of diversion same as identified water right	
Amount (Acre-Feet) authorized to divert under this contract	
Amount (Acre-Feet) authorized to be diverted in 2021	
Amount (Acre-Feet) projected for 2022	
Exchange or settlement of prior rights	
All monthly reported diversion claimed under the prior rights	
Amount (Acre-Feet) of reported diversion solely under contract	

Credits Claimed			
	Conservation	**Reclaimed Water Use**	**Conjunctive Groundwater Use**
Claimed? (Yes/No)	No	No	No
January			
February			
March			
April			
May			
June			
July			
August			
September			

Conservation Supporting Information	
Description of conservation methods	
Description of baseline water use and time period	
Description of conservation calculation methods	
Conserved water used?	

Additional Remarks
The 2020 water year was critically dry, and almost no water was available for diversion.

Attachments		
File Name	**Description**	**Size**
416 Day Qs 2021wy.xlsx	416 Day Qs 2021WY	17 KB

Contact Information of the Person Submitting the Form	
First Name	Derrick
Last Name	Tito
Relation to Water Right	Company Representative
The information in the report is true to the best of his/her knowledge and belief	Yes

Contact Information of the Person Submitting the Form	
First Name	Derrick
Last Name	Tito
Relation to Water Right	Company Representative

Information on Certification and Signatory	
Name of Person Signing and Certifying the Report	Derrick Tito
Date of Signature	03/10/2022

[SUMMARY OF FINAL SUBMITTED VERSION]

SUPPLEMENTAL STATEMENT OF WATER DIVERSION AND USE FOR REPORTING PERIOD

October 1, 2021 to September 30, 2022

Primary Owner: SOUTHERN CALIFORNIA EDISON COMPANY
Statement Number: S001830
Date Submitted: 01/19/2023

Water is used under	Pending Appropriative Right
Year diversion commenced	1924

Purpose of Use	
Power	40 MW

Special Use Categories	
Are you using any water diverted under this right for the cultivation of cannabis?	No

Amount of Water Diverted and Used			
Month	**Amount directly diverted (Acre-Feet)**	**Amount diverted or collected to storage (Acre-Feet)**	**Amount beneficially used (Acre-Feet)**
2021			
October	0	0	0
November	0	0	0
December	0	0	0
2022			
January	0	0	0
February	0	0	0
March	0	0	0
April	0	0	0
May	0	0	0
June	0	0	0
July	0	0	0
August	0	0	0
September	0	0	0
Total	0	0	0
Type of Diversion	No Diversion		
Comments	The 2022 water year was critically dry, and followed two equally dry years. There was never sufficient water to meet the minimum in-stream flow requirements and allow water to be diverted for power generation.		

Water Diversion Measurement	
Required to measure as of the date this report is submitted	Yes
Is diversion measured?	Yes
An alternative compliance plan was submitted to the division of water rights on	
A request for additional time was submitted to the division of water rights on	

Measurement ID number	M004004
This Device/Method was used to measure water during the current reporting period	Yes
Briefly describe the measurement device or method	Acoustic Velocity Meter measures velocity in a fixed geometry Pipeline
Nickname	Corral AVM
Type of device / method	Flow meter (ultrasonic)
Device make	Panametrics
Serial number	M02190039
Model number	AT600
Approximate date of installation	10/01/2019
Additional info	A pair of clamp-on transducers are uised by the AT600 AVM to sense the pipe water velocity. This velocity is used along with the fixed cross-sectional area to compute a direct read CFS output.
Approximate date the measuring device was last calibrated or the measurement method was updated	11/10/2019
Estimated accuracy of measurement	10
Description of calibration method	Monthly Visits to ensure correct sound speed is reported as a function of measured water temperature.
Describe the maintenance schedule for the device/method	Monthly visits to ensure calibration of sound speed and discharge. Battery voltage checks are also performed.
Information for the person who last calibrated the device or designed the measurement method	
Name	Derrick Tito
Phone number	760-376-8350
Email	derrick.tito@sce.com
Qualifications of the individual	Person working under the supervision of a California Professional Engineer
License number and type for the qualified individual above and/or any other relevant explanation	The individual above works under the supervision of a California-Registered Professional Engineer License # C85109
Type of data recorder device / method	Data logger (digital)
Data recorder device make	Design Analysis
Data recorder serial number	2340
Data recorder model number	H500XL
Data recorder units of measurement	Cubic Feet per Second
Frequency of data recording	More frequent than hourly
Additional data recorder info	The previous level system remains in place, and can be used as backup data if the AVM malfunctions. The level data requires the use of a rating table to convert to flow.
I am required to report my diversion or storage data by telemetry as of the date this report is submitted	No
I report my diversion or storage date by telemetry to the following website	

Measurement Attachments			
Measurement ID Number	**File Name**	**Description**	**Size**
M004004	S001830 CFS to AF.docx	Flow to volume conversion	11 KB

Measurement Data Files			
Measurement ID Number	**File Name**	**Description**	**Size**

M004004	416 Raw Data 2022wy.xlsx	416 Raw Data File 2022WY	443 KB

Maximum Rate of Diversion	
Month	**Rate of Diversion (Cubic Feet Per Second)**
2021	
October	0
November	0
December	0
2022	
January	0
February	0
March	0
April	0
May	0
June	0
July	0
August	0
September	0

Water Transfers	
Water transfered	No
Quantity transfered (Acre-Feet)	
Dates which transfer occurred	/ to /
Transfer approved by	

Water Supply Contracts	
Water supply contract	No
Contract with	
Contract number	
Source from which contract water was diverted	
Point of diversion same as identified water right	
Amount (Acre-Feet) authorized to divert under this contract	
Amount (Acre-Feet) authorized to be diverted in 2022	
Amount (Acre-Feet) projected for 2023	
Exchange or settlement of prior rights	
All monthly reported diversion claimed under the prior rights	
Amount (Acre-Feet) of reported diversion solely under contract	

Credits Claimed			
	Conservation	**Reclaimed Water Use**	**Conjunctive Groundwater Use**
Claimed? (Yes/No)	No	No	No
2021			
October			
November			
December			
2022			
January			
February			
March			

April			
May			
June			
July			
August			
September			

Conservation Supporting Information	
Description of conservation methods	
Description of baseline water use and time period	
Description of conservation calculation methods	
Conserved water used?	

Additional Remarks
The 2022 Water year was too dry to allow for any diversion.

Attachments		
File Name	**Description**	**Size**
416 Day Qs 2022wy.docx	416 Daily Values and Monthly Volumes 2022WY	25 KB

Contact Information of the Person Submitting the Form	
First Name	Derrick
Last Name	Tito
Relation to Water Right	Company Representative

Contact Information of the Person Submitting the Form	
First Name	Derrick
Last Name	Tito
Relation to Water Right	Company Representative

Information on Certification and Signatory	
Name of Person Signing and Certifying the Report	Derrick Tito
Date of Signature	01/19/2023

415 CORAL CREEK 2005 WY

Southern California Edison Company

HYDRO DIVISION LOG SHEET

DATE	TIME	ORIFICE ~~DATE~~ STATUS	DIVERTED FLOW	COMMENTS SHEET NO. 06951	MADE BY
9-22-04	1140	CLEAR	Ø	TURNED OUT STILL. DIVERSION OUT OF SERVICE	D. TITO
9-30-04	0800	Clear	Ø	Turned out - Est 1 CFS Total in Creek	J Downum
10-13-04	1300	clear	Ø	Turned out - 2 1/2 CFS in Creek	D. Kench
10-14-04	1420	CLEAR	Ø	TURNED OUT – GATE OPEN. DIVERSION OUT OF SRV.	D. TITO
10-17-04	0900	Clear	Ø	T.O. Cleared For Tunnel outage	RA
10/25/04	1045	Clear	Ø	Turned off Tunnel back in Service	RA
10/25/04	1500	clear	Ø	T.O. Tunnel back out of Service	RA
11/2/04	1100	clear	Ø	T.O Tunnel Back in Service	RA
11/4/04	0900	clear	Ø	Turned out Approx. .79 CFS	RA
11/17/04	1400	CLEAR	Ø	T.O. CIVIL CREW FINISHING REPAIRS ON DIVERSION	D. TITO
11-27-04	0730	Clear	Ø	T.O. Due To Low Water	JD
11-28-04	1140	CLEAR	Ø	T.O.	DA TITO
12-8-04	1100	Clear	Ø	T.O	J Downum
12-9-04	1040	Clear	Ø	T.O	RP
12-10-04	0950	CLEAR	Ø	T.O.	D. TITO
12-13-04	0840	Clear	Ø	T.O.	RT
12/30/04	0815	CLR	Ø	Turned out Est 1 cfs in D.V	RA
1/5/05	0935	Clear	Ø	Turned out Repairs beg made	D. Kench
1-10-05	0850	UNDER H_2O	?	FLOOD LEVEL. DAM SPILLING EST. 50+ CFS IN CR. TURNED OUT, BUT FLOW ENTERING CONDUIT.	D. TITO
1-10-05	0855	" "	11.2	RAKED GRIDS, TURNED IN, DRAIN @ DAM OPEN	D. TITO J.D. & DK
1-11-05	0810	" "	11.2	" ", WERE CLOCKED, " " " "	D. TITO
1-14-05	0830	Clear	Zero	Closed Drain Gate	J Downum
1-17-05	1440	Clear	3.77		Stivers
1-20-05	1010	clear	~~5.76~~ 9.14	Raked Grids	D Ind
2-2-05	1045	clear	2	Raked Grids / Clear	ASK
2/8/5	0840	CLR	1.30	GH 12.40 in Pipe	CA
2/10/05	0850	CLR	1.30	GH 12.40 in Pipe	RA
2-12-05	1210	CLR	1.4	Pond Only 1/2 Full - Raked Grids	JA
2/16/05	1215	CLR	3.52	GH 5.61	RA
2/23/05	1355	Cloudy	3.77	Pond -.24 RAKED GRIDS	JS
~~2-27-05~~ 3-1-05	1230	CLR	3.30	GH = 15.59	JD
3-1-05	1215	CLR	3.30	Cleaned Grids	JD
3-4-05	0815	Clr	Ø	Turned out for Plant outage	DSK
3-23-05	1110	CLEAR	Ø	TURNED OUT. DAM SPILLING. DRAIN OPEN	DAT/DSK
4-3-05	1053	clr	16.49/9.69cfs	TURNED IN.	R. PARKER
4-4-05	1210	CLEAR	3.0	MEASURED 1.0 RELEASE W/ AVM	D. TITO

SCE OD 67-B REV 10/85 (CW)

415 CORAL CREEK

2005 WY

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 06952

DATE	TIME	ORIFICE ~~DATE~~ STATUS	DIVERTED FLOW	COMMENTS	MADE BY:
4/5/05	1135	CLEAR	T/O	TURNED-OUT	[illegible]
4-11-05	1150	clear		Turned In	J Dor
5-9-05	1520	clear		Turned In Racked boards.	DM
5/21/05	1145	Clear	11.3	Pond spilling/ Approx 15-20 CFS	[illegible]
5-26-05	1110	CLEAR		USGS INSP. 1 CFS ORIFICE + SPILL	DAT/DB
6-15-05	1300	clear		Turned In Flush D.V Racked Gates	DSK/RA
6-16-05	1330	CLEAR	2.20-4	TURNED OUT - DRAIN GATE OPEN.	DAT
6-23-05	1000	clear	T/O	~~Turned~~ Flow line Ins	DSK
6-27-05	1530	clear	T/O	Turnout Biweekly Ins	DSK
7-11-05	1405	clear	T/O	Drain Gate Open - Turned Out	DSK
7-14-05	1000	CLEAR	T/O	DRAIN OPEN - ZERO DIVERSION	DAT
7-18-05	1500	clear	T/O	Drain open - Used Pump to pasted Clear Pond	DSK
8/4/05	1040	CLR	Turnout	Rountine check	RLH
8-11-05	1430	clr	T/O	Weekly check - Turned Out	DSK
8-15-05	1000	CLEAR	T/O	CHECK - TURNED OUT.	DAT
8-18-05	0800	clear	T/O	Weekly Check - Turned Out	DSK
8/29/05	1500	Clr	T/O	weekly check Turned out	DSK
9-6-05	1330	CLEAR	T/O	TURNED OUT - DRAIN OPEN. RAN LEVELS	DAT/DK
9-12-05	1415	clear	T/O		RG
9-27-05	1105	CLEAR	T/O	TURNED OUT - USGS INSP.	DAT/DB
9/28/05	0850	Clear	TO	Approx .75 CFS in Reach	KA
10/3/05	1125	CLEAR	TO	TURNED OUT.	DAT

SCE OD 67-B REV 10/85 (CW)

415 CORAL CREEK

2006 WY

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 06953

DATE	TIME	ORIFICE FLOW DATE	DIVERTED FLOW	COMMENTS	MADE BY
10/3/05	1125	TØ	Ø	TURNED OUT.	DAT
10/11/05	1425		Ø	TURNED OUT	RA/DK
11/15/05	1215	TØ	Ø	TURNED OUT 1 CFS PLATE REMAINS OBL.	DAT
12/28/05	1405	TØ	Ø	" " " " DRAIN GATE OPEN.	DAT
2-13/06	1155	TØ	Ø	" " " " " "	DAT
2/28/06	1338	Turned In	5.05	Load Plant up From Station 15.736H	RH
3/1/06	1025	TURNED IN	1.89	ORIFICE CLEAR. 1.0 CFS PLATE ON	DAT
3/7/06	0817	T.I.	1.89	ORIFICE CLEAR. RAKED GRIDS	JRS
3-30-06	1340	T.I	10.1	Orifice Pipe Damaged - Will Place In CAMS	JA
4-5-06	0945	T.I.	> 11.3	POND SPILLING @ 1.55	GB
4-6-06	0930	Clear	11.3	Pond Spilling	RH
4-12-06	1150	Clear	15.14	O.S .066	RT
4-17-06	1120	U.W.	10.5	OSS 1.38 DAM SPILLING Plugged GRIDS	JRS
4-18-06	1405	T In	11.2	OSS .50 17.8P GH	DSK
4-19-06	0800	T.O.	Ø	Turned Out for orifice repairs.	DSK
4-24-06	1405	T.O.	Ø	FOUND OUT FROM REPAIRS. 1 CFS VERIFIED PLATE. TURNED IN @ 1424 10+SPILL	DAT
4-27-06	1120	T.I.	11.1	DAM @ Slight Spill	JRS
5/30-06	0800	Under Water	11.3	Dam Spilling Approx 10 CFS	RH
5/7/06	0930	Clear	11.3	Dam Spilling Approx 5 CFS	RH
6/2/06	1050	Clear	2	Total 3 CFS	RH
6/6/06	1035	CLEAR	1	DUG CONTROL TO IZEL. POOL. GRIDS CLEAN. 1 CFS PLATE IS ON.	DAT
6/20/06	0920	Clear	<1	Turned Out Due To Low Flows (Pasha)	GB
7/19/06	1500	CLEAR	Ø	TURNED OUT - USGS INSP.	DAT/OB
8/24/06	1450	Clear	Ø	Turned out (Removed Wasp Nest)	DSK
9/7/06	0900	CLEAR	Ø	TURNED OUT. DRAIN WIDE OPEN	DAT

415 CORAL CREEK REL. 2007 WY

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 06954

DATE	TIME	ORIFICE STATUS	DIVERSION FLOW	COMMENTS	MADE BY
10-2-06	1135	CLEAR	ϕ	TURNED OUT. DRAIN OPEN. 1CFS PLATE ON	DAT
10/16/06	0945	clr	ϕ	Draining Flow Line for Plant Repairs	RLH
10/31/06	1155	CLEAR	ϕ	TURNED OUT, USGS INSP.	DAT/DB
11/27/06	1100	CLEAR	ϕ	TURNED OUT.	DAT
12/14/06	1530	clear	ϕ	T/O	DSK
1/2/07	1600	CLEAR	ϕ	TURNED OUT. DRAIN OPEN, 1 CFS PLATE ON	DAT/MW
2/14/07	1115	CLEAR	ϕ	TO	DAT
3/7/07	1215	CLEAR	ϕ	TO DIVERSION ICE REMAINS TO	DAT
3/20/07	0845	CLEAR	ϕ	CLEARANCE RELEASED. NOT ENOUGH H_2O TO TURN-IN	DAT
4/9/07	1240	CLEAR	ϕ	TO	DAT
5/16/07	1200	CLEAR	ϕ	TO - USGS INSP.	DAT/DB
6/18/07	1515	CLEAR	ϕ	TO EST < 0.1 CFS IN CREEK	DAT
7/23/07	1050	CLEAR	ϕ	TO " " " " " " VERY DRY!	DAT
8/4/07	1030	clr	ϕ	TO Tagged gates ~~to~~ clr shake	DSK
8/30/07	1330	CLEAR	ϕ	TO	DAT
9/19/07	1045	CLEAR	ϕ	TO	DAT
10/26/07	1400	CLEAR	ϕ	TO	DAT/KB
10/8/07	0940	clr	ϕ	TO	DSK

Southern California Edison Company
HYDRO DIVISION LOG SHEET

415 CORAL CREEK REL.
2008 WY

SHEET NO. 06955

DATE	TIME	ORIFICE FLOW	DIVERTED FLOW	COMMENTS	MADE BY
10/8/07	0940	CLEAR	ϕ	TϕT	DSK
10/16/07	1200	CLEAR	ϕ	TϕT	DAT
10-23-07	9:45	Clear	ϕ		RT
11-7-07	1735	CLEAR	ϕ	TϕT ICE3 PLATE REMAINS OVR.	DAT/DB
11/24/07	0935	clear	ϕ		JLH
12/17/07	1315	CLEAR	ϕ	TURNED OUT.	DAT
1-21-08	11:45AM	clear	ϕ	Turned out	JLW
1/24/08	1PM	Clear	ϕ	TO Parker	
1/29/08	1100	CLEAR	ϕ	TϕT	DAT
3/10/08	1520	CLEAR	ϕ	TϕT. WATER IN KR3 CANAL @ 1230 DIVERSION REMAINS TϕT	DAT
4/2/08	1151	clear	ϕ	Cloudy Day	MP
4/14/08	1510	CLEAR	ϕ	TϕT ALL WATER IN CREEK	DAT
5/1/08	1430	CLEAR	ϕ	TϕT " " " "	DAT
5/13/08	1340	CLEAR	ϕ	TϕT " " " ", USGS INSP.	DAT/DB
6/4/08	1240	CLEAR	ϕ	TϕT, " " " "	DAT
7/7/08	1230	CLEAR	ϕ	TϕT, " " " ", NAT. CREEK VERY LOW.	DAT
8/4/08	1405	CLEAR	ϕ	TϕT, RECENT FLASH FLOOD DEBRIS PRESENT	DAT
9/11/08	1300	CLEAR	ϕ	TϕT - DIVERSION DEBRIS REMOVED	DAT
9/29/08	1220	CLEAR	ϕ	TϕT - ALL WATER IN CREEK.	DAT
9/30/08	1110	CLEAR	ϕ	TϕT - RAN FULL SET OF LEVELS	DAT/KB

SCE OD 67-B REV 10/85 (CW)

CORAL CR. REL. 2009 WY

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 06956

DATE	TIME	ORIFICE STATUS	DIVERTED FLOW	DESCRIPTION	VISIT MADE BY
10-9-08	1310	CLEAR	ϕ	TURNED OUT.	DAT
10/15/08	1315	clear	ϕ	TO	JB/RM
10/30/08	1340	clear	ϕ	Turned out / monthly routines	Justin Humphers
11/5/08	1315	CLEAR	ϕ	TURNED OUT. 1CFS PLATE ON.	DAT
11/18/08	1610	CLEAR	ϕ	TO, USGS INSP.	DAT/OB
12/4/08	1010	CLEAR	ϕ	TO	DAT
1/13/09	0900	CLEAR	ϕ	TO. 1 CFS PLATE ON.	DAT
2/4/09	1340	CLEAR	ϕ	TO. 1 CFS PLATE ON	DAT
3/1/09	1100	ok	2.08 c/s	Turned in 15.48 = 2.08 c/s	DSK
3/2/09	1200	Debris	2.50	Turned in 15.50 = 2.50	JLA
3/9/09	0830	CLEAR	1.30	SAND EXCESSIVE @ GRIDS — TURNING OUT.	DAT/JLH
3/16/09	1100	clear	ϕ	excessive sand at grids	JLA
3/17/09	1230	clear	0	removing sand	JLA
3/19/09	1145	clear	0	removing sand	JLH
3/23/09	1140	clear	0	removing sand / routines	JLH
3/25/09	1030	clear	0	Turned out Sand / weekly routines	JLH
3/26/09	1330	clear	0	Turned out monthly routines	JLH
4/6/09	1100	clear	0	Turned out weekly routines	JLH
4/9/09	1000	Clear	0	Turned out weekly routines	MP
4/13/09	1030	Clear	0	Turned out Weekly routines	MP
4/15/09	1430	clear	0	Turned out Routines	JLH
4/20/09	1120	Clear	0	Turned out weekly routines	MP
4/21/09	1105	Clear	0	Turned out Monthly routines	MP
4/27/09	0945	Clear	0	Turned Out weekly routines	MP
4/27/09	1145	Clear	0	Turned out Weekly routines	MP
4/29/09	1105	Clear	0	Turned Out	MP
5/4/09	1135	Clear	0	Turned Out	MP
5-6-09	1140	clear	0	Turned Out	MP
5-11-09	1030	Clear	0	Turned Out	MP
5-12-09	0815	CLEAR	ϕ	TURNED OUT	DAT
5-14-09	1025	Clear	0	Turned out	MP
5-17-09	1010	Clear	0	Turned out	MP
5-20-09	0925	Clear	0	Turned out	MP
6-1-09	10:00	clear	ϕ	Turned out	RT
6-3-09	1610	Clear	ϕ	Turned out	RT
6-8-09	1455	CLEAR	ϕ	TURNED OUT - ORIFICE AREA SANDED	DAT
6-6-09	1500	clear	0	Turned out	JLH

SCE OD 67-B REV 10/85 (CW)

CORAL CR DIV.

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 06957

DATE	TIME	ORIFICE STATUS	DIVERTED FLOW	DESCRIPTION	VISIT MADE BY
6-10-09	1530	clear	0	Turned out Routines	JLH
6-15-09	1645	clear	0	"	DTE
6-17-09	1630	clear	0	"	JLH
6-23-09	1630	clear	0	"	DTE
6-25-09	1820	CLEAR	0	TURNED OUT - USGS INSP.	DAT/DB
7-16-09	1035	clear	0	Turned out / Routines	DTE
8-3-09	1530	clear	0	Turned out	JLH
8-10-09	0935	CLEAR	0	TURNED OUT.	DAT
8-10-09	1430	clear	0	Turned out	JLH
8-12-09	1550	clear	0	Turned out	JLH
8-24-09	1555	clear	0	Turned out all ok	JLH
9-21-09	1530	CLEAR	0	TURNED OUT.	DAT

SCE OD 67-B REV 10/85 (CW)

Southern California Edison Company

HYDRO DIVISION LOG SHEET

CORAL CR DIV. DIV. REL.

DATE	TIME	ORIFICE DATE STATUS	DIVERTED FLOW CFS	NOTES SHEET NO. 06958	VISIT BY:
10-6-09	1410	*	ϕ	TURNED OUT. * ORIFICE IN MUD. NOT READY FOR SERVICE	DAT
10-21-09	1325	*	ϕ	TURNED OUT. * " " " " "	DAT
11-24-09	1555	*	ϕ	" " * " " " " " "	DAT
12-14-09	1235	*	ϕ	Tϕ, * NOT READY FOR SERVICE	DAT
1-11-10	1130	*	ϕ	Tϕ, * " " " "	DAT
2-1-10	1035	*	ϕ	Tϕ, * DIVERSION NOT READY FOR SERVICE.	DAT
2-3-10	1500		Q	Routines	JCH
2-8-10	1530		Q	Routines	JCH
2-10-10	1000		Q	Routines	JCH
2-11-10	1300		Q	Monthly Routines	JCH
2-16-10	1500		Q	weekly routines	JCH
2-18-10	1540		Q	Weekly routines	WP
2-22-10	1355		Q	weekly routines	JCH
2-25-10	1500		Q	weekly routines	JCH
3-1-10	0840	*	ϕ	Tϕ, * ORIFICE BURIED IN MUD/SAND - NOT READY 4 SER.	DAT
3-1-10	1540		Q	weekly routines	WP
3-2-10	1145		Q	Monthly routines	JCH
3-8-10	1505		Q	weekly routines	WP
3-10-10	1615		Q	Weekly routines	WP
3-15-10	1455		Q	Weekly routines	WP
3-18-10	1520		Q	Weekly routines	WP
3-22-10	1600		Q	Weekly routines	WP
3-24-10	1505		Q	Weekly routines	WP
3-31-10	1325		Q	Routines	JCH
4-5-10	1400		Q	Routines	JCH
4-13-10	0805	*	ϕ	Tϕ, * NOT READY FOR SERVICE	[illegible]
4-20-10	1430		Q	routines.	JCH
5-3-10	0810	*	ϕ	Tϕ, NOT READY FOR SERVICE.	DAT
5-7-10	1300		9+1	Tuned in It's Ready Now	DSK
5-9-10	0845		10+1	Tuned in Ready and	DSK
5-10-10	0910	CLEAR	11.3	DAM SPILLING. DIVERSION IN SERVICE. TCES OUT FOR...	DAT
5-12-10	1500	clear	11.3	Routines raked grids	JCH
5-13-10	1230	CLEAR	7.0	SAND IN POND. REL OK. CLEANED BLW ORIFICE	DAT
5-13-10	1455	CLEAR	7.3 – ϕ	TURNED OUT DIVERSION TO FLUSH SAND	DAT
~~5-14-10~~	~~1045~~	~~clear~~		~~TURNED IN DIVERSION CLEAR~~ DAT	~~TOT DP~~
5-19-10	1530	clear	Q	Routines	JCH
5-20-10	1030	CLEAR	6.6 CFS	TURNED-IN. SAND CLEAR ORIFICE OK	DAT

COYAL CR. DIVERSION

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 06959

DATE	TIME	ORIFICE STATUS	DIVERTED FLOW	NOTES	VISIT BY
5-20-10	1330	clear	6.86	Routines check in	JLH
5-24-10	1500	clear	6.29	Routines Raked Grids	JLH
5-25-10	1105	clear	6.00	Routines / check in raked grids	JLH
5-26-10	1600	clear	5.45	Routines raked grids	JLH
6-27-10	1700	clear		Turned out (Sand)	JLH
6-2-10	0835	CLEAR	ø	TURNED OUT.	DAT
6-2-10	0900	clear	ø	Turned Out / Routines	JLH
6-17-10	12.50	CLEAR	ø	TURNED OUT/USGS INSP	DAT/OB
7-1-10	0945	CLEAR	ø	TURNED OUT - NAT. FLOW VERY LOW	DAT
7-14-10	1600	Clear	ø	Turned out	MP
7-21-10	1522	clear	ø	Turned out All OK	JLH
8-9-10	1445	Clear	ø	Turned out	MP
8-16-10	0850	CLEAR	ø	TURNED OUT	DAT
8-25-10	1430	clear	ø	Routines	JLH
8-26-10	1105	clear	ø	Monthly Routines	JLH
9-7-10	1600	clear	ø	Routines	JLH
9-14-10	1130	clear	ø	monthly Routines	JLH

SCE OD 67-B REV 10/85 (CW)

CORAL CR DIV.

Southern California Edison Company FAIN. REL. 415

HYDRO DIVISION LOG SHEET

SHEET NO. 06960

DATE	TIME	ORIFICE DATE STATUS	DIVERTED FLOW	NOTES:	VISIT BY
10-5-10	1330	CLEAR	∅	TURNED OUT.	DAT
11-4-10	1340	CLEAR	∅	TURNED OUT	DAT
12-1-10	1450	CLEAR	∅	TURNED OUT	DAT
1-11-11	1644	Clear		Routines / Monthly	JCA
1-24-11	1115	Clear	∅	Routines	MP
1-27-11	0900	Clear	∅	Turned out	DSK
2-1-11	1030	CLEAR	∅	TURNED OUT	DAT
2-2-11	1100	clear	∅	Routines	JCA
2-7-11	1100	clear	∅	Routines	JCA
2-9-11	1300	clear	∅	Routines	MA
2-14-11	0900	clear	∅	Routines	JCA
2-16-11	1030	CLEAR	∅	CHANGED BATT. RAIN GAL	DAT
2-18-11	1200	clear	∅	Routines	JCA
2-22-11	1000	clear	∅	Routines	JCA
2-24-11	1115	clear	∅	Routines	JCA
2-28-11	10:15	clear	∅	Routines	MA
3-2-11	1430	clear	∅	Routines	JCA
3-3-11	1305	CLEAR	∅	TURNED OUT.	DAT
3-7-11	1519	clear	∅	Routines	JCA
3-14-11	0930	clear	∅	Routines	JCA
3-16-11	1255	clear	∅	Routines	JCA
3-30-11	1400	Clear	∅	Routines	JCA
4-5-11	0910	CLEAR	∅	HEAVY SPILL - TURNED OUT.	DAT
4-7-11	0945	Clear	∅	Routines	JCA
4-24-11	1200	clear	∅	Routines	JCA
5-2-11	0900	CLEAR	∅	TURNED OUT.	DAT
5-[illegible]-11	0930	Clear	∅	Routines	JCA
5-25-11	0945	clear	∅	Routines	JCA
6-1-11	0830	CLEAR	∅	TURNED OUT	DAT
6-12-11	1120	clear	∅	Routines	JCA
6-23-11	1530	clear	∅	Patrol	DTE
7-5-11	0842	CLEAR	∅	TURNED OUT.	DAT
7-6-11	0945	clear	∅	Routines	JCA
7-11-11	1045	Clear	∅	Routines	JCA
7-14-11	0755	clear	∅	Routines	JCA
7-18-11	1200	clear	∅	Routines	JCA
8-1-11	1330	clear	∅	Routines	RT

CORRAL CREEK

Southern California Edison Company

HYDRO DIVISION LOG SHEET

415

SHEET NO. 06961

DATE	TIME	ORIFICE STATUS	DIVERTED FLOW	NOTES	VISIT BY
8-3-11	0900	CLEAR	ϕ	TURNED OUT.	DAT
8-15-11	1545	clear	ϕ	Turned Out / Routines	JLA
8-17-11	1005	clear	ϕ	Turned Out / Routines	JLA
8-17-11	1520	CLEAR	ϕ	TURNED OUT. USGS INSP.	DAT/DB
8-22-11	1000	clear	ϕ	Turned out / Routines	JLA
9-6-11	1045	clear	ϕ	Turned out / Routines	JLA
9-7-11	0905	CLEAR	ϕ	TURNED OUT.	DAT
9-20-11	1430	CLEAR	ϕ	TURNED OUT/ USGS INSP. SOLAR PANNEL STOLEN.	DAT/RJS
9-26-11	1115	CLEAR	ϕ	SOLAR PANNEL WAS STOLEN.	DAT
9-27-11	1030	CLEAR	ϕ	INSTALLED SOLAR PANNEL	
10-3-11	1635	Clear	ϕ	Turned Out / Routines	DTE

SCE OD 67-B REV 10/85 (CW)

Southern California Edison Company

HYDRO DIVISION LOG SHEET

CORRAL CREEK DIVERSION

SHEET NO. 06962

DATE	TIME	ORIFICE STATUS	DIVERTED FLOW	NOTES	VIS BY
10-5-11	0820	CLEAR	∅	TURNED OUT.	
10-10-11	1556	Clear	∅	Turned out.	
10-19-11	1640	clear	∅	Turned out	
10/24/11	1134	CLEAR	∅	TURNED OUT	
10/26/11	1545	CLEAR	∅	TURNED OUT. →USGS INSP.	
11/1/11	0820	CLEAR	∅	TURNED OUT.	
11-23-11	1345	clear	∅	Turned out	
11/25/11	1000	CLEAR	∅	TURNED OUT	
12/5/11	1400	Clear	∅	Turned out	
12/19-11	1600	Clear	∅	Turned out	
1-3-12	1545	clear	∅	Turned out	
1-9-12	0930	CLEAR	∅	TURNED OUT	
1-11-12	1400	clear	∅	Turned out	
1-16-12	1656	clear	∅	Turned Out	
1-23-12	1630	Clear	∅	Turned Out	
1-25-12	1530	clear	∅	Turned out	
1-30-12	1540	clear	∅	Tured OUT	
2-2-12	1510	clear	∅	Turned out	
2-6-12	1605	clear	∅	Turned out	
2-8-12	1620	clear	∅	Turned Out	
2-13-12	1515	Clear	∅	Routines	
2-16-12	0915	Clear	∅	Routines	
2-22-12	1500	clear	∅	Routines	
3-5-12	1630	Clear	∅	Routines	
3-12-12	1600	clear	∅	Routines	
3-19-12	1000	Clear	∅	Routines	
3-22-12	0825	CLEAR	∅	TO	
3-24-12	1002	CLEAR	∅	Routines	
3-27-12	1630	Clear	∅	Routine	
3-28-12	0930	Clear	∅	Turned In	
3/29/12	1234	CLEAR	1.22	INSPECTION	
3/31/12	1252	CLEAR	1.79	INSPECTION	
4-2-12	0915	clear	1.22	Routines	
4-3-12	0900	CLEAR	1.14	INSPECTION	
4-4-12	0915	CLEAR	1.14	INSPECTION	
4-5-12	1145	clear	1.06	Routines	
4-8-12	1315	Clear	.52	INSPECTION	

SCE OD 67-B REV 10/85 (CW)

CORAL CREEK DIVERSION

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 06963

DATE	TIME	DATE	DIVERTED FLOW	NOTES	VISIT BY
4-9-12	1030		.593	Routines	JLM
4-9-12	1245		~~5.20~~		
4-12-12	1045		5.20	Routine	CS/D
4-16-12	1230		1.89	Routines	JLM
4-18-12	1630		3.06	Routines	JLM
4-23-12	1200		3.25	Routines	CS/J
4-24-12	1340		2.61	KR3 Monthly inspection	CS/J
4-30-12	0925		1.59	TURNING OUT - OPS TEST OF CANAL FLOW	DAT
5-2-12	1530		0	Turned out / Routines	JLM
5-2-2	1330		∅	Turned out / Routines	CWS
5-28	1545		∅	Turned Out / Routines	DTE
6-4-12	1445		∅	Turned out	JRS/I
6-7-12	1100		∅	Routines	JLM
6-14-12	1400		∅	Turned out / Routines	CS/JH
7-5-12	0730		∅	TURNED OUT	JRS
7-19-12	1615		∅	Routines	JLM
8-1-12	1510		∅	TURNED OUT	JRS
8-21-12	1440		∅	TURNED OUT USGS INSP.	DAT/JRS
8-26-12	1100		∅	Routines	JLM
9-4-12	1540		∅	TURNEED OUT CLEAR	JRS
9-11-12	0745		∅	TO	DAT

SCE OD 67-B REV 10/85 (CW)

Southern California Edison Company

HYDRO DIVISION LOG SHEET

CORRAL CR. DIVERSION
2012 WY
NOTES

SHEET NO. 06964

DATE	TIME	~~DATE~~	DIVERTED FLOW	NOTES	VISIT BY.
9-11-12	0745		∅	TURNED OUT ALL WATER IN CREEK	DAT
9-19-12	1505		∅	T∅. - FERC INSP.	DAT/BK/KA/AL

SCE OD 67-B REV 10/85 (CW)

415 CORRAL CR. DIVERSION

Southern California Edison Company 2013 WY

HYDRO DIVISION LOG SHEET

SHEET NO. 06965

DATE	TIME	GHT	DIVERTED FLOW	NOTES	VISIT BY
10-1-12	0820	14.01	ϕ	TURNED OUT. 1 CFS PLATE ON-	DAT
11-1-12	0745	13.96	ϕ	TURNED OUT. 1 CFS PLATE ON.	DAT
12-3-12	1035	13.43	ϕ	TURNED OUT. 1 CFS PLATE ON	DAT
12-3-12	1040	13.43	ϕ	Turned out	JLM
12-4-12	1150	13.43	ϕ	TURNED OUT: USGS INSP.	DAT/ORS/LHS
12-5-12	1220	13.42	ϕ	TURNED OUT	ST
12-10-12	1102	13.42	ϕ	TURNED OUT	ST
12-12-12	0928	13.42	ϕ	TURNED OUT	ST
12-17-12	1119	13.41	ϕ	TURNED OUT	ST
12-19-12	0938	13.40	ϕ	TURNED OUT	ST
12-26-12	11000	13.40	ϕ	Turned out	JLM
12-31-12	10:37	13.40	ϕ	TURNED OUT	SRH
1-2-13	1003	13.39	ϕ	TURNED OUT	ST
1-2-13	1445	13.40	ϕ	TURNED OUT	JRS
1-7-13	1045	13.39	ϕ	TURNED OUT	ST
1-10-13	0929	13.40	ϕ	TURNED OUT	ST
1-14-13	1051	13.38	ϕ	TURNED OUT	ST
1-16-13	1005	13.38	ϕ	TURNED OUT	ST
1-23-13	0953	13.38	ϕ	TURNED OUT	ST
1-28-13	1030	13.38	ϕ	TURNED OUT	ST
1-30-13	0951	13.38	ϕ	TURNED OUT	ST
2-4-13	1044	13.38	ϕ	TURNED OUT	ST
2-6-13	0823	13.38	ϕ	TURNED OUT	ST
2-7-13	1150	13.38	ϕ	TURNED OUT. 1 CFS PLATE ON	DAT
2-11-13	1117	13.36	ϕ	TURNED OUT	ST
2-13-13	1440	13.36	ϕ	TURNED OUT	ST
2-19-13	1445	13.36	ϕ	TURNED OUT	ST
2-21-13	0923	13.36	ϕ	TURNED OUT	ST
2-25-13	1045	13.36	ϕ	TURNED OUT	ST
3-4-13	1015	13.36	ϕ	TURNED OUT	ST
3-6-13	0830	13.36	ϕ	TURNED OUT	ST
3-7-13	0710	13.36	ϕ	TURNED OUT, 1 CFS PLATE ON	JRS
3-11-13	1119	13.34	ϕ	TURNED OUT	ST
3-13-13	1034	13.34	ϕ	TURNED OUT	ST
3-13-13	1400	13.34	ϕ	TURNED IN	TV
3-14-13	1038	13.38	ϕ	TURNED IN/HERE TO RAKE GRIDS	ST
3/18/13	1121	13.46	ϕ	TURNED IN / RAKE GRIDS	ST

415 CORRAL CREEK DIVERSION

Southern California Edison Company 11186750 2013 WY

HYDRO DIVISION LOG SHEET

SHEET NO. 06966

DATE	TIME	GHT DATE	DIVERTED FLOW	NOTES	VIS BY
3-20-13	1045	13.45	Ø	ROUTINES / RAKE GRIDS	ST
3-25-13	1038	13.44	Ø	ROUTINES / RAKE GRIDS	ST
3-31-13	1245	13.49	Ø	INSPECTION	VIGTH
4-1-13	0900	13.45	Ø	TURNED IN. 1CFS PLATE ON. ALL WATER RELEASE OUT PIPE	D.T
4-7-13	1200	13.50	Ø	INSPECTION	VIGTH
4-8-13	1038	13.46	Ø	ROUTINES	ST
4-10-13	1517	13.50	Ø	ROUTINES	ST
4-22-13	1036	13.71	Ø	ROUTINES	ST
4-29-13	1106	13.62	Ø	ROUTINES	ST
5-1-13	1245	13.67	Ø	TURNED IN. ALL WATER OUT ORIFICE	D.T
5-13-13	1130	13.45	Ø	ROUTINES	ST
5-28-13	0815	13.62	Ø	TURNED IN. ALL WATER OUT ORIFICE	D.T
5-29-13	1579	13.62	Ø	Turned out Per Anzaldo & Tito	JLT
6-3-13	1245	13.67	Ø	Turned out / Routines	JLT
6-6-13	1540	1540	Ø	TURNED OUT. ALL H2O IN CREEK	DAT/J
6-10-13	1100	13.67	Ø	TURNED OUT	SRH
6-26-13	1100	13.66	Ø	Routines / Turned out	JLT
7-1-13	1345	13.66	Ø	Routines	JLT
7-1-13	1539	13.67	Ø	TURNED OUT. CLEAR	JRS
7-8-13	10.05	13.68	Ø	TURNED OUT / ROUTINES	SRH
7-9-13	1145	13.68	Ø	Monthly Routine	JLT
7/15/13	1050	13.70	Ø	WEEKLY ROUTINES / TURNED OUT	SRH
7-22-13	1700	13.72	Ø	Routine	JLT
7-29-13	1700	13.48	Ø	Routines	JLT
8-7-13	1415	13.52	Ø	TURNED OUT.	DAT/JR
8-12-13	1600	13.54	Ø	Routines	JLT
8-14-13	1635	13.56	Ø	Routine	JLT
8-19-13	1700	13.58	Ø	Routine	JLT
8-27-13	1519	13.45	Ø	CLEAR, TURNED OUT	DAT/JR
8-28-13	1695	13.45	Ø	Routines	JLT
9-11-13	1310	13.42	Ø	TØ - RUNNING USGS REQ LEVELS	JRS/D
9-11-13	1333	13.42	Ø	PERMISSION WALKDOWN	VIGTH

SCE OD 67-B REV 10/85 (CW)

415 CORRAL CR. DIVERSION

Southern California Edison Company 2013 WY

HYDRO DIVISION LOG SHEET

SHEET NO. 06965

DATE	TIME	GHT	DIVERTED FLOW	NOTES	VISIT BY
10-1-12	0820	14.01	∅	TURNED OUT. 1 CFS PLATE ON.	DAT
11-1-12	0745	13.96	∅	TURNED OUT. 1 CFS PLATE ON.	DAT
12-3-12	1035	13.43	∅	TURNED OUT. 1 CFS PLATE ON	DAT
12-3-12	1040	13.43	∅	Turned out	JLA
12-4-12	1150	13.43	∅	TURNED OUT. USGS INSP.	DAT/ORS/CHS
12-5-12	1220	13.42	∅	TURNED OUT	ST
12-10-12	1102	13.42	∅	TURNED OUT	ST
12-12-12	0928	13.42	∅	TURNED OUT	ST
12-17-12	1119	13.41	∅	TURNED OUT	ST
12-19-12	0938	13.40	∅	TURNED OUT	ST
12-26-12	11600	13.40	∅	Turned out	JLA
12-31-12	10:37	13.40	∅	TURNED OUT	SRH
1-2-13	1003	13.39	∅	TURNED OUT	ST
1-2-13	1445	13.40	∅	TURNED OUT	JRS
1-7-13	1045	13.39	∅	TURNED OUT	ST
1-10-13	0929	13.40	∅	TURNED OUT	ST
1-14-13	1051	13.38	∅	TURNED OUT	ST
1-16-13	1005	13.38	∅	TURNED OUT	ST
1-23-13	0953	13.38	∅	TURNED OUT	ST
1-28-13	1030	13.38	∅	TURNED OUT	ST
1-30-13	0951	13.38	∅	TURNED OUT	ST
2-4-13	1044	13.38	∅	TURNED OUT	ST
2-6-13	0823	13.38	∅	TURNED OUT	ST
2-7-13	1150	13.38	∅	TURNED OUT. 1 CFS PLATE ON	DAT
2-11-13	1117	13.36	∅	TURNED OUT	ST
2-13-13	1440	13.36	∅	TURNED OUT	ST
2-19-13	1445	13.36	∅	TURNED OUT	ST
2-21-13	0923	13.36	∅	TURNED OUT	ST
2-25-13	1045	13.36	∅	TURNED OUT	ST
3-4-13	1015	13.36	∅	TURNED OUT	ST
3-6-13	0830	13.36	∅	TURNED OUT	ST
3-7-13	0910	13.36	∅	TURNED OUT, 1 CFS PLATE ON	JRS
3-11-13	1119	13.34	∅	TURNED OUT	ST
3-13-13	1034	13.34	∅	TURNED OUT	ST
3-13-13	1400	13.34	∅	TURNS IN	TV
3-14-13	1038	13.38	∅	TURNED IN/HERE TO RAKE GRIDS	ST
3/18/13	1121	13.46	∅	TURNED IN/RAKE GRIDS	ST

SCE OD 67-B REV 10/85 (CW)

415 · CORRAL CREEK DIVERSION

Southern California Edison Company 11186750 2013 WY

HYDRO DIVISION LOG SHEET

SHEET NO. 06966

DATE	TIME	GHT DATE	DIVERTED FLOW	NOTES	VIS BY
3-20-13	1045	13.45	Ø	ROUTINES / RAKE GRIDS	ST
3-26-13	1038	13.44	Ø	ROUTINES / RAKE GRIDS	ST
3-31-13	1245	13.49	Ø	INSPECTION	VIGTH
4-1-13	0900	13.45	Ø	TURNED IN. 1CFS PLATE ON. ALL WATER OUT RELEASE PLATE	D T
4-7-13	1200	13.50	Ø	INSPECTION	VIGTH
4-8-13	1038	13.46	Ø	ROUTINES	ST
4-10-13	1517	13.50	Ø	ROUTINES	ST
4-22-13	1036	13.71	Ø	ROUTINES	ST
4-29-13	1106	13.67	Ø	ROUTINES	ST
5-1-13	1245	13.67	Ø	TURNED IN. ALL WATER OUT ORIFICE	D.T.
5-13-13	1130	13.45	Ø	ROUTINES	ST
5-28-13	0815	13.62	Ø	TURNED IN. ALL WATER OUT ORIFICE	D.T.
5-29-13	1519	13.62	Ø	Turned out per Anzaldo / Tito	JLT
6-3-13	1245	13.67	Ø	Turned out / Routines	JLT
6-6-13	1540	1540	Ø	TURNED OUT. ALL H_2O IN CREEK	DAT/S
6-10-13	1100	13.67	Ø	TURNED OUT	SRH
6-26-13	1100	13.66	Ø	Routines / Turned out	JLT
7-1-13	1345	13.66	Ø	Routines	JLT
7-1-13	1539	13.67	Ø	TURNED OUT. CLEAR	JRS
7-8-13	10.05	13.68	Ø	TURNED OUT / ROUTINES	SRH
7-9-13	1145	13.68	Ø	Monthly Readings	JLT
7/15/13	1050	13.70	Ø	WEEKLY ROUTINES / TURNED OUT	SRH
7-22-13	1700	13.72	Ø	Readings	JLT
7-29-13	1700	13.48	Ø	Routines	JLT
8-7-13	1415	13.52	Ø	TURNED OUT.	DAT/JR
8-12-13	1600	13.54	Ø	Routines	JLT
8-14-13	1635	13.56	Ø	Routine	JLT
8-19-13	1700	13.58	Ø	Routines	JLT
8-27-13	1519	13.45	Ø	CLEAR, TURNED OUT	DAT/JR
8-28-13	1645	13.45	Ø	Routines	JLT
9-11-13	1310	13.42	Ø	TO - RUNNING USGS REQ LEVELS	JRS/D
9-11-13	1333	13.42	Ø	PERMISSION WALKDOWN	VIGTH

SCE OD 67-B REV 10/85 (CW)

415 CORAL CR DIVERSION 11186750 2014 W4

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 06967

DATE	TIME	GHT	DIVERTED FLOW	NOTES	VISIT BY
10-1-13	0710	13.37	ϕ	TΦ TUNNEL CONSTRUCTION	D. TITO
11-5-13	1445	13.34	ϕ	" " "	TITO / SHERM
12-2-13	1315	13.34	ϕ	" " "	TITO / SHERM
12-30-13	0940	13.32	ϕ	" " "	SHERMAN
1-8-14	1455	13.32	ϕ	NO WATER IN PIPE	SHERMAN
2-4-14	1558	13.44	ϕ	NO FLOW IN PIPE. DIV VALVE CLOSED	SHERMAN
2-10-14	1140	13.44	ϕ	Turned out, Div valve closed	Sexton
2-18-14	1100	13.42	ϕ	Turned out Routines	T. Hughes
3-3-14	1010	13.42	ϕ	TURNED OUT.	D. TITO
3-5-14	1230	13.42	ϕ	Routines	TLH
3-7-14	1700	13.43	ϕ	Routines	JCM
3-27-14	1000	13.42	ϕ	Routines	JWA
3-31-14	1620	13.43	ϕ	Routines	CWJ
4	~~1620~~				
4-2-14	1115	13.42	ϕ	Routines	HUG
4-3-14	1310	13.42	ϕ	TURNED OUT.	DAT
4-10-14	1330	13.44	ϕ	Routins	JWA
4-21-14	1144	13.44	ϕ	Routines	CWJ
4-23-14	0750	13.43	ϕ	TΦ. USGS INSP	SH/EH/DAT/SS
4-23-14	1630	13.44	ϕ	TΦ - Routines	HUG
4-27-14	1215	13.44	ϕ	Routines	JCM
5-5-14	1251	13.44	ϕ	NO FLOW IN PIPE. SOME ROCKS IN POND OUTLET	JRS
5-13-14	1140	13.44	ϕ	CLEAR ROCKS ROUTINES	SRM.
5-19-14	1040	13.44	ϕ	TΦ Routines	SRM.
5-27-14	1545	13.44	ϕ	Routines	JCM
5-28-14	1040	13.44	ϕ	TΦ.	DAT
6-9-14		13.44	ϕ	Routines	TB
6-16-14	1630	13.44	ϕ	Routnenes	C. Roberts
6-23-14	~~14:50~~	13.44	ϕ	Routines	TB
6-25-14	0850	13.44	ϕ	PIPE EMPTY	JRS
6-30-14	1650	13.46	ϕ	Routins.	JCM
7-7-14	~~15:40~~	13.45	ϕ	Routines	TB
7-14	15:00	13.45	ϕ	Routines	JB
7-17-14	13:40	13.44	ϕ	CANAL TURNED OUT	JRS
7-28-14	1640	13.44	ϕ	Routines	DAT
8-4-14	15:30	13.44	ϕ	Routines	TB
8-12-14	1120	13.44	ϕ	PERMISSION WALK-DOWN	JV

SCE OD 67-B REV 10/85 (CW)

415 CORAL CR DIVERSION 11186750 2014 WY

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 06968

DATE	TIME	GMT ~~DATE~~	DIVERTED FLOW	NOTES	VISIT BY
8-12-14	1600	13.44	0	Routines	JCA
8-19-14	1610	13.44	0	Routines	J.B
8-21-14	1155	13.44	0	TO. VERY LOW FLOW IN CREEK	DAT
8-25-14	16:10	13.44	0	Routines	TB
9-2-14	1055	13.44	0	TURNED OUT	JRS
9-2-14	15:07	13.44	0	Routines	T.B.
9-9-14	16:15	13.44	0	Routines	T.B.
9-15-14	16:50	13.44	0	Routines	JCA
9-23-14	15:40	13.44	0	Routines	T.B
9-29-14	7:55	13.43	0	TURNED OUT USGS INSPECTION	JRS
10-1-14	8:56	13.43	0	TURNED OUT HERE TO COLLECT END OF WATER YEAR DATA & LOG SHEETS	JRS

SCE OD 67-B REV 10/85 (CW)

4

415 CORRAL CR DIVERSION

Southern California Edison Company 11186750

HYDRO DIVISION LOG SHEET

SHEET NO. 06972

DATE	TIME	GHT DATE	DIVERTED FLOW	NOTES	VISIT BY
10-5-15	1110	14.61	ø	RECENT RAIN. VALVE OPEN	JRS
10-9-15	1215	14.60	ø	Routines	JCA
10-21-15	1020	14.58	ø	Routines	DTE
10-27-15	1330	14.57	ø	Routines	CR
11-3-15	10:00	14.56	ø	Routines	CR
11-2-15	1115	14.56	ø	TØ	DAT
11-10-15	1225	14.54	ø	Routines	DTE
11-16-15	1550	14.54	ø	Routines	T.B
11-23-15	1145	14.42	ø	Routines	D.T.E
12-2-15	1300	14.31	ø	CLEAR. VALVE OPEN	JRS
12-7-15	14:00	14.27	ø	Routines	TB
12-20-15	1100	14.24	ø	Routine	JCA
1-5-16	0840	13.92	ø	TØ	DAT
1-6-16	1100	13.41	ø	Routines	JCA
1-13-16	1330	13.40	ø	Routines	JCA
1-21-16	1600	13.40	0	Routines	CR
1-25-16	1106	13.39	ø	Routines	TB
2-2-16	1315	13.38	ø	Turned In to SERVICE	JCA
2-2-16	1435	15.44	1.69	Away to KR-3 intake	JCA
2-3-16	0945	15.38	1.14	TURNED IN & DIVIRTING	DAT
2-3-16	1125	15.37	1.06	Routines	JCA
2-8-16	1115	15.43	1.59	Routines	JCA
2-10-16	1310	15.39	1.22	Routines	JCA
2-16-16	1145	15.35	.910	Routines	JCA
2-16-16	1310	15.34	0.83	BATT CHECK	DAT
2-18-16	1100	15.48	2.08	Routines	JCA
2-22-16	1315	15.33	.747	Monthly / weekly inspection	JCA
2-25-16	1145	1531	.593	Routines	JCA
2-29-16	1230	1532	.669	Routines	JCA
2-29-16	1500	15.32	.669	CLEARED BRANCHES AND CLEANED OUT MUD	JRS / DAT
3-7-16	1216	15.48	2.08	Routines	JCA
3-10-16	10:00	15.44	1.69	TURNED IN 0.0% GH @ POND	JRS
3-10-16	1315	15.42	1.49	Routines	JCA
3-14-16	1200	15.50	2.28	Routines	JCA
3-16-16	9:37	15.49	2.28	Routines	T.B
3-21-16	1150	15.49	2.08	Routines	JCA
3-21-16	1217	15.47	1.98	Monthly Flowline Patrol	D.T.E.
3-29-16	1400	15.44	1.49	Routines	JCA

SCE OD 67-B REV 10/85 (CW)

415 CONRAL CREEK DIVERSION

Southern California Edison Company 11186750

HYDRO DIVISION LOG SHEET

SHEET NO. 06973

DATE	TIME	GAGE DATE	DIVERTED FLOW	NOTES	VISIT BY
3-30-16	0903	15.40	1.30	Routines	DTE
4-4-16	1300	15.39	1.22	Routines	DAT
4-4-16	1515	15.38	1.14	CHECK	DAT
4-7-16	1300	15.43	1.59	Turned out per (Vicette)	JRS
5-2-16	1030	15.08	0	Routines / monthly	DAT
5-4-16	1558	15.08	0	USGS INSPECTION	JRS
5-11-16	1550	15.07	ϕ	COPY CEG FILE FOR CAGE REBUILD	DAT
5-12-16	1115	15.07	ϕ	TO CHECKING DL FILES.	DAT
5-26-16	1048	15.05	ϕ	Routines	TB
5-31-16	1150	15.03	ϕ	Routines	DAT
6-2-16	1400	15.02	ϕ	weekly Routines	CR
6-6-16	1500	15.01	ϕ	REBUILDING CAGE	JRS
6-25-16	1300	[illegible]	ϕ	Routine	DAT
7-11-16	1400	0	0	Routine	DAT
7-18-16	1410	ϕ	ϕ	TURNED OUT	DAT
7-20-16	1340	ϕ	ϕ	Routines / monthly inspection	DAT/EH
8-9-16	1405	ϕ	ϕ	TURNED OUT. USGS INSP.	DTE
8-15-16	1102	ϕ	ϕ	Routines	DTE
8-22-16	1108	ϕ	ϕ	Routines	JRS
9-6-16	1420	ϕ	ϕ	TURNED OUT. OUTAGE IN PROGRESS	DTE
9-8-16	1110	ϕ	ϕ	Turned Out / Routines	DAT
9-21-16	1100	0	0	Routine	DAT
9-26-16	1430	0	0	Routines / Monthly	

415 CANAL CR DIVERSION

Southern California Edison Company 111867750

HYDRO DIVISION LOG SHEET

DATE	TIME	GHT DATE	DIVERTED FLOW	NOTES SHEET NO. 06974	VIS IT BY
10/3/16	0905	—	ϕ	TURNED OUT, 1 CFS PLATE ON.	DAT
10/10/16	1085	—	ϕ	T∅. HOME TO PAINT GAGE	DAT
10/17/16	1545	—	ϕ	TURNED IN. 1 CFS PLATE ON.	JRS
10-31-16	1150	13,91	0	Routines	JUA
10-31-16	1610	13.86	0	Put 1/2 CFS Plate on per Tito	JUA
11-3-16	1145	13.74	0	Routines	JUA
11-7-16	0957	13.73	ϕ	Routines	T.B
11-9-16	1150	13.73	ϕ	1/2 CFS PLATE ON. ZERO DIVERSION.	DAT.
11-16-16	1110	15.46	ϕ	1/2 CFS PLATE ON. USGS INSP.	DAT
11-16-16	1551	15.47	ϕ	Routines	CR
11-21-16	1215	15.46	ϕ	weekly - monthly routines	T.B
11-28-16	1430	15.47	ϕ	TURNED IN ZERO DIVERSION	JRS
12-29-16	1206	15.46	ϕ	weekly routines	T.B
12-1-16	1257	15.46	ϕ	Routines	DTE
12-5-16	1045	15.46	ϕ	TURNED IN ZERO DIVERSION	JRS
12-5-16	1235	15.46	ϕ	Routine	JUA
12-8-16	1406	15.46	ϕ	Routines	DTE
12-12-16	1400	15.46	ϕ	Routines	JUA
12-14-16	1637	15.46	ϕ	Routined	T.B
12-19-16	1400	15.59	0,583	Routines	JUA
12-21-16	1300	15.53	0.260	Routins	JUA
1-3-17	1145	15.57	0.461	Routines	JUA
1-5-17	1145	17.20	10.7	Routines	JUA
1-9-17	1315	15.47	0	Routines	JUA
1-19-17	1200	15.47	0	Routines / Flush Pond	JUA
1-30-17	1000	15.41	0	TURNED OUT	JRS
1-31-17	1400	15.44	0	PUT 1 CFS PLATE ON. TURNED OUT	JRS
2-6-17	1100	15.67	0	Routing	JUA
2-14-17	1445	15.60	0.65	TURNED OUT	JRS
2-15-17	1130	15.60	0.65	Routines	CR
2-16-17	0800	15.60	0.65	TURN IN TO LOWER POND FOR SAND FLUSH	DAT
2-16-17	1520	19.05	11.3	SAND FLUSH UNSUCCESSFUL, TURNING OUT	JRS
2-23-17	1021	15.64	0.979	weekly routines	TB
2-28-17	1530	15.47	ϕ	CLEARED DRAIN VALVES & FLUSHED POND	JRS/CR/TB
3-1-17	1422	15.46	ϕ	weekly routines	TB
3-6-17	0910	15.47	ϕ	TURNED OUT	DAT
3-7-17	1430	15.48	ϕ	CLEARED DRAIN VALVES & FLUSHED POND	JRS/DAT

SCE OD 67-B REV 10/85 (CW)

415 COMAL CR. DIVERSION.

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 06975

DATE	TIME	GAUGE DATE	DIVERTED FLOW	NOTES	VISIT BY
3-9-17	0940	16.11	6.43	TURNED IN PER OPS.	JRS
3-13-17	1050	19.12	no chart	Routines	JLA
3-13-17	1205	19.10	11.4	OPENING DRAIN GATE TO PASS SAND	DAT
3-13-17	1220	15.72	1.7	DRAIN OPEN. DIV. TURNED - ok.	DAT
3-13-17	1500	17.30	10.8	DRAIN GATE CLOSED. TURNED IN	JRS
3-16-17	1300	19.23	11.3	FLUSHED POND	JRS
3-22-17	1018	19.31	11.3	Routines	TB
3-27-17	1130	19.04	11.3	Routines	JLA
~~3-29-17~~	~~1000~~				
3-29-17	1000	18.97	11.3	Routines	TB
3-30-17	1500	15.76	2.07	FLUSHING POND.	JRS
3-30-17	1515	16.53	8.47	POND DRAIN CLOSED	JRS
4-3-17	0947	18.92	11.3	Routines	TB
4-4-17	1610	18.81	11.3	FLUSHED POND	JRS
4-10-17	1443	18.91	11.3	Routines	TB
4-13-17	1100	15.47	0	OPENED DRAIN GATE TO FLUSH POND	JRS
4-11-17	1526	17.80	11.2	CLOSED DRAIN GATE, TURNED IN	JRS
4-17-17	1145	18.80	11.3	Routines	JLA
4-21-17	1050	18.52	11.3	Routines	JLA
4-26-17	1600	13.94	11.3	FLUSHED BOTH WELLS. COM VERY SLOW	JRS
4-26-17	1450	18.94	11.3	FLUSHED COM LINE. ALL CLEAR	JRS
5-1-17	1545	15.94	4.14	Routines	TB
5-2-17	1555	17.02	10.3	FLUSHED POND. POND NO LONGER SPILLING	JRS
5-8-17	1400	16.13	6.72	Routines	JLA
5-10-17	0918	16.13	6.72	Routines	TB
5-15-17	1030	16.06	5.72	FLUSHED POND. NO SPILL, ORIFICE CLEAR	DAT
5-17-17	1000	16.04	5.45	Routines	JLA
5-30-17	1350	~~15.76~~ 15.76	2.07	Routines	TB.
6-1-17	1300	15.76	2.07	Routines	JLA
6-5-17	1345	15.66	1.13	Routines	JLA
6-7-17	0945	15.66	1.13	Routines	TB
6-12-17	1550	15.62	.815	Routines	TB
6-20-17	0955	15.54	0.306	DATA. VERY HOT	JR
6-20-17	1200	15.54	0.306	Routines / Monthly	JLA
6-27-17	1315	15.47	ø	USGS INSP. TURNED OUT	DAT
7-6-17	1510	15.44	ø	INSTALLED 1/2 CFS PLATE, TURNED IN, TURNED OUT (NOT ENOUGH H2O)	JRS
7-10-17	1506	15.43	ø	Routines diversion turned out	TB

SCE OD 67-B REV 10/85 (CW)

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 06976

DATE	TIME	GHT ~~DATE~~	DIVERTED FLOW	NOTES	VISIT BY
7-24-17	0852	15.40	0	FLOW CHECK	SHERMAN
8-8-17	1355	15.36	0	TURNED OUT	SHERMAN
8-31-17		1200	0	Routines/monthly	Roberts
8-28-17	1050	15.32	0	Routines	OUT
9-9-17	1005	15.29	0	DATA	JRS
10-3-17	1525	15.28	0	DATA	JRS
10-9-17	1527	16.30	0	Routines	JRS

415/416 CORRAL CREEK DIVERSION 11186750

Southern California Edison Company
HYDRO DIVISION LOG SHEET

SHEET NO. 06977

DATE	TIME	GHT ~~DATE~~	DIVERTED FLOW	NOTES	VISIT BY
10-3-17	1525	15.28	0	DATA	JRS
10-9-17	1527	15.30	0	Routines	JRS
10-19-17	1445	15.26	0	COLLECTING LOG SHEETS	JRS
10-24-17	1355	15.26	0	monthly routines	TB
11-7-17	1110	15.24	ø	TURNED OUT	DAT
11-21-17	1314	15.20	ø	Routines	TB
12-11-17	1252	15.20	0	TURNED OUT	JRS
1-8-18	1235	15.16	ø	TURNED OUT. RAIN	DAT
1-22-18	1330	15.16	0	Routines	TB
2-8-18	1350	15.13	ø	TURNED OUT, PUT .1 cfs PLATE ON	JRS
3-5-18	1030	15.12	0	TURNED IN	JRS
3-12-18	1130	15.54	0.306	Routines / monthly	JRS
3-26-18	0830	15.75	1.97	GRIDS PLUGGED, RAKED GRIDS	JRS
3-26-18	1145	15.74	1.88	Routines	JRS
4-2-18	1050	15.64	1.13	Routines	JRS
4-2-18	1255	15.66	1.13	GRIDS CLEAN.	DAT
4-9-18	1100	15.47	0	TURNED OUT PER OPERATIONS	JRS
4-26-18	1100	15.46	0	Routines / monthly	JRS
5-7-18	1412	15.45	ø	Routines	T. Brown
5-8-18	1000	15.45	ø	TURNED OUT	JRS
6-21-18	1530	15.46	ø	TURNED OUT LOW WATER	JRS
6-26-18	1457	15.46	ø	Turned Out, Low Water	LW
7-2-18	1321	15.46	ø	Turned Out, Low Water	LW
7-3-18	1125	15.46	ø	RR, TURNED OUT, 1/2cfs PLATE ON	JRS
7-16-18	1003	15.46	ø	Turned, low water	LW
8-1-18	945	15.46	ø	Turned out.	JRS
8-6-18	1220	15.46	ø	TURNED OUT. RAN LEVELS @ 415	DAT
9-12-18	1300	15.44	ø	TURNED OUT. USGS HISP. DAT/JRS/EIT	
9-26-18	1300	15.44	ø	Monthly/weekly	JRS
10-2-18	1320	15.41	ø	TURNED OUT	JRS
10-30-18	1300	15.38	0	Monthly/weekly inspection	JRS
11-7-18	1235	15.37	ø	RR, TURNED OUT	JRS

415 CORRAL CREEK 11186750

Southern California Edison Company DIVERSION

HYDRO DIVISION LOG SHEET

2019 WY

SHEET NO. 06978

DATE	TIME	GHT RATE	DIVERTED FLOW	NOTES	VISIT BY
10-2-18	1320	15.41	0	TURNED OUT	JRS
10-30-18	1300	15.38	0	MONTHLY/ WEEKLY & INSPECTION	JLH
11-7-18	1235	15.37	0	RR, TURNED OUT	JRS
11-28-18	1153	15.34	0	Monthly Routines, Turned Out	L. Watts
12-27-18	1400	15.32	0	Monthly	JLH
12-27-18	1015	15.47	0	RR, TURNED IN	JRS
1-7-19	1330	1580	0.145	Routines	JLH
1-14-19	0750	15.51	0.156	RR, RAIN COMING	JRS
1-29-19	1540	14.55	0	RR, PUT ON 1 CFS PLATE	JRS
1-31-19	1030	15.57	0	Routines	TB
2-12-19	1100	15.76	2.07	Routines	JLH
2-20-19	1405	15.82	2.72	Turn in	LW
2-20-19	1525	15.83	2.84	RR, LOOKS GOOD, RAIN & SNOW COMING	JRS
2-27-19	1422	15.84	2.95	WKly Routines	LW
3-4-19	1135	15.47	ϕ	TURNED OUT.	DAT
3-4-19	1240	15.47	ϕ	Routines, Turned Out	LW
3-12-19	10:30	16.14	6.76	ROUTINES, TURNED IN	MC
3-13-19	10:30	15.48	0	Flushed Pond gate still open to control	JLH
3-14-19	1500	16.06	5.72	TURNED IN AFTER FLUSH	DA
3-18-19	1650	16.08	6.00	FLUSHED & VENTED	JRS
3-19-19	1530	16.96	8.16	BIG POND FLUSH POND @ 0.35	JRS
3-25-19	1300	16.06	5.72	WRAP PIPE & WELD ON VENT TO POND.	DAT
3-26-19	0905	16.08	6.00	TURNED IN. WRAP HOLDING WELL	JRS
3-26-19	1100	16.08	6.00	Routines / Monthly	JLH
4-1-19	1330	16.21	7.07	Routines	JLH
4-8-19	1030	18.92	11.3	DAM SPILLING, PIPE FULL	JRS
4-9-19	1600	19.14	11.3	Routines	JLH
4-11-19	0955	18.9	11.3	FLOW CHECK	DAT
4-11-19	1230	18.99	11.3	FLUSHED POND	JRS
4-16-19	1511	19.00	11.3	Cleaned Grids, wkly routine	LW
4-22-19	1020	19.12	11.3	WKly routine, cleaned grids	LW
4-29-19	1000	15.45	ϕ	FOUND GRIDS 100% CLOGGED. POND FULL SAND	DAT
4-29-19	1015	17.34	10.9	FLUSHING POND. GRIDS CLEAN.	DAT
4-30-19	1019	19.13	11.3	WKly routines	LW
5-3-19	0900	18.99	11.3	Rounds	MC
5/6/19	1400	18.98	11.3	Rounds	RA
5-7-19	1528	16.52	8.43	Routines	TB

SCE OD 67-B REV 10/85 (CW)

416 CORRAL CREEK INB6750

Southern California Edison Company 2019 WY

HYDRO DIVISION LOG SHEET

SHEET NO. 06979

DATE	TIME	GHT	DIVERTED FLOW	NOTES	VIS BY
5-8-19	11:20	15.46	–	FLUSHING POND	JR
6-8-19	11:10	17.26	10.8	BACK IN SERVICE	JRS
5-13-19	1140	17.54	11.1	Routines, take grids	LW
5-15-19	1400	16.26	7.11	Monthly inspection	DAT
5-20-19	1309	16.58	8.69	Routines	TB
5-28-19	1155	16.72	9.30	DATA	JRS
5-29-19	1290	16.69	9.13	Routines	DAT
6-3-19	1120	17.44	10.0	INST. ANM PROTECTION BOX.	DAT
6-4-19	1500	16.61	8.82	Routine	DAT
6-10-19	1400	16.02	5.18	Routines	LW
6-15-19	1500	15.80	2.49	LOOKING AROUND	DAT
6-17-19	1515	15.78	2.28	USGS INSP.	DAT
6-20-19	1135	15.75	1.97	FLUSHED POND	JRS
7-1-19	1550	15.54	.979	Routines / take grids	LW
7-8-19	1528	15.47	0.0	Routines	LW
7-11-19	1340	15.47	0.0	FLUSHED POND	JRS
7-17-19	1003	15.46	0.0	Turned out, low water, routines	LW
8-1-19	0915	15.46	0.0	DATA	JRS
8-15-19	1520	15.46	0.0	INSTALLED 1/2 cfs PLATE	JRS
9-3-19	1340	15.46	ϕ	TURNED OUT. REMOVED WASPS.	DAT
9-17-19	1300	15.45	ϕ	TURNED OUT. USGS INSP.	DAT
9-30-19	1320	13.54	ϕ	TO. DEMO OLD SOLAR SYSTEM	DAT

415 COMAL CR DIV. 11106150

Southern California Edison Company

HYDRO DIVISION LOG SHEET

2020 WY.

DATE	TIME	GAT DATE	DIVERTED FLOW	AVM	NOTES SHEET NO. 06980	VISIT BY
10-1-19	1455	13.54	ϕ		TURNED OUT	D.TITO
11-12-19	1045	15.42	ϕ		TURNED OUT	JRS
12-3-19	1135	13.47	ϕ		TURNED OUT	D.TITO
12-30-19	1205	13.47	ϕ		TURNED OUT	D.TITO
1-6-20	1555	13.47	ϕ		TURNED OUT. INSTALLED AVM TRANS.	D.TITO
1-7-20	1320	15.66	0.25		TURNED IN. WORKED ON AVM INSTALL	JRS
1-8-20	1400	15.56	0.26		AVM WORKING. MORE INSTALL WORK	JRS
1-13-20	1450	15.55	0.36	0.17	AVM INSTALLED	JRS
1-21-20	1045	15.57	0.46	0.26	CLEAR	JRS
1-23-20	1023	15.56	0.25		Routines	LW
1-27-20	1245	15.47	ϕ	0.0	PUT 1 CFS PLATE ON, TURNED OUT	JRS
2-10-20	12:06	15.45	ϕ	0.0	TURNED OUT	JRS
3-9-20	1220	15.43	ϕ	ϕ	TURNED OUT. WASPS!	DAT
3-18-20	1630	15.43	0		Turned IW Per Anzaldo	DM
3-19-20	1100	15.52	0.2600		monthly routines	MA
3-23-20	1144	15.75	1.97	1.96	INSPECTION	RA
4-9-20	1101	15.95	4.26		Routines	LW
4-9-20	1125	15.93	4.0	3.80	TURNED IN. ORIFICE CLEAR	DAT
4-13-20	1120	17.49	11.0		Routines	LW
4-20-20	1044	17.47	11.0	AVM	Routines	LW
4-22-20	1115	16.14	—	4.60	CHECK. USE AVM READ FOR FLOW	DAT
4-27-20	1156	16.22	[illegible]	7.11	Routines	LW
4-27-20	1600	16.21	7.07	5.26	FLUSHED POND	JRS
4-28-20	1100	16.23	7.16	4.52	USE AVM.	DAT
5-4-20	1030	15.79	2.38	2.44	USE AVM. FLUSHED POND.	DAT
5-11-20	1127	15.67	1.21		Routines	LW
5-12-20	1240	15.65	—	0.60	USE AVM.	DAT
5-18-20	1107	15.61	.73		Routine	LW
5-26-20	1020	15.49	ϕ	ϕ	TURNED OUT & DRAIN PIPE	DAT
6-3-20	1100	13.65	0	0	RR	JRS
6-10-20	1155	13.64	ϕ	ϕ	TURNED OUT. USGS HSP	DAT
7-7-20	0910	13.51	ϕ	ϕ	TURNED OUT.	DAT
7-7-20	1110	13.51	ϕ	ϕ	Turned out / Routines	TT
8-3-20	1520	13.49	ϕ	ϕ	TURNED OUT.	DAT
8-20-20	1245	13.48	0	0	INSTALLED ½ CFS PLATE, TURNED IN	JRS
9-3-20	1300	13.48	0	0	RR TURNED OUT (NOT BY ME)	JRS
9-14-20	1115	13.47	ϕ	ϕ	Routines	TT

SCE OD 67-B REV 10/85 (CW)

415/416 CORRAL CK DIVERSION
11186750

Southern California Edison Company

HYDRO DIVISION LOG SHEET

DATE	TIME	GAGE ~~GAGE~~	AVM	DIVERTED FLOW	NOTES ~~SHEET NO.~~ 86981	VISIT BY
9-17-20	0850	13.47	ϕ	ϕ	Tϕ. USGS INSP.	TITO
9-21-20	1030	13.47	ϕ	ϕ	Routine	Fisher

SCE OD 67-B REV 10/83 (CW)

415/416 CORRAL CR DIV.
(11186750)

Southern California Edison Company

HYDRO DIVISION LOG SHEET

SHEET NO. 06982

DATE	TIME	GHT DATE	DIVERTED FLOW	AVM	NOTES	VISIT BY
10-5-20	1020	13.47	ϕ	ϕ	TURNED OUT	TITO
10-7-20	1100	13.47	ϕ	ϕ	"	Fisher
10-26-20	1610	13.47	ϕ	ϕ	"	Fisher
11-2-20	1605	13.47	ϕ	ϕ	DATA	JRS
12-10-20	1500	13.47	ϕ	ϕ	Routines	Fisher
12-15-20	1345	13.47	ϕ	ϕ	DATA, TURNED IN TO TEST	JRS
12-15-20	1530	13.47	ϕ	ϕ	TURNED OUT, NOT ENOUGH H_2O	JRS
12-29-20	1640	13.47	ϕ	ϕ	Routines	Fisher
1-11-21	1605	13.47	ϕ	ϕ	Routines	Fisher
1-19-21	1150	13.47	ϕ	ϕ	TURNED OUT	TITO
1-28-21	1045	13.47	ϕ	ϕ	TURNED OUT, PUT ICFS PLATE ON	JRS
2-8-21	1700	13.47	ϕ	ϕ	Routines	JRS
2-18-21	1530	13.47	ϕ	ϕ	DATA	JRS
3-2-21	1035	13.47	ϕ	ϕ	TURNED OUT. TUNNEL OUTAGE	D TITO
4-6-21	1035	13.47	0	0	Routines	DMA
4-8-21	1010	13.47	0	0	DATA	JRS
5-5-21	1550	13.47	ϕ	ϕ	USGS INSP.	PH
5-11-21	1330	13.47	ϕ	ϕ	INSTALLING TEMP & DO SENSORS	D. TITO
6-9-21	0820	13.47	0	0	DATA	JRS
6-21-21	1000	13.47	0	0	Monthly	MA
7-6-21	1610	13.47	0	0	DATA	JRS
7-21-21	0930	13.47	0	0	INSTALLED 1/2 CFS PLATE	JRS
8-2-21	0900	13.47	ϕ	ϕ	TURNED OUT.	DAT
8-30-21	1100	13.47	0	0	Monthly	JRS
9-2-21	1110	13.47	ϕ	ϕ	TURNED OUT.	DAT
9-29-21	1000	13.47	0	0	Monthly/would walk down permission	JRS

SCE OD 67-B REV 10/85 (CW)

Date	Time	GHT	Flow	AVM	Notes	Visit by
10-13-21	1440	13.47	ϕ	ϕ	TURNED OUT, 1/2 CFS PLATE ON. MIN. BATT 12.2V	D. TITO
10-26-21	1160	13.47	0	0	Weekly / monthly inspection	JA
11-9-21	10.20	13.47	ϕ	ϕ	weekly routies	T. Simmons
11-9-21	1450	13.47	0	0	DATA	JRS
11-15-21	1130	13.48	0	0	weekly routies	T. Simmons
11-18-21	1710	13.47	ϕ	ϕ	USGS INSP.	D. TITO
11-29-21	13 00	13.47	0	0	monthly / weekly inspection	JA
12-1-21	1125	13.48	ϕ	ϕ	TURNED OUT. BATT 13.6 MIN 12.7 1/2 CFS PLATE ON	D. TITO
12-8-21	15:20	13.48	ϕ	ϕ	weekly routies	T. Simmons
12-13-21	0450	13.47	ϕ	ϕ	weekly routies	T. Simmons
12-16-21	1205	13.47	ϕ	ϕ	TESTING AVM. TURNING IN. DW.	D. TITO
12-20-21	1030	15.47	ϕ	ϕ	weekly routies	T. Simmons
12-27-21	1030	16.25	7.25	0	Weekly / monthly	JA
12-31-21	1100	15.65	1.05	0	Weekly Check	JA
1-10-22	1600	15.60	0.653	ϕ	weekly routines	T. Simmons
1-18-22	1104	15.58	0.52	0.1	VERY LOW DIVERSION RATE	D. TITO
1-19-22	0920	15.48	ϕ	ϕ	CHANGED 1/2 CFS TO 1 CFS PLATE	D. TITO
1-19-22	1000	15.48	ϕ	ϕ	TURNED IN. NO FLOW YET.	D. TITO
1-20-22	0907	15.46	ϕ	ϕ	" "	LB
1-27-22	1020	15.44	ϕ	ϕ	TURNED OUT. DRAIN SIPHON. 1 CFS PLATE ON	D. TITO
2-1-22	1330	15.43	ϕ	ϕ	TURNED OUT	JRS
2-8-22	1050	15.43	ϕ	ϕ	weekly routies	T. Simmons
2-17-22	1300	15.43	0	0	Routines	JA
2-22-22	1000	15.41	ϕ	ϕ	weekly routines	T. Simmons
3-1-22	1120	13.69	ϕ	ϕ	TURNED OUT, 1 CFS PLATE OK.	D. TITO
3-1-22	1330	13.69	ϕ	ϕ	weekly / monthly inspection	T. Simmons
3-14-22	1030	13.66	ϕ	ϕ	weekly routines	T. Simmons
3-21-22	1130	13.65	ϕ	ϕ	weekly routines	T. Simmons
3-29-22	1209	13.63	ϕ	ϕ	weekly / monthly inspection	T. Simmons
4-4-22	1220	13.62	0	0	DATA	JRS
4-21-22	1450	13.59	ϕ	ϕ	weekly routines	T. Simmons
4-25-22	1240	13.59	ϕ	ϕ	weekly / monthly inspection	T. Simmons
4-28-22	0835	13.59	ϕ	ϕ	USGS INSP. TO	D. TITO
5-2-22	0944	13.59	ϕ	ϕ	weekly routine	T. Simmons
5-4-22	1110	13.58	ϕ	ϕ	TURNED OUT. 1 CFS PLATE ON	D. TITO

Date	Time	GHT	Flow	AVM	Notes	Visit by
5-11-22	1438	13.58	0	0	weekly routines	T. Simmons
5-19-22	1419	13.58	0	0	weekly routines	T. Simmons
5-31-22	1015	13.57	0	0	weekly routines	T. Simmons
6.6.22	1355	13.57	0	0	TURNED OUT 13.7V	D. TITO
6-22-22	1100	13.57	0	0	weekly / monthly inspection	T. Simmons
7-5-22	0935	13.57	0	0	weekly routines	T. Simmons
7.5.22	1045	13.57	0	0	TO. ICES PLATE 12.4V OK MIN BATT 12.1V	D. TITO
7-11-22	1100	13.57	0	0	weekly routines	T. Simmons
7-18-22	1326	13.57	0	0	weekly routines	T. Simmons
8-24-22	1135	13.67	0	0	DATA	JRS
9-6-22	0910	13.57	0	0	weekly routines	T. Simmons
10-10-22	1035	13.57	0	0	weekly routines	T. Simmons

2023 WY
~~2022 WY~~

415 Corral Creek Diversion 11186750

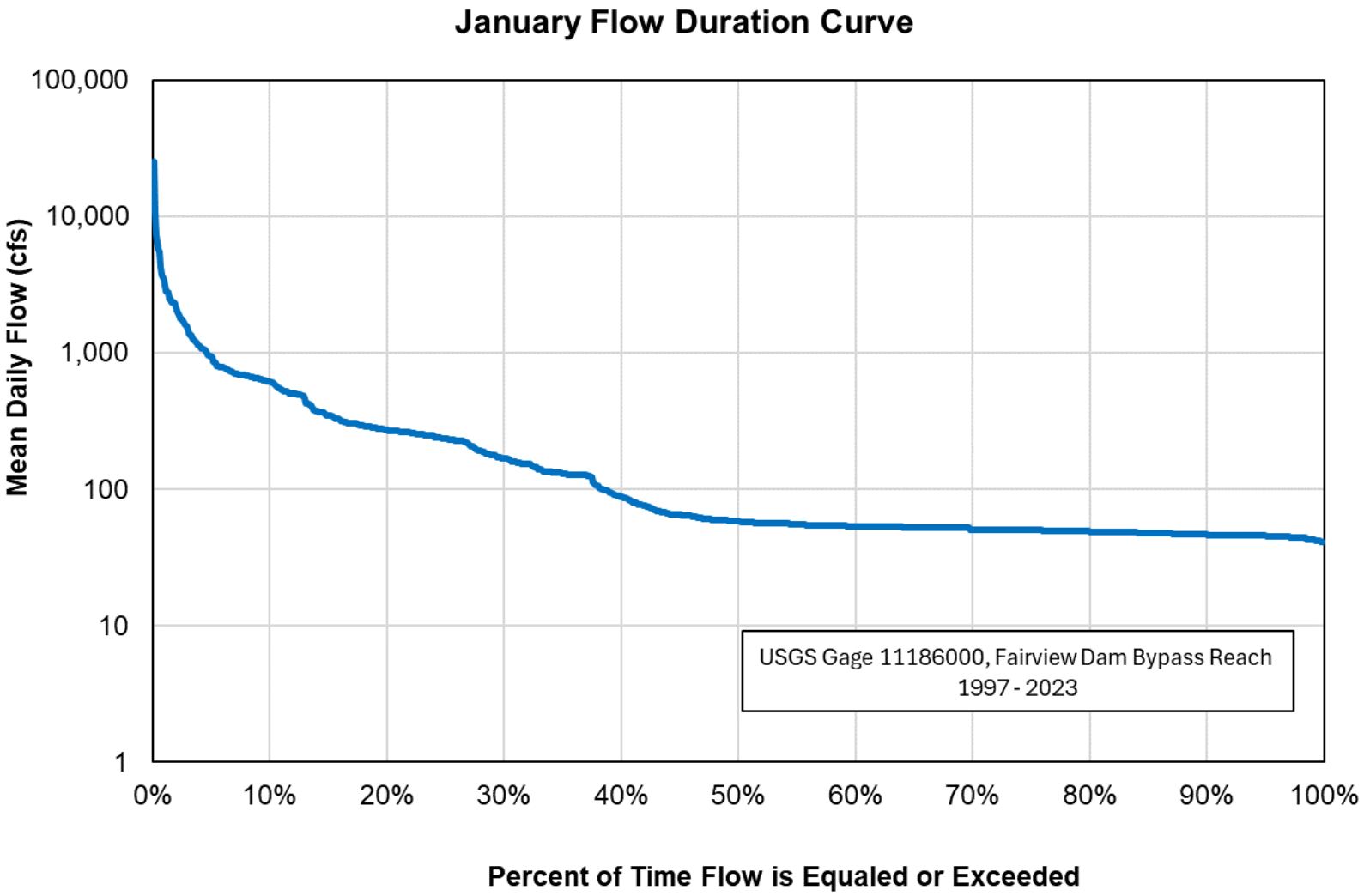
Date	Time	GHT	Flow	AVM	Notes	Visit by
10-10-22	1036	13.57	0	0	WEEKLY ROUTINES	T. Simmons
10-13-22	0950	13.57	0	0	USGS INSP. ½ CFS PLATE ON DAT	JRS. DAT
11-3-22	1616	13.57	0	0	routines	T. Simmons
11-7-22	1340	13.57	0	0	weekly routines	T. Simmons
11-14-22	1555	13.57	0	0	DATA	JRS
11-21-22	1509	13.57	0	0	weekly / monthly routines	T. Simmons
12-12-22	1049	13.57	0	0	weekly routines	T. Simmons
12-19-22	1156	13.57	0	0	weekly routines	T. Simmons
12-28-22	1010	13.57	0	0	weekly / monthly inspection	T. Simmons
1-12-23	1033	14.85	0	0	weekly / routines	T. Simmons
1-17-23	1602	13.92	0	0	weekly routines	T. Simmons
1-25-23	1300	13.95	0	0	weekly routines	T. Simmons
1-31-23	1512	15.35	0	0	weekly / monthly routines	T. Simmons
2-9-23	1345	13.72	ϕ	ϕ	TURNED OUT. ORIFICE BURNED	D. TITO
2-13-23	1020	13.71	ϕ	ϕ	weekly routine 1 CFS plate is on there	T. Simmons
2-	1300	15.68	1.30		Turned In Per Anzaldo	J. Hughes
2-21-23	0945	15.67	1.21	0.96	weekly routines	T. Simmons
2-23-23	1122	15.70	1.48	0	check diversion	T. Simmons
2-27-23	1057	15.75	1.97	0	weekly / monthly inspection	T. Simmons
3-6-23	1340	15.91	3.76	ϕ	AVM NOT READING.	D. TITO
3-6-23	1600	15.94	4.14	0	weekly Routines	T. Simmons
3-9-23	1500	15.93	4.02		Turned out for Storm	T. Hughes
3-28-23	1515	14.24	ϕ	ϕ	TURNED OUT ISTV	D. TITO
4-3-23	1330	17.43	11.0	11.0	Turned In	DAT
4-11-23	0935	17.57	11.1	ϕ	Turned IN, DRAIN GATE OPEN GATE OPEN SPILLING	JRS/DAT
4-11-23	1045	19.03	11.3	ϕ	WORKING ON AVM.	DAT/JRS
4-12-23	1020	18.02	13.3	13.3	REPAIRED AVM. DRAIN GATE OPEN	DAT/JRS
4-24-23	0849	15.93	4.02	0	weekly / monthly inspection	T. Simmons
4-26-23	0902	16.55	8.56	ϕ	Diversion cutback	T. A
5-2-23	1009	ϕ	ϕ	ϕ	Turned out Diary with CA	
5-8-23	1100	0	0		Routines	
5-3-23	0905	14.01	ϕ	ϕ	TURNED OUT.	DAT
5-11-23	1140	—	—	9.14	TURNED IN. DRAIN GATE 100% OPEN DEPLOY TEMP PROBES	DAT
5-18-23	1420	13.76	0	12.94	weekly Routines	T. Simmons
5-22-23	1412	13.77		0	weekly Routines	T. Simmons

APPENDIX B
FLOW DURATION CURVES

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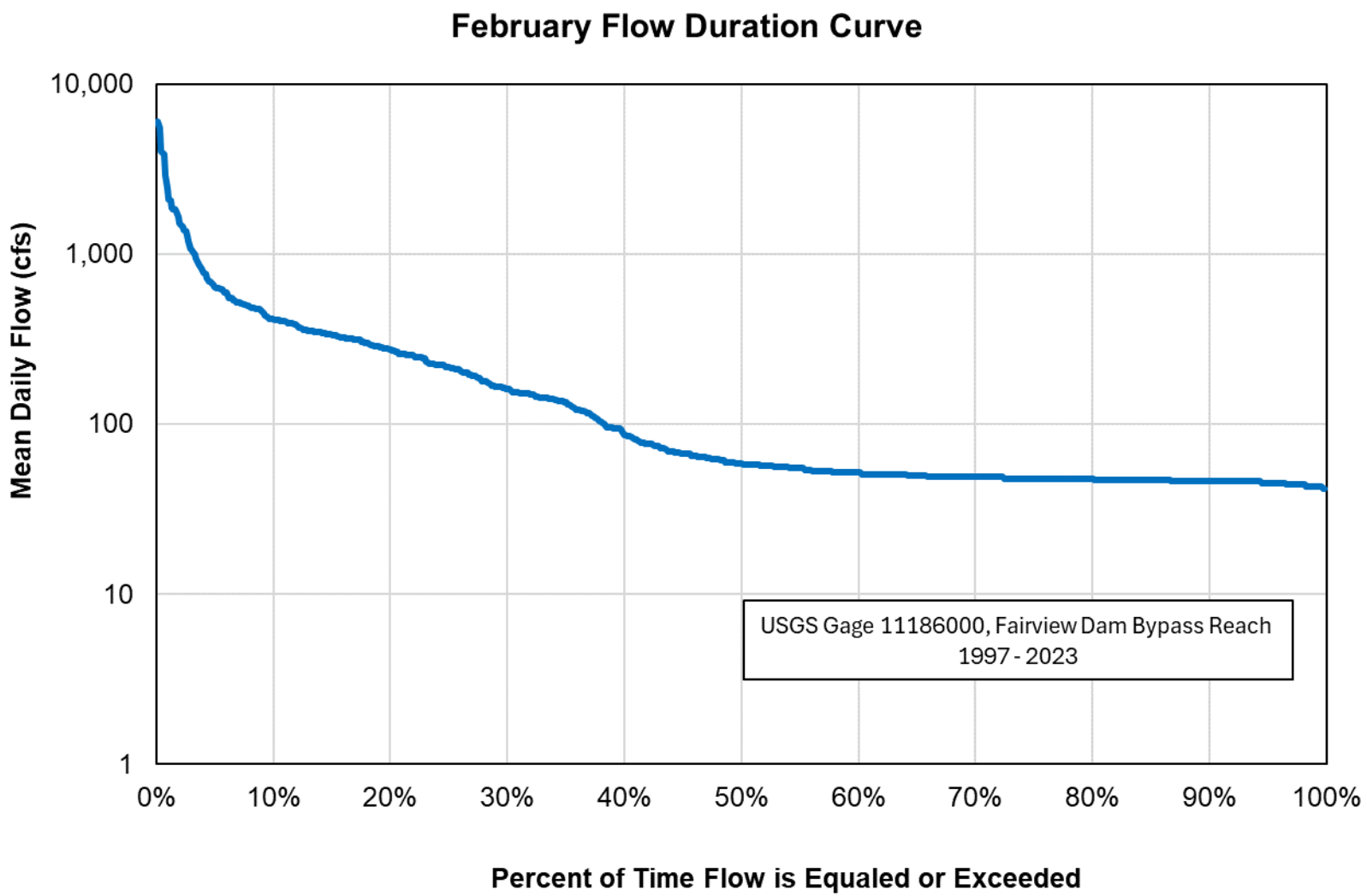
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Source: SCE, 2023c; USGS, 2023a

Figure B-1. January Monthly Flow Duration Curve for the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023.

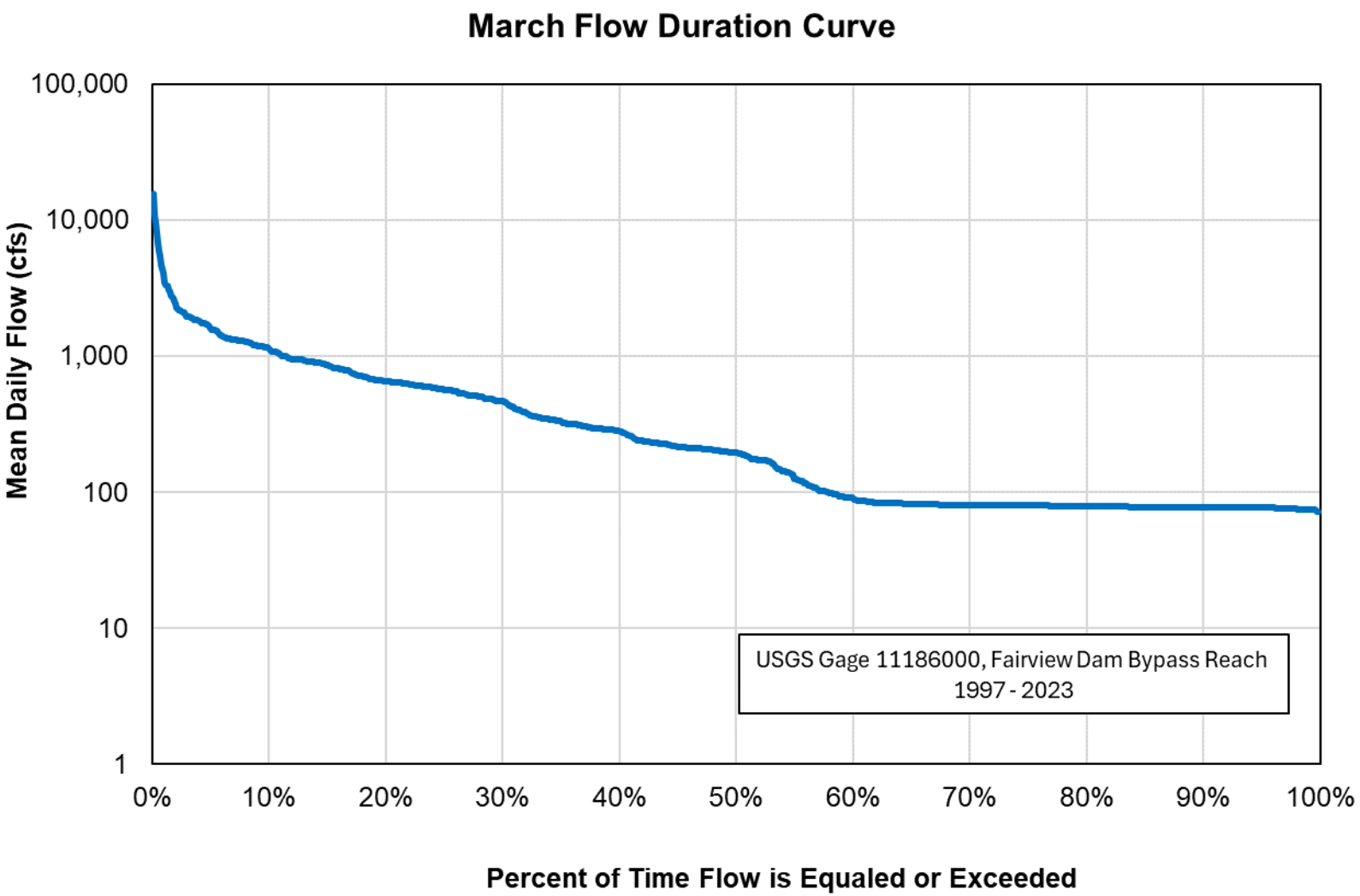
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Source: SCE, 2023c; USGS, 2023a

Figure B-2. February Monthly Flow Duration Curve for the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023.

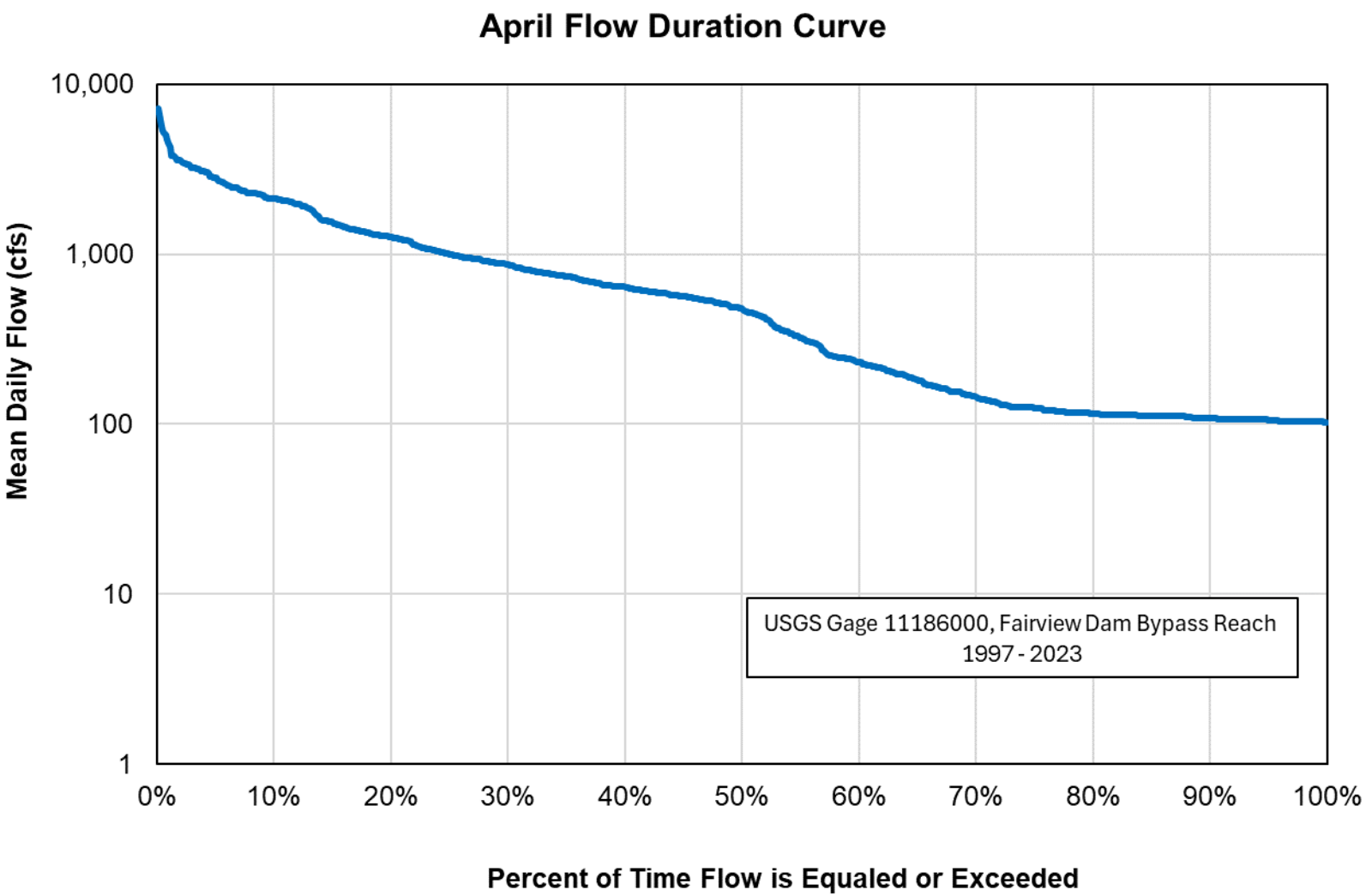
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Source: SCE, 2023c; USGS, 2023a

Figure B-3. March Monthly Flow Duration Curve for the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023.

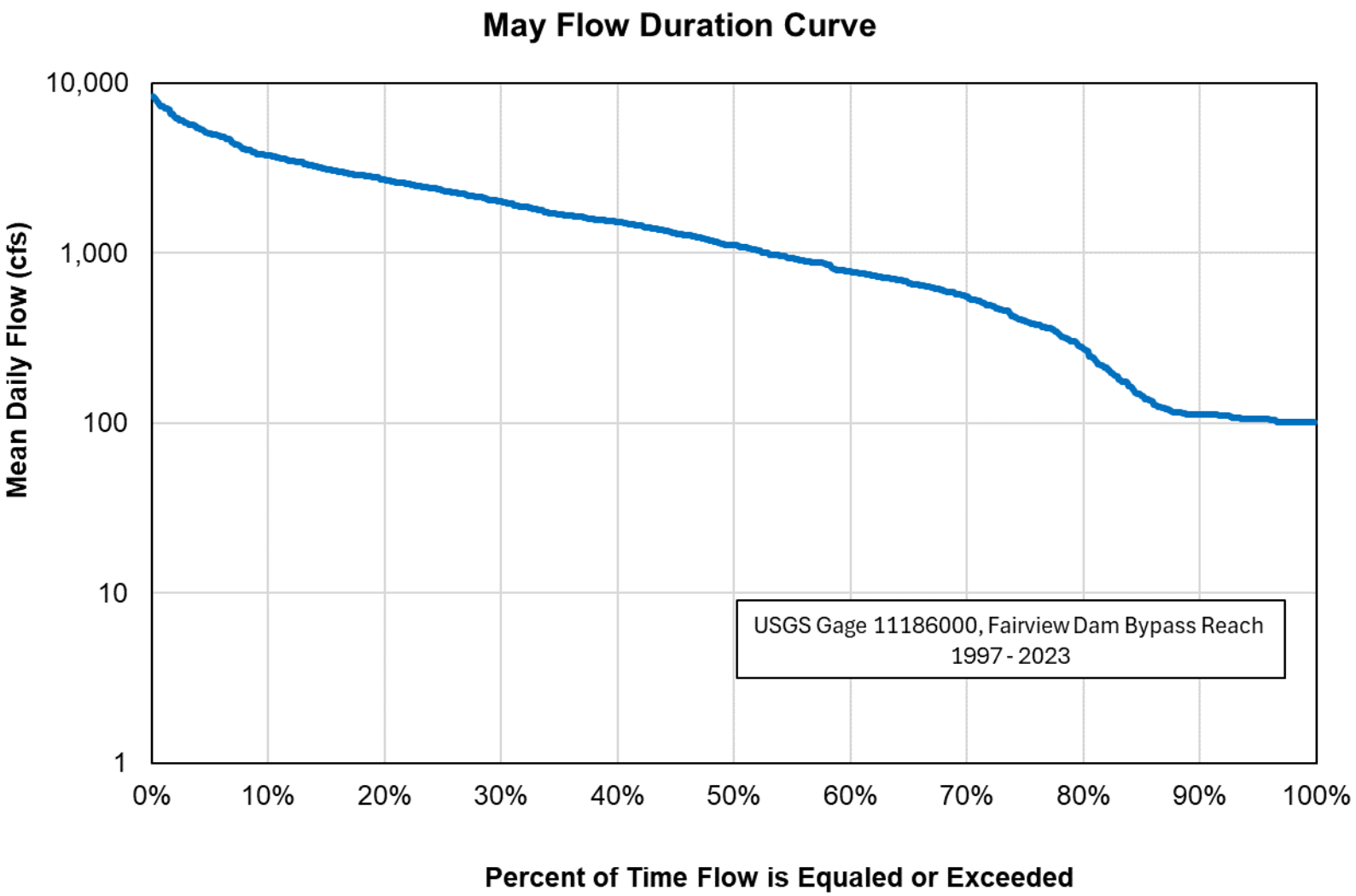
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Source: SCE, 2023c; USGS, 2023a

Figure B-4. April Monthly Flow Duration Curve for the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023.

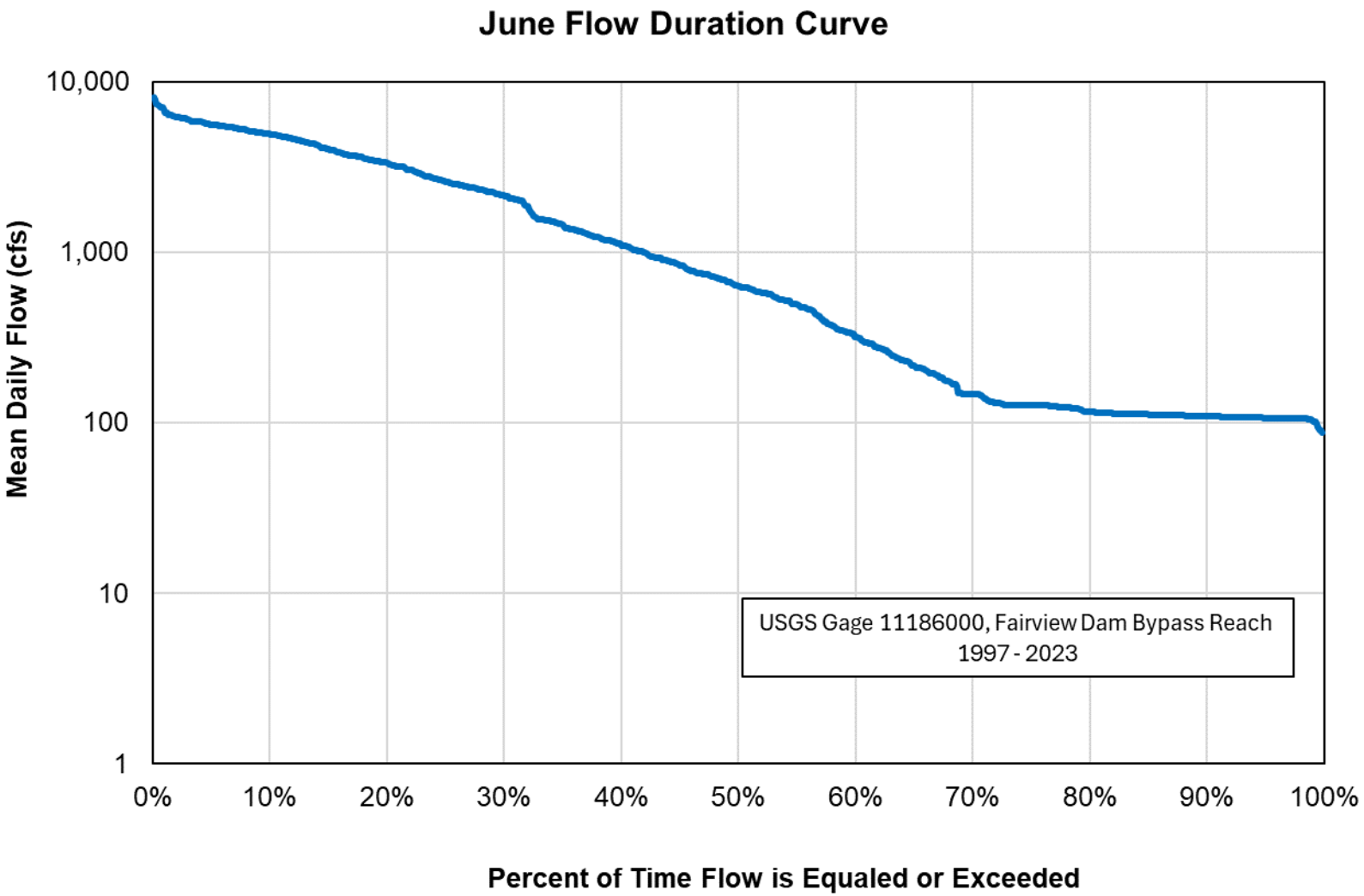
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Source: SCE, 2023c; USGS, 2023a

Figure B-5. May Monthly Flow Duration Curve for the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023.

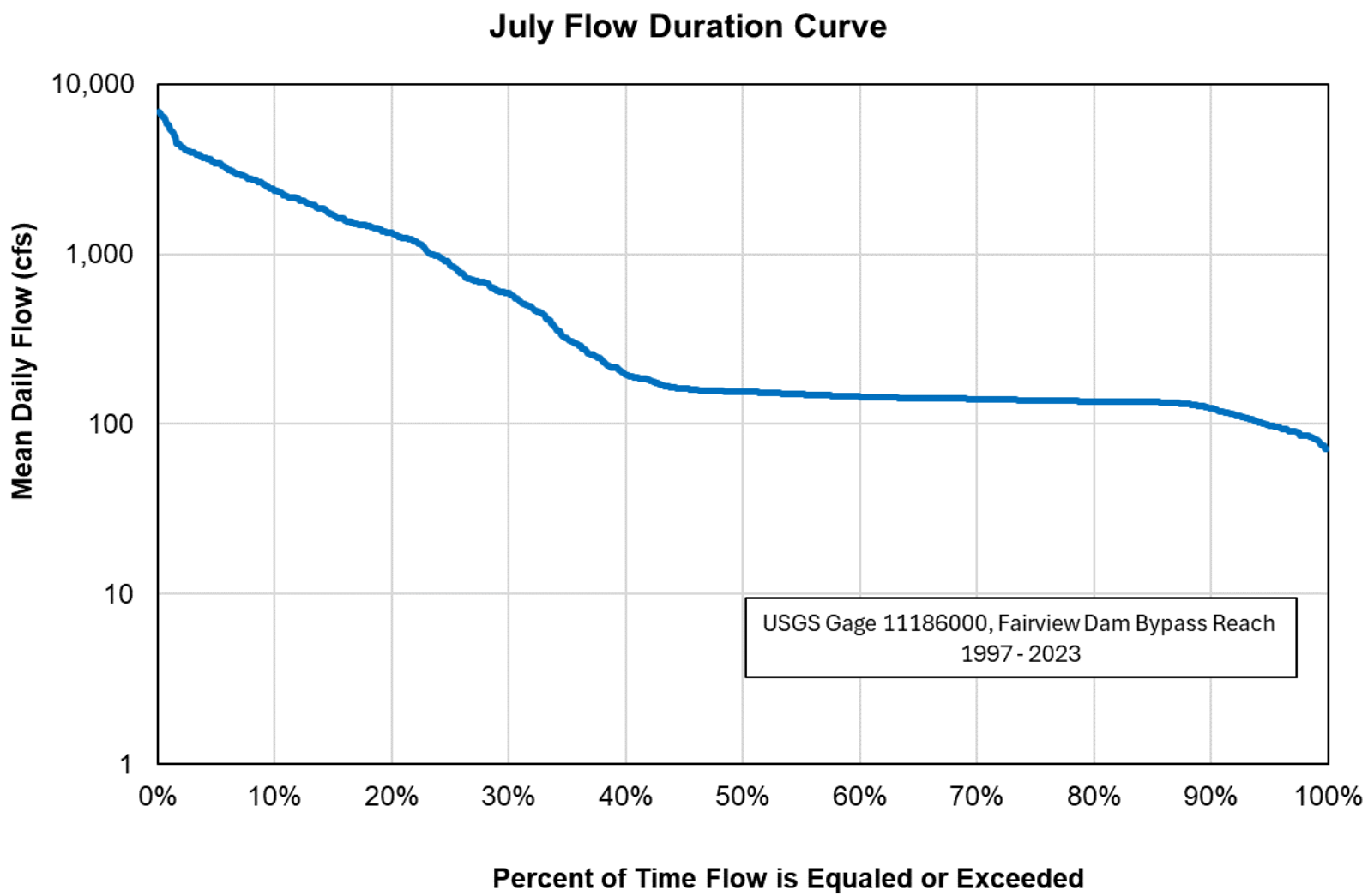
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Source: SCE, 2023c; USGS, 2023a

Figure B-6. June Monthly Flow Duration Curve for the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023.

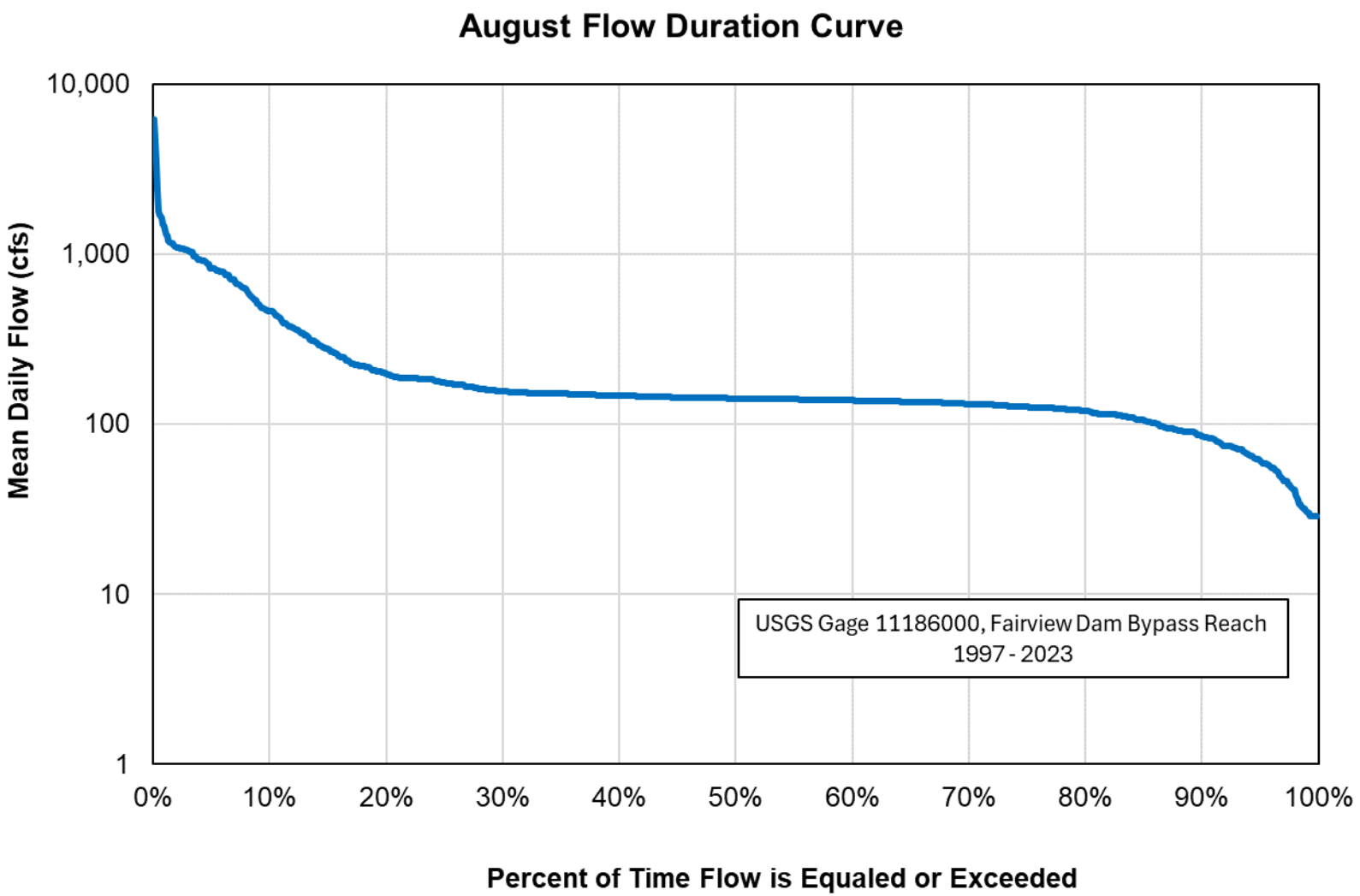
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Source: SCE, 2023c; USGS, 2023a

Figure B-7. July Monthly Flow Duration Curve for the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023.

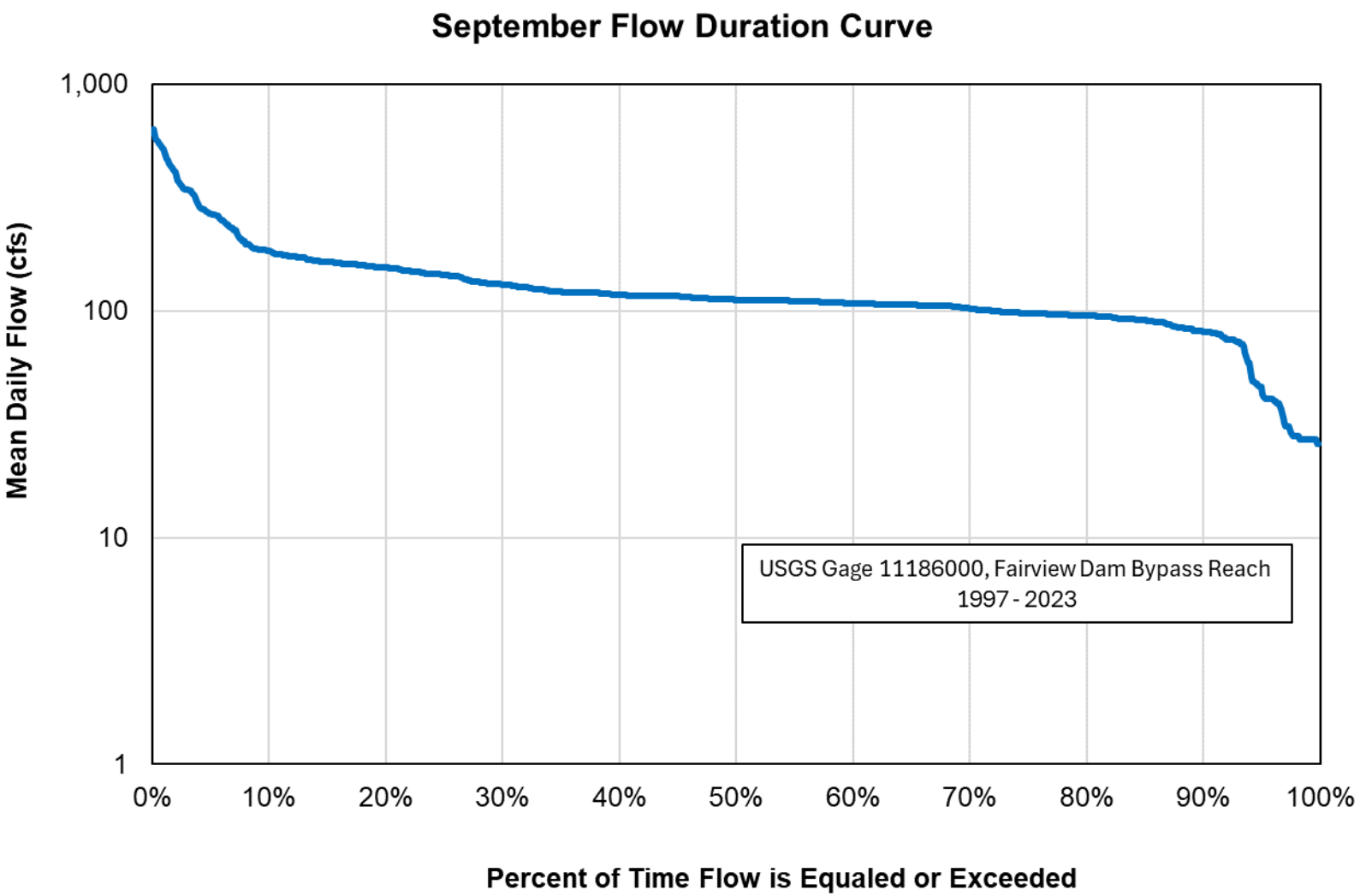
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Source: SCE, 2023c; USGS, 2023a

Figure B-8. August Monthly Flow Duration Curve for the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023.

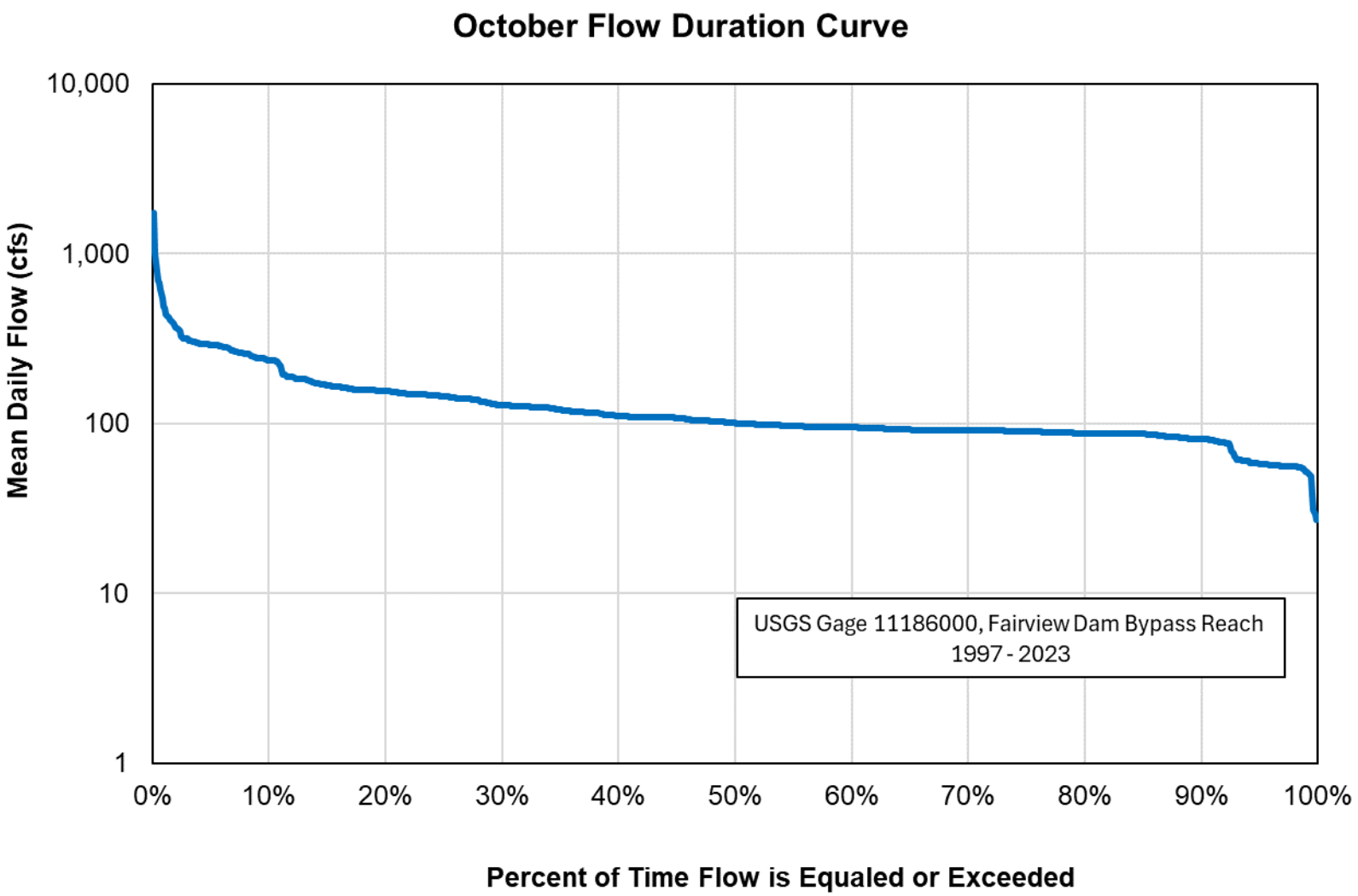
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Source: SCE, 2023c; USGS, 2023a

Figure B-9. September Monthly Flow Duration Curve for the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023.

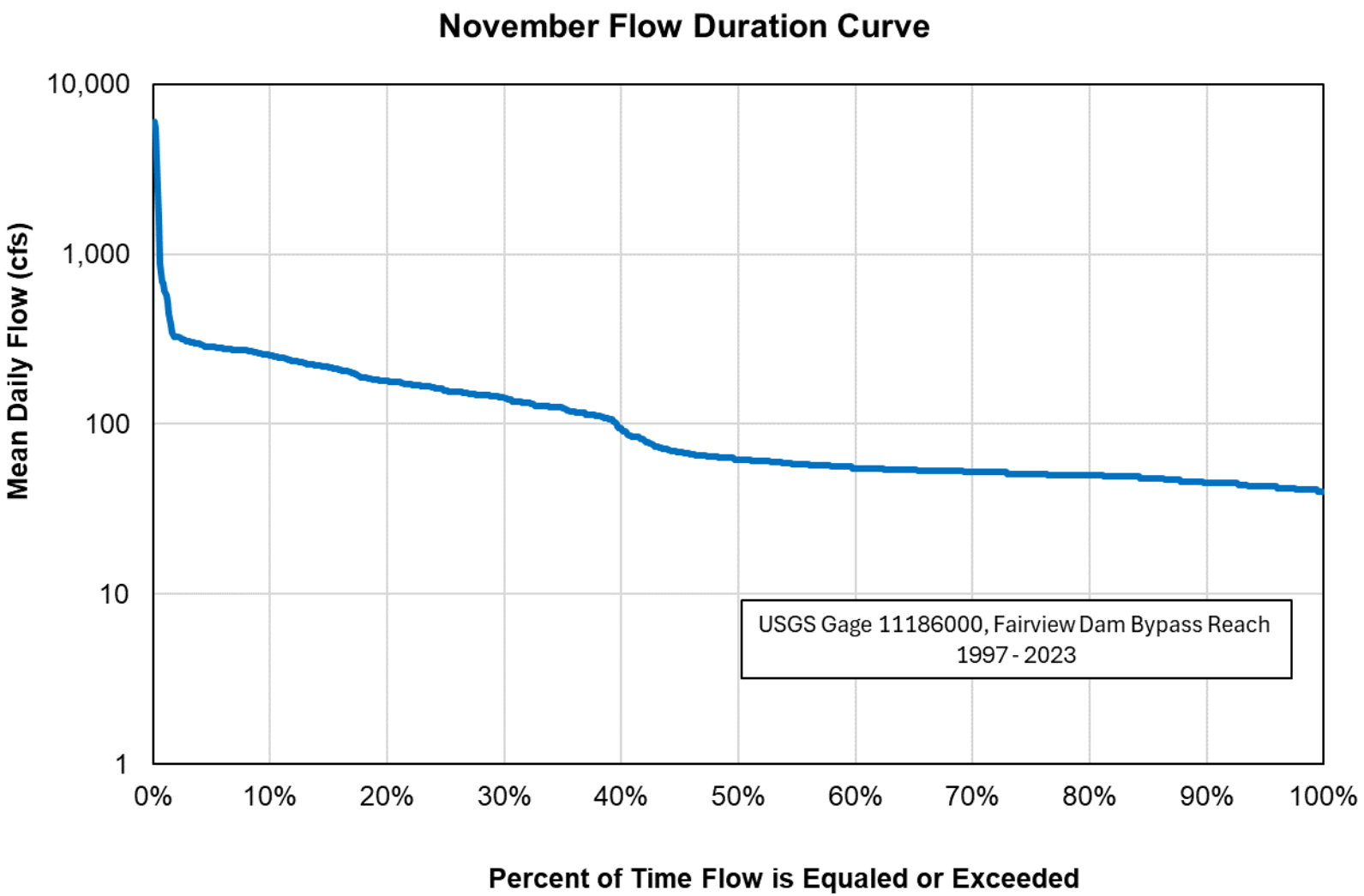
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Source: SCE, 2023c; USGS, 2023a

Figure B-10. October Monthly Flow Duration Curve for the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023.

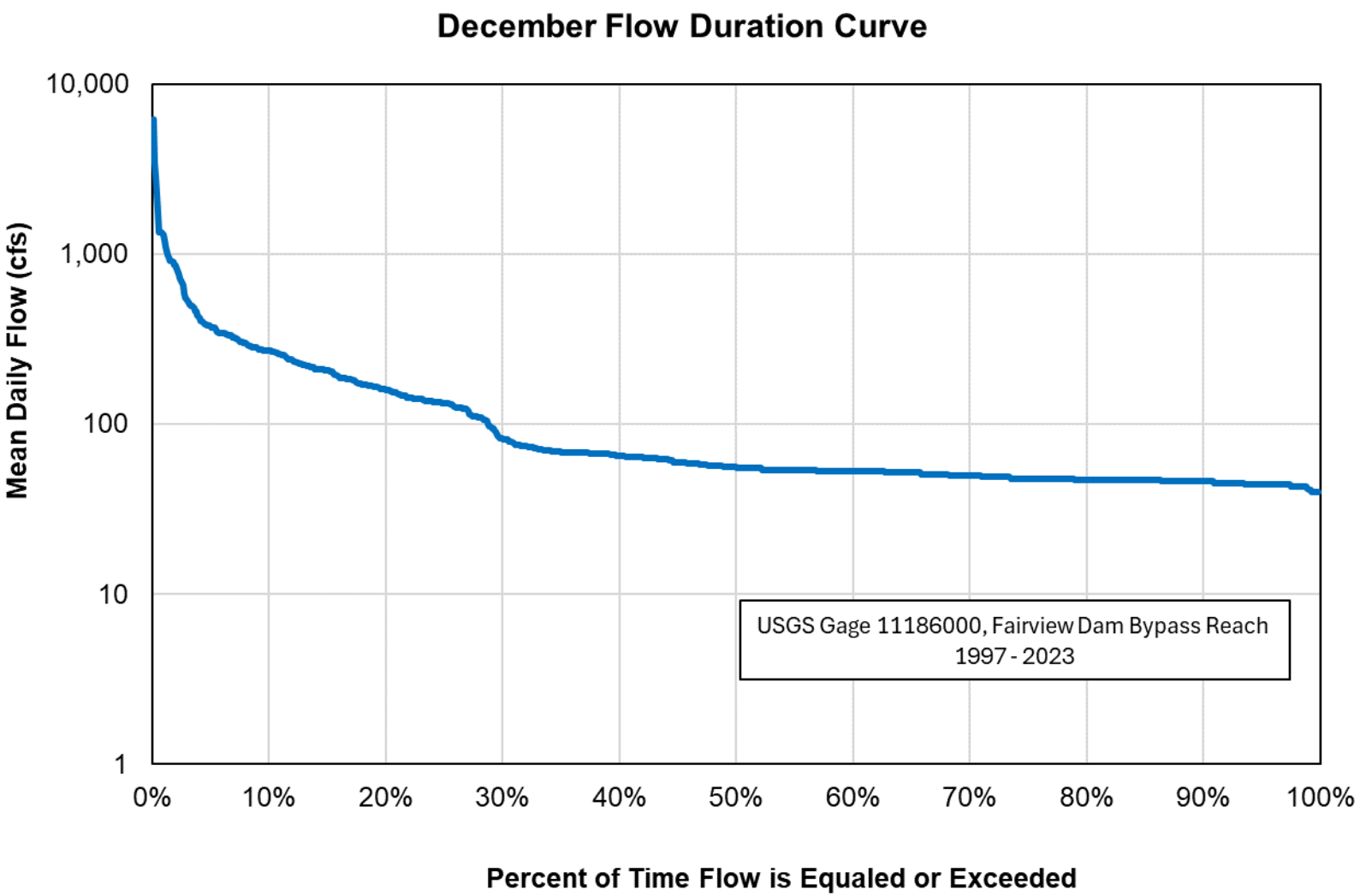
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Source: SCE, 2023c; USGS, 2023a

Figure B-11. November Monthly Flow Duration Curve for the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023.

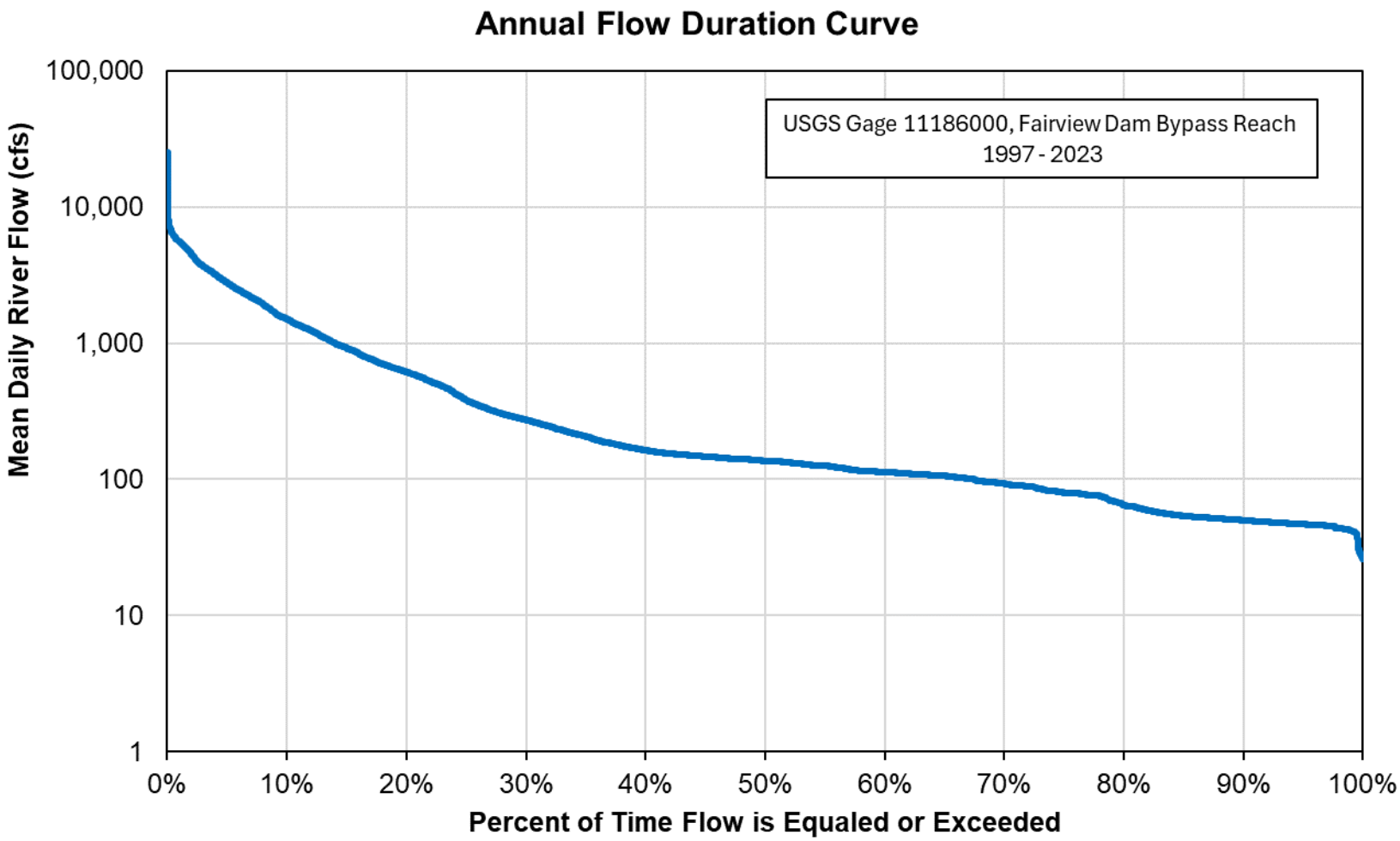
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Source: SCE, 2023c; USGS, 2023a

Figure B-12. December Monthly Flow Duration Curve for the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023.

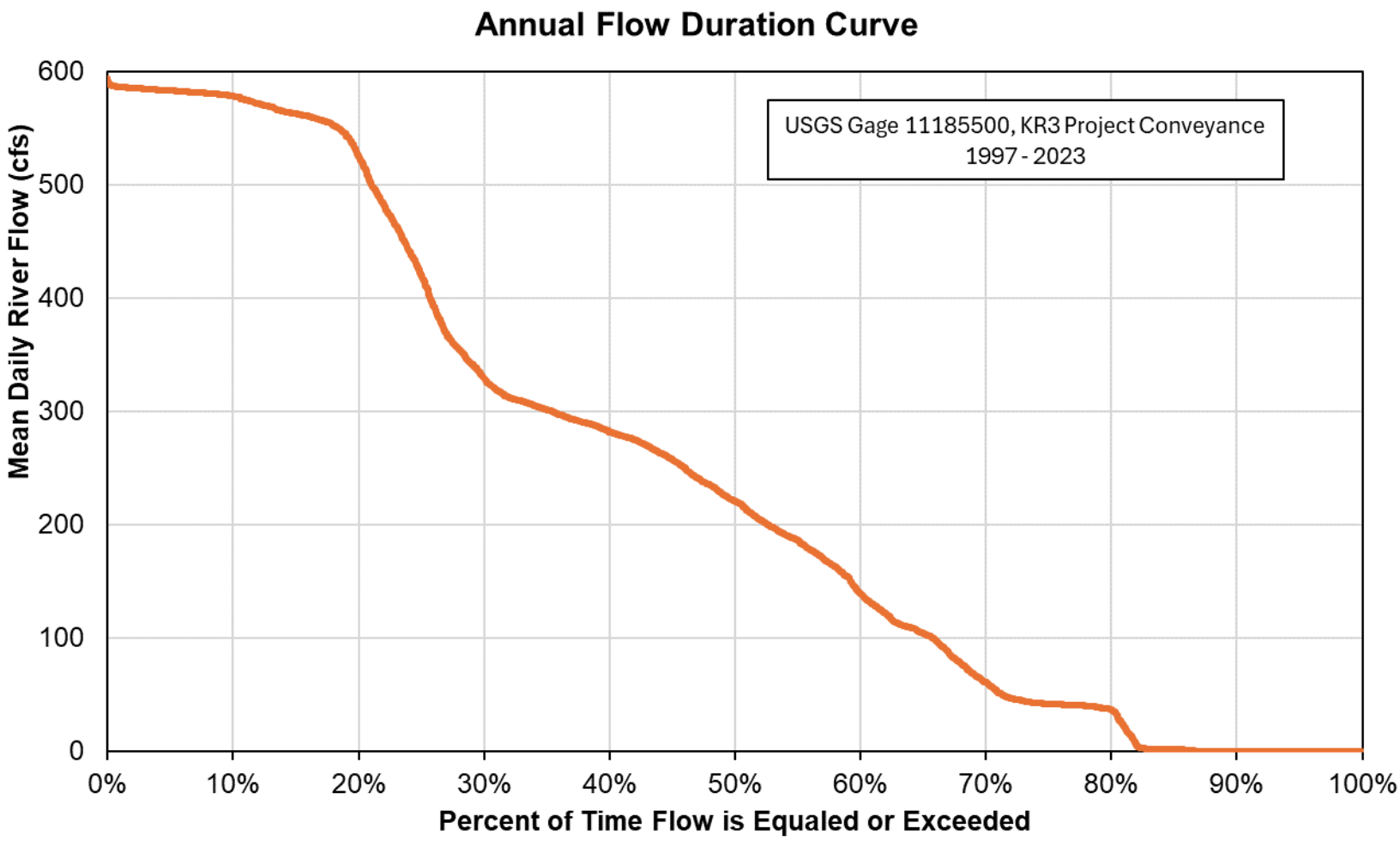
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Source: SCE, 2023c; USGS, 2023a

Figure B-13. Annual Flow Duration Curve for the North Fork Kern River Fairview Dam Bypass Reach, Water Years 1997–2023.

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Source: SCE, 2023c; USGS, 2023b

Figure B-14. Annual Flow Duration Curve for the Kern River No. 3 Project Water Conveyance System, Water Years 1997–2023.

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BIO-1 FOOTHILL YELLOW-LEGGED FROG TECHNICAL MEMORANDUM

KERN RIVER NO. 3 HYDROELECTRIC PROJECT
FERC PROJECT NO. 2290

PREPARED FOR:



KERNVILLE, CALIFORNIA

October 2024

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TABLE OF CONTENTS

Page

1.0 Introduction 1
2.0 Study Goals and Objectives 1
3.0 Study Area and Study Sites 1
4.0 Methods 4
4.1. Variances from Study Plan 4
4.2. Phase I: Identification of Suitable Habitat and Selection of Survey Sites 4
4.3. Phase II: Conduct Field Surveys 5
4.3.1. Visual encounter surveys 5
4.3.2. Environmental DNA sampling 5
5.0 Data Summary 6
5.1. Phase I: Identification of Suitable Habitat and Selection of Survey Sites 6
5.2. Phase II: Conduct Field Surveys 6
6.0 Study Specific Consultation 9
7.0 Outstanding Study Plan Elements 10
8.0 References 10

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LIST OF TABLES

Table 5.2-1. Foothill Yellow-legged Frog Visual Encounter Survey and Habitat Characterization Results 7

LIST OF FIGURES

Figure 3-1. Kern River No. 3 Hydroelectric Project Map of Foothill Yellow-legged Frog Survey Sites, 2023–2024. 3

Figure 5.2-1. Incidental Herpetofauna Observed During Field Surveys: Southern Alligator Lizard (*Elgaria multicarinata*) (top) and Northwestern Pond Turtle *(Actinemys marmorata*) (bottom). 9

LIST OF ACRONYMS AND ABBREVIATIONS

eDNA	environmental DNA
FERC	Federal Energy Regulatory Commission
Forest Service	U.S. Forest Service
NFKR	North Fork Kern River
KR3	Kern River No. 3
Project	Kern River No. 3 Hydroelectric Project
qPCR	quantitative polymerase chain reaction
RM	river mile
SCE	Southern California Edison
USDA	U.S. Department of Agriculture

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1.0 INTRODUCTION

SCE filed an Interim Technical Memorandum as part of the Initial Study Report on October 9, 2023, which included a summary of data collection efforts conducted in 2023 and a summary of variances to the Federal Energy Regulatory Commission (FERC)-approved BIO-1 Foothill Yellow-legged Frog Study Plan (SCE, 2022). This updated Technical Memorandum provides the complete methods and findings of field surveys associated with the BIO-1 Study Plan, and any remaining study plan variances, in support of Southern California Edison's (SCE) Kern River No. 3 (KR3) Hydroelectric Project (Project) relicensing, FERC No. 2290.

The BIO-1 Study Plan was included in SCE's Revised Study Plan submitted on July 1, 2022 (SCE, 2022). In the October 12, 2022, Study Plan Determination, FERC approved the BIO-1 Study Plan with modifications. Specifically, FERC stipulated that SCE conduct one additional field survey, for a total of two field surveys. One survey was conducted in late spring/early summer to observe egg oviposition sites, and the other survey was conducted in late summer prior to larvae (tadpole) metamorphosis. FERC also stipulated that SCE consult with the U.S. Fish and Wildlife Service and U.S. Forest Service (Forest Service) in selecting appropriate survey sites.

Biologists conducted a reconnaissance and site-selection field visit on August 29 to 31, 2022. Field surveys were conducted on June 20 to 21, 2023; September 6 to 7, 2023; and June 18 to 20, 2024. Methods and results are discussed below.

Results of this study will be used to examine Project operations and maintenance activities and inform the assessment of Project effects within the license application.

2.0 STUDY GOALS AND OBJECTIVES

The objectives of the study, as outlined in the BIO-1 Study Plan (SCE, 2022), are to:

- Assess habitat suitability for all foothill yellow-legged frog (*Rana boylii*) life stages (i.e., egg masses, larvae, subadults, and adults) in the study area; and
- Ascertain whether any life stage of foothill yellow-legged frog is extant in the study area.

3.0 STUDY AREA AND STUDY SITES

The study area includes lands and waters within the FERC Project Boundary in addition to areas adjacent to, or in the proximity of, the FERC Project Boundary along the North Fork Kern River (NFKR) and Salmon, Corral, and Cannel Creeks.

Survey sites include the following areas and locations, extending up to 400 meters at each location.

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- NFKR between the KR3 Powerhouse and the Brush Creek Confluence:
  - Brush Creek Confluence at Brush Creek Campground (river mile [RM] 20.4)
  - Fairview Campground (RM 16.2)
  - Salmon Creek confluence (RM 13.2)
  - Headquarters Campground (RM 5.0)
  - Downstream of the KR3 Powerhouse (RM 2.9)
- Tributaries to the Kern River:
  - Salmon Creek (one site at NFKR confluence and one site upstream of the diversion)
  - Corral Creek (one site at NFKR confluence and one site upstream of the diversion)
  - Cannell Creek (one site at NFKR confluence and one site upstream of the siphon)

A map of specific survey sites is provided in Figure 3-1.

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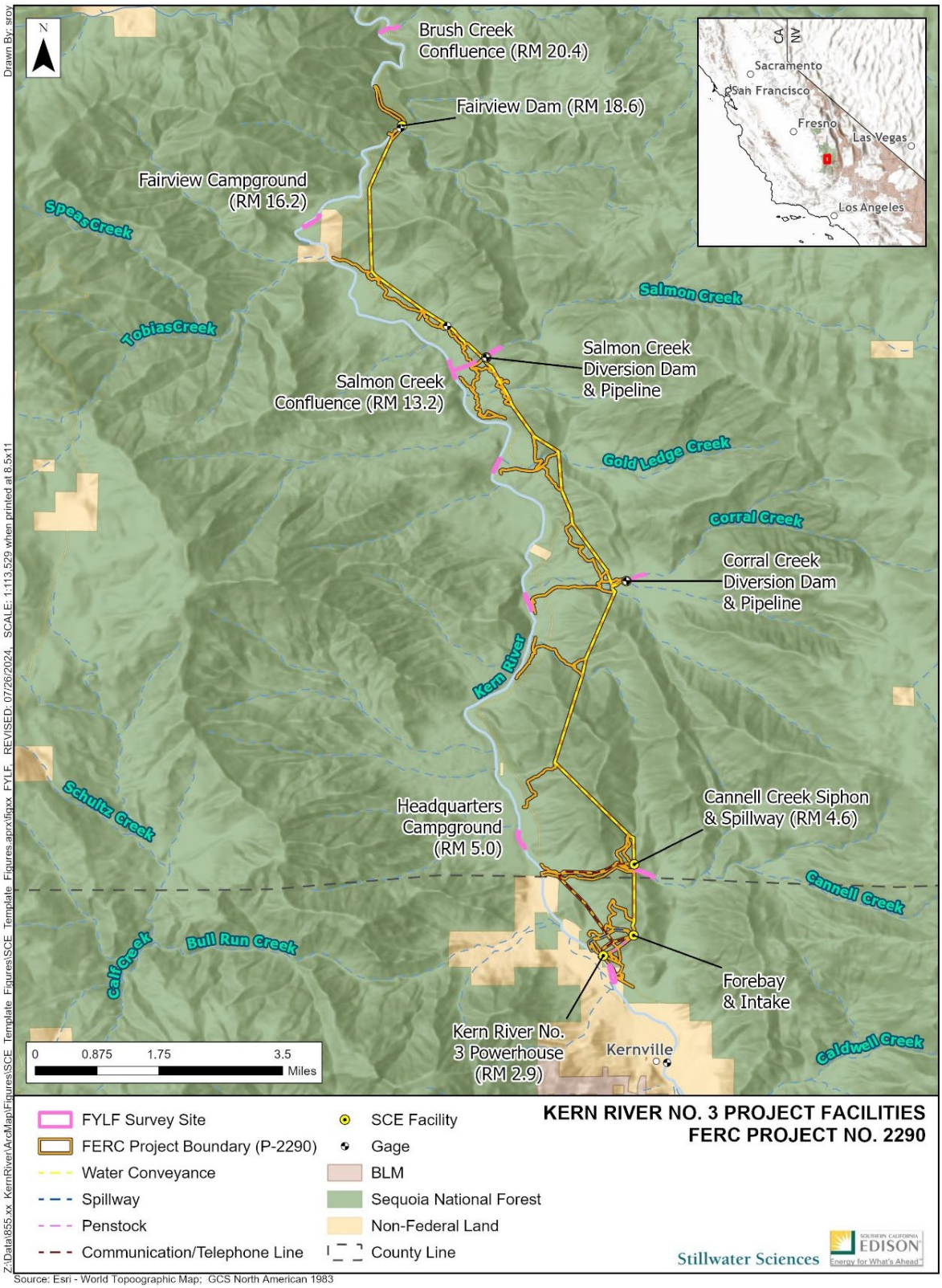


Figure 3-1. Kern River No. 3 Hydroelectric Project Map of Foothill Yellow-legged Frog Survey Sites, 2023–2024.

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4.0 METHODS

Study implementation followed the methods described in SCE's Revised Study Plan Package (SCE, 2022), as amended by FERC in its Study Plan Determination (FERC, 2022), with the exceptions noted below.

4.1. VARIANCES FROM STUDY PLAN

Surveys were delayed from May to late June because high stream flows prevented surveyors from safely accessing the NFKR and its tributaries. The delay also allowed surveyors to time the surveys with the expected breeding and egg mass oviposition periods, which are flow and temperature dependent. During the June 2023 field survey, no NFKR or Salmon Creek sites were surveyed because high flows created unsafe wading conditions. Similarly, during the September 2023 field survey, the reach downstream of the KR3 Powerhouse was not surveyed because high flows created unsafe wading conditions; the same site was only partially surveyed in June 2024, where safely accessible.

These variances are not expected to affect the results of the study. If present, foothill yellow-legged frog breeding would have also been delayed due to the high flows, delaying the timeline for egg mass oviposition and constraining the timeline available for metamorphosis. Biologists also consulted with the U.S. Fish and Wildlife Service and the Forest Service regarding survey timing prior to the surveys (see Section 6, *Study Specific Consultation*, below). An additional survey was conducted in June 2024 to capture sites that were missed in 2023 due to the high flows.

4.2. PHASE I: IDENTIFICATION OF SUITABLE HABITAT AND SELECTION OF SURVEY SITES

Survey sites were selected using results from a desktop analysis and information gathered during a reconnaissance field visit. Prior to the reconnaissance visit, biologists reviewed available data sources such as online databases including California Natural Diversity Database, iNaturalist, and Global Biodiversity Information; aerial satellite imagery; and drone video to aid in identifying areas of potential habitat for the foothill yellow-legged frog. On August 29 to 30, 2022, biologists conducted a reconnaissance field visit with a Forest Service representative to identify suitable foothill yellow-legged frog habitat and select study sites that would provide reasonable coverage of representative highly or moderately suitable habitat. Suitability was characterized based on the following categories.

- High: areas containing suitable habitat for all life stages, especially breeding. These stream segments would provide protection for egg mass deposition and larval maturation (e.g., wide channel areas with edgewater and backwater areas sheltered from flow, banks with shallow slopes).

- Moderate: areas containing suitable habitat for most life stages, although areas may lack potential habitat for one or more life stages (e.g., some habitat may be exposed to the main flow or may include moderately steep or incised banks).

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- Low: areas containing little or no suitable habitat for breeding or larval development and minimal refugia for post-metamorphic life stages (i.e., young-of-year, juveniles, and adults). Habitat may function as a dispersal corridor or overwintering habitat.

- Not suitable: areas containing no potentially suitable habitat for any life stage.

4.3. PHASE II: CONDUCT FIELD SURVEYS

4.3.1. VISUAL ENCOUNTER SURVEYS

Two biologists working in tandem conducted Visual Encounter Surveys. Surveyors waded into shallow-water habitats or walked along the shoreline of shallow-water habitats scanning ahead and searching stream banks, back-channel areas, and instream habitats for egg masses, larvae, and post-metamorphic frog life stages (juveniles and adults) on both sides of the river, where possible.

All other amphibian and aquatic reptile species observed during the surveys were recorded. Each species' detection was recorded by life stage along with associated habitat data. Surveyors also noted any incidental observations of non-native invasive aquatic species (e.g., bullfrog, crayfish, Asian clams, and invasive fishes) and other key species of interest (e.g., special-status freshwater mussels, bald eagle, osprey, and great blue heron).

4.3.2. ENVIRONMENTAL DNA SAMPLING

Environmental DNA (eDNA) samples were collected at all Visual Encounter Survey sites (Figure 3-1) in 2023. Surveyors collected four 500-milliliter water samples at 100-meter increments for a total of 2 liters of water collected and filtered at each site. The eDNA samples were collected from the water's surface in high-quality foothill yellow-legged frog habitats/micro-habitats (e.g., backwaters, rocky slow-moving streams). To prevent downstream contamination, surveyors wore disposable nitrile gloves, collected all samples from downstream to upstream, and, where possible, avoided entering the riverine system.

Surveyors used 0.45-micron Cellulose Nitrile filters paper and a polypropylene vacuum flask with a rubber stopper fixed peristaltic pump to filter all eDNA water samples. After filtration, the filter paper was stored in desiccate beads in a fridge or cooler prior to DNA extraction. All personnel wore disposable nitrile gloves during sample filtration and changed gloves prior to handling the filter membrane. To create a field blank (i.e., control sample), surveyors filtered 1 liter of distilled water at the end of each day following collection.

eDNA samples were extracted and analyzed by a recognized laboratory that conducts eDNA analysis. Laboratory personnel followed best practices for eDNA extraction and created and analyzed an extraction and quantitative polymerase chain reaction (qPCR) negative[1] with every extraction batch and qPCR plate. All eDNA samples were analyzed

[1] A negative control is used to detect any potential DNA contamination introduced during analysis.

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with an internal positive control to ensure samples are not inhibited and that a negative result signifies DNA was not detected (not a failed qPCR reaction). Laboratory personnel analyzed the samples for foothill yellow-legged frogs using previously published assays that have been peer reviewed as well as tested *in situ* and *in vivo* (Bedwell and Goldberg 2020).

5.0 DATA SUMMARY

5.1. PHASE I: IDENTIFICATION OF SUITABLE HABITAT AND SELECTION OF SURVEY SITES

Because the reconnaissance visit was conducted during extreme drought conditions, study sites were reassessed for habitat suitability during the first field survey. Table 5.2-1 includes habitat rankings and descriptions for study sites surveyed during the 2023 and 2024 field efforts.

5.2. PHASE II: CONDUCT FIELD SURVEYS

Surveyors did not observe foothill yellow-legged frogs during the June 2023, September 2023, or June 2024 field surveys. Table 5.2-1 includes habitat rankings and descriptions for study sites surveyed during the 2023 and 2024 field efforts.

During the September 2023 surveys, biologists collected eDNA samples at all monitoring sites. No foothill yellow-legged frog DNA was detected in any of the eDNA samples. During laboratory analysis, none of the samples showed signs of inhibition and all the negative control samples (including extraction negative and qPCR negative) tested negative. Surveyors observed non-native crayfish.

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Table 5.2-1. Foothill Yellow-legged Frog Visual Encounter Survey and Habitat Characterization Results

Site	Foothill Yellow-legged Frog Observed	Overall Habitat Quality	High-quality Breeding Habitat Present	Moderate-quality Breeding Habitat Present	Average Riparian Canopy Cover	Reach Description and Habitat Notes	Fish Observed	Other Species Observed
Brush Creek Confluence at Brush Creek Campground (RM 20.4)	No	Moderate	0%	1–20%	51–75%	Very shady reach with a few areas of moderate-quality breeding habitat and unembedded boulders present in shallow slow-moving water. Some of the main channel pools had good basking habitat. Overhanging bank present throughout.	No	None
Fairview Campground (RM 16.2)	No	Moderate	0%	21–40%	1–25%	Reach was mostly long glides/pool habitat with some riffles. Limited breeding habitat available along the top of bars at pool tails and some side channels with unembedded boulders.	Yes	Sierran treefrog (*Pseudacris sierra*)
Salmon Creek confluence (RM 13.2)	No	Moderate	0%	1–20%	0–25%	Low- to moderate-quality habitat in the mainstem with some basking habitat for adults. Side-channel habitat present, consisting of low flow over unembedded boulders that offer some breeding habitat.	Yes	Sierra garter snake (*Thamnophis couchii*)
Headquarters Campground (RM 5.0)	No	Moderate	1–20%	21–40%	0–25%	Reach consisted of run-riffle complexes with high flows; good basking habitat throughout. Some high-quality breeding habitat in backwater pools and along the top of cobble bars.	Yes	Sierran treefrog
Downstream of the Kern River No. 3 Powerhouse (RM 2.9)	No	Low	0%	1–20%	0–25%	A deep, fast run reach with steep-sided bank that quickly reaches depths greater than 1 meter. Very limited shoreline basking habitat.	Yes	None
Corral Creek upstream of Diversion Dam	No	Low to Moderate	0%	0%	51–75%	Overgrown vegetation and high canopy cover. Mid-channel and side-channel habitat with limited or poor breeding locations. Some basking sites on bedrock and several undercut banks present Potentially good overwintering habitat depending on flow conditions.	No	• Sierran treefrog • Southern alligator lizard (*Elgaria multicarinata*) • Blainville's horned lizard (*Phrynosoma blainvilli*)
Corral Creek at NFKR Confluence	No	Moderate	0%	1–20%	51–75%	Few sunny areas with numerous basking rocks. Some areas of open canopy basking sites and undercut banks. Few moderate breeding pools present. Potentially good overwintering habitat depending on flow conditions.	Yes	None
Cannell Creek upstream of the siphon	No	High	21–40%	21–40%	1–25%	Numerous backwater pools and channels with areas of high-quality breeding habitat. Small unembedded boulders present for ovipositing. Basking habitat present, especially upstream of the siphon.	No	• Sierran treefrog • Northwestern pond turtle (*Actinemys marmorata*)
Cannell Creek at NFKR Confluence	No	High	41–60%	41–60%	1–25%	Areas of high-quality breeding habitat with slow-moving water and small-sized unembedded boulders. Open canopy with hanging vegetation/undercut banks that provides protection and good basking habitat. High-quality breeding habitat with some undercut banks and several mid-channel pools present.	Yes	Sierran treefrog
Salmon Creek upstream of Diversion Dam	No	Low	0%	0%	51–75%	Poor habitat. Very shaded with limited basking and breeding areas. Undercut banks present. Some deep pools and a few long waterfalls.	No	None
Salmon Creek at NFKR Confluence	No	Moderate	0%	1–20%	51–75%	Swift moving tributary with some basking habitat and overhanging and undercut banks. High canopy cover and little suitable breeding habitat present.	Yes	Sierra garter snake

NFKR = North Fork Kern River; RM = river mile

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Photo Credit: J. Woodall, Stillwater Sciences

Figure 5.2-1. Incidental Herpetofauna Observed During Field Surveys: Southern Alligator Lizard (*Elgaria multicarinata*) (top) and Northwestern Pond Turtle *(Actinemys marmorata*) (bottom).

6.0 STUDY SPECIFIC CONSULTATION

Biologists consulted with the U.S. Fish and Wildlife Service and the Forest Service regarding survey timing, study design, and study site selection.

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7.0 OUTSTANDING STUDY PLAN ELEMENTS

There are no outstanding study plan elements.

8.0 REFERENCES

Bedwell, M. E., and Goldberg, C. S. 2020. *Spatial and temporal patterns of environmental DNA detection to inform sampling protocols in lentic and lotic systems*. Ecology and evolution, 10(3), 1602–1612.

FERC (Federal Energy Regulatory Commission). 2022. *Study Plan Determination for the Kern River No. 3 Hydroelectric Project*. 20221012-3024. October 12.

SCE (Southern California Edison). 2022. *Kern River No. 3 Hydroelectric Project, Revised Study Plan*. Filed with FERC July 1. Accession No. 20220705-5032.

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BIO-2 SPECIAL-STATUS SALAMANDERS TECHNICAL MEMORANDUM

KERN RIVER NO. 3 HYDROELECTRIC PROJECT
FERC PROJECT NO. 2290

PREPARED FOR:

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead®

KERNVILLE, CALIFORNIA

October 2023

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TABLE OF CONTENTS

Page

1.0 Introduction 1

2.0 Study Goals and Objectives 1

3.0 Study Area and Study Sites 1

4.0 Methods 3

4.1. Phase 1: Habitat Assessment 4

4.2. Phase 2: Cover Object Searches 11

5.0 Data Summary 12

6.0 Study Specific Consultation 16

7.0 Outstanding Study Plan Elements 16

8.0 References 16

LIST OF TABLES

Table 5-1. Weather Data Summary 12

Table 5-2. Results Summary 13

LIST OF FIGURES

Figure 3-1. Special-Status Salamander Study Area 2

Figure 4.1-1a. Potentially Suitable Salamander Habitat. 5

Figure 4.1-1b. Potentially Suitable Salamander Habitat. 7

Figure 4.1-1c. Potentially Suitable Salamander Habitat. 9

Figure 5.1-1a. Survey Results. 14

Figure 5.1-1b. Survey Results. 15

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LIST OF APPENDICES

Appendix A	Results of a Habitat Assessment Conducted for the Kern River No. 3 Hydroelectric (FERC Project No. 2290), Kern and Tulare Counties, California
Appendix B	Representative Site Photos
Appendix C	Wildlife Compendium

LIST OF ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
COS	Cover Object Search
FERC	Federal Energy Regulatory Commission
KR3	Kern River No. 3
NFKR	North Fork Kern River
Project	Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)
RSP	Revised Study Plan
SCE	Southern California Edison
SPD	Study Plan Determination

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1.0 INTRODUCTION

This Technical Memorandum provides the methods and findings of field surveys associated with the *BIO-2 Special-Status Salamanders Study Plan* in support of Southern California Edison's (SCE) Kern River No. 3 (KR3) Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 2290. The BIO-2 Study Plan was included in SCE's Revised Study Plan (RSP) submitted on July 1, 2022 (SCE, 2022). In the October 12, 2022, Study Plan Determination (SPD; FERC, 2022), FERC approved the BIO-2 Study Plan with the modification of adding the Fairview Dam Bypass Reach.[1]

Habitat assessment surveys were conducted October 25 to 28 and November 14 to 16, 2022. Focused salamander surveys were conducted February 6 to 9 and April 17 to 18, 2023. All field sampling efforts and data analysis are complete and are summarized below.

2.0 STUDY GOALS AND OBJECTIVES

The objectives of the study, as outlined in the BIO-2 Study Plan (SCE, 2022) include the following:

- Obtain additional information on the Fairview salamander (*Batrachoseps bramei*), a U.S. Forest Sensitive Species, and other potentially occurring salamanders in the study area, including the Kern Canyon salamander (*Batrachoseps simatus*), a federally proposed threatened and state-listed threatened species; Kern Plateau salamander (*Batrachoseps robustus*); and Greenhorn Mountains salamander (*Batrachoseps altasierrae*)[2];
- Identify and map potentially suitable salamander habitat; and
- Document presence, if found.

3.0 STUDY AREA AND STUDY SITES

The study area includes lands and waters within the FERC Project Boundary in addition to areas adjacent to, or in the proximity of, the FERC Project Boundary along the North Fork Kern River (NFKR) and Salmon, Corral, and Cannell creeks for the purposes of characterization and data collection relevant to understanding Project operations and maintenance activities. Specific study sites are further described below and shown on Figure 3-1.

[1] The Fairview Dam Bypass Reach is defined as the approximately 16-mile bypass reach of the North Fork Kern River (NFKR) between Fairview Dam and the KR3 Powerhouse tailrace.

[2] Kern Plateau salamander and Greenhorn Mountains salamander have no formal agency listing at the time of writing (CDFW, 2023).

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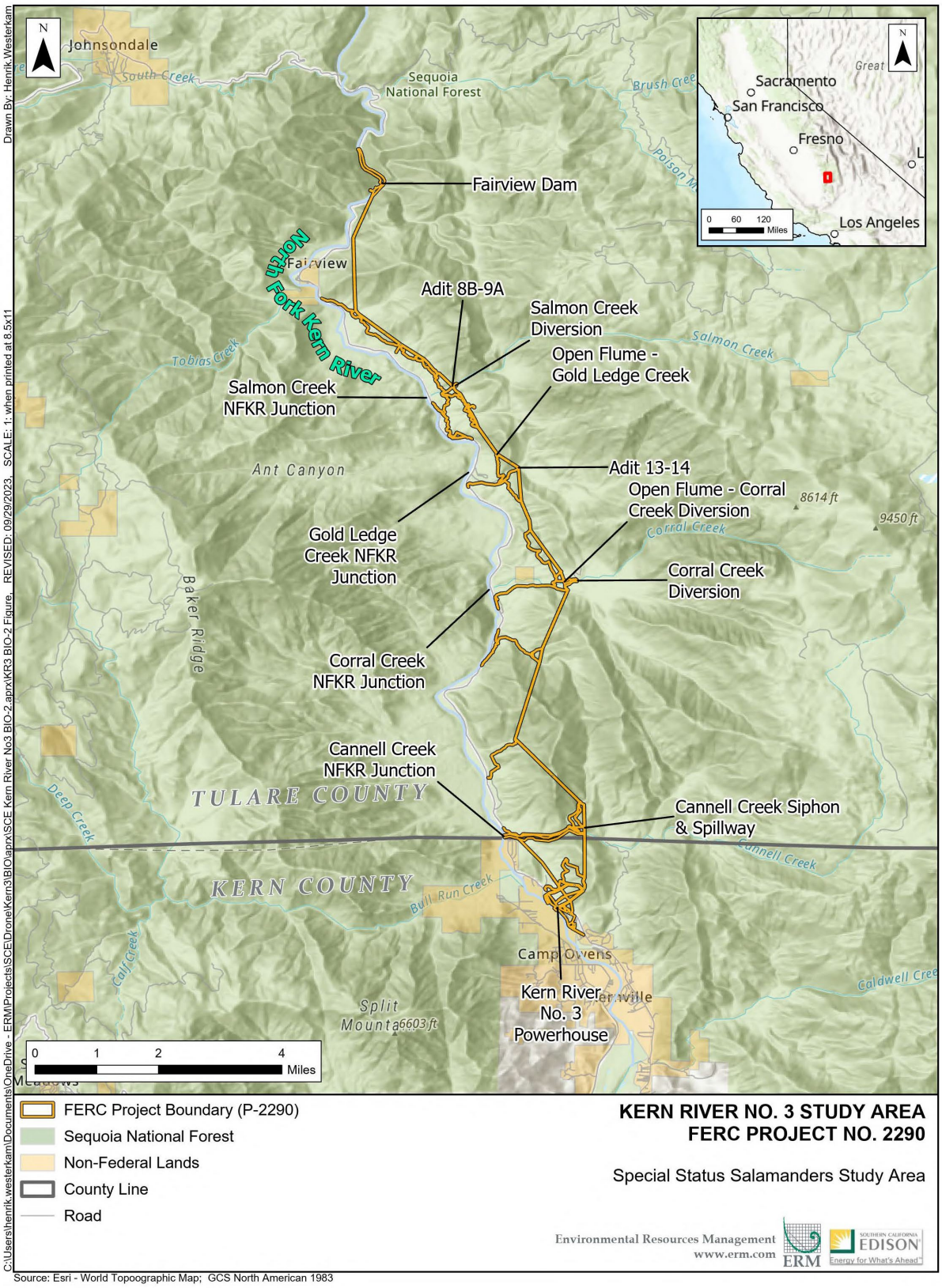


Figure 3-1. Special-Status Salamander Study Area

Perennial streams, ephemeral creeks, dry ravines, and other areas matching the habitat description in Jockusch et al. (2012) for the Fairview salamander and Greenhorn Mountains salamander and in Morey and Basey (1988) for the Kern Canyon salamander are located within the FERC Project Boundary, including a 50-foot buffer. Survey locations included the following:

- Fairview Dam;
- Fairview Dam Bypass Reach (as defined in the Section 1.0, Introduction) along safe and accessible river segments of the east side bank (west bank was not accessible);
- Salmon Creek Diversion, open flume segment, Adit 8B-9A, and adjacent access roads;
- Gold Ledge Creek open flume segment, Adit 13-14, and adjacent access road;
- Corral Creek Diversion, open flume segment, and access road;
- Cannell Creek, Cannel Creek Siphon, and access road; and
- NFKR junction with Salmon Creek, Gold Ledge Creek, Corral Creek, and Cannell Creek.

The type locality[3] for Fairview salamander is in Packsaddle Canyon, a steep canyon directly east of Fairview Dam, which was visited prior to focused surveys to provide the model for Fairview salamander habitat.

4.0 METHODS

Study implementation generally followed the methods described in SCE's RSP (SCE, 2022), and as amended by FERC in their SPD (FERC, 2022), with the exceptions noted below.

Study Plan Variances

- The study area experienced heavy rainfall in March 2023, which led to flooding and generally unsafe conditions to public and Project roads in the study area. Therefore, biologists delayed the second salamander survey until April when roads were open and road conditions were safe.
- Cover Object Searches (COSs) were conducted instead of Visual Encounter Surveys. This survey approach involves searching under objects such as rocks where humidity levels are higher. The weather conditions made the implementation of the planned Visual Encounter Surveys unsafe. The survey requires searches during or just after

[3] The location where a species is first identified.

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rain fall events. However, the heavy rain made road conditions in the survey area unsafe.

- A modified time-constrained search was used instead of an area-constrained search. Due to the topography of the survey area (steep canyons), transects were not feasible. Time-constrained searches, which limited searches of patches of microhabitat to approximately 10 minutes and ceasing searches once a salamander was detected, would limit habitat disturbances, an expressed concern of the U.S. Forest Service.

4.1. PHASE 1: HABITAT ASSESSMENT

Using online database queries (i.e., the California Natural Diversity Database, iDigBio, i-Naturalist, and Amphibiaweb) and literature reviews (e.g., Jockusch et al., 2012; CDFW, 2023a and 2023b), known locations of special-status salamanders were mapped in relation to the Project study area.

Mapping of museum records obtained from iDigBio and Amphibiaweb was performed prior to field work. IDigBio has records for Fairview salamander, Kern Canyon salamander, and Greenhorn Mountains salamander. Mapped records of readily accessible locations were used to assist in determining characteristics of suitable habitat.

Prior to the start of the habitat assessment survey, field maps showing the survey area were created from aerial photographs at a 1-inch to 200-foot scale for field use. Field maps were loaded onto an iPad Mini 6 for reference.

Biologists drove the survey area looking for potentially suitable habitat for special-status salamanders based on habitat characteristics. Potentially suitable habitat locations were mapped directly onto hard copy 11x17-inch aerial field maps. The results of the habitat assessment survey conducted October 25 to 28 and November 14 to 16, 2022, were used to target specific areas within the Project Area that were the subject of COSs conducted in February and April 2023. Habitat descriptions can be found in the Habitat Assessment Memo for the Project (Appendix A). Potentially suitable habitat depicted on Figure 4.1-1 was the focus of the Phase 2 surveys.

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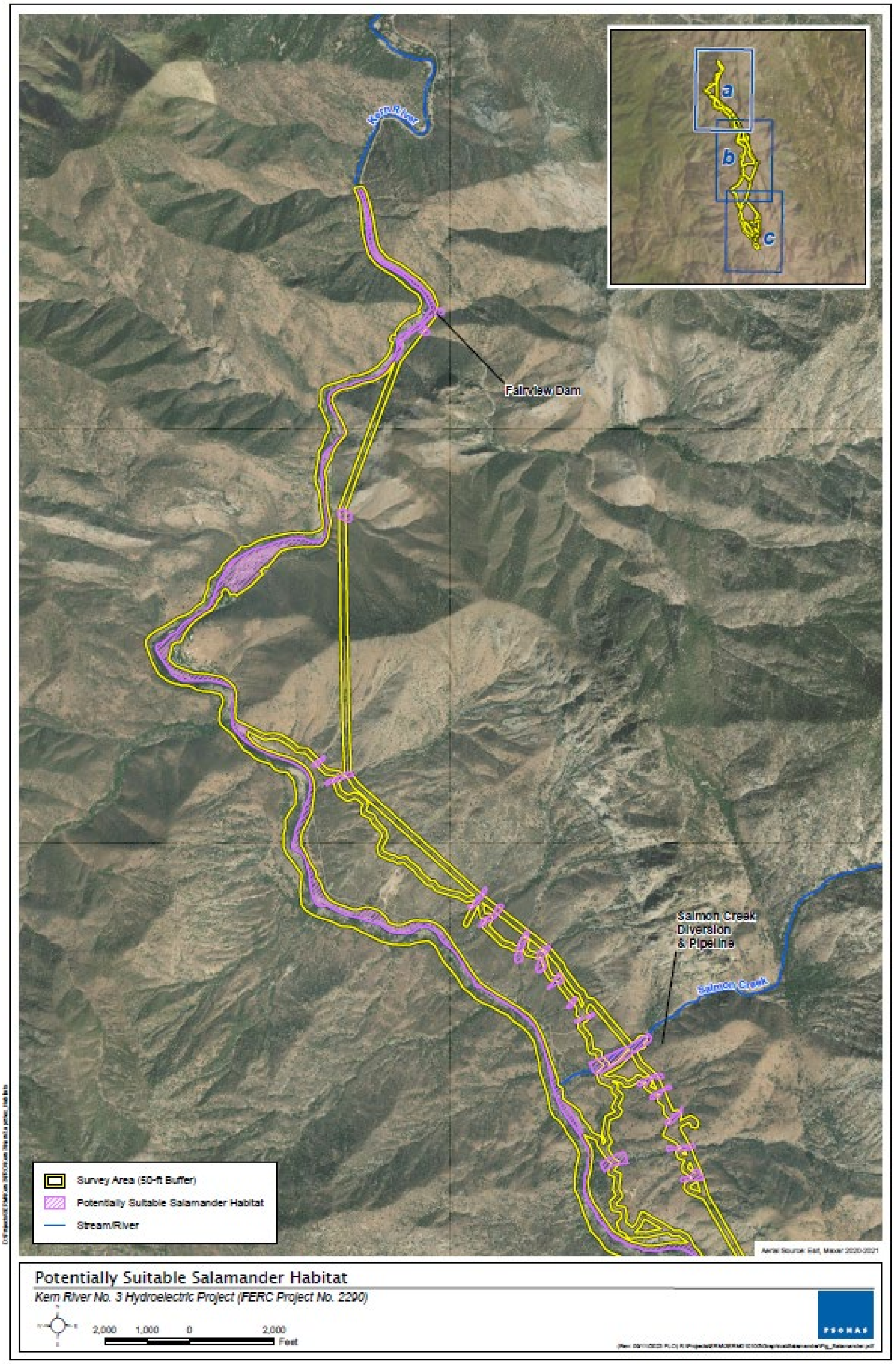


Figure 4.1-1a. Potentially Suitable Salamander Habitat.

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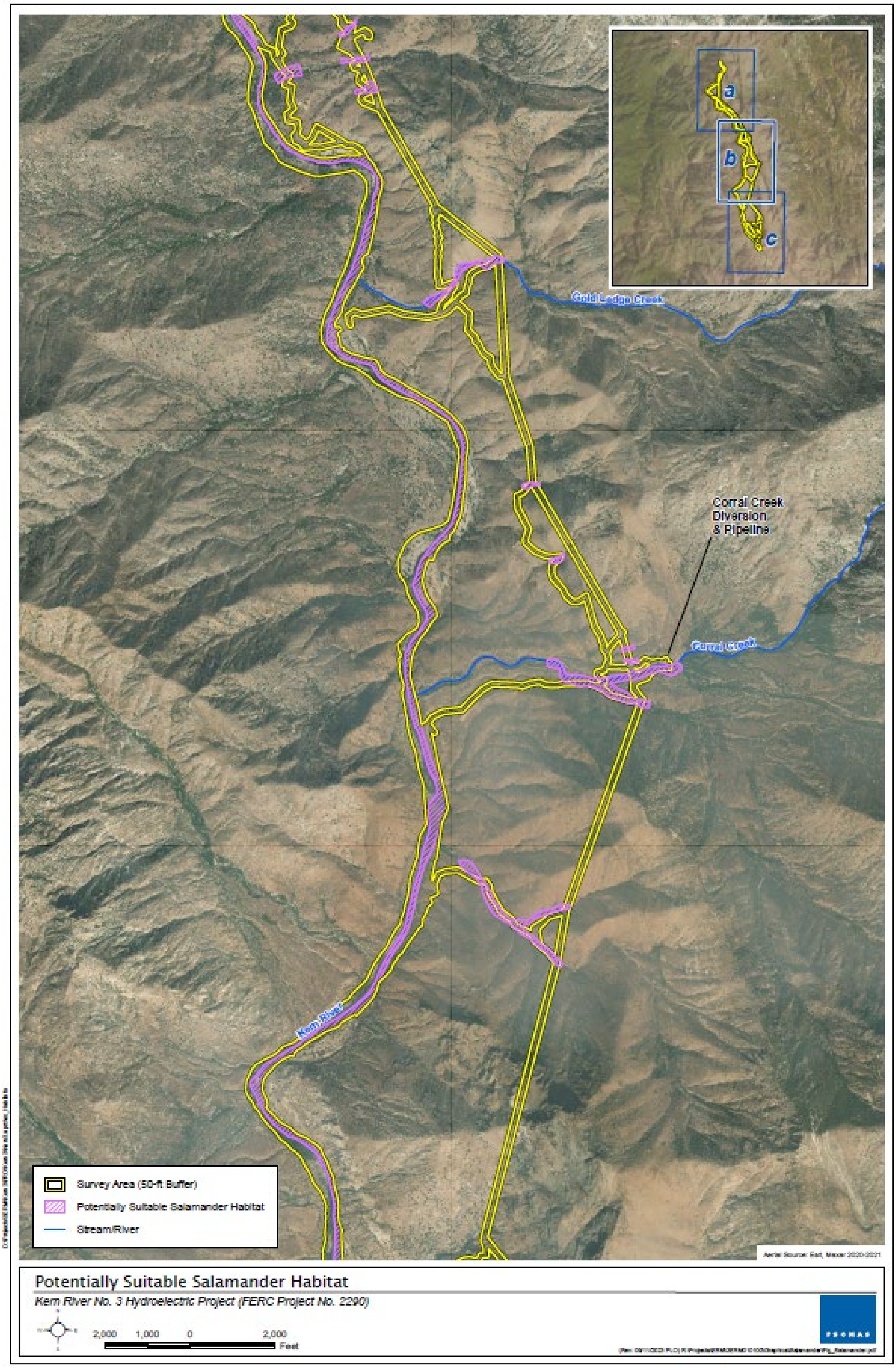


Figure 4.1-1b. Potentially Suitable Salamander Habitat.

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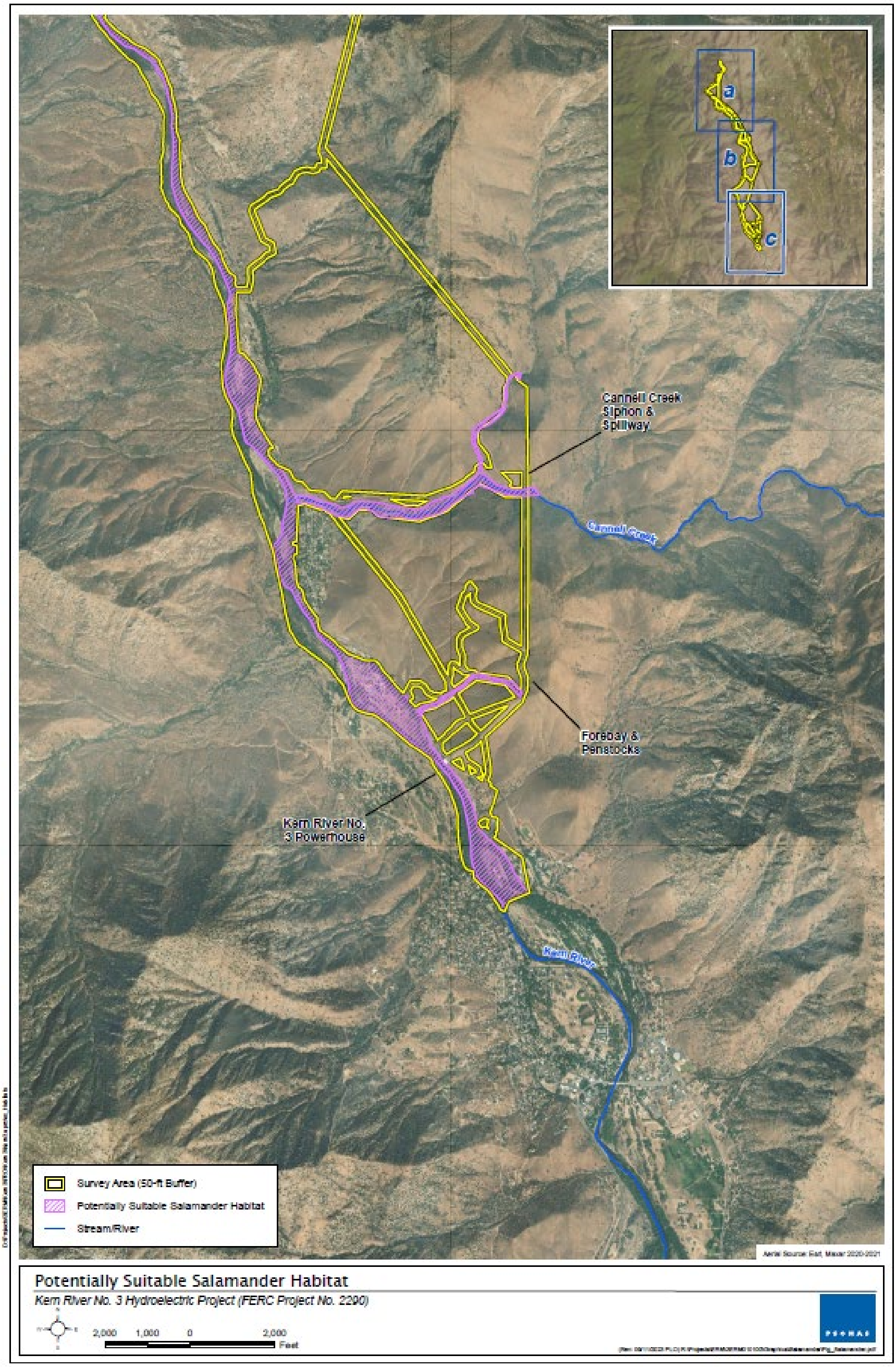


Figure 4.1-1c. Potentially Suitable Salamander Habitat.

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Three 23 3/4-inch x 47 3/4-inch x 5.2-millimeter cover boards for salamanders and other reptiles were laid out: one adjacent to Salmon Creek, one adjacent to Corral Creek, and one adjacent to the NFKR near the access road to Corral Creek. The cover boards were checked periodically and inspected during Phase 2 COSs. Although the target special-status salamanders are known to inhabit drier situations under rocks and cover in moist microhabitats, the boards will be left out over the winter and during rain events. Unfortunately, the Kern River board was washed away and the board at Corral Creek was stolen. These salamanders, as with all salamanders, are known to move about during rain events when the surrounding terrain is wet, and so the available suitable habitat is expanded. Therefore, the cover boards may provide suitable moist habitats for salamanders and increase the opportunity to document presence of the target salamanders and other species of wildlife.

4.2. PHASE 2: COVER OBJECT SEARCHES

Survey sites for COSs were selected using the available information on potential habitat identified during Phase 1. No survey protocol exists for the Fairview salamander, or any of the other salamander species occurring in the Project region. Survey methods were tailored to the survey area topography and species microhabitat (e.g., talus on/at the base of steep north facing canyon walls) with a prioritization of mitigating disruptions to habitat using a light-handed approach, per request of the U.S. Forest Service.

COSs were timed to maximize the potential for observing these species based on life history and literature review. Slender salamanders are generally easier to observe on rainy nights with moderately cool temperatures, a day or two following rain events while the habitat is still damp. Two separate surveys were conducted in February and April 2023. Surveys were conducted within 3 days of rain events, did not commence until temperatures were at least 41 degrees Fahrenheit (°F), and freezing temperatures (32 °F) had not occurred at the survey location during the preceding 72 hours. Surveys did not occur if it was snowing or if snow had recently (< 72 hours) covered the ground.

Surveys generally followed the time-constrained search methods described in Olson et al. (1999) and included lifting, overturning, and carefully replacing objects such as rocks, boards, and debris, and carefully searching leaf litter and under loose tree bark. Biologists spent approximately 10-person minutes searching a designated microhabitat patch (varying sizes) to limit disturbances and prevent over-searching an area. While searching, biologists attempted to return all rocks and other large cover objects to their original positions. Moss mats were carefully lifted at the edges but not removed or permanently impacted. When an individual salamander was found, biologists replaced cover objects in their original position, then placed the animal next to the object, allowing the animal to return underneath the object. Searching was stopped and "presence" for that location was designated.

Slender salamanders were identified to species in the field to the extent possible based on Jockusch et al. (2012), Stebbins (2012), and other references; however, individual salamanders were not collected for later identification. Observations of special-status salamanders were recorded on a Garmin GPSMAP 64sx Global Positioning System, and

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notes on the general habitat and microhabitat were taken. A centimeter ruler was placed next to the salamander if the salamander would not be harmed.

Biologists noted any incidental observations of non-native invasive aquatic species (e.g., bullfrog, crayfish, Asian clams, and invasive fishes) and other key species of interest (e.g., special-status freshwater mussels, aquatic reptiles, amphibians, Bald Eagle [*Haliaeetus leucocephalus*], Osprey [*Pandion haliaetus*], and Great Blue Heron [*Ardea herodias*]). Of the species listed here, Osprey was observed during surveys as a fly-over at Kern River near the confluence of Cannell Creek. None of the other species were observed during salamander surveys.

Slender salamanders and their habitat were photographed and are included as Appendix B; a list of wildlife species observed during surveys can be found in Appendix C.

5.0 DATA SUMMARY

Three Fairview salamanders were observed in the survey area—two in Packsaddle Canyon and one in a small un-named canyon adjacent to Adit 16/17 (Figures 5-1a and 5-1b). A summary of weather conditions can be found in Table 5-1, and a description of salamander observations habitat/microhabitat can be found in Table 5-2. Each observation occurred within 5 to 10 minutes of searching the survey polygon.

Table 5-1. Weather Data Summary

Survey #	Date	Time (Start/End)	Temperature (°F) (Start/End)	Cloud Cover (%) (Start/End)	Wind (mph) (Start/End)	Relative Humidity of Project Area (%) (Start/End)
1	2/7/2023	1:30 PM–5:00 PM	51/57	40/40	1–3/0–1	55/46
1	2/8/2023	1:00 PM–4:30 PM	63/60	50/60	1–3/1–3	67/55
1	2/9/2023	9:30 AM–12:00 PM	54/65	0/0	1–2/0	77/67
2	4/17/2023	9:00 AM–3:00 PM	65/66	0/0	0–1/3–5	65/40
2	4/18/2023	9:00 AM–2:30 PM	50/58	10/0	3–8/5–8	60/34

°F=degrees Fahrenheit; %=percent; mph=miles per hour

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Table 5-2. Results Summary

Species	Obs. #	Location (Date)	General Habitat Description	Microhabitat
Fairview salamander (*Batrachoseps bramei*)	1	Packsaddle Canyon (February 7, 2023)	Lower Montane Mixed Chaparral. Dominant species include *Ceanothus* spp., *Quercus wislizeni*, *Pinus sabiniana*, *Cercocarpus betuloides*, and *Fremontodendron californicum*	Base of steep north facing canyon wall. Large flat rock (cover) on rock substrate; substrate wet to touch, decomposing leaf litter surrounding cover rock. Running water (heavy flow) nearby.
Fairview salamander (*Batrachoseps bramei*)	2 [a]	Packsaddle Canyon (April 17, 2023)	Same as Observation #1	On steep north facing canyon wall. Large rock (cover) on thin layer of soil substrate on small rock outcrop/seep. Substrate wet to touch. Running water (heavy flow) nearby.
Fairview salamander (*Batrachoseps bramei*)	3	Adit 16/17 (April 17, 2023)	Wedgeleaf Ceonothus Scrub. Dominant species include *Ceanothus cuneatus*, *Ericameria cuneata*, *Pinus sabiniana*, and *Q. wislizeni*	Base of north facing rock outcrop. Small rock (cover) on soil substrate; substrate moist to touch, grasses surrounding cover rock. Running water (very light flow) nearby.

Notes:
[a] This observation was not measured to avoid prolonged exposure to the elements.

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Figure 5.1-1a. Survey Results.

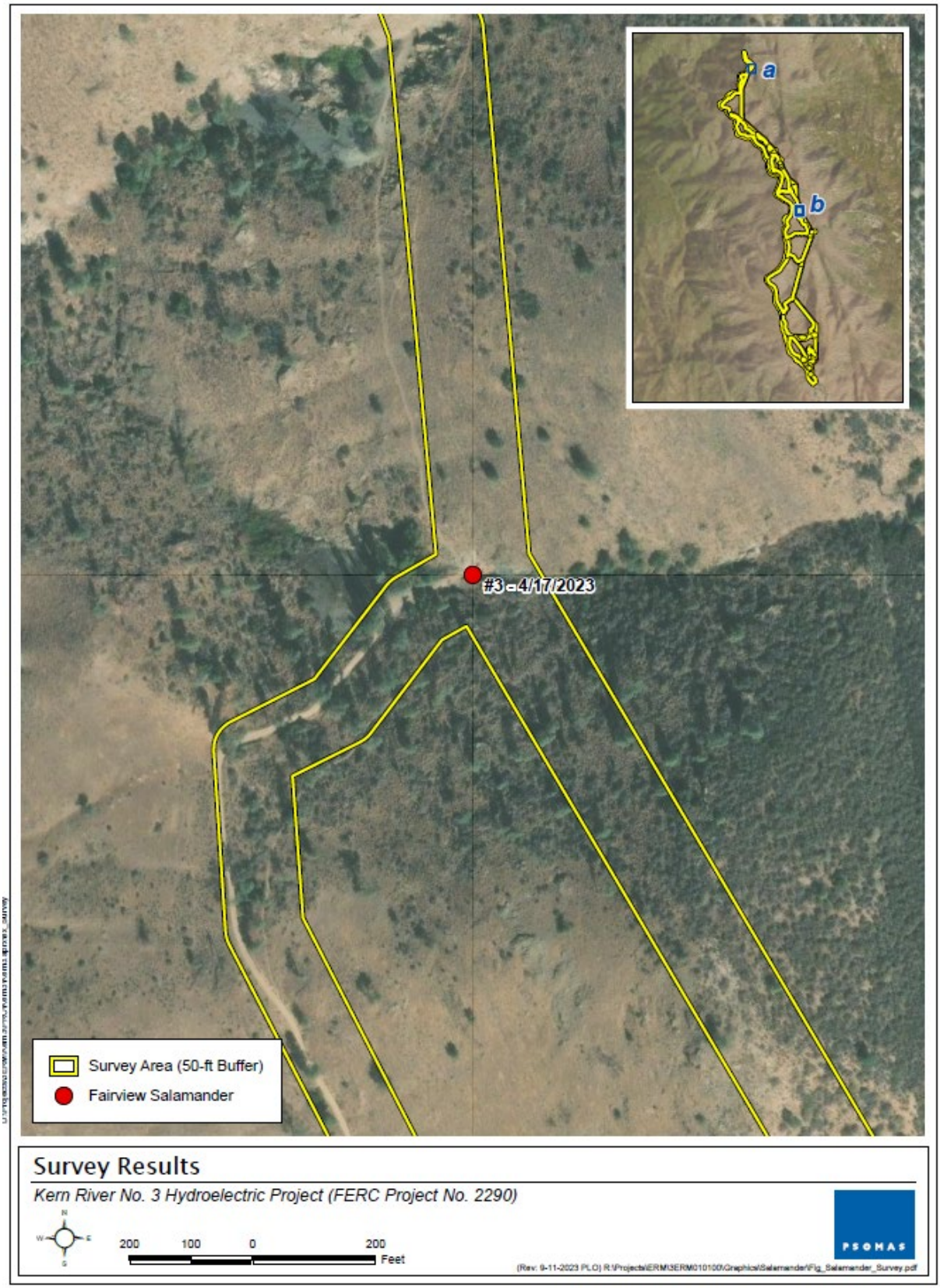


Figure 5.1-1b. Survey Results.

Two special-status species, the Fairview salamander and the Golden Eagle (*Aquila chrysaetos*), were observed during the surveys. California Natural Diversity Database forms will be submitted to the California Department of Fish and Wildlife for these observations.

6.0 STUDY SPECIFIC CONSULTATION

No study-specific consultation is required, and no consultation has been conducted to date.

7.0 OUTSTANDING STUDY PLAN ELEMENTS

All Study Plan elements have been completed as outlined in SCE's RSP (SCE, 2022) filing and FERC's SPD (FERC, 2022) with the exception of the variances described above.

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APPENDIX A
RESULTS OF A HABITAT ASSESSMENT CONDUCTED FOR THE KERN RIVER NO. 3 HYDROELECTRIC (FERC PROJECT NO. 2290), KERN AND TULARE COUNTIES, CALIFORNIA

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MEMORANDUM

To	Southern California Edison (SCE)
From	Brad R. Blood, PhD Lindsay Messett Sarah Thomas Psomas
Date	September 12, 2023
Subject	Results of a Habitat Assessment Conducted for the Kern River No. 3 Hydroelectric (FERC Project No. 2290), Kern and Tulare Counties, California

This memorandum presents the results of habitat assessment for the Kern River No. 3 Hydroelectric Project Relicensing, Federal Energy Regulatory Commission (FERC) Project No. 2290 (hereinafter referred to as the "Project"). The Project is located on the North Fork Kern River (NFKR) and on Salmon and Corral Creeks near the town of Kernville in Kern and Tulare counties, California (Exhibits 1 and 2). The habitat assessment was conducted to determine the location of potential habitat for special status wildlife species within the wildlife study area and to determine future survey areas. This memorandum fulfills requirements for habitat assessments from the following Study Plans: Special-Status Salamander Study Plan (BIO-2), General Wildlife Study Plan (BIO-3), and Western Pond Turtle Study Plan (BIO-5). This habitat assessment did not include species-specific focused surveys.

PROJECT BACKGROUND

The 40.2-megawatt run-of-river Project includes an intake diversion dam, a water conveyance system consisting of concrete-lined arched tunnels, covered and open concrete box flumes, a metal siphon, two diversion dams and conduits, a forebay, two penstocks, and a powerhouse. Southern California Edison (SCE) is the licensee, owner, and operator of the existing hydroelectric facilities subject to the relicensing effort. SCE currently operates the Project under a 30-year license that was issued by FERC on December 24, 1996, which was subsequently amended in 1997, 2004, and 2019. Because the current license will expire on November 30, 2026, SCE is seeking a license renewal for continued operations and maintenance (O&M) of the Project. As part of the relicensing process, SCE will review the existing FERC Project Boundary and, if needed, propose revisions needed to: (1) include all facilities necessary for Project O&M; and (2) exclude lands within the current FERC Project Boundary that are not necessary for Project O&M. There are no new proposed facilities planned to increase the generator capacity of the Project, and there are no changes to O&M anticipated (SCE 2021).

ENVIRONMENTAL SETTING

The Project occurs along the NFKR and its tributaries including Salmon and Corral Creeks, in the southern portion of the Sierra Nevada. The NFKR begins at Lake South America nine miles northwest of Mount Whitney and approximately 50 miles north of the Project's northern terminus and drains into Lake Isabella approximately five miles south of the Project's southern terminus. The Project Area is one of moderate to steep ridge and valley topography. Elevations within the drainages range from approximately 2,700 feet above mean sea level (msl) to 3,600 feet above msl. Project facilities are primarily located on federal lands within Sequoia National Forest, with a small portion (around the powerhouse) within SCE ownership. Land uses adjacent to the Project include residential, grazing, and public recreation (e.g., whitewater rafting, camping, destination recreation areas, trails). Some portions of the water conveyance system and Project access roads fall within the Wild and Scenic River corridor quarter mile buffer. The

Project is located on U.S. Geological Survey's (USGS') Fairview and Kernville 7.5-minute topographic quadrangles (Exhibit 3).

The Project Area consists upland vegetation communities in higher terraces areas and riparian in and adjacent to Kern River and select tributaries. Plant community types mapped in the study area consist of annual grasses and forbs, California buckwheat scrub, lower montane mixed chaparral, scrub oak chaparral, upper montane mixed chaparral, wedgeleaf ceanothus chaparral, willow (shrub) alliance, California black oak forest and woodland, canyon live oak woodland, ponderosa pine forest and woodland, interior live oak alliance, interior live oak woodland and forest, riparian mixed hardwood alliance, and foothill pine woodland (Exhibit 4).

METHODS

In accordance with the Special-Status Salamander Study Plan (BIO-2), General Wildlife Study Plan (BIO-3), and Pond Turtle Study Plan (BIO-5), a habitat assessment (Phase 1) was conducted to identify and map potentially suitable habitat for northwestern pond turtle (*Actinemys marmorata*), special-status salamanders, and special status wildlife and Endangered and Threatened riparian bird species. The study area included riparian and upland habitats (e.g., perennial streams, ephemeral creeks, dry ravines, and other areas) matching each species' potential habitat needs located within the Project boundary, including a 50-foot buffer. Additionally, features that may support roosting bats were identified.

Target survey locations include, but are not limited to the following areas:

- Fairview Dam, intake, and sandbox;
- aboveground sections of the conveyance flowline, including the siphon;
- Fairview Dam Bypass Reach[1] from the river's edge to the outer edge of the riparian strip plus a 50-foot buffer, or to the edge of Mountain Highway 99, whichever is closer;
- Salmon Creek diversion, Open Flume, Adit 8B-9A, and adjacent access roads;
- Corral Creek diversion, open flume, and the access road;
- Cannell Creek, siphon, and access road;
- Gold Ledge Creek Open Flume, Adit 13-14, and adjacent access road;
- Pressure flume, forebay, and penstocks;
- Project access roads;
- Kern River No. 3 (KR3) Powerhouse and supporting maintenance buildings; and
- the NFKR confluences with Salmon, Gold Ledge, Corral, and Cannell Creeks.

Literature Review

Prior to the start of the field surveys, a review of the existing literature was conducted to determine the potential for special status species to occur in the vicinity of the Project. This review included the Study Plans as well as previous biological reports prepared for individual projects such as: Southwestern Pond Turtle Observations during Pre-construction Surveys in Support of the KR3 Flowline Roads Improvement Project (Psomas 2013a); Biological Resources Technical Report for the Kern River 3 Sandbox Repair

[1] The Fairview Dam Bypass Reach is defined as the approximately 16-mile bypass reach of the NFKR between Fairview Dam and the KR3 Powerhouse tailrace.

Project (Psomas 2013b). The Pre-Application Document for the SCE Kern River No. 3 Hydroelectric Project was also reviewed (SCE 2021).

Museum records, AmphibiaWeb, as well as crowdsourcing platforms (e.g., iNaturalist) were utilized during the literature review. In addition, the California Department of Fish and Wildlife's (CDFW's) California Natural Diversity Database (CDFW 2022) was queried for special status wildlife species for the following USGS' 7.5-minute topographic quadrangles: Johnsondale, Fairview, Kernville, Tobias Peak, Cannell Peak, Alta Sierra, and Lake Isabella.

Habitat Assessment Field Surveys

Based on the Project Study Plans and agency comments, potentially suitable habitat for the following species was evaluated during the habitat assessment: Fairview salamander (*Batrachoseps bramei*)—a Forest Service Sensitive Species (FSS); Kern Canyon salamander (*Batrachoseps simatus*)—a federally proposed threatened/State-listed threatened/FSS species; Kern Plateau salamander (*Batrachoseps robustus*)— a G3/S3 ranked species[2]; Greenhorn mountains slender salamander (*Batrachoseps altasierrae*)—a G2/S2 ranked species[3]; northwestern pond turtle—a Federal Candidate for listing as Threatened (FCT), CDFW Species of Special Concern (SSC)/FSS; Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) —a State-listed Endangered and federally-listed threatened species; southwestern willow flycatcher (*Empidonax traillii extimus*)—a State and federally-listed Endangered species; least Bell's vireo (*Vireo bellii pusillus*) —a State and federally-listed Endangered species; California condor (*Gymnogyps californianus*)—a State and federally-listed Endangered/CDFW fully protected species; and fisher southern Sierra Nevada Distinct Population Segment (*Pekania pennanti* pop 2)—a federally-listed Endangered/State-listed Threatened/CDFW SSC/FSS species.

Other special status species that may occur in the Project Area, as shown in Table 5.5-1 of the Pre-Application Document for the Project, or are otherwise known from the Project Vicinity, include but are not limited to: yellow-blotched salamander (*Ensatina eschscholtzii croceator*), southern Sierra legless lizard (*Anniella campi*), California legless lizard (*Anniella* spp.), coast horned lizard (*Phrynosoma blainvillii*), northern goshawk (*Accipiter gentilis*), yellow warbler (*Dendroica petechial brewsteri*), yellow-breasted chat (*Icteria virens*), tricolored blackbird (*Agelaius tricolor*), Sierra Nevada mountain beaver (*Aplodontia rufa californica*), pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), spotted bat (*Euderma maculatum*), western red bat (*Lasiurus blossevillii*), western mastiff bat (*Eumops perotis californicus*), and American badger (*Taxidea taxus*).

Prior to field surveys, field maps created from aerial photographs of the study area at a 1-inch to 200-foot scale were prepared for field use and included any known wildlife occurrences for special-status wildlife. The aerials were pre-loaded on to an iPad Mini 6 for use in in the field. On October 25–28; and November 14–16 2022, Psomas Senior Biologist Lindsay Messett and Biologist Sarah Thomas conducted reconnaissance-level habitat assessment of the entire study area. Biologists visually inspected the entire

[2] Global-rank 3 (G3): Vulnerable – At moderate risk of extinction due to restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors. State-rank 3 (S3): Vulnerable – At moderate risk of extirpation in the State due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors (CDFW 2023).

[3] Global-rank 2 (G2): Imperiled – At high risk of extinction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors. State-rank 2 (S2): Imperiled – At high risk of extirpation in the state due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors (CDFW 2023).

study area to document potentially suitable habitat for special status species known from the Project Vicinity. Potentially suitable habitat for special status species was delineated in the field on 11 x 17-inch paper aerial maps and notes were taken on habitat including description including dominant species present; description of understory including dominant species present; presence/absence of talus; and observed disturbances (e.g., fire, trash). A list of wildlife observed, and weather data was recorded in field notes. The type locality for the Fairview salamander is Packsaddle Canyon (adjacent to Fairview Dam), which was surveyed prior to the habitat assessment to provide the model for suitable habitat. In addition, Biologists searched for signs of bats (staining and guano piles) at the powerhouse and various facilities and bridges in the study area. Representative photographs were taken throughout the study area and can be found in Attachment A. A list of can be found in Attachment B. One special status species, the golden eagle, was observed during the habitat assessment. A CNDDB will be submitted for this observation.

Active searches for reptiles and amphibians included lifting, overturning, and carefully replacing objects such as rocks, boards, and debris. Birds were identified by visual and auditory recognition. Mammals were identified by visual recognition or evidence of diagnostic signs including scat, footprints, scratch-outs, dust bowls, burrows, and trails. Nomenclature of wildlife taxa conform to the *Special Animals List* (CDFW 2023) for special status species; nomenclature for non-special status wildlife generally follows Crother (2012) for amphibians and reptiles, AOS (2021) for birds, and Bradley et.al (2014) and Blood (2023) for mammals.

Cover Boards and Wildlife Cameras

In order to increase the potential for documenting special status salamanders and other reptiles and amphibians in the study area, three wooden boards (measuring 4 feet x 4 feet x 1/2 inch) were placed in potentially suitable habitat in Kern River, Salmon Creek, and Corral Creek (Exhibit 5). Additionally, Biologists installed two trail cameras at locations likely to capture wildlife—specifically Pacific fisher—that may not be observable during pedestrian surveys (Exhibit 5). All cameras are equipped with night recording capabilities and were programmed to record 5 second videos when the sensor is activated. Camera placement will be reassessed after reviewing the second round of data.

RESULTS

Salamander

Fairview salamander

Fairview salamander is not listed by federal Endangered Species Act or the California Endangered Species Act nor is it a California SSC. It is included here at the request of the resource agencies. The Fairview salamander is known from the multiple locations in the Project Area (Exhibit 6). This species is generally associated with talus on north-facing slopes in steep canyons in a variety of habitats including riparian and chaparral plant communities and is most often found beneath rocks. These areas typically do not get sun in winter and remain moist and cool into the spring (Jockusch et al. 2012).

Potentially suitable habitat for the Fairview salamander was identified in Packsaddle Canyon and the gully directly to the north; along the access road to the Salmon Creek diversion; at the Corral Creek diversion and pipeline; Tunnel 18/19 Flume Access Road; and the Cannell Creek Siphon and Spillway; Gold Ledge Creek; Salmon Creek Diversion and Pipeline; Tunnel 16/17 Flume Access Road; the NFKR confluences with Salmon; Gold Ledge, Corral, and Cannell Creeks; and the drainage originating at the forebay and extending down to Kern River (Exhibit 7).

Kern Canyon salamander

Kern Canyon salamander is known from 18 sites south of Lake Isabella in the Lower Kern River Canyon, Piute Mountains, and along Erskine and Bodfish Creeks. This species is found within wet margins of creeks and seeps in narrow canyons shaded with willows (*Salix* spp.), cottonwoods (*Populus* spp.), oaks (*Quercus* spp.), and pines (*Pinus* spp.). The Kern Canyon slender salamander has also been found on talus slopes and in open grasslands (USFWS 2022). This species is not known from the Project Area. In the study area, potentially suitable habitat for this species overlaps that of the Fairview salamander.

Kern Plateau Salamander

The Kern Plateau salamander is known from 35 sites on the Kern Plateau (a high elevation plateau east of the study area), the Scodie Mountains, the eastern slope of the Sierra Nevada, Owens Valley, and Indian Wells Valley. On the Kern Plateau, Kern Plateau salamanders are found at high elevations in moist areas under woody debris and leaf litter in mesic pine-fir forests (*Pinus* spp.–*Abies* spp.), pinyon pine (*Pinus monophylla*), sagebrush (*Artemisia* spp.), and oaks in drier habitats (USFWS 2022). This species is not known from the Project Area. In the study area, potentially suitable habitat for this species overlaps that of the Fairview salamander and includes some drier drainage habitat along Tunnels 5–8A Access Road, Rincon Access Road, Tunnels 10–12 Access Road, Corral Creek Diversion Access Road, and Corral Creek Flumes North Access Road (Exhibit 7).

Greenhorn mountains slender salamander

Greenhorn mountains slender salamander is known from high elevations in the Greenhorn Mountains west of the Project Area (and one location east of the Project Area in the western Kern Plateau) (CDFW 2022; Jockusch et al. 2012). Most populations are found in mesic areas (e.g., swales, drainages, etc.) with an overstory of trees or shrubs and abundant rocks, litter, or woody debris in coniferous forests containing a mixture of pine, fir, and incense cedar (*Calocedrus decurrens*) (CDFW CIWTG 2014, Jockusch et al. 2012). This species is not known from the Project Area. In the study area, potentially suitable habitat for this species overlaps that of the Fairview salamander (Exhibit 7).

Northwestern Pond Turtle

The northwestern pond turtle is associated with permanent or nearly permanent water in a wide variety of habitats. It requires basking sites such as partially submerged logs, rocks, mats of floating vegetation, or open mud banks. Along large slow-moving streams, eggs are deposited in nests constructed in sandy banks. Along foothill streams, females may climb hillsides, sometimes moving considerable distances to find a suitable nest site (Ernst et al. 1994; Pilliod, et al. 2013; Thompson et al. 2016). The northwestern pond turtle is known from Cannell Creek in the study area (Psomas 2013a). In the study area potentially suitable habitat for the northwestern pond turtle was identified in Kern River at numerous locations where water was slow moving, and in Cannell Creek (Exhibit 8). On October 3, 2023, the U.S. Fish and Wildlife Service published a proposed rule to list the northwestern pond turtle as a federally threatened species (USFWS 2023).

California Condor

Suitable habitat for the California condor includes adequate food supply, open areas to locate food, and reliable air movements to allow for extending soaring (Bloom 2009). Foraging habitat consists of vast expanses of open savannah and grassland, including cattle ranches or pastures within chaparral with cliffs,

large trees, and snags. Roosting habitat is located near important foraging grounds, often near a previously discovered carcass. The California condor nests in caves, crevices, and large ledges on high sandstone cliffs (Bloom 2009).

Based on habitat requirements for nesting, the California condor is not expected to breed in the study area. Marginal foraging habitat occurs in the Project Area. In the study area, potentially suitable foraging habitat occurs in the grassland areas in the southern portion of the study area (Exhibit 4).

Riparian Birds

Western Yellow-Billed Cuckoo

The western yellow-billed cuckoo requires large tracts of riparian forest or woodland habitat along low-gradient rivers and streams in open riverine valleys that provide wide floodplain conditions (USFWS 2014). The optimal size of habitat patches for the species is generally greater than 200 acres in extent and has dense canopy closure and high foliage volume of willows and cottonwoods (Laymon and Halterman 1989). Habitat between 100 acres and 200 acres, although considered suitable, are not consistently used by the species (Laymon and Halterman 1989). Habitat patches from 50 to 100 acres in size are considered marginal habitat; sites less than 37 acres are considered unsuitable habitat (Laymon and Halterman 1989). The species does not use narrow, steep-walled canyons (USFWS 2014). Sites with strips of habitat less than 325 feet in width are rarely occupied for nesting (USFWS 2014). Stopover and foraging sites can be similar to breeding sites but can be smaller in size (sometimes less than 10 acres in extent), narrower in width, and lack understory vegetation when compared to nesting sites (Laymon and Halterman 1989; USFWS 2014). Minimum patch size for cuckoo occupancy is 12.4 acres; no cuckoos have been detected attempting to nest in patches this size or smaller in California or Arizona (Halterman et al. 2001; Johnson et al. 2010). They have also not been found nesting in narrow; linear habitat that is less than 33 to 66 feet wide (Halterman et al. 2015).

Based on the habitat needs for the cuckoo, there is low potential for nesting and foraging in the study area; however, the cuckoo may migrate through the study area on its way to/from suitable habitat near the Kern River. The study area does not support the acreage of riparian woodland required by this species. All riparian woodland habitat was delineated on field maps during the habitat assessment (Exhibit 4).

Southwestern Willow Flycatcher

The southwestern willow flycatcher occurs in dense riparian habitat along rivers, streams, and other wetlands. Typically, southwestern willow flycatcher nests in thickets of trees and shrubs 13 to 23 feet or greater in height, with a dense understory and a high percentage of canopy cover (USFWS 1995).

Based on the habitat needs for the flycatcher, there is low potential for nesting and foraging in the study area; however, the southwestern willow flycatcher may migrate through the study area on its way to/from suitable habitat near the Kern River. The study area does not support the dense understory required by this species. All riparian habitat was delineated on field maps during the habitat assessment (Exhibit 9).

Least Bell's Vireo

The breeding habitat of the least Bell's vireo is primarily riparian dominated by willows with dense understory vegetation; shrubs such as mule fat *(Baccharis salicifolia*) and California rose (*Rosa californica*) are often a component of the understory (Goldwasser 1981). The least Bell's vireo is often

found in areas that include trees such as willow, western sycamore (*Platanus racemosa*), or cottonwood, particularly where the canopy is within or immediately adjacent to an understory layer of vegetation (Salata 1983).

Based on the habitat needs for least Bell's vireo, there is low potential for nesting and foraging in the study area; however, least Bell's vireo may migrate through the study area on its way to/from suitable habitat near the Kern River. The study area does not support the dense understory required by this species. All riparian habitat was delineated on field maps during the habitat assessment (Exhibit 9).

Fisher

The fisher is a medium-sized forest-dwelling carnivore whose primary habitat in the western United States is dense coniferous forest, usually with a deciduous component and abundant physical structure in the form of large trees, snags, and logs (Zielinski et al. 2013). The Southern Sierra Nevada Distinct Population Segment of the fisher is an isolated population in the southern Sierra Nevada. In the Project region, the U.S. Fish and Wildlife Service (USFWS) proposed critical habitat occurs east of the Project Area in the Kern Plateau (Unit 1); and west of the Project Area in the southwestern tip of the Sierra Nevada and Greenhorn Mountains—between the Kern River and Bear Creek in the Tule River watershed (Unit 2) (USFWS 2022). No proposed critical habitat occurs in the Project Area. Fisher has not been documented in the Project Area (CDFW 2023).

USFWS proposed critical habitat units were determined based on modeled suitable, high-quality denning habitat[4] that includes intermixed foraging and dispersal areas. Female fishers have the strictest habitat requirements, and they raise their young alone; therefore, maintaining and increasing carrying capacity for breeding females is essential to sustaining and recovering the fisher population (Spencer et al. 2016). Denning habitat used by females to raise young appears to be a subset of resting habitat (used by both sexes year-round) and is restricted to forest stands with dense canopy cover (greater than 60 percent), structural diversity, large trees, and a moderate intermix with black oaks (*Quercus kelloggii*). Resting typically occurs in the largest available (e.g., conifers greater than or equal to 35 inches and hardwoods greater than or equal to 25 inches) live trees, snags, or logs that provide cavities, platforms, or other deformities used by resting fishers (USFWS 2022, Spencer et al. 2016).

In addition to core denning habitat, the Conservation Biology Institute's (CBI) Southern Sierra Nevada Fisher Conservation Strategy identifies least risky potential linkages based on expert assumptions about fisher dispersal relative to vegetation, terrain, and other factors used by fisher to disperse between critical habitat units. Linkages identified by CBI are not included in USFWS proposed critical habitat (USFWS 2022, Spencer et al. 2016). Genetic analyses suggest that female fishers primarily disperse through dense forest stands with large trees; however, fisher experts expect that shrubs (e.g., chaparral) may provide sufficient hiding and escape cover for dispersing male fishers in non-forested portions of linkage areas (Spencer et al. 2016). The closest identified linkage (linking Critical Habitat Units 1 and 2) occurs approximately 12 miles north of the Project site and crosses Kern River (Spencer et al. 2016). No identified linkages occur in the Project Area.

On the Project site, Salmon Creek diversion, Corral Creek diversion, and forested areas adjacent to Kern River may contain marginal foraging and resting habitat for dispersing fisher from Critical Habitat Unit 1

[4] Such habitat provides structural features for birthing kits, raising kits, protection from adverse weather conditions, facilitation of safe movement, sites to rest and thermoregulate, foraging opportunities, and cover to reduce predation risk for adults and young (USFWS 2022).

east of the Project site. These areas contain riparian habitat with high canopy cover (mostly greater than 60 percent) that fisher require for movement (Exhibit 4). Dens are primarily in mixed-coniferous and coniferous-hardwood stands with dense canopy cover, a moderate intermix of California black oaks, on steep slopes (approximately 20–50 percent slopes); these habitat elements are lacking on the Project site.

Bats

No sign of bat roosting was observed in any of the Project facilities including the KR3 Powerhouse, bridges, overhanging adits, or visible rock crevices along Project access roads. SCE field staff members were consulted during surveys to inquire about any bat observations in any Project facilities. They reported no roosting bat observations on Project facilities in the Project Area.

CONCLUSIONS

Biologists mapped potentially suitable habitat for key special status species in the study area to establish sites in accessible locations for targeted visual encounter surveys (Phase 2). In 2023, surveys will be conducted by foot during appropriate seasons and conditions to maximize the potential for observing salamanders (i.e., late-winter, early spring rainy seasons). Active searches for reptiles and amphibians will also be conducted. Methods will include lifting, overturning, and carefully replacing objects such as rocks, boards, and debris, and cover boards placed during the habitat assessment surveys. Additionally, surveys will be performed in potentially suitable habitat at appropriate times of the year (e.g., nesting season) to maximize the opportunity to observe western yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, California condor, and Pacific fisher.

Exhibits: Exhibit 1 – Regional Location
Exhibit 2 – Project Location
Exhibit 3 – U.S. Geological Survey 7.5-Minute Quadrangle
Exhibit 4 – Plant Communities
Exhibit 5 – Wildlife Camera and Herp Board Locations
Exhibit 6 – CNDDB Wildlife Locations
Exhibit 7 – Potentially Suitable Salamander Habitat
Exhibit 8 – Potentially Suitable Pond Turtle Habitat
Exhibit 9 – Potentially Suitable Riparian Bird Habitat

Attachments: Attachment A – Representative Site Photographs
Attachment B – Wildlife Compendium

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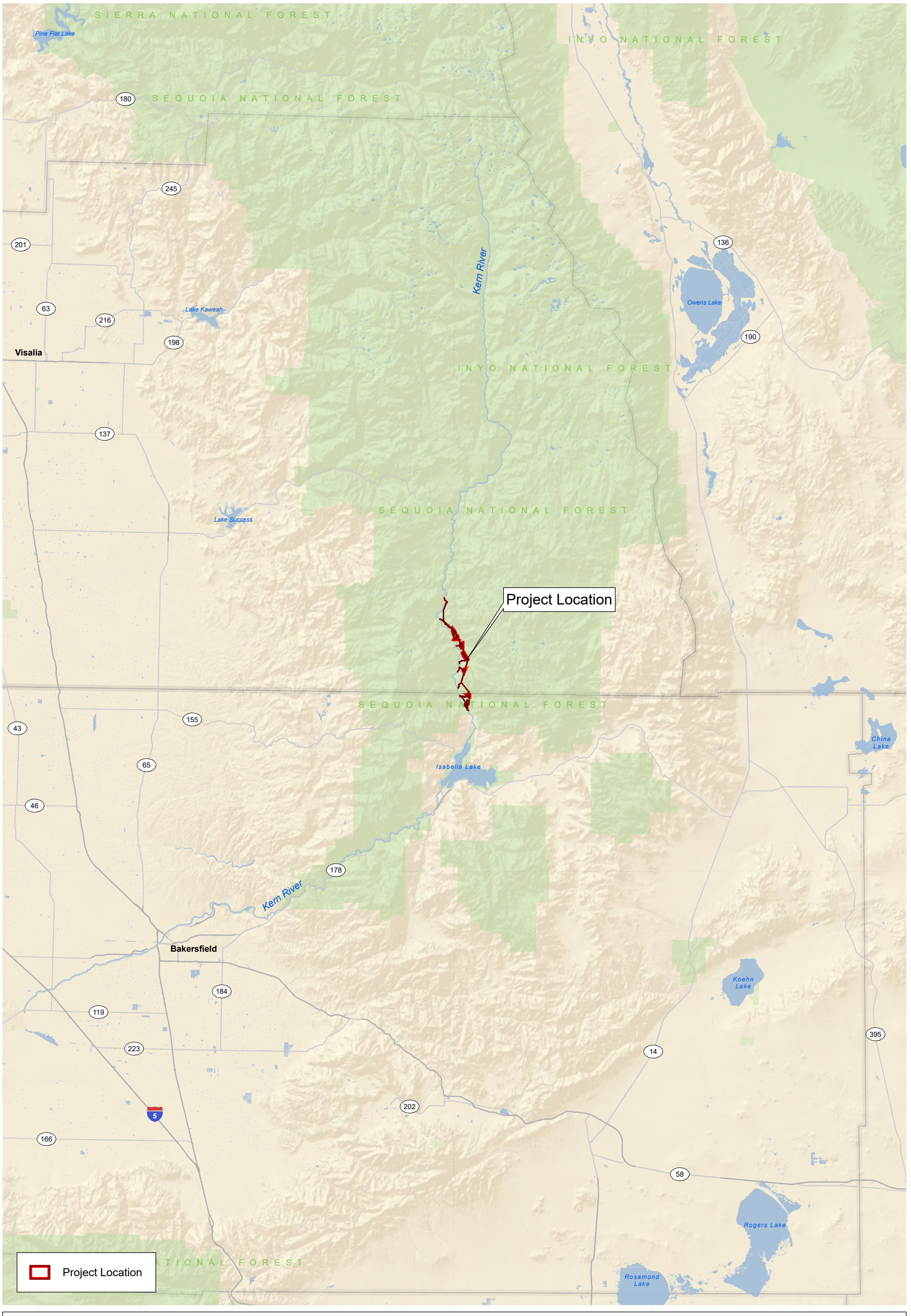
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Regional Location

Exhibit 1

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

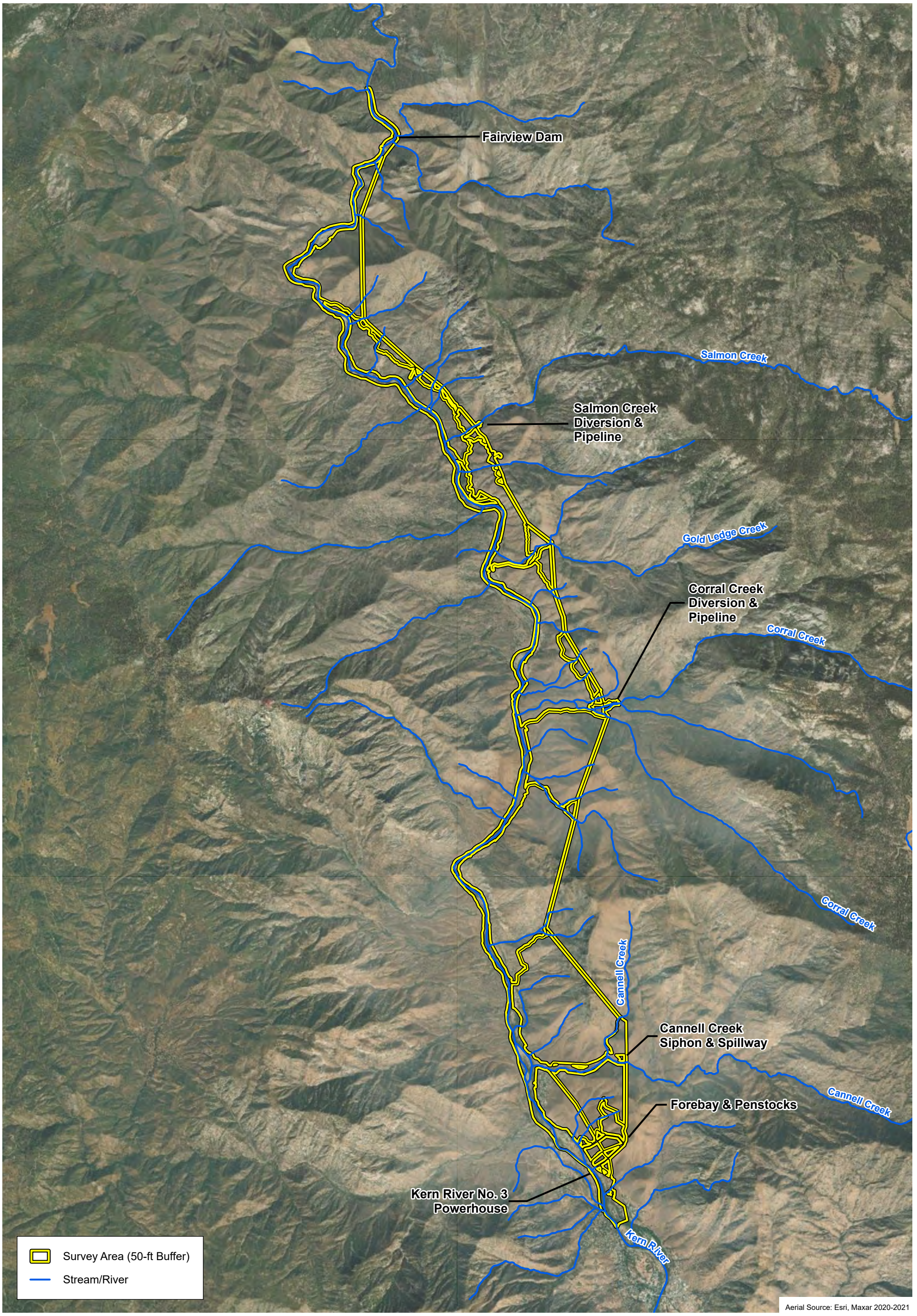
N W E S

10 5 0 10 Miles

PSOMAS

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Project Location

Exhibit 2

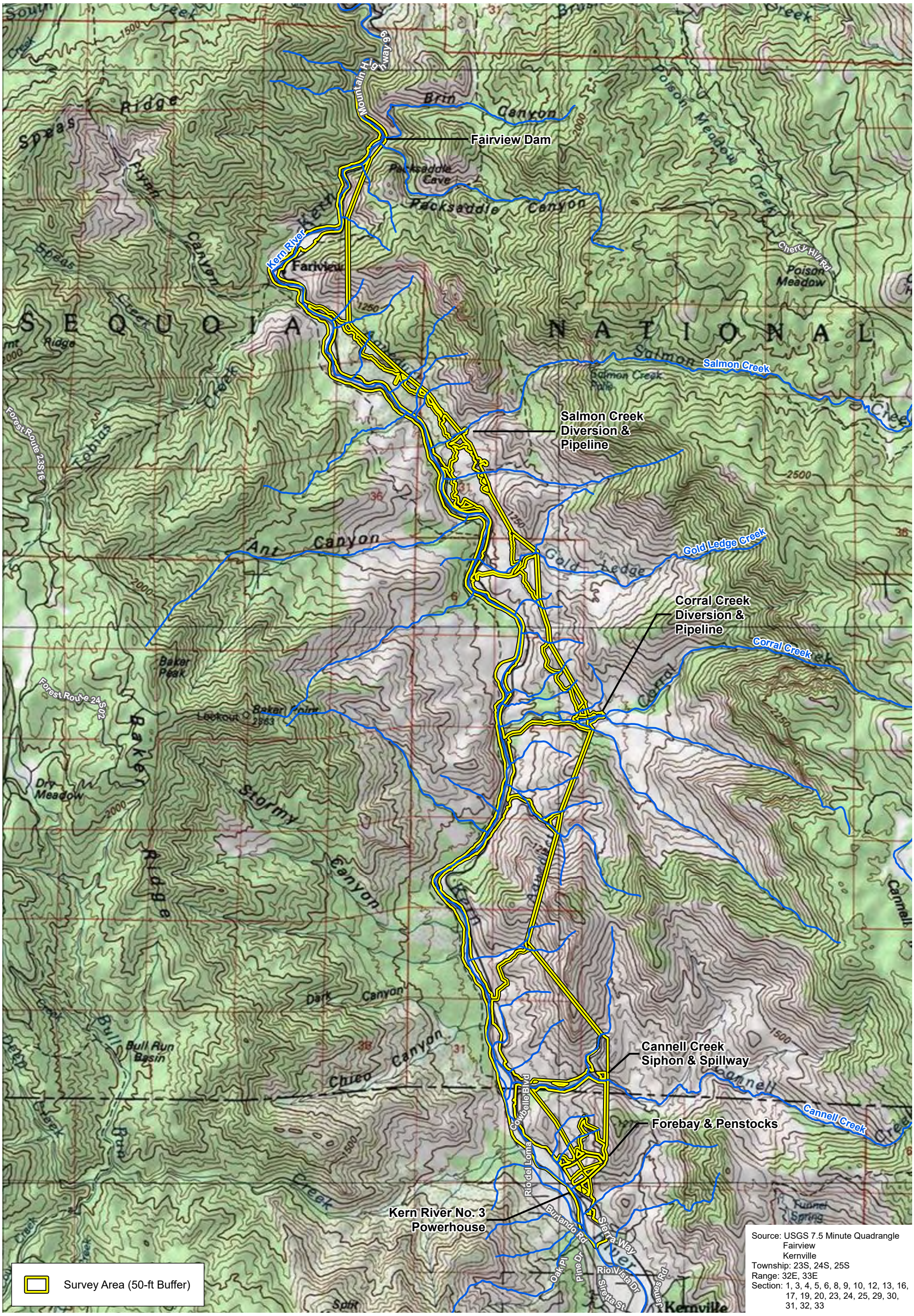
Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N W E S

1 0.5 0 1 Mile

PSOMAS

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Source: USGS 7.5 Minute Quadrangle
Fairview
Kernville
Township: 23S, 24S, 25S
Range: 32E, 33E
Section: 1, 3, 4, 5, 6, 8, 9, 10, 12, 13, 16, 17, 19, 20, 23, 24, 25, 29, 30, 31, 32, 33

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USGS 7.5-Minute Digital Quadrangle

Exhibit 3

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N W E S

1 0.5 0 1 Miles

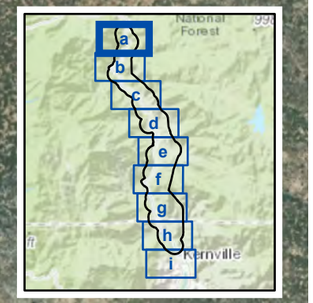
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FERC Project Boundary
FERC Project Boundary Buffer
Adits and Flumes
Tunnel Centerline
Project Roads

South Sierra Vegetation

Annual Grasses and Forbs
Barren
Black Oak
Interior Live Oak
Lower Montane Mixed Chaparral
Ponderosa Pine
River/Stream/Canal
Scrub Oak
Wedgeleaf Ceanothus



Fairview Dam
Open Flume
Sandbox
Intake/Start Tunnel

Aerial Source: Esri, Maxar 2020-2021
Vegetation Source: McCormick Biological, Inc.

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Plant Communities

Exhibit 4a

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N W E S

1,000 500 0 1,000 Feet

PSOMAS

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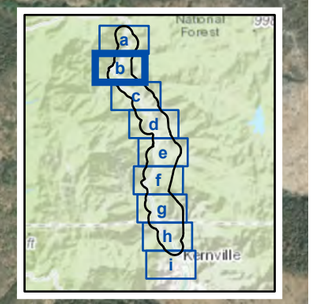
FERC Project Boundary
FERC Project Boundary Buffer
Adits and Flumes
Tunnel Centerline
Project Roads

Central Valley Vegetation

Annual Grasses and Forbs
Buckwheat
Interior Live Oak
Lower Montane Mixed Chaparral
River/Stream/Canal
Wedgeleaf Ceanothus

South Sierra Vegetation

Annual Grasses and Forbs
Barren
Black Oak
Buckwheat
Canyon Live Oak
Gray Pine
Interior Live Oak
Lower Montane Mixed Chaparral
Ponderosa Pine
River/Stream/Canal
Scrub Oak
Upper Montane Mixed Chaparral
Water (General)
Wedgeleaf Ceanothus
Willow (Shrub)



Adit 4/5

Aerial Source: Esri, Maxar 2020-2021
Vegetation Source: McCormick Biological, Inc.

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Plant Communities

Exhibit 4b

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N
W E
S

1,000 500 0 1,000
Feet

PSOMAS

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FERC Project Boundary
FERC Project Boundary Buffer
Adits and Flumes
Tunnel Centerline
Project Roads

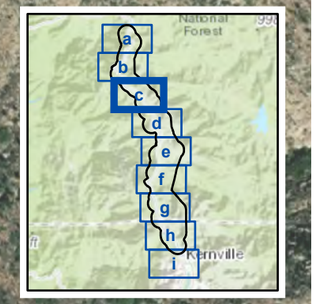
Central Valley Vegetation

Annual Grasses and Forbs
Barren
Buckwheat
Canyon Live Oak
Gray Pine
Interior Live Oak
Lower Montane Mixed Chaparral
Riparian Mixed Hardwood
River/Stream/Canal
Urban-related Bare Soil
Water (General)
Wedgeleaf Ceanothus

South Sierra Vegetation

Interior Live Oak
Lower Montane Mixed Chaparral

Adit 6/7A
Adit 7B/8A
Adit 8A/8B
Salmon Creek Flume (Adit 8B/9A)
Adit 9A/9B
Adit 9B/10



Aerial Source: Esri, Maxar 2020-2021
Vegetation Source: McCormick Biological, Inc.

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Plant Communities

Exhibit 4c

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N
W E
S

1,000 500 0 1,000
Feet

PSOMAS

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FERC Project Boundary
FERC Project Boundary Buffer
Adits and Flumes
Tunnel Centerline
Project Roads

Central Valley Vegetation

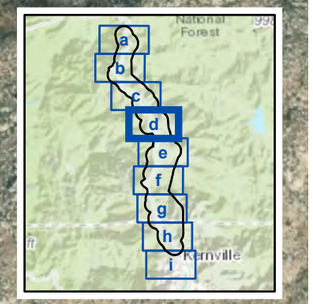
Annual Grasses and Forbs
Barren
Buckwheat
Gray Pine
Interior Live Oak
River/Stream/Canal
Water (General)
Wedgeleaf Ceanothus

Adit 12/13

Bryn Canyon Flume (Adit 13/14)

Adit 14/15

Adit 16/17



Aerial Source: Esri, Maxar 2020-2021
Vegetation Source: McCormick Biological, Inc.

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Plant Communities

Exhibit 4d

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N
W E
S

1,000 500 0 1,000
Feet

PSOMAS

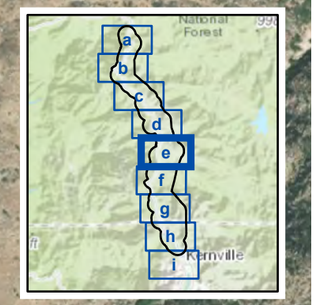
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FERC Project Boundary
FERC Project Boundary Buffer
Adits and Flumes
Tunnel Centerline
Project Roads

Central Valley Vegetation

Annual Grasses and Forbs
Barren
Buckwheat
Canyon Live Oak
Gray Pine
Interior Live Oak
Lower Montane Mixed Chaparral
Riparian Mixed Hardwood
River/Stream/Canal
Wedgeleaf Ceanothus

Corral Creek Flume A
Corral Creek Flume B
Corral Creek Flume C
Corral Creek Flume D
Corral Creek Flume E (Adit17/18)



Aerial Source: Esri, Maxar 2020-2021
Vegetation Source: McCormick Biological, Inc.

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Plant Communities

Exhibit 4e

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N
W E
S

1,000 500 0 1,000
Feet

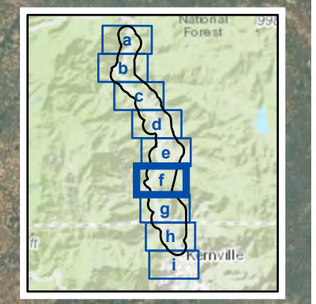
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FERC Project Boundary
FERC Project Boundary Buffer
Adits and Flumes
Tunnel Centerline
Project Roads

Central Valley Vegetation

Annual Grasses and Forbs
Barren
Buckwheat
Canyon Live Oak
Gray Pine
Interior Live Oak
Lower Montane Mixed Chaparral
Riparian Mixed Hardwood
River/Stream/Canal
Wedgeleaf Ceanothus



Aerial Source: Esri, Maxar 2020-2021
Vegetation Source: McCormick Biological, Inc.

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Plant Communities

Exhibit 4f

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N
W E
S

1,000 500 0 1,000
Feet

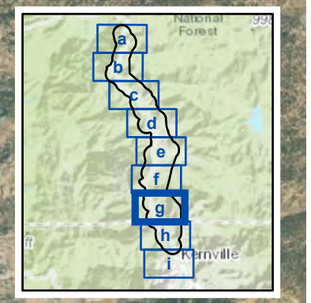
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FERC Project Boundary
FERC Project Boundary Buffer
Adits and Flumes
Tunnel Centerline
Project Roads

Central Valley Vegetation

Annual Grasses and Forbs
Barren
Basin Sagebrush
Buckwheat
California Juniper (tree)
Canyon Live Oak
Gray Pine
Interior Live Oak
Lower Montane Mixed Chaparral
Riparian Mixed Hardwood
River/Stream/Canal
Urban-related Bare Soil
Water (General)
Wedgeleaf Ceanothus



Aerial Source: Esri, Maxar 2020-2021
Vegetation Source: McCormick Biological, Inc.

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Plant Communities

Exhibit 4g

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N
W E
S

1,000 500 0 1,000
Feet

PSOMAS

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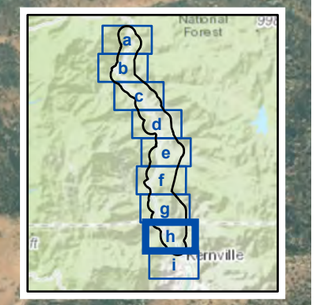
FERC Project Boundary
FERC Project Boundary Buffer
Adits and Flumes
Tunnel Centerline
Project Roads

Central Valley Vegetation

Annual Grasses and Forbs
Basin Sagebrush
Buckwheat
Fremont Cottonwood
Gray Pine
Interior Live Oak
Lower Montane Mixed Chaparral
Riparian Mixed Hardwood
River/Stream/Canal
Urban-related Bare Soil
Water (General)
Wedgeleaf Ceanothus

Penstocks

Powerhouse



Aerial Source: Esri, Maxar 2020-2021
Vegetation Source: McCormick Biological, Inc.

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Plant Communities

Exhibit 4h

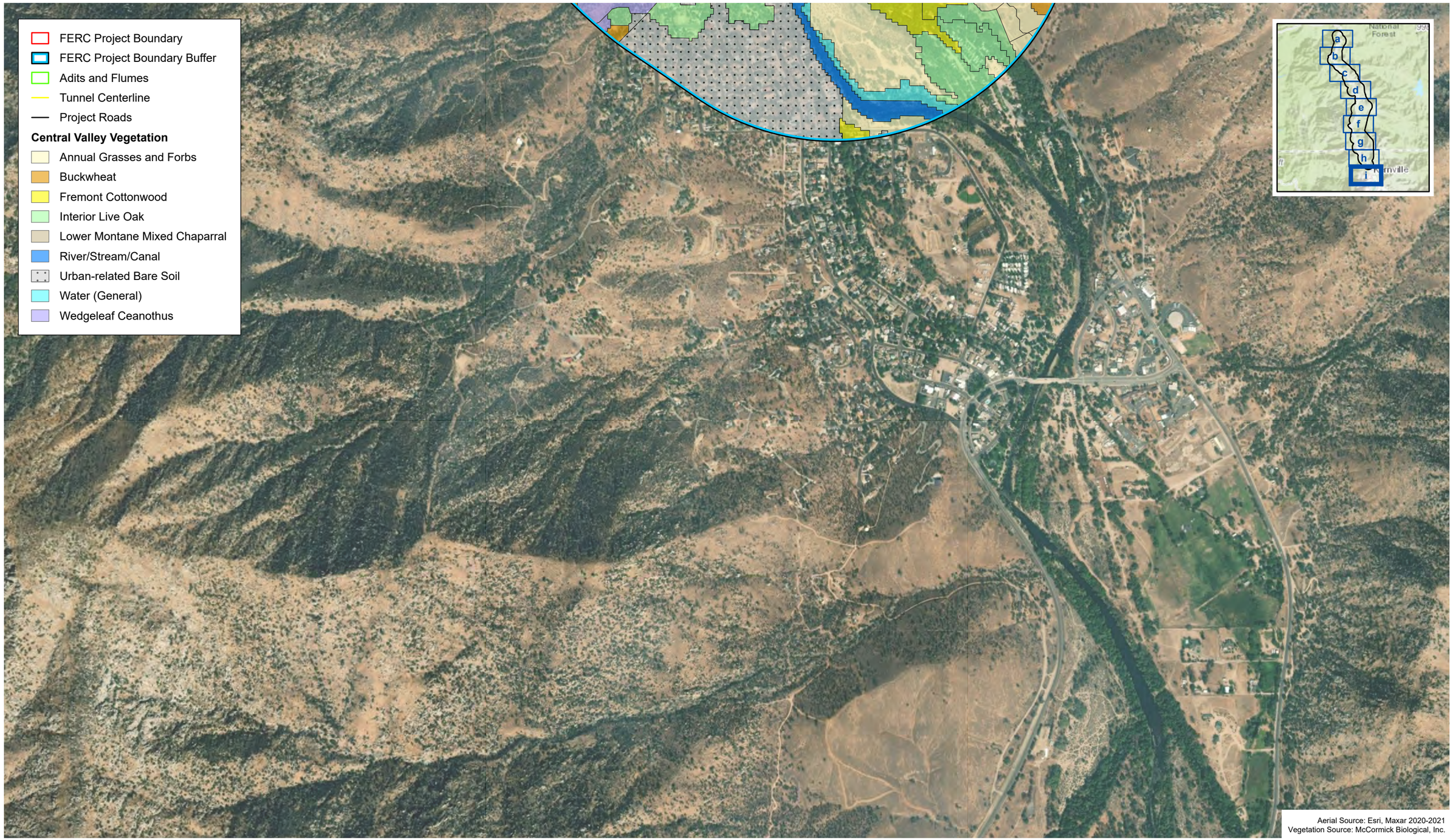
Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N
W E
S

1,000 500 0 1,000
Feet

PSOMAS

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Aerial Source: Esri, Maxar 2020-2021
Vegetation Source: McCormick Biological, Inc.

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Plant Communities

Exhibit 4i

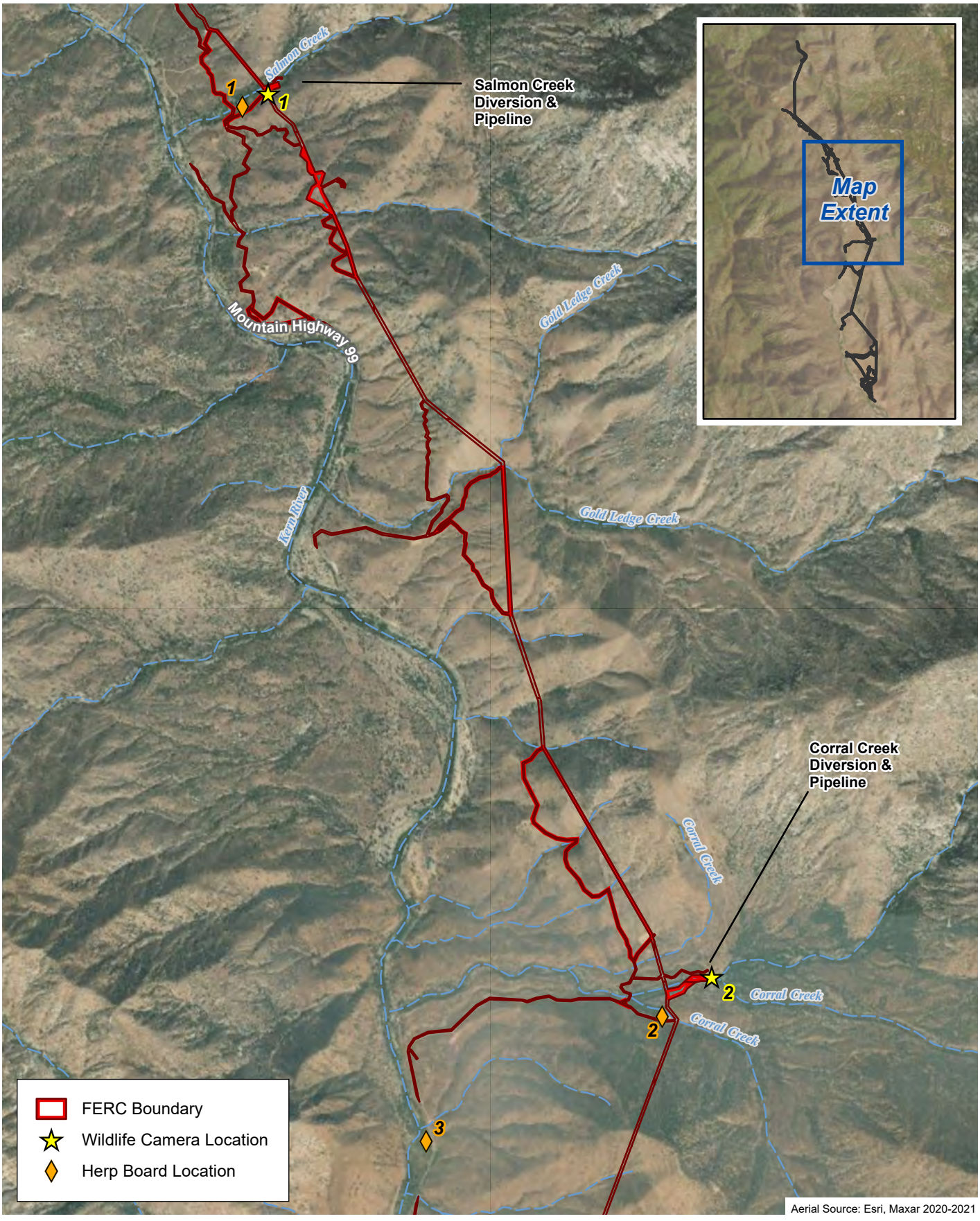
Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N
W E
S

1,000 500 0 1,000
Feet

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Wildlife Camera and Herp Board Locations

Exhibit 5

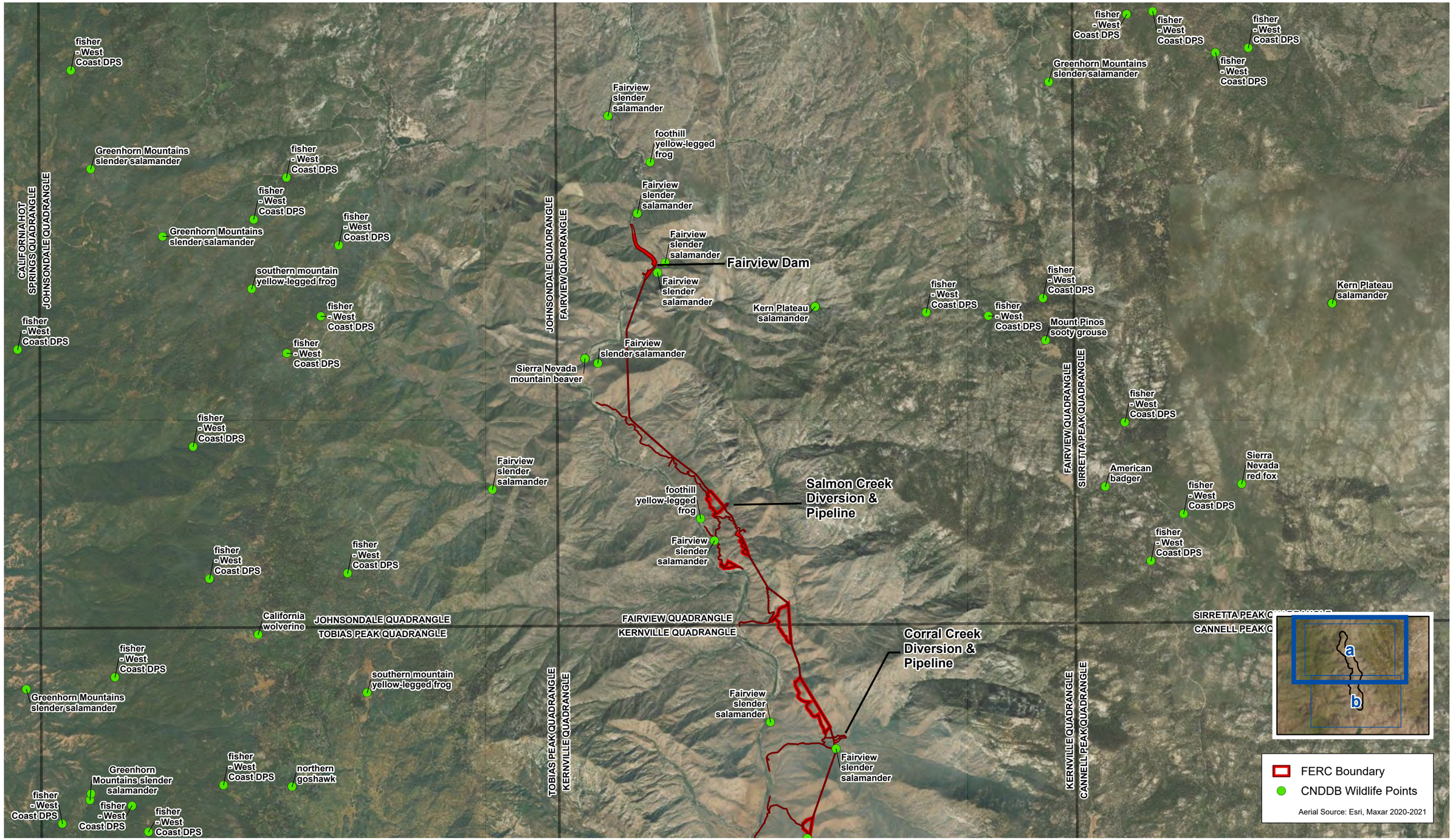
Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N W E S

2,500 1,250 0 2,500 Feet

PSOMAS

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CNDDB Wildlife Locations

Exhibit 6a

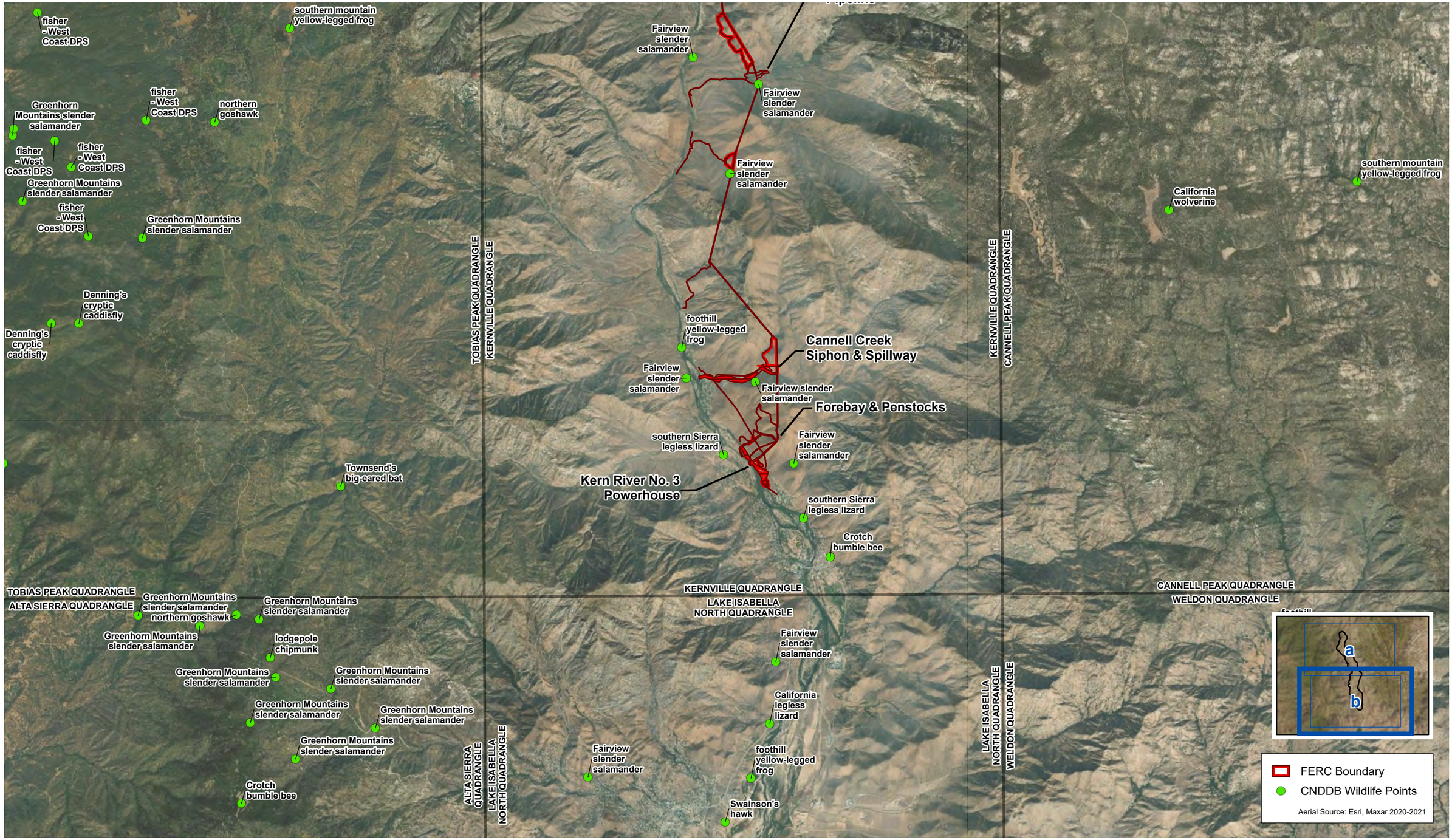
Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N W E S

1 0.5 0 1 Miles

PSOMAS

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CNDDB Wildlife Locations

Exhibit 6b

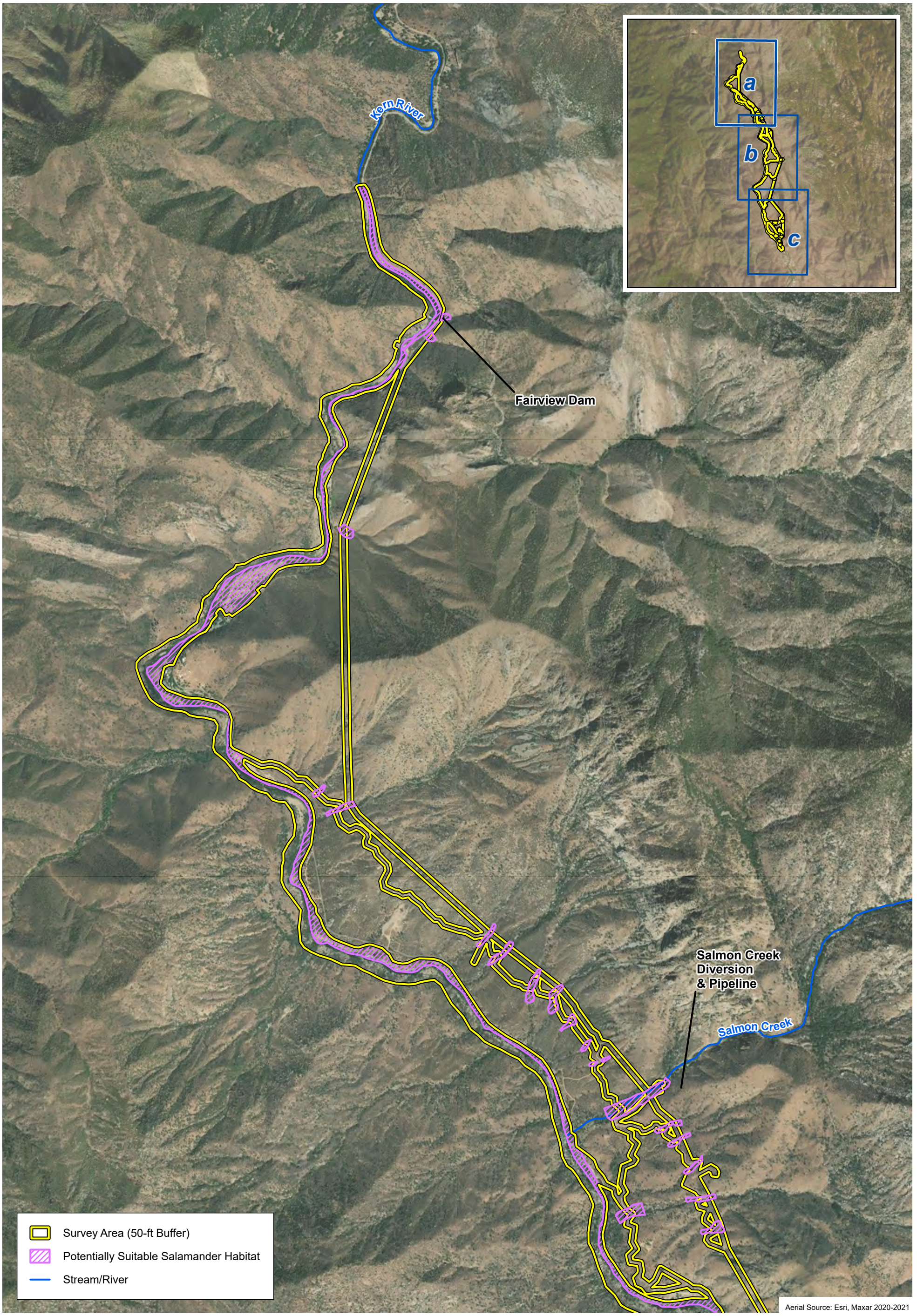
Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N W E S

1 0.5 0 1 Miles

PSOMAS

(Rev: 09/01/2023 PLO) R:\Projects\ERM\3ERM010100\Graphics\HA_Memo\ex_CNDDB.pdf



Potentially Suitable Salamander Habitat

Exhibit 7a

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

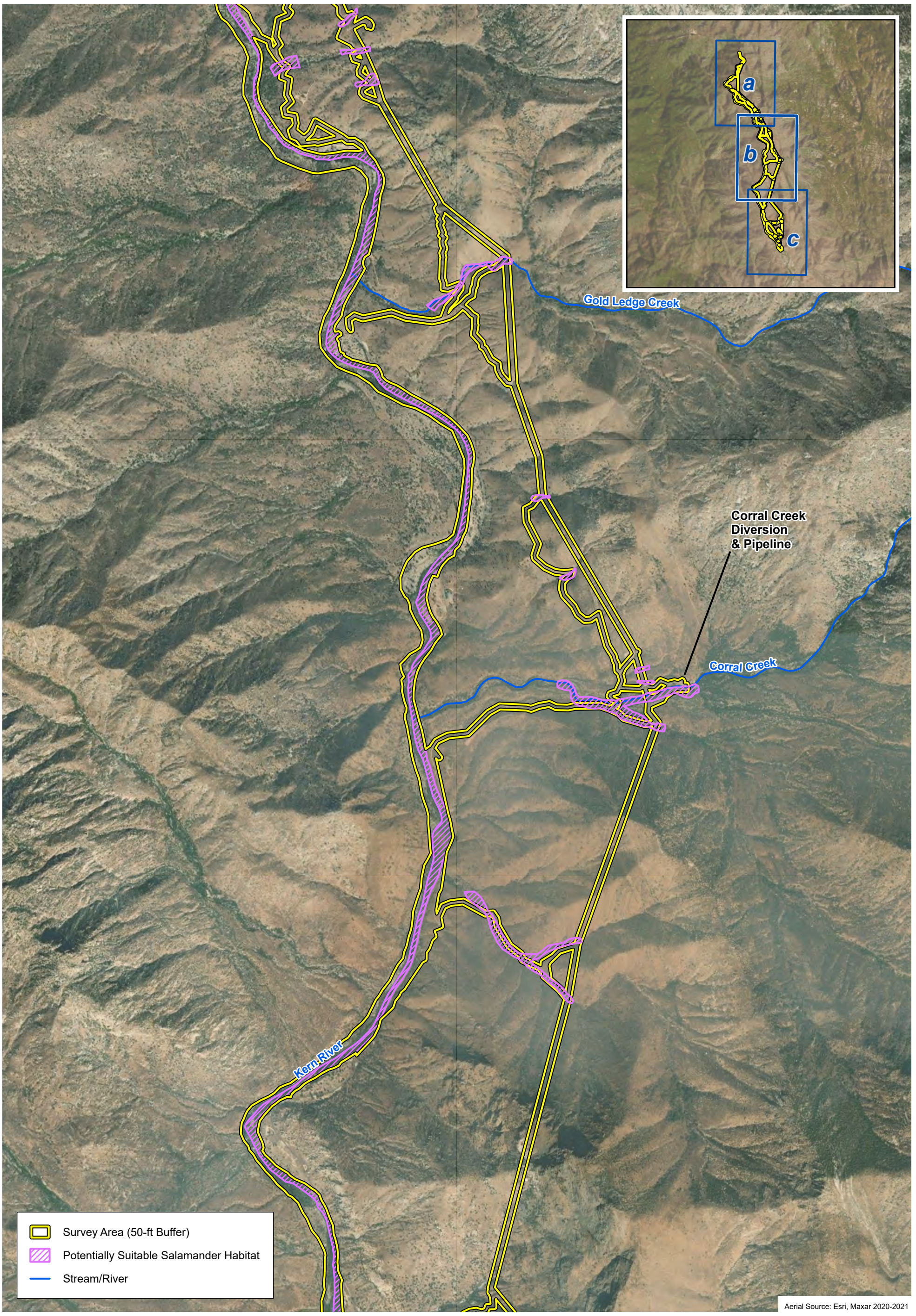
N
W E
S

2,000 1,000 0 2,000
Feet

PSOMAS

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Potentially Suitable Salamander Habitat

Exhibit 7b

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

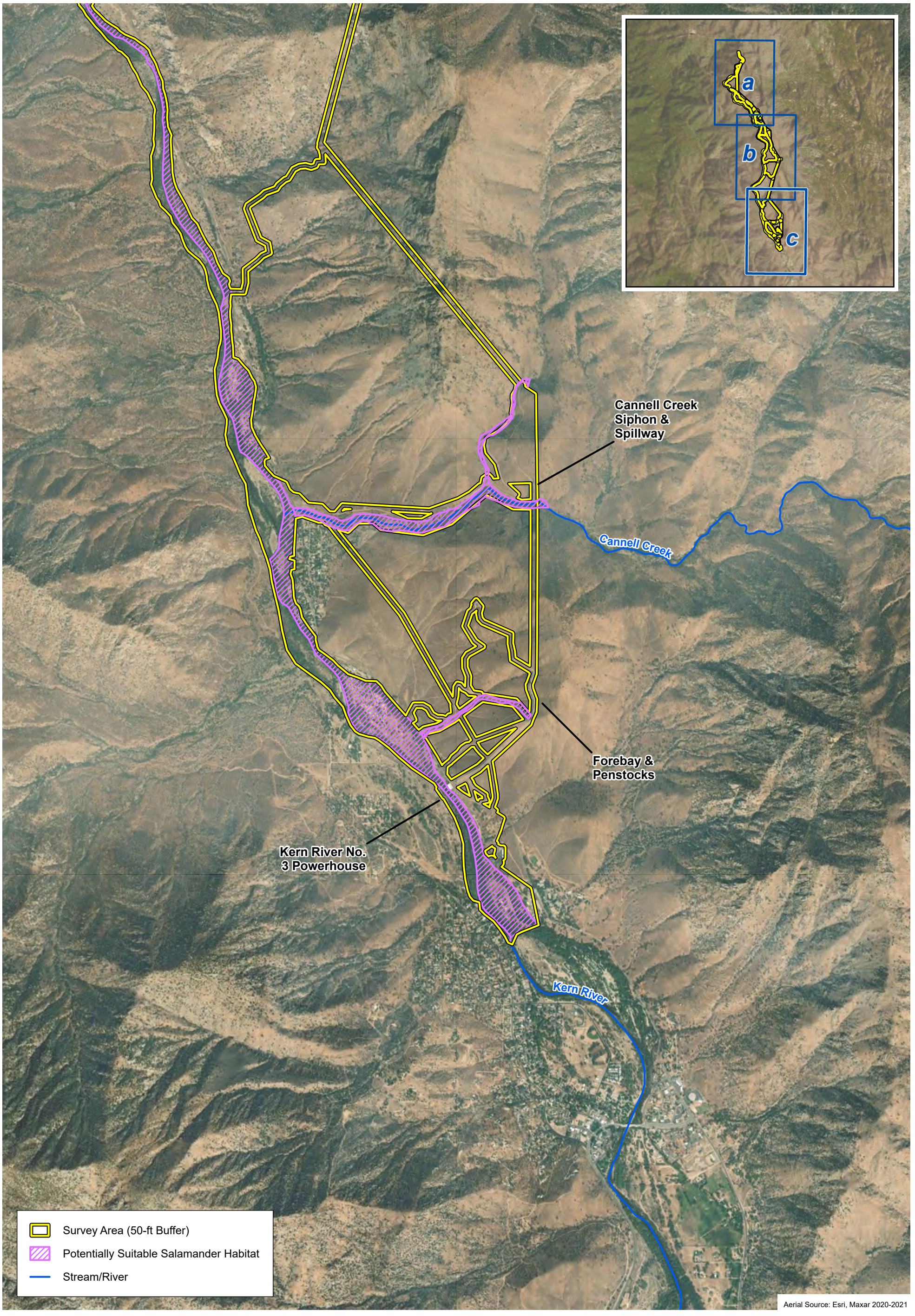
N W E S

2,000 1,000 0 2,000 Feet

PSOMAS

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Potentially Suitable Salamander Habitat

Exhibit 7c

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

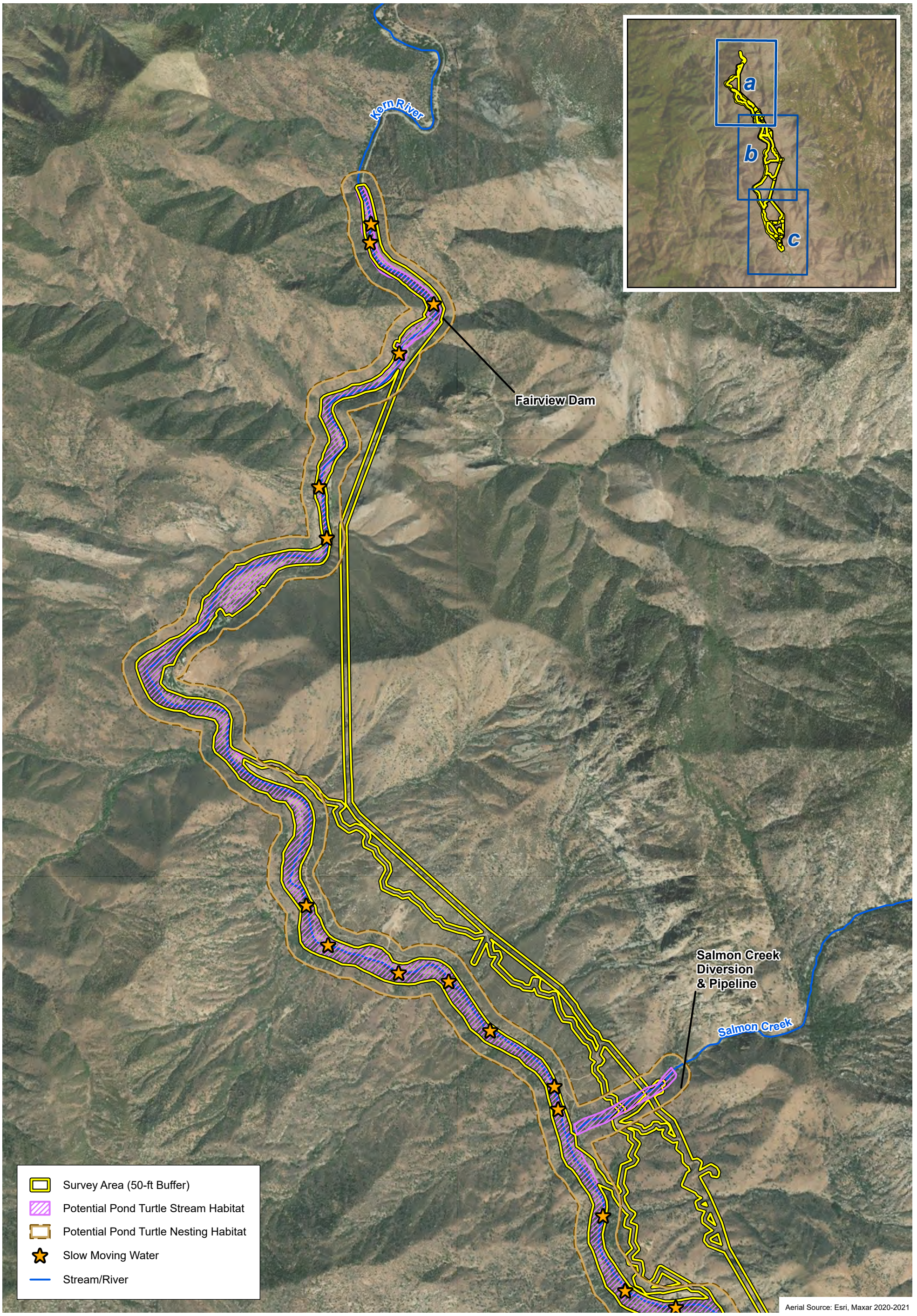
N W E S

2,000 1,000 0 2,000 Feet

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Potentially Suitable Pond Turtle Habitat

Exhibit 8a

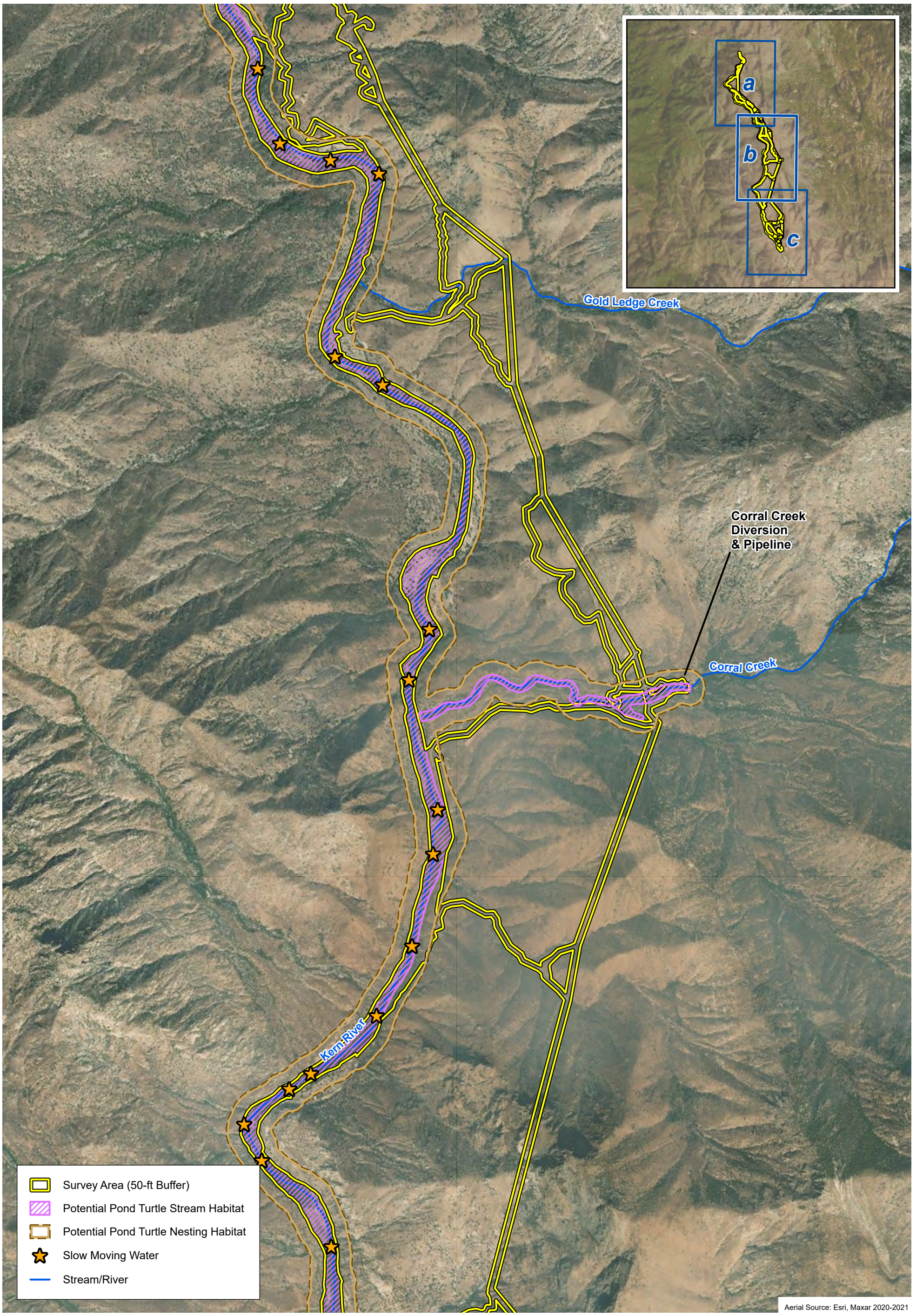
Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N W E S

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Potentially Suitable Pond Turtle Habitat

Exhibit 8b

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

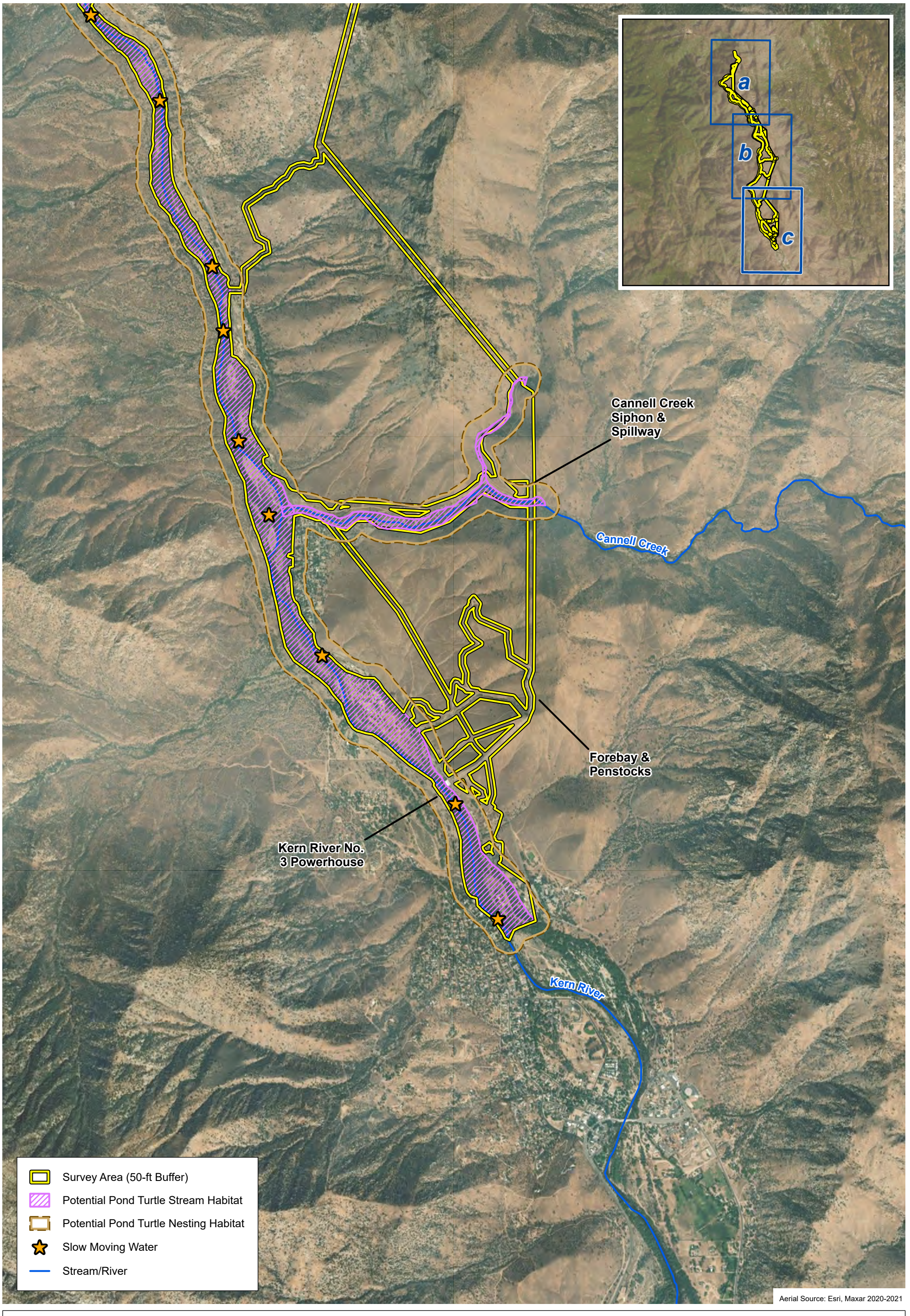
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Potentially Suitable Pond Turtle Habitat

Exhibit 8c

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

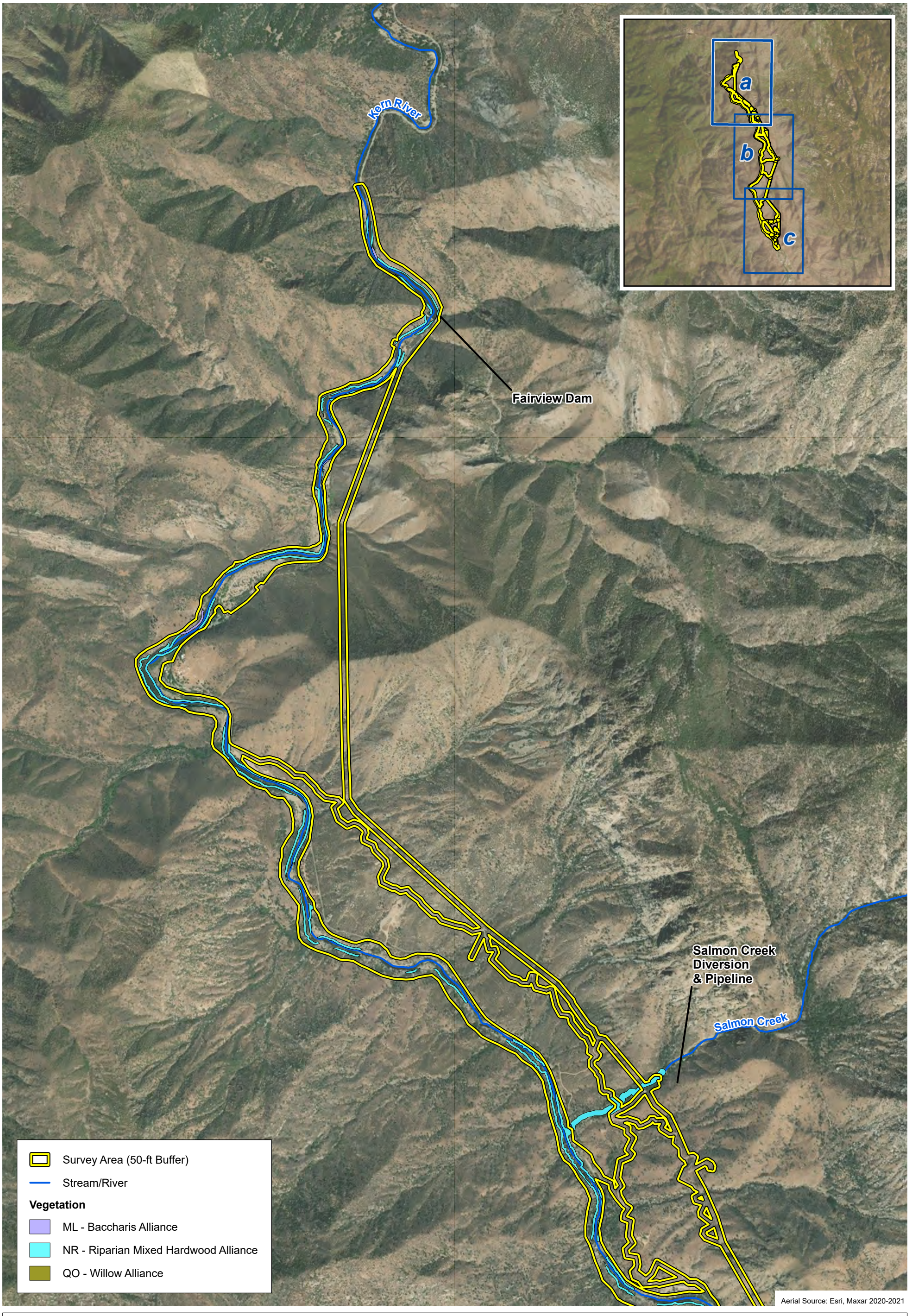
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Potentially Suitable Riparian Bird Habitat

Exhibit 9a

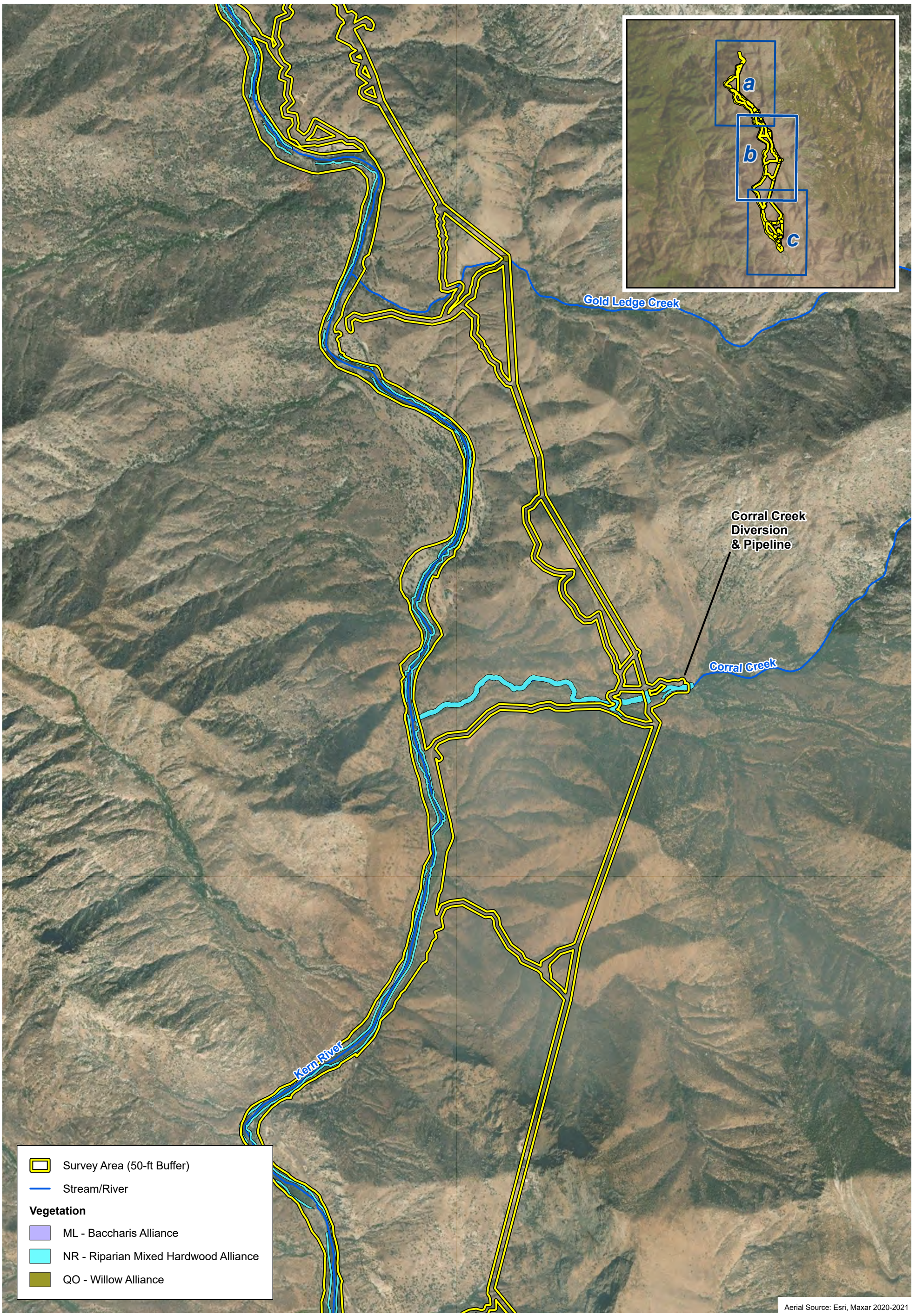
Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

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Potentially Suitable Riparian Bird Habitat

Exhibit 9b

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

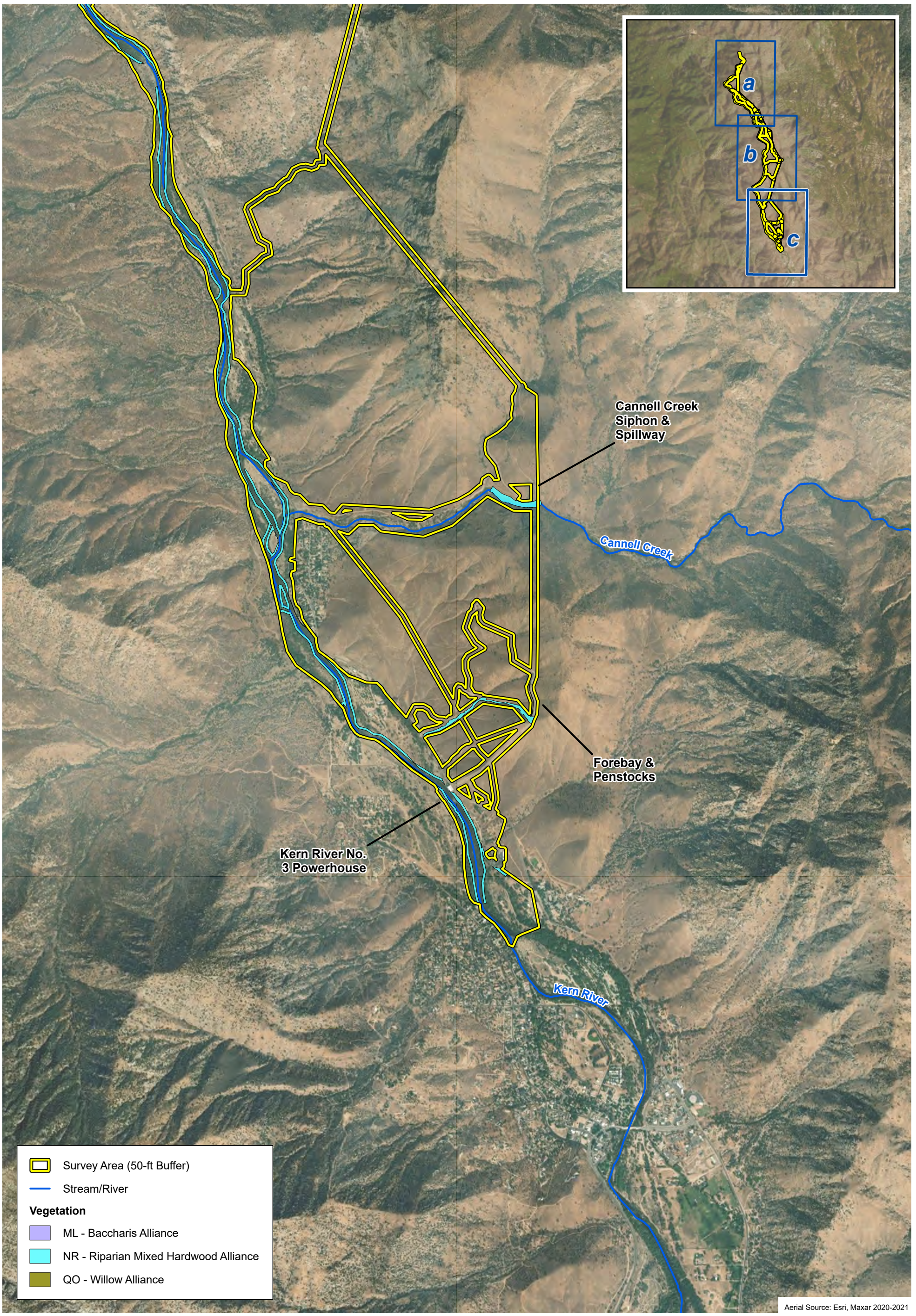
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Potentially Suitable Riparian Bird Habitat

Exhibit 9c

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N W E S

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ATTACHMENT A

REPRESENTATIVE SITE PHOTOS



Photo 1: Kern River in the southern portion of the survey area showing slow moving water potentially suitable for pond turtle.



Photo 2: Kern River in the northern portion of the survey area showing riparian habitat and slow moving water potentially suitable for pond turtle.

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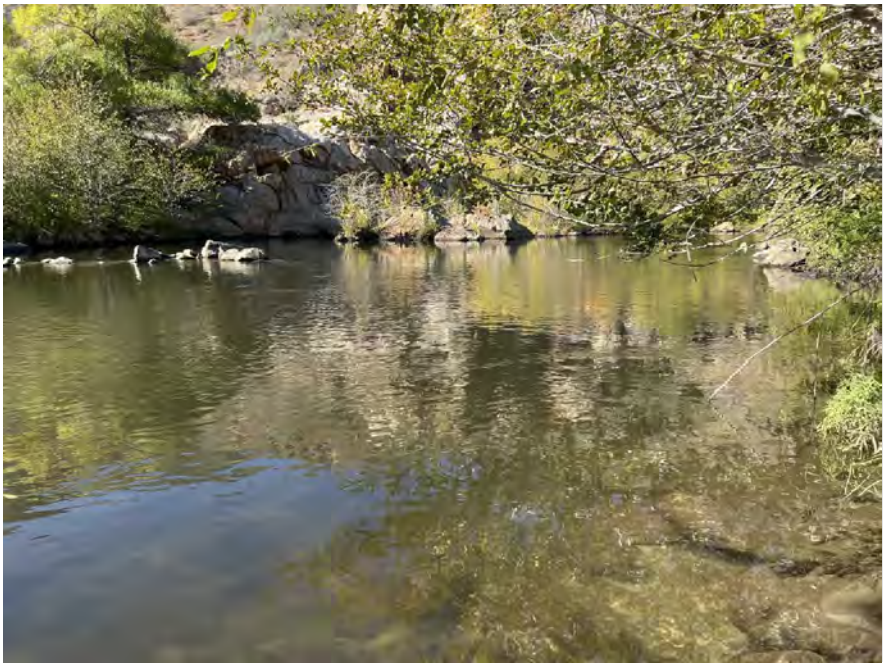


Photo 3: Kern River in the northern portion of the survey area showing slow moving water potentially suitable for pond turtle.



Photo 4: Cannell Creek facing upstream showing riparian habitat.

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Representative Site Photographs

Attachment A-2

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

PSOMAS



Photo 5: Corral Creek facing downstream showing riparian habitat.



Photo 6: Salmon Creek showing riparian habitat and open flume conveying water.

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Photo 7: Cover board placed in upland habitat at Salmon Creek.



Photo 8: Firepit at Salmon Creek, showing human recreational use of the area.

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Photo 9: Packsaddle Canyon facing downstream, Fairview salamander suitable habitat occurs in the shade on the left side of the photo.



Photo 10: View of Fairview Dam facing upstream.

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Photo 11: Confluence of Cannell Creek and Kern River, showing riparian habitat.



Photo 12: Confluence of Salmon Creek and Kern River, showing riparian habitat.

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Photo 13: Confluence of Corral Creek and Kern River, showing riparian habitat.



Photo 14: View of pool in Cannell Creek, suitable pond turtle habitat. Pond turtle was observed basking on a rock at the margin of this pool on August

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Photo 15: View of pool in Cannell Creek, potentially suitable pond turtle habitat.

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ATTACHMENT B

WILDLIFE COMPENDIUM

WILDLIFE SPECIES OBSERVED DURING SURVEYS

Species		Special Status
Scientific Name	**Common Name**	
LIZARDS		
PHRYNOSOMATIDAE – SPINY LIZARD FAMILY		
Sceloporus occidentalis	western fence lizard	
BIRDS		
ANATIDAE – SWAN, GOOSE, AND DUCK FAMILY		
Anas platyrhynchos	mallard	
ODONTOPHORIDAE – NEW WORLD QUAIL FAMILY		
Oreortyx pictus	mountain quail	
Callipepla californica	California quail	
COLUMBIDAE – PIGEON AND DOVE FAMILY		
*Streptopelia decaocto**	Eurasian collared-dove	
Zenaida macroura	mourning dove	
CUCULIDAE – CUCKOO AND ROADRUNNER FAMILY		
Geococcyx californianus	greater roadrunner	
APODIDAE – SWIFT FAMILY		
Aeronautes saxatalis	white-throated swift	
TROCHILIDAE – HUMMINGBIRD FAMILY		
Calypte anna	Anna's hummingbird	
ARDEIDAE – HERON FAMILY		
Ardea herodias	great blue heron	
CATHARTIDAE – NEW WORLD VULTURE FAMILY		
Cathartes aura	turkey vulture	
ACCIPITRIDAE – HAWK FAMILY		
Buteo jamaicensis	red-tailed hawk	
Aquila chrysaetos	golden eagle	FP
ALCEDINIDAE – KINGFISHER FAMILY		
Megaceryle alcyon	belted kingfisher	
PICIDAE – WOODPECKER FAMILY		
Melanerpes formicivorus	acorn woodpecker	
Picoides nuttallii	Nuttall's woodpecker	
Colaptes auratus	northern flicker	
FALCONIDAE – FALCON FAMILY		
Falco sparverius	American kestrel	
TYRANNIDAE – TYRANT FLYCATCHER FAMILY		
Sayornis nigricans	black phoebe	
CORVIDAE – JAY AND CROW FAMILY		
Aphelocoma californica	California scrub-jay	
Corvus corax	common raven	
PARIDAE – TITMOUSE FAMILY		
Poecile gambeli	mountain chickadee	

WILDLIFE SPECIES OBSERVED DURING SURVEYS

Species		Special Status
Scientific Name	**Common Name**	
Baeolophus inornatus	oak titmouse	
AEGITHALIDAE – BUSHTIT FAMILY		
Psaltriparus minimus	bushtit	
TROGLODYTIDAE – WREN FAMILY		
Thryomanes bewickii	Bewick's wren	
TURDIDAE – THRUSH FAMILY		
Catharus guttatus	hermit thrush	
Turdus migratorius	American robin	
MIMIDAE – MOCKINGBIRD AND THRASHER FAMILY		
Mimus polyglottos	northern mockingbird	
STURNIDAE – STARLING FAMILY		
*Sturnus vulgaris**	European starling*	
BOMBYCILLIDAE – WAXWING FAMILY		
Bombycilla cedrorum	cedar waxwing	
PTILOGONATIDAE – SILKY-FLYCATCHER FAMILY		
Phainopepla nitens	phainopepla	
FRINGILLIDAE – FINCH FAMILY		
Haemorhous mexicanus	house finch	
Spinus psaltria	lesser goldfinch	
PASSERELLIDAE – NEW WORLD SPARROW FAMILY		
Junco hyemalis	dark-eyed junco	
Zonotrichia leucophrys	white-crowned sparrow	
Melospiza melodia	song sparrow	
Melozone crissalis	California towhee	
Pipilo maculatus	spotted towhee	
PARULIDAE – WOOD-WARBLER FAMILY		
Setophaga petechia	yellow warbler	SSC
Setophaga coronata	yellow-rumped warbler	
CARDINALIDAE – CARDINALS AND ALLIES		
Piranga ludoviciana	western tanager	
MAMMALS		
SCIURIDAE – SQUIRREL FAMILY		
Sciurus griseus	western gray squirrel	
Otospermophilus beecheyi	California ground squirrel	
FELIDAE – CAT FAMILY		
Lynx rufus	bobcat	
CERVIDAE – CERVID FAMILY		
Odocoileus hemionus	southern mule deer	

* Non-native species

Special Status

State (CDFW)

FP Fully Protected
SSC Species of Special Concern

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APPENDIX B
REPRESENTATIVE SITE PHOTOS

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Photo 1: Fairview salamander #1, located under large flat rock at the base of north facing slope in Packsaddle canyon (Feb. 7, 2023).



Photo 2: Photo showing salamander #1 found location under rock (circled in red).

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Photo 3: Close-up view of habitat where salamander #1 was located in Packsaddle canyon.



Photo 4: Overview of Packsaddle canyon facing upstream from near observation #1 location.

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Photo 5: Close-up view of Fairview salamander #2, located under rock embedded on north facing slope in Packsaddle canyon (April 17, 2023).



Photo 6: View of salamander #2 found location (red circle).

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Photo 7: Overview of salamander #2 found location in foreground (mossy seep) with upstream view of Packsaddle canyon in the background.



Photo 8: Close-up view of Fairview salamander #3, located under small rock at the base of an un-named canyon adjacent to Adit 16/17 (April 17, 2023).



Photo 9: Salamander #3 next to cenimeter ruler. This individual is estimated to measure approximately 1.9 cm snout-to-vent.



Photo 10: Photo showing salamander #3 found location under small rock (circled in red).

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Photo 11: Overview of salamander #3 found location under small rock at base of rock outcrop to the right, with trickle of water flowing to the left.

APPENDIX C
WILDLIFE COMPENDIUM

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Wildlife Species Observed During Surveys

Scientific Name	Common Name	Special Status
AMPHIBIANS		
PLETHODONTIDAE – LUNGLESS SALAMANDER FAMILY		
Batrachoseps bramei	Fairview salamander	FSS
SNAKES		
COLUBRIDAE – COLUBRID SNAKE FAMILY		
Pituophis catenifer	gophersnake	
NATRICIDAE – HARMLESS LIVE-BEARING SNAKE FAMILY		
Thamnophis couchii	Sierra gartersnake	
BIRDS		
COLUMBIDAE – PIGEON AND DOVE FAMILY		
Zenaida macroura	mourning dove	
PANDIONIDAE – OSPREY FAMILY		
Pandion haliaetus	osprey	
ACCIPITRIDAE – HAWK FAMILY		
Aquila chrysaetos	golden eagle	FP
TYRANNIDAE – TYRANT FLYCATCHER FAMILY		
Myiarchus cinerascens	ash-throated flycatcher	
CORVIDAE – JAY AND CROW FAMILY		
Aphelocoma californica	California scrub-jay	
Corvus corax	common raven	
FRINGILLIDAE – FINCH FAMILY		
Spinus psaltria	lesser goldfinch	
PASSERELLIDAE – NEW WORLD SPARROW FAMILY		
Melozone crissalis	California towhee	

Notes:
Species Status:
State (California Department of Fish and Wildlife)
FP=Fully Protected

U.S. Forest Service:
FSS=Forest Service Sensitive

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BIO-3 GENERAL WILDLIFE RESOURCES TECHNICAL MEMORANDUM

KERN RIVER NO. 3 HYDROELECTRIC PROJECT
FERC PROJECT NO. 2290

PREPARED FOR:

SOUTHERN CALIFORNIA EDISON®

Energy for What's Ahead®

KERNVILLE, CALIFORNIA

October 2023

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TABLE OF CONTENTS

Page

1.0 Introduction 1
2.0 Study Goals and Objectives 2
3.0 Study area and Study areas 2
4.0 Methods 5
4.1. Literature Review 5
4.2. Habitat Assessment 5
4.3. Field Surveys 6
4.3.1. Riparian Birds 6
4.3.2. Pedestrian Surveys for general wildlife 7
4.3.3. Trail Camera Surveys 7
5.0 Data Summary 8
5.1. Species Background 8
5.1.1. Western Yellow-Billed Cuckoo 8
5.1.2. Southwestern Willow Flycatcher 10
5.1.3. Least Bell's Vireo 11
5.1.4. California Condor 13
5.1.5. Pacific Fisher West Coast DPS 15
5.2. Field Survey Results 16
5.2.1. Riparian Birds 16
5.2.2. Bats 19
5.2.3. Camera Surveys 22
5.2.4. Additional Observations 22
6.0 Study Specific Consultation 34

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7.0 Outstanding Study Plan Elements 34

8.0 References 34

LIST OF TABLES

Table 5.2-1. Riparian Bird Survey Results 17

Table 5.2-2. Special Status Wildlife Species 23

Table 5.2-3. U.S. Fish and Wildlife Service Bird Species of Conservation Concern 33

LIST OF FIGURES

Figure 3-1. Wildlife Study Area. 4

LIST OF APPENDICES

Appendix A Site Photographs

Appendix B Wildlife Compendium

Appendix C Bat Natural History Summary

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LIST OF ACRONYMS AND ABBREVIATIONS

DPS	Distinct Population Segment
ESA	Endangered Species Act
Fed. Reg.	Federal Register
FERC	Federal Energy Regulatory Commission
FSCC	Forest Species of Conservation Concern
KR3	Kern River No. 3
NFKR	North Fork Kern River
Project	Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)
RSP	Revised Study Plan
SCE	Southern California Edison
SPD	Study Plan Determination
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service

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1.0 INTRODUCTION

This Technical Report provides the methods and findings of field surveys and literature review associated with the *BIO-3 General Wildlife Resources Study Plan* in support of Southern California Edison's (SCE) Kern River No. 3 (KR3) Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 2290. The BIO-3 Study Plan was included in SCE's Revised Study Plan (RSP) submitted on July 1, 2022 (SCE, 2022). In the October 12, 2022, Study Plan Determination (SPD), FERC approved the BIO-3 Study Plan with modifications. Specifically, FERC recommended SCE do the following:

- Compile existing information on bats using Project facilities, including available information in consultation with the U.S. Forest Service (USFS).

- Modify the study area to include the bypass reaches downstream of Project diversions on Salmon Creek and Corral Creek and downstream of the Cannell Creek spillway to their confluence with the North Fork Kern River (NFKR).

- Modify the habitat suitability assessment phase of the plan to also identify and map any non-breeding habitat potentially used by Endangered Species Act (ESA)-listed species in the study area.

- Provide more information in future study reports on survey methods for each listed species potentially occurring in the Project Area, including but not limited to the following:

  - Describe the number of survey locations, points, and/or transects to be conducted within suitable breeding habitat, including, if applicable, the aggregate length of survey transects.

  - Provide, for each survey location, the duration of time that surveys are conducted, the frequency and duration of playbacks, and the total effort per species (e.g., total time per survey replicate).

  - Describe survey methods in sufficient detail for the Pacific fisher (*Pekania pennanti*), California condor (*Gymnogyps californianus*), and any special-status species identified as potentially affected by continued and proposed operation of the Project, including species-specific methodology, number of survey locations, survey effort (e.g., time, area), information collected (e.g., signs, habitat data), etc.

  - Use playback surveys for least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), and western yellow-billed cuckoo (*Coccyzus americanus occidentalis*).

Data collection efforts were initiated in April 2023 to July 2023 where literature reviews and field surveys for riparian birds (i.e., western yellow-billed cuckoo, southwestern willow flycatcher, and least Bell's vireo), California condor, and Pacific fisher were conducted. All field sampling efforts and data analysis are complete and summarized below.

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2.0 STUDY GOALS AND OBJECTIVES

The objectives of the study, as outlined in BIO-3 Study Plan (SCE, 2022), was to supplement the existing information for the following species and any other special-status wildlife or Forest Species of Conservation Concern (FSCC):

- Western yellow-billed cuckoo
- Southwestern willow flycatcher
- Least Bell's vireo
- California condor
- Pacific fisher

This was done by:

- Identifying and mapping potentially suitable nesting or denning habitat in the study area, and
- Identifying and mapping their presence in the study area.

3.0 STUDY AREA AND STUDY AREAS

The study area includes lands and waters within the FERC Project Boundary in addition to areas adjacent to, or in the proximity of, the FERC Project Boundary along the NFKR and Salmon, Corral, and Cannell Creeks for the purposes of characterization and data collection relevant to understanding Project operations and maintenance activities. The study area is located on U.S. Geological Survey's Fairview and Kernville 7.5-minute topographic quadrangles. Specific study areas are further described below.

The study area (see Figure 3-1) included a 50-foot buffer around the aboveground locations, including:

- Fairview Dam, intake, and sandbox;
- Aboveground sections of the conveyance flowline, including the siphon;
- Fairview Dam Bypass Reach[1] from the river's edge to the outer edge of the riparian strip plus a 50-foot buffer, or to the edge of Mountain Highway 99, whichever is closer;
- Salmon Creek diversion, open flume, Adit 8B-9A, and adjacent access roads;
- Corral Creek diversion, open flume, and the access road;

[1] The Fairview Dam Bypass Reach is defined as the approximately 16-mile bypass reach of the NFKR between Fairview Dam and the KR3 Powerhouse tailrace.

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- Cannell Creek, siphon, and access road;
- Gold Ledge Creek open flume, Adit 13–14, and adjacent access road;
- Pressure flume, forebay, and penstocks;
- Project access roads;
- KR3 Powerhouse and supporting maintenance buildings; and
- The NFKR confluences with Salmon, Gold Ledge, Corral, and Cannell Creeks.

The study area consists of upland vegetation communities in higher terrace areas and riparian in and adjacent to Kern River and select tributaries. Plant community types mapped in the study area consist of annual grasses and forbs, California buckwheat scrub, lower montane mixed chaparral, scrub oak chaparral, upper montane mixed chaparral, wedgeleaf ceanothus chaparral, willow (shrub) alliance, California black oak forest and woodland, canyon live oak woodland, Ponderosa pine forest and woodland, interior live oak alliance, interior live oak woodland and forest, riparian mixed hardwood alliance, and foothill pine woodland.

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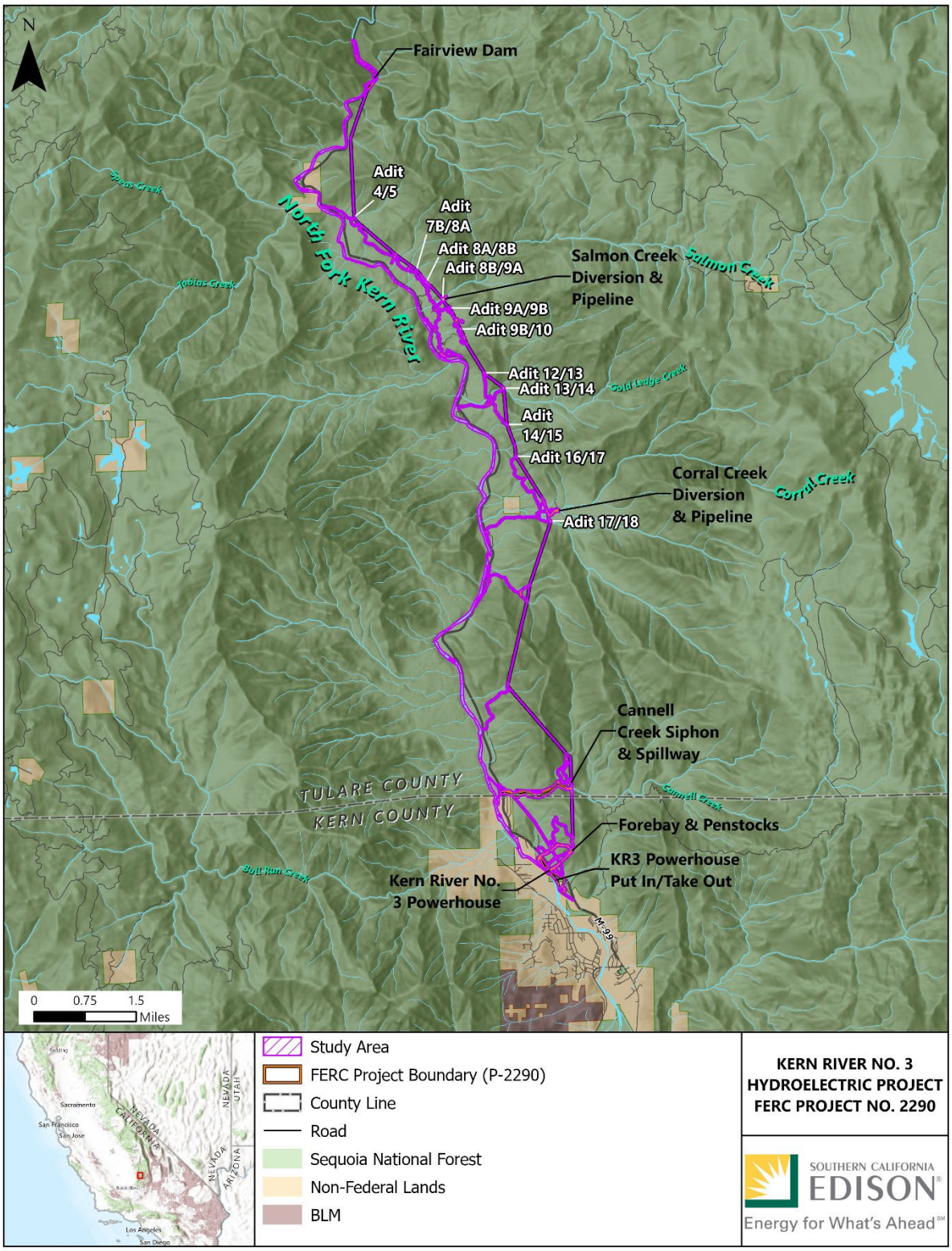


Figure 3-1. Wildlife Study Area.

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4.0 METHODS

Study implementation generally followed the methods described in SCE's RSP (SCE, 2022), and as amended by FERC in their SPD (FERC, 2022), with the exceptions noted below.

Study Plan Variances

FERC recommended to use playback surveys for the lead Bell's vireo in the SPD (FERC, 2022). However, the least Bell's vireo survey protocol does not require the playback of vocalizations. Additionally, per U.S. Fish and Wildlife Service (USFWS; communication with Stacey Love), permits are not issued for playback of least Bell's vireo outside of conducting research and/or pulling them into mist nets for banding. Therefore, recorded least Bell's vireo vocalizations were not used during the surveys.

4.1. LITERATURE REVIEW

A literature review was conducted to determine if any additional special-status wildlife species or FSCC have been identified as having the potential to occur within the study area or in the surrounding Project Vicinity. This review included the study plans as well as previous biological reports prepared for individual projects such as *Southwestern Pond Turtle Observations during Pre-construction Surveys in Support of the KR3 Flowline Roads Improvement Project* (Psomas, 2013a); *Biological Resources Technical Report for the Kern River 3 Sandbox Repair Project* (Psomas, 2013b). The Pre-Application Document for the Project was also reviewed (SCE, 2021).

Museum records, AmphibiaWeb, as well as crowdsourcing platforms (e.g., iNaturalist) were also used during the literature review. In addition, the California Department of Fish and Wildlife's California Natural Diversity Database (CDFW, 2022) was queried for special-status wildlife species for the following U.S. Geological Survey's 7.5-minute topographic quadrangles: Johnsondale, Fairview, Kernville, Tobias Peak, Cannell Peak, Alta Sierra, and Lake Isabella.

The review verified the protective status of any of the previously identified special-status species and reviewed any new literature on the ecology and life history of special-status wildlife species and determine if any bat species have been identified as having the potential to occur within the study area or in the surrounding Project Vicinity.

USFS vegetation alliances were cross-referenced with the criteria for potentially suitable habitat for the above-listed species. Where the criteria for potentially suitable habitat intersect or match the USFS vegetation alliances, those areas were mapped as target areas for field surveys for the above species.

4.2. HABITAT ASSESSMENT

A habitat assessment for ESA-listed birds was conducted in the fall of 2022 concurrently with the habitat assessment for special status salamanders. Biologists walked the study area looking for potentially suitable habitat for special-status wildlife, especially ESA-listed

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riparian birds based on habitat characteristics. Suitable habitat locations were mapped directly onto an iPad with pre-loaded study area maps. Biologists noted any incidental observations of non-native invasive aquatic species (e.g., bullfrog, crayfish, Asian clams, and invasive fishes) and other key species of interest (e.g., special-status freshwater mussels, aquatic reptiles, amphibians, bald eagle [*Haliaeetus leucocephalus*], osprey [*Pandion haliaetus*], great blue heron [*Ardea herodias*], and American dipper [*Cinclus mexicanus*]) on data sheets. The results of the habitat assessment survey were used to target specific areas within the Project that were the subject of Visual Encounter Surveys conducted in 2023.

4.3. FIELD SURVEYS

4.3.1. RIPARIAN BIRDS

Prior to the start of the surveys, field maps created from aerial photographs of each facility at a 1-inch to 200-foot scale were prepared for field use and included any known wildlife occurrences and areas of potentially suitable habitat for special-status wildlife. These field maps were pre-loaded onto an iPad for use in collecting data in the field. Surveys were performed at appropriate times of the year (e.g., nesting season) to maximize the opportunity to observe western yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, California condor, and Pacific fisher as determined by the literature review (USFWS, 1998, 2002; Sogge et al., 2010; Spencer et al., 2016; 85 Fed. Reg. 39 p. 11458).

Per USFWS guidelines, USFWS was notified on April 6, 2023, that Psomas was scheduled to begin non-protocol-level riparian bird surveys related to the Project. During surveys in appropriate riparian habitat, playback vocalizations were played for western yellow-billed cuckoo and southwestern willow flycatcher. As the least Bell's vireo survey protocol does not require the playback of least Bell's vireo vocalizations, recorded least Bell's vireo vocalizations were not used during the surveys.

Psomas Senior Biologist Lindsay Messett (USFWS Permit No. TE 067064-6) conducted all riparian bird surveys, looking specifically for western yellow-billed cuckoo, southwestern willow flycatcher, and least Bell's vireo. Psomas Biologist Sarah Thomas assisted on all surveys. Surveys were conducted on May 15, 16, 17, 18, June 21, 22, 23, and July 10, 11, and 12, 2023. The two Psomas biologists systematically surveyed by walking slowly and methodically along the margins of all riparian habitats, using meandering transects through the areas with wider riparian corridors in the survey area. Generally following the USFWS survey protocol for western yellow-billed cuckoo, Ms. Messett played recorded contact or "kowlp" calls five times at 1-minute intervals at various points throughout the survey area. Compact speakers capable of broadcasting recorded bird calls in excess of 70 decibels were used during all surveys. Upon arriving at each calling point, Ms. Messett and Ms. Thomas listened and watched for cuckoos for 1 minute prior to playing the broadcast contact calls. Calling points were established approximately every 300 feet in riparian habitat that provided potentially suitable habitat for the western yellow-billed cuckoo. Generally following the southwestern willow flycatcher protocol, recorded vocalizations were also used to elicit a response from any potentially territorial

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southwestern willow flycatchers. If no southwestern willow flycatchers were detected after the initial playing of the recorded vocalization, Ms. Messett occasionally replayed the recording depending on site conditions. As the least Bell's vireo survey protocol does not require the playback of least Bell's vireo vocalizations, recorded least Bell's vireo vocalizations were not used during the surveys. Any western yellow-billed cuckoo, southwestern willow flycatcher, or least Bell's vireo detected were recorded with a Global Positioning System (GPS) unit (i.e., Garmin Vista) or an iPad. Representative riparian habitat photographs were taken and are included in Appendix A, Site Photographs.

All surveys were conducted under optimal weather conditions and during early morning hours when bird activity is at its peak. All bird species detected during the surveys were recorded, including notable observations of special-status species or other birds (e.g., brown-headed cowbird [*Molothrus ater*]).

4.3.2. Pedestrian Surveys for General Wildlife

Biologists performed pedestrian surveys within the wildlife study area defined above to: (1) ground-truth the potentially suitable habitat maps developed during the literature review and (2) document any wildlife observations, including additional special-status species California condor and Pacific fisher. Pedestrian surveys were performed with binoculars to directly observe wildlife. Access roads were driven slowly in teams of two, with one biologist acting as an observer. Access roads were walked in areas of representative habitat. Active searches for reptiles and amphibians were conducted. Methods included lifting, overturning, and carefully replacing objects such as rocks, boards, and debris. Cover boards (Strain et al., 2009; Grover, 2006) were placed throughout the study area during Phase 1 of special-status salamander surveys and were checked for salamanders and other amphibians and reptiles during general wildlife surveys. Evening spot-lighting surveys were undertaken as road/safety conditions allow.

Biologists searched for signs of bats (staining on walls and guano piles) at the KR3 Powerhouse and associated out buildings. No sign of bat occupation was detected during the habitat assessment; therefore, acoustic surveys were not performed.

All wildlife species observed including special-status species and non-native invasive species were recorded in field notes and their location mapped onto an iPad. A complete list of wildlife species observed during the surveys is included in Appendix B, Wildlife Compendium.

4.3.3. Trail Camera Surveys

Biologists installed two trail cameras at locations likely to capture wildlife—specifically Pacific fisher—that may not be observable during pedestrian surveys. All cameras were able to take night photographs and video. Cameras were checked and memory cards were replaced during each survey visit in May, June, and July.

Cameras will be deployed for 1 to 2 years. Memory cards will be replaced every 6 months to download photos and document wildlife captured on camera. Camera placement will be reassessed after reviewing the second round of data.

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5.0 DATA SUMMARY

5.1. SPECIES BACKGROUND

5.1.1. WESTERN YELLOW-BILLED CUCKOO

Western yellow-billed cuckoo (Distinct Population Segment [DPS]) is a federally and state-listed endangered species. The USFWS concluded that the western population was discrete from the eastern population based on geographic separation during the breeding season, morphological differences, and behavioral differences (USFWS, 2014a, 2014b). The western yellow-billed cuckoo generally occurs west of the crest of the Rocky Mountains, specifically in southwest British Columbia in Canada; Washington, Idaho, western Montana, Oregon, California, Nevada, southwestern Wyoming, Utah, western Colorado, Arizona, western New Mexico, and Texas in the United States; and Baja California Sur, Sonora, Sinaloa, western Chihuahua, and northwestern Durango in Mexico (USFWS 2014b). It winters in South America east of the Andes, primarily south of the Amazon Basin in southern Brazil, Paraguay, Uruguay, eastern Bolivia, and northern Argentina (Ehrlich, et al. 1992; American Ornithologists' Union, 1998; Johnson et al., 2008). The western yellow-billed cuckoo arrives in southern California between late May and early July, with most arriving in mid-June; it departs for its wintering grounds from mid-September to mid-October (Halterman et al., 2015). The peak of breeding activity lasts about 1 month and is typically in July; but in some years it can begin as early as May and can end as late as September (Laymon et al., 1997; Halterman, 1991, 2009; McNeil et al., 2013; Halterman et al., 2015).

The western yellow-billed cuckoo requires large tracts of riparian forest or woodland habitat along low-gradient rivers and streams in open riverine valleys that provide wide floodplain conditions (USFWS, 2014c). The optimal size of habitat patches for the species is generally greater than 200 acres in extent and has dense canopy closure and high foliage volume of willows and cottonwoods (Laymon and Halterman, 1989). Habitat between 100 acres and 200 acres, although considered suitable, are not consistently used by the species (Laymon and Halterman, 1989). Habitat patches from 50 to 100 acres in size are considered marginal habitat; sites less than 37 acres are considered unsuitable habitat (Laymon and Halterman, 1989). The species does not use narrow, steep-walled canyons (USFWS, 2014c). Sites with strips of habitat less than 325 feet in width are rarely occupied for nesting (USFWS, 2014c). Stopover and foraging sites can be similar to breeding sites but can be smaller in size (sometimes less than 10 acres in extent), narrower in width, and lack understory vegetation when compared to nesting sites (Laymon and Halterman, 1989; USFWS, 2014c). Minimum patch size for cuckoo occupancy is 12.4 acres; no cuckoos have been detected attempting to nest in patches this size or smaller in California or Arizona (Halterman et al., 2001; Johnson et al., 2010). They have also not been found nesting in narrow, linear habitat that is less than 33 to 66 feet wide (Halterman et al., 2015).

Optimal breeding habitat contains willow-dominated groves with dense canopy closure and well-foliaged branches for nest building with nearby foraging areas consisting of a mixture of cottonwoods and willows with a high volume of healthy foliage (USFWS,

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2014c). Sites can be relatively dense, contiguous stands or irregularly shaped mosaics of dense vegetation with open areas (USFWS, 2014c). In California, habitat often consists of willows mixed with Fremont cottonwood (Halterman et al., 2015). Nest trees range from 10 feet to 98 feet in height and are an average of 35 feet in height. Nests are typically well-concealed in dense vegetation (Halterman, 2002; Laymon et al., 1997; McNeil, et al. 2013). Hydrologic conditions can vary from dry in some years to inundated in others (USFWS, 2014c). Humid conditions created by surface and subsurface moisture appear to be important habitat parameters for selection of nest sites (USFWS, 2014c). Multiple studies have found that cuckoo preferred nesting sites in younger riparian habitat that, when compared to mature woodlands, provided high productivity of invertebrate prey and reduced predator abundance (Layman, 1998; McNeil et al., 2013; Carstensen et al., 2015; Stanek and Stanek, 2012; Johnson et al., 2008). The dynamic transitional process of vegetation recruitment and maturity must be maintained to keep riparian habitat viable for this species over the long-term (USFWS, 2014b).

Western yellow-billed cuckoos historically bred throughout riparian systems in western North America from southern British Columbia, Canada, to northwestern Mexico (Hughes, 1999). In the past 90 years, the species' range in the western United States has contracted; the northern limit of breeding along the west coast is now in the Sacramento Valley, while the breeding limit in the western interior states is in southeastern Idaho (USFWS, 2013). Within the three states with the highest historical number of yellow-billed cuckoo, past riparian habitat losses are estimated to be 90 to 95 percent in Arizona, 90 percent in New Mexico, and 90 to 99 percent in California (Ohmart, 1994; USDOI, 1994; Noss et al., 1995; Greco, 2008). The primary factors threatening the western yellow-billed cuckoo are the loss and degradation of habitat for the species from altered watercourse hydrology and natural stream processes, livestock overgrazing, encroachment from agriculture, and conversion of native habitat to predominantly non-native vegetation. Additional threats to the species include the effects of climate change, pesticides, wildfire, and small and widely separated habitat patches (USFWS, 2014b). Compared to conditions historically, the areas currently used for nesting by the western yellow-billed cuckoo are very limited and disjunct. The breeding population is small, with 680 to 1,025 nesting pairs (350 to 495 pairs in the United States and 330 to 530 nesting pairs in Mexico) and with no site exceeding 60 nesting pairs. Estimating numbers is problematic because an individual can nest in more than one location in a single year, possibly causing overestimates of the number of nesting pairs (USFWS, 2014c). The current nesting population in California, based on surveys conducted in 2010, likely does not exceed 40 to 50 pairs found in only the three core locations. Core areas in California include (1) the Sacramento River between Colusa and Red Bluff, (2) the South Fork of the Kern River upstream of Lake Isabella, and (3) lower Colorado River (Laymon and Halterman, 1987).

This species formerly nested in the Los Angeles, San Gabriel, and the Santa Clara River systems (Allen and Garrett, 1996). Breeding persisted until at least 1952 in the San Gabriel River near El Monte (Long, 1993; Garrett and Dunn, 1981). No nesting of this species has been documented in Los Angeles County since the late 1950s, although breeding is still "conceivable" in remnant riparian habitat along the Santa Clara River (Allen and Garrett, 1996). In recent years, yellow-billed cuckoos occur in Los Angeles

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County and elsewhere in the southern California coastal region only as rare migrants (Lehman, 2022; Unitt, 2004; Hamilton and Willick, 1996; Garrett and Dunn ,1981; Webster et al., 1980). Although no recent breeding observations have been confirmed in the southern California coastal region, multiple observations of yellow-billed cuckoos have been reported at some locations with suitable breeding habitat, including the lower Santa Clara River in Ventura County, the Whittier Narrows area in Los Angeles County, Prado Basin in Riverside and San Bernardino Counties, San Joaquin Marsh in Orange County, and San Luis Rey River near Oceanside in San Diego County. These observations generally consist of single birds and sometimes occur at times that suggest summering individuals rather than migrants (McCaskie and Garrett, 2013, 2014, 2015, 2016).

On August 15, 2014, the USFWS published a rule designating proposed critical habitat for the western DPS of the yellow-billed cuckoo (USFWS, 2014c). This proposed rule designated approximately 546,335 acres in Arizona, California, Colorado, Idaho, Nevada, New Mexico, Texas, Utah, and Wyoming. In California, proposed critical habitat includes Eel River (Humboldt County), Sacramento River (Colusa, Glenn, Butte, and Tehama Counties), Sutter Bypass (Sutter County), South Fork Kern River Valley (Kern County), Owens River (Inyo County), and Prado Flood Control Basin (Riverside County) and in two areas along the Colorado River (Imperial, Riverside, and San Bernardino Counties in California; Yuma, La Paz, and Mojave Counties in Arizona) (USFWS, 2014c). This proposed rule has not yet been finalized by the USFWS. The Project is not located within the proposed designated critical habitat area for this species.

5.1.2. SOUTHWESTERN WILLOW FLYCATCHER

Southwestern willow flycatcher is a federally and state-listed endangered species. It is one of four subspecies of the willow flycatcher (*Empidonax traillii*) (Sedgwick, 2000); the breeding range of the southwestern willow flycatcher includes southern California, southern Nevada, southern Utah, Arizona, New Mexico, western Texas, and extreme northwestern Mexico (i.e., Baja California del Norte, Sonora, and Chihuahua) (USFWS, 2002). The winter range of the southwestern willow flycatcher includes the tropical regions of southern Mexico, Central America, and northern South America (Sogge et al., 2010).

The southwestern willow flycatcher arrives in southern California in mid-May and departs for its wintering grounds in late July to mid-September. The spring migration of southwestern willow flycatcher is earlier than that of the northern subspecies of willow flycatchers (Unitt, 1984; 58 Fed. Reg. 140 p. 39495). As a result, the presence of more abundant subspecies that migrate through the range of the southwestern willow flycatcher during its breeding season complicates surveys for nesting southwestern willow flycatchers. Similarly, the other subspecies may pass through southern California during their fall migration in July and August while the southwestern willow flycatcher is still breeding; therefore, there is only a short period from June 15 to July 20 when the presence of a willow flycatcher in southern California can be determined to be southwestern subspecies of the willow flycatcher (USFWS, 2002).

The southwestern willow flycatcher occurs in dense riparian habitat along rivers, streams, and other wetlands. Typically, southwestern willow flycatcher nests in thickets of trees

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and shrubs 13 to 23 feet or greater in height, with a dense understory and a high percentage of canopy cover (60 Fed. Reg. 38 p. 10694). The dense patches are often interspersed with small openings, open water, or small areas of shorter/sparse vegetation that create a mosaic of habitat that is not uniformly dense (USFWS, 2002). In almost all cases, slow-moving or still surface water and/or saturated soil is present during wet or non-drought years (USFWS, 2002). Plant species composition of low to mid-elevation sites ranges from monotypic stands to mixtures of broadleaf trees and shrubs including willows, cottonwoods, coast live oak, ash (*Fraxinus* sp.), alder (*Alnus* sp.), blackberry (*Rubus* sp.), and nettle (*Urtica* sp.) (USFWS, 2002). They can also nest in riparian habitats dominated by a mix of native and introduced species, such as Russian olive (*Elaeagnus angustifolia*) and tamarisk (*Tamarix* sp.) or in monotypic stands of these introduced species; however, southwestern willow flycatchers rarely nest in giant reed (*Arundo donax*) (USFWS, 2002). Overall, nest site selection appears to be driven more by plant structure than species composition (Sogge et al., 2010).

In California, the southwestern willow flycatcher was once considered common in all lower elevation riparian areas in the southern third of the state including the Los Angeles Basin, Riverside/San Bernardino area, and San Diego County (Wheelock, 1912; Willett, 1912; Grinnell and Miller, 1944; Unitt, 1984, 1987). The primary cause of the southwestern willow flycatcher's decline is the loss and modification of riparian habitat (USFWS, 2002). With the increase in urbanization and agricultural development, these systems have declined or have been further degraded by reduction in water flow, interruption of the natural hydrogeological events or cycles, physical modifications to streams, removal of riparian vegetation, invasion by non-native invasive plant species, livestock grazing, and recreation (USFWS, 2002). Additionally, agriculture and certain other types of development can increase foraging habitat for brown-headed cowbirds in proximity to southwestern willow flycatcher breeding habitat, which can increase nest parasitism (USFWS, 2002). Flycatcher habitat and their populations are threatened further with additional stressors such as introductions of tamarisk leaf beetle (*Diorahbda carninulata*), which defoliates tamarisk, and shot hole borer beetle (*Euwallacea* sp.)/Fusarium (*Fusarium euwallaceae*), a beetle/fungi complex that causes tree die-off (USFWS, 2017). All of these threats to the flycatcher and its habitat vary in severity over the southwest; and, at any given location, multiple stressors are likely to be at work, with cumulative and synergistic effects (USFWS, 2017).

On January 3, 2013, the USFWS published a Revised Final Critical Habitat for the southwestern willow flycatcher (USFWS, 2013). This final rule designated 208,973 acres (1,227 stream miles) in 24 Management Units on a combination of federal, state, Tribal, and private lands in California, Nevada, Utah, Arizona, and New Mexico. In California, critical habitat was designated in Inyo, Kern, Los Angeles, Riverside, Santa Barbara, San Bernardino, San Diego, and Ventura Counties. The Project is not located within the 2013 Revised Critical Habitat for the southwestern willow flycatcher.

5.1.3. LEAST BELL'S VIREO

Least Bell's vireo is a federally and state-listed endangered species. It is one of four subspecies of the Bell's vireo (*Vireo bellii*); this subspecies is the westernmost of the four

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subspecies, breeding entirely in southwestern California and northwestern Baja California, Mexico. Although not well known, the winter range of the least Bell's vireo is believed to be the west coast of Central America from southern Sonora, Mexico, south to northwestern Nicaragua, including the cape region of Baja California, Mexico (Brown, 1993). The least Bell's vireo arrives in southern California from mid-March to early April and departs for its wintering grounds in August to mid-September.

The least Bell's vireo is a small, gray migratory songbird that is about 4.5 to 5 inches long. It has short, rounded wings and a short, straight bill for catching insects. Feathers are gray above and pale below. "The least Bell's vireo is easily recognized on the breeding grounds by its distinctive song" (Coues, 1903). Males establish and defend territories through counter-singing, chasing, and sometimes physically confronting neighboring males (USFWS, 1998).

Least Bell's vireos consume a "wide variety of insects including bugs, beetles, grasshoppers, moths, and particularly caterpillars" (Chapin, 1925; Bent, 1940). They obtain prey through foliage gleaning (i.e., picking prey from leaves or bark) and through hovering (i.e., removing prey from vegetation surfaces while fluttering in the air) (Salata, 1983; Miner, 1989). Vireos will forage in all layers of the canopy but tend to concentrate their foraging in the lower to mid-strata from 9 to 18 feet in height (Miner, 1989). Vireos forage in both riparian and adjacent upland habitat (Salata, 1983; Kus and Miner, 1987).

The least Bell's vireo is an obligate riparian species (i.e., nests exclusively in riparian habitat) and prefers early-successional habitat. On its breeding grounds, it typically inhabits structurally diverse woodlands along watercourses. In California, least Bell's vireo habitat consists of southern willow scrub, mule fat scrub, sycamore alluvial woodland, coast live oak riparian forest, arroyo willow riparian forest, and cottonwood bottomland forest (Faber et al., 1989). Although least Bell's vireos typically nest in willow-dominated areas, plant species composition does not appear to be as important in nest site selection as habitat structure (USFWS, 1998). The most critical factor in habitat structure is the presence of a dense understory shrub layer from approximately 3 to 6 feet aboveground, where nests are typically placed, and a dense stratified canopy for foraging (Goldwasser, 1981; Gray and Greaves, 1981; Salata, 1981, 1983; RECON, 1989). This structure is typically met by willows that are between 4 and 10 years of age (RECON, 1988; Franzreb, 1989). As stands mature, the tall canopy tends to shade out the shrub layer, making the sites less suitable for nesting; however, least Bell's vireos will continue to use such areas if patches of understory exist (USFWS, 1998). Vireo nest placement tends to occur in openings and along the riparian edge, where exposure to sunlight allows the development of shrubs (USFWS, 1998). The riparian ecosystems required by the vireo are dynamic systems; and the scouring of vegetation during periodic floods is required to create the low, dense vegetation favored by the bird (51 Fed. Reg. 85 p. 16474).

Males arrive on the breeding grounds about 1 week prior to females, and older birds arrive before first-year birds. Pair formation occurs within a few days, and pairs build a nest together over the next 4 to 5 days. The typical clutch size for least Bell's vireo is four eggs, which are incubated for approximately 14 days. The young remain in the nest for

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approximately 10 to 12 days. Adults continue to care for the young for at least 2 weeks post-fledging, as the family groups forage over larger areas. The largest causes of least Bell's vireo nest failure are nest parasitism by brown-headed cowbird and egg predation; nests also fail due to vegetation clearing, trampling by humans and cattle, ant infestations, and rainstorms. Least Bell's vireo will make up to five nesting attempts per season, assuming adequate energy resources; typically, a pair will successfully fledge young from one to two nests per season. Few nests are initiated after mid-July (USFWS, 1998). The least Bell's vireo often shows a strong site fidelity, returning not just to the same drainage and the same territory but even to the same tree where it previously nested. However, vireos may move locations due to habitat loss or failure to attract a mate (USFWS, 1998).

The least Bell's vireo was formerly considered a common breeder in riparian habitats throughout the Central Valley and other low-elevation riverine systems throughout California and Baja California, Mexico (USFWS, 1998). At the time of its listing, the least Bell's vireo had been eliminated from 95 percent of its former range (51 Fed. Reg. 85 p. 16474). The decline of least Bell's vireo is attributed to the widespread loss of riparian woodlands coupled with the increase in brown-headed cowbirds (51 Fed. Reg. 85 p. 16474). Loss of riparian habitat has been attributed to flood control and water development projects, agricultural development, livestock grazing, spread of invasive exotic plant species, degradation of habitat by off-road vehicles, and urban development. With the implementation of intensive brown-headed cowbird management programs, the least Bell's vireo numbers have dramatically increased (USFWS, 1998). Vireos have also expanded their range into areas where they were formerly extirpated.

On February 2, 1994, the USFWS issued their final determination of critical habitat for the least Bell's vireo, identifying approximately 37,560 acres as critical habitat in Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, and San Diego Counties (59 Fed. Reg. 22 p. 4845). The Project is not located in designated critical habitat for this species.

5.1.4. California Condor

The California condor is a federally and state-listed endangered species. It has broad habitat and climatic tolerances. Suitable habitat for the condor includes adequate food supply, open areas to locate food, and reliable air movements to allow for extending soaring (Bloom, 2009). Foraging habitat consists of vast expanses of open savannah and grassland, including potreros (cattle ranches or pastures) within chaparral with cliffs, large trees, and snags that are often separated by far distances from the nesting sites. Roosting habitat is located near important foraging grounds, often near a previously discovered carcass. Nesting habitat ranges from chaparral to forested montane regions, including redwood forests. The California condor nests in caves, crevices, and large ledges on high sandstone cliffs. Expending very little energy, these scavengers soar on thermal updrafts and wind currents until they spot potential food sources. Breeding birds typically forage within 31 to 43.5 miles) of their nesting areas, with core foraging areas ranging from 2,500 to 2,800 square kilometers (970 to 1,100 square miles) (Bloom, 2009).

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In the early 1980s, the total population for this species was estimated at fewer than 20 individuals. By the end of 1986, all but two condors had been taken into captivity. On April 19, 1987, the last wild condor was captured and taken to the San Diego Wild Animal Park (Bloom, 2009). Decline of this species has been attributed to many factors, including reduction or modification of foraging habitat, decrease in available food, disturbance around nest sites, shooting, poisoning, pesticide residues, and general senescence (growing old; aging) of the species (Garrett and Dunn, 1981). A captive breeding program was initiated, and birds have since been reintroduced into the wild at the Sespe Reserve, at Big Sur, and in the Grand Canyon. Currently, there are over 400 condors in the world population (both captive and wild), 128 of whom are in California (CDFW, 2015). Due to the combination of captive breeding and limited wild nest reproduction, the condor population is steadily increasing (Bloom, 2009). In more recent years, the greatest cause of death is believed to be lead poisoning from eating carcasses with lead shot in them. Most recently, the California has enacted the Ridley-Tree Condor Preservation Act, which bans lead shot ammunition within the range of the California condor (Bloom, 2009).

Nesting California condors, prior to the use of radio telemetry in the wild, were not known to travel more than 50 to 75 kilometers (31 to 43.5 miles) from an active nest. As opportunistic scavengers, California condors may travel tremendous distances in search of food (Bloom, 2009); in some instances, they can travel up to 225 kilometers (about 140 miles; Meretsky and Snyder, 1992). As a resident, non-migratory species, the California condor has the largest home range of any terrestrial bird in North America studied to date.

Condors apparently avoid valley floors for foraging; they rarely fly over valley floor habitat and almost never land there (Bloom, 2009). By example, from 1982 to 1987, no condors with transmitters were known to cross the Central Valley. Instead, all birds followed the foothills and mountains surrounding the valley floor to move from the Sierra Nevada foothills to the Coast Ranges and back. Observations of flying condors prior to 1987 indicate that, on the few instances that they were known to have flown over valley floor habitat the birds were usually flying high over the landscape, probably at an altitude of over 1,000 feet. During these flights, the condors rarely, if ever, landed and their movements appeared transitory.

The closest recorded occurrence of a condor is approximately 30 miles northeast of the northern end of the study area. This occurrence is historical from 1978 at the Blue Ridge Condor Area. The most recent recorded occurrence of a condor in the vicinity of the study area is from 2013 and is approximately 50 miles south on Tejon Ranch. Based on habitat requirements for nesting, the California condor is not expected to breed in the study area. Marginal foraging habitat occurs on the Project. Potentially suitable foraging habitat occurs in the grassland areas in the southern portion of the study area.

On September 24, 1976, the USFWS designated critical habitat for the condor consisting of 9 areas that encompass approximately 600,000 acres (41 Fed. Reg. 187 p.41914). These areas occur in the following counties: Tulare, San Luis Obispo, Ventura, Kern, Santa Barbara, and Los Angeles. The Sespe-Piru, Matilija, Sisquoc-San Rafael, and Hi Mountain-Beartrap condor areas were considered critical for nesting and related

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year-long activity and the Mt. Pinos and Blue Ridge condor areas were considered critical for roosting. Tejon Ranch, Kern County rangelands, and Tulare County rangelands were considered important for feeding and related activities. Tejon Ranch and the Bitter Creek Wildlife Refuge were considered to be important because they contained the only significant feeding habitat remaining in close proximity to the Sespe-Piru condor nesting area (41 Fed. Reg. 187 p.41914). The Project is not located within designated critical habitat for this species.

5.1.5. PACIFIC FISHER WEST COAST DPS

The fisher is a medium-sized forest-dwelling carnivore whose primary habitat in the western United States is dense coniferous forest, usually with a deciduous component and abundant physical structure in the form of large trees, snags, and logs (Zielinski et al., 2013). The southern Sierra Nevada DPS of the fisher is an isolated population in the southern Sierra Nevada. In the Project region, USFWS proposed critical habitat occurs east of the Project Area in the Kern Plateau (Unit 1); and west of the Project Area in the southwestern tip of the Sierra Nevada and Greenhorn Mountains—between the Kern River and Bear Creek in the Tule River watershed (Unit 2) (USFWS, 2022). No proposed critical habitat occurs in the Project Area. Fisher has not been documented in the Project Area (CDFW, 2023).

The USFWS-proposed critical habitat units were determined based on modeled suitable, high-quality denning habitat[2] that includes intermixed foraging and dispersal areas. Female fishers have the strictest habitat requirements, and they raise their young alone; therefore, maintaining and increasing carrying capacity for breeding females is essential to sustaining and recovering the fisher population (Spencer et al., 2016). Denning habitat used by females to raise young appears to be a subset of resting habitat (used by both sexes year-round) and is restricted to forest stands with dense canopy cover (greater than 60 percent), structural diversity, large trees, and a moderate intermix with black oaks (*Quercus kelloggii*). Resting typically occurs in the largest available live trees (e.g., conifers greater than or equal to 35 inches and hardwoods greater than or equal to 25 inches), snags, or logs that provide cavities, platforms, or other deformities used by resting fishers (USFWS, 2022, Spencer et al., 2016).

In addition to core denning habitat, the Conservation Biology Institute's southern Sierra Nevada Fisher Conservation Strategy (Spencer et al., 2016) identifies least risky potential linkages based on expert assumptions about fisher dispersal relative to vegetation, terrain, and other factors used by fisher to disperse between critical habitat units. Linkages identified by the institute are not included in USFWS proposed critical habitat (USFWS, 2022, Spencer et al., 2016). Genetic analyses suggest that female fishers primarily disperse through dense forest stands with large trees; however, fisher experts expect that shrubs (e.g., chaparral) may provide sufficient hiding and escape cover for dispersing male fishers in non-forested portions of linkage areas (Spencer et al., 2016). The closest identified linkage (linking Critical Habitat Units 1 and 2) occurs approximately

[2] Such habitat provides structural features for birthing kits, raising kits, protection from adverse weather conditions, facilitation of safe movement, sites to rest and thermoregulate, foraging opportunities, and cover to reduce predation risk for adults and young (USFWS, 2022).

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12 miles north of the Project and crosses Kern River (Spencer et al., 2016). No identified linkages occur in the Project Area.

On the Project, Salmon Creek diversion, Corral Creek diversion, and forested areas adjacent to Kern River may contain marginal foraging and resting habitat for dispersing fisher from Critical Habitat Unit 1 east of the Project. These areas contain riparian habitat with high canopy cover (mostly greater than 60 percent) that fisher require for movement. Dens are primarily in mixed-coniferous and coniferous-hardwood stands with dense canopy cover, a moderate intermix of California black oaks, on steep slopes (approximately 20 to 50 percent slopes)—habitat elements lacking on the Project.

5.2. FIELD SURVEY RESULTS

5.2.1. RIPARIAN BIRDS

No western yellow-billed cuckoo, southwestern willow flycatcher or least Bell's vireo were observed or detected in the survey area during the non-protocol surveys. A summary of the riparian bird survey data is presented below in Table 5.2-1.

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Table 5.2-1. Riparian Bird Survey Results

Survey Number	Date	Survey Area	Time (Start/End)	Surveyor	Weather Conditions			Special-Status Riparian Bird Species Observed or Detected
					Temperature (°F) (Start/End)	Wind (mph) (Start/End)	Cloud Cover (%) (Start/End)	
1	May 15, 2023	Kern River	0630/1130	Messett and Thomas	62/87	3–4/3–4	Clear/5	No special-status riparian bird species observed or detected.
1	May 16, 2023	Cannel Creek and Corral Creek	0610/1155	Messett and Thomas	59/83	1–2	5/50	No special-status riparian bird species observed or detected.
1	May 17, 2023	Salmon Creek and Gold Ledge Creek	0630/1140	Messett and Thomas	56/87	1–2/2–3	Clear/Clear	No special-status riparian bird species observed or detected.
1	May 18, 2023	Forebay	0715/0830	Messett and Thomas	63/76	2–3/2–3	Clear/Clear	No special-status riparian bird species observed or detected.
2	June 21, 2023	Salmon Creek and Gold Ledge Creek	0700/1145	Messett and Thomas	65/76	0–1/0–1	Clear/Clear	No special-status riparian bird species observed or detected.
2	June 22, 2023	Corral Creek, Cannel Creek	0700/1230	Messett and Thomas	53/76	0–1/1–2	Clear/Clear	No special-status riparian bird species observed or detected.
2	June 23, 2023	Kern River and Forebay	0700-1135	Messett and Thomas	60/75	0–1/1–2	Clear/Clear	No special-status riparian bird species observed or detected.
3	July 10, 2023	Salmon Creek, Gold Ledge Creek, and Kern River	0615/1200	Messett and Thomas	65/84	0–1/2–3	Clear/Clear	No special-status riparian bird species observed or detected.

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Survey Number	Date	Survey Area	Time (Start/End)	Surveyor	Weather Conditions			Special-Status Riparian Bird Species Observed or Detected
					Temperature (°F) (Start/End)	Wind (mph) (Start/End)	Cloud Cover (%) (Start/End)	
3	July 11, 2023	Corral Creek, Cannel Creek, and Kern River	0605/1150	Messett and Thomas	73/89	2–3/4–5	10/Clear	No special-status riparian bird species observed or detected.
3	July 12, 2023	Forebay and Kern River	0630/1145	Messett and Thomas	74/91	1–2/3–4	10/5	No special-status riparian bird species observed or detected.

% = percent; °F = degrees Fahrenheit; mph = miles per hour

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5.2.2. BATS

No sign of bat roosting was observed in the KR3 Powerhouse and associated out buildings, bridges, overhanging adits, or visible rock crevices along Project access roads. SCE field staff members were consulted during surveys to inquire about any bat observations in any Project facilities. They reported no roosting bat observations on Project facilities in the Project Area.

In general, occurrence data on bats in the Kern River Valley area is lacking (Noel, 2021). Noel (2021) has documented species and seasonal occurrence of bats along the upper and lower Kern River. Noel's (2021) lower Kern River sites were located below the Kern Canyon mouth and extended on the valley floor a distance of approximately 24 miles. The upper Kern River sites were located from Democrat Station, approximately 15 miles below Lake Isabella, to Brush Creek, approximately 18 miles north of the lake. Blood (2023) has museum records for bats in the Project Area. These sources have documented 15 species of bats from two families: Molossidae and Vespertilionidae.

These species include the following Vespertilionids: hoary bat (*Aeorestes cinereus*), pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), big brown bat (*Eptesicus fuscus*), spotted bat (*Euderma maculatum*), western red bat (*Lasiurus frantzii*), California myotis (*Myotis californicus*), western small-footed myotis (*Myotis ciliolabrum*), long-eared myotis (*Myotis evotis*), fringed myotis (*Myotis thysanodes*), long-legged myotis (*Myotis volans*), Yuma myotis (*Myotis yumanensis*), and canyon bat (*Parastrellus hesperus*). Two molossids have been recorded and include western bonneted bat (*Eumops perotis*) and Brazilian free-tailed bat (*Tadarida brasiliensis*).

Corben (2001) surveyed the national forests in California for western red bat. The survey included the lower and upper Kern River. The lower Kern River sites were between Democrat Station and Bodfish along Kern River Canyon Road. The upper Kern River sites started north of Lake Isabella just above where the South Fork of the Kern River joins the lake to above Fairview end Road's End along Mountain Highway 99. The surveys took place on June 6 and 7, 2001. He detected the following species at the lower Kern sites, which were all below Bodfish: pallid bat, big brown bat, California myotis, western small-footed myotis, long-eared myotis, canyon bat, and Brazilian free-tailed bat. At the upper Kern sites, which were all below the Project site, he detected all of the above plus Yuma myotis, Townsend's big-eared bat, hoary bat, western red bat, and *western bonneted bat*.

Of the above, fringed myotis and Townsend's big-eared bat are Sequoia National FSCC.

The following species are California Species of Special Concern: pallid bat, Townsend's big-eared bat, spotted bat, western red bat, and western bonneted bat.

Based on these studies it appears that at least 15 species of bats occur, at least seasonally, along the Kern River. Brief biological sketches of each species are Found in Appendix C, Bat Natural History Summary.

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Family Vespertilionidae

Hoary bat: Occurrence in Study Area: The hoary bat was recorded by Noel (2021) from the upper Kern River sites in both summer and winter. The hoary bat was recorded more often at the lower Kern River sites. Corben (2001) recorded this species from the upper Kern River site which is 1 mile south of Camp 3.

Pallid bat: Occurrence in Study Area: Noel (2021) demonstrated that the pallid bat only occurs in the Central Valley floor outside and below the Kern River Valley and so is not a species to be considered further with regard to the relicensing of the Project. Corben (2001) also only recoded the pallid bat at the lower Kern River sites.

Townsend's big-eared bat: Occurrence in Study Area: Noel (2021) did not record Townsend's big-eared bat as part of the study. Corben (2001) recorded Townsend's big-eared bat in the upper Kern River site at the northeast corner of Lake Isabella.

Big brown bat: Occurrence in Study Area: Noel (2021) recorded the big brown bat in winter and summer from the upper Kern River site, but like the hoary bat, it was recorded more often at the lower Kern River sites. Corben (2001) recorded the big brown bat at the lower and upper Kern River sites.

Spotted bat: Occurrence in Study Area: Noel (2021) recorded this species, but the detection was outside the parameters of the study and so was not analyzed. A single individual was recorded at an upper Kern River site at the Cannell trail. Corben (2001) did detect this species.

Western red bat: Occurrence in Study Area: Noel (2021) had very few detection and only at the lower Kern River site. Corben (2001) recorded western red bat at the upper Kern River site at the northeast corner of Lake Isabella. These two studies demonstrate that red bats are not using the upper Kern River or the study area.

California myotis: Occurrence in Study Area: Noel (2021) recorded the California myotis in both winter and summer. The study recorded this species more often at the upper Kern River sites and most often in the summer. Corben (2001) recorded California myotis at the upper and lower Kern River sites.

Western small-footed myotis: Occurrence in Study Area: Noel (2021) recorded the western small-footed myotis at both the lower and upper Kern River sites, mostly during the summer and at the upper Kern River sites. Corben (2001) recorded this species at the lower Kern River sites. It is unclear from the report if this species was recorded at the upper sites.

Long-eared myotis: Occurrence in Study Area: Noel (2021) recorded this species only once in the winter at an upper Kern River site. Corben (2001) recorded this species at the lower Kern River sites. It is unclear from the report if this species was recorded at the upper sites.

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Fringed myotis: Occurrence in Study Area: Noel (2021) recorded this species from the upper Kern River in the summer. Very few calls were captured. Corben (2001) only recorded this species from the upper Kern River sites.

Long-legged myotis: Occurrence in Study Area: Noel (2021) had very few sections of this species and only at the upper Kern locations in October. Corben (2001) detected this species in the upper Kern River sites.

Yuma myotis: Occurrence in Study Area: Noel (2021) recorded this species at the lower and upper Kern River sites. The majority of detections were during the summer. Corben (2001) only detected this species at the upper Kern River sites.

Canyon bat: Occurrence in Study Area: Noel (2021) recorded this species at the lower and upper Kern River sites. The majority of detections were during the summer. Corben (2001) recorded this species at the lower and upper Kern River sites.

Family Molossidae

Western bonneted bat (*Eumops perotis*): Occurrence in Study Area: Noel (2021) recorded the western bonneted bat at the lower and upper Kern River sites in the winter and summer. Corben (2001) recorded this species only at the upper sites.

Brazilian free-tailed bat: Occurrence in Study Area: Noel (2021) recorded this species in the lower and upper Kern River sites in the winter and summer. This species was much more numerous in the summer and was the most recorded species in the study. Corben (2001) also recoded this species at the lower and upper sites.

Notes on Flight and Foraging

It has been suggested that the flumes provide foraging habitat and are a source of insects. The open flumes may provide a source of aquatic insects, but compared to the amount of surrounding habitat, the flumes would be a minor source of insect prey. The open flumes are designed with numerous cross bars over the upper surface. The cross bars most likely create a hinderance to bats to forage over the immediate flume surface but would not hinder their foraging above the flumes. The cross bars also present a barrier to bats using the flumes as a source of drinking water, even for the clutter specialist species (i.e., those species with low aspect ratio wings and slow fluttery flight).

There is a close association between wing size and shape and a bat's flight/foraging behavior (Farney and Fleharty, 1969; Findley et al., 1972; Lawlor, 1973; Norberg, 1994; Struthsaker, 1961; Vaughan, 1959, 1966). The shape of a bat's wing is commonly expressed through the use of the aspect ratio or aspect ratio index (Findley et al., 1972). These numbers express the wing's relative width to length. A high value for the aspect ratio denotes a relatively long and narrow wing. Bats with high aspect ratio wings tend to forage at high altitude and fly at fast speeds. They use direct flight and do not usually make dramatic turns or maneuvers.

Molossid bats, such the western bonneted bat and the Brazilian free-tailed bats have high aspect ratio wings and tend to feed in open, clear air ways. These two species would be

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more likely to forage above the flumes and above the riparian canopy or through open riparian corridors rather that in and around the open flumes.

Low aspect ratio indicates a relatively short and broad wing. Bats with low aspect wings are slow maneuvering flyers that forage at low altitudes about trees and shrubs. They display highly erratic and maneuverable flight patterns. The canyon bat and Yuma myotis are good examples of low aspect ratio foragers. Other species such as the pallid bat and the long-eared myotis will also glean prey from the surface of the ground, while bats, like the big brown bat, are known to forage over open riparian corridors. The vespertilionids that occur along the Kern River present a variety of flight behaviors and foraging behaviors.

5.2.3. CAMERA SURVEYS

During the initial habitat assessment effort on October 28, 2022, one camera was placed along Salmon Creek, just upstream of the flume, and a second camera was placed along Corral Creek under a walking bridge which faced a trail. During a second habitat assessment effort on November 17, 2023, the camera locations were checked, and the camera placed along Corral Creek had been stolen. New cameras were purchased, and one was placed at a new location along Corral Creek further downstream. Wildlife species detected on the cameras included California ground squirrel (*Otospermophilus beecheyi*), western gray squirrel (*Sciurus griseus*), desert cottontail (*Sylvilagus audubonii*), common gray fox (*Urocyon cinereoargenteus*), and black bear (*Ursus americanus*). Additional species observed on the cameras included domestic dog (*Canis lupus familiaris*) and domestic cow (*Bos taurus*).

5.2.4. ADDITIONAL OBSERVATIONS

This section describes special-status wildlife that occur or may potentially occur in the Project Vicinity. This section addresses only special-status terrestrial wildlife species. Amphibians and reptiles that use aquatic habitats are included in this section because of their utilization of adjacent terrestrial habitats. Special-status wildlife species are those species that are considered California Species of Special Concern by the State of California, categorized as Sensitive by the USFS and/or the Bureau of Land Management, or as a Species of Conservation Concern by the USFWS.

Table 5.2-2 provides a list of special-status wildlife species evaluated for their potential to occur in the Project Vicinity. Species listed in the table are categorized as known to occur or having the potential to occur in appropriate habitat. Table 5.2-2 summarizes pertinent information for each bird species, including status and preferred habitat, with information on the location of the occurrence, if applicable.

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Table 5.2-2. Special Status Wildlife Species

Scientific/ Common Name	Federal Status	State Status	Habitat	Likelihood for Occurrence/ Occurrence Notes
Insects				
Bombus crotchii Crotch bumble bee	–	Candidate Endangered	Occurs from coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include *Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia,* and Eriogonum.	May occur, but the potential is low. The Project is within the historic range for this species; however, the last known occurrence in the Project Vicinity was in 1993. Not observed during general biological surveys in 2023.
Plebulina emigdionis San Emigdio blue butterfly	USFS_S	–	Found in desert canyons and along riverbeds in Inyo, Kern, Los Angeles, and San Bernardino Counties. Host plant is *Atriplex canescens*; maybe *Lotus purshianus* also.	May occur, but the potential is low. Suitable habitat is present in the Project Vicinity; however, the most recent occurrence is 10 miles south of the Project near Weldon. Not observed during general biological surveys in 2023.
Amphibians				
Batrachoseps bramei Fairview slender salamander	USFS_S	–	Known only from the Upper Kern River Canyon and west side of Lake Isabella, within metamorphic rock outcrops in a variety of habitats, including chaparral and mixed oak and conifer woodland. Generally found beneath rocks, often on talus slopes. Occasionally found beneath logs, river gravel, and leaf litter.	**Present.** A total of three individuals were observed at two locations within the study area during biological surveys by Psomas in 2023. Two individuals were observed in a canyon across from Fairview Dam and one individual was observed near Adit 16/17. There is suitable habitat throughout the Project Area and vicinity.

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Scientific/ Common Name	Federal Status	State Status	Habitat	Likelihood for Occurrence/ Occurrence Notes
Batrachoseps robustus Kern Plateau salamander	–	–	Found only in the semi-arid Kern Plateau and Scodie Mountains. Frequents Jeffery pine/red fir, lodgepole pine, and riparian scrub. Found under rocks, bark fragments, logs, and within and under wet logs, especially in spring and seep areas.	May occur. There is suitable habitat in the Project Vicinity along Salmon and Corral Creeks. However, these salamanders are known to occur at higher elevations on the Kern Plateau in Salmon Creek. Not observed during salamander surveys in 2023.
Batrachoseps simatus Kern Canyon slender salamander	USFS_S	CDFW_ST	A semifossorial species that occurs in isolated colonies along stream courses and on ridges and hillsides. Cool, moist, north-facing slopes and shaded narrow tributary canyons seem to be favored. They are found in talus slopes and under logs and other surface objects especially after rains. Frequents streamside vegetation of willows and cottonwoods, and slopes grown to interior live oak, canyon oak, pine, and mixed chaparral.	Not likely to occur. No known occurrences of this species north of Lake Isabella. Suitable chaparral and woodland habitat exists within Project Vicinity only at existing road crossings. Not observed during salamander surveys in 2023.
Batrachoseps altasierrae Greenhorn Mountains slender salamander	–	–	Known from high elevations in the Greenhorn Mountains west of the Project Area (and one location east of the Project Area in the western Kern Plateau). Most populations are found in mesic areas (e.g., swales, drainages, etc.) with an overstory of trees or shrubs and abundant rocks, litter, or woody debris in coniferous forests containing a mixture of pine, fir, and incense cedar (*Calocedrus decurrens*).	Not likely to occur. This species is not known from the Project Area. In the study area, potentially suitable habitat for this species overlaps that of the Fairview salamander. Not observed during salamander surveys in 2023.

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Scientific/ Common Name	Federal Status	State Status	Habitat	Likelihood for Occurrence/ Occurrence Notes
Rana boylii foothill yellow-legged frog	USFS_S BLM_S	CDFW _SSC	Found in partly shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Needs at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis.	May occur, but the potential is low. Records along Kern River are all prior to 1960. Suitable aquatic habitat in the vicinity at the NFKR, and in the upstream wetted portions of the channel. This species is addressed in further detail in a separate study plan. Project is outside designated critical habitat.
Rana muscosa southern mountain yellow-legged frog	USFWS_FE	CDFW_SE	This species prefers sunny riverbanks, meadow streams, isolated pools, lake borders, and rocky stream courses in the mountains of southern California. In southern California, populations are restricted to streams in Ponderosa pine, montane hardwood-conifer, and montane riparian habitats. They are always found within a few feet of water. They appear to prefer open stream and lake margins that gently slope. They seem to be most successful where predatory fish are absent. Tadpoles may require 2 to 4 years to complete their aquatic development.	May occur, but the potential is low. Project site does not contain suitable habitat. The nearest known location is approximately 14.6 miles southeast of the Project Vicinity. This species is addressed in further detail in a separate study plan. Project is outside designated critical habitat.
Reptiles				
Anniella campi southern Sierra legless lizard	USFS_S	CDFW _SSC	Found in desert canyons and springs along western edge of the Mojave Desert in Kern and Inyo Counties. Microhabitat of this species is poorly known. Other legless lizard species occur in sparsely vegetated areas with moist, loose soil. Often found underneath leaf litter, rocks, and logs.	May occur. Suitable habitat in chaparral and woodland habitats adjacent to Project Vicinity. Know to occur just north of the City of Kernville. Not observed during general biological surveys in 2023.

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Scientific/ Common Name	Federal Status	State Status	Habitat	Likelihood for Occurrence/ Occurrence Notes
Anniella spp. California legless lizard	–	CDFW _SSC	Occurs from Contra Costa County south to San Diego, within a variety of open habitats. Found in a variety of habitats; generally, in moist, loose soil. They prefer soils with a high moisture content.	High potential to occur. Suitable habitat in chaparral and woodland habitats adjacent to Project Vicinity. Not observed during general biological surveys in 2023.
Actinemys marmorata northwestern pond turtle	USFWS_FCT USFS_S BLM_S	CDFW _SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams, and irrigation ditches, usually with aquatic vegetation, below 6,000 feet elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 1,500 feet from water for egg-laying.	**Present.** One individual was observed in Corral Creek during pond turtle surveys by Psomas in 2023. The Project contains suitable habitat within Salmon Creek, Corral Creek, Cannell Creek, and the NFKR. This species is addressed in further detail in a separate study plan.
Birds				
Accipiter gentilis northern goshawk	USFS_S BLM_S	CDFW _SSC	Found within, and in vicinity of, coniferous forest. Uses old nests and maintains alternate sites. Usually nests on north slopes, near water. Red fir, lodgepole pine, Jeffrey pine, and aspens are typical nest trees.	May occur, but the potential is low for nesting and moderate for foraging. Suitable coniferous habitat in and adjacent to Project Vicinity. Not observed during general biological surveys in 2023.
Agelaius tricolor tricolored blackbird	USFWS_BCC BLM_S	CDFW_ST CDFW _SSC	A highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few kilometers of the colony.	May occur, but the potential is low for nesting and foraging. No suitable open water, marsh, limited cattail nesting habitat in Project Vicinity. Not observed during general biological surveys in 2023.

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Scientific/ Common Name	Federal Status	State Status	Habitat	Likelihood for Occurrence/ Occurrence Notes
Buteo swainsoni Swainson's hawk	USFWS_BCC BLM_S	CDFW_ST	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	May occur during migration, but the potential is low for nesting and foraging. Outside the current known breeding range. No suitable grassland habitat in Project Vicinity. Not observed during general biological surveys in 2023.
Coccyzus americanus occidentalis western yellow-billed cuckoo	USFWS_FT USFS_S USFWS_BCC BLM_S	CDFW_SE	A riparian forest nester, along the broad, lower flood-bottoms of larger river systems. Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.	May occur, but the potential is low for nesting and foraging. There is limited suitable riparian habitat within the Project Vicinity. However, this species is known to nest in areas where suitable riparian habitat is present around Lake Isabella, the Kern River Preserve, and the South Fork Wildlife Area. Not observed during riparian bird surveys in 2023. Project is outside designated critical habitat.
Cypseloides niger black swift	USFWS_BCC	CDFW _SSC	Occurs within the coastal belt of Santa Cruz and Monterey Counties; central and southern Sierra Nevada; San Bernardino and San Jacinto Mountains. Breeds in small colonies on cliffs behind or adjacent to waterfalls in deep canyons and sea-bluffs above the surf; forages widely.	May occur, but the potential is low for nesting and foraging. Limited nesting habitat in the Project Vicinity. Not observed during general biological surveys in 2023.
Dendragapus fuliginosus howardi Mount Pinos sooty grouse	–	CDFW _SSC	An inhabitant of southern Sierra Nevada Mountains, in small islands of populations. Mainly inhabits white fir covered slopes. Also found in other conifer types and open, brushy areas adjacent to forest.	May occur, but the potential is low for nesting and foraging. Limited nesting habitat in the Project Vicinity. Not observed during general biological surveys in 2023.

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Scientific/ Common Name	Federal Status	State Status	Habitat	Likelihood for Occurrence/ Occurrence Notes
Empidonax traillii extimus southwestern willow flycatcher	USFWS_FE	CDFW_SE	Found in riparian woodlands in southern California. Willow-dominated riparian habitats that are similar to least Bell's vireo nesting habitats; shows a stronger preference for sites with surface water in the vicinity, such as along streams, on the margins of a pond or lake, and at wet mountain meadows.	May occur, but the potential is low nesting and foraging. Limited suitable riparian habitat in Project Vicinity. However, this species has been known to nest in areas where there is suitable riparian habitat around Lake Isabella, the Kern River Preserve, and the South Fork Wildlife Area. Not observed during riparian bird surveys in 2023. Project is outside designated critical habitat.
Gymnogyps californianus California Condor	USFWS_FE	CDFW_SE	This species requires vast expanses of open savannah, grasslands, and foothill chaparral with cliffs, large trees and snags for roosting. Condors nest in caves, crevices, hollow trees, and large ledges on high sandstone cliffs. The condor is somewhat unpredictable because the behavior of reintroduced birds is not always predictable.	May occur, but the potential is low for nesting and low for foraging. The Project contains suitable foraging habitat to support the California condor. Not observed during general biological surveys in 2023. Project is outside designated critical habitat.
Icteria virens yellow-breasted chat	–	CDFW _SSC	A summer resident; inhabits riparian thickets of willow and other brushy tangles near watercourses. Nests in low, dense riparian, consisting of willow, blackberry, wild grape; forages and nests within 10 feet of ground.	May occur. Low potential for nesting and foraging due to limited suitable riparian habitat in Project Vicinity. However, this species has been observed south of the Project just north of Lake Isabella. Not observed during riparian bird surveys in 2023.

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Scientific/ Common Name	Federal Status	State Status	Habitat	Likelihood for Occurrence/ Occurrence Notes
Setophaga petechia yellow warbler	USFWS_BCC	CDFW _SSC	Found in riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in the Cascades and Sierra Nevada. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	**Present.** Species was observed along Salmon Creek, Corral Creek, Cannel Creek, and various locations along the Kern River.
Vireo bellii pusillus least Bell's vireo	USFWS_FE	CDFW_SE	A summer resident of southern California in low riparian in vicinity of water or in dry river bottoms; below 2,000 feet. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, Baccharis, and mesquite.	May occur, but the potential is low for nesting and foraging. Limited suitable riparian habitat in the Project Vicinity. However, this species has been observed around Lake Isabella, the Kern River Preserve, and the South Fork Wildlife Area. Not observed during riparian bird surveys in 2023. Project is outside designated critical habitat.
Mammals				
Antrozous pallidus pallid bat	USFS_S BLM_S	CDFW _SSC	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	May occur, but the potential is low for roosting and moderate for foraging. This species has been documented to occur south of the Project at Lake Isabella. Not observed during general biological surveys in 2023.

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Scientific/ Common Name	Federal Status	State Status	Habitat	Likelihood for Occurrence/ Occurrence Notes
Aplodontia rufa californica Sierra Nevada mountain beaver	–	CDFW _SSC	Found in the dense growth of small deciduous trees and shrubs, wet soil, and abundance of forbs in the Sierra Nevada and east slope. Needs dense understory for food and cover. Burrows into soft soil. Needs abundant supply of water.	May occur. Moderate potential due to marginally suitable habitat in Project Vicinity. However, suitable wet forest habitat occurs along stream adjacent to the Project Vicinity. There are multiple documented occurrences along the Kern River. Not observed during general biological surveys in 2023.
Corynorhinus townsendii Townsend's big-eared bat	USFS_S BLM_S	CDFW _SSC	Found throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	May occur but the potential is low for roosting and high for foraging. This species has been documented to occur south of the Project near Lake Isabella. Not observed during general biological surveys in 2023.
Eumops perotis western bonneted bat (western mastiff bat)	BLM_S	CDFW _SSC	Found in many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub, and urban. Crevices in cliff faces, high buildings, trees, and tunnels are required for roosting.	May occur but the potential is low for roosting and high for foraging. This species has been documented to occur south of the Project near Lake Isabella. Not observed during general biological surveys in 2023.
Gulo gulo California wolverine	Proposed Threatened USFS_S	CDFW_ST CDFW _FP	Found in the north coast mountains and the Sierra Nevada. Found in a wide variety of high elevation habitats. Needs water source. Uses caves, logs, burrows for cover and den area. Hunts in more open areas. Can travel long distances.	No potential to occur. Extirpated from this part of California. Not observed during general biological surveys in 2023.

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Scientific/ Common Name	Federal Status	State Status	Habitat	Likelihood for Occurrence/ Occurrence Notes
Martes caurina sierrae Sierra marten	USFS_S	–	Found in mixed evergreen forests with more than 40% crown closure along Sierra Nevada and Cascade mountains. Needs a variety of different-aged stands, particularly old-growth conifers and snags which provide cavities for dens/nests.	May occur, but the potential is low for denning but moderate for foraging. There is no suitable denning habitat within the Project Vicinity. The Project is below the known and elevation range of the species. Not observed during general biological surveys in 2023.
Onychomys torridus tularensis Tulare grasshopper mouse	BLM_S	CDFW _SSC	Found in hot, arid valleys and scrub deserts in the southern San Joaquin Valley. Diet almost exclusively composed of arthropods, therefore needs abundant supply of insects.	No potential to occur. There is no suitable habitat within the Project Vicinity and the Project is outside the known historic and elevation range. Not observed during general biological surveys in 2023.
Pekania pennanti Pacific fisher – West Coast DPS	USFS_S BLM_S	CDFW_ST CDFW _SSC	Found in the intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure. Uses cavities, snags, logs, and rocky areas for cover and denning. Needs large areas of mature, dense forest.	No potential to occur. Suitable dense forest and canopy cover is not present in Project Vicinity. Not observed during general biological surveys in 2023.
Taxidea taxus American badger	–	CDFW _SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils, and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	May occur, but the potential is low. No known records of occurrence in the Project Vicinity. However, there is suitable habitat in the Project Vicinity. Not observed during general biological surveys in 2023.

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Scientific/ Common Name	Federal Status	State Status	Habitat	Likelihood for Occurrence/ Occurrence Notes
Vulpes vulpes necator Sierra Nevada red fox	Candidate USFS_S	CDFW_ST	Historically found from the Cascades down to the Sierra Nevada. Found in a variety of habitats from wet meadows to forested areas. Use dense vegetation and rocky areas for cover and den sites. Prefer forests interspersed with meadows or alpine fell-fields.	May occur, but the potential is low. Suitable habitat is not present within the Project Vicinity and known populations occur at higher elevations further north. Not observed during general biological surveys in 2023.

BLM: Bureau of Land Management; CDFW = California Department of Fish and Wildlife; DPS = Distinct Population Segment; NFKR = North Fork Kern River; USFS = U.S. Forest Service

Notes:

USFWS
FE = Endangered
FT = Threatened
FCT = Federal Candidate Threatened
BCC = Birds of Conservation Concern

USFS
S = Sensitive

BLM
S = Sensitive

CDFW
SE = Endangered
ST = Threatened
FP = Fully Protected
SSC = Species of Special Concern

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Table 5.2-3. U.S. Fish and Wildlife Service Bird Species of Conservation Concern

Species	Common Name	Occurrence Notes
Cypseloides niger	Black Swift	Not observed during general biological surveys.
Spizella atrogularis	Black-chinned Sparrow	Not observed during general biological surveys.
Strix occidentalis occidentalis	California Spotted Owl	Not observed during general biological surveys.
Toxostoma redivivum	California Thrasher	**Observed** throughout the study area during general biological surveys.
Carpodacus cassinii	Cassin's Finch	Not observed during general biological surveys.
Aechmophorus clarkii	Clark's Grebe	Not observed during general biological surveys.
Geothlypis trichas sinuosa	Common Yellowthroat	Not observed during general biological surveys.
Calypte costae	Costa's Hummingbird	Not observed during general biological surveys.
Aquila chrysaetos	Golden Eagle	**Observed** just south of Cannel Creek during habitat assessment and general biological surveys. One individual was observed flying over the study area.
Carduelis lawrencei	Lawrence's Goldfinch	**Observed** along the Kern River during riparian bird surveys.
Melanerpes lewis	Lewis's Woodpecker	Not observed during general biological surveys.
Picoides nuttallii	Nuttall's Woodpecker	**Observed** along Corral Creek during habitat assessment and riparian bird surveys.
Baeolophus inornatus	Oak Titmouse	**Observed** during habitat assessment and riparian bird surveys.
Contopus cooperi	Olive-sided Flycatcher	Not observed during general biological surveys.
Selasphorus rufus	Rufous Hummingbird	**Observed** throughout the study area during general biological surveys.
Melospiza melodia	Song Sparrow	**Observed** along Salmon Creek, Corral Creek, Cannel Creek, and the Kern River during habitat assessment and riparian bird surveys.
Pipilo maculatus clementae	Spotted Towhee	**Observed** throughout the study area during habitat assessment and general biological surveys.
Agelaius tricolor	Tricolored Blackbird	Not observed during general biological surveys.
Numenius phaeopus	Whimbrel	Not observed during general biological surveys.
Picoides albolarvatus	White Headed Woodpecker	Not observed during general biological surveys.

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Species	Common Name	Occurrence Notes
Sphyrapicus thyroideus	Williamson's Sapsucker	Not observed during general biological surveys.
Empidonax traillii	Willow Flycatcher	Not observed during general biological surveys.
Chamaea fasciata	Wrentit	Not observed during general biological surveys.

One additional species of interest, the American dipper, was observed at two locations in the study area during the riparian bird surveys. The first location was along the Kern River, just upstream of the Fairview Dam, and the second location was along Salmon Creek near Adit 8B/9A. Both locations consisted of pairs that were presumably nesting in the immediate vicinities.

6.0 STUDY SPECIFIC CONSULTATION

USFWS was consulted regarding the request to use playback vocalizations for the least Bell's vireo. The USFWS does not issue permits for individuals to use playback of least Bell's vireo outside of conducting research and/or pulling the species into mist nets for banding (personal communication, Stacey Love, Recovery Permit Coordinator, USFWS, February 13, 2023). Therefore, recorded least Bell's vireo vocalizations were not used during the riparian bird surveys.

7.0 OUTSTANDING STUDY PLAN ELEMENTS

All study plan elements have been completed as outlined in SCE's RSP (SCE, 2022) filing and FERC's SPD (FERC, 2022) with the exception of the variances described above.

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APPENDIX A
SITE PHOTOGRAPHS

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Photo 1: Riparian habitat located in Salmon Creek near the Salmon Creek flume and Adit 8B/9A.



Photo 2: Riparian habitat located at the confluence of Salmon Creek and the Kern River.

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Representative Site Photographs

Appendix A-1

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

PSOMAS



Photo 3: Riparian habitat located within Gold Ledge Creek.



Photo 4: Riparian habitat located within Corral Creek.

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Photo 5: Riparian habitat located near the confluence of Corral Creek and the Kern River.



Photo 6: Riparian habitat located within Cannell Creek.

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Photo 7: Riparian habitat located at the confluence of Cannell Creek and the Kern River.



Photo 8: Riparian habitat located within the Forebay.

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Photo 9: Riparian habiat located at the confluence of the Forebay and the Kern River.



Photo 10: Riparian habitat located along the Kern River, located in the northern portion of the study area.

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Photo 11: Riparian habitat located along the Kern River, located in the central portion of the study area.



Photo 12: Riparian habitat located along the Kern River, located in the southern portion of the study area.

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Photo 13: Grassland habitat suitable for California condor foraging, located in the southern portion of the study area, near Cannell Creek.



Photo 14: Grassland habitat suitable for California condor foraging, located in the southern portion of th study area, near Corral Creek.

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Photo 15: Woodland habitat with marginal foraging and resting habitat for dispersing Pacific fisher from Critical Habitat Unit 1 within Corral Creek.



Photo 16: Woodland habitat with marginal foraging and resting habitat for dispersing Pacific fisher from Critical Habitat Unit 1 within Salmon Creek.

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Photo 17: Common gray fox captured on wildlife camera 1, located along Salmon Creek on March 12, 2023.



Photo 18: Black bear captured on wildlife camera 3, located along Corral Creek on May 20, 2023.

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Photo 19: Western gray squirrel captured on wildlife camera 1, located along Salmon Creek on April 21, 2023.



Photo 20: American dipper observed within Salmon Creek on Adit 8B/9A.

APPENDIX B
WILDLIFE COMPENDIUM

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Wildlife Species Observed During Surveys

Scientific Name	Common Name	Special Status
LIZARDS		
PHRYNOSOMATIDAE – SPINY LIZARD FAMILY		
Sceloporus occidentalis	western fence lizard	
Uta stansburiana	common side-blotched lizard	
TEIIDAE – WHIPTAIL LIZARD FAMILY		
Aspidoscelis tigris munda	California whiptail	
BIRDS		
ODONTOPHORIDAE – NEW WORLD QUAIL FAMILY		
Callipepla californica	California quail	
COLUMBIDAE – PIGEON AND DOVE FAMILY		
Patagioenas fasciata	band-tailed pigeon	
*Streptopelia decaocto**	Eurasian collared-dove	
Zenaida macroura	mourning dove	
APODIDAE – SWIFT FAMILY		
Aeronautes saxatalis	white-throated swift	
TROCHILIDAE – HUMMINGBIRD FAMILY		
Selasphorus sasin	Allen’s hummingbird	
ARDEIDAE – HERON FAMILY		
Ardea alba	great egret	
CATHARTIDAE – NEW WORLD VULTURE FAMILY		
Cathartes aura	turkey vulture	
ACCIPITRIDAE – HAWK FAMILY		
Buteo lineatus	red-shouldered hawk	
Aquila chrysaetos	golden eagle	FP
PICIDAE – WOODPECKER FAMILY		
Sphyrapicus ruber	red-breasted sapsucker	
Picoides nuttallii	Nuttall’s woodpecker	
Picoides villosus	hairy woodpecker	
Colaptes auratus	northern flicker	
TYRANNIDAE – TYRANT FLYCATCHER FAMILY		
Contopus sordidulus	western wood-pewee	

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Sayornis nigricans	black phoebe	
Myiarchus cinerascens	ash-throated flycatcher	
Tyrannus vociferans	Cassin's kingbird	
Tyrannus verticalis	western kingbird	
CORVIDAE – JAY AND CROW FAMILY		
Aphelocoma californica	California scrub-jay	
Corvus corax	common raven	
HIRUNDINIDAE – SWALLOW FAMILY		
Petrochelidon pyrrhonota	cliff swallow	
AEGITHALIDAE – BUSHTIT FAMILY		
Psaltriparus minimus	bushtit	
TROGLODYTIDAE – WREN FAMILY		
Troglodytes aedon	house wren	
CINCLIDAE – DIPPER FAMILY		
Cinclus mexicanus	American dipper	
TURDIDAE – THRUSH FAMILY		
Sialia mexicana	western bluebird	
MIMIDAE – MOCKINGBIRD AND THRASHER FAMILY		
Toxostoma redivivum	California thrasher	
PTILOGONATIDAE – SILKY-FLYCATCHER FAMILY		
Phainopepla nitens	phainopepla	
FRINGILLIDAE – FINCH FAMILY		
Haemorhous mexicanus	house finch	
Spinus lawrencei	Lawrence's goldfinch	
PASSERELLIDAE – NEW WORLD SPARROW FAMILY		
Melospiza melodia	song sparrow	
Melozone crissalis	California towhee	
Pipilo maculatus	spotted towhee	
ICTERIDAE – BLACKBIRDS AND ORIOLES		
Icterus cucullatus	hooded oriole	
Agelaius phoeniceus	red-winged blackbird	
PARULIDAE – WOOD-WARBLER FAMILY		
Geothlypis trichas	common yellowthroat	
Setophaga petechia	yellow warbler	SSC
Setophaga townsendi	Townsend's warbler	

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CARDINALIDAE – CARDINALS AND ALLIES		
Piranga ludoviciana	western tanager	
Passerina caerulea	blue grosbeak	
Passerina amoena	lazuli bunting	
MAMMALS		
SCIURIDAE – SQUIRREL FAMILY		
Sciurus griseus	western gray squirrel	
Otospermophilus beecheyi	California ground squirrel	

USFWS: U.S. Fish and Wildlife Service; CDFW: California Department of Fish and Wildlife
Notes:
Species Status:
State (CDFW)
FP = Fully Protected
SSC = Species of Special Concern

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APPENDIX C
BAT NATURAL HISTORY SUMMARY

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Family Vespertilionidae

Hoary bat (*Aeorestes cinereus*): The hoary bat roosts in medium to large trees in areas with dense leaf coverage, generally 3 to 5 meters above the ground. It roosts solitarily, making it difficult to locate. Roosts can be in conifers, hardwoods, or even palm trees. It has been found in buildings and caves, but trees are preferred. Roost sites need to have open space below. It is found in wild areas and also in urban, suburban, and rural areas. The hoary bat is an insectivore, eating primarily on moths, but does take other insects as well. Its foraging flight is swift and straight and includes soaring and gliding. It forages in open areas and open forest edges, near the treetops, along streams, lake shores, and in urban areas where there are lots of trees. The hoary bat has long, narrow wings designed for fast (up to 20 kilometers per hour), less maneuverable flight, so it prefers open uncluttered habitats for foraging.

Pallid bat (*Antrozous pallidus*): The pallid bat is found in a wide variety of habitats, including grasslands, farmland, shrublands, woodlands, deserts, and conifer forests. Rocky outcrops are its preferred roost site, but it will also roost in caves, rock crevices, mines, hollow trees, and buildings. It uses separate day and night roosts. Roosts are often located near water, but nearby water is not a requirement for the siting of a roost. Night roosts may be located in more open sites, such as porches and open buildings. It is known to roost with a number of other bats, principally various species of Myotis and the Brazilian free-tailed bat. The pallid bat is a social species and colonies can number over 100. The pallid bat is an insectivore, eating a wide variety of large flying and ground-dwelling insects and arachnids, including beetles, orthopterans, homopterans, moths, spiders, scorpions, solpugids, and Jerusalem crickets. Also, it is known to occasionally take small lizards and small mice. Its foraging flight is unique among North American bats, being slow and maneuverable, but characterized by dips, swoops, and short glides. Besides capturing aerial prey, it also gleans prey off the ground. It forages close to the ground, usually at a height of between 0.5 and 2.5 meters. It is also able to forage for aerial insects among leaves and flowers of shrubs and trees.

Townsend's big-eared bat (*Corynorhinus townsendii*): Townsend's big-eared bat is found in a wide range of habitats from desert scrub to coastal scrub lands to montane forests with pine, fir, and aspen trees and is bound by shrub and grasslands, with a preference for mesic habitats. Its roosts are located in caves, cliff faces, rocky ledges, mines, tunnels, buildings, or other human-made structures. Townsend's big-eared bat is easily disturbed in the roost and will abandon a roost when disturbed by humans. Townsend's big-eared bat is an insectivore, eating primarily moths, but also beetles and other soft-bodied insects. It is a slow, maneuverable flyer and gleans insects from branches and foliage and also captures prey in flight. It is also able to hover. Foraging sites are usually near dense foliage, among tree branches, or along the edges of forested areas.

Big brown bat (*Eptesicus fuscus*): The big brown bat is found in nearly all habitats and plant communities. Prior to human presence and human-made structures and in nature, the big brown bat is found roosting in hollow trees, caves, or openings in rock ledges. It

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uses buildings and other human-made structures for roosting, including residences, barns, silos, churches, storm sewers, and expansion joint spaces in concrete structures.

The big brown bat prefers to forage over open areas, water sources, or among trees in fairly open stands. It is an insectivore, eating a variety of flying insects, particularly large, hard-shelled scarab beetles and other beetles, but it will also eat dipterans, hymenopterans, and other insects. It usually forages above open habitats among scattered trees at an elevation of about 6 to 9 meters above the ground, though it will forage as close as 1 meter over the ground. The big brown bat's foraging flight is slow and steady.

Spotted bat (*Euderma maculatum*): The spotted bat is found in a variety of habitats, including deserts, grasslands, woodlands, Ponderosa pine, and mixed conifer forests. Within these habitats, its occurrence is patchy and depends on suitable roost habitat, of which, rock crevices on cliff faces are preferred, although it is known to roost in caves and in buildings. Usually found only as single individuals, the spotted bat is thought to be solitary and maintains a sizable distance between individuals but communicates with neighbors via vocalizations that are audible by humans.

The spotted bat is an insectivore, eating primarily moths (most likely Noctuid moths), but it may also take some beetles. It forages alone and may keep an exclusive foraging territory. It forages close to the ground, between 5 and 15 meters of the surface. The foraging flight is slow and elliptical, and its foraging path is about 200 to 300 meters in width. Its usual foraging sites are over water and adjacent open spaces. The spotted bat forages close to its day roost, normally within 10 kilometers. No night roosts are used; it forages continuously throughout the night.

Western red bat (*Lasiurus frantzii*): The western red bat is found along the coast, grasslands, shrublands, open woodlands, and mixed conifer woodlands. The western red bat is a treeroosting bat, and its roosts are located in the foliage of trees and shrubs in woodland and forests as well as wooded urban and suburban areas. Roosts are usually sited approximately 1.5 to 12.0 meters above the ground. Its preferred roost sites are dark and sheltered with clear air below the roost. Roost sites are often located in edge habitats adjacent to streams, fields, or urban and suburban areas. Riparian habitats are also used, and it is known to roost in mature stands of cottonwood, sycamore, and willows adjacent to streams. The western red bat has a summer and a winter range and migrates between the two. It most likely undertakes migration during the spring (i.e., March to May) and autumn (i.e., September to October). However, some western red bats have been known to hibernate in leaf litter throughout the winter instead of migrating.

It feeds over a wide variety of habitats, including grasslands, shrublands, open woodlands and forests, and croplands. The western red bat is an insectivore, eating primarily moths, crickets, beetles, and cicadas. It typically forages over habitat edges and open areas but has been observed foraging in urban, suburban, and rural environments. It forages from above the tree canopy to just above the ground. The western red bat's foraging flight is slow, erratic, and maneuverable.

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California myotis (*Myotis californicus*): The California myotis can be found in coastal plains to desert, chaparral, woodlands, and mixed and coniferous forests. It roosts in crevices, buildings, under loose bark on trees (Ponderosa pine is a favorite), caves, and mines. Night roosts are usually open places, especially in human-made structures. The California myotis does not continuously use the same roost site but uses other available nearby roost sites.

The California myotis is an insectivore, eating a wide variety of flying insects and other arthropods, including moths, midge, flies, other dipterans, beetles, and spiders. It forages in areas with rock-walled canyons with open water, open woodlands and forests, or brushy habitats. Foraging flights are low over the ground or water, and among shrubs and trees, generally below 4 meters. The California myotis' foraging flight is slow and highly maneuverable, so it is able to quickly respond to patches of prey when located. It is able to detect prey at short distances and can make sharp turns to make repeated passes through "clouds of prey."

Western small-footed myotis (*Myotis ciliolabrum*): The western small-footed myotis is found in a wide variety of habitats, including relatively arid wooded and brushy uplands near water, semi-arid habitats, riparian areas near open grasslands, Great Basin scrub and pinyon-juniper forests, and coniferous forests. It is associated with open stands in forests and woodlands as well as brushy habitats. It roosts in caves, buildings, mines, crevices, and sometimes under bridges and under loose bark. It has been documented roosting in abandoned swallow nests. It often uses human-made structures as night roosts.

The western small-footed myotis is an insectivore, eating a variety of small, flying insects including moths, flies, beetles, and true bugs. Its foraging flight is slow and maneuverable. The small-footed myotis is often seen foraging among trees and over water. Its foraging flight pattern is in irregular circles from 1 meter above the ground to the tops of trees. When the western small-footed myotis and the California myotis co-occur, the western small-footed myotis forages along rock bluffs and the California myotis forages over water.

Long-eared myotis (*Myotis evotis*): The long-eared myotis is found in a variety of habitats, including bush lands, woodlands, and mixed coniferous forests from the coast to the higher elevation montane forests. In native forests, it roosts in tree cavities or large snags. Its preferred snags are high and reach above the surrounding canopy. Interestingly, in areas of clear-cut forests, it will roost in clear-cut stumps, especially Ponderosa pine and lodgepole pine. It will also use abandoned buildings, cracks in the ground, caves, mines, and spaces under loose bark on living and dead trees.

The long-eared myotis is an insectivore, eating a variety of arthropods, including beetles, moths, flies, and spiders. Its diet is heavy on beetles, and it may eat a higher percentage of beetles than any other species of Myotis. However, the literature also indicates that it feeds mainly on moths. Like other aerial insectivores, the long-eared myotis captures its prey in flight. The long-eared myotis, however, also gleans prey off the ground and off other surfaces. Its flight pattern is slow and maneuverable, and it is capable of hovering.

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It forages along habitat edges, over open habitats, and over water. When foraging, it flies within 12 meters of the ground. It needs free water to drink and drinks while in flight.

Fringed myotis (*Myotis thysanodes*): The fringed myotis is found in a variety of habitats from desert scrub to pinyon-juniper, valley foothill hardwood, and hardwood-conifer forests at higher elevations. It roosts in caves, mines, tunnels, crevices, and old buildings. It has separate day and night roosts and is sensitive to human disturbance at roost sites.

The fringed myotis is an insectivore, primarily eating beetles, but also taking moths, arachnids, and orthopterans. Its foraging flight is slow and maneuverable and forages over water, near vegetation, and over open habitats, flying low over the canopy. Like many aerial insectivores, it captures its prey in its tail and wing membranes. Perhaps the fringe acts like a trap to help capture smaller insects. The fringed myotis can also hover and may prey on ground-dwelling prey items. Its ability to hover, along with slow, maneuverable flight allows the fringed myotis to glean prey on the surface of vegetation. This flight pattern is typical of bats with shorter, rounded wings with low aspect ratios.

Long-legged myotis (*Myotis volans*): The long-legged myotis is found in woodland and forest habitats, but can also be found foraging in chaparral, coastal scrub, and Great Basin shrub habitats. Roosts are located in hollow trees, in spaces under tree bark, in rock crevices, in fissures in stream banks, and on buildings. Caves and mines are used as night roosts. Trees are the most important day roosts.

The long-legged myotis is an insectivore, eating primarily moths, but also other flying insects such as termites, spiders, flies, beetles, leafhoppers, and lacewings. It can be found feeding alongside other bats, taking advantage of insect swarms. It forages a repeated circuit throughout the evening and will use the same circuit several nights in a row.

Yuma myotis (*Myotis yumanensis*): The Yuma myotis is found in a variety of habitats, including deserts, desert riparian, open woodlands and forests, juniper woodlands, and riparian habitats. Its roosts are located in caves, rock crevices, attics, buildings, mines, underneath bridges, and other similar structures. It also uses abandoned swallow nests. Its foraging flight is described as fluttery. It is surprisingly inconsistent and fluttering in its flight.

The Yuma myotis is an insectivore, eating a wide variety of insects, including moths, midges, flies, craneflies, beetles, termites, ants, homopterans, and caddisflies. An efficient forager, it can forage and return with a full stomach in 15 minutes. It has been reported that the Yuma myotis follows a regular foraging route and takes advantage of swarms of insects.

Canyon bat (*Parastrellus hesperus*): The canyon bat is found in a variety of habitats, including deserts, arid grasslands, brush and scrub lands, woodlands, and coniferous forests. It may be the most common bat in California's desert areas, especially those areas with rocky canyon walls and cliffs. It roosts in rock crevices, beneath rocks, in burrows (including kangaroo rat burrows), mines, and buildings. Roost sites are usually

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located near a source of free water. It is also one of the earliest emerging bats, easily observed in the early evening just prior to sunset.

The canyon bat is an insectivore, eating a wide variety of flying insects, including moths, flies, true bugs, Hymenoptera, Hemipterans, and Coleoptera. It primarily eats soft-bodied prey, and usually only on one type of insect at a time, which means it seeks and forages through insect swarms. The canyon bat's foraging flight is slow and fluttery. It forages from between 2 to 15 meters above the ground. It often forages over water, in rocky canyons, over deserts, and along cliff faces.

Family Molossidae

Western bonneted bat (*Eumops perotis*): The western bonneted bat (also known as the western mastiff bat) is found in open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub, and urban habitats. Suitable roosting habitat consists of open areas with roost locations that have vertical faces that allow it to drop vertically to gain flight speed, such as crevices in rock outcroppings and cliff faces, tunnels, and tall buildings. The distribution of the western bonneted bat is likely limited by geomorphology because of its preference for crevices, caves, and tunnels with high vertical spaces. Rock crevices with horizontal entrances that face downward are preferred because it approaches and enters its roost from below. Natural roosts are often found under large exfoliating slabs of granite, sandstone slabs or in columnar basalt, on cliff faces or in large boulders, or man-made structures that mimic these features. In all cases, the vertical clearance needs to be at least 3.5 meters above the ground. Nursery roosts described as tight rock crevices are at least 90 centimeters deep and 5 centimeters wide or may be found in building crevices.

The western bonneted bat is an insectivore, eating relatively small, low-flying, and weak-flying insects, including moths, crickets, grasshoppers, bees, dragonflies, leaf bugs, beetles, true bugs, ants, and wasps. It also takes ground-dwelling insects, meaning that these prey items must be plucked from the ground or off the surface of vertical rock faces or other structures. It forages from ground level up to over 60 meters in elevation. Like other molossids, the western bonneted bat captures its prey on the wing. It rarely uses a night roost but rather forages continuously for 6 to 7 hours nightly. Foraging areas can range as far as 24 kilometers or more from its day roost site.

Brazilian free-tailed bat (*Tadarida brasiliensis*): The Brazilian free-tailed bat is found in a wide variety of habitats from mean sea level up through mixed conifer forests but prefers open habitats such as woodlands, shrublands, and grasslands. Roost sites include caves and man-made structures, such as bridges and attics. In nature, caves with large rooms and high ceilings are the best roosting sites for this species. It is also known to roost in hollow trees.

The Brazilian free-tailed bat is insectivorous, eating moths, beetles, dragonflies, flies, true bugs, wasps, bees, and ants. It forages high over surrounding habitats (30 meters or higher) and water sources. Its diet varies by prey availability. Insects are captured on the

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wing. It may forage in the company of other bats, but it can usually be distinguished from these other species by its rapid, high flight.

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BIO-4 BENTHIC MACROINVERTEBRATE TECHNICAL MEMORANDUM

KERN RIVER NO. 3 HYDROELECTRIC PROJECT
FERC PROJECT NO. 2290

PREPARED FOR:

SOUTHERN CALIFORNIA EDISON®

Energy for What's Ahead®

KERNVILLE, CALIFORNIA

July 2024

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TABLE OF CONTENTS

Page

1.0 Introduction 1
2.0 Study Goals and Objectives 1
3.0 Study Area and Study Sites 1
4.0 Methods 4
4.1. Study Plan Variances 4
4.2. Benthic Macroinvertebrates 4
4.2.1. Sample Collection 4
4.2.2. Water Quality and Physical Habitat Measurements 4
4.2.3. Laboratory Methods 5
4.2.4. Data Analysis 5
5.0 Data Summary 7
5.1. Water Quality 7
5.2. Physical Habitat Assessment 7
5.3. Benthic Macroinvertebrate Assemblages 10
5.4. Incidental Observations 11
6.0 Study-Specific Consultation 11
7.0 Outstanding Study Plan Elements 11
8.0 References 11

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LIST OF TABLES

Table 3-1. Benthic Macroinvertebrate Sites Sampled in 2023 for the Kern River No. 3 Hydroelectric Project 2

Table 4.2-1. Component Metrics Used in the California Stream Condition Index 6

Table 5.1-1. Water Quality Data by Site for Benthic Macroinvertebrate Samples Collected in 2023 for the Kern River No. 3 Hydroelectric Project 7

Table 5.2-1. Physical Habitat Data Collected by Site during Benthic Macroinvertebrate Sampling in 2023 for the Kern River No. 3 Hydroelectric Project 8

Table 5.2-2. Instream Habitat Complexity and Riparian Vegetation Cover Data Collected by Site during Benthic Macroinvertebrate Sampling in 2023 for the Kern River No. 3 Hydroelectric Project 9

LIST OF FIGURES

Figure 3-1. Benthic Macroinvertebrate Study Area. 3

Figure 5.3-1. California Stream Condition Index Scores and Condition Categories for Samples Collected during Benthic Macroinvertebrate Sampling in 2023 for the Kern River No. 3 Hydroelectric Project. 10

LIST OF APPENDICES

Appendix A Benthic Macroinvertebrate Site Photographs

Appendix B Benthic Macroinvertebrate Taxonomic List

Appendix C Benthic Macroinvertebrate Metric Values

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LIST OF ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
%	percent
% sat.	percent saturation
µS/cm	microsiemens per centimeter
BIO-4 Study	BIO-4 Benthic Macroinvertebrate Study
BMI	benthic macroinvertebrate
CSCI	California Stream Condition Index
cfs	cubic feet per second
EPT	Ephemeroptera, Plecoptera, and Trichoptera
FERC	Federal Energy Regulatory Commission
KR3	Kern River No. 3
m	meter
mg/L	milligram per liter
MMI	multi-metric index
NFKR	North Fork Kern River
O/E	observed-to-expected
Project	Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)
RM	river mile
SAFIT	Southwestern Association of Freshwater Invertebrate Taxonomists
SCE	Southern California Edison
s.u.	standard unit
SWAMP	Surface Water Ambient Monitoring Program

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1.0 INTRODUCTION

This Technical Memorandum provides the results of the BIO-4 Benthic Macroinvertebrate Study (BIO-4 Study) conducted in support of Southern California Edison's (SCE) Kern River No. 3 (KR3) Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 2290. The *BIO-4 Benthic Macroinvertebrate Study Plan* was included in SCE's Revised Study Plan submitted on July 1, 2022 (SCE, 2022). In the October 12, 2022, Study Plan Determination (FERC, 2022), FERC approved the BIO-4 Study with modifications. Specifically, FERC recommended that SCE include an additional sampling site.

The benthic macroinvertebrate field surveys were conducted in October 2023. All field sampling efforts and data analyses are complete and summarized below.

2.0 STUDY GOALS AND OBJECTIVES

The objective of the study, as outlined in the *BIO-4 Benthic Macroinvertebrate Study Plan* (SCE, 2022), is to conduct an inventory and assessment of benthic macroinvertebrate (BMI) diversity and abundance in the Fairview Dam Bypass Reach[1] using an aquatic ecosystem health index.

3.0 STUDY AREA AND STUDY SITES

The study area includes regulated and unregulated reaches of the North Fork Kern River (NFKR) as described below:

- Downstream of KR3 Powerhouse (Site KR-1)
- Immediately upstream of KR3 Powerhouse (Site KR-2)
- Downstream of Gold Ledge Campground (Site KR-3)
- Upstream of Fairview Dam (control site) (Site KR-4)

Additional detail regarding the BMI study sites is provided in Table 3-1 and locations are shown in Figure 3-1.

[1] The Fairview Dam Bypass Reach is defined as the approximately 16-mile bypass reach of the North Fork Kern River (NFKR) between Fairview Dam and the KR3 Powerhouse tailrace.

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Table 3-1. Benthic Macroinvertebrate Sites Sampled in 2023 for the Kern River No. 3 Hydroelectric Project

Site Code	Location Description	Location Coordinates (decimal degrees)		Sample Date (2023)	Elevation (meter)	Reach Length (meter)
		Latitude	Longitude			
KR-1	Downstream of KR3 Powerhouse	35.772203	-118.434222	10/24	818	100
KR-2	Upstream of KR3 Powerhouse	35.777042	-118.437793	10/24	823	100
KR-3	Downstream of Gold Ledge Campground	35.835710	-118.452380	10/25	912	100
KR-4	Upstream of Fairview Dam (control site)	35.955413	-118.482610	10/25	1,114	100

KR3 = Kern River No. 3

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Figure 3-1. Benthic Macroinvertebrate Study Area.

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4.0 METHODS

Study implementation followed the methods described in SCE's Revised Study Plan Package (SCE, 2022), as amended by FERC in its Study Plan Determination (FERC, 2022).

4.1. STUDY PLAN VARIANCES

Monitoring scheduled for October 2022 was rescheduled due to substantial rainfall resulting in high turbidity in the river that prevented effective sampling. SCE postponed the scheduled monitoring until 2023 to allow for safe and effective monitoring conditions. The benthic macroinvertebrate field surveys were conducted in October 2023. All field sampling efforts and data analyses are complete.

4.2. BENTHIC MACROINVERTEBRATES

4.2.1. SAMPLE COLLECTION

As required by the Study Plan, BMI sampling was conducted following the standard reach-wide benthos method for documenting and describing BMI assemblages and physical habitat described by Ode et al. (2016) for the Surface Water Ambient Monitoring Program (SWAMP) protocol and included the following:

- Establishment of a 100-meter reach[2] (measured along the bank) divided into 11 equidistant main transects and 10 inter-transects arranged perpendicular to the direction of flow.
- Collection of BMI at each main transect with a D-frame kick net (0.5-millimeter-diameter mesh) with subsequent combination into a single reach-wide benthos composite sample for each site.

4.2.2. WATER QUALITY AND PHYSICAL HABITAT MEASUREMENTS

Water quality and physical habitat parameters were recorded using methods described in the SWAMP protocol (Ode et al., 2016), including geographic coordinates (i.e., latitude and longitude), total sample site length, gradient, discharge, water temperature, specific conductance, alkalinity, pH, and dissolved oxygen. Water quality measurements were taken using a YSI Pro Plus, calibrated as specified by the manufacturer. Discharge was estimated using the average daily flow recorded at the nearest gage (U.S. Army Corps of Engineers Kernville Gage for Site KR-1, SCE gage 401 at Kern River below Fairview Dam for Sites KR-2 and KR-3, and the sum of SCE gage 401 and SCE gage 402 at the KR3 Flowline for Site KR-4). Percent gradient was calculated using satellite imagery and the U.S. Geological Survey's National Elevation Dataset Digital Elevation Model.

[2] In accordance with the Study Plan (SCE, 2022), the length of the sample reach (typically based on average wetted width) was adjusted to 100 meters due to swift water, which limited the availability of contiguously wadeable and safely accessible aquatic habitat.

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Additional physical habitat data were collected from main transects and/or inter-transects, including wetted width; depth (averaged from five points on each transect); bankfull width and depth (estimated); bank stability (categorized as stable, vulnerable, or eroded); percent aquatic habitat type (e.g., riffle, run); canopy cover (using the Strickler [1959] modification for a convex spherical densiometer); substrate measurements (using a modified Wolman [1954] pebble count); percent cobble embeddedness (for a minimum of 25 cobbles); and presence or absence of algae, macrophytes, and coarse particulate organic matter. Additionally, an evaluation of riparian vegetation and instream habitat complexity was conducted along the main transects.

4.2.3. LABORATORY METHODS

Laboratory methods followed procedures outlined in the *Standard Operating Procedures for Laboratory Processing and Identification of Benthic Macroinvertebrates in California* (Woodard et al. 2012) with approximately 600 individuals subsampled from each composite BMI sample[3] and identified using standard aquatic BMI identification keys (e.g., Merritt et al., 2008; Stewart and Stark, 2002; Thorp and Covich, 2001; Wiggins, 1996). All organisms from the subsample were identified to a minimum level 1 taxonomic effort as specified by the Southwestern Association of Freshwater Invertebrate Taxonomists (SAFIT; Richards and Rogers, 2011). An independent laboratory was contracted to conduct an external quality control review of the BMI identification for one of the samples.

4.2.4. DATA ANALYSIS

In accordance with current SWAMP practices for BMI sample evaluation, the California Stream Condition Index (CSCI; Rehn et al., 2015) was calculated for the BMI samples collected in 2023. The CSCI score is based on predictive modeling generated from a state-wide BMI database and was used as a composite biological response variable to evaluate aquatic habitat quality at sites and identify overall trends related to stream condition as reflected by the BMI community. In addition, a suite of commonly reported metrics (Karr and Chu, 1999) regarding taxonomic richness, composition (e.g., Shannon-Weaver Diversity Index), and tolerance (Richards and Rogers, 2011) was calculated using Microsoft Excel or R Studio for each sample.

The CSCI integrates two measures for evaluating sample sites: (1) BMI taxonomic completeness based on an observed-to-expected (O/E) ratio and (2) ecological structure and function derived from a comparison of anticipated and empirical values for a multi-metric index (MMI). The O/E ratio is a measure of taxonomic completeness between observed (O) taxa collected at a site and expected (E) taxa generated through predictive modeling from the input of site-specific environmental variables (e.g., climate, topography, and geology) that are known to influence BMI communities (Rehn et al., 2015). The MMI component of the CSCI generates anticipated values for six metrics (Table 4.2-1) demonstrated to have a high signal-to-noise response (i.e., a clear indicator

[3] For composite samples containing greater than 600 individuals. Site KR-2 contained 425 individuals, all of which were identified.

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with minimal variability) (Rehn et al., 2015). Values for each metric were calculated by comparing anticipated values based on environmental variables and taxonomic composition at reference sites built into the model with empirical values from the BMI sample collected from each site. As observed values approach those predicted by the model, scores for each measure (i.e., MMI and O/E) increase; conversely, as observed values deviate from those expected, scores decrease.

CSCI calculation integrates O/E taxonomic completeness and MMI results into a single score that typically ranges from 0.1 (great deviation from reference condition) to 1.4 (exceeding quality of reference condition). CSCI scores are further divided into three thresholds, based on the 30th, 10th, and 1st percentiles of CSCI scores at reference sites in the state-wide database. These three thresholds divide the CSCI scoring range into the following four categories of biological condition (Rehn et al., 2015):

- ≥ 0.92 = likely intact condition
- 0.91 to 0.80 = possibly altered condition
- 0.79 to 0.63 = likely altered condition
- ≤ 0.62 = very likely altered condition

Scores within the highest category (≥ 0.92) are generally indicative of healthy stream conditions.

Table 4.2-1. Component Metrics Used in the California Stream Condition Index

Metric	Description	Response to Disturbance [a]
Taxonomic richness	Total number of distinct taxa identified to a standardized taxonomic level	Decrease
Shredder taxa richness	Number of taxa within the shredder functional feeding group [b]	Decrease
Percent clinger taxa	Percentage of taxa with behavioral and morphological adaptions for attachment to surfaces in stream riffles	Decrease
Percent Coleoptera taxa	Percentage of taxa in the Coleoptera insect order	Decrease
Percent EPT taxa	Percentage of taxa in the EPT insect orders	Decrease
Percent intolerant individuals	Percentage of BMIs that are intolerant to water and/or habitat quality impairment as indicated by tolerance values[b]	Decrease

BMI = Benthic macroinvertebrate; EPT = Ephemeroptera, Plecoptera, and Trichoptera
Notes:
[a] The responses indicated are generalized and can vary with natural gradients associated with elevation, water temperature, and substrate composition, as well as impairment to the aquatic environment unrelated to project operations.
[b] The Southwestern Association of Freshwater Invertebrate Taxonomists (SAFIT; Richards and Rogers, 2011) used as source for functional feeding group and tolerance value designations.

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5.0 DATA SUMMARY

A total of four samples were collected from four sites within the NFKR: one control site upstream of Fairview Dam, two within the Fairview Dam Bypass Reach, and one downstream of the Kern 3 Powerhouse (Table 3-1 and Figure 3-1).

5.1. WATER QUALITY

Water quality parameters recorded at sites during BMI collection are shown in Table 5.1-1. Water quality conditions were consistent with those that typically support aquatic life (Allan and Castillo, 2008).

Table 5.1-1. Water Quality Data by Site for Benthic Macroinvertebrate Samples Collected in 2023 for the Kern River No. 3 Hydroelectric Project

Site Code	Water Temperature (°C)	pH (s.u.)	Alkalinity (mg/L)	Dissolved Oxygen (% sat.)	Dissolved Oxygen (mg/L)	Specific Conductance (µS/cm)
KR-1	10.8	7.7	50	108	10.8	110
KR-2	12.9	7.9	80	105	10.0	105
KR-3	11.3	8.0	80	97	9.6	97
KR-4	10.2	7.8	60	101	9.9	107

°C = degrees Celsius; % sat. = percent saturation; µS/cm = microsiemens per centimeter; mg/L = milligram per liter; s.u. = standard unit

5.2. PHYSICAL HABITAT ASSESSMENT

Physical habitat data are summarized by site in Table 5.2-1 and Table 5.2-2. Photographs of the sites are presented in Appendix A. Physical habitats among sampling sites were primarily riffle, run, glide, and rapid, and the associated substrate size classes were sand, cobble, and small boulder (Table 5.2-1). Instream habitat complexity element abundances were absent to sparse; undercut banks and artificial structures were absent at all sites (Table 5.2-2). Average canopy cover was low (1 to 7 percent) (Table 5.2-1). The upper and lower riparian canopy covers were sparse to heavy and ground cover was moderate at all sites (Table 5.2-2). Stream banks were predominantly categorized as stable and vulnerable except for two transects at Site KR-3 where erosion was noted.

No evidence of in-channel human disturbance was observed at any site. However, human influence (i.e., roads) was observed outside the channel at all sites. Highway 99 and other small roadways were present to the east of the NFKR at all sites. Additional human disturbance, including the presence of cleared lots, roads, buildings, and pipes, was noted at Site KR-1.

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Table 5.2-1. Physical Habitat Data Collected by Site during Benthic Macroinvertebrate Sampling in 2023 for the Kern River No. 3 Hydroelectric Project

Site Code	Gradient (%) [a]	Discharge (cfs) [b]	Average Wetted Width (m) [c]	Average Canopy Cover (%)	Dominant Habitat (subdominant)	Dominant Substrate (subdominant)
KR-1	0.3%	532	74	1	Riffle (Run)	Cobble (Sand)
KR-2	0.8%	82	27	2	Run (Riffle)	Sand (Cobble / small boulder)
KR-3	1.2%	82	31	1	Glide (Run)	Cobble (Sand)
KR-4	1.1%	465	29	7[d]	Rapid (Run)	Small boulder (Cobble)

% = percent; cfs = cubic feet per second; m = meter

Notes:

[a] Calculated using satellite imagery and the U.S. Geological Survey National Elevation Dataset Digital Elevation Model.

[b] Estimated using the average daily flow recorded at the nearest gage.

[c] Averaged across 11 main transects.

[d] Canopy cover was not recorded at seven transects due to high flows that prevented safe access to the middle of the channel.

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Table 5.2-2. Instream Habitat Complexity and Riparian Vegetation Cover Data Collected by Site during Benthic Macroinvertebrate Sampling in 2023 for the Kern River No. 3 Hydroelectric Project

Site	Instream Habitat Complexity Elements[a]									Riparian Cover[a]		
	Filamentous Algae	Aquatic Macrophytes/ Emergent Vegetation	Boulders	Woody Debris (>0.3 meter)	Woody Debris (< 0.3 meter)	Undercut Banks	Overhang Vegetation	Live Tree Roots	Artificial Structures	Upper Canopy (>5 meter)	Lower Canopy (0.5–5 meter)	Ground Cover (<0.5 meter)
KR-1	Sparse	Sparse	Sparse	Sparse	Sparse	Absent	Sparse	Sparse	Absent	Heavy	Heavy	Moderate
KR-2	Sparse	Sparse	Sparse	Absent	Sparse	Absent	Absent	Absent	Absent	Sparse	Sparse	Moderate
KR-3	Sparse	Sparse	Sparse	Absent	Absent	Absent	Sparse	Absent	Absent	Sparse	Moderate	Moderate
KR-4	Absent	Sparse	Sparse	Sparse	Sparse	Absent	Sparse	Sparse	Absent	Moderate	Sparse	Moderate

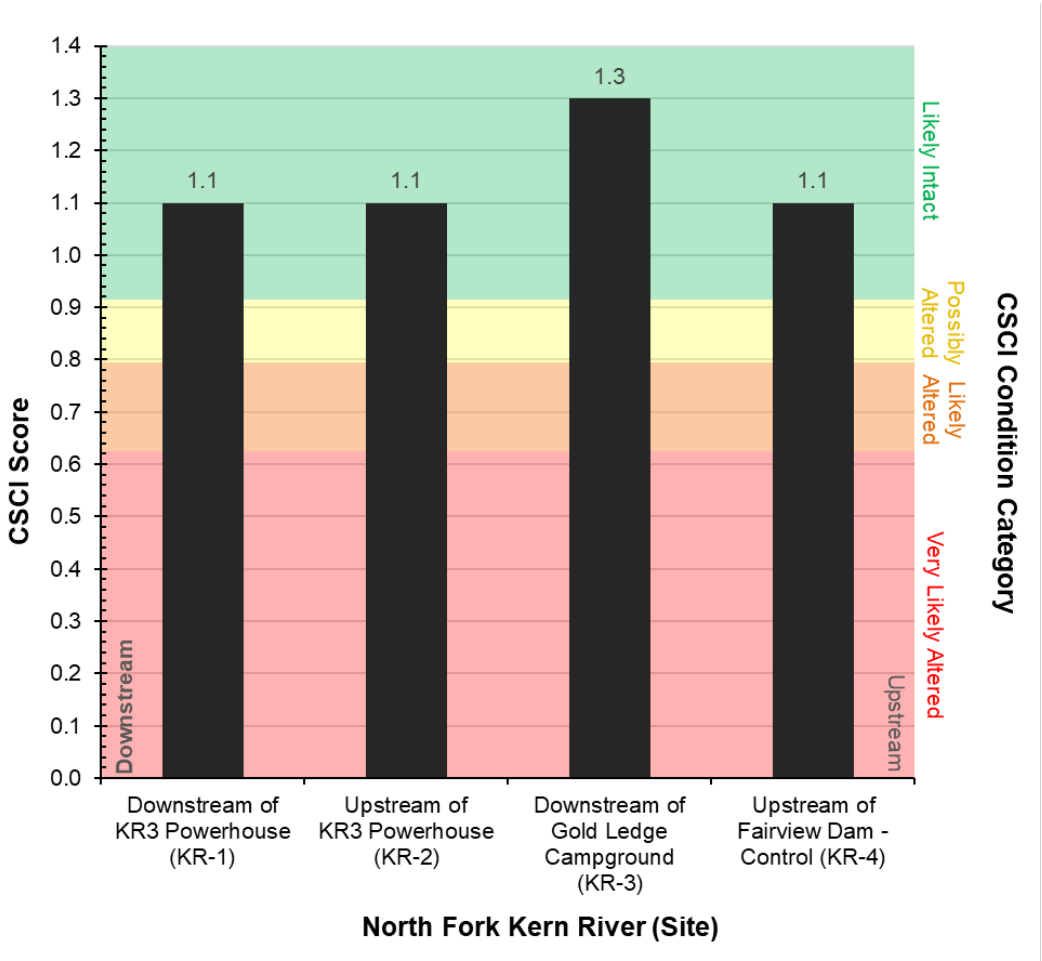
Notes:
[a] Presence averaged across 11 main transects: Absent = 0%; Sparse = < 10%; Moderate = 10–40%; Heavy = 41–75%; Very Heavy = > 75%

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5.3. BENTHIC MACROINVERTEBRATE ASSEMBLAGES

A total of 2,281 individuals representing 52 distinct taxa (identified to a minimum level 1 taxonomic effort as specified in SAFIT [Richards and Rogers, 2011]) were processed from the four samples collected from the NFKR in 2023. The BMI taxa and associated tolerance values and functional feeding groups are included in Appendix B.

The CSCI scores for the samples collected in the NFKR downstream of the KR3 Powerhouse (Site KR-1), upstream of the KR3 Powerhouse (Site KR-2), downstream of Gold Ledge Campground (Site KR-3), and the control site upstream of Fairview Dam (Site KR-4) were within the condition category described as "likely intact" with a score greater than or equal to 0.92 (Figure 5.3-1). MMI components (as described in Table 4.2-1) of the CSCI and other commonly reported metrics regarding richness, composition (e.g., Shannon-Weaver Diversity Index), and tolerance values for each sample are included in Appendix C.



CSCI = California Stream Condition Index

Figure 5.3-1. California Stream Condition Index Scores and Condition Categories for Samples Collected during Benthic Macroinvertebrate Sampling in 2023 for the Kern River No. 3 Hydroelectric Project.

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5.4. INCIDENTAL OBSERVATIONS

There were no incidental observations of native freshwater mussels (western ridged mussel [*Gonidea angulata*] or western pearlshell mussel [*Margaritifera falcata*]*) or* invasive species (e.g., Asian clam [*Corbicula fluminea*]*,* American bullfrog (*Lithobates catesbeianus*), crayfish species).

6.0 STUDY-SPECIFIC CONSULTATION

No study-specific consultation is required for this study, and no consultation has been conducted to date.

7.0 OUTSTANDING STUDY PLAN ELEMENTS

All Study Plan elements have been completed as outlined in SCE's Revised Study Plan (SCE, 2022) filing and FERC's Study Plan Determination (FERC, 2022).

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APPENDIX A
BENTHIC MACROINVERTEBRATE SITE PHOTOGRAPHS

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Facing upstream from Transect A



Facing downstream from Transect F



Facing upstream from Transect F



Facing downstream from Transect K

Figure A-1. North Fork Kern River Downstream of Kern River No. 3 Powerhouse (Site KR-1), Kern River No. 3 Hydroelectric Project, 2023.

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Facing upstream from Transect A



Facing downstream from Transect F



Facing upstream from Transect F



Facing downstream from Transect K

Figure A-2. North Fork Kern River Immediately Upstream of Kern River No. 3 Powerhouse (Site KR-2), Kern River No. 3 Hydroelectric Project, 2023.

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Facing upstream from Transect A



Facing downstream from Transect F



Facing upstream from Transect F



Facing downstream from Transect K

Figure A-3. North Fork Kern River Downstream of Gold Ledge Campground (Site KR-3), Kern River No. 3 Hydroelectric Project, 2023.

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Facing upstream from Transect A



Facing downstream from Transect F



Facing upstream from Transect F



Facing downstream from Transect K

Figure A-4. North Fork Kern River Control Site Upstream of Fairview Dam (Site KR-4), Kern River No. 3 Hydroelectric Project, 2023.

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APPENDIX B
BENTHIC MACROINVERTEBRATE TAXONOMIC LIST

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Table. B-1. Benthic Macroinvertebrate Taxa Identified by Site for Benthic Macroinvertebrate Samples Collected during 2023 for the Kern River No. 3 Hydroelectric Project

Phylum	Class	Order	Family	Common Name	Final ID	TV [a]	FFG [b]	Site			
								KR-1	KR-2	KR-3	KR-4
Arthropoda	Arachnida	Trombidiformes	Hygrobatidae	Water mite	*Atractides*	8	P	2	--	1	--
Arthropoda	Arachnida	Trombidiformes	Hygrobatidae	Water mite	*Hygrobates*	8	P	--	--	2	--
Arthropoda	Arachnida	Trombidiformes	Lebertiidae	Water mite	*Lebertia*	8	P	1	2	1	--
Arthropoda	Arachnida	Trombidiformes	Sperchontidae	Water mite	*Sperchon*	8	P	4	4	4	2
Arthropoda	Arachnida	Trombidiformes	Torrenticolidae	Water mite	*Torrenticola*	5	P	--	2	3	1
Arthropoda	Insecta	Ephemeroptera	Ameletidae	Mayfly	*Ameletus*	0	CG	--	3	4	8
Arthropoda	Insecta	Ephemeroptera	Baetidae	Mayfly	*Acentrella insignificans*	4	CG	18	11	7	4
Arthropoda	Insecta	Ephemeroptera	Baetidae	Mayfly	*Anafroptilum* (previously *Centroptilum)*	2	CG	--	--	1	--
Arthropoda	Insecta	Ephemeroptera	Baetidae	Mayfly	*Baetis piscatoris* complex	5	CG	27	11	10	11
Arthropoda	Insecta	Ephemeroptera	Baetidae	Mayfly	*Baetis tricaudatus* complex	5	CG	199	41	37	175
Arthropoda	Insecta	Ephemeroptera	Ephemerellidae	Mayfly	*Drunella grandis*	0	CG	--	--	1	--
Arthropoda	Insecta	Ephemeroptera	Ephemerellidae	Mayfly	*Ephemerella*	1	CG	138	145	129	58
Arthropoda	Insecta	Ephemeroptera	Ephemerellidae	Mayfly	*Serratella micheneri*	1	CG	1	--	--	--
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	Mayfly	*Cinygma*	2	SC	--	1	--	--
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	Mayfly	*Cinygmula*	4	SC	1	4	7	7
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	Mayfly	*Ecdyonurus*	3	SC	--	--	1	--
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	Mayfly	*Epeorus*	0	SC	2	7	15	1
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	Mayfly	*Rhithrogena*	0	SC	65	64	90	132
Arthropoda	Insecta	Ephemeroptera	Leptohyphidae	Mayfly	*Tricorythodes*	4	CG	--	3	--	--
Arthropoda	Insecta	Ephemeroptera	Leptophlebiidae	Mayfly	*Paraleptophlebia*	4	CG	1	5	12	6
Arthropoda	Insecta	Plecoptera	Capniidae	Stonefly	Capniidae	1	SH	1	1	--	15
Arthropoda	Insecta	Plecoptera	Chloroperlidae	Stonefly	*Sweltsa*	1	P	--	1	--	--
Arthropoda	Insecta	Plecoptera	Nemouridae	Stonefly	*Zapada cinctipes*	2	SH	3	2	1	1
Arthropoda	Insecta	Plecoptera	Perlidae	Stonefly	Perlidae	2	P	--	1	--	3
Arthropoda	Insecta	Plecoptera	Perlidae	Stonefly	*Calineuria californica*	2	P	--	--	--	2
Arthropoda	Insecta	Plecoptera	Perlidae	Stonefly	*Hesperoperla pacifica*	2	P	1	--	7	6
Arthropoda	Insecta	Plecoptera	Perlodidae	Stonefly	*Cultus*	2	P	4	6	9	1
Arthropoda	Insecta	Plecoptera	Perlodidae	Stonefly	*Isoperla*	2	P	6	7	20	10
Arthropoda	Insecta	Plecoptera	Perlodidae	Stonefly	*Perlinodes aureus*	2	P	3	--	--	1
Arthropoda	Insecta	Plecoptera	Perlodidae	Stonefly	*Skwala*	2	P	5	2	4	1
Arthropoda	Insecta	Plecoptera	Pteronarcyidae	Stonefly	*Pteronarcys californica*	1	OM	1	1	3	7
Arthropoda	Insecta	Trichoptera	Glossosomatidae	Caddisfly	*Glossosoma*	1	SC	1	2	1	--
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Caddisfly	*Cheumatopsyche*	5	CF	3	6	31	7
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Caddisfly	*Hydropsyche*	4	CF	54	35	174	84

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Phylum	Class	Order	Family	Common Name	Final ID	TV [a]	FFG [b]	Site			
								KR-1	KR-2	KR-3	KR-4
Arthropoda	Insecta	Trichoptera	Hydroptilidae	Caddisfly	*Leucotrichia*	6	SC	1	--	--	--
Arthropoda	Insecta	Trichoptera	Lepidostomatidae	Caddisfly	*Lepidostoma*	1	SH	--	--	3	--
Arthropoda	Insecta	Trichoptera	Rhyacophilidae	Caddisfly	*Rhyacophila coloradensis* group	2	P	--	--	--	1
Arthropoda	Insecta	Coleoptera	Dryopidae	Dryopid beetle	*Helichus*	5	SH	--	--	1	--
Arthropoda	Insecta	Coleoptera	Elmidae	Riffle beetle	*Cleptelmis addenda*	4	CG	--	--	1	--
Arthropoda	Insecta	Coleoptera	Elmidae	Riffle beetle	*Microcylloepus*	4	CG	2	--	--	--
Arthropoda	Insecta	Coleoptera	Elmidae	Riffle beetle	*Optioservus*	4	SC	2	3	5	1
Arthropoda	Insecta	Coleoptera	Elmidae	Riffle beetle	*Ordobrevia nubifera*	4	SC	--	--	1	1
Arthropoda	Insecta	Coleoptera	Elmidae	Riffle beetle	*Zaitzevia parvula*	4	SC	5	2	37	9
Arthropoda	Insecta	Diptera	Athericidae	Watersnipe fly	*Atherix*	2	P	1	1	--	1
Arthropoda	Insecta	Diptera	Chironomidae	Non-biting midge	Chironominae	6	CG	4	9	5	2
Arthropoda	Insecta	Diptera	Chironomidae	Non-biting midge	Diamesinae	2	CG	--	1	--	--
Arthropoda	Insecta	Diptera	Chironomidae	Non-biting midge	Orthocladiinae	5	CG	18	35	6	18
Arthropoda	Insecta	Diptera	Chironomidae	Non-biting midge	Tanypodinae	7	P	--	2	2	6
Arthropoda	Insecta	Diptera	Empididae	Dance fly	*Neoplasta*	6	P	--	--	1	2
Arthropoda	Insecta	Diptera	Empididae	Dance fly	*Wiedemannia*	6	P	--	--	--	1
Arthropoda	Insecta	Diptera	Simuliidae	Black fly	*Simulium*	6	CF	26	2	1	12
Annelida	Oligochaeta	--	--	Aquatic worm	Oligochaeta	5	CG	2	3	5	14

-- = no data
Notes:
[a] Tolerance Value (TV): Values ranging from 0–10 were assigned to each taxon and reflect the taxon's sensitivity to perturbations in water and habitat quality; as values increase, sensitivity decreases (Richards and Rogers, 2011).[1]
[b] functional feeding group (FFG): CF = collector-filterer; CG = collector-gatherer; OM = omnivore; P = predator; SC = scraper; SH = shredder

[1] Richards, A.B., and D.C. Rogers. 2011. *Southwest Association of Freshwater Invertebrate Taxonomists (SAFIT) List of Freshwater Macroinvertebrate Taxa from California and Adjacent States including Standard Taxonomic Effort Levels*. Accessed: April 2024. Retrieved from: https://safit.org/downloads/

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APPENDIX C
BENTHIC MACROINVERTEBRATE METRIC VALUES

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Table C-1. California Stream Condition Index Results by Metric Component for the Benthic Macroinvertebrate Samples Collected during 2023 for the Kern River No. 3 Hydroelectric Project

Metric			Site			
			KR-1	KR-2	KR-3	KR-4
Multi-metric Index	Percent clinger taxa	Observed	73	65	64	64
		Predicted	63	60	63	68
	Percent Coleoptera taxa	Observed	10	7	14	9
		Predicted	11	10	10	9
	Taxonomic richness	Observed	28	30	33	29
		Predicted	28	28	28	29
	Percent EPT taxa	Observed	66	70	61	65
		Predicted	50	50	50	52
	Shredder taxa richness	Observed	1.9	2	2.7	1.8
		Predicted	1.0	1.0	1.0	0.8
	Percent intolerant individuals	Observed	39	57	45	41
		Predicted	16	16	17	26

EPT = Ephemeroptera, Plecoptera, and Trichoptera

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Table C-2. Biological Metric Values for the Benthic Macroinvertebrate Sample Collected during 2023 for the Kern River No. 3 Hydroelectric Project

Metric		Site			
		KR-1	KR-2	KR-3	KR-4
Richness	Taxonomic richness [a]	28.1	30	32.6	29
	EPT taxa	21	22	22	22
	Ephemeroptera taxa	9	11	12	9
	Plecoptera taxa	8	8	6	10
	Trichoptera taxa	4	3	4	3
	Coleoptera taxa	3	2	5	3
	Predator taxa	9	10	11	14
	ET taxa	13	14	16	12
	Shredder taxa [a]	2	2	3	2
Composition	EPT taxa (%) [a]	66	70	61	65
	Sensitive EPT index (%)	38	57	45	40
	Shannon-Weaver Diversity Index	2.2	2.4	2.5	2.3
	Dominant taxon (%)	33	34	27	29
	Non-insect taxa (%)	13	12	16	9
	Clinger taxa (%) [a]	73	65	64	64
	Coleoptera taxa (%) [a]	10	7	14	9
	Predators (%)	4	7	8	6
	Scrapers (%)	13	20	24	25
	Shredder taxa [a]	6	6	8	6

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Metric		Site			
		KR-1	**KR-2**	**KR-3**	**KR-4**
Tolerance [b]	Tolerance value	3.3	2.5	2.8	3.1
	Intolerant individuals (%) [a]	39	57	45	41
	Tolerant individuals (%)	1.0	1	1	0

EPT = Ephemeroptera, Plecoptera, and Trichoptera, ET = Ephemeroptera and Trichoptera
Notes:
a Metrics used for California Stream Condition Index (Rehn et al. 2015).[1]
b Tolerance Value: Values ranging from 0–10 were assigned to each taxon and reflect the taxon's sensitivity to perturbations in water and habitat quality; as values increase, sensitivity decreases (Richards and Rogers, 2011).[2]

[1] Rehn, A.C., R.D. Mazor, and P.R. Ode. 2015. *The California Stream Condition Index (CSCI): A New Statewide Biological Scoring Tool for Assessing the Health of Freshwater Streams.* California State Water Resources Control Board SWAMP Technical Memorandom-2015-002.
[2] Richards, A.B., and D.C. Rogers. 2011. *Southwest Association of Freshwater Invertebrate Taxonomists (SAFIT) List of Freshwater Macroinvertebrate Taxa from California and Adjacent States including Standard Taxonomic Effort Levels*. Accessed: April 2024. Retrieved from: https://safit.org/downloads/

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BIO-5 WESTERN POND TURTLE TECHNICAL MEMORANDUM

KERN RIVER NO. 3 HYDROELECTRIC PROJECT
FERC PROJECT NO. 2290

PREPARED FOR:

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead®

KERNVILLE, CALIFORNIA

October 2023

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TABLE OF CONTENTS

Page

1.0 Introduction 1

2.0 Study Goals and Objectives 1

3.0 Study Area and Study Sites 1

4.0 Methods 4

4.1. Literature Review and Mapping 4

4.1.1. Phase 1: Habitat Assessment 4

4.1.2. Phase 2: Visual Encounter Surveys 11

5.0 Data Summary 11

6.0 Study Specific Consultation 14

7.0 Outstanding Study Plan Elements 14

8.0 References 14

LIST OF TABLES

Table 5-1. Survey Data 12

LIST OF FIGURES

Figure 3-1. Northwestern Pond Turtle Study Area. 3

Figure 4.1-1a. Potentially Suitable Pond Turtle Habitat. 5

Figure 4.1-1b. Potentially Suitable Pond Turtle Habitat 7

Figure 4.1-1c. Potentially Suitable Pond Turtle Habitat 9

Figure 5-1. Survey Results. 13

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LIST OF APPENDICES

Appendix A Representative Photographs

Appendix B Wildlife Compendium

LIST OF ACRONYMS AND ABBREVIATIONS

FERC	Federal Energy Regulatory Commission
KR3	Kern River No. 3
NFKR	North Fork Kern River
Project	Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)
RSP	Revised Study Plan
SCE	Southern California Edison

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1.0 INTRODUCTION

This Technical Memorandum provides the methods and findings of field surveys associated with the *BIO-5 Western Pond Turtle Study Plan* in support of Southern California Edison's (SCE) Kern River No. 3 (KR3) Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 2290. The BIO-5 Study Plan was included in SCE's Revised Study Plan (RSP) submitted on July 1, 2022 (SCE, 2022). In the October 12, 2022, Study Plan Determination (FERC, 2022), FERC approved the BIO-5 Study Plan with modifications. Specifically, FERC recommended that the northwestern pond turtle (*Actinemys marmorata*) be allocated in its own Study Plan separate from special-status salamanders. Since the conception, approval, and implementation of the BIO-5 Study Plan, the Western pond turtle was split into two species: the northwestern pond turtle and southwestern pond turtle (*Actinemys pallida*). The species that occurs in the Project Area is now known as the northwestern pond turtle. This common name is used throughout this report.

Data collection efforts were initiated May 15 to 18 and August 10 to 11, 2023, where focused northwestern pond turtle surveys were conducted. All field sampling efforts and data analysis are completed and summarized below.

On October 3, 2023, the U.S. Fish and Wildlife Service published a proposed rule to list the northwestern pond turtle as a federally threatened species ("Endangered and Threatened Wildlife and Plants; Threatened Species Status with Section 4(d) Rule for the Northwestern Pond Turtle and Southwestern Pond Turtle," of the Federal Register, Volume 88, Issue 190, p. 63870).

2.0 STUDY GOALS AND OBJECTIVES

The objectives of the study, as outlined in the BIO-5 Study Plan (SCE, 2022), include the following:

- Obtain additional information to supplement the existing information regarding the northwestern pond turtle including:
  - Identify and map potentially suitable habitat.
  - Document presence, if found.
  - Resurvey previously documented locations of northwestern pond turtles in the study area (Psomas, 2013).

3.0 STUDY AREA AND STUDY SITES

The study area includes lands and waters within the FERC Project Boundary in addition to areas adjacent to, or in the proximity of, the FERC Project Boundary along the North Fork Kern River (NFKR) and Salmon, Corral, and Cannell Creeks for the purposes of characterization and data collection relevant to understanding Project operations and

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maintenance activities. Figure 3-1 shows the FERC Project Boundary. Specific study sites are further described below and shown on Figure 4.1-1.

- The study area includes:
  - Perennial streams, ephemeral creeks, off-channel ponds, or wetlands located within the FERC Project Boundary, including a 50-foot buffer around the following:
    - Fairview Dam;
    - Salmon Creek Diversion, Open Flume, Adit 8B-9A, and adjacent access roads;
    - Gold Ledge Creek Open Flume, Adit 13-14, and adjacent access road;
    - Corral Creek Diversion, Open Flume, and access road; and
    - Cannell Creek, Siphon, and access road.
  - NFKR junction with Salmon Creek, Gold Ledge Creek, Corral Creek, and Cannell Creek.
  - Fairview Dam Bypass Reach[1] between Fairview Dam and the KR3 Powerhouse.

[1] The Fairview Dam Bypass Reach is defined as the approximately 16-mile bypass reach of the NFKR between Fairview Dam and the KR3 Powerhouse tailrace.

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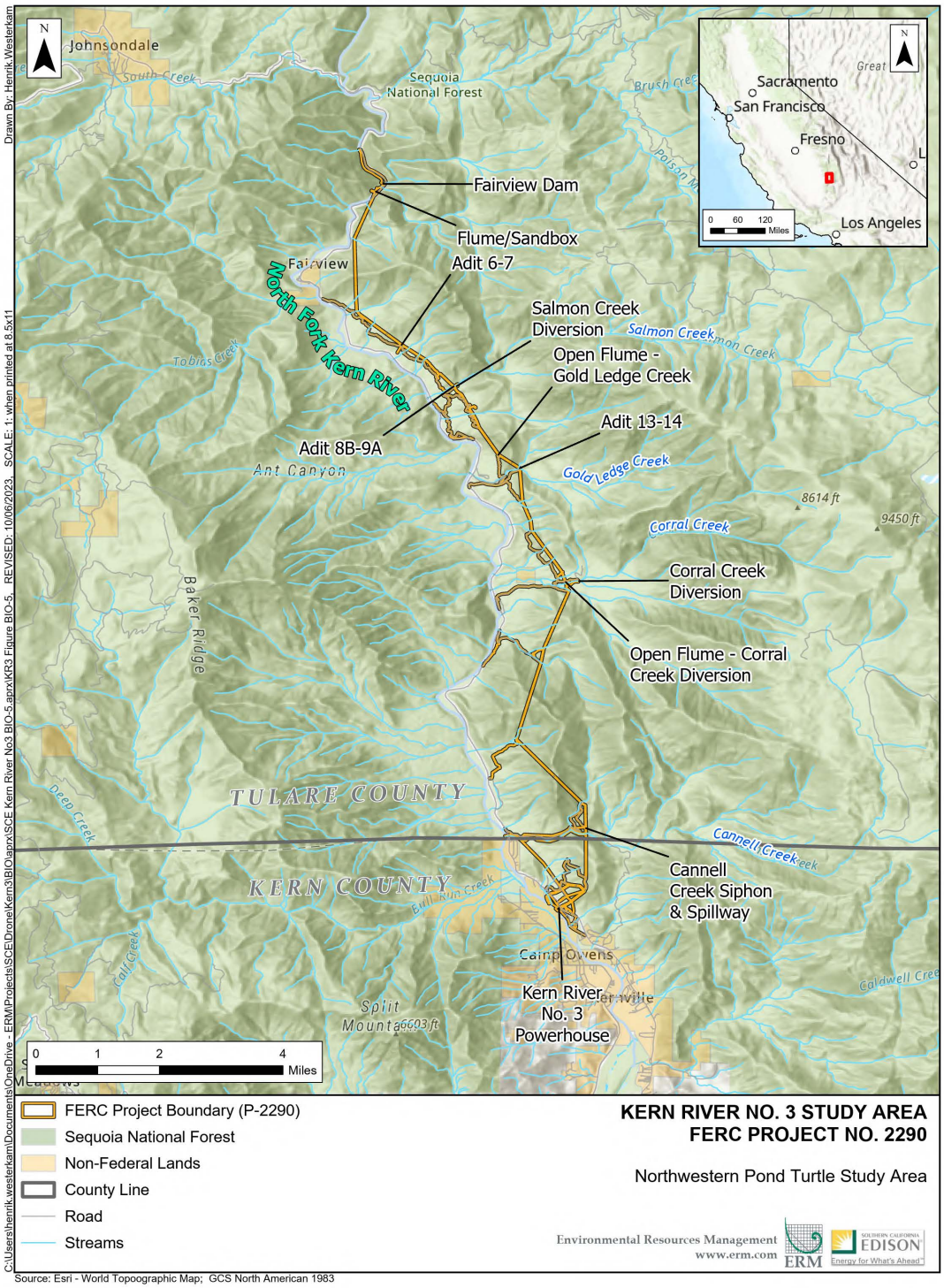


Figure 3-1. Northwestern Pond Turtle Study Area.

4.0 METHODS

Study implementation followed the methods described in SCE's RSP Package (SCE, 2022), with the exception noted below.

Study Plan Variances

Due to high flows in the NFKR and surrounding creeks, some locations were unsafe to access/cross during early breeding season surveys; when this occurred, potentially suitable habitat locations were viewed using binoculars.

4.1. LITERATURE REVIEW AND MAPPING

A literature review was conducted including the use of online databases such as California Natural Diversity Database records (CDFW, 2022) or iNaturalist (2023) to look for new reported occurrences in the Project Vicinity.

4.1.1. PHASE 1: HABITAT ASSESSMENT

In-house Geographic Information System (GIS) mapping of U.S. Forest Service vegetation communities and National Wetlands Inventory sites was compiled and followed by on-the-ground habitat assessment surveys. Prior to the start of the habitat assessment survey, field maps were created from aerial photographs at a 1-inch to 200-foot scale and included previous northwestern pond turtle occurrences.

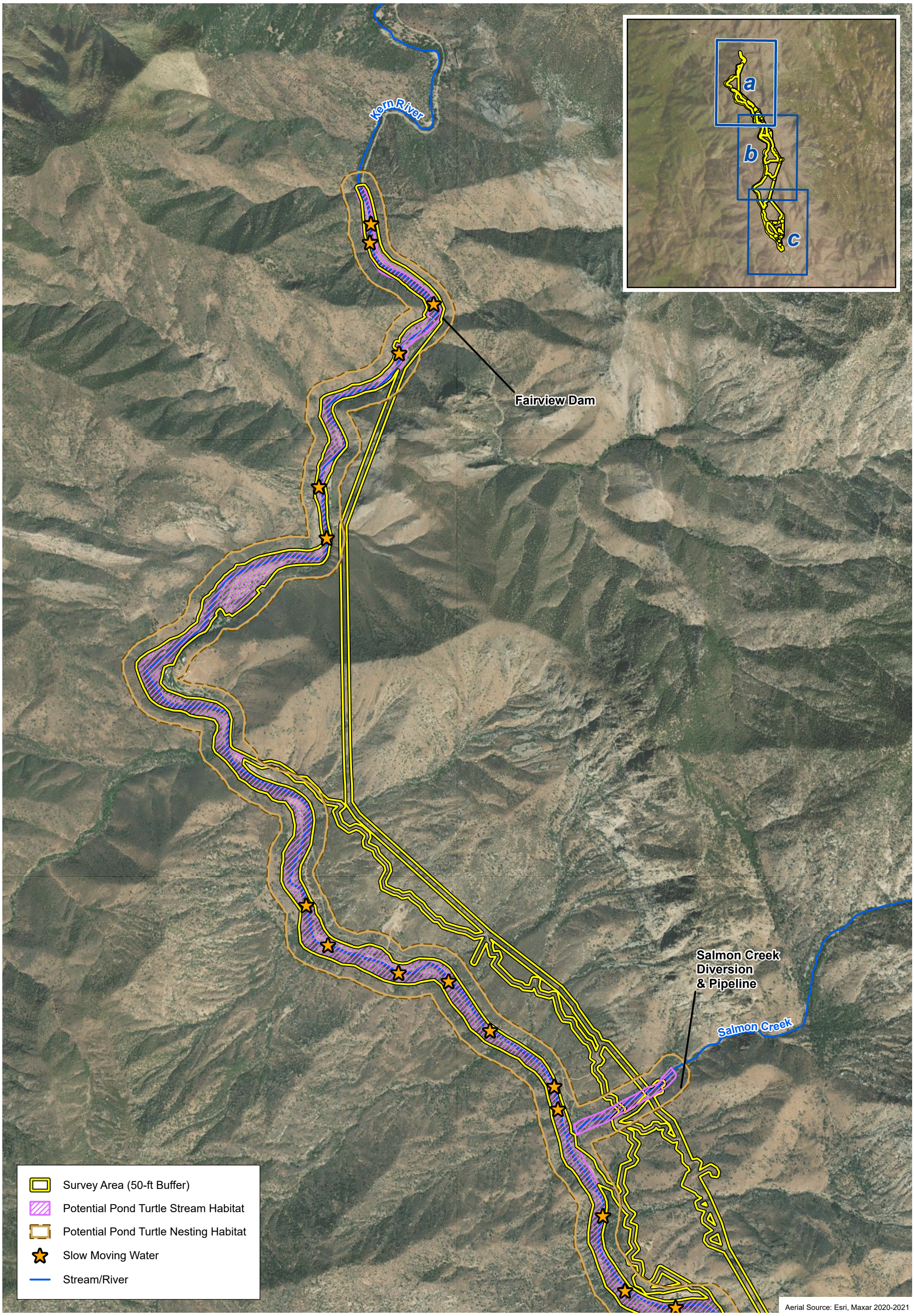
During the habitat assessment, biologists walked the study area to document habitat conditions. Maps were loaded onto an iPad mini 6 for field navigation. The Fairview Dam Bypass Reach was walked where accessible, otherwise visually surveyed with binoculars for suitable pond turtle habitat, such as basking sites and slow water pools and ponds depicted on Figure 4.1-1. All potential pond turtle stream sites (e.g., slow moving water, basking sites, aquatic and streamside refugia) were mapped onto aerial photographs at a 1-inch to 200-foot scale (Figure 4.1-1).

Biologists noted any incidental observations of non-native invasive aquatic species (e.g., bullfrog, crayfish, Asian clams, and invasive fishes) and other key species of interest (e.g., special-status freshwater mussels, aquatic reptiles, and amphibians, Bald Eagle, Osprey, and Great Blue Heron).

After the field portion of the habitat assessment, potentially suitable nesting habitat was mapped at a distance of 325 feet from all stream habitat based on available literature for maximum nesting distance from water (Morey, 2000) (Figure 4.1-1).

The results of the habitat assessment survey were used to target specific areas within the study area that were the subject of Visual Encounter Surveys described below. Figure 4.1-1 shows the potentially suitable northwestern pond turtle stream habitat identified during the habitat assessment. Potentially suitable nesting habitat was not surveyed during Phase 2 surveys.

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Potentially Suitable Pond Turtle Habitat

Figure 4.1-1a

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N W E S

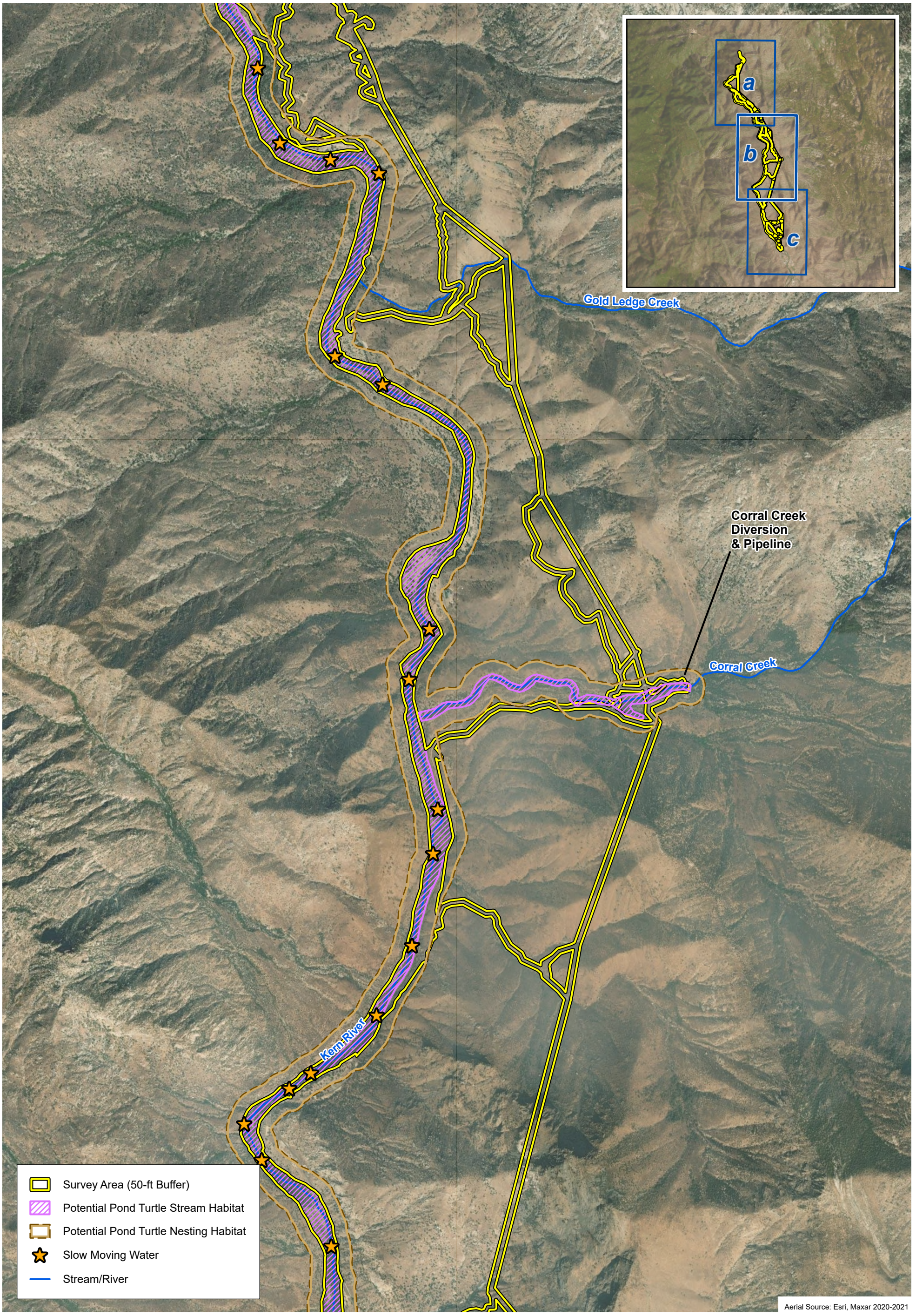
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Potentially Suitable Pond Turtle Habitat

Figure 4.1-1b

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

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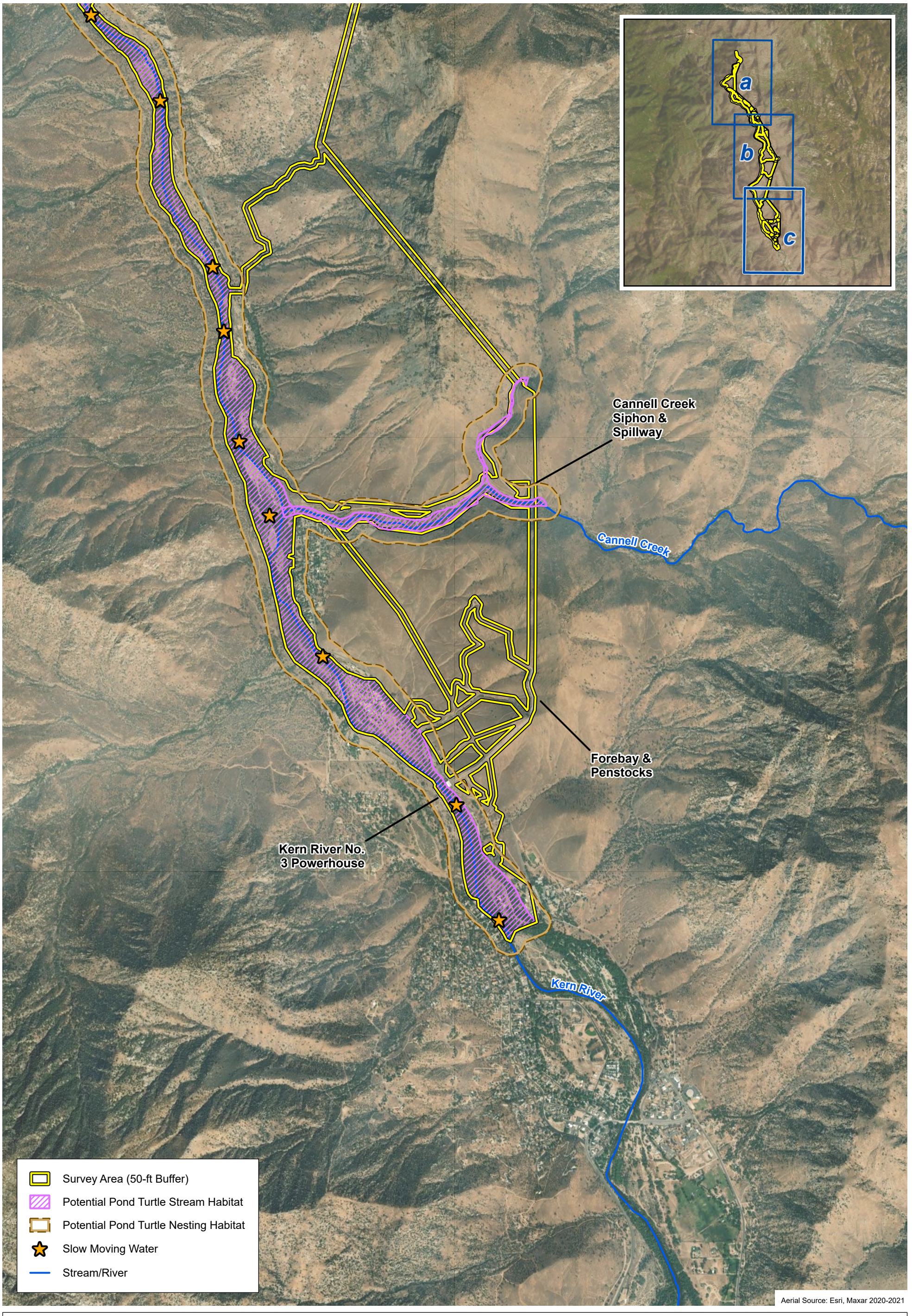
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Potentially Suitable Pond Turtle Habitat

Figure 4.1-1c

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

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4.1.2. PHASE 2: VISUAL ENCOUNTER SURVEYS

Northwestern pond turtle surveys were timed to coincide with their typical breeding period in southern California, typically March through August. Two separate surveys periods were conducted: one early in the breeding season (March to May) and one later in the breeding season (June to August). Northwestern pond turtle surveys were conducted May 15 to18 and August 10 to 11, 2023.

A team of two qualified biologists with experience following the Visual Encounter Survey protocol for northwestern pond turtle (USGS, 2006) walked slowly along the stream channels scanning with and without binoculars and stopping at all likely pond turtle habitat areas to look for basking or underwater turtles. During the May survey, water flow was too high to traverse to the opposite side of streams at sites of potentially suitable stream habitat; therefore, vantage points along the banks of stream habitat were utilized to scan basking areas with binoculars. The Kern River was flooded over its normal banks due to the heavy rain events of early 2023, and no suitable habitat (e.g., slow-moving water) was present during the first survey. Safe and accessible portions of Cannell Creek, Corral Creek, and Salmon Creek were walked from downstream to upstream during the August survey as water flow had slowed. Biologists visually surveyed pooled areas using binoculars before approaching potential basking sites. Noise and movement was kept to a minimum during the observation period to avoid disturbing basking turtles. Biologists surveyed exposed basking sites and searched for turtles basking in the water and swimming turtles.

Vegetation data and physical features were recorded at each site turtles were observed. Biologists surveyed and documented current conditions at the known Cannell Creek location documented previously (Psomas, 2013). Any sightings of northwestern pond turtle were recorded on a Garmin GPSMAP 64sx Global Positioning System.

Biologists noted any incidental observations of non-native invasive aquatic species (e.g., bullfrog, crayfish, Asian clams, and invasive fishes) and other key species of interest (e.g., special-status freshwater mussels, aquatic reptiles and amphibians, Bald Eagle, Osprey, and Great Blue Heron). Sierra gartersnake (*Thamnophis couchii*), an aquatic reptile, was observed in Cannell Creek.

5.0 DATA SUMMARY

Psomas biologists Lindsay Messett and Sarah Thomas observed one adult (sex unknown) northwestern pond turtle basking on a small rock at the northern edge of a pool below Siphon Road in Cannell Creek on August 11, 2023 (Figure 5-1). This individual jumped into the water shortly after being observed; biologists observed it from afar and had no opportunity to catch the turtle. Pond turtle have been previously observed in this general location (Psomas, 2013). This pool and the surrounding area downstream and upstream provides high-quality basking, foraging, and refugia habitat. Photos of the pond turtle and suitable habitat can be viewed in Appendix A of this memorandum. A summary of survey conditions can be found in Table 5-1. A compendium of wildlife observed is found in Appendix B.

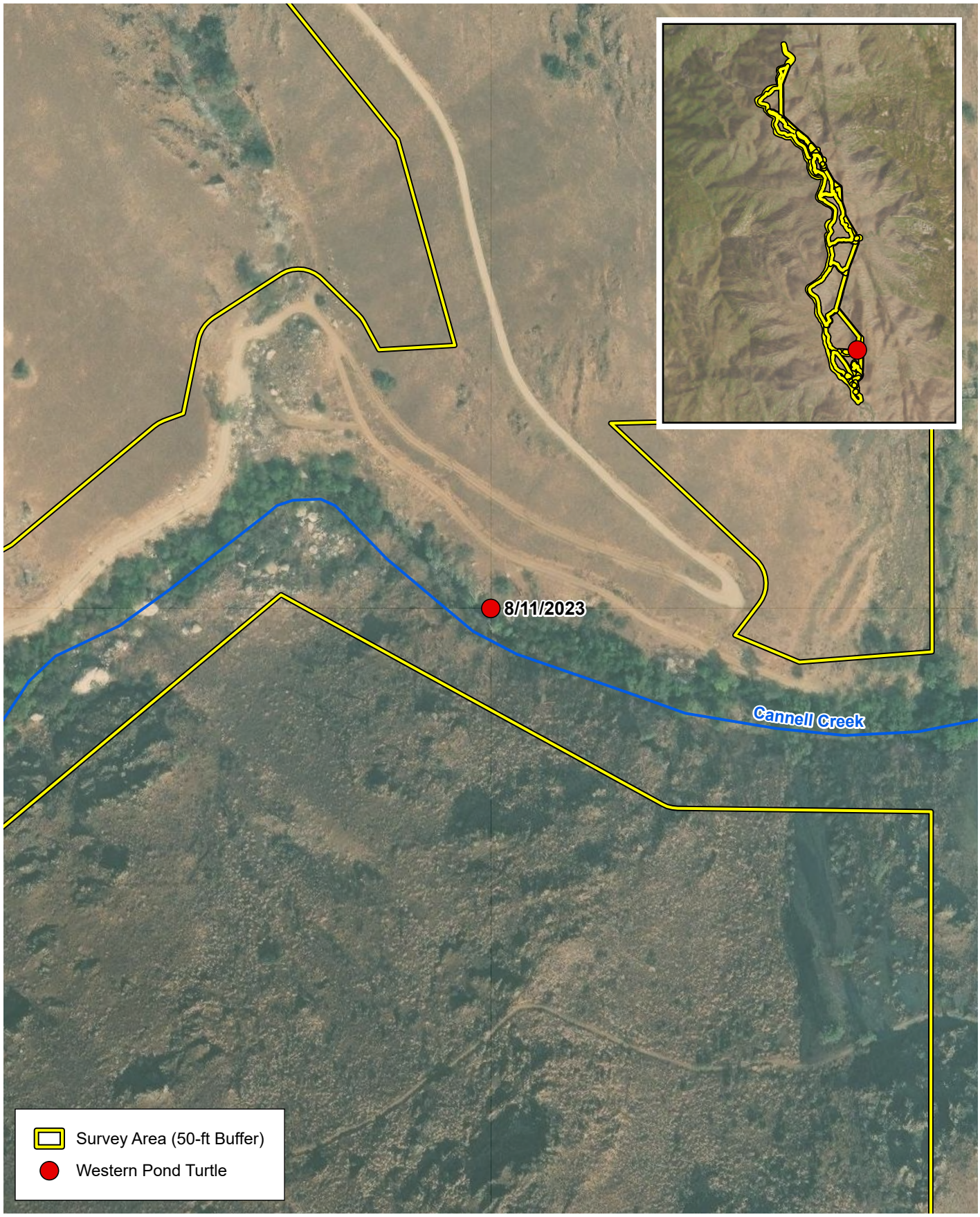
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Table 5-1. Survey Data

Survey Number	Date	Time (Start/End)	Weather Conditions		
			Temperature (°F) (Start/End)	Wind (mph) (Start/End)	Cloud Cover (%) (Start/End)
1	5/15/2023	1130/1410	87/95	3–4/3–4	5/10
1	5/16/2023	1205/1435	83/89	1–2/1–2	50/50
1	5/17/2023	1145/1515	87/95	1–2/2–3	Clear/Clear
1	5/18/2023	0900/1300	76/90	2–3/2–3	Clear/Clear
2	8/10/2023	0800/1200	81/85	0–1/1–3	60/100
2	8/11/2023	0835/1400	74/89	0–1/10–2	Clear/Clear

% = percent; °F = degrees Fahrenheit; mph = miles per hour

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Survey Results

Figure 5-1

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

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200 100 0 200 Feet

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6.0 STUDY SPECIFIC CONSULTATION

No study-specific consultation is required, and no consultation has been conducted to date.

7.0 OUTSTANDING STUDY PLAN ELEMENTS

All Study Plan elements have been completed as outlined in SCE's RSP (SCE, 2022) filing and FERC's Study Plan Determination (FERC, 2022) with the exception of the variance described above.

8.0 REFERENCES

CDFW (California Department of Fish and Wildlife). 2022. California Natural Diversity Database (CNDDB) Records of Occurrence for: Johnsondale, Fairview, Kernville, Tobias Peak, Cannell Peak, Alta Sierra, and Lake Isabella. Sacramento, CA: CDFW, Natural Heritage Division.

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Psomas. 2013. *Southwestern Pond Turtle Observations during Pre-construction Surveys in Support of the KR3 Flowline Roads Improvement Project, Kern and Tulare Counties, California.* Memorandum.

SCE (Southern California Edison). 2022. *Kern River No. 3 Hydroelectric Project, Revised Study Plan*. Filed with FERC on July 1. Accessed: August 2023. Retrieved from: sce.com/sites/default/files/custom-files/Web files/Revised_Study_Plan_KR3_20220701.pdf

USGS (U.S. Geological Survey). 2006. *USGS Western Pond Turtle* (Emys marmorata) *Visual Survey Protocol for the Southcoast Ecoregion*. Survey Protocol, version 1. San Diego, CA.

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APPENDIX A
REPRESENTATIVE PHOTOGRAPHS

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Photo 1: Western pond turtle observed basking on a small rock in Cannell Creek (August 11, 2023).



Photo 2: Close-up view of western pond turtle found in Cannell Creek.

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Representative Photographs

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

PSOMAS



Photo 3: View of suitable habitat in Cannell Creek with rock the pond turtle was found basking on circled in red.



Photo 4: Close-up view of suitable pond turtle habitat in Cannell Creek showing rocks for basking and vegetation/rocks for hiding from predators.

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Representative Photographs

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

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Photo 5: Overview of suitable pond turtle habitat in Cannell Creek where pond turtle was observed.

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Representative Photographs

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

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APPENDIX B
WILDLIFE COMPENDIUM

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WILDLIFE SPECIES OBSERVED DURING SURVEYS

Scientific Name	Common Name	Special Status
AMPHIBIANS		
HYLIDAE – TREEFROG FAMILY		
Pseudacris hypochondriaca	Baja California treefrog	
TURTLES		
EMYDIDAE – BOX AND BASKING TURTLE FAMILY		
Actinemys marmorata	northwestern pond turtle	FCT, SSC, FSS
LIZARDS		
PHRYNOSOMATIDAE – SPINY LIZARD FAMILY		
Sceloporus occidentalis	western fence lizard	
Uta stansburiana	common side-blotched lizard	
SNAKES		
NATRICIDAE – HARMLESS LIVE-BEARING SNAKE FAMILY		
Thamnophis couchii	Sierra gartersnake	
BIRDS		
ODONTOPHORIDAE – NEW WORLD QUAIL FAMILY		
Callipepla californica	California quail	
COLUMBIDAE – PIGEON AND DOVE FAMILY		
*Streptopelia decaocto**	Eurasian collared-dove	
Zenaida macroura	mourning dove	
PICIDAE – WOODPECKER FAMILY		
Colaptes auratus	northern flicker	
TYRANNIDAE – TYRANT FLYCATCHER FAMILY		
Contopus sordidulus	western wood-pewee	
Myiarchus cinerascens	ash-throated flycatcher	
CORVIDAE – JAY AND CROW FAMILY		
Aphelocoma californica	California scrub-jay	
Corvus corax	common raven	
CINCLIDAE – DIPPER FAMILY		
Cinclus mexicanus	American dipper	
FRINGILLIDAE – FINCH FAMILY		

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Scientific Name	Common Name	Special Status
Spinus psaltria	lesser goldfinch	
PASSERELLIDAE – NEW WORLD SPARROW FAMILY		
Melozone crissalis	California towhee	

Species Status:
SSC = Species of Special Concern (California Department of Fish and Wildlife)
FSS = Forest Service Sensitive (U.S. Forest Service)
FCT = Federal Candidate Threatened

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MEMORANDUM

November 6, 2024

To:
ERM
(Ms. Jillian Roach)
Southern California Edison Company
(Ms. Stephanie Fincher)

From:
Psomas
(Ms. Lindsay Messett)
(Dr. Brad Blood)
(Ms. Sarah Thomas)

Subject: Results of the Trapping Program for Northwestern Pond Turtle for the Kern 3 Hydroelectric Project (FERC Project No. 2290), Tulare County, California

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This Memorandum transmits to ERM and Southern California Edison Company (SCE) the preliminary results of a trapping program (program) for the northwestern pond turtle (*Actinemys marmorata*) conducted within Cannell Creek in support of the Kern River No. 3 Hydroelectric Relicensing Project (FERC Project No. 2290) (Project). The Project is located in Kern and Tulare Counties, California. The trapping program within Cannell Creek is located solely in Tulare County. The purpose of this program is to obtain information to begin to assess the population dynamics of this species on and adjacent to the Project site. A qualified Biologist with the necessary experience and a California Department of Fish and Wildlife (CDFW) Scientific Collecting Permit conducted the program. The program began in October of 2024 and continues through the present time.

PROJECT LOCATION AND DESCRIPTION

The Project occurs along the North Fork Kern River and its tributaries including Salmon, Corral, and Cannell Creeks, in the southern portion of the Sierra Nevada mountains (Exhibit 1). The Project area is one of moderate to steep ridge and valley topography with elevations ranging from approximately 2,700 to 3,600 feet above mean sea level. Project facilities are primarily located on federal lands within Sequoia National Forest, with a small amount occurring within Southern California Edison (SCE) ownership. Land uses adjacent to the Project include residential, grazing, and public recreation (e.g., whitewater rafting, camping, destination recreation areas, trails). Some portions of the water conveyance system and Project access roads fall within the Wild and Scenic River corridor quarter mile buffer. The Project site is located on the U.S. Geological Survey's Kernville 7.5-minute quadrangle map (Exhibit 2).

The program was limited to Cannell Creek from approximately 1000 feet upstream from the siphon downstream to the creeks' confluence with the Kern River.

SPECIES BACKGROUND

The northwestern pond turtle is a California Species of Special Concern and a U.S. Forest Service Sensitive Species. In 2015, the U.S. Fish and Wildlife Service (USFWS) published a finding that the listing of this species may be warranted and requested that information on this species be submitted to the USFWS for review (USFWS 2015). In 2023, the USFWS proposed to list the northwestern pond turtle as Threatened under the Endangered Species Act (USFWS 2023); a final decision is pending.

Historically, this species was known as the western pond turtle (*Emys marmorata*) or Pacific Pond turtle (*Clemmys marmorata*), but its taxonomy has been revised multiple times in recent years due to genetic studies. The species has alternated between the genera *Emys* and *Actinemys*. Current nomenclature recognizes two distinct species: the southwestern pond turtle (*Actinemys pallida*) and the northwestern pond turtle (*Actinemys marmorata*).

The northwestern pond turtle is a relatively flat, dark turtle of moderate size, with a carapace (shell) length that rarely exceeds 10 inches (Spinks et al. 2003). They are cryptically colored brown, olive brown, or dark brown (USGS 2006b). The carapace is usually brown or blackish in color with a series of darker spots, lines, or dashes that radiate out from the center of each shield (Stebbins and McGinnis 2012). Their head and body have a mottled appearance (USGS 2006b). Males tend to have thicker tails, while females have thinner tails. Males tend to have concave plastrons (i.e., shells), while females tend to have flat or slightly convex plastrons; the carapaces of females are also taller to allow room for eggs. The cloacal opening (i.e., opening for digestive, urinary, and reproductive tracts) is also further back in males than in females (USGS 2006b). They typically reach sexual maturity when they are approximately 4 inches and four to six years of age (USGS 2006b).

The northwestern pond turtle is found in southern California, ranging from Monterey County south through Los Angeles, Riverside, and San Diego counties into northern Baja California, Mexico (USFWS 2023). It inhabits ponds, lakes, marshes, reservoirs, seasonal standing or slow-moving streams, canals, sloughs, vernal pools, and occasionally in brackish water (Germano and Bury 2001). Sufficient cover (e.g., vegetation, undercut banks) and basking sites are important components of suitable habitat (Spinks et al. 2003). Suitable basking sites include partially submerged logs, rocks, floating vegetation, and open mud banks (CDFW 2000). Adults are often observed basking on logs or other objects protruding out of the water or floating in the warmer surface water. They have both good hearing and eyesight and are easily disturbed; they are often heard splashing into the water to take cover before being seen (USGS 2006b). Their omnivorous diet primarily consists of aquatic invertebrates, but they also consume carrion, small fish, frogs, and plants (USGS 2006b).

Breeding typically occurs from April to May, although timing varies depending on location and seasonal conditions (Jennings and Hayes 1994). Females move from the water to adjacent upland habitats to lay eggs, usually sometime in late May to early July, although movement could occur as early as April or as late as August (Ernst et al. 1994). Nest site selection favors unshaded slopes that may be at least in part south-facing, likely to ensure that substrate temperatures will be high enough to incubate the eggs (Rathbun et al. 2002). The northwestern pond turtle can nest in a variety of soil conditions, but the soil must be at least 4 inches deep and have relatively high internal humidity (CDFW 2000). Clutch size varies from 1 to 13 eggs, positively correlated with body size; they can sometimes double-clutch (i.e., have more than one nest per year) (Goodman 1997a, 1997b; Lovich and Meyer 2002; Holland 1991, 1994; Hays et al. 1999; Pires 2001). Most hatchlings emerge in the early fall, while some may over-winter in the nest (Holland 1994).

Adults may remain active in the water year-round if conditions are suitable (i.e., enough water, warm temperatures) (USGS 2006b). Basking behavior may also be witnessed year-round due to warmer year-round temperatures (USGS 2006b). However, during the coldest months (i.e., October to April), this species will often seek upland refugia (i.e., shelter with appropriate

temperature and moisture conditions) and enter a period of aestivation. Aestivation is a period of inactivity and decreased metabolic rate in response to seasonal temperature changes (similar to hibernation); it occurs more frequently in more temperate, high-elevation areas of the species' range (Holland and Goodman 1996). Terrestrial refugia are typically covered with dense leaf litter produced by a thick overstory of woody vegetation, such as in dense riparian thickets of willows (Rathbun et al. 2002). Northwestern pond turtles may choose sites where they can bask in direct sunlight or may bury themselves deep into leaf litter and duff (Rathbun et al. 2002). Winter refugia are often found in the same upland habitats as nesting sites. Northwestern pond turtles can also hibernate underwater in bottom mud (CDFW 2000).

The northwestern pond turtle faces several ongoing threats, including habitat loss, worsening drought conditions, and predation by invasive species. Urban development, especially for flood control, and agricultural expansion have led to significant habitat fragmentation and population declines (Spinks et al. 2003). Invasive, non-native plant species such as tamarisk (*Tamarix ramosissima*) and giant reed (*Arundo donax*) have altered stream morphology, reduced plant diversity, and eliminated basking sites (Lovich et al. 1994). The introduction of non-native turtle species, such as the red-eared slider (*Trachemys scripta elegans*) and western painted turtle (*Chrysemys picta bellii*), leads to competition for resources. These invasive turtles often have higher reproductive rates, which can result in them outcompeting the native northwestern pond turtle (Spinks et al. 2003; Lovich & Meyer 2002). As the northwestern pond turtle is the only native freshwater turtle in its historic range, it may lack competitive advantages against these invasive species. Additionally, the invasive American bullfrog (*Lithobates catesbeianus*) is a voracious predator that will eat any live animal it can swallow, and American bullfrog predation of hatchling and young western pond turtles has been recorded (Holland 1994). The intensity of American bullfrog predation is severe enough to eliminate recruitment in some northwestern pond turtle populations (Overtree and Collings 1997).

METHODS

Trapping surveys followed the methods outlined in the Western Pond Turtle Trapping Survey Protocol for the Southcoast Ecoregion (USGS 2006b). A five-day/four-night trapping program was conducted in October and November 2024. Nylon mesh hoop traps and floating basking traps were placed in suitable locations in Cannell Creek, baited with cans of sardines in oil to attract turtles. Traps were set near habitat features likely to be used by pond turtles (possible basking areas, areas with underwater refugia). Two sizes of hoop traps were used. One measured 2.5 feet in diameter by 6 feet long with 1-inch square mesh and one measured 1.5 feet in diameter by 5 feet long with 1-inch square mesh. Both funnel traps featured one-way funnel entrances. Floating basking traps were briefly used during the first trapping session and measured 20 inches wide by 28 inches long and 13 inches deep, with two 13-inch wings. Both hoop and basking traps were equipped with floats and securely fastened to immovable objects to prevent submersion to allow for captured turtles (and other animals) to surface for air.

Traps were left in place for a maximum of 24 hours before being checked by biologists to retrieve captured turtles and other aquatic species (e.g. fish, frogs, invertebrates). Data collected included age, sex, length, weight, and photo. Additionally, all pond turtles were marked with non-toxic paint for the purpose of future identification. All pond turtles captured were released unharmed at the site of capture after handling and processing. General weather data (i.e., ambient air temperature, sky conditions, wind speed) and water temperature were also

recorded at the start and end of each trapping session. Two trapping sessions were conducted in October and an additional trapping session is scheduled for November 5-9, 2024. Additional trapping sessions may occur if suitable warm weather permits.

Psomas Senior Biologist Lindsay Messett (Scientific Collecting Permit [SCP] ID: S-182810004-20009-001) was the Principal Investigator for the trapping sessions, with assistance from Psomas Biologist Sarah Thomas. Both Ms. Messett and Ms. Thomas are knowledgeable about the northwestern pond turtle and Ms. Messett holds the necessary CDFW authorization to trap and handle the species. All traps were tagged with Ms. Messett's CDFW SCP number, under which the live trapping was conducted. Prior to the start of the trapping program, Ms. Messett notified CDFW and the U.S. Fish and Wildlife Service of the intended start date of the program. The notification was sent via email on September 10, 2024.

Trapping sessions were conducted from October 1-5, 2024, and October 21-25, 2024. Trapping Sessions were conducted during weather conditions favorable for turtle activity (Table 1). A total of 8 hoop traps and 2 basking traps were set in Cannell Creek. Trap locations were selected based on suitable habitat in areas with adequate water depths. Trap locations were recorded with a GPS unit and mapped on an aerial photograph (Table 2, Exhibit 3).

TABLE 1
SUMMARY OF SURVEY DATA AND CONDITIONS FOR NORTHWESTERN POND TURTLE TRAPPING IN CANNELL CREEK

Survey Number	Survey Date	Surveying Biologists	Start/End Time	Water Temperature (°F)		Wind (mph)		Temperature (°F)		Cloud Cover (%)
				Start	End	Start	End	Start	End	
Trapping Session 1										
1	10/1/2024	Messett, Thomas	4:41 PM/6:15 PM	73.8	72.3	1	2	102.0	92.7	10
2	10/2/2024	Messett, Thomas	11:53 AM/2:10 PM	70.7	68.7	0	1	91.6	97.9	20
3	10/3/2024	Messett, Thomas	10:26 AM/11:20 AM	66.4	65.5	1	2	77.2	87.4	0
4	10/4/2024	Messett, Thomas	10:58 AM/1:13 PM	68.0	68.0	0	2	78.4	93.0	0
5	10/5/2024	Messett, Thomas	10:19 AM/12:37 PM	64.6	67.5	1	2	76.6	88.5	0

TABLE 1
SUMMARY OF SURVEY DATA AND CONDITIONS FOR NORTHWESTERN POND TURTLE TRAPPING IN CANNELL CREEK

Survey Number	Survey Date	Surveying Biologists	Start/End Time	Water Temperature (°F)		Wind (mph)		Temperature (°F)		Cloud Cover (%)
				Start	End	Start	End	Start	End	
Trapping Session 2										
1	10/21/2024	Messett, Thomas	3:05 PM/5:50 PM	72.4	71.6	0	1	80	77	0
2	10/22/2024	Messett, Thomas	12:56 PM/3:10 PM	61.5	57.2	1	2	72.3	72.3	10
3	10/23/2024	Messett, Thomas	11:50 AM/12:50 PM	59.0	59.9	1	2	73.0	75.9	20
4	10/24/2024	Messett, Thomas	10:28 PM/11:12 PM	54.7	56.1	2	2	64.2	69.4	0
5	10/25/2024	Messett, Thomas	9:57 AM/11:17 AM	52.7	55.2	0	1	58.6	66.2	0

°F: degrees Fahrenheit; mph: miles per hour; %: percent.

TABLE 2
TRAP LOCATIONS

Trap Number	Trap Locations (Latitude, Longitude)
Trapping Session 1 (October 1-5, 2024)	
Basking/Hoop Trap (1.5) 1	35.793831, -118.429425
Hoop Trap 2 (2.5)	35.793220, -118.428444
Hoop Trap 3 (2.5)	35.793161, -118.428186
Basking/Hoop Trap (1.5) 4	35.793000,118.427911
Hoop Trap 5 (2.5)	35.7939335, -118.4322906
Hoop Trap 6 (2.5)	35.7924668, -118.4266188
Hoop Trap 7 (2.5)	35.794156, -118.432575
Hoop Trap 8 (1.5)	35.792897, -118.427277
Trapping Session 2 (October 21-25, 2024)	
Hoop Trap 1 (1.5)	35.7924880, -118.4266422
Hoop Trap 2 (1.5)	35.7929743, -118.4278864
Hoop Trap 3 (1.5)	35.7931606, -118.4281865
Hoop Trap 4 (1.5)	35.7932196, -118.4284437
Hoop Trap 5 (1.5)	35.7937037, -118.4294418
Hoop Trap 6 (2.5)	35.793969, -118.432249
Hoop Trap 7 (2.5)	35.794046, -118.432449
Hoop traps were 1.5 and 2.5 feet in diameter	

RESULTS

Northwestern Pond Turtle Trapping

Over the course of the two completed trapping efforts, 60 trap days were completed (i.e., 15 traps multiplied by four days of trapping each). A total of 22 northwestern pond turtles were captured during the two trapping sessions. Fifteen individuals were captured during the first session and seven were captured during the second session. Three turtles were recaptures; therefore, not marked again. Additionally, one individual was incidentally captured and marked during a visual survey on July 31, 2024, for a total of 20 marked individuals (Tables 3 and 4).

Other species observed during the trapping include Sierran treefrog (*Pseudacris sierra)*, western fence lizard (*Sceloporus occidentalis*), common side-blotched lizard (*Uta stansburiana*) and Northern pacific rattlesnake (*Crotalus oreganus*).

Representative photographs of the turtle trapping effort and the species captured during the sessions are included in Attachments A and B.

TABLE 3
SUMMARY OF TRAPPING RESULTS FOR NORTHWESTERN POND TURTLE TRAPPING IN CANNELL CREEK FOR TRAPPING SESSION 1

Survey Number	Survey Date	Trap Number	Trap Results
1	10/1/2024	Installation of Basking Trap 1	N/A
		Installation of Hoop Trap 2	N/A
		Installation of Hoop Trap 3	N/A
		Installation of Basking Trap 4	N/A
		Installation of Hoop Trap 5	N/A
2	10/2/2024	Basking Trap 1	No animals captured
		Hoop Trap 2	3 NWPT
		Hoop Trap 3	No animals captured
		Basking Trap 4	No animals captured
		Hoop Trap 5	No animals captured
		Installation of Hoop Trap 6	N/A
		Installation of Hoop Trap 7	N/A
2	10/2/2024	N/A	1 NWPT incidentally captured by hand
3	10/3/2024	Basking Trap 1	No animals captured
		Hoop Trap 2	No animals captured
		Hoop Trap 3	1 NWPT (recapture)
		Basking Trap 4	No animals captured
		Hoop Trap 5	No animals captured
		Hoop Trap 6	No animals captured
		Hoop Trap 7	No animals captured
4	10/4/2024	Installation of Hoop Trap 1	No animals captured
		Hoop Trap 2	1 NWPT
		Hoop Trap 3	3 NWPT
		Installation of Hoop Trap 4	No animals captured
		Hoop Trap 5	No animals captured
		Hoop Trap 6	No animals captured
		Hoop Trap 7	No animals captured
		Installation of Hoop Trap 8	N/A
5	10/5/2024	Hoop Trap 1	No animals captured
		Hoop Trap 2	2 NWPT (one recapture)
		Hoop Trap 3	1 NWPT
		Hoop Trap 4	4 NWPT
		Hoop Trap 5	No animals captured
		Hoop Trap 6	No animals captured
		Hoop Trap 7	No animals captured
		Hoop Trap 8	No animals captured

TABLE 4
SUMMARY OF TRAPPING RESULTS FOR NORTHWESTERN POND TURTLE TRAPPING IN CANNELL CREEK FOR TRAPPING SESSION 2

Survey Number	Survey Date	Trap Number	Trap Results
1	10/21/2024	Installation of Hoop Trap 1	N/A
		Installation of Hoop Trap 2	N/A
		Installation of Hoop Trap 3	N/A
		Installation of Hoop Trap 4	N/A
		Installation of Hoop Trap 5	N/A
		Installation of Hoop Trap 6	N/A
2	10/22/2024	Hoop Trap 1	No animals captured
		Hoop Trap 2	2 NWPT
		Hoop Trap 3	2 NWPT
		Hoop Trap 4	1 NWPT
		Hoop Trap 5	No animals captured
		Hoop Trap 6	No animals captured
		Installation of Hoop Trap 7	N/A
3	10/23/2024	Hoop Trap 1	No animals captured
		Hoop Trap 2	No animals captured
		Hoop Trap 3	1 NWPT (recapture)
		Hoop Trap 4	No animals captured
		Hoop Trap 5	No animals captured
		Hoop Trap 6	No animals captured
		Hoop Trap 7	No animals captured
4	10/24/2024	Hoop Trap 1	No animals captured
		Hoop Trap 2	No animals captured
		Hoop Trap 3	No animals captured
		Hoop Trap 4	No animals captured
		Hoop Trap 5	No animals captured
		Hoop Trap 6	No animals captured
		Hoop Trap 7	No animals captured
5	10/25/2024	Hoop Trap 1	No animals captured
		Hoop Trap 2	1 NWPT (recapture)
		Hoop Trap 3	No animals captured
		Hoop Trap 4	No animals captured
		Hoop Trap 5	No animals captured
		Hoop Trap 6	No animals captured
		Hoop Trap 7	No animals captured

ADDITIONAL INFORMATION

SCE performed a controlled water release at the siphon within Cannel Creek on October 27, 2024. The release was approximately 130 cubic feet per second (cfs). Ms. Messett was present on site to document the creek conditions prior to and during the release. The release began at approximately 5:10 PM and continued until approximately 6:15 PM. Once the water travels downslope, it loses velocity as it breaks up into a number of smaller streams and enters the creek. It then runs through a series of waters falls and pools filling each pool in turn and as it does so the velocity slows at each pool. Approximately 900 feet downstream of the siphon, the creek makes a sharp turn to the southwest and increases in width. The water spreads out at this point and slows down further as it travels downstream. This portion of the creek was largely dry prior to the release and suitable ponding habitat for the turtle was very limited in these areas.

While a handful of turtles have been previously observed downstream of the siphon during 2023 surveys, no turtles have been captured in Cannell Creek downstream of the siphon during the recent trapping program. Therefore, the potential for turtles to have been impacted by the controlled water release is assumed to be very low to zero. This implies that during the time of the year when Cannell Creek is dry any spills from the Siphon would likely not have an impact on pond turtles.

Representative photographs of the controlled water release are included in Attachment C.

If you have any comments or questions concerning the contents of the memorandum, please contact Dr. Brad Blood at bblood@psomas.com or Lindsay Messett at Lindsay.Messatt@Psomas.com.

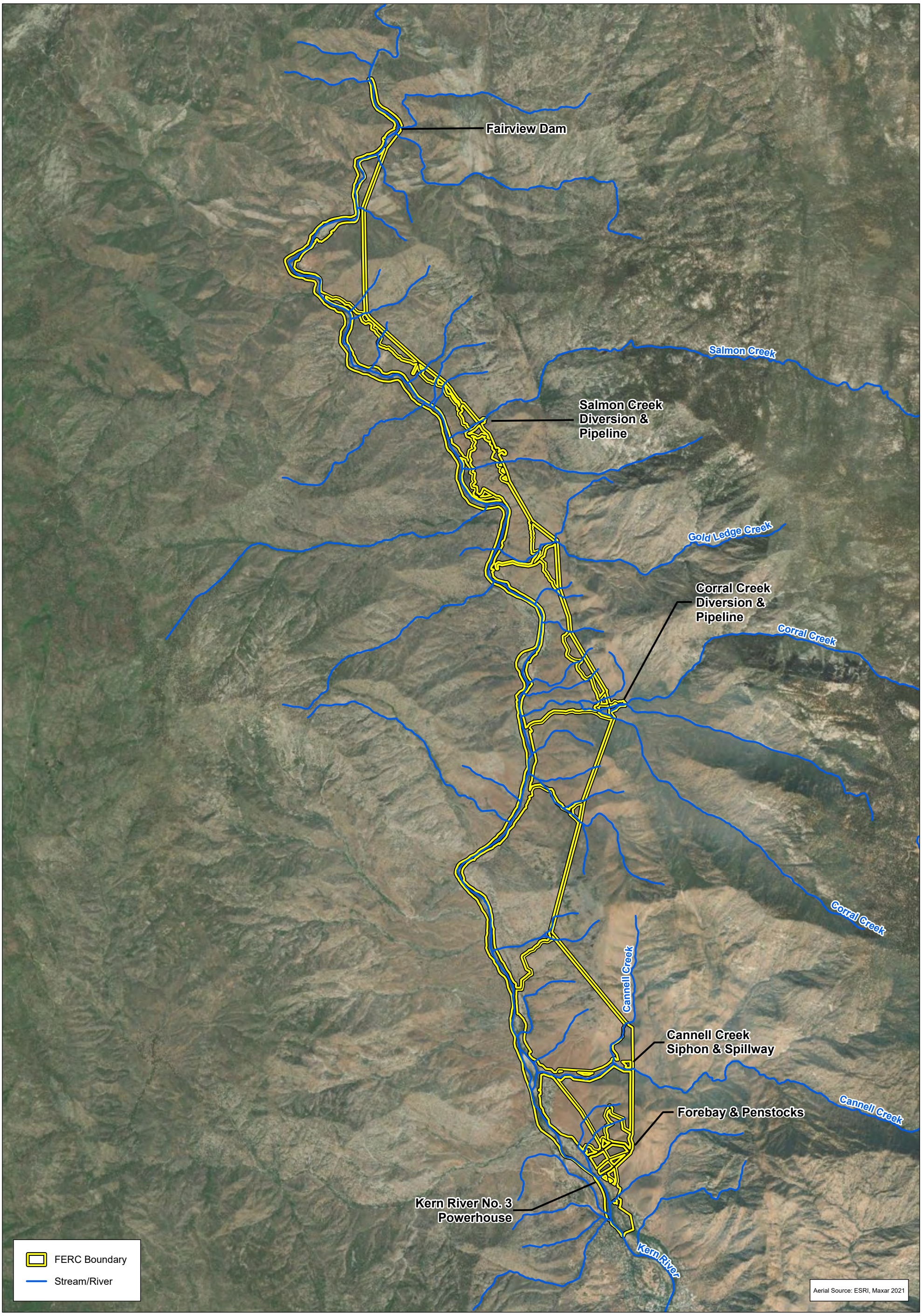
Sincerely,
PSOMAS

Brad R. Blood, Ph.D.
Senior Project Manager, Resource Management

Lindsay A. Messett, CWB®
Senior Biologist

Enclosures: Exhibits 1–3
Attachment A – Turtle Trapping Photographs
Attachment B – Captured Turtle Photographs
Attachment C – Controlled Release Photographs

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Project Location

Exhibit 1

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N W E S

0 0.5 1 Miles

PSOMAS

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Fairview Dam

Salmon Creek Diversion & Pipeline

Corral Creek Diversion & Pipeline

Cannell Creek Siphon & Spillway

Forebay & Penstocks

Kern River No. 3 Powerhouse

FERC Boundary

Source: USGS 7.5 Minute Quadrangle
Fairview
Kernville
Township: 23S, 24S, 25S
Range: 32E, 33E
Section: 1, 3, 4, 5, 6, 8, 9, 10, 12, 13, 16, 17, 19, 20, 23, 24, 25, 29, 30, 31, 32, 33

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Project Location

Exhibit 2

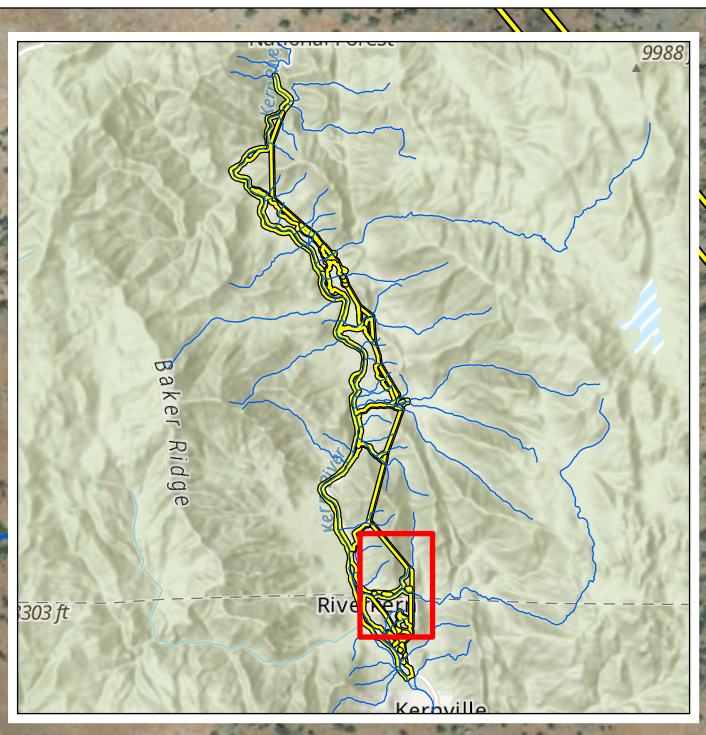
Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N W E S

0 0.5 1 Miles

PSOMAS

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Cannell Creek

Kern River

Cannell Creek
Siphon &

Cannell Creek

FERC Boundary

Stream/River

Northwestern Pond Turtle

Northwestern Pond Turtle (Hand Captured) - July 31, 2024

Northwestern Pond Turtle (Hand Captured) - October 3, 2024

Trapping Session 1 (October 1-5, 2024)

Basking Trap/Hoop Trap (1.5-Foot Diameter)

Hoop Trap (1.5-Foot Diameter)

Hoop Trap (2.5-Foot Diameter)

Trapping Session 2 (October 21-25, 2024)

Hoop Trap (1.5-Foot Diameter)

Hoop Trap (2.5-Foot Diameter)

Aerial Source: ESRI, Maxar 2021

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Trap and Turtle Locations

Exhibit 3

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

N W E S

0 400 800

Feet

PSOMAS

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ATTACHMENT A

TURTLE TRAPPING PHOTOGRAPHS



Photo 1: Representative site photograph depicting a basking trap used in the Cannell Creek trapping program.



Photo 2: Representative site photograph depicting a 2.5-foot diameter hoop trap used in the Cannell Creek trapping program.

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Trapping Photographs

Attachment A-1

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

PSOMAS

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Photo 3: Representative site photograph depicting a 1.5-foot diameter hoop trap used in the Cannell Creek trapping program.



Photo 4: Representative site photograph depicting a northwestern pond turtles captured inside a 1.5-foot diameter hoop trap.

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Trapping Photographs

Attachment A-2

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

PSOMAS

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Photo 5: Representative site photograph depicting the processing of a northwestern pond turtle.



Photo 6: Representative site photograph depicting a marked northwestern pond turtle.

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Trapping Photographs

Attachment A-3

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

PSOMAS

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ATTACHMENT B

CAPTURED TURTLE PHOTOGRAPHS

T1



T2



T3



T4



T5



T6



T7



T8



T9



T10



T11



T12



T13



T14



T15



T16



T17



T18



T19



T20 (Same as 5)



Captured Northwestern Pond Turtle Photographs

Exhibit B-1

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

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ATTACHMENT C

CONTROLLED RELEASE PHOTOGRAPHS



Photo 1: Representative site photograph depicting the controlled water release from the Cannell Creek Siphon.



Photo 2: Representative site photograph depicting water from the controlled release entering Cannell Creek.

Controlled Water Release Photographs

Attachment C-1

Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)

PSOMAS

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BIO-6 STREAM HABITAT TYPING TECHNICAL MEMORANDUM

KERN RIVER NO. 3 HYDROELECTRIC PROJECT
FERC PROJECT NO. 2290

PREPARED FOR:

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead®

KERNVILLE, CALIFORNIA

October 2023

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TABLE OF CONTENTS

Page

1.0 Introduction 1
2.0 Study Goals and Objectives 1
3.0 Study Area and Study Sites 1
4.0 Methods 4
4.1. Habitat Type Classification 4
4.2. Analysis 5
5.0 Data Summary 5
5.1. North Fork Kern River 5
5.2. Corral and Salmon Creeks 9
5.3. Comparison to Previous Habitat Composition 11
6.0 Study Specific Consultation 13
7.0 Outstanding Study Plan Elements 13
8.0 References 14

LIST OF TABLES

Table 3-1. Habitat Mapping Stream Segments 2
Table 4.1-1. Habitat-type Classifications 4
Table 5.1-1. North Fork Kern River, Fairview Dam to Hospital Flat Campground (Segment 1, RM 18.6–7.3) Stream Habitat Typing Summary, 2023 6
Table 5.1-2. North Fork Kern River, Hospital Flat Campground to KR3 Powerhouse (Segment 2, RM 7.3–3.1) Stream Habitat Typing Summary, 2023 6
Table 5.1-3. North Fork Kern River Dominant Substrate Composition, 2023 6
Table 5.2-1. Corral Creek Stream Habitat Typing Summary, 2023 10
Table 5.2-2. Substrate Composition in Corral and Salmon Creeks, 2023 10

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Table 5.2-3. Salmon Creek Stream Habitat Typing Summary, 2023..... 10

LIST OF FIGURES

Figure 3-1. Stream Habitat Typing Study Area..... 3

Figure 5.1-1. Representative Boulder Run in NFKR Segment 1 at 81 cfs, March 2023. 7

Figure 5.1-2. Representative Shallow Pool in NFKR Segment 1 at 81 cfs, March 2023.8

Figure 5.1-3. Representative Riffle in NFKR Segment 2 at 81 cfs, March 2023..... 8

Figure 5.1-4. Representative Deep Pool in NFKR Segment 2 at 81 cfs, March 2023. ... 9

Figure 5.2-1. Representative Cascades in Corral Creek at Roughly 3 cfs (Top) and Salmon Creek at Roughly 4 cfs (bottom) Downstream of the Diversions, July 2023. 11

Figure 5.3-1. Habitat Composition in Segment 1 of the North Fork Kern River in 1991 and 2023..... 12

Figure 5.3-2. Habitat Composition in Segment 2 of the North Fork Kern River in 1991 and 2023..... 12

Figure 5.3-3. Habitat Composition in the Total Sampled Portion of the North Fork Kern River in 1991 and 2023..... 13

LIST OF ACRONYMS AND ABBREVIATIONS

cfs	cubic feet per second
FERC	Federal Energy Regulatory Commission
KR3	Kern River No. 3
NFKR	North Fork Kern River
Project	Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)
RM	River Mile
RSP	Revised Study Plan
SCE	Southern California Edison
SPD	Study Plan Determination

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1.0 INTRODUCTION

This Technical Memorandum provides the methods and findings of desktop analyses and field surveys associated with the *BIO-6 Stream Habitat Typing Study Plan* in support of Southern California Edison's (SCE) Kern River No. 3 (KR3) Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 2290. The BIO-6 Study Plan was included in SCE's Revised Study Plan (RSP) submitted on July 1, 2022 (SCE, 2022). In the October 12, 2022, Study Plan Determination (SPD) (FERC, 2022), FERC approved the BIO-6 Study Plan with modifications. Specifically, FERC stipulated that SCE expand the study to generally describe physical habitat upstream and downstream of the diversions and along accessible areas of the bypassed reaches of Salmon and Corral Creeks in addition to the Fairview Dam Bypass Reach.[1]

Data collection efforts were initiated in the North Fork Kern River (NFKR) in September 2022. Field surveys were conducted in March 2023 in the NFKR and in July 2023 in Salmon and Corral Creeks. All field sampling efforts and data analyses are complete and summarized below.

2.0 STUDY GOALS AND OBJECTIVES

The objectives of the study, as outlined in the BIO-6 Study Plan (SCE, 2022) and as amended in the SPD (FERC, 2022), follow:

- Conduct reach-scale habitat characterization within the Fairview Dam Bypass Reach to evaluate the effects of Project operations on stream habitat and distribution.
- Map macro-habitats within the NFKR study area using high-resolution aerial photographs or video of the Fairview Dam Bypass Reach.
- Compare current conditions to habitat composition described in the *Kern River No. 3 Water Power Project (FERC Project No. 2290) Application for New License* (SCE, 1991).
- Describe physical habitat upstream and downstream of the diversions and along accessible areas in the Salmon Creek and Corral Creek Bypass Reaches.

3.0 STUDY AREA AND STUDY SITES

The study area includes Project-affected stream reaches along the NFKR and Salmon and Corral Creeks for the purposes of characterization and data collection relevant to understanding potential effects of Project operations and maintenance activities on stream habitat and distribution. Specifically, the study area includes the Project-affected stream reaches between Fairview Dam and the KR3 Powerhouse on the NFKR and Salmon and Corral Creeks downstream of the Project diversions. Consistent with the 1991 Application for New License (SCE, 1991), the study reach in the NFKR was divided

[1] The Fairview Dam Bypass Reach is defined as the approximately 16-mile bypass reach of the North Fork Kern River (NFKR) between Fairview Dam and the KR3 Powerhouse tailrace.

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into two segments: a narrow single channel segment from Fairview Dam downstream to Hospital Flat Campground (NFKR Segment 1) and a wider segment with split and single channels from Hospital Flat Campground to the KR3 Powerhouse (NFKR Segment 2; see Table 3-1). The study reaches in Salmon and Corral creeks extend from 0.1 mile upstream of the diversions to the confluence with the NFKR. Project features and streams are shown in Figure 3-1.

Table 3-1. Habitat Mapping Stream Segments

Segment	Boundaries	River Mile
NFKR Segment 1	Fairview Dam to Hospital Flat Campground	18.6–7.3[a]
NFKR Segment 2	Hospital Flat Campground to KR3 Powerhouse	7.3–3.1[a]
Salmon Creek	Upstream of Salmon Creek Diversion to Salmon Creek Confluence with the NFKR	From 0.1 mile upstream of Salmon Creek Diversion to the NFKR confluence (total of 0.5 mile)
Corral Creek	Upstream of Corral Creek Diversion to Coral Creek Confluence with the NFKR	From 0.1 mile upstream of Corral Creek Diversion to the NFKR confluence (total of 1.2 miles)

KR3 = Kern River No. 3; NFKR= North Fork Kern River
Notes:
[a] For the purposes of this document, NFKR River Mile (RM) 0.0 begins at the high-water mark of Isabella Lake.

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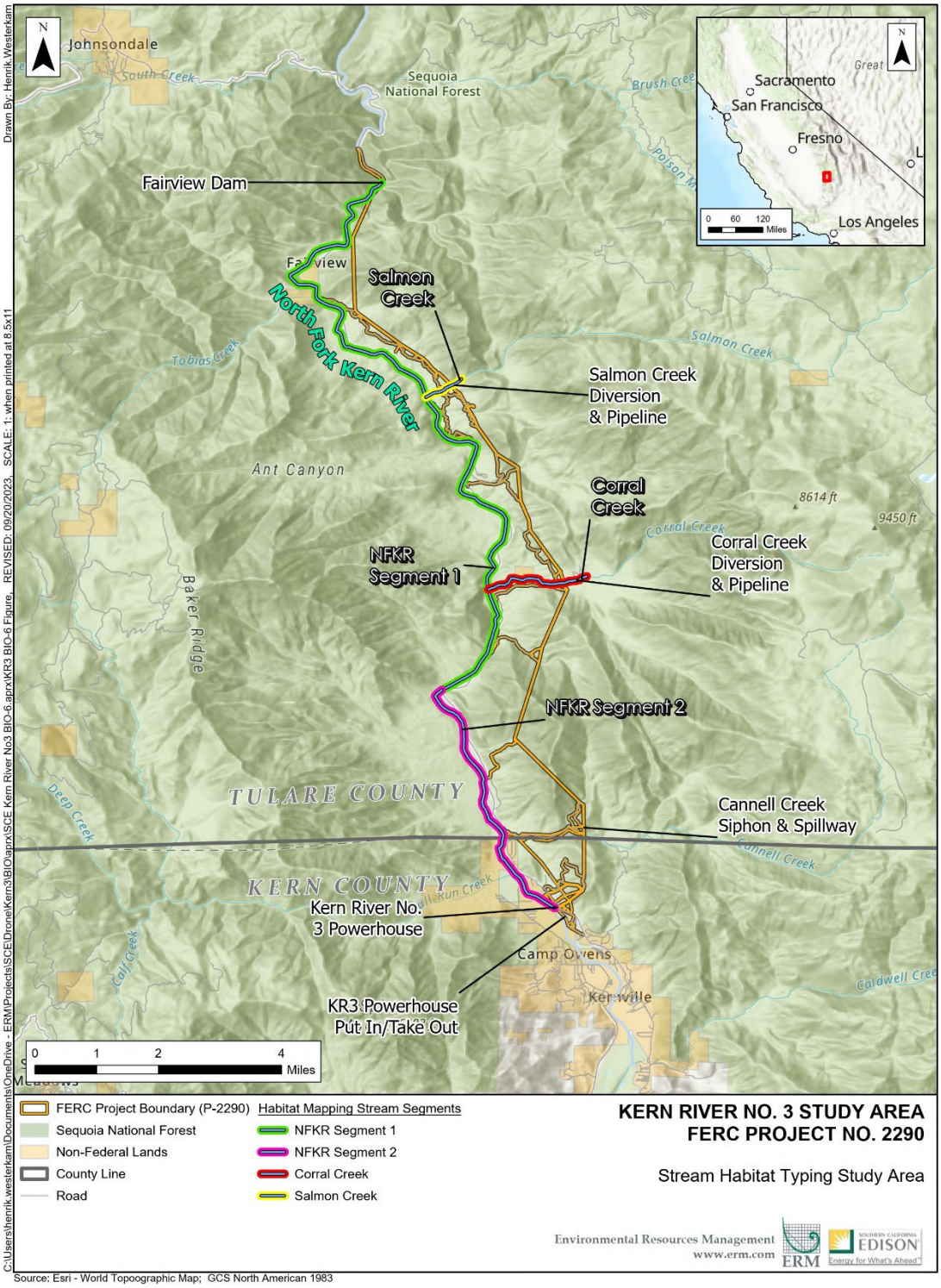


Figure 3-1. Stream Habitat Typing Study Area.

4.0 METHODS

Study implementation followed the methods described in SCE's RSP Package (SCE, 2022), and as amended by FERC in its SPD (FERC, 2022).

Study Plan Variances

There are no variances from the BIO-6 Study Plan as amended by FERC in its SPD (FERC, 2022).

4.1. HABITAT TYPE CLASSIFICATION

Habitat typing was conducted via pedestrian surveys and through use of aerial videography and high-resolution aerial photographs. Macrohabitat typing followed the previous habitat-type classifications used in the 1991 Application for New License (SCE, 1991) (see Table 4.1-1). Habitat units were separately identified where the unit length was at least equal to one-to-two times the active channel width (McCain et al., 1990; Flosi and Reynolds, 1994), or if the unit was otherwise distinctive. Mapping was contiguous within accessible portions of the channel, with each habitat unit abutted to the next unit. Each distinct habitat unit was numbered consecutively in an upstream direction, beginning at the downstream end of a designated reach.

Table 4.1-1. Habitat-type Classifications

Macrohabitat	Description
Boulder Pocket Water	Moderate- and high-gradient stream sections containing large closely spaced boulders that cause uneven water surface elevations, multi-directional flow patterns, small cascades, strong eddy currents, and backwater zones.
Boulder Run	Low- to moderate-gradient stream reach containing sparsely spaced boulders and cobbles. Water surface elevations are generally flat and of a uniform gradient through the habitat unit. The large streambed particles disrupt vertical and horizontal velocity profiles often causing high velocity zones to occur adjacent to low velocity areas.
Cascade	Steep gradient habitat unit with a vertical change or series of changes in the water surface elevation of more than 4 percent.
Deep Pools	Low-gradient habitat unit with a flat-water surface, low velocities, and depths greater than 6 feet.
Shallow Pools	Low-gradient habitat unit with a flat-water surface, low velocities, and depths less than 6 feet.
Runs	Low- to moderate-gradient habitat unit with a relatively uniform water surface gradient, moderate velocities, and relatively uniform depths.
Riffles	Moderate- to steep-gradient habitat unit of shallow depth, high velocity, and irregular water surface elevation.

Source: SCE, 1991

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Aerial video and high-resolution aerial photographs were used to map habitat types and measure unit dimensions in the Fairview Dam Bypass Reach. Drone footage captured in October 2022 was analyzed using mapping software in spring 2023. Unit lengths and widths were calculated using a distance measuring tool in mapping software on georeferenced aerial footage. The most and second-most common particle sizes found on the bed of the stream were recorded as dominant and subdominant substrate types for each unit, where visible from the aerial footage.

Pedestrian surveys were conducted by teams of two individuals in stream and river reaches where crews were able to safely access and hike portions of the reach. Pedestrian surveys of the NFKR were conducted on March 7 to 8, 2023, at a subset of units and in areas without aerial footage to validate and refine desktop mapping results; unit type, unit boundaries, and substrate types were confirmed and updated as needed based on pedestrian surveys. Habitat typing in Corral and Salmon Creeks was conducted on July 10 to 11, 2023, entirely via pedestrian surveys due to the narrow width of the streams and dense vegetation cover. In addition to habitat typing, other habitat attributes (unit length, dominant substrate type, subdominant substrate type, stream width, and pool depth) were quantified and recorded.

4.2. ANALYSIS

Data were entered into a Microsoft Excel spreadsheet for reduction, tabulation, and summarization. Habitat-type composition was calculated using individual unit lengths and the number of habitat units. The substrate composition and average stream width and pool depths were evaluated and summarized; 2022 and 2023 survey results were compared to the habitat compositions described in the 1991 Application for New License (SCE, 1991).

5.0 DATA SUMMARY

5.1. NORTH FORK KERN RIVER

NFKR Segment 1 (River Mile [RM] 18.6 to 7.3) primarily consisted of low gradient pools, runs, and pocket water (Table 5.1-1). Most of the segment was a single channel with wetted channel widths ranging from 33 to 164 feet and averaging 77 feet.

NFKR Segment 2 (RM 7.3 to 3.1) was primarily characterized by boulder runs, shallow pools, riffles, and runs (Table 5.1-2). The channel was split throughout several portions of the segment with wetted widths ranging from 33 to 138 feet and averaging 86 feet.

The substrate in both segments of the NFKR was primarily composed of boulder and cobble (Table 5.1-3). Dominant and subdominant substrate types could not be identified in some individual habitat unit types in NFKR Segments 1 and 2 due to high turbidity in the NFKR at the time of aerial data collection (Table 5.1-3). Representative photos of habitat units in assessed segments of the NFKR are provided in Figures 5.1-1 through 5.1-4.

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Table 5.1-1. North Fork Kern River, Fairview Dam to Hospital Flat Campground (Segment 1, RM 18.6–7.3) Stream Habitat Typing Summary, 2023

Habitat Type	Total Length (feet)	Length Relative Frequency (%)	Number of Units	Unit Relative Frequency (%)
Boulder Pocket Water	2,996	5	9	5
Boulder Run	14,754	25	39	21
Cascade	2,692	5	20	11
Deep Pool	7,421	13	16	8
Shallow Pool	12,105	20	33	17
Run	10,787	18	35	18
Riffle	8,395	14	38	20
Total	59,149	100	190	100

Table 5.1-2. North Fork Kern River, Hospital Flat Campground to KR3 Powerhouse (Segment 2, RM 7.3–3.1) Stream Habitat Typing Summary, 2023

Habitat Type	Total Length (feet)	Length Relative Frequency (%)	Number of Units	Unit Relative Frequency (%)
Boulder Pocket Water	965	4	3	5
Boulder Run	5,682	24	15	25
Cascade	1,034	4	4	7
Deep Pool	1,004	4	2	3
Shallow Pool	6,690	28	10	17
Run	3,248	13	10	17
Riffle	5,525	23	15	25
Total	24,149	100	59	100

Table 5.1-3. North Fork Kern River Dominant Substrate Composition, 2023

Substrate Type	NFKR Segment 1		NFKR Segment 2	
	Dominant Substrate (%)	Subdominant Substrate (%)	Dominant Substrate (%)	Subdominant Substrate (%)
Bedrock	1	3	1	0
Boulder	43	23	36	31
Cobble	29	29	59	31
Gravel	0	<1	0	4
Sand	7	9	2	2

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Substrate Type	NFKR Segment 1		NFKR Segment 2	
	Dominant Substrate (%)	Subdominant Substrate (%)	Dominant Substrate (%)	Subdominant Substrate (%)
Silt	0	1	0	7
Unknown[a]	20	35	2	25

Notes:
[a] High turbidity prevented substrate type identification.



Figure 5.1-1. Representative Boulder Run in NFKR Segment 1 at 81 cfs, March 2023.

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Figure 5.1-2. Representative Shallow Pool in NFKR Segment 1 at 81 cfs, March 2023.



Figure 5.1-3. Representative Riffle in NFKR Segment 2 at 81 cfs, March 2023.

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Figure 5.1-4. Representative Deep Pool in NFKR Segment 2 at 81 cfs, March 2023.

5.2. CORRAL AND SALMON CREEKS

Corral Creek, from its confluence with the NFKR upstream to 0.1 mile past the diversion, was generally steep and characterized by boulder cascades and riffles with small sections of flatwater habitat (Table 5.2-1). The average maximum pool depth was 2.6 feet, and the average pool depth across pool units was 2 feet. The wetted channel width in the reach was 11 feet on average and ranged from 3 to 33 feet. Corral Creek was primarily composed of boulder substrate with some sections of cobble and bedrock (Table 5.2-2).

Salmon Creek, from the confluence with the NFKR upstream to 0.1 mile past the diversion, was mainly composed of long, high-gradient boulder and bedrock cascades, punctuated by a few deep pools and runs throughout the reach (Table 5.2-3). The average maximum pool depth was 4.3 feet, and the average pool depth across pool units was 3.8 feet. The wetted channel width in the reach was 4 feet on average and ranged from 4 to 30 feet. The primary substrate for most of the assessed portion of Salmon Creek was boulders and bedrock (Table 5.2-3). Representative photos of habitat in Corral and Salmon Creeks are provided in Figure 5.2-1.

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Table 5.2-1. Corral Creek Stream Habitat Typing Summary, 2023

Habitat Type	Total Length (feet)	Length Relative Frequency (%)	Number of Units	Unit Relative Frequency (%)
Boulder Pocket Water	0	0	0	0
Boulder Run	59	1	1	1
Cascade	4,449	60	27	40
Deep Pool	0	0	0	0
Shallow Pool	568	8	11	16
Run	827	11	12	18
Riffle	1,542	21	16	24
Total	7,444	0	67	100

Table 5.2-2. Substrate Composition in Corral and Salmon Creeks, 2023

Substrate Type	Corral Creek		Salmon Creek	
	Dominant Substrate (%)	Subdominant Substrate (%)	Dominant Substrate (%)	Subdominant Substrate (%)
Bedrock	9	10	36	0
Boulder	67	20	62	38
Cobble	16	59	2	62
Sand	8	11	0	0

Table 5.2-3. Salmon Creek Stream Habitat Typing Summary, 2023

Habitat Type	Total Length (feet)	Length Relative Frequency (%)	Number of Units	Unit Relative Frequency (%)
Boulder Pocket Water	0	0	0	0
Boulder Run	0	0	0	0
Cascade	800	90	5	50
Deep Pool	26	3	2	20
Shallow Pool	0	0	0	0
Run	64	7	3	30
Riffle	0	0	0	0
Total	890	0	10	100

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Figure 5.2-1. Representative Cascades in Corral Creek at Roughly 3 cfs (Top) and Salmon Creek at Roughly 4 cfs (bottom) Downstream of the Diversions, July 2023.

5.3. COMPARISON TO PREVIOUS HABITAT COMPOSITION

Habitat typing results within Segment 1 and Segment 2 of the NFKR in 2023 were generally consistent with the results from the habitat conditions described in the 1991 Application for New License (SCE, 1991) with few minor differences. The 2023 typing show a higher percentage of boulder run versus boulder pocket water and a higher percentage of riffles with lower percentage of runs (Figures 5.3-1 and 5.3-2). These trends continue over the entire sampled portion of the NFKR (Figure 5.3-3) and may reflect tighter delineation (i.e., “splitting”) of defined units (e.g., short riffles between longer runs).

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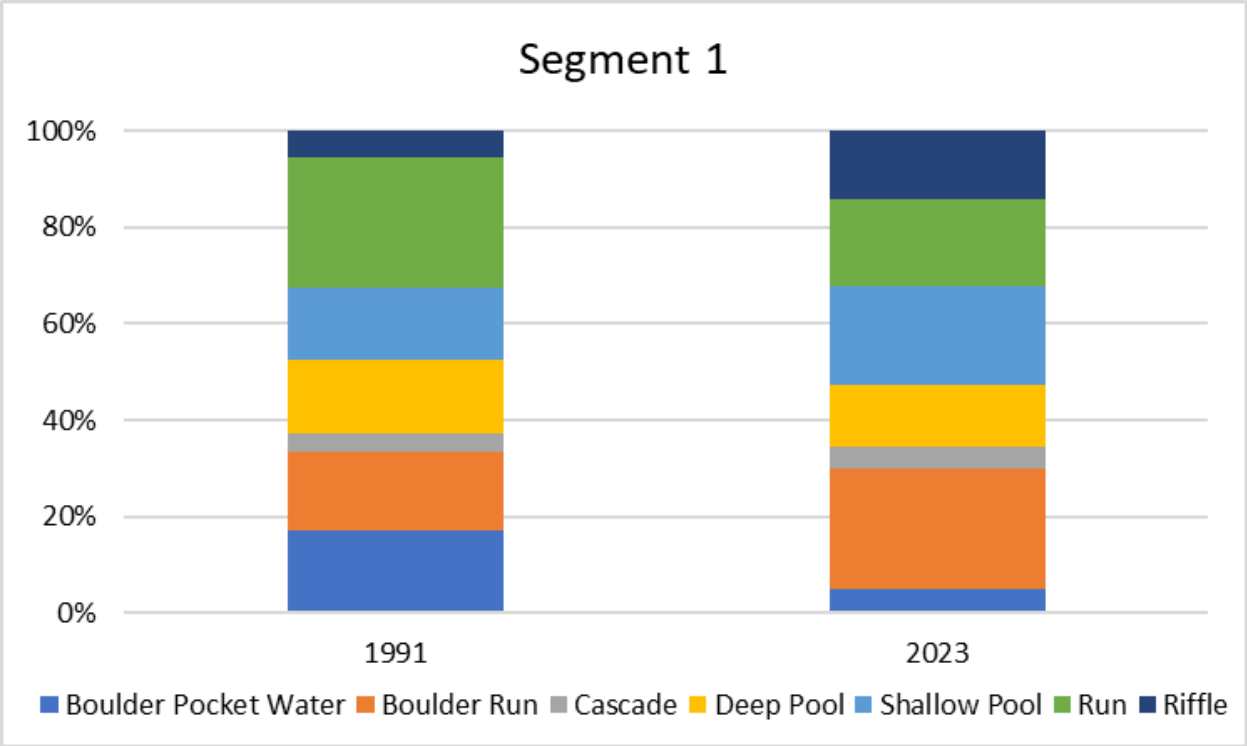


Figure 5.3-1. Habitat Composition in Segment 1 of the North Fork Kern River in 1991 and 2023.

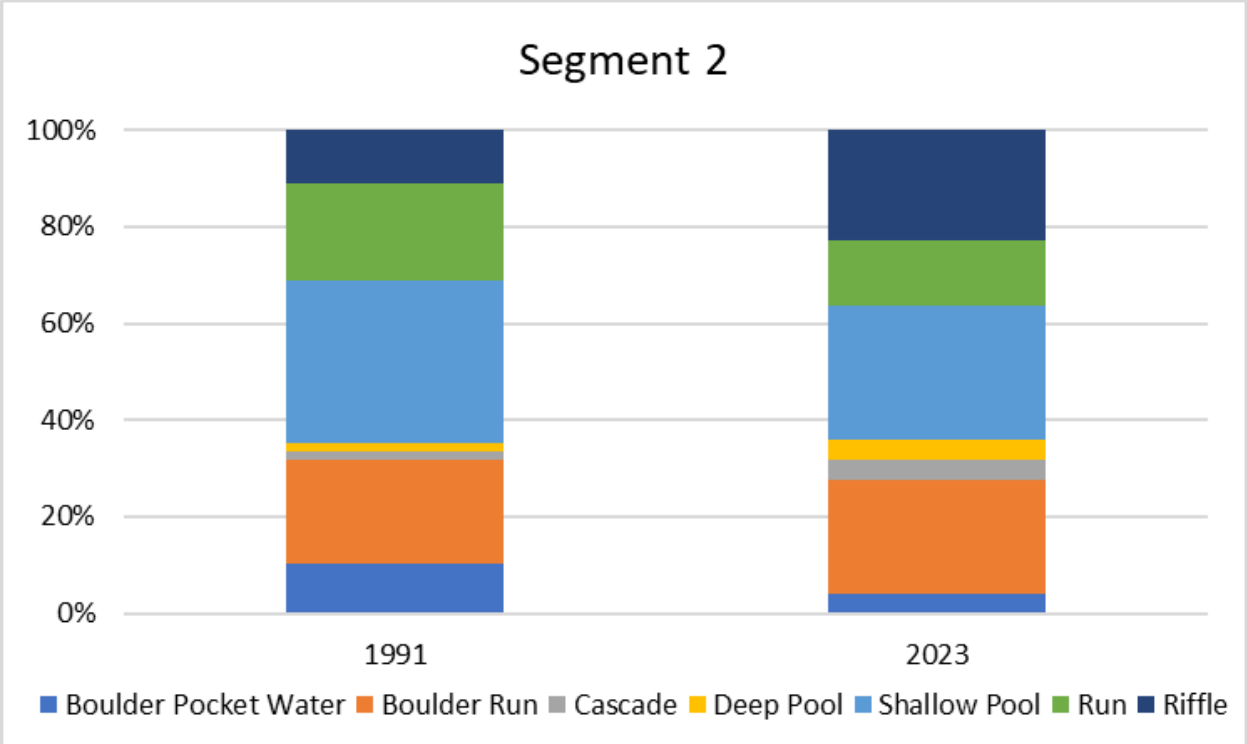


Figure 5.3-2. Habitat Composition in Segment 2 of the North Fork Kern River in 1991 and 2023.

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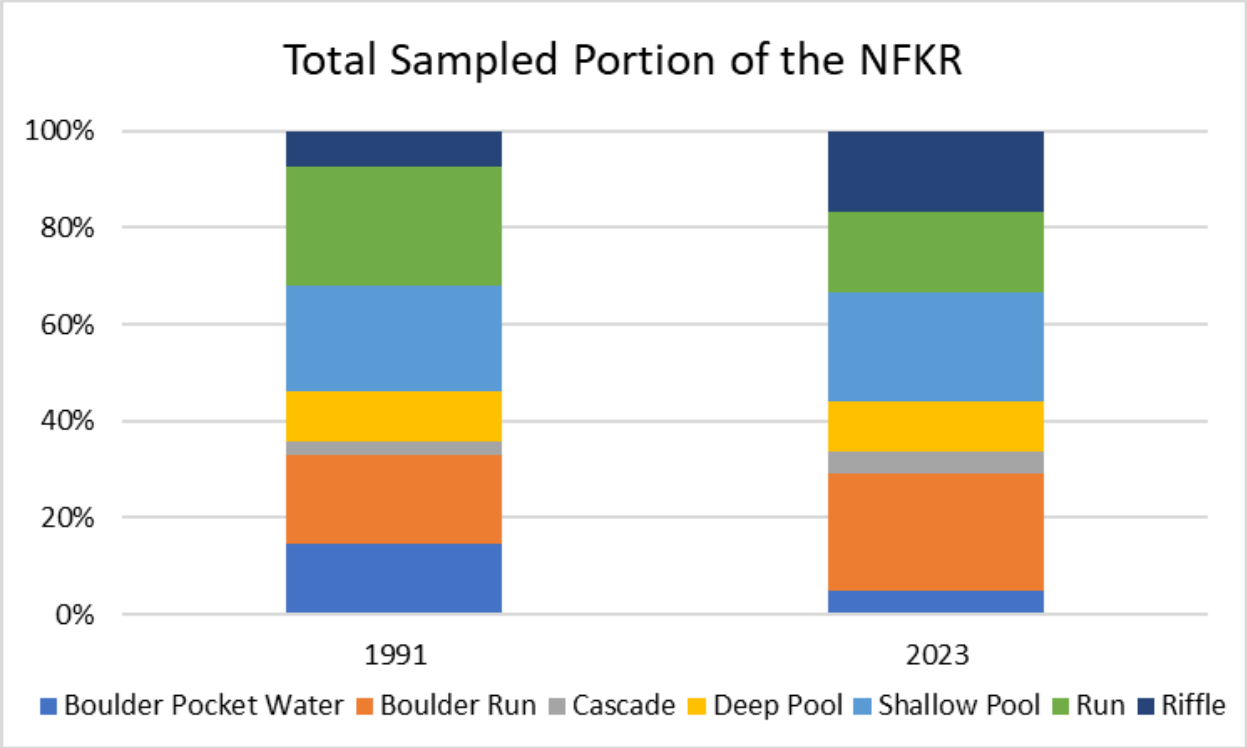


Figure 5.3-3. Habitat Composition in the Total Sampled Portion of the North Fork Kern River in 1991 and 2023.

6.0 STUDY SPECIFIC CONSULTATION

No study-specific consultation is required; no consultation has been conducted to date.

7.0 OUTSTANDING STUDY PLAN ELEMENTS

All Study Plan elements have been completed as specified in SCE's RSP (SCE, 2022) filing and FERC's SPD (FERC, 2022).

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BOT-1 GENERAL BOTANICAL RESOURCES TECHNICAL MEMORANDUM

KERN RIVER NO. 3 HYDROELECTRIC PROJECT
FERC PROJECT NO. 2290

PREPARED FOR:

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead®

KERNVILLE, CALIFORNIA

October 2023

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TABLE OF CONTENTS

Page

1.0 Introduction 1
2.0 Study Goals and Objectives 1
3.0 Study Area 1
4.0 Methods 4
4.1. Literature Review 4
4.2. Field Surveys 5
5.0 Data Summary 6
5.1. Literature Review 6
5.2. Field Surveys 7
6.0 Study Specific Consultation 9
7.0 Outstanding Study Plan Elements 9
8.0 References 9

LIST OF TABLES

Table 4.2-1. Schedule of Field Surveys 6
Table 5.1-1. Sensitive Natural Communities Potentially Occurring in the Project Vicinity 7

LIST OF FIGURES

Figure 3-1. General Botanical Resources Study Area. 3

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LIST OF APPENDICES

Appendix A Target Special-Status Plans

Appendix B Potentially Occurring Non-Native Invasive Plants

Appendix C Compendium of Plants Documented in Field Surveys

Appendix D Documented Locations of Special-Status Plants

Appendix E Documented Locations of Cal-IPC High Non-Native Invasive Plants

Appendix F USFS Descriptions of Vegetation Alliances in the Study Area

Appendix G Ground-Truthed USFS Vegetation Alliances Occurring in the Study Area

LIST OF ACRONYMS AND ABBREVIATIONS

Cal-IPC	California Invasive Plant Council
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CR	California State listed as rare
CRPR	California Rare Plant Rank
FERC	Federal Energy Regulatory Commission
FSS	U.S. Forest Service Sensitive Species
KR3	Kern River No. 3
NFKR	North Fork Kern River
NNIP	non-native invasive plant
PAD	Preliminary Application Document
Project	Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)
RSP	Revised Study Plan
SCE	Southern California Edison
SE	California State listed as endangered
SSP	special-Status plant
USFS	U.S. Forest Service

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1.0 INTRODUCTION

This Technical Memorandum provides the methods and findings of field surveys associated with the *BOT-1 General Botanical Resources Study Plan* in support of Southern California Edison's (SCE) Kern River No. 3 (KR3) Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 2290. The BOT-1 Study Plan was included in SCE's Revised Study Plan (RSP) submitted on July 1, 2022 (SCE, 2022). In the October 12, 2022, Study Plan Determination (SPD), FERC approved the BOT-1 Study Plan with modifications. Specifically, FERC recommended that SCE modify the study area to include the Salmon, Corral, and Cannell Creek Bypass Reaches[1] and the Fairview Dam Bypass Reach,[2] plus buffers (FERC, 2022).

Data were collected from April to October 2022 and April to June 2023. All field sampling efforts and data analysis are completed and summarized below.

2.0 STUDY GOALS AND OBJECTIVES

The objectives of the study, as outlined in the BOT-1 Study Plan (SCE, 2022), include:

- Documenting the presence of Mojave tarplant (*Deinandra mohavensis)* and Tracy's eriastrum (*Eriastrum tracyi*)
- Mapping any sensitive natural communities
- Documenting the presence of other special-status plants (SSPs), including U.S. Forest Service (USFS) Sensitive Species (FSS)
- Ground-truthing USFS vegetation mapping
- Documenting non-native invasive plants (NNIPs) with high ecological impact (Cal-IPC, 2023)

3.0 STUDY AREA

The study area includes lands and waters within the FERC Project Boundary in addition to areas adjacent to, or in the proximity of, the FERC Project Boundary along the North Fork Kern River (NFKR) and Salmon, Corral, and Cannel Creeks for the purposes of characterization and data collection relevant to understanding Project operations and

[1] The Salmon Creek Diversion Bypass Reach is defined as the 0.4-mile bypass reach from Salmon Creek Diversion downstream to the confluence with the North Fork Kern River (NFKR). The Corral Creek Diversion Bypass Reach is defined as the 1.1-mile bypass reach from Corral Creek Diversion downstream to the confluence with the NFKR. The Cannell Creek Bypass Reach is defined as the 1-mile bypass reach from the spillway to the confluence with the NFKR.

[2] The Fairview Dam Bypass Reach is defined as the approximately 16-mile bypass reach of the NFKR between Fairview Dam and the KR3 Powerhouse tailrace.

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maintenance activities. Specific study sites are further described below and shown on Figure 3-1.

The study sites include:

- A 50-foot buffer around the following:
  - Project roads
  - Fairview Dam, intake, and sandbox
  - Aboveground sections of the conveyance flowline, including the siphon
  - Salmon and Corral Creek Diversions
  - Pressure flume, forebay, and penstocks
  - KR3 Powerhouse Put-in/Take-out parking area
  - KR3 Powerhouse and supporting maintenance buildings
  - The habitat corridors along the 0.4-mile-long bypass reach of Salmon Creek
  - The 1.1-mile-long bypass reach of Corral Creek
  - The approximately 1-mile-long bypass reach of Cannell Creek
- Fairview Dam Bypass Reach from the river's edge to the outer edge of the riparian strip, plus a 50-foot buffer or to the edge of Mountain Highway 99, whichever is closer.

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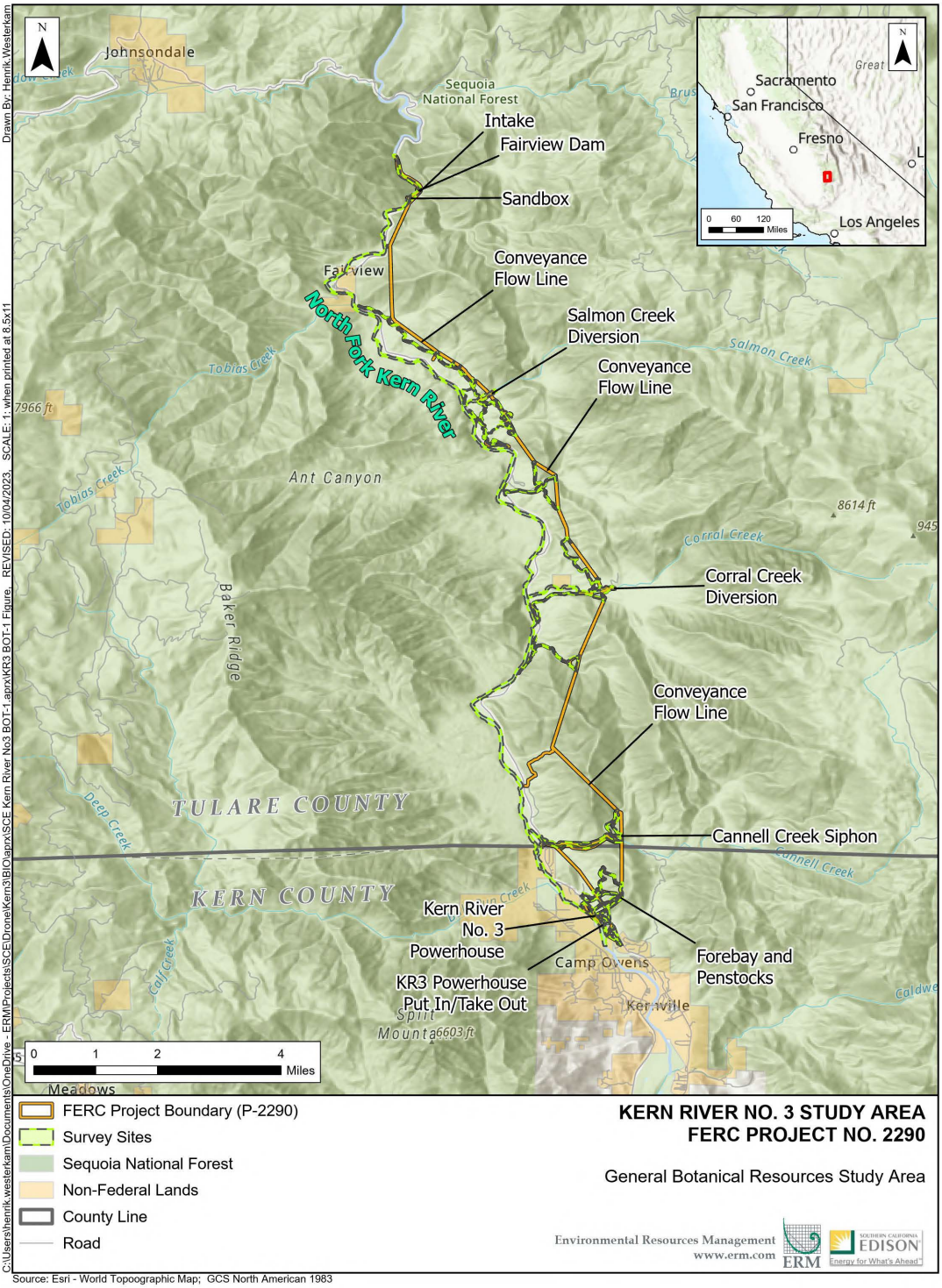


Figure 3-1. General Botanical Resources Study Area.

4.0 METHODS

Study implementation generally followed the methods described in the BOT-1 Study Plan (SCE, 2022), and as amended by FERC in their SPD (FERC, 2022), with the exceptions noted below.

Study Plan Variances

The BOT-1 Study Plan was implemented as stated for all study sites except:

- Access to the west bank of the Fairview Dam Bypass Reach.

Pedestrian access to the west bank was restricted based on lack of trails or crossings and unsafe terrain blocking access to portions of the Fairview Dam Bypass Reach. Traversing the NFKR as a crossing to the west bank (via raft or other watercraft) was deemed infeasible and unsafe for botanical surveys and was not attempted. While the Whiskey Flat Trail was used for accessing a portion of the west bank, trail length and trail distance from the NFKR limited pedestrian access to the entire portion of the study site. Where access to the NFKR west bank within the Fairview Dam Bypass Reach was limited by safety, botanical resources were evaluated from the east bank using 8X binoculars to the extent possible. Target plants (SSPs and NNIPs) were evaluated using these alternative methods. Although the entire west bank of the NFKR in the Fairview Dam Bypass Reach could not be directly surveyed, it is not suspected that the resources are substantially different than those observed on the east bank. Access to the east bank of the NFKR within the Fairview Dam Bypass Reach is well-established, and pedestrian access to this portion of the study site was determined to be safe.

- Geospatial data was collected for all target NNIPs except:
  - Red brome (*Bromus madritensis* ssp. *rubens*)
  - Cheatgrass (*Bromus tectorum*)

These two species (both NNIPs; California Invasive Plant Council [Cal-IPC] High) were found to be ubiquitous throughout the study sites in such a large volume that mapping was deemed impractical. Therefore, specific location data was not collected.

4.1. LITERATURE REVIEW

SSP occurrences and sensitive vegetation communities documented by past studies and multiple databases were examined in the Preliminary Application Document (PAD) (SCE, 2021). Since those studies were conducted, new occurrences have been recorded to the California Natural Diversity Database (CNDDB), Consortium of California Herbaria (CCH), California Native Plant Society (CNPS), or iNaturalist (CDFW, 2023a; CCH, 2023; CNPS, 2023; iNaturalist, 2023). Also, new species have been added to the federal and state special-status species lists, and others have been deemed sensitive by various government and non-governmental organizations (NGOs).

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This literature review verified the protective status of SSPs identified in the PAD or RSP (SCE, 2021; SCE, 2022; CDFW, 2023b). Literature on the ecology and life history of special-status botanical resources was reviewed with a focus on Mojave tarplant and Tracy's eriastrum.

These databases were accessed to update the previous literature review conducted when preparing the RSP and PAD. A target list of SSPs was compiled from the following sources:

- The CNDDB (CDFW, 2023a) and the CNPS Inventory of Rare, Threatened and Endangered Plants (CNPS, 2023). The following U.S. Geological Survey 7.5-minute topographic Quadrangles were queried for SSP species: Fairview and Kernville, Sentinel Peak, Durrwood Creek, Bonita Meadows, Sirretta Peak, Cannell Peak, Weldon, Lake Isabella North, Alta Sierra, Tobias Peak, and Johnsondale.

Location records for species found in the CNDDB and CNPS quad search were refined by accessing the CCH (2023). These records were used to evaluate the potential for each SSP to occur in the Project Vicinity based on the proximity to the study area and the vegetation alliances. The target list includes two categories of potential occurrence in the study area:

1. Known to occur in the Project Vicinity—SSPs with recorded populations in the Project Vicinity, as determined by CNDDB, CCH, or SCE studies; and

2. May occur in the Project Vicinity—SSPs that may occur in the Project Vicinity based on the geographic location and elevation of the Project, vegetation alliances, and other habitat features present.

USFS-provided vegetation alliances within the study area were obtained as geospatial layers and reviewed prior to ground-truthing in Task 2 (Appendix A).

A list of non-native plants with a Cal-IPC rating of High (NNIPs) potentially occurring within the study area with severe ecological impacts was prepared.

4.2. FIELD SURVEYS

Three botanical survey periods were identified based on published phenologies of target NNIPs and SSPs: spring (March through April), summer (June through July), and late summer/fall (August through September). Between 2022 and 2023, surveys were conducted across the study sites as described above. Specific study site survey times are shown in Table 4.2-1.

Prior to the start of field surveys, known occurrences of special-status botanical resources and areas of potentially suitable habitat for special-status botanical resources were prepared as printed paper maps or as maps accessible by a handheld device. Reference population locations of SSPs known to occur near the study area were visited to verify survey timing and phenology.

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Plants were identified by visual recognition and comparison to plant keys using The Jepson Manual (Baldwin et al., 2012) supplemented by the Jepson eFlora (Jepson Flora Project, 2023) and Kern County Flora (Moe, 2016) where appropriate and where key characters required additional examination. Observations of SSPs and NNIPs (high ecological impact) were recorded in the field using hand-held Global Positioning System (GPS) units. A cumulative list of plant species observed was compiled during field surveys. All plants were documented to species, subspecies, or variety (if possible).

For groups of plants that are difficult to differentiate, specimens were collected for laboratory analysis. Documented habitats and localities were consulted when reviewing species identifications to ensure the validity of any potential range extensions.

Table 4.2-1. Schedule of Field Surveys

Survey Dates	Survey Season	Survey Area and Task
April 12 to 20, 2022	Spring	Conducted field botanical surveys of aboveground Project facilities and the Cannell Creek Bypass Reach
June 7 to 9, 2022	Summer	Conducted field botanical surveys of aboveground Project facilities and the Cannell Creek Bypass Reach
August 3 to 11, 2022	Late Summer/Fall	Conducted field botanical surveys of aboveground Project facilities, the Corral Creek Bypass Reach, the Cannell Creek Bypass Reach, the Salmon Creek Bypass Reach, and the Fairview Dam Bypass Reach Mapped vegetation alliances of aboveground Project facilities, the Corral Creek Bypass Reach, the Cannell Creek Bypass Reach, and the Salmon Creek Bypass Reach,
October 27, 2022	None	Mapped vegetation alliances of the Fairview Dam Bypass Reach
April 17 to 20 2023	Spring	Conducted field botanical surveys of the Corral Creek Bypass Reaches, the Salmon Creek Bypass Reaches, and the Fairview Dam Bypass Reaches
May 30 to June 2, 2023	Summer	Conducted field botanical surveys of the Corral Creek Bypass Reaches, Salmon Creek Bypass Reaches, and the Fairview Dam Bypass Reaches

5.0 DATA SUMMARY

5.1. LITERATURE REVIEW

Three Sensitive Natural Communities were found to potentially occur in the Project Vicinity (Table 5.1-1) The literature review returned a target plant list of 8 SSPs that were known to occur and 15 SSPs that may occur (Table A-1 in Appendix A) and 25 Cal-IPC high NNIPs that could potentially occur in the Project Vicinity (Table B-1 in Appendix B).

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Table 5.1-1. Sensitive Natural Communities Potentially Occurring in the Project Vicinity

Natural Community	Rank [a] Global/ State	Query Sources	Habitat [b]	Potential to Occur
Big Tree Forest	G3/S3.2	CNDDB	Lower montane coniferous forest, including groves of giant sequoia (*Sequoiadendron giganteum*) and associated with abundant groundwater.	Occurrence unlikely. Several groves known from west of the Project Vicinity, with the closest located approximately 5 miles to the west (CDFW, 2023a). This community is extremely conspicuous, and groves are well-reported in the Project Vicinity.
Great Valley Cottonwood Riparian Forest	G2/S2.1	CNDDB	Riparian forest in fine-grained alluvial soils with a canopy of broadleafed, deciduous species, dominated by Fremont cottonwoods (*Populus fremontii*) and Goodding's black willow (*Salix gooddingii*) and with an understory adapted to annual flooding.	May potentially occur. Known along the South Fork of the Kern River, from eastern Isabella Lake to Canebrake Creek. Riparian habitat along upper Kern River within the Project Vicinity may meet the classification for the natural community.
Southern Interior Cypress Forest	G2/S2.1	CNDDB	Closed-cone coniferous forest, densely spaced, and fire-adapted with dominant species varying by elevation.	May potentially occur. Several groves known from canyons and ephemeral channels within the Project Vicinity (CDFW, 2023a).

CNDDB = California Natural Diversity Data Base
[a] Rank (CDFW, 2023a)
Global/State Rank
G1/S1: Fewer than 6 viable occurrences worldwide/statewide, and/or up to 518 hectares
G2/S2: 6–20 viable occurrences worldwide/statewide, and/or more than 518–2,590 hectares
G3/S3: 21–100 viable occurrences worldwide/statewide, and/or more than 2,590–12,950 hectares
[b] Holland, 1986

5.2. FIELD SURVEYS

The following SSPs[3] were found:

- Call's Angelica (*Angelica callii)* —California Rare Plant Rank (CRPR) 4.3
- Kern Canyon clarkia (*Clarkia xantiana* ssp. *parviflora*)—CRPR 4.2
- Kern County larkspur (=Rose-flowered larkspur) (*Delphinium purpusii*)—CRPR 1B.3/FSS
- Kern River daisy (*Erigeron multiceps*)—CRPR 1B.2/FSS

[3] Plant status listed as per the *Special Vascular Plants, Bryophytes, and Lichens List* (CDFW, 2023b).

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- Limestone dudleya (*Dudleya abramsii* ssp. *calcicola*)—CRPR 4.3
- Mojave tarplant (*Deinandra mohavensis*)—California State listed as endangered (SE) / CRPR 1B.3 / FSS
- Piute cypress (*Hesperocyparis nevadensis*)—CRPR 1B.2
- Tracy's eriastrum (*Eriastrum tracyi*)— California State listed as endangered (CR) / CRPR 3.2/FSS
- Transverse Range phacelia (*Phacelia exilis*)—CRPR 4.3
- Two-colored monkeyflower (*Erythranthe discolor*)—CRPR 4.2

A compendium of 347 plant species were documented within the study sites (Table C-1 in Appendix C). Field surveys located 8 of the 23 target SSPs (Table A-1 in Appendix A). An additional two SSPs were located that were not identified as target species identified in the PAD (SCE, 2021). Locations of documented SSPs are shown in Appendix D (Figures D-1a through D-1f), and associated geospatial data will be submitted to the CNDDB.

The following Cal-IPC high NNIPS were found:

- Cheatgrass (*Bromus tectorum*)
- Red brome (*Bromus madritensis* ssp. *rubens*)
- Himalayan blackberry (*Rubus armeniacus*)

Three of the 25 NNIPs that could potentially occur in the Project Vicinity were located during field surveys (Table B-1 in Appendix B). As previously described, cheatgrass and red brome were ubiquitous at study sites and no geospatial data were collected. Locations of Himalayan blackberry are shown in Appendix E (Figure E-1).

Ground-truthing of the vegetation of the study area documented 19 of the USFS mapped vegetation alliances (Appendix F). While many of the USFS mapped alliances were found to be generally accurate at the study sites, some revisions were made using data collected during ground-truthing (Figure G-1a through G-1g in Appendix G).

Of the three documented CNDDB Sensitive Natural Communities in the vicinity of the study area (see Appendix B), Great Valley Cottonwood Riparian Forest was found to be represented by the USFS Mixed Riparian vegetation alliance (Figures G-1a through G-1g in Appendix G). Three small stands of Piute cypress (Southern Interior Cypress Forest) were found (Figures D-1a through D-1f in Appendix D). No big trees (Big Tree Forest) were found in the study sites.

Finally, one western pond turtle (*Emys marmorata*) (state species of special concern; USFS sensitive) was incidentally observed basking on the margins of Cannell Creek

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during focused botanical field surveys (for more information on western pond turtle, see the *BIO-5 Western Pond Turtle Interim Technical Memorandum* [Attachment J to this Initial Study Report]). No other incidental special-status wildlife observations were documented during this study.

6.0 STUDY SPECIFIC CONSULTATION

- 8 April 2022: Jillian Roach (Environmental Resources Management, Inc.), David Moore (SCE), and Randi McCormick (McCormick Biological, Inc.) met with Norman Leonard (USFS) to discuss survey timing and adequacy of rainfall during the previous rainy season (2021/2022) and circumstances under which survey periods/sites would potentially be augmented in 2023.

7.0 OUTSTANDING STUDY PLAN ELEMENTS

All Study Plan elements have been completed as outlined in SCE's RSP (SCE, 2022) filing, and as amended in FERC's SPD (FERC 2022), with the exception of the variances described above. This study is now complete.

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APPENDIX A
TARGET SPECIAL-STATUS PLANTS

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Table A-1. Target Special-Status Plants

Species Name	Status Federal/State/ CRPR/USFS	Blooming Period	Elevation Range (feet)	Habitat	Potential to Occur
Alkali mariposa lily *Calochortus striatus*	–/–/1B.2/FSS	April–June	225–5,235	Moist alkaline and/or mesic sites in chaparral, chenopod scrub, Mojavean desert scrub, meadows and seeps	May occur. Potentially suitable habitat is present; nearest record is less than 1 mile southeast of the Project Vicinity near Kernville (CCH, 2023). Not observed during 2022 or 2023 study site surveys.
Calico monkeyflower *Diplacus pictus*	–/–/1B.2/–	March–May	325–4,690	Broadleafed upland forest, cismontane woodland	May occur. Suitable habitat is present; numerous populations are known from as close as 12 miles south and west of the Project Vicinity (CCH, 2023), with several records in habitat similar to the Project Vicinity. Not observed during 2022 or 2023 study site surveys.
Call's angelica *Angelica callii*	–/–/4.3/–	June–July	3,605–6,560	Cismontane woodland, lower montane coniferous forest	Known to occur. Prior to field surveys, this species has been recorded less than 1 mile north of the Project Vicinity (CCH, 2023). Not observed during 2022 or 2023 study site surveys.
Cut-leaf checkerbloom *Sidalcea multifida*	–/–/2B.3/–	May–September	5,740–9,185	Great Basin scrub, lower montane coniferous forest, meadows and seeps, pinyon and juniper woodland	May occur. A small portion of the Project Vicinity is within the elevation range for this species; general vegetation may be present, conditions in the Project Vicinity are unlikely to support this species. One record is located approximately 2.5 miles north of the northern portion of the Project Vicinity (CDFW, 2023a). Note: One CCH specimen location is within the Project Vicinity; however, the specimen label states, “in open Yellow Pine forest” and “along fork of Kern Trail between Lloyd Meadow and canyon rim Sequoia National Forest” (CCH, 2023). Lloyd Meadow is 12 miles north of the northern limit of the Project Vicinity. Not observed during 2022 or 2023 study site surveys.
Delicate bluecup *Githopsis tenella*	–/–/1B.3/–	April–June	1,065–6,235	Chaparral, cismontane woodland	May occur. Suitable habitat is present and there are records from approximately 9 miles southeast of the Project Vicinity in similar habitat (CCH, 2023). Not observed during 2022 or 2023 study site surveys.
Kern Canyon clarkia *Clarkia xantiana* ssp. *parviflora*	–/–/4.2/–	May–June	2,295–11,875	Chaparral, cismontane woodland, Great Basin scrub, valley and foothill grassland	Known to occur. This plant is known from several locations both inside and outside of the Project Vicinity within the Kern River drainage (CCH, 2023; CDFW, 2023a). Observed during 2022 and 2023 study site surveys.
Kern River daisy *Erigeron multiceps*	–/–/1B.2/FSS	June–September	4,920–8,315	Meadows and seeps, openings in upper montane coniferous forest	Known to occur. Several populations known from the Project Vicinity (CCH, 2023; CDFW, 2023a). Observed during 2022 and 2023 study site surveys.
Kern River evening-primrose *Camissonia integrifolia*	–/–/1B.3/–	(sometimes April) May	2,295–3,280	Chaparral	May occur. Suitable habitat is present; and the nearest record is in rabbitbush scrub approximately 9 miles southeast of the Project Vicinity (CCH, 2023). Not observed during 2022 or 2023 study site surveys.
Kernville poppy *Eschscholzia procera*	–/–/3/–	June–July (sometimes August)	2,655–3,365	Sandy floodplains in cismontane woodland	May occur. Suitable habitat is present on the Project Vicinity and populations are known from the vicinity (CCH, 2023). Not observed during 2022 or 2023 study site surveys.
Mojave tarplant *Deinandra mohavensis*	–/SE/1B.3/FSS	(sometimes May) June–October (sometimes January)	2,095–5,250	Chaparral, coastal scrub, riparian scrub	Known to occur. Localities reported include “Kernville” and Corral Creek near the Kern River within the Project Vicinity (CCH, 2023). Observed during 2022 and 2023 study site surveys.
Muir's tarplant *Carlquistia muirii*	–/–/1B.3/FSS	July–August (sometimes October)	2,475–8,200	Dry, open sites on granitic soil in montane chaparral, lower montane coniferous forest, upper montane coniferous forest	May occur. Potentially suitable habitat is present, although records in the region are within chaparral types that are typically found at higher elevations; nearest record is approximately 2.7 miles west of Project Vicinity (CCH, 2023). Not observed during 2022 or 2023 study site surveys.
Palmer's mariposa lily *Calochortus palmeri* var. *palmeri*	–/–/1B.2/FSS	April–July	2,325–7,840	Chaparral, lower montane coniferous forest, meadows and seeps	Known to occur. Suitable habitat is present and at least one population is located within the Project Vicinity (CDFW, 2023a). Not observed during 2022 or 2023 study site surveys.
Piute cypress *Hesperocyparis nevadensis*	–/–/1B.2/–	NA	2,360–6,005	Closed-cone coniferous forest, chaparral, cismontane woodland, pinyon and juniper woodland	Known to occur. Two locations recorded within the Project Vicinity with several just outside of the Project Vicinity (CCH, 2023; CDFW, 2023a). Observed during 2022 and 2023 study site surveys.

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Species Name	Status Federal/State/ CRPR/USFS	Blooming Period	Elevation Range (feet)	Habitat	Potential to Occur
Prairie wedge grass *Sphenopholis obtusata*	–/–/2B.2/–	April–July	980–6,560	Cismontane woodland, meadows, streambanks, and seeps	Known to occur. Northern portion of Project Vicinity in limestone cliffs Kern River Canyon (CCH, 2023; CDFW, 2023a). Not observed during 2022 or 2023 study site surveys.
Rose-flowered larkspur (=Kern County larkspur) *Delphinium purpusii*	–/–/1B.3/FSS	(sometimes March) April–May	980–4,395	Chaparral, cismontane woodland, pinyon and juniper woodland	Known to occur. Suitable habitat present and several populations are known to occur within the Project Vicinity (CCH, 2023a). Observed during 2022 and 2023 study site surveys.
Shevock's copper moss *Mielichhoferia shevockii*	–/–/1B.2/FSS	NA	2,460–4,595	Areas of cismontane woodland with metamorphic rock and mesic soils	Known to occur. One CNDDB record located along the Kern River within the Project Vicinity (CDFW, 2023a) Not observed during 2022 or 2023 study site surveys.
Shevock's golden-aster *Heterotheca shevockii*	–/–/1B.3/FSS	August–November	750–2,955	Chaparral, cismontane woodland	May occur. Suitable habitat is present; records approximately 11 miles south-southwest of the Project Vicinity in similar habitat along the lower Kern River canyon (CCH, 2023). Not observed during 2022 or 2023 study site surveys.
The Needles buckwheat *Eriogonum breedlovei* var. *shevockii*	–/–/4.3/–	(sometimes June) July–September	5,295–8,450	Granite crevices; pinyon and juniper woodland, upper montane coniferous forest	May occur. Although potential vegetation types are not present, granite outcrops and crevices occur in Project Vicinity; several records approximately 2.5 miles west of Project Vicinity near Baker Point (CCH, 2023).
Tracy's eriastrum *Eriastrum tracyi*	–/CR/3.2/FSS	May–July	1,030–5,840	Chaparral, cismontane woodland, valley and foothill grassland	Known to occur (initially identified as “may occur”). Suitable habitat is present. Prior to field surveys, this species has been recorded less than 1 mile north and 6 miles southeast of the Project Vicinity in similar habitat (CCH, 2023; CDFW, 2023a). Observed during 2022 or 2023 study site surveys.
Tulare cryptantha *Cryptantha incana*	–/–/1B.3/FSS	June–August	4,690–7,055	Gravelly or rocky areas in lower montane coniferous forest	May occur. Potentially suitable habitat is present several populations recorded within 5 miles of the Project Vicinity (CCH, 2023; CDFW, 2023a). Not observed during 2022 or 2023 study site surveys.
Two-colored monkeyflower *Erythranthe discolor*	-/-/4.2/-	June–July	4,265–8,200	Openings along small streams, meadow edges, generally in granitic soils	Known to occur (initially identified as “may occur”). Suitable habitat is present. Prior to field surveys, this species has been recorded in the Project Vicinity in similar habitat (CCH, 2023). Observed during 2022 and 2023 study site surveys.
Unexpected larkspur *Delphinium inopinum*	–/–/4.3/FSS	May–July	6,200–9,185	Areas with metamorphic rocks in upper montane coniferous forest	May occur. Although the Project Vicinity is outside of the published elevation range and habitat for this species, a record has been reported from about 2.5 miles south of the Project Vicinity at Kern Hot Springs with habitat similar to the Project Vicinity in the surrounding area (CCH, 2023). Not observed during 2022 or 2023 study site surveys.
White pygmy-poppy *Canbya candida*	–/–/4.2/FSS	March–June	1,965–4,790	Sandy soils in Joshua tree woodland, Mojavean desert scrub, pinyon and juniper woodland	May occur. Several populations have been recorded in Cyrus Canyon, approximately 3.5 miles south of the Project Vicinity, and one location was recorded as “Kernville” in 1891, which is less than 1 mile south of the Project Vicinity (CCH, 2023). Given the widespread nature of the known occurrences in the region, this plant should be considered even though habitat types are not present. Not observed during 2022 or 2023 study site surveys.

CNDDB = California Natural Diversity Data Base; CRPR = California Rare Plant Rank; FSS = U.S. Forest Service Sensitive; USFS = U.S. Forest Service

Status:

Federal

FE Federally listed as endangered
FT Federally listed as threatened
– No federal status

State

SE California State listed as endangered
ST California State listed as threatened
SR California State Listed as rare
– No state status

CRPR (California Rare Plant Rank) List Ranks

List 1B Plants rare, threatened, or endangered in California and elsewhere
List 2B Plants rare, threatened, or endangered in California, but more common elsewhere
List 3 More information needed about this plant, a review list
List 4 Plants of limited distribution, a watch list

CRPR Threat Ranks

0.1 Seriously threatened in California (high degree/immediacy of threat)
0.2 Fairly threatened in California (moderate degree/immediacy of threat)

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APPENDIX B
POTENTIALLY OCCURRING NON-NATIVE INVASIVE PLANTS

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Table B-1. Non-Native Invasive Plants Potentially Occurring in the Project Vicinity with a High Ecological Impact Rating (Cal-IPC)

Scientific Name	Common Names	Field Survey Results
Aegilops triuncialis	Barb goatgrass	Not documented.
Arundo donax	Giant reed	Not documented.
Brassica tournefortii	Sahara mustard	Not documented.
Bromus madritensis ssp. *rubens*	Red brome	Present through the study area; specific location data was not collected.
Bromus tectorum	Cheatgrass	Present through the study area; specific location data was not collected.
Carthamnus lanatus	Wooly distaff thistle	Not documented.
Centaurea solstitialis	Yellow starthistle	Not documented.
Centaurea stoebe ssp. *micranthos*	Spotted knapweed	Not documented.
Cortaderia jubata	Jubatagrass	Not documented.
Cortaderia selloana	Pampasgrass	Not documented.
Cytisus scoparius	Scotch broom	Not documented.
Elymus caput-medusae	Medusahead	Not documented.
Euphorbia virgata	Leafy spurge	Not documented.
Genista monspessulana	French broom	Not documented.
Hedera helix	English ivy	Not documented.
Lepidium latifolium	Perennial pepperweed	Not documented.
Lythrum salicaria	Purple loosestrife	Not documented.
Onopordum acanthium	Scotch thistle	Not documented.
Rubus armeniacus	Himalayan blackberry	Populations documented at Salmon Creek, Corral Creek, and along Mountain 99 near Fairview Dam.
Sesbania punicea	Scarlet wisteria	Not documented.
Spartium junceum	Spanish broom	Not documented.

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Scientific Name	Common Names	Field Survey Results
Tamarix chinensis	Chinese tamarisk	Not documented.
Tamarix parviflora	Smallflower tamarisk	Not documented.
Tamarix ramosissima	Saltcedar	Not documented.
Ulex europaeus	Gorse	Not documented.

Source: Cal-IPC, 2023

Cal-IPC = California Invasive Plant Council

Cal-IPC Rating Definitions:

High These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

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APPENDIX C
COMPENDIUM OF PLANTS DOCUMENTED IN FIELD SURVEYS

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Table C-1. Compendium of Plants Documented in Field Surveys

Family	Scientific Name	Common Name	Status (Federal/State/CRPR/USFS)
Agavaceae	*Hesperoyucca whipplei*	Chaparral yucca	Native
Asteraceae	*Brickellia californica*	California brickellia	Native
Asteraceae	*Brickellia microphylla*	Little leaved brickellia	Native
Asteraceae	*Centromadia pungens*	Common tarweed	Native
Asteraceae	*Chaenactis fremontii*	Fremont pincushion	Native
Asteraceae	*Chaenactis glabriuscula*	Common yellow chaenactis	Native
Asteraceae	*Chaenactis xantiana*	Xantus' chaenactis	Native
Asteraceae	*Cirsium occidentale*	Western thistle	Native
Asteraceae	*Cirsium occidentale* var. *californicum*	California thistle	Native
Asteraceae	*Cirsium vulgare*	Bullthistle	Cal-IPC Moderate
Asteraceae	*Corethrogyne filaginifolia*	Common sandaster	Native
Asteraceae	*Deinandra mohavensis*	Mojave tarplant	-/SE/1B.3/FSS
Asteraceae	*Encelia actoni*	Acton encelia	Native
Asteraceae	*Ericameria arborescens*	Goldenfleece	Native
Asteraceae	*Ericameria cuneata*	Rock goldenbush	Native
Asteraceae	*Ericameria linearifolia*	Interior goldenbush	Native
Asteraceae	*Ericameria nauseosa*	Rubber rabbitbrush	Native
Asteraceae	*Ericameria teretifolia*	Green rabbitbrush	Native
Asteraceae	*Erigeron canadensis*	Canada horseweed	Native
Asteraceae	*Erigeron multiceps*	Kern River daisy	-/-/1B.3/FSS
Asteraceae	*Eriophyllum ambiguum*	Annual wooly sunflower	Native
Asteraceae	*Eriophyllum confertiflorum*	Yellow yarrow	Native
Asteraceae	*Eriophyllum lanatum*	Wooly sunflower	Native
Asteraceae	*Eriophyllum pringlei*	Pringle eriophyllum	Native
Asteraceae	*Euthamia occidentalis*	Western goldenrod	Native
Asteraceae	*Gnaphalium palustre*	Lowland cudweed	Native
Asteraceae	*Helianthus annuus*	Hairy leaved sunflower	Native
Asteraceae	*Hemizonella minima*	Opposite leaved tarweed	Native

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Family	Scientific Name	Common Name	Status (Federal/State/CRPR/USFS)
Asteraceae	*Heterotheca grandiflora*	Telegraph weed	Native
Asteraceae	*Heterotheca sessiliflora*	Golden aster	Native
Asteraceae	*Holocarpha heermannii*	Heermann's tarweed	Native
Asteraceae	*Lactuca serriola*	Prickly lettuce	Non-native
Asteraceae	*Lasthenia debilis*	Greene's goldfields	Native
Asteraceae	*Lasthenia gracilis*	Needle goldfields	Native
Asteraceae	*Layia glandulosa*	White layia	Native
Asteraceae	*Lepidospartum squamatum*	Scalebroom	Native
Asteraceae	*Leptosyne bigelovii*	Bigelow coreopsis	Native
Asteraceae	*Logfia filaginoides*	Filago	Native
Asteraceae	*Logfia gallica*	Narrowleaf cottonrose	Native
Asteraceae	*Malacothrix californica*	California dandelion	Native
Asteraceae	*Malacothrix clevelandii*	Cleveland's malacothrix	Native
Asteraceae	*Malacothrix glabrata*	Desert dandelion	Native
Asteraceae	*Matricaria discoidea*	Pineapple weed	Native
Asteraceae	*Micropus californicus*	Qtips	Native
Asteraceae	*Monolopia lanceolata*	Common monolopia	Native
Asteraceae	*Orochaenactis thysanocarpha*	Mountain pincushion	Native
Asteraceae	*Pseudognaphalium beneolens*	Cudweed	Native
Asteraceae	*Pseudognaphalium luteoalbum*	Jersey cudweed	Non-native
Asteraceae	*Rafinesquia californica*	California chicory	Native
Asteraceae	*Rigiopappus leptocladus*	Wireweed	Native
Asteraceae	*Senecio flaccidus* var. *douglasii*	Bush groundsel	Native
Asteraceae	*Senecio vulgaris*	Common groundsel	Non-native
Asteraceae	*Solidago elongata*	West coast Canada goldenrod	Native
Asteraceae	*Stephanomeria pauciflora*	Wire lettuce	Native
Asteraceae	*Stephanomeria virgata*	Twiggy wreath plant	Native
Asteraceae	*Stylocline gnaphaloides*	Everlasting stylocline	Native

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Family	Scientific Name	Common Name	Status (Federal/State/CRPR/USFS)
Asteraceae	*Syntrichopappus fremontii*	Fremont's syntrichopappus	Native
Asteraceae	*Uropappus lindleyi*	Silver puffs	Native
Asteraceae	*Xanthium strumarium*	Cocklebur	Native
Bartramiaceae	*Anacolia* sp.	No common name	Native
Betulaceae	*Alnus rhombifolia*	White alder	Native
Boraginaceae	*Amsinckia intermedia*	Common fiddleneck	Native
Boraginaceae	*Amsinckia menziesii*	Menzies' fiddleneck	Native
Boraginaceae	*Amsinckia tessellata*	Devil's lettuce	Native
Boraginaceae	*Cryptantha echinella*	Prickly cryptantha	Native
Boraginaceae	*Cryptantha flaccida*	Beaked cryptantha	Native
Boraginaceae	*Cryptantha muricata*	Prickly cryptantha	Native
Boraginaceae	*Pectocarya penicillata*	Winged pectocarya	Native
Boraginaceae	*Pectocarya setosa*	Moth combseed	Native
Boraginaceae	*Plagiobothrys acanthocarpus*	Adobe allocarya	Native
Boraginaceae	*Plagiobothrys arizonicus*	Arizona popcorn flower	Native
Boraginaceae	*Plagiobothrys tenellus*	Slender popcorn flower	Native
Brassicaceae	*Boechera arcuata*	Arching rockcress	Native
Brassicaceae	*Boechera sparsiflora*	Sicklepod rockcress	Native
Brassicaceae	*Boechera stricta*	Drummond's rockcress	Native
Brassicaceae	*Brassica nigra*	Black mustard	Cal-IPC Moderate
Brassicaceae	*Caulanthus coulteri*	Coulter's jewel flower	Native
Brassicaceae	*Descurainia pinnata* ssp. *brachycarpa*	Western tansymustard	Native
Brassicaceae	*Descurainia sophia*	Herb sophia	Cal-IPC Limited
Brassicaceae	*Draba verna*	Whitlow grass	Non-native
Brassicaceae	*Erysimum capitatum* var. *capitatum*	Sanddune wallflower	Native
Brassicaceae	*Hirschfeldia incana*	Summer mustard	Cal-IPC Moderate
Brassicaceae	*Lepidium nitidum*	Shining pepper grass	Native
Brassicaceae	*Nasturtium officinale*	Watercress	Native
Brassicaceae	*Sisymbrium altissimum*	Tumble mustard	Non-native

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Family	Scientific Name	Common Name	Status (Federal/State/CRPR/USFS)
Brassicaceae	*Sisymbrium irio*	London rocket	Cal-IPC Limited
Brassicaceae	*Sisymbrium orientale*	Indian hedge mustard	Non-native
Brassicaceae	*Streptanthus tortuosus*	Jewelweed	Native
Brassicaceae	*Thysanocarpus curvipes*	Common fringe pod	Native
Brassicaceae	*Thysanocarpus laciniatus*	Narrow leaved lacepod	Native
Brassicaceae	*Tropidocarpum gracile*	Slender tropidocarpum	Native
Cactaceae	*Opuntia basilaris* var. *basilaris*	Beavertail cactus	Native
Caprifoliaceae	*Lonicera interrupta*	Chaparral honeysuckle	Native
Caryophyllaceae	*Herniaria hirsuta*	Herniaria	Non-native
Caryophyllaceae	*Silene gallica*	Common catchfly	Non-native
Caryophyllaceae	*Silene laciniata* ssp. *californica*	California Indian pink	Native
Caryophyllaceae	*Stellaria media*	Chickweed	Non-native
Chenopodiaceae	*Chenopodium atrovirens*	Dark green goosefoot	Native
Chenopodiaceae	*Chenopodium berlandieri*	Pit seed goosefoot	Native
Chenopodiaceae	*Chenopodium californicum*	California goosefoot	Native
Chenopodiaceae	*Chenopodium fremontii*	Fremont's goosefoot	Native
Chenopodiaceae	*Chenopodium pratericola*	Meadow goosefoot	Native
Chenopodiaceae	*Salsola tragus*	Russian thistle	Cal-IPC Limited
Comandraceae	*Comandra umbellata*	Bastard toadflax	Native
Convolvulaceae	*Calystegia longipes*	Piute morning glory	Native
Convolvulaceae	*Cuscuta californica*	California dodder	Native
Crassulaceae	*Dudleya abramsii* ssp. *calcicola*	Limestone dudleya	-/-/4.3/-
Crassulaceae	*Sedella pumila*	Sierra mock stonecrop	Native
Cucurbitaceae	*Cucurbita palmata*	Coyote melon	Native
Cucurbitaceae	*Marah horrida*	Sierra man-root	Native
Cupressaceae	*Calocedrus decurrens*	Incense cedar	Native
Cupressaceae	*Hesperocyparis nevadensis*	Piute cypress	-/-/1B.2/-
Cupressaceae	*Juniperus californica*	California juniper	Native
Cyperaceae	*Carex alma*	Sedge	Native

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Family	Scientific Name	Common Name	Status (Federal/State/CRPR/USFS)
Cyperaceae	*Carex nudata*	Torrent sedge	Native
Cyperaceae	*Carex praegracilis*	Field sedge	Native
Cyperaceae	*Carex senta*	Rough sedge	Native
Cyperaceae	*Eleocharis parishii*	Parish's spike rush	Native
Dennstaedtiaceae	*Pteridium aquilinum*	Western brackenfern	Native
Dryopteridaceae	*Dryopteris arguta*	California wood fern	Native
Ephedraceae	*Ephedra nevadensis*	Nevada ephedra	Native
Ephedraceae	*Ephedra viridis*	Green ephedra	Native
Equisetaceae	*Equisetum arvense*	Common horsetail	Native
Ericaceae	*Arctostaphylos glauca*	Big berry manzanita	Native
Ericaceae	*Arctostaphylos patula*	Green leaf manzanita	Native
Ericaceae	*Arctostaphylos viscida*	Whiteleaf manzanita	Native
Euphorbiaceae	*Croton setiger*	Turkey-mullein	Native
Euphorbiaceae	*Euphorbia albomarginata*	Rattlesnake sandmat	Native
Fabaceae	*Acmispon argophyllus*	Silverleaf trefoil	Native
Fabaceae	*Acmispon glaber*	Deerweed	Native
Fabaceae	*Acmispon grandiflorus*	Large leaved lotus	Native
Fabaceae	*Acmispon strigosus*	Strigose lotus	Native
Fabaceae	*Albizia julibrissin*	Silktree	Non-native
Fabaceae	*Astragalus purshii* var. *tinctus*	Pursh's milk vetch	Native
Fabaceae	*Lupinus adsurgens*	Drew's silky lupine	Native
Fabaceae	*Lupinus andersonii*	Anderson's lupine	Native
Fabaceae	*Lupinus benthamii*	Spider lupine	Native
Fabaceae	*Lupinus bicolor*	Lupine	Native
Fabaceae	*Lupinus cocinnus*	Bajada lupine	Native
Fabaceae	*Lupinus excubitus*	Grape lupine	Native
Fabaceae	*Lupinus stiversii*	Harlequin lupine	Native
Fabaceae	*Melilotus albus*	White sweetclover	Non-native
Fabaceae	*Robinia pseudoacacia*	Black locust	Cal-IPC Limited
Fabaceae	*Trifolium hirtum*	Rose clover	Cal-IPC Limited
Fabaceae	*Trifolium microcephalum*	Hairy clover	Native
Fabaceae	*Trifolium willdenovii*	Tomcat clover	Native

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Family	Scientific Name	Common Name	Status (Federal/State/CRPR/USFS)
Fagaceae	*Quercus chrysolepis*	Gold cup live oak	Native
Fagaceae	*Quercus garryana*	Oregon oak	Native
Fagaceae	*Quercus kelloggii*	California black oak	Native
Fagaceae	*Quercus wislizeni*	Interior live oak	Native
Garryaceae	*Garrya flavescens*	Ashy silk tassel	Native
Gerinaceae	*Erodium cicutarium*	Coastal heron's bill	Cal-IPC Limited
Grimmiaceae	*Grimmia* sp.	Grimmia moss	Native
Grossulariaceae	*Ribes cereum*	Wax currant	Native
Grossulariaceae	*Ribes roezlii*	Sierra gooseberry	Native
Hydrophyllaceae	*Emmenanthe penduliflora*	Whispering bells	Native
Hydrophyllaceae	*Nemophila pulchella*	Eastwood's nemophila	Native
Hydrophyllaceae	*Phacelia cicutaria* var. *hispida*	Caterpillar phacelia	Native
Hydrophyllaceae	*Phacelia distans*	Common phacelia	Native
Hydrophyllaceae	*Phacelia egena*	Rock phacelia	Native
Hydrophyllaceae	*Phacelia exilis*	Transverse Range phacelia	-/-/4.3/-
Hydrophyllaceae	*Phacelia mutabilis*	Changeable phacelia	Native
Hydrophyllaceae	*Phacelia ramosissima*	Branching phacelia	Native
Hydrophyllaceae	*Phacelia tanacetifolia*	Tansy leafed phacelia	Native
Hydrophyllaceae	*Pholistoma auritum* var. *auritum*	Blue fiesta flower	Native
Juncaceae	*Juncus balticus*	Wire rush	Native
Juncaceae	*Juncus bufonius*	Common toad rush	Native
Juncaceae	*Juncus mexicanus*	Mexican rush	Native
Juncaceae	*Juncus rugulosus*	Wrinkled rush	Native
Lamiaceae	*Lamium amplexicaule*	Henbit	Non-native
Lamiaceae	*Marrubium vulgare*	White horehound	Cal-IPC Limited
Lamiaceae	*Monardella breweri*	Brewer's monardella	Native
Lamiaceae	*Salvia columbariae*	Chia sage	Native
Lamiaceae	*Stachys albens*	Cobwebby hedge nettle	Native
Lamiaceae	*Trichostema lanceolatum*	Vinegarweed	Native
Liliaceae	*Calochortus invenustus*	Plain mariposa	Native

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Family	Scientific Name	Common Name	Status (Federal/State/CRPR/USFS)
Liliaceae	*Calochortus venustus*	Butterfly mariposa lily	Native
Loasaceae	*Mentzelia albicaulis*	White stemmed blazing star	Native
Loasaceae	*Mentzelia veatchiana*	Veatch's blazing star	Native
Lythraceae	*Lythrum californicum*	Common loosestrife	Native
Malvaceae	*Fremontodendron californicum*	California fremontia	Native
Malvaceae	*Malacothamnus fremontii*	Fremont's bush mallow	Native
Malvaceae	*Malacothamnus orbiculatus*	Tehachapi bush mallow	Native
Montiaceae	*Calandrinia menziesii*	Calandrinia	Native
Montiaceae	*Calyptridium monandrum*	Common pussypaws	Native
Montiaceae	*Claytonia exigua*	Little spring beauty	Native
Montiaceae	*Claytonia parviflora* ssp. *parviflora*	Miner'slettuce	Native
Montiaceae	*Claytonia perfoliata*	Miner's lettuce	Native
Myrtaceae	*Eucalyptus sideroxylon*	Red iron bark	Non-native
Namaceae	*Eriodictyon californicum*	Yerba santa	Native
Nyctaginaceae	*Mirabilis laevis*	Desert wishbone bush	Native
Oleaceae	*Forestiera pubescens*	Desert olive	Native
Oleaceae	*Fraxinus latifolia*	Oregon ash	Native
Oleaceae	*Fraxinus velutina*	Arizona ash	Native
Onagraceae	*Camissonia campestris*	Field primrose	Native
Onagraceae	*Camissonia contorta*	Contorted sun cup	Native
Onagraceae	*Clarkia speciosa*	Red spotted clarkia	Native
Onagraceae	*Clarkia speciosa* ssp. *polyantha*	Red spot clarkia	Native
Onagraceae	*Clarkia unguiculata*	Woodland clarkia	Native
Onagraceae	*Clarkia xantiana* ssp. *parviflora*	Kern Canyon clarkia	-/-/4.2/-
Onagraceae	*Clarkia xantiana* ssp. *xantiana*	Xantus' clarkia	Native
Onagraceae	*Epilobium brachycarpum*	Willow herb	Native
Onagraceae	*Epilobium canum* ssp. *latifolium*	California fuchsia	Native

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Family	Scientific Name	Common Name	Status (Federal/State/CRPR/USFS)
Onagraceae	*Epilobium ciliatum*	Slender willow herb	Native
Onagraceae	*Oenothera californica* ssp. *californica*	California evening primrose	Native
Onagraceae	*Oenothera elata*	Evening primrose	Native
Orobanchaceae	*Castilleja applegatei*	Wavy leaf paintbrush	Native
Orobanchaceae	*Castilleja exserta*	Owl's clover	Native
Orobanchaceae	*Castilleja minor*	Lesser paintbrush	Native
Orobanchaceae	*Castilleja subinclusa* ssp. *subinclusa*	Long leaf paintbrush	Native
Orobanchaceae	*Pedicularis semibarbata*	Pine woods lousewort	Native
Papaveraceae	*Argemone munita*	Prickly poppy	Native
Papaveraceae	*Ehrendorferia chrysantha*	Golden eardrops	Native
Papaveraceae	*Eschscholzia caespitosa*	Tufted eschscholzia	Native
Papaveraceae	*Eschscholzia californica*	California poppy	Native
Papaveraceae	*Eschscholzia minutiflora*	Coville's poppy	Native
Papaveraceae	*Platystemon californicus*	Cream cups	Native
Phrymaceae	*Diplacus aurantiacus*	Sticky monkeyflower	Native
Phrymaceae	*Diplacus calycinus*	Rock Bush Monkeyflower	Native
Phrymaceae	*Erythranthe cardinalis*	Cardinal monkey flower	Native
Phrymaceae	*Erythranthe discolor*	Two-colored monkeyflower	-/-/4.2/-
Phrymaceae	*Erythranthe floribunda*	Many flowered monkey flower	Native
Phrymaceae	*Erythranthe guttata*	Seep monkey flower	Native
Phrymaceae	*Mimetanthe pilosa*	Snouted monkey flower	Native
Pinaceae	*Pinus jeffreyi*	Jeffrey pine	Native
Pinaceae	*Pinus monophylla*	Single leaf pinyon	Native
Pinaceae	*Pinus sabiniana*	Gray pine	Native
Plantaginaceae	*Collinsia torreyi*	Torrey's collinsia	Native
Plantaginaceae	*Keckiella breviflora*	Gaping keckiella	Native
Plantaginaceae	*Penstemon grinnellii* var. *scrophularioides*	Grinnell's beardtongue	Native

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Family	Scientific Name	Common Name	Status (Federal/State/CRPR/USFS)
Plantaginaceae	*Penstemon laetus* var. *laetus*	Mountain blue penstemon	Native
Plantaginaceae	*Penstemon speciosus*	Showy penstemon	Native
Plantaginaceae	*Plantago ovata*	Desert plantain	Native
Plantaginaceae	*Veronica persica*	Bird's eye speedwell	Non-native
Platanaceae	*Platanus racemosa*	California sycamore	Native
Poaceae	*Agrostis exarata*	Spike bentgrass	Native
Poaceae	*Argopyron cristatum*	Crested wheatgrass	Non-native
Poaceae	*Avena barbata*	Slim oat	Cal-IPC Moderate
Poaceae	*Avena fatua*	Wildoats	Cal-IPC Moderate
Poaceae	*Bromus diandrus*	Ripgut brome	Cal-IPC Moderate
Poaceae	*Bromus hordeaceus*	Soft chess	Cal-IPC Limited
Poaceae	*Bromus madritensis* ssp. *rubens*	Red brome	Cal-IPC High
Poaceae	*Bromus sitchensis* var. *carinatus*	California brome	Native
Poaceae	*Bromus tectorum*	Cheatgrass	Cal-IPC High
Poaceae	*Deschampsia danthonioides*	Annual hairgrass	Native
Poaceae	*Distichlis spicata*	Salt grass	Native
Poaceae	*Elymus elymoides*	Squirrel tail grass	Native
Poaceae	*Elymus glaucus*	Blue wildrye	Native
Poaceae	*Elymus triticoides*	Beardless wild rye	Native
Poaceae	*Festuca microstachys*	Small fescue	Native
Poaceae	*Festuca myuros*	Rattail sixweeks grass	Cal-IPC Moderate
Poaceae	*Hordeum murinum*	Foxtail barley	Cal-IPC Moderate
Poaceae	*Melica californica*	California melicgrass	Native
Poaceae	*Melica imperfecta*	California melic	Native
Poaceae	*Melica stricta*	Nodding melic	Native
Poaceae	*Muhlenbergia rigens*	Deergrass	Native
Poaceae	*Poa bulbosa*	Bulbous blue grass	Non-native
Poaceae	*Poa secunda*	Pine bluegrass	Native
Poaceae	*Polypogon monspeliensis*	Annual beard grass	Cal-IPC Limited
Poaceae	*Schismus arabicus*	Arabian schismus	Cal-IPC Limited

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Family	Scientific Name	Common Name	Status (Federal/State/CRPR/USFS)
Poaceae	*Setaria pumila*	Yellow bristlegrass	Non-native
Poaceae	*Stipa occidentalis*	Western needle grass	Native
Poaceae	*Stipa speciosa*	Desert needle grass	Native
Polemoniaceae	*Allophyllum gilioides*	Dense false gilia	Native
Polemoniaceae	*Eriastrum tracyi*	Tracy's eriastrum	-/CR/3.2/FSS
Polemoniaceae	*Gilia brecciarum* ssp. *neglecta*	Nevada gilia	Native
Polemoniaceae	*Gilia cana*	Showy gilia	Native
Polemoniaceae	*Gilia capitata* ssp. *abrotanifolia*	Ball gilia	Native
Polemoniaceae	*Gilia leptantha* ssp. *purpusii*	Purpus' gilia	Native
Polemoniaceae	*Gilia ocroleuca*	Volcanic gilia	Native
Polemoniaceae	*Gilia tricolor*	Bird's eyes	Native
Polemoniaceae	*Leptosiphon bicolor*	True babystars	Native
Polemoniaceae	*Leptosiphon nudatus*	Tehachapi linanthus	Native
Polemoniaceae	*Linanthus dichotomus*	Evening snow	Native
Polemoniaceae	*Phlox diffusa*	Spreading phlox	Native
Polygonaceae	*Centrostegia thurberi*	Thurber spiny herb	Native
Polygonaceae	*Chorizanthe membranacea*	Pink spineflower	Native
Polygonaceae	*Chorizanthe xanti*	Riverside spineflower	Native
Polygonaceae	*Eriogonum baileyi* var. *baileyi*	Bailey's buckwheat	Native
Polygonaceae	*Eriogonum fasciculatum*	California buckwheat	Native
Polygonaceae	*Eriogonum gracillimum*	Rose and white buckwheat	Native
Polygonaceae	*Eriogonum nudum* var. *pubiflorum*	Hairy flowered buckwheat	Native
Polygonaceae	*Eriogonum nudum* var. *westonii*	Weston's buckwheat	Native
Polygonaceae	*Eriogonum roseum*	Wand buckwheat	Native
Polygonaceae	*Eriogonum saxatile*	Rock buckwheat	Native
Polygonaceae	*Eriogonum wrightii* var. *subscaposum*	Wright's buckwheat	Native
Polygonaceae	*Eriogonum wrightii* var. *trachygonum*	Wright's buckwheat	Native
Polygonaceae	*Fallopia convolvulus*	Black bindweed	Non-native

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Family	Scientific Name	Common Name	Status (Federal/State/CRPR/USFS)
Polygonaceae	*Persicaria punctata*	Dotted smartweed	Native
Polygonaceae	*Rumex crispus*	Curly dock	Cal-IPC Limited
Pottiaceae	*Didymodon vinealis*	Didymon moss	Native
Pteridaceae	*Adiantum capillus-veneris*	Venus hair	Native
Pteridaceae	*Myriopteris covillei*	Coville's lip fern	Native
Pteridaceae	*Pellaea mucronata*	Bird's foot fern	Native
Pteridaceae	*Pentagramma triangularis*	Gold back fern	Native
Ranunculaceae	*Clematis ligusticifolia*	Creek clematis	Native
Ranunculaceae	*Delphinium hansenii* ssp. *kernense*	Kern larkspur	Native
Ranunculaceae	*Delphinium purpusii*	Kern County larkspur	-/-/1B.3/FSS
Ranunculaceae	*Ranunculus testiculatus*	Tubercled crowfoot	Non-native
Ranunculaceae	*Thalictrum fendleri*	Fendler's meadow rue	Native
Rhamnaceae	*Ceanothus cuneatus* var. *cuneatus*	Buck brush	Native
Rhamnaceae	*Ceanothus leucodermis*	Chaparral whitethorn	Native
Rhamnaceae	*Frangula californica*	California coffeeberry	Native
Rhamnaceae	*Rhamnus crocea*	Redberry	Native
Rhamnaceae	*Rhamnus ilicifolia*	Evergreen buckthorn	Native
Rosaceae	*Adenostoma fasciculatum*	Chamise	Native
Rosaceae	*Cercocarpus betuloides* var. *betuloides*	Birch leaf mountain mahogany	Native
Rosaceae	*Chamaebatia foliolosa*	Sierran mountain misery	Native
Rosaceae	*Prunus andersonii*	Desert peach	Native
Rosaceae	*Pyracantha coccinea*	Scarlet firethorn	Cal-IPC Limited
Rosaceae	*Rosa woodsii*	Woods' rose	Native
Rosaceae	*Rubus armeniacus*	Himalayan blackberry	Cal-IPC High
Rosaceae	*Rubus parviflorus*	Thimbleberry	Native
Rubiaceae	*Galium aparine*	Cleavers	Native
Rubiaceae	*Galium bolanderi*	Bolander's bedstraw	Native
Rubiaceae	*Galium nuttallii*	Climbing bedstraw	Native
Rutaceae	*Ruta graveolens*	Common rue	Non-native
Salicaceae	*Populus fremontii*	Fremont cottonwood	Native

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Family	Scientific Name	Common Name	Status (Federal/State/CRPR/USFS)
Salicaceae	*Populus trichocarpa*	Black cottonwood	Native
Salicaceae	*Salix exigua*	Narrowleaf willow	Native
Salicaceae	*Salix geyeriana*	Geyer's willow	Native
Salicaceae	*Salix laevigata*	Polished willow	Native
Salicaceae	*Salix lasiolepis*	Arroyo willow	Native
Salicaceae	*Salix melanopsis*	Dusky willow	Native
Sapindaceae	*Aesculus californica*	Buckeye	Native
Saxifragaceae	*Lithophragma parviflorum*	Pink woodland star	Native
Scrophulariaceae	*Scrophularia californica*	California bee plant	Native
Scrophulariaceae	*Verbascum thapsus*	Wooly mullein	Cal-IPC Limited
Selaginellaceae	*Selaginella* sp.	Unknown spikemoss	Native
Simaroubaceae	*Ailanthus altissima*	Tree of heaven	Cal-IPC Moderate
Solanaceae	*Datura wrightii*	Jimsonweed	Native
Solanaceae	*Nicotiana attenuata*	Coyote tobacco	Native
Solanaceae	*Solanum umbelliferum*	Blue witch	Native
Solanaceae	*Solanum xanti*	Nightshade	Native
Themidaceae	*Brodiaea terrestris* ssp. *kernensis*	Kern dwarf brodiaea	Native
Themidaceae	*Dichelostemma volubile*	Twining brodiaea	Native
Themidaceae	*Dipterostemon capitatum* ssp. *capitatum*	Bluedicks	Native
Typhaceae	*Typha latifolia*	Broadleaf cattail	Native
Ulmaceae	*Ulmus parviflora*	Chinese elm	Non-native
Urticaceae	*Urtica dioica*	Stinging nettle	Native
Verbanaceae	*Verbena lasiostachys* var. *lasiostachys*	Vervain	Native
Viburnaceae	*Sambucus mexicana*	Blue elderberry	Native
Viscaceae	*Arceuthobium campylopodum*	Pine dwarf mistletoe	Native
Viscaceae	*Phoradendron leucarpum*	American mistletoe	Native
Vitaceae	*Parthenocissus inserta*	Woodbine	Non-native
Vitaceae	*Vitis californica*	California wild grape	Native
Zygophyllaceae	*Tribulus terrestris*	Puncture vine	Cal-IPC Limited

Cal-IPC = California Invasive Plant Council; CRPR = California Rare Plant Rank; FSS = U.S. Forest Service Sensitive; USFS = U.S. Forest Service

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Status:

Federal

FE Federally listed as endangered
FT Federally listed as threatened
– No federal status

State

SE California State listed as endangered
ST California State listed as threatened
SR California State Listed as rare
– No state status

CRPR (California Rare Plant Rank) List Ranks

List 1B Plants rare, threatened, or endangered in California and elsewhere
List 2B Plants rare, threatened, or endangered in California, but more common elsewhere
List 3 More information needed about this plant, a review list
List 4 Plants of limited distribution, a watch list

CRPR Threat Ranks

0.1 Seriously threatened in California (high degree/immediacy of threat)
0.2 Fairly threatened in California (moderate degree/immediacy of threat

Cal-IPC Rating Definitions:

High	These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
Moderate	These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.
Limited	These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

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APPENDIX D
DOCUMENTED LOCATIONS OF SPECIAL-STATUS PLANTS

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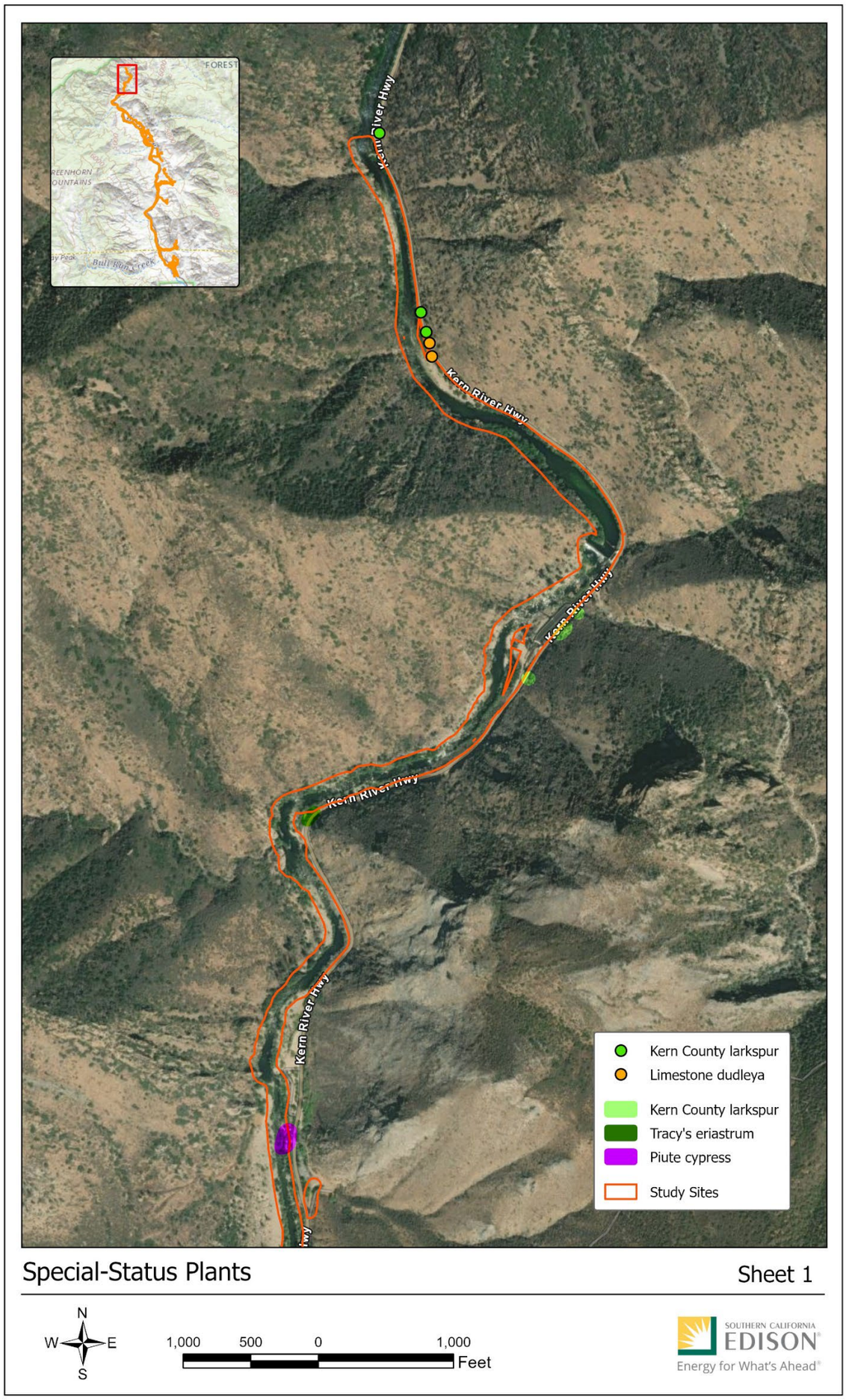


Figure D-1a. SSPs Observed during Botanical Field Surveys.

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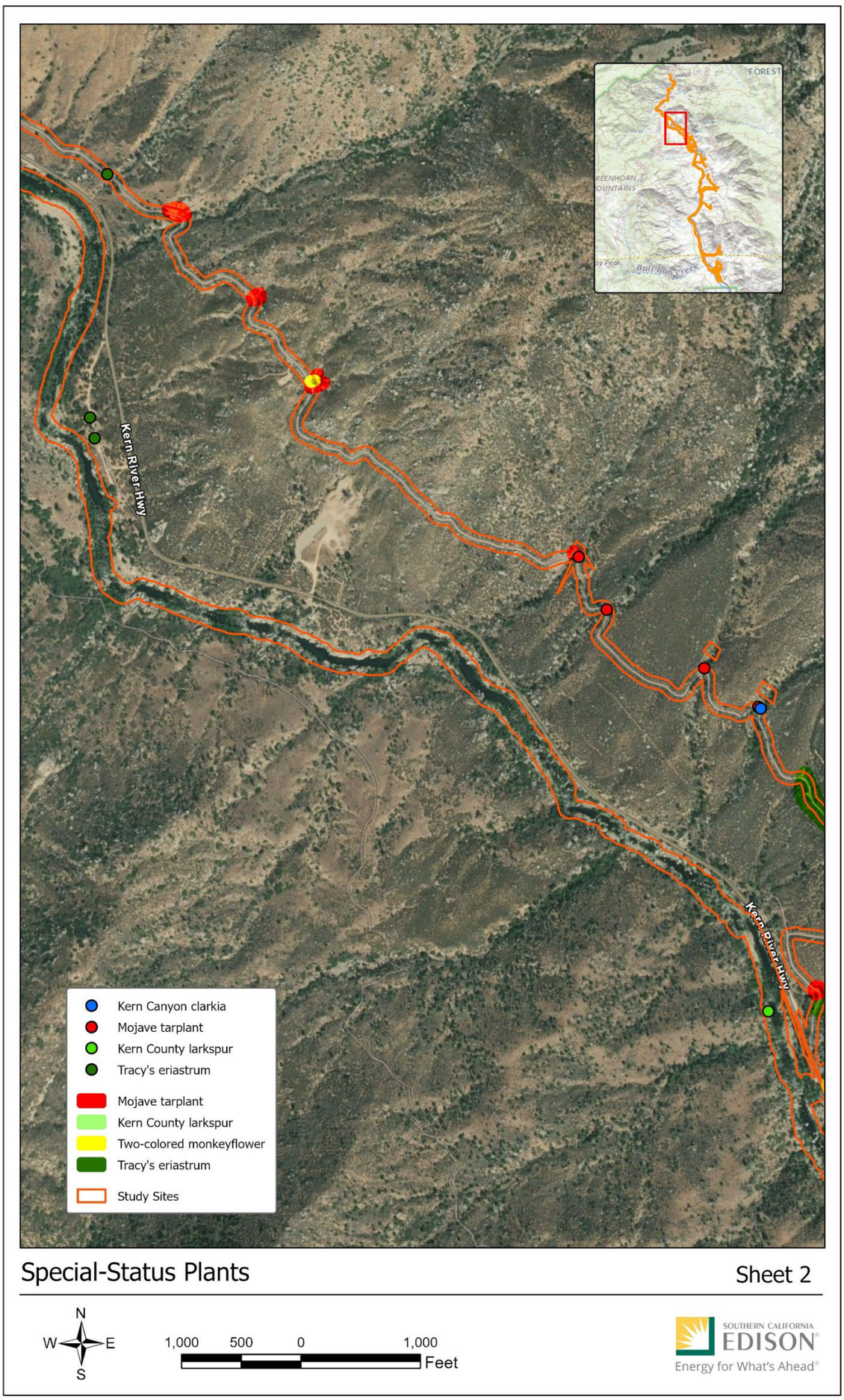


Figure D-1b. SSPs Observed during Botanical Field Surveys.

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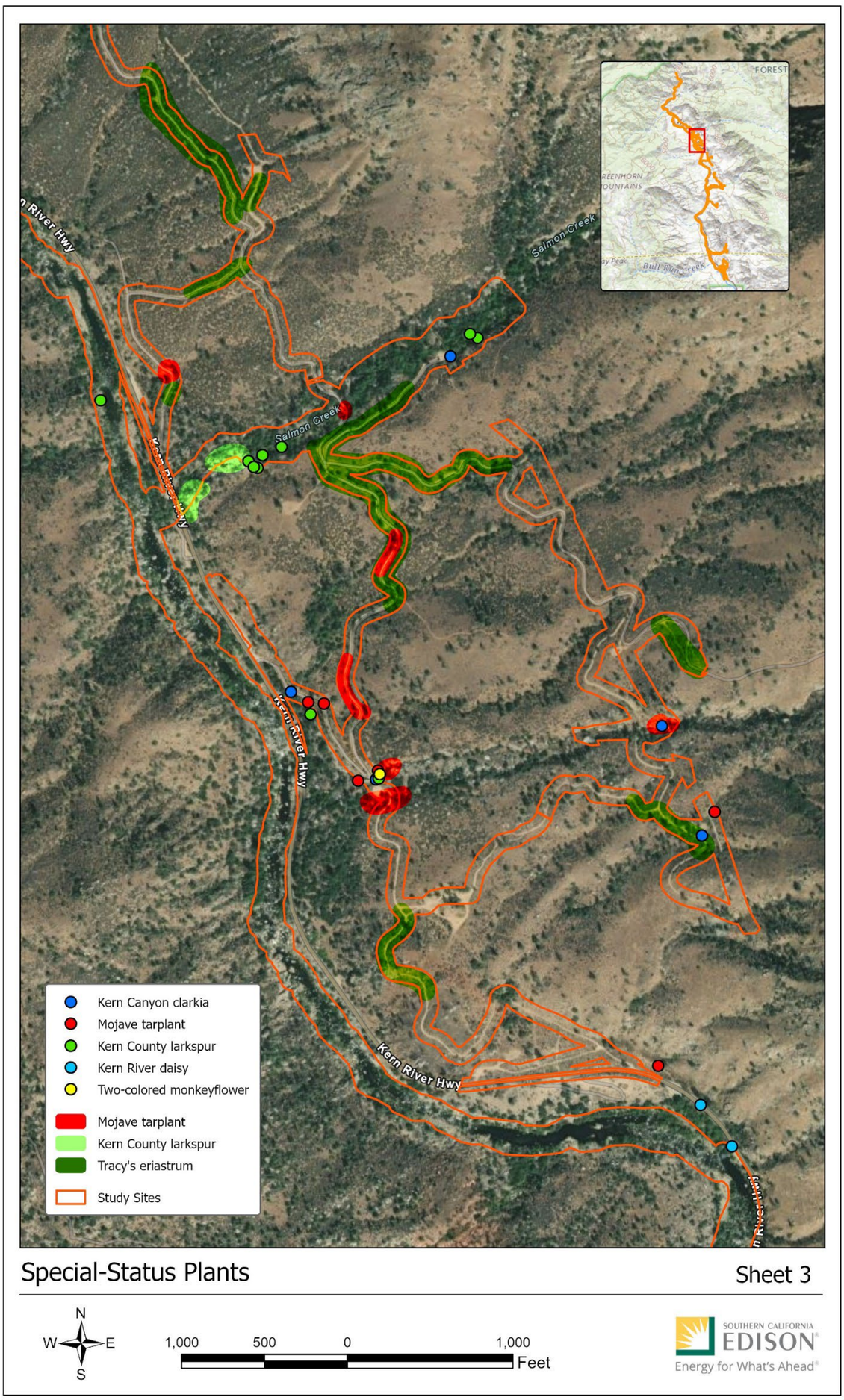


Figure D-1c. SSPs Observed during Botanical Field Surveys.

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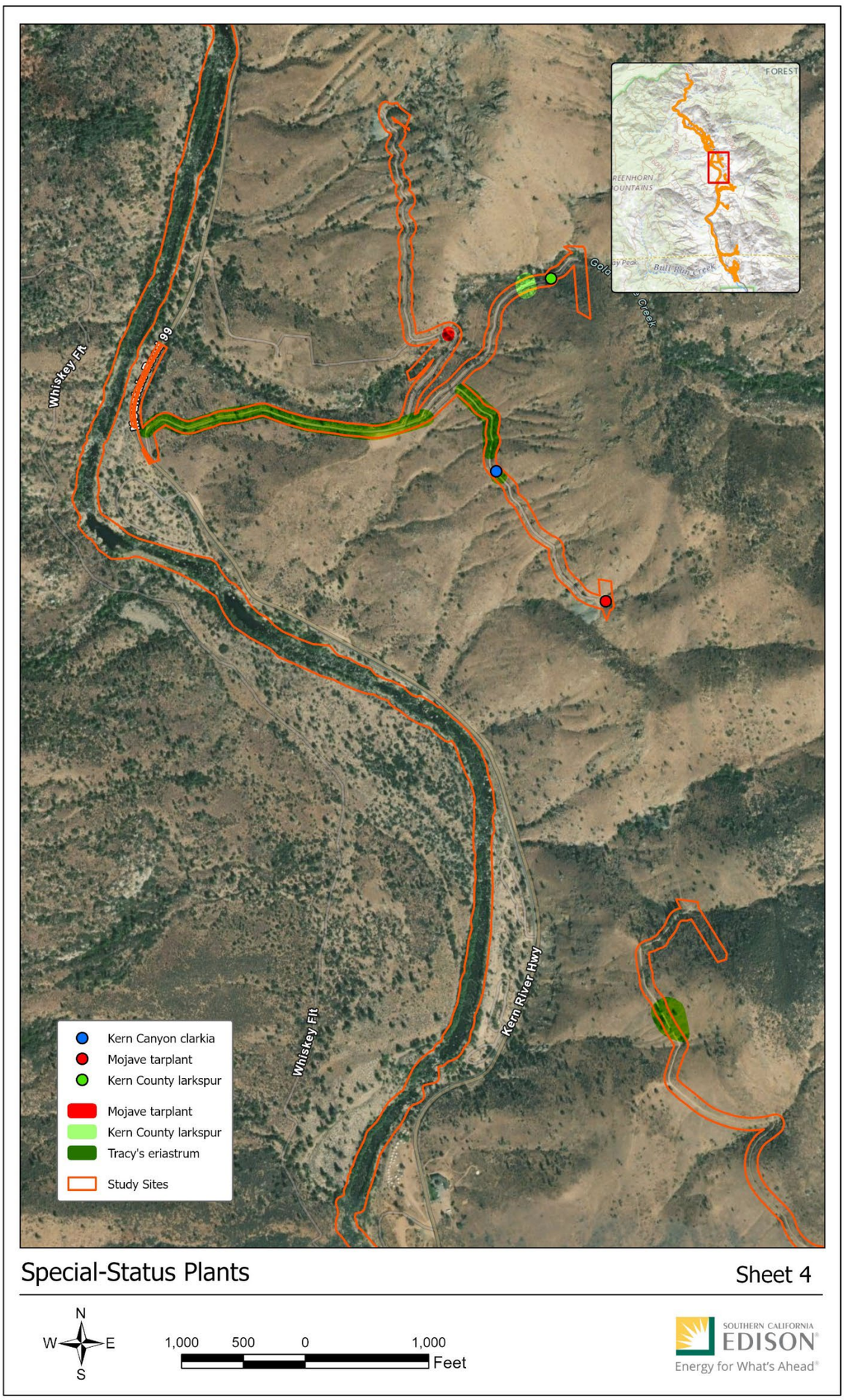


Figure D-1d. SSPs Observed during Botanical Field Surveys.

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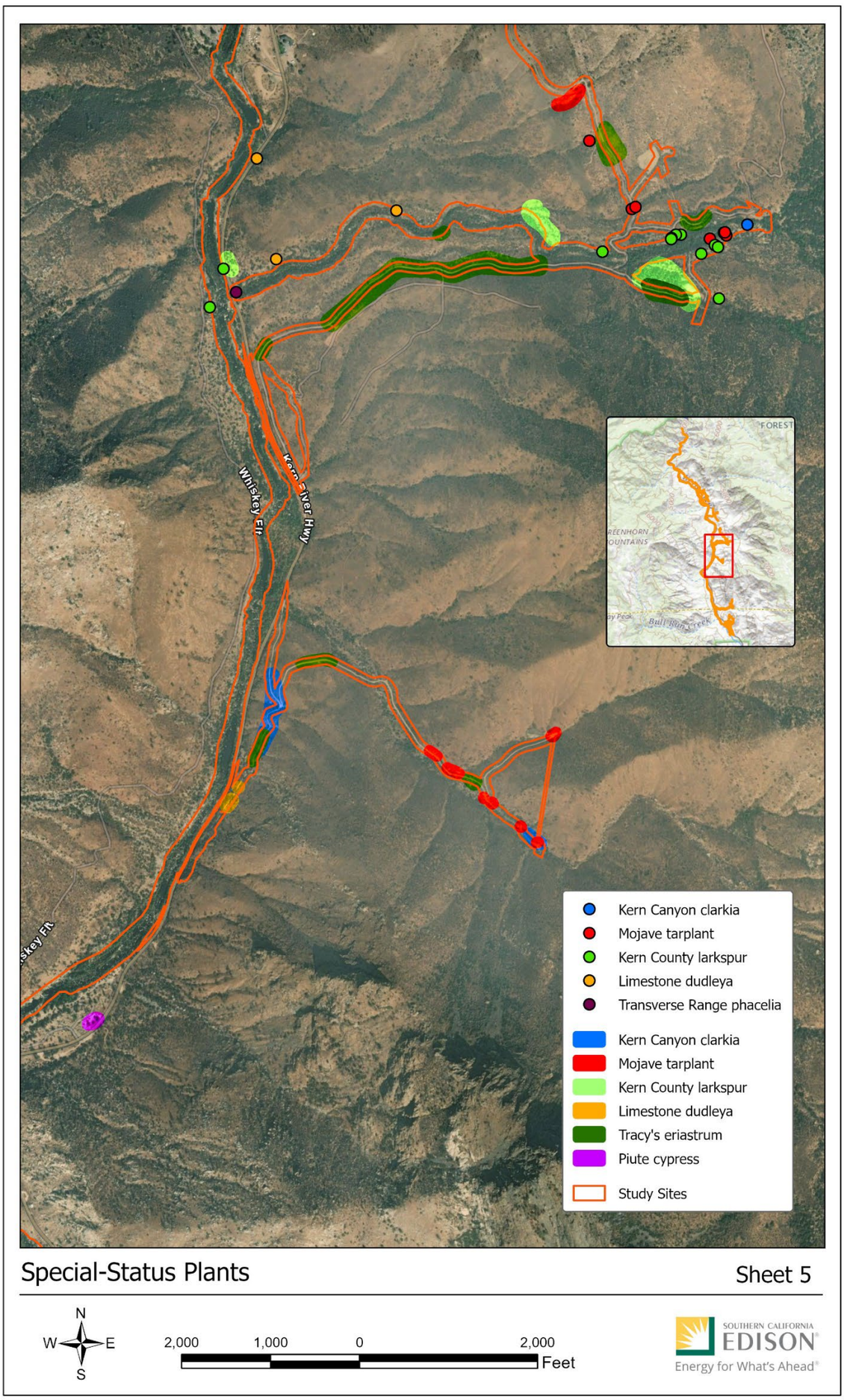


Figure D-1e. SSPs Observed during Botanical Field Surveys.

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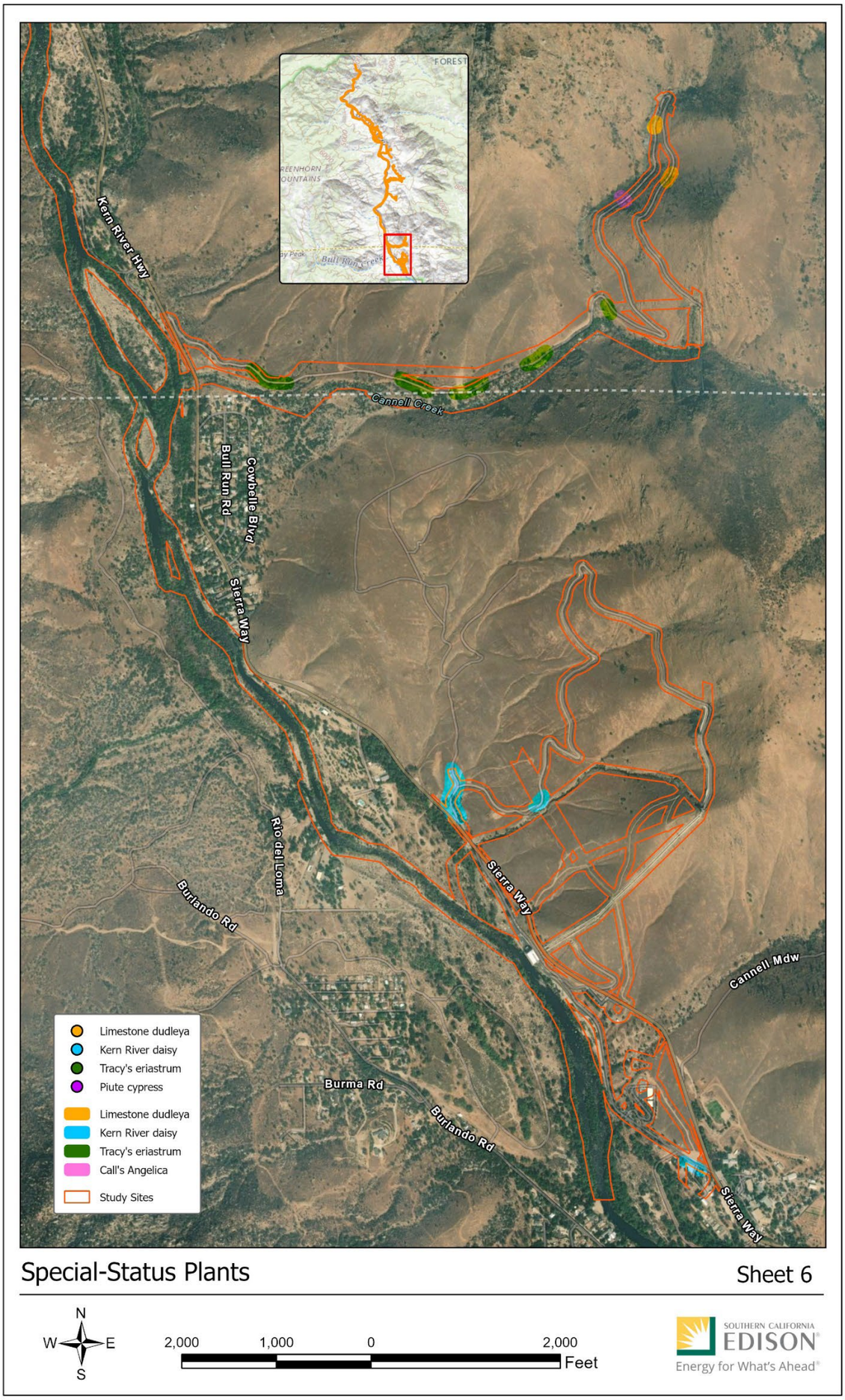


Figure D-1f. SSPs Observed during Botanical Field Surveys.

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APPENDIX E
DOCUMENTED LOCATIONS OF CAL-IPC HIGH NON-NATIVE INVASIVE PLANTS

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Figure E-1. Cal-IPC High NNIPs Observed during Botanical Field Surveys.

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APPENDIX F
USFS DESCRIPTIONS OF VEGETATION ALLIANCES IN THE STUDY SITES

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The following vegetation descriptions of the U.S. Forest Service (USFS) Vegetation Alliances are taken from the Southern Sierra Ecological Province (USFS, 2009). Scientific and common names for plants listed here were listed as named by the USFS without any name changes that may have occurred since vegetation description publication.

(BR) - RABBITBRUSH ALLIANCE

Extreme southeastern areas of the southern Sierra Nevada are partially under the influence of the Mojave Desert climate regime. This Alliance is found on dry slopes and flats that are dominated by various species of Rabbitbrush (*Chrysothamnus* spp.) in those areas as well as in other sites that may have a history of ground disturbance. The Bitterbrush Alliance has been mapped in scattered locations in six subsections, chiefly within an elevation range of about 2,600 to 9,000 feet, often in proximity to the Annual Grasses and Forbs Alliance in the Eastern Slopes, Kern Plateau and Tehachapi – Piute Mountains Subsections. In the Tehachapis, it is also associated with Gray Pine (*Pinus sabiniana*) and in eastside environments, with Big Sagebrush (*Artemisia tridentata*). California Buckwheat (*Eriogonum fasciculatum*) may be present in this alliance in minor amounts.

(CA) - CHAMISE ALLIANCE

Chamise (*Adenostoma fasciculatum*) is a dominant shrub of lower elevation, xeric slopes and ridges of the western Sierra Nevada Mountains between about 1,200 to 4,800 feet. This alliance has been mapped most frequently in the westside Upper Foothills Metamorphic Belt Subsection, and more sparsely in the Lower Batholith Subsection. Associated minor species of this Alliance include shrubs of the Lower Mixed Chaparral Alliance such as Birchleaf Mountain Mahogany (*Cercocarpus betuloides*) and Whiteleaf Manzanita (*Arctostaphylos viscida*). California Buckwheat (*Eriogonum fasciculatum* var. *polifolium*) and, especially towards the eastside, the grass Squirreltail (*Elymus elymoides*) may also be present in this type. Interior Live Oak (*Quercus wislizenii*), Canyon Live Oak (*Q. chrysolepis*), Gray Pine (*Pinus sabiniana*) and Ponderosa Pine (*P. ponderosa*) may occur in close proximity to the Chamise Alliance.

(CQ) – LOWER MONTANE MIXED CHAPARRAL ALLIANCE

The Lower Montane Mixed Chaparral Alliance is very common in the southern Sierra Nevada Mountains at elevations below about 5,800 feet on the westside and higher in the Tehachapi – Piute Mountains Subsection. The Alliance has been mapped in nine subsections and may contain mixtures of Ceanothus species, Whiteleaf and Common Manzanitas (*Arctostaphylos viscida, A. manzanita*), Chamise (*Adenostoma fasciculatum*), Fremont or Wavyleaf Silk-tassel (*Garrya fremontii, G. elliptica*), Flannelbush (*Fremontodendron californicum*), Birchleaf Mountain Mahogany (*Cercocarpus betuloides*), Poison Oak (*Toxicodendron diversilobum*), Shrub Oaks (*Quercus* spp.) and other lower elevation shrub species. Foothill Ash (*Fraxinus dipetala*) and Bush Poppy (*Dendromecon rigida*) may occasionally be part of this mixture as well.

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Individual sites may support pure stands of these shrubs such as in the Wedgeleaf Ceanothus (*C. cuneatus*) Alliance. Associated trees often include Canyon and Interior Live Oaks (*Quercus chrysolepis, Q. wislizenii*) adjacent to these sites and often Ponderosa Pine (*Pinus ponderosa*) as well.

(CL) – WEDGELEAF CEANOTHUS ALLIANCE

Wedgeleaf Ceanothus (*Ceanothus cuneatus*) may dominate low elevation shrub habitats that have recently had ground disturbances such as intense fires as well as on certain nutrient-poor substrates, such as coarse textured soils or ultramafics. This alliance has been mapped occasionally in the three sections at elevations below about 5,600 feet. Minor amounts of other lower elevation shrubs such as California Buckwheat (*Eriogonum fasciculatum*) and Chamise (*Adenostoma fasciculatum*) and trees such as Gray Pine (*Pinus sabiniana*) and Blue Oak (*Quercus douglasii*) are typically associated with this Alliance.

(CS) – SCRUB OAK ALLIANCE

Shrub forms of oaks (*Quercus* spp.) may occur as recognized species, varietal forms of tree oaks, unclassified oak hybrids or as environmentally determined morphologic forms in which frequent fires may play a role. The Scrub Oak Alliance consists of shrubby oaks that are dominant in the shrub canopy at the time of mapping. It has been mapped abundantly in four subsections and less commonly in three others. Elevations generally range from about 2,600 to 9,000 feet, reflecting a variety of species that may occur in the mixture. In the southern Sierras, including the Tehachapi Mountains, mesic sites may have Scrub Oak (*Q. berberidifolia*), Interior Live Oak (*Q. wislizenii* var*. frutescens*), Brewer Oak (*Q. garryana var. breweri*) and/or Canyon Live Oak (*Q. chrysolepis* var*. nana*) in the mixture, with Huckleberry Oak (Q. vaccinifolia) on harsher sites and Tucker Oak (*Q. john-tuckeri*) in drier climates. Alliances adjacent to the Scrub Oak Alliance reflect this habitat diversity such as the common occurrence of tree forms of the Live Oaks, Blue Oak (*Q. douglasii*), Gray Pine (Pinus sabiniana), Singleleaf Pinyon Pine (*P. monophylla*), both Upper and Lower Montane Mixed Chaparral types, Buckwheat (*Eriogonum fasciculatum*) and the Great Basin – Mixed Chaparral Transition type.

(FD) – EPHEDRA ALLIANCE

Single species or a mixture of several species of the gymnosperm Mormon Tea (*Ephedra californica, E. nevadensis, E. viridis)* may dominate a site in this zone. The Ephedra Alliance has been mapped sparsely in several pockets in the Eastern Slopes Subsection at elevations from about 5,400 to 6,600 feet. It associates with species such as Bitterbrush (*Purshia tridentata*) and Big Sagebrush (*Artemisia tridentata*).

(HG) – ANNUAL GRASSES AND FORBS ALLIANCE

Throughout the low elevations of the western slopes of the southern Sierra Nevada, annual grasses such as Bromes (*Bromus* spp.), Needlegrass (*Achnatherum* spp.) and Wild Oats (*Avena* spp.) may dominate rolling hills. Dominant forbs in this Alliance include Owl's Clover (*Orthocarpus* spp.), Fiddleneck (*Amsinckia* intermedia) and Stork's

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Bill (*Erodium* spp.). They may occur in pure stands or contain an overstory of scattered oaks (*Quercus* spp.) or California Buckeye (*Aesculus californica*). Associated westside species include hardwoods growing in sheltered areas and conifers such as Gray Pine (*Pinus sabiniana*) or Ponderosa Pine (*P. ponderosa*) in the Upper Foothills Metamorphic Belt and Lower Batholith Subsections. In some areas, this Alliance may dominate a vast array of slopes and aspects due to wildfires, xeric conditions and other factors; on eastside slopes in the Eastern Slopes and Kern Plateau Subsections, recent wildfires have created large grass patches at elevations up to 8,000 feet or more. Great Basin species such as Big Sagebrush (*Artemisia tridentata*), Rabbitbrush (*Chrysothamnus* spp.), Singleleaf Pinyon Pine (*P. monophylla*) and Jeffrey Pine (*P. jeffreyi*) are often found adjacent to these patches.

(IB) – URBAN-RELATED NON-VEGETATED

Urban development in California occurs in phases. When land is cleared prior to being paved, this category represents the occurrence of non-vegetated barren ground that is caused by urbanization. This land-use type also represents other mechanically-caused barren ground, such as open quarries or mined areas, barren ground along highways, and other areas cleared of vegetation prior to, during and after construction. The category has been mapped throughout this state, usually adjacent to agricultural areas, already established urbanized centers or other paved areas of the landscape.

(LS) – SCALEBROOM ALLIANCE

Drainages of low-gradient intermittent streams and washes in interior locations of the semiarid Tehachapi – Piute Mountains Subsection may be dominated by Scalebroom (*Lepidospartum squamatum*), a nearly leafless shrub. This Alliance has been mapped in a small area within an elevation range of about 2,400 to 3,200 feet in close association with species of Rabbitbrush (*Chrysothamnus* spp.). Trees found in this vicinity include Blue Oak (*Quercus douglasii*) and Gray Pine (*Pinus sabiniana*).

(ML) – BACCHARIS (RIPARIAN)

This riparian or dry wash Alliance is dominated by any species of Baccharis occupying wet habitats, including the most common, Mule Fat (*B. salicifolia*) and /or Desert Baccharis (*B. sergiloides*) in this area of the southern Sierras. Shortleaf Baccharis (*B. brachyphylla*) and/or Marsh Baccharis (*B. douglasii*) may also be found in this Alliance, which has been mapped occasionally in the Eastern Slopes and Tehachapi – Piute Mountains Subsections at elevations from about 2,000 to 2,800 feet. Fremont Cottonwood (*Populus fremontii*) and wet meadows are often found adjacent to or within these riparian sites, while Gray Pine (*Pinus sabiniana*) and Blue Oak (*Quercus douglasii*) stands are commonly found upland in the general vicinity.

(NR) – RIPARIAN MIXED HARWOOD ALLIANCE

A mixture of two or more non-dominant hardwoods found in shaded drainages, riparian and seep sites has been mapped in scattered pockets of seven subsections in the southern Sierras zone such as in the Upper Foothills Metamorphic Belt, Tehachapi –

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Piute Mountains, and Lower Batholith Subsections. Elevations range from below 1,000 feet up to about 9,600 feet, reflecting a variety of hardwoods such as Bigleaf Maple (*Acer macrophyllum*), California Bay (*Umbellularia californica*), Mountain Dogwood (*Cornus nuttallii*), Fremont or Black Cottonwoods (*Populus fremontii, P. balsamifera* ssp. *trichocarpa*) and Oregon Ash (*Fraxinus latifolia*). Tree Willows (Salix spp.), White Alder (*Alnus rhombifolia*) also commonly occur, with California Sycamore (*Platanus racemosa*) occasionally towards the west part of this zone. Upland trees such as Interior Live Oak (*Quercus wislizenii*) and Canyon Live Oak (*Q. chrysolepis*) occasionally occur on these sites. Quaking Aspen (*Populus tremuloides*) and Water Birch (*Betula occidentalis*) are more prevalent in this type in the Eastern Slopes Subsection and an occasional Valley Oak (*Q. lobata*) is more likely to occur in the Kern Plateau Subsection.

(PD) – GRAY PINE ALLIANCE

Gray Pine (*Pinus sabiniana*) is primarily found in the foothills, front country and steep, drier canyons of the Southern Sierras. When it is the dominant (and usually the only) conifer, such stands typically have a diverse multi-layered structure, with a mix of hardwoods and shrubs. The Gray Pine Alliance tends to be discontinuous, with interspersed patches of annual grasses. Blue Oak (*Quercus douglasii*), Interior Live Oak (*Q. wislizenii*) and Canyon Live Oak (*Q. chrysolepis*) often occur as mixed conifer-hardwood stands in this Alliance, especially towards the west and under drier site conditions in the southern Sierras. It has been mapped abundantly in the Upper Foothills Metamorphic Belt, Lower Batholith and Tehachapi – Piute Mountains Subsections and occasionally in the Upper Batholith and Volcanic Flows, Kern Plateau, Eastern Slopes and Upper Batholith Subsections at elevations up to about 7,000 feet, but usually much lower.

(QO) – WILLOW ALLIANCE

This Alliance is dominated by mixed or single species of tree Willow (*Salix* spp.). It has been mapped most frequently on the east side of the Sierra Nevada where stream or pond conditions provide sufficient moisture in seven subsections at low to moderate elevations, mostly from about 2,600 to 7,400 feet. Riparian hardwoods such as Water Birch (*Betula occidentalis*) and Fremont Cottonwood (*Populus fremontii*) often occur in close proximity to these areas, while Great Basin upland shrub species such as Rabbitbrush (*Chrysothamnus* spp.), Interior Rose (*Rosa woodsii*), and Big Sagebrush (*Artemisia tridentata*) may occur in narrow canyons adjacent to this Alliance.

(QW) – INTERIOR LIVE OAK ALLIANCE

Interior Live Oak (*Quercus wislizenii*) occurs as a hardwood dominant in semi-open or closed stands in this Alliance, and was mapped broadly and widespread along the western borders and some interior locations of six subsections of the southern Sierra Nevadas. It is most abundant in the Lower Batholith, Upper Foothills Metamorphic Belt and Tehachapi – Piute Mountains, and Batholith and Volcanic Flows Subsections, generally at elevations between about 1,200 to 6,400 feet. Canyon Live Oak (Q.

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chrysolepis) or Black Oak (*Q. kelloggii*) may become associated with the Interior Live Oak Alliance at higher elevations, grading into the Interior Mixed Hardwoods Alliance, especially in the Tehachapi – Piute Mountains Subsection. Ponderosa Pine (Pinus ponderosa) commonly occurs with Interior Live Oak in mixed stands. On drier sites or lower elevations, Gray Pine (*P. sabiniana*), Blue Oak (*Q. douglasii*) and Buckeye (Aesculus californica) are associated trees. In most areas, shrub associates are chiefly those in the Lower Montane Mixed Chaparral type, such as Chamise (*Adenostoma fasciculatum*) and Wedgeleaf Ceanothus (*Ceanothus cuneatus*). However, shrubs such as California Buckwheat (*Eriogonum fasciculatum*), Scrub Oak (*Q. berberidifolia*) and Big Sagebrush (*Artemisia tridentata*) are more likely to be within and adjacent to this Alliance in the Tehachapi – Piute Mountains Subsection.

(SB) – BUCKWHEAT ALLIANCE

California Buckwheat (*Eriogonum fasciculatum* var. *polifolium*), a semi-woody shrub, has been mapped very commonly as a dominant shrub in the Tehachapi – Piute Mountains, Eastern Slopes and Kern Plateau Subsections. Additionally, it has been identified sparsely in the Lower Batholith Subsection. The usual mapped elevation range is from about 3,000 to 6,200 feet. It is closely associated with the Annual Grasses and Forbs and the Pinyon – Juniper Alliances throughout the area. In the limited region of Kern Plateau where California Buckwheat is dominant, westside species such as Canyon Live Oak (*Quercus chrysolepis*), Gray Pine (*Pinus sabiniana*) and shrubs in the Lower Montane Chaparral Alliance such as Wedgeleaf Ceanothus (*Ceanothus cuneatus*) occur in close proximity to this Alliance. In the Tehachapis and in the Eastern Slopes, more xeric conditions favor an association with Singleleaf Pinyon Pine (*P. monophylla*), Big Sagebrush (*Artemisia tridentata*) and shrubs in the High Desert Mixed Scrub Alliance and Great Basin – Desert Mixed Scrub Alliances.

(UB) – URBAN-OR DEVELOPED

This category applies to landscapes that are dominated by urban structures, residential units, or other developed land use elements such as highways, city parks, cemeteries and the like. In those cases in which the managed landscapes may have a considerable vegetation component, other land use categories may be more appropriate, such as Ornamental Conifer and Hardwood mixtures within city parks.

(WA) – WATER

Water is labeled in Calveg mapping in those cases in which permanent sources of surface water are identified within a landscape unit of sufficient size to be mapped. The category includes lakes, streams and canals of various size, bays and estuaries and similar water bodies. These areas are considered to have a minimum of vegetation components, except along the edges, which may be mapped as types such as Wet Meadows, Tule-Cattail freshwater marshes, or Pickleweed-Cordgrass saline or mixed marshes. Islands within water bodies may be mapped according to their terrestrial dominant vegetation types.

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In addition, surface water bodies have recently been mapped separately in some parts of this zone under the following categories:

- **(W1)** Rivers and Streams (natural, flowing surface waters)
- **(W3)** Reservoirs (human-made lakes and ponds)
- **(W9)** Exposed non-water features such as gravel, sand bars, etc.

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APPENDIX G
GROUND-TRUTHED USFS VEGETATION ALLIANCES OCCURRING IN THE STUDY AREA

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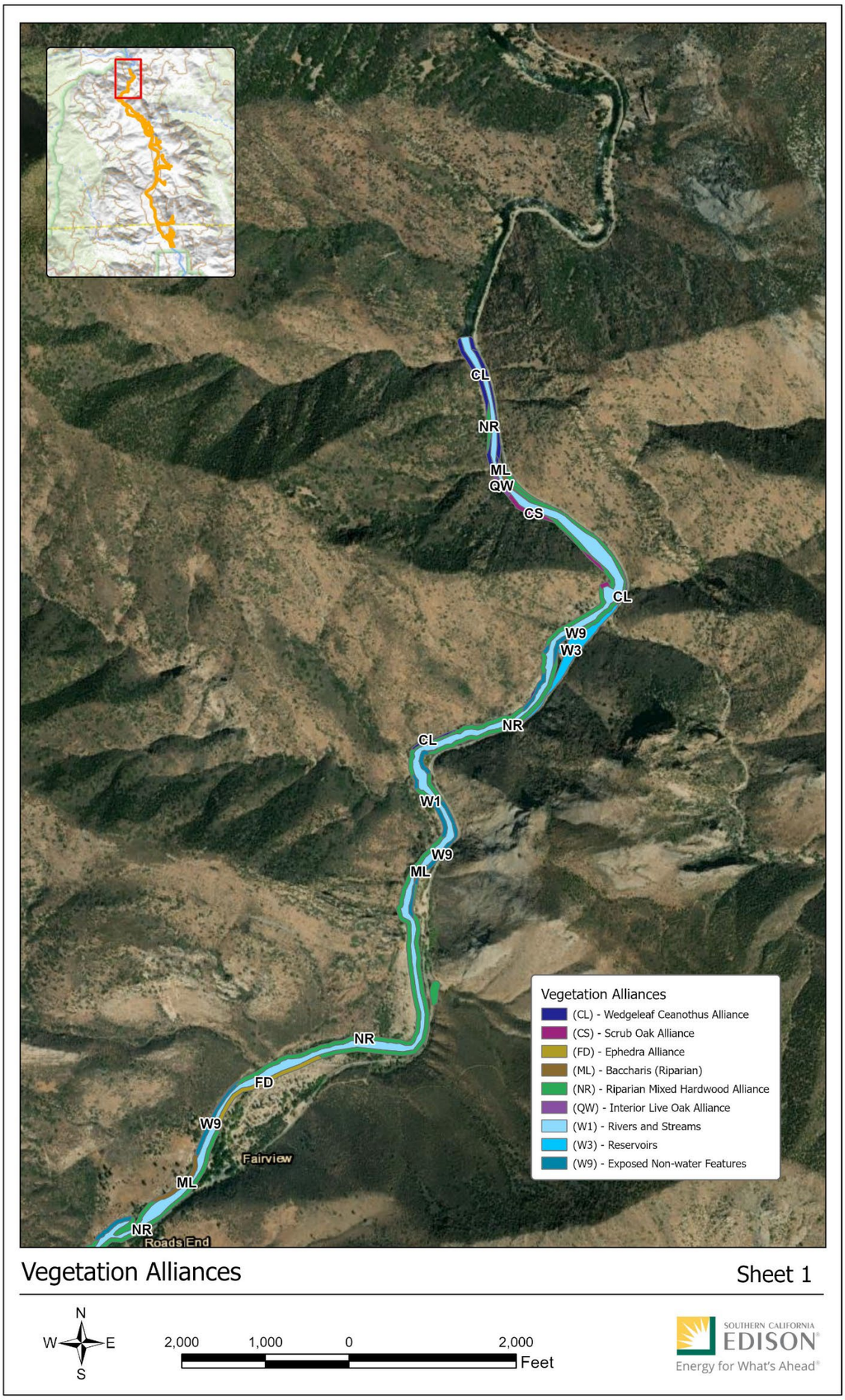


Figure G-1a. Mapped USFS Vegetation Alliances Ground-Truthed during Botanical Field Surveys.

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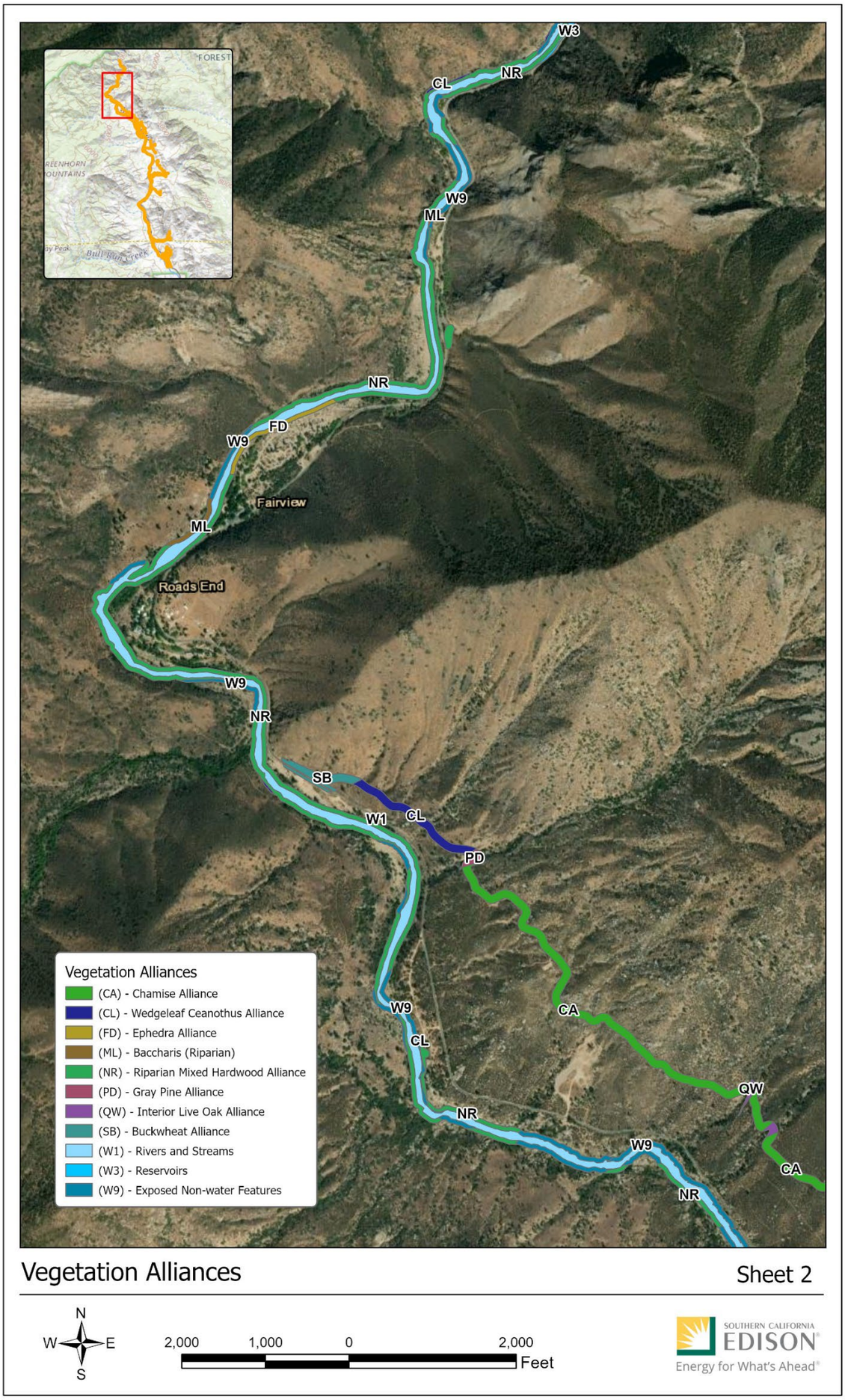


Figure G-1b. Mapped USFS Vegetation Alliances Ground-Truthed during Botanical Field Surveys.

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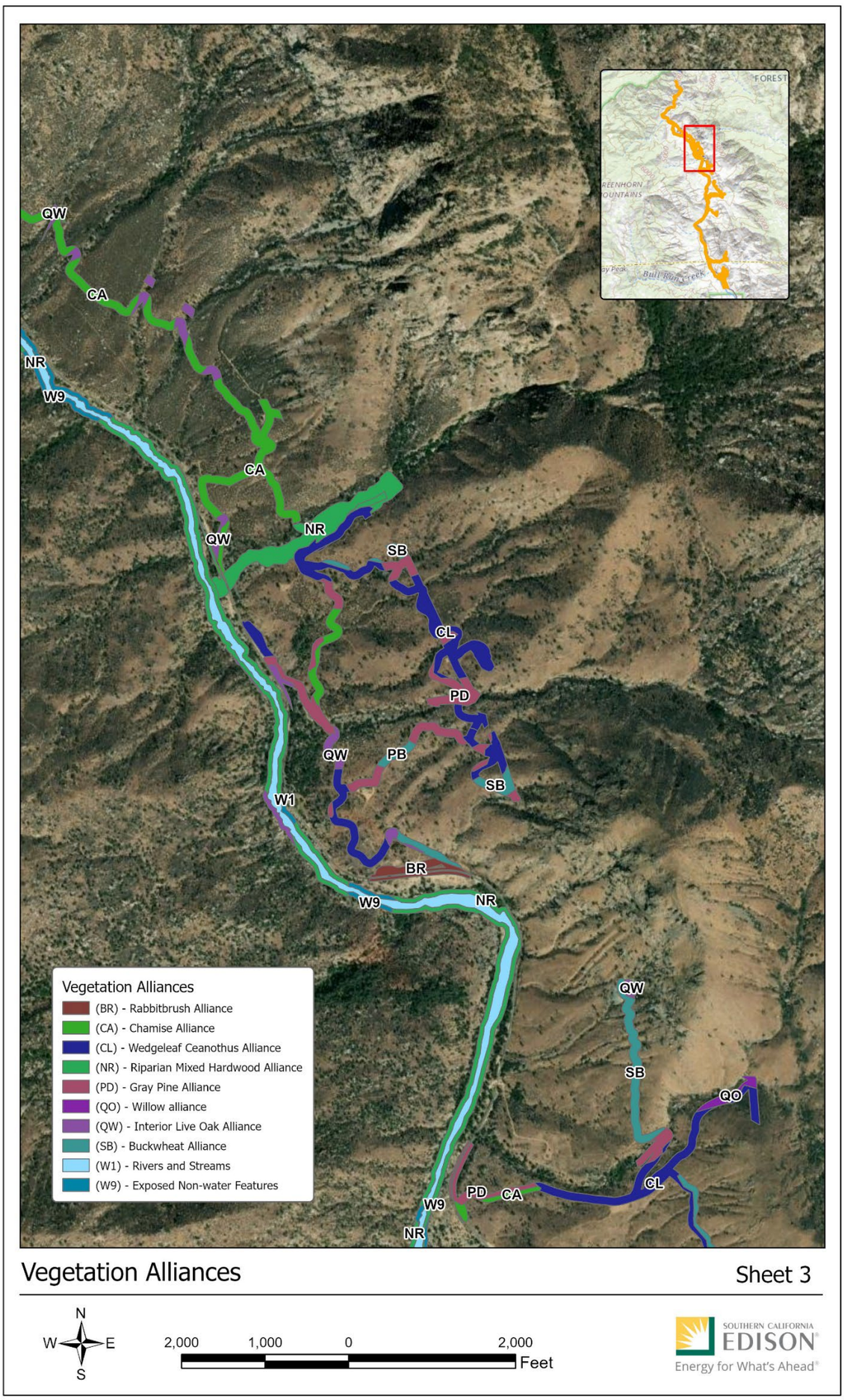


Figure G-1c. Mapped USFS Vegetation Alliances Ground-Truthed during Botanical Field Surveys.

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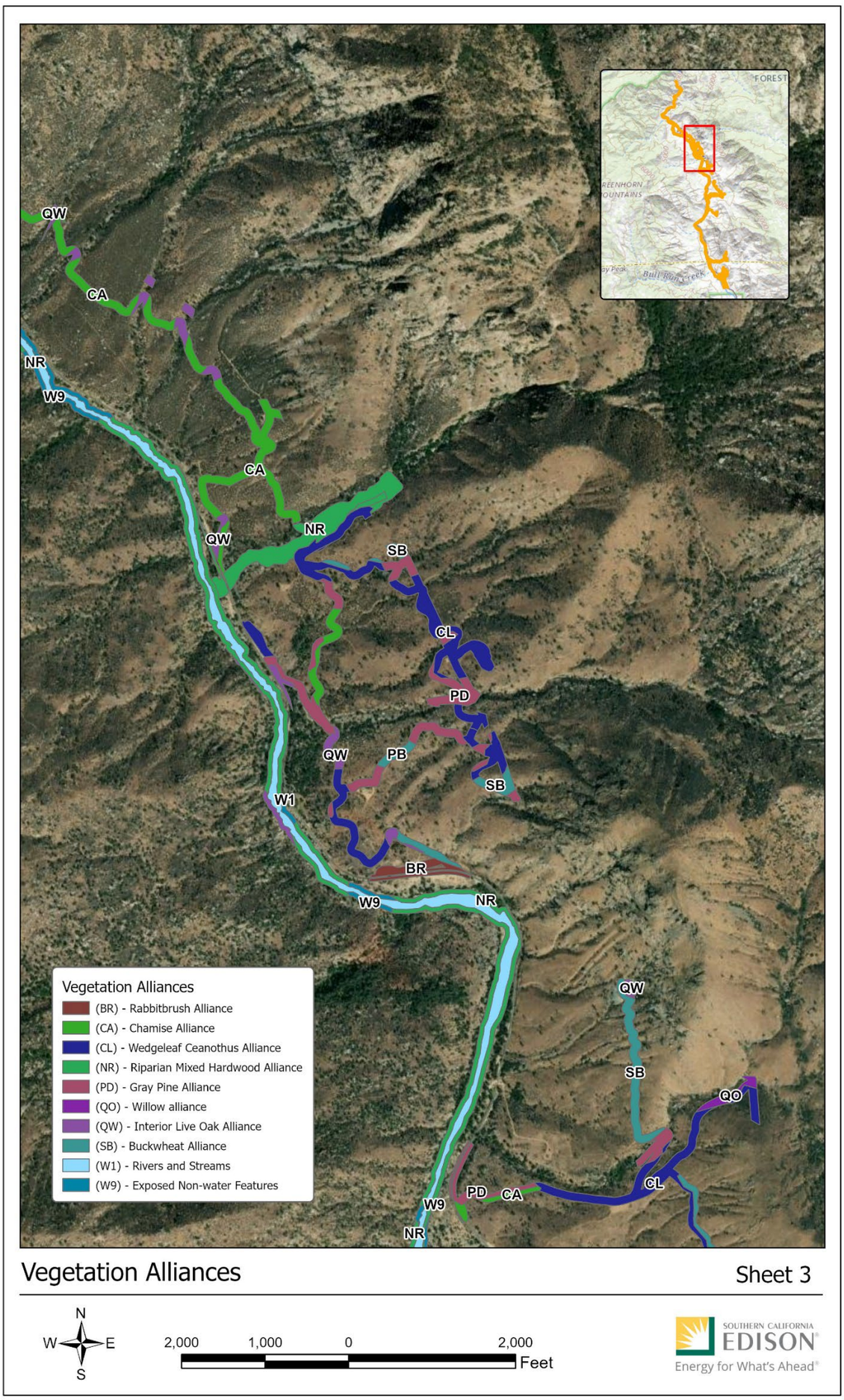


Figure G-1d. Mapped USFS Vegetation Alliances Ground-Truthed during Botanical Field Surveys.

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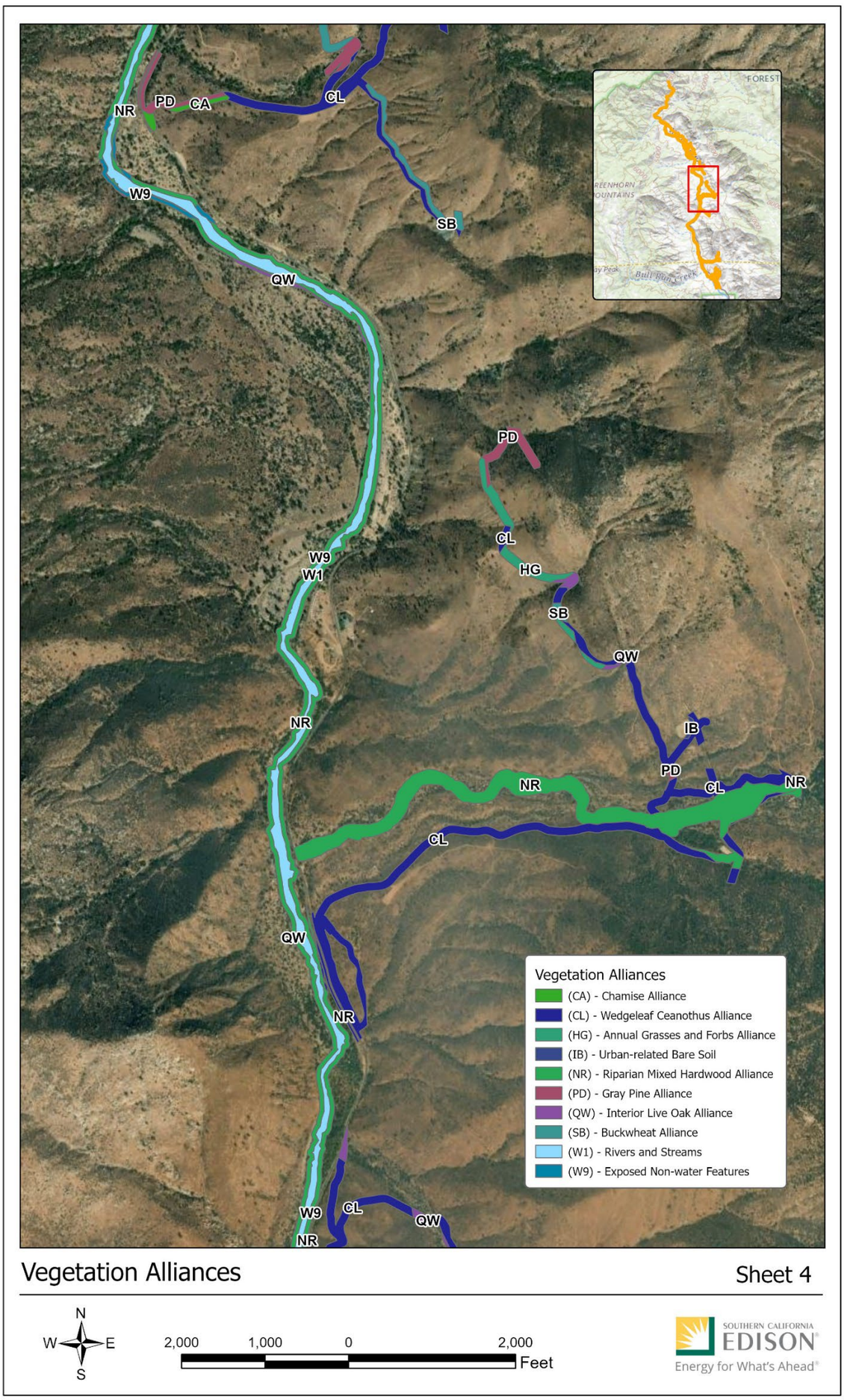


Figure G-1e. Mapped USFS Vegetation Alliances Ground-Truthed during Botanical Field Surveys.

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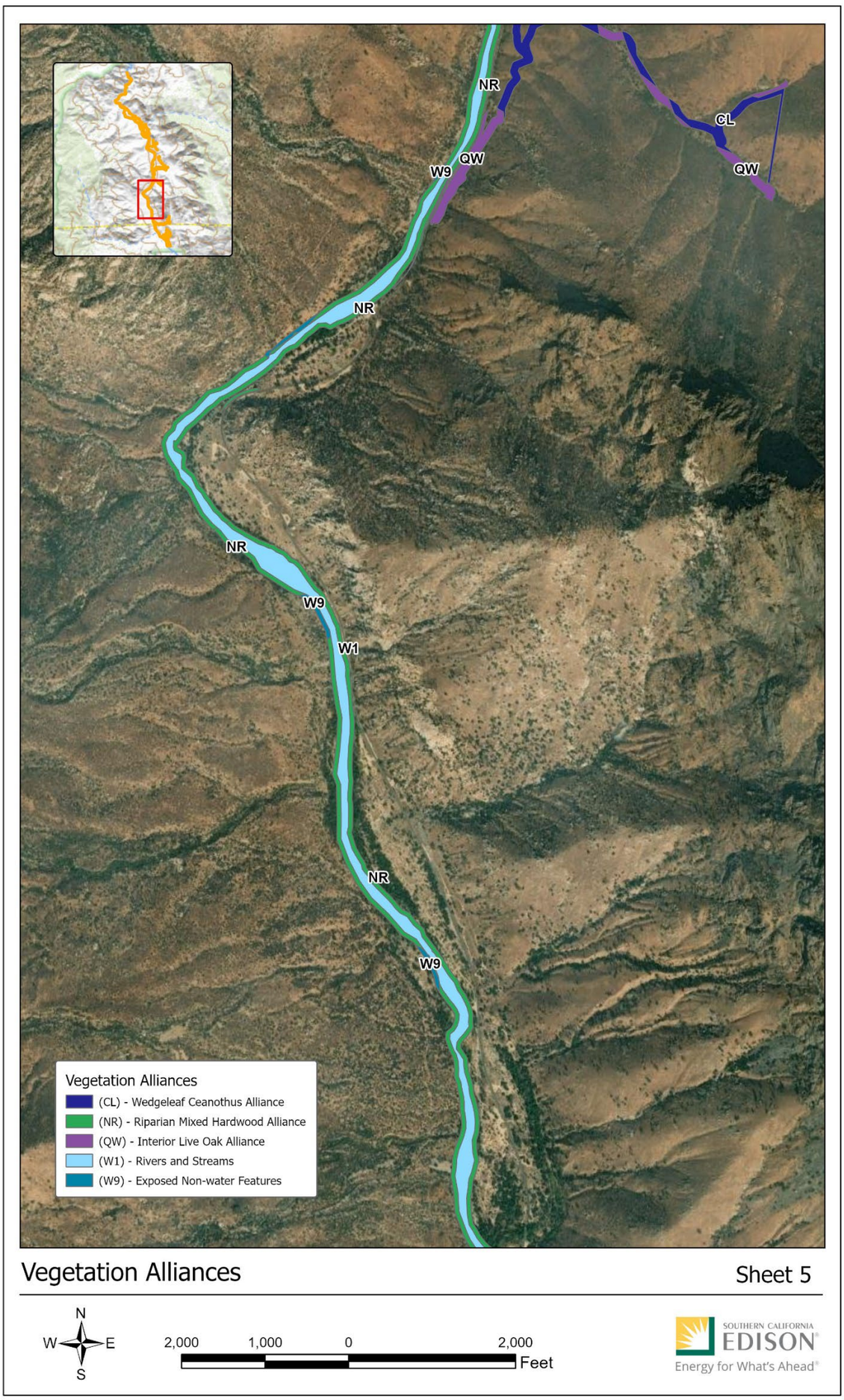


Figure G-1f. Mapped USFS Vegetation Alliances Ground-Truthed during Botanical Field Surveys.

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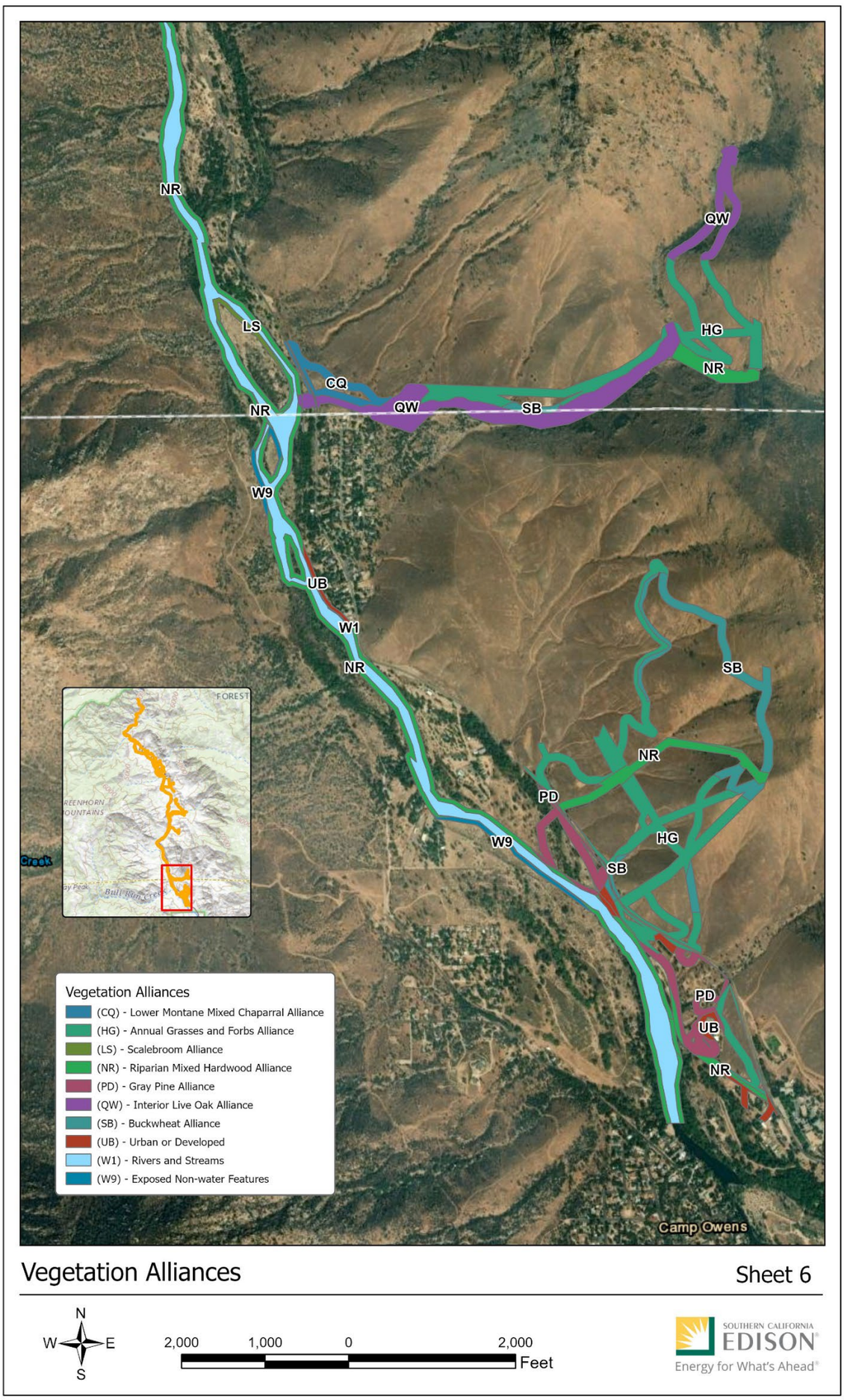


Figure G-1g. Mapped USFS Vegetation Alliances Ground-Truthed during Botanical Field Surveys.

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