SOUTHERN CALIFORNIA EDISON

Kern River No. 1 Hydroelectric Project
(FERC Project No. 1930)

UPDATED STUDY REPORT



March 2026

SOUTHERN CALIFORNIA EDISON

Kern River No. 1 Hydroelectric Project (FERC Project No. 1930)

Updated Study Report

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

March 2026

Support from

Stantec

TABLE OF CONTENTS

Page

1.0 Introduction 1
2.0 Background 1
2.1 Pre-Application Document Development and Distribution 1
2.2 Federal Energy Regulatory Commission Scoping 2
2.3 Study Plan Development and FERC Study Plan Determination 2
2.4 Initial Study Report 2
3.0 Study Implementation Progress 3
4.0 Updated Study Report Meeting 4
5.0 Next Steps 5

LIST OF TABLES

Table 1. Study Plan Technical Memorandum Status and Distribution Dates 7

Table 2. SCE Response to Forest Service Comments on Interim Technical Memos (Comment Letters dated December 1, 2025) 8

Table 3. Updated Study Report Technical Study Plan Implementation Summary 16

LIST OF APPENDICES

Appendix A AQ 1 – Hydrology Technical Memorandum

Appendix B AQ 2 – Water Quality/Water Temperature Technical Memorandum

Appendix C AQ 3 – Fish Population Technical Memorandum

Appendix D EJ 1 – Environmental Justice Technical Memorandum

Appendix E LAND 1 – Road and Trail Condition Assessment Technical Memorandum

Appendix F LAND 2 – Erosion and Sedimentation Technical Memorandum

Copyright 2026 Southern California Edison

Appendix G REC 1 – Recreation Facility Condition Assessment Technical Memorandum

Appendix H REC 2 – Recreation Facility Use Assessment Technical Memorandum

Appendix I REC 3 – Whitewater Boating Technical Memorandum

Appendix J TERR 1 – Botanical Resources Technical Memorandum

Appendix K TERR 2 – Wildlife Resources Technical Memorandum

LIST OF ACRONYMS

CFR	Code of Federal Regulations
DLA	Draft License Application
EPA	U.S. Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
Forest Service	U.S. Forest Service
FLA	Final License Application
HPMP	Historic Properties Management Plan
ISR	Initial Study Report
NRHP	National Register of Historic Places
PAD	Pre-Application Document
POR	Period of Record
Project	Kern River No. 1 Hydroelectric Project
PSP	Proposed Study Plan
RSP	Revised Study Plan
SCE	Southern California Edison
SHPO	State Historic Preservation Officer
SPD	Study Plan Determination
SQF	Sequoia National Forest
SWRCB	State Water Resources Control Board
TSP	Technical Study Plan
TSR	Technical Study Report

Copyright 2026 Southern California Edison

Tribes	Native American Tribes
USR	Updated Study Report

Copyright 2026 Southern California Edison

1.0 INTRODUCTION

Southern California Edison (SCE) owns and operates the Kern River No. 1 Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC) Project No. 1930. The Project is currently operated under a 30-year license issued by FERC on June 16, 1998 (83 FERC ¶ 62,241), which expires on May 31, 2028. SCE is seeking a new license to continue operation and maintenance of the Project.

The Project is a 26.3-megawatt run-of-river hydroelectric facility located on the lower Kern River on the western slope of the Sierra Nevada, approximately 15 miles east of the City of Bakersfield in Kern County, California. The Project occupies federal lands within the Sequoia National Forest, administered by the U.S. Forest Service (Forest Service), and includes a diversion dam and impoundment; water conveyance system; powerhouse; access roads and trails; communication and power lines; gaging stations; and ancillary and support facilities.

Pursuant to Title 18 of the Code of Federal Regulations, Section 5.15(f) (18 CFR § 5.15(f)), SCE is filing this Updated Study Report (USR) to provide FERC and relicensing stakeholders—including regulatory agencies, Native American Tribes, non-governmental organizations, and members of the public—with an update on implementation of the 14 FERC-approved Study Plans, conducted pursuant to FERC's Study Plan Determination (SPD) issued on March 14, 2024.

The document is organized as follows:

- Section 1.0: Introduction
- Section 2.0: Background
- Section 3.0: Study Implementation Progress
- Section 4.0: Updated Study Report Meeting
- Section 5.0: Next Steps
- Appendices A through K

2.0 BACKGROUND

2.1 PRE-APPLICATION DOCUMENT DEVELOPMENT AND DISTRIBUTION

On May 5, 2023,[1] SCE filed a Notice of Intent to seek a new license for the Project and a Pre-Application Document (PAD), which initiated the formal relicensing proceeding using

[1] Notice of Intent to File License Application and Pre-Application Document, Project No. 1930-090, Accession No. 20230505-5209 (filed May 5, 2023).

Copyright 2026 Southern California Edison

FERC's Integrated Licensing Process. The PAD also included 13 Draft Technical Study Plans.

2.2 FEDERAL ENERGY REGULATORY COMMISSION SCOPING

On June 29, 2023, FERC issued a Notice of Commencement of Pre-Filing Process and Scoping Document 1[2] for the Project. During the comment period, FERC conducted an environmental site review on August 1, 2023, and held two public scoping meetings on August 2, 2023. Six entities, including SCE, filed comments on Scoping Document 1. Based on oral comments received during the scoping meetings and written comments submitted through the scoping process, FERC revised Scoping Document 1 and issued Scoping Document 2[3] on October 17, 2023.

2.3 STUDY PLAN DEVELOPMENT AND FERC STUDY PLAN DETERMINATION

On August 23, 2023, SCE filed Updated Draft Technical Study Plans with FERC. The updated study plans incorporated stakeholder comments received during 13 Technical Working Group meetings held between June 28 and August 30, 2023. The Updated Draft Technical Study Plans superseded the Draft Technical Study Plans filed in the PAD in May 2023.

On October 17, 2023, SCE filed a Proposed Study Plan[4] (PSP) with FERC that included 13 Technical Study Plans for the Project. SCE revised four Technical Study Plans in response to study requests filed with FERC as part of its scoping process.

On February 13, 2024, SCE filed a Revised Study Plan[5] (RSP). In the RSP, SCE addressed specific study plan comments either by modifying the previously filed PSP or by providing a rationale for why a comment or new study request was not adopted. The RSP included revisions to five Technical Study Plans.

On March 14, 2024,[6] FERC issued its SPD, approving SCE's RSP with staff-recommended modifications. Of the 13 studies proposed by SCE, 12 were approved as filed and one was approved with staff-recommended modifications. FERC also adopted one new staff-recommended study, resulting in a total of 14 approved study plans.

2.4 INITIAL STUDY REPORT

SCE began implementing the FERC-approved study plans in 2024. Study methods and results were documented in a series of technical memoranda. Prior to filing the Initial Study Report (ISR) for the Project, SCE distributed the technical memoranda to stakeholders in January, February, and March 2025 for a 90-day review period from the date of distribution.

---

[2] Scoping Document 1, Accession No. 20230629-3043 (issued June 29, 2023).
[3] Scoping Document 2, Accession No. 20231017-3020 (issued October 17, 2023).
[4] Proposed Study Plan, Accession No. 20231017-5105 (filed October 17, 2023).
[5] Revised Study Plan, Accession No. 20240213-5104 (filed February 13, 2024).
[6] Study Plan Determination, Accession No. 20240314-3013 (issued March 14, 2024).

Copyright 2026 Southern California Edison

In accordance with individual study plan schedules, three technical memoranda were updated with additional data collected since the initial distribution and distributed for a second review period. These studies were: TERR 2 – Wildlife Resources (June 2025), REC 2 – Recreation Facility Use Assessment (September 2025), and AQ 2 – Water Quality/Water Temperature (January 2026). Table 1 presents the distribution schedule for each technical memorandum and their current status.

On March 12, 2025, SCE filed the ISR with FERC.[7] The ISR summarized SCE's progress in implementing the relicensing studies during the first study season, including explanations of any variances and modifications to ongoing studies. Because many studies were still in progress at the time of filing the ISR, SCE provided summaries of data collection efforts to date in the form of Interim Technical Memoranda, which were included as attachments to the ISR.

SCE held a meeting in Kernville, California, on March 19, 2025, to discuss the contents of the ISR and address comments regarding study plan implementation. The meeting discussion was documented in a meeting summary that SCE filed with FERC on April 3, 2025.[8]

Two Stakeholders filed comments with FERC in response to SCE's ISR / ISR Meeting Summary. The comments were on elements of the technical memoranda submitted as part of the ISR filing. No formal requests for study modification or requests for new studies were filed by Stakeholders. On June 12, 2025, SCE filed a response to these comments with FERC. Because no disagreements or requests to amend the study plan were filed with FERC by the May 14, 2025 deadline, FERC did not issue a determination related to the ISR process.

Subsequent to the ISR process, on December 1, 2025, the Sequoia National Forest submitted two letters to SCE with additional comments on various technical memoranda. Letter No. 1 provided comments on the REC 2 – Recreation Facility Use Assessment ITM, which was distributed for stakeholder review in September 2025. Letter No. 2 provided additional comments on several ITMs distributed with the ISR: TERR 1 – Botanical Resources, AQ 2 – Water Quality and Water Temperature, and AQ 3 – Fish Population ITMs, as well as on the TERR 2 – Wildlife Resources ITM, which was updated following the ISR and distributed for stakeholder review in June 2025. Responses to these comments are provided in Table 2.

3.0 STUDY IMPLEMENTATION PROGRESS

A second study season (2025) was completed for study components that were not completed in 2024. Table 3 identifies, for each study: (1) study plan elements completed since the ISR was filed; (2) study plan variances; (3) ongoing or outstanding study plan

[7] Initial Study Report, Accession No. 20250313-5015 (filed March 12, 2025).
[8] Initial Study Report Meeting Summary, Accession No. 20250403-5029 (filed April 3, 2025).

Copyright 2026 Southern California Edison

elements; and (4) modifications to ongoing studies. The following summarizes study implementation progress:

- **Elements Completed Since the ISR was Filed**: Nine studies were updated to include results from data collected and/or analyzed since the ISR was filed.

- **Variances**: Six studies were implemented with a variance from the FERC-approved study. Variances are a change from the from the methods approved in the study plan or schedule due to changed circumstances, field conditions, or other factors. All variances that occurred were minor and did not result in data gaps that would preclude a comprehensive analysis of potential Project effects; the study goals and objectives were met as described in the FERC-approved study.

- **Ongoing/Outstanding Study Plan Elements**: As of this filling, data collection, analysis, and final technical memoranda have been completed for 11 FERC-approved study plans; there are no ongoing or outstanding study plan elements for these plans. Three study plans have study elements to be completed. These are the cultural and Tribal resource studies: CUL 1 – Built Environment, CUL 2 – Archaeology, and TRI 1 – Tribal Resources. For each of these studies, consultation with the Sequoia National Forest and Native American Tribes (Tribes) is ongoing. In addition, each study report will be submitted to the State Historic Preservation Officer (SHPO) for concurrence on National Register of Historic Places (NRHP) eligibility. The results from the cultural and Tribal resource studies as well as SHPO concurrence on NRHP eligibility will be incorporated into a Historic Properties Management Plan.

- **Modifications**: Under FERC's ILP regulations, study plan modifications are forward-looking adjustments to anticipated future work under an approved study plan, which must be approved by FERC as part of its study plan determination issued after the USR meeting and submittal of the USR meeting summary and comment periods. Because 11 studies are now final, SCE proposes no modifications to the completed studies. For the three ongoing studies, SCE does not propose any modifications. Therefore, as indicated in Table 3, SCE is not proposing any modification to any FERC-approved study plan as part of this USR.

4.0 UPDATED STUDY REPORT MEETING

In accordance with 18 CFR § 5.15(f) and 5.15(c)(2)-(7), SCE will convene a USR meeting to review study plan implementation and provide an overview of the studies included in the USR filing. The meeting will be held in person in Kernville, California, with a virtual attendance option available to attendees.

Meeting details are as follows:

Date	Thursday, March 26, 2026
Time	1:00 p.m. – 4:00 p.m. (Pacific Standard Time)

Copyright 2026 Southern California Edison

Location	U.S. Forest Service Kern River Ranger District–Kernville Office 11380 Kernville Road Kernville, CA 93238
Virtual Attendance Option	**Join the meeting now** Meeting ID: 228 895 180 632 78 Passcode: jw7yU6gp Dial in by phone +1 213-336-0347 Phone conference ID: 130 273 990#

The principal objectives of the meeting are to: (1) summarize overall progress in implementing the study plans, including an overview of the data collected; (2) review any variances from the study plans and schedule; and (3) discuss any modification that an agency or stakeholder may propose to any of the FERC-approved study plans.

Within 15 days following the USR meeting, SCE will file the USR Meeting Summary with FERC. Stakeholders or FERC staff may file a disagreement with the USR Meeting Summary within 30 days of filing. Responses to such filings are due 30 days thereafter. FERC will resolve any disagreements and amend the approved study plan, as appropriate, no later than 30 days following the due date for responses. If no disagreements are filed within the 30-day period, the meeting summary and any proposed amendments to the approved study plan will be deemed approved.

5.0 NEXT STEPS

In accordance with 18 CFR § 5.16(a) and (c), SCE filed a Draft License Application (DLA) on December 18, 2025[9], which is more than 150 days prior to the deadline for filing a new license application. Appendix E.2 of the DLA includes technical memoranda documenting the results of the relicensing studies conducted for the Project, which provide the basis for the impact analysis presented in the DLA. The 90-day public review and comment period for the DLA ends on April 1, 2026. SCE's responses to any comments received will be provided in the Final License Application (FLA).

In accordance with 16 U.S.C. § 808(c)(1) and 18 CFR § 5.17(a), SCE will file its FLA with FERC by June 1, 2026, to meet the statutory and regulatory requirement that the FLA be filed no later than 24 months before the existing Project license expires on May 31, 2028.

[9] Draft License Application, Accession No. 20251218-5273 (filed December 18, 2025).

Copyright 2026 Southern California Edison

TABLES

Copyright 2026 Southern California Edison

Table 1. Study Plan Technical Memorandum Status and Distribution Dates

Technical Memorandum/Report	Study Plan Status	Technical Working Group Distribution Date[1]
AQ 1 – Hydrology Technical Memorandum	Completed	January 31, 2025
AQ 2 – Water Quality/Water Temperature Technical Memorandum[2]	Completed	March 11, 2025 January 27, 2026
AQ 3 – Fish Population Technical Memorandum[2]	Completed	February 28, 2025
EJ 1 – Environmental Justice Technical Memorandum	Completed	February 28, 2025
LAND 1 – Road and Trail Condition Assessment Technical Memorandum	Completed	January 31, 2025
LAND 2 – Erosion and Sedimentation Technical Memorandum	Completed	February 28, 2025
REC 1 – Recreation Facility Condition Assessment Technical Memorandum	Completed	February 28, 2025
REC 2 – Recreation Facility Use Assessment Technical Memorandum[2]	Completed	February 28, 2025 September 9, 2025
REC 3 – Whitewater Boating Technical Memorandum	Completed	February 28, 2025
TERR 1 – Botanical Resources Technical Memorandum	Completed	January 31, 2025
TERR 2 – Wildlife Resources Technical Memorandum	Completed	March 11, 2025 June 6, 2025
CUL 1 – Built Environment Technical Report[3]	Ongoing	January 31, 2025 March 3, 2026 to SQF
CUL 2 – Archaeology Technical Report[3]	Ongoing	January 31, 2025 March 3, 2026 to SQF
TRI 1 – Tribal Resources Technical Report[3]	Ongoing	January 31, 2025 February 2, 2026 to participating Tribes March 3, 2026 to SQF March 9, 2026 to other Tribes

Notes: [1] In addition to distribution of the technical memoranda as part of the Technical Working Groups, the technical memoranda were also provided for stakeholder review as part of the Initial Study Report filed with FERC on March 12, 2025, and the Draft License Application (except for the cultural and tribal studies) filed with FERC on December 18, 2025.
[2] Technical memorandum was updated to include additional data collection following filing of the Draft License Application.
[3] Study is complete and technical report is under review by the U.S. Forest Service and Tribes. Final technical report will be filed as confidential and privileged information in the Final License Application.

Copyright 2026 Southern California Edison

Table 2. SCE Response to Forest Service Comments on Interim Technical Memos (Comment Letters dated December 1, 2025)

No.	Stakeholder Comment	SCE Response
COMMENT LETTER 1		
1-1	**Subject: Kern River No. 1 Hydroelectric Project, FERC Project No. 1930; REC 2 Recreation Facility Use Assessment Interim Technical Memo (Update)** The U.S. Forest Service, Sequoia National Forest (hereafter "Forest Service") provides the following comments in the spirit of collaboration with SCE, and other relicensing participants. We are fully committed to working with SCE both before and after filing the technical memos to develop approaches, solutions, and measures that will address as many of the relicensing participants' interests as possible.	SCE appreciates Forest Service's review of the REC 2 Interim Technical Memorandum (REC 2 ITM) released in September 2025. The REC 2 technical study is now complete, and the REC 2 Technical Memo (TM) is filed herein as Appendix H.
1-2	**REC 2 ITM, September 2025 version** The REC 2 Recreation Facility Use Assessment Interim Technical Memo (REC 2 ITM) did not take into consideration new management direction included in the Land Management Plan for the Sequoia National Forest (2023). For example, portions of the KR-1 permit area now lay within an established Eligible, Suitable or Recommended Wild and River Scenic Corridor. This new land designation status was never addressed. Interim protection measures provided by citation in the new Forest Plan were not considered in the development of any of these technical memos. Those interim protection measures can be found in Forest Service Handbook 1909.12, section 84.2. Those interim protection measures can be incorporated into the various Management Plans that will be developed as part of the project 4(e) conditions.	The REC 2 technical study was completed in accordance with the FERC-approved study plan (refer to SCE's Revised Study Plan, SCE 2024; and FERC Study Plan Determination, FERC 2024). Compliance with the Sequoia National Forest Land Management Plan – including the relationship of the Project with eligible, suitable, or recommended wild and scenic river designations – is discussed in the Draft License Application filed with FERC on December 18, 2025 (DLA; SCE 2025). Proposed environmental measures, management, and monitoring plans associated with relicensing the Kern River No. 1 Project (Project) are described in Appendix E.1 of the DLA.
1-3	**REC 2 ITM, September 2025 version** As noted in your email transmission, dated September 9, 2025, the memo is referred to as an Interim Technical Memo (Update) and data collection is ongoing. The next iteration of the REC 2 ITM will be included in the Draft License Application (DLA) to be filed with FERC in December 2025. I offer the following comments to ensure that recreation use patterns, safety issues, and capacity needs are accurately reflected in the final license documents to ensure that the recreating public and the resource are given the best possible opportunity to benefit from these studies.	Comment noted.
1-4	**REC 2 ITM, September 2025 version** **Methods** Survey scheduling and peak use representation resulted in a dataset that represents shoulder-use conditions rather than actual peak recreation demand. Vehicle count data was collected on only two weekend days per month, with additional surveys during three holidays.	The REC 2 technical study was completed in accordance with the FERC-approved study plan. Data collection included conducting in-person intercept surveys at least four days per month over a 12-month period (two weekend days plus two weekdays) as well as collecting data on one randomly selected day on three holiday weekends (Memorial Day, Independence Day/Fourth of July, and Labor Day).This data provides a representative range of seasonal and holiday recreation use consistent with the FERC-approved study plan.
1-5	**REC 2 ITM, September 2025 version** **Section 4.2 Methods (continued)** Road closed signs posted on the roads leading to the Penstock/Spillway Trail and the Willow Springs/Democrat Dam Road caused significant confusion to forest visitors and may be having a detrimental effect on project trails and angler results for the Rec 2 study.	The signs described are at the entrance to two Project roads: (1) Willow Creek Spring/Democrat Dam Road (approximately 0.9 mile in length) and (2) Upper Powerhouse Road (approximately 0.1 mile in length). This signage pre-dates development of the relicensing studies for the Project and is an existing condition of the recreation environment that is the focus of the study. Results from the REC 2 technical study indicate light use of all Project trails (whether behind signed gates or not), averaging one to three users per trail per day, inclusive of use by SCE personnel to operate and maintain Project facilities.

Copyright 2026 Southern California Edison

No.	Stakeholder Comment	SCE Response
1-6	**REC 2 ITM, September 2025 version** **Table 5-9 Misclassification of Turnouts as Parking Capacity** The REC-2 study assumes a total of 116 available parking spaces, including approximately 25 along SR-178 at undeveloped shoulder sites. However, the report acknowledges occupancy exceeding 133% to 250% at these informal locations, which should instead be identified as safety hazards and indicators of unmet capacity rather than formal recreation assets.	The REC 2 TM filed with the USR reports the data collected in accordance with the FERC-approved study plan. As stated in the REC 2 TM, this included characterizing recreation use at four Forest Service owned and operated developed recreation facilities and at undeveloped locations identified as river access points along SR-178/the bypass reach (five locations). The five undeveloped locations identified as river access points are not characterized in the study plan or in the TM as formal recreation facilities or designated parking areas. The TM reports the total number of vehicles parked at Forest Service developed recreation areas and at the undeveloped river access points along SR-178. Vehicle counts were conducted on two weekend-days and two weekdays each month, as well as during three holiday weekends (a total of 51 days of vehicle counts) over the course of the study year (May 2024–April 2025). As stated in Table 5-9, the two undeveloped locations identified as river access points where parking capacity was observed to be exceeded on some survey days were River Access Site 1 – estimated parking capacity 2 vehicles, and River Access Site 3 – estimated parking capacity 3 vehicles. While vehicle presence at these sites was observed to exceed capacity on some survey days, surveyors never observed any of the Forest Service developed day use parking lots fill to capacity (including on holidays and weekends), and therefore there was always capacity at a developed recreation site that could have been utilized. On average just 15 percent of the total parking capacity was occupied on an average day when vehicle counts occurred, indicating there is more than enough capacity for parking along the bypass reach.
1-7	**REC 2 ITM, September 2025 version** **Section 5.1.2.1 - Underrepresentation of Whitewater Boating** Random shift times may have inadvertently biased outfitter use of the Democrat Raft Take-out Site. Only two survey responses were recorded for whitewater boating during the entire study period, despite well-documented rafting activity at the Democrat Raft Take-out. The methodology did not align with commercial rafting schedules or peak flow periods, resulting in a severe undercount of this major recreation use. Most rafting companies finish rafting trips by 2 or 3 P.M., and generally do not have much activity before 10 A.M. If whitewater boating use is addressed in another study report, then it should be referenced in this report.	The REC 2 technical study was completed in accordance with the FERC-approved study plan. At the Forest Service developed day use areas, including Democrat Dam Take-Out Boating Site, this included routine data collection via vehicle counts, intercept in-person surveys, and physical self-survey boxes. The Democrat Dam Take-out Boating Site is above Democrat Dam (along the impoundment) and is not a location where boats are launched to boat the bypass reach, the reach of river below Democrat Dam that is the focus of the REC 3 – Whitewater Boating study. The studies undertaken for the relicensing of the Project were not intended or designed to characterize boating along any reach of the lower Kern River other than the bypass reach. The bypass reach is a river reach with class V+ rapids. There is no commercial boating along the bypass reach. Please refer to the REC 3 – Whitewater Boating TM to review the study methods to characterize whitewater boating along the bypass reach as well as the study results.
1-8	**REC 2 ITM, September 2025 version** **Section 5.2.1 - Trail Counter Data Quality** Trail use monitoring via TrafX counters included false triggers caused by livestock, vegetation, and SCE personnel. While some data were filtered, this introduces uncertainty in true public-use estimation	Project roads and trails, which are developed and maintained by SCE to access Project facilities and are generally located within the FERC Project boundary on Sequoia National Forest land, are available for public use. Preliminary results from the REC 2 study indicate low levels of use, averaging approximately one to three users per trail per day, including use by SCE personnel. Trail use data were collected using TrafX counters; however, in addition to detections associated with SCE personnel and public recreationists, some recorded counts were likely triggered by livestock or vegetation movement. As a result, actual recreational use of Project trails by the public is likely lower than indicated by the recorded data.

Copyright 2026 Southern California Edison

No.	Stakeholder Comment	SCE Response
1-9	**REC 2 ITM, September 2025 version** **Section 5.2.1 - Trail Counter Data Quality (continued)** Serious questions remain regarding the study plan for recreation use along project trails due to “no trespassing or loitering” signs being placed at the entrance to the Penstock/Spillway Trail and the Willow Springs/Democrat Dam Road (which may also affect angler responses for the latter road). A closed gate on the Stark Creek Road may also serve as a deterrent to some users who may have intended to access the Stark Creek or Powerhouse Trails (albeit a slight deterrent). Respondents wanted more maintenance and greater access to other trails in the lower Kern Canyon. This should be given serious consideration in any discussion of estimated future recreation use in the vicinity of the project.	As described in response to Comment 1-5, the signage referenced by the commenter is located at the entrances to two Project roads: (1) Willow Springs/Democrat Dam Road (approximately 0.9 mile in length) and (2) Upper Powerhouse Road (approximately 0.1 mile in length). This signage predates development of relicensing recreation studies and represents the existing condition of the recreation environment during the study period. Similarly, the gated access at the beginning of the approximately 0.8-mile-long Stark Creek Road, which limits public vehicle access, also predates implementation of the recreation studies and reflects existing access conditions. These conditions were present prior to and throughout the data collection period and were therefore inherently reflected in observed recreation use patterns. DLA, Exhibit E, Section 7.10, Recreation Resources evaluates Project effects on recreation, including trail use and the adequacy of existing facilities to meet current and reasonably foreseeable future demand, based in part on REC 2 study results. This analysis will be updated in the FLA, as appropriate, based on the completed REC 2 TM filed with the USR.
1-10	**REC 2 ITM, September 2025 version** **Section 5.1.1 Vehicle Count: Data Summary, Volume of vehicles compared to capacity** The study’s “data indicates that surveyors never observed any of the developed day-use parking lots fill to capacity” overlooks displacement to unsafe highway shoulders. Users of those day-use areas often seek to park in road turnouts to avoid paying the Day Use Area parking fees. This creates a safety hazard for the public because they often need to walk along the edge of narrow highway containing blind curves and not designed for safe pedestrian traffic. The analysis should incorporate recreation carrying capacity, crowding thresholds, and risk-based site design metrics consistent with USFS Recreation Opportunity Spectrum (ROS) and Scenic Integrity Objectives (SIO) standards.	The REC 2 technical study was completed in accordance with the FERC-approved study plan. As provided in the FERC-approved study plan, the five undeveloped river access locations were included in the study to characterize dispersed recreation use at undeveloped sites along the bypass reach accessible from State Route 178; they are not characterized in the TM as formal recreation facilities or designated parking areas. The relationship of the Project to SQF Forest Plan ROS and SIO designations are discussed in the DLA. Refer to Exhibit E, Section 7.10, Recreation Resources and Section 7.11, Aesthetics. SCE does not believe these requested modifications to the study plan are warranted. Not only does study data indicate that there is sufficient available parking along the bypass reach, including on holidays and weekends (refer to SCE’s response to comment 1-6), but these proposed modifications do not meet the criteria for justifying a study modification as provided in FERC’s regulations. Under the ILP, any proposal to modify an ongoing study must be accompanied by a showing of good cause why the proposal should be approved, and must include, as appropriate to the facts of the case, a demonstration that: (1) Approved studies were not conducted as provided for in the approved study plan; or (2) The study was conducted under anomalous environmental conditions or that environmental conditions have changed in a material way (refer to 18 CFR § 5.15(d)).

Copyright 2026 Southern California Edison

No.	Stakeholder Comment	SCE Response
1-11	**REC 2 ITM, September 2025 version** **Requested Revisions and Future Coordination** The Forest Service recommends that the final REC-2 report include (1) targeted summer-weekend monitoring during high-flow periods; (2) reclassification of roadside turnout parking as unmanaged overflow; (3) correction of whitewater boating data; and (4) integration of visitor safety and access data consistent with NEPA and FERC Part 12D public-safety review frameworks.	The REC 2 technical study was completed in accordance with the FERC-approved study plan, which was designed to meet the study objectives established through the relicensing process. Recreation use along the bypass reach was characterized over the course of one year using multiple methods, including vehicle counts and in-person intercept surveys at both Forest Service developed recreation sites (four day-use areas) and at undeveloped river access sites along the bypass reach (five locations). Data collection included summer weekends and identified holiday periods, providing a representative range of seasonal and holiday conditions consistent with the approved study design. Whitewater boating use is addressed separately in the REC 3 – Whitewater Boating Study, which presents boating-specific data and analysis consistent with the FERC-approved REC 3 study objectives and methods. Potential public safety issues and existing programs and measures that are implemented by SCE to protect public health and safety are described in Section 5.4 of the REC 2 TM. To the extent that the REC 2 and REC 3 TMs do not address the commenter's request for additional information, SCE notes that these requests do not meet the criteria for supporting a study plan modification under FERC's ILP regulations, Under the ILP, any proposal to modify an ongoing study must be accompanied by a showing of good cause why the proposal should be approved, and must include, as appropriate to the facts of the case, a demonstration that: (1) Approved studies were not conducted as provided for in the approved study plan; or (2) The study was conducted under anomalous environmental conditions or that environmental conditions have changed in a material way, refer to 18 CFR § 5.15(d). The commenter does not make any of these showings in its request to modify the FERC-approved study plan.
1-12	**REC 2 ITM, September 2025 version** **7.0 Outstanding Study Plan Elements** Future Recreation Use and Demand - The Rec 2 study should address visitor concerns about trail maintenance and greater access to trails in the lower Kern canyon, as this activity is only likely to increase in the future. For recreation use along project trails the majority (72%) of the survey respondents had a home zip code within Bakersfield, and largest user-group among trail users was the 50–59-year-old age group at 18.3%, followed by the 60 – 69-year-old age group at 17.5%. With such a large percentage of respondents from the Bakersfield area, the study should give serious consideration to future growth and use of the project area by those living in the Bakersfield vicinity. Future recreation use should include the total number of day users when it comes to the cleanliness and maintenance of facilities. The impact on existing facilities and related maintenance, trash, restroom cleaning costs should be considered.	DLA, Exhibit E, Section 7.10, Recreation Resources discusses effects of the Project in relation to recreation use, and adequacy of existing recreation facilities to meet current and future recreation demand based in part on data collected during the REC 2 study. Consistent with the methodology identified in the FERC-approved study plan data collected as part of the REC 2 study includes information from recreators who answered survey questions about their recreation experience, including their experience as it relates to available facilities such as restrooms, parking, and garbage collection, and the condition of those facilities.
1-13	**REC 2 ITM, September 2025 version** **Public Safety** SCE will include measures implemented by SCE to protect public health and safety (i.e., buoy lines, fencing, signage, and alarms) in the REC 2 Technical Memorandum distributed with the DLA. Public safety issues may not be fully characterized by visitor use surveys of undeveloped recreation sites, trailheads, and parking spots if this topic does not receive consideration from those with expertise in vehicle and pedestrian safety. Many hikers are required to cross a busy highway to access the study's five trails and are parking in areas (turnouts) that are not currently authorized or designed for such uses.	The REC 2 study methodology was completed in accordance with the FERC-approved study plan. The objective of the study includes characterizing available recreation opportunities in the study area and recreation use of the study area. Refer to Section 5.4 of the REC 2 TM included with the USR for a description of measures SCE employs to protect public health and safety near or within locations SCE facilities are present. Refer also to SCE's responses to comment 1-6 and 1-10.

Copyright 2026 Southern California Edison

No.	Stakeholder Comment	SCE Response
COMMENT LETTER 2		
2-1	**TERR 1 ITM, January 2025 version** TERR-1 NNIP Target species list should include Sequoia National Forest NNIP Target species. That list is included in the comments package from the LTBMU. Please move the NNIP species found during the floristic surveys to the Target NNIP Species section of Appendix G for ease of navigating. For example, *Avenda barbata*, *Bromus diandrus*, and *Cynodon dactylon* were found on the riparian transects but not identified as NNIP species to apply forest plan components to.	SCE contacted Sequoia National Forest by e-mail on March 28, 2024 and June 25, 2025 informing them of upcoming botanical surveys. Each e-mail included a request for updated information on target NNIPs. No responses were received, and therefore surveys were completed based on best available information (i.e., Cal-IPC lists). Riparian transects are not part of the NNIP study areas as defined in Section 3.0 of the TERR 1 TM. These transects are located outside the FERC Project boundary, and no Project facilities or operations occur at these locations. As such, they were not included in the 2024–2025 botanical survey results. *Avena barbata* and *Cynodon dacylon* are not included on the most recent NNIP species list provided by the Forest Service on December 1, 2025. Footnotes have been added to TERR 1, Table 5-4, (Riparian/Wetland Herbaceous and Graminoid Plants Observed at Riparian Transects) to reflect that *Bromus diandrus* is included on the Sequoia National Forest NNIP list.
2-2	**TERR 1 ITM, January 2025 version** NNIP species were detected in the riparian transects but were not included in the TERR-1 list of NNIP species detected during surveys. Please ensure all NNIP species, whether on the initial Cal-IPC target list or no, are included in the NNIP survey reports and considered for resource protection measures and effects in DLA.	Riparian transects are not part of the NNIP study area as defined in Section 3.0 of the TERR 1 TM. These transects are located beyond the FERC Project boundary; and no Project facilities or operations occur at these locations. As such, they were not included in the 2024–2025 botanical survey results. To provide additional context, a brief discussion of NNIP species has been incorporated into the riparian study section of the TERR 1 TM. In addition, a footnote has been added to Table 5-4 (Riparian/Wetland Herbaceous and Graminoid Plants Observed at Riparian Transects) to clarify that *Bromus diandrus* is included on the Sequoia National Forest NNIP list. All NNIP species, including the original NNIP target list and the Sequoia National Forest NNIP list, will be considered in resource protection measures in the FLA.
2-3	**TERR 1 ITM, January 2025 version** The following SCC were not included in TERR-1 and need to be considered: Palmer's mariposa lily (*Calochortus palmeri var. palmeri*) Tulare cryptantha (*Cryptantha incana*) Unexpected larkspur (*Delphinium inopinum*) Two-colored monkeyflower (*Erythranthe discolor*) Pygmy hulsea (*Hulsea vestita ssp. pygmaea*) Chickweed oxytheca (*Sidotheca carophylloides*)	TERR 1 TM, Appendix F, *Special-Status Plants Known to Occur or Potentially Occurring in the Study Area*, has been updated to incorporate the May 2023 FSCC species list for completeness. Botanical surveys were conducted during the appropriate bloom period for all of the FSCC species, including those listed in this comment. None of these species were observed during the 2024–2025 botanical surveys.
2-4	**TERR 1 ITM, January 2025 version** Status of *Leptosiphon serrulatus* in TERR-1 Appendix D should be updated to FSCC. It appears that the project study area overlaps with the lower extent of the elevational range of the species. Please elaborate on rational for determination of unlikely to occur due to lack of suitable habitat.	The status of *Leptosiphon serrulatus* was updated to FSCC in TERR 1 TM, Appendix F. Because the species occurs within the elevational range and suitable habitat may be present, it has been classified as "May Potentially Occur" in Appendix F. However, the species was not observed during the 2024–2025 botanical surveys.
2-5	**TERR 1 ITM, January 2025 version** It's unclear in TERR-1 whether *Diplacus pictus* wasn't found because it wasn't present during the survey, or because the habitat on the north side of the Kern was not accessible. If it was due to inaccessibility, should assume presence as consistent with forest plan unless surveys can be completed.	*Diplacus pictus* was not observed during the 2024–2025 botanical surveys. Accessible areas along the north shore of Democrat Dam Impoundment were surveyed on foot, and the species was not detected. While certain areas could not be safely accessed on foot, they were reviewed to the extent practicable using binoculars from a boat along the shoreline.

Copyright 2026 Southern California Edison

No.	Stakeholder Comment	SCE Response
2-6	**TERR 1 ITM, January 2025 version** Based on the presence of ultramafic shrub alliance in the TERR-1 vegetation maps, it seems there may be suitable habitat for *Leptosiphon serrulatus* in the study area. Can you elaborate on why unlikely to occur due to lack of suitable habitat in TERR-1 Appendix D?	Refer to the response to Comment 2-4.
2-7	**TERR 1 ITM, January 2025 version** Based on the vegetation maps in TERR-1, it seems there may be suitable habitat for *Viburnum ellipticum* species in the study area. Can you elaborate on why unlikely to occur due to lack of suitable habitat in TERR-1 Appendix D?	*Viburnum ellipticum* has been reclassified from “unlikely to occur” to “may potentially occur” in TERR 1 TM, Appendix F, per the updated information provided. The species was not observed during the 2024–2025 botanical surveys.
2-8	**TERR 1 ITM, January 2025 version** TERR-1 needs to be updated with the results of late season botanical surveys. If they were not completed in 2025, the plan needs to be updated to conduct them in 2026. Finalization of TERR-1 can not be completed until surveys complete or alternative assumptions be made about occupancy. If surveys cannot be completed for whatever reason, occupancy shall be assumed as consistent with 2023 SQF FMP.	Late-season botanical surveys were completed in late June/early July 2025. Results of the survey are included in the TERR 1 TM filed with the USR.
2-9	**TERR 1 ITM, January 2025 version** TERR-1 needs to consider July 2024 survey record in USFS NRM Database that shows *Opuntia treleasei* occurrences in study area. Shape file is included in comments package from the LTBMU. A biological assessment will likely need to be prepared to document effects to this species.	Upon review of the shape file provided by the LTBMU, it was determined that the *O. treleasei* population referenced is located outside both the 2024–2025 botanical survey study area and the FERC Project boundary.
2-10	**TERR 1 ITM, January 2025 version** Fritillaria striata is included in TERR-1 Appendix D and labeled as a SCC. This species is not included in the 2023 SCC list from the SQF Forest Plan. If it is included in the report, TERR-1 should discuss/confirm 1983 Fritillaria striata occurrence in the USFS NRM Database was revisited during surveys and report on the results of those revisits.	The status of *Fritillaria striata* has been updated in TERR 1 TM, Appendix F. Surveys were conducted during the appropriate bloom period for this species (February – April) and no *Fritillaria striata* were observed in the study area.
2-11	**TERR 1 ITM, January 2025 version** TERR-1 needs to consider several USFS NRM records documenting occurrences of *Heterotheca shevockii* in the study area in 1996 and 2024. These occurrences need to be revisited during flowering season and included in TERR-1 and DLA. Occurrence data is included in LTBMU comments package	Upon review of occurrence data included in the LTBMU comment package, it was determined that all *H. shevockii* occurrences along Highway 178 are located outside both the 2024–2025 botanical survey study area and the FERC Project boundary. Note that botanical surveys were conducted during the appropriate bloom period for special-status plants, including *H. shevockii*. SCE conducted reference checks of known special-status plant populations prior to each season of surveys to confirm annual bloom periods and allow for adjustment of survey timing, if necessary. On June 23, 2025, SCE completed a reference check of several *H. shevockii* populations in the vicinity of the Project, including the USFS NRM *H. schevockii* population described in this Forest Service comment. While *H. shevockii* is typically in bloom August–September, early blooming of this species was observed during the visit. Based on this observation, the timing for the late-season botanical survey was adjusted to occur in late June/early July. No *Heterotheca shevockii* were observed within the TERR 1 study area during surveys conducted between June 30 – July 4, 2025.

Copyright 2026 Southern California Edison

No.	Stakeholder Comment	SCE Response
2-12	**TERR 2 ITM, May 2025 version** The following SCC and FWS species have, or may have habitat within or in the vicinity of the project, were not included in TERR-2 and need to be considered: California condor, California spotted owl, Southwestern willow flycatcher, bald eagle, American goshawk, tricolored blackbird, San Joaquin kit fox, monarch butterfly, Kern Plateau salamander, and fairview slender salamander.	One objective of the TERR 2 – Wildlife Resources study was to document special-status wildlife and associated habitat within the study area. This objective was completed pursuant to the FERC-approved study plan. Refer to Table 5-2 of the TERR 2 – Wildlife Resources Technical Memorandum (TERR 2 TM) for a list of special-status wildlife known or potentially occurring in California wildlife habitats relationships. In addition, cliff-nesting habitat for California condor and forest habitat for California spotted owl were considered in the evaluation of suitable habitat for special-status wildlife (refer to Section 4.1.3 of the TERR 2 TM). DLA, Exhibit E, Section 7.5, Botanical and Wildlife Resources includes a determination on likelihood for occurrence of California condor, California spotted owl, southwestern willow flycatcher, bald eagle, American goshawk, tricolored blackbird, San Joaquin kit fox, monarch butterfly, Kern Plateau salamander, and fairview slender salamander.
2-13	**AQ 3 ITM, February 2025 version** The following SCC species have, or may have habitat within or in the vicinity of the project, were not included in AQ-3 and need to be considered: California golden trout and Kern River rainbow trout. Mention if the project is outside of the species range.	One objective of the AQ 3 – Fish Population study was to document and characterize fish species in Democrat Dam Impoundment and the bypass reach. This objective was completed pursuant to the FERC-approved study plan. DLA, Exhibit E, Section 7.4, Fish and Aquatic Resources includes a discussion related to Kern River rainbow trout, a sub-species of golden trout. Specifically, the DLA states that Kern River rainbow trout are endemic to the Kern River and tributaries from Lake Isabella upstream to the headwaters but are not present in the Project area. No Kern River rainbow trout were observed during the AQ 3 study in 2024 and 2025 in the Project area, nor in historical surveys completed by SCE during 1999–2008 fisheries monitoring in the bypass reach required by Article 403 of the existing license.
2-14	**TERR 2 ITM, May 2025 version** Pallid bat was included as an SCC in the PAD but is not on the Forest SCC list.	The Pre-Application Document (PAD) was issued on May 5, 2023. The PAD initiated the relicensing process but is now superseded by the DLA. Please note that the TERR 2 TM included in the USR does not include a Forest Service status for pallid bat.
2-15	**TERR 2 ITM, May 2025 version** The following listed or proposed species need to be included in a BA for this project: California condor, California spotted owl, Southwestern willow flycatcher, San Joaquin kit fox, Monarch butterfly, northwestern pond turtle, foothill yellow-legged frog, Kern Canyon slender salamander, relictual slender salamander, and western spadefoot toad.	Comment noted. As FERC's non-federal representative for purposes of informal consultation under section 7 of the Endangered Species Act related to the relicensing of the Project, SCE will be consulting with the USFWS on the project.
2-16	**General Comment – Draft License Application** The DLA needs to include applicable elements of SPEC-FW-GDL, SPEC-CSO-STD, SPEC-CSO-GDL, and SPEC-WF-STD, in order meet the LMP.	Compliance with the Sequoia National Forest Land Management Plan is discussed in the DLA.
2-17	**AQ 3 ITM, February 2025 version and TERR 2 ITM, May 2025 version** The information provided in AQ-3 and TERR-2 for western pearlshell mussel and northwestern pond turtle are insufficient to determine absence. Provide more thorough and recent survey data, or assume presence for the purposes of analysis.	One objective of the AQ 3 – Fish Population study was to document and characterize fish species in Democrat Dam Impoundment and the bypass reach. The TERR 2 TM is focused on terrestrial species. Both studies were completed in accordance with the FERC-approved study plan. Pursuant to the AQ 3 – Fish Population Technical Study Plan, SCE made observations of northwestern pond turtle during implementation of the AQ 2 and AQ 3 studies. As noted in the AQ 3 ITM, two northwestern pond turtles were observed in the Democrat Dam Impoundment in 2024. No northwestern pond turtles were observed in the Project area in 2025. DLA, Exhibit E, Section 7.4, Fish and Aquatic Resources includes additional discussion related to the known distribution of western pearlshell mussel and northwestern pond turtle and provides a detailed analysis of the potential effects of proposed Project operations on northwestern pond turtle.

Copyright 2026 Southern California Edison

No.	Stakeholder Comment	SCE Response
2-18	**AQ 3 ITM, February 2025 version** AQ-3 needs to be updated with survey data from the bypass reach (planned for late summer/early fall 2025).	SCE completed additional fish population sampling in Democrat Dam Impoundment in October 2025 (trammel netting) and sampled the bypass reach in December 2025. Results from the 2025 sampling have been incorporated into the AQ 3 TM included in the USR filing.
2-19	**AQ 2 ITM, March 2025 version** The DLA needs to include applicable elements of WTR-RCA-STD, WTR-FW-STD, and WTR-RCA-RIV-DC as they pertain to aquatic wildlife in order to meet the LMP. Data from AQ-2 and LAND-2 will be pertinent.	Compliance with the Sequoia National Forest Land Management Plan is discussed in the DLA.
2-20	**AQ 2 ITM, March 2025 version** Data provided in AQ-2 is insufficient in determining whether water temperatures are suitable for SCC and FWS listed fish (WTR-RCA-STD). Recommending year round water temperature monitoring; more than 2 years of monitoring to encompass seasonal variability (drought, flood); sampling slow moving waters; and sampling directly upstream of Democrat Dam at varying depths to ensure water temperatures and DO levels are not impacted by the impoundment.	The AQ 2 – Water Quality/Water Temperature study was completed in accordance with the FERC-approved study plan and results are detailed in the AQ 2 – Water Quality/Water Temperature Technical Memorandum (AQ 2 TM). Data collected during the AQ 2 study was used in the effects analysis included in DLA, Exhibit E, Section 7.3, Water Quality (2024 data). The study was completed in 2025 and an updated version of the AQ 2 TM, inclusive of 2024 and 2025 data, is provided in the USR. The FLA will include an updated analysis of the complete data set. The final AQ 2 TM provides a review of water temperature requirements for fish species found in the Project area.
2-21	**AQ 3 ITM, February 2025 version** Data provided in LAND-2 is insufficient in determining whether erosion and sedimentation may impact SCC and FWS listed aquatic wildlife (WTR-RCA-RIV-DC). More information is needed to determine if operational flushing and full pond drains impact listed species (particularly hardhead, northwestern pond turtle, and western pearlshell mussel).	The LAND 2 – Erosion and Sedimentation Technical Memorandum (LAND 2 TM) was completed in accordance with the FERC-approved study plan. Data collected from this study was used in the effects analysis included in DLA, Exhibit E, Section 7.4, Fish and Aquatic Resources.
2-22	**AQ 2 ITM, March 2025 and AQ 3 ITM, February 2025 version** Components of WTR-RCA-DC and WTR-RCA-RIV-DC are not addressed in the technical reports. Particularly in regards to stream connectivity: movement of wood, organic matter, and sediment, and fish passage.	All technical memorandums completed for the Project relicensing were completed in accordance with the FERC-approved study plan.
2-23	**TERR 2 ITM, May 2025 version** TERR-2 section 5.1.2.5 says no habitat for goshawk and spotted owl, but the PAD states that there are detections for spotted owl within 1 mile of the project area and for goshawk within 5 miles of the project area. Additionally table 5-1 shows shows the CWHR habitats present within 1 mile of the project area, and table 5-2 shows goshawk and spotted owl as known or potentially occurring in some of those same habitats. Please reconsile these inconsistencies.	As stated above, the PAD has been superseded by the DLA and the information from the PAD has been updated and built upon as the relicensing process has progressed. The USR includes the most current version of the TERR 2 TM. The study area discussed in Section 5.1.2.5 of the ITM consists of the FERC Project boundary and Project facilities (i.e., the study area for wildlife reconnaissance surveys). There is no suitable habitat for spotted owl or goshawk in the immediate vicinity of Project facilities. However, there is suitable habitat within the 1-mile buffer of the Project area (note that all spotted owl occurrences are >0.25 mile from Project facilities). This distinction is explained in the DLA, Exhibit E, Table 7.5-6.
2-24	**TERR 2 ITM, May 2025 version and AQ 3 ITM, February 2025 version** Double check or update the wildlife NRIS/CNDDB data pull. In several cases I saw different data than what was stated in the PAD.	As stated above, the PAD has been superseded by the DLA and the information from the PAD has been updated and built upon as the relicensing process has progressed. The NRIS/CNDDB data was updated in the most recent version of the TERR 2 TM included in the USR. Specifically, NRIS (2022) and CNDDB (2024) data was pulled. SCE will review this data prior to filing the FLA to make sure there is not newer data available.
2-25	**TERR 2 ITM, May 2025 version** In the DLA please state which special status species are not being addressed and why.	Please refer to DLA, Exhibit E, Section 7.5, Botanical and Wildlife Resources for a description of which special-status species are not being addressed and why.

Copyright 2026 Southern California Edison

Table 3. Updated Study Report Technical Study Plan Implementation Summary

Technical Memorandum (USR Appendix)	Study Plan Elements Completed Since Filing of the Initial Study Report	Study Plan Variances	Ongoing/Outstanding Study Plan Elements	Modifications to Ongoing Studies
AQ 1 – Hydrology (Appendix A)	• Completed final Technical Memo.	• The AQ 1 TSP specified that a POR of 1998–2021 would be used for the hydrology modeling. Based on data availability (historical gage data), a POR of 1999–2023 Water Year was used for the modeling and hydrologic alteration analysis.	None	None
AQ 2 – Water Quality/Water Temperature (Appendix B)	• Water temperature monitoring, seasonal in-situ field measurements, seasonal water quality grabs samples, and bacterial sampling were conducted in 2025. • Laboratory analysis of methylmercury fish tissue concentrations. • Completed final Technical Memo.	**General Variance** • For some analytes, the laboratories used Standard Methods analyses rather than EPA methods analyses specified in the AQ 2 TSP; however, EPA recognizes the Standard Methods analyses as equivalent. **2024 Variances** • Grab samples were collected at KR 55.6 in the spring (one sample) and at KR 55.2 in the fall (once sample),[1] rather than at both sites in both seasons, due to TSP discrepancies. These sites are very near each other and the study results demonstrated that water quality at each site was very similar. In 2025, grab samples were collected in the spring and fall from both sites. • The AQ 2 TSP schedule for bacterial sampling required sampling to occur over five relatively evenly spaced dates in July 2024. Due to the Borel Fire, which began on July 24, 2024, in the immediate vicinity of the study area, four samples were collected before the fire in July 2024, and the fifth sample was collected on August 13, 2024, when the area was reopened and safe for access. This exceeded the 30-day sampling window specified in the Basin Plan. • AQ 2 TSP had inconsistencies for seasonal in-situ field measurement (turbidity, alkalinity, and salinity). As a result, in-situ measurements of turbidity were not collected in 2024. However, turbidity data were collected in 2025 during in-situ water quality measurements in the spring and fall and at other opportunistic times in the Project area [i.e., during temperature logger installation (May), temperature logger downloads (August), and temperature logger removals (October)] to collect more information about turbidity. Alkalinity test kits were used in the field to measure alkalinity, and salinity was calculated from specific conductance measurements. • In 2024, water grab samples were analyzed for total mercury, but not methylmercury. In 2025, water grab samples were analyzed for total mercury and methylmercury. **2025 Variances/Additions** • AQ 2 TSP specified total and fecal coliform analyses and did not require analysis for Escherichia coli (*E. coli*); however, the State Water Resources Control Board (SWRCB 2019) generally requires *E. coli* sampling for recreation contact bacterial analysis. In 2025, *E. coli* was included in the analysis (presence/absence). • AQ 2 TSP did not require hardness (as CaCO3) as a seasonal water quality parameter. Criteria for several water quality parameters are, however, hardness dependent (cadmium, copper, lead, and nickel) (there was no detection of these parameters in 2024). Hardness was analyzed in water quality grab samples in 2025 to support the laboratory analysis of cadmium, copper, lead, and nickel required by the TSP. • Two water temperature loggers were vandalized in May 2025 at water temperature monitoring location KR 44.0 (Kern River upstream of Kern River No. 1 Powerhouse). As a result, data from May 15 to June 2, 2025, at this site are not available.	None	None

Copyright 2026 Southern California Edison

Technical Memorandum (USR Appendix)	Study Plan Elements Completed Since Filing of the Initial Study Report	Study Plan Variances	Ongoing/Outstanding Study Plan Elements	Modifications to Ongoing Studies
AQ 3 – Fish Population (Appendix C)	• Completed remaining fish population sampling in the Democrat Dam Impoundment (trammel netting) in September/October 2025 and all fish population monitoring in the bypass reach in December 2025. • Completed final Technical Memo.	• Sampling in the bypass reach could not be completed in 2024 due to unsafe conditions and high flows. Bypass reach sampling and trammel netting in the Democrat Dam Impoundment were completed in the fall of 2025.	None	None
EJ 1 – Environmental Justice (Appendix D)	• Completed final Technical Memo.	None	None	None
LAND 1 – Road and Trail Condition Assessment (Appendix E)	• Completed final Technical Memo.	None	None	None
LAND 2 – Erosion and Sedimentation (Appendix F)	• Completed final Technical Memo.	• LAND 2 Technical Memo was released for stakeholder review in February 2025 instead of January 2025.	None	None
REC 1 – Recreation Facility Condition Assessment (Appendix G)	• Completed final Technical Memo.	None	None	None

REC 2 – Recreation Facility Use Assessment
(Appendix H)
	• Completed study to characterize recreation use at developed recreation facilities and at undeveloped locations identified as river access points along State Route 178/the bypass reach.
	  ○ Collected a complete year of intercept surveys and vehicle counts (May 2024 through April 2025).
	  ○ Collected a complete year of recreation use data via survey box forms (January 2025 through January 2026).
	• Completed study to characterize recreation use at Project trails.
	  ○ Collected a complete year of trail use data via infrared trail cameras and survey box forms (January 2025 through January 2026).
	• Contacted Sequoia National Forest personnel and other interested stakeholders who frequent the Project area to request their impressions of visitor use Estimated future recreation use and demand.
	• Documented public safety issues and existing programs and measures.
	• Completed final Technical Memo.
		• The schedule for implementation of the full study plan was extended compared to the schedule anticipated. This delay is associated with a later start due to the Forest Service approvals required to install trail cameras and survey boxes.
		• The intercept survey form does not include the full suite of questions associated with collecting all the information necessary to meet the REC 3 – Whitewater Boating TSP objectives. These objectives are being met though implementation of the REC 3 – Whitewater Boating TSP.
		• Due to factors of both safety and timing, survey technicians conducted vehicle counts only once per shift instead of twice.
			None	None

Copyright 2026 Southern California Edison

Technical Memorandum (USR Appendix)	Study Plan Elements Completed Since Filing of the Initial Study Report	Study Plan Variances	Ongoing/Outstanding Study Plan Elements	Modifications to Ongoing Studies
REC 3 – Whitewater Boating (Appendix I)	• Quantified the annual and monthly frequency that minimum acceptable and optimum whitewater flows occur in the bypass reach under current Project operations and without Project diversion for each watercraft type. • Completed final Technical Memo.	None	None	None
TERR 1 – Botanical Resources (Appendix J)	• Completed the riparian vegetation-flow conditions studies. • Completed final Technical Memo.	• TERR 1 TSP requires implementation of both early season and late season botanical surveys. The late season botanical surveys were scheduled to occur in late July 2024; however, due to the Borel Fire and associated area evacuations, road closures, and public safety concerns, the late season surveys were postponed to July 2025.	None	None
TERR 2 – Wildlife Resources (Appendix K)	• Completed special-status salamander visual encounter surveys in March 2025 during appropriate weather conditions. • Completed final Technical Memo.	None	None	None
CUL 1 – Built Environment (Appendix L)	• Established Area of Potential Effects. • Completed survey of the built environment in June 2024. • Conducted archival research. • Completed final Technical Memo.	None	• Finalize TSR and consult with SQF and Tribes. • Prepare final TSR and submit to the SHPO for concurrence on NRHP eligibility. • Prepare and consult on development of the HPMP.	None
CUL 2 – Archaeology (Appendix M)	• Established Area of Potential Effects. • Completed archaeological survey in July and November 2024, and July 2025. • Conducted archival research. • Completed final Technical Memo.	None	• Finalize TSR and consult with SQF and Tribes. • Prepare final TSR and submit to the SHPO for concurrence on NRHP eligibility. • Prepare and consult on development of the HPMP.	None
TRI 1 – Tribal Resources (Appendix N)	• Communicated and consulted with Tribes regarding the Project. • Established Area of Potential Effects. • Conducted archival research. • Met with Tribal Governments. • Conducted interviews. • Documented and evaluated tribal resources and tribal cultural properties in the TSR.	None	• Address Tribal and SQF comments on TRI 1 TSR. • Prepare final TSR and submit to the SHPO for concurrence on NRHP eligibility. • Prepare and consult on development of the HPMP.	None

Notes: [1]KR 55.6 = Kern River upstream of Democrat Dam Impoundment; KR 55.2 = Democrat Dam Impoundment, downstream of rafting take-out
Key: EPA = U.S. Environmental Protection Act
Forest Service = U.S. Forest Service
HPMP = Historic Properties Management Plan
NRHP = National Register of Historic Places

Copyright 2026 Southern California Edison

POR = Period of Record
SHPO = State Historic Preservation Officer
SQF = Sequoia National Forest
Tribes = Native American Tribes
TSP = Technical Study Plan
TSR = Technical Study Report

Copyright 2026 Southern California Edison

APPENDIX A

AQ 1 – HYDROLOGY TECHNICAL MEMORANDUM

Copyright 2026 Southern California Edison

AQ 1 – HYDROLOGY
TECHNICAL MEMORANDUM

KERN RIVER NO. 1 HYDROELECTRIC PROJECT
FERC PROJECT NO. 1930

PREPARED FOR:



March 2026

TABLE OF CONTENTS

1.0 Introduction 1

2.0 Study Objectives 1

3.0 Study Area 1

4.0 Methods 1

4.1 Study Plan Variances 1

4.2 Hydrology Model Development 2

4.3 Hydrologic Alteration Analysis 2

5.0 Results Summary 3

5.1 Hydrology Development 3

5.1.1 Flow Data 3

5.1.2 Hourly Flow Dataset 3

5.2 Hydrologic Alteration Analysis 3

5.2.1 Time Series Plots for the POR 3

5.2.2 Flow Exceedance Plots for the POR 3

5.2.3 Annual Plots Showing Mean Daily and 95%, 90%, 75%, 50%, 25%, 10%, and 5% Exceedance Flows. 4

5.2.4 Monthly Timing and Magnitude of Mean and Median Flow Conditions 4

5.2.5 Magnitude, Duration, and Timing of Annual High-Flow and Low-Flow Conditions 4

5.2.6 Rate, Timing, and Frequency of Hydrograph Changes 4

5.3 Operations Model 4

5.3.1 Model Development 4

5.3.2 Model Validation 5

6.0 Study Specific Consultation 5

7.0 Outstanding Study Plan Elements 5

8.0 References 5

LIST OF TABLES

Table 5-1. Project Flow Gages 8
Table 5-2. Time Periods That Daily Average USGS Gage Data Were Used to Estimate Hourly Hydrology 8
Table 5-3. Annual Flow Volumes for the Hydrology Dataset 9
Table 5-4. Annual Exceedance Flows, Project Inflow 10
Table 5-5. Annual Exceedance Flows, Release to Bypass Reach 11
Table 5-6. Monthly Mean and Median Flows 12
Table 5-7. Average Magnitude of Annual Extremes 12
Table 5-8. Average Annual Pulse Flow Events 13
Table 5-9. Average Annual Hydrograph Changes 13
Table 5-10. Minimum Instream Flow Requirements and Buffer Flows 13
Table 5-11. Annual Flow Volumes, Modeled and Gaged 14

LIST OF FIGURES

Figure 5-1. Year 2007 USGS Gage No. 11192500 daily average flow and SCE Gage No. 409 hourly average flow showing an example of hourly flow discrepancies highlighted in yellow (top) and a revised combined hourly flow dataset using the USGS daily average flows to replace the SCE Gage No. 409 hourly flow discrepancies (bottom). 16
Figure 5-2. Average Monthly Flow, Water Years 1999–2023 17
Figure 5-3. Project Inflow and Release to Bypass Reach, Water Years 1999 through 2011 18
Figure 5-4. Project Inflow and Release to Bypass Reach, Water Years 2012 through 2023 19
Figure 5-5. Hourly Flow Exceedance Plots, January through June 20
Figure 5-6. Hourly Flow Exceedance Plots, July through December 21

Figure 5-7. Yearly Exceedance Plots for the 1999–2023 Period-of-Record for Project Inflow (top) and Release to Bypass Reach (bottom) 22

Figure 5-8. Monthly Mean Flows 23

Figure 5-9. Timing of Annual Peak Flow 24

Figure 5-10. Declining Limb Hydrograph for the 1999–2023 Period-of-Record for Project Inflow (top) and Release to Bypass Reach (bottom) 25

Figure 5-11. Modeled Diversion to KR1 Powerhouse Conduit, Water Years 1999 through 2010 26

Figure 5-12. Modeled Diversion to KR1 Powerhouse Conduit, Water Years 2011 through 2023 27

Figure 5-13. Modeled Release to Project Bypass Reach, Water Years 1999 through 2010 28

Figure 5-14. Modeled Release to Project Bypass Reach, Water Years 2011 through 2023 29

Figure 5-15. Annual Release to Project Bypass Reach, Modeled and Observed 30

Figure 5-16. Annual Diversion to KR1 Powerhouse Conduit, Modeled and Observed 30

LIST OF MAPS

Map 3-1. Gage Locations and Study Area 32

LIST OF ACRONYMS

ac-ft	acre-feet
AQ 1 TM	AQ 1 – Hydrology Technical Memorandum
AQ 1 TSP	AQ 1 – Hydrology Technical Study Plan
cfs	cubic feet per second
FERC	Federal Energy Regulatory Commission
KR1	Kern River No. 1
POR	Period of Record
Project	Kern River No. 1 Hydroelectric Project
SCE	Southern California Edison

SPD	Study Plan Determination
TWG	Technical Working Group
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
WY	water year

1.0 INTRODUCTION

This AQ 1 – Hydrology Technical Memorandum (AQ 1 TM) provides the methods and findings of the AQ 1 – Hydrology Technical Study Plan (AQ 1 TSP) in support of the Southern California Edison's (SCE) Kern River No. 1 (KR1) Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 1930. The AQ 1 TSP was included in SCE's Revised Study Plan filed on February 13, 2024 (SCE 2024). In its March 14, 2024 Study Plan Determination (SPD), FERC approved the AQ 1 TSP without modifications (FERC 2024).

This AQ 1 TM presents a hydrological operations model of the Project, including inflow hydrology, powerhouse flows, and releases to the Kern River bypass reach using an hourly timestep over the hydrological period of record (POR) covering water years 1999 through 2023. This AQ 1 TM also includes a hydrologic alteration analysis of flows in the bypass reach.

2.0 STUDY OBJECTIVES

The objectives of the study, as outlined in AQ 1 TSP (SCE 2024), include the following:

- Develop a model of the Project operations with and without the Project diversion and refine (as needed) the analysis of hydrology presented in the Pre-Application Document Section 3.3, Water Use and Hydrology.

- Perform a hydrologic alteration analysis of flows related to Project diversions.

3.0 STUDY AREA

The Study Area includes the bypass reach on the Kern River from Democrat Dam to the KR1 Powerhouse Tailrace (Map 3-1).

4.0 METHODS

The methods below were used to develop the Project Operations Model and provide a hydrologic alterations analysis of the bypass reach on the Kern River from Democrat Dam to the KR1 Powerhouse Tailrace. Study implementation followed the methods described in the AQ 1 TSP (SCE 2024).

4.1 STUDY PLAN VARIANCES

There was one minor study plan variance. The AQ 1 TSP specified that a POR of 1998–2021 would be used for the hydrology modeling. Based on data availability (historical gage data), a POR of 1999–2023 water year (WY) was used for the modeling and hydrologic alteration analysis.

4.2 HYDROLOGY MODEL DEVELOPMENT

- Four stakeholder hydrological modeling Technical Working Group (TWG) meetings were conducted in 2023 and 2024 (July 7, July 31, and August 24, 2023, and August 8, 2024) to review and help guide the hydrological modeling approach.

- The 1999–2023 POR was used for hydrological modeling based on data availability. This is a slightly different POR (longer and different start year) than the AQ 1 TSP identified (i.e., 1998–2021) due to availability of data.

- A spreadsheet-based operations model was developed to characterize the Project average hourly flow hydrology for the POR. The model includes inflow to Democrat Dam, releases to the bypass reach below the dam, and powerhouse outflows. The model includes minimum instream flow requirements and other constraints Project (e.g., flow line capacity).

- Climate change modeling for Lake Isabella releases (inflow to the Kern No. 1 Project), which are controlled by United States Army Corps of Engineers (USACE) operations and the Kern River Water Master scheduled releases, was not available over the 1999–2023 POR; therefore, climate change modeling of the inflow hydrology was not included in the t operations model.

- We coordinated with other study plans / analyses (e.g., recreation, riparian) to ensure the model addressed their needs.

4.3 HYDROLOGIC ALTERATION ANALYSIS

- A hydrologic alteration analysis was developed comparing with Project and without Project flows in the bypass reach using the following data and approaches (e.g., Richter et. al. 1996):

  – Timeseries plots for the POR.

  – Monthly flow exceedance plots / tables for the POR.

  – January to December (annual) plots / tables showing mean daily and 95%, 90%, 75%, 50% (median), 25%, 10%, and 5% exceedance flows.

  – Tables and summary analysis showing differences in the following:

    - Monthly timing and magnitude of mean and median flow conditions.

    - Magnitude, duration, and timing of annual high flow conditions and low flow conditions (1-day, 3-day, 7-day, monthly), including the presence of pulse flow events.

- Rate, timing, and frequency of hydrograph changes (e.g., rate and timing of the declining limb of the spring high flow hydrograph) were developed to characterize flow changes on a sub-daily basis.

5.0 RESULTS SUMMARY

5.1 HYDROLOGY DEVELOPMENT

5.1.1 Flow Data

Hourly flow data was developed for the 1999–2023 POR using the flow gages listed in Table 5-1. Hourly flows were only available from SCE beginning in 2004 or 2005. The United States Geological Survey (USGS) gage daily average flow was used for each hour of the day before that hourly flows were available. Some discrepancies were found between the USGS (USGS 2022a,b,c) daily flow record and the SCE hourly flow record in WY 2007–2009 at SCE Gage No. 409. The USGS record was used when discrepancies occurred. The periods where the USGS record was used to replace the SCE hourly gage data records are shown in Table 5-2. An example of the hourly and daily flow discrepancies is shown in Figure 5-1 with the discrepancy periods highlighted in orange. The revised / combined hydrology data set is also shown in Figure 5-1.

5.1.2 Hourly Flow Dataset

The resulting hydrology set provides an hourly timestep dataset for use in the hydrologic model and the hydrologic alteration analysis. Annual flow volumes in acre-feet (ac-ft) for the hydrology dataset are shown in Table 5-3. The monthly average flows for the diversion into the Kern River No. 1 Conduit and release to the bypass reach are shown in Figure 5-2.

5.2 HYDROLOGIC ALTERATION ANALYSIS

The hydrologic alteration analysis compares observed flows in the bypass reach resulting from the operation of the Project (release to bypass reach) to flows that would be present in the bypass reach without the Project (Project inflow).

5.2.1 Time Series Plots for the POR

Time series plots for the POR are shown on an hourly time step in Figure 5-3 and Figure 5-4.

5.2.2 Flow Exceedance Plots for the POR

Hourly time step flow exceedance plots for the POR are shown for each month in Figure 5-5 and Figure 5-6.

5.2.3 Annual Plots Showing Mean Daily and 95%, 90%, 75%, 50%, 25%, 10%, and 5% Exceedance Flows.

Annual plots showing mean daily and 95%, 90%, 75%, 50%, 25%, 10%, and 5% exceedance flows are shown in Figure 5-7.

A table of annual exceedances for Project inflow is shown in Table 5-4 and for release to the bypass reach in Table 5-5.

5.2.4 Monthly Timing and Magnitude of Mean and Median Flow Conditions

Monthly mean and median Project inflow and release to the bypass reach are shown in Table 5-6, along with the change in the mean and median flow. Monthly mean flows are shown graphically in Figure 5-8.

5.2.5 Magnitude, Duration, and Timing of Annual High-Flow and Low-Flow Conditions

Average magnitude of the annual high and annual low 1-day, 3-day, 7-day, 30-day, and 90-day flow events are shown in Table 5-7. The timing of the maximum flow events is shown in Figure 5-9.

The count of average annual high-flow pulses (flow events that exceed the 25% exceedance level) and annual low-flows pulses (flows events below the 25% exceedance level) and the average duration of these pulses are shown in Table 5-8.

5.2.6 Rate, Timing, and Frequency of Hydrograph Changes

The count of hourly flow increases and decreases, and the mean hourly flow increase and decrease is shown in Table 5-9. The declining limb of the hydrograph is shown in Figure 5-10, with an average of dry, median, and wet years (below 25% exceedance, between 25% and 75% exceedance, and above 75% exceedance) highlighted.

5.3 OPERATIONS MODEL

5.3.1 Model Development

A spreadsheet-based operations model was developed to characterize existing Project operations on an hourly time step. The model operates the Project with the following priorities:

1. Make minimum instream flow requirement releases to the Project bypass reach, plus a buffer flow to ensure compliance.

2. Divert water to the powerhouse conduit up to the available capacity of the conduit.

3. Remaining inflow is released (spilled) to the Project bypass reach.

Minimum instream flow requirements and buffer flows (releases above the minimum flow requirement to ensure the minimum flow requirement is always met) are shown in Table 5-10.

In the model, the powerhouse conduit capacity is limited to 385 cfs to provide sufficient freeboard on the canal sections. Unit outages are modeled as they occurred historically as a representation of potential outage timing and frequency and limit the powerhouse capacity.

5.3.2 Model Validation

Plots showing model results compared to gaged flow for the diversion to Kern No. 1 Powerhouse conduit are shown in Figure 5-11 and Figure 5-12. Plots showing model results compared to gaged flow for the release to the project bypass reach are shown in Figure 5-13 and Figure 5-14.

Modeled annual flow compared to gaged annual flow is shown in Table 5-11. Annual flows are shown graphically for the release to the Project bypass reach in Figure 5-15 and for the diversion to the powerhouse conduit in Figure 5-16.

6.0 STUDY SPECIFIC CONSULTATION

This study included four hydrological modeling consultation meetings with the hydrology TWG (see Section 4.2) that included stakeholders with expertise in hydrology modeling.

7.0 OUTSTANDING STUDY PLAN ELEMENTS

There are no outstanding study plan elements. The AQ 1 – Hydrology Study is complete.

8.0 REFERENCES

FERC (Federal Energy Regulatory Commission). 2024. Study Plan Determination for the Kern River No. 1 Hydroelectric Project. March 14.

Richter, B.D., Baumgartner, J.V., Powell, J., and Braun, D.P. 1996. A Method for Assessing Hydrologic Alteration within Ecosystems.

SCE (Southern California Edison). 2024. Kern River No. 1 Hydroelectric Project (FERC Project No. 1930) Revised Study Plan. February 13.

USGS (United States Geological Survey). 2022a. USGS 11192000 Kern River No 1 Conduit near Democrat Springs. Available at: https://waterdata.usgs.gov/nwis/dv/?site_no=11192000. Accessed August 22, 2022.

_____. 2022b. USGS 11192500 Kern River near Democrat Springs (River only). Available at: https://waterdata.usgs.gov/nwis/dv/?site_no=11192500. Accessed August 22, 2022.

_____. 2022c. USGS 11192501 Kern River near Democrat Springs Total Flow. Available at: https://waterdata.usgs.gov/nwis/dv/?site_no=11192501. Accessed August 22, 2022.

TABLES

Table 5-1. Project Flow Gages

Station	USGS Gage No. (daily average flow, cfs)	SCE Gage No. (hourly average flow, cfs)	POR
Kern River No 1 Conduit near Democrat Springs	11192000	410	USGS: 1999–2003 and 2005–2023 SCE: 2004–2023
Kern River near Democrat Springs (River Only)	11192500	409	USGS: 1999–2023 SCE: 2005–2023
Kern River near Democrat Springs Total Flow	11192501	N/A	USGS: 1999–2023

Key: POR = period of record
SCE = Southern California Edison
USGS = United States Geological Survey

Table 5-2. Time Periods That Daily Average USGS Gage Data Were Used to Estimate Hourly Hydrology

Time Period
March 12, 2007, to July 16, 2007
October 3, 2007, to December 1, 2007
March 22, 2008, to May 6, 2008
September 3, 2008 to November 17, 2008
June 12, 2009, to July 20, 2009

Table 5-3. Annual Flow Volumes for the Hydrology Dataset

Water Year	Kern River near Democrat Springs (River Only) (ac-ft)	Kern River No 1 Conduit near Democrat Springs (ac-ft)	Total Project Inflow (ac-ft)
1999	339,126	269,454	608,580
2000	230,172	232,290	462,461
2001	196,044	185,575	381,619
2002	120,234	220,920	341,154
2003	285,398	169,272	454,670
2004	274,816	165,446	440,262
2005	685,244	168,368	853,611
2006	1,017,034	81,910	1,098,945
2007	178,527	186,211	364,738
2008	392,651	74,970	467,621
2009	279,215	171,928	451,144
2010	642,122	81,230	723,353
2011	1,086,910	251,831	1,338,740
2012	239,940	244,564	484,503
2013	117,081	114,136	231,217
2014	61,580	106,909	168,490
2015	30,712	105,262	135,974
2016	64,754	189,169	253,923
2017	1,558,647	179,263	1,737,909
2018	286,359	233,530	519,889
2019	880,313	202,479	1,082,792
2020	217,605	226,271	443,876
2021	30,811	156,655	187,466
2022	47,237	159,640	206,877
2023	1,725,595	178,189	1,903,783
Average	**439,525**	**174,219**	**613,744**

Key: ac-ft = acre-feet

Table 5-4. Annual Exceedance Flows, Project Inflow

Year	Mean (cfs)	95% Exd (cfs)	90% Exd (cfs)	75% Exd (cfs)	50% Exd (cfs)	25% Exd (cfs)	10% Exd (cfs)	5% Exd (cfs)
1999	618	187	221	391	540	775	1,227	1,328
2000	638	178	200	324	466	954	1,280	1,368
2001	527	190	207	277	416	679	1,031	1,365
2002	482	212	236	330	409	567	868	1,017
2003	634	226	237	371	466	953	1,305	1,372
2004	585	213	237	273	460	858	1,092	1,212
2005	1,293	363	462	583	865	1,824	3,033	3,219
2006	1,428	298	325	375	626	1,948	4,663	4,705
2007	466	150	163	265	392	598	903	989
2008	658	123	231	296	517	991	1,387	1,559
2009	650	152	191	335	549	874	1,293	1,428
2010	1,037	180	220	330	841	1,829	2,152	2,380
2011	1,922	386	436	1,085	1,531	2,787	3,982	4,134
2012	522	160	186	255	459	631	1,070	1,171
2013	294	37	113	175	289	381	507	594
2014	243	106	118	139	213	350	405	431
2015	184	67	70	129	168	239	310	325
2016	358	136	153	197	331	396	665	728
2017	2,513	346	387	896	1,554	4,405	5,063	5,334
2018	618	164	180	257	411	1,065	1,353	1,468
2019	1,580	112	309	406	1,031	2,744	3,669	4,439
2020	514	138	159	196	377	818	1,072	1,157
2021	259	99	111	151	239	364	423	481
2022	276	99	109	154	250	395	458	492
2023	3,472	319	393	1,073	3,325	5,424	6,646	7,083

Key: cfs = cubic feet per second
Exd = exceedance

Table 5-5. Annual Exceedance Flows, Release to Bypass Reach

Year	Mean (cfs)	95% Exd (cfs)	90% Exd (cfs)	75% Exd (cfs)	50% Exd (cfs)	25% Exd (cfs)	10% Exd (cfs)	5% Exd (cfs)
1999	280	21	22	26	166	415	847	958
2000	377	19	28	90	288	599	885	981
2001	215	20	21	25	58	288	633	987
2002	180	18	19	22	56	274	489	672
2003	395	32	37	76	244	641	1,016	1,080
2004	363	29	29	61	321	612	815	892
2005	1,113	240	275	345	767	1,720	2,721	2,899
2006	1,243	34	38	223	570	1,617	4,326	4,648
2007	281	54	65	149	227	373	581	664
2008	500	28	29	65	396	877	1,091	1,241
2009	467	40	53	154	371	789	981	1,110
2010	856	28	33	180	615	1,463	2,021	2,238
2011	1,549	29	56	694	1,169	2,399	3,587	3,735
2012	232	28	29	36	113	354	680	776
2013	183	35	37	64	161	292	341	398
2014	61	21	21	23	46	66	156	192
2015	42	16	18	20	25	61	65	106
2016	90	20	20	23	30	81	277	345
2017	2,215	22	26	612	1,442	4,139	4,708	4,980
2018	337	24	27	29	109	702	992	1,103
2019	1,275	35	65	120	709	2,375	3,299	4,067
2020	236	16	16	27	102	423	680	765
2021	45	17	17	18	23	58	69	130
2022	65	20	21	23	48	75	160	178
2023	3,178	20	30	1,073	3,087	5,143	6,279	6,725

Key: cfs = cubic feet per second
Exd = exceedance

Table 5-6. Monthly Mean and Median Flows

Month	Mean Flow (cfs)			Median Flow (cfs)		
	Project Inflow	Release to Bypass Reach	Change	Project Inflow	Release to Bypass Reach	Change
January	398	224	-174	330	113	-216
February	452	288	-163	333	147	-186
March	678	447	-231	409	123	-286
April	1,032	743	-289	509	186	-323
May	1,530	1,212	-318	763	423	-340
June	1,875	1,530	-345	1,227	858	-369
July	1,510	1,182	-328	1,226	892	-334
August	1,013	721	-292	860	555	-305
September	625	413	-212	435	194	-241
October	441	257	-185	271	35	-236
November	302	133	-169	213	30	-183
December	289	115	-174	264	32	-232

Key: cfs = cubic feet per second

Table 5-7. Average Magnitude of Annual Extremes

Duration	Minimum Flow (cfs)			Maximum Flow (cfs)		
	Project Inflow	Release to Bypass Reach	Change	Project Inflow	Release to Bypass Reach	Change
1-day	134	31	-103	2,289	1,990	-300
3-day	141	33	-108	2,243	1,943	-301
7-day	150	35	-115	2,176	1,872	-304
30-day	180	41	-139	2,015	1,697	-317
90-day	233	67	-166	1,745	1,430	-316

Key: cfs = cubic feet per second

Table 5-8. Average Annual Pulse Flow Events

Indicator	Project Inflow	Release to Bypass Reach	Change
Average count of annual high-flow pulses	3.7	4.3	0.6
Average count of annual low-flow pulses	4.7	5.5	0.8
Average duration of high-flow pulses, days	22.8	19.6	-3.2
Average duration of low-flow pulses, days	19.4	16.7	-2.7

Table 5-9. Average Annual Hydrograph Changes

Indicator	Project Inflow	Release to Bypass reach	Change
Average count of increases in flow per year	1,063	671	-392
Average count of increases in flow per year	1,100	730	-370
Mean flow increase, cfs per hour	1.7	1.5	-0.2
Mean flow decrease, cfs per hour	-1.7	-1.5	0.2

Key: cfs = cubic feet per second

Table 5-10. Minimum Instream Flow Requirements and Buffer Flows

Season	Minimum Instream Flow	Buffer Flow
October 1 through May 31	15 cfs	5 cfs
June 1 through September 30	50 cfs	10 cfs

Key: cfs = cubic feet per second

Table 5-11. Annual Flow Volumes, Modeled and Gaged

Water Year	Inflow (ac-ft)	Release to Project Bypass Reach (ac-ft)		Diversion to Powerhouse Conduit (ac-ft)	
		Gaged	Modeled	Gaged	Modeled
1999	608,580	339,126	330,537	269,454	278,043
2000	462,461	230,172	225,129	232,290	237,333
2001	381,619	196,044	198,500	185,575	183,119
2002	341,154	120,234	108,264	220,920	232,891
2003	454,670	285,398	278,247	169,272	176,423
2004	440,262	274,816	268,909	165,446	171,353
2005	853,611	685,244	679,924	168,368	173,687
2006	1,098,945	1,017,034	1,006,921	81,910	92,024
2007	364,738	178,527	155,929	186,211	208,810
2008	467,621	392,651	381,592	74,970	86,028
2009	451,144	279,215	250,252	171,928	200,892
2010	723,353	642,122	642,089	81,230	81,264
2011	1,338,740	1,086,910	1,087,686	251,831	251,054
2012	484,503	239,940	237,777	244,564	246,727
2013	231,217	117,081	115,558	114,136	115,659
2014	168,490	61,580	58,300	106,909	110,190
2015	135,974	30,712	29,409	105,262	106,565
2016	253,923	64,754	61,566	189,169	192,357
2017	1,737,909	1,558,647	1,547,226	179,263	190,683
2018	519,889	286,359	275,165	233,530	244,725
2019	1,082,792	880,313	867,105	202,479	215,687
2020	443,876	217,605	213,996	226,271	229,880
2021	187,466	30,811	31,322	156,655	156,144
2022	206,877	47,237	45,571	159,640	161,306
2023	1,903,783	1,725,595	1,712,624	178,189	191,160
Average	**613,744**	**439,525**	**432,384**	**174,219**	**181,360**

Key: ac-ft = acre-feet

FIGURES

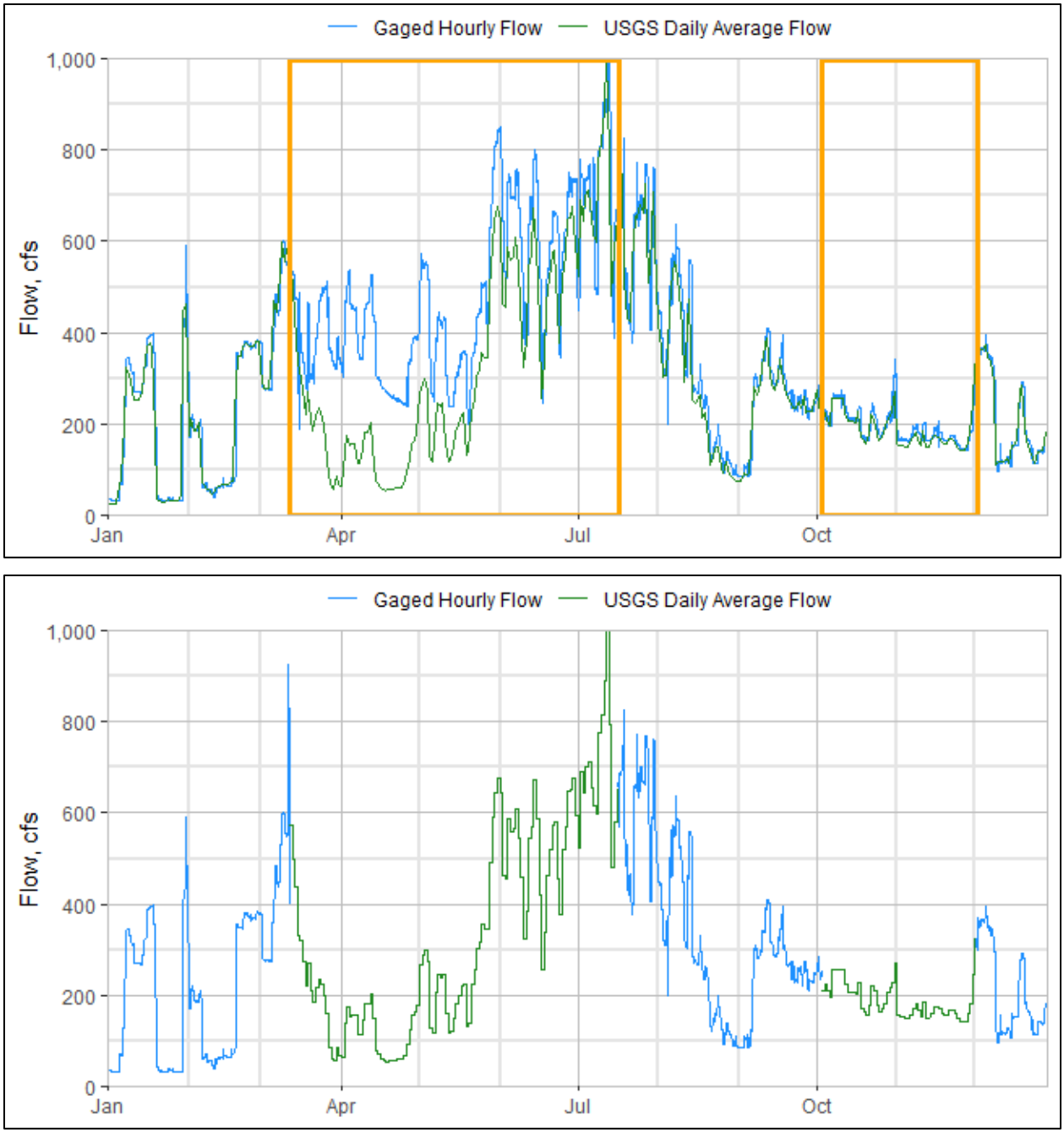


Figure 5-1. **Year 2007 USGS Gage No. 11192500 daily average flow and SCE Gage No. 409 hourly average flow showing an example of hourly flow discrepancies highlighted in yellow (top) and a revised combined hourly flow dataset using the USGS daily average flows to replace the SCE Gage No. 409 hourly flow discrepancies (bottom).**

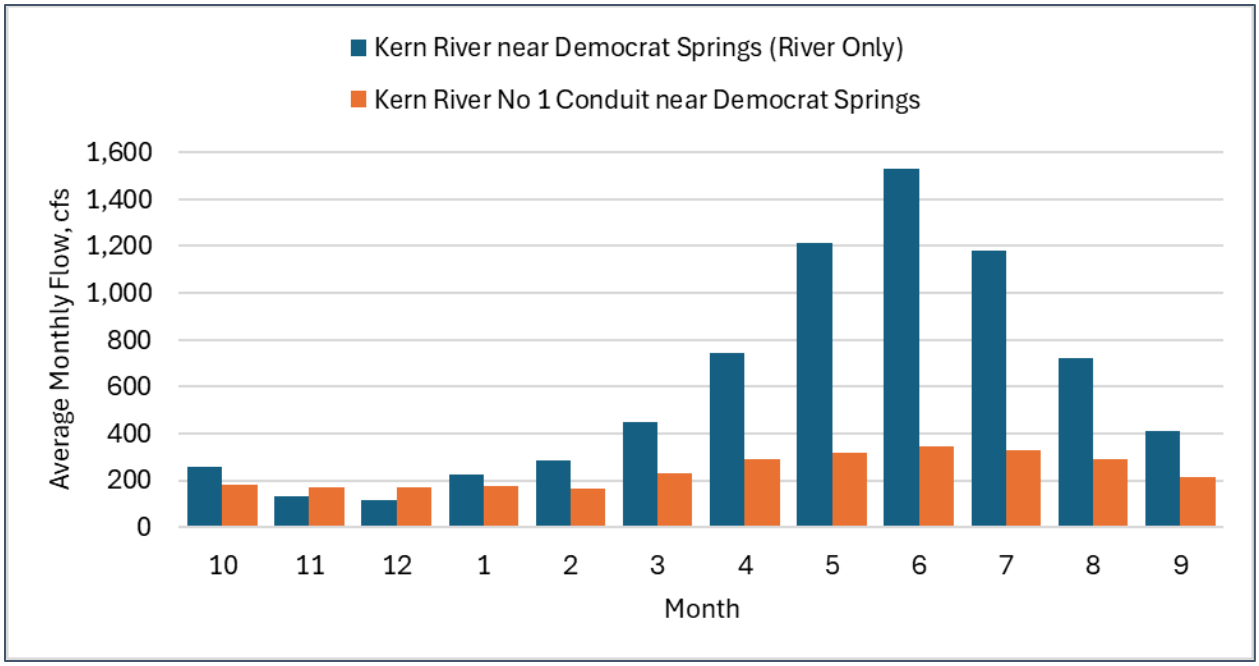


Figure 5-2. Average Monthly Flow, Water Years 1999–2023

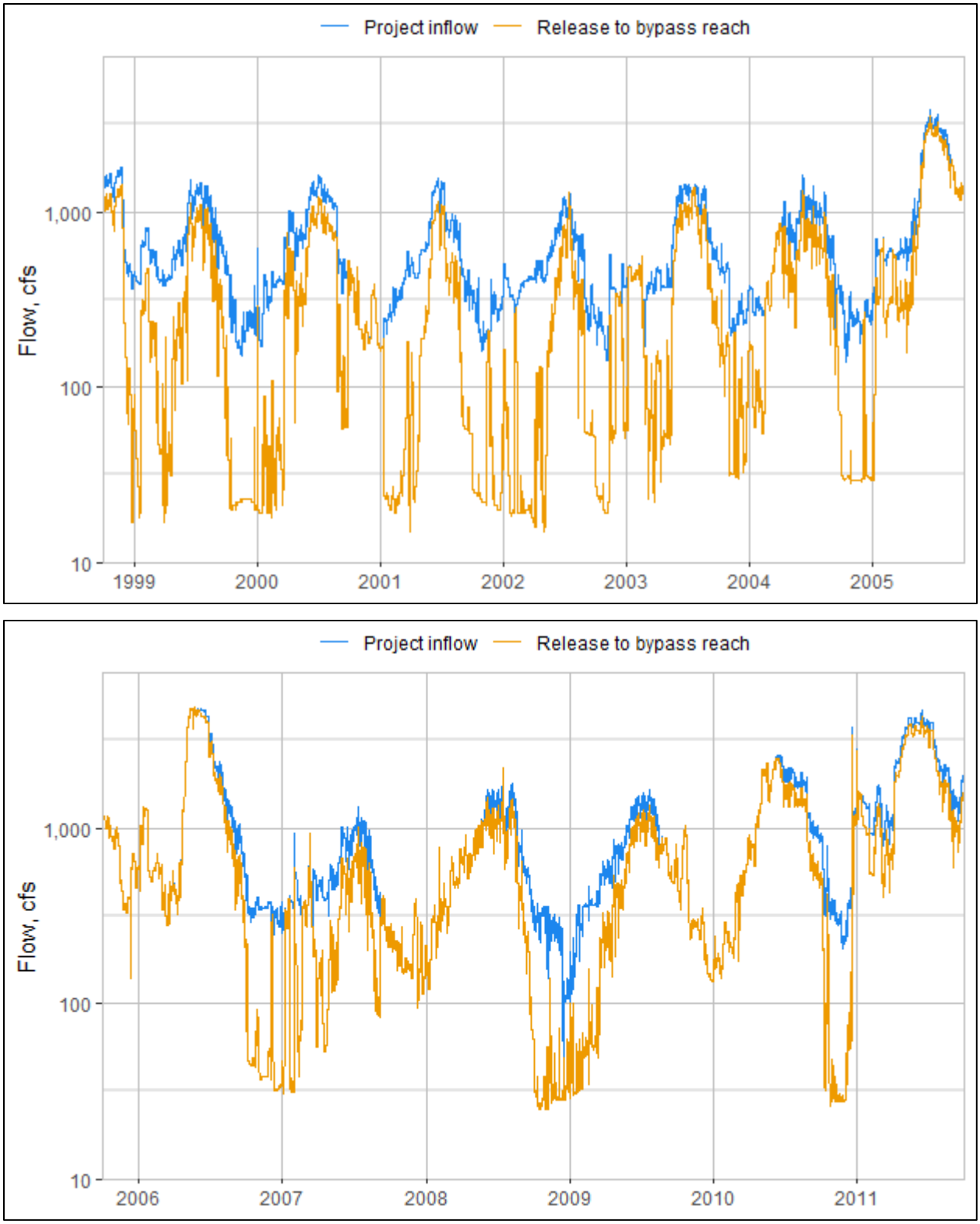


Figure 5-3. Project Inflow and Release to Bypass Reach, Water Years 1999 through 2011

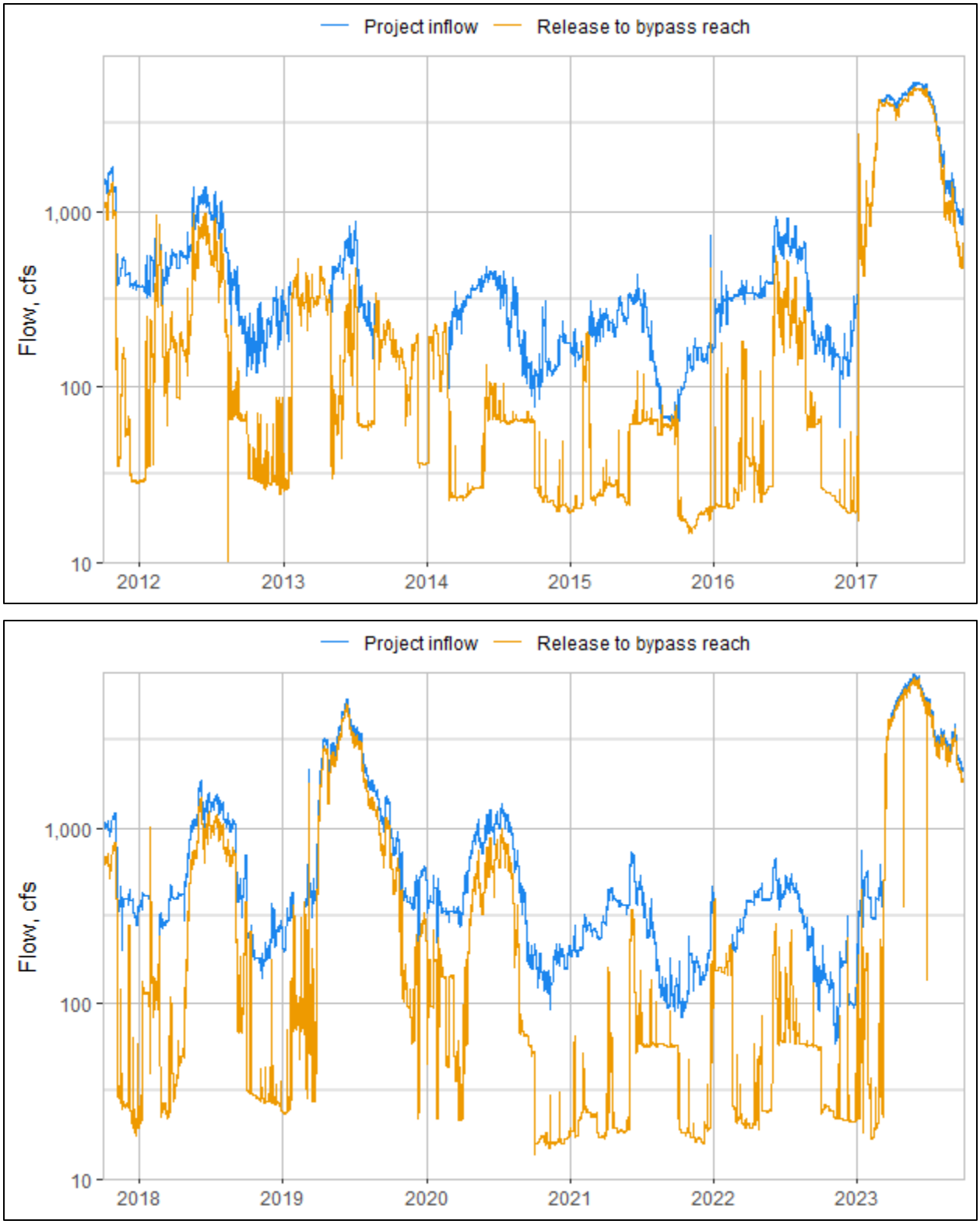


Figure 5-4. Project Inflow and Release to Bypass Reach, Water Years 2012 through 2023

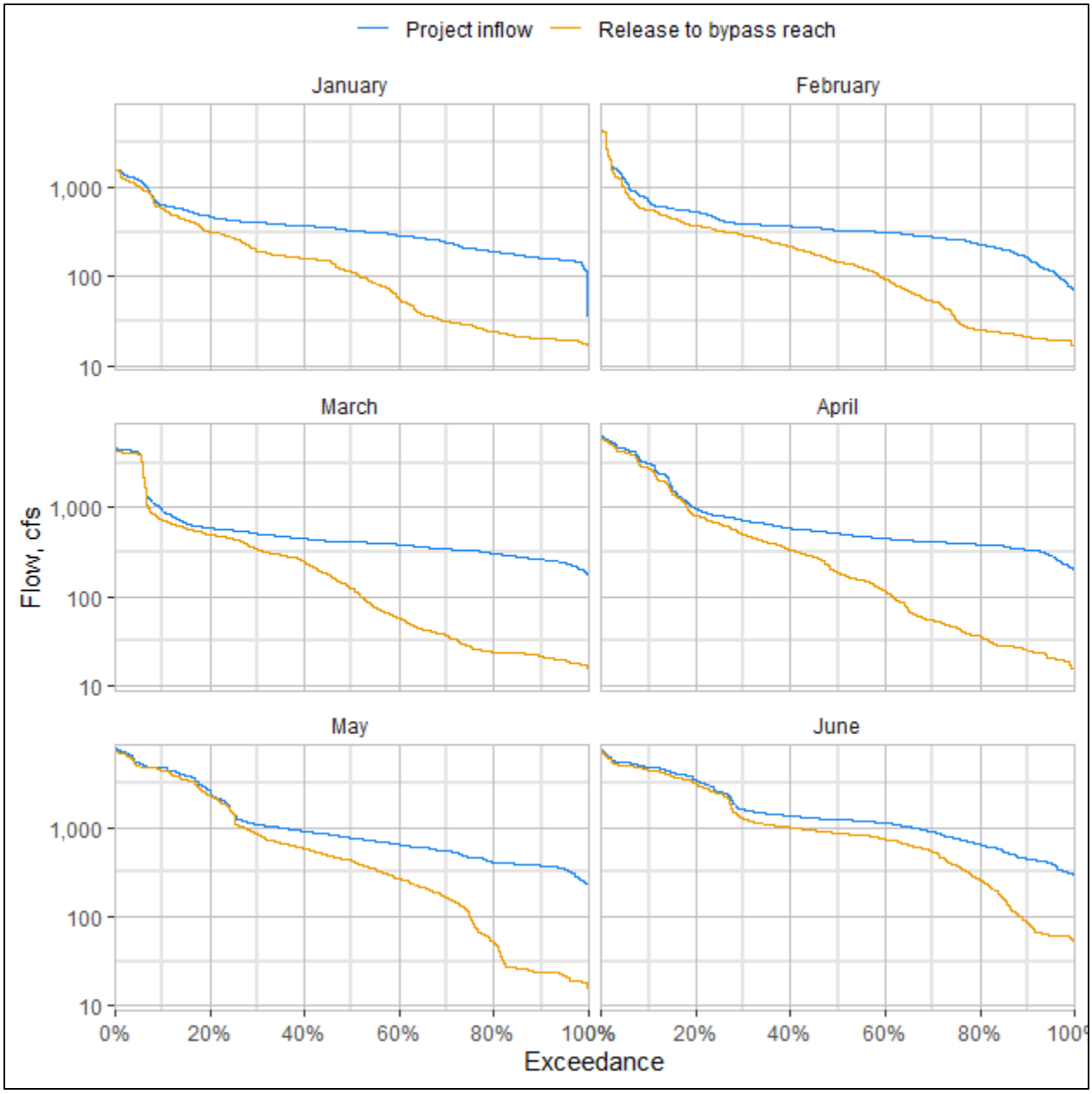


Figure 5-5. Hourly Flow Exceedance Plots, January through June

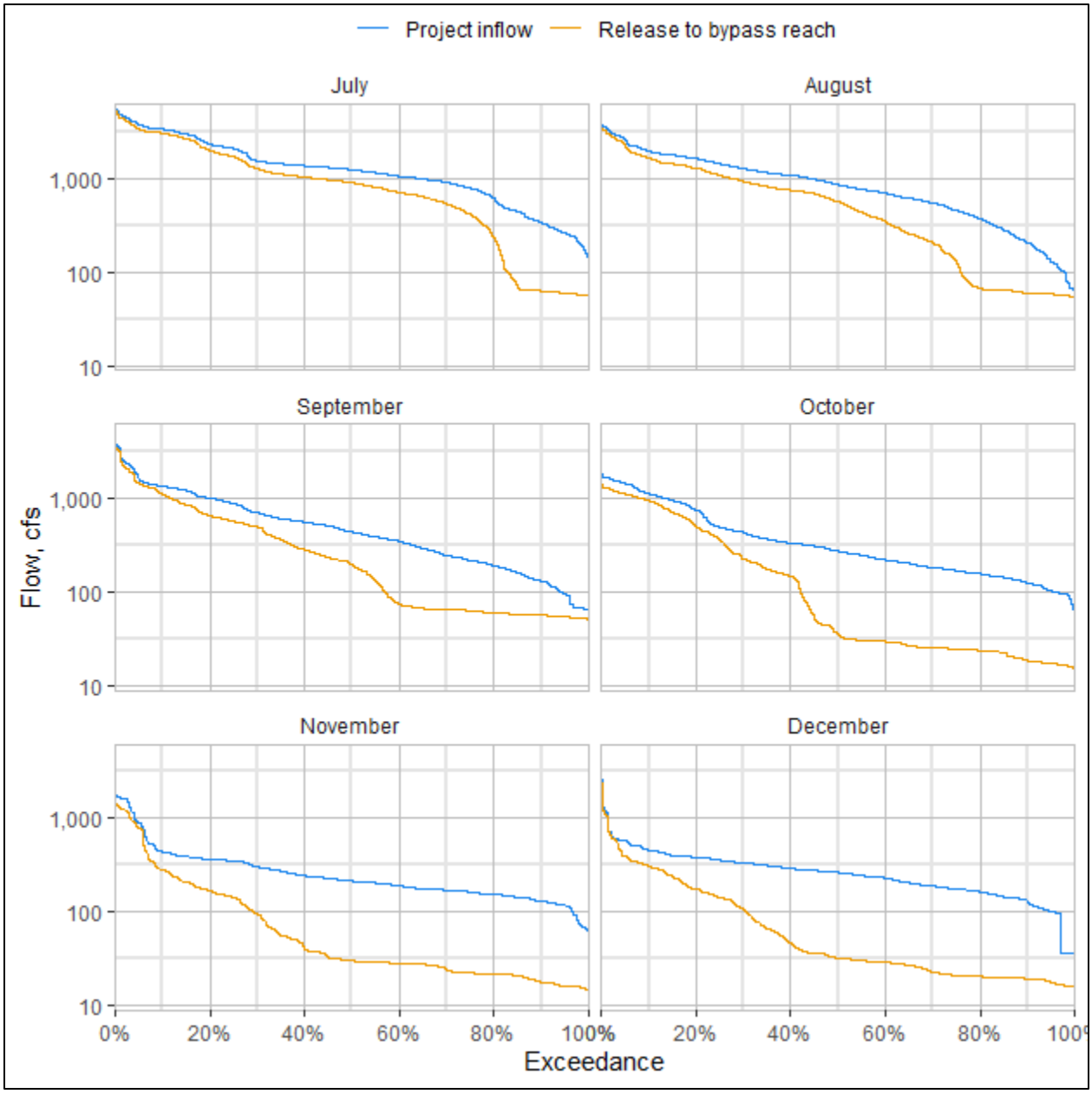


Figure 5-6. Hourly Flow Exceedance Plots, July through December

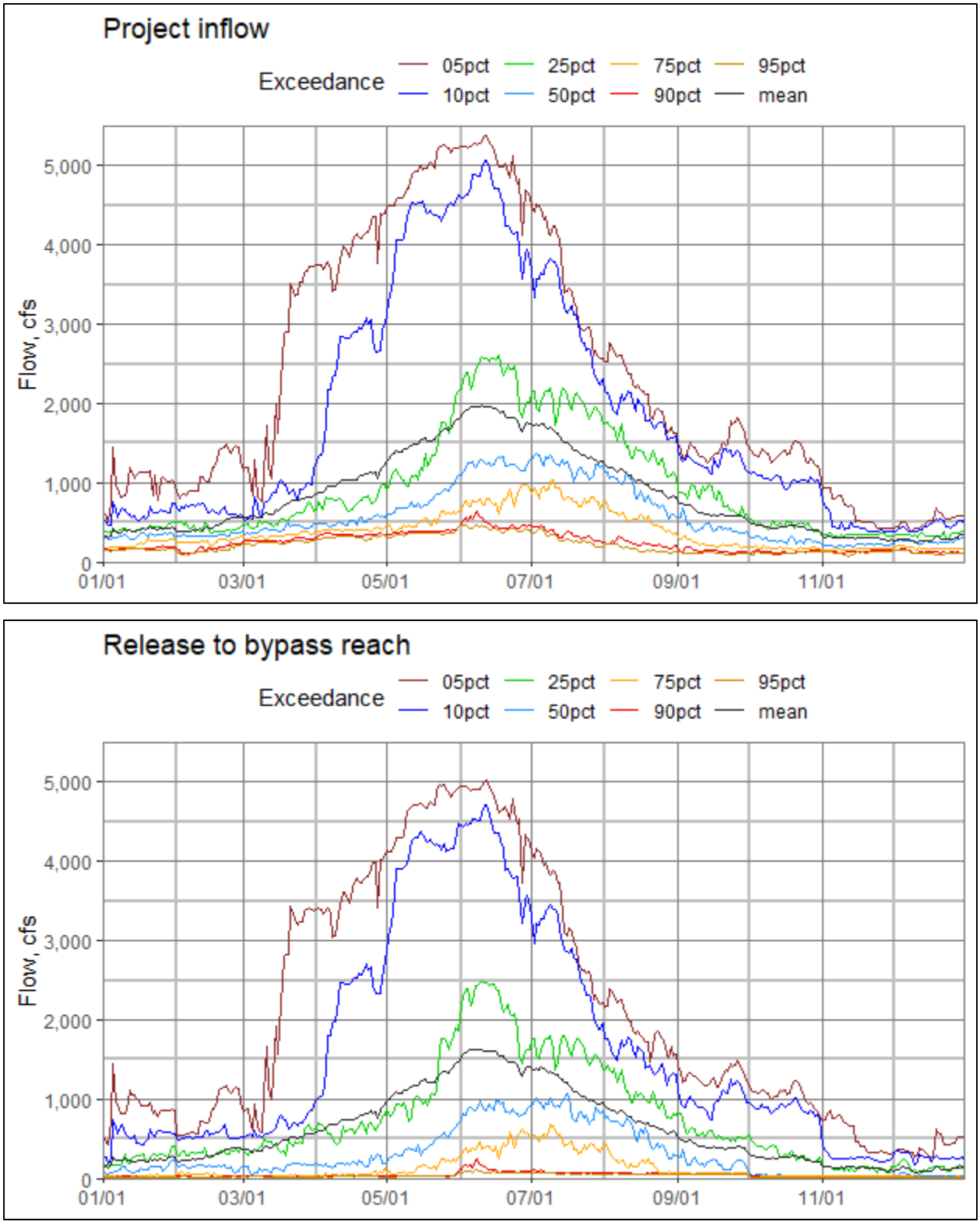


Figure 5-7. Yearly Exceedance Plots for the 1999–2023 Period-of-Record for Project Inflow (top) and Release to Bypass Reach (bottom)

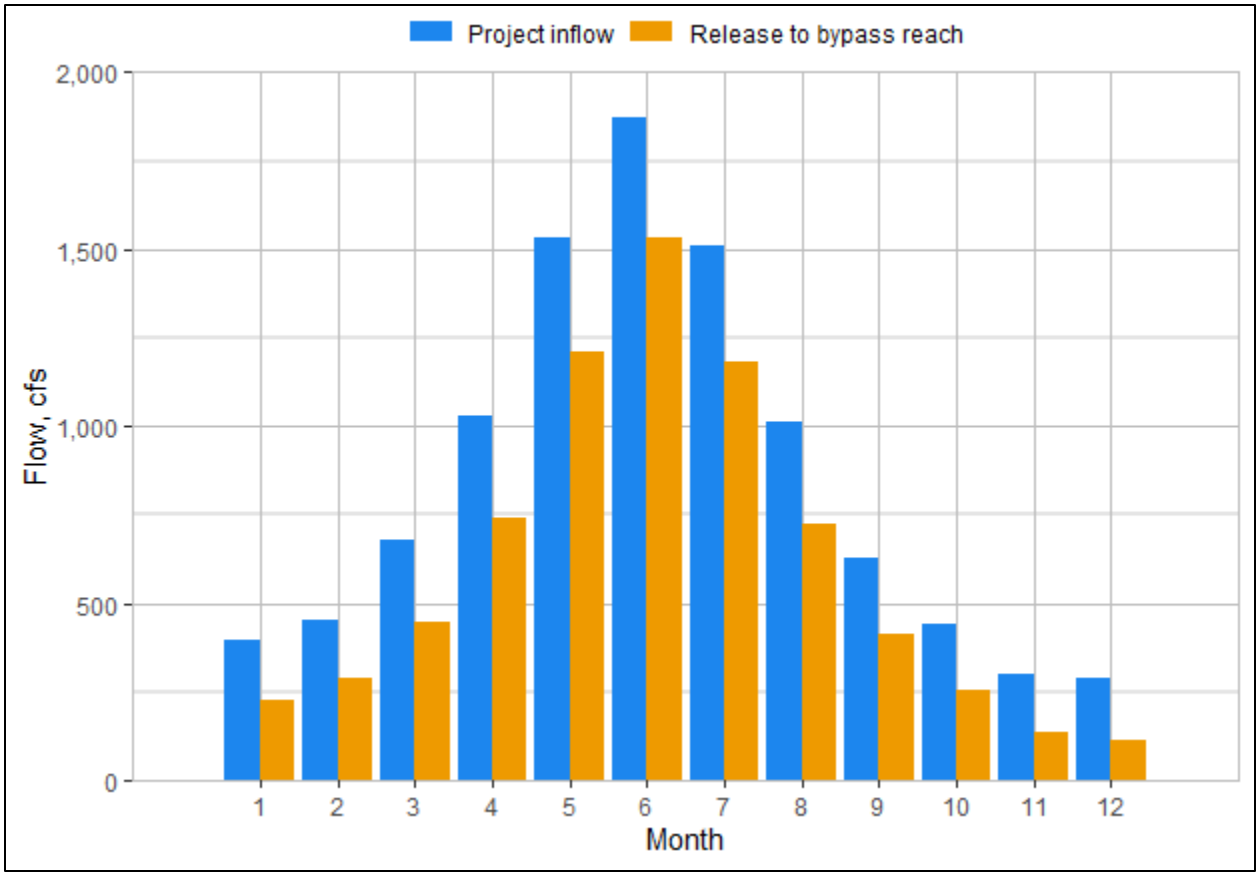


Figure 5-8. Monthly Mean Flows

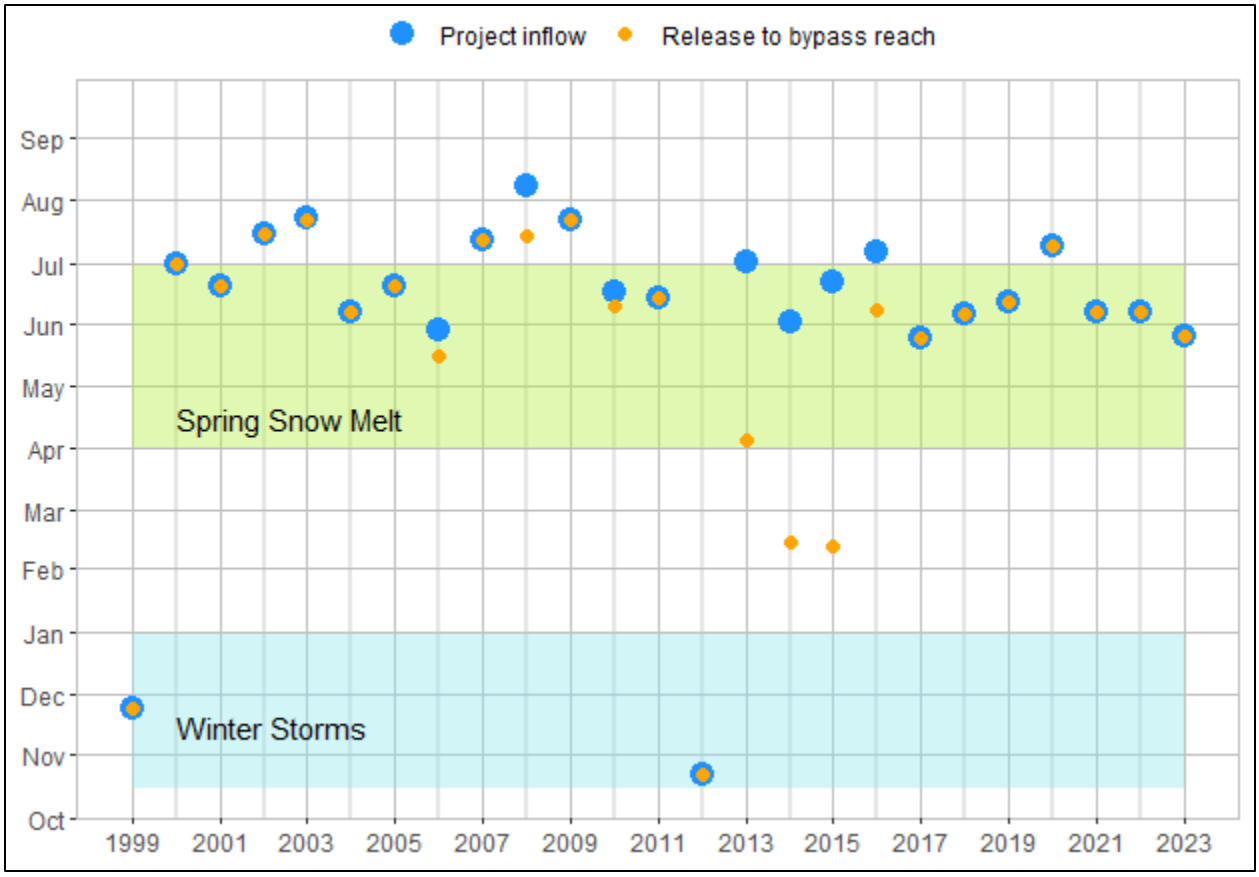


Figure 5-9. Timing of Annual Peak Flow

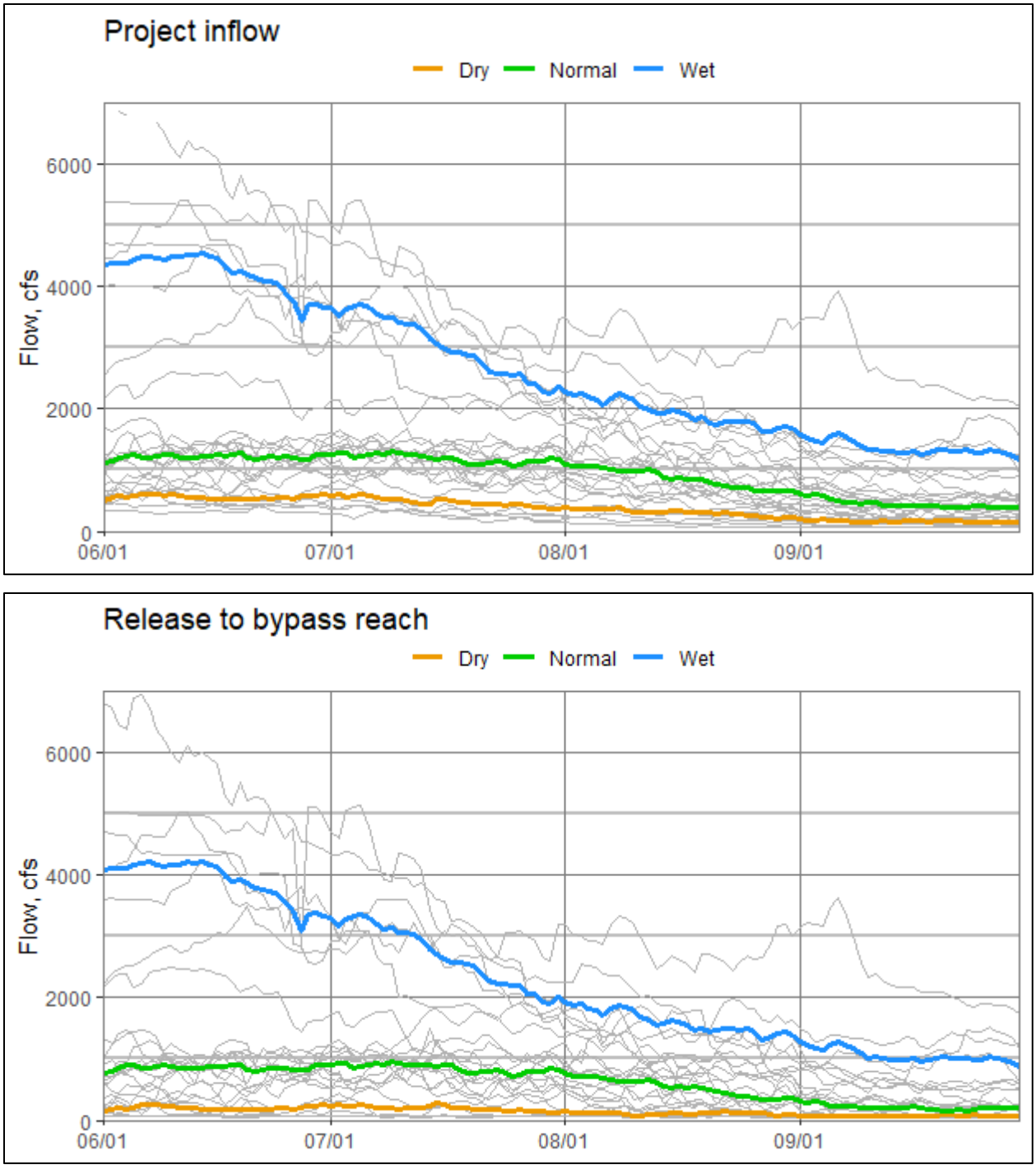


Figure 5-10. Declining Limb Hydrograph for the 1999–2023 Period-of-Record for Project Inflow (top) and Release to Bypass Reach (bottom)

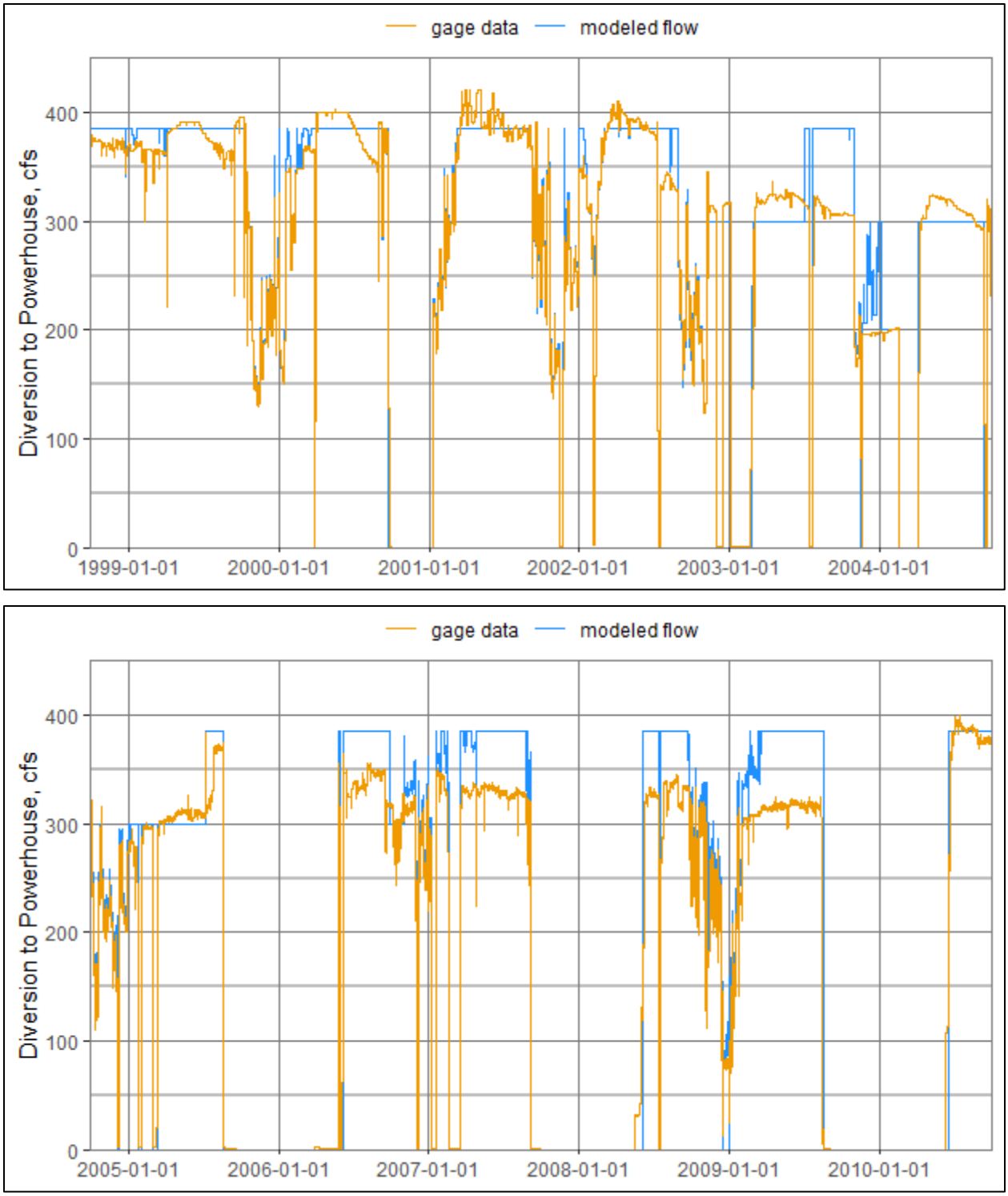


Figure 5-11. Modeled Diversion to KR1 Powerhouse Conduit, Water Years 1999 through 2010

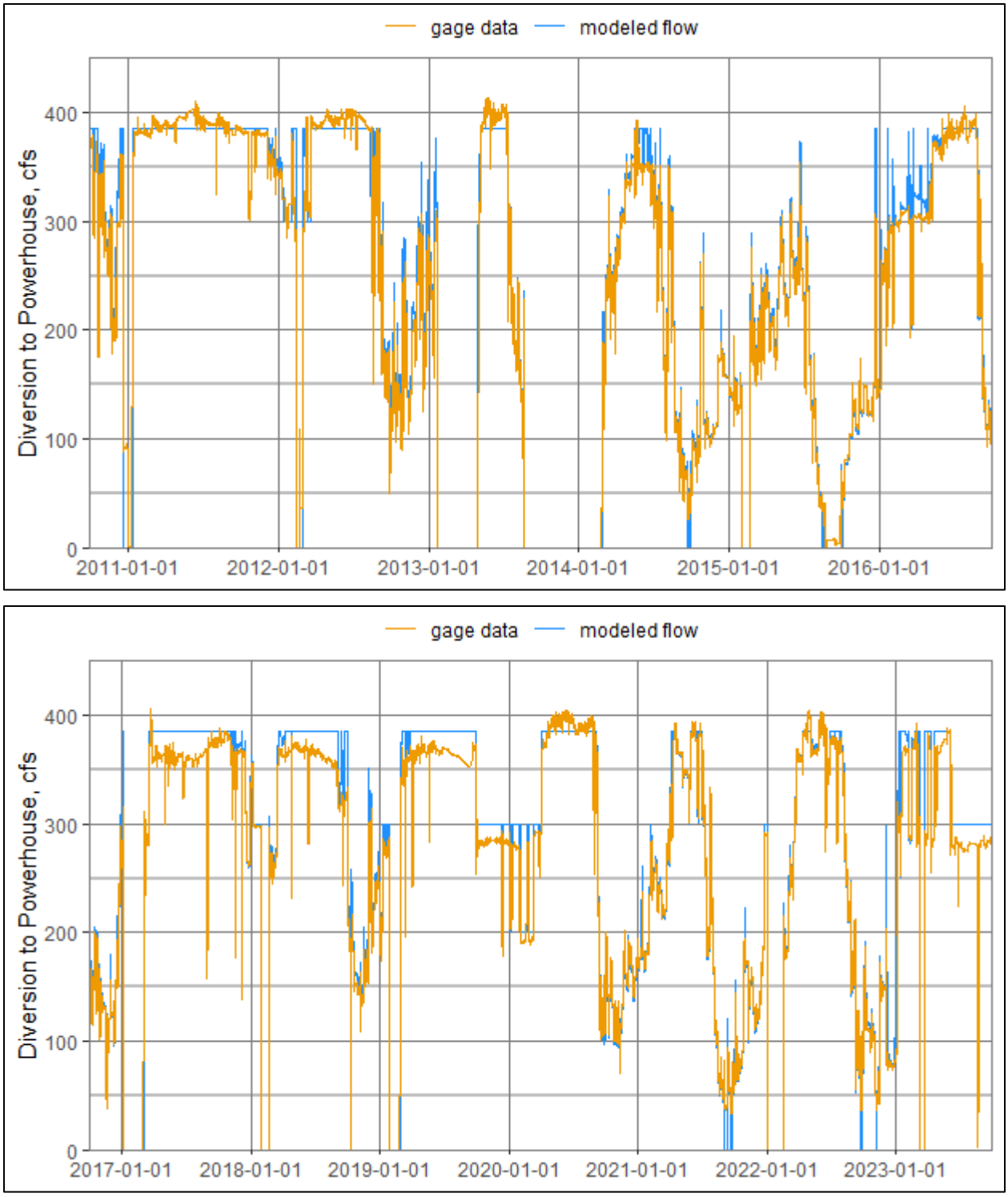


Figure 5-12. Modeled Diversion to KR1 Powerhouse Conduit, Water Years 2011 through 2023

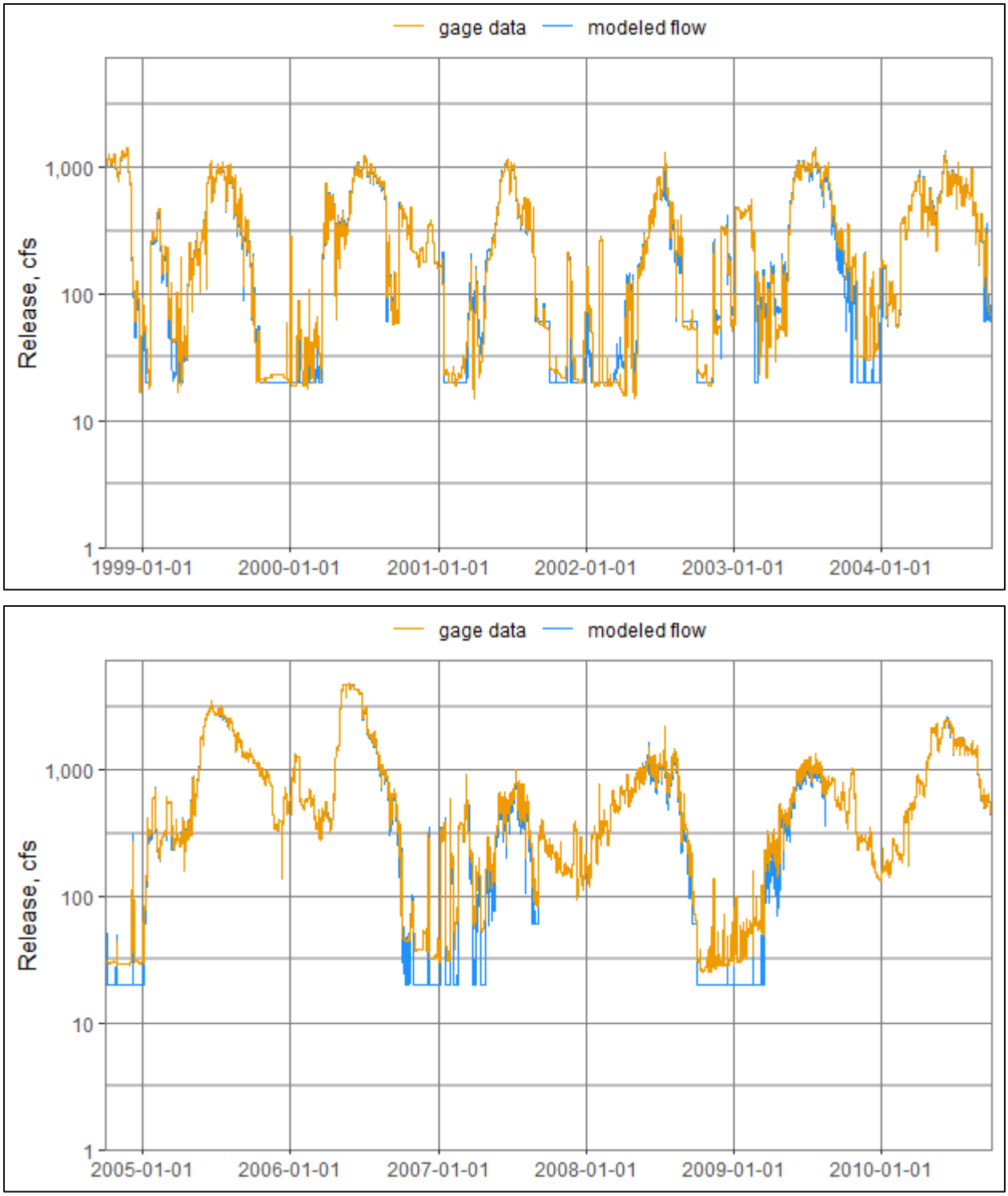


Figure 5-13. Modeled Release to Project Bypass Reach, Water Years 1999 through 2010

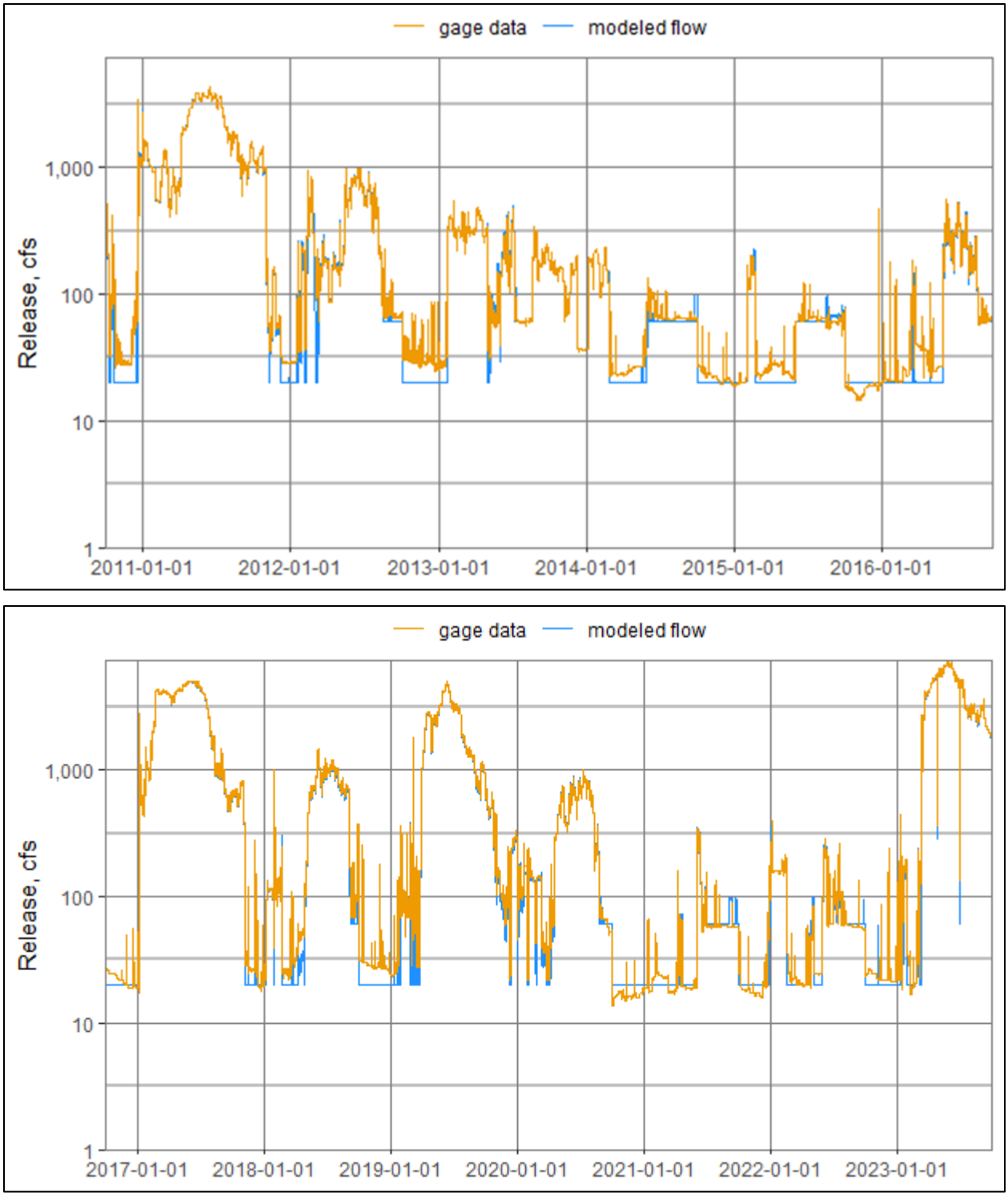


Figure 5-14. Modeled Release to Project Bypass Reach, Water Years 2011 through 2023

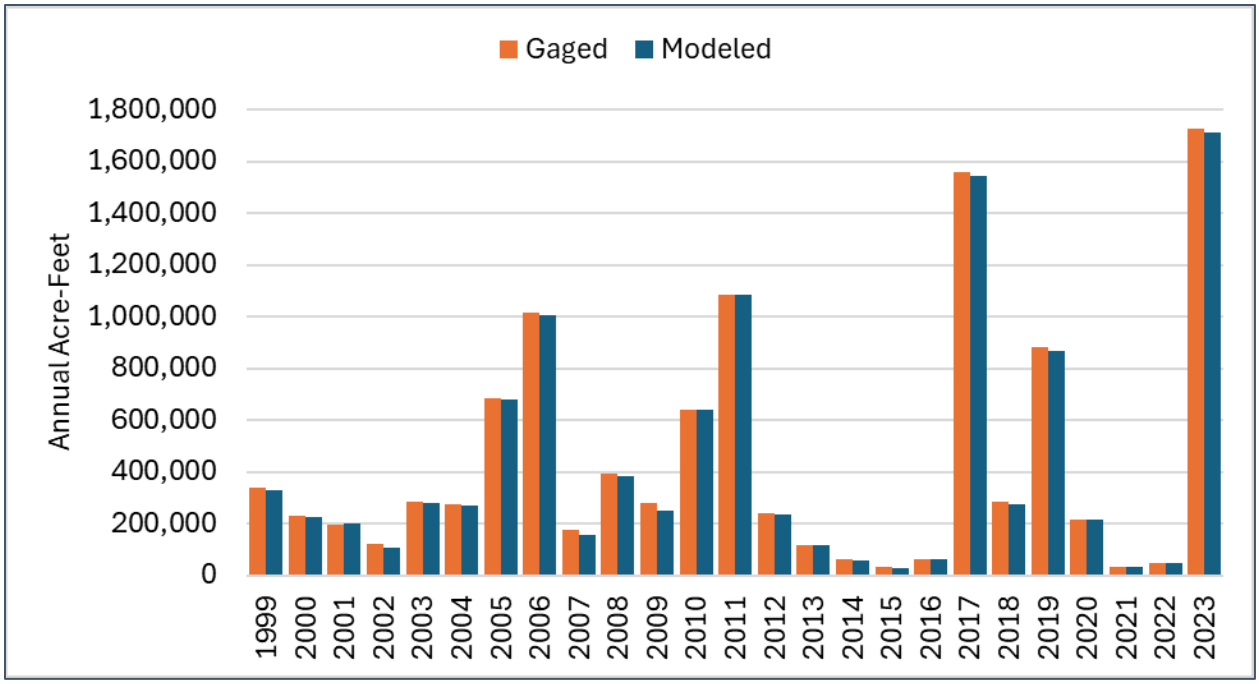


Figure 5-15. Annual Release to Project Bypass Reach, Modeled and Observed

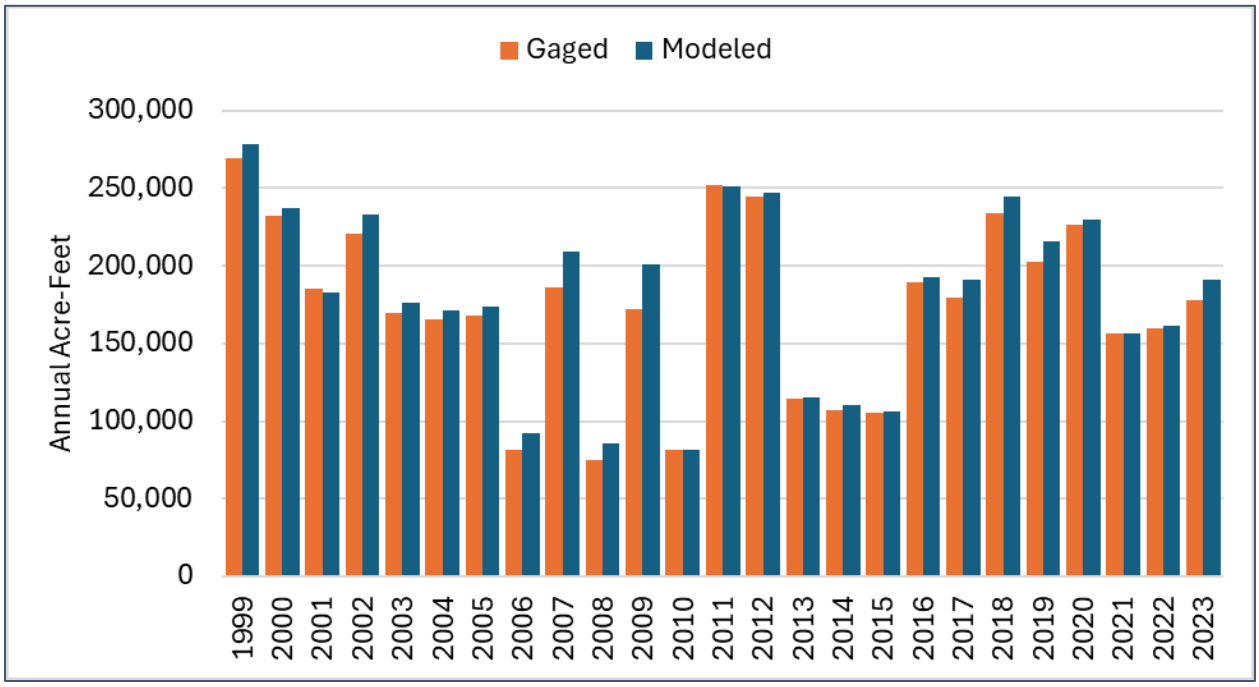
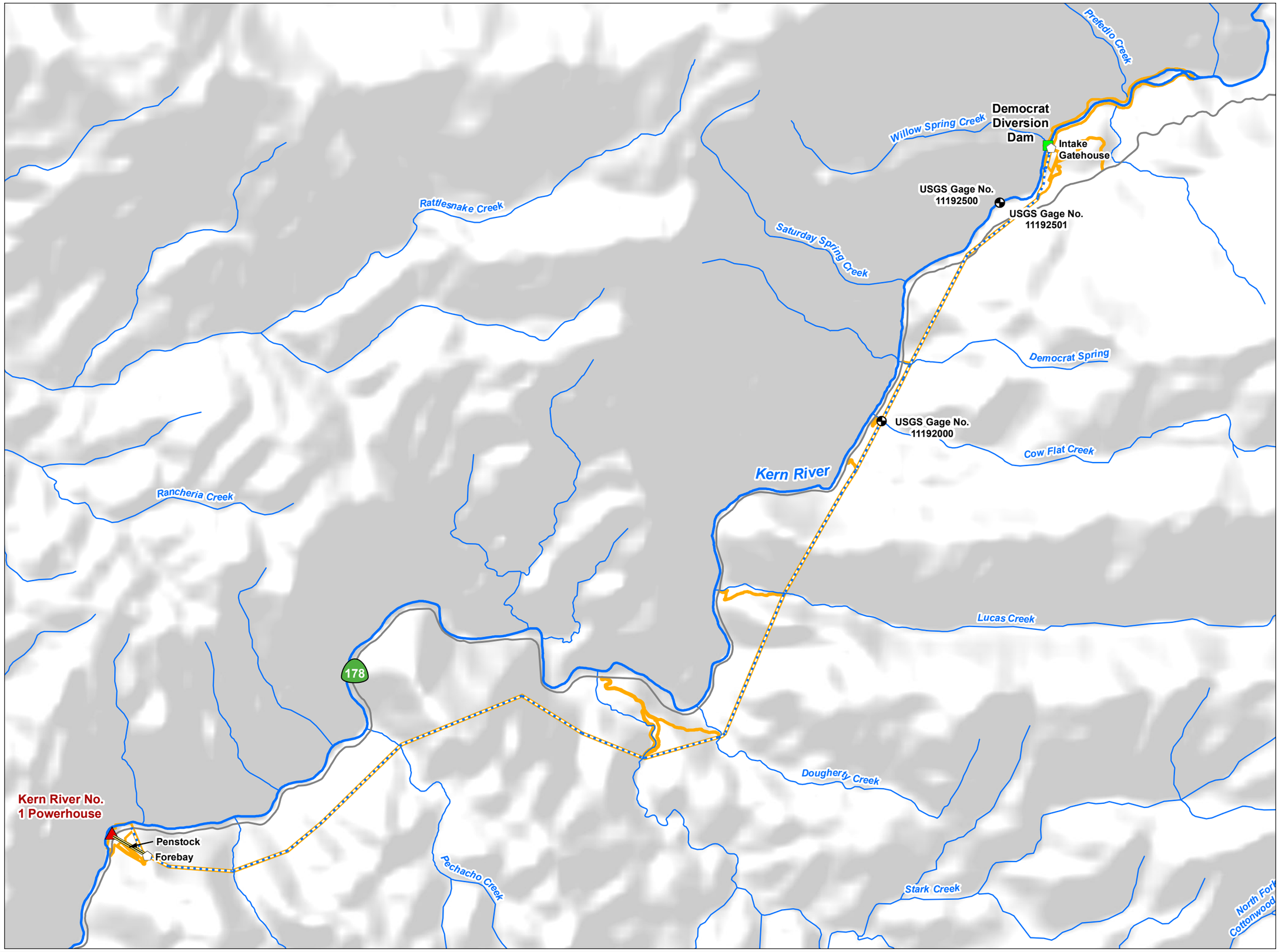


Figure 5-16. Annual Diversion to KR1 Powerhouse Conduit, Modeled and Observed

MAPS

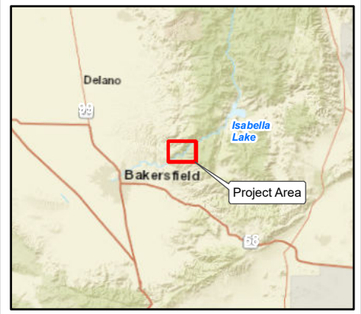


Facilities

- Dam
- Gage Station
- Powerhouse
- Water Conveyence Feature
- Flowline
- Penstock
- FERC Boundary

Other Features

- Watercourse
- Highway



SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1

Study Area and Gage Locations

Date: 1/4/2025

0 0.25 0.5 Miles

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company

APPENDIX B

AQ 2 – WATER QUALITY/WATER TEMPERATURE TECHNICAL MEMORANDUM

Copyright 2026 Southern California Edison

AQ 2 – WATER QUALITY/WATER TEMPERATURE TECHNICAL MEMORANDUM

KERN RIVER NO. 1 HYDROELECTRIC PROJECT
FERC PROJECT NO. 1930

PREPARED FOR:



March 2026

TABLE OF CONTENTS

1.0 Introduction 1

2.0 Study Objectives 1

3.0 Study Area 1

4.0 Methods 1

4.1 Study Plan Variances 2

4.2 Water Quality Sampling Locations 3

4.3 Seasonal *In-Situ* Field Measurements 3

4.4 Seasonal Water Quality Grab Samples 4

4.5 Bacterial Sampling 5

4.6 Water Temperature 5

4.7 Laboratory Analysis 6

4.8 Methylmercury Fish Tissue Sampling 7

4.9 Reporting 7

5.0 Results Summary 7

5.1 Seasonal *In-Situ* Field Measurements 8

5.1.1 Water Temperature 8

5.1.2 Dissolved Oxygen 8

5.1.3 Conductivity (measured as Specific Conductance) 8

5.1.4 pH 9

5.1.5 Alkalinity 9

5.1.6 Salinity 9

5.1.7 Turbidity 9

5.2 Seasonal Water Quality Grab Samples 10

5.3 Bacterial Sampling 10

5.4 Continuous Water Temperature Data and Meteorological Data 11

5.5 Laboratory Analysis Procedures and QA/QC 12

5.6 Methylmercury and Total Mercury Fish Tissue Sampling 12

6.0 Study Specific Consultation 13

7.0 References 13

LIST OF FIGURES

Figure 5-1. 2024 Kern River Daily Average Water Temperature (top) and 15-minute Temperature Data (bottom) with Daily Mean Discharge (total inflow and flow downstream of Democrat Dam) 54

Figure 5-2. 2025 Kern River Daily Average Water Temperature (top) and 15-minute Temperature Data (bottom) with Daily Mean Discharge (total inflow and flow downstream of Democrat Dam) 55

Figure 5-3. Kern River above Democrat Dam, Site KR 55.6, Water Temperature and Daily Mean Discharge for 2024 (Top) and 2025 (Bottom)..... 56

Figure 5-4. Kern River between Democrat Dam and Instream Flow Release, Site KR 54.36 Water Temperature and Daily Mean Discharge for 2024 (Top) and 2025 (Bottom) 57

Figure 5-5. Kern River below Instream Flow Release, KR 54.2 Water Temperature and Daily Mean Discharge for 2024 (Top) and 2025 (Bottom)..... 58

Figure 5-6. Kern River near USGS gage 11192500; below Democrat Dam, KR 53.84 Water Temperature and Daily Mean Discharge for 2024 (Top) and 2025 (Bottom) 59

Figure 5-7. Kern River near Lucas Creek, KR 50.3 Water Temperature and Daily Mean Discharge for 2024 (Top) and 2025 (Bottom) 60

Figure 5-8. Kern River No. 1 Powerhouse Tailrace, KRTR 43.94 Water Temperature and Daily Mean Discharge for 2024 (Top) and 2025 (Bottom)..... 61

Figure 5-9. Kern River upstream of Kern River No. 1 Powerhouse, Site KR 44.0 Water Temperature and Daily Mean Discharge for 2024 (Top) and 2025 (Bottom) 62

Figure 5-10. 2024 and 2025 Meteorological Station (MET) Data (Daily Average Air Temperature) near the Project Area (Isabella Dam [ISB]) and Arvin-Edison – San Joaquin Valley – Station 125..... 63

Figure 5-11. 2024 Fish Tissue Methylmercury Concentrations at Democrat Dam Impoundment..... 64

LIST OF TABLES

Table 3-1. Water Quality and Water Temperature Sampling Locations 16

Table 4-1. Summary of Water Quality Analytical Tests, Including Laboratory Methods and Detection Limits, and Chemical Water Quality Objectives..... 17

Table 5-1. Water Quality Control Plan for the Tulare Lake Basin Beneficial Uses in the Project Study Area..... 20

Table 5-2. Summary of In-Situ Sample Results for the 2024 Sampling Year 21

Table 5-3. Summary of In-Situ Sample Results for the 2025 Sampling Year 22

Table 5-4. Summary of 2025 Turbidity Sampling Results 23

Table 5-5. Summary of Seasonal Grab Sample Results Collected During the Spring 2024 Sampling Event 24

Table 5-6. Summary of Seasonal Grab Sample Results Collected During the Fall 2024 Sampling Event..... 25

Table 5-7. Summary of Seasonal Grab Sample Results Collected During the Spring 2025 Sampling Event 26

Table 5-8. Summary of Seasonal Grab Sample Results Collected During the Fall 2025 Sampling Event..... 28

Table 5-9. Calculated Ammonia Concentration Criteria for the Spring and Fall 2024 Sampling Events..... 30

Table 5-10. Calculated Ammonia Concentration Criteria for the Spring and Fall 2025 Sampling Events..... 32

Table 5-11. Hardness-Based Water Quality Criteria for Cadmium, Copper, Lead, and Nickel for the Spring 2025 Sampling 34

Table 5-12. Hardness-Based Water Quality Criteria for Cadmium, Copper, Lead, and Nickel for the Fall 2025 Sampling..... 35

Table 5-13. Summary of Analytical Results for Bacterial Sampling in 2024..... 36

Table 5-14. Summary of Analytical Results for Bacterial Sampling in 2025..... 37

Table 5-15. Kern River Monthly Mean, Minimum, and Maximum Water Temperature (°C) by Site in 2024..... 38

Table 5-16. Kern River Monthly Mean, Minimum, and Maximum Water Temperature (°C) by Site in 2025 39

Table 5-17. Kern River Daily Average, Maximum, and Minimum of Water Temperature (°C) by Site (May 15 to October 15, 2024) 40

Table 5-18. Kern River Daily Average, Maximum, and Minimum of Water Temperature (°C) by Site (May 15 to October 15, 2025) 45

Table 5-19. Preferred Temperatures for Growth and Activity of Fish Species Observed during Bypass Sampling, December 2025. 50

Table 5-20. Methylmercury Fish Tissue Analysis Summary 51

LIST OF MAPS

Map 3-1. Study Area/Water Quality Measurement Sites 66

LIST OF APPENDICES

Appendix A. Description Water Quality Parameters

Appendix B. Quality Assurance/Quality Control Laboratory Review

Appendix C. Calculations Used for Water Quality Criteria Analysis

LIST OF ACRONYMS

°C	degrees Celsius
°F	degrees Fahrenheit
µg/L	micrograms per liter
µS/cm	microsiemens per centimeter
AQ 2 ITM	AQ 2 – Water Quality/Water Temperature Interim Technical Memorandum
AQ 2 TSP	AQ 2 – Water Quality/Water Temperature Technical Study Plan
Cal EPA	California Environmental Protection Agency
CCC	Criterion Continuous Concentration
cfs	cubic feet per second
cm	centimeter

COC	contaminant of concern
CRWQCB	California Regional Water Quality Control Board
CTR	California Toxics Rule
DO	dissolved oxygen
EPA	Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
g	gram
IRIS	Integrated Risk Information System
ISB	Isabella Dam
ISR	Initial Study Report
MCL	maximum concentration levels
MDL	Method Detection Limit
MET	Meteorological Station
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mL	milliliters
mm	millimeters
MPN	most probable number
MPSL	Marine Pollution Studies Laboratory
MRL	method reporting limit
ng/L	nanograms per liter
NS	no standard available
NTR	National Toxics Rule
NTU	Nephelometric Turbidity Units
OEHHA	Office of Environmental Health Hazard Assessment
ppt	parts per trillion
Project	Kern River No. 1 Hydroelectric Project, FERC Project No. 1930
QA/QC	quality assurance/quality control
RL	reporting limit
RM	river mile
SCE	Southern California Edison
SPD	Study Plan Determination
SWRCB	State Water Resources Control Board
TDS	Total dissolved solids
TKN	Total Kjeldahl nitrogen
USGS	U.S. Geological Survey

1.0 INTRODUCTION

This AQ 2 – Water Quality/Water Temperature Technical Memorandum (AQ 2 TM) provides the methods and findings from the 2024 (Year 1) and 2025 (Year 2) water quality and water temperature sampling completed in support of Southern California Edison's (SCE) Kern River No. 1 Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 1930. The AQ 2 – Technical Study Plan (AQ 2 TSP) was included in SCE's Revised Study Plan filed on February 13, 2024 (SCE 2024). In its March 14, 2024, Study Plan Determination (SPD), FERC approved the AQ 2 TSP without modifications (FERC 2024). The SPD required SCE to sample water quality and water temperature in 2024 and 2025. An initial interim technical memorandum (AQ 2 ITM) describing 2024 data collection and results was included in the Initial Study Report filed with FERC on March 12, 2025, and an updated AQ 2 ITM was provided in the Draft License Application (DLA) filed on December 18, 2025.

Data reported in this final AQ 2 TM were collected from May 15 to October 15, 2024, and May 15 to October 15, 2025, pursuant to the FERC-approved study plan.

2.0 STUDY OBJECTIVES

The objectives of the study, as outlined in AQ 2 TSP (SCE 2024), included the following:

- Collect seasonal water quality data (physical, chemical, and bacterial) and water temperature data in the Democrat Dam Impoundment and bypass reach.[1]
- Compare water quality and water temperature conditions to the objectives/criteria of the Basin Plan (California Regional Water Quality Control Board [CRWQCB] 2018) and other water quality standards.
- Test edible sized sport fish captured in the Democrat Dam Impoundment (AQ 3 – Fish Population Study) for concentrations of both total and methylmercury.

3.0 STUDY AREA

- The AQ 2 study area included the Democrat Dam Impoundment, bypass reach, and tailrace (Table 3-1 and Map 3-1).
- Sampling was not conducted at locations where access was unsafe (e.g., where there is very steep terrain).

4.0 METHODS

This section describes the water quality and water temperature sampling methodology for seasonal in-situ field measurements, seasonal water quality grab sampling, bacterial sampling, continuous (i.e., 15-minute interval) water temperature sampling with

[1] The bypass reach is the 10.2-mile-long section of the Kern River downstream of Democrat Dam where Project operations result in the diversion of a portion of the water from the river.

dataloggers, laboratory analysis, and methylmercury fish tissue sampling. Study implementation followed the methods described in the AQ 2 TSP (SCE 2024), except for the minor variances described in Section 4.1.

4.1 STUDY PLAN VARIANCES

There was one general variance related to the AQ 2 TSP study methods. In addition, there were four small variances in 2024 and three small variances in 2025 to the AQ 2 TSP study methods approved in FERC's SPD (FERC 2024).

- General AQ 2 TSP variance:
  - For some analytes, the laboratories used Standard Methods analyses rather than Environmental Protection Agency (EPA) methods analyses specified in the AQ 2 TSP; however, EPA recognizes the Standard Methods analyses as equivalent (Table 4-1).
- 2024 AQ 2 TSP variances:
  - Grab samples were collected at KR 55.6 in the spring (one sample) and at KR 55.2 in the fall (once sample)[2], rather than at both sites in both seasons, due to TSP discrepancies. These sites are very near each other and the study results demonstrated that water quality at each site was very similar. In 2025, grab samples were collected in the spring and fall from both sites.
  - The AQ 2 TSP schedule for bacterial sampling required sampling to occur over five relatively evenly spaced dates in July 2024. Due to the Borel Fire, which began on July 24, 2024, in the immediate vicinity of the study area, four samplings occurred before the fire in July 2024 and the fifth sampling occurred on August 13, 2024, when the area was reopened and safe for access. This exceeded the 30-day sampling window specified in the Basin Plan.
  - AQ 2 TSP had inconsistencies between sampling parameters in the text and Table AQ 2-2 for seasonal in-situ field measurement (turbidity, alkalinity, and salinity). As a result, in-situ measurements of turbidity were not collected in 2024. Turbidity data were collected in 2025 in the Project area during in-situ water quality measurements in the spring and fall and at other opportunistic times [i.e., during temperature logger installation (May), August temperature logger downloads, and temperature logger removals (October)] to collect more information about turbidity. Alkalinity test kits were used in the field to measure alkalinity, and salinity was calculated from specific conductance measurements.

[2] KR 55.6 = Kern River upstream of Democrat Dam Impoundment; KR 55.2 = Democrat Dam Impoundment, downstream of rafting take-out (see Table 3-1 and Map 3-1).

  - In 2024, water grab samples were analyzed for total mercury, but not methylmercury. In 2025, water grab samples were analyzed for total mercury and methylmercury.

- 2025 AQ 2 TSP variances/additions:

  - AQ 2 TSP specified total and fecal coliform analyses and did not require analysis for *Escherichia coli* (*E. coli*); however, the State Water Resources Control Board (SWRCB 2019) generally requires *E. coli* sampling for recreation contact bacterial analysis. In 2025, *E. coli* was included in the analysis (presence/absence).

  - AQ 2 TSP did not require water hardness (as $CaCO_3$) as a seasonal water quality parameter. Criteria for several water quality parameters are, however, hardness dependent (cadmium, copper, lead, and nickel) (there was no detection of these parameters in 2024). Water hardness was analyzed in water quality grab samples in 2025 to support the laboratory analysis of cadmium, copper, lead, and nickel required by the TSP.

  - Two water temperature loggers were vandalized in May 2025 at water temperature monitoring location KR 44.0 (Kern River upstream of Kern River No. 1 Powerhouse). As a result, data from May 15 to June 2, 2025, at this site are not available (Table 5-16 and Table 5-18).

4.2 WATER QUALITY SAMPLING LOCATIONS

- Water quality and water temperature sampling locations are identified in Table 3-1 and Map 3-1.[3]

- Exact sampling locations were determined in the field based on sampling suitability (i.e., well-mixed and deep enough for representative sampling) and accessibility.

- Sampling locations were documented using hand-held global positioning system units.

- Sediment management related issues and their potential effects on water quality were addressed in the LAND 2 – Erosion and Sedimentation Technical Study Memorandum.

4.3 SEASONAL *IN-SITU* FIELD MEASUREMENTS

- In-situ water quality measurements of dissolved oxygen (DO) (milligrams per liter [mg/L] and percent saturation), pH, turbidity (nephelometric units [NTU]), specific

[3] In the AQ 2 Interim Technical Study Memorandum submitted in March 2025, the Kern River sampling station near Lucas Creek was incorrectly described as KR 50.28 – the correct sampling site name and location is KR 50.3.

conductance[4] (microsiemens/centimeter [µS/cm]), salinity (ppt), alkalinity (mg/L), and water temperature (degrees Celsius [°C]) were collected in the impoundment, tailrace, and bypass reach (Table 3-1).

- Samples were collected once during the spring runoff (June), and once during the late summer/early fall base-flow period (October) in 2024 and 2025.

- At stream locations, measurements were made approximately 0.1 meter beneath the surface in flowing, well-mixed riffle or run areas.[5]

- In-situ samples were collected using a YSI Pro Digital Sampling System multi-parameter water quality meter.

- Pre- and post-sampling calibration of the YSI was conducted following the manufacturer's instructions.

4.4 SEASONAL WATER QUALITY GRAB SAMPLES

- Water quality grab samples were collected in the Kern River just upstream of Democrat Dam Impoundment, in the Democrat Dam Impoundment, in the tailrace, and at several sites in the bypass reach (Table 3-1 and Map 3-1).

  – In 2024 and 2025, samples were collected once during the spring runoff (high flow) and once during the late summer/early fall base-flow period (low flow) period, in coordination with the in-situ water quality measurements to screen for potential water quality issues (Table 4-1).

  – At stream locations, grab samples were taken approximately 0.1 meter beneath the surface in flowing, well-mixed riffle or run areas.

  – At the impoundment location, grab samples were collected from near the surface (1 meter depth) and at mid-column depth.

- Samples were collected consistently with EPA protocols for each analyte (see Section 4.7, Laboratory Analysis) and consistent with general water quality sampling methods (e.g., National Field Manual for the Collection of Water-Quality Data).

  – The sampling team employed a strict quality assurance/quality control (QA/QC) program. Equipment (bottles/samplers) was cleaned and thoroughly rinsed in the field prior to sampling at each location. The Kemmerer water sampler used for impoundment mid-column samples was filled and rinsed three times before sampling. Sampling bottles were clean and sterile from the laboratory and

[4] Specific conductance is a measurement of conductivity that compensates for water temperature and is the preferred method for measuring electrical conductivity in water quality studies (USGS 2019)

[5] In-situ measurements at KR 55.2 (impoundment) were taken at water surface (i.e., 0.1 meter below surface) and at mid-column depth, based on impoundment water levels at the time of sampling.

remained sealed until sample collection. Specific collection of equipment blanks was not necessary for these samples. Laboratory blanks were performed for all samples. Field replicates and field blanks were also collected but data were not presented unless there was an exceedance reported.

  – Water quality samples were decanted into laboratory-supplied sample containers and analyzed at a State-certified water quality laboratory.

  – The sample containers were labeled with the date and time that the samples were collected along with the sampling site or identification label.

  – The sample containers were preserved (as appropriate), stored on ice, and delivered to a State-certified water quality laboratory for analyses in accordance with maximum holding periods.

  – A chain-of-custody record was maintained with the samples.

4.5 BACTERIAL SAMPLING

- Surface water bacteria samples for total and fecal coliform were collected downstream of the following day-use recreation areas in the Project area: the Democrat Dam Impoundment downstream of the rafting take-out, and the Kern River downstream of the Upper Richbar, Lower Richbar, and Live Oak day use areas (Table 3-1 and Map 3-1). In 2024, samples were collected on four relatively evenly spaced days in July. The final, fifth sampling was disrupted due to the Borel Fire but occurred as soon as practicable in August following fire containment. The sampling was repeated in July 2025, on five relatively evenly spaced days in July, and the analysis included *E. coli* presence/absence in conjunction with total and fecal coliform.

- Field staff avoided collecting surface “scum” by plunging the open bottle (sterilized) mouth quickly downward below the water surface and avoiding contact with or disturbance of the streambed. Bottles were filled with the opening pointed slightly upward into the current and the bottles were removed with the opening pointed upward toward the water surface and tightly capped, allowing about 2.5 to 5 centimeters (cm) of headspace for proper mixing.

4.6 WATER TEMPERATURE

- Continuous water temperature data were collected at seven locations in the Project area (Table 3-1) from May 15 to October 15, 2024, and from May 15 to October 15, 2025. Sampling locations included upstream of the Democrat Dam Impoundment, five sites in the bypass reach, and in the tailrace.

  – Each water temperature monitoring station was equipped with two HOBO Tidbit MX TEMP 5000 temperature loggers set to record data at 15-minute intervals.

  - In 2024, the data were downloaded at least once every two months between June and October except for sites that were inaccessible during the Borel Fire and associated National Forest closure. In 2025, following vandalism at KR 44.0, the download frequency was increased to every two to three weeks to limit potential data gaps.

- Meteorological station data[6] (relative humidity, windspeed, solar radiation, air temperature) were collected from nearby existing weather stations: Isabella Dam;[7] (ISB) and Arvin-Edison – San Joaquin Valley – Station 125.[8]

- Temperature and meteorological data, including a depiction of seasonal patterns and daily averages, minimums, and maximums, as a function of time and location in the study area and aquatic species requirements (e.g., Moyle 2002) were summarized.

4.7 LABORATORY ANALYSIS

- Water quality grab samples collected during the field program were processed by several State-certified laboratories approved by the State Water Resources Control Board for chemical and bacterial analysis.

  - Zalco Laboratories Inc. (Zalco) in Bakersfield, CA completed general parameters and dissolved metals analysis.

    - BSK Associates in Fresno, California was subcontracted by Zalco for several tests.

  - Pace Analytical completed the bacterial analysis.

  - Marine Pollution Studies Laboratory at Moss Landing Marine Laboratories (MPSL) in Moss Landing, California, completed fish tissue and water sample methylmercury analysis.

- The parameters analyzed by the laboratories are provided in Table 4-1 and described in Appendix A.

- The laboratories reported each parameter with the laboratory method detection limit and reporting limit. The laboratories attempted to attain reporting detection limits that are at or below the applicable regulatory criteria.

- Results from the water quality sampling were compared with the water quality objectives/criteria identified in the Tulare Lake Basin Plan (CRWQCB 2018) and with other relevant water quality standards, including the EPA numeric aquatic life

[6] Relative humidity, windspeed, and solar radiation only available from Arvin-Edison – San Joaquin Valley – Station 125 station.
[7] Isabella Dam; ISB: CA Dept of Water Resources https://cdec.water.ca.gov/dynamicapp/staMeta?station_id=ISB.
[8] Arvin-Edison – San Joaquin Valley – Station 125 California Irrigation Management Information System (CIMIS).

and human health criteria (65 FR 31682, EPA 2023), the National Toxics Rule (NTR) (Federal Register FR 57 60848, EPA 1992), and the California Toxics Rule (CTR) (Federal Register, 65 FR 31682, EPA 2000).

- Appendix C provides calculations methods used for certain Water Quality Criteria.

4.8 METHYLMERCURY FISH TISSUE SAMPLING

- Edible-sized sport fish were captured in the Democrat Dam Impoundment as part of the AQ 3 – Fish Population Technical Study and their fish tissue was tested for concentrations of total mercury and methylmercury.

- Electrofishing was used to capture 29 edible-sized sport fish to analyze total and methylmercury fish tissue concentrations.

  – Three days of sampling were conducted to meet target capture numbers during the fish population study because numbers of edible sized fish of some species were low (e.g., <5 fish per species). See AQ 3 – Fish Population Interim Technical Memorandum for details on collection procedures.

  – Fish samples were submitted to MPSL for fish tissue analysis. The results of the fish tissue analyses were summarized and include the fish identification number, date and time collected, total length or fork length, weight, and total and methylmercury concentrations. Average total mercury and methylmercury concentrations by species were also calculated. The mercury concentrations are also presented relative to fish weight in graphical format and compared to appropriate California Environmental Protection Agency (Cal EPA) Office of Environmental Health Hazard Assessment (OEHHA) and/or EPA screening value guidelines.

4.9 REPORTING

- Study methods and results are documented in this AQ 2 TM. The AQ 2 ITM that reported on the 2024 sampling was provided to relicensing stakeholders on March 11, 2025, for a 90-day review. An updated AQ 2 ITM was provided as part of the DLA that was filed with FERC on December 18, 2025. This final AQ 2 TM presents data collected both in 2024 and 2025.

- Upon request, data will be provided to resource agencies and interested stakeholders in an Excel spreadsheet (electronic format).

5.0 RESULTS SUMMARY

Results for the Water Quality/Water Temperature Study are provided below for both sampling years (2024 and 2025). The Basin Plan (CRWQCB 2018) includes water quality objectives/criteria (Table 4-1) for the protection of beneficial uses in the study area (Table 5-1), including: (1) power generation; (2) water contact recreation; (3) water non-contact

recreation; (4) warm freshwater habitat; (5) cold freshwater habitat; (6) wildlife habitat; and (7) rare, threatened, or endangered species.

5.1 SEASONAL *IN-SITU* FIELD MEASUREMENTS

Seasonal in-situ field measurement results are presented in Table 5-2 for the 2024 spring runoff sampling (June 26–27, 2024) and the late summer/early fall base flow period (October 9–10, 2024) and in Table 5-3 for the 2025 spring runoff sampling (June 3-5, 2025) and the late summer/early fall base flow period (September 30, 2025). Results were generally consistent between sampling years. River flow as measured at U.S. Geological Survey (USGS) gage 11192500[9] during spring sampling was 1,970 cubic feet per second (cfs) (June 27, 2024) and 1,060 cfs (June 4, 2025); river flow during fall sampling was 310 cfs (October 10, 2024) and 140 cfs (September 30, 2025). Each parameter is discussed below.

5.1.1 Water Temperature

The Basin Plan objective for water temperature states that elevated temperature wastes shall not cause the temperature of waters designated COLD or WARM to increase by more than 5 degrees Fahrenheit (°F) (2.78°C) above natural receiving water temperature (CRWQCB 2018). In 2024, water temperatures ranged from 18.9 to 20.5°C during the spring in-situ sampling and from 19.8 to 20.4°C during the fall sampling in the Project area. In 2025, water temperatures ranged from 16.5 to 18.9°C during the spring in-situ sampling and from 20.5 to 21.9°C during the fall sampling in the Project area. Water temperatures exhibited very little temporal or spatial fluctuation throughout the Project area (i.e., above Democrat Dam Impoundment, within the bypass reach, and below the powerhouse) (Table 5-2 and Table 5-3). Continuous water temperature data collected from May 15 to October 15 in 2024 and 2025 are discussed in Section 5.4 below.

5.1.2 Dissolved Oxygen

The Basin Plan DO water quality objective for the Kern River from Lake Isabella to the Kern River No. 1 Powerhouse is a minimum of 8.0 mg/L, which is consistent with EPA criterion (CRWQCB 2018, EPA 1986). In-situ measurements of DO ranged from 8.58 to 9.12 mg/L during the spring and fall sampling periods in 2024 and from 8.33 to 9.33 mg/L during the spring and fall sampling periods in 2025 (Table 5-2 and Table 5-3), which is consistent with Basin Plan criteria. Percent saturation was greater than 90 percent for all measurements.

5.1.3 Conductivity (measured as Specific Conductance)

The Basin Plan water quality objective for conductivity is a maximum of 300 µS/cm for the Kern River from Lake Isabella to the Kern River No. 1 Powerhouse. In 2024, specific conductance (i.e., temperature-compensated conductivity) ranged from 92 to 93 µS/cm in the spring sampling and 140 to 143 µS/cm in the fall sampling (Table 5-2). In 2025, it

[9] SCE gage # 409, located at Democrat Springs.

ranged from 108 to 117 µS/cm in the spring sampling and 132 to 146 µS/cm in the fall sampling. All specific conductance measurements met the Basin Plan criterion.

5.1.4 pH

The Basin Plan water quality objective for pH states that "the pH of water shall not be depressed below 6.5, raised above 8.3, or changed at any time more than 0.3 units from normal ambient pH" (CRWQCB 2018). The national EPA pH criterion is 6.5 to 9 for chronic exposure in fresh water (EPA 2023). In 2024, pH ranged from 7.96 to 8.17 during spring and fall sampling (Table 5-2), which is within the range specified in the Basin Plan. In 2025, excluding one sample, pH ranged from 7.88 to 8.29 during spring and fall sampling (Table 5-3). One pH measurement on September 30, 2025, at KR 50.3 was 8.34, just 0.04 units over the Basin Plan objective, but well within national EPA pH criterion.

5.1.5 Alkalinity

There are no alkalinity criteria in the Basin Plan. The NTR states a total alkalinity continuous concentration "of 20 mg/L is a minimum value except where alkalinity is naturally lower, in which case the criterion cannot be lower than 25 percent of the natural level" (EPA 2023). Alkalinity was >20 mg/L in the Project area in 2024 and 2025, ranging from 40 to 44 mg/L in 2024 (Table 5-2) and 32 to 45 mg/L in 2025 (Table 5-3).

5.1.6 Salinity

Salinity is normally estimated indirectly by measuring specific conductance (see Section 5.1.3). There are no salinity criteria in the Basin Plan water quality objectives. To estimate salinity, electrical conductivity samples were converted to salinity using the following equation: salinity ppt = 0.4665 * (conductivity [µS/cm] *1.0878) (Dohrman 2023). Salinity values during the spring runoff and fall sampling period in 2024 ranged from 0.034 to 0.055 ppt (Table 5-2) and from 0.038 to 0.057 ppt in 2025 (Table 5-3). Freshwater usually has a salinity value of <0.5 ppt (Wetzel 2001).

5.1.7 Turbidity

The Basin Plan states the "waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses." Additionally, "increases in turbidity attributable to controllable water quality factors shall not exceed the following limits: where natural turbidity is between 0 and 5 NTUs, increases shall not exceed 1 NTU. Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent. Where natural turbidity is equal to or between 50 and 100 NTUs, increases shall not exceed 10 NTUs. Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent" (CRWQCB 2018). There are no turbidity criteria in the CTR or in the EPA's national water quality criteria.

. Measurements were taken during the spring (June 3–5) and fall (September 30) in-situ sampling periods, as well as on May 4–5, August 14, and October 22, at water temperature monitoring locations during logger installation, download, and removal.

Turbidity varied throughout 2025 monitoring. Overall, turbidity ranged from 1.20 to 14.75 NTU. The lowest turbidity measurements occurred during June and August, ranging from 1.20 to 3.09 NTU. Turbidity in May and September was more elevated, ranging from 2.40 to 8.20 NTU. Turbidity was highest in October with values ranging from 7.50 NTU to 14.75 NTU. Turbidity measurements from the 2025 in-situ and supplemental measurements are shown in Table 5-4. As noted above in Section 4.1, Study Plan Variances, turbidity data were not collected in 2024 due to study plan text/table inconsistencies.

There was a tendency for turbidity to increase slightly from upstream to downstream in the Project area (Table 5-4). This was likely the result of natural increases in turbidity within the steeper / higher gradient sediment transport reach of the river from upstream of Democrat Dam to downstream of the Kern No. 1 Powerhouse. Inflowing turbidity to the study area was represented by values measured at KR 55.6, the upstream most sampling location in the Project area. Measured turbidity at this location in May, June, and August was between 1.26 and 2.56 NTUs. Turbidity in the bypass reach from 1.31 to 8.0 NTU during this same period. In September and October, inflowing turbidity was 5.96 to 7.50 NTU, and turbidity in the bypass reach ranged from 4.98 to 14.75 NTU. The Basin Plan states that increases in turbidity should be attributable to controllable water quality factors. The Project consists of concrete diversions and lined flowlines and is unlikely to alter turbidity because of normal operations; however, the bypass river reach is a narrow, steep (1.4 to 3.5 percent gradient), high energy section of river that naturally erodes and transports sediment and increases turbidity. Sediment management related issues and their potential effects on water quality are addressed in the LAND 2 – Erosion and Sedimentation Technical Study Memorandum.

5.2 SEASONAL WATER QUALITY GRAB SAMPLES

Results of the 2024 water quality grab sampling are presented in Table 5-5 (spring) and Table 5-6 (fall). Results of the 2025 water quality grab sampling are presented in Table 5-7 (spring) and Table 5-8 (fall). Sampling occurred concurrently with the in-situ field measurements in both sampling years. Table 5-9 and Table 5-10 provide the results for ammonia sampling in 2024 and 2025, respectively, which has criteria based on temperature and pH and was calculated on a location-by-location basis. Table 5-11 and 5-12 contain calculated criteria and results for cadmium, copper, lead, and nickel, which have hardness-based criteria.

All water quality sampling parameters and dissolved and total metal concentrations met Basin Plan water quality objectives and CTR and EPA water quality criteria.

5.3 BACTERIAL SAMPLING

The Basin Plan water quality objective for bacteria states that, “in water designated REC-1, the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 milliliters (mL), nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 mL” (CRWQCB 2018). The results of total coliform and fecal coliform sampling are detailed in Table 5-13 for 2024 and Table 5-14 for 2025. The threshold for

fecal coliform was not exceeded during the sampling periods. Neither the Basin Plan nor the EPA have criteria for total coliform.

Although not required by AQ 2 TSP, the SWRCB's updated water quality control plan for inland surface waters (SWRCB 2019) includes *E. coli* sampling for recreation contact bacterial analysis. In 2025, *E. coli* was included in the analysis, and presence/absence testing was used to align with the TSP sampling effort and schedules. *E. coli* was "present" for all samples at all four sampling sites in 2025 (Table 5-14).

5.4 CONTINUOUS WATER TEMPERATURE DATA AND METEOROLOGICAL DATA

Continuous water temperature monitoring occurred from May 15 to October 15 in 2024 and 2025. In both years, water temperature loggers were installed prior to May 15 and maintained through October 15. Between October 12, 2024, and October 15, 2024, temperature loggers at KR 50.3 and KR 54.2 were dewatered during low flows that SCE temporarily provided in the bypass reach to evaluate the feasibility of fish sampling.[10] In 2025, temperature loggers were vandalized at KR 44.0, resulting in a data gap from May 15 to June 2, 2025, at this monitoring location.

Average, maximum, and minimum monthly water temperature data for each sampling location are provided in Table 5-15 (2024) and Table 5-16 (2025). Average monthly water temperature ranged from approximately 17°C in May to 23°C in August of both sampling years. Table 5-17 (2024) and Table 5-18 (2025) provide daily average, daily minimum, and daily maximum water temperature data. Figures 5-1 through 5-8 display average daily water temperature data at each site along with corresponding flow data from the Project area. Average daily temperature ranged from 15.7°C (May 14) to 24.4°C (August 6) during the 2024 monitoring period and from 15.5°C (May 17) to 24.8°C (September 4 and September 5) during the 2025 monitoring period. Overall, water temperature was warmest in the months of August and September in the Project area. Generally, the maximum daily average and maximum instantaneous water temperature occurred in late July to mid-September when flows were lower following spring runoff and air temperatures were highest.

There was very little change in water temperature from upstream to downstream in the Project area. The Kern River from upstream of Democrat Dam Impoundment downstream to the Kern No. 1 Powerhouse (i.e., within the Project area) generally exhibited a <1°C water temperature difference (Figure 5-1 and Figure 5-2). The maximum downstream change in average daily water temperature in the bypass reach compared to inflowing water was 1.7°C for two days in early May of 2024 and 1.8°C on June 10, 2025, at site KR 44.0. Some natural warming of flows in the downstream direction is expected due to warm air temperatures and solar radiation. The water temperature data indicate that the Project has little effect on water temperature.

Table 5-19 shows preferred temperature ranges for fish species collected in the bypass reach during the AQ 3 – Fish Population Study completed in December of 2025. Most

[10] Fish population sampling as part of AQ 3 study did not occur until December of 2025.

species collected (e.g., Sacramento sucker, hardhead, smallmouth bass, largemouth bass, brown bullhead, and white catfish) are cool or warmwater fish species with wide temperature tolerances. The water temperatures observed in the bypass reach (e.g., 20°C to 25°C) are suitable for these species (Moyle 2002) and too warm for cold water species like rainbow trout. Rainbow trout, which are stocked in the Project area, prefer colder water (i.e., 15 to 18°C). It is likely that rainbow trout that are not harvested by anglers can rear and grow during the cooler seasons (fall, winter, spring) but are unlikely to be able to grow and survive during the summer season.

Air temperatures (2024 and 2025) for the study (May 15 to October 15) retrieved from the ISB meteorological station near Lake Isabella Dam (upstream of the Project area) and from Arvin-Edison Station 125 (downstream of the Project area) are shown in Figure 5-10, along with relative humidity. In 2024, daily air temperatures ranged from 46°F (7.7°C) to 113°F (41°C) with a mean air temperature around 80°F (27°C) for the monitoring period. In 2025, air temperatures were generally cooler and ranged from 42°F (5.5°C) to 108°F (42°C) with a mean air temperature around 78°F (25.5 °C).

Other MET parameters (relative humidity, wind speed, solar radiation) were retrieved from Arvin-Edison San Joaquin Valley Station 125, though the station is not in Kern Canyon. Data from this station showed relative humidity near the Project was on average in the 30 percent range (Figure 5-10), wind speeds averaged approximately 4 miles per hour, and solar radiation ranged from 192 to 760 Langley/day through the 2024 and 2025 monitoring periods.

5.5 LABORATORY ANALYSIS PROCEDURES AND QA/QC

A detailed summary of the QA/QC review of the seasonal water quality grab sampling reports received from the various labs can be found in Appendix B. The QA/QC review of the reports indicated that all samples were acceptable (i.e., hold times, preservation, containers were appropriate).

5.6 METHYLMERCURY AND TOTAL MERCURY FISH TISSUE SAMPLING

During the 2024 Fish Population Study, SCE collected 29 edible-sized sport fish from the Democrat Dam Impoundment for total mercury and methylmercury fish tissue analysis. The catch represented six species, including 10 largemouth bass, three black crappie, five bluegill sunfish, one channel catfish, one white catfish, and nine brown bullhead. Fish ranged in size from 151–545 millimeters (fork length or total length, depending on the species).[11] OEHHA issues fish consumption advisories when methylmercury concentrations in fish exceed a Guidance Tissue Level of 0.08 mg/kg (OEHHA 2005). Table 5-20 provides total mercury and methylmercury results for each individual fish, along with sample dates, times collected, weight, total and fork length (as applicable).

[11] Fork length was measured for species with a forked caudal fin (i.e., bluegill sunfish, black crappie, and largemouth bass). Total length was measured for species without a forked caudal fin (i.e., brown bullhead, channel catfish, and white catfish).

All 29 of the fish tissue samples were equal to or exceeded the reference methylmercury concentration of 0.08 mg/kg (Figure 5-11 and Table 5-20). Concentrations were higher in larger fish. The highest concentrations of methylmercury (up to 0.57 mg/kg) were measured in largemouth bass. The lowest concentrations were measured in black crappie and bluegill sunfish (as low as 0.08 mg/kg). The highest average concentration of methylmercury by species was in largemouth bass (0.29 mg/kg), followed by channel catfish (0.24 mg/kg, single sample), brown bullhead (0.20 mg/kg), and white catfish (0.19 mg/kg, single sample). Black crappie and bluegill sunfish had the lowest average methylmercury concentration by species (0.14 mg/kg). Concentrations were positively related to fish size, with larger fish (particularly largemouth bass and catfish) exhibiting the highest methylmercury levels (Figure 5-11 and Figure 5-12). The lowest concentration was found in the smallest black crappie sampled (160-millimeter fork length), at 0.08 mg/kg.

6.0 STUDY SPECIFIC CONSULTATION

A copy of the AQ 2 ITM that reported on the 2024 sampling was provided to relicensing stakeholders on March 12, 2025, for a 90-day review. SCE presented the results of the 2024 water quality/water temperature study in the Initial Study Report (ISR) and at the ISR meeting held on March 19, 2025. No comments on the AQ 2 ITM were received.

7.0 REFERENCES

CRWQCB (California Regional Water Quality Control Board), Central Valley Region. 2018. Water Quality Control Plan for the Tulare Lake Basin Third Edition. Revised May 2018 (with approved amendments). Available at: https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/tularelakebp_201805.pdf

Diaz, Fernando, Re, Ana Denisse, Gonzalez, Ricardo A., Sanchez, L. Noemi, Leyva, Gustavo, and Valenzuela, Francisco. 2007. Temperature preference and oxygen consumption of the largemouth bass Micropterus salmoides (Lacepede) acclimated to different temperatures. Aquaculture research 38(13):1387-1394

Dohrman, Paul. 2023. How to Convert Specific Conductivity to Salinity. Last modified December 7, 2023. Available at: https://www.sciencing.com/convert-specific-conductivity-salinity-5915328/

EPA (Environmental Protection Agency). 1986. Quality Criteria for Water.

———. 1992. National Toxics Rule (NTR) “Water Quality Standards: Establishment of Numeric Criteria for Priority Toxic Pollutants.” Federal Register, 57 FR 60848.

———. 2000. California Toxics Rule (CTR) “Water Quality Standards: Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California.” Federal Register, 65 FR 31682.

———. 2023. National Recommended Water Quality Criteria – Aquatic Life Criteria Table. Retrieved December 2023. Available at: https://www.epa.gov/wqc/aquaticlife- criteria-and-methods-toxics.

FERC (Federal Energy Regulatory Commission). 2024. Study Plan Determination for the Kern River No. 1 Hydroelectric Project. March 14, 2024.

Horning II, W.B. and, R.E, Pearson. 1973. Growth Temperature Requirements and Lower Lethal Temperatures for Juvenile Smallmouth Bass (*Micropterus dolomieui*). *Journal of the Fisheries Research Board of Canada*. 30(8): 1226-1230. https://doi.org/10.1139/f73-194.

Keast, A. 1985. Growth responses of the brown bullhead (*Ictalurus nebulosus*) to temperature. *Canadian Journal of Zoology*. 63(6): 1510-1515. https://doi.org/10.1139/z85-224.

Kellogg, R.L. and J.J Gift. 1983. Relationship between optimum temperature for growth and preferred temperatures for the young of four fish species. Transactions of the American Fisheries Society 112:424- 430.

Moyle, P. 2002. Inland fishes of California. University of California Press, Berkeley. 502 pp.

OEHHA (Office of Environmental Health Hazard Assessment). 2005. General Protocol for Sport Fish Sampling and Analysis. December 2005.

SCE (Southern California Edison). 2024. Kern River No. 1 Hydroelectric Project (FERC Project No. 1930) Revised Study Plan. February 13, 2024.

SWRCB (State Water Resources Control Board). 2019. Part 3 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California, Bacterial Provisions and a Water Quality Standards Variance Policy.

U.S. Geological Survey, 2019, Specific conductance: U.S. Geological Survey Techniques and Methods, book 9, chap. A6.3, 15 p., https://doi.org/10.3133/tm9A6.3.

TABLES

Table 3-1. Water Quality and Water Temperature Sampling Locations

Site Name/ID and Description	Sampling Location River Mile (RM)	Coordinates	Seasonal In-situ Field Measurements	Seasonal Water Quality Grab Samples/ Temperature Monitoring Locations	Bacterial Sampling
KR 55.6 (Kern River above Democrat Dam impoundment)	RM 55.6	35.531954, -118.658381	X	X[1]	–
KR 55.2 (Kern River impoundment below rafting take-out)	RM 55.2	35.531481, -118.664900	X	–[1]	X
KR 54.36 (Kern River between Democrat Dam and Instream Flow Release)	RM 54.36	35.523707, -188.675464	X	X	–
KR 54.2 (Kern River below Instream Flow Release)	RM 54.2	35.22709, -118.675759	X	X	–
KR 53.84 (Kern River near USGS gage 11192500; below Democrat Dam)	RM 53.84	35.20211, -118.680249	X	X	–
KR 50.3 (Kern River near Lucas Creek)	RM 50.3	35.483765, -118.711885	X	X	–
KR 48.7 (Kern River below Upper Richbar Day Use Area)	RM 48.7	35.476250, -118.724036	X	–	X
KR 48.4 (Kern River below Lower Richbar Day Use Area)	RM 48.4	35.475149, -118.728459	X	–	X
KR 47.78 (Kern River below Live Oak Day Use Area)	RM 47.78	34.479729, -118.733570	X	–	X
KRTR 43.94 (Kern River No. 1 Powerhouse Tailrace)	RM 43.94	34.460697, -118.779644	X	X	–
KR 44.0 (Kern River upstream of Kern River No. 1 Powerhouse)	RM 44.0	35.461124, -118.778816	X	X	–

Notes: [1] As described in Section 4.1 above (Study Plan Variances), grab samples were taken at KR 55.6 during the spring and at KR 55.2 (within the impoundment at water surface and mid-column) during the fall of 2024 due to TSP discrepancies. In 2025, grab samples were collected at KR 55.6 and KR 55.2 (water surface and mid-column) in the spring and in the fall. Continuous water temperature data were only recorded at KR 55.6 in 2024 and 2025 as required by AQ 2 TSP.

Key: RM = river mile

Table 4-1. Summary of Water Quality Analytical Tests, Including Laboratory Methods and Detection Limits, and Chemical Water Quality Objectives

Analyte	Units[1]	Analysis Method[2]	MDL	RL	Water Quality Criteria			Sample Container	Hold Time	Preservative/ Comment
					Basin Plan[3]	CTR[4]	EPA Criteria[5]			
***In-Situ* Measurements**										
Water Temperature	Celsius (°C)	Water Quality Meter	Not Applicable	Not Applicable	≤ +5°F[6]	NS	NS	Not Applicable	Not Applicable	None
Dissolved Oxygen (DO)	mg/L	Water Quality Meter	Not Applicable	Not Applicable	5.0–7.0[7]	NS	3.0 - 8.0[8]	Not Applicable	Not Applicable	None
Specific Conductance	µS/cm at 25°C	Water Quality Meter	Not Applicable	Not Applicable	300	NS	NS	Not Applicable	Not Applicable	None
pH	unitless	Water Quality Meter	Not Applicable	Not Applicable	6.5–8.3[9]	NS	6.5 – 9.0	Not Applicable	Not Applicable	None
Alkalinity	mg/L	Alkalinity Test Kit	Not Applicable	10	NS	NS	>20[12]	Not Applicable	Not Applicable	None
Salinity	PPT	Calculated	Not Applicable	Not Applicable	NS	NS	NS	Not Applicable	Not Applicable	None
Turbidity	NTU	Water Quality Meter	Not Applicable	Not Applicable	Depends on Turbidity Baseline	NS	NS	Not Applicable	Not Applicable	None
General Parameters										
Nitrate	mg/L	EPA 300.0	0.01	0.1	10	NS	NS	500mL plastic	48 hours	H_2SO_4, maintain at ≤6°C
Nitrite	mg/L	EPA 300.0	6.7	150	1	NS	NS	500mL plastic	48 hours	H_2SO_4, maintain at ≤6°C
Ammonia as N	mg/L	SM 4500 / EPA 350.1	0.33	0.8	0.025	NS	Depends on pH & temperature	500mL plastic	28 days	H_2SO_4, maintain at ≤6°C
TKN	mg/L	SM 4500 / EPA 351.2	0.30	0.1	NS	NS	NS	500mL plastic	28 days	H_2SO_4, maintain at ≤6°C
Total Phosphorus	µg/L	SM 4500	0.0022	0.1	NS	NS	NS	500mL plastic	28 days	H_2SO_4, maintain at ≤6°C
Ortho-phosphate	mg/L	SM 4500-P E	0.016	0.3	NS	NS	NS	500mL amber glass	48 hours	Maintain at ≤6°C
Total Dissolved Solids	mg/L	SM 2540C	5.0	10	500[10]	NS	NS	500mL plastic	7 days	Maintain at ≤6°C
Total Suspended Solids	mg/L	SM 2540D	2.0	2.5	NS	NS	NS	500mL plastic	7 days	Maintain at ≤6°C
Total Alkalinity	mg/L	SM 2320B	10.0	10	NS	NS	>20[12]	250mL plastic	14 days	Maintain at ≤6°C
Hardness	mg/L	EPA 200.7	2.0	2.0	NS	NS	ND	250mL plastic	14 days	Maintain at ≤6°C
Metals-Dissolved										
Arsenic	µg/L	EPA 200.7	0.005	0.02	10[11]	150/340[13]	150/340[13], 0.018[14], 0.14[15]	125mL plastic	48 hours	Maintain at ≤6°C
Cadmium	µg/L	EPA 200.7	7	10	5[11]	2.2/4.3[13, 16]	0.72/1.8[13, 16]	125mL plastic	48 hours	Maintain at ≤6°C
Copper	µg/L	EPA 200.7	16	50	1,300[11]	9.0/13[13, 16], 1,300[14]	9.0/13[13, 16, 17]	125mL plastic	48 hours	Maintain at ≤6°C
Iron	µg/L	EPA 200.7	0.031	0.1	300[11]	NS	1,000[18], 300[19]	125mL plastic	48 hours	Maintain at ≤6°C
Lead	µg/L	EPA 200.7	0.01	0.05	15[11]	2.5/65[13, 16]	2.5/65[13, 16]	125mL plastic	48 hours	Maintain at ≤6°C
Manganese	µg/L	EPA 200.7	0.003	0.03	50[11]	NS	50[20]	125mL plastic	48 hours	Maintain at ≤6°C
Nickel	µg/L	EPA 200.7	0.001	0.01	100[11]	52/470[13, 16], 610[14], 4,600[15]	52/470[13, 16], 610[14], 4,600[15]	125mL plastic	48 hours	Maintain at ≤6°C
Chromium-Total	µg/L	EPA 200.7	2	10	50[11]	NS	100[10]	125mL plastic	48 hours	Maintain at ≤6°C

Analyte	Units[1]	Analysis Method[2]	MDL	RL	Water Quality Criteria			Sample Container	Hold Time	Preservative/ Comment
					Basin Plan[3]	CTR[4]	EPA Criteria[5]			
Metals-Total										
Total Mercury	ng/L	EPA 245.1	0.13	0.40	2,000	50[14], 51[15]	770/1,400[13]	125mL plastic	48 hours	Maintain at ≤6°C
Methylmercury (Water)	ng/L	EPA 1630	0.02	0.49	NS	NS	NS	125mL plastic	48 hours	Maintain at ≤6°C
Bacteria										
Total Coliform	MPN/100 mL	EPA SM9223B	Not Applicable	1	NS	NS	NS	100 mL plastic	24 hours	Maintain at ≤6°C
Fecal Coliform	MPN/100 mL	EPA SM9223B	Not Applicable	1	200/100 mL[21]	NS	126	100 mL plastic	24 hours	Maintain at ≤6°C
E. coli [20]	MPN/100 mL	EPA SM9223B	Not Applicable	1	100/100 mL[22]	NS	NS	100 mL plastic	8 Hours	8 hours

Notes

[1] Units follow listed criterion standards. If standards were not available, laboratory supplied units were used. (Note: µg/L-ppb and mg/L=ppm)

[2] Analysis methods are periodically updated by the EPA. The analyses method used by laboratories are reflected in this table. Analytes that were analyzed using differing methods than identified in the AQ-2 TSP included nitrate/nitrite, ammonia, total phosphorus, ortho-phosphate, TDS, TSS, total alkalinity, all dissolved metals, total mercury, and bacteria testing. SM/EPA analysis methods used by the laboratories are equivalent to those identified in the AQ-2 TSP.

[3] The Water Quality Control Plan for the Tulare Lake Basin Third Edition relies on California primary and secondary Maximum Concentration Level objectives as criteria for water quality to be used as a municipal and domestic supply for human consumption.

[4] CTR criteria are based primarily on EPA standards developed under the Clean Water Act for human consumption of water and aquatic organisms with an adult risk for carcinogens estimated to be one in one million as contained in the Integrated Risk Information System (IRIS) as of October 1, 1996.

[5] Federal water quality criteria are from the EPA's website unless otherwise noted in the footnotes.
Aquatic Life Criteria: https://www.epa.gov/wqc/national-recommended-water-quality-criteria-aquatic-life-criteria-table#table.
Human Health Criteria: https://www.epa.gov/wqc/national-recommended-water-quality-criteria-human-health-criteria-table.

[6] Elevated temperature wastes shall not cause the temperature of waters designated COLD or WARM to increase by more than 5°F above natural receiving water temperature.

[7] 5.0 mg/L for waters designated WARM, 7.0 mg/L for waters designated COLD or SPWN.

[8] The 1-day minimum warmwater criteria are 5.0 mg/L for early life stages, which includes all embryonic and larval stages and all juveniles forms to 30 days following hatching, and 3.0 mg/L for other life stages. The 1-day minimum coldwater criteria are 8.0 mg/L to achieve required intergravel DO concentrations for early life stages, 5.0 mg/L for early life stages exposed directly to the water column, and 4.0 mg/L for other life stages (EPA's 1986 “Gold Book”).

[9] pH shall not be depressed below 6.5, raised above 8.3, or changed at any time more than 0.3 units from normal ambient pH.

[10] The criteria listed are secondary Maximum Concentration Levels (MCLs) for California drinking water quality objectives that do not necessarily indicate a toxic amount of contamination. Rather these standards dictate water quality objectives designed to preserve taste, odor, or appearance of drinking water.

[11] The criteria listed are primary MCLs listed to address health concerns. Updated November 2024

[12] The criterion continuous concentration (CCC) of 20 mg/L is a minimum value except where alkalinity is naturally lower, in which case the criterion cannot be lower than 25 percent of the natural level.

[13] Freshwater aquatic life protection, continuous concentration (4-day average)/maximum concentration (1-hour average).

[14] Human health criterion (30-day average) for drinking water sources (consumption of water and aquatic organisms).

[15] Human health criterion (30-day average) for other waters (consumption of aquatic organisms only).

[16] Criterion is hardness dependent which is expressed as a function of hardness and decreases as hardness decreases. The actual criteria are calculated based on the hardness (as $CaCO_3$) of the sample water. Values displayed above correspond to a total hardness of 100mg/L.

[17] Criteria values are from the EPA's 2004 National Recommended Water Quality Criteria.

[18] Criterion for freshwater aquatic life protection (EPA's 1986 “Gold Book”).

[19] Criterion for domestic water supplies (EPA's 1986 “Gold Book”).

[20] *E. coli* data were not required in the TSP and therefore were not collected in 2024; however, as noted during the ISR meeting, SCE collected supplemental *E. coli* data in 2025.

[21] Geometric mean of five samples - criterion for domestic water supplies (EPA's 1986 “Gold Book”).

[22] Six-week rolling geometric mean of 100/100 mL and a statistical threshold value of 320/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month. Presence/Absence analysis was used to align with current TSP sampling effort/schedule.

Key: °C = degrees celsius
µg/L = micrograms per liter
µS/cm = microsiemens per centimeter
CTR = California Toxics Rule
DO = dissolved oxygen
EPA = Environmental Protection Agency
MDL= Method Detection Limit: The minimum measured concentration of a substance that can be reported with 99 percent confidence that the measured concentration is distinguishable from method blank results.
mg/L = milligrams per liter
mL = milliliters
MPN = Most probable number of bacterial colonies per 100 mL of water.

Copyright 2026 by Southern California Edison

MRL= Method Reporting Limit: The lowest concentration of a substance that can be reliably reported under current laboratory operating conditions.
NS = no standard available
NTU = Nephelometric Turbidity Units
ppt = parts per trillion
RL = reporting limit
TKN = total Kjeldahl nitrogen

Table 5-1. Water Quality Control Plan for the Tulare Lake Basin Beneficial Uses in the Project Study Area

Beneficial Use	Definition
Hydropower Generation (POW)	Beneficial uses of waters used for hydroelectric power generation.
Water Contact Recreation (REC-1)	Beneficial uses of waters used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, and use of natural hot springs.
Non-contact Water Recreation (REC-2)	Beneficial uses of waters used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.
Warm Freshwater Habitat (WARM)	Beneficial uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
Cold Freshwater Habitat (COLD)	Beneficial uses of waters that support cold water ecosystems including, but not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.
Wildlife Habitat (WILD)	Beneficial uses of waters that support wildlife habitats including, but not limited to, the preservation and enhancement of vegetation and prey species used by wildlife, such as waterfowl.
Rare, Threatened, or Endangered Species (RARE)	Beneficial uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.

Table 5-2. Summary of In-Situ Sample Results for the 2024 Sampling Year

Site ID	Site Description	Date	Time of Day	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% saturation)	Specific Conductance (µS/cm at 25°C)	pH	Alkalinity (mg/L)	Salinity (ppt)[1]
Spring Runoff										
KR 55.6	Kern River above Democrat Dam	6/27/2024	0830	18.9	8.68	94	92	7.97	40	0.0348
KR 55.2	Kern River below rafting take-out	6/27/2024	0845	19.0	8.73	94	92	7.97	40	0.0348
KR 54.36	Kern River between Democrat Dam and Instream Flow Release	6/27/2024	940	19.0	9.10	98	92	7.96	40	0.0348
KR 54.2	Kern River below Instream Flow Release	6/27/2024	1000	19.1	9.06	98	92	8.01	40	0.0348
KR 53.84	Kern River near USGS gage 11192500; below Democrat Dam	6/27/2024	1030	19.2	8.99	92	93	8.00	40	0.0352
KR 50.3	Kern River near Lucas Creek	6/27/2024	1110	19.5	8.93	97	92	8.04	40	0.0348
KR 48.7	Kern River below Upper Richbar Day Use Area	6/27/2024	1130	19.6	8.94	98	92	8.12	40	0.0348
KR 48.4	Kern River below Lower Richbar Day Use Area	6/27/2024	1145	19.6	8.96	98	92	8.14	40	0.0348
KR 47.78	Kern River below Live Oak Day Use Area	6/27/2024	1200	19.7	8.93	98	92	8.12	40	0.0348
KRTR 43.94	Kern River No. 1 Powerhouse Tailrace	6/26/2024	1220	20.5	9.06	100	93	8.17	40	0.0352
KR 44.0	Kern River upstream of Kern River No. 1 Powerhouse	6/26/2024	1300	19.3	8.84	97	93	8.00	40	0.0352
Late Summer/Early Fall Base-Flow Period										
KR 55.6	Kern River above Democrat Dam	10/10/2024	1030	20.0	8.72	95	143	7.95	43	0.0562
KR 55.2	Kern River below rafting take-out	10/10/2024	1110	20.1	8.89	98	142	7.99	43	0.0558
KR 54.36	Kern River between Democrat Dam and Instream Flow Release	10/9/2024	1200	20.1	8.63	95	141	7.95	43	0.0554
KR 54.2	Kern River below Instream Flow Release	10/9/2024	1215	20.2	8.58	95	141	7.95	44	0.0554
KR 53.84	Kern River near USGS gage 11192500; below Democrat Dam	10/9/2024	1300	20.3	8.67	96	142	7.99	44	0.0558
KR 50.3	Kern River near Lucas Creek	10/10/2024	0935	19.8	8.90	97	141	7.97	43	0.0554
KR 48.7	Kern River below Upper Richbar Day Use Area	10/10/2024	1150	20.2	8.79	97	140	7.98	44	0.0550
KR 48.4	Kern River below Lower Richbar Day Use Area	10/10/2024	1200	20.4	8.95	99	142	8.00	44	0.0558
KR 47.78	Kern River below Live Oak Day Use Area	10/10/2024	1215	20.4	8.89	99	142	8.10	43	0.0558
KRTR 43.94	Kern River No. 1 Powerhouse Tailrace	10/9/2024	1030	20.3	8.95	99	142	7.89	43	0.0558
KR 44.0	Kern River upstream of Kern River No. 1 Powerhouse	10/9/2024	1015	20.1	9.12	100	140	8.00	43	0.0550

Notes:
[1] Salinity was calculated by converting conductivity measurements (Dohrman 2023)
Key: °C = degrees Celsius
µS/cm = microsiemens per centimeter
mg/L = milligrams per liter
pH = potential of hydrogen
ppt = parts per trillion
USGS = U.S. Geological Survey

Copyright 2026 by Southern California Edison

Table 5-3. Summary of In-Situ Sample Results for the 2025 Sampling Year

Site ID	Site Description	Date	Time of Day	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% saturation)	Specific Conductance (µS/cm at 25 °C)	pH	Alkalinity (mg/L)	Salinity (PPT)[1]
Spring Runoff										
KR 55.6	Kern River above Democrat Dam	6/4/2025	1000	16.7	8.56	95	109	8.16	38	0.0419
KR 55.2	Kern River below rafting take-out (surface; impoundment)	6/4/2025	0940	16.6	8.70	96	109	8.06	46	0.0419
KR 55.2	Kern River below rafting take-out (mid-column; impoundment)	6/4/2025	0945	16.5	9.15	101	109	7.98	43	0.0419
KR 54.36	Kern River between Democrat Dam and Instream Flow Release	6/5/2025	0850	16.6	9.33	103	108	8.03	36	0.0414
KR 54.2	Kern River below Instream Flow Release	6/5/2025	0900	16.7	9.16	101	109	8.02	34	0.0419
KR 53.84	Kern River near USGS gage 11192500; below Democrat Dam	6/5/2025	0830	16.7	9.11	100	110	7.88	45	0.0423
KR 50.3	Kern River near Lucas Creek	6/4/2025	1230	17.8	8.91	100	110	8.18	32	0.0423
KR 48.7	Kern River below Upper Richbar Day Use Area	6/4/2025	1240	17.9	9.27	103	110	8.18	40	0.0423
KR 48.4	Kern River below Lower Richbar Day Use Area	6/4/2025	1245	17.9	9.33	104	100	8.23	40	0.0381
KR 47.78	Kern River below Live Oak Day Use Area	6/4/2025	1255	18.0	9.32	104	110	8.25	40	0.0423
KRTR 43.94	Kern River No. 1 Powerhouse Tailrace	6/3/2025	1140	16.7	9.12	97	112	8.00	40	0.0431
KR 44.0	Kern River upstream of Kern River No. 1 Powerhouse	6/3/2025	1200	18.9	8.75	97	117	8.13	40	0.0452
Late Summer/Early Fall Base-Flow Period										
KR 55.6	Kern River above Democrat Dam	9/30/2025	1250	21.2	8.60	103	133	8.18	42	0.0520
KR 55.2	Kern River below rafting take-out (surface; impoundment)	9/30/2025	1215	21.0	8.63	103	132	8.18	43	0.0515
KR 55.2	Kern River below rafting take-out (mid-column; impoundment)	9/30/2025	1220	21.0	8.66	104	133	8.18	42	0.0520
KR 54.36	Kern River between Democrat Dam and Instream Flow Release	9/30/2025	1615	21.5	8.33	101	144	8.09	43	0.0567
KR 54.2	Kern River below Instream Flow Release	9/30/2025	1630	21.5	8.34	101	134	7.91	44	0.0524
KR 53.84	Kern River near USGS gage 11192500; below Democrat Dam	9/30/2025	1335	21.9	8.61	104	144	7.96	42	0.0567
KR 50.3	Kern River near Lucas Creek	9/30/2025	1415	21.8	8.62	104	145	8.34	42	0.0571
KR 48.7	Kern River below Upper Richbar Day Use Area	9/30/2025	1700	21.9	8.76	102	144	8.20	43	0.0567
KR 48.4	Kern River below Lower Richbar Day Use Area	9/30/2025	1710	21.8	8.82	103	142	8.12	43	0.0558
KR 47.78	Kern River below Live Oak Day Use Area	9/30/2025	1715	21.8	8.75	102	142	8.29	44	0.0558
KRTR 43.94	Kern River No. 1 Powerhouse Tailrace	9/30/2025	0940	20.9	8.91	103	143	7.99	43	0.0562
KR 44.0	Kern River upstream of Kern River No. 1 Powerhouse	9/30/2025	0915	20.5	8.98	103	146	7.92	43	0.0575

Notes:
[1] Salinity was calculated by converting conductivity measurements (Dohrman 2023)
Key: °C = degrees Celsius
µS/cm = microsiemens per centimeter
mg/L = milligrams per liter
pH = potential of hydrogen
ppt = parts per trillion
USGS = U.S. Geological Survey

Table 5-4. Summary of 2025 Turbidity Sampling Results

Site ID[2]	Site Description	Turbidity (NTU)				
		Sampling Period[1]				
		Water Temperature Logger Installation (May 4-5, 2025)	Spring In-situ Sampling (June 3-5, 2025)	Water Temperature Logger Download (Mid-Season) (August 14, 2025)	Fall In-situ Sampling (September 30, 2025)	Water Temperature Logger Removal (October 22, 2025)
KR 55.6	Kern River above Democrat Dam (representative of natural turbidity)	2.40	1.26	2.56	5.96	7.50
KR 55.2	Kern River below rafting take-out (surface; impoundment)	–	1.31	–	5.09	–
KR 55.2	Kern River below rafting take-out (mid-column; impoundment)	–	1.47	–	4.98	–
KR 54.36	Kern River between Democrat Dam and Instream Flow Release	4.80	1.20	2.60	4.96	9.60
KR 54.2	Kern River below Instream Flow Release	4.50	1.29	2.40	5.45	9.10
KR 53.84	Kern River near USGS gage 11192500; below Democrat Dam	4.20	1.38	2.60	5.54	10.10
KR 50.3	Kern River near Lucas Creek	5.05	2.16	2.50	7.03	10.00
KR 48.7	Kern River below Upper Richbar Day Use Area	–	2.15	–	4.99	–
KR 48.4	Kern River below Lower Richbar Day Use Area	–	2.55	–	5.05	–
KR 47.78	Kern River below Live Oak Day Use Area	–	2.30	–	5.65	–
KRTR 43.94	Kern River No. 1 Powerhouse Tailrace	4.50	2.65	N/A[3]	8.20	10.65
KR 44.0	Kern River upstream of Kern River No. 1 Powerhouse	8.00	3.09	2.50	7.95	14.75

Notes:
[1] Turbidity was recorded during the 2025 spring and fall in-situ field measurement periods and opportunistically at water temperature monitoring locations in May, August, and October.
[2] Turbidity was only recorded at water temperature monitoring locations during the supplemental sampling.
[3] Flowing water was not present in tailrace at the time of sampling.

Copyright 2026 by Southern California Edison

Table 5-5. Summary of Seasonal Grab Sample Results Collected During the Spring 2024 Sampling Event

Water Quality Parameters	Units	MDL	RL	Water Quality Criteria	Site ID, Lab Sample ID, Date, Time and Analytical Results							
					KR 55.6 Kern River above Democrat Dam (surface)	KR 55.2 Kern River above Democrat Dam (mid-column)	KR 54.36 Kern River between Democrat Dam and Instream Flow Release	KR 54.2 Kern River below Instream Flow Release	KR 53.84 Kern River near USGS Gage 11192500	KR 50.3 Kern River near Lucas Creek	KRTR 43.94 Kern River No. 1 Powerhouse Tailrace	KR 44.0 Kern River upstream of Kern No. 1 Powerhouse
					2406585-02	–	2406585-01	2406585-05	2406585-03	2406585-04	2406558-01	2406558-02
					6/27/2024	–	6/27/2024	6/27/2024	6/27/2024	6/27/2024	6/26/2024	6/26/2024
					0830	–	0940	1000	1030	1110	1220	1300
General Parameters												
Nitrate as N	mg/L	0.01	0.10	10[2]	0.35	–	0.15	0.30	0.46	0.28	0.15	0.40
Nitrite as N	mg/L	6.7	150	1[2]	ND	–	ND	ND	ND	ND	ND	ND
Ammonia as N	mg/L	0.33	0.80	0.025[3]	ND	–	ND	ND	ND	ND	ND	ND
TKN	mg/L	0.30	0.80	NS	0.39	–	ND	ND	ND	0.35	0.32	0.61
Total Phosphorus	µg/L	0.0022	0.10	NS	ND	–	ND	ND	ND	ND	ND	ND
Ortho-phosphate	mg/L	0.016	0.30	NS	ND	–	ND	ND	ND	ND	ND	ND
Total Dissolved Solids	mg/L	5.0	10.0	500[2]	94.0	–	80.0	69.0	89.0	86.0	ND	49.0
Total Suspended Solids	mg/L	2.0	2.5	NS	56.0	–	6.7	6.2	7.9	8.7	9.1	7.4
Total Alkalinity (as $CaCO_3$)	mg/L	10.0	10.0	>20[4]	38.0	–	38.0	38.0	37.0	38.0	36.0	36.0
Metals - Dissolved												
Arsenic	µg/L	0.005	0.020	10[2]	ND	–	ND	ND	ND	ND	ND	ND
Cadmium	µg/L	7.0	10.0	Hardness dependent[5]	ND	–	ND	ND	ND	ND	ND	ND
Copper	µg/L	16	50.0	Hardness dependent[5]	ND	–	ND	ND	ND	ND	ND	ND
Iron	µg/L	0.031	0.10	300[2]	0.10	–	0.10	ND	0.10	ND	ND	0.10
Lead	µg/L	0.01	0.05	Hardness dependent[5]	ND	–	ND	ND	ND	ND	ND	ND
Manganese	µg/L	0.0030	0.030	50[2]	0.056	–	0.056	0.055	0.054	0.057	0.061	0.069
Nickel	µg/L	0.0010	0.010	Hardness dependent[5]	ND	–	ND	ND	ND	ND	ND	ND
Chromium-Total	µg/L	2.00	10.0	50[2]	ND	–	ND	ND	ND	ND	ND	ND
Metals-Total												
Total Mercury	ng/L	0.08	0.20	1,400[6]	ND	–	ND	ND	ND	ND	ND	ND

Notes: [1] KR 55.2 was not sampled in the spring.
[2] Water quality objective from the 2018 Water Quality Control Plan for the Tulare Lake Basin Third Edition.
[3] Basin Plan water quality objective is 0.025 mg/L. EPA criterion is pH, temperature, and life cycle dependent. See Table 5-9 for EPA criteria and results.
[4] EPA criterion. The CCC of 20 mg/L is a minimum value except where alkalinity is naturally lower, in which case the criterion cannot be lower than 25 percent of the natural level.
[5] Criterion is hardness dependent which is expressed as a function of hardness and decreases as hardness decreases. Actual criterion is calculated based on the hardness (as $CaCO_3$) of the sample water. Hardness was not directly analyzed in 2024 but all values were ND.
[6] EPA maximum concentration (1-hour average) criterion for freshwater aquatic life protection. Basin Plan water quality objective is less stringent (2,000 ng/L).

Key: µg/L = micrograms per liter
MDL= Method Detection Limit
mg/L = milligrams per liter
ND = Analyte was not detected above the MDL and is therefore considered a non-detect.
ng/L = nanograms per liter
NS = No standard
RL = Reporting Limit: The lowest concentration of a substance that can be reliably reported under current laboratory operating conditions.
TKN = total Kjeldahl nitrogen

Copyright 2026 by Southern California Edison

Table 5-6. Summary of Seasonal Grab Sample Results Collected During the Fall 2024 Sampling Event

Water Quality Parameters	Units	MDL	RL	Water Quality Criteria	Site ID, Lab Sample ID, Date, Time and Analytical Results							
					KR 55.2 Kern River above Democrat Dam (surface)	KR 55.2 Kern River above Democrat Dam (mid-column)	KR 54.36 Kern River between Democrat Dam and Instream Flow Release	KR 54.2 Kern River below Instream Flow Release	KR 53.84 Kern River near USGS Gage 11192500	KR 50.3 Kern River near Lucas Creek	KRTR 43.94 Kern River No. 1 Powerhouse Tailrace	KR 44.0 Kern River upstream of Kern No. 1 Powerhouse
					2410283-02 AHJ3577	2410283-03 AHJ3577	2410259-03 AHJ3600	2410259-02 AHJ3600	2410259-05 AHJ3600	2410283-01 AHJ3577	2410259-01 AHJ3600	2410259-04 AHJ3600
					10/10/2024	10/10/2024	10/9/2024	10/9/2024	10/9/2024	10/10/2024	10/9/2024	10/9/2024
					1035	1100	1200	1215	1300	1000	1030	1015
General Parameters												
Nitrate as N	mg/L	0.01	0.10	10[1]	0.15	0.18	0.13	0.26	0.22	0.15	0.12	0.20
Nitrite as N	mg/L	6.7	150	1[1]	ND	ND	ND	ND	ND	ND	ND	ND
Ammonia as N	mg/L	0.33	0.80	0.025[2]	ND	ND	ND	ND	ND	ND	ND	ND
TKN	mg/L	0.30	0.10	NS	ND	ND	ND	ND	ND	ND	1.4	ND
Total Phosphorus	ug/L	0.0022	0.10	NS	ND	ND	ND	ND	ND	ND	ND	ND
Ortho-phosphate	mg/L	0.016	0.30	NS	ND	ND	ND	ND	ND	ND	ND	ND
Total Dissolved Solids	mg/L	5.0	10.0	500[1]	88.0	79.0	65.0	70.0	100.0	86.0	74.0	68.0
Total Suspended Solids	mg/L	2.0	2.5	NS	2.8	ND	2.9	2.8	2.8	ND	3.6	2.7
Total Alkalinity	mg/L	10.0	10.0	>20[3]	59.0	56.0	56.0	56.0	54.0	60.0	58.0	57.0
Metals - Dissolved												
Arsenic	µg/L	0.005	0.020	10[1]	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	µg/L	7.0	10.0	Hardness dependent[4]	ND	ND	ND	ND	ND	ND	ND	ND
Copper	µg/L	16	50.0	Hardness dependent[4]	ND	ND	ND	ND	ND	ND	ND	ND
Iron	µg/L	0.031	0.10	300[1]	ND	ND	ND	ND	ND	ND	0.48	ND
Lead	µg/L	0.01	0.05	Hardness dependent[4]	ND	ND	ND	ND	ND	ND	ND	ND
Manganese	µg/L	0.0030	0.030	50[1]	0.069	0.068	0.078	0.075	0.060	0.047	0.080	0.073
Nickel	µg/L	0.0010	0.010	Hardness dependent[4]	ND	ND	ND	ND	ND	ND	ND	ND
Chromium-Total	µg/L	2.00	10.0	50[1]	ND	ND	ND	ND	ND	ND	ND	ND
Metals-Total												
Total Mercury	ng/L	0.08	0.20	1,400[5]	ND	ND	ND	ND	ND	ND	ND	ND

Notes: [1] Water quality objective from the 2018 Water Quality Control Plan for the Tulare Lake Basin Third Edition.
[2] Basin Plan water quality objective is 0.025 mg/L. EPA criterion is pH, temperature, and life cycle dependent. See Table 5-9 for EPA criteria and results.
[3] EPA criterion. The CCC of 20 mg/L is a minimum value except where alkalinity is naturally lower, in which case the criterion cannot be lower than 25 percent of the natural level.
[4] Criterion is hardness dependent which is expressed as a function of hardness and decreases as hardness decreases. Actual criterion is calculated based on the hardness (as $CaCO_3$) of the sample water. Hardness was not directly analyzed in 2024 but all values were ND.
[5] EPA maximum concentration (1-hour average) criterion for freshwater aquatic life protection. Basin Plan water quality objective is less stringent (2,000 ng/L).

Key: µg/L = micrograms per liter
MDL= method detection limit
mg/L = milligrams per liter
ND = Analyte was not detected above the MDL and is therefore considered a non-detect.
ng/L = nanograms per liter
NS = No standard
RL = Reporting Limit: The lowest concentration of a substance that can be reliably reported under current laboratory operating conditions.
TKN = total Kjeldahl nitrogen

Copyright 2026 by Southern California Edison

Table 5-7. Summary of Seasonal Grab Sample Results Collected During the Spring 2025 Sampling Event

Water Quality Parameters	Units	MDL	RL	Water Quality Criteria	Site ID, Lab Sample ID, Date, Time and Analytical Results								
					KR 55.2[1] Kern River below rafting take-out (surface)	KR 55.2[1] Kern River below rafting take-out (mid-column)	KR 55.6[1] Kern River above Democrat Dam	KR 54.36 Kern River between Democrat Dam and Instream Flow Release	KR 54.2 Kern River below Instream Flow Release	KR 53.84 Kern River near USGS Gage 11192500	KR 50.3 Kern River near Lucas Creek	KRTR 43.94 Kern River No. 1 Powerhouse Tailrace	KR 44.0 Kern River upstream of Kern No. 1 Powerhouse
					2506102-03	2506102-01	2506102-04	2506125-02	2506125-01	2506125-03	2506102-06	2506076-03	506076-02
					6/4/2025	6/4/2025	6/4/2025	6/5/2025	6/5/2025	6/5/2025	6/4/2025	6/3/2025	6/3/2025
					0940	0945	0930	0845	0855	0825	1230	1140	1150
General Parameters													
Nitrate as N	mg/L	0.01	0.10	10[2]	0.09	0.12	0.19	0.34	ND	ND	0.14	0.16	0.19
Nitrite as N	mg/L	6.7	150	1[2]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ammonia as N	mg/L	0.33	0.80	0.025[3]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Kjeldahl Nitrogen (TKN)	mg/L	0.30	0.80	NS	0.12	0.05	0.21	0.06	0.08	0.08	0.08	0.06	0.77
Total Phosphorus	ug/L	0.0022	0.10	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ortho-phosphate	mg/L	0.016	0.30	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Dissolved Solids	mg/L	5.0	10.0	500[2]	73	70	84	75	78	88	96	86	100
Total Suspended Solids	mg/L	2.0	2.5	NS	ND	5.6	ND	3.0	2.6	ND	3.8	ND	4.8
Total Alkalinity (as CaCO3)	mg/L	10.0	10.0	>20[4]	46	43	44	36	34	45	32	40	34
Hardness (as CaCO3)	mg/L	2.0	2.0	NS	35	32	35	32	35	35	35	35	38
Metals - Dissolved													
Arsenic	µg/L	0.005	0.020	10[2]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	µg/L	7.0	10.0	Hardness dependent[5]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	µg/L	16	50.0	Hardness dependent[5]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	µg/L	0.031	0.10	300[2]	0.12	0.11	0.11	ND	0.12	0.12	0.13	0.15	0.15
Lead	µg/L	0.01	0.05	Hardness dependent[5]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese	µg/L	0.0030	0.030	50[2]	ND	0.031	ND	0.030	0.032	0.031	0.039	0.047	0.051
Nickel	µg/L	0.0010	0.010	Hardness dependent[5]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium-Total	µg/L	2.00	10.0	50[2]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metals-Total													
Mercury	ng/L	0.08	0.20	1,400[6]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylmercury[7]	ng/L	0.020	0.049	NS	0.072	0.059	0.057	0.073	0.066	0.065	0.075	0.078	0.084

Notes: [1] Grab samples taken at KR55.2 and KR 55.6 to address variance discussed in Section 4.1. Impoundment grab samples (KR 55.2) taken at water surface and mid-column.
[2] Water quality objective from the 2018 Water Quality Control Plan for the Tulare Lake Basin Third Edition.
[3] Basin Plan water quality objective is 0.025 mg/L. EPA criterion is pH, temperature, and life cycle dependent. See Table 5-10 for EPA criteria and results.
[4] EPA criterion. The CCC of 20 mg/L is a minimum value except where alkalinity is naturally lower, in which case the criterion cannot be lower than 25 percent of the natural level.
[5] Criterion is hardness dependent which is expressed as a function of hardness and decreases as hardness decreases. Actual criterion is calculated based on the hardness (as $CaCO_3$) of the sample water. See Table 5-11 for criteria and results.
[6] EPA maximum concentration (1-hour average) criterion for freshwater aquatic life protection. Basin Plan water quality objective is less stringent (2,000 ng/L).
[7] All methylmercury water samples (spring and fall) were batch run in the fall of 2025 by MPSL.

Key: µg/L = micrograms per liter
MDL= method detection limit
mg/L = milligrams per liter
ND = Analyte was not detected above the MDL and is therefore considered a non-detect.

ng/L = nanograms per liter
NS = No standard
RL = Reporting Limit: The lowest concentration of a substance that can be reliably reported under current laboratory operating conditions.
TKN = total Kjeldahl nitrogen

Table 5-8. Summary of Seasonal Grab Sample Results Collected During the Fall 2025 Sampling Event

Water Quality Parameters	Units	MDL	RL	Water Quality Criteria	Site ID, Lab Sample ID, Date, Time and Analytical Results								
					KR 55.2[1] Kern River below rafting take-out (surface)	KR 55.2[1] Kern River below rafting take-out (mid-column)	KR 55.6[1] Kern River above Democrat Dam	KR 54.36 Kern River between Democrat Dam and Instream Flow Release	KR 54.2 Kern River below Instream Flow Release	KR 53.84 Kern River near USGS Gage 11192500	KR 50.3 Kern River near Lucas Creek	KRTR 43.94 Kern River No. 1 Powerhouse Tailrace	KR 44.0 Kern River upstream of Kern No. 1 Powerhouse
					2510049-06	2510049-07	2510049-08	2510049-01	2510049-02	2510049-09	2510049-10	2510049-05	2510049-03
					10/1/2025	10/1/2025	10/1/2025	9/30/2025	9/30/2025	10/1/2025	10/1/2025	10/1/2025	10/1/2025
					1200	1200	1240	1615	1630	1330	1415	0935	0915
General Parameters													
Nitrate as N	mg/L	0.01	0.10	10[2]	0.26	0.23	0.19	0.18	0.33	0.32	0.78	0.28	0.28
Nitrite as N	mg/L	6.7	150	1[2]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ammonia as N	mg/L	0.33	0.80	0.025[3]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Kjeldahl Nitrogen (TKN)	mg/L	0.30	0.10	NS	0.28	0.33	0.26	0.23	0.56	0.21	0.32	0.37	0.23
Total Phosphorus	ug/L	0.0022	0.10	NS	0.12	0.11	0.13	0.14	0.13	0.12	0.12	0.10	0.15
Ortho-phosphate	mg/L	0.016	0.30	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Dissolved Solids	mg/L	5.0	10.0	500[2]	77	65	75	92	92	92	84	96	81
Total Suspended Solids	mg/L	2.0	2.5	NS	11.0	12.0	11.0	9.6	9.6	8.3	12.0	20.0	14.0
Total Alkalinity (as CaCO3)	mg/L	10.0	10.0	>20[4]	55	57	58	51	56	57	58	60	58
Hardness (as CaCO3)	mg/L	2.0	2.0	NS	44	44	44	44	44	44	44	44	44
Metals - Dissolved													
Arsenic	µg/L	0.005	0.020	10[2]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cadmium	µg/L	7.0	10.0	Hardness dependent[5]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	µg/L	16	50.0	Hardness dependent[5]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Iron	µg/L	0.031	0.10	300[2]	0.11	0.11	0.11	ND	ND	ND	0.10	ND	0.11
Lead	µg/L	0.01	0.05	Hardness dependent[5]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Manganese	µg/L	0.0030	0.030	50[2]	0.098	0.099	0.10	0.074	0.082	0.085	0.089	0.110	0.094
Nickel	µg/L	0.0010	0.010	Hardness dependent[5]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium-Total	µg/L	2.00	10.0	50[2]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metals-Total													
Mercury	ng/L	0.08	0.20	1,400[6]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylmercury[7]	ng/L	0.020	0.049	NS	0.110	0.140	0.130	0.130	0.140	0.120	0.140	0.170	0.160

Notes:
[1] Grab samples taken at KR55.2 and KR 55.6 to address variance discussed in Section 4.1. Impoundment grab samples (KR 55.2) taken at water surface and mid-column.
[2] Water quality objective from the 2018 Water Quality Control Plan for the Tulare Lake Basin Third Edition.
[3] Basin Plan water quality objective is 0.025 mg/L. EPA criterion is pH, temperature, and life cycle dependent. See Table 5-10 for EPA criteria and results.
[4] EPA criterion. The CCC of 20 mg/L is a minimum value except where alkalinity is naturally lower, in which case the criterion cannot be lower than 25 percent of the natural level.
[5] Criterion is hardness dependent which is expressed as a function of hardness and decreases as hardness decreases. Actual criterion is calculated based on the hardness (as $CaCO_3$) of the sample water. See Table 5-12 for criteria and results.
[6] EPA maximum concentration (1-hour average) criterion for freshwater aquatic life protection. Basin Plan water quality objective is less stringent (2,000 ng/L).
[7] All methylmercury water samples (spring and fall) were batch run in the fall of 2025 by MPSL.

Key:
µg/L = micrograms per liter
MDL= method detection limit
mg/L = milligrams per liter
ND = Analyte was not detected above the MDL and is therefore considered a non-detect.
ng/L = nanograms per liter

NS = No standard
RL = Reporting Limit: The lowest concentration of a substance that can be reliably reported under current laboratory operating conditions.
TKN = total Kjeldahl nitrogen

Copyright 2026 by Southern California Edison

Table 5-9. Calculated Ammonia Concentration Criteria for the Spring and Fall 2024 Sampling Events

Site ID	Date	pH	Temperature (°C)	Basin Plan Waste Discharge Exceedance Criteria (mg/L)	EPA Ammonia Chronic Criteria[1] (mg/L)	EPA Ammonia Acute Criteria[1] (mg/L)	Ammonia Concentration[2] (mg/L)
Spring Sampling							
KR 55.6 Kern River above Democrat Dam (surface)	6/27/2024	7.97	18.9	0.025	0.87	4.53	ND
KR 54.36 Kern River between Democrat Dam and Instream Flow Release	6/27/2024	7.96	19.0	0.025	0.88	4.57	ND
KR 54.2 Kern River below Instream Flow Release	6/27/2024	8.01	19.1	0.025	0.81	4.13	ND
KR 53.84 Kern River near USGS Gage 11192500	6/27/2024	8.00	19.2	0.025	0.82	4.17	ND
KR 50.3 Kern River near Lucas Creek	6/27/2024	8.04	19.5	0.025	0.76	3.77	ND
KRTR 43.94 Kern River No. 1 Powerhouse Tailrace	6/26/2024	8.17	20.5	0.025	0.58	2.70	ND
KR 44.0 Kern River upstream of Kern No. 1 Powerhouse	6/26/2024	8.00	19.3	0.025	0.81	4.14	ND

Site ID	Date	pH	Temperature (°C)	Basin Plan Waste Discharge Exceedance Criteria (mg/L)	EPA Ammonia Chronic Criteria[1] (mg/L)	EPA Ammonia Acute Criteria[1] (mg/L)	Ammonia Concentration[2] (mg/L)
Fall Sampling							
KR 55.6 Kern River above Democrat Dam (surface)	10/10/2024	7.95	20.0	0.025	0.83	4.29	ND
KR 54.36 Kern River between Democrat Dam and Instream Flow Release	10/9/2024	7.95	20.1	0.025	0.83	4.25	ND
KR 54.2 Kern River below Instream Flow Release	10/9/2024	7.95	20.2	0.025	0.82	4.22	ND
KR 53.84 Kern River near USGS Gage 11192500	10/9/2024	7.99	20.3	0.025	0.77	3.88	ND
KR 50.3 Kern River near Lucas Creek	10/10/2024	7.97	19.8	0.025	0.82	4.20	ND
KRTR 43.94 Kern River No. 1 Powerhouse Tailrace	10/9/2024	7.89	20.3	0.025	0.89	4.67	ND
KR 44.0 Kern River upstream of Kern No. 1 Powerhouse	10/9/2024	8.00	20.1	0.025	0.77	3.87	ND

Notes: [1] Ammonia criterion calculated using guidelines from the EPA's 2013 Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater, which is based on ambient pH and temperature conditions.
[2] ND: Analyte was not detected above the method detection limit (MDL) and is therefore considered a non-detect. The MDL for ammonia is 0.015 mg/L.

Key: °C = degrees Celsius
EPA = Environmental Protection Agency
mg/L = milligrams per liter
USGS = U.S. Geological Survey

Copyright 2026 by Southern California Edison

Table 5-10. Calculated Ammonia Concentration Criteria for the Spring and Fall 2025 Sampling Events

Site ID	Date	pH	Temperature (°C)	Basin Plan Waste Discharge Exceedance Criteria (mg/L)	EPA Ammonia Chronic Criteria[1] (mg/L)	EPA Ammonia Acute Criteria[1] (mg/L)	Ammonia Concentration[2] (mg/L)
Spring Sampling							
KR 55.6 Kern River above Democrat Dam	6/4/2025	8.16	16.7	0.025	0.75	3.78	ND
KR 55.2 Kern River below rafting take-out (surface)	6/4/2025	8.06	16.6	0.025	0.89	4.62	ND
KR 55.2 Kern River below rafting take-out (mid-column)	6/4/2025	7.98	16.5	0.025	1.00	5.42	ND
KR 54.36 Kern River between Democrat Dam and Instream Flow Release	6/5/2025	8.03	16.6	0.025	0.93	4.89	ND
KR 54.2 Kern River below Instream Flow Release	6/5/2025	8.02	16.7	0.025	0.93	4.94	ND
KR 53.84 Kern River near USGS Gage 11192500	6/5/2025	7.88	16.7	0.025	1.13	6.42	ND
KR 50.3 Kern River near Lucas Creek	6/4/2025	8.18	17.8	0.025	0.68	3.32	ND
KRTR 43.94 Kern River No. 1 Powerhouse Tailrace	6/3/2025	8.00	16.7	0.025	0.96	5.13	ND
KR 44.0 Kern River upstream of Kern No. 1 Powerhouse	6/3/2025	8.13	18.9	0.025	0.69	3.34	ND

Site ID	Date	pH	Temperature (°C)	Basin Plan Waste Discharge Exceedance Criteria (mg/L)	EPA Ammonia Chronic Criteria[1] (mg/L)	EPA Ammonia Acute Criteria[1] (mg/L)	Ammonia Concentration[2] (mg/L)
Fall Sampling							
KR 55.6 Kern River above Democrat Dam	9/30/2025	8.18	21.2	0.025	0.55	2.50	ND
KR 55.2 Kern River below rafting take-out (surface)	9/30/2025	8.18	21.0	1.025	0.55	2.54	ND
KR 55.2 Kern River below rafting take-out (mid-column)	9/30/2025	8.18	21.0	2.025	0.55	2.54	ND
KR 54.36 Kern River between Democrat Dam and Instream Flow Release	9/30/2025	8.09	21.5	0.025	0.62	2.90	ND
KR 54.2 Kern River below Instream Flow Release	9/30/2025	7.91	21.5	0.025	0.80	4.08	ND
KR 53.84 Kern River near USGS Gage 11192500	9/30/2025	7.96	21.9	0.025	0.73	3.60	ND
KR 50.3 Kern River near Lucas Creek	9/30/2025	8.34	21.8	0.025	0.41	1.74	ND
KRTR 43.94 Kern River No. 1 Powerhouse Tailrace	9/30/2025	7.99	20.9	0.025	0.74	3.69	ND
KR 44.0 Kern River upstream of Kern No. 1 Powerhouse	9/30/2025	7.92	20.5	0.025	0.84	4.35	ND

Notes: [1] Ammonia criterion calculated using guidelines from the EPA's 2013 Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater, which is based on ambient pH and temperature conditions.
[2] ND: Analyte was not detected above the method detection limit (MDL) and is therefore considered a non-detect. The MDL for ammonia is 0.015 mg/L.

Key: °C = degrees Celsius
EPA = Environmental Protection Agency
mg/L = milligrams per liter
USGS = U.S. Geological Survey

Table 5-11. Hardness-Based Water Quality Criteria for Cadmium, Copper, Lead, and Nickel for the Spring 2025 Sampling

Sample Location	KR 55.2 Kern River below rafting take-out (surface)	KR 55.2 Kern River below rafting take-out (mid-column)	KR 55.6 Kern River above Democrat Dam	KR 54.36 Kern River between Democrat Dam and Instream Flow Release	KR 54.2 Kern River below Instream Flow Release	KR 53.84 Kern River near USGS Gage 11192500	KR 50.3 Kern River near Lucas Creek	KRTR 43.94 Kern River No. 1 Powerhouse Tailrace	KR 44.0 Kern River upstream of Kern No. 1 Powerhouse
Lab Sample ID	2510049-06	2510049-07	2510049-08	2510049-01	2510049-02	2510049-09	2510049-10	2510049-05	2510049-03
Date Sampled	10/1/2025	10/1/2025	10/1/2025	9/30/2025	9/30/2025	10/1/2025	10/1/2025	10/1/2025	10/1/2025
Time Sampled	1200	1200	1240	1615	1630	1330	1415	0935	0915
Hardness (CaCO3) (mg/L)	35	32	35	32	35	35	35	35	38
Cadmium (Cd)									
Laboratory Result (µg/L)	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Maximum Criterion (µg/L)	0.67	0.62	0.67	0.62	0.67	0.67	0.67	0.67	0.73
Continuous Criterion (µg/L)	0.33	0.30	0.33	0.30	0.33	0.33	0.33	0.33	0.35
Copper (Cu)									
Laboratory Result (µg/L)	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Maximum Criterion (µg/L)	5.00	4.59	5.00	4.59	5.00	5.00	5.00	5.00	5.40
Continuous Criterion (µg/L)	3.65	3.38	3.65	3.38	3.65	3.65	3.65	3.65	3.92
Lead (Pb)									
Laboratory Result (µg/L)	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Maximum Criterion (µg/L)	20.25	18.32	20.25	18.32	20.25	20.25	20.25	20.25	22.20
Continuous Criterion (µg/L)	0.79	0.71	0.79	0.71	0.79	0.79	0.79	0.79	0.87
Nickel (Ni)									
Laboratory Result (µg/L)	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Maximum Criterion (µg/L)	192.64	178.58	192.64	178.58	192.64	192.64	192.64	192.64	206.52
Continuous Criterion (µg/L)	21.40	19.83	21.40	19.83	21.40	21.40	21.40	21.40	22.94

Notes: <MDL: Analyte was not detected above the method detection limit (MDL) and is therefore considered a non-detect. The MDL for cadmium is 0.031 µg/L, the MDL for lead is 0.026 µg/L, and the MDL for nickel is 0.117 µg/L.

Key: mg/L = milligrams per liter
µg/L = micrograms per liter

Copyright 2026 by Southern California Edison

Table 5-12. Hardness-Based Water Quality Criteria for Cadmium, Copper, Lead, and Nickel for the Fall 2025 Sampling

Sample Location	KR 55.2 Kern River below rafting take-out (surface)	KR 55.2 Kern River below rafting take-out (mid-column)	KR 55.6 Kern River above Democrat Dam	KR 54.36 Kern River between Democrat Dam and Instream Flow Release	KR 54.2 Kern River below Instream Flow Release	KR 53.84 Kern River near USGS Gage 11192500	KR 50.3 Kern River near Lucas Creek	KRTR 43.94 Kern River No. 1 Powerhouse Tailrace	KR 44.0 Kern River upstream of Kern No. 1 Powerhouse
Lab Sample ID	2510049-06	2510049-07	2510049-08	2510049-01	2510049-02	2510049-09	2510049-10	2510049-05	2510049-03
Date Sampled	10/1/2025	10/1/2025	10/1/2025	9/30/2025	9/30/2025	10/1/2025	10/1/2025	10/1/2025	10/1/2025
Time Sampled	1200	1200	1240	1615	1630	1330	1415	0935	0915
Hardness (CaCO3) (mg/L)	44	44	44	44	44	44	44	44	44
Cadmium (Cd)									
Laboratory Result (µg/L)	<MDL[1]	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Maximum Criterion (µg/L)	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Continuous Criterion (µg/L)	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
Copper (Cu)									
Laboratory Result (µg/L)	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Maximum Criterion (µg/L)	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20
Continuous Criterion (µg/L)	4.44	4.44	4.44	4.44	4.44	4.44	4.44	4.44	4.44
Lead (Pb)									
Laboratory Result (µg/L)	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Maximum Criterion (µg/L)	26.14	26.14	26.14	26.14	26.14	26.14	26.14	26.14	26.14
Continuous Criterion (µg/L)	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Nickel (Ni)									
Laboratory Result (µg/L)	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL	<MDL
Maximum Criterion (µg/L)	233.79	233.79	233.79	233.79	233.79	233.79	233.79	233.79	233.79
Continuous Criterion (µg/L)	25.97	25.97	25.97	25.97	25.97	25.97	25.97	25.97	25.97

Notes: [1] <MDL: Analyte was not detected above the method detection limit (MDL) and is therefore considered a non-detect. The MDL for cadmium is 0.031 µg/L, the MDL for lead is 0.026 µg/L, and the MDL for nickel is 0.117 µg/L.
Key: mg/L = milligrams per liter
µg/L = micrograms per liter

Copyright 2026 by Southern California Edison

Table 5-13. Summary of Analytical Results for Bacterial Sampling in 2024

Sample Location	Test[1]	Sample Dates					
		7/2/2024	7/9/2024	7/18/2024	7/24/2024	8/13/2024[1]	Geometric Mean
KR 55.2	*Total Coliform (MPN/100mL)*	23.0	33.0	7.8	4.5	<1.8	8.6
	Fecal Coliform (MPN/100mL)	23.0	33.0	2.0	4.5	<1.8	6.6
KR 48.7	*Total Coliform (MPN/100mL)*	23.0	23.0	7.8	2.0	<1.8	6.8
	Fecal Coliform (MPN/100mL)	23.0	23.0	7.8	2.0	<1.8	6.8
KR 48.4	*Total Coliform (MPN/100mL)*	23.0	23.0	7.8	4.5	2.0	8.2
	Fecal Coliform (MPN/100mL)	<1.8	23.0	2.0	4.5	<1.8	3.7
KR 47.78	*Total Coliform (MPN/100mL)*	>1600	33.0	49.0	7.8	<1.8	32.5
	Fecal Coliform (MPN/100mL)	>1600	33.0	22.0	7.8	<1.8	27.7

Notes: [1] Sampling delayed until August due to the Borel Fire
Key: mL = milliliter
MPN = Most probable number of bacterial colonies per 100 mL of water

Table 5-14. Summary of Analytical Results for Bacterial Sampling in 2025

Sample Location	Test[1]	Sample Dates					Geometric Mean
		7/3/2025 7/8/2025 (*E. coli*)	7/10/2025	7/17/2025	7/24/2025	7/31/2025	
KR 55.2	*Total Coliform (MPN/100mL)*	350.0	23.0	130	280	1600	215.9
	Fecal Coliform (MPN/100mL)	350.0	4.5	7.8	7.8	7.8	15.0
	E. coli (Presence/Absence)	Present	Present	Present	Present	Present	N/A
KR 48.7	*Total Coliform (MPN/100mL)*	920.0	33.0	240	210.0	1600	300.4
	Fecal Coliform (MPN/100mL)	920.0	4.5	33	9.3	17	29.3
	E. coli (Presence/Absence)	Present	Present	Present	Present	Present	N/A
KR 48.4	*Total Coliform (MPN/100mL)*	920.0	49.0	240	220	1600.0	328.2
	Fecal Coliform (MPN/100mL)	920.0	23.0	23.0	17	12	39.8
	E. coli (Presence/Absence)	Present	Present	Present	Present	Present	N/A
KR 47.78	*Total Coliform (MPN/100mL)*	1600	33.0	240.0	1600	1600	503.8
	Fecal Coliform (MPN/100mL)	240	1.8	1.8	13	4.5	8.5
	E. coli (Presence/Absence)	Present	Present	Present	Present	Present	N/A

Notes: 1 Presence/Absence SM-9223B test for E.coli included in 2025 sampling only.
Key: mL = milliliter
MPN = Most probable number of bacterial colonies per 100 mL of water
N/A = not applicable

Table 5-15. Kern River Monthly Mean, Minimum, and Maximum Water Temperature (°C) by Site in 2024

Site ID		May	June	July	August	September	October
KR 55.6 Above Democrat Dam	**Mean (°C)**	16.4	18.8	21.6	23.1	21.7	20.7
	Min	14.1	15.9	19.0	21.2	19.5	19.3
	Max	19.1	22.0	24.6	24.9	23.7	21.6
KR 54.36 Bypass Reach	**Mean (°C)**	16.5	19.0	21.7	23.2	21.7	20.7
	Min	14.6	16.1	19.0	21.2	19.8	19.2
	Max	19.1	22.0	24.6	24.9	23.7	21.7
KR 54.2[1] Bypass Reach	**Mean (°C)**	16.5	19.0	21.8	23.2	21.7	21.0
	Min	14.6	16.1	19.0	21.2	19.8	20.2
	Max	19.1	22.0	24.6	24.9	23.7	21.3
KR 53.84 Bypass Reach	**Mean (°C)**	16.6	19.0	21.8	23.1	21.6	20.9
	Min	14.6	16.1	19.0	21.2	19.5	20.2
	Max	19.0	22.0	24.5	24.8	23.6	21.6
KR 50.3[1] Bypass Reach	**Mean (°C)**	17.0	19.3	22.1	23.3	21.8	21.1
	Min	14.9	16.5	19.2	21.4	19.2	19.5
	Max	19.1	22.1	24.5	24.9	23.9	22.6
KR 44.0 Bypass Reach	**Mean (°C)**	17.7	20.0	22.6	23.6	22.2	21.1
	Min	16.0	17.4	19.7	22.1	19.8	19.2
	Max	19.3	22.1	24.5	24.9	24.9	22.6
KRTR 43.94 Powerhouse Tailrace	**Mean (°C)**	16.8	19.4	21.8	23.3	21.9	20.9
	Min	14.8	16.7	19.2	21.4	20.0	19.4
	Max	19.0	22.1	24.6	24.9	23.8	21.8

Notes: [1] The data loggers at sites KR 54.2 and KR 50.3 were dewatered from October 12 through October 15, 2024, during a flow decrease. Data from these dates were omitted from analysis.

Key: °C = degrees Celsius

Table 5-16. Kern River Monthly Mean, Minimum, and Maximum Water Temperature (°C) by Site in 2025

Site ID		May	June	July	August	September	October
KR 55.6 Above Democrat Dam	**Mean (°C)**	16.7	18.7	21.1	22.7	22.5	19.9
	Min	15.5	17.5	20.0	21.8	21.7	17.9
	Max	18.1	20.1	22.0	23.2	23.5	21.5
KR 54.36 Bypass Reach	**Mean (°C)**	16.8	18.8	21.2	22.8	23.1	19.9
	Min	15.7	17.6	20.1	21.9	22.1	17.7
	Max	18.3	20.3	22.1	23.3	24.2	21.5
KR 54.2 Bypass Reach	**Mean (°C)**	16.9	18.9	21.2	22.8	22.6	19.9
	Min	15.7	17.7	20.1	21.9	21.8	17.7
	Max	18.3	20.3	22.1	23.3	23.7	21.5
KR 53.84 Bypass Reach	**Mean (°C)**	16.9	18.9	21.2	22.8	22.6	19.8
	Min	15.8	17.7	20.1	21.9	21.7	17.6
	Max	18.3	20.3	22.2	23.3	23.7	21.5
KR 50.3 Bypass Reach	**Mean (°C)**	17.3	19.2	21.5	23.0	22.8	19.6
	Min	16.0	18.1	20.4	22.0	21.7	17.2
	Max	18.8	20.7	22.4	23.7	24.1	21.4
KR 44.0[1] Bypass Reach	**Mean (°C)**	N/A	20.0	22.1	23.5	23.3	19.6
	Min	N/A	18.7	20.8	22.3	22.1	16.9
	Max	N/A	21.4	22.9	24.3	24.8	21.6
KRTR 43.94 Powerhouse Tailrace	**Mean (°C)**	16.9	18.9	21.2	23.4	22.9	20.1
	Min	15.8	17.8	20.2	22.3	21.9	17.9
	Max	18.4	20.4	22.2	24.2	23.8	21.6

Notes: [1] The data loggers at KR 44.0 were vandalized; data from this site is not available from May 15 to June 2.
Key: °C = degrees Celsius

Table 5-17. Kern River Daily Average, Maximum, and Minimum of Water Temperature (°C) by Site (May 15 to October 15, 2024)

Date	Kern River Daily Average, Maximum, and Minimum of Water Temperature (°C)																				
	KR 55.6			KR 54.36			KR 54.2			KR 53.84			KR 50.3			KR 44.0			KRTR 43.94		
	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min
5/15/2024	15.7	16.7	14.5	15.9	16.7	14.6	15.9	16.7	14.7	15.9	16.7	14.7	16.4	17.1	15.4	17.3	17.9	16.8	16.0	17.0	14.8
5/16/2024	16.0	17.5	14.6	16.2	17.5	14.7	16.2	17.5	14.7	16.2	17.5	14.7	16.7	17.6	15.4	17.5	18.5	16.7	16.2	17.6	14.9
5/17/2024	16.1	17.5	14.7	16.3	17.6	14.9	16.3	17.5	14.9	16.4	17.5	14.9	16.9	17.6	15.5	17.8	18.4	17.2	16.5	17.6	15.0
5/18/2024	16.2	17.8	14.5	16.3	17.8	14.6	16.3	17.8	14.6	16.4	17.8	14.7	16.8	17.8	15.4	17.7	18.3	17.0	16.6	17.9	15.1
5/19/2024	16.3	17.8	14.8	16.5	17.8	15.0	16.5	17.8	15.0	16.6	17.8	15.0	17.1	17.8	16.0	18.0	18.7	17.5	16.9	17.9	15.6
5/20/2024	16.0	17.4	14.7	16.1	17.4	14.7	16.1	17.4	14.7	16.1	17.4	14.7	16.6	17.7	15.1	17.3	17.8	16.4	16.5	17.6	15.2
5/21/2024	16.1	17.6	14.6	16.1	17.6	14.7	16.1	17.6	14.7	16.1	17.6	14.6	16.4	17.6	14.9	17.0	17.7	16.0	16.4	17.6	15.1
5/22/2024	16.3	17.4	15.2	16.4	17.3	15.2	16.4	17.3	15.2	16.5	17.3	15.2	16.8	17.6	15.7	17.5	18.3	16.8	16.9	17.6	16.0
5/23/2024	16.0	17.5	14.6	16.2	17.5	14.6	16.2	17.5	14.6	16.2	17.4	14.6	16.6	17.5	15.0	17.2	17.9	16.5	16.5	17.6	15.1
5/24/2024	16.1	17.6	14.7	16.2	17.6	14.8	16.2	17.6	14.8	16.2	17.5	14.7	16.6	17.4	15.1	17.2	17.7	16.4	16.5	17.6	15.3
5/25/2024	15.9	17.1	14.4	16.0	17.2	14.6	16.0	17.1	14.6	16.0	17.1	14.6	16.3	17.1	15.2	17.1	17.9	16.3	16.4	17.3	15.2
5/26/2024	16.4	18.1	14.7	16.5	18.0	15.0	16.5	18.0	15.0	16.5	17.9	15.1	16.9	17.8	15.9	17.6	19.0	16.6	16.6	18.0	15.3
5/27/2024	17.1	18.5	15.7	17.2	18.4	15.8	17.2	18.4	15.8	17.2	18.4	15.8	17.6	18.4	16.4	18.3	19.2	17.6	17.4	18.5	16.2
5/28/2024	17.1	18.4	15.7	17.3	18.4	15.8	17.3	18.4	15.8	17.3	18.3	15.8	17.7	18.4	16.6	18.5	19.2	18.1	17.7	18.5	16.6
5/29/2024	16.9	18.4	15.3	17.0	18.5	15.4	17.0	18.5	15.4	17.1	18.4	15.4	17.5	18.5	15.8	18.2	18.6	17.5	17.5	18.5	16.2
5/30/2024	17.1	18.9	15.6	17.2	18.9	15.7	17.2	18.9	15.7	17.2	18.8	15.7	17.5	18.9	16.0	18.2	19.0	17.0	17.6	18.9	16.3
5/31/2024	17.5	19.1	16.1	17.6	19.1	16.2	17.6	19.1	16.2	17.6	19.0	16.2	18.0	19.1	16.6	18.6	19.3	17.7	18.1	19.0	17.0
6/1/2024	17.4	18.8	15.9	17.6	18.8	16.1	17.5	18.7	16.1	17.6	18.7	16.1	18.0	18.9	16.8	18.9	19.5	18.2	18.0	18.9	16.9
6/2/2024	17.3	18.6	16.0	17.5	18.7	16.1	17.5	18.7	16.1	17.6	18.6	16.2	18.1	18.7	17.1	18.8	19.6	18.4	17.9	18.8	16.7
6/3/2024	17.3	18.4	16.1	17.4	18.5	16.2	17.4	18.5	16.2	17.4	18.5	16.1	17.7	18.7	16.5	18.4	19.0	17.4	17.9	18.7	16.8
6/4/2024	17.9	19.6	16.4	18.0	19.7	16.4	18.0	19.7	16.4	18.0	19.7	16.4	18.4	19.8	16.8	18.9	20.0	17.9	18.5	19.8	17.3
6/5/2024	18.3	20.1	17.0	18.4	20.1	17.1	18.4	20.1	17.1	18.5	20.1	17.1	18.9	20.3	17.5	19.7	20.4	18.6	19.0	20.2	17.8
6/6/2024	18.4	19.9	17.2	18.6	20.0	17.3	18.6	20.0	17.3	18.6	20.0	17.3	19.1	20.2	17.7	19.9	20.6	18.7	19.1	20.3	17.8
6/7/2024	18.3	19.4	17.3	18.5	19.8	17.4	18.5	19.8	17.4	18.5	19.8	17.4	19.0	19.9	17.8	19.9	20.6	18.9	19.0	20.0	17.9
6/8/2024	18.1	19.2	17.0	18.3	19.6	16.8	18.3	19.6	16.8	18.3	19.5	16.8	18.6	19.7	17.1	19.3	20.2	18.1	18.8	19.8	17.6
6/9/2024	18.0	19.1	16.9	18.3	19.7	16.7	18.3	19.7	16.7	18.3	19.7	16.8	18.7	19.8	17.3	19.5	20.0	18.7	18.6	19.8	17.1
6/10/2024	18.4	20.2	17.2	18.5	20.3	16.9	18.5	20.3	16.9	18.5	20.2	16.9	18.8	20.4	17.1	19.3	20.6	17.8	18.8	20.4	17.2
6/11/2024	18.7	20.7	17.2	18.8	20.7	17.3	18.8	20.7	17.3	18.8	20.6	17.4	19.2	20.8	17.7	19.9	21.0	18.7	19.2	20.7	17.8
6/12/2024	18.7	20.6	17.3	18.9	20.6	17.4	18.9	20.6	17.4	18.9	20.5	17.4	19.3	20.7	17.8	20.1	21.1	18.8	19.3	20.6	17.9
6/13/2024	18.8	20.1	17.4	18.9	20.2	17.5	18.9	20.2	17.5	18.9	20.2	17.5	19.3	20.4	18.0	20.1	20.9	19.1	19.5	20.4	18.3
6/14/2024	18.8	20.5	17.4	18.9	20.6	17.5	18.9	20.6	17.5	18.9	20.5	17.5	19.3	20.7	17.9	19.9	20.8	18.7	19.5	20.6	18.1
6/15/2024	18.4	19.8	17.2	18.6	19.8	17.2	18.6	19.8	17.2	18.6	19.8	17.2	18.9	20.1	17.5	19.6	20.8	18.5	19.0	20.5	17.7
6/16/2024	18.3	19.9	17.0	18.4	19.8	17.0	18.4	19.9	16.9	18.4	19.8	16.9	18.7	19.9	17.2	19.2	19.9	18.2	18.5	19.9	17.2
6/17/2024	18.5	19.9	17.5	18.6	19.9	17.5	18.6	19.9	17.5	18.6	19.9	17.4	18.8	20.0	17.5	19.3	20.0	18.0	18.9	20.0	17.7
6/18/2024	18.7	20.3	17.2	18.8	20.3	17.2	18.8	20.3	17.2	18.7	20.2	17.2	18.9	20.3	17.3	19.3	20.3	18.0	19.1	20.2	17.7
6/19/2024	19.0	20.4	17.9	19.1	20.4	18.0	19.1	20.4	18.0	19.1	20.3	18.0	19.3	20.5	18.2	19.7	20.5	18.6	19.5	20.4	18.4
6/20/2024	19.1	20.7	17.7	19.2	20.8	17.7	19.2	20.7	17.7	19.2	20.7	17.7	19.4	20.8	17.8	19.8	20.8	18.5	19.6	20.7	18.2

Date	Kern River Daily Average, Maximum, and Minimum of Water Temperature (°C)																				
	KR 55.6			KR 54.36			KR 54.2			KR 53.84			KR 50.3			KR 44.0			KRTR 43.94		
	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min
6/21/2024	19.4	21.0	18.1	19.5	21.1	18.1	19.5	21.1	18.1	19.5	21.0	18.1	19.8	21.2	18.2	20.2	21.3	18.9	19.8	21.1	18.5
6/22/2024	19.7	21.5	18.3	19.8	21.4	18.4	19.8	21.5	18.4	19.8	21.4	18.3	20.1	21.6	18.6	20.6	21.6	19.4	20.1	21.4	18.8
6/23/2024	19.8	21.3	18.7	20.0	21.3	18.8	20.0	21.3	18.8	20.0	21.2	18.8	20.4	21.5	19.2	21.1	21.9	19.9	20.5	21.4	19.5
6/24/2024	19.8	21.1	18.9	20.0	21.2	18.9	19.9	21.1	18.9	20.0	21.1	18.9	20.4	21.4	19.2	21.1	21.9	19.8	20.7	21.6	19.5
6/25/2024	20.1	21.5	19.0	20.2	21.6	19.0	20.2	21.6	19.0	20.2	21.5	19.0	20.6	21.7	19.3	21.2	22.0	20.0	20.8	21.8	19.7
6/26/2024	19.9	21.1	18.9	20.0	21.1	18.9	20.0	21.1	18.9	20.0	21.0	18.9	20.4	21.5	19.2	21.1	22.0	19.9	20.5	21.6	19.6
6/27/2024	19.8	21.2	18.8	19.9	21.3	18.8	19.9	21.4	18.8	19.9	21.4	18.9	20.3	21.5	19.0	20.8	21.7	19.5	20.0	21.4	19.0
6/28/2024	20.0	21.4	18.9	20.1	21.5	18.8	20.1	21.5	18.8	20.1	21.5	18.8	20.3	21.6	19.0	20.8	21.8	19.5	20.1	21.6	19.0
6/29/2024	20.3	22.0	18.8	20.4	22.0	18.8	20.4	22.0	18.8	20.4	22.0	18.8	20.7	22.1	19.2	21.1	22.1	20.0	20.5	22.1	19.0
6/30/2024	20.2	21.7	19.0	20.3	21.7	19.0	20.3	21.7	19.0	20.3	21.7	19.0	20.7	21.8	19.2	21.3	22.1	20.1	20.4	21.7	19.2
7/1/2024	20.4	22.0	19.0	20.5	22.0	19.0	20.5	22.0	19.0	20.5	22.0	19.0	20.8	22.2	19.2	21.4	22.4	19.7	20.6	22.1	19.2
7/2/2024	20.7	22.5	19.3	20.8	22.6	19.3	20.8	22.6	19.3	20.8	22.6	19.2	21.2	22.8	19.4	21.7	23.0	20.2	20.9	22.6	19.4
7/3/2024	20.8	22.2	19.6	20.9	22.2	19.6	20.9	22.2	19.6	20.9	22.2	19.6	21.3	22.4	19.9	21.9	22.9	20.7	21.0	22.3	19.8
7/4/2024	20.7	22.1	19.5	20.9	22.1	19.6	20.9	22.2	19.6	20.9	22.1	19.6	21.2	22.3	19.9	21.9	22.6	20.7	21.0	22.2	19.7
7/5/2024	21.0	22.4	19.7	21.1	22.5	19.7	21.1	22.5	19.7	21.1	22.5	19.7	21.5	22.7	20.0	22.1	23.0	20.9	21.2	22.6	19.8
7/6/2024	21.0	22.9	19.6	21.1	23.1	19.6	21.1	23.1	19.6	21.1	23.1	19.6	21.5	23.3	19.9	22.1	23.4	20.7	21.2	23.1	19.8
7/7/2024	21.1	22.7	19.7	21.2	22.8	19.7	21.2	22.8	19.7	21.2	22.7	19.7	21.6	22.9	20.0	22.3	23.4	21.0	21.3	22.8	19.9
7/8/2024	21.1	22.4	20.0	21.3	22.5	20.1	21.3	22.5	20.1	21.3	22.4	20.1	21.7	22.6	20.4	22.3	23.2	21.1	21.3	22.5	20.2
7/9/2024	21.2	22.9	20.1	21.4	23.0	20.1	21.4	23.0	20.1	21.4	23.0	20.1	21.7	23.1	20.3	22.3	23.3	20.9	21.5	23.0	20.2
7/10/2024	21.1	22.8	19.8	21.2	23.0	19.8	21.2	23.0	19.8	21.2	23.0	19.8	21.6	23.1	20.0	22.2	23.3	20.7	21.3	23.0	20.0
7/11/2024	21.3	22.9	20.1	21.4	23.1	20.1	21.4	23.1	20.1	21.4	23.1	20.1	21.7	23.2	20.2	22.3	23.3	20.9	21.5	23.1	20.2
7/12/2024	21.2	22.6	20.1	21.3	22.8	20.1	21.3	22.8	20.1	21.3	22.7	20.1	21.6	22.9	20.3	22.1	23.3	20.9	21.4	22.8	20.2
7/13/2024	21.4	22.7	20.3	21.5	22.9	20.3	21.5	22.9	20.3	21.5	22.9	20.2	21.8	23.0	20.5	22.4	23.2	21.3	21.6	22.9	20.4
7/14/2024	21.3	22.5	20.6	21.4	22.6	20.6	21.5	22.6	20.6	21.5	22.6	20.6	21.9	22.8	20.8	22.6	23.4	21.3	21.6	22.6	20.7
7/15/2024	21.6	22.8	20.6	21.7	22.9	20.7	21.7	22.9	20.7	21.7	22.9	20.7	22.0	23.1	20.9	22.5	23.4	21.4	21.7	22.9	20.8
7/16/2024	21.8	23.6	20.6	21.9	23.7	20.6	21.9	23.7	20.6	21.9	23.7	20.6	22.2	23.8	20.8	22.7	23.9	21.4	22.0	23.7	20.7
7/17/2024	21.7	23.3	20.4	21.7	23.3	20.4	21.7	23.3	20.4	21.7	23.3	20.4	22.1	23.4	20.7	22.6	23.9	21.2	21.9	23.4	20.6
7/18/2024	21.8	23.4	20.5	21.9	23.5	20.5	21.9	23.5	20.5	21.9	23.4	20.5	22.2	23.5	20.7	22.7	23.6	21.2	21.9	23.5	20.6
7/19/2024	21.8	23.7	20.5	21.9	23.7	20.5	21.9	23.7	20.5	21.9	23.7	20.4	22.2	23.8	20.5	22.6	23.9	21.1	22.0	23.7	20.6
7/20/2024	21.9	23.6	20.7	22.0	23.7	20.7	22.1	23.7	20.7	22.0	23.6	20.6	22.4	23.8	20.8	23.0	23.9	21.5	22.1	23.7	20.8
7/21/2024	22.0	23.7	20.7	22.1	23.7	20.7	22.1	23.7	20.7	22.1	23.6	20.7	22.4	23.8	21.0	23.0	23.9	21.8	22.2	23.7	20.9
7/22/2024	22.3	24.3	20.9	22.4	24.3	20.9	22.4	24.3	20.9	22.4	24.3	20.9	22.7	24.4	21.1	23.2	24.5	21.8	22.5	24.4	21.0
7/23/2024	22.3	23.8	21.1	22.4	23.8	21.2	22.4	23.8	21.2	22.4	23.8	21.2	22.8	24.0	21.4	23.5	24.5	22.2	22.5	23.9	21.3
7/24/2024	22.5	23.8	21.5	22.6	23.9	21.5	22.7	23.9	21.5	22.7	23.9	21.5	23.1	24.1	21.8	23.8	24.5	22.6	22.8	23.9	21.7
7/25/2024	22.6	24.2	21.3	22.7	24.2	21.3	22.7	24.2	21.3	22.7	24.2	21.3	22.9	24.3	21.5	23.5	24.4	22.2	22.7	24.2	21.4
7/26/2024	22.5	23.9	21.4	22.7	23.9	21.4	22.7	23.9	21.4	22.7	23.8	21.4	23.1	24.2	21.7	23.7	24.5	22.8	22.8	24.0	21.5
7/27/2024	22.1	23.3	20.8	22.2	23.2	20.8	22.2	23.2	20.7	22.2	23.2	20.7	22.4	23.5	20.9	22.9	23.8	21.8	22.3	23.5	20.9
7/28/2024	22.0	23.1	20.8	22.1	23.1	20.7	22.1	23.1	20.7	22.1	23.1	20.7	22.3	23.3	20.9	22.7	23.4	21.8	22.2	23.2	20.9

Copyright 2026 by Southern California Edison

Date	Kern River Daily Average, Maximum, and Minimum of Water Temperature (°C)																				
	KR 55.6			KR 54.36			KR 54.2			KR 53.84			KR 50.3			KR 44.0			KRTR 43.94		
	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min
7/29/2024	22.4	24.0	20.9	22.4	23.9	20.8	22.4	23.9	20.8	22.4	23.8	20.8	22.5	23.8	21.0	22.8	23.7	21.9	22.4	23.9	21.0
7/30/2024	22.5	24.2	21.1	22.6	24.2	21.0	22.6	24.2	21.0	22.6	24.1	21.0	22.8	24.1	21.1	23.2	23.7	22.2	22.7	24.2	21.2
7/31/2024	22.8	24.6	21.1	22.8	24.6	21.1	22.8	24.6	21.1	22.8	24.5	21.1	23.0	24.5	21.1	23.3	24.3	21.8	22.9	24.6	21.2
8/1/2024	22.9	24.3	21.6	22.9	24.3	21.6	22.9	24.3	21.6	22.9	24.2	21.6	23.2	24.3	21.8	23.6	24.3	22.6	23.0	24.3	21.8
8/2/2024	22.8	23.7	22.1	22.9	23.6	22.1	22.9	23.6	22.1	22.8	23.6	22.1	23.1	24.1	22.4	23.6	24.3	22.9	23.0	23.9	22.3
8/3/2024	23.2	24.8	21.8	23.3	24.7	21.9	23.3	24.7	21.9	23.3	24.6	22.0	23.5	24.7	22.4	23.9	24.5	23.3	23.3	24.8	22.0
8/4/2024	23.3	24.7	21.8	23.4	24.6	21.9	23.4	24.7	21.8	23.4	24.6	21.9	23.7	24.7	22.3	24.2	24.6	23.6	23.5	24.7	22.0
8/5/2024	23.5	24.8	22.3	23.6	24.8	22.3	23.6	24.8	22.3	23.5	24.7	22.3	23.9	24.8	22.5	24.3	24.9	23.5	23.6	24.8	22.4
8/6/2024	23.5	24.9	22.3	23.6	24.9	22.2	23.6	24.9	22.2	23.6	24.8	22.3	23.9	24.9	22.5	24.4	24.9	23.6	23.7	24.9	22.4
8/7/2024	23.5	24.7	22.3	23.6	24.7	22.4	23.6	24.7	22.3	23.6	24.7	22.3	23.9	24.8	22.7	24.3	24.7	23.6	23.7	24.8	22.5
8/8/2024	23.4	24.6	22.4	23.5	24.6	22.3	23.5	24.6	22.3	23.5	24.6	22.3	23.8	24.6	22.6	24.2	24.7	23.5	23.6	24.7	22.5
8/9/2024	23.4	24.7	22.2	23.4	24.6	22.1	23.4	24.6	22.1	23.4	24.6	22.1	23.6	24.5	22.3	24.0	24.5	23.2	23.5	24.7	22.3
8/10/2024	23.5	24.9	22.2	23.6	24.8	22.2	23.6	24.8	22.2	23.5	24.8	22.2	23.8	24.7	22.6	24.1	24.6	23.5	23.6	24.9	22.4
8/11/2024	23.5	24.7	22.1	23.5	24.6	22.1	23.5	24.6	22.1	23.5	24.6	22.1	23.8	24.5	22.5	24.1	24.5	23.6	23.6	24.7	22.3
8/12/2024	23.5	24.7	22.4	23.6	24.7	22.3	23.6	24.7	22.3	23.6	24.6	22.3	23.8	24.6	22.6	24.1	24.6	23.5	23.7	24.7	22.5
8/13/2024	23.5	24.6	22.5	23.5	24.6	22.4	23.5	24.6	22.4	23.5	24.5	22.4	23.7	24.5	22.5	24.0	24.4	23.2	23.6	24.7	22.6
8/14/2024	23.3	24.4	22.2	23.3	24.4	22.2	23.3	24.3	22.2	23.3	24.3	22.2	23.5	24.2	22.3	23.7	24.2	23.0	23.4	24.4	22.3
8/15/2024	23.2	24.4	22.3	23.3	24.4	22.2	23.3	24.4	22.2	23.3	24.3	22.1	23.4	24.2	22.2	23.6	24.2	22.9	23.4	24.4	22.3
8/16/2024	23.3	24.6	22.2	23.3	24.5	22.1	23.3	24.5	22.1	23.3	24.5	22.1	23.5	24.3	22.1	23.7	24.3	22.9	23.4	24.6	22.2
8/17/2024	23.3	24.5	22.1	23.4	24.4	22.1	23.4	24.4	22.1	23.3	24.3	22.1	23.5	24.2	22.3	23.7	24.2	23.2	23.5	24.4	22.3
8/18/2024	23.4	24.6	22.3	23.5	24.5	22.3	23.5	24.5	22.3	23.5	24.4	22.3	23.6	24.3	22.6	23.9	24.6	23.3	23.6	24.5	22.5
8/19/2024	23.4	24.6	22.3	23.5	24.5	22.2	23.5	24.5	22.2	23.5	24.4	22.3	23.6	24.3	22.4	23.9	24.4	23.3	23.6	24.6	22.4
8/20/2024	23.4	24.5	22.3	23.5	24.4	22.2	23.5	24.4	22.2	23.4	24.3	22.2	23.6	24.3	22.4	23.9	24.3	23.3	23.6	24.5	22.4
8/21/2024	23.3	24.3	22.2	23.3	24.2	22.2	23.3	24.2	22.2	23.3	24.1	22.1	23.4	24.2	22.3	23.7	24.1	23.3	23.4	24.4	22.3
8/22/2024	23.1	24.2	22.1	23.1	24.1	22.0	23.1	24.1	22.0	23.1	24.0	22.0	23.2	23.8	22.0	23.4	23.9	22.8	23.2	24.2	22.2
8/23/2024	22.8	23.6	21.9	22.7	23.5	21.8	22.7	23.5	21.8	22.7	23.5	21.8	22.8	23.6	21.8	23.0	23.5	22.4	22.9	23.9	22.0
8/24/2024	22.5	23.3	21.7	22.5	23.3	21.6	22.5	23.2	21.6	22.5	23.2	21.6	22.6	23.1	21.6	22.7	23.1	22.3	22.7	23.4	21.7
8/25/2024	22.4	23.5	21.4	22.4	23.3	21.3	22.4	23.3	21.3	22.4	23.2	21.3	22.4	23.1	21.4	22.6	23.1	22.1	22.5	23.4	21.4
8/26/2024	22.6	23.7	21.5	22.6	23.6	21.4	22.6	23.6	21.4	22.6	23.5	21.5	22.7	23.4	21.5	22.8	23.4	22.2	22.7	23.7	21.6
8/27/2024	22.5	23.7	21.4	22.6	23.6	21.4	22.6	23.6	21.4	22.6	23.5	21.4	22.8	23.5	21.5	23.0	23.6	22.5	22.7	23.6	21.6
8/28/2024	22.6	23.6	21.5	22.6	23.6	21.4	22.6	23.6	21.4	22.6	23.5	21.4	22.8	23.5	21.5	23.1	23.6	22.5	22.7	23.6	21.6
8/29/2024	22.5	23.5	21.3	22.5	23.4	21.3	22.5	23.4	21.3	22.5	23.3	21.3	22.7	23.4	21.6	23.1	23.6	22.6	22.6	23.6	21.5
8/30/2024	22.5	23.6	21.2	22.5	23.5	21.2	22.5	23.5	21.2	22.5	23.4	21.2	22.6	23.3	21.5	22.9	23.5	22.4	22.6	23.5	21.4
8/31/2024	22.6	23.6	21.5	22.7	23.6	21.5	22.7	23.5	21.5	22.6	23.5	21.5	22.9	23.5	21.9	23.3	24.0	22.7	22.8	23.6	21.6
9/1/2024	22.7	23.7	21.5	22.8	23.6	21.6	22.8	23.6	21.6	22.7	23.5	21.6	23.0	23.6	22.1	23.5	24.2	22.8	22.9	23.7	21.7
9/2/2024	22.9	23.7	21.7	23.0	23.7	21.8	23.0	23.7	21.8	22.9	23.6	21.9	23.2	23.7	22.6	23.6	24.4	23.1	23.1	23.8	21.9
9/3/2024	22.9	23.7	21.6	23.0	23.7	21.8	23.0	23.7	21.8	22.9	23.5	22.0	23.3	23.8	22.6	23.7	24.6	23.0	23.0	23.8	22.0
9/4/2024	23.0	23.7	21.8	23.1	23.6	22.0	23.1	23.6	22.0	23.0	23.5	22.1	23.4	23.9	22.7	23.8	24.9	23.1	23.2	23.7	22.1

Date	Kern River Daily Average, Maximum, and Minimum of Water Temperature (°C)																				
	KR 55.6			KR 54.36			KR 54.2			KR 53.84			KR 50.3			KR 44.0			KRTR 43.94		
	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min
9/5/2024	22.9	23.7	21.7	23.0	23.7	21.8	23.0	23.7	21.8	22.9	23.5	21.9	23.2	23.7	22.5	23.6	24.5	22.9	23.1	23.7	22.0
9/6/2024	23.0	23.6	22.0	23.1	23.6	22.1	23.1	23.6	22.1	23.1	23.5	22.3	23.4	23.9	22.9	23.8	24.7	23.2	23.2	23.7	22.2
9/7/2024	22.8	23.4	21.8	22.9	23.4	21.9	22.9	23.4	22.0	22.8	23.2	22.1	23.1	23.7	22.6	23.6	24.5	22.8	23.0	23.5	22.1
9/8/2024	22.8	23.5	21.7	22.9	23.5	21.9	22.9	23.5	21.9	22.8	23.3	22.0	23.1	23.7	22.4	23.5	24.4	22.7	23.0	23.6	22.0
9/9/2024	22.9	23.5	21.7	22.9	23.5	22.0	22.9	23.5	22.0	22.9	23.3	22.1	23.1	23.9	22.4	23.4	24.3	22.6	23.0	23.6	22.1
9/10/2024	22.7	23.4	21.6	22.8	23.3	21.9	22.8	23.3	21.9	22.7	23.1	22.0	22.9	23.6	22.3	23.3	24.1	22.5	22.9	23.4	22.0
9/11/2024	22.2	23.1	21.2	22.3	23.0	21.5	22.3	22.9	21.5	22.2	22.8	21.5	22.4	23.1	22.0	22.8	23.5	22.1	22.5	23.2	21.6
9/12/2024	21.8	22.4	20.7	21.8	22.3	21.0	21.8	22.3	21.0	21.6	22.1	20.9	21.9	22.8	21.2	22.3	22.9	21.5	21.9	22.5	21.1
9/13/2024	21.9	22.5	20.9	21.8	22.5	21.1	21.8	22.5	21.1	21.6	22.1	21.1	21.9	23.3	20.9	22.1	22.8	21.1	22.0	22.6	21.3
9/14/2024	22.0	22.6	21.1	22.0	22.6	21.4	22.0	22.6	21.4	21.8	22.3	21.3	22.0	23.4	21.1	22.3	23.0	21.4	22.2	22.7	21.5
9/15/2024	22.0	22.6	21.1	22.0	22.6	21.5	22.0	22.5	21.5	21.8	22.3	21.4	22.0	23.2	21.3	22.3	22.9	21.5	22.2	22.7	21.6
9/16/2024	21.1	22.1	20.3	21.2	22.0	20.5	21.1	22.0	20.5	21.0	21.8	20.6	21.1	21.8	20.2	21.5	22.4	20.9	21.4	22.3	20.6
9/17/2024	20.6	21.2	19.7	20.5	21.1	19.8	20.5	21.1	19.8	20.2	20.7	19.5	20.4	21.6	19.6	20.6	21.3	19.8	20.7	21.3	20.0
9/18/2024	20.7	21.4	19.9	20.7	21.2	20.1	20.7	21.2	20.1	20.2	20.7	19.7	20.4	22.0	19.2	20.6	21.3	19.8	20.8	21.4	20.2
9/19/2024	21.0	21.5	20.4	21.0	21.5	20.6	21.0	21.5	20.6	20.7	21.2	20.3	20.9	22.2	20.0	21.0	21.7	20.4	21.1	21.6	20.7
9/20/2024	20.7	21.2	20.0	20.7	21.1	20.1	20.7	21.1	20.1	20.6	20.9	20.0	20.8	21.1	20.7	21.3	21.8	20.8	20.9	21.2	20.2
9/21/2024	20.6	21.4	19.6	20.7	21.4	19.8	20.7	21.4	19.8	20.5	21.2	19.8	20.8	21.8	19.9	21.0	22.1	20.1	20.8	21.5	20.0
9/22/2024	20.8	21.3	19.8	20.8	21.4	20.1	20.8	21.4	20.1	20.7	21.2	20.1	21.0	22.2	20.0	21.3	22.1	20.4	21.0	21.5	20.3
9/23/2024	21.0	21.5	20.1	21.1	21.6	20.4	21.1	21.6	20.4	20.9	21.4	20.5	21.3	22.5	20.3	21.7	22.5	20.8	21.2	21.7	20.6
9/24/2024	21.0	21.5	20.1	21.0	21.4	20.5	21.0	21.4	20.5	20.9	21.3	20.5	21.2	22.5	20.2	21.8	22.4	21.0	21.2	21.5	20.6
9/25/2024	20.9	21.5	19.8	21.0	21.4	20.1	21.0	21.4	20.1	20.9	21.2	20.1	21.1	21.9	20.5	21.7	22.4	20.8	21.1	21.5	20.2
9/26/2024	20.7	21.4	19.7	20.8	21.3	19.9	20.8	21.3	20.0	20.7	21.1	20.0	21.0	21.7	20.5	21.5	22.2	20.6	20.9	21.4	20.1
9/27/2024	20.6	21.1	19.5	20.6	21.1	19.9	20.6	21.1	19.9	20.5	20.9	19.9	20.7	21.8	19.9	21.1	21.9	20.3	20.7	21.2	20.0
9/28/2024	20.8	21.2	20.0	20.9	21.3	20.4	20.8	21.3	20.4	20.7	21.1	20.3	20.9	22.3	19.8	21.2	22.0	20.4	21.0	21.4	20.5
9/29/2024	20.8	21.3	19.9	20.8	21.3	20.2	20.8	21.3	20.2	20.6	21.1	20.1	20.9	22.0	20.0	21.3	22.0	20.5	20.9	21.4	20.3
9/30/2024	20.7	21.2	19.7	20.7	21.1	20.0	20.7	21.1	20.0	20.5	21.0	20.0	20.8	21.7	20.0	21.2	21.9	20.3	20.8	21.2	20.1
10/1/2024	21.0	21.6	20.2	21.0	21.4	20.5	21.0	21.4	20.5	20.8	21.3	20.4	21.0	22.2	20.1	21.3	22.1	20.5	21.1	21.5	20.6
10/2/2024	21.2	21.6	20.3	21.3	21.7	20.7	21.3	21.7	20.7	21.2	21.6	20.7	21.5	22.5	20.7	21.8	22.6	21.0	21.4	21.8	20.8
10/3/2024	21.2	21.6	20.2	21.2	21.7	20.5	21.3	21.7	20.5	21.2	21.6	20.6	21.5	22.3	20.9	22.0	22.6	21.1	21.4	21.8	20.7
10/4/2024	21.0	21.4	20.3	21.1	21.5	20.6	21.1	21.5	20.6	21.0	21.4	20.6	21.3	22.3	20.5	21.7	22.3	21.0	21.2	21.6	20.7
10/5/2024	21.2	21.6	20.7	21.3	21.7	20.9	21.3	21.7	20.9	21.1	21.6	20.7	21.3	22.6	20.2	21.7	22.2	21.0	21.4	21.8	21.0
10/6/2024	21.0	21.4	20.4	21.1	21.5	20.7	21.1	21.5	20.7	20.9	21.4	20.5	21.2	22.3	20.2	21.7	22.2	21.0	21.2	21.6	20.8
10/7/2024	21.1	21.5	20.4	21.1	21.5	20.7	21.1	21.5	20.7	21.0	21.4	20.7	21.2	22.2	20.4	21.6	22.1	20.9	21.2	21.6	20.8
10/8/2024	21.0	21.5	20.1	21.1	21.4	20.4	21.0	21.4	20.5	20.9	21.3	20.4	21.1	22.0	20.5	21.6	22.2	20.9	21.2	21.5	20.6
10/9/2024	20.8	21.2	19.9	20.8	21.2	20.2	20.8	21.2	20.2	20.7	21.1	20.2	20.9	21.6	20.3	21.3	21.8	20.6	20.9	21.3	20.3
10/10/2024	20.7	21.1	20.0	20.7	21.1	20.2	20.7	21.1	20.2	20.6	21.0	20.2	20.7	21.8	20.0	21.0	21.6	20.3	20.8	21.2	20.4
10/11/2024	20.6	21.0	20.0	20.7	21.0	20.3	20.6	21.0	20.3	20.5	20.8	20.2	20.5	21.6	19.5	21.0	21.5	20.4	20.8	21.1	20.4
10/12/2024	20.2	20.5	19.7	20.2	20.5	19.8	**19.4**	**20.7**	**13.3**	20.0	20.4	19.5	**19.0**	**23.2**	**16.4**	20.2	20.9	19.4	20.4	20.7	19.9

Date	Kern River Daily Average, Maximum, and Minimum of Water Temperature (°C)																				
	KR 55.6			KR 54.36			KR 54.2			KR 53.84			KR 50.3			KR 44.0			KRTR 43.94		
	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min
10/13/2024	20.0	20.5	19.5	19.8	20.5	19.3	**16.9**	**28.6**	**11.4**	19.7	20.4	19.1	**18.3**	**26.5**	**14.5**	20.0	20.7	19.2	20.1	20.7	19.5
10/14/2024	20.1	20.9	19.4	19.8	20.6	19.2	**17.8**	**30.4**	**11.4**	19.7	20.3	19.0	**18.8**	**27.3**	**14.5**	20.0	20.7	19.2	20.1	21.0	19.5
10/15/2024	20.1	21.1	19.3	19.9	20.5	19.3	**18.7**	**31.3**	**11.9**	19.8	20.4	19.0	**19.4**	**28.9**	**15.1**	20.2	20.9	19.4	20.2	21.1	19.4

Notes: Values in bold show dates that the loggers at sites KR 54.2 and KR 50.3 were dewatered due to flow decrease to attempt to facilitate the AQ 3 – Fish Population Study.

Copyright 2026 by Southern California Edison

Table 5-18. Kern River Daily Average, Maximum, and Minimum of Water Temperature (°C) by Site (May 15 to October 15, 2025)

Date	Kern River Daily Average, Maximum, and Minimum of Water Temperature (°C)																				
	KR 55.6			KR 54.36			KR 54.2			KR 53.84			KR 50.3			KR 44.0			KRTR 43.94		
	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min
5/15/2025	15.9	17.3	14.3	15.9	17.2	14.4	16.0	17.1	14.4	16.0	17.1	14.5	16.2	17.0	15.2	–	–	–	16.0	17.2	14.6
5/16/2025	16.1	17.0	14.8	16.2	17.1	15.0	16.2	17.1	15.1	16.3	17.1	15.2	16.7	17.1	16.1	–	–	–	16.3	17.2	15.2
5/17/2025	15.5	16.6	14.7	15.7	16.8	15.1	15.7	16.8	15.2	15.8	16.8	15.3	16.3	16.9	15.5	–	–	–	15.9	17.0	15.2
5/18/2025	15.7	16.7	14.4	15.7	16.6	14.8	15.8	16.5	14.9	15.8	16.5	15.0	16.0	16.9	15.3	–	–	–	15.8	16.7	14.9
5/19/2025	16.0	17.4	14.2	16.0	17.3	14.4	16.1	17.3	14.4	16.1	17.3	14.5	16.4	17.1	15.5	–	–	–	16.1	17.4	14.6
5/20/2025	16.5	17.8	14.9	16.6	17.8	15.2	16.7	17.8	15.2	16.7	17.8	15.3	17.1	17.7	16.1	–	–	–	16.7	17.9	15.3
5/21/2025	16.6	17.8	15.0	16.8	17.8	15.3	16.8	17.8	15.3	16.8	17.7	15.5	17.3	17.7	16.4	–	–	–	16.9	17.8	15.5
5/22/2025	16.7	17.8	15.2	16.8	17.8	15.5	16.9	17.8	15.5	16.9	17.7	15.6	17.3	17.8	16.4	–	–	–	16.9	17.9	15.6
5/23/2025	16.5	17.6	15.0	16.7	17.6	15.2	16.7	17.6	15.2	16.8	17.7	15.3	17.2	17.7	16.4	–	–	–	16.8	17.8	15.3
5/24/2025	16.6	17.8	15.1	16.7	17.8	15.2	16.7	17.8	15.2	16.7	17.8	15.4	17.1	17.8	16.1	–	–	–	16.8	17.9	15.4
5/25/2025	16.9	18.3	15.2	17.1	18.2	15.6	17.1	18.1	15.7	17.1	18.1	15.9	17.6	18.0	16.9	–	–	–	17.1	18.2	15.7
5/26/2025	17.0	18.0	15.8	17.1	18.2	16.1	17.2	18.1	16.1	17.2	18.1	16.2	17.6	18.0	17.1	–	–	–	17.3	18.3	16.2
5/27/2025	17.1	18.6	15.3	17.1	18.6	15.4	17.1	18.5	15.5	17.1	18.5	15.5	17.4	18.4	16.3	–	–	–	17.1	18.6	15.6
5/28/2025	17.6	18.6	16.2	17.8	18.6	16.4	17.8	18.6	16.4	17.8	18.6	16.5	18.2	18.8	17.4	–	–	–	17.9	18.7	16.5
5/29/2025	17.6	18.6	16.3	17.8	18.6	16.5	17.8	18.6	16.6	17.8	18.6	16.7	18.3	18.8	17.5	–	–	–	17.9	18.7	16.7
5/30/2025	17.7	19.4	16.2	17.8	19.3	16.3	17.9	19.3	16.4	17.9	19.3	16.4	18.3	19.2	17.1	–	–	–	17.9	19.4	16.5
5/31/2025	18.1	19.0	16.8	18.3	19.2	17.0	18.3	19.2	17.0	18.3	19.3	17.1	18.8	19.3	17.8	–	–	–	18.4	19.4	17.2
6/1/2025	18.0	19.1	16.7	18.3	19.1	17.0	18.3	19.1	17.1	18.3	19.1	17.2	18.9	19.3	18.1	–	–	–	18.4	19.2	17.2
6/2/2025	17.9	19.4	16.4	18.1	19.3	16.5	18.1	19.3	16.6	18.1	19.3	16.7	18.5	19.4	17.3	–	–	–	18.2	19.4	16.7
6/3/2025	17.5	18.3	16.5	17.6	18.7	16.6	17.7	18.7	16.7	17.7	18.8	16.7	18.1	19.2	17.2	18.7	18.9	18.4	17.8	19.1	16.8
6/4/2025	17.8	19.6	16.3	17.9	19.5	16.4	17.9	19.5	16.4	17.9	19.5	16.4	18.2	19.5	16.9	18.7	19.7	17.8	17.9	19.6	16.5
6/5/2025	18.1	19.4	16.6	18.2	19.4	16.8	18.3	19.4	16.8	18.3	19.4	16.9	18.7	19.5	17.6	19.5	20.2	19.0	18.3	19.5	16.9
6/6/2025	18.0	19.5	16.4	18.2	19.5	16.5	18.2	19.5	16.5	18.2	19.5	16.6	18.6	19.5	17.2	19.5	20.0	18.8	18.3	19.5	16.7
6/7/2025	18.2	19.5	16.7	18.3	19.5	16.8	18.3	19.5	16.8	18.4	19.5	16.9	18.8	19.6	17.5	19.7	20.3	19.1	18.4	19.6	17.0
6/8/2025	18.4	19.7	16.9	18.5	19.7	17.1	18.6	19.7	17.1	18.6	19.7	17.2	19.1	19.8	18.1	20.1	20.9	19.6	18.6	19.8	17.2
6/9/2025	18.4	20.2	16.8	18.6	20.2	16.9	18.6	20.2	16.9	18.6	20.2	17.0	19.1	20.3	17.6	20.0	20.6	19.4	18.7	20.3	17.1
6/10/2025	18.6	20.3	17.1	18.8	20.3	17.2	18.8	20.3	17.2	18.9	20.3	17.3	19.4	20.4	17.9	20.4	21.0	19.8	18.9	20.3	17.4
6/11/2025	18.5	19.7	17.3	18.7	19.8	17.4	18.7	19.8	17.4	18.8	19.8	17.5	19.3	20.4	18.1	20.2	20.6	19.8	18.9	20.2	17.6
6/12/2025	18.2	19.7	16.6	18.3	19.6	16.7	18.3	19.6	16.7	18.4	19.6	16.7	18.7	19.7	17.3	19.5	19.9	18.9	18.4	19.7	16.9
6/13/2025	18.1	19.6	16.6	18.2	19.7	16.6	18.2	19.7	16.6	18.2	19.7	16.6	18.6	19.6	17.0	19.2	19.8	18.3	18.3	19.7	16.7
6/14/2025	18.5	20.2	16.7	18.5	20.1	16.8	18.5	20.1	16.8	18.6	20.1	16.9	18.8	20.0	17.4	19.5	20.2	18.7	18.6	20.2	17.0
6/15/2025	18.6	20.2	16.8	18.8	20.1	17.0	18.8	20.1	17.0	18.9	20.1	17.2	19.3	20.1	18.2	20.1	20.9	19.6	18.9	20.2	17.2
6/16/2025	18.6	20.3	16.9	18.7	20.2	16.9	18.7	20.2	16.9	18.7	20.2	17.0	19.1	20.2	17.6	19.8	20.2	19.4	18.8	20.3	17.1
6/17/2025	18.5	20.1	17.0	18.6	20.1	17.0	18.7	20.1	17.0	18.7	20.1	17.0	19.0	20.1	17.3	19.6	20.1	18.7	18.8	20.2	17.1
6/18/2025	18.9	20.9	17.0	18.9	20.9	17.1	19.0	20.9	17.1	19.0	20.9	17.1	19.2	20.9	17.5	19.8	20.4	19.0	19.0	20.9	17.2
6/19/2025	19.1	21.0	17.3	19.2	21.0	17.4	19.3	21.0	17.4	19.3	21.0	17.4	19.7	20.9	18.1	20.3	20.8	19.6	19.3	21.0	17.6
6/20/2025	18.6	19.8	17.4	18.8	19.9	17.4	18.8	20.0	17.4	18.8	20.1	17.4	19.2	20.8	17.7	19.9	20.7	19.2	19.0	20.7	17.6

Date	Kern River Daily Average, Maximum, and Minimum of Water Temperature (°C)																				
	KR 55.6			KR 54.36			KR 54.2			KR 53.84			KR 50.3			KR 44.0			KRTR 43.94		
	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min
6/21/2025	18.3	19.5	17.1	18.3	19.4	17.0	18.3	19.4	17.0	18.4	19.4	17.0	18.5	19.4	17.2	19.0	19.6	18.3	18.5	19.5	17.2
6/22/2025	18.6	20.4	16.9	18.6	20.3	16.9	18.6	20.3	16.9	18.6	20.3	16.9	18.7	20.1	17.3	19.0	19.8	18.1	18.7	20.3	17.0
6/23/2025	19.2	20.6	17.8	19.2	20.5	17.8	19.2	20.5	17.8	19.3	20.5	17.8	19.4	20.4	18.1	19.7	20.5	18.9	19.3	20.6	18.0
6/24/2025	19.4	20.8	18.1	19.5	20.8	18.1	19.5	20.8	18.1	19.5	20.8	18.1	19.7	20.7	18.4	20.2	20.9	19.4	19.6	20.8	18.2
6/25/2025	19.7	21.2	18.2	19.8	21.2	18.3	19.8	21.2	18.3	19.8	21.1	18.4	20.1	21.1	18.8	20.6	21.2	19.9	19.9	21.2	18.5
6/26/2025	19.8	21.1	18.4	19.9	21.1	18.4	19.9	21.1	18.4	19.9	21.1	18.5	20.3	21.1	18.9	20.9	21.4	20.2	20.0	21.1	18.6
6/27/2025	19.9	21.3	18.5	20.0	21.3	18.5	20.0	21.3	18.5	20.0	21.3	18.6	20.3	21.3	19.0	20.9	21.6	20.0	20.1	21.4	18.7
6/28/2025	20.1	21.4	18.7	20.2	21.4	18.8	20.2	21.4	18.9	20.2	21.4	18.9	20.6	21.4	19.4	21.3	22.1	20.5	20.3	21.4	19.0
6/29/2025	20.1	21.4	18.9	20.3	21.3	19.0	20.3	21.3	19.0	20.3	21.3	19.0	20.7	21.4	19.6	21.4	22.2	20.8	20.4	21.4	19.1
6/30/2025	20.1	21.4	18.8	20.2	21.4	18.9	20.2	21.4	18.9	20.2	21.4	18.9	20.6	21.4	19.3	21.2	22.0	20.6	20.3	21.5	19.0
7/1/2025	20.0	21.4	18.7	20.1	21.4	18.7	20.1	21.4	18.7	20.2	21.4	18.8	20.5	21.4	19.1	21.0	21.6	20.3	20.4	21.4	19.0
7/2/2025	20.1	21.4	18.9	20.2	21.4	18.9	20.2	21.4	18.9	20.2	21.4	19.0	20.6	21.4	19.3	21.2	21.8	20.6	20.3	21.4	19.1
7/3/2025	20.2	21.7	18.8	20.3	21.7	18.9	20.3	21.7	18.9	20.3	21.7	18.9	20.6	21.7	19.2	21.3	22.0	20.4	20.4	21.7	19.0
7/4/2025	20.0	21.1	18.7	20.1	21.1	18.8	20.1	21.1	18.8	20.1	21.1	18.8	20.5	21.5	19.2	21.1	21.6	20.5	20.3	21.7	18.9
7/5/2025	20.1	21.6	18.7	20.1	21.6	18.7	20.1	21.6	18.7	20.1	21.6	18.8	20.4	21.5	19.0	20.8	21.5	19.8	20.2	21.7	18.9
7/6/2025	20.4	21.9	18.9	20.4	21.8	19.0	20.4	21.8	19.0	20.4	21.8	19.1	20.7	21.7	19.4	21.2	21.9	20.4	20.5	21.9	19.2
7/7/2025	20.4	21.9	19.1	20.5	21.8	19.1	20.5	21.8	19.1	20.5	21.8	19.1	20.8	21.7	19.4	21.3	22.0	20.6	20.6	21.8	19.3
7/8/2025	20.4	21.9	18.9	20.5	21.9	18.9	20.5	21.9	18.9	20.5	21.9	18.9	20.8	21.8	19.3	21.3	22.0	20.6	20.6	21.9	19.1
7/9/2025	20.5	21.9	19.1	20.6	21.9	19.1	20.6	21.9	19.1	20.7	21.9	19.2	21.0	21.9	19.6	21.6	22.2	20.8	20.7	21.9	19.3
7/10/2025	20.6	22.2	19.1	20.7	22.1	19.2	20.7	22.1	19.2	20.8	22.1	19.2	21.1	22.1	19.6	21.7	22.2	20.9	20.8	22.2	19.4
7/11/2025	21.0	22.6	19.5	21.1	22.6	19.6	21.1	22.6	19.6	21.1	22.6	19.7	21.4	22.5	20.1	21.9	22.6	21.2	21.1	22.6	19.8
7/12/2025	21.0	22.6	19.4	21.1	22.6	19.5	21.1	22.6	19.5	21.1	22.6	19.5	21.5	22.6	20.0	22.1	22.7	21.5	21.2	22.6	19.6
7/13/2025	21.1	22.7	19.6	21.3	22.6	19.7	21.3	22.6	19.7	21.3	22.6	19.8	21.7	22.7	20.3	22.4	22.9	21.9	21.4	22.7	19.9
7/14/2025	21.3	23.0	19.7	21.4	23.0	19.8	21.4	22.9	19.8	21.4	23.0	19.8	21.8	23.0	20.3	22.4	22.8	21.7	21.7	23.3	20.5
7/15/2025	21.3	23.0	19.9	21.4	22.9	19.9	21.5	22.9	19.9	21.5	22.9	19.9	21.8	22.9	20.4	22.5	23.0	21.8	21.5	23.0	20.1
7/16/2025	21.3	22.7	19.8	21.4	22.8	19.8	21.4	22.8	19.8	21.4	22.8	19.9	21.8	22.8	20.2	22.4	22.8	21.7	21.5	22.8	20.0
7/17/2025	21.3	22.8	19.8	21.4	22.8	19.9	21.4	22.7	19.9	21.5	22.7	20.0	21.7	22.7	20.5	22.4	22.9	21.7	21.5	22.8	20.1
7/18/2025	21.4	22.9	19.9	21.5	22.8	20.0	21.5	22.8	20.0	21.6	22.8	20.0	21.9	22.7	20.6	22.5	23.0	22.1	21.6	22.9	20.1
7/19/2025	21.5	22.9	20.0	21.6	22.9	20.1	21.6	22.9	20.1	21.7	22.9	20.1	22.0	22.9	20.7	22.6	23.1	22.2	21.7	22.9	20.2
7/20/2025	21.7	23.1	20.1	21.8	23.0	20.2	21.8	23.0	20.2	21.8	23.0	20.2	22.1	22.9	20.9	22.8	23.3	22.5	21.9	23.0	20.3
7/21/2025	21.5	22.9	20.0	21.6	22.8	20.1	21.6	22.8	20.0	21.6	22.8	20.1	22.0	22.9	20.6	22.6	23.0	22.2	21.7	23.0	20.2
7/22/2025	21.3	22.6	20.0	21.4	22.7	20.0	21.5	22.6	20.0	21.5	22.6	20.0	21.8	22.6	20.4	22.3	22.7	21.7	21.6	22.7	20.1
7/23/2025	21.3	22.9	19.9	21.4	22.8	20.0	21.4	22.8	20.0	21.4	22.7	20.0	21.5	22.5	20.4	22.0	22.7	21.2	21.5	22.8	20.1
7/24/2025	21.6	23.0	20.1	21.6	22.9	20.2	21.6	22.9	20.2	21.7	22.9	20.3	21.8	22.8	20.7	22.2	22.9	21.5	21.7	23.0	20.4
7/25/2025	21.6	22.7	20.3	21.7	22.6	20.4	21.7	22.6	20.4	21.7	22.6	20.4	21.9	22.7	20.8	22.4	23.0	21.8	21.8	22.9	20.5
7/26/2025	21.6	22.9	20.1	21.6	22.8	20.2	21.6	22.8	20.2	21.6	22.8	20.2	21.8	22.6	20.8	22.3	23.0	21.8	21.7	22.8	20.3
7/27/2025	21.7	23.1	20.1	21.8	23.1	20.1	21.8	23.0	20.1	21.8	23.0	20.2	22.0	22.8	20.8	22.5	23.1	22.0	21.8	23.1	20.3
7/28/2025	22.0	23.3	20.6	22.1	23.2	20.6	22.1	23.2	20.6	22.1	23.2	20.6	22.3	23.1	21.0	22.7	23.4	22.3	22.1	23.3	20.8

Copyright 2026 by Southern California Edison

Date	Kern River Daily Average, Maximum, and Minimum of Water Temperature (°C)																				
	KR 55.6			KR 54.36			KR 54.2			KR 53.84			KR 50.3			KR 44.0			KRTR 43.94		
	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min
7/29/2025	22.0	23.4	20.5	22.1	23.3	20.6	22.1	23.3	20.6	22.2	23.3	20.7	22.4	23.2	21.2	22.9	23.4	22.5	22.2	23.3	20.8
7/30/2025	22.0	23.2	20.5	22.1	23.2	20.6	22.1	23.2	20.6	22.1	23.2	20.6	22.4	23.1	21.1	22.8	23.0	22.4	21.5	23.3	20.8
7/31/2025	22.0	23.5	20.4	22.0	23.4	20.4	22.0	23.4	20.4	22.1	23.4	20.4	22.2	23.2	20.8	22.6	23.0	21.9	21.1	21.7	20.7
8/1/2025	22.1	23.3	20.7	22.2	23.2	20.8	22.2	23.2	20.8	22.2	23.2	20.8	22.4	23.2	21.3	22.8	23.4	22.2	22.3	23.3	21.6
8/2/2025	22.3	23.3	20.9	22.4	23.3	21.0	22.4	23.3	21.0	22.4	23.3	21.1	22.6	23.2	21.7	23.1	23.6	22.6	23.2	23.8	22.7
8/3/2025	22.2	23.3	20.7	22.2	23.2	21.0	22.3	23.2	21.0	22.3	23.2	21.0	22.5	23.1	21.6	23.0	23.6	22.6	23.4	24.0	22.8
8/4/2025	21.8	22.8	20.7	21.9	23.0	20.8	22.0	23.0	20.8	22.0	23.0	20.9	22.2	23.0	21.4	22.5	22.8	22.2	22.8	23.3	22.5
8/5/2025	21.9	23.2	20.5	21.9	23.2	20.5	21.9	23.1	20.5	21.9	23.1	20.6	22.0	23.0	20.9	22.3	23.0	21.6	22.7	23.4	22.1
8/6/2025	22.2	23.3	20.8	22.2	23.2	20.9	22.2	23.2	20.9	22.2	23.2	20.9	22.4	23.1	21.3	22.7	23.3	22.1	23.1	23.6	22.6
8/7/2025	22.4	23.5	21.1	22.5	23.4	21.2	22.5	23.4	21.2	22.5	23.4	21.3	22.7	23.3	21.7	23.0	23.6	22.5	23.4	23.9	22.9
8/8/2025	22.6	23.7	21.2	22.6	23.6	21.3	22.6	23.6	21.3	22.6	23.6	21.3	22.8	23.6	21.7	23.2	24.0	22.5	23.5	24.4	22.8
8/9/2025	22.6	23.5	21.3	22.6	23.4	21.4	22.7	23.5	21.4	22.7	23.5	21.5	22.9	23.5	21.9	23.3	24.1	22.7	23.4	23.9	22.8
8/10/2025	22.7	23.6	21.4	22.8	23.6	21.6	22.8	23.6	21.6	22.8	23.6	21.7	23.0	23.5	22.1	23.5	24.4	22.8	23.7	24.3	23.1
8/11/2025	22.9	23.8	21.6	23.0	23.8	21.8	23.0	23.8	21.8	23.0	23.8	21.8	23.3	23.8	22.4	23.7	24.4	23.3	23.8	24.3	23.4
8/12/2025	22.8	23.7	21.6	22.9	23.7	21.7	22.9	23.7	21.7	22.9	23.7	21.8	23.2	23.7	22.4	23.7	24.3	23.4	23.9	24.3	23.5
8/13/2025	22.7	23.5	21.5	22.8	23.5	21.6	22.8	23.5	21.6	22.8	23.5	21.7	23.1	23.6	22.3	23.6	24.2	23.2	23.7	24.2	23.4
8/14/2025	22.5	23.5	21.2	22.5	23.4	21.3	22.6	23.4	21.3	22.6	23.4	21.4	22.8	23.3	21.9	23.2	23.9	22.7	23.4	24.0	22.9
8/15/2025	22.5	23.6	21.1	22.6	23.5	21.4	22.6	23.5	21.4	22.6	23.5	21.4	22.8	23.4	22.0	23.2	24.2	22.6	23.7	24.3	23.0
8/16/2025	22.7	23.6	21.4	22.8	23.6	21.6	22.8	23.6	21.6	22.8	23.5	21.7	23.0	23.5	22.3	23.4	24.2	22.9	23.8	24.6	23.1
8/17/2025	22.8	23.7	21.6	22.9	23.7	21.8	22.9	23.7	21.8	22.9	23.7	21.8	23.1	23.6	22.4	23.6	24.5	23.0	24.0	24.8	23.5
8/18/2025	22.8	23.6	21.6	22.9	23.6	21.8	22.9	23.6	21.8	22.9	23.6	21.9	23.1	23.5	22.4	23.5	24.3	23.1	24.2	24.8	23.4
8/19/2025	22.8	23.7	21.5	22.8	23.6	21.6	22.8	23.6	21.7	22.9	23.6	21.7	23.0	23.5	22.2	23.3	24.1	22.9	23.5	24.0	23.0
8/20/2025	22.8	23.6	21.5	22.9	23.6	21.7	22.9	23.6	21.7	22.9	23.5	21.8	23.1	23.5	22.4	23.4	24.2	22.9	23.7	24.4	23.2
8/21/2025	22.8	23.6	21.6	22.9	23.6	21.8	22.9	23.6	21.8	23.0	23.6	21.9	23.1	23.6	22.4	23.4	24.1	22.8	23.7	24.2	23.2
8/22/2025	23.2	24.2	22.0	23.3	24.1	22.1	23.3	24.1	22.1	23.3	24.1	22.2	23.5	24.1	22.7	23.9	25.0	23.0	23.6	24.3	22.2
8/23/2025	23.1	24.1	22.4	23.3	24.1	22.6	23.3	24.1	22.6	23.3	24.0	22.7	23.7	24.0	23.4	24.2	24.8	23.7	23.4	24.1	22.7
8/24/2025	23.1	23.8	22.4	23.2	23.8	22.5	23.2	23.8	22.5	23.2	23.8	22.6	23.5	24.2	22.8	24.1	24.9	23.2	23.2	23.8	22.6
8/25/2025	23.0	23.5	22.3	23.1	23.7	22.5	23.2	23.8	22.5	23.2	23.9	22.5	23.6	24.3	22.9	24.3	25.3	23.5	23.2	23.7	22.6
8/26/2025	23.1	24.0	22.2	23.2	24.0	22.4	23.3	24.0	22.4	23.3	23.9	22.6	23.4	24.7	22.6	24.0	25.3	22.8	23.3	24.1	22.6
8/27/2025	23.0	23.6	22.0	23.1	23.7	22.5	23.1	23.7	22.5	23.2	23.6	22.7	23.4	24.8	22.3	23.8	25.1	22.6	23.3	23.8	22.6
8/28/2025	22.7	23.2	21.9	22.8	23.1	22.3	22.8	23.1	22.3	22.8	23.1	22.4	22.9	24.2	21.8	23.5	24.5	22.3	22.9	23.4	22.4
8/29/2025	22.8	23.5	21.9	22.8	23.5	22.2	22.8	23.5	22.2	22.8	23.4	22.2	22.9	24.3	21.7	23.5	24.6	22.4	22.9	23.7	22.3
8/30/2025	23.0	23.7	22.3	23.1	23.6	22.5	23.1	23.7	22.5	23.1	23.8	22.4	23.2	24.5	21.9	23.7	25.0	22.6	23.2	23.8	22.6
8/31/2025	23.2	23.9	22.6	23.3	23.8	22.6	23.3	24.0	22.6	23.3	24.2	22.5	23.5	25.0	22.0	24.2	25.5	23.1	23.4	24.0	22.8
9/1/2025	23.3	24.0	22.7	23.4	24.0	22.6	23.4	24.2	22.6	23.5	24.4	22.6	23.6	25.0	22.1	24.5	25.6	23.3	23.5	24.2	22.9
9/2/2025	23.3	23.7	23.0	23.5	24.1	23.0	23.5	24.3	22.9	23.6	24.5	22.8	23.5	24.8	22.4	24.5	25.1	23.8	23.6	24.3	23.1
9/3/2025	23.2	24.1	22.4	23.3	24.2	22.5	23.3	24.2	22.5	23.3	24.2	22.5	23.7	24.9	22.5	24.4	25.4	23.5	23.4	24.3	22.6
9/4/2025	23.5	24.0	22.8	23.6	24.1	23.2	23.7	24.2	23.2	23.7	24.3	23.2	24.1	25.2	22.8	24.8	25.9	23.8	23.8	24.3	23.3

Date	Kern River Daily Average, Maximum, and Minimum of Water Temperature (°C)																				
	KR 55.6			KR 54.36			KR 54.2			KR 53.84			KR 50.3			KR 44.0			KRTR 43.94		
	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min
9/5/2025	23.4	23.9	22.8	23.5	23.9	23.1	23.5	24.0	23.1	23.6	24.1	23.1	23.9	25.1	22.9	24.8	25.7	23.8	23.6	24.1	23.2
9/6/2025	23.0	23.6	22.3	23.1	23.6	22.6	23.1	23.5	22.5	23.2	23.7	22.6	23.4	24.5	22.1	24.2	25.2	23.3	23.3	23.7	22.7
9/7/2025	22.8	23.4	22.1	22.8	23.4	22.3	22.9	23.4	22.3	22.9	23.4	22.3	22.9	24.1	21.8	23.6	24.5	22.6	23.0	23.6	22.5
9/8/2025	22.4	23.1	21.7	22.5	23.0	21.9	22.5	23.0	21.9	22.5	23.0	21.9	22.5	23.7	21.2	23.0	24.0	21.9	22.7	23.2	22.1
9/9/2025	22.4	23.1	21.7	22.4	23.0	21.7	22.4	23.1	21.7	22.4	23.1	21.7	22.4	23.6	21.3	22.8	23.9	21.9	22.5	23.2	21.9
9/10/2025	22.3	22.9	21.8	22.3	22.7	21.9	22.3	22.8	21.9	22.3	22.8	21.8	22.3	23.4	21.5	22.7	23.4	22.0	22.5	22.9	22.1
9/11/2025	22.1	22.6	21.6	22.1	22.6	21.6	22.1	22.6	21.6	22.0	22.5	21.6	21.9	22.8	21.2	22.2	22.6	21.8	22.2	22.8	21.8
9/12/2025	22.2	22.6	21.6	22.1	22.6	21.8	22.1	22.6	21.8	22.1	22.5	21.7	21.9	22.5	21.3	22.1	23.0	21.4	22.5	23.3	22.0
9/13/2025	22.4	23.1	21.6	22.4	23.0	21.8	22.4	23.0	21.8	22.4	23.0	21.7	22.3	23.6	21.2	22.4	23.6	21.4	23.0	23.8	22.5
9/14/2025	22.5	23.1	21.9	22.6	23.1	22.0	22.6	23.2	22.0	22.6	23.2	22.0	22.6	23.8	21.5	22.9	23.9	22.1	23.2	23.8	22.7
9/15/2025	22.4	22.9	21.8	22.5	22.9	21.9	22.5	23.0	21.9	22.5	23.1	21.9	22.6	23.7	21.4	23.1	24.1	22.2	23.1	23.7	22.6
9/16/2025	22.4	23.0	21.7	22.4	23.1	21.7	22.4	23.2	21.7	22.4	23.3	21.6	22.4	23.6	20.9	23.1	24.2	22.0	23.1	23.8	22.4
9/17/2025	22.6	23.0	22.1	22.6	23.2	22.1	22.6	23.3	22.0	22.6	23.3	21.9	22.7	23.6	21.4	23.1	24.1	22.1	23.3	23.9	22.8
9/18/2025	22.2	22.6	21.9	22.4	22.7	22.0	22.4	22.7	22.0	22.4	22.8	22.0	22.5	23.1	22.2	23.0	23.6	22.7	23.0	23.5	22.7
9/19/2025	22.0	22.4	21.7	22.0	22.5	21.6	22.1	22.6	21.7	22.1	22.6	21.7	22.4	23.0	21.7	22.8	23.8	22.1	22.7	23.2	22.3
9/20/2025	22.5	23.2	21.9	22.1	22.3	21.9	22.6	23.4	21.9	22.5	23.3	21.8	22.7	24.1	21.6	23.4	24.4	22.5	23.2	24.1	22.6
9/21/2025	22.8	23.3	22.5	22.8	23.7	22.2	23.1	23.8	22.4	23.1	23.8	22.4	23.2	24.6	22.1	23.9	24.7	23.1	23.7	24.5	23.2
9/22/2025	22.6	23.0	22.2	22.8	23.3	22.2	22.8	23.5	22.2	22.8	23.5	22.2	23.2	24.2	22.2	23.7	24.3	23.0	23.4	24.0	22.9
9/23/2025	22.5	22.8	22.2	22.7	23.3	22.1	22.7	23.5	22.1	22.8	23.7	22.0	23.0	24.4	21.7	23.7	24.8	22.7	23.1	23.6	22.4
9/24/2025	22.7	23.1	22.4	22.4	22.8	22.3	22.9	23.7	22.3	22.9	23.7	22.2	23.4	24.7	22.7	24.2	24.8	23.5	22.9	23.8	22.4
9/25/2025	22.3	22.6	22.0	22.4	22.9	22.0	22.5	23.0	22.1	22.5	23.0	22.1	22.8	23.8	22.2	23.9	24.5	23.2	22.6	23.1	22.2
9/26/2025	22.1	22.4	21.6	22.1	22.4	21.7	22.1	22.5	21.7	22.1	22.6	21.7	22.3	22.9	21.6	23.2	23.7	22.6	22.2	22.5	21.8
9/27/2025	22.1	22.5	21.7	22.2	22.7	21.8	22.2	22.7	21.8	22.2	22.7	21.7	22.1	22.8	21.3	22.6	23.2	22.0	22.3	22.8	22.0
9/28/2025	22.3	22.9	21.7	22.2	22.7	21.8	22.3	22.8	21.8	22.2	22.8	21.8	22.4	23.5	21.5	22.7	23.7	21.9	22.4	22.9	22.0
9/29/2025	22.2	22.6	21.7	22.2	22.6	21.8	22.2	22.6	21.8	22.2	22.7	21.8	22.3	23.2	21.5	22.7	23.4	22.0	22.4	22.7	22.0
9/30/2025	21.7	22.1	21.3	21.8	22.1	21.5	21.8	22.0	21.5	21.7	22.1	21.6	21.7	22.5	21.2	22.2	22.7	21.7	21.9	22.3	21.7
10/1/2025	21.5	22.0	20.8	21.4	22.0	20.9	21.4	22.0	20.9	21.4	21.8	20.8	21.3	22.3	20.5	21.6	22.4	20.8	21.6	22.1	21.1
10/2/2025	21.5	22.1	20.7	21.5	22.0	21.0	21.5	21.9	21.0	21.5	21.8	21.0	21.4	22.4	20.6	21.6	22.5	20.7	21.6	22.1	21.1
10/3/2025	21.1	21.8	20.3	21.3	21.7	20.3	21.2	21.7	20.2	21.2	21.7	20.4	21.0	21.7	20.3	21.3	22.0	20.5	21.5	21.9	20.6
10/4/2025	20.2	20.8	19.6	20.1	20.7	19.5	20.1	20.6	19.5	20.0	20.6	19.4	19.9	21.2	18.9	20.1	20.8	19.3	20.3	21.0	19.7
10/5/2025	20.3	20.7	19.8	20.2	20.8	19.6	20.1	20.9	19.5	20.0	20.9	19.3	19.5	21.1	18.3	19.8	20.7	18.9	20.4	21.0	19.8
10/6/2025	20.4	20.9	20.0	20.3	21.0	19.8	20.3	21.1	19.6	20.2	21.1	19.4	19.7	21.2	18.5	19.8	20.7	18.8	20.5	21.2	20.0
10/7/2025	20.2	20.8	19.8	20.2	20.8	19.6	20.2	20.9	19.5	20.1	21.0	19.3	19.7	21.0	18.7	20.0	20.9	19.0	20.4	21.0	19.9
10/8/2025	20.0	20.4	19.5	20.0	20.3	19.6	20.0	20.6	19.4	19.9	20.5	19.4	19.7	20.6	18.4	19.9	20.7	19.0	20.2	20.5	19.8
10/9/2025	19.9	20.4	19.1	19.8	20.1	19.4	19.8	20.0	19.4	19.8	20.0	19.5	19.6	20.6	18.7	19.6	20.4	18.8	20.0	20.2	19.6
10/10/2025	20.2	20.7	19.4	20.1	20.6	19.7	20.1	20.6	19.7	20.0	20.5	19.7	19.8	20.8	19.1	19.7	20.5	18.8	20.2	20.7	19.8
10/11/2025	19.7	20.6	19.1	19.8	20.4	19.3	19.8	20.3	19.2	19.8	20.3	19.3	19.7	20.4	19.0	19.7	20.3	19.1	20.0	20.5	19.5
10/12/2025	19.2	19.7	18.4	19.1	19.5	18.5	19.1	19.5	18.6	19.0	19.3	18.6	18.8	19.7	18.2	18.9	19.6	17.9	19.3	19.7	18.7

Date	Kern River Daily Average, Maximum, and Minimum of Water Temperature (°C)																				
	KR 55.6			KR 54.36			KR 54.2			KR 53.84			KR 50.3			KR 44.0			KRTR 43.94		
	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min
10/13/2025	18.6	19.3	18.1	18.6	19.2	18.3	18.5	19.1	18.3	18.6	19.1	18.3	18.2	18.5	17.7	17.9	18.7	17.1	18.8	19.4	18.4
10/14/2025	18.2	18.6	17.6	18.2	18.4	17.8	18.1	18.4	17.8	18.1	18.3	17.9	17.7	17.9	17.2	17.3	17.9	16.8	18.4	18.6	18.0
10/15/2025	17.9	18.6	17.3	17.7	18.4	17.1	17.7	18.3	17.0	17.6	18.2	17.0	17.2	17.5	16.8	16.9	17.4	16.5	17.9	18.6	17.3

Notes: "**–**" Indicates missing data due to vandalism at KR 44.0

Table 5-19. Preferred Temperatures for Growth and Activity of Fish Species Observed during Bypass Sampling, December 2025.

Species	Temperature Preferences (°C)	
	Adult	Juvenile
Smallmouth bass	20–27	26[2]
Sacramento sucker	20–25	20–25[1]
Largemouth bass	25–30	28[3]
Rainbow trout	15–18	15–18[1]
Hardhead	24–28	24–28[1]
Brown bullhead	20–33	20–30[4]
White catfish	>21	20[5]

Sources: [1]Moyle 2002
[2]Horning II and Pearson 1973
[3]Diaz et al. 2007
[4]Keast 1985
[5]Kellogg and Gift 1983
Key: °C = degrees Celsius

Table 5-20. Methylmercury Fish Tissue Analysis Summary

Species	Sample ID	Sample Date	Sample Time	Fish Weight (g)	Total Length (mm)	Fork Length (mm)	Methylmercury (mg/kg)	Total Mercury (mg/kg)
Brown bullhead *Ameiurus nebulosus*	BBH-1	10/15/24	1248	210.0	247	–	0.24	0.38
	BBH-2	10/15/24	1400	148.0	223	–	0.20	0.32
	BBH-3	10/16/24	1131	185.0	232	–	0.35	0.59
	BBH-4	10/16/24	1133	110.0	189	–	0.21	0.31
	BBH-5	10/16/24	1135	113.0	204	–	0.17	0.23
	BBH-6	10/16/24	1140	168.0	230	–	0.15	0.28
	BBH-7	10/16/24	1148	214.0	251	–	0.21	0.42
	BBH-8	10/17/24	1121	124.7	205	–	0.17	0.24
	BBH-9	10/17/24	1121	136.4	222	–	0.13	0.26
Black crappie *Pomoxis nigromaculatus*	BCR-1	10/15/24	1315	150.0	–	203	0.16	0.23
	BCR-2	10/15/24	1321	121.0	–	200	0.17	0.28
	BCR-3	10/16/24	1129	61.0	–	160	0.08	0.16
Bluegill sunfish *Lepomis macrochirus*	BGS-1	10/15/24	1248	153.0	–	163	0.14	0.22
	BGS-2	10/15/24	1320	162.0	–	169	0.16	0.20
	BGS-3	10/16/24	1122	109.4	–	155	0.14	0.24
	BGS-4	10/17/24	1104	103.8	–	165	0.11	0.19
	BGS-5	10/17/24	1107	96.5	–	158	0.13	0.27
Channel catfish *Ictalurus punctatus*	CHC-1	10/17/24	1055	2010.0	545	–	0.24	0.51

Species	Sample ID	Sample Date	Sample Time	Fish Weight (g)	Total Length (mm)	Fork Length (mm)	Methylmercury (mg/kg)	Total Mercury (mg/kg)
Largemouth bass *Micropterus salmoides*	LMB-1	10/15/24	1332	1276.0	–	401	0.52	0.88
	LMB-2	10/15/24	1333	242.0	–	258	0.25	0.51
	LMB-3	10/15/24	1332	213.0	–	213	0.11	0.23
	LMB-4	10/15/24	1333	207.0	–	272	0.21	0.34
	LMB-5	10/15/24	1350	216.0	–	252	0.21	0.37
	LMB-6	10/15/24	1529	1257.0	–	420	0.23	0.47
	LMB-7	10/15/24	1530	122.0	–	210	0.13	0.24
	LMB-8	10/15/24	1535	>3100	–	520	0.57	1.10
	LMB-9	10/15/24	1549	205.4	–	248	0.16	0.29
	LMB-10	10/16/24	1119	998.0	–	380	0.51	0.99
White catfish *Ameiurus catus*	WC-1	10/16/24	1117	972.0	151	–	0.19	0.37

Key: g = gram
mg/kg = milligrams per kilogram
mm = millimeter

FIGURES

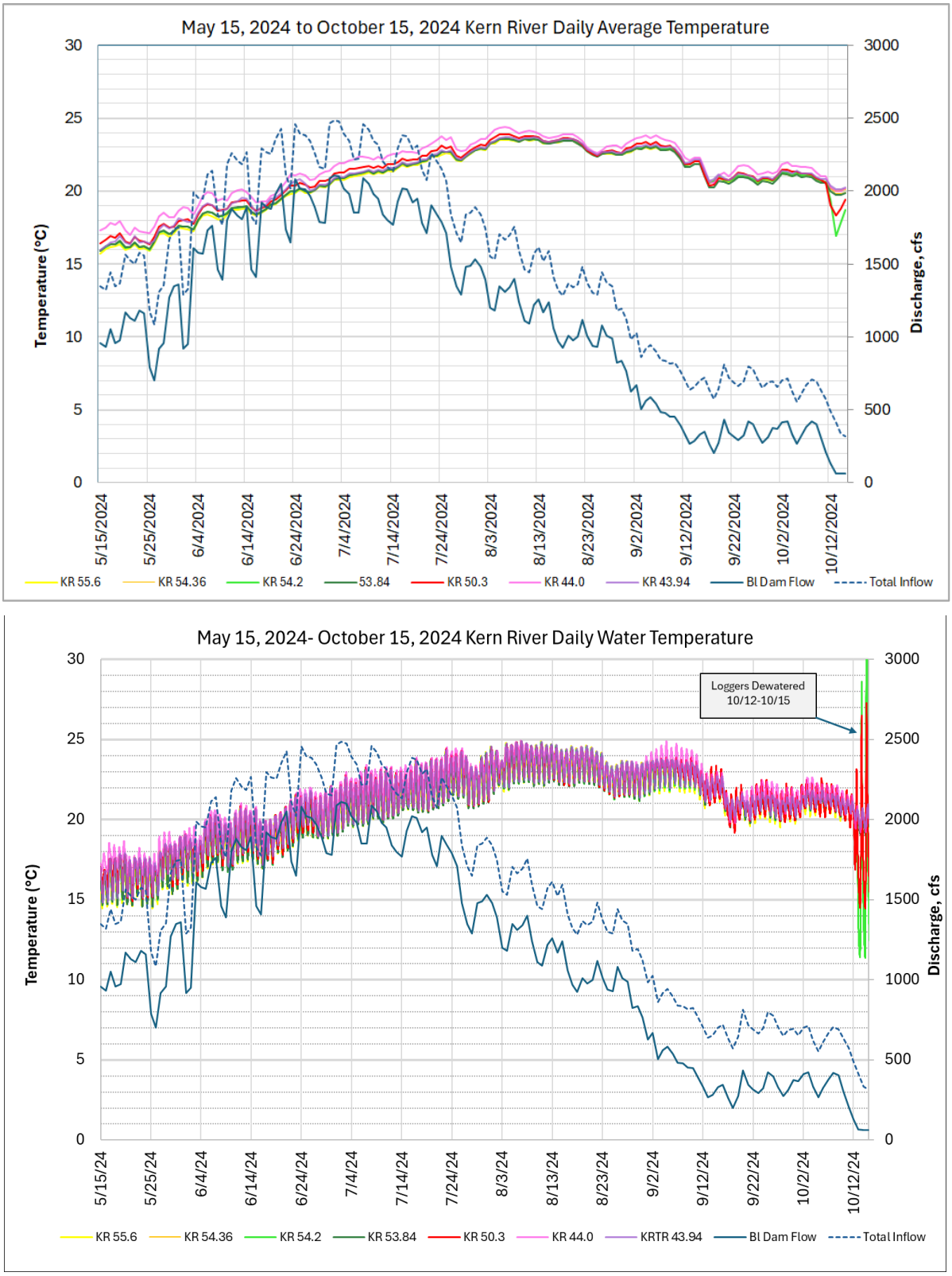
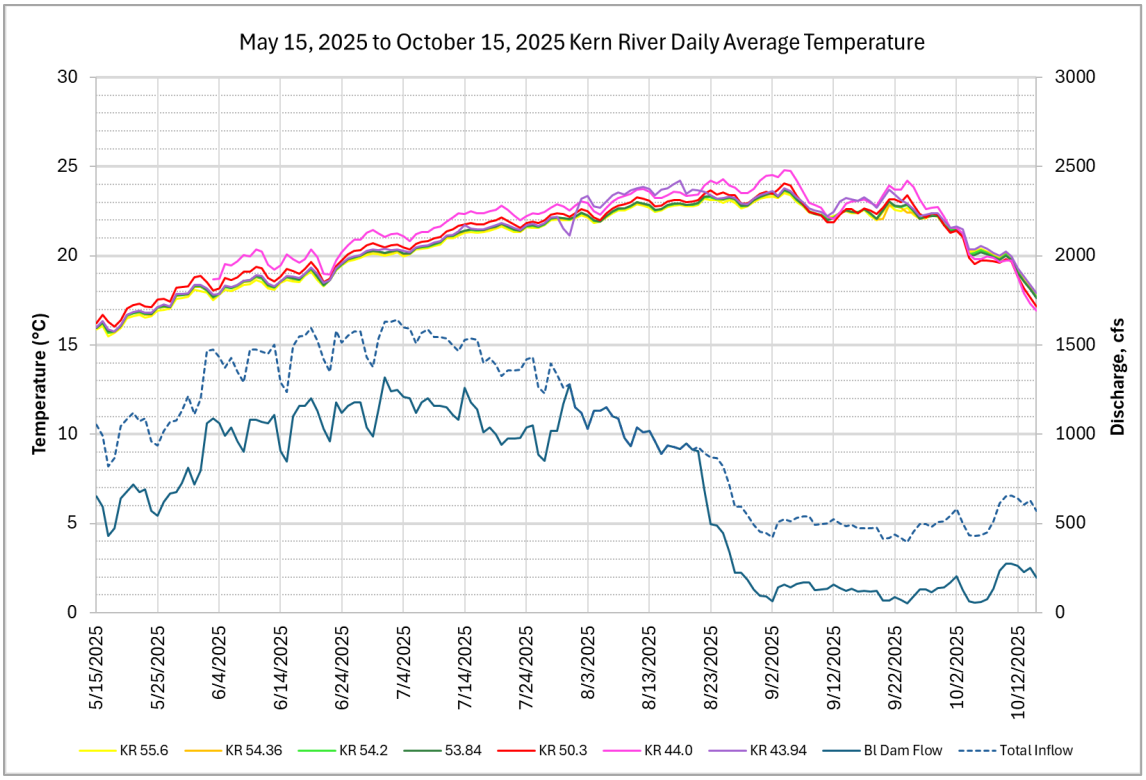


Figure 5-1. 2024 Kern River Daily Average Water Temperature (top) and 15-minute Temperature Data (bottom) with Daily Mean Discharge (total inflow and flow downstream of Democrat Dam)



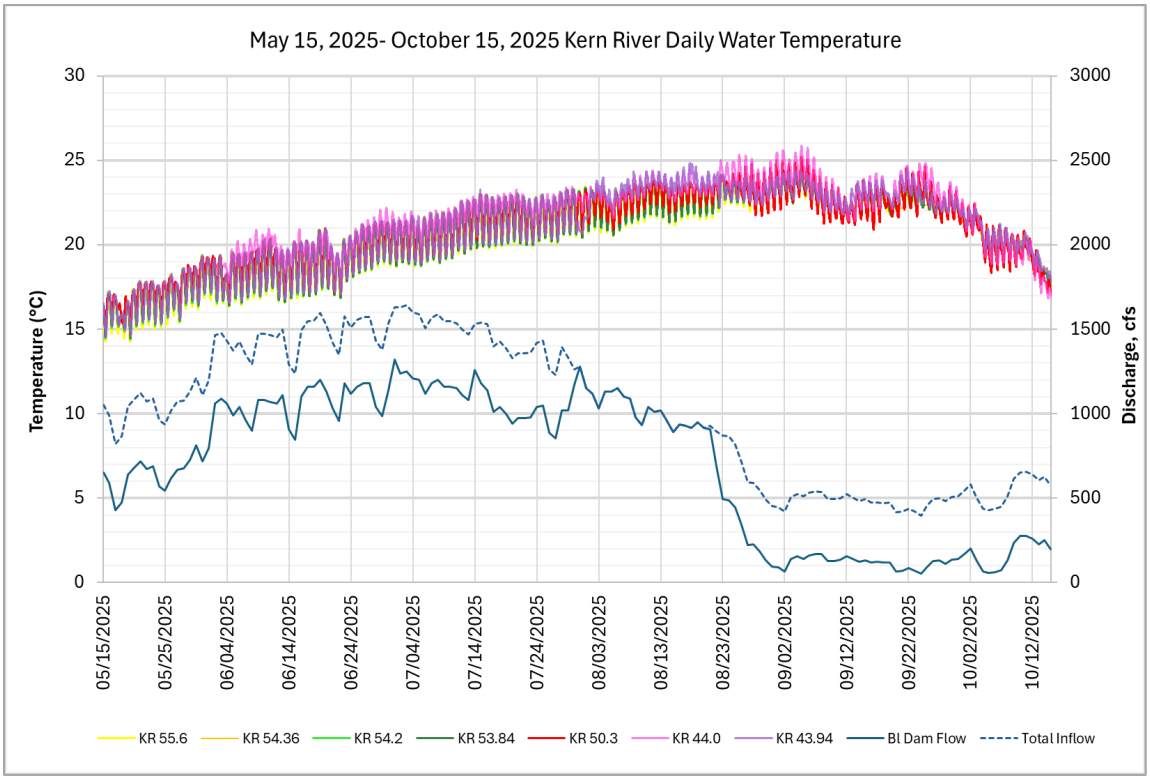


Figure 5-2. 2025 Kern River Daily Average Water Temperature (top) and 15-minute Temperature Data (bottom) with Daily Mean Discharge (total inflow and flow downstream of Democrat Dam)

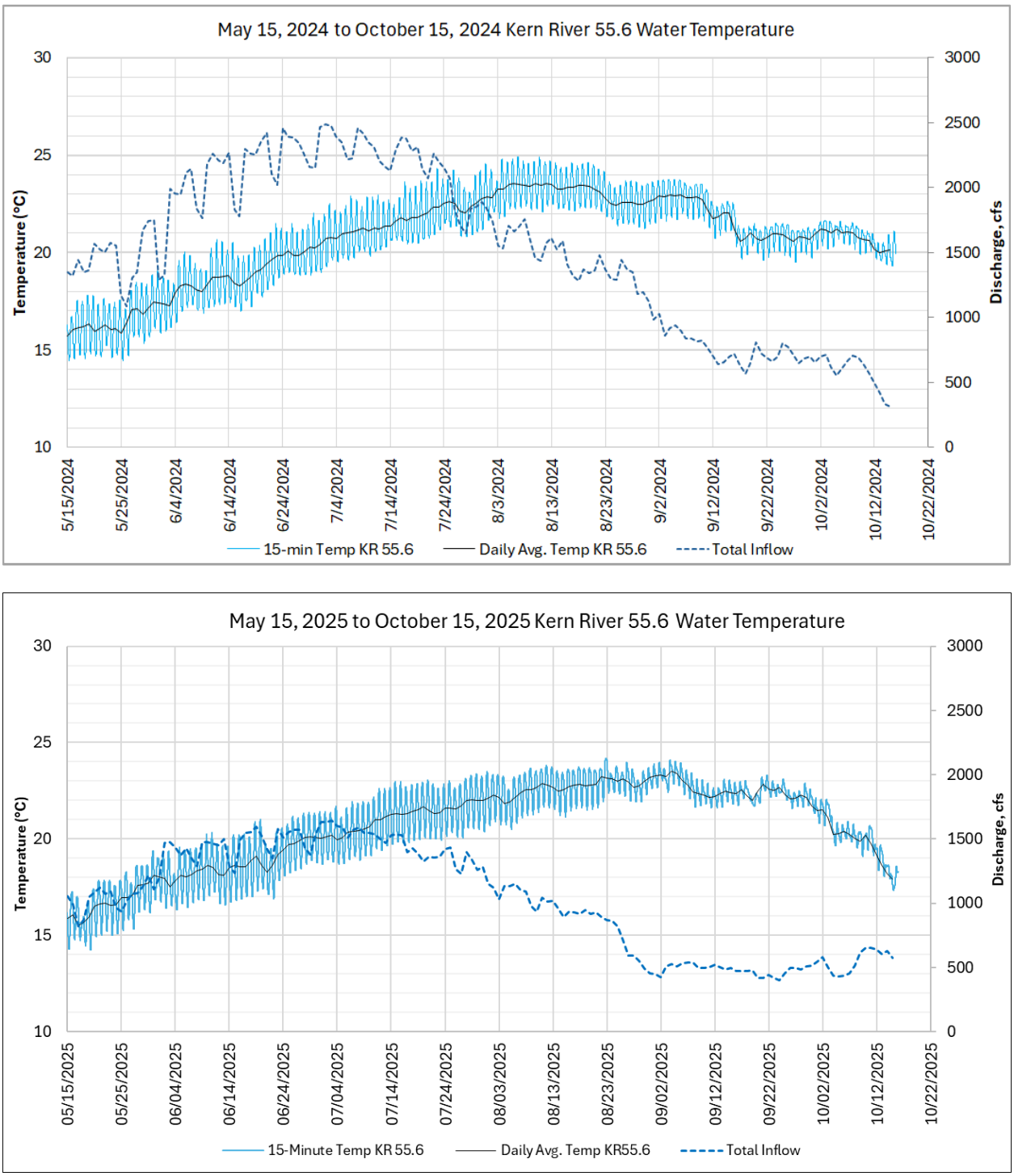


Figure 5-3. Kern River above Democrat Dam, Site KR 55.6, Water Temperature and Daily Mean Discharge for 2024 (Top) and 2025 (Bottom)

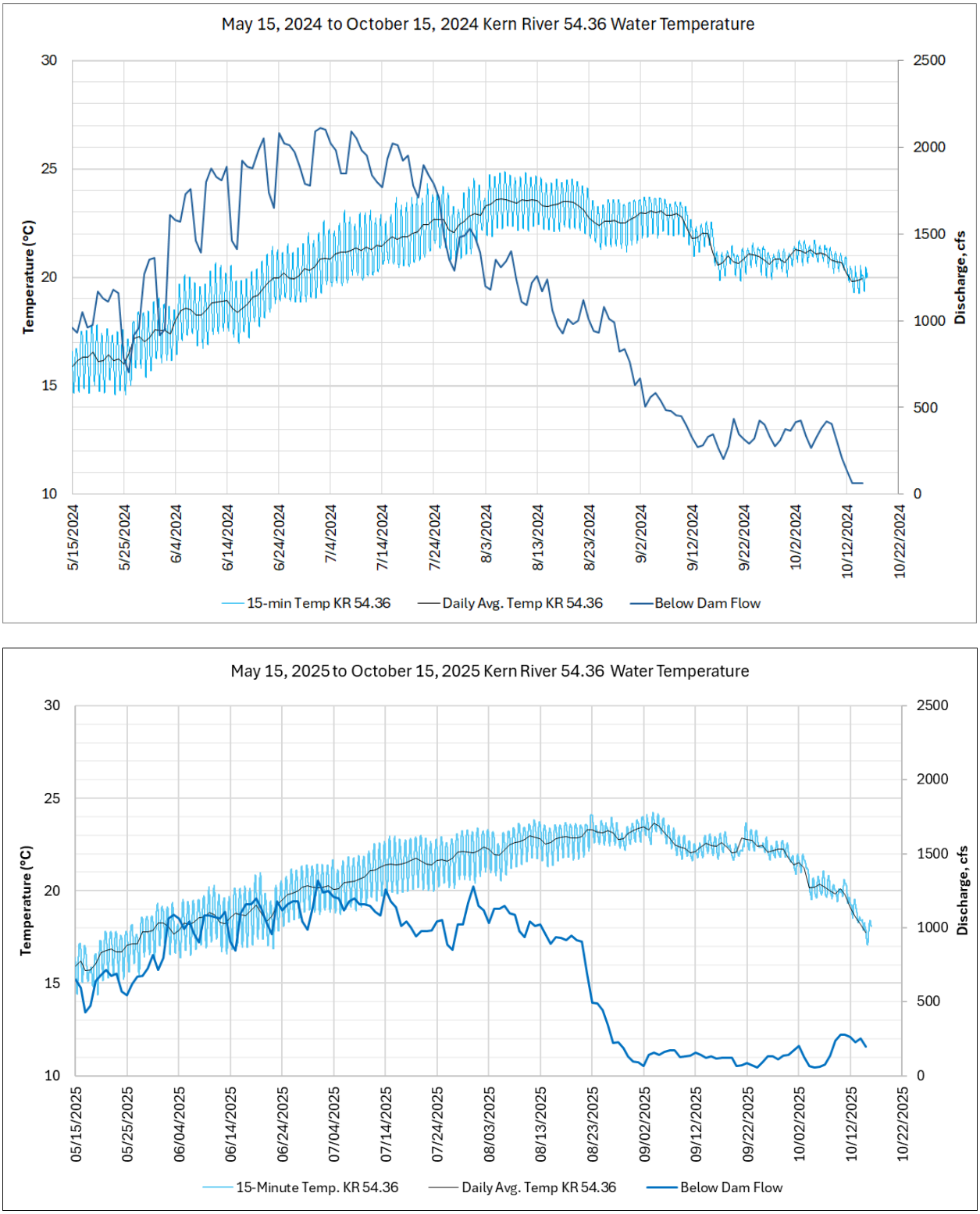


Figure 5-4. Kern River between Democrat Dam and Instream Flow Release, Site KR 54.36 Water Temperature and Daily Mean Discharge for 2024 (Top) and 2025 (Bottom)

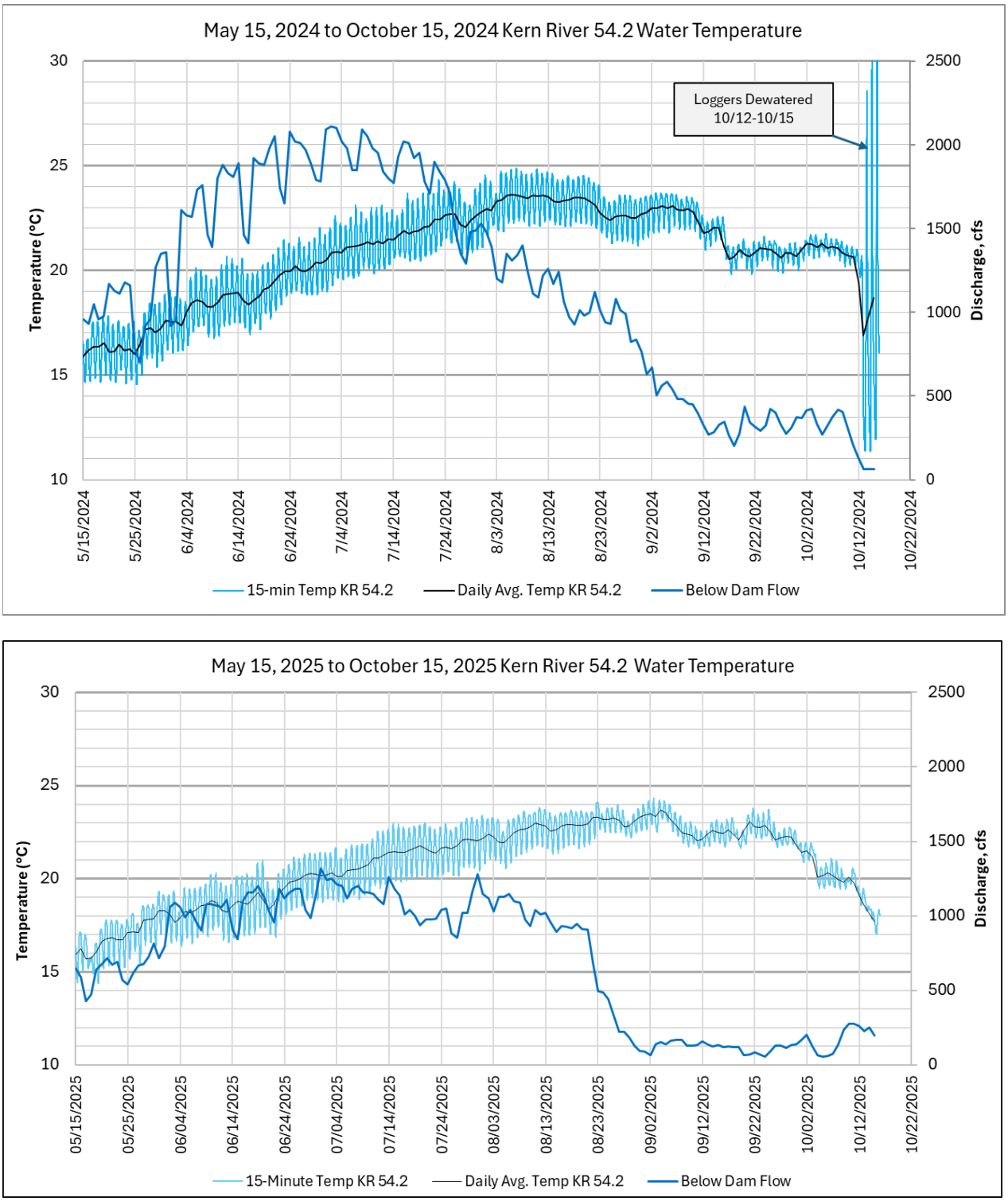


Figure 5-5. Kern River below Instream Flow Release, KR 54.2 Water Temperature and Daily Mean Discharge for 2024 (Top) and 2025 (Bottom)

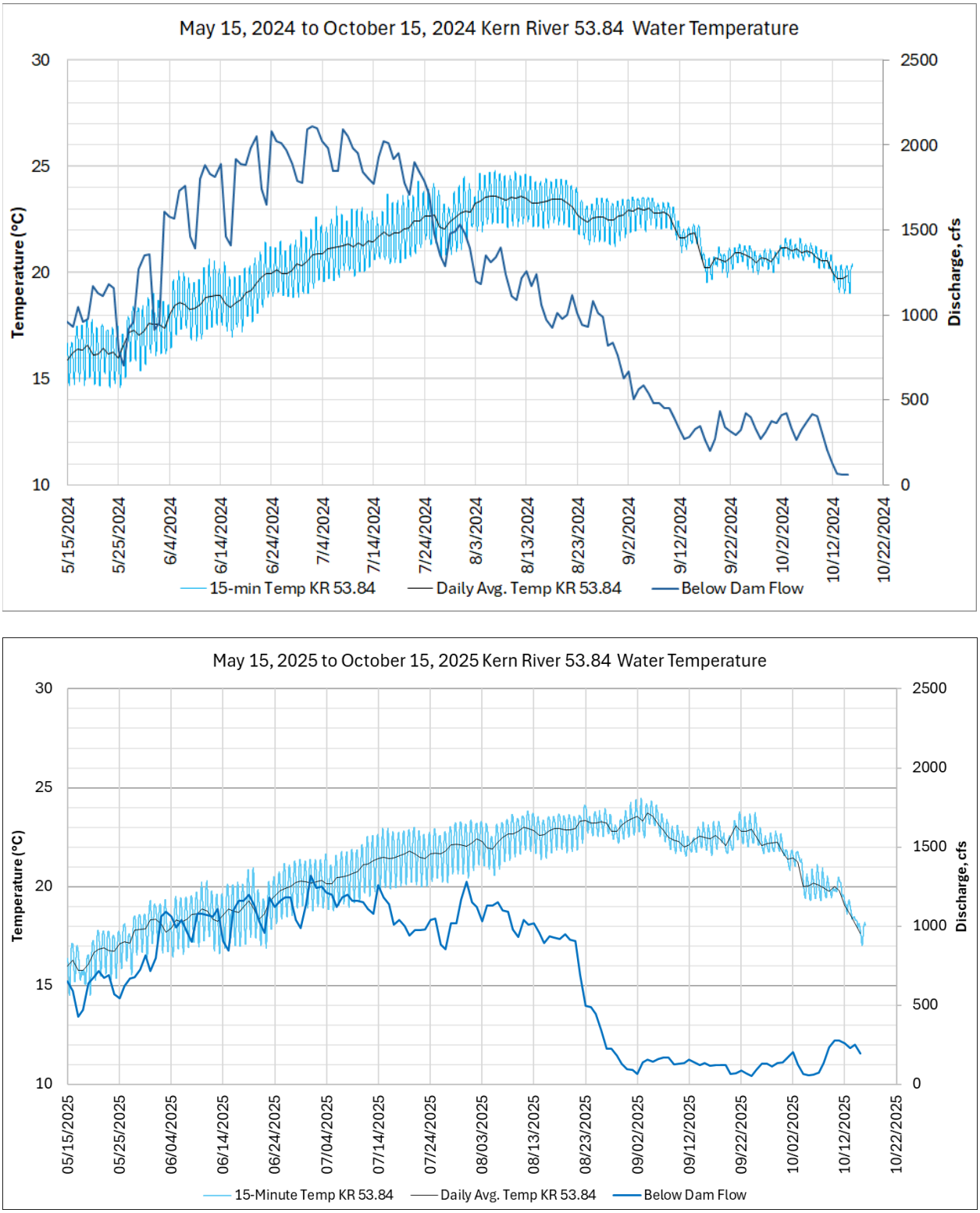


Figure 5-6. Kern River near USGS gage 11192500; below Democrat Dam, KR 53.84 Water Temperature and Daily Mean Discharge for 2024 (Top) and 2025 (Bottom)

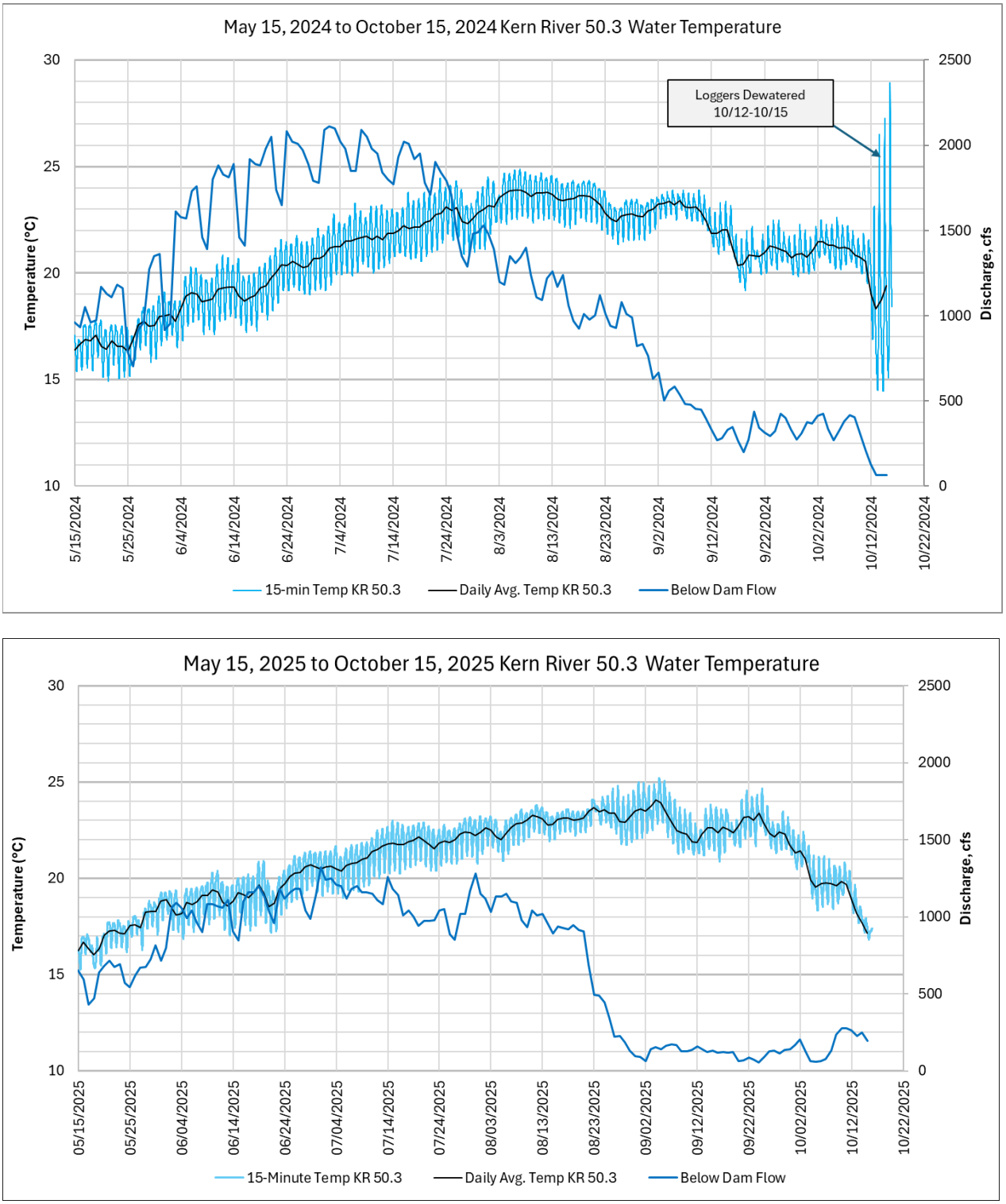
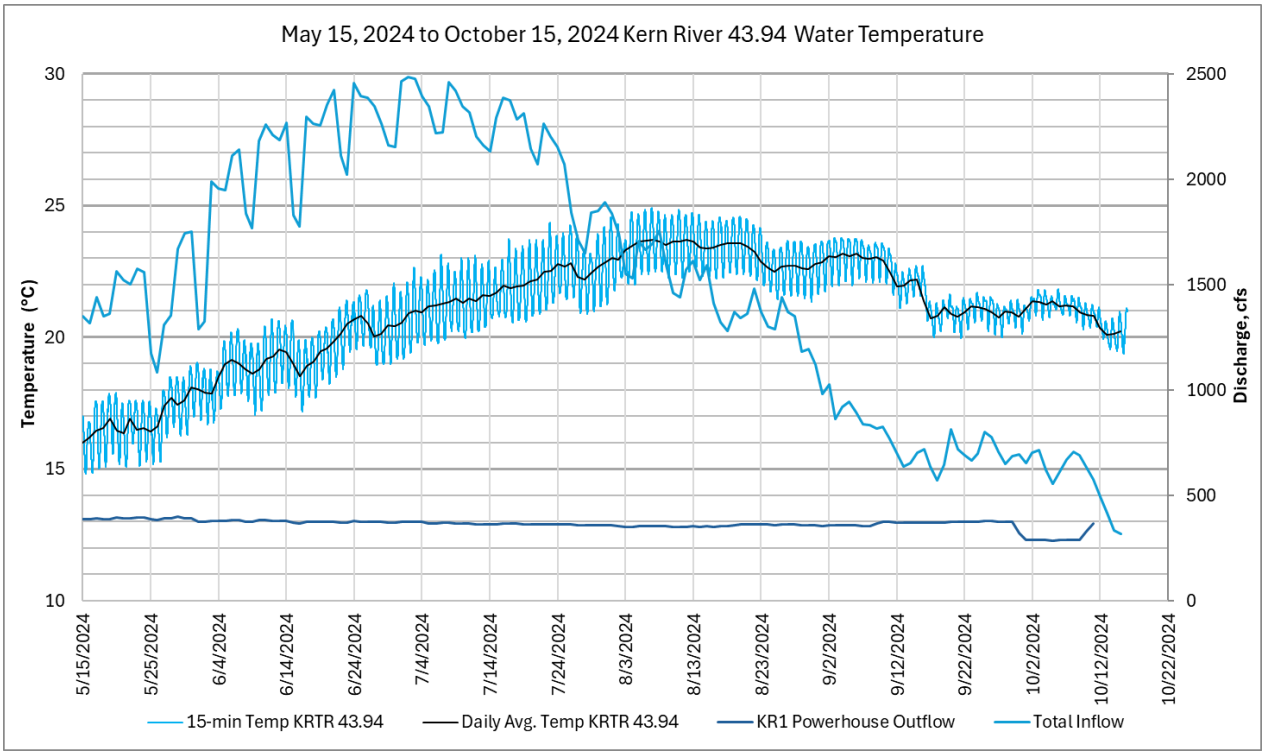


Figure 5-7. Kern River near Lucas Creek, KR 50.3 Water Temperature and Daily Mean Discharge for 2024 (Top) and 2025 (Bottom)



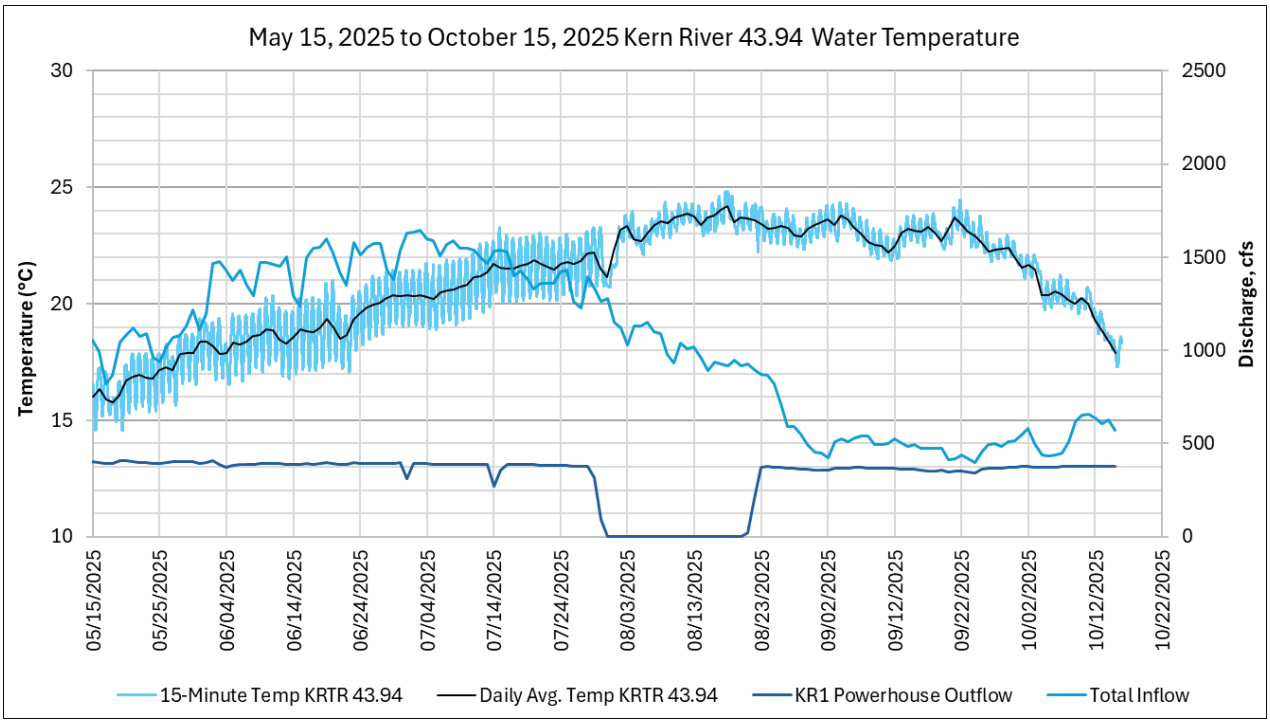


Figure 5-8. Kern River No. 1 Powerhouse Tailrace, KRTR 43.94 Water Temperature and Daily Mean Discharge for 2024 (Top) and 2025 (Bottom)

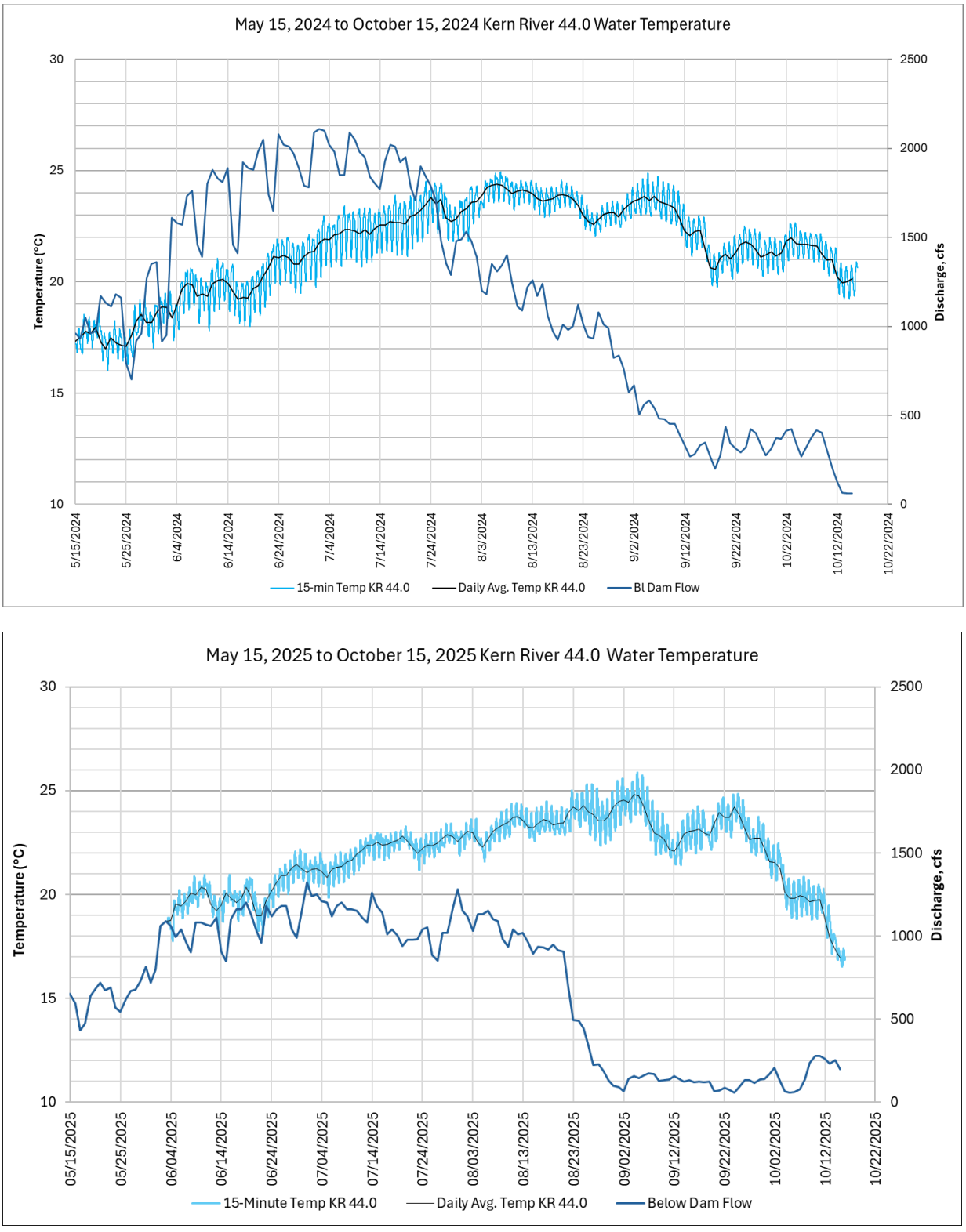


Figure 5-9. Kern River upstream of Kern River No. 1 Powerhouse, Site KR 44.0 Water Temperature and Daily Mean Discharge for 2024 (Top) and 2025 (Bottom)

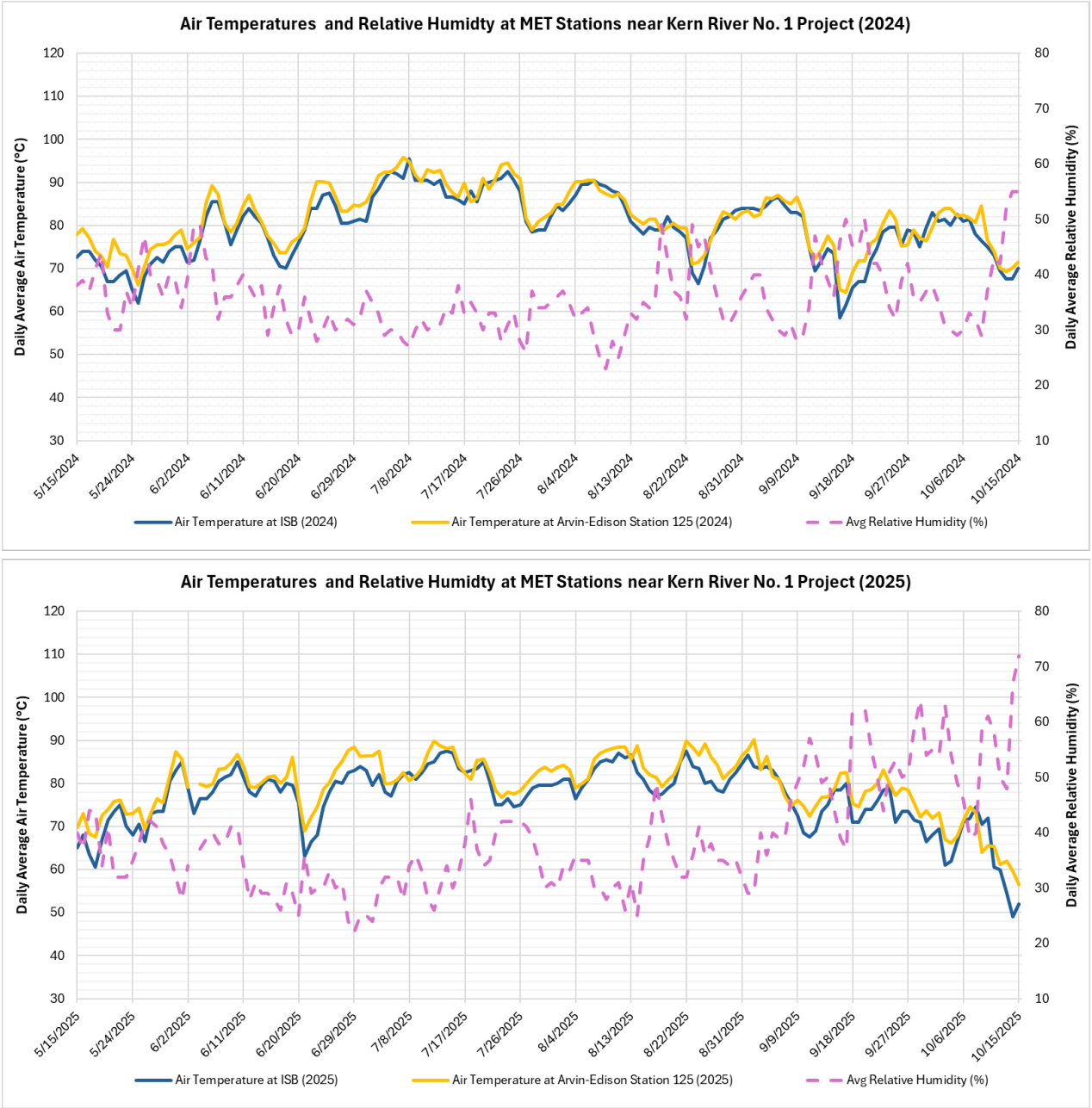


Figure 5-10. 2024 and 2025 Meteorological Station (MET) Data (Daily Average Air Temperature) near the Project Area (Isabella Dam [ISB]) and Arvin-Edison – San Joaquin Valley – Station 125

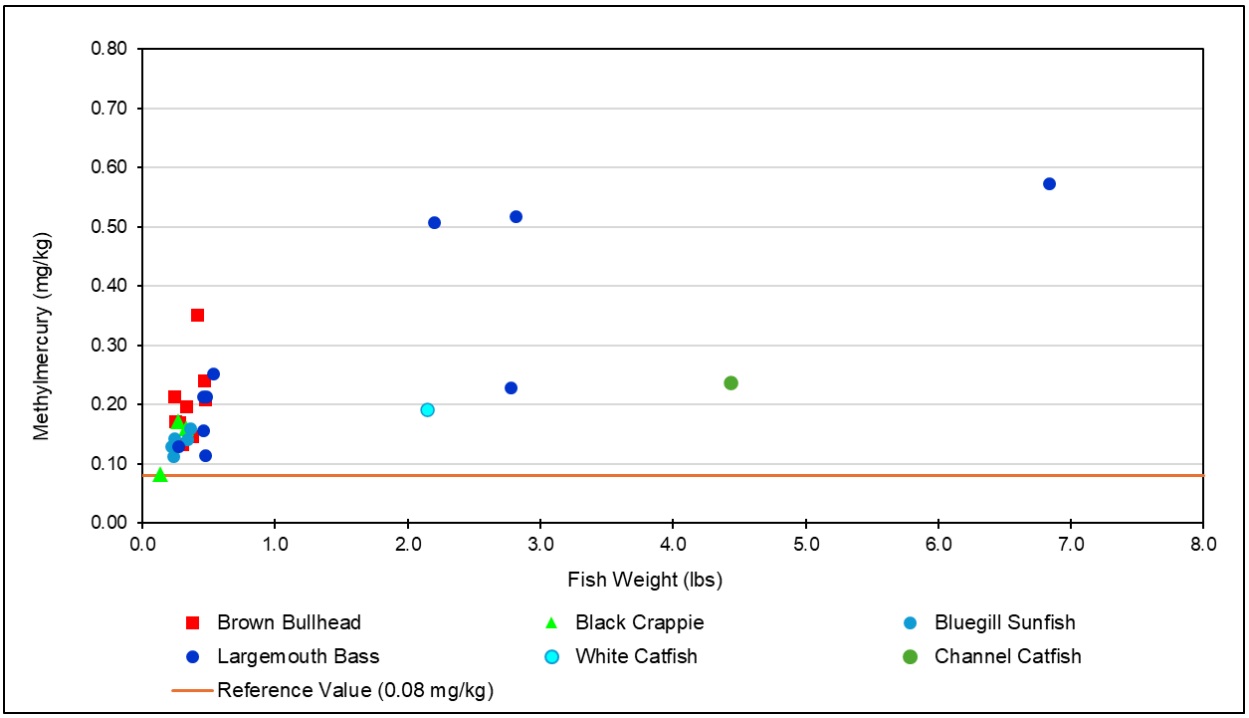
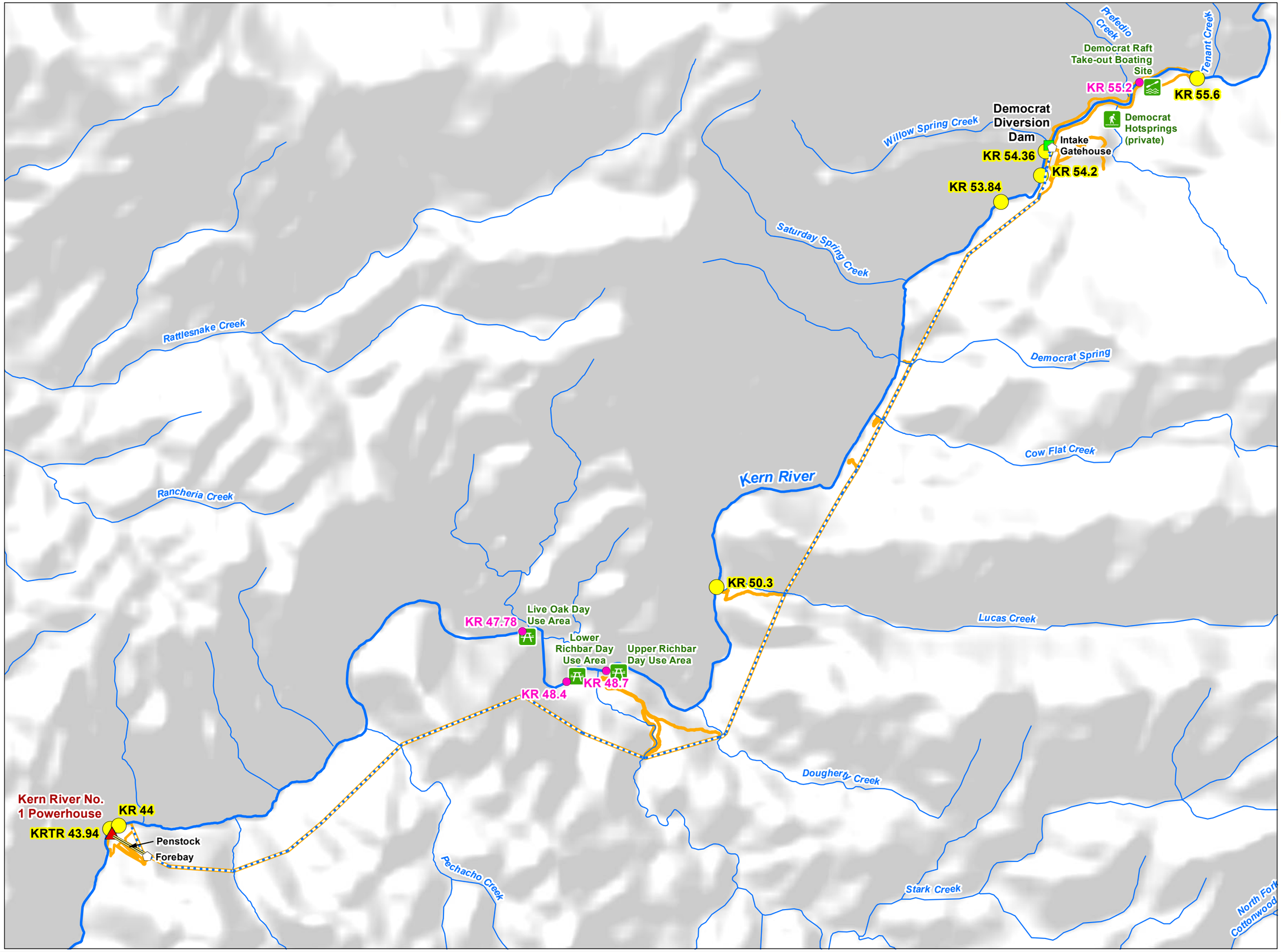


Figure 5-11. 2024 Fish Tissue Methylmercury Concentrations at Democrat Dam Impoundment

MAPS



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Flowline
- Penstock
- FERC Boundary

Other Features

- Watercourse

Water Quality Measurement Sites*

- In-situ Field Measurement and Recreational Site Fecal Coliform
- In-situ Field Measurement, Water Quality Grab Sample, and Continuous Temperature Monitoring

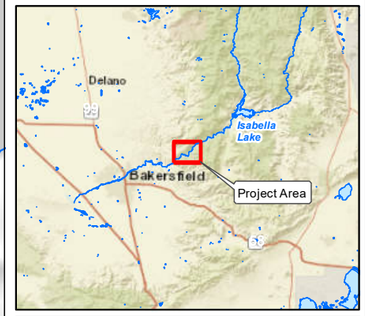
*NOTE: Water Quality Grab Sampling and In-situ Field Measurements occurred at both KR 55.2 and KR 55.6 in 2025.

Forest Service Recreation Sites

- Raft Takeout
- Day Use Area

Private Recreation Sites

- Democrat Hotsprings



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1

Study Area/Water Quality Measurement Sites

0 0.25 0.5 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 12/9/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company

APPENDIX A

Description of Water Quality Parameters

Copyright 2026 by Southern California Edison

APPENDIX A TABLE OF CONTENTS

Page

Water Quality Monitoring Parameter A-1
In-situ Measurements A-1
Temperature A-1
Dissolved Oxygen A-1
Conductivity A-2
pH A-2
Laboratory Analysis Parameter A-3
General Parameters A-3
Nitrate/Nitrite A-3
Ammonia A-3
Total Kjeldahl Nitrogen A-4
Total Phosphorus A-4
Ortho-phosphate A-5
Total Dissolved Solids A-5
Total Suspended Solids A-5
Total Alkalinity (as $CaCO_3$) A-6
Metals Dissolved A-6
Arsenic A-6
Cadmium A-7
Copper A-7
Iron A-8
Lead A-8
Manganese A-9
Nickel A-9
Chromium A-10
Metals—Total A-10
Mercury A-10
Bacteria A-11
Total Coliform A-11
Fecal Coliform A-12
References A-12

LIST OF ACRONYMS

µS/cm	microsiemens per centimeter
As	arsenic
ATSDR	Agency for Toxic Substances and Disease Registry
BASIN	Boulder Area Sustainability Information Network
$CaCO_3$	calcium carbonate
Cd	cadmium
Cu	copper
Cr	chromium
DO	dissolved oxygen
EPA	Environmental Protection Agency
Fe	iron
Hg	mercury
Hg^0	elemental mercury
Hg^{2+}	inorganic mercury
HSDB	Hazardous Substances Data Bank
MELP	Ministry of Environment, Lands and Parks, British Columbia
MeHg	methylmercury
mg/L	micrograms per liter
mL	milliliter
Mn	manganese
NH^3	ammonium (toxic)
NH_4^+	ammonium (non-toxic)
Ni	nickel
ng/L	nanograms per liter
NO_2	nitrite
NO_3	nitrate
NTU	Nephelometric Turbidity Units
P	phosphorus
Pb	lead
PO_4	Ortho-phosphate
TKN	Total kjeldahl nitrogen
TDS	Total dissolved solids
TSS	Total suspended solids
USGS	U.S. Geological Survey

WATER QUALITY MONITORING PARAMETER

IN-SITU MEASUREMENTS

Temperature

Ambient water temperature is a measurement of the intensity of heat stored in a volume of water and is generally reported in degrees Celsius (°C) or Fahrenheit (°F). Natural heat sources include solar radiation, air transfer, condensation of water vapor at the water surface, sediments, precipitation, surface runoff, and groundwater. Anthropogenic sources of heat include industrial effluents, agriculture, forest harvesting, decreases in streamside vegetation coverage, urban development, and mining.

Water temperature has important effects on aquatic biota. Increased water temperature reduces oxygen solubility while elevating metabolic oxygen demand. This causes lower oxygen concentrations that may be detrimental to some aquatic organisms. Reproductive and other biological activities, such as migration, spawning, egg incubation, and fry rearing, are often triggered by water temperature. A rise in water temperature can also provide conditions for the growth of disease-causing organisms. Temperature also influences the solubility of many chemical compounds, thus affecting their toxicity to aquatic life (Environmental Protection Agency [EPA] 1986, Ministry of Environment, Lands and Parks, British Columbia [MELP] 1998).

Dissolved Oxygen

Dissolved oxygen (DO) is a measure of the amount of oxygen dissolved in water. Values for DO in water analyses are commonly provided in mg/L, although a percentage of saturation may also be used. The concentration of DO in surface water is usually less than 10 mg/L (Ministry of Environment, Lands and Parks, British Columbia [MELP] 1998). The actual concentration will vary with other parameters such as temperature, elevation, photosynthetic activity, biotic activity, stream discharge, and the concentration of other solutes (Hem 1989, Michaud 1994). The maximum solubility of oxygen (fully saturated) at sea level is 12.75 mg/L at 5ºC and 8 mg/L at 25ºC. DO concentrations decrease within increasing temperatures or elevation (MELP 1998).

Dissolved oxygen is derived from the atmosphere and photosynthetic production by aquatic plants. Atmospheric oxygen is changed to dissolved oxygen when it enters the water, with more mixing occurring in turbulent waters. Dissolved oxygen is essential for the respiration of fish and other aquatic organisms (Michaud 1994). As water moves past their breathing apparatus (such as gills in fish), oxygen gas bubbles in the water (DO) are transferred from the water to their blood. The transfusion is efficient only above certain concentrations. Oxygen is also used for the decomposition of organic matter and other biological and chemical processes. Anoxic waters have obvious detrimental effects on aerobic organisms. These conditions can also lead to the accumulation of chemically reduced compounds, such as ammonium and hydrogen sulfide, in the bottom sediments that can be toxic to benthic organisms (Michaud 1994).

Nutrient solubility and availability rely partly on DO levels, and thus DO also affects the productivity of aquatic ecosystems. In streams, DO concentrations tend to be higher in faster moving waters. During the summer, in particular, when discharges and velocities decrease in streams, DO concentrations can be quite low. Pollution can cause decreases in average DO concentrations by contributing organic matter that uses oxygen or nutrients and stimulates the growth of algae.

Conductivity

Conductivity is a measurement of the ability of water to conduct an electric current and provides an estimate of the concentration of dissolved solids. This property is related to water temperature and total ion content (e.g. chloride, sulfate, sodium, and calcium), and depends on the concentration of dissolved metals and other dissolved materials. Water carries more current with increased ion content in the water. Conductivity is lower in cooler waters. Conductivity is measured in terms of resistance and reported in microsiemens per centimeter (µS/cm) at 25^{o}C. Water source and geologic composition of the watershed are important controlling factors of conductivity. Streams that flow through granite bedrock, for example, have lower conductivity than those that flow through limestone or clay soils. The conductivity of pure waters is 0.055 µS/cm. The conductivity of freshwater at 25^{o}C varies between 50 and 1,500 µS/cm (Hem 1989, MELP 1998). Conductivity measurements in streams flowing through granitic, siliceous, or other igneous rocks usually range between 10 and 50 µS/cm. In comparison, it generally ranges between 150 and 500 µS/cm in streams that are flowing through limestones. Conductivity itself is not an aquatic health concern, but it serves as an indicator of other water quality concerns.

pH

A pH value is a measure of the activity of hydrogen ions in a water sample. Various types of chemical reactions that occur in natural waters produce hydrogen ions, which are then consumed by participating in subsequent chemical reactions in the system. These interrelated chemical reactions that produce and consume hydrogen ions control the pH value of a water body. The pH value shows the status of equilibrium reactions in which the water participates. A pH of 7 is considered neutral, a value less than 7 is acidic, and a value greater than 7 is basic. The units of pH are logarithmic, so a difference of one unit represents a 10-fold change in hydrogen ion concentration. The higher the pH, the fewer free hydrogen ions are present in the water. The pH of natural fresh waters ranges from 4.0 to 10.0, with most waters falling between 6.5 and 8.5 (EPA 1986, Hem 1989, MELP 1998).

The pH of water determines the solubility (the amount that can be dissolved in water) and biological availability (the amount that can be used by aquatic biota) of chemical constituents, such as nutrients (e.g. carbon, nitrogen and phosphorus) and heavy metals (e.g. lead, copper). Unusually high or low pH can have adverse effects on aquatic biota. Values above 9.5 and below 4.5 are considered lethal to aquatic organisms (EPA 1996, MELP 1998). For heavy metals, the degree to which they are soluble determines their toxicity. They tend to be more toxic when pH is lower because they are more soluble and bioavailable.

The pH of water is naturally variable, although the amount of change in natural waters tends to be very small due to many chemical reactions. This ability of the water to maintain a stable pH is called buffering capacity. The initial pH of water is influenced by the geology of the watershed and the original source of the water. In particular, alkalinity, which is typically low in granitic drainages, is usually the primary factor that influences pH values. This causes the waters to be more acidic (pH <7.0) in these types of watersheds (Wetzel 2001). The greatest natural cause for variation is the daily and seasonal changes in photosynthesis. Photosynthesis uses up hydrogen molecules and therefore increases the pH. The pH increases during the day (with maximum values up to 9.0) and decreases at night. Respiration and decomposition processes lower pH. The pH also tends to be higher during the growing season when photosynthesis is greater. As a result, most streams that drain coniferous forests tend to be slight acidic (6.5 to 6.8) (Hem 1989, Michaud 1994, Wetzel 2001).

LABORATORY ANALYSIS PARAMETER

GENERAL PARAMETERS

Nitrate/Nitrite

Nitrate (NO_3^-) and nitrite (NO_2^-) ions are produced during nitrification of reduced and organic forms of nitrogen. Nitrate and nitrite are typically reported in mg/L or μg/L. Nitrite is usually present in only minute quantities in water (<0.001 mg/L) because it in an intermediate, unstable form of nitrogen within the nitrogen cycle (MELP 1998). It is formed from nitrate or ammonium ions by certain microorganisms found in soil and water (EPA 1986). Nitrate is formed by the complete oxidation of ammonium by microorganism in the soil and water. It is the most oxidized and stable form of nitrogen in water, and therefore is the principal form of combined nitrogen. Most surface waters contain less than 0.01 mg/L of nitrite and less than 0.2 mg/L nitrate (MELP 1998, Wetzel 2001).

Nitrate is the primary form of nitrogen used during plant growth. Excessive amounts of nitrate may cause phytoplankton or macrophyte outbreaks. Nitrite is toxic to aquatic life at relatively low concentrations (MELP 1998). Although it is an essential plant nutrient, excessive nitrogen can cause proliferation of algae and macrophytes, resulting in eutrophic water conditions. Eutrophication causes decreased oxygen levels which may cause stress or mortality of fish and invertebrates (EPA 1986). Sources of elevated nitrate and nitrite come from municipal and industrial wastewaters, agricultural runoff, urban development, and automobile exhausts.

Ammonia

Ammonia is found in two forms, ammonium (NH_4^+) that is not toxic and NH_3, which is toxic (EPA 1986). Ammonium is readily adsorbed onto mineral surfaces (Hem 1989). It is reported as mg/L or μg/L, with typical surface water values less than 0.1 mg/L (MELP 1998, Wetzel 2001). Ammonia as NH_3 is reported to be toxic to various aquatic organisms over a range of concentrations (0.53 to 22.8 mg/L) (Oram 2007).

Complex nitrogen cycling and processes occur within aquatic systems. Nitrogen is an essential plant nutrient which contributes to the productivity of a water body. However, excessive ammonia over-stimulates the growth of algae and other plants, leading to eutrophication of a water body. The resulting decrease of oxygen levels may cause stress and mortality of fish and invertebrates (EPA 1986). High ammonia concentrations are also toxic to aquatic life. The specific concentration at which ammonia is harmful to organisms depends upon the temperature and pH of the water. At higher temperatures and pH, a greater proportion of the total ammonia is present as NH_3, increasing the toxicity of the water (EPA 1986). The distribution of ammonia in surface waters varies spatially and seasonally depending upon productivity and the amount of organic matter. Anthropogenic sources of ammonia include fertilizers, livestock wastes, residential effluents (e.g. cleaning products), mining, sewage treatments plans, and effluent from various types of industries (Oram 2007).

Total Kjeldahl Nitrogen

Total kjeldahl nitrogen (TKN) is a measure of both the ammonia and organic forms of nitrogen. Organic nitrogen includes organic compounds, such as proteins, polypeptides, amino acids, and urea. TKN is reported in mg/L or μg/L (MELP 1998). In Sierra Nevadan rivers and streams, TKN values typically range between 0.025 and 0.65 mg/L (EPA 2000).

High ammonia concentrations can be deleterious to aquatic life, as it contributes to the eutrophication of water bodies. Organic nitrogen is not biologically available. As a result, it does not influence plant growth or water quality condition until it is transformed to the inorganic forms of nitrogen (MELP 1998). Natural sources of TKN include decaying organic material such as plants and animals wastes. Some species of streamside vegetation, such as alders, are nitrogen fixers. Elevated nitrogen concentrations have been measured in waters with decaying alder leaves (Wetzel 2001). Anthropogenic sources of TKN include effluents from sewage treatment plants and industry, agriculture (fertilizers), urban developments, paper plants, recreation, and mining.

Total Phosphorus

Phosphorus (P) is a nutrient that is essential for growth, and is a measure of both organic and inorganic forms of phosphorus. It can be measured as total phosphorus or ortho-phosphate. Total phosphorus is the total amount of phosphorus in the sample. Ortho-phosphate is the portion that is available to organisms for growth. Total phosphorus measurements include phosphorus that is in biological tissue, as well as the insoluble mineral particles (Michaud 1994, MELP 1998). Phosphorus is fairly abundant in sediments, but concentrations are usually less than a few tenths of a milligram per liter in surface waters (Hem 1989). Total phosphorus concentrations in the rivers and streams in the Sierra Nevada typically range between 2.5 and 485 μg/L (EPA 2000). It is usually reported in μg/L or mg/L.

Phosphorus is essential for plant growth and is often the most limiting nutrient for plant growth in surface waters. As a result, inputs of phosphorus into surface waters can cause algal blooms. Anthropogenic sources of phosphorus include effluents from sewage

treatment plants and industry, agriculture, and urban developments (EPA 1986, Hem 1989, MELP 1998).

Ortho-phosphate

Ortho-phosphate (PO_4) is a measure of the inorganic oxidized form of soluble phosphorus. It is generally reported in mg/L or μg/L. Background concentrations of orthophosphate in surface waters generally average 0.01 mg/L (Hem 1989).

Along with nitrogen, phosphorus is a necessary nutrient for plant growth. Ortho-phosphate is the most readily available form of phosphorus for uptake during photosynthesis. Animals obtain phosphorus through the consumption of plant materials. Excess ortho-phosphate causes prolific algal growth, causing the same detrimental water conditions as described for nitrogen and total phosphorus (MELP 1998). Since phosphorus is typically the most limiting nutrient for plant growth in fresh water, additions of this element are often the primary causes of eutrophication of water bodies. Phosphate ions readily and strongly adsorb onto soils, suspended solids, and streambed sediments. As a result, soil erosion can be a source of ortho-phosphate. Other sources include agricultural, urban, and industrial wastewater effluents.

Total Dissolved Solids

Total dissolved solids (TDS) is a measure of the concentration of inorganic salts (e.g. sodium, chloride, potassium, calcium, magnesium, and sulfate), small amounts of organic material, and dissolved materials in the water column and is reported in mg/L. The value of TDS in fresh water naturally ranges from 0 to 1,000 mg/L (EPA 1986, MELP 1998). Concentrations tend to be comparatively low in streams in granitic and sandstone-dominated watersheds than watersheds with abundant limestone.

The effect of elevated TDS levels on aquatic biota depends on the ionic composition of the dissolved material and the extent of the increase in concentration. Under natural conditions, all aquatic life must be able to survive a range of TDS concentrations (EPA 1986). Sources of TDS include sewage, stormwater and agricultural runoff, salts from roads, and industrial and water treatment plant wastewater discharges. TDS can also be derived from natural sources, including carbonate and salt deposits and mineral springs.

Total Suspended Solids

Total suspended solids (TSS) is a measurement of particulate matter suspended in the water column and is typically reported in mg/L (MELP 1998). Nephelometric Turbidity Units (NTUs) correspond approximately to TSS concentrations. TSS fluctuate with stream flow and may increase significantly during snowmelt and runoff from rain events. Streams in forested watersheds tend to have low TSS concentrations, usually less than 50 mg/L, although concentrations can be naturally much higher in some streams and rivers (Windell 1992). Waters with TSS concentrations less than 20 mg/L are usually considered to be clear. Concentrations between 40 and 80 mg/L are considered to be cloudy. Waters with concentrations greater than 150 mg/L appear dirty.

High TSS concentrations can increase turbidity, resulting in reduced light penetration, reduced primary productivity, damage to fish gills, and impaired fish feeding ability. Once the suspended solids settle on the stream or lake bottom, invertebrate and other benthic organisms and fish spawning can be adversely affected (EPA 1986).

The freshwater aquatic life criterion for TSS set forth in the EPA's *Quality Criteria for Water* (1976) states that "settable and suspended solids should not reduce the depth of the composition point for photosynthetic activity by more than 10 percent from the seasonally established norm for aquatic life." In other words, light penetration should not be decreased more than 10 percent.

Total Alkalinity (as $CaCO_3$)

Alkalinity is a measurement of the ability of water to neutralize acids (buffering capacity). Alkalinity is the concentration of bases in dissolved in water. These bases are usually carbonate and bicarbonate, but can also be hydroxides. These buffers are important because they slow the rate at which the pH changes. The pH can change naturally as a result of photosynthetic activity of the aquatic vegetation. When the pH is very high (greater than 9) hydroxide ions may also be present. In addition, carbonate and bicarbonate reduce the toxicity of some toxic heavy metals (EPA 1986, Hem 1989, Wetzel 2001). Alkalinity is typically expressed as an equivalent amount of calcium carbonate ($CaCO_3$) in mg/L and generally ranges from 0 to 500 mg/L in fresh waters (MELP 1998). Alkalinity levels up to 400 mg/L are not considered to be detrimental to human health (EPA 1986). Alkalinity values less than 10 mg/L are considered very low and the pH of these waters is very susceptible to acid inputs. Alkalinity values are often very low in granitic drainages (Wetzel 2001). Values between 10 and 20 mg/L are considered moderately susceptible to acid inputs.

In general, very low or high alkalinity itself does not cause detrimental effects to aquatic organisms. However, the concentration of the dissolved materials (alkalinity) and their ratio to one another determines the actual pH and buffering capacity in a given water system (EPA 1986, Wetzel 2001). Waters with very low alkalinity values have little capacity to buffer acid inputs and are thus susceptible to acidification (MELP 1998). As previously discussed, extreme pH values can adversely affect aquatic biota, particularly in low pH (acidic) waters. Acidified drainage basins are known to possess increased sulfate and dissolved aluminum concentrations, as well as significant changes in the ion species and ratios (Wetzel 2001). In some inland waters of extremely high salinity, hydroxide, borate, silicate, phosphate, and sulfide may be the major sources of alkalinity (Wetzel 2001). Relatively few aquatic organisms are adapted to these unusual conditions.

METALS DISSOLVED

Arsenic

Arsenic (As) is a widely distributed element in the Earth's crust (Agency for Toxic Substances and Disease Registry [ATSDR] 2007). It is highly volatile and is an important component in many biochemical processes (Hem 1989). In its elemental form, it appears as a metal-like substance but it is usually found in compounds with other elements and appears

as white or colorless powder. Inorganic arsenic results from compounds with elements such as oxygen, chlorine, or sulfur. Organic arsenic results from compounds with hydrogen and carbon. Organic arsenic is generally less harmful than inorganic arsenic (ATSDR 2007). Arsenic is measured in µg/L or mg/L. Natural surface water normally contains an arsenic concentration of about 1 µg/L.

Arsenic can be highly toxic to most organisms in excess concentrations. Concentrations above 5 µg/L have been shown to reduce growth and reproduction in aquatic invertebrates and algae (MELP 1998). Concentrations of 550 µg/L have produced mortality in fish (MELP 1998). In addition, organic arsenic can bioaccumulate in fish and shellfish (ATSDR 2007). Concentrations above 25 µg/L can have negative effects on livestock and, therefore, are potentially toxic to wildlife (MELP 1998). Arsenic is used as a preservative for wood, and is used in pesticides, metal alloys (especially in automobile batteries), and semiconductors and light diodes. Anthropogenic sources of arsenic include coal-fired power plants, industrial water discharge, and agricultural runoff (Hem 1989). It occurs naturally in soil and can enter water from wind-blown dust, runoff, and leaching. Volcanoes are another natural source of arsenic (ATSDR 2007).

Cadmium

Cadmium (Cd) is an element that occurs naturally in the environment. It is usually found combined with other elements, such as zinc and lead rather than occurring as a pure metal (MELP 1998, ATSDR 1999). It can be measured in either the dissolved (as in this study) or in the total state in water. It dissolves in water at varying degrees depending on which other elements it is combined. Cadmium most easily dissolves in water when it is in a compound with chlorides and sulfates. These compounds are usually present only in small amounts in the environment (ATSDR 1999). It is reported in mg/L or µg/L. It usually found in very small concentrations (less than 0.1 µg/L) (Wetzel 2001).

Cadmium has highly toxic effects on aquatic plants and animals in all chemical forms. It is extremely toxic to fish and zooplankton, and has been found to accumulate in plant cells and some aquatic organisms. It also diminishes plant growth. Its toxicity increases with the presence of other metals, including zinc and copper (MELP 1998, Oram 2007). The majority of cadmium is released into the environment from natural sources, primarily from the weather of rocks that naturally contain various amounts of cadmium. In addition, it can be releases into the environment by forest fires and volcanoes. Anthropogenic sources of cadmium include industrial effluents, fossil fuels burning, and mining (ATSDR 1999).

Copper

Copper (Cu) is a metallic element, which can occur as a free native metal or combined with ionic metals (Hem 1989). It is measured in either the total or dissolved state in water samples, and reported in µg/L or mg/L. Copper is typically found in trace concentrations from 1 to 10 µg/L (MELP 1998) and levels near 10 µg/L are common in river water (Hem 1989). The fresh water aquatic life criterion for copper depends on the hardness of the water body being tested. Copper toxicity decreases with increasing hardness and increases with increasing pH (EPA 1986, Wetzel 2001).

Copper is an essential element in plant and animal metabolism, but quantities above normal trace concentrations are highly toxic to most aquatic life forms (MELP 1998). Many of the deleterious effects of copper, such as inhibition of phosphorus uptake in green algae, are highly variable depending on other environmental conditions such as pH, alkalinity, total organic carbon, and water hardness (EPA 1986, Wetzel 2001). Copper may be released during industrial, agricultural, and mining activities. Other common sources include copper plumbing and equipment (Hem 1989, MELP 1998).

Iron

Iron (Fe) is the second most abundant metallic element in the Earth's outer crust, but concentrations in water tend to be small (Hem 1989). Iron can be measured in either the total or dissolved state and reported as µg/L or mg/L. Average iron concentrations of 40 µg/L are found in the world's lake and rivers. The typical amount found in neutral and alkaline surface waters ranges from 0.05 to 0.20 mg/L (Wetzel 2001), with an average of 0.16 mg/L in surface waters in North America (Schlesinger 1997). High concentrations of iron are generally only found in acidic waters (pH less than 3 to 4), such as in runoff of streams from strip mines (Wetzel 2001). Concentrations of iron above 0.3 mg/L cause undesirable taste, and when precipitated out of solution due to oxidation, cause a reddish brown color to the water.

Iron is an essential element in plant and animal respiration and its availability in lakes and streams can limit photosynthetic productivity (Wetzel 2001). The chemical behavior of iron is highly dependent on oxidation intensity and is a function of pH and temperatures (Hem 1989, Wetzel 2001). Iron is released in sediment when igneous rock minerals are broken down by water. Iron is also present in organic matter in soils and can be processed into surface water through oxidation and reduction activities that often involve microorganism (Hem 1989). Industrial effluent, acid mine drainage, and smelters are also sources of iron (MELP 1998).

Lead

Lead (Pb) is a metallic element, which is widely dispersed in sedimentary rocks, but has low natural mobility due to low solubility (Hem 1989). The criterion for lead is expressed in terms of dissolved metal in the water column (MELP 1998). Lead concentration is reported in µg/L. The relative abundances of different species of lead are pH dependent and solubility increases with increasing alkalinity (EPA 1986). The freshwater aquatic life criterion for lead depends on the hardness of the water body being tested. The toxic effects of lead decreases as DO and hardness concentrations increase (MELP 1998).

Lead is toxic to all animals (MELP 1998) and is particularly toxic to aquatic organism at relatively low concentrations (Wetzel 2001). Fossil fuel combustion, especially of leaded gasoline, contributed greatly to the deposition of lead in waterways in the twentieth century. Other sources of lead include industrial effluent, smelting and refining, batteries, and lead pipe used to transport drinking water (Wetzel 2001).

Manganese

Manganese (Mn) is one of the more abundant metallic elements, although there is only one-fiftieth the amount of manganese in the Earth's crust as there is iron (Hem 1989). It does not naturally occur as a metal, but is found in association with various salts and minerals, often with iron compounds (EPA 1986). Its chemical reactivity is very similar to that of iron and they behave much the same way in freshwater systems (Wetzel 2001). It is a minor constituent of many igneous and metamorphic minerals (Hem 1989). It can substitute for iron, magnesium, or calcium in silicate structures, but it is not an essential element of silicate rock minerals (Hem 1989). Small amounts of manganese are often present in dolomite or limestone as a substitute for calcium. The average concentration of manganese in surface waters is about 35 µg/L (Wetzel 2001). It is rarely found in surface waters at concentrations greater than 1 mg/L (EPA 1986).

Manganese is an essential nutrient for microflora, plants, and animals as an enzyme catalyst and as an important component of photosynthesis and nitrogen fixation (EPA 1986, Hem 1989). High concentrations of manganese can have an inhibitory effect on cyanobacteria and green algae and tend to favor diatom growth (Wetzel 2001). Divalent manganese is released into aqueous solution during weathering of rock and through organic processes (Hem 1989).

Nickel

Nickel (Ni) is one of the five ferromagnetic elements. It only occurs as a very small fraction (0.018 percent) in the Earth's crust (Hazardous Substances Data Bank [HSDB] 2007). It can be combined with various other metals, including iron, copper, chromium, and zinc, and may substitute for iron in igneous rocks. Nickel also may be precipitated with iron oxides and manganese oxides (Hem 1989, ATSDR 2005). In addition, nickel can also be combined with other elements, most commonly sulfur, and oxygen. Many of the compounds containing nickel easily dissolve in water (ATSDR 2005). Concentrations in natural surface waters are usually low (10 µg/L, Hem 1989).

Nickel is an essential element in some enzymes found in bacteria and plants. It is an important component in nitrogen fixation and some enzymes (Wetzel 2001). However, when it occurs in large quantities and is combined with some elements, for example nitrate, sulfur, and chloride, nickel can be very toxic to aquatic biota. It may accumulate in some plants (ATSDR 2005). The toxicity of nickel to aquatic biota is dependent on hardness. Toxicity is greater when the water is softer compared to harder water conditions. It can also be released from volcanoes. Nickel is naturally found in all soils, and strongly attaches to particles that contain iron or magnesium. When this occurs, it is not readily available for uptake by plants and animals. Nickel is found in surface waters as a result of weathering of rocks containing nickel. Anthropogenic sources of nickel include industrial effluent, oil-burning and coal-burning power plants, mining, and trash incinerators (ATSDR 2005).

Chromium

Chromium (Cr) is naturally present in the environment and has a number of oxidation states. The most common forms are chromium (0), trivalent (chromium (III)), and hexavalent (chromium (VI)). Hexavalent chromium (chromium VI) compounds are the most toxic state. It is usually measured as total chromium. Naturally, chromium concentrations in surface water are usually less than 10 µg/L (Hem 1989).

Chromium (VI) compounds adversely affect all aquatic biota, including algae. It does not appear to bioaccumulate in plants and animals. It is also a known human carcinogen (EPA 1986). The toxicity of chromium (VI) increases as hardness and pH increase. Chromium (III) is more toxic in soft waters. Chromium naturally occurs in rocks and soil, but in very small amounts. It is also released during volcanic eruptions. Anthropogenic sources of chromium (0), (III) and (VI) include emissions from coal and oil burning and industrial effluents (ATSDR 2000).

METALS—TOTAL

Mercury

Mercury (Hg) is a trace element in the Earth's crust that normally occurs in quantities of only 1 to 2 ng/L in natural waters (MELP 1998). It may be present in the environment as elemental mercury (Hg^0), inorganic mercury (Hg^{2+}), or organic mercury (primarily methylmercury, MeHg). Elemental mercury was commonly used in thermometers. Methyl mercury is the most toxic of these mercury compounds (EPA 1986). It is a serious neuron-toxin and has been found in high concentrations in lakes far removed from sources of mercury (EPA 1986). Methyl mercury bioaccumulates, which is the process by which organisms that are exposed to chemicals either from their diet, water, or other sources accumulate and retain the chemicals. Inorganic mercury does not accumulate in aquatic organisms. Various chemical and biological processes can readily convert various forms of mercury. Anaerobic bacteria in sediments readily convert inorganic mercury into methylmercury. Except for gold mining areas where elemental mercury is used, mercury is typically present in surface waters, sediment, or soils as inorganic mercury.

Mercury is highly toxic and has a long retention time in animal cells. Rates of methylmercury production and bioaccumulation depend not only on the abundance of inorganic mercury but also on a complex assortment of environmental variables which affect the activities and species composition of the bacteria and the availability of the inorganic mercury for methylation (U.S. Geological Survey [USGS] 2003, HSDB 2007). These variables include, but are not limited to, pH of the water, the length of the food chain, dissolved organic matter, soil type, and the proportion of wetlands in the watershed. Once converted to methylmercury by bacteria, it can bioaccumulate in aquatic organisms and be passed up the food chain (Hem 1989). Temperature, pH, alkalinity, suspended sediment load, and the geomorphology of the watershed are known to affect the accumulation of mercury in fish (Klasing et al. 2006). In addition to bioaccumulating, methylmercury also biomagnifies (higher concentrations at higher levels in the food chain) (USGS 2003). Because bacteria mediate the rate of methylmercury formation, fish living in even mildly contaminated waters are not safe to eat.

Detectible levels of mercury are found in almost all fish, with more than 95 percent of it occurring as methylmercury (Klasing et al. 2006). People primarily become exposed to methylmercury by consuming fish (Klasing et al. 2006). Fish at the highest trophic levels (higher up the food chain) tend to have higher levels of methylmercury than those lower in the food chain. Larger and older fish of a given species also tend to have higher methylmercury levels than smaller and younger fish of the same species. It is particularly toxic to the fetus and young children and can cause serious neurological abnormalities to a fetus even without symptoms in the mother. Recent studies indicate that the fetus is more sensitive to methylmercury than adults. As a result, the Office of Environmental Health Hazard Assessment has established separate 'reference doses', which is "the daily exposure likely to be without significant risk of deleterious health effects during a lifetime". The reference dose for women of childbearing age and children aged 17 and younger is $1x10^{-4}$ mg/kg-day. For men and women beyond childbearing age, the reference dose is $3x10^{-4}$ mg/kg-day (Klasing et al. 2006).

Mercury contamination can occur from both natural processes and human activities. Mercury is highly volatile and thus, atmospheric deposition is a major pathway into aquatic systems (Hem 1989, MELP 1998). Impounded water and flooding also cause the release of sedimentary mercury (MELP 1998). Sources of mercury contamination include coal combustion, waste incineration, mining and smelting, and production of fertilizers (MELP 1998, USGS 2003). Mercury is typically measured as the total mercury in water, soil, or tissue samples. Water samples containing just 5 to 10 ng/L are considered polluted (MELP 1998).

BACTERIA

Total Coliform

Coliform bacteria are a group of several genera of relatively harmless microorganisms that live in soil, water, and the intestines of cold- and warm-blooded animals including humans (Murphy 2007). Total coliform concentrations are reported as the most probable number of bacteria colonies present per 100 milliliter (mL) of sample water (Michaud 1994).

Total coliform bacteria occur naturally in surface and shallow ground waters and are essential in the breakdown or organic matter in water. Oxygen is not a requirement for these bacteria, but they can use it. They produce acid and gas from the fermentation of lactose. Coliform bacteria are not pathogenic and are only mildly infectious. The total coliform group is relatively easy to culture in the lab, and therefore, has been selected as the primary indicatory bacteria for the presence of disease-causing organisms. If large numbers of coliform bacteria are found in water, there is a high probability that pathogenic bacteria or organisms, such as Giardia may be present. Coliform bacteria, rather than actual pathogens, are used to assess water quality because they are easier to isolate and identify (Murphy 2007).

Fecal Coliform

Fecal coliform is a subgroup of the coliform bacteria that live in the intestinal tract and feces of warm-blooded animals (Murphy 2007). The most common member of this group is *Escherichia coli* (*E. coli*). Fecal coliform concentrations are reported as the number of bacteria colonies present per 100 mL of sample water (#/100 mL, Michaud 1991). Fecal coliform bacteria can multiply quickly under optimum growing conditions and die off rapidly when conditions change. For this reason, fecal coliform counts are difficult to predict (Michaud 1994).

Fecal coliform species by themselves are not usually harmful, but are an indicator of the possible presence of pathogenic organisms, such as bacteria, viruses, and parasites, that live in the same environment (Windell 1992; Murphy 2007). Thus, it is used as a parameter for testing the quality of waters used for recreation. The presence of fecal coliform indicates contamination from the feces of humans or other animals. Swimming in waters with high levels of fecal coliform bacteria (over 200 colonies/100 mL) presents a health risk of contracting diseases such as typhoid fever, hepatitis, gastroenteritis, ear infection, and dysentery (Windell 1992; Murphy 2007). Some strains of *E. coli*, such as *E. coli* O157:H7, which is found in the digestive tract of cattle, can cause intestinal illness. The major sources of fecal coliform to freshwater are wastewater treatment plant effluent, failing septic systems, and human and animal wastes. Human and animal wastes can be washed into storm drains, streams, and lakes during storms (Michaud 1994; Murphy 2007).

REFERENCES

ATSDR (Agency for Toxic Substances and Disease Registry). 1999. Toxicological Profile for Cadmium. Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service. Available: http://www/atsdr.cdc.gov/toxprofiles/phs5.html.

ATSDR (Agency for Toxic Substances and Disease Registry). 2000. Toxicological Profile for Chromium (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service. Available: http://www.atsdr.cdc.gov/.

ATSDR (Agency for Toxic Substances and Disease Registry). 2005. Toxicological Profile for Nickel (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service. Available: http://www.atsdr.cdc.gov/.

ATSDR (Agency for Toxic Substances and Disease Registry). 2007. Toxicological Profile for Arsenic (Update). Atlanta, GA: U.S. Department of Public Health and Human Services, Public Health Service. Available: http://www.atsdr.cdc.gov/.

EPA (Environmental Protection Agency). 1976. Quality Criteria for Water, 1976. EPA 440-9-76-023. U.S. Environmental Protection Agency, Washington D.C. 20460.

EPA (Environmental Protection Agency). 1986. Quality Criteria for Water, 1986. EPA 440/5-86-001. Office of Water Regulations and Standards, Environmental Protection Agency, Washington D.C.

EPA (Environmental Protection Agency). 1996. The Metals Translator: Guidance for calculating a total recoverable permit limit for a dissolved criterion. June 1996. EPA 823-B-96-007.

EPA (Environmental Protection Agency). 2000. Ambient Water Quality Criteria Recommendations Information Supporting the Development of State and Tribal Nutrient Criteria for Rivers and Streams in Nutrient Ecoregion II. EPA-822-B-00-015. Office of Water, Office of Science and Technology, Health and Ecological Criteria Division, Washington DC.

Hem, J.D. 1989. Study and Interpretation of the Chemical Characteristics of Natural Water. Third Edition. U. S. Geological Survey Water-Supply Paper 2254.

HSDB (Hazardous Substances Data Bank). 2007. Methylmercury. Available at: http://toxnet.nlm.nih.gov/cgi-bin/sis/search/f./temp/~ZtXdUB:3.

Klasing, S., M. Gassel, S. Roberts, R. Brodberg. 2006. Health Advisory Safe Eating Guidelines for Fish from the Lower Feather River (Butte, Yuba, and Sutter Counties). Pesticide and Environmental Toxicology Branch, Office of Environmental Health Hazard Assessment, California Environmental Protection Agency.

MELP (Ministry of Environment, Lands and Parks, British Columbia). 1998. Guidelines for Interpreting Water Quality Data. Resources Inventory Committee Publications. Available at: ilmbwww.gov.bc.ca/risc/pubs/aquatic/interp/index.htm.

Michaud, J. 1994. A Citizen's Guide to Understanding and Monitoring Lakes and Streams. January 1994. Washington State, Department of Ecology. 73 pp.

Murphy, S. 2007. General Information on Fecal Coliform. Boulder Area Sustainability Information Network (BASIN). Available at: bcn.boulder.co.us/basin/data/FECAL/info/FColi.html.

Oram, B. 2007. Watershed Assessment, Education, Training, Monitoring Resources In Northeastern Pennsylvania. Wilkes University Center for Environmental Quality Environmental Engineering and Earth Sciences. Available at: http://www.water-research.net/Watershed.

Schlesinger, W.H. 1997. Biogeochemistry An Analysis of Global Change. San Diego, California: Academic Press, Inc. Chapter 8: pp. 261-290.

USGS (U.S. Geological Survey). 2003. Geologic Studies of Mercury by the U.S. Geological Society. Edited by John E. Gray. U.S. Geological Survey Circular 1248. Reston Virginia.

Wetzel, R.G. 2001. Limnology Lake and River Ecosystems. Third Edition. New York: Academic Press. Pp 169-186; 205-237; 289-330.

Windell, J.T. 1992. Stream Riparian and Wetland Ecology. TRUIS Corp for the Colorado Division of Wildlife. Pp. 95-114

APPENDIX B

Quality Assurance/Quality Control Review of Spring and Fall 2024 and 2025 Sample Laboratory Analyses

Copyright 2026 by Southern California Edison

Table B-1. Quality Assurance/Quality Control Review of Spring and Fall 2024 Sample Laboratory Analyses

	Spring Sampling		Fall Sampling			
Report ID	ZALCO: 2406558_rpt	ZALCO: 240585_rpt	ZALCO: 2410259_rpt	ZALCO: 2410283_rpt	BSK: AHJ3600	BSK: AHJ3577
Sample Locations	KRTR 43.94 KR44.0	KR 54.36 KR 55.2 KR 53.84 KR 50.3 KR 54.2	KRTR 43.94 KR 54.2 KR 53.46 KR 44.0 KR 53.84	KR 50.3 KR 55.2 (surface) KR 55.2 (mid-column)	KRTR 43.94 KR 54.2 KR 53.46 KR 44.0 KR 53.84	KR 50.3 KR 55.6 (surface) KR 55.6 (mid-column)
ZALCO Sample ID Numbers	2406558-01 2406558-02	2406585-01 2406585-02 2406585-03 2406585-04 2406585-05	2410259-01 2410259-02 2410259-03 2410259-04 2410259-05	2410283-01 2410283-02 2410283-03	2410259-01 2410259-02 2410259-03 2410259-04 2410259-05	2410283-01 2410283-02 2410283-03
Date Sampled	6/26/2024	6/27/2024	10/9/2024	10/10/2024	10/9/2024	10/10/2024
Analysis	General Parameters Dissolved Metals Total Mercury	General Parameters Dissolved Metals Total Mercury	General Parameters Dissolved Metals Total Mercury	General Parameters Dissolved Metals Total Mercury	General Parameters: Ammonia as N TKN	General Parameters: Ammonia as N TKN
Do all samples match COC?	Yes	Yes	Yes	Yes	Yes	Yes
Are Sample Locations correct on COC?	No: KRTR = KRTR 43.94	No: KR 50.28 = KR 50.3 KR 55.6 = KR 55.2	No: KR 55.2 = KR 54.2	No: KR 55.6 = KR 55.2	Yes	Yes
Is sample ID consistent throughout report?	Yes	Yes	Yes	Yes	Yes	Yes

	Spring Sampling		Fall Sampling			
Were all sample holding times met?	Yes	Yes	Yes	Yes	Yes	Yes
Were there any quality control data issues?	No	No	No	No	No	No

Key: BSK = BSK Associates
COC = Chain of custody form
TKN = total Kjeldahl nitrogen
ZALCO = ZALCO laboratories, Inc.

Table B-2. Quality Assurance/Quality Control Review of Spring and Fall 2025 Sample Laboratory Analyses

	Spring Sampling				Fall Sampling	
Report ID	ZALCO: 2506076	ZALCO: 2506102	ZALCO: 2506125	Marine Pollution Studies Lab: KR1_2025_W_MeHg_Results	ZALCO: 2510049	Marine Pollution Studies Lab: KR1_2025_W_MeHg_Results
Sample Locations	KR 44.0 KR 44.0 (Duplicate) KRTR 43.94	KR 55.2 (mid-column) Field Blank KR 55.2 (surface) KR 55.6 KR 55.6 (Duplicate) KR 50.3	KR 54.2 KR 54.36 KR 53.84	KR 55.6 KR 55.2 (surface) KR 55.2 (mid-column) KR 54.36 KR 54.2 KR 53.84 KR 50.3 KRTR 43.94 KR 44.0 KR 44.0 (Duplicate) Field Blank	KR 54.36 KR 54.2 KR 44.0 KR 44.0 (Duplicate) KRTR 43.94 KR 55.2 (surface) KR 55.2 (mid-column) KR 55.6 KR 53.84 KR 50.3 Field Blank	Field Blank KR 44.0 KR 44.0 (Duplicate) KRTR 43.94 KR 54.36 KR 54.2 KR 55.2 (surface) KR 55.2 (mid-column) KR 55.6 KR 53.84 KR 50.3
ZALCO Sample ID Numbers	2506076-01 2506076-02 2506076-03	2506102-01 2506102-02 2506102-03 2506102-04 2506102-05 2506102-06	2506125-01 2506125-02 2506125-03	2025-0625 2025-0625-ms 2025-0625-msd 2025-0626 2025-0627 2025-0627-ms 2025-0627-msd 2025-0628 2025-0628-dup 2025-0629 2025-0630 2025-0631 2025-0632 2025-0633 2025-0634 2025-0635	2510049-01 2510049-02 2510049-03 2510049-04 2510049-05 2510049-06 2510049-07 2510049-08 2510049-09 2510049-10 2510049-11	2025-1067 2025-1068 2025-1068-ms 2025-1068-msd 2025-1069 2025-1070 2025-1070-ms 2025-1070-msd 2025-1071 2025-1072 2025-1072-dup 2025-1073 2025-1074 2025-1075 2025-1076 2025-1077
Date Sampled	6/3/2025	6/4/2025	6/5/2025	6/3/2025	9/30/2025 - 10/1/2025	10/1/2025

	Spring Sampling				Fall Sampling	
Analysis	General Parameters Dissolved Metals Total Mercury	General Parameters Dissolved Metals Total Mercury	General Parameters Dissolved Metals Total Mercury	Methylmercury (water samples)	General Parameters Dissolved Metals Total Mercury	Methylmercury (water samples)
Do all samples match COC?	Yes	No: KR 50.28 on COC is labeled as KR 55.28 on lab report.	Yes	Yes	Yes	Yes
Are Sample Locations correct on COC?	No: KR 44 = KR 44.0 KR 43.94 = KRTR 43.94	No: KR 55 hypo = KR55.2 (mid-column) KR 55 blank = Field Blank KR 55 epi = KR 55.2 (surface) KR 50.28 = KR 50.3	Yes	No: KR 55.6 (Sample #1) = KR 55.2 (surface) KR 55.6 (Sample #2) = KR 55.2 (mid-column) KR 55 Democrat Hypolimnion = KR 55.6	No: KR 44.0 (rep) = KR 44.0 (Duplicate) KR 55.2 (mid) = KR 55.2 (mid-column) KR 43.94 = KRTR 43.94	No KR 43.94 = KRTR 43.94
Is sample ID consistent throughout report?	Yes	No: KR 50.28 on COC is labeled as KR 55.28 on lab report.	Yes	Yes	Yes	Yes
Were all sample holding times met?	Yes	Yes	Yes	Yes	Yes	Yes

Copyright 2026 by Southern California Edison

	Spring Sampling				Fall Sampling	
Were there any quality control data issues?	No	Original report amended by Zalco to include Hardness	Original report amended by Zalco to include Hardness	No	No	No

Key: COC = Chain of custody form
ZALCO = ZALCO laboratories, Inc.

APPENDIX C

Calculations used for Water Quality Criteria Analysis

Copyright 2026 by Southern California Edison

Calculations

Several criteria must be calculated on a site-by-site basis. The following equations apply to those analytes.

Ammonia:

Criteria are temperature and pH dependent. Equations are from the EPA's Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater (EPA 2013). The Criteria Continuous Concentration (CCC) is a 30-day rolling average concentration of total ammonia nitrogen (milligrams per liter [mg/L]) that cannot be exceeded more than once every three years on average. The Criteria Maximum Concentration (CMC) is the one-hour average concentration of total ammonia nitrogen (mg/L) that cannot be exceeded more than once every three years on average where *Oncorhynchus* species are present. In these equations, temperature should be in degrees Celsius (°C).

$$CCC = 0.8876 \times \left(\frac{0.0278}{1 + 10^{7.688-pH}} + \frac{1.1994}{1 + 10^{pH-7.688}}\right) \times \left(2.126 \times 10^{0.028\times(20-MAX(T,7))}\right)$$

$$CMC = MIN\left(\left(\frac{0.275}{1 + 10^{7.204-pH}} + \frac{39.0}{1 + 10^{pH-7.204}}\right), \left(0.7249 \times \left(\frac{0.0114}{1 + 10^{7.204-pH}} + \frac{1.6181}{1 + 10^{pH-7.204}}\right) \times \left(23.12 \times 10^{0.036\times(20-T)}\right)\right)\right)$$

Cadmium (Cd):

Criteria are hardness dependent. The EPA's national water quality criteria equations for cadmium are more stringent than the California Toxics Rule (CTR) criteria equations (65 FR 31682), so the national water quality criteria equations are used (EPA 2019). These equations calculate the freshwater CCC and CMC for cadmium. Hardness should be in mg/L.

$$CCC\ (in\ \mu g/L) = (1.101672 - [\ln(hardness) * 0.041838]) * e^{0.7977 * \ln(hardness) - 3.909}$$

$$CMC\ (in\ \mu g/L) = (1.136672 - [\ln(hardness) * 0.041838]) * e^{0.9789 * \ln(hardness) - 3.866}$$

Copper (Cu):

Criteria are hardness dependent. The EPA's national water quality criteria equations for copper are the same as the equations in the CTR (65 FR 31682, EPA 2019). These equations calculate the freshwater CCC and CMC for copper. Hardness should be in mg/L.

$$CCC\ (in\ \mu g/L) = 0.96 *\ e^{0.8545 * \ln(hardness) - 1.702}$$

$$CMC\ (in\ \mu g/L) = 0.96 * e^{0.9422 * \ln(hardness) - 1.7}$$

Lead (Pb):

Criteria are hardness dependent. The EPA's national water quality criteria equations for lead are the same as the equations in the CTR (65 FR 31682, EPA 2019). These equations calculate the freshwater CCC and CMC for lead. Hardness should be in mg/L.

$$CCC\ (in\ \mu g/L) = (1.46203 - [\ln(hardness) * 0.145712]) *\ e^{1.273 * \ln(hardness) - 4.705}$$

$$CMC\ (in\ \mu g/L) = (1.46203 - [\ln(hardness) * 0.145712]) * e^{1.273 * \ln(hardness) - 1.46}$$

Nickel (Ni):

Criteria are hardness dependent. The EPA's national water quality criteria equations for nickel are the same as the equations in the CTR (65 FR 31682, EPA 2019). These equations calculate the freshwater CCC and CMC for nickel. Hardness should be in mg/L.

$$CCC\ (in\ \mu g/L) = 0.997 *\ e^{0.846 * \ln(hardness) + 0.0584}$$

$$CMC\ (in\ \mu g/L) = 0.998 * e^{0.846 * \ln(hardness) + 2.255}$$

APPENDIX C

AQ 3 – FISH POPULATION TECHNICAL MEMORANDUM

Copyright 2026 Southern California Edison

AQ 3 – FISH POPULATION TECHNICAL MEMORANDUM

KERN RIVER NO. 1 HYDROELECTRIC PROJECT
FERC PROJECT NO. 1930

PREPARED FOR:



March 2026

TABLE OF CONTENTS

1.0 Introduction 1

2.0 Study Objectives 1

3.0 Study Area and Study Sites 1

4.0 Methods 2

4.1 Study Plan Variance 2

4.2 Democrat Dam Impoundment Sampling (2024-2025) 2

4.3 Bypass Reach Sampling (2025) 2

4.4 Fish Processing 3

4.5 Northwestern Pond Turtle and Incidental Species Observations 4

4.6 Data Analysis 4

4.7 In-Situ Water Temperature and Specific Conductance 5

5.0 Results Summary 5

5.1 Fish Species and Life Stage Periodicity 5

5.2 Democrat Dam Impoundment Fish Sampling (2024 and 2025) 6

5.2.1 Species Captured, Density, and Catch per Unit Effort 6

5.2.2 Fish Tissue Methylmercury 7

5.2.3 Length-Frequency 7

5.2.4 Condition Factor and Fish Health 7

5.2.5 Comparison to Historical Data 8

5.3 Bypass Reach Fish Sampling (2025) 8

5.3.1 Riverine Habitat Characterization 8

5.3.2 Species Composition, Standing Crop, Population Estimates, and Catch per Unit Effort 8

5.3.3 Bypass Reach Trammel Net Catch Per Unit Effort (CPUE) 11

5.3.4 Length-Frequency 11

5.3.5 Condition Factor and Fish Health 12

5.3.6 Comparison to Recent and Historical Data 12

5.4 Northwestern Pond Turtle and Other Incidental Observations 13

5.5 In-Situ Water Temperature and Specific Conductance 14

6.0 Study-Specific Consultation 14

7.0 Outstanding Study Plan Elements 14

8.0 References 14

LIST OF TABLES

Table 3-1. Fish Population Sampling Site Locations in the Kern River No.1 Bypass Reach and Democrat Dam Impoundment 2

Table 3-2. Fish Species Observed During Fish Population Sampling in the Kern River No. 1 Bypass Reach and Democrat Dam Impoundment 3

Table 3-3. Life Stage Periodicities for Species Observed during Fish Population Sampling in the Kern River No. 1 Bypass Reach and Democrat Dam Impoundment [1] 4

Table 3-4. Summary of Fish Abundance and Distribution - Fish Population Sampling in the Kern River No. 1 Bypass Reach and Democrat Dam Impoundment 6

Table 3-5. Species and Fork Length Range of Fish Collected from Democrat Dam Impoundment, 2024-2025 (E-Cat and Trammel Net) 7

Table 3-6. Catch Rates by Sampling Pass (Fish per Mile Sampled) from E-Cat Electrofishing in Democrat Dam Impoundment, 2024 8

Table 3-7. Catch per Unit Effort (CPUE) from Trammel Net Sampling in Democrat Dam Impoundment, 2025[1] 9

Table 3-8. Condition Factors of Species Captured during 2024-2025 Sampling in Democrat Dam Impoundment 10

Table 3-9. Density, Biomass, and Population Estimates of Fish Species Captured at Backpack Electrofishing Sites in the Kern River No. 1 Bypass Reach, 2025[1] 11

Table 3-10. Catch per Unit Effort (CPUE) from Trammel Net Sampling in the Kern River No. Bypass Reach, 2025 13

Table 3-11. Condition Factors of Species Captured during 2025 Stream Sampling in the Kern River No. 1 Bypass Reach 13

Table 3-12. Historical Comparison of Fish Collected During 1999-2008 and 2025 Fish Population Surveys in the Kern River No. 1 Bypass

Reach and the 2020 Fish Population Surveys in the Borel Project Bypass Reach[1,2] 14

LIST OF FIGURES

Figure 3-1. Fish Species Composition in the Democrat Dam Impoundment during 2024 E-Cat Sampling by Number Captured (top) and Biomass (bottom). 16

Figure 3-2. Fish Species Capture Rates by Sampling Transect (fish per mile) in Democrat Dam Impoundment in 2024. 17

Figure 3-3. Fish Species Composition in Democrat Dam Impoundment during 2025 Trammel Net Sampling by Number Captured (top) and Biomass (bottom). 18

Figure 3-4. Length-Frequency Histogram for all Fish Species Captured during E-Cat Sampling in Democrat Dam Impoundment, 2024. 19

Figure 3-5. Historical Comparison of Fish Species Collected in Democrat Dam Impoundment during 1994, 1995, and 2024-2025 Sampling. 20

Figure 3-6. Fish Species Composition in the Kern River No. 1 Bypass Reach Backpack Electrofishing and Trammel Netting (total catch, n=591)..... 21

Figure 3-7. Fish Species Composition at Kern River No. 1 Project Sampling Sites by Number Captured during Backpack Electrofishing and E-Cat Sampling, Overlaid on Aerial Imagery. 22

Figure 3-8a. Composition of Fish Species Captured at 2025 Kern River No. 1 Bypass Reach Backpack Electrofishing Site A (n=50). 23

Figure 3-8b. Composition of Fish Species Captured at 2025 Kern River No. 1 Bypass Reach Backpack Electrofishing Site B (n=92). 23

Figure 3-8c. Composition of Fish Species Captured at 2025 Kern River No. 1 Bypass Reach Backpack Electrofishing Site C (n=118). 24

Figure 3-8d. Composition of Fish Species Captured at 2025 Kern River No. 1 Bypass Reach Backpack Electrofishing Site D (n=136). 24

Figure 3-8e. Composition of Fish Species Captured at 2025 Kern River No. 1 Bypass Reach Backpack Electrofishing Site E (n=172). 25

Figure 3-9. Fish Species Density Estimates at 2025 Kern River No. 1 Bypass Reach Sampling Sites, with Sacramento suckers (top) and without Sacramento suckers (bottom). 26

Figure 3-10. Fish Species Biomass Estimates at 2025 Kern River No. 1 Bypass Reach Sampling Sites, with Sacramento suckers (top) and without Sacramento suckers (bottom). 27

Figure 3-11. Length-Frequency Histogram for all Fish Species Captured during Backpack Electrofishing in the Kern River No. 1 Bypass Reach, 2025. 28

Figure 3-12. Historical Comparison of Fish Species from 2025 Kern River No. 1 Bypass Reach Sampling and 2020 Borel Project Stream Sampling, without Sacramento sucker (top) and with (bottom). 29

LIST OF MAPS

Map 3-1. 2025 Bypass Reach Fish Population Sampling Locations..... 31

Map 3-1a. 2025 Bypass Reach Site A. 31

Map 3-1b. 2025 Bypass Reach Site B. 31

Map 3-1c. 2025 Bypass Reach Site C. 31

Map 3-1d. 2025 Bypass Reach Site D. 31

Map 3-1e. 2025 Bypass Reach Site E. 31

Map 4-1. 2024-2025 Democrat Dam Impoundment Fish Population Sampling Locations. 31

LIST OF APPENDICES

Appendix A. Bypass Reach Samplng Site Photos

Appendix B. Length-Frequency Histograms by Site and Species

Appendix C. Photos from 2024-2025 Fish Population Study

LIST OF ACRONYMS

µS/cm	microsiemens per centimeter
AQ TM	AQ 2 – Water Quality and Water Temperature Technical Memorandum
AQ 2 TSP	AQ 2 – Water Quality and Water Temperature Technical Study Plan
AQ 3 ITM	AQ 3 – Fish Population Interim Technical Memorandum
AQ 3 TM	AQ 3 – Fish Population Technical Memorandum
AQ 3 TSP	AQ 3 – Fish Population Technical Study Plan
cfs	cubic feet per second
CPUE	catch-per-unit effort
DLA	Draft License Application
E-Cat	cataraft electrofisher
FERC	Federal Energy Regulatory Commission
FL	fork length
GPS	global positioning system
ISR	Initial Study Report
KR1	Kern River No.1
mm	millimeter
n	number
OEHHA	Office of Environmental Health Hazard Assessment
Project	Kern River No. 1 Hydroelectric Project, FERC No. 1930
SCE	Southern California Edison
TL	total length
YOY	young-of-the-year

1.0 INTRODUCTION

This AQ 3 – Fish Population Technical Memorandum (AQ 3 TM) describes the data and findings for fish population monitoring completed in 2024 and 2025 in support of Southern California Edison's (SCE) Kern River No. 1 (KR1) Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 1930. The AQ 3 – Fish Population Technical Study Plan (AQ 3 TSP) was included in SCE's Revised Study Plan filed on February 13, 2024 (SCE 2024). In its March 14, 2024 Study Plan Determination, FERC approved the AQ 3 TSP without modifications (FERC 2024). The AQ – 3 Interim Technical Memorandum (AQ 3 ITM) describing 2024 methods and results was included in the Initial Study Report (ISR) filed with FERC on March 12, 2025, and an updated AQ 3 ITM was provided in the Draft License Application (DLA) filed on December 18, 2025.

Data in this final AQ 3 TM were collected in the Democrat Dam Impoundment in October of 2024 and in the Project bypass reach in the fall of 2025.[1] As described in the AQ 3 ITM, flows in the Kern River were too high to safely sample the bypass reach in the fall of 2024 but conditions were suitable in the fall of 2025.

2.0 STUDY OBJECTIVES

The objectives of the fish population study as outlined in the AQ 3 TSP (SCE 2024) included the following:

- Document fish species composition, distribution, and abundance in the Democrat Dam Impoundment and bypass reach.
- Characterize fish size, condition factor, and approximate population age class structure in the Democrat Dam Impoundment and bypass reach.

3.0 STUDY AREA AND STUDY SITES

The study area included the Democrat Dam Impoundment and the bypass reach from Democrat Dam to the Kern River No. 1 Powerhouse Tailrace (Table 3-1, Map 3-1, and Map 4-1). Sampling in 2024 and 2025 was conducted during the late summer or fall base-flow period. Democrat Dam Impoundment shoreline electrofishing included multiple passes throughout most of the approximately 1-mile-long impoundment (Map 4-1). Sampling sites in the bypass reach were approximately 100-meters-long or longer and included historical sampling sites (see ENTRIX 2009). Mesohabitat characterization (i.e., riffle, run, pool) in the bypass reach based on aerial image mapping (Google Earth) and field observations were used to identify representative sampling sites within mesohabitat types in approximately similar proportion to the larger geomorphic river segment. Final sampling locations in the bypass reach were determined in the field based on access, safety, historical sampling sites, and mesohabitat types. Appendix A includes photos of specific river sampling sites.

[1] The bypass reach is the 10.2-mile-long section of the Kern River downstream of Democrat Dam where Project operations result in the diversion of a portion of the water from the river.

4.0 METHODS

The study followed the methods described in AQ 3 TSP (SCE 2024), except for the following minor variance related to the timing of sampling.

4.1 STUDY PLAN VARIANCE

Electrofishing was conducted in the Democrat Dam Impoundment in 2024; however, trammel netting in the impoundment was completed in the fall of 2025. Sampling in the bypass reach could not be completed in 2024 due to unsafe, high-flow conditions. Bypass reach sampling was completed in early December of 2025 when flow conditions were low enough to sample safely and effectively.

4.2 DEMOCRAT DAM IMPOUNDMENT SAMPLING (2024-2025)

SCE sampled approximately 4.65 miles of shoreline habitat from October 15 to 17, 2024, using a Smith-Root™ light-duty cataraft electrofisher (E-Cat) with oars and a small outboard motor (Map 4-1). Biologists sampled most of the approximately 1-mile-long impoundment, including shoreline margins and open water habitat up to 6-feet-deep. Each E-Cat sampling pass (route) is shown on Map 4-1. In addition to fish population data, SCE also collected edible-sized sport fish pursuant to the AQ 2 – Water Quality and Water Temperature Technical Study Plan (AQ 2 TSP) for total mercury and methylmercury fish tissue analysis. Additional details about the sampling methods for fish tissue mercury analysis are provided in the AQ 2 – Water Quality and Water Temperature Technical Memorandum (AQ 2 TM).

On September 30 and October 1, 2025, SCE deployed trammel nets to sample deep water portions of the Democrat Dam Impoundment. Two 300-foot-long, 8-feet-deep trammel nets were set for approximately 4-hours. One net was set in the late afternoon, and one net was set in the morning (Map 4-1).

4.3 BYPASS REACH SAMPLING (2025)

Five sampling sites (Sites A-E) were established in the field during reconnaissance in September 2025. Mesohabitat characterization (based on Google Earth imagery) was used to confirm that the sampling sites were representative of habitat (e.g., riffles, pools, runs) within the 10.2-mile-long bypass reach. The sites were sampled with backpack electrofishing units in early December (December 1 - December 5, 2025), when flows were approximately 20 cubic feet per second (cfs) and low enough to safely wade and sample effectively.[2]

- At each site, a team of approximately 10 biologists (3 backpack units and 6-7 netters) were deployed. The survey team started at the bottom of each habitat unit and moved in an upstream direction to collect fish. At four of five sites (Sites B-E),

[2] As noted in the AQ 3 ITM, SCE proposed to use an E-Cat to sample the bypass reach if site conditions and access allowed. After further evaluation of the site in 2024 and 2025, SCE determined that an E-Cat was not feasible in the bypass reach due to access constraints and safety considerations (i.e., steep banks, unstable terrain).

the sampling area was partitioned into smaller habitat units based on mesohabitat type (e.g., run, riffle, pool) using block nets. At these sites, block nets were installed at the top and bottom of each individual habitat unit to allow for multi-pass depletion sampling (e.g., Reynolds 1996; Van Deventer and Platts 1989; Rexstad and Burnham 1992). Due to the difficult sampling environment (i.e., difficult terrain, deep water; see Appendix A photos), block nets could not be installed and multi-pass depletion sampling could not be conducted at Site A. Captured fish from each pass were kept in separate live wells or 5-gallon buckets and recorded separately.

- Trammel nets (300-foot-long, 8-feet-deep) were used to capture fish in deep pools (> 2.5 meters) immediately downstream of Sites D and E, Table 3-1; Maps 3-1d and 3-1e). Trammel nets were set for approximately 4 hours during the late afternoon and early evening. Trammel nets were not deployed at the remaining three sampling sites in the bypass reach due to shallow pool depths, large substrate impediments, or unsafe access (e.g., steep, rocky banks).

4.4 FISH PROCESSING

Fish processing included the following:

- Fish were enumerated, identified to species, and measured to fork length (FL) or total length (TL) (millimeter [mm]) as appropriate for the species, and weighed to the nearest gram.[3,4]

- Fish were returned to the river when sampling was completed at each site.

- Global Positioning System (GPS) coordinates were collected at the top and bottom of each sampled habitat unit in the bypass reach and at the upstream end of each trammel net; a GPS track was recorded for all E-Cat sampling routes in the impoundment.

- Deployment and retrieval times of the trammel nets and electrofishing start and end times were recorded.

- The length of habitat units sampled in the Democrat Dam Impoundment were measured to calculate fish abundance by length (i.e., fish/mile).

- The lengths and widths of the habitat units sampled in the bypass reach were measured to calculate fish abundance and density metrics (i.e., fish/mile and fish/acre).

[3] Sampling protocols and field forms were consistent with Flosi et al. 1998.

[4] Fork length (tip of snout to fork of tail) was measured for species with a forked caudal fin. Total length was measured for species without a forked caudal fin.

4.5 NORTHWESTERN POND TURTLE AND INCIDENTAL SPECIES OBSERVATIONS

Incidental observations of northwestern pond turtle (*Actinemys marmorata)* and other aquatic species were made during E-Cat sampling in the Democrat Dam Impoundment in 2024. Observations were also made from a two-person inflatable kayak in 2024 in portions of the reservoir inaccessible to the E-Cat. Incidental observations of northwestern pond turtles and other aquatic species were also made during 2025 sampling in the bypass reach and trammel netting in the impoundment.

4.6 DATA ANALYSIS

The following analyses were completed:

- In the Democrat Dam Impoundment, fish abundance was reported by species and by catch-per-unit-effort (CPUE) (fish/net-hour) for trammel netting or catch rate (fish/mile) for E-Cat electrofishing.

- In the bypass reach, fish abundance was reported by species at each sampling site during backpack electrofishing surveys and trammel netting. At Sites B-E, where multi-pass depletion backpack electrofishing was performed, fish population estimates were developed for each species using depletion data analyzed in MicroFish software.[5] Site A was not suitable for multi-pass depletion sampling (i.e., difficult sampling terrain), so depletion sampling population estimates were not developed for this site.

- Site-specific population estimates were used to calculate fish standing crop metrics (i.e., fish/mile and fish/acre) and biomass (pounds/mile and pounds/acre) at Sites B-E.

- Fish assemblage data collected in 2024 and 2025 in the Democrat Dam Impoundment was compared to previous sampling data from 1994 and 1995 (ENTRIX 1994, ENTRIX 1995).

- Fish assemblage data collected in 2025 from the bypass reach was compared to previous sampling in the late 1990s and early 2000s (ENTRIX 2009) and to recent sampling in the Borel Project (FERC No. 382) reach of the Kern River (Cardno 2021), which is located upstream of Democrat Dam Impoundment and downstream of Lake Isabella.

- A distribution map of fish species in the study area was developed using the quantitative abundance estimates and qualitative sampling data.

[5] Multi-pass depletion sampling and MicroFish are commonly used to generate population estimates for fish species (Reynolds 1996; Van Deventer and Platts 1989; Rexstad and Burnham 1992).

- A fish life stage periodicity chart (by calendar month) was developed for each species based on Moyle (2002), consultation with qualified fisheries biologists, and fish population sampling data.

- Length-frequency histograms of fish collected in the Democrat Dam Impoundment and bypass reach were generated to evaluate the general age-class structure of the fish assemblage.

- Fulton's condition factor (Ricker 1975) was calculated for larger-bodied fish collected during the study. Fish smaller than 150 mm FL or TL were excluded from the condition factor analysis due to lower measurement precision and variable growth patterns in small juvenile fish.

- Upon request, an electronic database (Excel spreadsheet) can be provided of all fish sampling data (date, location, fish species, fish size, sampling pass, etc.) to resource agencies and interested stakeholders.

4.7 IN-SITU WATER TEMPERATURE AND SPECIFIC CONDUCTANCE

Water temperature and specific conductance were recorded at each sampling site in the bypass reach and Democrat Dam Impoundment with a calibrated YSI ProDSS water quality meter.

5.0 RESULTS SUMMARY

5.1 FISH SPECIES AND LIFE STAGE PERIODICITY

SCE collected ten fish species in the impoundment and eight species in the bypass reach. Two species were native: hardhead minnow (*Mylopharodon conocephalus*) and Sacramento sucker (*Catostomus occidentalis*). Hardhead minnow is a California Species of Special Concern and Forest Service Sensitive Species. All other species were introduced, non-native species. These included rainbow trout (*Oncorhynchus mykiss*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*M. salmoides*), black crappie (*Pomoxis nigromaculatus*), bluegill sunfish (*Lepomis macrochirus*), common carp (*Cyprinus carpio*), channel catfish (*Ictalurus punctatus*), brown bullhead catfish (*Ameiurus nebulosus*), white catfish (*A. catus*), and threadfin shad (*Dorosoma petenense*). The fish species collected during fish population monitoring in Democrat Dam Impoundment (Section 5.2) and in the bypass reach (Section 5.3) are shown in Table 3-2.

An approximate life stage periodicity (i.e., life history chronology) chart by month for each fish species in the Project area is provided in Table 3-3. Actual spawning and rearing timelines may vary in response to environmental and hydrological conditions. Adult and juvenile fish are present in the bypass reach year-round. The most sensitive spawning window for species like hardhead and smallmouth bass is approximately mid-March through May.

Rainbow trout are stocked annually in the bypass reach and in the Kern River between Democrat Dam and Lake Isabella. There is no known rainbow trout spawning activity in the bypass reach and little to no wild recruitment of juvenile rainbow trout (SCE 2023). Therefore, rainbow trout in the bypass reach represent a 'put and take' fishery where mature trout are stocked in the spring and reside in the bypass reach until they are harvested.

5.2 DEMOCRAT DAM IMPOUNDMENT FISH SAMPLING (2024 AND 2025)

5.2.1 Species Captured, Density, and Catch per Unit Effort

SCE collected 379 fish (10 species) from the Democrat Dam Impoundment during electrofishing and trammel netting surveys in 2024 and 2025 (Table 3-2, Table 3-4, and Table 3-5). Native species included hardhead minnow and Sacramento sucker. Introduced species included brown bullhead catfish, channel catfish, white catfish, common carp, black crappie, bluegill sunfish, largemouth bass, and threadfin shad. Threadfin shad are likely present in the Democrat Dam Impoundment because of spill events from Lake Isabella. No smallmouth bass (*M. dolomieu*) or rainbow trout (*Oncorhynchus mykiss*) were captured in the impoundment.

The most abundant species collected during 2024 electrofishing in the Democrat Dam Impoundment were largemouth bass (number [n]=131, 39.8 percent), threadfin shad (n=96, 29.2 percent), and Sacramento sucker (n=50, 15.2 percent) (Figure 3-1, top chart). By weight, Sacramento sucker (49.7 percent) and common carp (34.2 percent) accounted for most of the biomass, followed by largemouth bass (10.4 percent) (Figure 3-1, bottom chart). Linear catch rates during 2024 electrofishing in the impoundment ranged from 31 to 125 fish/mile per pass for all fish species combined (Table 3-6 and Figure 3-2). The highest species-specific catch rates were for largemouth bass (28.2 fish/mile) and Sacramento sucker (10.8 fish/mile). The lowest species-specific catch rates were for channel catfish (0.2 fish/mile), hardhead minnow (0.4 fish/mile), and white catfish (0.5 fish/mile).

In 2025, white catfish was the most abundant species collected in the impoundment during trammel netting (n=44, 88.0 percent) and accounted for most of the biomass (85.0 percent) (Figure 3-3). CPUE during 2025 trammel net sampling in the Democrat Dam Impoundment was highest for white catfish (5.33 fish/net hour), followed by channel catfish (0.36 fish/net hour), largemouth bass (0.24 fish/net hour), and hardhead minnow (0.12 fish/net hour) (Table 3-7). All fish were captured in the trammel net that was set in the evening of September 30, 2025, closer to Democrat Dam (Map 4-1). No fish were captured in the trammel net that was set on the morning of October 1, 2025, farther upstream (Map 4-1). Trammel nets captured some of the same species and size classes captured by electrofishing but with a higher catch of white catfish due to the deep benthic orientation of the nets.

5.2.2 Fish Tissue Methylmercury

Pursuant to the AQ 2 TSP, SCE collected 29 edible-sized sport fish during 2024 impoundment sampling for total mercury and methylmercury fish tissue analysis. The catch included ten largemouth bass, three black crappie, five bluegill sunfish, one channel catfish, one white catfish, and nine brown bullhead catfish. Fish ranged in size from 151 to 545 mm FL or TL. Samples were processed by the Marine Pollution Studies Lab in Moss Landing, California. All 29 of the fish tissue samples exceeded or were equal to the reference methylmercury concentration of 0.08 mg/kg (OEHHA 2005). Methylmercury tissue concentrations ranged from 0.08 mg/kg to 0.57 mg/kg and were positively correlated with fish size and trophic level. Additional information on the fish tissue methylmercury analysis is provided in the AQ 2 TM (SCE 2026) and the DLA filed with FERC on December 18, 2025.

5.2.3 Length-Frequency

Length-frequency histograms were created for species collected during E-Cat sampling in the Democrat Dam Impoundment in 2024. A length-frequency histogram for all species collected during the electrofishing surveys is provided in Figure 3-4. Length-frequency histograms for individual species are provided in Appendix B. Fish between 50- and 150-mm FL were the most frequently collected, consisting primarily of threadfin shad and largemouth bass. Low to moderate numbers of fish between 150- and 400-mm FL were observed, consisting of largemouth bass, bluegill sunfish, black crappie, brown bullhead catfish, white catfish, and hardhead. Several large Sacramento suckers and common carp ranging in size from 400-mm to > 600-mm FL were collected. Length-frequency histograms for 2025 trammel net sampling in the impoundment were not developed, as the monofilament mesh size of the nets (4-inch) resulted in a relatively selective size of fish that could be captured. The length of all 50 fish collected in the impoundment in 2025 with trammel nets ranged from 174-mm to 445-mm FL.

5.2.4 Condition Factor and Fish Health

The average condition factor for all species collected in the Democrat Dam Impoundment during 2024 and 2025 sampling ranged from 1.14 to 2.92, indicating that most fish were in healthy condition (Table 3-8). The lowest condition factor for an individual fish (0.69) was observed in a largemouth bass. For native species, condition factors for individual fish ranged from 1.38 to 1.48 (hardhead minnow; average condition factor of 1.43) and 0.84 to 2.55 (Sacramento sucker; average condition factor of 1.35) (Table 3-8). Diseases or parasites were encountered incidentally in some fish but were not widespread. A large hardhead was captured in poor health with an unidentified wound in 2024 (Appendix C, Photo C-1). The wound was not consistent with an external parasite or electrofishing injury and may have been due to internal infection or injury from catch by recreational fishers.

Representative photos of native and introduced fish species captured in the impoundment are provided in Appendix C.

5.2.5 Comparison to Historical Data

Catch data from 2024 boat electrofishing and 2025 trammel net sampling in the Democrat Dam Impoundment were compared to data from sampling conducted in 1994 (ENTRIX 1994) and 1995 (ENTRIX 1995) as part of the last relicensing effort for the Project (Figure 3-5). Overall, more fish were collected in 2024-2025 (n=379, sum of both sampling years) than in 1994 (n=39) or 1995 (n=227); however, the sampling effort varied across sampling years. The sampling effort in 1994 included four pulls of a 50-foot beach seine, deployment of three monofilament gill nets fished for 24 hours each, nine minnow traps each set for 72 hours, and boat electrofishing (unknown area). In 1995, the sampling effort consisted of four pulls of a 50-foot beach seine, deployment of two monofilament gill nets fished for 24 hours each, nine minnow traps each set for 72 hours, three hoop nets (also called Indiana trap nets) fished for 24 hours each, and boat electrofishing (unknown area).

Few fish were collected in 1994; high flows (400 cfs) and cold water likely resulted in reduced fish activity and low catch numbers (ENTRIX 1995). In 1995, 13 species were captured, and the assemblage was dominated by white crappie (*Pomoxis annularis*), (43.6 percent), brown bullhead catfish (32.2 percent), and largemouth bass (11.0 percent); fewer (10 individuals or less) bluegill sunfish, common carp, hitch (*Lavinia exilicauda*), hardhead, mosquitofish (*Gambusia affinis*), rainbow trout (stocked), Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento sucker, smallmouth bass, and white catfish made up the rest of the catch. The species composition was generally similar in 1995 and 2024-2025 with the fish community mostly comprised of non-native, warm water fish species. In 2024-2025, more largemouth bass, Sacramento sucker, hardhead, bluegill sunfish, common carp, and white catfish were observed than in 1995. Hitch, mosquitofish, rainbow trout, Sacramento pikeminnow, smallmouth bass, and white crappie were collected in 1994 and/or 1995 but were not observed in 2024 or 2025 within the Democrat Dam Impoundment. Conversely, black crappie and threadfin shad were collected in 2024 but not in 1994 or 1995.

5.3 BYPASS REACH FISH SAMPLING (2025)

5.3.1 Riverine Habitat Characterization

Mesohabitat categorization of the bypass reach using Google earth aerial imagery demonstrated that the bypass reach is approximately 40 percent riffle and 60 percent pool/run. Sites A-E were representative of the overall mesohabitat composition of the bypass reach and contained the mesohabitat types identified in the larger reach (i.e., riffle, pool). Sampling sites were dominated by pools and riffles (Table 3-1).

5.3.2 Species Composition, Standing Crop, Population Estimates, and Catch per Unit Effort

SCE collected 591 fish (8 species) in the bypass reach during electrofishing and trammel netting surveys in 2025 (Table 3-2, Table 3-4, Table 3-9, and Figure 3-6). Two native species (hardhead minnow and Sacramento sucker) and six introduced species (brown

bullhead catfish, channel catfish, white catfish, largemouth bass, smallmouth bass, and rainbow trout) were collected. Overall, the bypass reach was dominated by native fish. Sacramento sucker (~63 percent), hardhead minnow (~ 15 percent), and brown bullhead catfish (~ 15 percent) were the most abundant species.

Fish assemblage data from backpack electrofishing at each site were overlaid on aerial imagery (Figure 3-7)[6] and shown by site (Figures 3-8a – 8e) to evaluate the spatial distribution of fish within the bypass reach. Species composition was similar from upstream to downstream; however, the total number of fish captured generally increased from upstream to downstream. Native species (hardhead minnow and/or Sacramento sucker) were observed at all five sites. Brown bullhead abundance generally increased from upstream to downstream. Largemouth bass were present at all sites except Site E and smallmouth bass were observed only at Sites B and D. A single rainbow trout was captured at Site D. The density and biomass per acre of all species combined generally increased from upstream to downstream. The upstream to downstream trend was primarily dominated by Sacramento suckers. Excluding Sacramento suckers, the density was similar by site and biomass was highest in sites C and D. The number of fish captured via backpack electrofishing, population estimates, and standing crop estimates (density and biomass) are presented in Table 3-4, Table 3-9, Figure 3-9, and Figure 3-10. Each sampling site is discussed below.

5.3.2.1 Site A

Due to the difficult sampling environment at Site A (i.e., difficult terrain, deep water; see Appendix A photos), block nets could not be installed, and multi-pass depletion sampling could not be conducted. Instead, approximately 90 percent of stream margin habitat and 40 percent of the total wetted habitat was surveyed at this site to qualitatively assess species composition. Fifty fish were collected at Site A (Table 3-4, Table 3-9, and Figure 3-8a). The fish community was dominated by Sacramento sucker (66.0 percent; 33 fish) and hardhead minnow (24.0 percent; 12 fish); a small number of largemouth bass, brown bullhead catfish, and white catfish made up the remainder of the catch (Figure 3-8a and Table 3-9). Site A had the highest abundance of adult hardhead minnow. No rainbow trout or smallmouth bass were observed at this site. Given the difficult terrain and single-pass approach, the fish assemblage metrics could not be compared to sites B-D.

5.3.2.2 Site B

Ninety-two fish were collected at Site B (Table 3-4, Table 3-9, and Figure 3-8b). The fish community was dominated by hardhead minnow (41.3 percent; 38 fish) and Sacramento sucker (38.0 percent; 35 fish), followed by largemouth bass (9.8 percent; 9 fish), brown bullhead catfish (5.5 percent; 5 fish) and smallmouth bass (5.5 percent; 5 fish) (Figure 3-8b and Table 3-9). Overall, based on fish population estimates, Site B had the lowest combined species density (fish/mile, fish/acre) in the bypass reach (Table 3-9 and Figure 3-9). Site B also had the lowest biomass (pounds/mile, pounds/acre) (Table 3-9 and

[6] Trammel net data were not included in electrofishing species composition charts given the limited number and diversity of captured fish.

Figure 3-10). Site B had the highest abundance of juvenile hardhead minnow. No rainbow trout were captured at this site.

5.3.2.3 Site C

At Site C, 118 fish were collected (Table 3-4, Table 3-9, and Figure 3-8c). The fish community was dominated by Sacramento sucker (64.4 percent; 76 fish), followed by hardhead minnow (17.8 percent; 21 fish) and brown bullhead catfish (11.9 percent; 14 fish). Largemouth bass and channel catfish each made up approximately 3 percent of the catch, with 3 and 4 individuals captured, respectively (Table 3-9 and Figure 3-8c). Based on fish population estimates, Site C had the second highest combined species density and biomass across all sampling sites when the analysis included Sacramento suckers, and the highest combined species density and biomass without Sacramento suckers (Table 3-9, Figure 3-9, and Figure 3-10). No rainbow trout or smallmouth bass were captured at this site.

5.3.2.4 Site D

At Site D, 159 fish were collected (Table 3-4, Table 3-9, and Figure 3-8d), including 136 fish captured during backpack electrofishing and 23 fish captured with trammel nets. Based on the number of fish captured during backpack electrofishing, species composition at Site D was dominated by Sacramento sucker (55.1 percent; 75 fish) and brown bullhead catfish (30.9 percent; 42 fish), followed by largemouth bass (8.1 percent; 11 fish) and lesser numbers of smallmouth bass (2.9 percent; 4 fish), channel catfish (2.2 percent; 3 fish), and rainbow trout (0.7 percent; 1 fish) (Table 3-9 and Figure 3-8d). Based on calculated fish population estimates, Site D had lower combined species density and biomass estimates than Site C or Site E, but higher species density and biomass than Site B (Table 3-9, Figure 3-9, and Figure 3-10). Fish captured by trammel net sampling in the deep pool downstream of Site D were primarily adult Sacramento sucker (22 fish). One adult white catfish was also captured. No hardhead minnows were captured at this site via backpack electrofishing or trammel net.

5.3.2.5 Site E

At Site E, 172 fish were collected (Table 3-4, Table 3-9, and Figure 3-8e) during backpack electrofishing. No fish were captured during trammel netting in the large, deep pool immediately downstream of this site. The species composition was dominated by Sacramento sucker (77.3 percent; 133 fish), followed by brown bullhead catfish (14.5 percent; 25 fish) and hardhead minnow (8.1 percent; 14 fish) (Table 3-9 and Figure 3-8e). Due to the large number of Sacramento suckers captured, Site E had the highest combined species density and biomass estimate of all stream sampling sites (Table 3-9, Figure 3-9, and Figure 3-10). However, when Sacramento suckers were excluded from the analysis, Site E had combined species density and biomass estimates lower than Sites C and D, but higher than Site B. No rainbow trout or smallmouth bass were captured at this site.

5.3.3 Bypass Reach Trammel Net Catch Per Unit Effort (CPUE)

CPUE during 2025 trammel net sampling in the bypass reach for the two sampling sites combined (Sites D and E) was highest for Sacramento sucker (1.78 fish/net hour), followed by white catfish (0.08 fish/net hour) (Table 3-10).

5.3.4 Length-Frequency

Length-frequency histograms were created for species collected during backpack electrofishing sampling in the bypass reach. A length-frequency histogram by species for all sampling sites is shown in Figure 3-11. Individual length-frequency histograms for each individual sampling site and species are provided in Appendix B. Length-frequency histograms for trammel net sampling in the bypass reach were not developed, as the monofilament mesh size of the nets (4-inch) resulted in a relatively selective size of fish that could be captured. All fish captured during 2025 trammel net sampling in the bypass reach (22 Sacramento suckers and one white catfish) were between 290-510 mm FL.

Evaluation of age classes in the bypass reach based on length-frequencies was possible for Sacramento sucker, hardhead, smallmouth bass, largemouth bass, and brown bullhead catfish. Age class analysis was not possible for other fish species due to an insufficient number of fish.

Sacramento suckers in the bypass reach represented three size cohorts (Figure 3-11, Appendix B). The smallest cohort, which ranged from approximately 90 – 180 mm FL, was likely all young-of-the-year (YOY) fish. The middle cohort, which ranged from approximately 230 – 310 mm FL, likely consisted of 1+ aged fish. The largest cohort, ranging from approximately 370 – 470 mm FL, likely consisted of 2+ and greater aged fish (Figure 3-11, Appendix B).

Two size cohorts were apparent in hardhead minnow captured in the bypass reach. The smallest cohort, which ranged from approximately 60 – 100 mm FL, was YOY individuals, and the second cohort, which ranged from approximately 160 – 210 mm FL, likely consisted of individuals 1+ and older. A few larger adult hardhead minnows over 250 mm FL were also captured, but catch data were insufficient to establish a definitive cohort (Figure 3-11, Appendix B).

One cohort of smallmouth bass (approximately 100 – 140 mm FL) was observed in the bypass reach and generally included juvenile YOY fish. These juvenile smallmouth bass were generally larger than the juvenile largemouth bass captured in the bypass reach, likely reflecting earlier spawning dates of smallmouth bass. A few larger individuals over 180 mm FL were also captured (Figure 3-11, Appendix B).

Only one cohort of largemouth bass (approximately 60 – 120 mm FL) was observed in the bypass reach and generally included juvenile YOY fish. A few larger individuals over 180 mm FL were also captured (Figure 3-11, Appendix B).

Two cohorts of brown bullhead catfish were observed in the bypass reach, ranging from approximately 50 – 100 mm TL (YOY) and 120 – 160 mm TL (likely 1+ and older age fish)

(Figure 3-11, Appendix B). Length differences between these two cohorts were not as pronounced in this species due to the shorter maximum length.

5.3.5 Condition Factor and Fish Health

The average condition factor for all species observed in the bypass reach during 2025 backpack electrofishing and trammel net sampling ranged from 1.00 to 1.27, representing fish in healthy condition (Table 3-11). For native species, the average condition factor for hardhead minnow was 1.01 and the average condition factor for Sacramento sucker was 1.19. The single rainbow trout captured at Site D had a condition factor of 1.0.[7] The average condition factor for largemouth bass was 1.24 and the one smallmouth bass captured with an FL greater than 150 mm had a condition factor of 1.27. For other non-native catfish species (brown bullhead catfish, channel catfish, and white catfish) condition factors for individual fish ranged from 0.96-1.44 (Table 3-11).

There were no obvious signs of disease or other indications of poor health in fish sampled in the bypass reach. Lack of parasites or disease indicators combined with normal body condition averages were indicative of fish populations in good health. Photos of native and non-native fish species captured in the bypass reach are provided in Appendix C.

5.3.6 Comparison to Recent and Historical Data

The fish assemblage data collected in 2025 in the bypass reach was compared to historical data from 1999-2008 (ENTRIX 2009) in the bypass reach and recent data collected at the Borel Project on the Kern River between Lake Isabella and the Democrat Dam Impoundment (Cardno 2021) (Table 3-12). Overall, more fish were collected in 2025 (n=591) than during the 1999-2008 sampling, where the number of fish varied from 90 to 419 depending on year, or during 2020 sampling in the Borel Project area (n=574). However, the sampling effort varied between studies and sampling years. During 1999-2008 sampling, surveys consisted of backpack or barge electrofishing in 150-foot-long (45.7 m) reaches at five sites, for a total of 750 feet (229 m). Sampling in 2020 as part of the Borel Project consisted of boat or backpack electrofishing in three reaches totaling 1,129 feet (344 m). With the increased length of river sampled in the bypass reach in 2025, a wider range of habitat types were represented than in previous years including a greater proportion of riffle habitat.

In general, the fish assemblage observed in 2025 was similar to what was documented in previous years, consisting of many introduced, cool and warm water game and non-game fish species. Species richness in the bypass reach varied year to year, ranging from 6 species in 2006 to 12 species in 2002; 8 species were collected in the bypass reach in 2025 and 11 species were collected in the Borel reach in 2020 (Table 3-12).

[7] Condition factors for trout can range from <0.6 to >2.0 (Carlander 1969), where starving fish often have a condition factor <0.7 (Reimers 1963; Carlander 1969), and exceptionally healthy fish have high condition factors (e.g., >1.5).

Species composition in the bypass reach in 2025 was characterized by more hardhead minnows and a greater proportion of native species as compared to previous years (1999-2008); in 2025, hardhead and Sacramento sucker comprised 77 percent of the total catch in the bypass reach. More hardhead minnows were captured in 2025 than in all other previous sample years in the bypass reach combined (Table 3-12). The presence of a robust cohort of juvenile hardhead minnow, combined with the presence of large adults, indicates ongoing reproduction and survival in the bypass reach. Sacramento suckers, which historically comprised a large proportion of the overall fish assemblage in the bypass reach, were the most abundant species collected in 2025.

Smallmouth bass abundance in the bypass reach was lower in 2025 than in previous sampling years and lower than in the Borel Project reach in 2020 (Table 3-12). Largemouth bass abundance in 2025 was comparable to historical data. Rainbow trout continued to occur at low densities in the bypass reach in 2025 as was documented during historical sampling years (i.e., 2001 and 2008).

Several non-native species captured in the bypass reach in previous years were not observed during 2025 sampling, including goldfish (*Carassius auratus*), common carp, and mosquitofish (*Gambusia affinis*). However, brown bullhead catfish were more abundant in 2025 than in previous years. No species were captured in 2025 that had not been observed in previous sampling.

5.4 NORTHWESTERN POND TURTLE AND OTHER INCIDENTAL OBSERVATIONS

Two northwestern pond turtles were observed in the Democrat Dam Impoundment on October 16, 2024. One juvenile (estimated to be 2 to 3 years old) was observed along the northern shoreline of the impoundment. The individual appeared to be healthy and in good condition. An adult male northwestern pond turtle was also observed basking in the northeast portion of the impoundment. Additionally, a red-eared slider was seen foraging underwater in the impoundment in the fall of 2024. Locations of northwestern pond turtle individuals observed in the impoundment are shown in Map 4-1.

No northwestern pond turtles were observed during 2025 fish population sampling efforts or site reconnaissance visits in the bypass reach. During the 2025 fish population surveys, suitable basking and aquatic refuge habitats were visually scanned prior to entering the site to search for presence of northwestern pond turtles. However, cool air temperatures and reduced solar exposure during fish population surveys in December 2025 may have limited the potential for observing basking or foraging northwestern pond turtles. Suitable basking habitat primarily consisting of exposed bedrock or boulders was observed throughout the reach. Some suitable breeding habitat (i.e., grassy terraces above the high-water mark with friable soil) was also observed.

Three invasive aquatic species were observed during the study. One American bullfrog (*Lithobates catesbeianus*) tadpole was observed at Site B during backpack electrofishing sampling (see Appendix C, Photo C-12). Asian clam (*Corbicula fluminea*) and curly-leaf pondweed (*Potamogeton crispus*) were observed throughout the study area during sampling in 2024 and 2025 (Appendix C, Photo C-13).

5.5 IN-SITU WATER TEMPERATURE AND SPECIFIC CONDUCTANCE

In-situ water temperature and specific conductance data were collected in the Democrat Dam Impoundment and the bypass reach during 2024 and 2025 fisheries sampling. Water temperature during 2024 sampling efforts in the impoundment ranged from 19.5 – 20.8 degrees Celsius (°C) and specific conductivity was approximately 135 – 147 microsiemens per centimeter (µS/cm). During bypass reach sampling in 2025, water temperature ranged from 8.5 to 9.2°C, and specific conductivity was approximately 110 – 165 µS/cm, with the highest conductivity observed at Site C. Additional information on water temperature and water quality data collected in the bypass reach and the impoundment during 2024 and 2025 is provided in the AQ 2 TM (SCE 2026).

6.0 STUDY-SPECIFIC CONSULTATION

The following study-specific consultation was conducted:

- **August 8, 2024:** A Technical Working Group meeting for aquatic resources was held to obtain stakeholder and resource agency input on the implementation of the fish population study. Details of field studies were covered, including specific locations of the fish sampling sites.

- **February 28, 2025:** The initial AQ 3 – ITM was provided to relicensing stakeholders for a 90-day review. SCE presented the results of the 2024 fish population monitoring study in the ISR and at the ISR meeting held on March 19, 2025. No comments on the AQ 3 ITM were received.

- **December 18, 2025:** SCE filed an updated AQ 3 ITM (exclusive of 2025 results) as an appendix to the DLA. To date, no comments have been received.

7.0 OUTSTANDING STUDY PLAN ELEMENTS

There are no outstanding study plan elements.

8.0 REFERENCES

Carlander, K.D. 1969. Handbook of Freshwater Fishery Biology, Volume 1. Iowa State University Press. pp. 752.

Cardno. 2021. Final Borel Fish Monitoring Report 2020. Southern California Edison Borel Hydroelectric Project. April 2021.

ENTRIX. 1994. Results of Kern River No. 1 Diversion Dam Poll Fish Sampling and Hydroacoustics Survey. Prepared for Southern California Edison, Rosemead, California.

_____. 1995. Results of Kern River No. 1 Diversion Dam Poll Fish Sampling and Hydroacoustics Survey. Prepared for Southern California Edison, Rosemead, California.

_____. 2009. Kern River No. 1 Hydroelectric Project Smallmouth Bass Study. Southern California Edison. San Dimas, California Project No. 3006663. March 2009.

FERC (Federal Energy Regulatory Commission). 2024. Study Plan Determination for the Kern River No. 1 Hydroelectric Project. March 14.

Flosi, G., S. Downie, J. Hopelain, M. Bird, R. Coey and B. Collins. 1998. California Salmonid Steam Restoration Manual, Third Edition. State of California, The Resources Agency, California Department of Fish and Game, Inland Fisheries Division, Sacramento, CA.

OEHHA (Office of Environmental Health Hazard Assessment). 2005. General Protocol for Sport Fish Sampling and Analysis. December 2005.

Reimers, N. 1963. Body condition, water temperature, and over-winter survival of hatchery-reared trout in Convict Creek, California. *Transactions of the American Fisheries Society* 92(1):39-46.

Rexstad, E. and K. Burnham. 1992. User's Guide for Interactive Program CAPTURE. Colorado Cooperative Fish and Wildlife Research Unit, Colorado State University, Fort Collins, CO.

Reynolds, J.B. 1996. Electrofishing. Pages 83-120 in B.R. Murphy and D.W. Willis, editors. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

Ricker, W. E. 1975. Computation and Interpretation of Biological Statistics of Fish Populations. Bulletin 191. Depart. Environ. Fish. And Marine Service, Ottawa.

SCE (Southern California Edison). 2023. Kern River No. 1 Hydroelectric Project (FERC Project No. 1930) Preliminary Application Document.

_____. 2024. Kern River No. 1 Hydroelectric Project (FERC Project No. 1930) Revised Study Plan. February 13.

_____. 2026. Kern River No. 1 Hydroelectric Project (FERC Project No. 1930) AQ 2 – Water Quality/Water Temperature Technical Memorandum.

Van Deventer, J.S. and W.S. Platts. 1989. Microcomputer software system for generating population statistics from electrofishing data-User's guide for MicroFish 3.0. US Department of Agriculture, Forest Service. Intermountain Research Station, General Technical Report INT-254.

TABLES

Table 3-1. Fish Population Sampling Site Locations in the Kern River No.1 Bypass Reach and Democrat Dam Impoundment

Study Sites [1, 2]	River Mile	GPS at Downstream Starting Location		Unit Name[3]	Habitat Type	Unit Length (meters)	Unit Width (meters)	Average Depth (meters)	Max. Depth (meters)	Sampling Date	Sampling Method
		Latitude	Longitude								
Democrat Dam Impoundment	54.5-55.5	35.52615	-118.67446	-	Res.	1,609	-	-	-	10/15-10/17 (2024)	Electrofishing (cataraft)
	54.5	35.52691	-118.67441	DD-T1	Res.	NA	NA	NA	NA	9/30/2025	Trammel Net
	55.5	35.52923	-118.66623	DD-T2	Res.	NA	NA	NA	NA	10/1/2025	Trammel Net
Site A - Kern River Bypass Reach	52.5	35.50465	-118.69156	A-1	Riffle	60	21	0.90	2.7	12/5/2025	Backpack Electrofishing
	52.8	35.50928	-118.69100	A-2	Pool	65	24	0.90	2.7	12/4/2025	Backpack Electrofishing
Site B - Kern River Bypass Reach	51.25	35.49304	-118.70433	B-1	Pool	45	14	0.45	1.1	12/4/2025	Backpack Electrofishing
	51.3	35.49307	-118.70382	B-2	Riffle	48	20	0.36	1.1		Backpack Electrofishing
Site C - Kern River Bypass Reach	50.25	35.48312	-118.71192	C-1	Pool	36	14	0.70	1.5	12/3/2025	Backpack Electrofishing
	50.3	35.48357	-118.71188	C-2	Riffle	58	14	0.54	1.7		Backpack Electrofishing
Site D - Kern River Bypass Reach	48.9	35.47625	-118.72101	D-1	Pool	54	16	0.67	1.2	12/2/2025	Backpack Electrofishing
	48.95	35.47596	-118.72047	D-2	Riffle	62	23	0.39	1.0		Backpack Electrofishing
	48.8	35.47680	-118.72330	D-T1	Pool	NA	NA	NA	NA		Trammel Net
	48.7	35.47615	-118.72424	D-T2	Pool	NA	NA	NA	NA		Trammel Net
Site E - Kern River Bypass Reach	47.15	35.48106	-118.74316	E-1	Riffle	16	16	0.39	0.6	12/1/2025	Backpack Electrofishing
	47.15	35.48109	-118.74301	E-2	Pool	40	14	0.79	1.7		Backpack Electrofishing
	47.2	35.48076	-118.74289	E-3	Riffle	42	16	0.27	0.9		Backpack Electrofishing
	47.1	35.48214	-118.74327	E-T1	Pool	NA	NA	NA	NA	12/3/20205	Trammel Net

Notes: [1] Study site locations in 2025 were representative of those used in the historical studies (1998-2008) to allow for comparison with recent data, with some variations due to site safety and geomorphological changes.
[2] See Maps AQ 3-1(a-e) for an overview of stream sampling sites and unit locations.
[3] Study sites were subdivided into units based on the habitat types within the sample area where applicable.
Key: NA = not applicable

Table 3-2. Fish Species Observed During Fish Population Sampling in the Kern River No. 1 Bypass Reach and Democrat Dam Impoundment

Study Site	Fish Species											
	Native Species		Non-Native/Introduced Species									
	Hardhead	Sacramento sucker	Rainbow trout	Smallmouth bass	Largemouth bass	Black crappie	Bluegill sunfish	Brown bullhead	Common carp	Channel catfish	White catfish	Threadfin shad
Democrat Dam Impoundment	•	•	-	-	•	•	•	•	•	•	•	•
Site A - Kern River Bypass Reach	•	•	-	-	•	-	-	•	-	-	•	-
Site B - Kern River Bypass Reach	•	•	-	•	•	-	-	•	-	-	-	-
Site C - Kern River Bypass Reach	•	•	-	-	•	-	-	•	-	•	-	-
Site D - Kern River Bypass Reach	-	•	•	•	•	-	-	•	-	•	•	-
Site E - Kern River Bypass Reach	•	•	-	-	-	-	-	•	-	-	-	-

Key: • = Species observed at this site
- = Species not observed at this site

Table 3-3. Life Stage Periodicities for Species Observed during Fish Population Sampling in the Kern River No. 1 Bypass Reach and Democrat Dam Impoundment [1]

Month	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Hardhead minnow												
Spawning												
Larval												
Juvenile												
Adult												
Sacramento sucker												
Spawning												
Larval												
Juvenile												
Adult												
Rainbow trout												
Spawning												
Fry												
Juvenile												
Adult												
Smallmouth bass												
Spawning												
Fry												
Juvenile												
Adult												
Largemouth bass												
Spawning												
Fry												
Juvenile												
Adult												
Black crappie												
Spawning												
Larval												
Juvenile												
Adult												
Bluegill sunfish												
Spawning												
Larval												
Juvenile												
Adult												
Brown bullhead catfish												
Spawning												
Larval												
Juvenile												

Month	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
Adult												
Common carp												
Spawning												
Larval												
Juvenile												
Adult												
Channel catfish												
Spawning												
Larval												
Juvenile												
Adult												
White catfish												
Spawning												
Larval												
Juvenile												
Adult												
Threadfin shad												
Spawning												
Larval												
Juvenile												
Adult												

Notes: [1] Periodicity estimates are based on available literature including reports from adjacent watersheds and published life history references for California freshwater fishes. Actual spawning and rearing timelines may vary in response to varying environmental and hydrological conditions.

Sources: SCE. 2009. Final Report Kern River No.1 Hydroelectric Project Smallmouth Bass Study.
SCE 2019. Kaweah Project, FERC Project No. 298, AQ 2 - Fish Population Draft Technical Study Report.
SCE 2024. Kern River No. 1 AQ-3 Fish Population Study Interim Study Report.
Moyle 2002. Inland Fishes of California.

Table 3-4. Summary of Fish Abundance and Distribution - Fish Population Sampling in the Kern River No. 1 Bypass Reach and Democrat Dam Impoundment

Study Site	Fish Species												
	Hardhead	**Sacramento sucker**	**Rainbow trout**	**Smallmouth bass**	**Largemouth bass**	**Brown bullhead**	**Black crappie**	**Bluegill**	**Common carp**	**Channel catfish**	**Threadfin shad**	**White catfish**	**Site Total**
Dem. Dam Impound[1]	2	50	0	0	131	15	7	8	13	1	96	6	329
Dem. Dam Impound[2]	1	0	0	0	2	0	0	0	0	3	0	44	50
Total	**3**	**50**	**0**	**0**	**133**	**15**	**7**	**8**	**13**	**4**	**96**	**50**	**379**
Bypass Site A[1]	12	33	0	0	2	2	0	0	0	0	0	1	50
Bypass Site B[1]	38	35	0	5	9	5	0	0	0	0	0	0	92
Bypass Site C[1]	21	76	0	0	3	14	0	0	0	4	0	0	118
Bypass Site D[1]	0	75	1	4	11	42	0	0	0	3	0	0	136
Bypass Site D[2]	0	22	0	0	0	0	0	0	0	0	0	1	23
Bypass Site E[1]	14	133	0	0	0	25	0	0	0	0	0	0	172
Bypass Site E[2]	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**85**	**374**	**1**	**9**	**25**	**88**	**1**	**0**	**0**	**7**	**0**	**2**	**591**

Notes: [1] Sampled with backpack electrofishers.
[2] Sampled with trammel nets.

Table 3-5. Species and Fork Length Range of Fish Collected from Democrat Dam Impoundment, 2024-2025 (E-Cat and Trammel Net)

Species	Total Fish Captured (n)	Length Range (mm)[1]	Percent Catch by Species
Largemouth bass	133	44-520	35.1
Threadfin shad	96	43-103	25.3
Sacramento sucker	50	81-525	13.2
White catfish	50	150-445	13.2
Brown bullhead catfish	15	159-251	4.0
Common carp	13	475-610	3.4
Bluegill sunfish	8	44-169	2.1
Black crappie	7	104-223	1.8
Channel catfish	4	211-545	1.1
Hardhead minnow	3	86-374	0.8
Total	**379**	**43-610**	**100%**

Notes: [1] Fork length was measured for all species with a forked caudal fin; total length was measured for species without a forked caudal fin (i.e., brown bullhead catfish).
Key: mm = millimeter
n = number

Table 3-6. Catch Rates by Sampling Pass (Fish per Mile Sampled) from E-Cat Electrofishing in Democrat Dam Impoundment, 2024

Date	Pass	Length of Pass (miles)	Total No. Fish	Fish/mi	Species																	
					Hardhead Minnow		Sacramento Sucker		Largemouth Bass		Black Crappie		Bluegill Sunfish		Brown Bullhead		Common Carp		Channel Catfish		White Catfish		Threadfin Shad	
					n	Fish/mi	n	Fish/mi	n	Fish/mi	n	Fish/mi	n	Fish/mi	n	Fish/mi	n	Fish/mi	n	Fish/mi	n	Fish/mi	n	Fish/mi
10/15/2024	1	0.48	15	31	–	–	9	18.8	–	–	–	–	–	–	1	2.1	–	–	–	–	1	2.1	4	8.3
	2	0.48	60	125	1	2.1	5	10.4	10	20.8	3	6.3	3	6.3	2	4.2	–	–	–	–	3	6.3	33	68.8
	3	0.41	45	110	1	2.4	3	7.3	17	41.5	2	4.9	–	–	–	–	2	4.9	–	–	–	–	20	48.8
	4	0.47	31	66	–	–	7	14.9	22	46.8	–	–	–	–	–	–	2	4.3	–	–	–	–	–	–
10/16/2024	1	1.09	62	57	–	–	4	3.7	30	27.5	1	0.9	2	1.8	5	4.6	2	1.8	1	0.9	1	0.9	16	14.7
	2	0.37	6	16	–	–	–	–	5	13.5	–	–	1	2.7	–	–	–	–	–	–	–	–	–	–
	3	0.62	25	40	–	–	13	21	6	9.7	–	–	–	–	2	3.2	4	6.5	–	–	–	–	–	–
10/17/2024	1	0.46	57	124	–	–	6	13	29	63	–	–	2	4.3	2	4.3	2	4.3	–	–	1	2.2	14	30.4
	2	0.27	28	104	–	–	3	11.1	12	44.4	–	–	–	–	3	11.1	1	3.7	–	–	–	–	9	33.3
Total[1]		**4.65**	**329**	**–**	**2**	**0.4**	**50**	**10.8**	**131**	**28.2**	**6**	**1.3**	**8**	**1.7**	**15**	**3.2**	**13**	**2.8**	**1**	**0.2**	**6**	**0.5**	**96**	**2.3**

Notes: [1] Total fish/mi estimates for each species were calculated by dividing the total number of captured fish by the total sample distance (4.65 miles).
Key: fish/mi = fish per mile
n = number

Copyright 2026 by Southern California Edison

Table 3-7. Catch per Unit Effort (CPUE) from Trammel Net Sampling in Democrat Dam Impoundment, 2025[1]

Date	Total Nets Deployed	Total Deployment Hours	Average Hours Per Net	Totals		Hardhead minnow		Largemouth bass		Channel catfish		White catfish	
				Total Fish	Fish per net hour	Total Fish	Fish per net hour	Total Fish	Fish per net hour	Total Fish	Fish per net hour	Total Fish	Fish per net hour
9/30/2025-10/1/2025	2	8.26	4.13	50	6.05	1	0.12	2	0.24	3	0.36	44	5.33

Notes: [1] Two 300-foot-long, 8-feet-deep trammel nets were set for approximately 4-hours. One net was set in the late afternoon, and one net was set in the morning.

Table 3-8. Condition Factors of Species Captured during 2024-2025 Sampling in Democrat Dam Impoundment

Species	Number of Fish ≥ 150 mm[1, 2]	Fulton's Condition Factor		
		Average	Minimum	Maximum
White catfish	50	1.19	0.99	1.65
Sacramento sucker	49	1.35	0.84	2.55
Largemouth bass	27	1.45	0.69	2.40
Brown bullhead catfish	15	1.3	0.75	1.68
Common carp	13	2.02	1.25	2.66
Black crappie	6	1.52	1.34	1.79
Bluegill sunfish	5	2.92	2.31	3.53
Channel catfish	4	1.14	0.83	1.58
Hardhead minnow	2	1.43	1.38	1.48

Notes: [1] Includes fish captured by electrofishing cataraft (E-Cat) and trammel net sampling.
[2] Condition factor analysis excludes fish under 150 mm in length.
Key: mm = millimeter(s)

Table 3-9. Density, Biomass, and Population Estimates of Fish Species Captured at Backpack Electrofishing Sites in the Kern River No. 1 Bypass Reach, 2025[1]

Site Name	Species	Number of Fish Captured[2]	Population Estimate[3]	Species Density		Species Biomass	
				Fish Per Mile	Fish Per Acre	Pounds per Mile	Pounds per Acre
Site A	Sacramento sucker	33	no multi-pass depletion sampling performed at Site A in 2025[6]				
	Hardhead minnow	12					
	Brown bullhead catfish	2					
	Largemouth bass	2					
	White catfish	1					
	Rainbow trout	0					
	Smallmouth bass	0					
	Channel catfish	0					
	Total[4]	**50**					
Site B	Hardhead minnow	38	41	1,382.40	179.7	19	2.4
	Sacramento sucker	35	39	1,315.40	171.3	486.9	65.2
	Largemouth bass	9	9	312.3	47.1	7.2	1.1
	Smallmouth bass	5	5	167.6	21.1	37.9	4.8
	Brown bullhead catfish	5	5	172.9	25.6	1.9	0.3
	Rainbow trout	0	0	0	0	0	0
	Channel catfish	0	0	0	0	0	0
	White catfish	0	0	0	0	0	0
	Total	**92**	**99**	**3,350.50**	**444.8**	**552.9**	**73.7**
Site C	Sacramento sucker	76	85	2,561.90	460.5	1,792.50	322.2
	Hardhead minnow	21	34	1418.3	254.9	17.5	3.2
	Brown bullhead catfish	14	14	575	103.4	44.6	8
	Channel catfish	4	6	268.2	48.2	55.1	9.9
	Largemouth bass	3	3	134.1	24.1	49.5	8.9
	Rainbow trout	0	0	0	0	0	0

Site Name	Species	Number of Fish Captured[2]	Population Estimate[3]	Species Density		Species Biomass	
				Fish Per Mile	Fish Per Acre	Pounds per Mile	Pounds per Acre
	Smallmouth bass	0	0	0	0	0	0
	White catfish	0	0	0	0	0	0
	Total	**118**	**142**	**3,794.20**	**770.3**	**1,959.30**	**352.2**
Site D	Sacramento sucker	75	93	2,418.00	265.6	2,798.70	305.9
	Brown bullhead catfish	42	50	1,466.80	223	92	13.9
	Largemouth bass	11	11	327.8	51.5	28.2	4.4
	Smallmouth bass	4	4	115.3	16.9	4.7	0.7
	Channel catfish	3	3	85.6	12.2	22	2.7
	Rainbow trout	1	(1)[5]	26	2.8	9.4	1
	Hardhead minnow	0	0	0	0	0	0
	White catfish	0	0	0	0	0	0
	Total	**136**	**161**	**4,439.40**	**572.1**	**2,955.00**	**328.6**
Site E	Sacramento sucker	133	157	10,188.50	1,617.80	7,198.00	1,139.1
	Brown bullhead catfish	25	25	993.2	176.4	11.7	2.1
	Hardhead minnow	14	16	737.8	121.8	40	6.6
	Rainbow trout	0	0	0	0	0	0
	Smallmouth bass	0	0	0	0	0	0
	Largemouth bass	0	0	0	0	0	0
	Smallmouth bass	0	0	0	0	0	0
	White catfish	0	0	0	0	0	0
	Total	**172**	**198**	**11,919.50**	**1,916.00**	**7,249.70**	**1,147.80**

Notes: [1] Density, biomass, and population estimates are calculated based on the lengths of individual sampled units within each site, rather than the total site length.
[2] Number of fish collected by backpack electrofishing.
[3] Fish population estimates were calculated using MicroFish software from electrofishing data.
[4] MicroFish population estimates were calculated separately for each species. The totals represented here are therefore simple sums and not statistically independent population, biomass, or density estimates.
[5] ( ) Insufficient information for maximum likelihood population estimate; actual catch was used for population estimate.
[6] Due to the difficult sampling environment (i.e., difficult terrain, deep water; see Appendix A photos), block nets could not be installed and multi-pass depletion sampling could not be conducted at Site A.

Copyright 2026 by Southern California Edison

Table 3-10. Catch per Unit Effort (CPUE) from Trammel Net Sampling in the Kern River No. Bypass Reach, 2025

Date	Site	Total Nets Deployed	Total Deployment Hours	Average Hours Per Net	Totals		Sacramento sucker		White catfish	
					Total Fish	Fish per net hour	Total Fish	Fish per net hour	Total Fish	Fish per net hour
12/2/2025	Site D	2	8.33	4.17	23	2.76	22	2.64	1	0.12
12/3/2025	Site E	1	4.00	4.00	0	0.00	0	0.00	0	0.00
Bypass Reach Total		**3**	**12.33**	**4.08**	**23**	**1.87**	**22**	**1.78**	**1**	**0.08**

Table 3-11. Condition Factors of Species Captured during 2025 Stream Sampling in the Kern River No. 1 Bypass Reach

Species	Number of Fish ≥ 150 mm [1,2]	Fulton's Condition Factor		
		Average	Minimum	Maximum
Sacramento sucker	285	1.19	0.55	3.12
Brown bullhead	14	1.15	0.97	1.31
Hardhead minnow	11	1.01	0.66	1.22
Channel catfish	7	1.08	0.96	1.21
Largemouth bass	6	1.24	1.08	1.43
White catfish	2	1.23	1.02	1.44
Rainbow trout	1	1.0	1.0	1.0
Smallmouth bass	1	1.27	1.27	1.27

Notes: [1] Includes fish captured by backpack electrofishing and trammel net sampling.
[2] Condition factor analysis excludes fish under 150 mm in length.

Table 3-12. Historical Comparison of Fish Collected During 1999-2008 and 2025 Fish Population Surveys in the Kern River No. 1 Bypass Reach and the 2020 Fish Population Surveys in the Borel Project Bypass Reach[1,2]

Species	Kern No. 1									Borel
	Oct-99	Jan-01	Oct-01	Oct-02	Nov-03	Oct-04	Oct-06	Oct-08	Dec-25	Oct-20
Sacramento sucker	234	40	45	79	33	23	13	58	374	499
Hardhead minnow	27	7	2	0	6	2	20	1	86	3
Sacramento pikeminnow	19	5	1	2	0	1	42	3	0	10
Rainbow trout	0	3	0	0	0	0	0	1	1	1
Smallmouth bass	118	71	33	168	96	92	15	23	9	45
Largemouth bass	6	8	10	17	21	17	16	0	25	2
Black crappie	0	0	0	14	10	0	0	0	0	0
Brown bullhead catfish[3]	0	0	0	14	12	1	0	3	88	4
Common carp	1	1	2	2	0	0	0	0	0	0
Channel catfish	2	3	2	7	0	1	0	0	7	3
Goldfish	0	0	0	51	4	0	0	0	0	0
Green sunfish	0	0	0	0	0	0	0	0	0	2
Mosquitofish	0	0	13	1	1	5	0	0	0	0
White catfish	12	49	6	31	7	6	10	1	1	2
White crappie	0	2	1	18	2	0	0	0	0	3
Total	**419**	**189**	**115**	**404**	**192**	**148**	**116**	**90**	**591**	**574**

Notes: [1] Sources include Entrix 2009 (1999-2008 data) and Cardno 2021 (Borel 2020 data).
[2] Level of effort for 1999-2008 Kern River No. 1 sampling (Entrix 2009) consisted of barge or backpack electrofishing approximately 750 linear feet of stream each year; 2020 Borel sampling (Cardno 2021) consisted of boat and backpack electrofishing approximately 1,129 linear feet of stream; 2025 Kern River No. 1 sampling consisted of backpack electrofishing approximately 1,726 linear feet of stream.
[3] Historical surveys in the bypass reach (1998-2008) did not identify bullhead catfish to species but were generally categorized as 'bullhead catfish species'. For the purposes of this report, they are identified as brown bullhead catfish.

Copyright 2026 by Southern California Edison

FIGURES

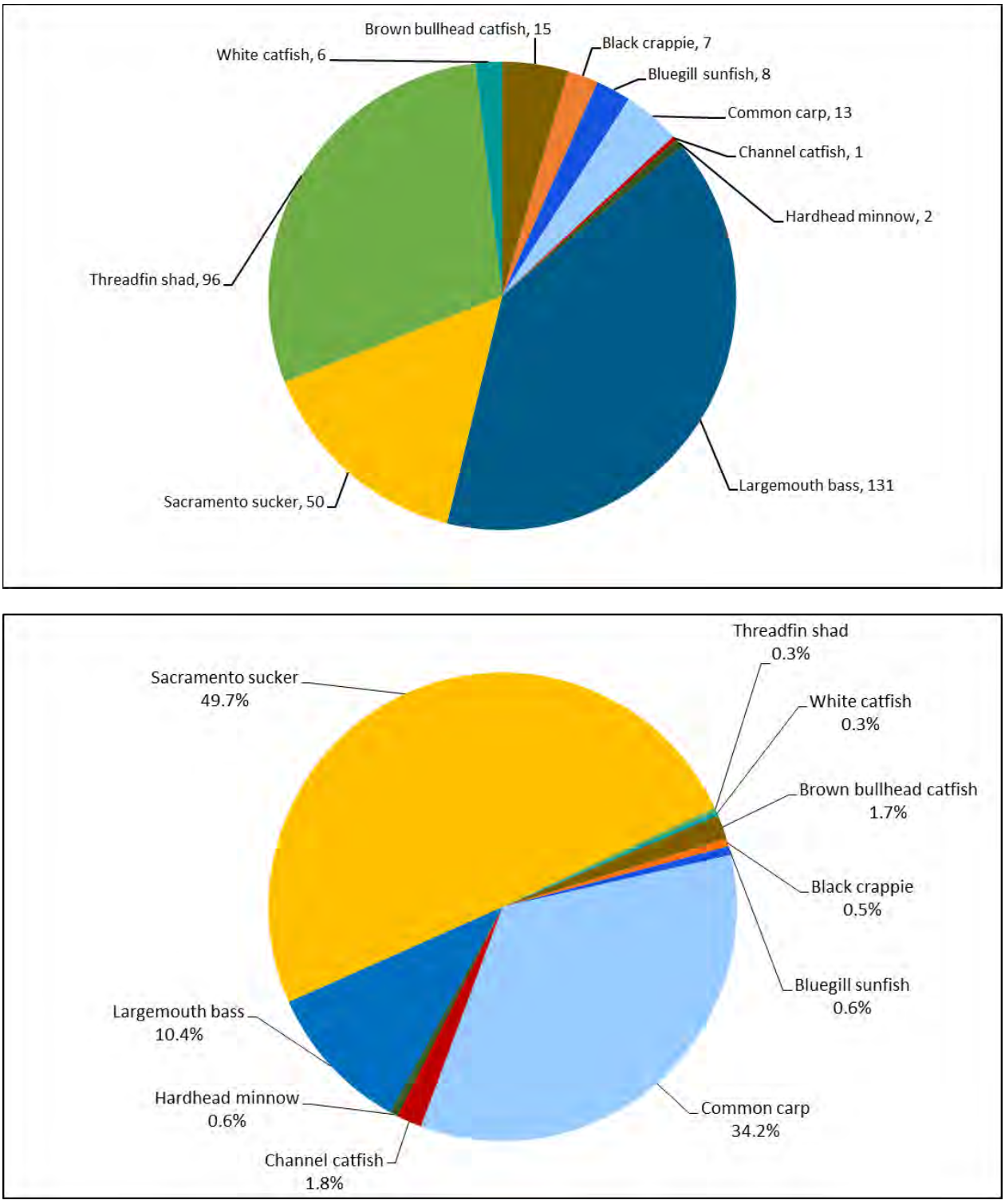


Figure 3-1. Fish Species Composition in the Democrat Dam Impoundment during 2024 E-Cat Sampling by Number Captured (top) and Biomass (bottom).

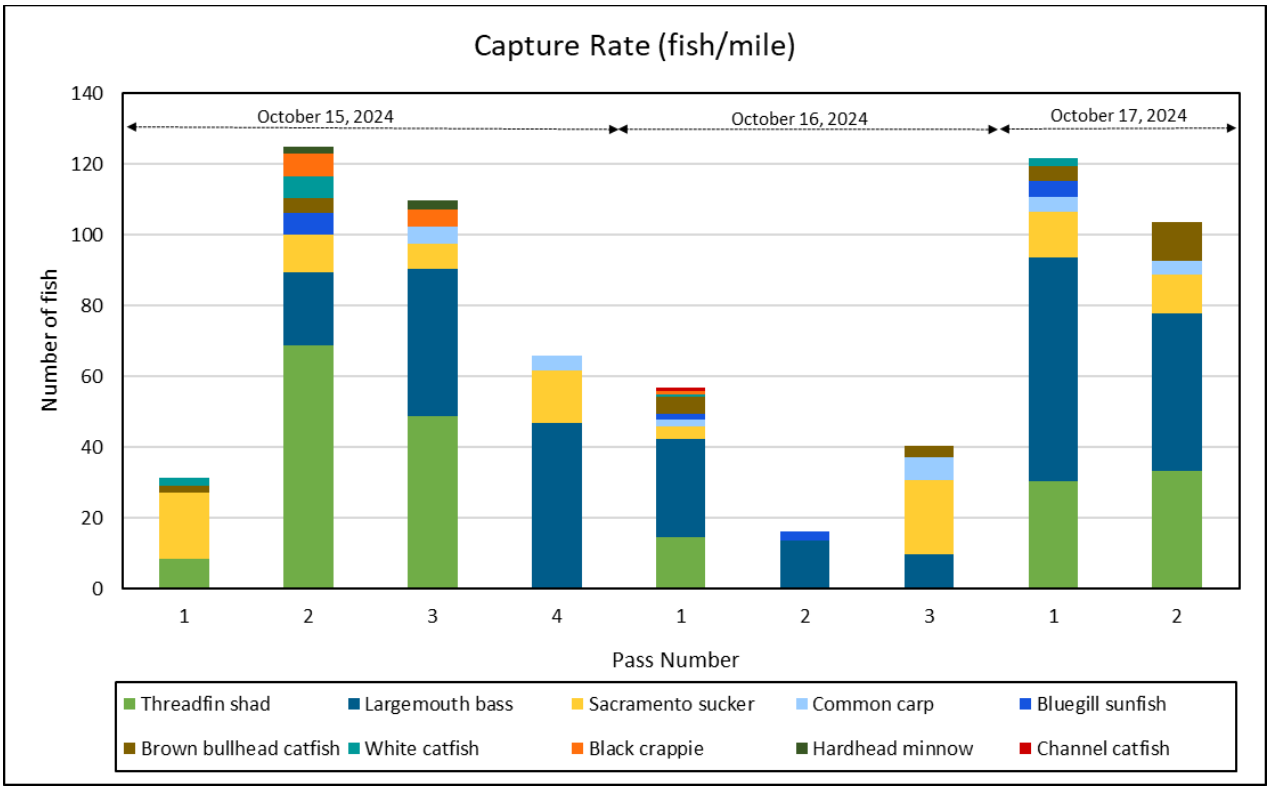
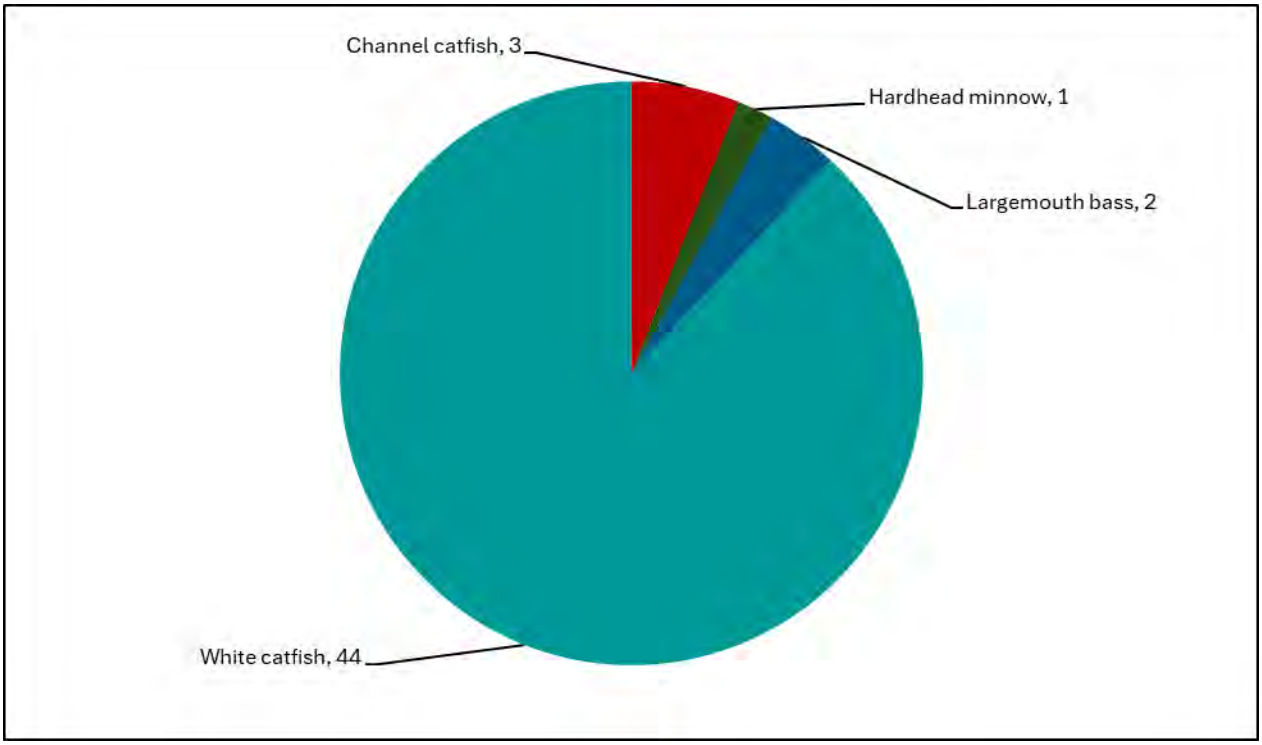


Figure 3-2. Fish Species Capture Rates by Sampling Transect (fish per mile) in Democrat Dam Impoundment in 2024.



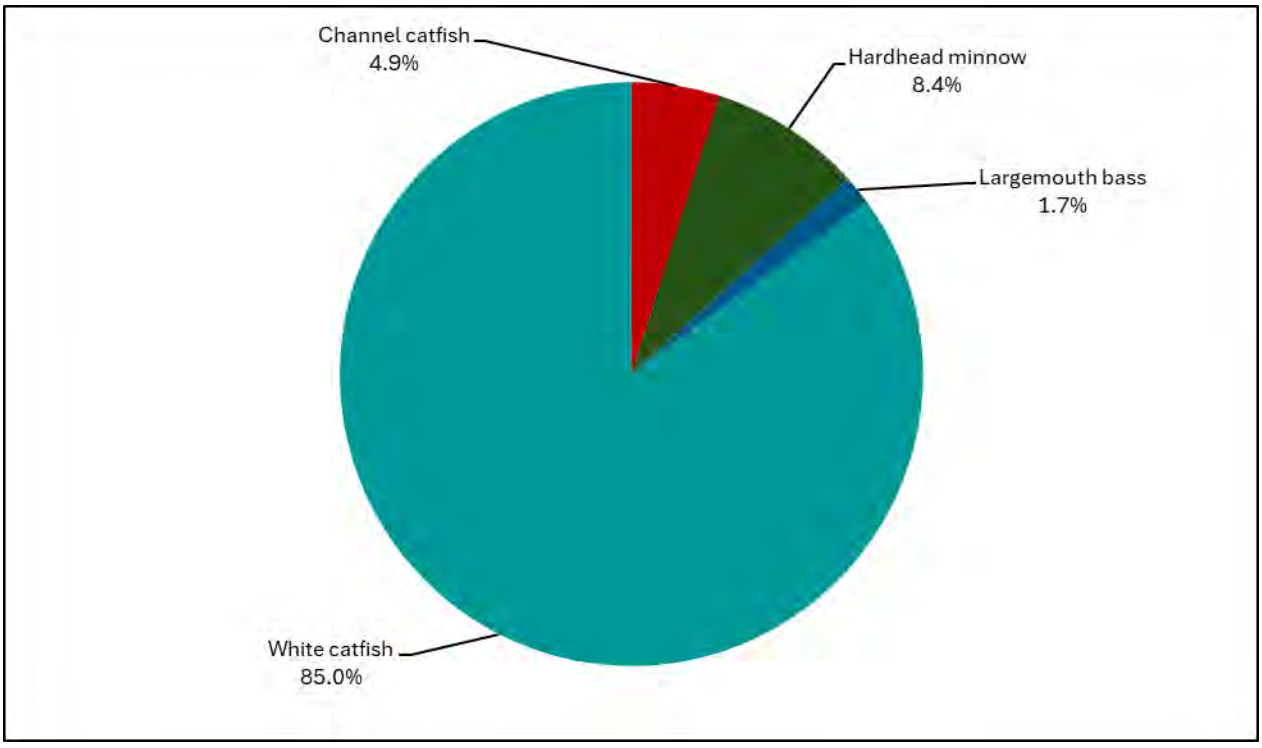


Figure 3-3. Fish Species Composition in Democrat Dam Impoundment during 2025 Trammel Net Sampling by Number Captured (top) and Biomass (bottom).

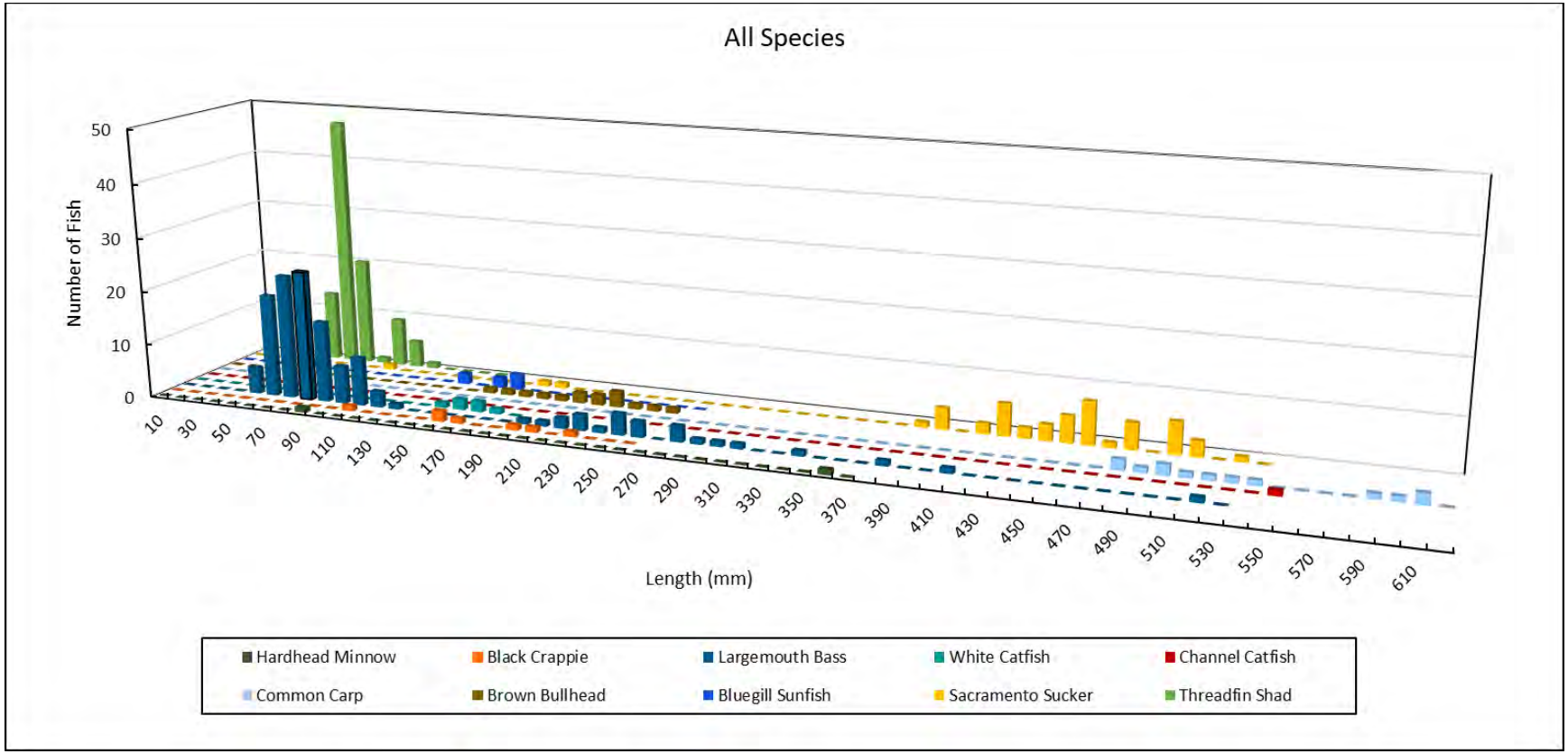
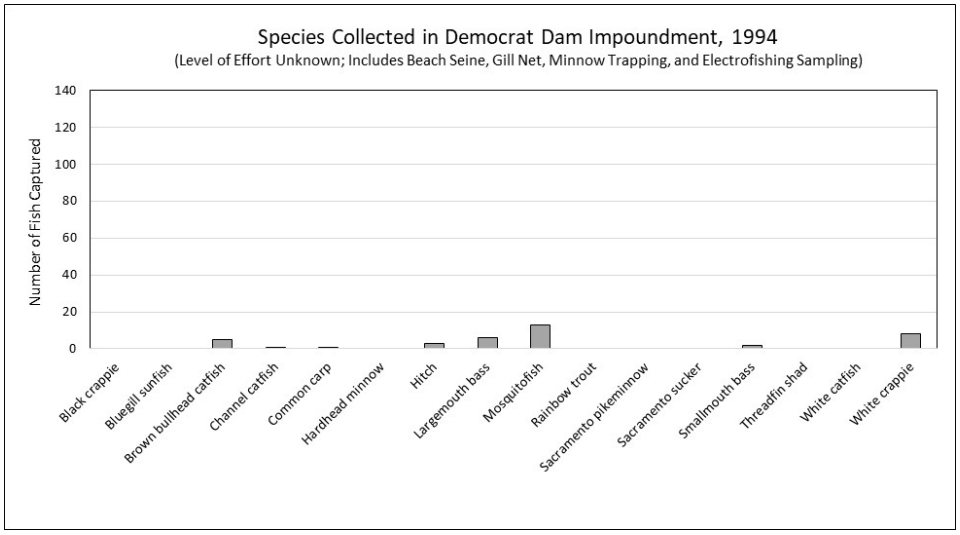
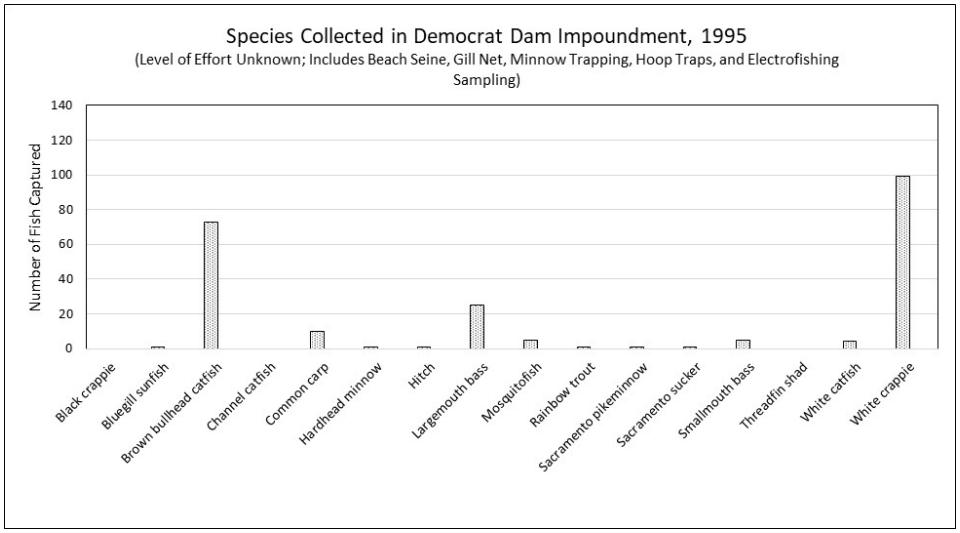


Figure 3-4. Length-Frequency Histogram for all Fish Species Captured during E-Cat Sampling in Democrat Dam Impoundment, 2024.





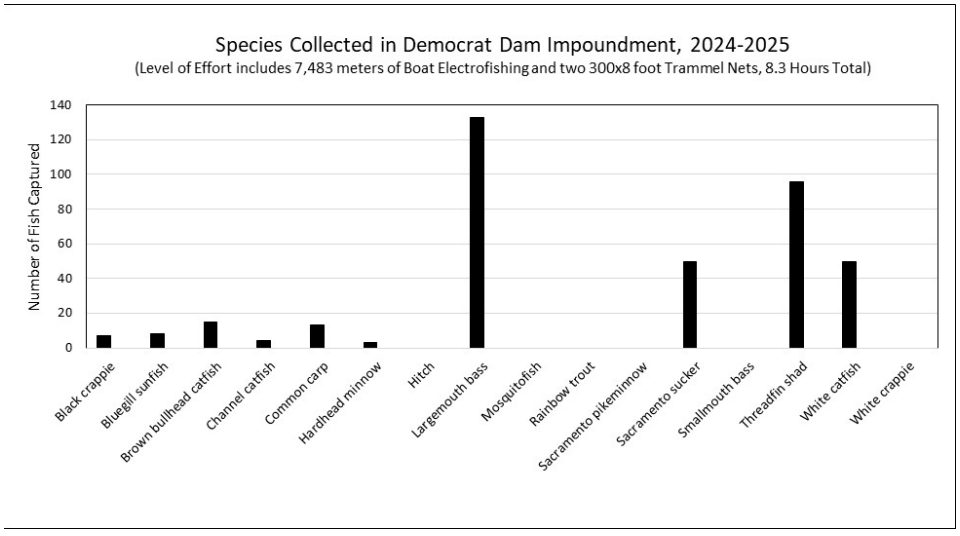


Figure 3-5. Historical Comparison of Fish Species Collected in Democrat Dam Impoundment during 1994, 1995, and 2024-2025 Sampling.

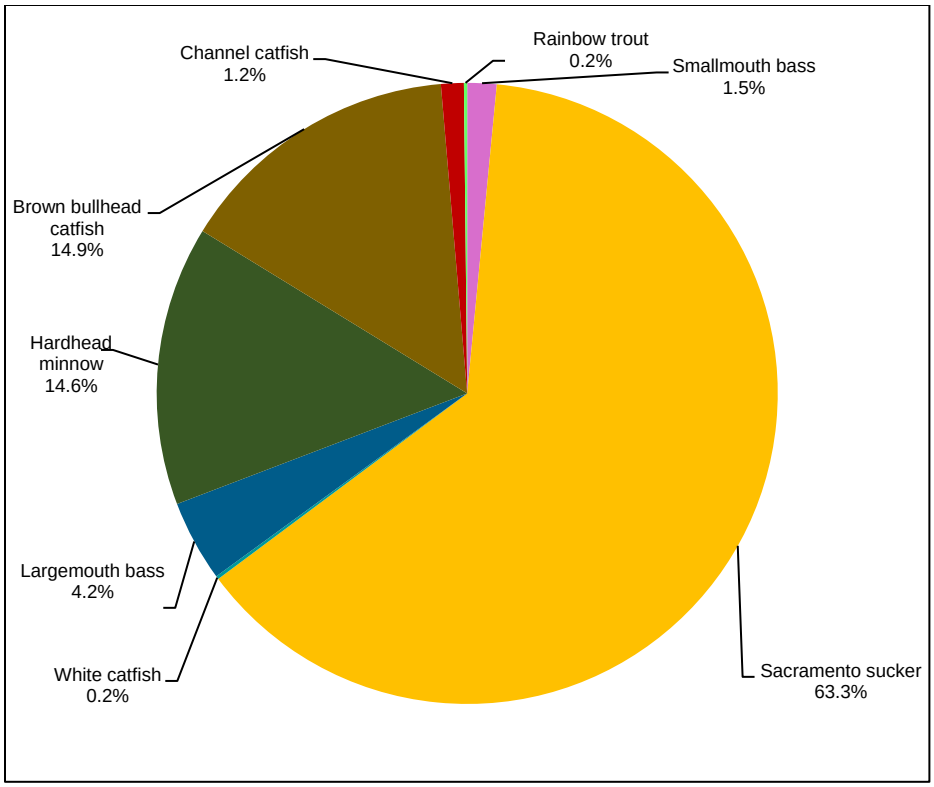


Figure 3-6. Fish Species Composition in the Kern River No. 1 Bypass Reach Backpack Electrofishing and Trammel Netting (total catch, n=591).

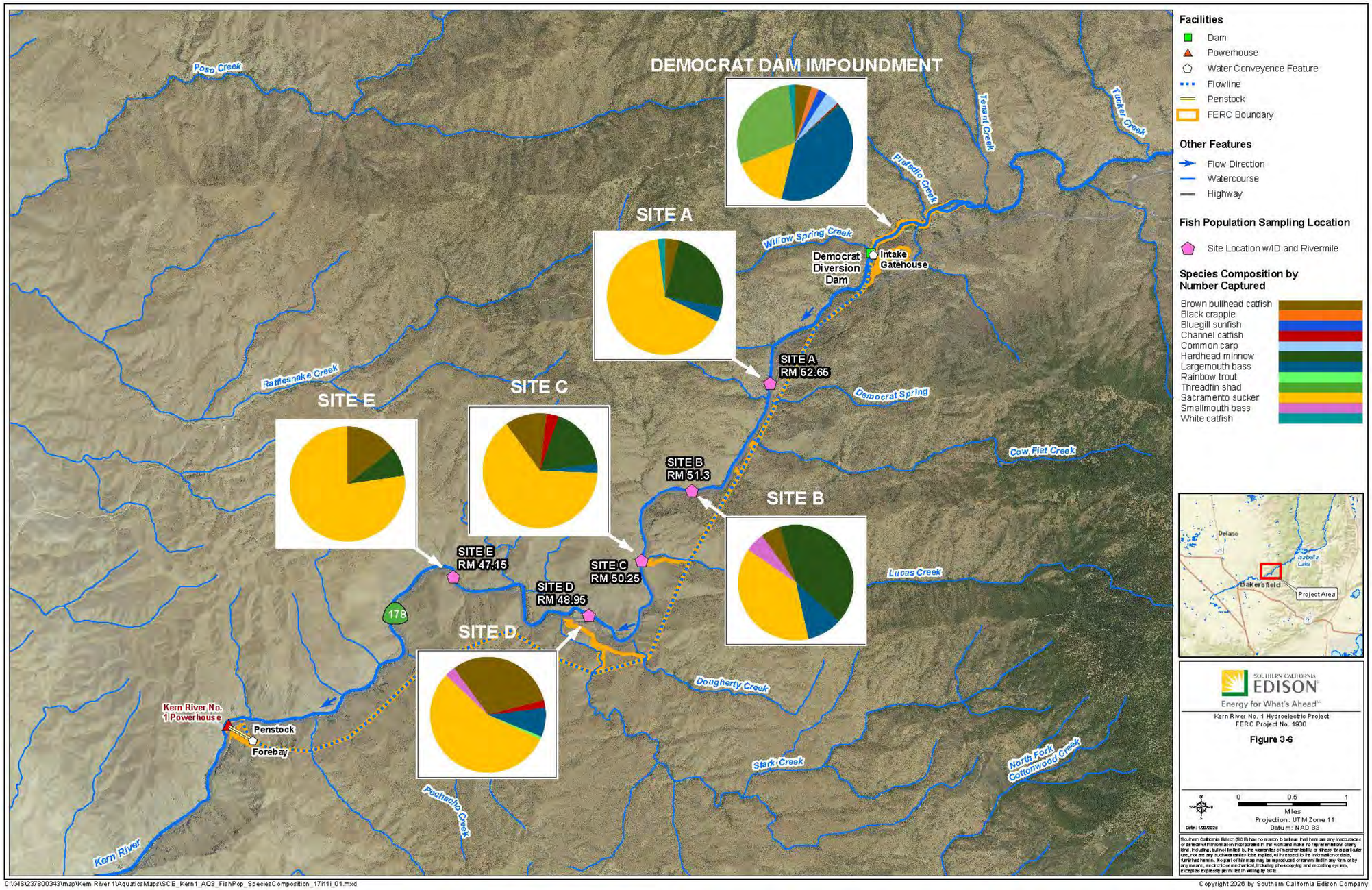


Figure 3-7. Fish Species Composition at Kern River No. 1 Project Sampling Sites by Number Captured during Backpack Electrofishing and E-Cat Sampling, Overlaid on Aerial Imagery.

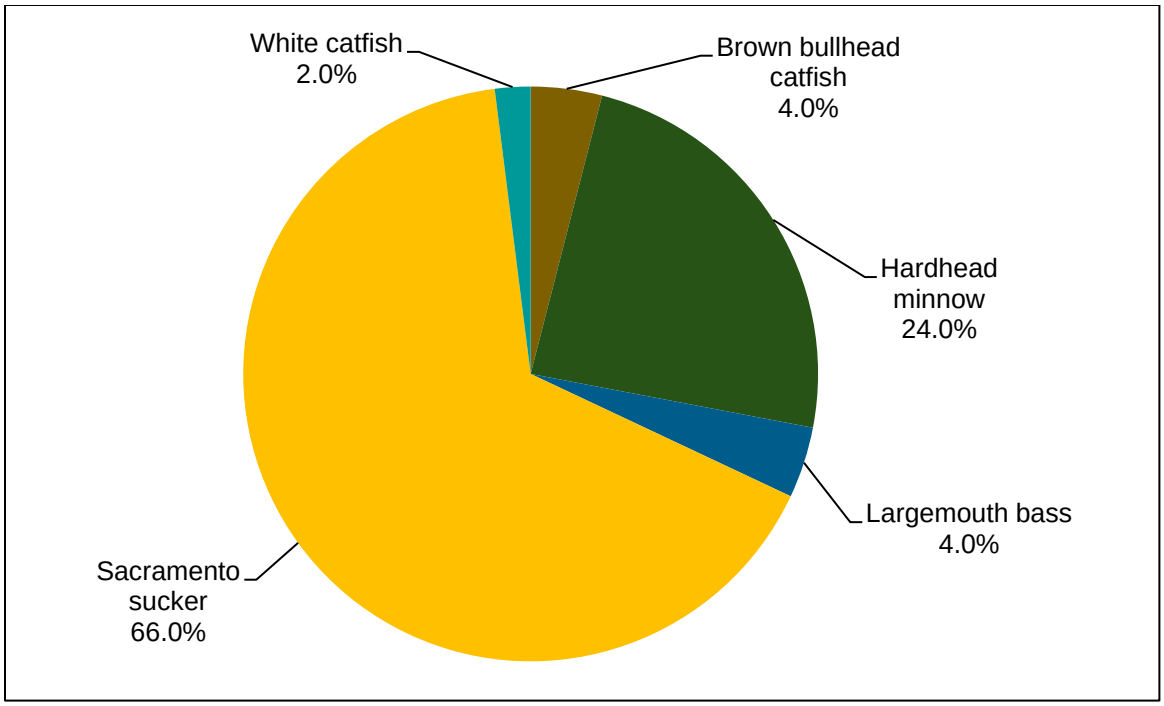


Figure 3-8a. Composition of Fish Species Captured at 2025 Kern River No. 1 Bypass Reach Backpack Electrofishing Site A (n=50).

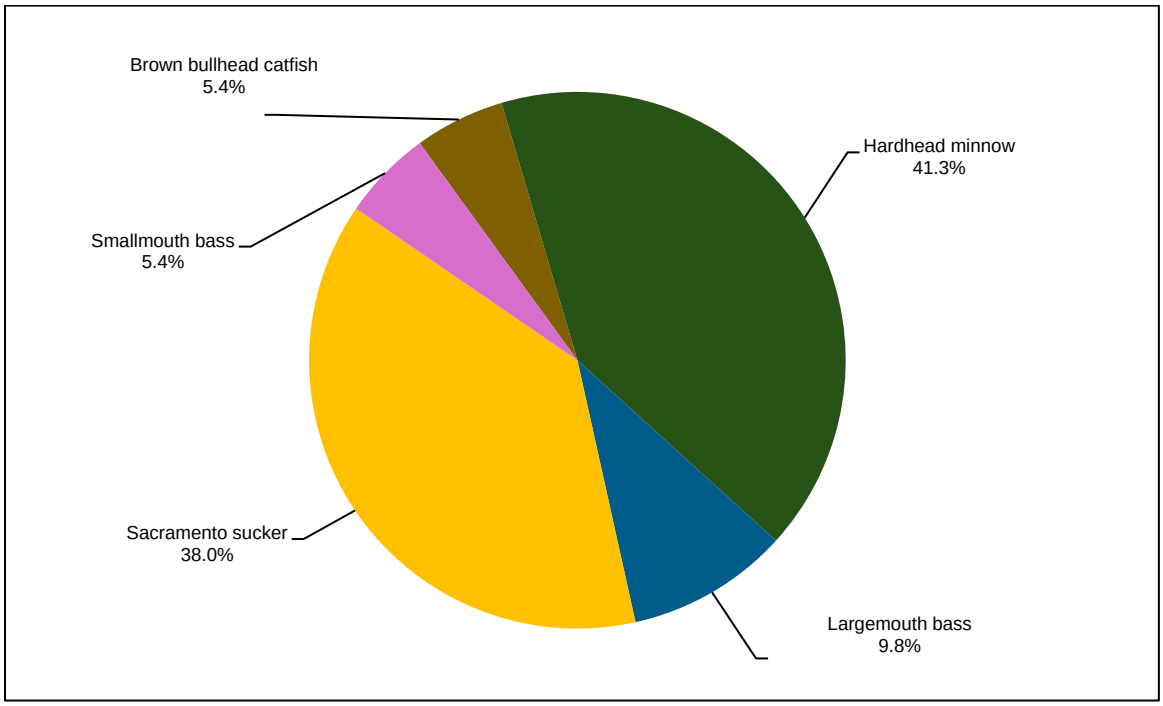


Figure 3-8b. Composition of Fish Species Captured at 2025 Kern River No. 1 Bypass Reach Backpack Electrofishing Site B (n=92).

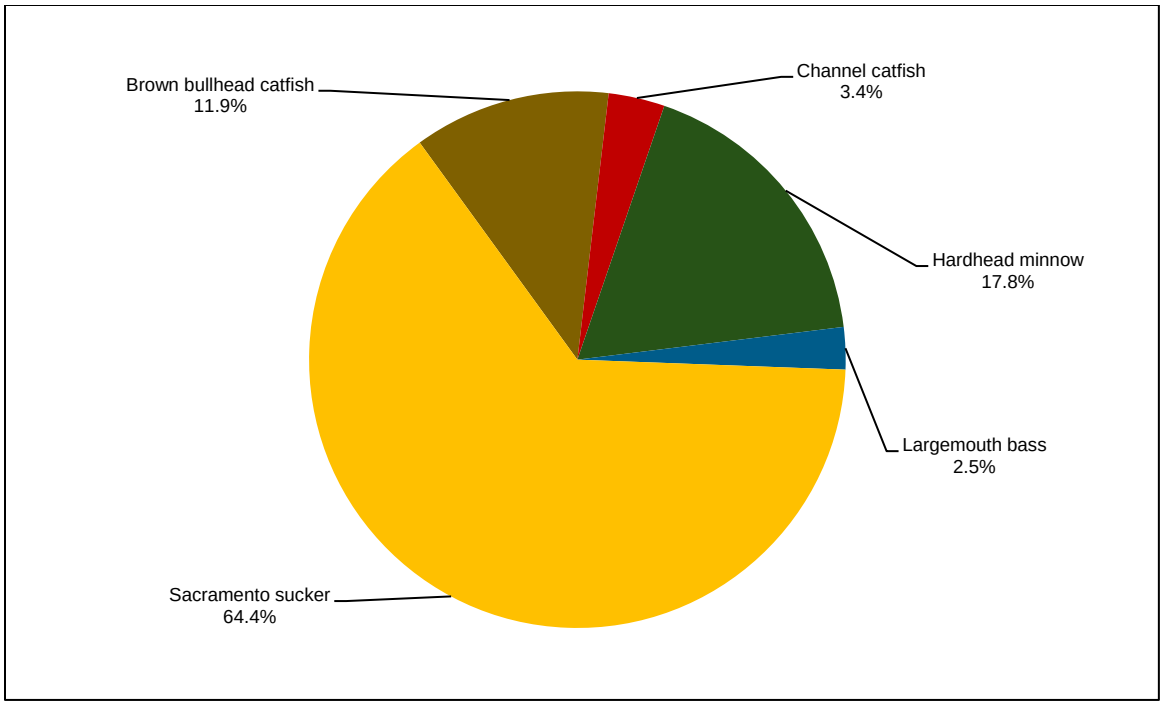


Figure 3-8c. Composition of Fish Species Captured at 2025 Kern River No. 1 Bypass Reach Backpack Electrofishing Site C (n=118).

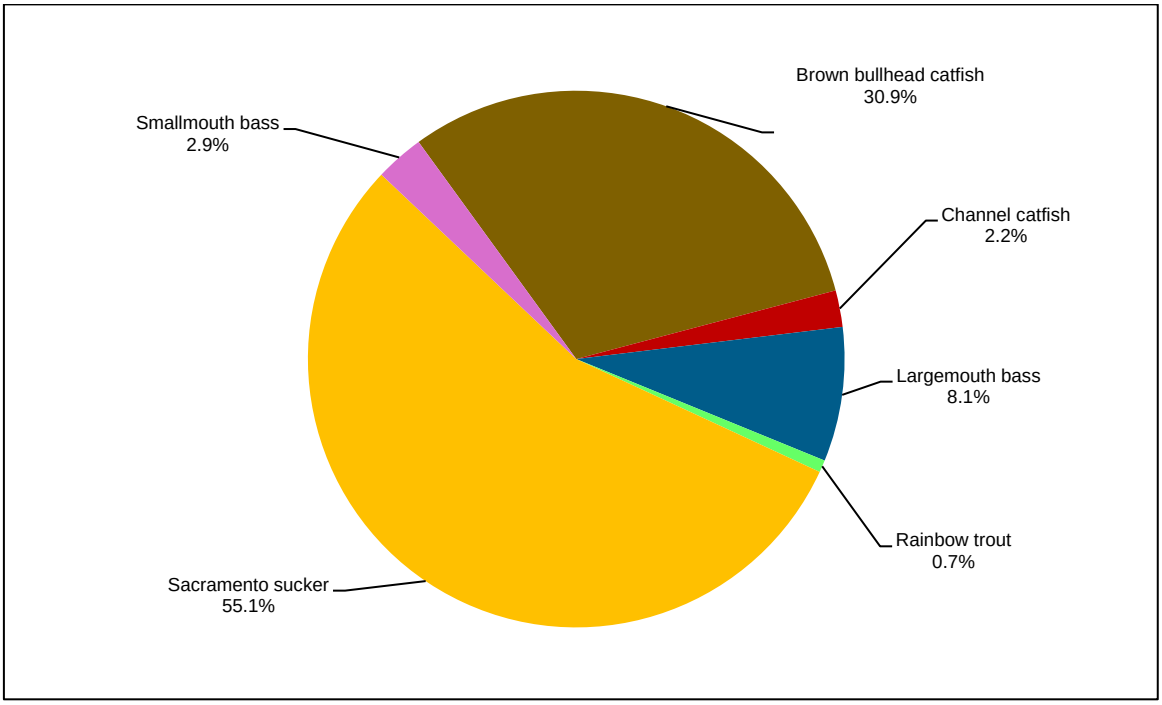


Figure 3-8d. Composition of Fish Species Captured at 2025 Kern River No. 1 Bypass Reach Backpack Electrofishing Site D (n=136).

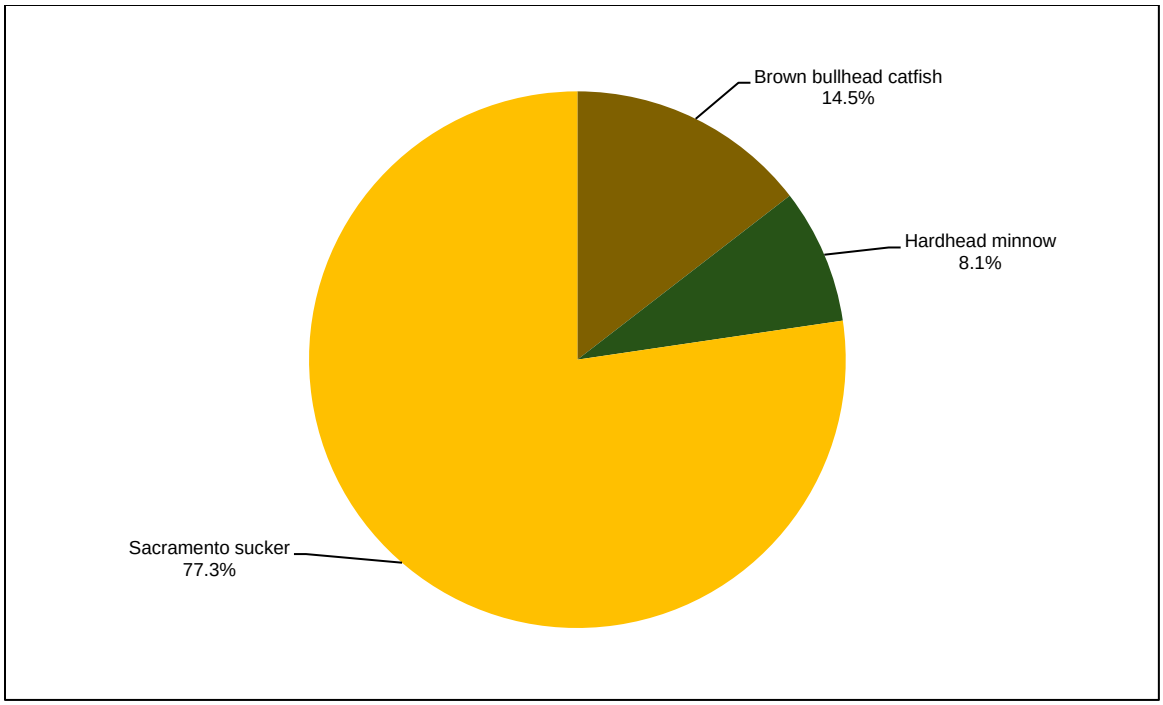
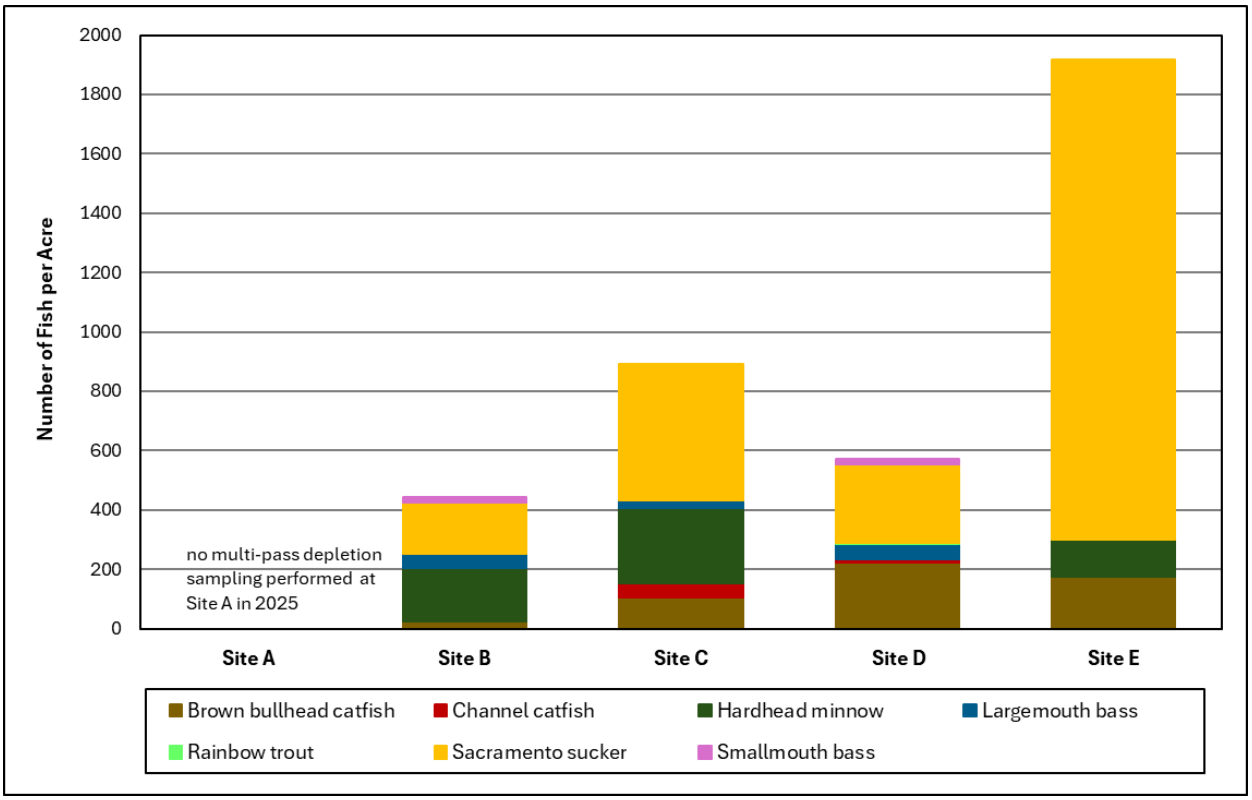


Figure 3-8e. Composition of Fish Species Captured at 2025 Kern River No. 1 Bypass Reach Backpack Electrofishing Site E (n=172).



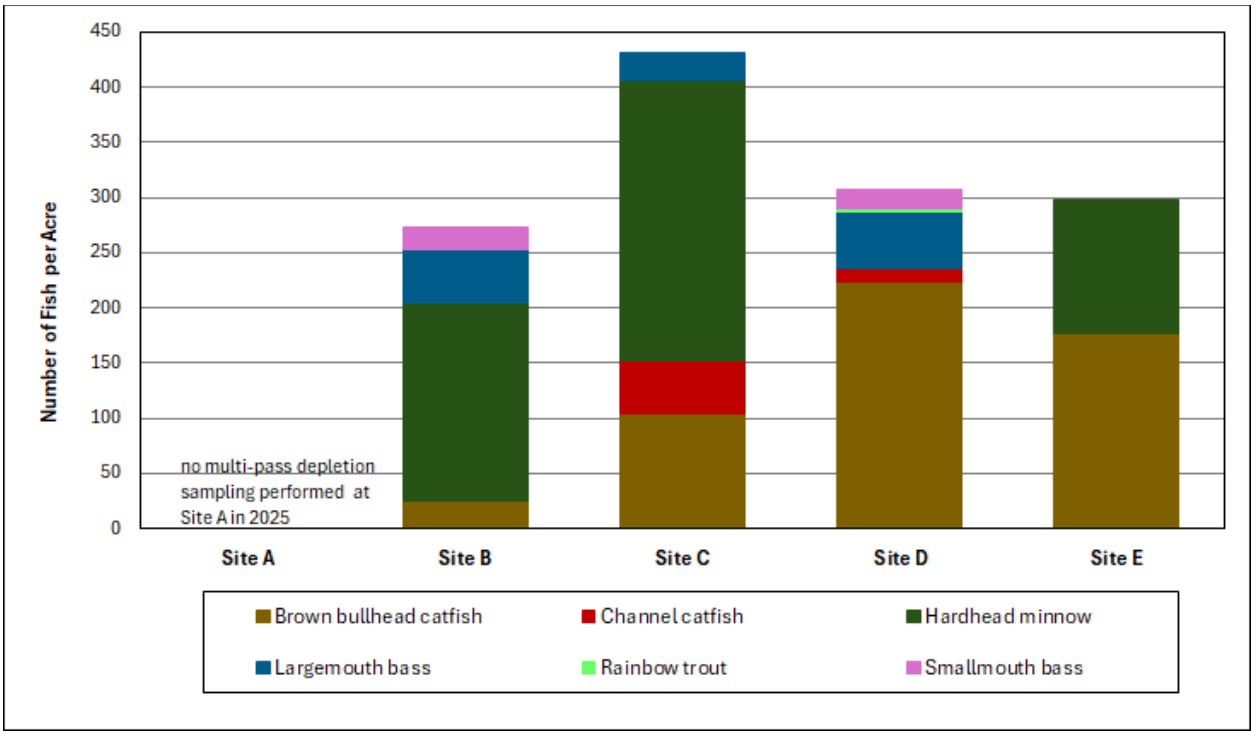


Figure 3-9. Fish Species Density Estimates at 2025 Kern River No. 1 Bypass Reach Sampling Sites, with Sacramento suckers (top) and without Sacramento suckers (bottom).

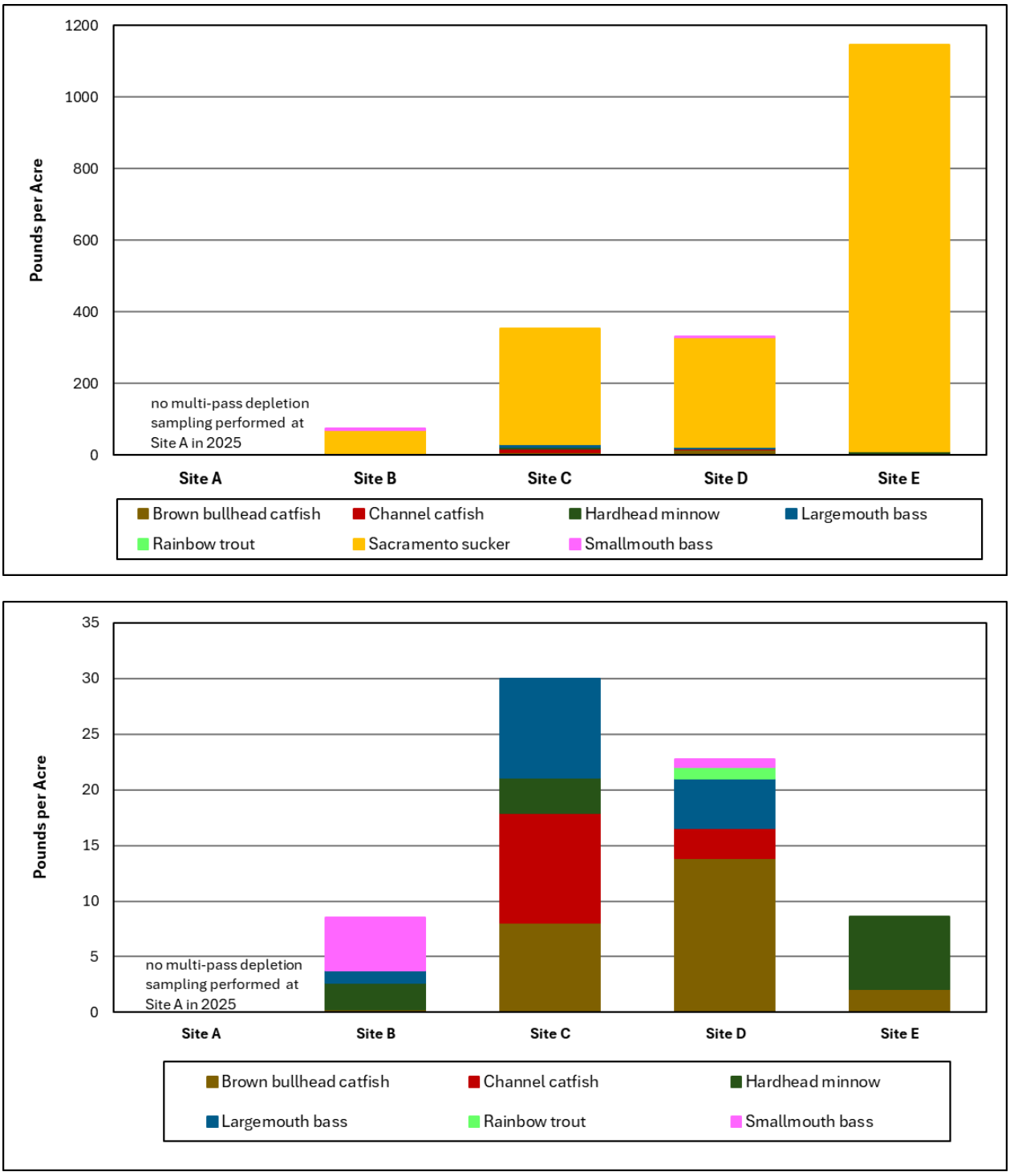


Figure 3-10. Fish Species Biomass Estimates at 2025 Kern River No. 1 Bypass Reach Sampling Sites, with Sacramento suckers (top) and without Sacramento suckers (bottom).

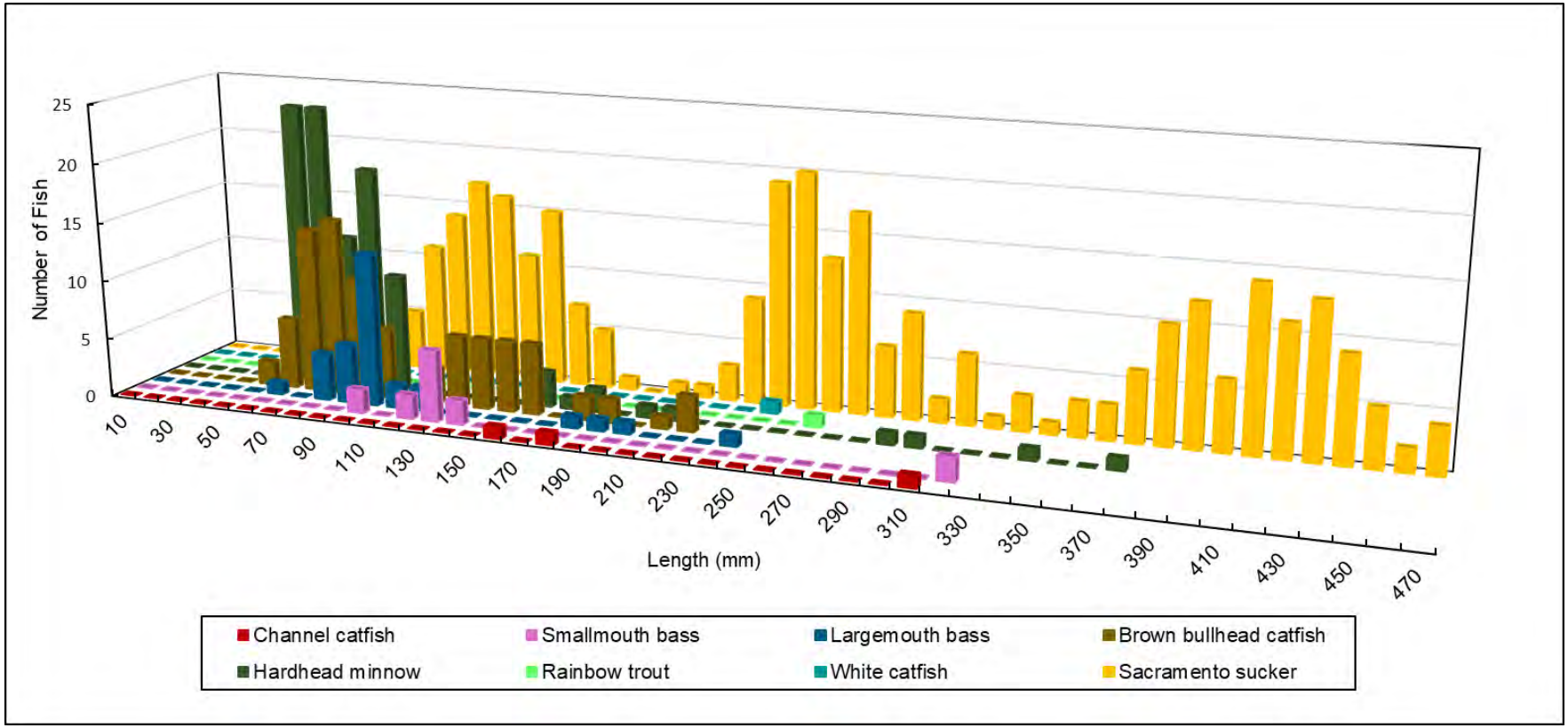
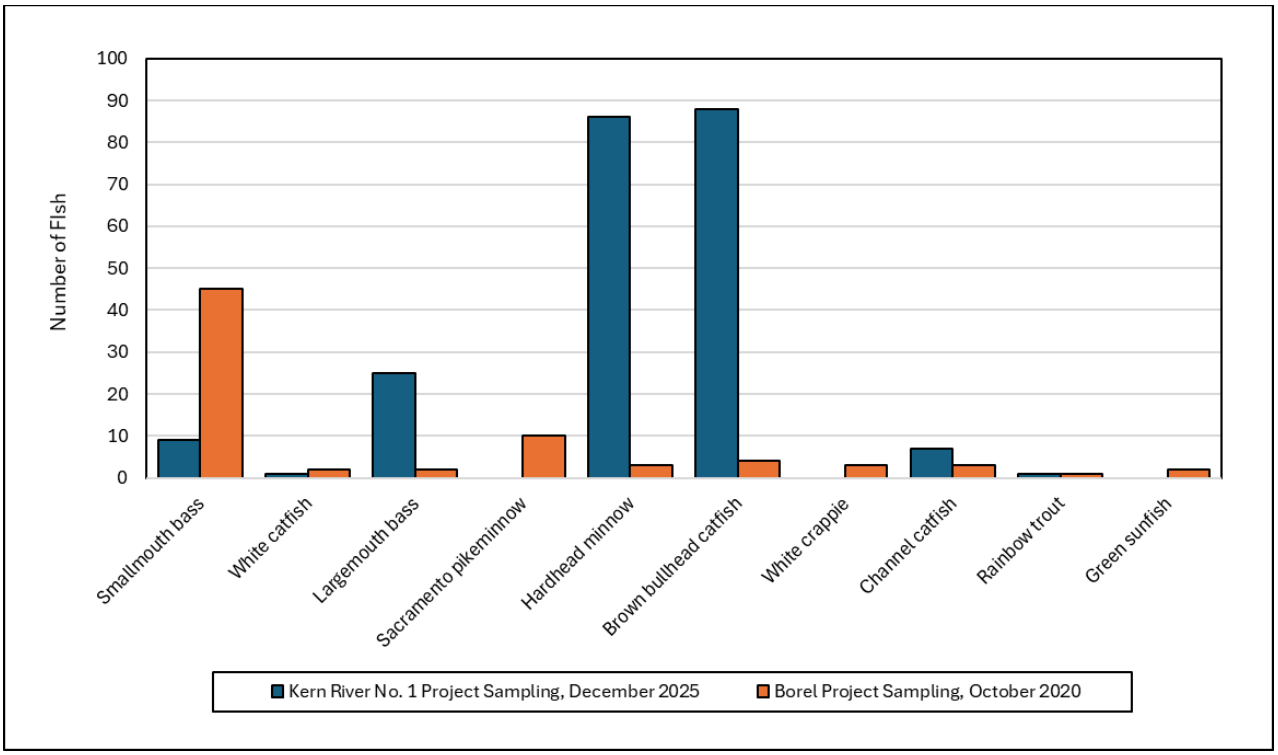


Figure 3-11. Length-Frequency Histogram for all Fish Species Captured during Backpack Electrofishing in the Kern River No. 1 Bypass Reach, 2025.



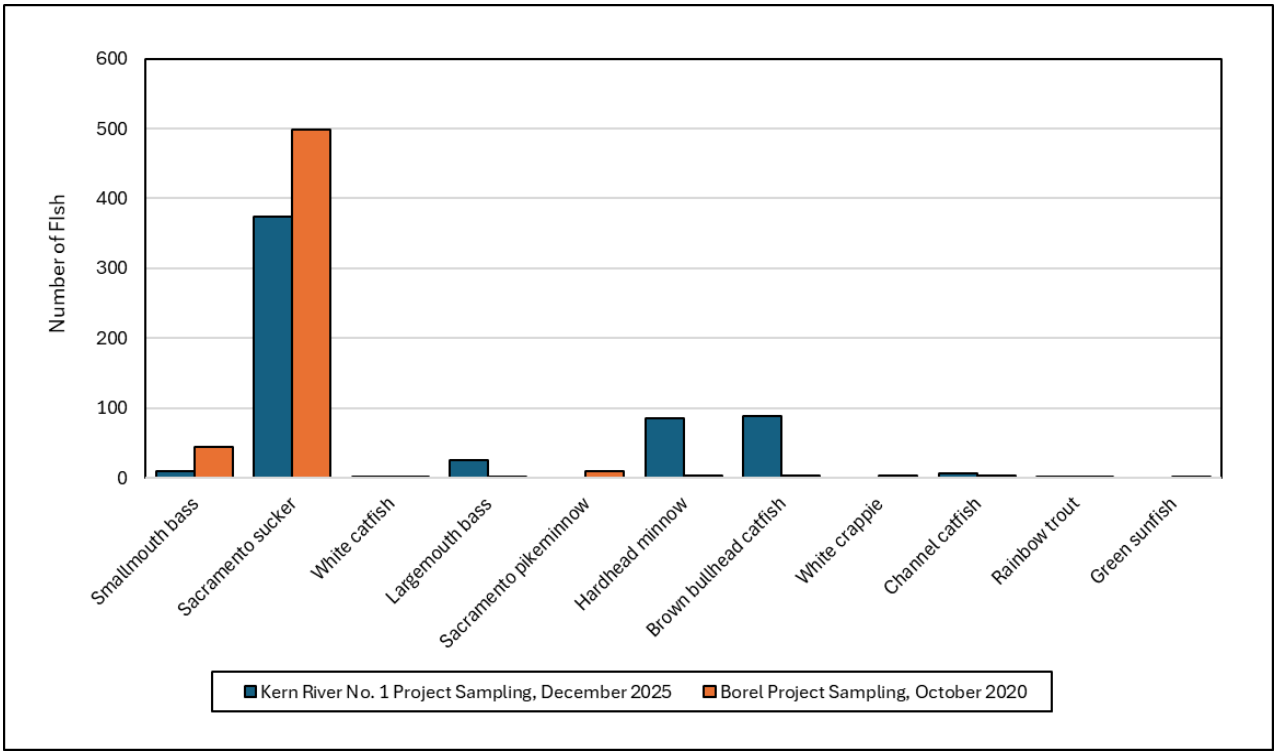
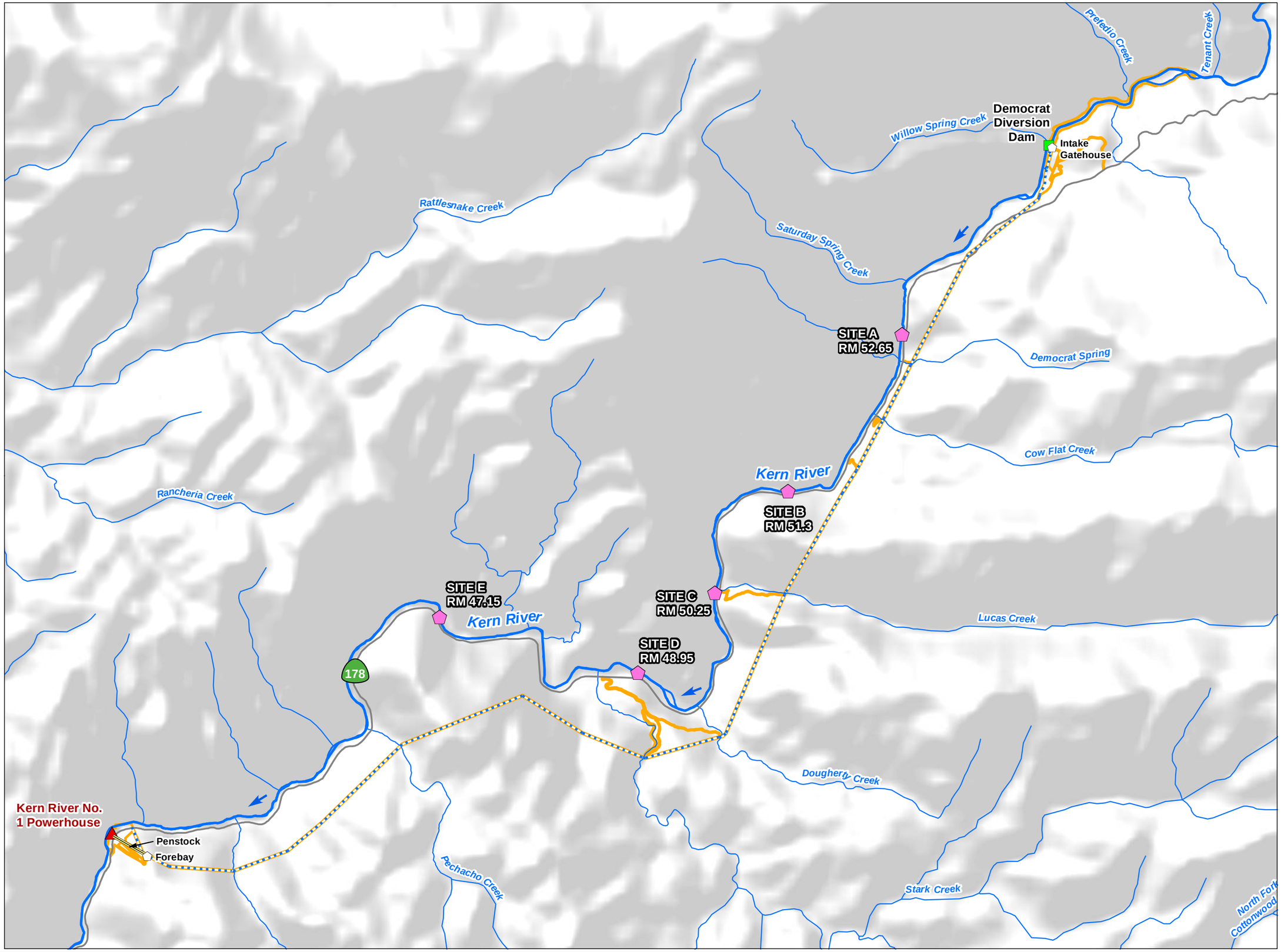


Figure 3-12. Historical Comparison of Fish Species from 2025 Kern River No. 1 Bypass Reach Sampling and 2020 Borel Project Stream Sampling, without Sacramento sucker (top) and with (bottom).

MAPS



Facilities

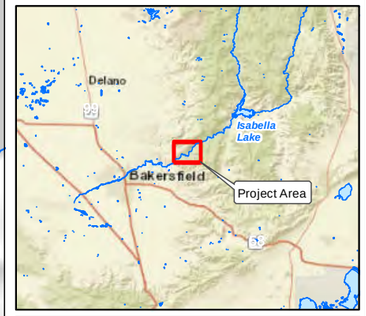
- Dam
- Powerhouse
- Water Conveyence Feature
- Flowline
- Penstock
- FERC Boundary

Other Features

- Flow Direction
- Watercourse
- Highway

Fish Population Sampling Location

- Site Location w/ID and Rivermile



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1

Fish Population Sampling Locations

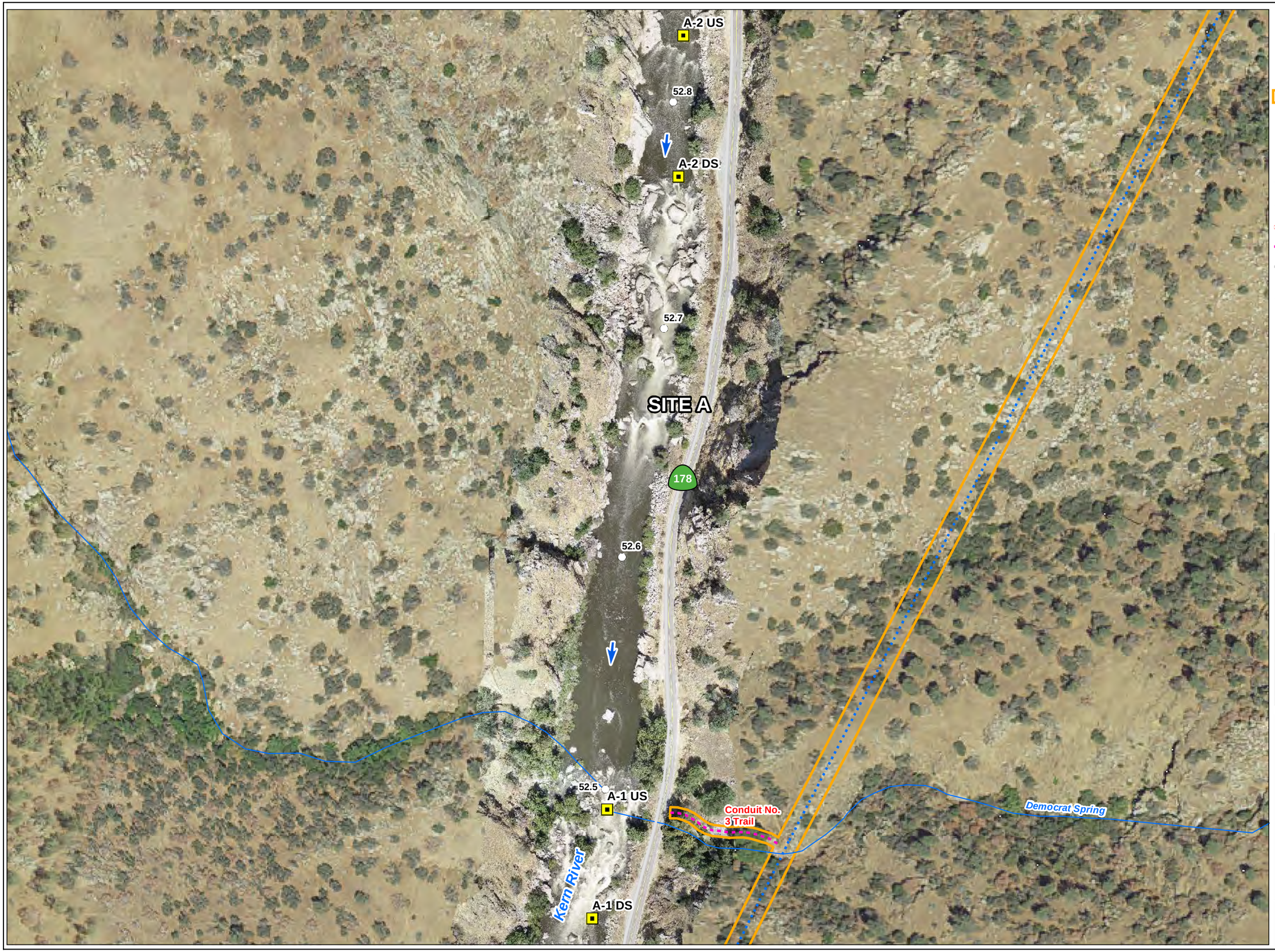
0 0.25 0.5
Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 12/12/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company

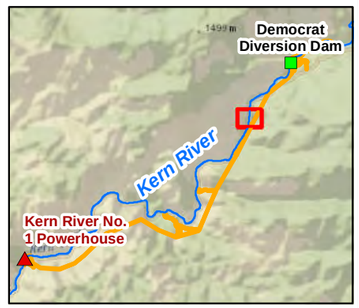


Facilities
- Dam
- Powerhouse
- Flowline
- FERC Boundary

Hydrology
- Watercourse
- River Mile
- Flow Direction

Transportation
- Project Road
- Project Trail
- Other Road

Sampling Methods
- Backpack Electrofishing Location
- Upstream End of Trammel Net



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1a

2025 Bypass Reach Sampling Site A

0 125 250
Feet
Projection: UTM Zone 11
Datum: NAD 83

Date: 1/29/2026

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\GIS\237800343\map\Kern River 1\AquaticsMaps\SCE_Kern1_AQ3_FishPop_2025_17i11i_01_new.mxd

Copyright 2026 by Southern California Edison Company

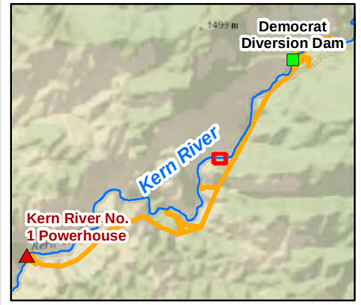


Facilities
- Dam
- Powerhouse
- Flowline
- FERC Boundary

Hydrology
- Watercourse
- River Mile
- Flow Direction

Transportation
- Project Road
- Project Trail
- Other Road

Sampling Methods
- Backpack Electrofishing Location
- Upstream End of Trammel Net



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1b

2025 Bypass Reach Sampling Site B

0 50 100
Feet
Projection: UTM Zone 11
Datum: NAD 83

Date: 1/29/2026

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2026 by Southern California Edison Company

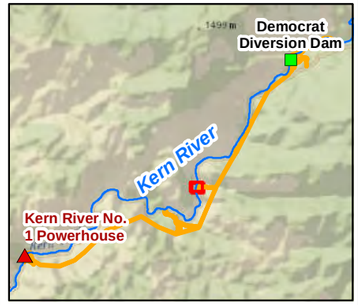


Facilities
- Dam
- Powerhouse
- Flowline
- FERC Boundary

Hydrology
- Watercourse
- River Mile
- Flow Direction

Transportation
- Project Road
- Project Trail
- Other Road

Sampling Methods
- Backpack Electrofishing Location
- Upstream End of Trammel Net



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1c

2025 Bypass Reach Sampling Site C

0 50 100
Feet
Projection: UTM Zone 11
Datum: NAD 83

Date: 1/29/2026

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2026 by Southern California Edison Company

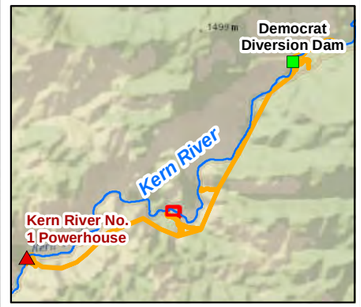


Facilities
- Dam
- Powerhouse
- Flowline
- FERC Boundary

Hydrology
- Watercourse
- River Mile
- Flow Direction

Transportation
- Project Road
- Project Trail
- Other Road

Sampling Methods
- Backpack Electrofishing Location
- Upstream End of Trammel Net



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1d

2025 Bypass Reach Sampling Site D

0 50 100
Feet
Projection: UTM Zone 11
Datum: NAD 83

Date: 1/29/2026

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\GIS\237800343\map\Kern River 1\AquaticsMaps\SCE_Kern1_AQ3_FishPop_2025_17i11i_01_new.mxd

Copyright 2026 by Southern California Edison Company

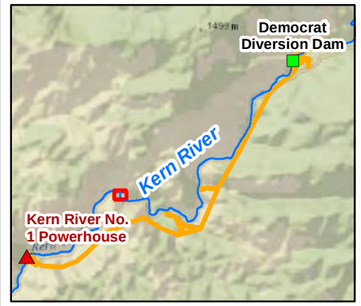


Facilities
- Dam
- Powerhouse
- Flowline
- FERC Boundary

Hydrology
- Watercourse
- River Mile
- Flow Direction

Transportation
- Project Road
- Project Trail
- Other Road

Sampling Methods
- Backpack Electrofishing Location
- Upstream End of Trammel Net



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1e

2025 Bypass Reach Sampling Site E

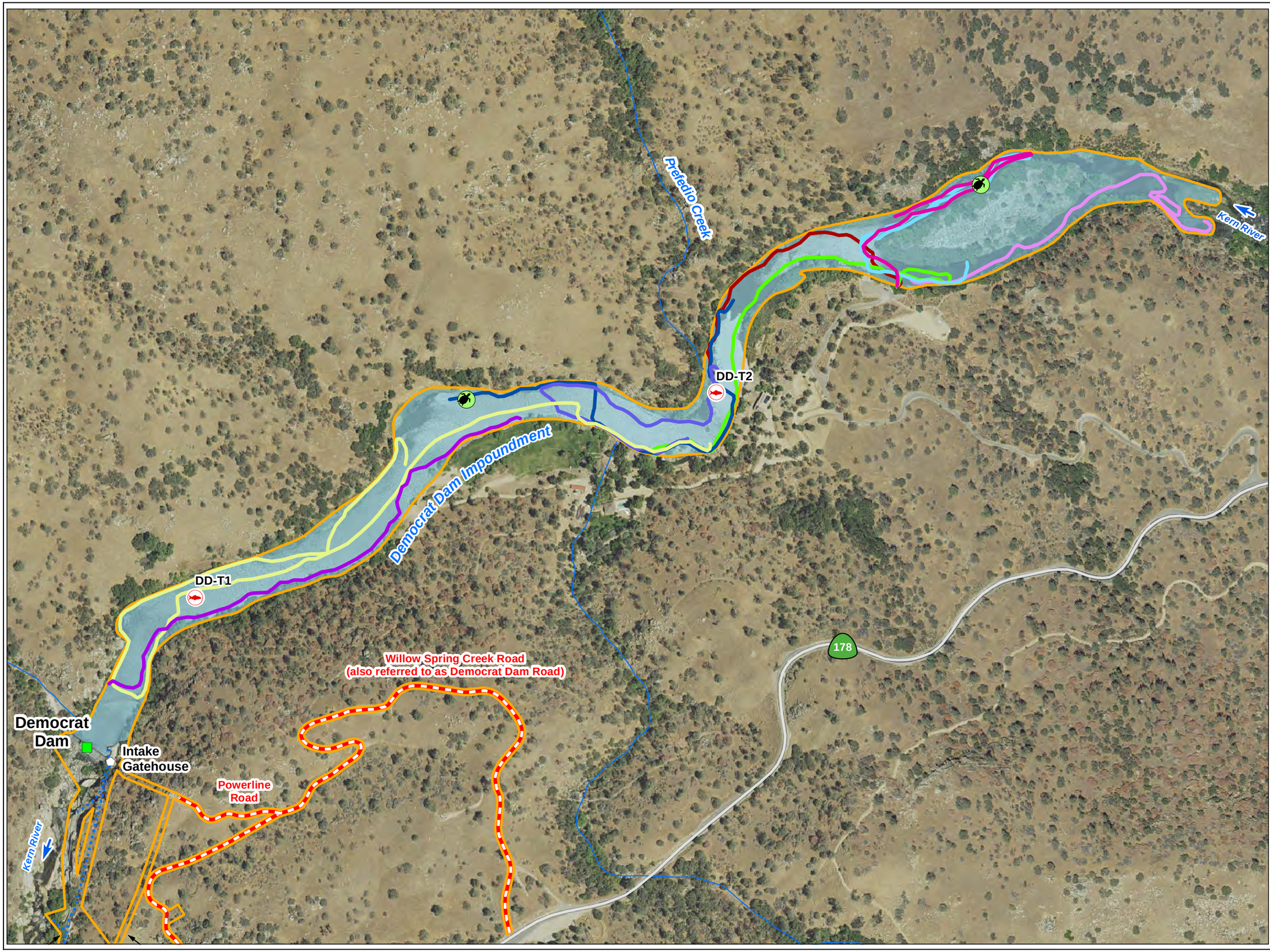
0 50 100
Feet
Projection: UTM Zone 11
Datum: NAD 83

Date: 1/29/2026

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\GIS\237800343\map\Kern River 1\AquaticsMaps\SCE_Kern1_AQ3_FishPop_2025_17i11i_01_new.mxd

Copyright 2026 by Southern California Edison Company



Facilities

- Dam
- Water Conveyence Feature
- Flowline
- FERC Boundary

Hydrology

- Watercourse
- Waterbody
- Flow Direction

Transportation

- Project Road
- Other Road

Electrofishing Cataraft Sampling, 2024

10/15/24
- Pass 1
- Pass 2
- Pass 3
- Pass 4

10/16/24
- Pass 1
- Pass 2
- Pass 3

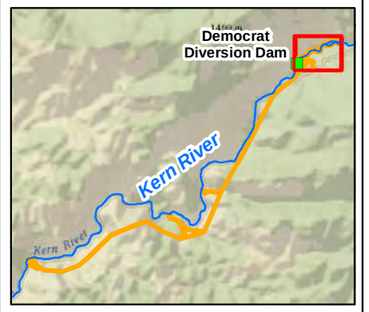
10/17/24
- Pass 1
- Pass 2

Trammel Net Sampling, 2025

- Upstream End of Trammel Net Locations 09/30/25 – 10/01/25

Species Observations

- Northwestern Pond Turtle Observation



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 4-1

2024-2025 Democrat Dam Impoundment Sampling

0 250 500
Feet
Projection: UTM Zone 11
Datum: NAD 83

Date: 1/29/2026

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\GIS\237800343\map\Kern River 1\AquaticsMaps\SCE_Kern1_AQ3_FishPop_2024-2025_DemDamImp_17i11i_01.mxd

Copyright 2026 by Southern California Edison Company

APPENDIX A
FISH POPULATION BYPASS REACH SAMPLING SITE PHOTOS

Copyright 2026 by Southern California Edison

Site A: Unit A-1



Downstream End of Unit



Upstream End of Unit

Site A: Unit A-2



Downstream End of Unit



Upstream End of Unit

Site B: Unit B-1



Downstream Net



Upstream Net

Site B: Unit B-2



Downstream Net



Upstream Net

Site C: Unit C-1



Downstream Net



Upstream Net

Site C: Unit C-2



Downstream Net



Upstream Natural Barrier

Site D: Unit D-1



Downstream Net



Upstream Net

Site D: Unit D-2



Downstream Net



Upstream Net

Site E: Unit E-1



Downstream Net



Upstream Net

Site E: Unit E-2



Downstream Net



Upstream Net

Site E: Unit E-3



Downstream Net



Upstream Net

APPENDIX B
LENGTH-FREQUENCY HISTOGRAMS BY SITE AND SPECIES

Copyright 2026 by Southern California Edison

Democrat Dam Impoundment

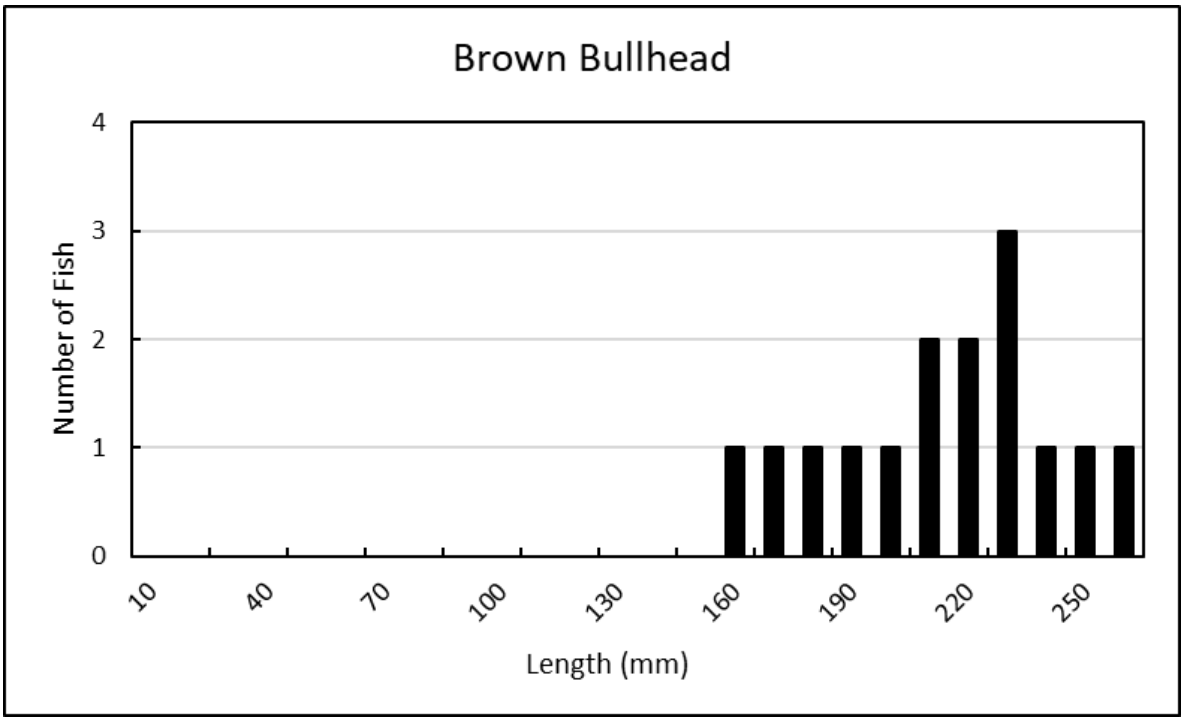


Figure A-1. Length-Frequency Histogram for Brown Bullhead collected in Democrat Dam Impoundment, 2024.

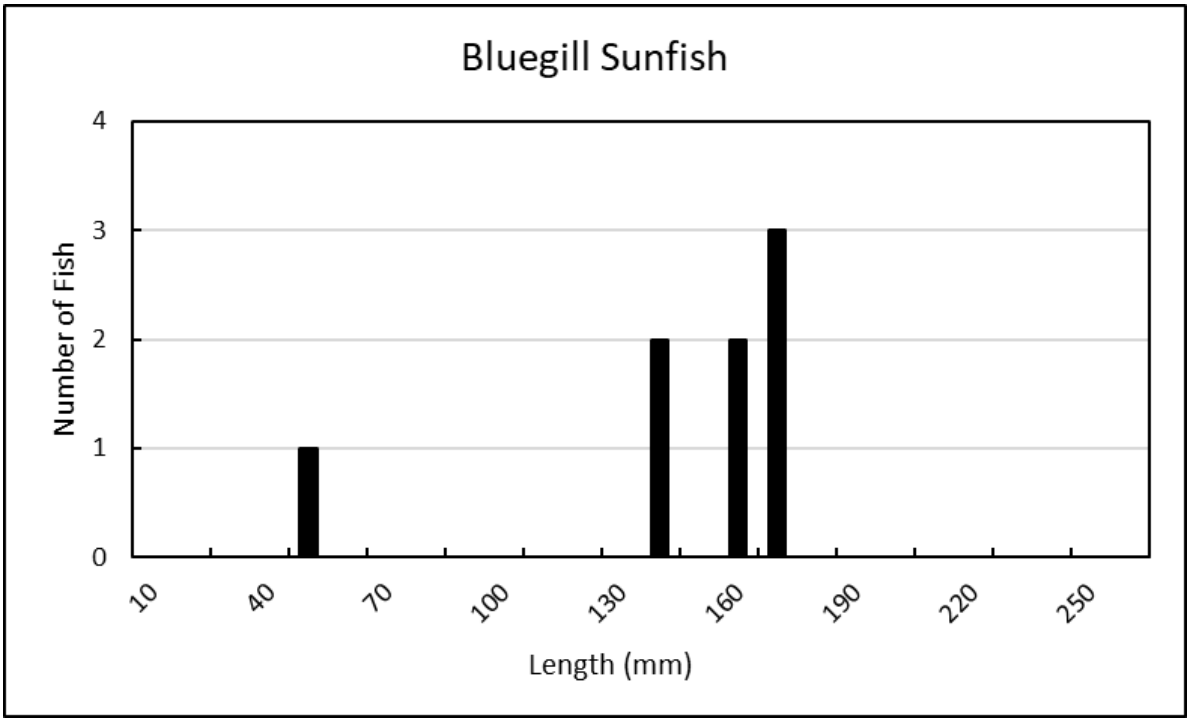


Figure A-2. Length-Frequency Histogram for Bluegill Sunfish collected in Democrat Dam Impoundment, 2024.

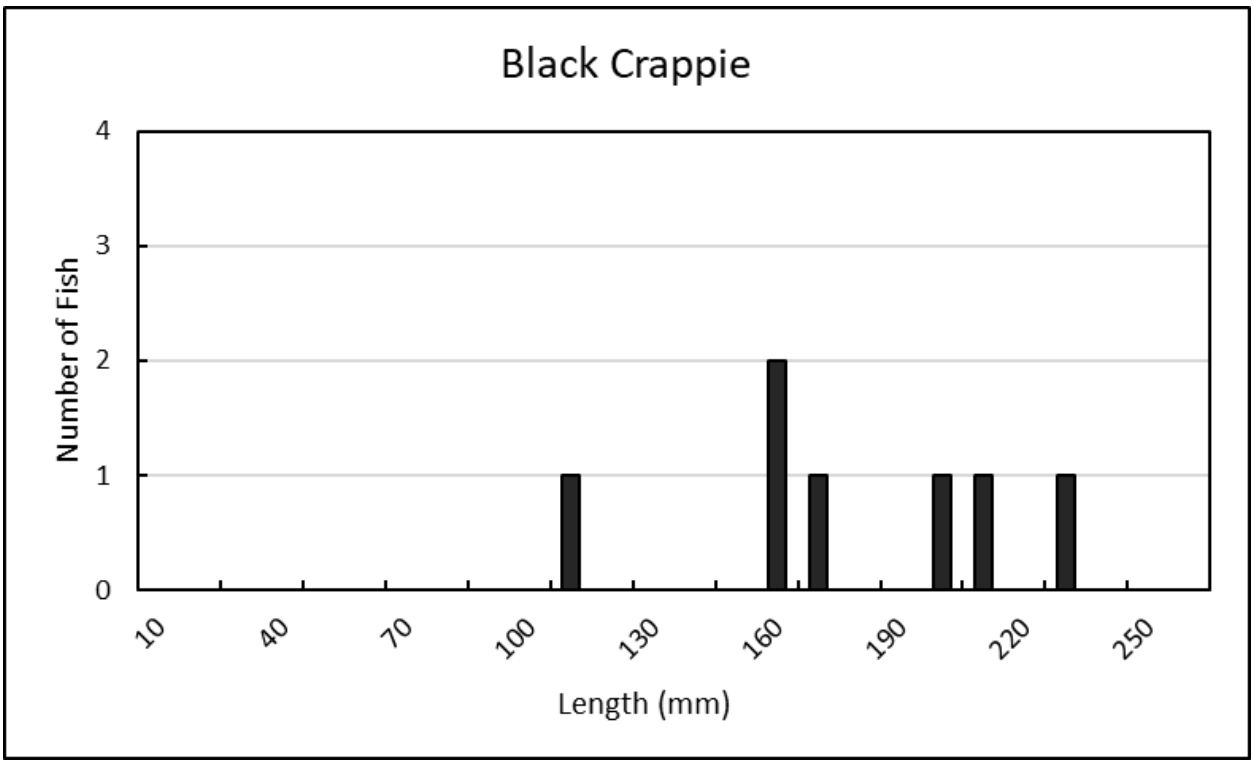


Figure A-3. Length-Frequency Histogram for Black Crappie collected in Democrat Dam Impoundment, 2024.

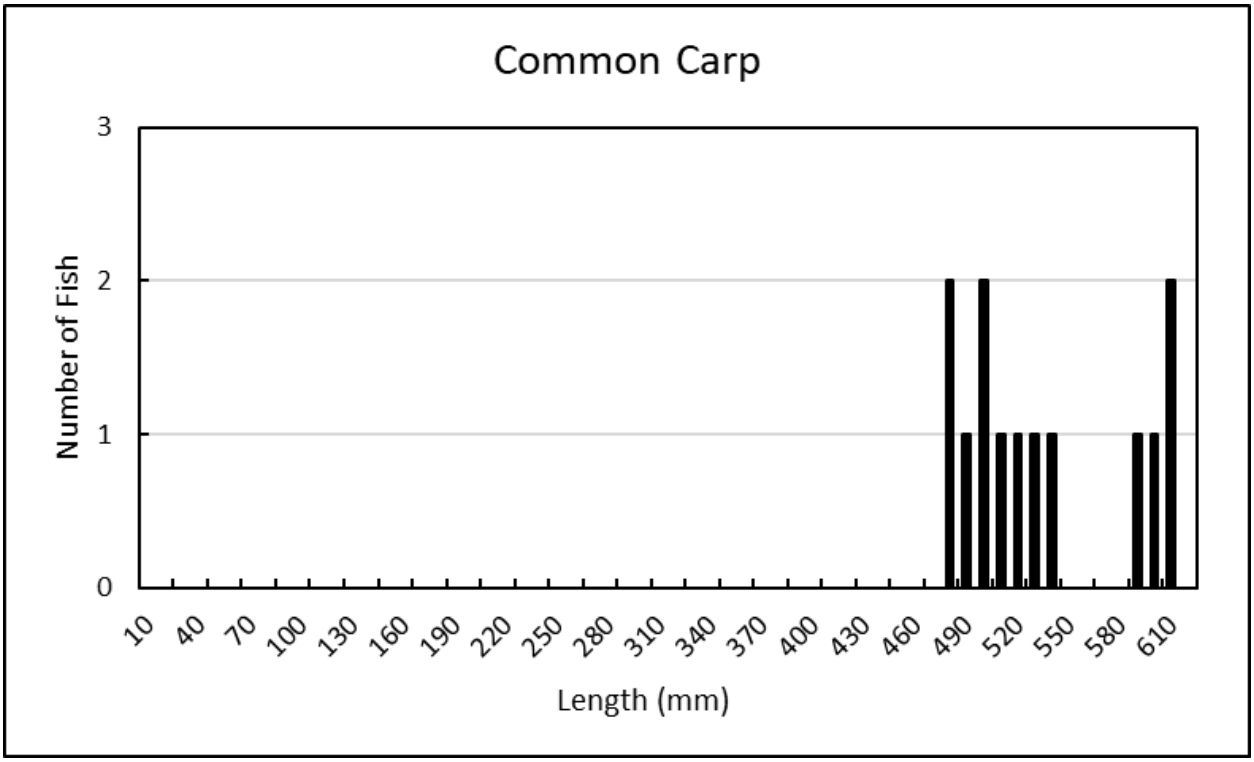


Figure A-4. Length-Frequency Histogram for Common Carp collected in Democrat Dam Impoundment, 2024.



Figure A-5. Length-Frequency Histogram for Hardhead Minnow collected in Democrat Dam Impoundment, 2024.

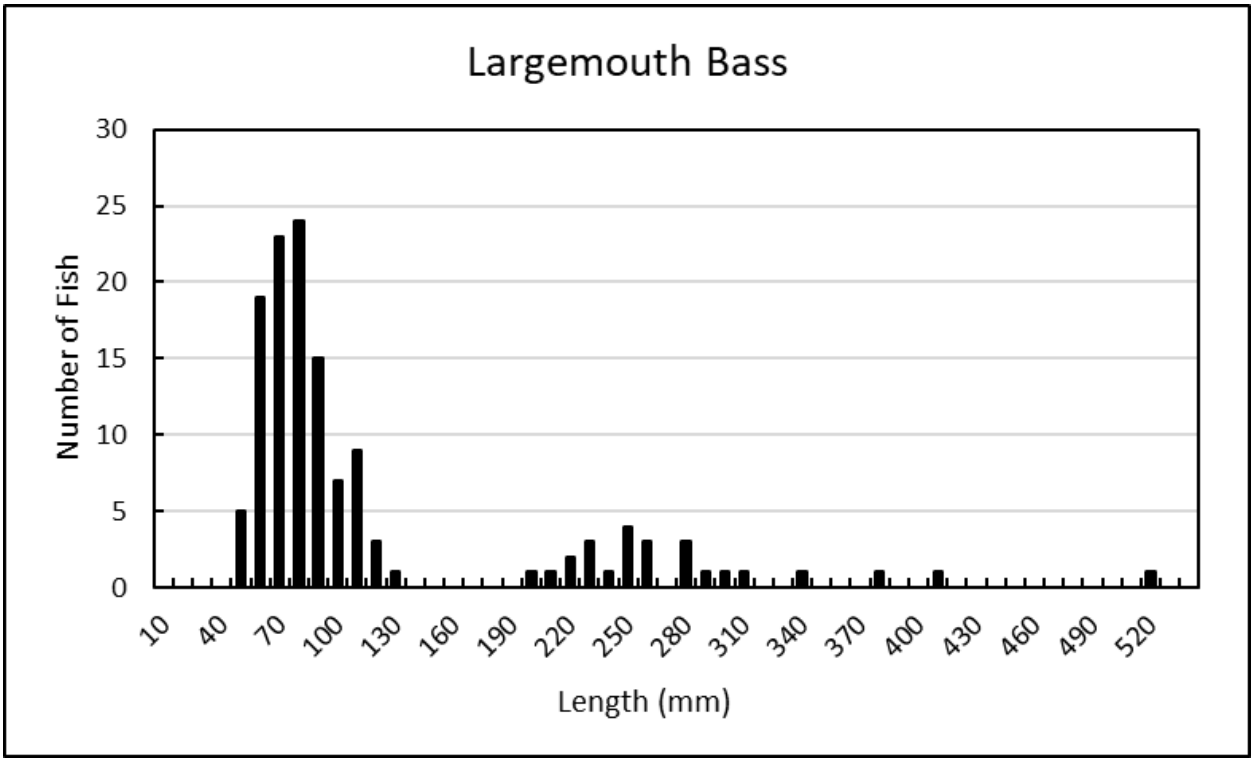


Figure A-6. Length-Frequency Histogram for Largemouth Bass collected in Democrat Dam Impoundment, 2024.

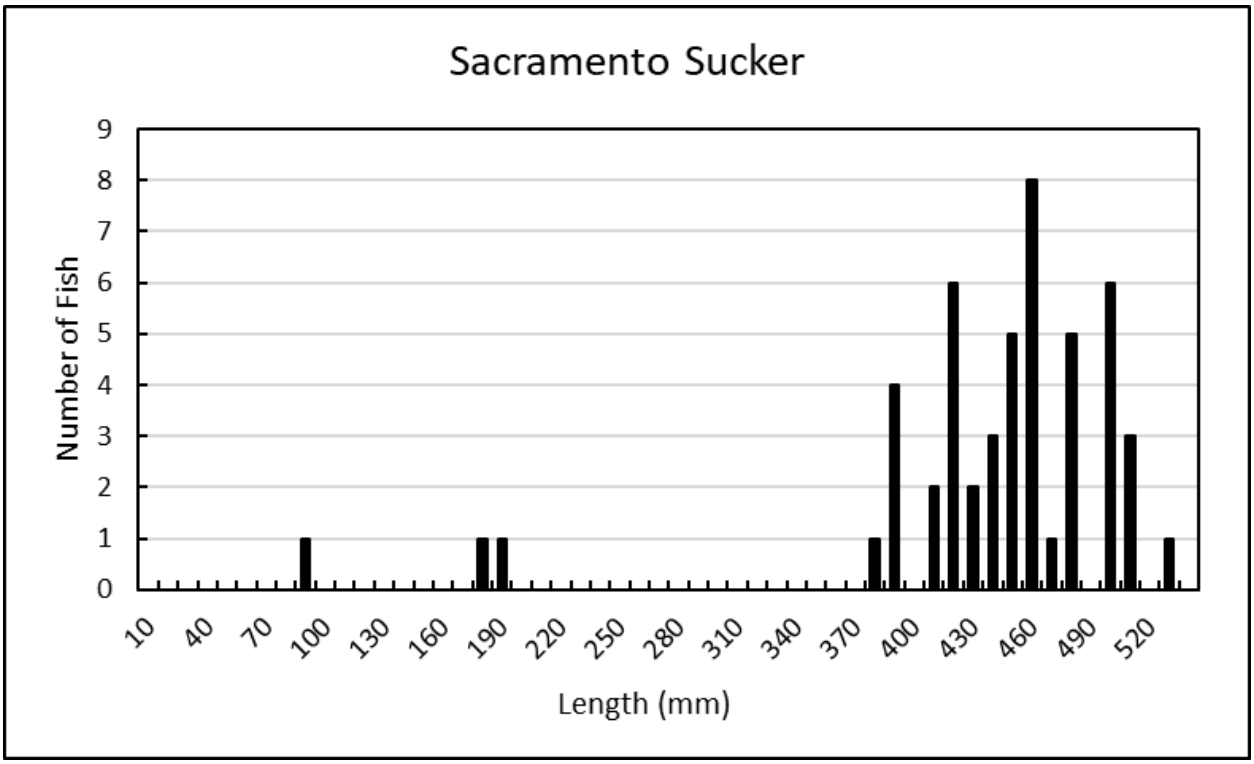


Figure A-7. Length-Frequency Histogram for Sacramento Sucker collected in Democrat Dam Impoundment, 2024.

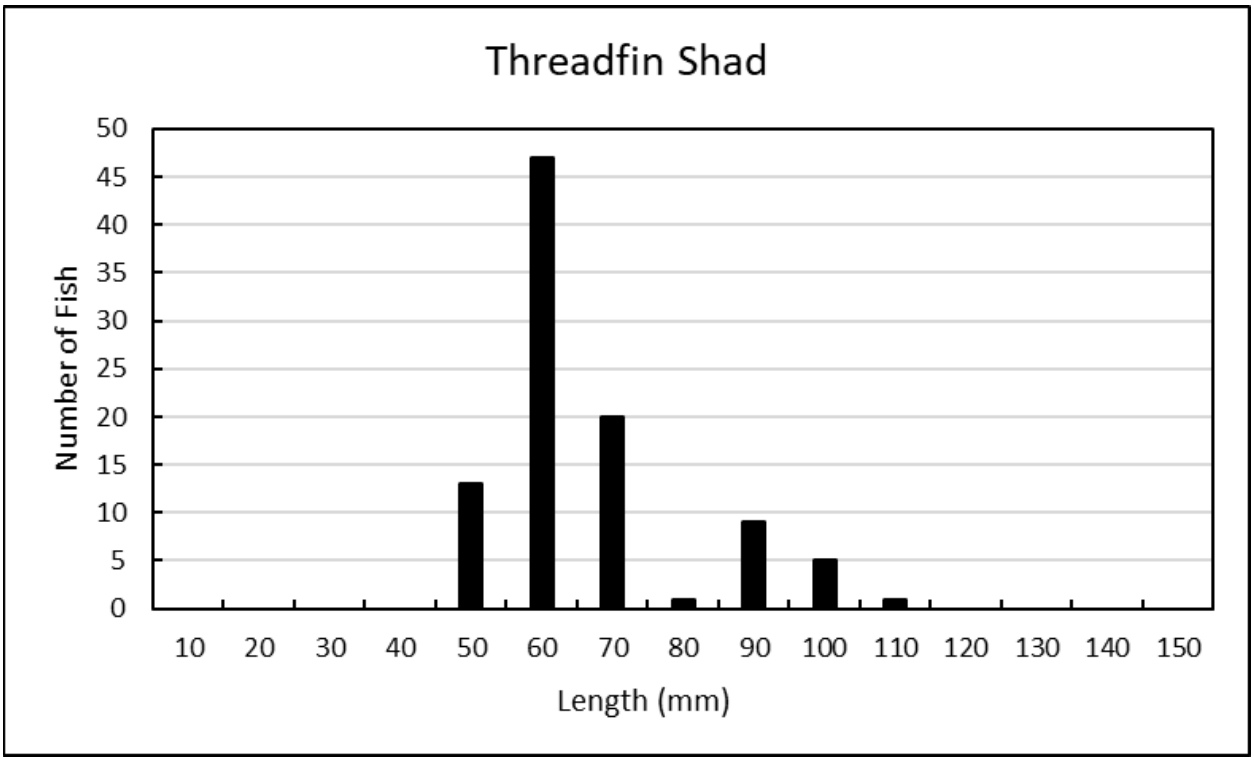


Figure A-8. Length-Frequency Histogram for Threadfin Shad collected in Democrat Dam Impoundment, 2024.

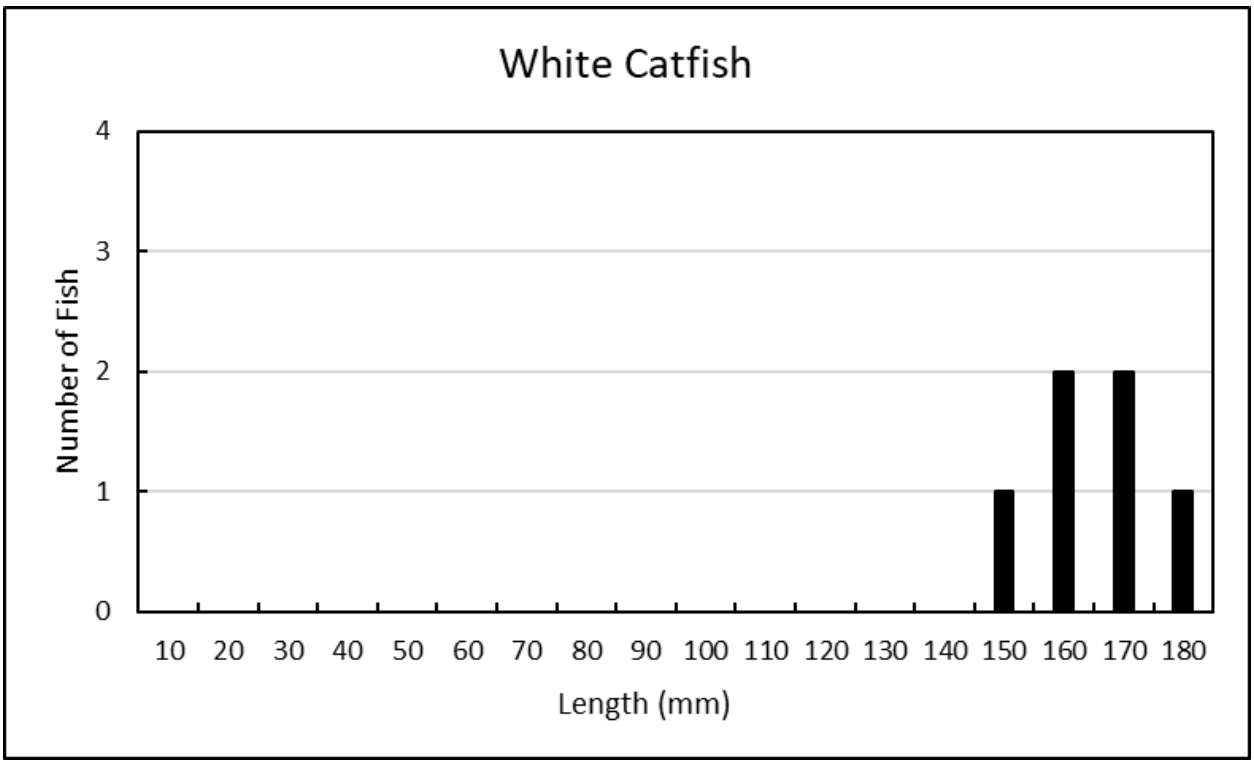
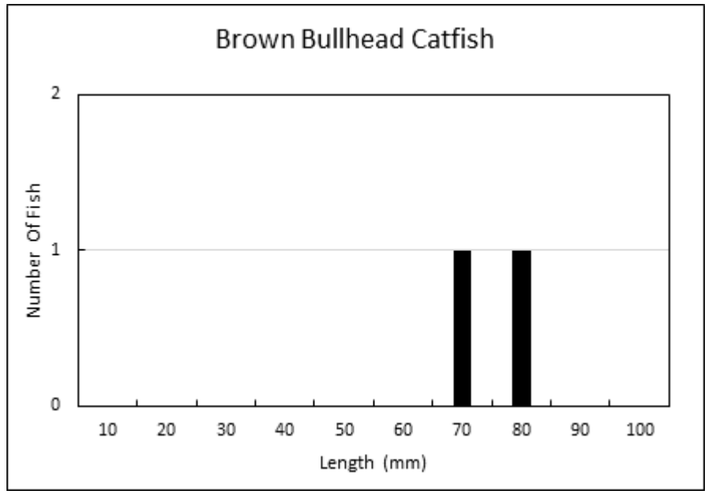
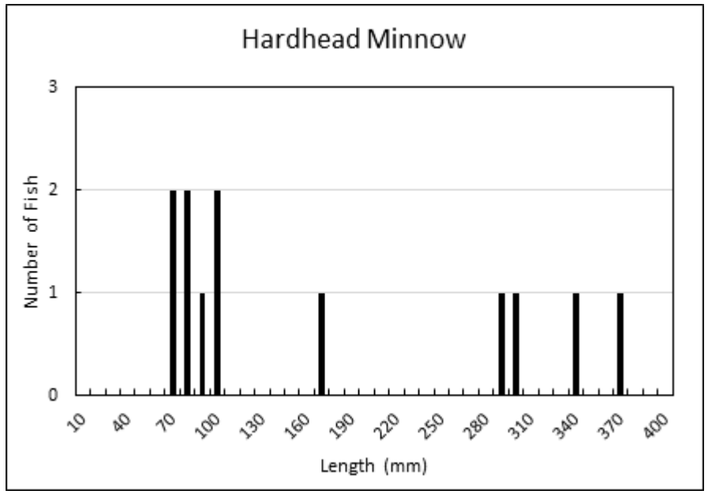
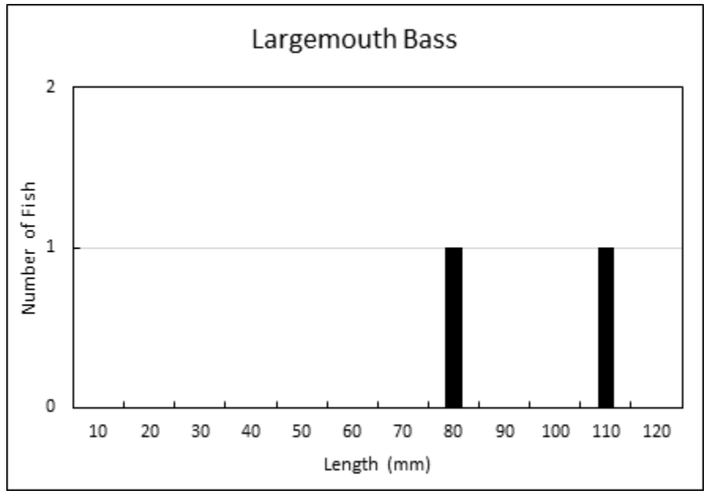


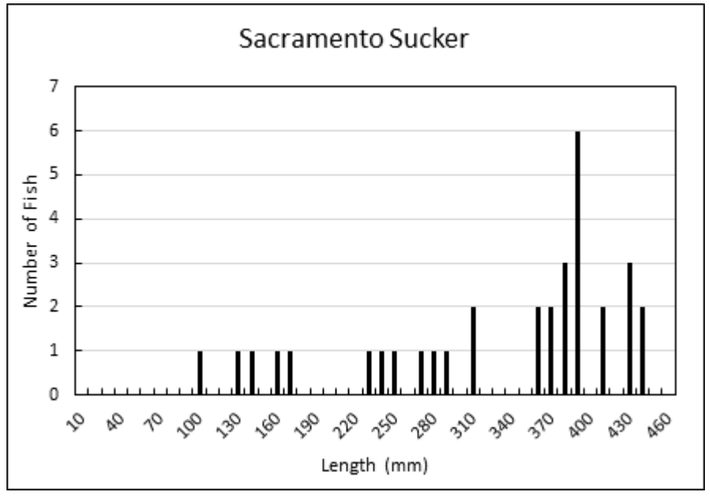
Figure A-9. Length-Frequency Histogram for Threadfin Shad collected in Democrat Dam Impoundment, 2024.

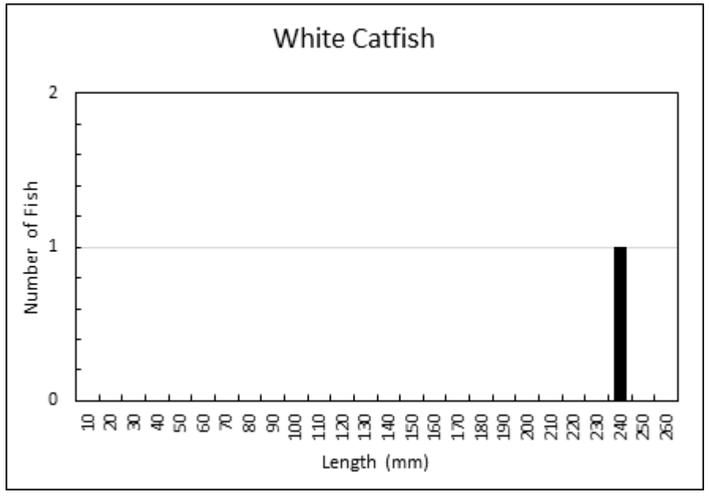
Kern River No. 1 Bypass Reach Site A Length-Frequency Historgrams





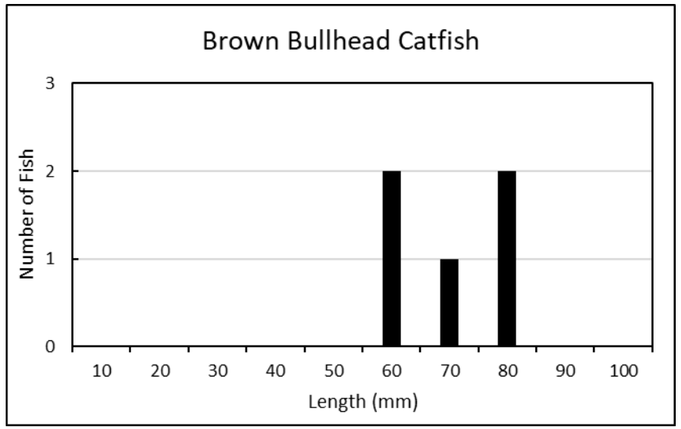


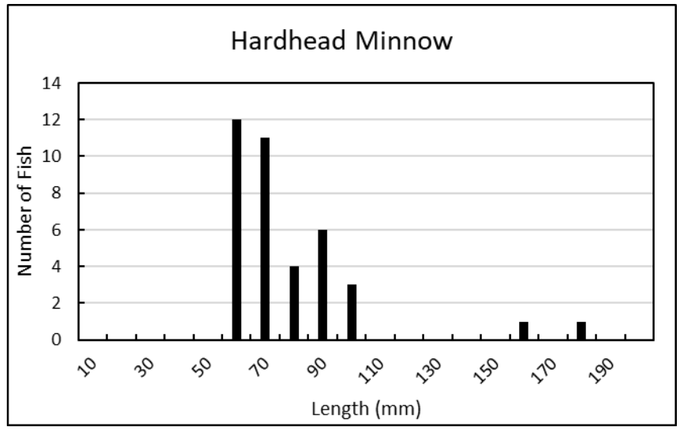


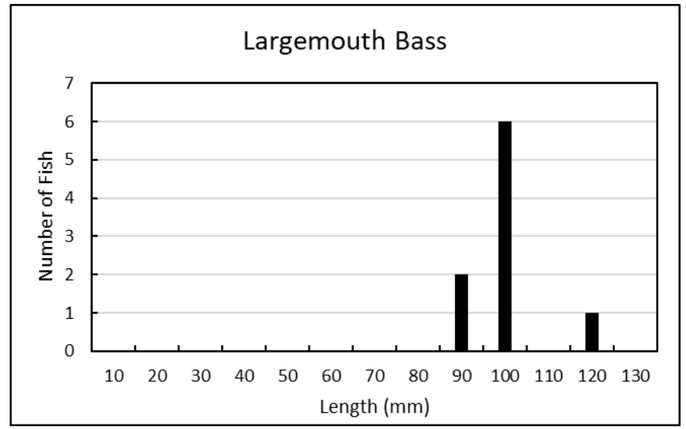


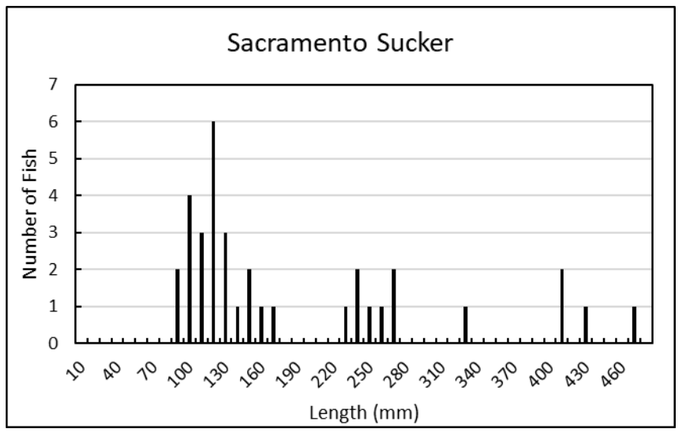
Copyright 2026 by Southern California Edison

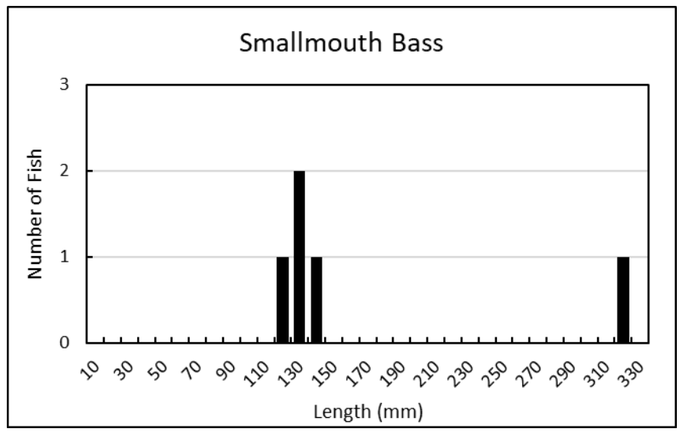
Kern River No. 1 Bypass Reach Site B Length-Frequency Historgrams





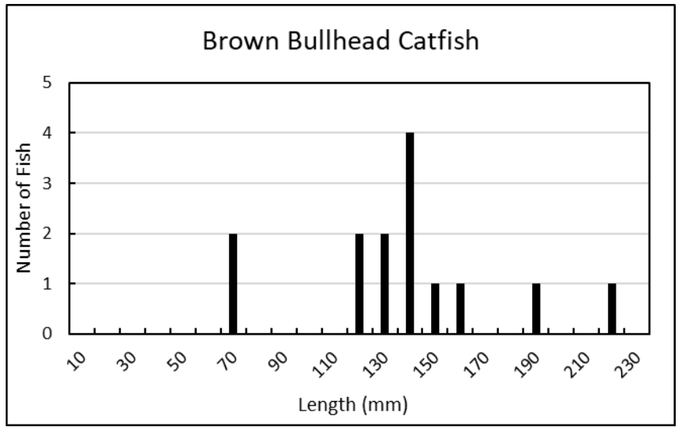


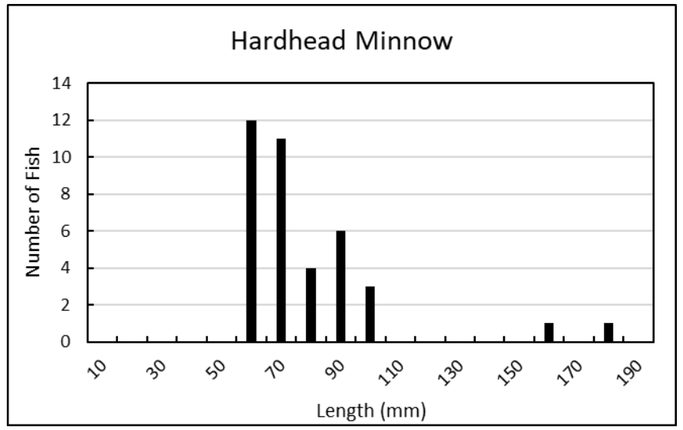


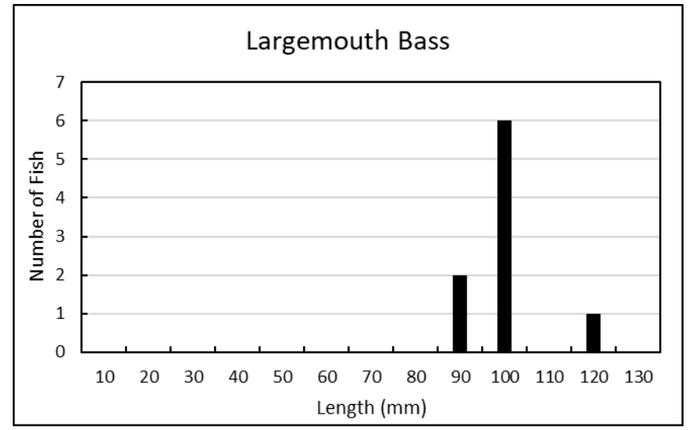


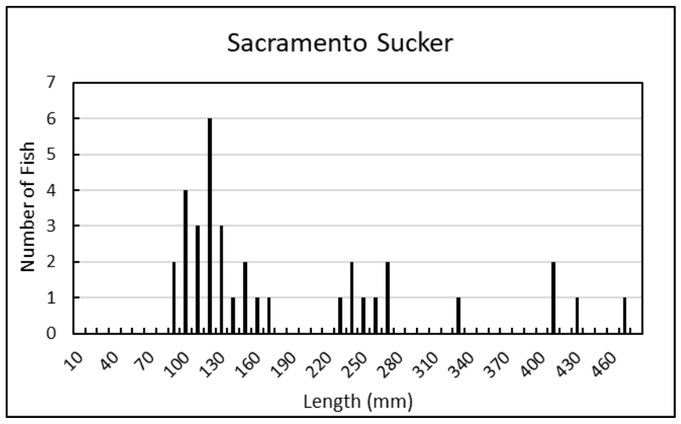
Copyright 2026 by Southern California Edison

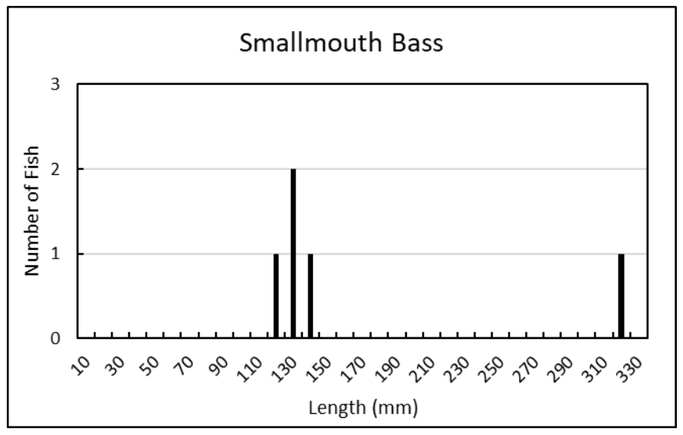
Kern River No. 1 Bypass Reach Site C Length-Frequency Historgrams





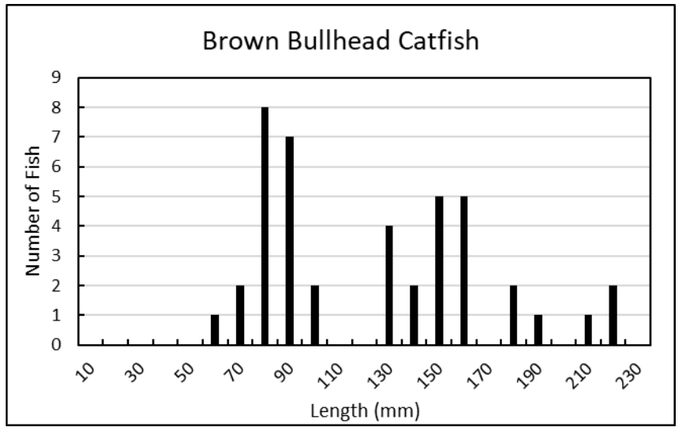


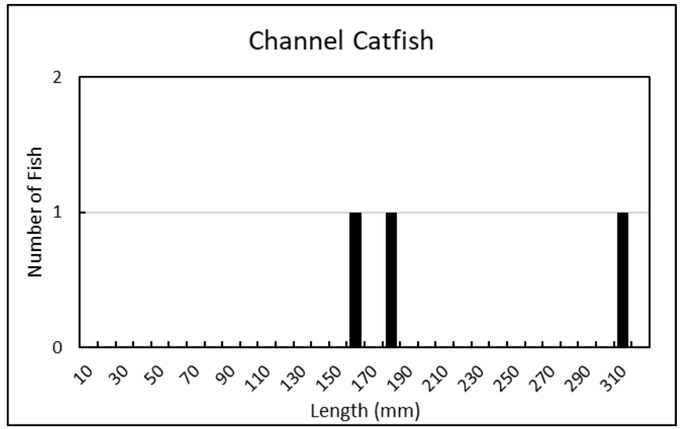


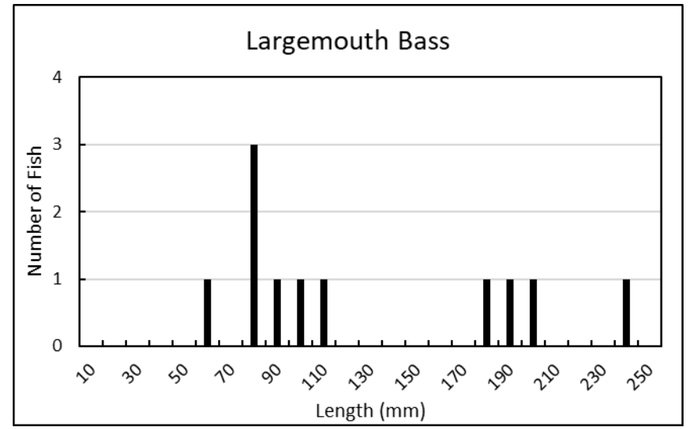


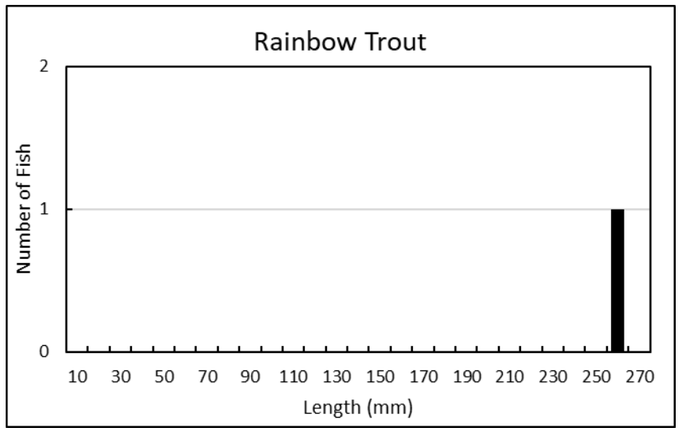
Copyright 2026 by Southern California Edison

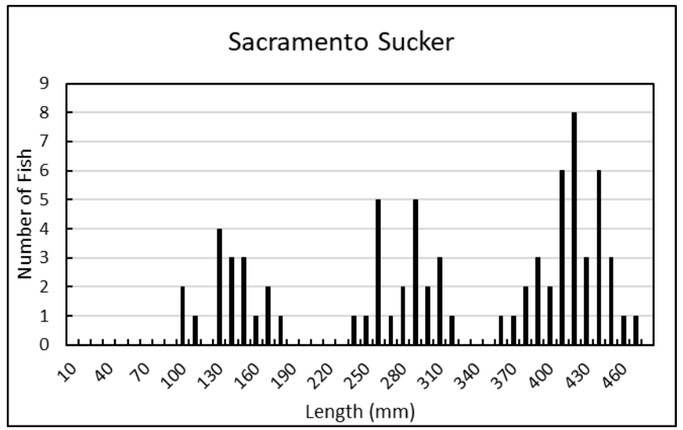
Kern River No. 1 Bypass Reach Site D Length-Frequency Historgrams

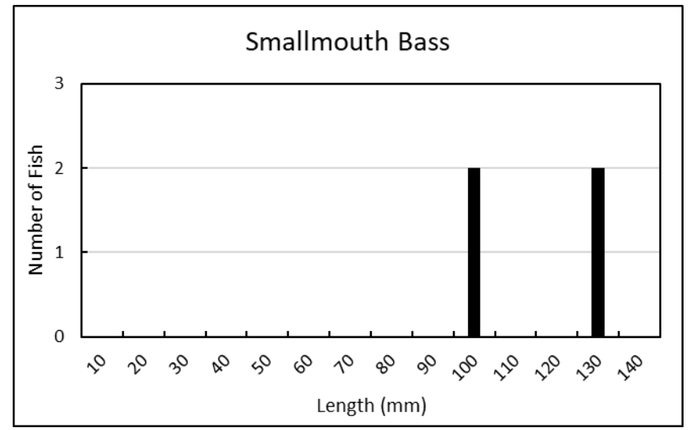






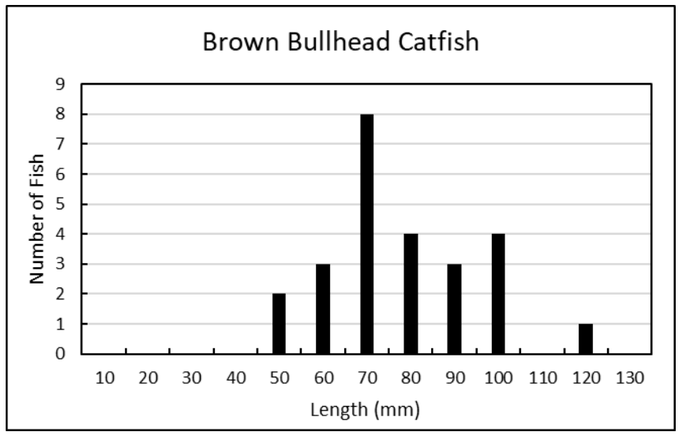




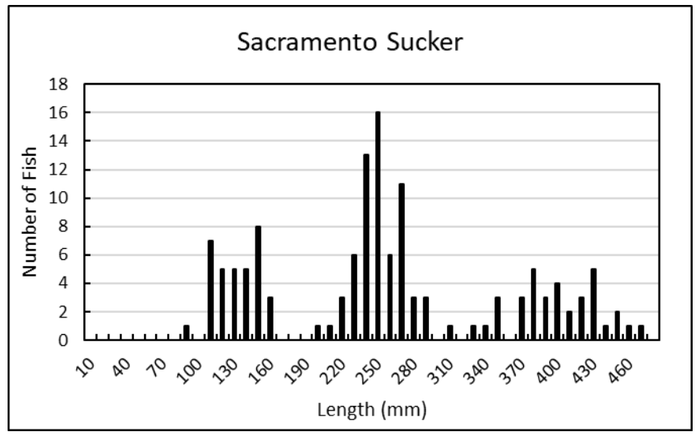


Copyright 2026 by Southern California Edison

Kern River No. 1 Bypass Reach Site E Length-Frequency Historgrams







Copyright 2026 by Southern California Edison

APPENDIX C
2024–2025 FISH POPULATION SAMPLING PHOTOS

Copyright 2026 by Southern California Edison



Photo C-1. Adult hardhead captured in Democrat Dam Impoundment during 2024 E-Cat sampling with unknown wound or infection.



Photo C-2. Adult white catfish (left), largemouth bass (middle), and black crappie (right) captured in Democrat Dam Impoundment during 2024 E-Cat sampling.



Photo C-3. Adult hardhead minnow captured in the Kern River No. 1 Bypass Reach in 2025.



Photo C-4. Juvenile hardhead minnow captured in the Kern River No. 1 Bypass Reach in 2025.



Photo C-5. Rainbow trout captured in the Kern River No. 1 Bypass Reach in 2025.



Photo C-6. Adult Sacramento sucker captured in the Kern River No. 1 Bypass Reach in 2025.



Photo C-7. Adult smallmouth bass captured in the Kern River No. 1 Bypass Reach in 2025.

Photo C-8. Juvenile largemouth bass (bottom) and smallmouth bass (top) captured in the Kern River No. 1 Bypass Reach in 2025.



Photo C-9. Juvenile channel catfish captured in the Kern River No. 1 Bypass Reach in 2025.



Photo C-10. Juvenile brown bullhead catfish captured in the Kern River No. 1 Bypass Reach in 2025.



Photo C-11. American bullfrog (*Lithobates catesbeianus*) tadpole observed in the Kern River No. 1 Bypass Reach (Site B) in 2025.



Photo C-12. Asian clams (*Corbicula fluminea*) observed in the Democrat Dam Impoundment during 2024 E-Cat sampling (left) and the Kern River No. 1 Bypass Reach during 2025 sampling (right).



Photo C-13. Curly-leaf pondweed (*Potamogeton crispus*) observed in the Kern River No. 1 Bypass Reach in 2025.

APPENDIX D

EJ 1 – ENVIRONMENTAL JUSTICE TECHNICAL MEMORANDUM

Copyright 2026 Southern California Edison

EJ 1 – ENVIRONMENTAL JUSTICE TECHNICAL MEMORANDUM

KERN RIVER NO. 1 HYDROELECTRIC PROJECT
FERC PROJECT NO. 1930

PREPARED FOR:



March 2026

TABLE OF CONTENTS

1.0 Introduction 1

2.0 Study Objectives 1

3.0 Study Area 1

4.0 Methods 2

4.1 Study Plan Variances 2

4.2 Environmental Justice Demographic Data 2

4.3 CalEnviroScreen 4.0 3

4.4 Sensitive Receptors 4

5.0 Results Summary 4

5.1 Environmental Justice Populations in the Study Area 4

5.2 CalEnviroScreen 4.0 5

5.3 Sensitive Receptors 5

5.4 Summary 6

6.0 Study Specific Consultation 6

7.0 Outstanding Study Plan Elements 7

8.0 References 7

LIST OF TABLES

Table 5-1. Census Block Groups within the Study Area 10

Table 5-2. Minority Populations by Race and Low-Income Populations within the Study Area 11

LIST OF MAPS

Map 3-1. Environmental Justice Study Area 13

Map 5-1. Study Area Map with Identified Environmental Justice Communities 14

Map 5-2. Kern County Census Tract 52.06 and 51.04 CalEnviroScreen Map 15

Map 5-3. Map of CalEPA Identified Disadvantaged Communities Relative to the Study Area 16

LIST OF ACRONYMS

BG	Block Group
CalEPA	California Environmental Protection Agency
CBG	Census Block Group
CEQ	Council on Environmental Quality
CT	Census Tract
DAC	Disadvantaged Communities
EJ	environmental justice
EJ Study	Environmental Justice Study
EJScreen	USEPA Environmental Justice Screening and Mapping Tools
FERC	Federal Energy Regulatory Commission
Forest Service	United States Forest Service
ILP	Integrated Licensing Process
NEPA	National Environmental Policy Act
Project	Kern River No. 1 Hydroelectric Project
SB	Senate Bill
SCE	Southern California Edison
SPD	Study Plan Determination
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

An Environmental Justice Study (EJ Study) was developed in response to the Federal Energy Regulatory Commission's (FERC) March 14, 2024, Study Plan Determination (SPD) (FERC 2024). This Technical Memorandum provides the methods and findings of desktop research associated with the EJ-Environmental Justice Study Plan outlined in FERC's SPD in support of Southern California Edison's (SCE) Kern River No. 1 Hydroelectric Project (Project) relicensing, FERC Project No. 1930. The EJ Study follows prior, recently abandoned federal guidelines and methodologies to identify the presence of environmental justice (EJ) communities, develop outreach strategies and solicit input from these communities regarding the Project, and assess the potential for the Project to have disproportionately adverse and significant impacts on those communities. Because the federal government abandoned EJ analyses for purposes of National Environmental Policy Act (NEPA) review subsequent to FERC's SPD in March 2024, this Technical Memorandum was prepared solely to comply with FERC's SPD. Desktop data collection efforts were completed in 2024 and are summarized below.

2.0 STUDY OBJECTIVES

The objectives of the study, as outlined in FERC's SPD and addressed in this memorandum, include:

- Identify the presence of any EJ communities that may be affected by the relicensing of the Project and identify outreach strategies to engage the identified EJ communities in the relicensing process, if present;
- Identify the presence of non-English speaking populations that may be affected by the Project and identify outreach strategies to engage non-English speaking populations in the relicensing process, if present;
- Discuss effects of relicensing the Project on any identified EJ communities and identify any effects that are disproportionately high and adverse;
- Identify mitigation measures to avoid or minimize Project effects on EJ communities; and
- Identify sensitive receptor locations within the Project area and identify potential effects and measures taken to avoid or minimize the effects of such locations, if they are present.

3.0 STUDY AREA

The Project is located along the Kern River in Kern County, California. The Project is situated in the foothills of the western slope of the Sierra Nevada and occupies federal lands within the Sequoia National Forest which is under the jurisdiction of the United States Forest Service (Forest Service). The study area includes areas within the FERC

Copyright 2026 by Southern California Edison

Project boundary and within 1 mile of the FERC Project boundary. The study area is shown on Map 3-1.

4.0 METHODS

Study implementation followed the methods described in FERC's SPD (FERC 2024).

The methodology used in the study is consistent with prior, recently abandoned guidance from the United States Environmental Protection Agency's (USEPA) *Promising Practices for EJ Methodologies in NEPA Reviews* (NEPA Committee and EJ IWG 2016) (Executive Order Nos. 14148, 14154, and 14173). The analysis was accomplished through a desktop review of available EJ data including but not limited to population, health, racial and economic composition, minority groups, low-income individuals, and non-English-speaking groups. The following sources were used to compile this information:

- United States Census Bureau (U.S. Census Bureau 2022a, 2022b, 2022c, 2022d, 2023a)
- USEPA Environmental Justice Screening and Mapping Tools (EJScreen) (USEPA 2024a, 2024b)
- California Environmental Protection Agency (CalEPA) CalEnviroScreen 4.0 (CalEPA 2021a)

4.1 STUDY PLAN VARIANCES

There are no variances from FERC's SPD (FERC 2024).

4.2 ENVIRONMENTAL JUSTICE DEMOGRAPHIC DATA

In accordance with recently abandoned federal guidelines, the EJ study includes demographic and poverty-level data for the geographical area potentially affected by the Project to determine if EJ populations are present. Prior to the recent abandonment of EJ as an element of NEPA review, EJ populations were identified by applying the methods included in USEPA's *Promising Practices for EJ Methodologies in NEPA Reviews* (NEPA Committee and EJ IWG 2016).

Individuals who identify as any race other than White and/or list their ethnicity as Hispanic or Latino were considered minority (USEPA 2024a). According to prior federal guidelines, an area where the minority population exceeds 50 percent of the total population or where the minority population percentage is "meaningfully greater" than the minority population of an appropriate unit of geographic analysis, referred to as a reference population, was determined to be an EJ population (Council on Environmental Quality [CEQ] 1997); for the purpose of this Technical Memorandum, and as recommended by FERC in the SPD, "meaningfully greater" has been set as 10 percent greater than the reference population percentage.

Unlike prior federal guidance on minority populations, there was no quantitative definition of what proportion of low-income populations constituted an EJ population. Prior guidelines suggested using an appropriate poverty threshold and comparing the low-income population in an affected area to a reference population (NEPA Committee and EJ IWG 2016). Within this memorandum, low-income percentages of census block groups (CBG) are compared to the relative county percentage, and any equal to or greater than that percentage is designated a low-income EJ population. Low-income was defined by the USEPA as households where the income is less than or equal to twice the federal poverty level (USEPA 2024a). The poverty threshold is calculated as a percentage of those for whom the poverty ratio was known, as reported by the U.S. Census Bureau. In 2022, the federally defined poverty threshold for an individual under age 65 was $15,230 (U.S. Census Bureau 2023a).

To define an analysis area and identify potentially impacted EJ populations, prior federal guidance advised using an "appropriate unit of geographic analysis" that did not "artificially dilute or inflate" the population (CEQ 1997). The selected area may be a neighborhood CBG,[1] Census Tract (CT),[2] a governing body's jurisdiction, or other similar geographic unit. The CBG is the smallest geographic unit for which U.S. Census Bureau demographic data are available.

This study defines the analysis area as the CBGs where the Project is located and any CBGs within 1 mile of the FERC Project boundary. A CBG was selected as the appropriate geographic unit for analysis for purposes of determining whether EJ populations are in the area that may be affected by operation and maintenance of the Project.

4.3 CALENVIROSCREEN 4.0

In addition to using the U.S. Census Bureau demographics, information from the California-specific EJ tool, CalEnviroScreen (CalEPA 2021a), was reviewed. CalEnviroScreen shows cumulative impacts in California communities by CT. The Project is located within two CTs in Kern County: CT 52.06 and CT 51.04. These two CTs make up the study area for the CalEnviroScreen data.

CalEnviroScreen scores are calculated from the scores for two groups of indicators (i.e., Pollution Burden and Population Characteristics) and present a relative, rather than an absolute, evaluation of pollution burdens and vulnerabilities in California communities by providing a relative ranking of communities across the state. The model uses 21 statewide indicators to characterize Pollution Burden and Population Characteristics and uses percentiles to assign scores for each of the indicators in a given geographic area. The percentile represents a relative score for the indicators. Percentiles are averaged using a scoring system for the set of indicators in each of the four components: Exposures, Environmental Effects, Sensitive Populations, and Socioeconomic Factors. These component scores are then combined to produce a CalEnviroScreen Score for a given

[1] A Census Block Group (CBG) is comprised of a Census Tract (CT) and a specific Block Group (BG) within the CT.
[2] A CT is comprised of a group of BGs.

place relative to other places in the state. The formula for calculating the CalEnviroScreen Score is as follows:

Pollution Burden × Population Characteristics = CalEnviroScreen Score

Where Pollution Burden is the average of exposures and environmental effects (environmental effects score is weighted half as much as the exposures score) and Population Characteristics is the average of sensitive populations and socioeconomic factors. A full description of the methodology for the tool can be found in the October 2021 CalEnviroScreen 4.0 Document on the CalEPA website (CalEPA 2021b).

CalEnviroScreen's purpose is to help calculate the cumulative impact of multiple environmental and social burdens on communities. It is not intended to determine classification of a community as an EJ population. The tool has helped CalEPA and other local, state, and federal agencies ensure their activities address these pollution burdens and protect those communities from additional ones. CalEPA uses CalEnviroScreen to prioritize enforcement and outreach in vulnerable communities.

4.4 SENSITIVE RECEPTORS

A look at specific locations within a study area community that may be associated with sensitive populations is also included. Sensitive Receptors include:

- Places where the community gathers such as community centers, senior facilities, or places of worship;
- Facilities where health vulnerable populations gather such as medical facilities; and
- Locations with large concentrations of children such as schools and daycare centers.

For this study, sensitive receptors were identified using a combination of mapping tools (Google Earth Pro, EJScreen, and ArcGIS) to search the study area for the closest sensitive receptor facilities to the Project.

5.0 RESULTS SUMMARY

The EJ study follows the prior, abandoned federal guidelines and methodologies outlined in Section 4.0 to assess the potential for the Project to have disproportionately adverse impacts on vulnerable populations (or EJ populations).

5.1 ENVIRONMENTAL JUSTICE POPULATIONS IN THE STUDY AREA

Using the U.S. Census Bureau data and the recommended FERC guidelines for identifying an EJ population, one CBG (CT 52.06 BG 1) within the study area is classified as an EJ community based on income.

None of the CBGs within the study area have minority populations that are meaningfully greater than the Kern County minority population. Kern County has a total minority population that is greater than 50 percent in addition to being greater than the minority population in the state of California; however, the CBGs in the study area have much lower populations of minority residents. Throughout the study area, the minority group with the highest populations are those identifying as Latino or Hispanic or Two or More Races. Refer to Table 5-1 and Map 5-1 for a breakdown of the CBGs in the study area. Minority populations by race and low-income populations within the study area are summarized in Table 5-2.

5.2 CALENVIROSCREEN 4.0

Map 5-2 identifies the overall CalEnviroScreen percentile of each CBG in the study area (CalEPA 2021a). To get the overall CalEnviroScreen percentile score, the Pollution Burden component and the Population Characteristics component are multiplied. Each component is made up of a set of indicators. There are 13 Pollution Burden indicators and 8 Population Characteristics indicators (California Office of Environmental Health Hazard Assessment 2024). CTs with darker red colors have higher CalEnviroScreen scores and therefore have relatively high pollution burdens and population sensitivities. CTs with lighter green colors have lower scores and correspondingly lower pollution burdens and sensitivities.

The overall percentile for CalEnviroScreen in CT 52.06 is 80 with the Pollution Burden percentile at 54 and the Population Characteristics percentile at 90, and the overall percentile for CalEnviroScreen in CT 51.04 is 31 with the Pollution Burden percentile at 36 and the Population Characteristics percentile at 28 (Map 5-2).

CalEPA also provides a mapping tool that identifies Disadvantaged Communities (DAC) in accordance with Senate Bill (SB) 535 established in 2012. SB 535 detailed initial requirements for minimum funding levels to DACs and gives CalEPA the responsibility for identifying those communities. The legislation states that CalEPA's designation of DACs must be based on "geographic, socioeconomic, public health, and environmental hazard criteria" (CalEPA 2024).

According to the CalEPA SB 535 map for the study area, the pollution and demographic burdens are in the low to mid-range for the state of California. Within the study area, CT 52.06 BG 1 qualifies as a DAC following the designation established by CalEPA (Map 5-3).

5.3 SENSITIVE RECEPTORS

The Project is in a rural area of Kern County on federal lands within the Sequoia National Forest. The nearest populated area to the Project (as measured from the Project powerhouse) is the City of Bakersfield, which is approximately 9 miles southwest.

SCE is not proposing any new construction as part of the Project that has the potential to affect sensitive receptors. Further, there are no sensitive receptor locations (e.g., schools, day care centers, hospitals, etc.) within the study area.

5.4 SUMMARY

According to the methodology described in FERC's SPD, there are no minority EJ communities in the study area. However, CT 52.06 BG 1 would be considered an EJ community under prior, now-abandoned federal guidelines, based on income, according to FERC's "low-income threshold criteria" since the percent of the population below the poverty level in the identified block group is equal to or greater than that of the reference population (Kern County).

SCE is seeking a new license to continue operation and maintenance of the existing Project. There are no changes to the Project that would result in impacts to low-income populations and mitigation is not required.

6.0 STUDY SPECIFIC CONSULTATION

To support public outreach and consultation, SCE has engaged with interested stakeholders throughout the relicensing process since 2022. Documents related to the relicensing are publicly available on FERC's e-Library and on SCE's public relicensing website. All interested stakeholders (including those who have filed a comment on the relicensing proceeding) are notified via email when documents are filed with FERC as part of this proceeding.

In addition to the consultation required as part of FERC's Integrated Licensing Process (ILP), SCE conducted the following stakeholder engagement activities:

- On July 21, 2022, SCE distributed a Project Information Questionnaire to stakeholders to solicit information on existing resources in the vicinity of the Project and to identify potential resource issues.

- On August 23, 2022, SCE notified stakeholders of the early outreach activities being conducted as part of the relicensing process, including the questionnaire that was also made electronically available on the Project website, and notice that a public relicensing kick-off teleconference would be conducted. In addition, SCE posted the relicensing public announcement on social networks (i.e., Facebook and Next Door).

- On June 13, 2023, SCE conducted a public relicensing teleconference to acquaint stakeholders with FERC's ILP, including key milestones and opportunities for stakeholder participation; describe Project facilities and operations; and explain the Pre-Application Document contents and organization.

- As part of other FERC-approved technical studies that include direct interactions with the public as part of study plan implementation, bilingual (English and Spanish) information flyers, public questionnaires, and bilingual field staff have been deployed.

SCE will continue ongoing outreach to the local communities and stakeholders in the vicinity of the Project to obtain comments regarding the relicensing of the Project and to understand primary concerns and questions from interested stakeholders as part of the ILP. If a Project-related impact that has a significant and disproportionate effect on low-income EJ communities is identified through the relicensing process, additional consultation may be necessary.

7.0 OUTSTANDING STUDY PLAN ELEMENTS

There are no outstanding study plan elements. The EJ Study is complete.

8.0 REFERENCES

CalEPA (California Environmental Protection Agency). 2021a. CalEnviroScreen, Version 4.0. Online tool. Accessed: September 2024. Available online: CalEnviroScreen 4.0 Results (arcgis.com).

_____. 2021b. California Communities Environmental Health Screening Tool Guide. Accessed: September 2024 Available online: CalEnviroScreen 4.0.

_____. 2024. California Climate Investments to Benefit Disadvantaged Communities. Accessed: September 2024. Available online: California Climate Investments to Benefit Disadvantaged Communities | CalEPA.

CEQ (Council on Environmental Quality). 1997. Environmental Justice Guidance Under the National Environmental Policy Act. Accessed: September 2024. Available online: Environmental Justice Guidance Under the National Environmental Policy Act (epa.gov).

Executive Order No. 14148. “Initial Rescissions of Harmful Executive Orders and Actions,” 90 FR 8237 (January 28, 2025).

Executive Order No. 14154. “Unleashing American Energy,” 90 FR 8353 (January 20, 2025).

Executive Order No. 14173. “Ending Illegal Discrimination and Restoring Merit-Based Opportunity,” 90 FR 6807 (January 21, 2025).FERC (Federal Energy Regulatory Commission). 2024. Study Plan Determination for the Kern River No. 1 Hydroelectric Project. March 14.

NEPA Committee and EJ IWG (National Environmental Policy Act Committee and Federal Interagency Working Group on Environmental Justice). 2016. Promising Practices for EJ Methodologies in NEPA Reviews. Accessed: September 2024. Available online: Promising Practices FOR EJ Methodologies IN NEPA Reviews

OEHHA (California Office of Environmental Health Hazard Assessment). 2024. CalEnviroScreen Scoring & Model. Accessed: September 2024. Available online: Scoring & Model | OEHHA (ca.gov).

U.S. Census Bureau (United States Census Bureau). 2022a. ACS 5-Year Estimates Detailed Tables. File B01001 Sex by Age. Accessed: September 2024. Available online: B01001: Census Bureau Table..

_____. 2022b. ACS 5-Year Estimates Detailed Tables. File B03002 Hispanic or Latino Origin by Race. Accessed: September 2024. Available online: B03002: Hispanic or Latino Origin ... - Census Bureau Table.

_____. 2022c. ACS 5-Year Estimates Detailed Tables. File B16004 Age by Language Spoken at Home by Ability to Speak English for the Population 5 Years and Older. Accessed: September 2024. Available online: B16004: Age by Language Spoken at ... - Census Bureau Table.

_____. 2022d. ACS 5-Year Estimates Detailed Tables. File B17017 Poverty Status in the past 12 Months by Household Type by Age of Householder. Accessed: September 2024. Available online: B17017: Census Bureau Table.

_____. 2023a. Poverty Thresholds by Size of Family and Number of Related Children Under 18 Years. Accessed: September 2024. Available online: Poverty Thresholds (census.gov).

_____.2023b. Code Lists, Definitions, and Accuracy – Subject Definitions. Accessed: September 2024. Available online: Code Lists, Definitions, and Accuracy (census.gov).

USEPA (United States Environmental Protection Agency). 2024a. EJScreen: Environmental Justice Screening and Map Tool – Overview of Socioeconomic Indicators in EJScreen. Accessed: September 2024. Available online: Overview of Socioeconomic Indicators in EJScreen | US EPA.

_____. 2024b. EPA EJScreen (Version 2.3). Online tool. Accessed: September 2024. Available online: EJScreen (epa.gov).

TABLES

Table 5-1. Census Block Groups within the Study Area

County	Census Block Groups
Kern County	CT 52.06 BG 1[1] CT 51.04 BG 4

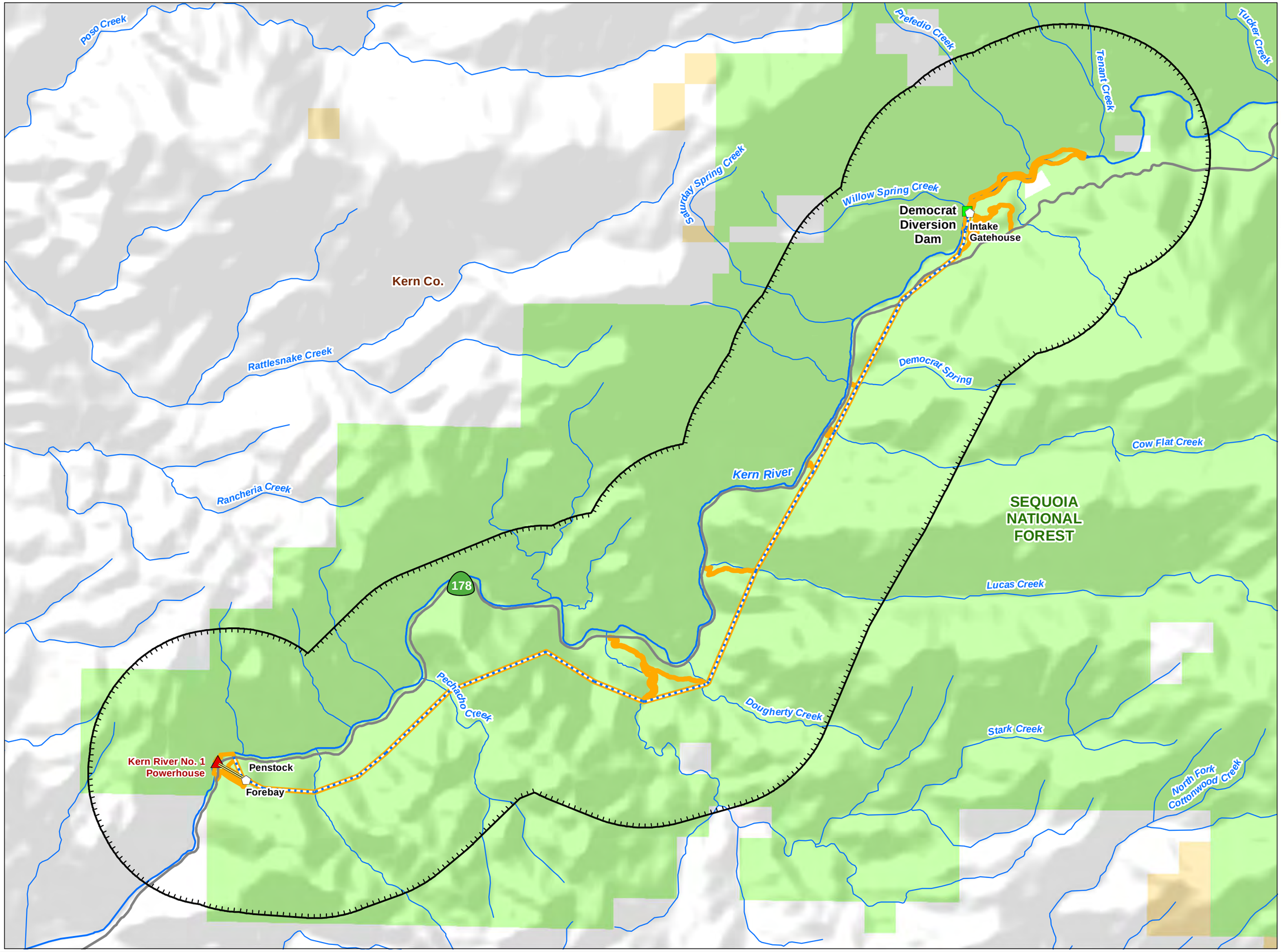
Notes: [1] EJ Community based on low-income population higher than the relative county percentage.
Key: BG = Block Group
CT = Census Tract

Table 5-2. Minority Populations by Race and Low-Income Populations within the Study Area

Geography	Race and Ethnicity Data[1,2]										Low-Income Data[1,2]
	Total Population	White Alone Not Hispanic	African American	Native American/ Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some Other Race	Two or More Races	Hispanic or Latino	Total Minority[3]	Below Poverty Level
California	39,356,104	35.2%	5.3%	0.3%	14.9%	0.3%	0.4%	3.8%	39.7%	64.8%	11.8%
Kern County	906,883	31.5%	4.9%	0.4%	4.8%	0.1%	0.4%	2.7%	55.3%	68.5%	18.2%
CT: 52.06 BG: 1	751	67.0%	3.3%	0.0%	0.0%	0.0%	0.0%	6.5%	23.2%	33.0%	**40.5%**
CT: 51.04 BG: 4	391	90.0%	0.0%	0.0%	3.07%	0.0%	0.0%	4.86%	2.05%	10.0%	0.0%

Source: U.S. Census Bureau 2022b and 2022d
Notes: [1] Bold type and gray shading indicate minority or low-income populations exceeding the established thresholds.
[2] Due to rounding differences in the dataset, the totals may not reflect the sum of the addends.
[3] "Minority" refers to people who reported their ethnicity and race as something other than Non-Hispanic White.
Key: BG = Block Group
CT = Census Tract

MAPS



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Flowline
- Penstock
- FERC Boundary

Other Features

- Watercourse
- Highway

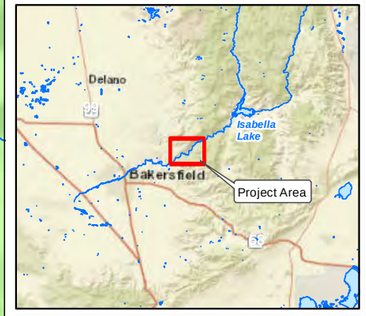
Land Jurisdiction**

- U.S. Forest Service
- U.S. Bureau of Land Management
- Private (Blank)

**SOURCE: BLM 2021

Environmental Justice Study

- Study Area (1-Mile Buffer of FERC Boundary)



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1

Environmental Justice Study Area

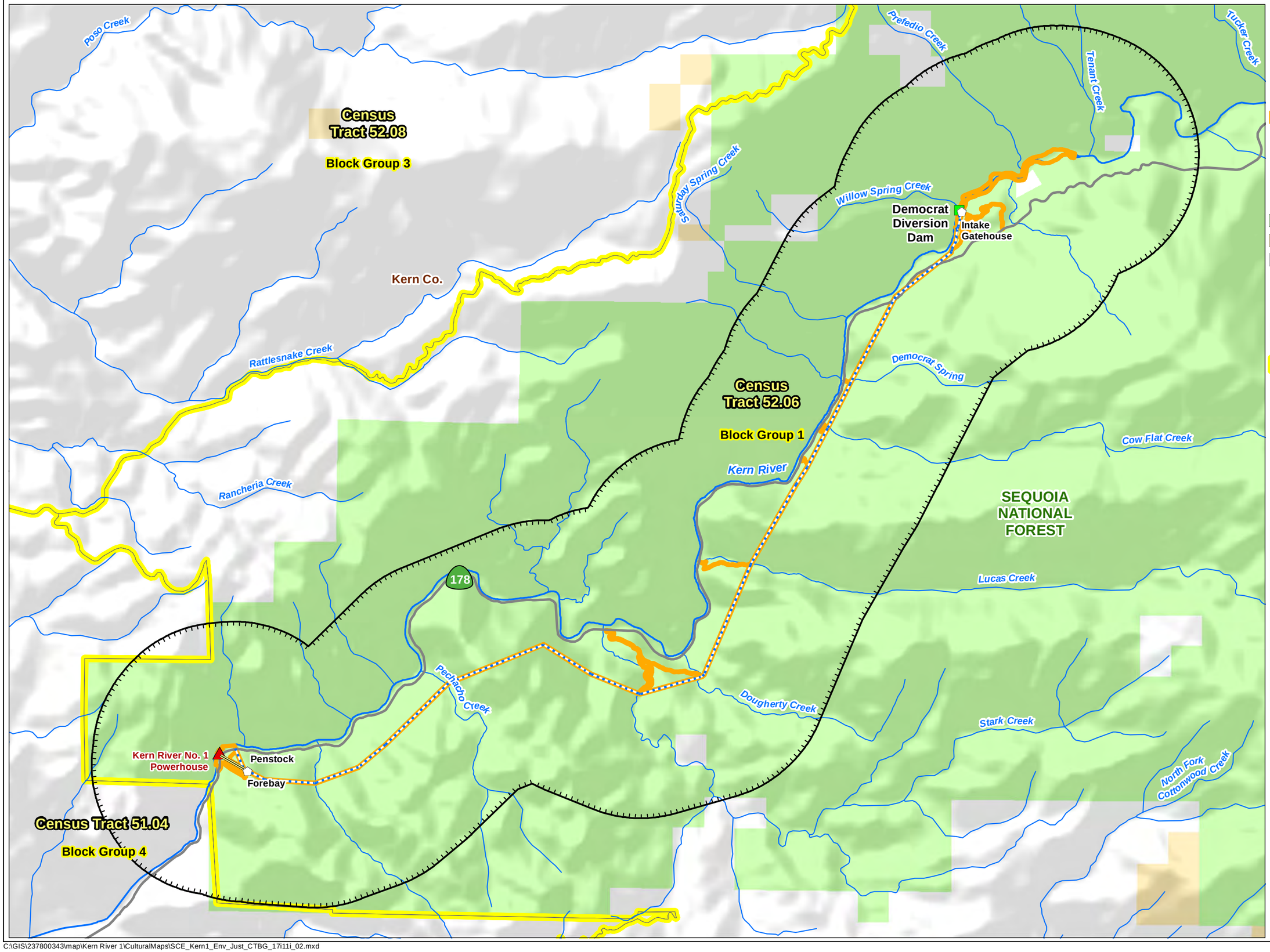
0 0.25 0.5 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 11/17/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Flowline
- Penstock
- FERC Boundary

Other Features

- Watercourse
- Highway

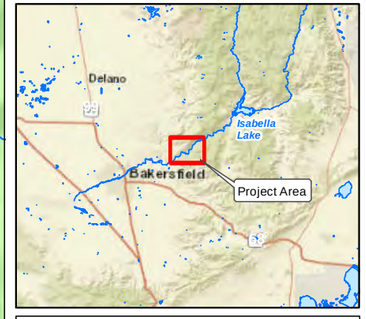
Land Jurisdiction**

- U.S. Forest Service
- U.S. Bureau of Land Management
- Private (Blank)

**SOURCE: BLM 2021

Environmental Justice Study

- Study Area (1-Mile Buffer of FERC Boundary)
- Census Tract / Block Group Boundary



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-1

Study Area with Identified Environmental Justice Communities

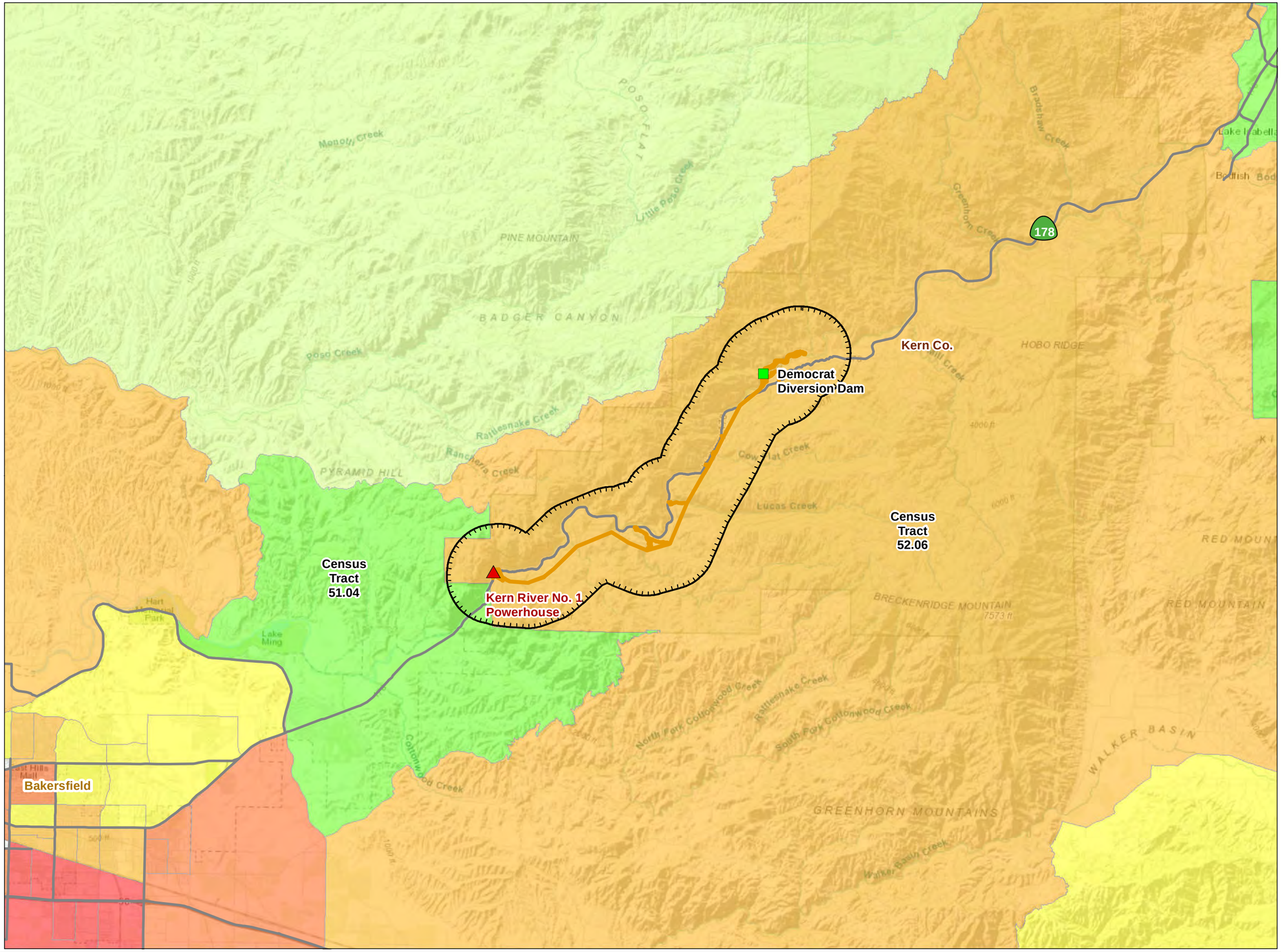
0 0.25 0.5 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 11/17/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- FERC Boundary

Other Features

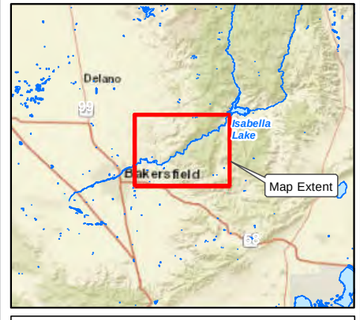
- Highway

Environmental Justice Study

- Study Area (1-Mile Buffer of FERC Boundary)
- Census Tract

CalEnviroScreen 4.0 Results (Overall Percentile)

- > 90-100 (Highest Scores)
- > 80 - 90
- > 70 - 80
- > 50 - 60
- > 30-40
- > 20 - 30



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-2

Kern County Census Tract 52.06 and 51.04 CalEnviroScreen Map

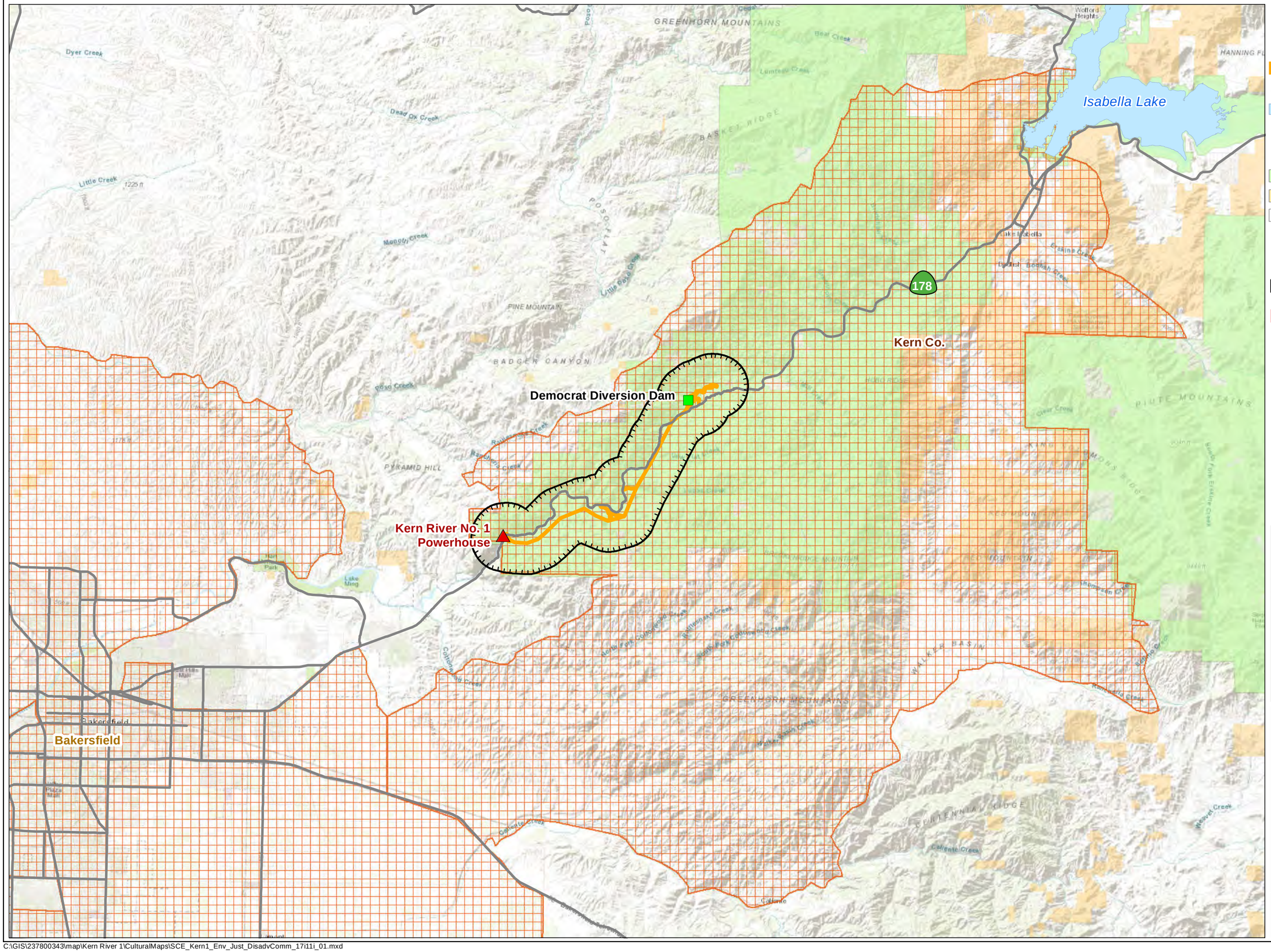
0 1.25 2.5 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 11/17/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- FERC Boundary

Other Features

- Lake
- Highway

Land Jurisdiction**

- U.S. Forest Service
- U.S. Bureau of Land Management
- Private (Blank)

**SOURCE: BLM 2021

Environmental Justice Study

- Study Area (1-Mile Buffer of FERC Boundary)
- Disadvantaged Communities

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3

Map of CalEPA Identified Disadvantaged Communities Relative to the Study Area

0 2 4 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 11/17/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company

APPENDIX E

LAND 1 – ROAD AND TRAIL CONDITION ASSESSMENT TECHNICAL MEMORANDUM

Copyright 2026 Southern California Edison

LAND 1 – ROAD AND TRAIL CONDITION ASSESSMENT TECHNICAL MEMORANDUM

KERN RIVER NO. 1 HYDROELECTRIC PROJECT
FERC PROJECT NO. 1930

PREPARED FOR:



March 2026

TABLE OF CONTENTS

1.0 Introduction 1

2.0 Study Objectives 1

3.0 Study Area and Study Sites 1

4.0 Methods 1

4.1 Study Plan Variances 1

4.2 Desktop Analysis 2

4.3 Reconnaissance-Level Condition Assessment 2

5.0 Results Summary 2

5.1 Desktop Analysis 2

5.1.1 Road and Trail Maintenance 3

5.1.2 Forest Service Maintenance Levels 3

5.2 Reconnaissance-Level Condition Assessment 4

5.2.1 Overall Condition 5

5.2.2 Culverts and Other Drainage Features 6

5.2.3 Erosion 6

5.2.4 Sensitive Resources 7

5.3 Road and Trail Use 7

6.0 Study Specific Consultation 8

7.0 Outstanding Study Plan Elements 8

8.0 References 8

LIST OF TABLES

Table 3-1. Project Access Roads and Trails within the Study Area 10

Table 4-1. Project Access Road and Trail Features Included in Reconnaissance-Level Condition Assessment 11

Table 5-1. Level 2 and 3 Forest Service Maintenance Prescription Guidelines 12

Table 5-2. Overall Condition of Project Access Roads 13
Table 5-3. Overall Condition of Project Access Trails 13
Table 5-4. Project Access Road Drainage Features and Classification 14
Table 5-5. Locations Experiencing Erosion on Project Access Roads 15
Table 5-6. Locations Experiencing Erosion on Project Access Trails 16

LIST OF MAPS

Map 3-1a. Project Access Roads and Trails within the Study Area 18
Map 3-1b. Project Access Roads and Trails within the Study Area 19
Map 3-1c. Project Access Roads and Trails within the Study Area 20
Map 3-1d. Project Access Roads and Trails within the Study Area 21
Map 3-1e. Project Access Roads and Trails within the Study Area 22
Map 3-1f. Project Access Roads and Trails within the Study Area 23
Map 3-1g. Project Access Roads and Trails within the Study Area 24

LIST OF APPENDICES

Appendix A Road and Trail Summary Table
Appendix B Road and Trail Condition Assessment Features
Appendix C Road and Trail Condition Assessment Maps
Appendix D Representative Photographs of Road and Trail Conditions

LIST OF ACRONYMS

CMP	corrugated metal pipe
FERC	Federal Energy Regulatory Commission
Forest Service	United States Forest Service
FSH	Forest Service Handbook
GIS	geographic information system
GPS	global positioning system

KR1	Kern River No. 1
LAND 1 TSP	LAND 1 – Road and Trail Conditions Assessment Technical Study Plan
O&M	operation and maintenance
PAD	Pre-Application Document
Project	Kern River No. 1 Hydroelectric Project Relicensing, FERC Project No. 1930
SCE	Southern California Edison
SPD	Study Plan Determination
SQF	Sequoia National Forest
SR-178	State Route 178
TSP	Technical Study Plan

1.0 INTRODUCTION

This LAND 1 – Road and Trail Condition Assessment Technical Memorandum provides the methods and findings of the LAND 1 – Road and Trail Condition Assessment Technical Study Plan (LAND 1 TSP). The LAND 1 TSP was conducted in support of Southern California Edison's (SCE) Kern River No. 1 (KR1) Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 1930. The LAND 1 TSP was included in SCE's Revised Study Plan submitted to FERC on February 13, 2024 (SCE 2024). In its March 14, 2024 Study Plan Determination (SPD), FERC approved the LAND 1 TSP without modifications (FERC 2024).

A desktop review of aerial imagery, existing geographic information system (GIS) road and trail data, and available operation and maintenance (O&M) records was conducted in June 2024. Following completion of this desktop review, a reconnaissance-level road and trail inventory was conducted in August 2024 to assess the current condition of all Project access roads and trails. As discussed in this report, all field reconnaissance efforts and data analyses associated with the LAND 1 TSP (SCE 2024) are complete.

2.0 STUDY OBJECTIVES

The objectives of the road and trail condition assessment study, as outlined in LAND 1 TSP (SCE 2024), include the following:

- Document current Project access road and trail conditions by conducting a reconnaissance-level inventory.
- Document SCE's current maintenance practices and frequency of use along Project access roads and trails.

3.0 STUDY AREA AND STUDY SITES

As defined in the KR1 Pre-Application Document (PAD), Project access roads and trails are those used for routine O&M of the Project (SCE 2023). As per the LAND 1 TSP the study area encompasses all Project access roads and trails identified in the PAD, which include eight roads (2.35 miles) and eleven trails (5.05 miles). These Project access roads and trails are identified in Table 3-1 (listed from downstream to upstream) and shown on Maps 3-1a–g.

4.0 METHODS

Study implementation followed the methods described in the LAND 1 TSP (SCE 2024).

4.1 STUDY PLAN VARIANCES

There are no variances from the LAND 1 TSP approved in FERC's SPD (FERC 2024).

4.2 DESKTOP ANALYSIS

A desktop analysis was conducted to characterize SCE's frequency of use along Project access roads and trails, frequency and type of maintenance activities, and location and size of culverts or other drainage features. Desktop GIS was used to compile data and develop annotated maps of available road features (i.e., culverts) for use during the reconnaissance-level condition assessment. Resources used to obtain information for the desktop analysis included the KR1 PAD (SCE 2023), aerial imagery, existing road and trail GIS data, and input from SCE O&M staff.

4.3 RECONNAISSANCE-LEVEL CONDITION ASSESSMENT

A reconnaissance-level condition assessment was conducted in August 2024 to characterize the current condition of Project access roads and trails relative to United States Forest Service (Forest Service) criteria for the assigned maintenance level (Forest Service 2005, 2014). Road and trail features identified in Table 4-1 were field-verified and/or collected during the August 2024 field assessment.

Project access roads and trails were surveyed by field personnel walking and/or slowly driving along each road/trail segment, periodically stopping to record general road/trail conditions, and documenting the condition of observed features. Features surveyed included culverts and other drainage features (i.e., water bars), erosion features, signs, riparian areas, and gates. Road and trail features were located using a Trimble Geo7X sub-meter Global Positioning System (GPS) unit. All GPS points collected in the field were assigned a unique feature ID, photographed, and georeferenced using the ArcGIS application Survey123. Condition and general observations were recorded in Survey123 for each feature.

Following the field visit, data collected in Survey123 was imported to Microsoft Excel and organized for reporting purposes. All data fields and photographs collected for each feature were reviewed for data quality assurance.

5.0 RESULTS SUMMARY

Results from the desktop analysis and August 2024 reconnaissance-level condition assessment are summarized below.

5.1 DESKTOP ANALYSIS

Preliminary road and trail information collected as part of the desktop analysis, including length, ownership, location relative to the FERC boundary, and Forest Service maintenance level; is summarized in Appendix A. As described in Section 4.1, the information obtained as part of the desktop analysis was then used to support the August 2024 reconnaissance-level condition assessment.

During the desktop analysis, information included in the KR1 PAD (SCE 2023) was verified to be accurate for all Project access roads and trails except Steel Flume Trail, which is shown in the wrong location. Specifically, current FERC Project boundary layers

(referenced in the KR1 PAD) indicate the Steel Flume Trail extends from State Route 178 (SR-178) up to the Forest Service trail called “Powerhouse Trail” and continues southeast along the Powerhouse Trail to Flume No. 3. However, during the field reconnaissance condition assessment staff confirmed that the segment of the Steel Flume Trail from SR-178 up to the Powerhouse Trail no longer exists. Refer to Map 3-1c for the field verified location of the Steel Flume Trail.

5.1.1 Road and Trail Maintenance

SCE conducts maintenance on all Project access roads and trails to ensure continued access to Project facilities. During the desktop analysis, SCE O&M staff confirmed that road and trail maintenance is performed according to the maintenance regime in Section 2.6 of the KR1 PAD (SCE 2023):

> *Project access roads are regularly inspected during normal Project activities. Minor repairs are conducted on an as-needed basis and major repairs are implemented annually during the late summer / fall. Minor road maintenance generally includes debris removal; basic repairs, including filing of potholes; maintenance of erosion control features such as culverts, drains, ditches, and water bars; repair, replacement, or installation of access control structures such as posts, cables, rails, gates, and barrier rock; and repair/replacement of signage. Major road maintenance generally includes placement or replacement of culverts and other drainage features; grading, sealing, resurfacing, and road replacement. Vegetation management may also be conducted concurrently with road maintenance.*
>
> *Project access trails are regularly inspected during normal Project activities. Repairs are conducted on an as-needed basis typically during late summer/fall. Trail maintenance generally includes debris and rock removal; basic repairs including minor brushing; maintenance of erosion control features such as water bars; repair, replacement, or installation of access control structures such as barrier rock; and repair / replacement of signage. Vegetation management may also be conducted concurrently with trail maintenance.*

5.1.2 Forest Service Maintenance Levels

Forest Service maintenance levels are classifications assigned to National Forest System roads that characterize “the level of service provided by, and maintenance required for, a specific road” (Forest Service 2005). Forest Service trails are not subject to Forest Service road maintenance levels and associated maintenance prescription guidelines. The five Forest Service road maintenance levels as defined by Forest Service Handbook (FSH) 7709.58,10,12.3 are summarized below (Forest Service 2005, 2014).

- Management Level 1 is assigned to intermittent service roads that are closed to vehicular traffic. Basic custodial maintenance is performed to keep damage to

adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities.

- Maintenance Level 2 is assigned to roads open for use by high-clearance vehicles. Traffic is typically minor, consisting of specialized uses such as administrative/permitted activities or dispersed recreation.

- Maintenance Level 3 is assigned to roads that are open and maintained for travel by standard passenger cars at low travel speeds. Roads are typically single-lane with turnouts and spot surfacing.

- Maintenance Level 4 is assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double-lane and aggregate surfaced, but may include single-lane roads.

- Maintenance Level 5 is assigned to roads that provide a high degree of user comfort and convenience. These roads are normally double-lane and paved, but may include aggregate surfaced roads.

Based on data collected during the desktop analysis, none of the Project access roads meet the moderate-to-high traffic volumes associated with Maintenance Levels 4 and 5, nor are any of the Project access roads closed to vehicular traffic (Management Level 1). All of the Project access roads are Maintenance Level 3, with the exception of Powerline Road and Dougherty Creek Road; these roads are less suitable for passenger vehicles and have a lower traffic volume, which are characteristic of Maintenance Level 2. Maintenance Level 3 roads are subject to the requirements of the Highway Safety Act and Manual of Uniform Traffic Control Devices, whereas Maintenance Level 2 roads are exempt.

Maintenance prescription guidelines for Level 2 and 3 roads as defined by FSH 7709.58,10,12.6, exhibit 01 (Forest Service 2005) are provided in Table 5-1.

5.2 RECONNAISSANCE-LEVEL CONDITION ASSESSMENT

The following section provides a summary of the following information:

- An overall condition assessment of all Project access roads and trails,

- A review of drainage features along Project access roads and trails,

- A review of locations experiencing erosion along Project access roads and trails, and

- A review of sensitive resources along Project access roads and trails.

Detailed road and trail feature information–including information about miscellaneous features such as signs, guardrails, and other safety features–are included in Appendix B, but are omitted from further discussion in this report.

5.2.1 Overall Condition

Road and trail conditions were categorized as “Good”, “Fair”, or “Poor” based on field observations, including erosion features, potholes, ruts, loose aggregate, missing aggregate, cracking debris, drainage feature classification, and excessive vegetation. These are defined as follows:

- **Good:** Most drainage features are designated as “No Apparent Concern” and functional; road/trail has adequate width to drive/walk safely; few erosion features may be present but are minor (small rills); little sign of surface deformation, including potholes, ruts, and wash boarding; no loose aggregate; sparse established vegetation in road/trail; road/trail is well-graded and does not need any maintenance/construction repairs.

- **Fair:** Most drainage features are designated as “No Apparent Concern” or “Potential Concern”; road/trail has adequate width to drive/walk safely; erosion features are present but consist of rills or minor drainage ditch erosion; some instances of surface deformation; sparse loose aggregate; vegetation may be present in some sections; road/trail may need some minor maintenance/construction repair; further monitoring may be necessary.

- **Poor:** Drainage features are not functioning as intended (standing water may be present) and need maintenance; sections of road/trail do not have adequate width for safe passage; major erosion concerns, including gully formation; road/trail surface deformation features are present and impact passage; loose aggregate is present; vegetation is established within road/trail; road/trail may have grading issues and needs maintenance/construction repairs; further monitoring is necessary.

Maps depicting Project access roads and trails, drainage features, and overall road/trail condition are provided in Appendix C. Representative photos depicting road and trail conditions are provided in Appendix D. While portions of some roads were observed to be in poor condition, all roads are maintained in accordance with their respective Forest Service Maintenance Level.

5.2.1.1 Roads

The overall condition of each of the eight Project access roads is summarized in Table 5-2.

5.2.1.2 Trails

The overall condition of each of the eleven Project access trails is summarized in Table 5-3.

5.2.2 Culverts and Other Drainage Features

A total of 41 drainage features were identified in the field, including 15 culverts and 26 miscellaneous drainage features such as water bars, slope drains, low-water crossings, drain inlets, and gutters. Based on conditions observed in the field, all drainage features were placed in one of the following categories:

- **No Apparent Concern:** Drainage feature appears to be functioning as designed; no major concerns with water conveyance due to sediment/detritus build-up or overgrown vegetation; no signs of erosion concerns including scouring; and no signs of structural issues including major rusting, holes, or other observed issues that would impact functioning of drainage feature.

- **Potential Concern:** Drainage feature shows some signs of not functioning as designed and warrants further monitoring and potential maintenance due to sediment/detritus build-up, overgrown vegetation, erosion concerns, and other observable structural issues.

- **Concern Likely:** Drainage feature is not functioning as designed and needs major maintenance or possible replacement due to sediment/detritus blockage, erosion concerns that are directing run-off away from drainage, and other observable structural issues.

Drainage concerns observed in the field included excess sediment/detritus in the inlet of culverts, sediment blockage at the outlet of culverts, and crushed/deteriorated corrugated metal pipe (CMP).

Additional information regarding the condition of each drainage feature is provided in Appendix B. Drainage feature locations are provided in Appendix C. Representative photos of drainage concern issues are provided in Appendix D.

5.2.2.1 Roads

Of the eight Project access roads, six included one or more drainage features. Powerline Road and Doughtery Creek Road did not include any drainage features. Table 5-4 summarizes the drainage classification of drainage features on each of the six roads.

5.2.2.2 Trails

All drainage features were located along roads except for one stream crossing and one seep along Lucas Creek Trail and a stream crossing along Stark Creek Trail (all classified as No Apparent Concern).

5.2.3 Erosion

A total of 91 locations experiencing erosion were identified in the field, including 31 road surface erosion features (i.e., chipped asphalt, alligator cracking, potholing) and 60 soil

erosion features (i.e., rills, gullies, slope instability). Based on conditions observed in the field, all erosion locations were placed in one of the following categories:

- **Low:** Erosion is discernable, but likely not introducing sediment to downstream drainages and waterways.
- **Moderate:** Erosion may be introducing sediment to downstream drainages and waterways, but does not currently pose a threat to the integrity of the road/trail prism.
- **High:** Erosion may potentially threaten the integrity of the road/trail prism if not addressed.

Most locations experiencing erosion observed in the field were minor-to-moderate; field staff did not observe any erosion that could result in a road or trail becoming impassible.

Additional information regarding the type and severity of each erosion location is provided in Appendix B. Representative photos of erosion are provided in Appendix D.

5.2.3.1 Roads

Erosion locations observed on Project access roads are summarized according to severity in Table 5-5.

5.2.3.2 Trails

Erosion locations observed on Project access trails are summarized according to severity in Table 5-6.

5.2.4 Sensitive Resources

Sensitive natural resources such as riparian areas were observed along many of the Project access roads and trails, including Democrat Gage Trail, Cow Flat Creek Trail, Lucas Creek Trail, Stark Creek Road, and Stark Creek Trail. Four stream crossings were identified in the field: Lucas Creek, which crosses Lucas Creek Trail at the beginning of the trail, and Stark Creek, which crosses Stark Creek Trail at the beginning of the trail as well as Stark Creek Road, which crosses twice within the final third of the road. Democrat Gage Trail travels adjacent to the Kern River, including portions of the trail that are located directly on the bank of the river.

Additional information regarding sensitive resources is provided in Appendix B. Representative photos are provided in Appendix D.

5.3 ROAD AND TRAIL USE

During the August 2024 field surveys, SCE staff and subcontractor crews were observed on several Project access roads. Neither SCE nor members of the public were observed utilizing any of the Project access trails during the surveys.

Refer to the REC 2 – Recreation Facility Use Assessment Interim Technical Memorandum for information related to use of Project Trails.

6.0 STUDY SPECIFIC CONSULTATION

The following study specific consultation was conducted:

- On June 24, 2024, SCE submitted a proposed approach to the Sequoia National Forest (SQF) for completion of the reconnaissance-level condition assessment for Project access roads and trails. On August 5, 2024, SQF provided concurrence for SCE's proposed approach via e-mail (personal electronic communication from Karen Miller, SQF Public Services Staff Officer, to Meg Richardson, KR1 Project Manager, August 5, 2024).

7.0 OUTSTANDING STUDY PLAN ELEMENTS

There are no outstanding study plan elements. The LAND 1 – Road and Trail Condition Assessment is complete.

8.0 REFERENCES

FERC (Federal Energy Regulatory Commission). 2024. Study Plan Determination for the Kern River No. 1 Hydroelectric Project. March 14.

Forest Service (United States Forest Service). 2005. Guidelines for Road Maintenance Levels. 7700-Transportation Management 0577 1205-SCTDC. December.

_____. 2014. Forest Service Manual (FSM) 7700. Travel management, Chapter 7730 – transportation system operation and maintenance. Amendment no. 7700-2014-1. Effective November 20, 2014.

SCE (Southern California Edison). 2023. Kern River No. 1 Hydroelectric Project, Pre-Application Document. May 5.

_____. 2024. Kern River No. 1 Hydroelectric Project (FERC Project No. 1930), Revised Study Plan. February 13.

TABLES

Table 3-1. Project Access Roads and Trails within the Study Area

Name	Length (miles)
Project Access Roads	
Democrat Dam Road[1]	0.93
Powerline Road	0.09
Flume No. 1 Road	0.08
Dougherty Creek Road	0.11
Stark Creek Road	0.82
Forebay Operations Area Road	0.13
Lower Powerhouse Road	0.09
Upper Powerhouse Road	0.10
Total	**2.35**
Project Access Trails	
Democrat Gage Trail[2]	0.30
Conduit No. 3 Trail	0.05
Cow Flat Creek Trail	0.13
Steel Flume Trail[3,4]	0.60
Lucas Creek Trail	0.52
Dougherty Creek Trail	0.45
Stark Creek Trail[2]	1.15
Adit 17 & 18 Trail[3]	0.67
Overflow Spillway Trail[3]	0.57
Skip Hoist/Forebay Trail[3]	0.57
Aerial Cable Upper Access Trail[2,4]	0.04
Total	**5.05**

Notes: [1] Democrat Dam Road is also referred to as Willow Spring Creek Road.
[2] Entirety of trail is outside the FERC Project boundary.
[3] A portion of the trail is outside the FERC Project boundary.
[4] Current FERC Project boundary layers (referenced in the PAD) indicate the Steel Flume Trail extends from State Route 178 (SR-178) up to the United States Forest Service (Forest Service) trail called “Powerhouse Trail” and continues southeast along the Powerhouse Trail to Flume No. 3. However, during the field reconnaissance condition assessment, staff confirmed that the segment of the Steel Flume Trail from SR-178 up to the Powerhouse Trail no longer exists; therefore that portion of the trail was not surveyed as part of the 2024 field reconnaissance. Instead, field technicians surveyed a contiguous section of the Powerhouse Trail (0.60-mile) extending south from Flume No. 2 (the upper terminus of the Cow Flat Creek Trail) to Conduit No. 6.
[5] Aerial Cable Upper Access Trail was not identified as a trail in the KR1 PAD. Consultation with SCE staff in 2024 confirmed that this trail is used for O&M.

Table 4-1. Project Access Road and Trail Features Included in Reconnaissance-Level Condition Assessment

Feature Type		Description
Road	Trail	
✓	✓	Land ownership/jurisdiction
✓	✓	Road/trail name
	✓	Location and condition of trailhead(s), if appropriate
✓	✓	Beginning and end points, and overall length
✓	✓	Average width
	✓	Average slope
	✓	Presence/absence of safety features such as handrails
✓		Surface type (e.g., paved, gravel, dirt)
✓	✓	Overall condition, including identification or issues pertaining to condition such as active erosion, potholes, ruts, loose aggregate, missing aggregate, cracking, debris, and excessive vegetation
✓		Location of natural resource features that may occur along Project access roads, such as stream crossings or riparian areas
✓	✓	Location, size, and condition of drainage and erosion control features such as culverts, water bars, and other drainage features
✓	✓	Location of areas experiencing erosion
✓		Location, type, and condition of signs (i.e., safety, traffic control, or informational)
✓	✓	Location and condition of access control features and barriers such as gates and other closure methods
	✓	Location of water crossings, if applicable
	✓	Observed public recreational use (e.g., hiking)
	✓	Resource concerns

Table 5-1. Level 2 and 3 Forest Service Maintenance Prescription Guidelines

Maintenance Type	Maintenance Level 2 Guidelines[1]	Maintenance Level 3 Guidelines[2]
General	As needed.	As needed.
Traveled way	Log out and brush as necessary to provide passage for planned traffic. Maintain road prism to provide for passage of high-clearance vehicles.	Maintain surface to provide travel by prudent drivers in standard passenger cars. Some surface roughness is tolerated. User comfort and convenience is a low priority. Maintain a traveled way crown or cross slope to provide adequate drainage. Replace the base course and surfacing as needed.
Shoulder	Maintain only as necessary for planned traffic.	Maintain existing shoulders commensurate with the traveled way.
Drainage	As necessary to keep drainage facilities functional and prevent unacceptable environmental damage.	As necessary to keep drainage facilities functional and prevent unacceptable environmental damage.
Roadway	Manage vegetative cover as needed for planned traffic. Remove and/or repair slides and/or slumps as needed for access with high clearance vehicles to control resource damage.	Maintain existing vegetative cover. Control the vegetation to provide sight distance. Repair and/or remove slides and slumps to provide passage by prudent drivers in standard passenger cars.
Roadside	Generally, no work is required.	Remove hazard trees and clean up litter.
Structure	Maintain all structures to provide for the passage of planned traffic.	Maintain all structures to provide for passage of planned traffic and to preserve structures for future use. Defer noncritical items and combine to provide for more economical project. For example, defective bridge rails, running planks, and bridge guideposts on a current basis. Defer the painting of bridge rails to a logical project cycle.
Traffic service	Install and maintain route markers; warning, regulatory, and guide signs; and other traffic control devices to provide for planned traffic and an appropriate traffic management strategy.	Install and maintain route markers; warning, regulatory, and guide signs; and other traffic devices to provide for planned traffic.

Source: Forest Service 2005
Notes: [1] Dougherty Creek Road and Powerline Road are maintenance level 2 roads.
[2] Democrat Dam Road, Flume No. 1 Road, Stark Creek Road, Forebay Operations Road, Lower Powerhouse Road, and Upper Powerhouse Road are maintenance level 3 roads.

Table 5-2. Overall Condition of Project Access Roads

Road Name	Overall Condition[1]
Democrat Dam Road	Fair
Powerline Road	Fair
Flume No. 1 Road	Fair
Dougherty Creek Road	Fair
Stark Creek Road	Fair
Forebay Operations Area Road	Fair
Lower Powerhouse Road	Fair
Upper Powerhouse Road	Good

Notes: [1] This column reflects the overall condition of each road; actual condition may vary for some segments of road. Refer to Appendix C for the condition of each segment along Project access roads.

Table 5-3. Overall Condition of Project Access Trails

Trail Name	Overall Condition[1]
Democrat Gage Trail	Good
Conduit No. 3 Trail	Good
Cow Flat Creek Trail	Good
Steel Flume Trail	Good
Lucas Creek Trail	Good
Dougherty Creek Trail	Good
Stark Creek Trail	Good
Adit 17 & 18 Trail	Fair
Overflow Spillway Trail	Poor
Skip Hoist/Forebay Trail	Fair
Aerial Cable Upper Access Trail	Fair

Notes: [1] This column reflects the overall condition of each trail; actual condition may vary for some segments of trail. Refer to Appendix C for the condition of each segment along Project access trails.

Table 5-4. Project Access Road Drainage Features and Classification

Road Name	Data ID	Description	Drainage Classification		
			No Apparent Concern	Potential Concern	Concern Likely
Democrat Dam Road	DD-1	Culvert, 10 inches		✓	
	DD-2	Culvert, 24 inches	✓		
	DD-3	Culvert, 10 inches			✓
	DD-4	Culvert, 24 inches			✓
	DD-5	Slope drain		✓	
	DD-6	Culvert, 12 inches	✓		
	DD-7	Culvert, 12 inches		✓	
Flume No. 1 Road	FN-1	Slope drain		✓	
Stark Creek Road	SC-1	Culvert, 12-inch CMP			✓
	SC-2	Culvert, 12-inch CMP		✓	
	SC-3	Culvert, 12-inch CMP		✓	
	SC-4	Culvert, 12-inch CMP	✓		
	SC-5	Culvert, 12-inch CMP	✓		
	SC-6	Culvert, 12-inch CMP		✓	
	SC-7	Culvert, 12-inch CMP			✓
	SC-8	Culvert, 12-inch CMP		✓	
	SC-9	Low-water crossing			✓
	SC-10	Water bar/slope drain	✓		
	SC-11	Water bar/slope drain	✓		
	SC-12	Low-water crossing	✓		
	SC-13	Slope drain	✓		
	SC-14	Slope drain	✓		
	SC-15	Water bar	✓		
Forebay Operations Area Road	FO-1	Drain inlet	✓		
	FO-2	Drain inlet	✓		
	FO-3	Drain inlet	✓		
Lower Powerhouse Road	LP-1	Drain outlet		✓	
	LP-2	Drain outlet	✓		

Road Name	Data ID	Description	Drainage Classification		
			No Apparent Concern	Potential Concern	Concern Likely
	LP-3	Drain outlet	✓		
	LP-4	Drain outlet	✓		
Upper Powerhouse Road	UP-1	Drain inlet	✓		
	UP-2	Drain inlet		✓	
	UP-3	Drain inlet	✓		
	UP-4	Drain inlet	✓		
	UP-5	Drain inlet	✓		
	UP-6	Drain inlet	✓		
	UP-7	Drain inlet	✓		
	UP-8	Curb and gutter	✓		

Key: CMP = corrugated metal pipe

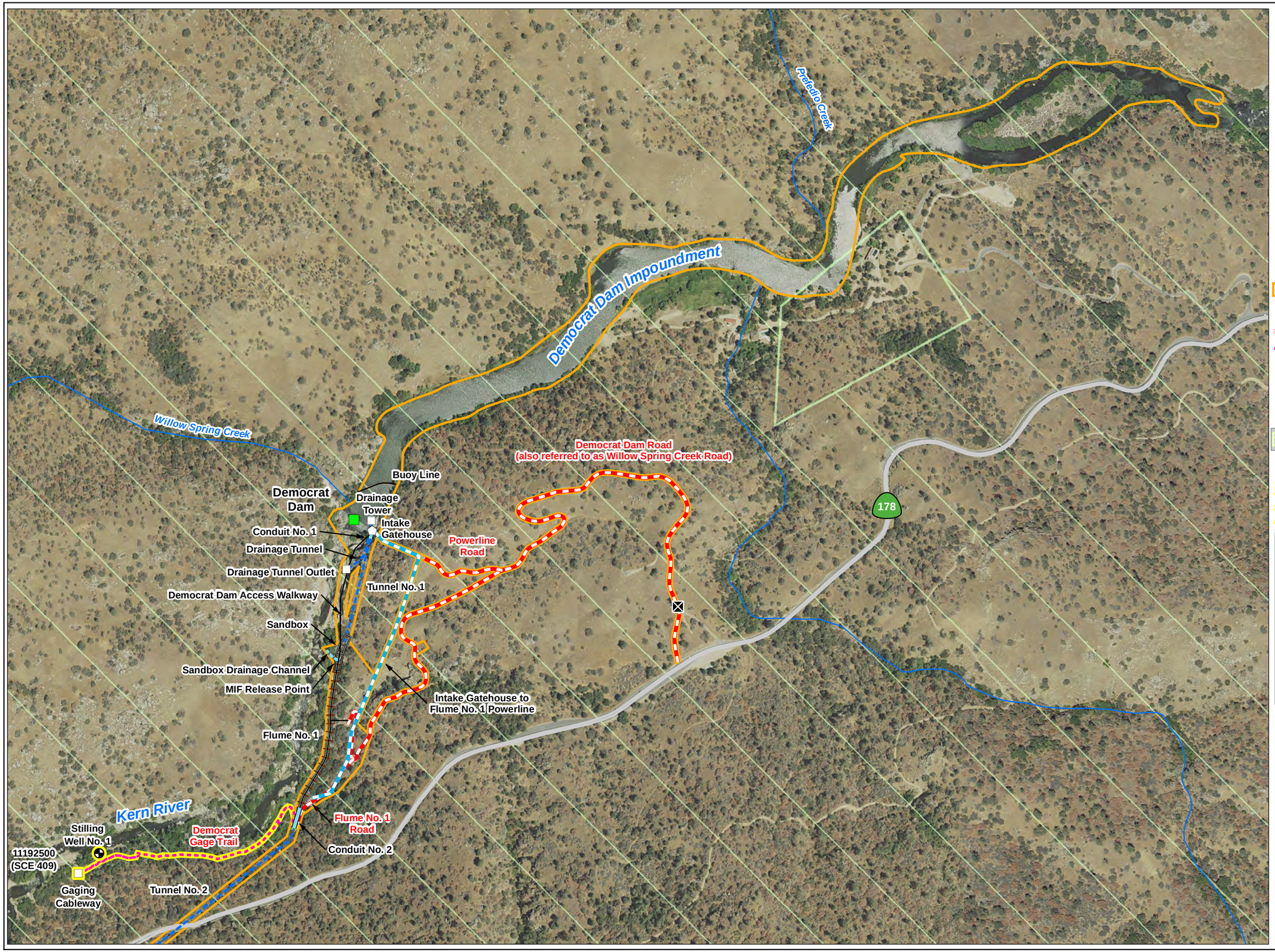
Table 5-5. Locations Experiencing Erosion on Project Access Roads

Road Name	Total No. of Locations Experiencing Erosion	Erosion Severity		
		Low	Moderate	High
Democrat Dam Road	23	2	6	15
Powerline Road	0	0	0	0
Flume No. 1 Road	3	0	3	0
Dougherty Creek Road	0	0	0	0
Stark Creek Road	4	0	0	4
Forebay Operations Area Road	5	0	3	2
Lower Powerhouse Road	4	0	2	2
Upper Powerhouse Road	1	0	0	1

Table 5-6. Locations Experiencing Erosion on Project Access Trails

Trail Name	Total No. of Erosion Features	Erosion Severity		
		Low	Moderate	High
Democrat Gage Trail	3	1	0	2
Conduit No. 3 Trail	1	0	0	1
Cow Flat Creek Trail	1	0	0	1
Steel Flume Trail	1	0	0	1
Lucas Creek Trail	3	3	0	0
Dougherty Creek Trail	0	0	0	0
Stark Creek Trail	2	0	1	1
Adit 17 & 18 Trail	13	0	10	3
Overflow Spillway Trail	17	1	2	14
Skip Hoist/Forebay Trail	10	0	3	7
Aerial Cable Upper Access Trail	0	0	0	0

MAPS



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication / Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

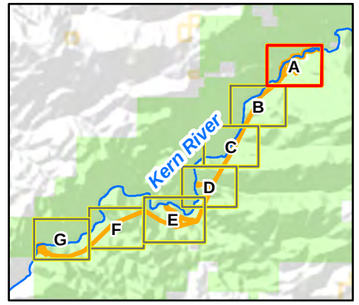
- Watercourse

Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

NOTE: PROJECT FEATURES OUTSIDE OF THE CURRENT FERC BOUNDARY ARE SHOWN WITH YELLOW HALOS AND APPEAR ON MAPS A,C,E AND G



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1A

Roads and Trails within the Study Area

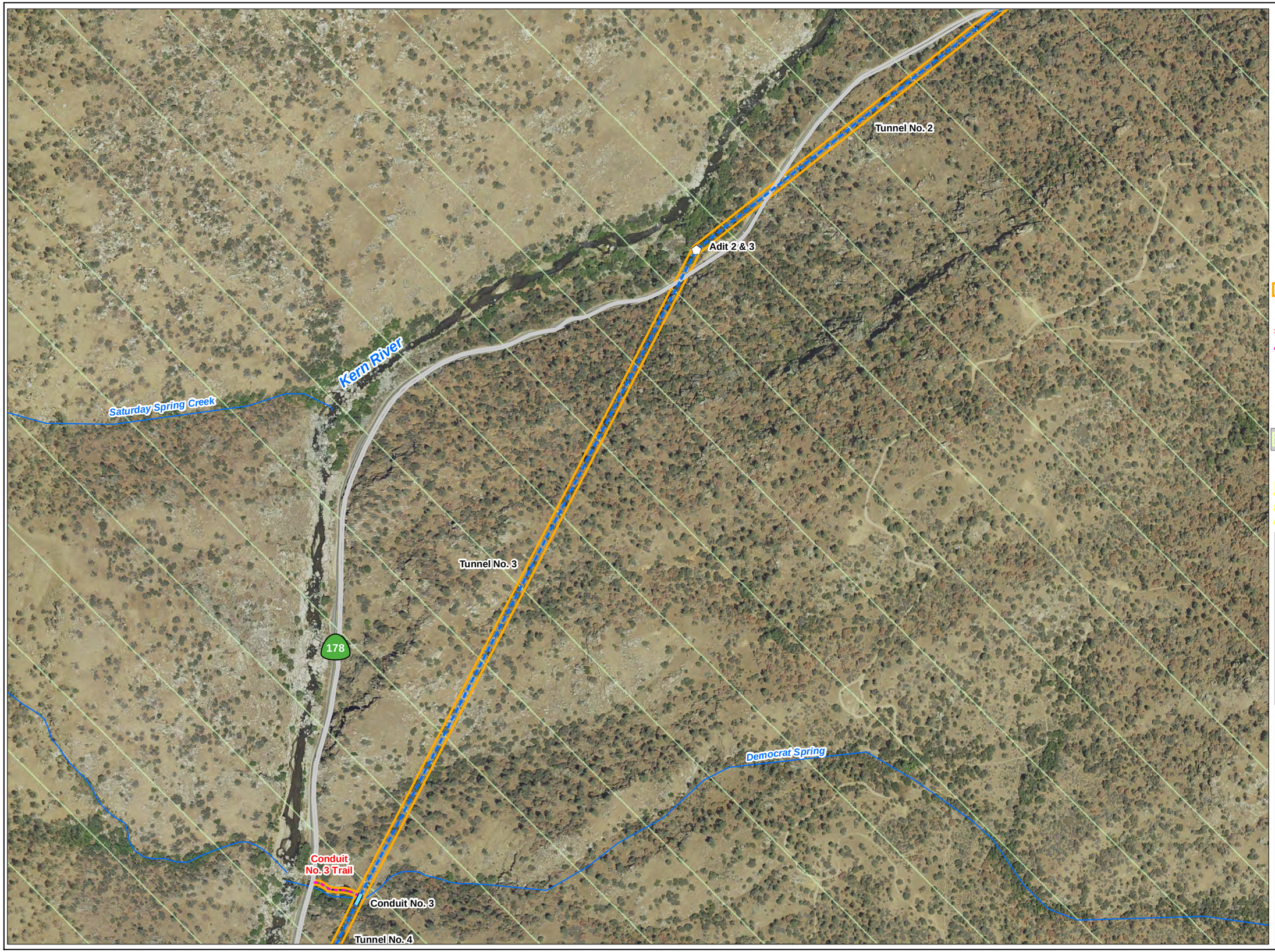
0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 7/16/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication / Powerline
- FERC Boundary

Transportation

- Project Road
- Other Road
- Project Trail
- Gate

Other Features

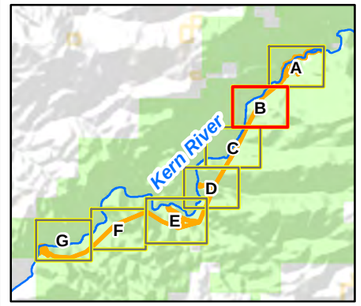
- Watercourse

Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

NOTE: PROJECT FEATURES OUTSIDE OF THE CURRENT FERC BOUNDARY ARE SHOWN WITH YELLOW HALOS AND APPEAR ON MAPS A,C,E AND G



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1B

Roads and Trails within the Study Area

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 7/16/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\Users\aclare\OneDrive - Stantec\Documents_CON01Data\gis_projects\237800343\03_data\gis_cad\map\Kern River 1\FacilitiesMaps\SCE_Kern1_ProjFacilities_17i11i_04_FeaturesOutsideFERC.mxd

Copyright 2025 by Southern California Edison Company

Tunnel No. 4
Adit 4 & 5
Tunnel No. 5
Stilling Well No. 2
Cow Flat Creek Trail
11192000 o. 2 Cow Flat Creek (SCE 410)
Cow Flat Creek
Powerhouse Trail (USFS)
Tunnel No. 6
Kern River
Steel Flume Trail
Conduit No. 4
Flume No. 3
Conduit No. 5
Tunnel No. 7
Conduit No. 6
178
Tunnel No. 8

Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication / Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

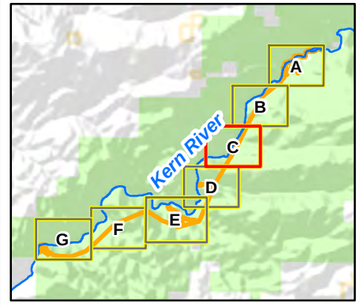
- Watercourse

Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

NOTE: PROJECT FEATURES OUTSIDE OF THE CURRENT FERC BOUNDARY ARE SHOWN WITH YELLOW HALOS AND APPEAR ON MAPS A,C,E AND G



Current FERC Project boundary layers (referenced in the PAD) indicate the Steel Flume Trail extends from SR-178 up to the Forest Service trail called “Powerhouse Trail” and continues southeast along the Powerhouse Trail to Flume No. 3. However, during the field reconnaissance condition assessment staff confirmed that the segment of the Steel Flume Trail from SR-178 up to the Powerhouse Trail no longer exists. The portion of Powerhouse Trail between Flume No. 2 and the intersection of Steel Flume Trail and Powerhouse Trail was also surveyed as part of the 2024 field reconnaissance surveys.”

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1C

Roads and Trails within the Study Area

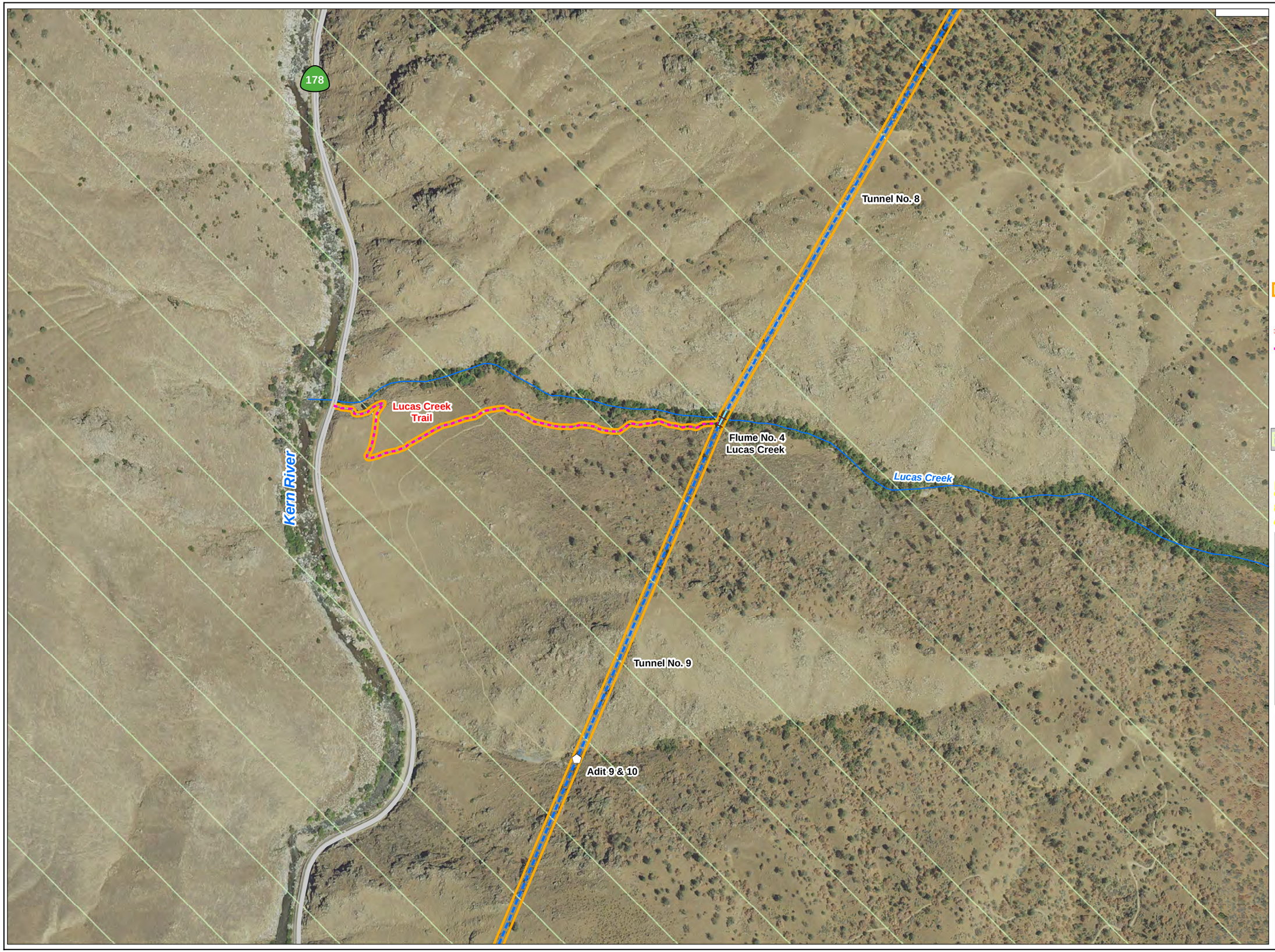
0 250 500
Feet

Date: 7/16/2025

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication / Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

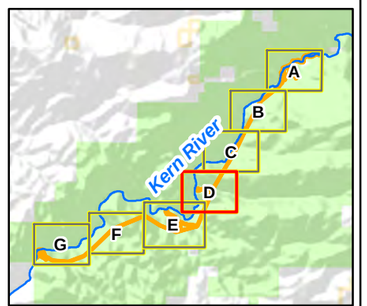
- Watercourse

Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

NOTE: PROJECT FEATURES OUTSIDE OF THE CURRENT FERC BOUNDARY ARE SHOWN WITH YELLOW HALOS AND APPEAR ON MAPS A,C,E AND G



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1D

Roads and Trails within the Study Area

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 7/16/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\Users\aclare\OneDrive - Stantec\Documents_CON01Data\gis_projects\237800343\03_data\gis_cad\map\Kern River 1\FacilitiesMaps\SCE_Kern1_ProjFacilities_17i11i_04_FeaturesOutsideFERC.mxd

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication / Powerline
- FERC Boundary

Transportation

- Project Road
- Other Road
- Project Trail
- Gate

Other Features

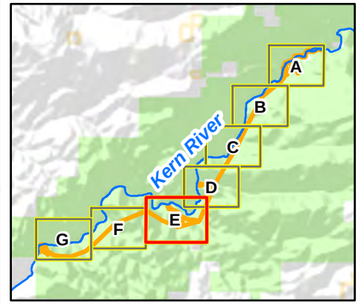
- Watercourse

Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

NOTE: PROJECT FEATURES OUTSIDE OF THE CURRENT FERC BOUNDARY ARE SHOWN WITH YELLOW HALOS AND APPEAR ON MAPS A,C,E AND G



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1E

Roads and Trails within the Study Area

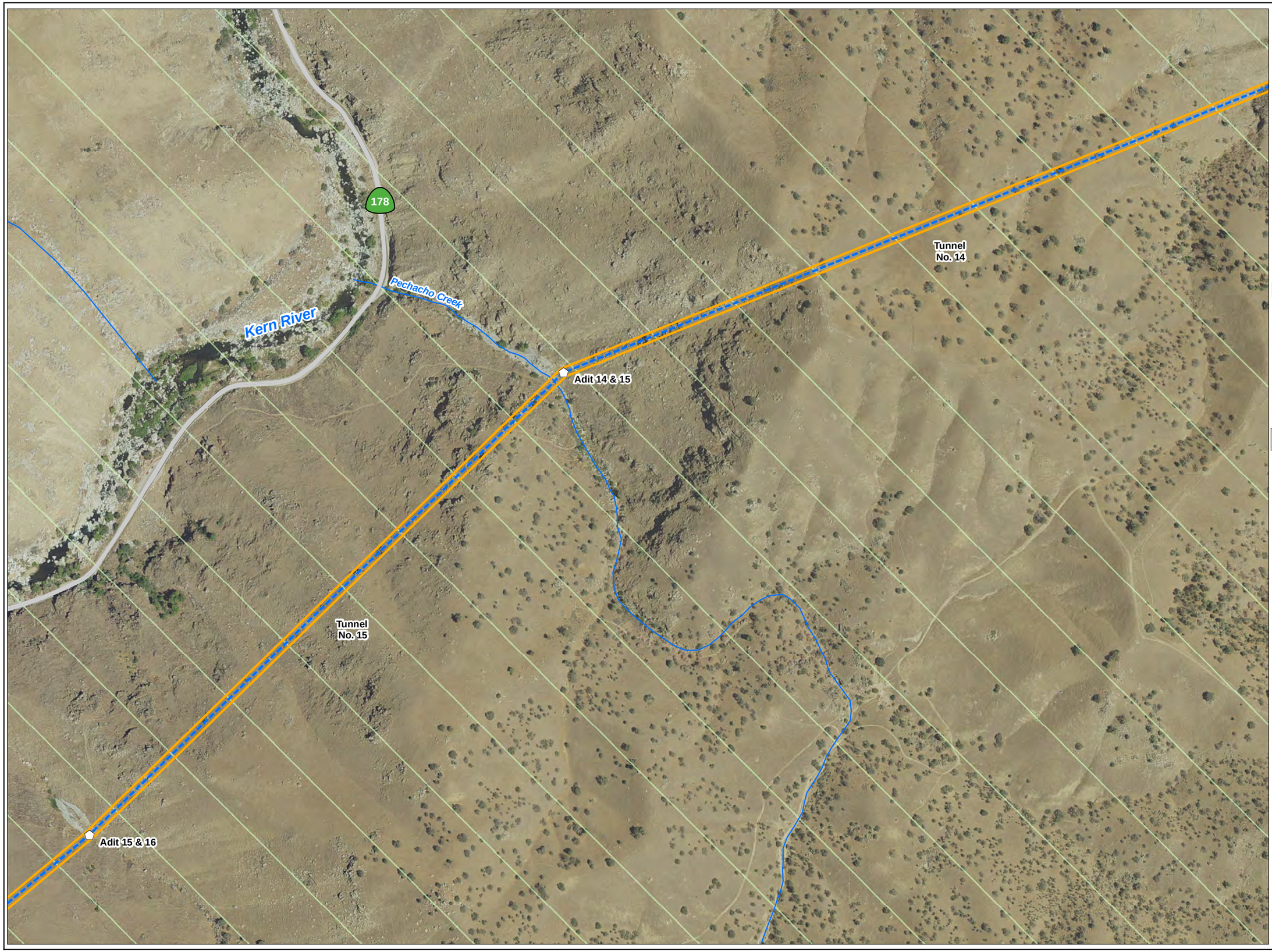
0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 7/16/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication / Powerline
- FERC Boundary

Transportation

- Project Road
- Other Road
- Project Trail
- Gate

Other Features

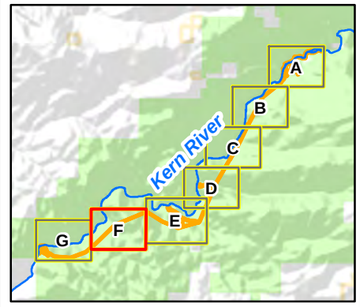
- Watercourse

Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

NOTE: PROJECT FEATURES OUTSIDE OF THE CURRENT FERC BOUNDARY ARE SHOWN WITH YELLOW HALOS AND APPEAR ON MAPS A,C,E AND G



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1F

Roads and Trails within the Study Area

0 250 500
Feet

Date: 7/16/2025

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication / Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

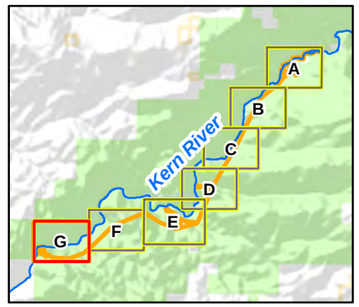
- Watercourse

Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

NOTE: PROJECT FEATURES OUTSIDE OF THE CURRENT FERC BOUNDARY ARE SHOWN WITH YELLOW HALOS AND APPEAR ON MAPS A,C,E AND G



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1G

Roads and Trails within the Study Area

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 7/25/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company

APPENDIX A

Project Access Road and Trail Summary Table

Copyright 2026 by Southern California Edison

Table A-1. Project Access Road and Trail Summary Table

Road/Trail Name	Start		End		Overall Length		Width (feet)	Surface Treatment	Gated and/or Vehicular Access Blocked	Within FERC Boundary?	Land Ownership	Forest Service Road Maintenance Level
	Description	Coordinates	Description	Coordinates	Feet	Mile						
Democrat Dam Road[1]	Kern Canyon Road (SR-178)	35.523384, -118.668729	Democrat Dam Access Walkway	35.5223245968, -118.675000594	4,892	0.93	16	Paved/ Aggregate	Yes	Yes	Sequoia National Forest	3
Powerline Road	Willow Spring Creek Road	35.5247682915, -118.672102875	Intake Gatehouse to Flume No. 1 Powerline	35.5249312287, -118.673585362	484	0.09	16	Native	Yes	Yes	Sequoia National Forest	2
Flume No. 1 Road	Willow Spring Creek Road	35.5217919309, -118.674884897	Flume No. 1	35.5209904858, -118.675837648	412	0.08	20	Native	Yes	Yes	Sequoia National Forest	3
Dougherty Creek Road	Stark Creek Road	35.4727034778, -118.719618033	Dougherty Creek Trail	35.4717749875, -118.718106301	577	0.11	20	Native	Yes	Yes	Sequoia National Forest	2
Stark Creek Road	Kern Canyon Road (SR-178)	35.4756047733, -118.724413543	Flume No. 6 Stark Creek	35.4686503859, -118.719082599	4,338	0.82	20	Paved/ Aggregate	Yes	Yes	Sequoia National Forest	3
Forebay Operations Area Road	Kern Canyon Road (SR-178)	35.4583489188, -118.779675975	Forebay Operations Area	35.460077796, -118.779069319	670	0.13	10	Paved	Yes	Yes	Sequoia National Forest	3
Lower Powerhouse Road	Upper Powerhouse Road	35.4588625773, -118.77959485	Switchyard	35.4600866242, -118.779908892	483	0.09	20	Paved/ Aggregate	Yes	Yes	Sequoia National Forest	3
Upper Powerhouse Road	Kern Canyon Road (SR-178)	35.4586249214, -118.779608558	Powerhouse	35.4600384784, -118.779485283	521	0.1	40	Paved	Yes	Yes	Sequoia National Forest	3
Democrat Gage Trail	Flume No. 1 Road	35.5209904858, -118.675837648	Gaging Cableway	35.5199418583, -118.680068369	1,596	0.3	4	Native	Yes	No	Sequoia National Forest	N/A
Conduit No. 3 Trail	Kern Canyon Road (SR-178)	35.5052742119, -118.691011269	Conduit No. 3	35.5050416266, -118.690184194	273	0.05	4	Native	Yes	Yes	Sequoia National Forest	N/A
Cow Flat Creek Trail	Kern Canyon Road (SR-178)	35.5001230664, -118.693912431	Flume No. 2 Cow Flat Creek	35.4997878015, -118.693401099	694	0.13	4	Native	Yes	Yes	Sequoia National Forest	N/A
Steel Flume Trail[2]	Flume No. 2 Cow Flat Creek	35.4997878015, -118.693401099	Conduit No. 6	35.4951411739, -118.696197014	3,168	0.60	4	Native	Yes	Partially	Sequoia National Forest	N/A
Lucas Creek Trail	Kern Canyon Road (SR-178)	35.4837700935, -118.711328628	Flume No. 4 Lucas Creek	35.4836012188, -118.704000824	2,758	0.52	4	Native	Yes	Yes	Sequoia National Forest	N/A
Dougherty Creek Trail	Dougherty Creek Road	35.4717883698, -118.718120316	Flume No. 5 Dougherty Creek	35.4702782426, -118.711100605	2,351	0.45	4	Native	Yes	Yes	Sequoia National Forest	N/A
Stark Creek Trail	Stark Creek Road	35.4689692629, -118.718862229	Adit 13 & 14	35.4738234076, -118.733186386	6,081	1.15	4	Native	Yes	No	Sequoia National Forest	N/A
Adit 17 & 18 Trail	Forebay	35.4585238793, -118.775404466	Conduit No. 9	35.4570588294, -118.765789912	3,547	0.67	4	Native	Yes	Partially	Sequoia National Forest	N/A

Copyright 2026 by Southern California Edison

Road/Trail Name	Start		End		Overall Length		Width (feet)	Surface Treatment	Gated and/or Vehicular Access Blocked	Within FERC Boundary?	Land Ownership	Forest Service Road Maintenance Level
	Description	Coordinates	Description	Coordinates	Feet	Mile						
Overflow Spillway Trail	Forebay Operations Area Lot	35.4602169072, -118.778362792	Adit 17 & 18 Trail	35.4578003034, -118.773366917	3,021	0.57	4	Native	Yes	Partially	Sequoia National Forest	N/A
Skip Hoist/Forebay Trail	Forebay Operations Area Lot	35.4598739793, -118.778747077	Forebay	35.4585238793, -118.775404466	3,055	0.57	4	Native	Yes	Partially	Sequoia National Forest	N/A
Aerial Cable Upper Access Trail	Skip Hoist Upper Landing	35.4581157268, -118.775998606	Aerial Cable Upper Mount	35.4577644514, -118.776063753	234	0.04	4	Native	Yes	Partially	Sequoia National Forest	N/A

Notes: [1] Democrat Dam Road is also referred to as Willow Spring Creek Road.
[2] Current FERC Project boundary layers (referenced in the PAD) indicate the Steel Flume Trail extends from SR-178 up to the Forest Service trail called “Powerhouse Trail” and continues southeast along the Powerhouse Trail to Flume No. 3. However, during the field reconnaissance condition assessment, staff confirmed that the segment of the Steel Flume Trail from SR-178 up to the Powerhouse Trail no longer exists; therefore that portion of the trail was not surveyed as part of the 2024 field reconnaissance. Instead, field technicians surveyed a contiguous section of the Powerhouse Trail (0.60-mile) extending south from Flume No. 2 (the upper terminus of the Cow Flat Creek Trail) to Conduit No. 6.

Key: FERC = Federal Energy Regulatory Commission
N/A = Not Applicable

Copyright 2026 by Southern California Edison

APPENDIX B

Project Access Road and Trail Condition Assessment Features

Copyright 2026 by Southern California Edison

Table B-1. Democrat Dam Road Features

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Democrat Dam Road	35.5227052737, -118.674251825	DD-1	Drainage feature	Culvert, 10" CMP	Potential Concern	–	Inlet pipe is bent and approximately 50% buried in sediment. Outlet pipe extends from hillside and is intact. Some rust is present. No erosion concerns were observed.
Democrat Dam Road	35.5229259399, -118.673559762	DD-2	Drainage feature	Culvert, 24" CMP	No Apparent Concern	–	Culvert drains a stream channel with evidence of ordinary high-water mark features (stained rock, abrupt changes in vegetation/sediment size). Inlet and outlet are free from sediment and in good condition. No erosion concerns were observed.
Democrat Dam Road	35.5236455694, -118.67383871	DD-3	Drainage feature	Culvert, 10" CMP	Concern Likely	–	Inlet is approximately 80% buried. Outlet discharges into a deteriorated steel slope drain. Minor erosion is present upstream of inlet. Gully erosion is present for approximately 80 feet below culvert.
Democrat Dam Road	35.5247324834, -118.672143454	DD-4	Drainage feature	Culvert, 12" steel	Concern Likely	–	Rusty steel pipe culvert (~12", not corrugated) with minor sediment accumulation at the inlet. Roadway is cracked along culvert path. Pipe is squished at outlet with substantial rust corrosion. Gully erosion is present along right side of roadway.
Democrat Dam Road	35.523770788, -118.674019181	DD-5	Drainage feature	Slope drain	Potential Concern	–	Steel slope drain in good condition with minor sediment accumulation at top of drain. Drain discharges into vegetated hillslope; no soil erosion was observed below drain.
Democrat Dam Road	35.5227052737, -118.674251825	DD-6	Drainage feature	Culvert, 12" CMP	No Apparent Concern	–	CMP in good condition. No sediment/debris accumulation observed. Some erosion is present along left shoulder near culvert.
Democrat Dam Road	35.5229259399, -118.673559762	DD-7	Drainage feature	Culvert, 12" CMP	Potential Concern	–	Inlet is approximately 30% buried. Small puddle of water is present upstream, which was trickling into the culvert. Culvert outlet (right side) is approximately 5% buried.
Democrat Dam Road	35.5225013845, -118.674798123	DD-8	Erosion	Road surface erosion	–	Low	Approximately 10 square feet of shallow potholes along right side of road.
Democrat Dam Road	35.5228840334, -118.673710733	DD-9	Erosion	Road surface erosion	–	Low	Shallow potholes, chipping, and loose aggregate along approximately 30'-40' of roadway.
Democrat Dam Road	35.5232552972, -118.673660288	DD-10	Erosion	Road surface erosion	–	Moderate	Potholes (1"-2" deep) along approximately 20'-30’ of roadway. Loose aggregate is scattered along side of road. Cracking through center of roadway is also present at this location.
Democrat Dam Road	35.5234513486, -118.673726875	DD-11	Erosion	Road surface erosion	–	Moderate	Alligator cracking and potholing (approximately 5 square feet).
Democrat Dam Road	35.5236511998, -118.673949031	DD-12	Erosion	Road surface erosion	–	Moderate	Alligator cracking and potholing (approximately 2' x 4').
Democrat Dam Road	35.5240026708, -118.67389582	DD-13	Erosion	Road surface erosion	–	Low	Chipped/missing asphalt along 2-4' of left edge of roadway.
Democrat Dam Road	35.5241152837, -118.673660457	DD-14	Erosion	Gullying	–	High	Gully erosion present along several hundred feet of roadway below culvert. Gully is up to 2 feet deep/2-4 feet wide in certain locations.

Copyright 2026 by Southern California Edison

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Democrat Dam Road	35.5255853482, -118.670973985	DD-15	Erosion	Soil erosion	–	Moderate	Low-to-moderate soil erosion on right side of road, which is concentrated at the natural depression at this location. Rilling is present along majority of road shoulder along the inside bend, with the largest rill/small gully approximately 5' x 1' with a depth of ~1-2". Alligator cracking also present along the inner radius of bend in road.
Democrat Dam Road	35.5255443788, -118.671481419	DD-16	Erosion	Road surface erosion	–	Moderate	Roadway is cracked for approximately 40-50' of roadway, with some localized chipping on left edge of road
Democrat Dam Road	35.5256334494, -118.671823211	DD-17	Erosion	Road surface erosion	–	Moderate	Right side of road is deteriorated along bend in road. Some localized potholing is present. Rill erosion is also present along left side of roadway.
Democrat Dam Road	35.5260899361, -118.670499936	DD-18	Erosion	Gullying	–	Moderate	Small gully on left side of road that extends into vegetated hillslope for approximately 50'.
Democrat Dam Road	35.5224236663, -118.674863816	DD-19	Erosion	Road surface erosion	–	Moderate	4' x 1' pothole and cracked asphalt in center of roadway.
Democrat Dam Road	35.5262397625, -118.669459401	DD-20	Erosion	Road surface erosion	–	Moderate	Pothole/missing asphalt on left side of road, approximately 2' x 6'.
Democrat Dam Road	35.5255619108, -118.668735182	DD-21	Erosion	Road surface erosion	–	Low	Alligator cracks/minor potholes prevalent throughout this portion of road. Minor soil erosion present along left side of road around bend.
Democrat Dam Road	35.5238542328, -118.668774838	DD-22	Erosion	Road surface erosion	–	Low	Small pothole with road base exposed.
Democrat Dam Road	35.5236221874, -118.66876191	DD-23	Erosion	Road surface erosion	–	Moderate	Pothole on right side of road, some soil erosion along roadside swale.
Democrat Dam Road	35.5222970419, -118.674891629	DD-24	Erosion	Road surface erosion	–	High	Substantial chipping/loss of roadway on left side of road along entirety of retaining wall (approximately 50').
Democrat Dam Road	35.521815669, -118.67494895	DD-25	Erosion	Soil erosion	–	Moderate	Slope instability at this location with erosion/soil creep.
Democrat Dam Road	35.5218218883, -118.674809036	DD-26	Erosion	Road surface erosion	–	Moderate	Substantial potholes on both sides of road, each encroaching on ~20% of the width of the roadway. Rilling is also occurring on left side of roadway above pothole.
Democrat Dam Road	35.5219624243, -118.674732282	DD-27	Erosion	Road surface erosion	–	Moderate	Small road collapse (~2' deep) along approximately 10' of left edge of roadway. Drainage channel on left side of road is exhibiting low to moderate erosion below this point.
Democrat Dam Road	35.5223131874, -118.674557064	DD-28	Erosion	Gullying	–	Moderate	Wide/moderately shallow gully (1-2 feet wide, several inches deep) is present along left drainage channel along road.
Democrat Dam Road	35.5224405921, -118.674461366	DD-29	Erosion	Road surface erosion	–	Low	Minor to moderate cracks/potholes are prevalent throughout this general location. Minor soil erosion is present on right side of hillside.
Democrat Dam Road	35.5227679945, -118.674117163	DD-30	Erosion	Soil erosion	–	Moderate	Boulders on hillside along right side of road appear to be moving downhill. Fresh soil is exposed, erosion appears to be active.

Copyright 2026 by Southern California Edison

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Democrat Dam Road	35.5242391917, -118.668743878	DD-31	Gate	Locked gate	–	–	Locked green gate in good condition with signage stating "NOTICE NO TRESPASSING OR LOITERING FORBIDDEN BY LAW". Gate is in good condition except for minor bend at bottom of gate arm. Locking mechanism includes individual locks with a sliding latch.
Democrat Dam Road	35.5234659255, -118.668769966	DD-32	Miscellaneous	Guardrail	–	–	Steel post + thick cable guardrail in good condition
Democrat Dam Road	35.5233650348, -118.668787372	DD-33	Miscellaneous	Guardrail	–	–	Steel post + thick cable guardrail in good condition
Democrat Dam Road	35.522759632, -118.674051492	DD-34	Miscellaneous	Other	–	–	Unknown shaft/adit.
Democrat Dam Road	35.5235358169, -118.67371432	DD-35	Miscellaneous	Other	–	–	Unknown shaft/adit.
Democrat Dam Road	35.5260571108, -118.670876123	DD-36	Miscellaneous	Stockpile	–	–	Gravel stockpile at right road shoulder. Minor alligator cracking present throughout this location.
Democrat Dam Road	35.5245841395, -118.668897924	DD-37	Miscellaneous	Barbed wire fence	–	–	Barbed wire fence along both sides of road.
Democrat Dam Road	35.5244543349, -118.668887558	DD-38	Sign	Forest Service sign	–	–	Forest Service sign with road number ("28S68") in fair condition. Stickers appear to be peeling slightly/sign is slightly sun-bleached, but sign is still legible.

Copyright 2026 by Southern California Edison

Table B-2. Flume No. 1 Road Features

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Flume No. 1 Road	35.5211573246, -118.675685633	FN-1	Drainage feature	Slope drain	Potential Concern	–	Steel slope drain in good condition. Moderate rilling is present above drain.
Flume No. 1 Road	35.5211241375, -118.675717203	FN-2	Erosion	Soil erosion	–	Low	Minor to moderate slope instability along the slope between the roadway and the flume.
Flume No. 1 Road	35.5210343518, -118.675784895	FN-3	Erosion	Soil erosion	–	Low	Localized slope failure, approximately 2' x 5'.
Flume No. 1 Road	35.5210026545, -118.675841988	FN-4	Erosion	Road surface erosion	–	Low	Gap in road surface adjacent to flume walkway, approximately 2' x 4'.

Table B-3. Dougherty Creek Road Features

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Dougherty Creek Road	35.4725390224, -118.719645913	DC-1	Miscellaneous	Railroad ties	–	–	Railroad ties, unknown function.
Dougherty Creek Road	35.4723654702, -118.719425157	DC-2	Miscellaneous	Railroad ties	–	–	Railroad ties, unknown function.
Dougherty Creek Road	35.472313941, -118.719133916	DC-3	Miscellaneous	Railroad ties	–	–	Railroad ties, unknown function. Remnant slope drain inlet is located at the Stark Creek Road side of the railroad ties.
Dougherty Creek Road	35.472758952, -118.719536103	DC-4	Miscellaneous	Railroad ties	–	–	Railroad ties, unknown function. Remnant slope drain inlet is located at the Stark Creek Road side of the railroad ties.
Dougherty Creek Road	35.4725189849, -118.719584728	DC-5	Miscellaneous	Concrete pad	–	–	Remnant concrete pad

Copyright 2026 by Southern California Edison

Table B-4. Stark Creek Road Features

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Stark Creek Road	35.4754111345, -118.723684212	SC-1	Drainage feature	Culvert, 12" CMP	Concern Likely	–	Inlet on the right discharges to a steel slope drain on the left. Pipe is intact, but outlet is plugged with sediment and overgrown with vegetation. Top of slope drain is buried in sediment. No evidence of significant erosion at discharge point.
Stark Creek Road	35.4745316366, -118.722320618	SC-2	Drainage feature	Culvert, 12" CMP	Potential Concern	–	24" grated metal drain inlet on the right discharging from 12" CMP/steel slope drain on the left. Minor vegetation accumulation in the inlet. Outlet is free from sediment/debris. While the culvert is in good condition, erosion is present on hillside below culvert.
Stark Creek Road	35.4742525256, -118.721672751	SC-3	Drainage feature	Culvert, 12" CMP	Potential Concern	–	24" grated metal drain inlet on the right discharging from 12" CMP/steel slope drain on the left. Inlet is partially buried by vegetative debris/pinecones. Outlet is ~50% plugged with hardened mud. Slope drain is also plugged with hardened mud near the outlet/partially hidden by grass. Erosion is present below culvert.
Stark Creek Road	35.473977599, -118.7209329	SC-4	Drainage feature	Culvert, 12" CMP	No Apparent Concern	–	24" grated metal drain inlet on the right discharging from 12" CMP/steel slope drain on the left. Inlet is partially buried by vegetative debris/pinecones. Culvert outlet and slope drain are free from sediment/debris. No signs of erosion present.
Stark Creek Road	35.4735804262, -118.720384894	SC-5	Drainage feature	Culvert, 12" CMP	No Apparent Concern	–	24" grated metal drain inlet on the right discharging from 12" CMP/steel slope drain on the left. Very minor sediment accumulation in slope drain/inlet. Outlet is free from sediment/debris. No signs of erosion present.
Stark Creek Road	35.4731559913, -118.719673548	SC-6	Drainage feature	Culvert, 12" CMP	Potential Concern	–	24" grated metal drain inlet on the right discharging from 12" CMP/steel slope drain on the left. Inlet, outlet, and slope drain are free from sediment/debris; however, slope drain appears to have been dislodged by approximately 30 degrees. No signs of erosion present.
Stark Creek Road	35.4718385975, -118.719469639	SC-7	Drainage feature	Culvert, 12" CMP	Concern Likely	–	24" grated drain inlet on the left. Outlet could not be located and is most likely completely buried. Outlet is likely located near two pins (likely for a slope drain) embedded into the ground, which is where the GPS point was collected.
Stark Creek Road	35.4704604021, -118.718708794	SC-8	Drainage feature	Culvert, 12" CMP	Potential Concern	–	24" grated metal drain inlet on the right discharging from 12" CMP outlet on the left. Outlet is ~75% buried. Minor scouring present below outlet.
Stark Creek Road	35.4712942769, -118.718671412	SC-9	Drainage feature	Low water crossing	Concern Likely	–	Low water crossing at Stark Creek consisting of an approximately 50' by 12' cement slab atop three 36" CMPs. The upstream (left) side of the easternmost CMP is severely compressed. Small curb on the downstream (right) side of the crossing is deteriorated. Accumulated vegetative debris (tumbleweeds) is present upstream of the CMPs. Minor sediment/debris accumulation is present within the CMPs at the downstream side. Riparian vegetation is present in the channel but is not encroaching into the roadway.
Stark Creek Road	35.4710299951, -118.718476951	SC-10	Drainage feature	Water bar/slope drain	No Apparent Concern	–	Asphalt water bar on roadway draining to slope drain on the left side of the road, both in good condition with minor debris accumulation in slope drain. No signs of erosion present.
Stark Creek Road	35.4695709657, -118.718310192	SC-11	Drainage feature	Water bar/slope drain	No Apparent Concern	–	Asphalt water bar on roadway draining to slope drain on the left side of the road, both in good condition with minor debris accumulation in slope drain. No signs of erosion present.

Copyright 2026 by Southern California Edison

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Stark Creek Road	35.4691690074, -118.718440806	SC-12	Drainage feature	Low water crossing	No Apparent Concern	–	At-grade cement low-water crossing (Stark Creek), approximately 10' by 70'. Minor cracking/chipping present. Riparian vegetation is absent at this crossing. No signs of erosion observed.
Stark Creek Road	35.468507784, -118.719400167	SC-13	Drainage feature	Slope drain	No Apparent Concern	–	Steel slope drain on right side of road conveying seep water from flume into Stark Creek. Water was present at the time of the survey.
Stark Creek Road	35.4686312942, -118.719093412	SC-14	Drainage feature	Slope drain	No Apparent Concern	–	Steel slope drain conveying flow from upper parking area. Drain is in good condition, but some erosion is present to the right (looking downstream) of the drain.
Stark Creek Road	35.4754096274, -118.724273244	SC-15	Drainage feature	Water bar	No Apparent Concern	–	Asphalt water bar with minor cracking. No signs of soil erosion present.
Stark Creek Road	35.4755599614, -118.72443097	SC-16	Erosion	Road surface erosion	–	Moderate	Cracked asphalt, approximately 30' x 40'.
Stark Creek Road	35.474304141, -118.721919613	SC-17	Erosion	Road surface erosion	–	Moderate	Low/moderate severity cracking along approximately 150 feet of roadway along steep portion of road.
Stark Creek Road	35.4738949016, -118.720837458	SC-18	Erosion	Road surface erosion	–	Moderate	Alligator cracking/minor potholing/overall surface deterioration along approximately 50 feet of roadway.
Stark Creek Road	35.4749949365, -118.723837161	SC-19	Erosion	Road surface erosion	–	Moderate	Alligator cracking covering approximately 10-15% of the flat pullout area. Weeds are starting to grow through cracks.
Stark Creek Road	35.4754396945, -118.724221966	SC-20	Gate	Gate	–	–	Rusty gate in fair condition with daisy chained locks. Gate is rusty and slightly bent but still works. No parking sign on gate.
Stark Creek Road	35.4745692091, -118.723707674	SC-21	Gate	Gate	–	–	Unlocked metal gate for cattle control with sliding latch enclosure mechanism. Gate includes Forest Service signage stating "Please! CLOSE THE GATE". The gate is moderately rusted, including the latch, which is still functional but required some force to open and close. Users appear to be wrapping wire around the gate as an alternative enclosure method.
Stark Creek Road	35.4685533751, -118.719296833	SC-22	Miscellaneous	Railroad ties	–	–	Railroad ties, unknown function.
Stark Creek Road	35.4754020689, -118.724459017	SC-23	Sign	Forest Service sign	–	–	Forest Service "no camping" sign in good condition.
Stark Creek Road	35.4753900102, -118.72424408	SC-24	Sign	Unknown	–	–	Rusty, unmarked metal sign in poor condition.
Stark Creek Road	35.4745837732, -118.723851562	SC-25	Sign	Unknown	–	–	Rusty metal sign in poor condition. Lettering is illegible.

Copyright 2026 by Southern California Edison

Table B-5. Forebay Operations Area Road Features

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Forebay Operations Area Road	35.4600810195, -118.779015214	FO-1	Drainage feature	Drain inlet	No Apparent Concern	–	Drain inlets in parking lot.
Forebay Operations Area Road	35.460034033, -118.778925162	FO-2	Drainage feature	Drain inlet	No Apparent Concern	–	Drain inlets in parking lot.
Forebay Operations Area Road	35.4601340832, -118.778775815	FO-3	Drainage feature	Drain inlet	No Apparent Concern	–	Drain inlets in parking lot.
Forebay Operations Area Road	35.4585048976, -118.779482913	FO-4	Erosion	Road surface erosion	–	Low	Relatively shallow pothole, ~2' x 4'. Entirety of road surface is slightly deteriorated (shallow cracks) from highway to gate.
Forebay Operations Area Road	35.4587095903, -118.779405162	FO-5	Erosion	Road surface erosion	–	Low	Asphalt curb on left side of road is cracking/loose (~4')
Forebay Operations Area Road	35.4588953295, -118.779379723	FO-6	Erosion	Road surface erosion	–	Moderate	Gap in asphalt curb on left side of road (~4')
Forebay Operations Area Road	35.4596260277, -118.779293019	FO-7	Erosion	Road surface erosion	–	Moderate	Gap in curb along approximately 20'-25'. Wet cement appears to have been placed here at some point.
Forebay Operations Area Road	35.460402112, -118.778714494	FO-8	Erosion	Road surface erosion	–	Low	Asphalt curb on left side of road is cracking/loose (~4')
Forebay Operations Area Road	35.4586834823, -118.779412965	FO-9	Gate	Gate	–	–	Metal gate in fair condition, locked w/ daisy chained padlocks on chain. Signage states "NOTICE TRESSPASSING/LOITERING FORBIDEN BY LAW SO CALIF EDISON CO". Gate post on left side of road is slumping, edge of gate is resting on asphalt curb along left side of road.
Forebay Operations Area Road	35.4593743056, -118.779357703	FO-10	Miscellaneous	Other	–	–	Exit point to stairs leading to Highway 178

Table B-6. Lower Powerhouse Road Features

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Lower Powerhouse Road	35.4598159471, -118.779736502	LP-1	Drainage feature	Drain outlet	Potential Concern	–	Damaged drain outlet along retaining wall.
Lower Powerhouse Road	35.4591363125, -118.779812863	LP-2	Drainage feature	Drain outlet	No Apparent Concern	–	Double 12" steel drain outlet in good condition.
Lower Powerhouse Road	35.4589398656, -118.77973287	LP-3	Drainage feature	Drain outlet	No Apparent Concern	–	8" PVC drain outlet in good condition.
Lower Powerhouse Road	35.4600097452, -118.779744007	LP-4	Drainage feature	Drain outlet	No Apparent Concern	–	Drain outlet embedded in grouted concrete. Grout is slightly cracked.
Lower Powerhouse Road	35.459988924, -118.779885839	LP-5	Erosion	Road surface erosion	–	Low	Tire ruts, approximately 10' x 20'
Lower Powerhouse Road	35.4595115459, -118.779990951	LP-6	Erosion	Road surface erosion	–	Moderate	Cracked asphalt
Lower Powerhouse Road	35.459435072, -118.779935062	LP-7	Erosion	Soil erosion	–	Moderate	Rill/gully, approximately 6" deep and 10' long
Lower Powerhouse Road	35.4599760262, -118.779745223	LP-8	Erosion	Road surface erosion	–	Low	Alligator cracking
Lower Powerhouse Road	35.4590889656, -118.779667823	LP-9	Miscellaneous	Guardrail	–	–	Riprap + guardrail in good condition
Lower Powerhouse Road	35.459345857, -118.779810139	LP-10	Miscellaneous	Guardrail	–	–	Riprap + guardrail in good condition
Lower Powerhouse Road	35.459482431, -118.779875301	LP-11	Miscellaneous	Guardrail	–	–	Riprap + guardrail in good condition
Lower Powerhouse Road	35.4595461349, -118.779868162	LP-12	Miscellaneous	Guardrail	–	–	Riprap + guardrail in good condition
Lower Powerhouse Road	35.4599417619, -118.779684202	LP-13	Miscellaneous	Guardrail	–	–	Riprap + guardrail in good condition
Lower Powerhouse Road	35.4597382922, -118.779925905	LP-14	Miscellaneous	Stockpile	–	–	Gravel stockpile, ~20x60
Lower Powerhouse Road	35.4597039423, -118.779811402	LP-15	Miscellaneous	Other	–	–	Unknown 4.5” pipes with mesh outlet in fair condition
Lower Powerhouse Road	35.4595752685, -118.779818121	LP-16	Miscellaneous	Other	–	–	Unknown 4.5” pipes with mesh outlet in fair condition
Lower Powerhouse Road	35.4595026691, -118.779957595	LP-17	Miscellaneous	Guardrail	–	–	Wooden retaining wall + steel guardrail in good condition
Lower Powerhouse Road	35.459421031, -118.779901908	LP-18	Miscellaneous	Guardrail	–	–	Wooden retaining wall + steel guardrail in good condition

Copyright 2026 by Southern California Edison

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Lower Powerhouse Road	35.4591699721, -118.779829976	LP-19	Miscellaneous	Other	–	–	White 4.5” drainpipe in good condition
Lower Powerhouse Road	35.4590515421, -118.779760739	LP-20	Miscellaneous	Other	–	–	White 4.5” drainpipe in good condition
Lower Powerhouse Road	35.4589150694, -118.779699215	LP-21	Miscellaneous	Other	–	–	White 4.5” drainpipe in good condition
Lower Powerhouse Road	35.4594272581, -118.779887586	LP-22	Miscellaneous	Other	–	–	Paved to gravel transition

Copyright 2026 by Southern California Edison

Table B-7. Upper Powerhouse Road Features

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Upper Powerhouse Road	35.4593026549, -118.77956249	UP-1	Drainage feature	Drain inlet	No Apparent Concern	–	Little to no debris accumulation is present in catch basin.
Upper Powerhouse Road	35.4591947891, -118.779668748	UP-2	Drainage feature	Drain inlet	Potential Concern	–	Trash and sediment is starting to accumulate. Outlet might be plugged.
Upper Powerhouse Road	35.4589402559, -118.779545506	UP-3	Drainage feature	Drain inlet	No Apparent Concern	–	Some sediment accumulation in catch basin.
Upper Powerhouse Road	35.4589436003, -118.779598401	UP-4	Drainage feature	Drain inlet	No Apparent Concern	–	Some sediment accumulation in catch basin.
Upper Powerhouse Road	35.4589311649, -118.779653892	UP-5	Drainage feature	Drain inlet	No Apparent Concern	–	Some sediment accumulation in catch basin.
Upper Powerhouse Road	35.4597792101, -118.779613481	UP-6	Drainage feature	Drain inlet	No Apparent Concern	–	Receives flow from swale in parking lot.
Upper Powerhouse Road	35.4600472546, -118.779560351	UP-7	Drainage feature	Drain inlet	No Apparent Concern	–	Receives flow from curb and gutter in parking lot.
Upper Powerhouse Road	35.4600194885, -118.779563027	UP-8	Drainage feature	Curb and gutter	No Apparent Concern	–	Curb and gutter along north side of parking area in good condition.
Upper Powerhouse Road	35.4587485906, -118.779619933	UP-9	Erosion	Road surface erosion	–	Moderate	Road fill is washed out above retaining wall
Upper Powerhouse Road	35.4592476554, -118.779611987	UP-10	Gate	Gate	–	–	Locked Gate
Upper Powerhouse Road	35.4594441389, -118.779572192	UP-11	Gate	Gate	–	–	2 locked pedestrian entrances, one vehicle sliding gate with locked entry + key lock for vehicle entry. Both in good condition.
Upper Powerhouse Road	35.4588096637, -118.77959336	UP-12	Gate	Gate	–	–	Automated swinging gate in good condition
Upper Powerhouse Road	35.4594361129, -118.779716315	UP-13	Miscellaneous	Guardrail	–	–	Guardrail + chain link fence in good condition
Upper Powerhouse Road	35.4592524692, -118.779682987	UP-14	Miscellaneous	Guardrail	–	–	Guardrail + chain link fence in good condition
Upper Powerhouse Road	35.4590353961, -118.779626038	UP-15	Miscellaneous	Guardrail	–	–	Guardrail + chain link fence in good condition
Upper Powerhouse Road	35.4590423244, -118.779543323	UP-16	Miscellaneous	Drainpipe	–	–	Drainpipe in retaining wall in fair condition.
Upper Powerhouse Road	35.4589929727, -118.779540451	UP-17	Miscellaneous	Drainpipe	–	–	Drainpipe in retaining wall in fair condition.
Upper Powerhouse Road	35.458940335, -118.779544294	UP-18	Miscellaneous	Drainpipe	–	–	Drainpipe in retaining wall in fair condition.

Copyright 2026 by Southern California Edison

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Upper Powerhouse Road	35.458906695, -118.779550424	UP-19	Miscellaneous	Drainpipe	–	–	Drainpipe in retaining wall in fair condition.
Upper Powerhouse Road	35.4588455382, -118.779555835	UP-20	Miscellaneous	Drainpipe	–	–	Drainpipe in retaining wall in fair condition.
Upper Powerhouse Road	35.458784633, -118.779557882	UP-21	Miscellaneous	Drainpipe	–	–	Drainpipe in retaining wall in fair condition.
Upper Powerhouse Road	35.4587283745, -118.779612176	UP-22	Miscellaneous	Other	–	–	Light post in good condition
Upper Powerhouse Road	35.4586558128, -118.779627286	UP-23	Miscellaneous	Other	–	–	Gabion baskets in good condition
Upper Powerhouse Road	35.4588944357, -118.779629488	UP-24	Miscellaneous	Other	–	–	White "X" for survey location (Psomas)

Copyright 2026 by Southern California Edison

Table B-8. Democrat Gage Trail Features

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Democrat Gage Trail	35.5209121733, -118.675992489	DG-1	Erosion	Soil erosion	–	Moderate	Low to moderate rilling/gullying present starting at the rocks below the end of the flume, extending downslope for approximately 50 feet. Vegetation in this area is also overgrown, and the trail is difficult to locate.
Democrat Gage Trail	35.5208049626, -118.676254239	DG-2	Erosion	Soil erosion	–	High	Bank failure extending into the established trail along approximately 10 feet of trail (right side). Vegetation within this portion of trail is also overgrown.
Democrat Gage Trail	35.5203948297, -118.676758547	DG-3	Erosion	Soil erosion	–	Moderate	Rill/small gully (approximately 4" deep) running through the center of the trail for approximately 70 feet.

Table B-9. Conduit No. 3 Trail Features

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Conduit No. 3 Trail	35.5051275504, -118.6901367	CO-1	Erosion	Soil erosion	–	Moderate	Fire affected, mild erosion to the west

Table B-10. Cow Flat Creek Trail Features

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Cow Flat Creek Trail	35.4998058486, -118.693942146	CF-1	Erosion	Soil erosion	–	Moderate	Soil instability along upslope of trail for approximately 70 feet.
Cow Flat Creek Trail	35.4997742932, -118.693368884	CF-2	Miscellaneous	Wire railing	–	–	Wire rail (poor condition) appears to be fire damaged. Lower span is broken and upper span toward gage is tied with caution tape.
Cow Flat Creek Trail	35.4966455591, -118.69596896	CF-3	Miscellaneous	Hollow/ephemeral drainage	–	–	No erosion present.
Cow Flat Creek Trail	35.498461974, -118.694467634	CF-4	Miscellaneous	Hazard	–	–	Narrow/hazardous portion of trail. Width of ~1 foot with steep drop straight down to highway.

Table B-11. Steel Flume Trail Features

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Steel Flume Trail	35.4951598062, -118.696409101	SF-1	Erosion	Soil erosion	–	Moderate	Soil sloughing from left slope is burying trail
Steel Flume Trail	35.495152083, -118.696310037	SF-2	Miscellaneous	Downed tree	–	–	Downed tree approximately 1.5 feet in diameter, blocking trail.
Steel Flume Trail	35.4941657152, -118.697203468	SF-3	Miscellaneous	Hollow/ephemeral drainage	–	–	Minor erosion and evidence of sediment transport is present.

Copyright 2026 by Southern California Edison

Table B-12. Lucas Creek Trail Features

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Lucas Creek Trail	35.4838112141, -118.710953885	LC-1	Drainage feature	Stream crossing	No Apparent Concern	–	Stream crossing at Lucas Creek. No water was present at the time of the survey. Stream width is approximately 4'.
Lucas Creek Trail	35.4836348287, -118.704039827	LC-2	Drainage feature	Seep	No Apparent Concern	–	Water is seeping from flow line and draining toward Lucas Creek.
Lucas Creek Trail	35.4837911749, -118.710482051	LC-3	Erosion	Soil erosion	–	Low	Minor washout along trail. Trail is still accessible over rocks.
Lucas Creek Trail	35.483491836, -118.706973074	LC-4	Erosion	Soil erosion	–	Low	Minor sloughing on trail. Soil is loose, trail compaction is poor.
Lucas Creek Trail	35.4834431068, -118.706154614	LC-5	Erosion	Soil erosion	–	Low	Small rock fall/sloughing
Lucas Creek Trail	35.4838317066, -118.710989764	LC-6	Miscellaneous	Barbed wire	–	–	Barbed wire spanning trail
Lucas Creek Trail	35.4837192474, -118.711052201	LC-7	Miscellaneous	Barbed wire	–	–	Barbed wire spanning (possibly) correct trail. Unclear whether trail crosses Lucas Creek or at this location. Barbed wire appears unpassable.
Lucas Creek Trail	35.4836534715, -118.704140879	LC-8	Miscellaneous	Downed tree	–	–	Approx 18” diameter tree blocking trail
Lucas Creek Trail	35.4835005339, -118.707109306	LC-9	Miscellaneous	Other	–	–	Rusty metal pipe on left side of trail (unknown function), approximately 4-5 feet exposed

Table B-13. Dougherty Creek Trail Features

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Dougherty Creek Trail	35.4706688549, -118.71205582	DT-1	Miscellaneous	Downed tree	–	–	Downed tree (not currently obstructing trail)

Copyright 2026 by Southern California Edison

Table B-14. Stark Creek Trail Features

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Stark Creek Trail	35.4689446483, -118.719019295	ST-1	Drainage feature	Stream crossing	No Apparent Concern	–	Streambed material varies from large boulders to cobbles and sand. Trail is not well-defined at this crossing.
Stark Creek Trail	35.4716961806, -118.725409774	ST-2	Erosion	Soil erosion	–	Low	Minor sloughing onto trail.
Stark Creek Trail	35.4705857923, -118.726514142	ST-3	Erosion	Soil erosion	–	Moderate	Small landslide scar (approximately 15' x 30'); trail is still accessible.
Stark Creek Trail	35.4730760422, -118.730966863	ST-4	Miscellaneous	Barbed wire fence	–	–	Barbed wire fencing along right side of trail
Stark Creek Trail	35.473490478, -118.731889843	ST-5	Miscellaneous	Barbed wire fence	–	–	End of barbed wire fence
Stark Creek Trail	35.4736142514, -118.731951619	ST-6	Miscellaneous	Barbed wire fence	–	–	Barbed wire
Stark Creek Trail	35.4737868827, -118.732578413	ST-7	Miscellaneous	Barbed wire fence	–	–	End of barbed wire
Stark Creek Trail	35.4709286852, -118.72340979	ST-8	Miscellaneous	Hollow/ephemeral drainage	–	–	No ordinary high-water mark features are present, but flow is likely concentrated at this location during rain events. No erosion present.
Stark Creek Trail	35.4710811844, -118.723732479	ST-9	Miscellaneous	Hollow/ephemeral drainage	–	–	No ordinary high-water mark features are present, but flow is likely concentrated at this location during rain events. No erosion present.
Stark Creek Trail	35.4704981828, -118.726628541	ST-10	Miscellaneous	Hollow/ephemeral drainage	–	–	No ordinary high-water mark features are present, but flow is likely concentrated at this location during rain events. No erosion present. Seepage water from adit is present.
Stark Creek Trail	35.4721474065, -118.728797692	ST-11	Miscellaneous	Hollow/ephemeral drainage	–	–	No ordinary high-water mark features are present, but flow is likely concentrated at this location during rain events. No erosion present. Adit tailings are present.
Stark Creek Trail	35.4728378005, -118.730897258	ST-12	Miscellaneous	Hollow/ephemeral drainage	–	–	No ordinary high-water mark features are present, but flow is likely concentrated at this location during rain events. Minor erosion present.
Stark Creek Trail	35.4705179208, -118.726652058	ST-13	Overgrown vegetation	Large riparian tree	–	–	Spans approximately 40 feet of trail. Trail is accessible, but veg may require trimming if equipment access is needed.

Copyright 2026 by Southern California Edison

Table B-15. Adit 17 and 18 Trail Features

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Adit 17 & 18 Trail	35.4582471111, -118.774643237	AD-1	Erosion	Soil erosion	–	Low	Slope instability somewhat localized at this location but is present throughout trail section.
Adit 17 & 18 Trail	35.4588943553, -118.768200084	AD-2	Erosion	Soil erosion	–	Moderate	Moderate slumping on right side of trail
Adit 17 & 18 Trail	35.4584077467, -118.766925692	AD-3	Erosion	Soil erosion	–	Low	Moderate erosion on trail left, moderate to severe erosion on trail right ~20-30 feet from GPS point.
Adit 17 & 18 Trail	35.4572313389, -118.766003145	AD-4	Erosion	Soil erosion	–	Low	Minor localized soil erosion/slope instability.
Adit 17 & 18 Trail	35.4581592802, -118.774070921	AD-5	Erosion	Soil erosion	–	Low	Minor channelized erosion on left side of trail with denuded vegetation.
Adit 17 & 18 Trail	35.458004656, -118.773633217	AD-6	Erosion	Soil erosion	–	Moderate	Localized active erosion, rill/small gully feature on right side of trail with sediment deposition.
Adit 17 & 18 Trail	35.4579162196, -118.773522043	AD-7	Erosion	Soil erosion	–	Low	Minor localized soil erosion/slope instability.
Adit 17 & 18 Trail	35.4578237468, -118.773430869	AD-8	Erosion	Soil erosion	–	Moderate	Erosion scar with denuded vegetation along substantial portion of slope right of trail, sediment deposition is present at base of trail.
Adit 17 & 18 Trail	35.4580156723, -118.771982376	AD-9	Erosion	Soil erosion	–	Low	Small hole in trail
Adit 17 & 18 Trail	35.4580331252, -118.771748311	AD-10	Erosion	Soil erosion	–	Low	Minor creep/slumping along both sides of trail
Adit 17 & 18 Trail	35.4585975716, -118.769539692	AD-11	Erosion	Soil erosion	–	Low	Channelized erosion on left side of trail
Adit 17 & 18 Trail	35.458866163, -118.768380627	AD-12	Erosion	Soil erosion	–	Low	Channelized erosion on left side of trail
Adit 17 & 18 Trail	35.4581823353, -118.7741987	AD-13	Erosion	Rock fall	–	Low	Minor rock fall; trail still passable
Adit 17 & 18 Trail	35.4585231642, -118.775361395	AD-14	Gate	Locked pedestrian gate	–	–	Locked (padlock) gate chain-link in good condition with signage stating "DANGER SWIFT WATER WILL BE RELEASED" and "NO TRESSPASSING AUTHORIZED PERSONNEL ONLY"
Adit 17 & 18 Trail	35.457692888, -118.772985329	AD-15	Miscellaneous	Other	–	–	Tailings from tunnel/adit
Adit 17 & 18 Trail	35.4577113217, -118.772428681	AD-16	Miscellaneous	Hollow/ephemeral drainage	–	–	Ephemeral drainage/hollow
Adit 17 & 18 Trail	35.4577017074, -118.772678083	AD-17	Overgrown vegetation	Shrub	–	–	Small shrub in center of trail

Copyright 2026 by Southern California Edison

Table B-16. Overflow Spillway Trail Features

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Overflow Spillway Trail	35.4602019795, -118.77836421	OS-1	Erosion	Soil erosion	–	Moderate	Loose soil, broken retaining wall chunks. Trail is not well-defined.
Overflow Spillway Trail	35.4601208379, -118.778183378	OS-2	Erosion	Soil erosion	–	Moderate	Soil at start of trail is loose, soil is slumping. Vegetation is overgrown in this area, trail is not well-established.
Overflow Spillway Trail	35.4583892859, -118.773349706	OS-3	Erosion	Soil erosion	–	Moderate	Small slope failure scar, approximately 2' x 4'
Overflow Spillway Trail	35.4585220424, -118.773458388	OS-4	Erosion	Soil erosion	–	Moderate	More characteristic slope instability for this section of trail, which is present for approximately 60% of slope in this area.
Overflow Spillway Trail	35.4584749719, -118.773351131	OS-5	Erosion	Soil erosion	–	Moderate	Localized slope failure characteristic of this trail section.
Overflow Spillway Trail	35.4586335188, -118.773340419	OS-6	Erosion	Soil erosion	–	Moderate	Slumping that is characteristic of this section of trail. Active erosion is present for approximately 80'
Overflow Spillway Trail	35.4588757628, -118.773639028	OS-7	Erosion	Soil erosion	–	Moderate	Small slope failure. Rocks embedded in soil are displaced slightly
Overflow Spillway Trail	35.4590086289, -118.773973977	OS-8	Erosion	Soil erosion	–	Moderate	Slumping/small slope failure scar, characteristic of this section of trail.
Overflow Spillway Trail	35.4601275343, -118.77572061	OS-9	Erosion	Soil erosion	–	Moderate	Minor slope failure on left side of trail next to possible retaining wall feature
Overflow Spillway Trail	35.4602425119, -118.777718426	OS-10	Erosion	Soil erosion	–	Moderate	Slope failure on slope, scar approximately 6' x 4'
Overflow Spillway Trail	35.4602171984, -118.777594333	OS-11	Erosion	Soil erosion	–	Moderate	Soil between switchbacks is slumping with signs of active erosion. Trail is partially buried in this location
Overflow Spillway Trail	35.4600967121, -118.777390771	OS-12	Erosion	Soil erosion	–	Low	Slope instability. Erosion appears recent.
Overflow Spillway Trail	35.460127761, -118.777274524	OS-13	Erosion	Soil erosion	–	Low	Right side of trail slumping.
Overflow Spillway Trail	35.4602077852, -118.776819622	OS-14	Erosion	Soil erosion	–	High	Landslide scar cutting into trail with approximately 1' of ground surface remaining between edge of trail and large boulder.
Overflow Spillway Trail	35.4578402979, -118.773369653	OS-15	Erosion	Soil erosion	–	Moderate	Slumping is localized at this location, approximately 10' radius. Slope erosion is persistent throughout this area.
Overflow Spillway Trail	35.4582708739, -118.773482158	OS-16	Erosion	Soil erosion	–	Moderate	Localized active erosion, rill/small gully feature on right side of trail with sediment deposition.
Overflow Spillway Trail	35.4582710098, -118.773252305	OS-17	Erosion	Soil erosion	–	Moderate	Slumping/creep, characteristic of majority of this section of trail.
Overflow Spillway Trail	35.4601655882, -118.778027964	OS-18	Miscellaneous	Barbed wire fence	–	–	Dilapidated barbed wire fence.

Copyright 2026 by Southern California Edison

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Overflow Spillway Trail	35.4601410217, -118.777023289	OS-19	Miscellaneous	Retaining wall	–	–	Erosion/undercutting present on upper (right) side of retaining wall - left side OK. Minor rock scrambling under spillway pipe.
Overflow Spillway Trail	35.4598417448, -118.774553346	OS-20	Miscellaneous	Rock wall	–	–	Rock wall feature in fair condition
Overflow Spillway Trail	35.4599358487, -118.774722291	OS-21	Miscellaneous	Rock wall	–	–	End of rock wall feature
Overflow Spillway Trail	35.4602357313, -118.777554181	OS-22	Overgrown vegetation	Shrub	–	–	Shrub blocking trail
Overflow Spillway Trail	35.4600920792, -118.777550759	OS-23	Overgrown vegetation	Shrub	–	–	Shrub partially blocking trail
Overflow Spillway Trail	35.4601435994, -118.777222536	OS-24	Overgrown vegetation	Shrub	–	–	Shrub partially blocking trail
Overflow Spillway Trail	35.4581867696, -118.773172417	OS-25	Overgrown vegetation	Shrub	–	–	Shrub partially blocking trail, almost not worth collecting
Overflow Spillway Trail	35.4584696432, -118.773213322	OS-26	Overgrown vegetation	Shrub	–	–	Shrubs growing within trail. Entire trail in this section is overgrown with grass and occasional shrubs
Overflow Spillway Trail	35.4589835096, -118.773894052	OS-27	Overgrown vegetation	Shrub	–	–	Shrubs growing adjacent to trail
Overflow Spillway Trail	35.4592435626, -118.774159508	OS-28	Overgrown vegetation	Shrub	–	–	Several shrubs partially blocking trail along ~40' of trail until bend. Slope instability persistent throughout.
Overflow Spillway Trail	35.4599429433, -118.774959422	OS-29	Overgrown vegetation	Shrub	–	–	Overgrown vegetation persistent along trail along this section of trail
Overflow Spillway Trail	35.4599968822, -118.775280552	OS-30	Overgrown vegetation	Shrub	–	–	Overgrown brushy veg; trail is rocky/hard to identify in this section
Overflow Spillway Trail	35.4602289326, -118.775711774	OS-31	Overgrown vegetation	Shrub	–	–	Vegetation is overgrown throughout entire steep portion of trail, but erosion is less severe in this section of trail

Copyright 2026 by Southern California Edison

Table B-17. Skip Hoist/Forebay Trail Features

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Skip Hoist/Forebay Trail	35.4580492809, -118.776339744	SH-1	Erosion	Soil erosion	–	Moderate	Boulders are sliding downhill. Grade is extremely steep along this trail. Trail is uncompacted throughout.
Skip Hoist/Forebay Trail	35.4597348785, -118.778709206	SH-2	Erosion	Soil erosion	–	Low	Minor, localized erosion on cut slope.
Skip Hoist/Forebay Trail	35.4581718319, -118.776318783	SH-3	Erosion	Soil erosion	–	Moderate	More displacement of boulders along uphill side of trail. Slope instability is persistent throughout trail.
Skip Hoist/Forebay Trail	35.4582093809, -118.776421905	SH-4	Erosion	Soil erosion	–	Moderate	Erosion is somewhat localized at this location, but still more or less characteristic of entire trail.
Skip Hoist/Forebay Trail	35.4582616223, -118.776456248	SH-5	Erosion	Soil erosion	–	Moderate	Localized slumping at this location.
Skip Hoist/Forebay Trail	35.4583321638, -118.776596901	SH-6	Erosion	Soil erosion	–	Moderate	Slope instability is localized on upslope portion around this switchback; soil is particularly loose in this location. Rocks that appear to be placed as slope stabilization are generally in place, a few may be traveling downhill.
Skip Hoist/Forebay Trail	35.4582593841, -118.776699948	SH-7	Erosion	Soil erosion	–	Moderate	Localized slope instability. Fresh, very loose colluvium covering trail at this location.
Skip Hoist/Forebay Trail	35.4583279432, -118.776821666	SH-8	Erosion	Soil erosion	–	Moderate	Longitudinal erosional feature (channelized, denuded veg) spanning 4 trail sections. Sediment deposition present on trail at approximate base of erosion scar.
Skip Hoist/Forebay Trail	35.4588650672, -118.777629352	SH-9	Erosion	Soil erosion	–	Low	Areas of minor localized erosion on cut slope of trail. Trail surface begins to improve slightly around this location (i.e. trail is compacted, notably less slope instability is present)
Skip Hoist/Forebay Trail	35.4592793543, -118.778094446	SH-10	Erosion	Soil erosion	–	Low	Localized/recent erosion on cut slope of trail extending upslope for 5-10 feet.
Skip Hoist/Forebay Trail	35.458270491, -118.775713691	SH-11	Gate	Gate	–	–	Locked gate to spillway area in good condition with signage stating "DANGER SWIFT WATER RELEASED AT INTERVALS" and "NO TRESSPASSING AUTHORIZED PERSONNEL ONLY"
Skip Hoist/Forebay Trail	35.458217545, -118.775786653	SH-12	Miscellaneous	Other	–	–	Light post in good condition
Skip Hoist/Forebay Trail	35.4581325725, -118.775972605	SH-13	Miscellaneous	Other	–	–	Light post in good condition
Skip Hoist/Forebay Trail	35.4580187485, -118.776083052	SH-14	Miscellaneous	Other	–	–	Light post in good condition
Skip Hoist/Forebay Trail	35.4579367106, -118.776150143	SH-15	Miscellaneous	Other	–	–	Light post in good condition
Skip Hoist/Forebay Trail	35.4596545822, -118.778721712	SH-16	Miscellaneous	Unknown drainage feature	–	–	Rocks appear to be placed intentionally around switchback, possibly for drainage purposes, although it is not clear. Minor rilling in soil is present below rocks.
Skip Hoist/Forebay Trail	35.4578262763, -118.776110332	SH-17	Miscellaneous	Other	–	–	Cable box for Skip Hoist

Copyright 2026 by Southern California Edison

Road/Trail Name	Coordinates	Data ID	Feature Type	Feature Description	Drainage Classification	Erosion Severity	Comment
Skip Hoist/Forebay Trail	35.4596957892, -118.778561716	SH-18	Miscellaneous	Barbed wire fence	–	–	Remnant barbed wire fence
Skip Hoist/Forebay Trail	35.4578784918, -118.776218591	SH-19	Miscellaneous	Other	–	–	Start of dirt trail from Skip Hoist platform
Skip Hoist/Forebay Trail	35.4578933549, -118.776284403	SH-20	Miscellaneous	Other	–	–	~15' rock protection fence (Trimble point taken at center)
Skip Hoist/Forebay Trail	35.4579218361, -118.776256296	SH-21	Miscellaneous	Other	–	–	Cable crossing point
Skip Hoist/Forebay Trail	35.4582074606, -118.776612303	SH-22	Miscellaneous	Other	–	–	Cable crossing point
Skip Hoist/Forebay Trail	35.4588542703, -118.777484677	SH-23	Miscellaneous	Other	–	–	Skip hoist pulley
Skip Hoist/Forebay Trail	35.4591527065, -118.777750284	SH-24	Miscellaneous	Other	–	–	Skip hoist pulley
Skip Hoist/Forebay Trail	35.4593485108, -118.778022741	SH-25	Miscellaneous	Other	–	–	Skip hoist pulley
Skip Hoist/Forebay Trail	35.4596967332, -118.778406827	SH-26	Miscellaneous	Other	–	–	Remnant skip hoist pulley

Copyright 2026 by Southern California Edison

APPENDIX C

Project Access Road and Trail Condition Assessment Maps

Copyright 2026 by Southern California Edison

Willow Spring Creek
Democrat Dam
Buoy Line
Drainage Tower
Intake Gatehouse
Conduit No. 1
Drainage Tunnel
Drainage Tunnel Outlet
Democrat Dam Access Walkway
Sandbox
Sandbox Drainage Channel
MIF Release Point
Flume No. 1
Tunnel No. 1
Tunnel No. 2
Intake Gatehouse to Flume No. 1 Powerline
Democrat Dam Road (also referred to as Willow Spring Creek Road)
Powerline Road
Flume No. 1 Road
Conduit No. 2
Kern River
Stilling Well No. 1
11192500 (SCE 409)
Gaging Cableway
Democrat Gage Trail
178

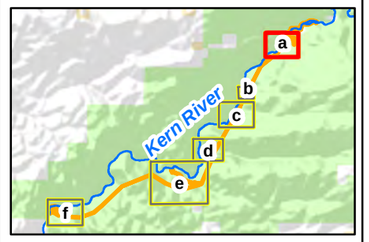
Facilities
- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation
- Other Road
- Gate

Other Features
- Watercourse

Conditions
- Drainage - No Apparent
- Drainage - Potential Concern
- Drainage - Concern Likely
- Road/Trail Condition - Good
- Road/Trail Condition - Fair
- Road/Trail Condition - Poor

Note: Current FERC Project boundary layers (referenced in the PAD) indicate the Steel Flume Trail extends from SR 178 up to the Forest Service trail called “Powerhouse Trail” and continues southeast along the Powerhouse Trail to Flume No. 3. However, during the field reconnaissance condition assessment staff confirmed that the segment of the Steel Flume Trail from SR 178 up to the Powerhouse Trail no longer exists. The field-verified Steel Flume Trail is the portion of the Powerhouse Trail within the current FERC Project Boundary



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map C-1a

Project Access Roads and Trails Condition Assessment

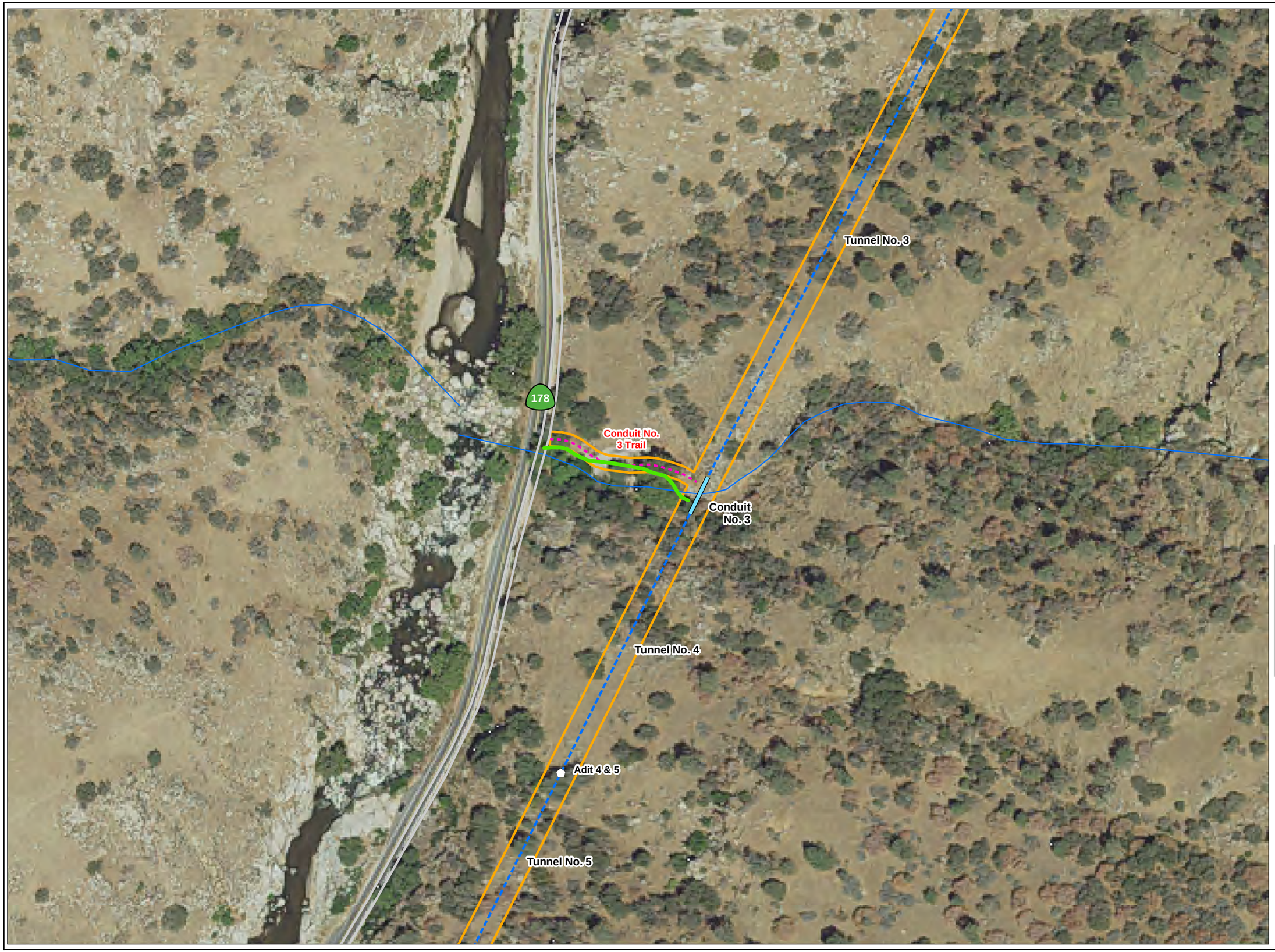
0 250 500
Feet

Date: 7/25/2025

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Other Road
- Gate

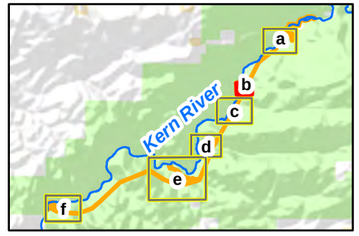
Other Features

- Watercourse

Conditions

- Drainage - No Apparent
- Drainage - Potential Concern
- Drainage - Concern Likely
- Road/Trail Condition - Good
- Road/Trail Condition - Fair
- Road/Trail Condition - Poor

Note: Current FERC Project boundary layers (referenced in the PAD) indicate the Steel Flume Trail extends from SR 178 up to the Forest Service trail called “Powerhouse Trail” and continues southeast along the Powerhouse Trail to Flume No. 3. However, during the field reconnaissance condition assessment staff confirmed that the segment of the Steel Flume Trail from SR 178 up to the Powerhouse Trail no longer exists. The field-verified Steel Flume Trail is the portion of the Powerhouse Trail within the current FERC Project Boundary



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map C-1b

Project Access Roads and Trails Condition Assessment

0 115 230
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 7/25/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company

Tunnel No. 5
Cow Flat Creek Trail
Stilling Well No. 2
Flume No. 2 Cow Flat Creek
Cow Flat Creek
Powerhouse Trail (USFS)
Tunnel No. 6
178
Kern River
Steel Flume Trail
Conduit No. 4
Flume No. 3
Conduit No. 5
Tunnel No. 7
Conduit No. 6
Tunnel No. 8

Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Other Road
- Gate

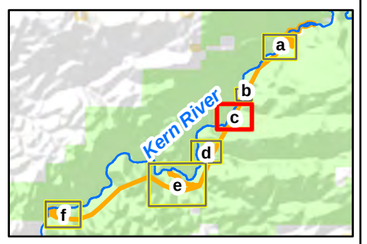
Other Features

- Watercourse

Conditions

- Drainage - No Apparent
- Drainage - Potential Concern
- Drainage - Concern Likely
- Road/Trail Condition - Good
- Road/Trail Condition - Fair
- Road/Trail Condition - Poor

Note: Current FERC Project boundary layers (referenced in the PAD) indicate the Steel Flume Trail extends from SR 178 up to the Forest Service trail called “Powerhouse Trail” and continues southeast along the Powerhouse Trail to Flume No. 3. However, during the field reconnaissance condition assessment staff confirmed that the segment of the Steel Flume Trail from SR 178 up to the Powerhouse Trail no longer exists. The field-verified Steel Flume Trail is the portion of the Powerhouse Trail within the current FERC Project Boundary



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map C-1c

Project Access Roads and Trails Condition Assessment

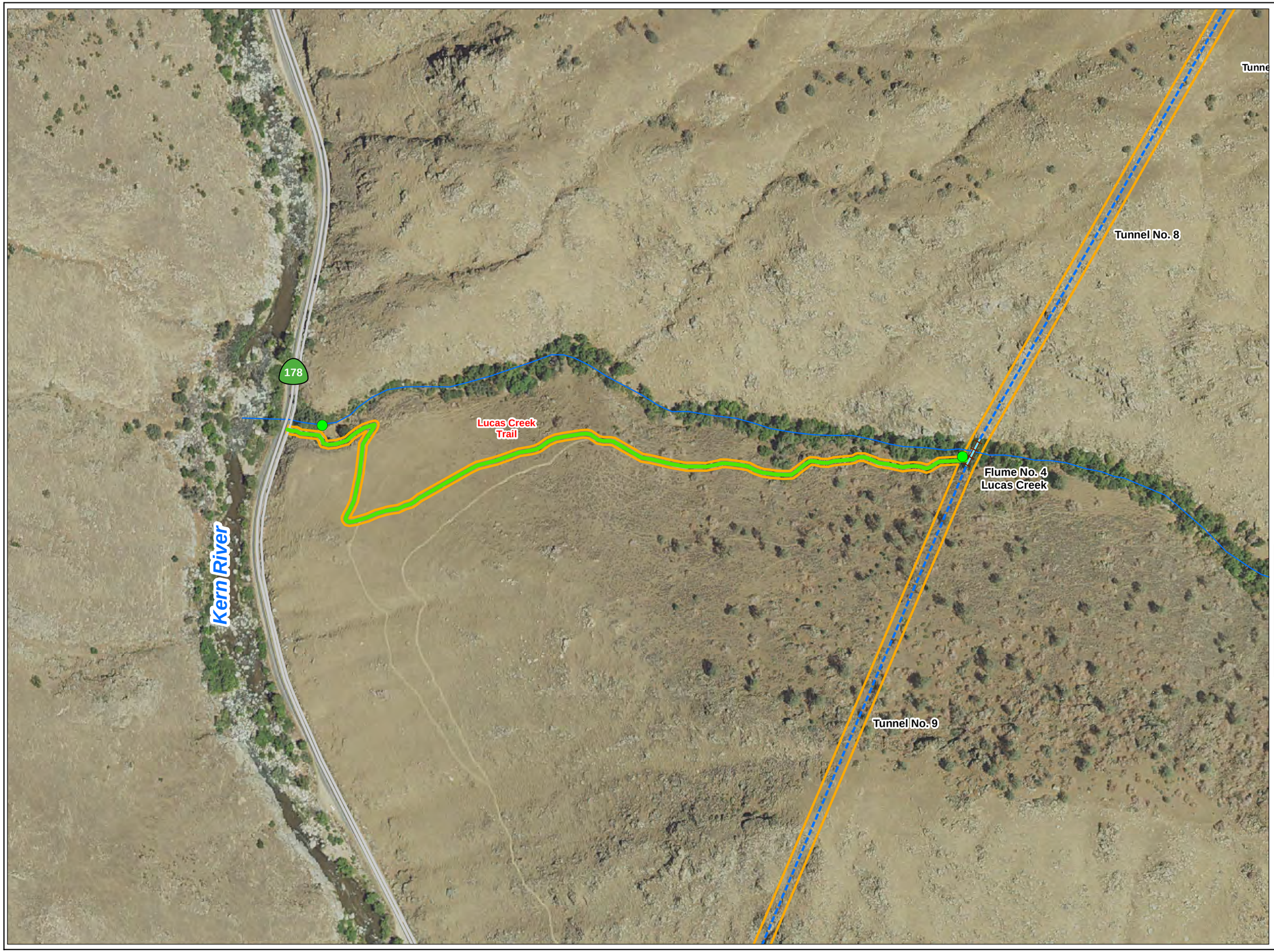
0 260 520
Feet

Date: 7/25/2025

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Other Road
- Gate

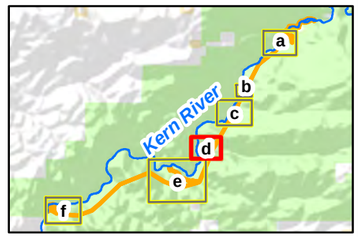
Other Features

- Watercourse

Conditions

- Drainage - No Apparent
- Drainage - Potential Concern
- Drainage - Concern Likely
- Road/Trail Condition - Good
- Road/Trail Condition - Fair
- Road/Trail Condition - Poor

Note: Current FERC Project boundary layers (referenced in the PAD) indicate the Steel Flume Trail extends from SR 178 up to the Forest Service trail called “Powerhouse Trail” and continues southeast along the Powerhouse Trail to Flume No. 3. However, during the field reconnaissance condition assessment staff confirmed that the segment of the Steel Flume Trail from SR 178 up to the Powerhouse Trail no longer exists. The field-verified Steel Flume Trail is the portion of the Powerhouse Trail within the current FERC Project Boundary



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map C-1d

Project Access Roads and Trails Condition Assessment

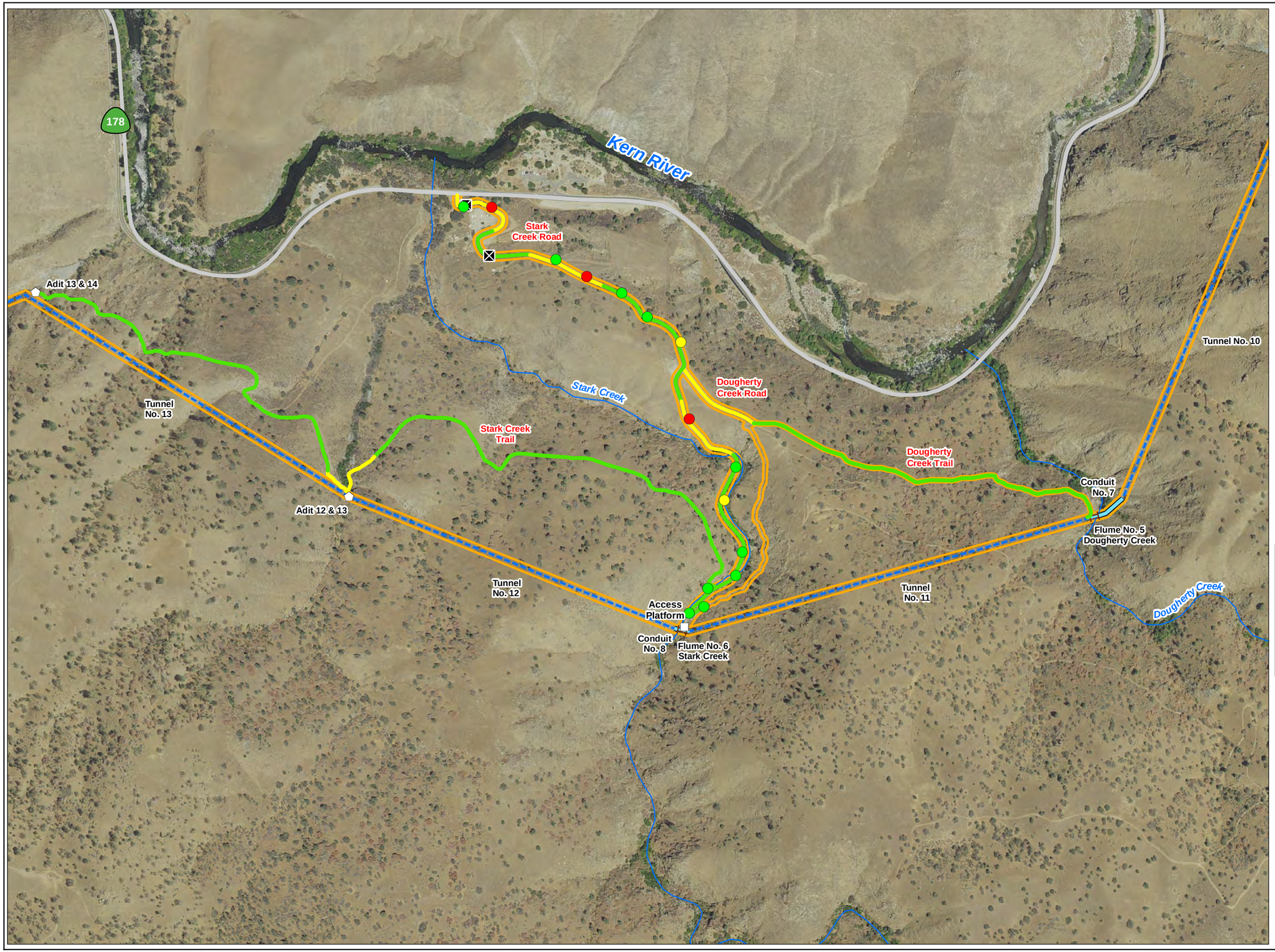
0 220 440
Feet

Date: 7/25/2025

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Other Road
- Gate

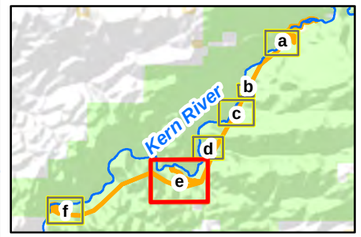
Other Features

- Watercourse

Conditions

- Drainage - No Apparent
- Drainage - Potential Concern
- Drainage - Concern Likely
- Road/Trail Condition - Good
- Road/Trail Condition - Fair
- Road/Trail Condition - Poor

Note: Current FERC Project boundary layers (referenced in the PAD) indicate the Steel Flume Trail extends from SR 178 up to the Forest Service trail called “Powerhouse Trail” and continues southeast along the Powerhouse Trail to Flume No. 3. However, during the field reconnaissance condition assessment staff confirmed that the segment of the Steel Flume Trail from SR 178 up to the Powerhouse Trail no longer exists. The field-verified Steel Flume Trail is the portion of the Powerhouse Trail within the current FERC Project Boundary



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map C-1e

Project Access Roads and Trails Condition Assessment

0 430 860
Feet

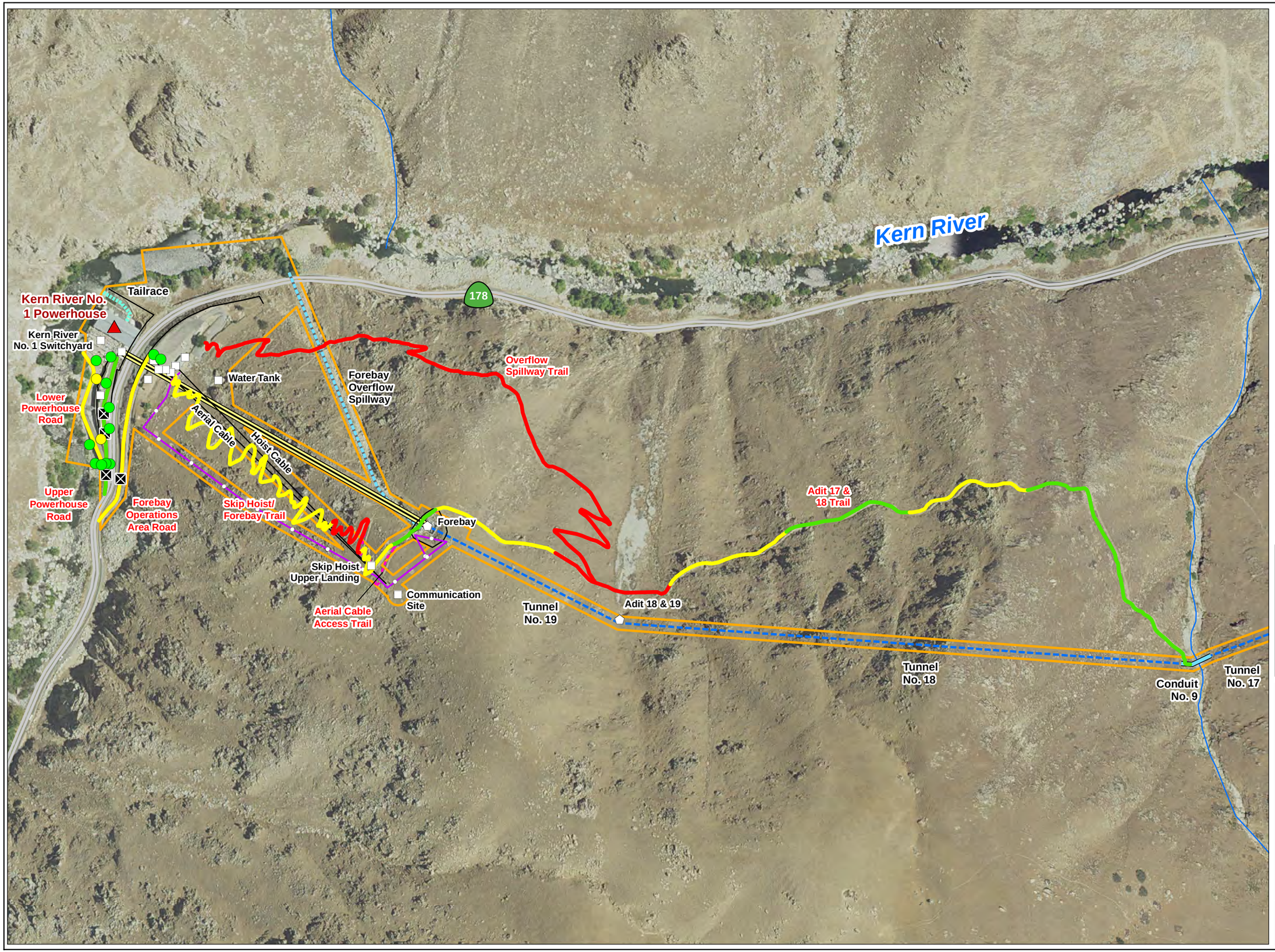
Date: 7/25/2025

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\Users\aclare\OneDrive - Stantec\Documents_CON01Data\gis_projects\237800343\03_data\gis_cad\map\Kern River 1\LandMaps\SCE_Kern1_RoadConditions_17i11i_02.mxd

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Other Road
- Gate

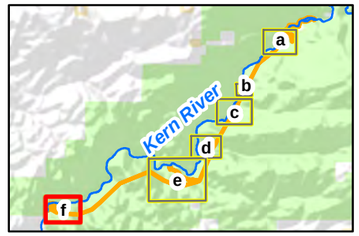
Other Features

- Watercourse

Conditions

- Drainage - No Apparent
- Drainage - Potential Concern
- Drainage - Concern Likely
- Road/Trail Condition - Good
- Road/Trail Condition - Fair
- Road/Trail Condition - Poor

Note: Current FERC Project boundary layers (referenced in the PAD) indicate the Steel Flume Trail extends from SR 178 up to the Forest Service trail called “Powerhouse Trail” and continues southeast along the Powerhouse Trail to Flume No. 3. However, during the field reconnaissance condition assessment staff confirmed that the segment of the Steel Flume Trail from SR 178 up to the Powerhouse Trail no longer exists. The field-verified Steel Flume Trail is the portion of the Powerhouse Trail within the current FERC Project Boundary



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map C-1f

Project Access Roads and Trails Condition Assessment

0 260 520
Feet

Date: 7/25/2025

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company

APPENDIX D

Representative Photographs of Project Access Road and Trail Conditions

Copyright 2026 by Southern California Edison

Table D-1. Photo Index

Photo No.	Road/Trail Name	Description
1	Adit 17/18 Trail	Example of hillslope erosion present within steep, grassy trails.
2	Conduit No. 3 Trail	Burned soil following the July 2024 Borel Fire.
3	Cow Flat Creek Trail	Damage to infrastructure sustained following the July 2024 Borel Fire.
4	Democrat Dam Road	Example of road surface erosion present throughout this road.
5	Democrat Dam Road	Gullying present along several hundred feet of roadway below culvert.
6	Democrat Dam Road	Gully along shoulder extending into vegetated hillslope
7	Democrat Gage Trail	Bank failure along trail and overgrown vegetation
8	Forebay Operations Area Road	Gap in curb along approximately 20-25 feet of roadway.
9	Lower Powerhouse Road	Broken drainpipe (elbow; see red arrow).
10	Lower Powerhouse Road	Tire ruts within the lower turnout area.
11	Overflow Spillway Trail	Example of overgrown vegetation that is typical of this trail.
12	Overflow Spillway Trail	Trail is poorly defined and unmaintained.
13	Skip Hoist/Forebay Trail	Example of soil erosion characteristic of this trail
14	Stark Creek Road	Low to moderate cracking along approximately 150 feet of roadway.
15	Stark Creek Road	Upstream side of low-water crossing along Stark Creek. Accumulated vegetative debris obscured the CMP underneath the cement slab, but the easternmost CMP appeared to be crushed.
16	Stark Creek Road	Example of steel slope drain in good condition, which are present throughout Stark Creek Road.



Photo D-1. August 27, 2024. Adit 17 & 18 Trail. Example of hillslope erosion present within steep, grassy trails.



Photo D-2. August 25, 2024. Conduit No. 3 Trail. Burned soil following the July 2024 Borel Fire.



Photo D-3. August 26, 2024. Democrat Dam Road. Example of road surface erosion present throughout this road.



Photo D-4. August 26, 2024. Democrat Dam Road. Gullying present along several hundred feet of roadway below culvert.



(a)



(b)

Photo D-5. August 26, 2024. Democrat Dam Road. Gully along shoulder extending into vegetated hillslope.



Photo D-6. August 26, 2024. Democrat Gage Trail. Bank failure along trail and overgrown vegetation.



Photo D-7. August 27, 2024. Forebay Operations Area Road. Gap in curb along approximately 20-25 feet of roadway.



Photo D-8. August 26, 2024. Lower Powerhouse Road. Broken drainpipe (elbow; see red arrow).



Photo D-9. August 26, 2024. Lower Powerhouse Road. Tire ruts within the lower turnout area.



Photo D-10. August 27, 2024. Overflow Spillway Trail. Example of overgrown vegetation that is typical of this trail.

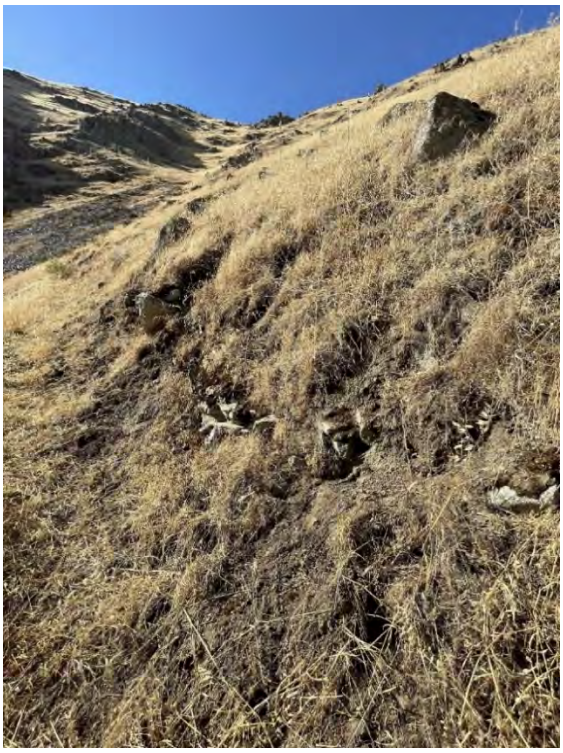


Photo D-11. August 27, 2024. Overflow Spillway Trail. Trail is poorly defined and unmaintained.



Photo D-12. August 27, 2024. Skip Hoist/Forebay Trail. Example of soil erosion characteristic of this trail.

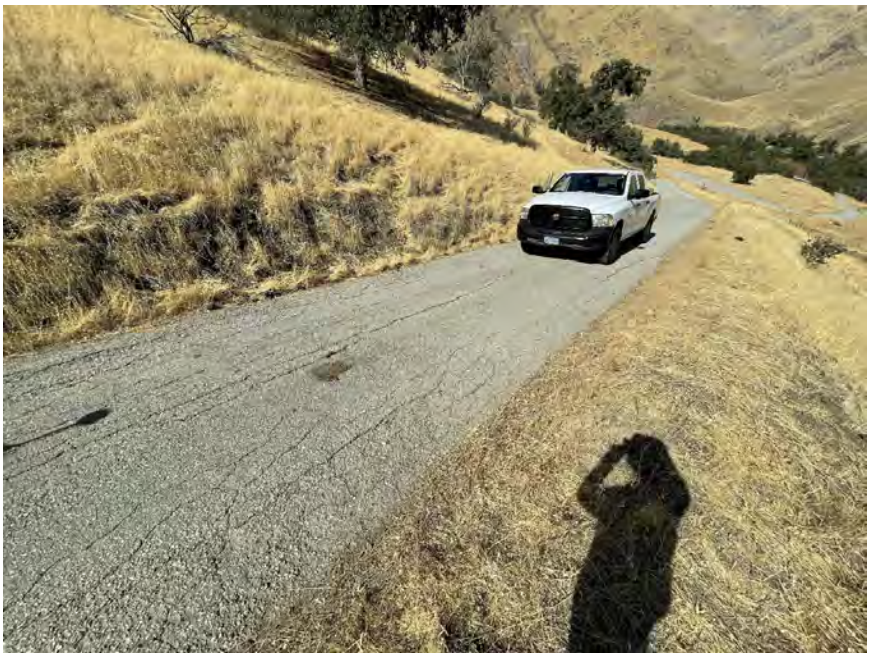


Photo D-13. August 26, 2024. Stark Creek Road. Low to moderate cracking along approximately 150 feet of roadway.



Photo D-14. August 26, 2024. Stark Creek Road. Upstream side of low-water crossing along Stark Creek. Accumulated vegetative debris obscured the CMP underneath the cement slab, but the easternmost CMP appeared to be crushed.



Photo D-15. August 26, 2024. Stark Creek Road. Example of steel slope drain in good condition, which are present throughout Stark Creek Road.

APPENDIX F

LAND 2 – EROSION AND SEDIMENTATION TECHNICAL MEMORANDUM

Copyright 2026 Southern California Edison

LAND 2 – EROSION AND SEDIMENTATION TECHNICAL MEMORANDUM

KERN RIVER NO. 1 HYDROELECTRIC PROJECT
FERC PROJECT NO. 1930

PREPARED FOR:

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

March 2026

TABLE OF CONTENTS

1.0 Introduction 1

2.0 Study Objectives 1

3.0 Study Area 1

4.0 Methods 1

4.1 Study Plan Variances 2

4.2 Identify Historical and Existing Sources of Sediment and Project-Related Erosion Areas 2

5.0 Results Summary 3

5.1 Sediment Recruitment, Mass Wasting, and/or Bank Erosion Sites 3

5.1.1 Natural Sediment Sources 3

5.2 Historical Storms and Debris Slides 4

5.2.1 August 19, 2013, Storm Event 4

5.2.2 Winter 2022–2023 Storm Cycles and Debris Slides 5

5.3 Project Facility Erosion 6

5.4 Sediment Management 6

6.0 Study Specific Consultation 9

7.0 Outstanding Study Plan Elements 9

8.0 References 9

LIST OF TABLES

Table 3-1. Kern River No. 1 Hydroelectric Project Facilities 12

Table 5-1. Locations of Potentially Significant Sources of Erosion and Sedimentation 14

LIST OF FIGURES

Figure 5-1. Example of Legacy Spoil Piles from Drilling the KR1 Conveyance Flowline. 17

Figure 5-2. Monthly Peak Precipitation at Lake Isabella from November 2022–March 2023 18

Figure 5-3. USGS Water Year Summary for Site USGS 11186000 at Lake Isabella Dam 19

LIST OF MAPS

Map 5-1. Erosion and Sedimentation Study Area 21

LIST OF APPENDICES

Appendix A. Photographs of Observed Potentially Significant Sources of Erosion and Sedimentation

LIST OF ACRONYMS

CDFW	California Department of Fish and Wildlife
cfs	cubic feet per second
CNRFC	California Nevada River Forecast Center
CY	cubic yards
DSSMP	Dam Safety Surveillance Monitoring Plan
EAP	Emergency Action Plan
FERC	Federal Energy Regulatory Commission
KR1	Kern River No. 1
LAND 2 TSP	LAND 2 – Erosion and Sedimentation Technical Study Plan
LB	left bank (when viewed in the downstream direction)
NOE	Notice of Categorical Exemption
Project	Kern River No. 1 Hydroelectric Project
RB	Right Bank (when viewed in the downstream direction)
SCE	Southern California Edison
SCH	State Clearinghouse
SMP	Sediment Management Plan
SPD	Study Plan Determination

SR-178	State Route 178
SWRCB	State Water Resources Control Board
TM	Technical Memorandum
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

1.0 INTRODUCTION

This LAND 2 – Erosion and Sedimentation Technical Memorandum (TM) provides the methods and findings of the LAND 2 – Erosion and Sedimentation Technical Study Plan (LAND 2 TSP) in support of Southern California Edison's (SCE) Kern River No. 1 (KR1) Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 1930. The LAND 2 TSP was included in SCE's Revised Study Plan submitted to FERC on February 13, 2024 (SCE 2024). In its March 14, 2024, Study Plan Determination (SPD), FERC approved the LAND 2 TSP without modification (FERC 2024).

During a desktop review from May to June 2024, aerial imagery and available operation and maintenance records were reviewed. A field survey was conducted from June 17 to 21, 2024 to document erosion from Project-related sources. All field reconnaissance efforts and data analyses are complete and summarized below.

2.0 STUDY OBJECTIVES

The objectives of the erosion and sedimentation study, as outlined in LAND 2 TSP (SCE 2024), include the following:

- Identify historical and existing sources of sediment adjacent to the bypass reach[1], Democrat Dam Impoundment, water conveyance system, and other Project facilities, including major gullies; areas of vegetation and/or soil loss; hillslope destabilization; and mass wasting.

- Identify and describe historical and existing operation and maintenance practices associated with managing accumulated sediment behind Democrat Dam.

- Document erosion and sedimentation associated with SCE's ongoing operation and maintenance activities.

- Document natural sources of sediment unrelated to the Project.

3.0 STUDY AREA

The study area for erosion and sedimentation includes the bypass reach, Democrat Dam Impoundment, water conveyance system, and other Project facilities listed in Table 3-1. Roads and trails are reported in the LAND 1 – Road and Trail Condition Assessment TM. Underground and underwater Project facilities were not evaluated.

4.0 METHODS

Study implementation followed the methods described in the LAND 2 TSP (SCE 2024).

[1] A bypass reach is a segment of a river downstream of a diversion facility where Project operations result in the diversion of a portion of the water from the river. For this Project, the bypass reach is a 10.2-mile reach of the lower Kern River from Democrat Dam downstream to the Kern River No. 1 Powerhouse Tailrace.

Copyright 2026 by Southern California Edison

4.1 STUDY PLAN VARIANCES

There are no variances from the LAND 2 TSP, as approved by FERC in its SPD (FERC 2024).

4.2 IDENTIFY HISTORICAL AND EXISTING SOURCES OF SEDIMENT AND PROJECT-RELATED EROSION AREAS

- Document the location and relative volume of historic and existing sediment recruitment to stream channels.
  - Significant sediment recruitment, mass wasting, and/or bank erosion sites were mapped via aerial photography (e.g., Google Earth images), topographic maps, geology and soils maps, and ground survey. Potential locations for ground survey included steep drainages in direct contact with the mainstem Kern River channel and/or State Route 178 (SR-178), the presence of rilling and/or signs of landsliding, areas with steep rock outcrops that could be susceptible to mass wasting processes, and areas that appeared to have loose material on the ground surface.
  - Identification of whether the sources of sediment were derived from natural watershed process or Project-related effects was based on context and field observation June 18–21, 2024. Surveys included GPS mapping, photographs, and if direct visual inspection was not possible, use of binoculars to assess conditions.
  - Determination of whether sediment sources were actively or inactively contributing sediment and if so by how much (e.g., low, moderate, high delivery potential to the stream channel) was based on field observation.
  - Reviewed the August 19, 2013, storm event that caused multiple rock falls and debris slides that closed SR-178 and caused a spill at the KR1 forebay (Section 3.7, Geology and Soils of the Pre-Application Document includes additional information).
  - Reviewed winter storm cycles of 2022–2023, which caused debris slides in the Project area/canyon closing SR-178.
  - Mapped historic and/or potential ongoing erosion at the Project facilities (including Project impoundment) by means of aerial photography (e.g., Google Earth images) and ground surveys June 18–21, 2024. Where possible, volumes of eroded material were estimated by measuring the surface area and approximate depth of the deposit.
- Summarized past and current sediment management practices at Democrat Dam, including sediment releases into the bypass reach and current permits associated with sediment management practices.

5.0 RESULTS SUMMARY

5.1 SEDIMENT RECRUITMENT, MASS WASTING, AND/OR BANK EROSION SITES

5.1.1 Natural Sediment Sources

Geology and soils data show that the study area is a steep, deeply incised, V-shaped canyon mostly dominated by bedrock and boulders. Periodic hillslope erosion and mass wasting processes do occur but are considered to be a relatively low contributor of sediment into the mainstem Kern River channel (SCE 2023). Reviews of aerial imagery showed many steep gullies and drainages with an abundance of boulders and cobbles present on the ground surface, as well as many steep to vertical rock outcrops, indicating the potential for debris flow, landslide, and rockfall processes of erosion. There is a history of periodic debris flow, landslide, and rockfall events that have occurred in the canyon, often closing SR-178 for extended periods of time. This was the case repeatedly during warm atmospheric river storm events of the 2022–2023 winter when heavy rain fell upon a record-breaking snowpack in the upper watersheds of the canyon. Additionally, there are several sub-vertical to vertical outcrops of bedrock at road cuts along SR-178. Such features have the potential for periodic rockfall events which could block the highway.

Of the 62 points of interest identified during the desktop review process, significant potential for erosion and/or sedimentation was observed at 19 sites during field surveys (June 18–21, 2024). Potential for erosion and/or sedimentation at 17 of the sites was a result of natural processes. Table 5-1 has a description of the type of erosion or deposition, and whether the feature was naturally caused or Project related. The locations of the sites are shown on Map 5-1 and photographs of the sites are shown in Appendix A. These sites showed signs of significant erosion and/or sedimentation in the form of: (1) sediment available for transport; (2) sand and gravel deposits at SR-178 culverts and/or in the stream channels and at confluences with the mainstem channel; (3) signs of active bank erosion on the mainstem channel of the Kern River; and/or (4) evidence of periodic landslide events.

Based on field observation, few of the sites were actively eroding, with the only exceptions being two sites where active bank erosion was observed (Bank Erosion RB_1, and Bank Erosion RB_2 in Table 5-1). The few drainages that had flowing water (low flows) were not actively contributing sediment to the stream channel. The sites presented in Table 5-1 were classified as having high sediment delivery potential during high flow / heavy precipitation events. Hazards related to debris flows, landslides, and rock falls during heavy precipitation are a distinct possibility throughout the canyon.Project-Related Sediment Sources

A review of historical aerial imagery and field observations indicated that potential erosion and sedimentation related to Project features was small scale and remained stable from 2002 to 2023 (availability of imagery). The only Project-related features that were identified as locations of potential ongoing erosion and sedimentation were the legacy spoil piles from drilling the KR1 Conveyance Flowline. These spoil piles were visible in all

photo sets and appear largely unchanged between 2002 and 2023. An aerial image of a few of the spoil piles is provided in Figure 5-1 (January 2025).

5.2 HISTORICAL STORMS AND DEBRIS SLIDES

5.2.1 August 19, 2013, Storm Event

On August 19, 2013, thunderstorms caused localized heavy rain in the Kern River Canyon at a peak intensity of approximately 0.5 inch per hour, and a cumulative total daily rainfall of approximately 0.83 inch. The impact on hydrology in the Kern River was minor, with river stage increasing from 2.29 to 2.66 feet following the storm (California Data Exchange Center 2024).

During the storm, however, rock, mud, water, and plant material from a debris flow entered the KR1 conduit approximately 1 mile upstream of the forebay. This debris flow (mud and plant material) entered the flowline at Adit 17/18, which is an open-air vent location in the flowline. At Adit 17/18 the debris flow passed over and into the flowline at the vent location and this temporary surge of flow (with mud and plant material) continued down the flowline to the forebay. At the forebay an overflow spillway pipe would have handled the flow surge except for the mud and plant material caused the intake to the spillway pipe to plug. The overflow spillway pipe conveys flow surges to the Kern River. Due to the plugged intake the forebay was overtopped resulting in erosion of the hillside below the forebay and along (parallel to) the overflow spillway pipe (SCE 2013). Refer to Appendix A, Photos A-20 to A-22.

The storm and resulting landslide that caused this incident was a naturally occurring event which could not have been anticipated. Thus, no measures could have been taken to prevent worsening of the condition. SR-178 was closed by the California Highway Patrol the evening of August 19, 2013 because of multiple rockslides that blocked the road, which made the Project inaccessible.

Following this event, SCE completed modifications to the flowline to prevent recurrence of a similar event. SCE has made modifications at the vent opening at Adit 17/18 to redirect any upslope runoff or debris flows over the opening and preventing flow, mud or plant material from entering the flowline. At the forebay measures were completed to prevent future overtopping by removing the screen/rack at the intake to the overflow spill pipe thus preventing plugging to allow any surge flow to enter the overflow pipe. Thus, this area is not subject to erosion/sedimentation due to ongoing, regular Project operations. Rather, the erosion was due to a unique, one-time event. At the time of field observations for this study, there was no evidence of ongoing active erosion observed at this location.

5.2.1.1 FERC Correspondence on Landslide Event

On September 10, 2013, in accordance with 18 CFR § 12.10(a) and verified according to § 12.13, SCE filed an incident report regarding the KR1 forebay spill. In a letter dated September 19, 2013, FERC requested additional information on the incident, including:

(1) clarification on the landslide location and supporting maps and photographs; (2) description of the current and future strategy for ensuring that debris does not enter the flowline; (3) a Registered Professional Engineer's assessment of the stability of all structures impacted by the event; (4) description of how information collected from the forebay overflow sensor is transmitted and used in controlling operations and measures to be implemented to ensure that the forebay overflow sensor functions and effectively detects similar future events prior to the forebay overtopping; (5) an update on consultation with resource agencies and coordination efforts with Caltrans; and (6) a proposed plan and schedule to mitigate the severely eroded areas. The requested information was provided in a letter to FERC dated November 1, 2013.

As a result of the landslide event, in a letter dated March 12, 2014, FERC made a determination to change the downstream potential hazard classification of the Kern River No. 1 Project from Low to Significant. Significant hazard Project features were identified by FERC as the Stark Creek Flume, Adit 17/18, and Kern No. 1 Forebay. Based on the revised hazard classification, FERC requested that SCE: (1) prepare a Dam Safety Surveillance Monitoring Plan (DSSMP); (2) prepare and Emergency Action Plan (EAP); (3) provide a schedule with milestones to complete rehabilitation of Project structures; (4) provide an update on consultation with resource agencies; and (5) provide an update on the proposed plan and schedule to mitigate the severely eroded areas. In a letter dated April 28, 2014, SCE provided responses to items 3 through 5.

To support development of the DSSMP and EAP (items 1 and 2 of FERC's request), SCE conducted Qualitative Risk Assessment (QRA) Workshops on September 18, 2014 and November 20, 2014, which included representatives from FERC. In addition, SCE conducted an investigation of the foundation conditions at Adit 17/18 to determine the soundness of the exposed existing foundation and collect soil data that could be used in development of remedial actions. Findings of the QRA Workshops and Adit 17/18 investigation were filed with FERC on January 6, 2015 and April 2, 2015, respectively. Responses to additional information requests by FERC on both filings were timely filed by SCE.

The DSSMP was accepted by FERC on November 23, 2015, the Adit 17/18 investigation accepted by FERC on December 22, 2015, and the EAP was submitted to FERC on December 28, 2015. Publicly available documentation associated with this incident is available in FERC's eLibrary.

5.2.2 Winter 2022–2023 Storm Cycles and Debris Slides

The 2023 Water Year, in particular the period from late December through the first half of January, and then again from late February through March, brought historic precipitation and snowpack conditions to parts of California and Nevada. Many of the storm systems were characterized by cool temperatures and low snow levels, brought on by numerous moist and strong low-pressure systems, including over a dozen Atmospheric Rivers and three bomb cyclones (i.e., a rapidly developing area of low pressure where the atmospheric pressure drops at least 24 millibars over a 24-hour period) during the period from December 2022 through March 2023.

Peak monthly rainfall of approximately 5.62 inches in January 2023, and 9.61 inches in March 2023 was measured at Lake Isabella (California Nevada River Forecast Center [CNRFC] 2024) (Figure 5-2). On March 10, 2023, flows in the Kern River at Kernville peaked at 15,700 cubic feet per second (cfs) (U.S. Geological Survey [USGS] 2024) (Figure 5-3). This was the second highest peak flow recorded at Kernville for the period of record spanning from 1961–2023, with the peak flow of 33,600 cfs occurring on December 6, 1966 (USGS 2024).

Heavy rainfall on a record snowpack in the upper watershed's drainages caused debris slides and rockfalls which closed SR-178 for several days on March 1 and March 15, 2023 (Appendix A, Photos A-23 to A-24).

5.3 PROJECT FACILITY EROSION

At the time of field observation there was no active erosion occurring at any Project facilities. The forebay spill event discussed in Section 5.2.1 was the most significant documented erosion that has occurred in the vicinity of the Project. There is rockfall area on the other side of the river from the KR1 Powerhouse that has potential to affect the powerhouse. A steel rockfall mitigation fence has been installed to help protect the powerhouse (Appendix A, Photos A-17 to A-19). The rockfall area is not caused by Project facilities.

5.4 SEDIMENT MANAGEMENT

Lake Isabella traps most sediment derived from the upper Kern River watershed. Downstream of Lake Isabella, there are several tributaries, however, entering the Kern River in the 20 miles between Lake Isabella and Democrat Dam. During intense winter storms and late summer and fall thunderstorm events these tributaries can introduce significant volumes of sediment to the Democrat Dam Impoundment.

Democrat Dam is an overflow concrete gravity dam with a crest length of 204 feet and a height of 29 feet. The impoundment formed by the dam has a surface area of 27 acres. Water is typically released to the Kern River either by flow over the dam or by a valve located along the southeast bank of the Kern River at the head of the flowline that diverts water to the Kern River No. 1 Powerhouse. Water stored in Democrat Impoundment can also be released from a low-level outlet, or drain gate, located at the bottom of the impoundment, immediately in front of the intake. The drain gate measures 4-feet wide by 8-feet tall, and when completely open can pass approximately 800 cfs of water.

The sandbox located at the head of the flowline beneath Democrat Dam acts as a sediment trap, preventing the entry of damaging sediments into the flowline and the downstream hydroelectric plant. Water flows from the flowline and diversion dam into the sandbox, which contains two slide-gate valves. Part of the water flowing from these valves is diverted to the Kern River No. 1 Powerhouse, the remaining water is released into the Kern River. One valve is left open year-round to provide minimum instream flow releases to the river (15 cfs minimum from October 1 through May 31 and 50 cfs minimum from June 1 through September 30). Since continuous flow occurs, there is a continuous

sediment release and sediment does not accumulate in the sandbox. This is a pass through of naturally occurring sediment.

Naturally occurring sediment also accumulates and is temporarily stored behind Democrat Dam. Sediment behind the dam is currently managed with a low-level outlet, or drain gate, located at the bottom of Democrat Dam. The drain gate bypasses water and sediment from behind the dam. The drain gate and the diversion can operate simultaneously. That is, if total river flow is 1,212 cfs, then SCE may divert 412 cfs to the Project powerhouse and 800 cfs may flow through the drain gate. However, it is typical to cease diverting water into the flowline prior to operating the lower drain gate, in order to avoid entraining mobilized sediment into the flowline, where it could cause damage to the powerhouse turbines.

Sediment management in Democrat Dam Impoundment was historically conducted in accordance with the Project's *Sediment Monitoring Results and Sediment Management Plan* (SMP) (ENTRIX/SCE 1999). The 1999 SMP was filed on March 1, 1999 pursuant to Article 402 of the license, and was approved by FERC Order on April 6, 1999 (FERC 1999).

In 2005, SCE, in consultation with resource agencies, prepared a *Revised Sediment Management Plan* (SCE 2005), which proposed additional sediment management strategies, as well as monitoring and adaptive management. From approximately 2005 until recently, accumulated sediment was managed in accordance with SCE's Revised Sediment Management Plan (SCE 2005) and resource agency permits. These permits include, California Department of Fish and Wildlife (CDFW) Fish and Game Code Section 1600 Routine Maintenance Agreement (Agreement), State Water Resources Control Board (SWRCB) Clean Water Act Section 401 Water Quality Certification, and U.S. Army Corps of Engineers (USACE) 404. CDFW filed a Notice of Categorical Exemption (NOE) with the State Clearinghouse (SCH 2006038514) on March 27, 2006. CDFW filed a second NOE with the SCH on August 24, 2018 (SCH 2006038514) to cover the 5-year extension of the CDFW Agreement (until March 17, 2023). The U.S. Forest Service, Sequoia National Forest completed an internal Decision Letter, dated January 14, 2013, approving sediment management activities at the KR1 Project. The letter determined that "this activity is necessary to maintain the safe and reliable operation of the hydroelectric project. This activity is authorized by SCE's FERC license."

In February 2022, the USACE permits expired followed by expiration of the CDFW Agreement in March 2023. SCE is currently in the process of renewing the permits. Historical and current sediment management is described below:

- Historical operation (2005 to 2022) for Democrat Dam included an operational flushing procedure, full pond drain procedure, and peak flow sediment bypass procedure:

  – Operational Flushing Procedure – Operational flushing is a standard maintenance procedure and is performed as needed to bypass sediment that has accumulated directly in front of the drain gate. During operational flushing

only sediment directly in front of the drain gate is scoured, resulting in mobilization of a relatively insignificant amount of sediment. Operational flushing should occur annually, whenever flow conditions allow, reducing the storage of sediments behind the dam and keeping the area in front of the intake clear of sediment. Operational flushing is subject to seasonal flow constraints related to fish spawning and rearing. Flow criteria include (1) flow in the bypassed reach >600 cfs from July 1 to March 14, and (2) flow in the bypassed reach >1,200 cfs during the smallmouth bass spawning and rearing period from March 15 to June 30.

– Full Pond Drain Procedure – Full pond drain involves draining the Democrat Impoundment by releasing full river flow through the lower drain gate, thereby creating conditions for increased scouring in the impoundment. A full pond drain can only feasibly occur when the lower drain gate is fully opened (releasing approximately 800 cfs) and the inflow into Democrat Impoundment is less than 800 cfs. This reduces the water level of the impoundment and allows the natural flow of the river and the impounded water to scour sediment accumulated in the impoundment. Full pond drains are more effective than operational flushing at removing sediment accumulated upstream from the intake gates due to increased velocity and scouring potential of the released water. Water is not typically diverted to the KR1 Powerhouse during full pond drains.

  During full pond drains, inflows must be less than 800 cfs to allow the impoundment to drain, and therefore flow in the bypassed reach does not exceed 800 cfs. However, flows exceeding 800 cfs are required to successfully transport the high volumes of sediment released into the bypassed reach from full pond drains. This causes temporary sediment deposition in the river below the dam. To address this, full pond drains are only implemented when anticipated flows, based on weather forecasts and expected Lake Isabella water releases, are determined to be sufficient to transport the deposited sediment through the bypassed reach.

  Based on previous consultation with CDFW, SCE only implements full pond drains between July 1 and March 14, to avoid the spawning and rearing period for hardhead minnow, which extends from March 15 to June 30.

  Full pond drains should occur annually, if possible, to ensure that sediment trapped behind the dam does not accumulate to unmanageable levels. However, full pond drains are not recommended during extended drought periods, when sediment transport in the lower Kern River is significantly reduced.

– Peak Flow Sediment Bypass Procedure – The peak flow sediment bypass procedure manages sediment-laden peak flows resulting from natural precipitation events, including winter storms and summer and fall thunderstorms. During storm events, tributary streams entering the Kern River

below Isabella Dam can transport significant amounts of sediment into the Democrat Impoundment. Under these conditions, fine sediment suspended in the water column can be entrained into the flowline and delivered to the powerhouse where it can cause increased wear on the wetted portion of the hydraulic turbines. Therefore, during turbid flow conditions SCE may temporarily cease diversion to the KR1 Powerhouse and allow the full river flow to pass over and through the lower drain gate directly into Kern River bypassed reach. In these situations, SCE closes the valve at the head of the flowline, and fully opens the lower drain gate to allow all inflow to flow into the bypassed reach. The sediment load is carried by the full river flow, thereby mimicking the natural sediment transport regime. When flood conditions and turbid flow conditions have improved, standard operating procedures are resumed.

- Current sediment management activities (since the permits expired) are limited to activities that allow inflow sediment to bypass Democrat Dam as part of regular Project operation and maintenance activities. These include the operational flushing and peak flow sediment bypass, but do not include full pond drain (see above). Full pond drain would occur in the future when the agency permits (CDFW Section 1600, SWRCB 401, USACE 404) are renewed.

Reporting of sediment operations listed above is provided in annual reports that SCE prepares each year for CDFW and the SWRCB. Since 2005, SCE has implemented full pond drains on five occasions (March 2007, September–March 2009, February 2012, February–March 2013, January–February 2018). Operational flushing and peak flow sediment bypass has occurred on an as needed basis since 2005.

The goal of sediment management at Democrat Dam is to emulate the natural sediment regime of the lower Kern River (to the extent possible) by allowing naturally occurring sediment that is temporarily deposited in the impoundment to continue downstream, past Democrat Dam, and through the lower Kern River system without building up behind Democrat Dam.

6.0 STUDY SPECIFIC CONSULTATION

No specific consultation is required for this study, and no consultation has been conducted to date.

7.0 OUTSTANDING STUDY PLAN ELEMENTS

There are no outstanding study plan elements. The LAND 2 – Erosion and Sedimentation Study is complete.

8.0 REFERENCES

California Data Exchange Center. 2024. California Department of Water Resources, hourly and daily precipitation at the Kern Powerhouse station on August 19, 1013. Accessed November 2024.

CNRFC (California Nevada River Forecast Center). National Oceanic and Atmospheric Administration, Monthly Precipitation Summary Water Year 2023, Station ISAC1 at Lake Isabella Dam. Accessed December 2024.

ENTRIX. 1999. Sediment Monitoring Results and Sediment Management Plan. Prepared for Southern California Edison.

FERC (Federal Energy Regulatory Commission). 1999. Order Approving Sediment Monitoring Results and Sediment Management Plan. April 6, 1999.

_____. 2024. Study Plan Determination for the Kern River No. 1 Hydroelectric Project. March 14.

Google Earth. Aerial imagery of the Kern River Canyon between Kernville, CA and Bakersfield, CA, imagery dates: 1992–2023. Accessed May 2024–November 2024.

SCE (Southern California Edison). 2005. Revised Sediment Management Plan for the Kern River No. 1 Hydroelectric Project. Prepared for Southern California Edison, Rosemead, CA. Prepared by ENTRIX, Inc., Ventura, CA. February 28.

_____. 2013. Kern River No. 1 Hydroelectric Project (FERC Project No. 1930), Incident Report of Landslide Initiated Forebay Spill.

_____. 2023. Kern River No. 1 Hydroelectric Project, Pre-Application Document. May 5.

_____. 2024. Kern River No. 1 Hydroelectric Project (FERC Project No. 1930) Revised Study Plan. February 13.

USGS (United States Geological Survey). 2024. Water Year Summary for Site USGS 1118600. Accessed December 2024.

TABLES

Table 3-1. Kern River No. 1 Hydroelectric Project Facilities

Diversion Dam
Democrat Dam
Impoundment
Democrat Dam Impoundment
Water Conveyance System
Sandbox
Tunnels, Flumes, Conduits, and Adits
Forebay
Forebay Overflow Spillway
Penstock
Powerhouse and Switchyard
Kern River No. 1 Powerhouse and Switchyard
Access Roads
Willow Spring Creek Road (also referred to as Democrat Dam Road)
Powerline Road
Flume No. 1 Road
Dougherty Creek Road
Stark Creek Road
Forebay Operations Area Road
Lower Powerhouse Road
Upper Powerhouse Road
Access Trails
Democrat Gage Trail
Conduit No. 3 Trail
Cow Flat Creek Trail
Steel Flume Trail
Lucas Creek Trail
Dougherty Creek Trail
Stark Creek Trail
Adit 17 & 18 Trail
Overflow Spillway Trail
Skip Hoist / Forebay Trail
Communication and Power Lines
Intake Gatehouse to Flume No. 1 Powerline
Powerhouse to Forebay Communication / Powerline
Gages and Stilling Wells
Kern River near Democrat Springs (USGS Gage No. 11192500 / SCE Gage No. 409)
Kern River No. 1 Conduit near Democrat Springs (USGS Gage No. 11192000 / SCE Gage No. 410)
Kern River near Democrat Springs (USGS Gage No. 11192501; calculated 11192500+11192000)

Stilling Well No. 1
Stilling Well No. 2
Ancillary and Support Facilities
Democrat Dam Area
Buoy Line in Democrat Dam Impoundment
Democrat Dam Intake Gatehouse
Democrat Dam Drainage Tower
Democrat Dam Drainage Tunnel
Democrat Dam Drainage Tunnel Outlet
Democrat Dam Access Walkway
Sandbox Drainage Channel
Gaging Cableway
Water Conveyance
Flume No. 6 Access Platform
Forebay Operations Area
Old Admin Building
Garage No. 1
Garage No. 2
Old Ice House
Water Tank
Aerial Cable Tower
Skip Hoist House and Lower Landing
Skip Hoist Cables and Cart
Skip Hoist Upper Landing
Skip Hoist Upper Landing to Forebay Catwalk
Communication Site
Forebay Operations Area Perimeter Fence
Forebay Perimeter Fence
Powerhouse Area
Machine Shop
Office / Lunchroom
Restroom
Powerhouse and Switchyard Perimeter Fence

Table 5-1. Locations of Potentially Significant Sources of Erosion and Sedimentation

Site	Photographs (Appendix A)	Approximate Volume (CY)	Hydrology at the Time of the Survey	Project Related	Natural Causes	Description
Willow Spring Creek	N/A	N/A	N/A	No	Yes	Willow Spring Creek at Democrat Dam. Considered to be a potentially significant source of sediment during high flows based on observations of other creeks in the canyon and aerial imagery. Not accessible for visual observation or photos.
Unnamed Tributary	A-1 to A-2	N/A	Dry	No	Yes	Unnamed Tributary (Lower) that connects to the mainstem channel on LB below the Democrat Dam access road parking area. Sand and gravel deposits above and below culvert would likely be transported during high-flow conditions.
	A-3	4	Dry	No	Yes	Unnamed Tributary (Upper) at water crossing on Cow Flat Rd. Prism of sand and gravel deposited above road suggests significant potential for sediment transport during high-flow conditions.
Saturday Spring Creek	N/A	N/A	N/A	No	Yes	Saturday Spring Creek on RB of mainstem channel. Considered to be a potentially significant source of sediment during high flows based on observations of other creeks in the canyon and aerial imagery. Not accessible for visual observation or photos.
Democrat Spring Creek	N/A	N/A	N/A	No	Yes	Democrat Spring Creek on LB of mainstem channel. Considered to be a potentially significant source of sediment during high flows based on observations of other creeks in the canyon and aerial imagery. Not accessible for visual observation or photos.
Cow Flat Creek	A-4	7	Dry	No	Yes	Upper Cow Flat Creek at water crossing on Cow Flat Rd. Prism of sand and gravel deposited above road suggests significant potential for sediment transport during high-flow conditions.
	A-5 to A-6	N/A	Dry	No	Yes	Cow Flat Creek at SR-178 culvert and confluence with mainstem channel. Prism of sand and gravel deposited below culvert adjacent to confluence suggests significant potential for sediment transport during high-flow conditions.
Lucas Creek	A-7 to A-8	N/A	Flowing	No	Yes	Upper Lucas Creek at water crossing on Cow Flat Rd. Abundant fine sediment that would likely be transported during high-flow conditions
	N/A	N/A	Flowing	No	Yes	Lucas Creek at SR-178 culvert and confluence with mainstem channel. Cobbles, sand, and gravel deposited below culvert adjacent to confluence suggests significant potential for sediment transport during high-flow conditions.
Dougherty Creek	A-9	N/A	Flowing	No	Yes	Dougherty Creek at SR-178 culvert and confluence with mainstem channel. Steep drainage with rilling suggests significant potential for erosion and sediment transport during high-flow conditions. Boulders, cobbles, gravel, and sand deposited below culvert.
Bank Erosion_RB1	A-10 to A-11	N/A	N/A	No	Yes	Bank erosion at the confluence of an ephemeral drainage and the mainstem channel on RB. Steep cut bank composed of loose cobbles, gravel, and sand with rilling, slumping, and potential for significant erosion and sediment deposition.
Stark Creek	A-12	N/A	Dry	No	Yes	Upper Stark Creek at the end of the flowline access road. Scoured bedrock channel and matrix supported cobbles suggest potential for significant episodic erosion and sediment transport. Deposits of fine sand and gravel that would likely be transported during high-flow conditions.
	A-13	N/A	Dry	No	Yes	Stark Creek at SR-178. Boulder and cobble bed with some sand and gravel. Observations of the upper drainage and channel geometry suggest the potential for episodic debris flows and sediment transport that could impact travel on SR-178. Confluence with mainstem channel not accessible for visual observation or photos.
Rilling/Landslide_RB1	A-14 to A-15	N/A	N/A	No	Yes	Landslide scar with rilling on RB across from Lower Richbar Day Use Area. Potential for episodic erosion and sediment delivery directly into mainstem channel.
Bank Erosion_RB2	A-16	N/A	N/A	No	Yes	Steep eroding cut bank on RB. Composed of boulders and cobbles supported by sand and gravel matrix.
Peachacho Creek	N/A	N/A	Dry	No	Yes	Peachacho Creek at SR-178. Steep, deeply incised drainage. Considered to be a potentially significant source of sediment during high flows based on observations of other creeks in the canyon and aerial imagery. Not accessible for visual observation or photos.
Natural Rockslide near KR1 Powerhouse	A-17 to A-19	N/A	N/A	No	Yes	Large rockslide above the KR1 powerhouse.

Site	Photographs (Appendix A)	Approximate Volume (CY)	Hydrology at the Time of the Survey	Project Related	Natural Causes	Description
8/20/2013 Forebay Spill	A-20	N/A	N/A	No*	Yes*	Rock, mud, water, and plant material from a landslide entered the KR1 conduit approximately 1 mile upstream of the forebay. This material continued downstream in the tunnel creating a temporary surge in flows at the forebay, causing the pipe spillway to plug and forebay to spill. This resulted in erosion of the hillside below the forebay and along the pipe spillway. This area is not subject to erosion/sedimentation due to ongoing, regular Project operations. Rather, the erosion was due to a unique, one-time event. At the time of field observations for this study, there was no evidence of ongoing erosion observed at this location.
8/20/2013 Forebay Erosion Deposit	A-21 to A-22	N/A	N/A	No*	Yes*	

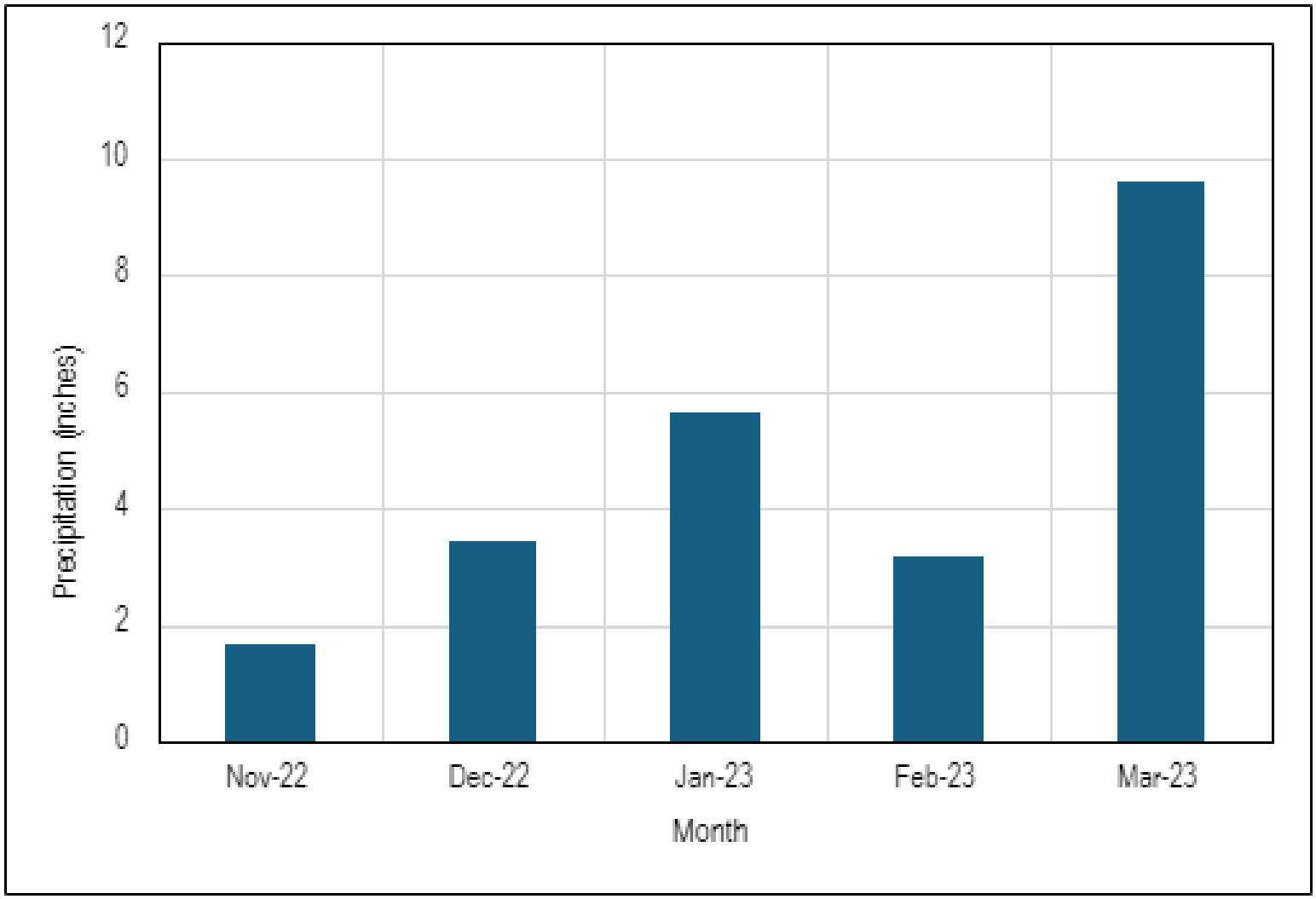
Notes: * This was a natural landslide that affected Project infrastructure causing a spill/erosion.
Key: CY = cubic yards
LB = Left Bank (when viewed in the downstream direction)
N/A = Not Applicable (not accessible for direct visual observation or photos, or the parameter is not applicable to the feature being described)
RB = Right Bank (when viewed in the downstream direction)
SR-178 = State Route 178

Copyright 2026 by Southern California Edison

FIGURES



Figure 5-1. Example of Legacy Spoil Piles from Drilling the KR1 Conveyance Flowline.



Source: CNRFC 2024

Figure 5-2. Monthly Peak Precipitation at Lake Isabella from November 2022–March 2023

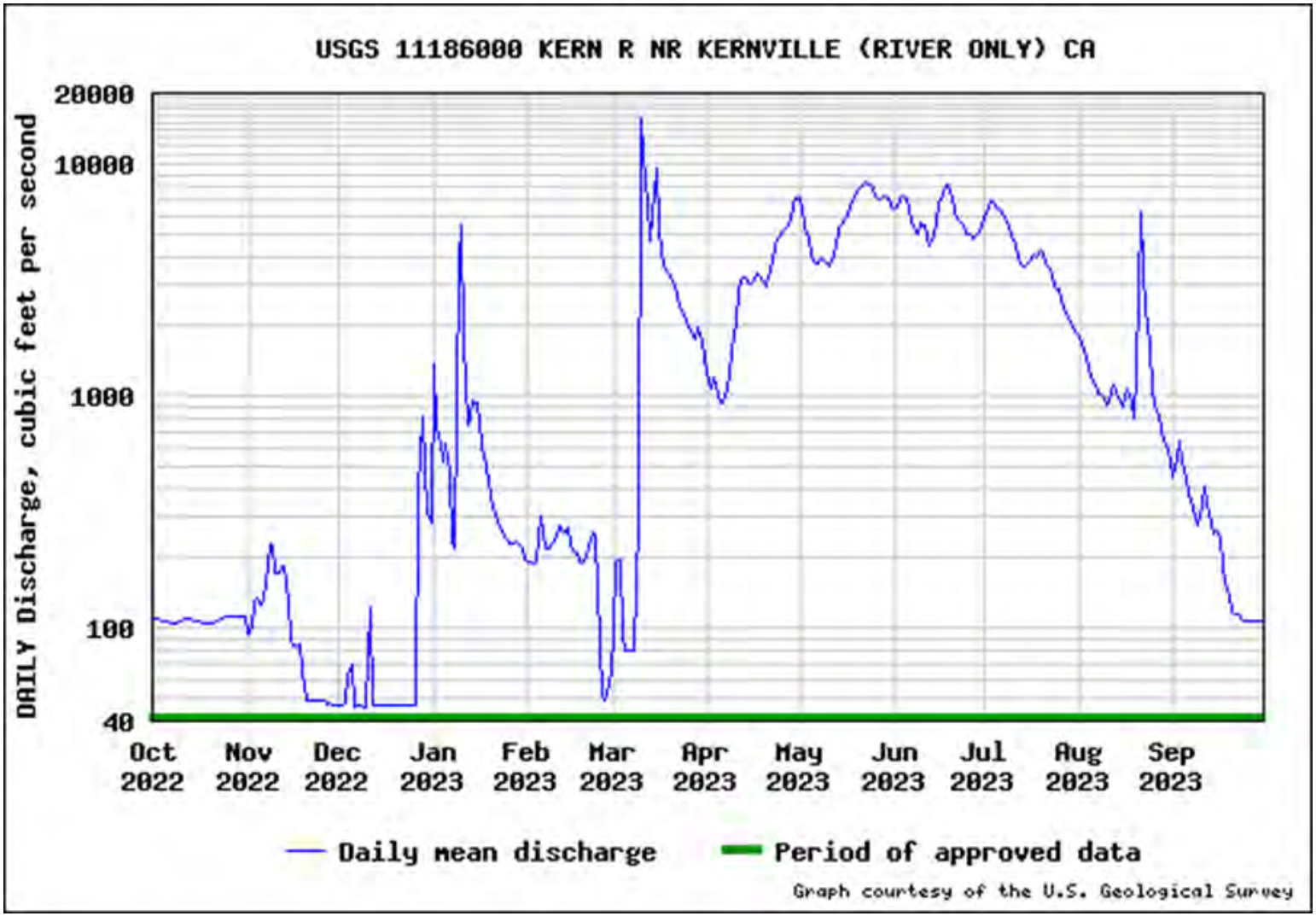


Figure 5-3. USGS Water Year Summary for Site USGS 11186000 at Lake Isabella Dam

MAPS

Democrat Diversion Dam
Willow Spring Creek
Unnamed Tributary (Lower)
Unnamed Tributary (Upper)
Saturday Spring Creek
Democrat Spring Creek
Cow Flat Creek
Kern River
Upper Cow Flat Creek
Lucas Creek
Upper Lucas Creek
Bank Erosion_RB2
Rilling/Landslide_RB1
Stark Creek
Bank Erosion_RB1
Peachacho Creek
Dougherty Creek
Upper Stark Creek
Kern River No.1 Powerhouse
08/20/2013 Forebay Erosion Deposit
Landslide at Powerhouse
08/20/2013 Forebay Spill
178

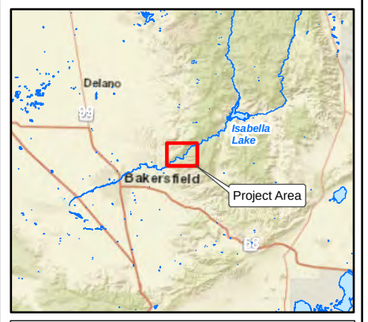
Facilities
- Dam
- Powerhouse
- Flowline
- Penstock
- FERC Boundary

Other Features
- Highway
- Watercourse

Land Jurisdiction*
- U.S. Forest Service
- U.S. Bureau of Land Management
- Private (Blank)

*SOURCE: BLM 2021

Erosion and Sedimentation Survey
- Observation Sites



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-1

Erosion and Sedimentation Study Area

0 0.125 0.25 0.5 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 1/4/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company

APPENDIX A

Photographs of Observed Potentially Significant Sources of Erosion and Sedimentation

Copyright 2026 by Southern California Edison



Photo A-1. Unnamed tributary on Democrat Dam Flowline Access Road



Photo A-2. Unnamed tributary on Democrat Dam Flowline Access Road



Photo A-3. Unnamed tributary at water crossing on Cow Flat Road



Photo A-4. Upper Cow Flat Creek



Photo A-5. Cow Flat Creek at SR-178 and confluence with mainstem channel



Photo A-6. Cow Flat Creek at SR-178 and confluence with mainstem channel



Photo A-7. Upper Lucas Creek at water crossing on Cow Flat Road



Photo A-8. Upper Lucas Creek at water crossing on Cow Flat Road



Photo A-9. Dougherty Creek drainage above SR-178



Photo A-10. Bank Erosion RB_1



Photo A-11. Bank Erosion RB_1



Photo A-12. Fine sediment in Stark Creek at end of flowline access road



Photo A-13. Stark Creek at SR-178



Photo A-14. Rilling/Landslide RB-1



Photo A-15. Rilling/Landslide RB-1 (Google Earth Image, Date: 8/24/23)



Photo A-16. Bank Erosion RB-2



Photo A-17. Natural Rockslide at KR1 Powerhouse

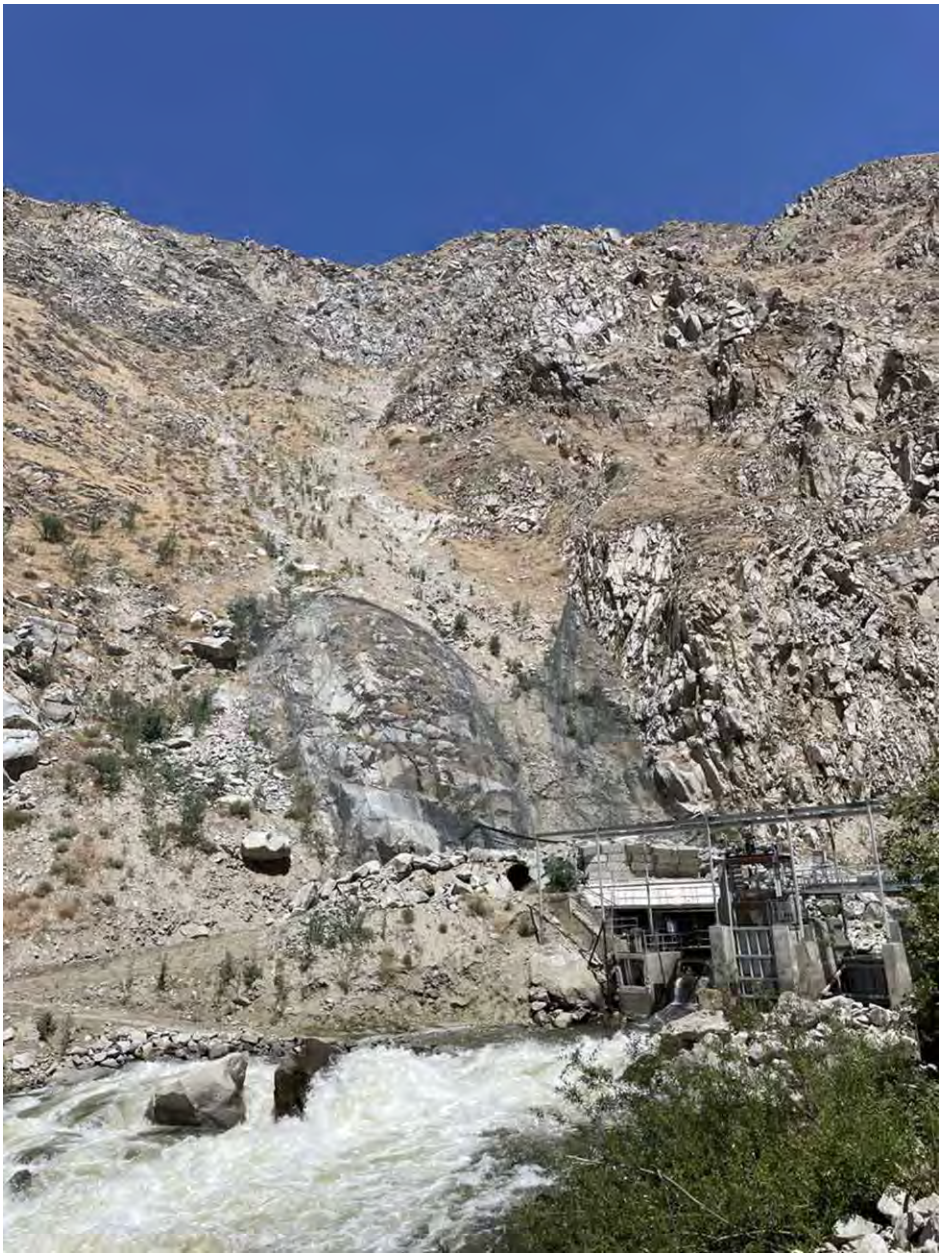


Photo A-18. Natural Rockslide at KR1 Powerhouse



Photo A-19. Natural Rockslide at KR1 Powerhouse

Kern River No. 1 Forebay Spill – August 20, 2013
Kern River No. 1 Project – FERC Project No. 1930



Kern River No. 1 Forebay

Photo A-20. Erosion from the August 20, 2013, Forebay Spill Event (SCE 2013)



Photo A-21. KR1 Penstock before the August 20, 2013, Forebay Spill Event (Google Earth Image, Date: 8/12/2013)



Photo A-22. KR1 Penstock Erosion and Sediment Deposition in the Kern River Channel After the August 20, 2013, Forebay Spill Event (Google Earth Image, Date: 4/15/2014)



Photo A-23. Debris Slide Closing SR-178 on March 1, 2023 (Caltrans 2023)



Photo A-24. Debris Slide Closing SR-178 on March 15, 2023 (Caltrans 2023)

APPENDIX G

REC 1 – RECREATION FACILITY CONDITION ASSESSMENT TECHNICAL MEMORANDUM

Copyright 2026 Southern California Edison

REC 1 – RECREATION FACILITY CONDITION ASSESSMENT TECHNICAL MEMORANDUM

KERN RIVER NO. 1 HYDROELECTRIC PROJECT
FERC PROJECT NO. 1930

PREPARED FOR:



March 2026

TABLE OF CONTENTS

1.0 Introduction 1

2.0 Study Objectives 1

3.0 Study Area and Study Sites 1

4.0 Methods 2

4.1 Characterization of Accessibility 2

4.2 Study Plan Variances 3

5.0 Data Summary 3

5.1 Democrat Raft Take-out Boating Site 3

5.2 Upper Richbar Day Use Area 4

5.3 Lower Richbar Day Use Area 5

5.4 Live Oak Day Use Area 6

6.0 Study Specific Consultation 7

7.0 Outstanding Study Plan Elements 7

8.0 References 7

LIST OF TABLES

Table 4-1. Facility Feature Condition Rating Table 10

Table 5-1. Democrat Raft Take-Out Boating Site Day Use Area Amenities 10

Table 5-2. Upper Richbar Day Use Area Amenities 12

Table 5-3. Lower Richbar Day Use Area Amenities 14

Table 5-4. Live Oak Day Use Area Amenities 15

LIST OF MAPS

Map 3-1. Day Use Areas within the Study Area 18

Map 5-1. Democrat Raft Take-out Boating Site..... 19
Map 5-2. Upper Richbar Day Use Area..... 20
Map 5-3. Lower Richbar Day Use Area..... 21
Map 5-4. Live Oak Day Use Area..... 22

LIST OF APPENDICES

Appendix A Recreation Site Inventory Form
Appendix B Site Photos
Appendix C Completed Recreation Site Inventory Forms

LIST OF ACRONYMS

ABAAS	Architectural Barriers Act Accessibility Standards
ADA	Americans with Disabilities Act
FERC	Federal Energy Regulatory Commission
Forest Service	U.S. Forest Service
FSORAG	Forest Service Outdoor Recreation Accessibility Guidelines
KR1	Kern River No. 1
ODAAG	Outdoor Developed Area Accessibility Guidelines
Project	Kern River No. 1 Hydroelectric Project Relicensing, FERC Project No. 1930
REC 1 TSP	REC 1 – Recreation Facility Condition Assessment Technical Study Plan
RSP	Revised Study Plan
SCE	Southern California Edison
SPD	Study Plan Determination
SQF	Sequoia National Forest
SR-178	State Route 178

1.0 INTRODUCTION

This REC 1 – Recreation Facility Condition Assessment Technical Memorandum provides the methods and findings of the REC 1 – Recreation Facility Condition Assessment Technical Study Plan (REC 1 TSP). The REC 1 TSP was conducted in support of Southern California Edison's (SCE) Kern River No. 1 (KR1) Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 1930. The REC 1 TSP was included in SCE's Revised Study Plan (RSP) submitted to FERC on February 13, 2024 (SCE 2024). In its March 14, 2024, Study Plan Determination (SPD), FERC approved the REC 1 TSP without modifications (FERC 2024).

The recreation facility condition assessment was conducted in September 2024. All data collection and analysis are complete and summarized below. There are no recreation facilities associated with the Project and none of the four day-use facilities included in this study are within the FERC Project boundary.

2.0 STUDY OBJECTIVES

The objectives of the recreation facility condition assessment, as outlined in the REC 1 TSP (SCE 2024), include the following:

- Identify, map, and describe public developed recreation facilities in the vicinity of the Project, including capacity.
- Conduct a facility inventory and condition assessment at the public recreation facilities including overflow parking areas, including an evaluation of signage and public safety features, and an assessment of the condition and potential for universal accessibility.

3.0 STUDY AREA AND STUDY SITES

The study area and specific study sites are focused on four public day-use facilities (non-Project facilities) along the bypass reach[1] that are owned and operated by the United States Forest Service (Forest Service), Sequoia National Forest (SQF). The bypass reach is an approximately 10.2-mile reach of the lower Kern River from Democrat Dam downstream to the Kern River No. 1 Powerhouse Tailrace. The recreation day-use facility locations are listed below and shown in Map 3-1.

- Democrat Raft Take-out Boating Site (non-Project facility)
- Upper Richbar Day Use Area (non-Project facility)
- Lower Richbar Day Use Area (non-Project facility)
- Live Oak Day Use Area (non-Project facility)

[1] A bypass reach is a segment of a river downstream of a diversion facility where Project operations result in the diversion of a portion of the water from the river.

Copyright 2026 by Southern California Edison

4.0 METHODS

Study implementation followed the methods described in the REC 1 TSP (SCE 2024). A recreation facility inventory and condition assessment was completed at the four SQF day-use areas by two field staff on September 24, 2024. Prior to implementation of the inventory and condition assessment, SCE developed a field inventory and condition assessment form to support consistent data collection. The form was approved by the SQF at the end of August 2024.[2] The field inventory and condition assessment form is included in Appendix A.

The study included an inventory and condition assessment of the following:

- Inventory of features at the day-use facilities
- Overall day-use facility capacity
- Assessment of the condition of facilities and associated features
- Characterization of universal accessibility
- Public safety measures
- Signage and wayfinding
- Site-specific circulation road(s) and parking area(s)

Field staff documented each facility with photographs and integrated data collected into a geographic information system database with relevant attributes as provided in Section 5, Data Summary. Items in need of maintenance, repair, replacement, or similar action were noted per the categories in Table 4-1.

4.1 CHARACTERIZATION OF ACCESSIBILITY

To characterize universal accessibility, SCE evaluated each site amenity using the Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG) (Forest Service 2013). These are the standards for use on the National Forest System for the facilities and features addressed in those guidelines. The standards incorporate the United States Access Board's Architectural Barriers Act Accessibility Standards (ABAAS) and the Outdoor Developed Area Accessibility Guidelines (ODAAG), developed by the Architectural and Transportation Barriers Compliance Board. While the standards incorporate the ODAAG, they also ensure the application of equivalent or higher guidelines (Forest Service 2013). FSORAG guidelines did not apply to every site amenity identified during the condition assessment. For example, boat ramps, gates, and unpaved

[2] Personal correspondence between SQF Supervisor, Anthony Edwards and SCE Relicensing Project Manager for the KR1 Project, Mary M. Richardson, on August 28, 2024.

roads are not features for which there are applicable FSORAG specifications. Amenities not addressed in the FSORAG guidelines were not evaluated for universal accessibility.

4.2 STUDY PLAN VARIANCES

There are no variances from the REC 1 TSP approved in FERC's SPD (FERC 2024).

5.0 DATA SUMMARY

The data collected for the recreation facility inventory and condition assessment focused on the four developed day-use areas identified above. The sites are owned and operated by the SQF and are all first come/first serve. There are no recreation facilities associated with the Project and none of the four day-use facilities included in this study are within the FERC Project boundary. The data collected at the time of observation is provided below. Photographs of each site are provided in Appendix B.

5.1 DEMOCRAT RAFT TAKE-OUT BOATING SITE

Democrat Raft Take-out Boating Site is open year-round from sunrise to sunset (Forest Service 2024a). The site is accessible via State Route 178 (SR-178). The SQF owns and maintains the site, but it is unstaffed. The site is not a KR1 Project facility and is not within the FERC Project boundary along the lower Kern River. No fee is required at the site.

Site Amenities and Parking: The site consists of a paved access road leading to a paved whitewater access area with a two-lane carry-in boat launch. There is also an unpaved access road leading to an unpaved parking lot and turnout area uphill from the paved whitewater access area. The unpaved parking lot/upper parking lot has capacity for approximately 22 vehicles, including two handicap parking spaces (handicap parking spaces are demarcated with signage). Other site amenities include one trash receptacle, one covered picnic area, one informal overlook and one pit toilet structure with two stalls. Signage, in English, was posted on two informal signboards. One signboard includes information about fire restrictions. The other signboard includes information about fishing, hours of operation, and site rules. Table 5-1 lists and describes each site amenity, indicates whether FSORAG guidelines apply and the FSORAG compliance status of each amenity as applicable, and identifies the corresponding photo of the amenity (photos are located in Appendix B). Map 5-1 illustrates the location of the site and site amenities.

FSORAG Compliance Summary: FSORAG compliant site amenities consist of the Americans with Disabilities Act (ADA) parking spaces (two handicap parking spaces as noted above), both pit toilets, and informational signboards/signage. Four site amenities are not compliant with FSORAG guidelines, as follows:

- The paved access paths are not compliant due to overgrown vegetation, missing handrails, and eroded, uneven and incomplete sections of pavement.

- The informal overlook is not compliant due to inadequate clearance around the picnic shelter for viewing and maneuvering.

- The trash receptacle is not compliant due to reach ranges outside of the required specifications.

- The covered picnic area is not compliant due to inadequate clearance around the picnic table and noncompliant access paths.

Site Condition: Field staff observed areas of erosion along the upper unpaved access road as well as within the unpaved parking lot. There is some evidence of vegetation disturbance due to extended footpath use and creation of informal trails. There is evidence of erosion near the informal overlook, at the covered picnic area, and at the stairs down to the lower boat ramp area. Overgrown vegetation is present on the paved access paths. There was no graffiti or litter throughout the site.

5.2 UPPER RICHBAR DAY USE AREA

Upper Richbar Day Use Area is open year-round from 6:00 am until 10:00 pm (Forest Service 2024b). The site is accessible via SR-178. The SQF owns and maintains the site, but it is unstaffed. The site is not a KR1 Project facility and is not within the FERC Project boundary along the lower Kern River. A $12 fee is required to park and utilize this site.

Site Amenities and Parking: The site consists of a paved access road, two paved parking lots, picnic areas, and paved access paths to sandy beaches along the river. The parking lots have capacity for 40 vehicles, including two handicap parking spaces (handicap spaces are demarcated by signage and paint). Other site amenities include 14 picnic tables, 10 grills, two pit toilet structures with two stalls each, a large roll-off dumpster, and multiple trash receptacles. Two informational signboards are present, providing fee information and site rules in both English and Spanish. In addition, there is one locked small, one-story, windowless building adjacent to the parking lot that appeared to be unused. Table 5-2 lists and describes each site amenity, indicates whether FSORAG guidelines apply and the FSORAG compliance status of each amenity as applicable, and identifies the corresponding photo of the amenity (photos are located in Appendix B). Map 5-2 illustrates the location of the site and site amenities.

FSORAG Compliance Summary: FSORAG compliant site amenities consist of the two paved parking areas, ADA parking spaces (two handicap parking spaces as noted above), trash receptacles, one of the pit toilet stalls,[3] and the informational signboards and fee post. Five site amenities are not compliant with FSORAG guidelines, as follows:

- One of the pit toilet stalls is not compliant due to uneven pavement limiting the door from opening to the specified width.

- The paved access paths leading to the beach access area are not compliant due to uneven surface, insufficient width, and a gap in connectivity between the end of the path and the beach.

[3] During the time of the survey, one pit toilet stall was locked on each of the two pit toilet structures and could not be evaluated under the FSORAG.

- The picnic tables are not compliant because they are not accessible via a paved access path. In addition, though one of the picnic tables is designed for universal access (providing an open seating area for a wheelchair), this picnic table has been relocated (assumingly by visitors) from along the paved access path to a river-side beach location at the end of a non-compliant paved access path.

- Grills are not compliant because they are not accessible from a paved access path.

- The large roll-off dumpster was not compliant due to reach ranges outside of specifications.

Site Condition: There is some evidence of vegetation disturbance due to extended footpath use and creation of informal trails west of the west parking lot. Graffiti is present on rocks, trees, and various structures throughout the site (refer to Appendix B, Photos B-37 and B-51). Litter was present throughout the site and at the beach below the site (refer to Appendix B, Photo B-41). Parking space delineation is faded and hard to see.

5.3 LOWER RICHBAR DAY USE AREA

Lower Richbar Day Use Area is open March through October from 6:00 am until 10:00 pm (Forest Service 2024c). However, during the survey period on September 24, 2024, the day use area appeared to be closed for the season based on the locked entry gate. In addition, the information signboard at the day use area was void of any postings (informational signboards at the open day use areas were populated with postings). The site is accessible via SR-178. The SQF owns and maintains the site, but it is unstaffed. The site is not a KR1 Project facility and is not within the FERC Project boundary along the lower Kern River. A $12 fee is required to park and utilize this site.

Site Amenities and Parking: The site consists of a paved parking lot, picnic areas, and informal trails to the river. The paved parking area has capacity for 11 vehicles, including one handicap parking space (handicap parking spaces are demarcated with signage and paint). Other site amenities include 11 picnic tables, five grills, one pit toilet structures with two stalls and multiple trash receptacles. One informational signboard and one fee post is present on-site. As noted above, there was no informational signage posted on the signboard. Table 5-3 lists and describes each site amenity, indicates whether FSORAG guidelines apply and the FSORAG compliance status of each amenity as applicable, and identifies the corresponding photo of the amenity (photos are located in Appendix B). Map 5-3 illustrates the location of the site and site amenities.

FSORAG Compliance Summary: FSORAG compliant site amenities consist of the ADA parking space (one handicap parking spaces as noted above), one of the picnic tables (designed for universal access because it provides an open seating area for a wheelchair), one of the grills (adequate height for an individual in a wheelchair), and one of the paved access paths. The pit toilet stalls, and trash receptacles could not be

evaluated under the FSORAG.[4] One site amenity is not compliant with FSORAG guidelines, as follows:

- The fee post is not compliant due to lack of adequate clearance surrounding the post.

Site Condition: There is some evidence of vegetation disturbance due to extended footpath use and creation of informal trails. Picnic tables were in generally good condition. Graffiti is present on rocks and trees throughout the site (refer to Appendix B, Photo B-57, B-58, and B-64). Litter was present throughout the site and at the beach below the site. Parking space delineation is faded and hard to see.

5.4 LIVE OAK DAY USE AREA

Live Oak Day Use Area is open May 10 through September 15 from 6 am to 10 pm (Forest Service 2024d). During the survey period on September 24, 2024, the day use area appeared to be closed for the season based on the locked entry gate. In addition, the informational signboard was void of any postings (informational signboards at the open day use areas were populated with postings). The site is accessible via SR-178. The SQF owns and maintains the site, but it is unstaffed. The site is not a KR1 Project facility and is not within the FERC Project boundary along the lower Kern River. A $12 fee is required to park and utilize this site.

Site Amenities and Parking: The site consists of a paved parking lot, picnic areas, and river access. The paved parking area has capacity for 16 vehicles, including three handicap parking spaces (handicap parking spaces are demarcated with signage and paint). Other site amenities include 10 picnic tables (including one covered picnic table), three grills, one pit toilet structures with two stalls, and multiple trash receptacles. One informational signboard and one fee post is present on-site. As noted above, there was no informational signage posted. Table 5-4 lists and describes each site amenity, indicates whether FSORAG guidelines apply and the FSORAG compliance status of each amenity as applicable, and identifies the corresponding photo of the amenity (photos are located in Appendix B). Map 5-4 illustrates the location of the site and site amenities.

FSORAG Compliance: FSORAG compliant site amenities consist of three ADA parking space (three handicap parking spaces as noted above), a covered picnic area with a grill (both designed for universal access: picnic table provides an open seating area for a wheelchair and grill is of adequate height for an individual in a wheelchair), and one of the paved access paths, and one of the uncovered picnic tables and grill (both designed for universal access). The pit toilet stalls, and trash receptacles could not be evaluated under the FSORAG.[5] Two site amenities are not compliant with FSORAG guidelines, as follows:

[4] During the time of the survey, both pit toilet stalls were locked, and no trash receptacles were on-site due to the site being closed for the season.

[5] During the time of the survey, both pit toilet stalls were locked, and no trash receptacles were on-site due to the site being closed for the season and could not be evaluated under the FSORAG.

- The fee post is not compliant due to lack of adequate clearance surrounding the post.

- Two paved paths are not compliant because they are too steep.

Site Condition: There is some evidence of vegetation disturbance due to extended footpath use and creation of informal trails (refer to Appendix B, Photo B-75 and B-77). Parking space delineation is faded and hard to see. Many of the picnic tables are in poor condition, require maintenance, or are missing. Some areas had posts for grills, but the grills themselves were absent (appeared to have been removed by force). Graffiti is present on rocks, pit toilets, and tables throughout the site (refer to Appendix B, Photo B-76).

6.0 STUDY SPECIFIC CONSULTATION

The following study specific consultation was conducted:

- The proposed field inventory and condition assessment form used to complete the field study was transmitted to the SQF for review via email on June 24, 2024, prior to study implementation. SQF approved the field inventory and condition assessment form at the end of August 2024.

7.0 OUTSTANDING STUDY PLAN ELEMENTS

There are no outstanding study plan elements. The REC 1 – Recreation Facility Condition Assessment is complete.

8.0 REFERENCES

FERC (Federal Energy Regulatory Commission). 2024. Study Plan Determination for the Kern River No. 1 Hydroelectric Project. March 14.

Forest Service (United States Forest Service). 2013. Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG). Accessed December 2024. Available online: https://www.fs.usda.gov/sites/default/files/FSORAG-2013-Update.1.pdf

———. 2024a. Democrat Raft Take-out Boating Site. Accessed: October 2024. Available online: https://www.fs.usda.gov/recarea/sequoia/recarea/?recid=79690

———. 2024b. Sequoia National Forest - Kern River Ranger District (usda.gov). Accessed: November 2024. Available online: https://www.fs.usda.gov/recarea/sequoia/recarea/?recid=79878

———. 2024c. Sequoia National Forest - Kern River Ranger District (usda.gov). Accessed: November 2024. Available online: https://www.fs.usda.gov/recarea/sequoia/recarea/?recid=79750

——. 2024d. Sequoia National Forest - Kern River Ranger District (usda.gov). Accessed: November 2024. Available online: https://www.fs.usda.gov/recarea/sequoia/recarea/?recid=79745

SCE (Southern California Edison). 2024. Kern River No. 1 Hydroelectric Project (FERC Project No. 1930) Revised Study Plan. February 13.

TABLES

Table 4-1. Facility Feature Condition Rating Table

ID	Category	Description
N	Needs Replacement	Facility feature is non-functional or has broken or missing components.
R	Needs Repair	Facility feature has structural damage or is in an obvious state of disrepair.
M	Needs Maintenance	Facility feature needs maintenance, such as cleaning or painting.
G	Good Condition	Facility feature is functional and well maintained.

Table 5-1. Democrat Raft Take-Out Boating Site Day Use Area Amenities

Amenity	Description	Condition[1]	FSORAG Compliance	Photo (Appendix B)
Boat Ramp	Two-lane, carry-in boat launch	G	NA	B-23
Upper Parking Area	Unpaved; approximately 20 parking spots	M	NA	B-3, B-4, B-6
Paved Whitewater Access Area	Paved; no parking allowed	G	NA	B-20, B-21
ADA Parking Spots	Two spots in the upper unpaved parking area	G	Yes	B-10
Covered Picnic Area	One table; covered	M	No: lack of adequate space (48 inch minimum) (FSORAG Section 4.1.4)	B-14, B-15, B-16, B-17
Informal Overlook	At picnic area overlooking lower paved whitewater access area	R	No: uneven surface (FSORAG Section 3.4.6) and lack of adequate space around picnic shelter (48 inch minimum) (FSORAG Section 4.1.4)	B-13
Pit Toilet	At upper unpaved parking area; two stalls	G	Yes	B-6, B-7, B-8, B-9, B-10

Amenity	Description	Condition[1]	FSORAG Compliance	Photo (Appendix B)
Trash Receptacle	At upper unpaved parking area	G	No: reach ranges are not within specifications (FSORAG 4.5.5and ABAAS section 308)	B-5
Access Roads	Paved and unpaved	Paved: G Unpaved: M	NA	B-3
Paved Access Path	From pit toilet structure to covered picnic table area	M	No: overgrown vegetation, missing handrails and eroded, uneven, and incomplete sections (ABAAS Section 505.1 and FSORAG Sections 2.2 and 2.7)	B-11, B-12, B-13
Entry Sign	Off SR-178	G	NA	B-1
Directional Sign Along Access Road	Along paved access road	G	NA	B-2
Informational Signboard 1 (Fire Information)	English; glass and fire information	G	Yes	B-16
Informational Signboard 2 (General Information)	English; hours of operation, fire, fishing, dog and glass information	G	Yes	B-22

Notes: [1] N=Needs Replacement; R=Needs Repair; M=Needs Maintenance; G=Good Condition; NA=not applicable
Key: ABAAS = Architectural Barriers Act Accessibility Standards
ADA = Americans with Disabilities Act
FSORAG = Forest Service Outdoor Recreation Accessibility Guidelines
NA = not applicable
SR-178 = State Route 178

Table 5-2. Upper Richbar Day Use Area Amenities

Amenity	Description	Condition[1]	FSORAG Compliance	Photo (Appendix B)
Entry Sign	Off SR-178	G	NA	B-24
West Parking Lot	Paved; 18 parking spots	M	Yes	B-26
Dirt Road	Closed off with a chain in the middle of site	G	NA	B-31
East Parking Lot	Paved; 22 parking spots	M	Yes	B-27, B-28
ADA Parking Spots	Two spots in the east paved parking lot	M	Yes	B-27, B-28
Picnic Tables	Uncovered; 14 tables	M/R	No: picnic tables are not accessible via the paved access path (FSORAG Section 3.3.2)	B-39, B-42, B-43, B-44, B-45, B-46, B-47, B-48, B-49, B-50
Paved Access Paths	Paths from parking lot lead to beach access area, picnic area with missing table, and pit toilets	M/G	No: the surface is uneven due to cracks caused by erosion and the path is not sufficiently wide (FSORAG Section 2.3 and 2.7)	B-34, B-35, B-36, B-37, B-38
Trash Receptacles	Metal trash cans outside pit toilet	G	Yes	B-30, B-32, B-33
Grills	10 grills, some rusted	M	No: grills are not accessible via the paved access path. (FSORAG Section 4.2.6 and 4.2.7)	B-42, B-43, B-44, B-46, B-47, B-48, B-49, B-50

Copyright 2026 by Southern California Edison

Amenity	Description	Condition[1]	FSORAG Compliance	Photo (Appendix B)
Pit Toilets	Two structures; four stalls total. One pit toilet stall was locked on each of the two structures during time of assessment	R	No: restroom door would not open to specified width (FSORAG Section 5.3.5, 5.3.2.1 and ABAAS Section 404)	B-30, B-32
Informational Signboard and Fee Post	Two signage boards; Spanish and English	G	Yes	B-25
Roll-off Dumpster		G	No: reach ranges are not within specifications (FSORAG 4.5.5and ABAAS section 308)	B-33
Utility Structure	One locked structure	NA	NA	B-29
River Access	West side of site	NA	NA	B-41
Beach Access	Sand areas	NA	NA	B-40

Notes: [1] N=Needs Replacement; R=Needs Repair; M=Needs Maintenance; G=Good Condition
Key: ABAAS = Architectural Barriers Act Accessibility Standards
ADA = Americans with Disabilities Act
FSORAG = Forest Service Outdoor Recreation Accessibility Guidelines
NA = not applicable
SR-178 = State Route 178

Table 5-3. Lower Richbar Day Use Area Amenities

Amenity	Description	Condition[1]	FSORAG Compliance	Photo (Appendix B)
Picnic Tables	Uncovered; 11 tables - including one picnic table designed for universal access.	G	Yes	B-61, B-62, B-63
Parking Lot	Paved; 10 spots	M	Yes	B-53, B-54
ADA Parking Spaces	One spot	M	Yes	B-54, B-55
Paved Access Paths	One paved trail from parking lot to paved picnic area. The surface is uneven but determined to remain accessible for a wheelchair.	M	Yes	B-60
Trash Receptacles	None on site due to site closed for season	Unknown[2]	Unknown[2]	NA
Grills	Five grills, some rusted	M	Yes	B-61, B-62
Pit Toilets	One structure; two stalls total. Pit toilets were locked during time of assessment	Unknown[2]	Unknown[2]	B-55, B-59
Informational Signboard and Fee Post	Site closed for season; void of postings	Unknown[2]	No: lack of adequate clearance surrounding fee post (FSORAG Section 3.5.3)	B-56
Gate	Locked gate just past entry sign	G	NA	NA
Entry Sign	Off SR-178	G	NA	B-52
River Access	Various river access locations on-site	G	NA	B-63, B-65

Notes: [1] N = Needs Replacement; R = Needs Repair; M = Needs Maintenance; G = Good Condition
[2] During the time of the survey, amenity was inaccessible or not present due to the site being closed for the season; therefore, amenity condition and FSORAG compliance could not be determined.

Key: ADA = Americans with Disabilities Act
FSORAG = Forest Service Outdoor Recreation Accessibility Guidelines
NA = not applicable
SR-178 = State Route 178

Table 5-4. Live Oak Day Use Area Amenities

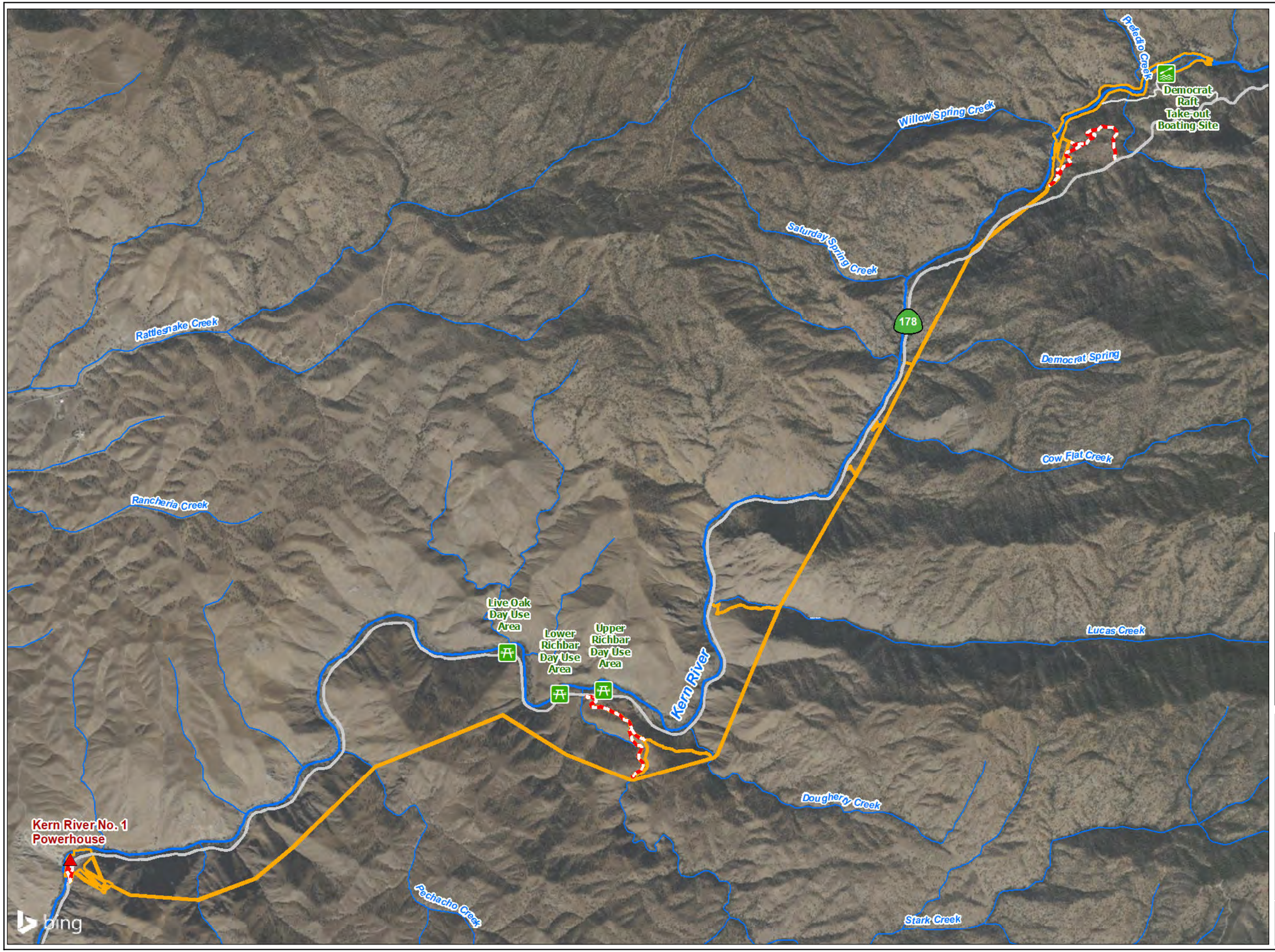
Amenity	Description	Condition[1]	FSORAG Compliance	Photo (Appendix B)
Picnic Tables	Nine uncovered picnic tables. One picnic table designed for universal access. Many of the tables are in poor condition and/or require maintenance.	M	Yes	B-72, B-73, B-74
Covered Picnic Table	One covered picnic table is designed for universal access	G	Yes	B-71
Parking Lot	Paved; 13 spots	M	Yes	B-67, B-68
Handicap Parking Spaces	Three spots	M	Yes	B-68
Paved Access Paths (3 paths)	Path 1: paved path leading to FSORAG picnic area Path 2: paved paths leading to beach Path 3: short path with no destination near parking lot	M	Path 1: yes Paths 2 and 3: no: too steep (FSORAG Section 2.4)	B-72, B-77
Trash Receptacles	None because site was closed for season	Unknown[2]	Unknown[2]	NA
Grills	Three grill locations; some missing throughout site	M	Yes	B-73
Pit Toilets	One structure; two stalls total. Pit toilets were locked during time of assessment	Unknown[2]	Unknown[2]	B-70
Informational Signboard and Fee Post	Site closed for season; void of postings	Unknown[2]	No: lack of adequate space surrounding fee post (FSORAG Section 3.5.3)	B-69

Copyright 2026 by Southern California Edison

Amenity	Description	Condition[1]	FSORAG Compliance	Photo (Appendix B)
Gate	Locked gate just past entry sign	G	NA	NA
Entry Sign	Off SR-178	G	NA	B-66
River Access	Various river access locations on-site	G	NA	B-78

Notes: [1] N=Needs Replacement; R=Needs Repair; M=Needs Maintenance; G=Good Condition; NA=not applicable
[2] During the time of the survey, amenity was inaccessible or not present due to the site being closed for the season; therefore, amenity condition and FSORAG compliance could not be determined.
Key: FSORAG = Forest Service Outdoor Recreation Accessibility Guidelines
NA = not applicable
SR-178 = State Route 178

MAPS



Facilities

- Powerhouse
- FERC Boundary (1930)

Transportation

- Project Road
- Other Road

Forest Service Recreation Sites

- Raft Takeout
- Day Use Area



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1

Day Use Areas within the Study Area

0 2,000 4,000
Feet

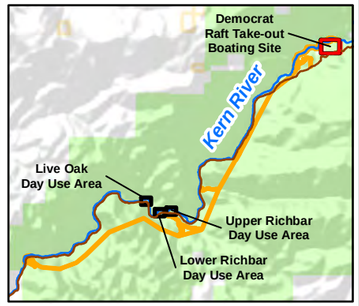
Projection: UTM Zone 11
Datum: NAD 83

Date: 1/4/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company





Recreation Facilities

- ADA Parking Spot
- Boat Ramp
- Directional Sign
- Entry Sign
- Fire Info Sign
- Info Sign
- Informal Overlook
- Parking
- Picnic Table
- Pit Toilet
- Trash Recepticles

Other Features

- FERC Boundary (1930)

Transportation

- Pedestrian Trail (stairs)
- Project Road
- Other Road

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-1

Democrat Raft Take-out Boating Area

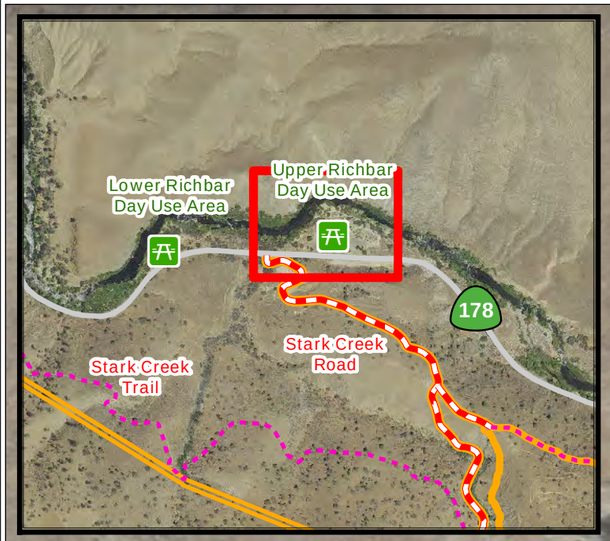
0 100 200
Feet

Date: 1/4/2025

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Kern River

178

Stark
Creek Road

bing

Recreation Facilities

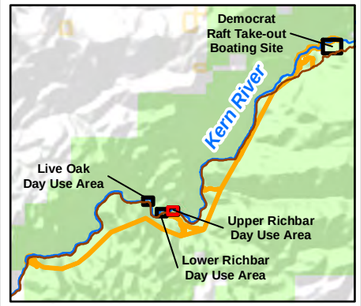
- ADA Parking Spot
- Beach Access
- Entry Sign
- Grill
- Info Sign and Fee Box
- Roll-off Dumpster
- Parking
- Picnic Table
- Pit Toilet
- River Access
- Trash Recepticles
- Utility Structure

Other Features

- FERC Boundary (1930)

Transportation

- Dirt Road
- Paved Access Path
- Project Road
- Project Trail
- Other Road



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project FERC
Project No. 1930

Map 5-2

Upper Richbar Day Use Area

0 50 100
Feet

Date: 1/4/2025

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\Users\aclare\OneDrive - Stantec\Documents_CON01Data\gis_projects\237800343\03_data\gis_cad\map\Kern River 1\RecreationMaps\SCE_Kern1_UpperRichBarDayUseArea_17i11i_01.mxd

Copyright 2025 by Southern California Edison Company



Recreation Facilities

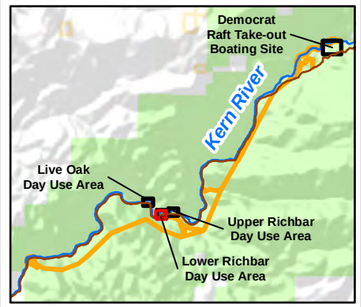
- ADA Parking Spot
- Entry Sign
- Gate
- Grill
- Info Sign and Fee Post
- Parking
- Parking (ADA)
- Picnic Table
- Pit Toilet
- River Access

Other Features

- FERC Boundary (1930)

Transportation

- Paved Access Path
- Project Road
- Project Trail
- Other Road



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Kern River No. 1 Hydroelectric Project FERC
Project No. 1930

Map 5-3

Lower Richbar Day Use Area

0 50 100
Feet

Date: 1/4/2025

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Recreation Facilities

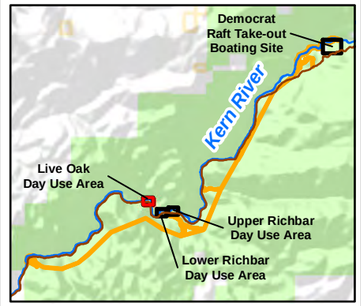
- ADA Parking Spot
- Entry Sign
- Gate
- Grill
- Info Sign and Fee Post
- Parking
- Picnic Table
- Pit Toilet
- River Access

Other Features

- FERC Boundary (1930)

Transportation

- Paved Access Path
- Project Trail
- Other Road



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-4

Live Oak Day Use Area

0 50 100
Feet

Date: 1/4/2025

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company

APPENDIX A

Recreation Site Inventory Form

Copyright 2026 by Southern California Edison

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

KERN RIVER NO. 1
FERC 1930 PROJECT
RECREATION FACILITY CONDITION SITE ASSESSMENT FORM

Observed by:_____ Date/Time: _____

Site Name:_____ GPS Coordinates:_____

Brief Description of Site (accessibility, health and safety concerns):

Facility Type

☐ Day Use Area ☐ Picnic Area ☐ Boat Launching Area
☐ Informal Site

Road Access

Condition Description: N R M G

☐ Paved access # lanes ____
☐ Unpaved access # lanes ____

Parking Lots:

Condition Description: N R M G

Brief Description of Parking Lot:

Type	# Paved	# Estimated Gravel	Space Delineation
Universal Access Spaces	____	____	☐ Painted ☐ Curbs ☐ Signage
Regular Spaces	____	____	☐ Painted ☐ Curbs ☐ Signage

1

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Vehicle & Trailer Spaces ____ ___ ☐ Painted ☐ Curbs ☐ Signage

Operations:

☐ Staffed ☐ Unstaffed ☐ Seasonal (From _____To_____)

☐ Fee: (Site $____; Parking $____) ☐ Year Round

Operating Hours_____ Owner/Manager_____

Project Facility: _____ Within FERC Project boundary?_____

2

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Day Use Site Amenities (total # of all amenities per site; provide additional specifications on next page):

#	Type	Condition (N-replace, R-repair, M-maintain, G-good)	Compliant with FSORAG Guidelines?) Y/N
	Picnic Shelter		
	Overlook		
	Picnic Tables		
	Pedestrian Trail		
	Boating Prep Area		
	Trash Receptacles		
	Grills		
	Fishing Pier/Platform		
	Firepit/ring		
	Fishing Prep Area		
	Safety Signage		
	Restrooms		
	Information Kiosk		
	Informational Signage		
	Benches		
	Dumping Station		
	Potable Water		
	Playground		

Other (specify)_____

Boat Launch Facilities
Condition Description:

☐ Hard surface ☐ Unimproved (informal) ☐ Gravel ☐ Carry In
☐ Universal Access ☐ Boat Prep Area _____ # of Lanes

Courtesy/Fishing Docks
Condition Description:

☐ Courtesy Dock ☐ Fishing Dock Dimensions:_____ ☐ Universal Access
☐ Courtesy Dock ☐ Fishing Dock Dimensions:_____ ☐ Universal Access

3

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Trails (within the recreation area)
Condition Description:

Type: _____ Length (ft): _____ Condition: _____ ☐ Universal Access
Type: _____ Length (ft): _____ Condition: _____ ☐ Universal Access
Type: _____ Length (ft): _____ Condition: _____ ☐ Universal Access

Interpretive/Site Information
Condition Description:

____ No. of Displays
☐ Boating Safety ☐ Invasive Species ☐ Fishing Regulations ☐ Fish Type
☐ Regional Events ☐ Other (specify)

Signage
Condition Description:

☐ Part 8 ☐ Directional ☐ Informational ☐ Other

Sanitation Facilities
Condition Description:

	# Flush	(# UA*)	# Portable	(# ADA)	Remarks
Unisex		(____)		(____)	
Women		(____)		(____)	
Men		(____)		(____)	

**UA = Universal Access*

Observed Vegetation and Erosion Impacts
_____ Cut trees for fires
_____ Trampled vegetation Mowed areas
_____ Trees damaged by people
_____ Trees damaged by environment Areas of noticeable erosion

4

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Description of Observations/Evidence of Vegetation Impacts:

Description of Observations/Evidence of Erosion:

Evidence of use at site: _____
(C) Compaction, (E) Erosion, (G) Garbage, (GD) Ground disturbance, (HW) Human waste, (UI) Unauthorized improvements, (V) Vandalism, (VR) Vegetation removal, (O) Other (Specify)

Evidence of Overcrowding: _____
(A) Anecdotal information, (FA) facility/amenity (C) capacity, (I) improper parking, (S) Signage, (SD) Site degradation, (U) Unauthorized sites, (W) Waiting lines, (O) Other (Specify)

Notes (including general condition, any restrictions/alerts, such as boating use, invasive species, etc.):

Photo number from ___ to ____

5

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Sketch of Site and Facilities:

6

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

KERN RIVER NO. 1 PROJECT
DATA DICTIONARY

Conditional Ratings

- N: Needs replacement-is non-functional or has broken or missing components
- R: Needs repair-has structural damage or is in an obvious state of disrepair
- M: Needs maintenance- is in need of attention (i.e. cleaning or painting is needed)
- G: Good condition-is functional and well maintained

Anecdotal Information:

- Observations made by field staff (i.e. overflowing trash cans, tire tracks outside of delineated parking areas and access roads)

Facility Type:

- The primary use of the site

Road Access:

- The road in which is used to access/enter the site.

Parking Lot:

- The designated or observed area where vehicles park to access the facility.

Trash receptacles:

- Include all vessels designed to collect trash (i.e. trash cans, dumpsters)

Informational Kiosk:

- A display structure with multiple informational signs

7

APPENDIX B

Site Photos

Copyright 2026 by Southern California Edison



Photo B-1. Democrat Raft Take-out Boating Site – Entrance Sign

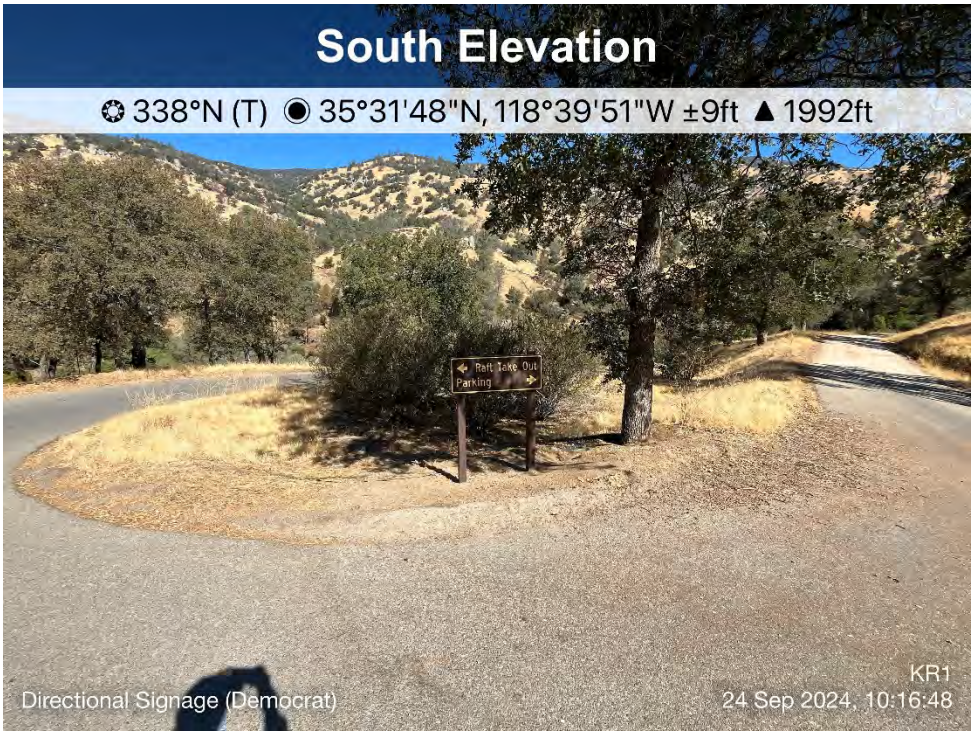


Photo B-2. Democrat Raft Take-out Boating Site – Directional Signage



Photo B-3. Democrat Raft Take-out Boating Site – Upper Parking Lot



Photo B-4. Democrat Raft Take-out Boating Site – Upper Parking Lot



Photo B-5. Democrat Raft Take-out Boating Site – Dumpster in Upper Parking Lot



Photo B-6. Democrat Raft Take-out Boating Site – Upper Parking Lot and Pit Toilets



Photo B-7. Democrat Raft Take-out Boating Site – Pit Toilets



Photo B-8. Democrat Raft Take-out Boating Site – Pit Toilet, Stall 1



Photo B-9. Democrat Raft Take-out Boating Site – Pit Toilet, Stall 2



Photo B-10. Democrat Raft Take-out Boating Site – ADA Parking and Pit Toilets



Photo B-11. Democrat Raft Take-out Boating Site – Paved Access Path and Overgrown Vegetation



Photo B-12. Democrat Raft Take-out Boating Site – Paved Access Path and Overgrown Vegetation

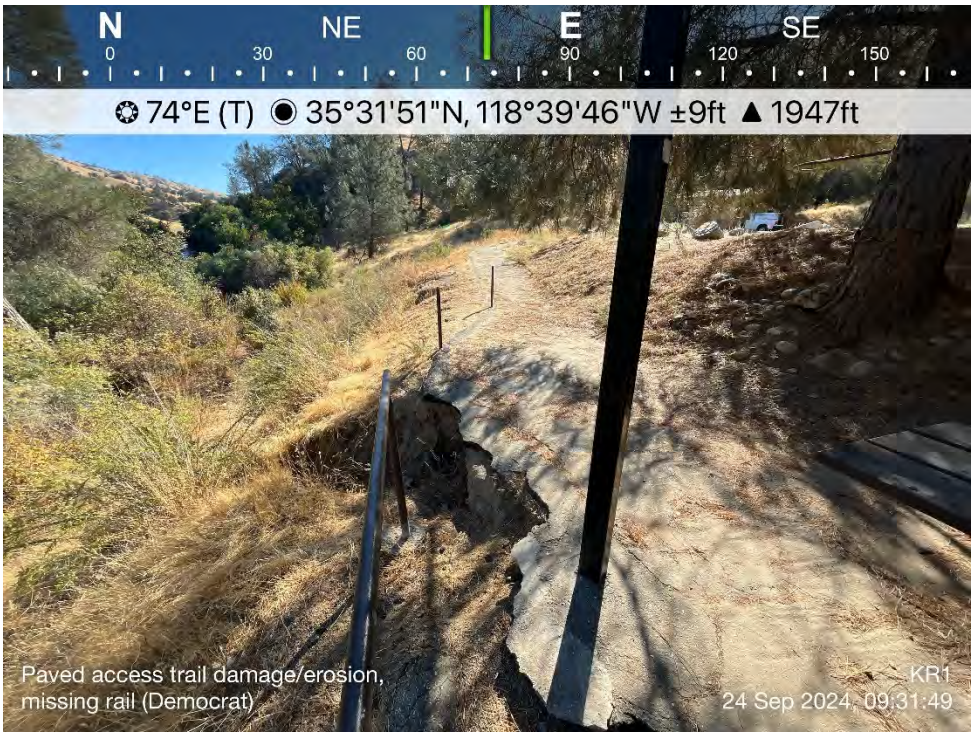


Photo B-13. Democrat Raft Take-out Boating Site – Paved Access Trail with Missing Handrails, Erosion and Wash Out



Photo B-14. Democrat Raft Take-out Boating Site – Covered Picnic Table



Photo B-15. Democrat Raft Take-out Boating Site – Covered Picnic Table and Erosion



Photo B-16. Democrat Raft Take-out Boating Site – Informational Signboard



Photo B-17. Democrat Raft Take-out Boating Site – Pedestrian Path from Upper Parking Lot



Photo B-18. Democrat Raft Take-out Boating Site – Pedestrian Path from Upper Parking Lot



Photo B-19. Democrat Raft Take-out Boating Site – Pedestrian Path from Upper Parking Lot



Photo B-20. Democrat Raft Take-out Boating Site – Lower Boat Take-out Area



Photo B-21. Democrat Raft Take-out Boating Site – Lower Boat Take-out Area



Photo B-22. Democrat Raft Take-out Boating Site – Informational Signboard



Photo B-23. Democrat Raft Take-out Boating Site – Boat Ramp



Photo B-24. Upper Richbar Day Use Area – Entrance Sign



Photo B-25. Upper Richbar Day Use Area – Informational Signboards and Fee Post



Photo B-26. Upper Richbar Day Use Area – West Parking Lot



Photo B-27. Upper Richbar Day Use Area – East Parking Lot and ADA Parking Spots



Photo B-28. Upper Richbar Day Use Area – East Parking Lot and ADA Parking Spots



Photo B-29. Upper Richbar Day Use Area – Locked Utility Structure



Photo B-30. Upper Richbar Day Use Area – Pit Toilets #1



Photo B-31. Upper Richbar Day Use Area – Dirt Road



Photo B-32. Upper Richbar Day Use Area – Pit Toilets #2



Photo B-33. Upper Richbar Day Use Area – Roll-off Dumpster



Photo B-34. Upper Richbar Day Use Area – Paved Access Path



Photo B-35. Upper Richbar Day Use Area – Paved Access Path



Photo B-36. Upper Richbar Day Use Area – Paved Access Path



Photo B-37. Upper Richbar Day Use Area – Paved Access Path and Graffiti



Photo B-38. Upper Richbar Day Use Area – Access Path to Beach Area



Photo B-39. Upper Richbar Day Use Area – Moved and Damaged FSORAG Compliant Picnic Table



Photo B-40. Upper Richbar Day Use Area – Beach Access



Photo B-41. Upper Richbar Day Use Area – Beach Access



Photo B-42. Upper Richbar Day Use Area – Picnic Area



Photo B-43. Upper Richbar Day Use Area – Picnic Area



Photo B-44. Upper Richbar Day Use Area – Picnic Area



Photo B-45. Upper Richbar Day Use Area – Picnic Area



Photo B-46. Upper Richbar Day Use Area – Picnic Area



Photo B-47. Upper Richbar Day Use Area – Picnic Area



Photo B-48. Upper Richbar Day Use Area – Picnic Area



Photo B-49. Upper Richbar Day Use Area – Picnic Area



Photo B-50. Upper Richbar Day Use Area – Picnic Area



Photo B-51. Upper Richbar Day Use Area – Graffiti on Trees



Photo B-52. Lower Richbar Day Use Area – Entrance Sign



Photo B-53. Lower Richbar Day Use Area – Parking Lot



Photo B-54. Lower Richbar Day Use Area – ADA Parking Spots



Photo B-55. Lower Richbar Day Use Area – Pit Toilets



Photo B-56. Lower Richbar Day Use Area – Informational Signboards and Fee Post



Photo B-57. Lower Richbar Day Use Area – Graffiti on Rocks



Photo B-58. Lower Richbar Day Use Area – Graffiti on Rocks



Photo B-59. Lower Richbar Day Use Area – Pit Toilets



Photo B-60. Lower Richbar Day Use Area – Paved Access Path



Photo B-61. Lower Richbar Day Use Area – Picnic Area



Photo B-62. Lower Richbar Day Use Area – Picnic Area

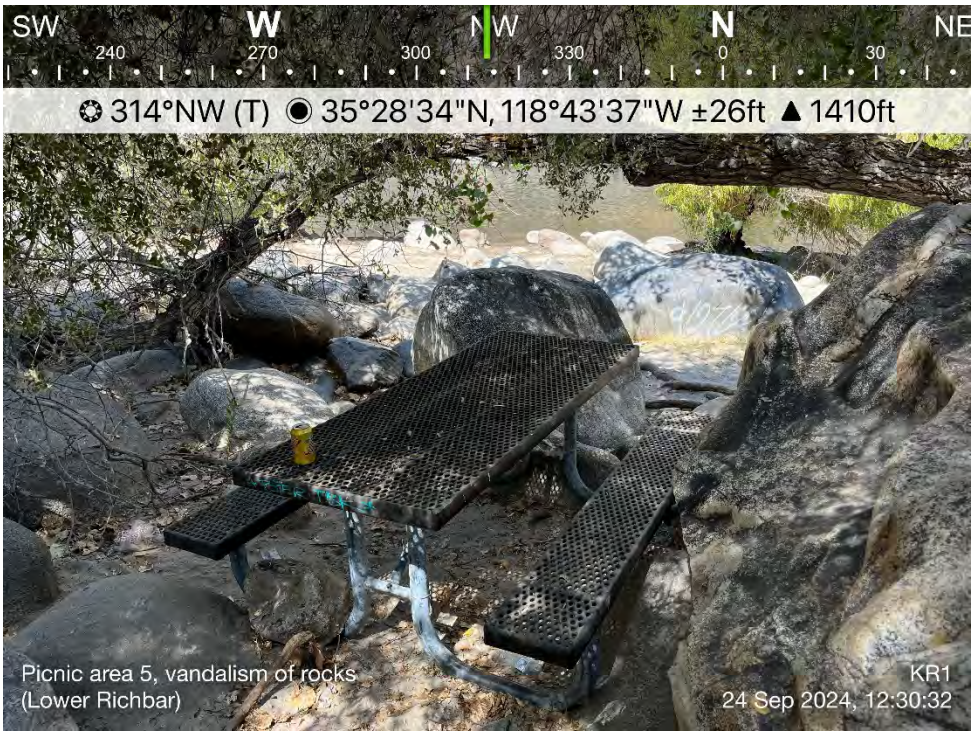


Photo B-63. Lower Richbar Day Use Area – Picnic Area



Photo B-64. Lower Richbar Day Use Area – Graffiti on Rocks



Photo B-65. Lower Richbar Day Use Area – Graffiti on Rocks

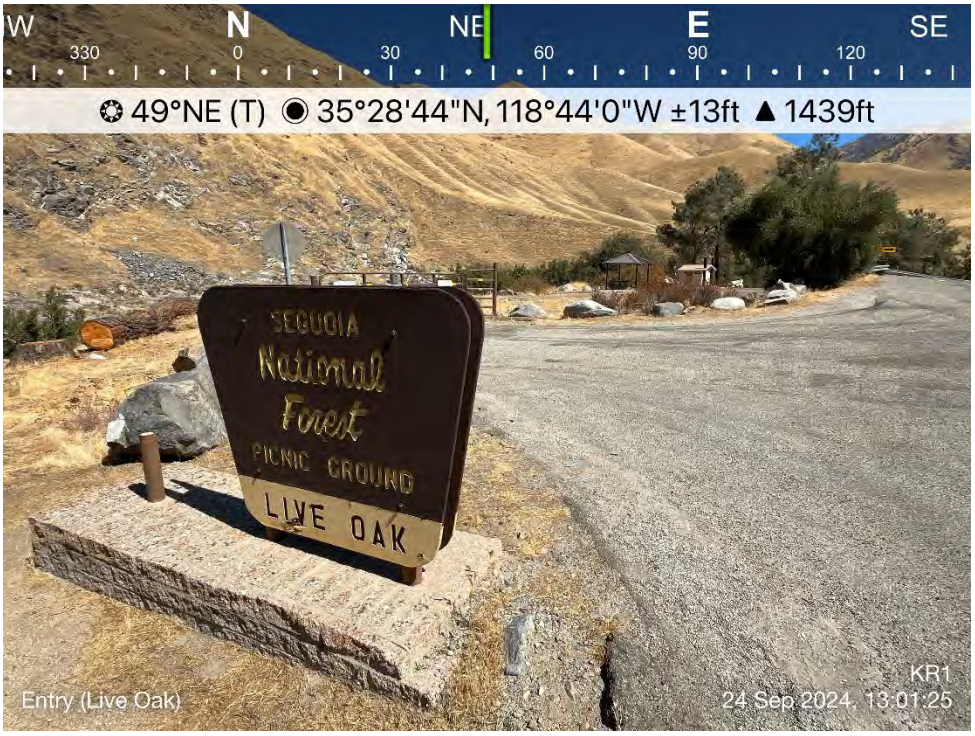


Photo B-66. Live Oak Day Use Area – Entrance Sign



Photo B-67. Live Oak Day Use Area – Parking Lot



Photo B-68. Live Oak Day Use Area – ADA Parking Spots



Photo B-69. Live Oak Day Use Area – Informational Signboards and Fee Post



Photo B-70. Live Oak Day Use Area – Pit Toilets



Photo B-71. Live Oak Day Use Area – Covered Picnic Area



Photo B-72. Live Oak Day Use Area – Picnic Area



Photo B-73. Live Oak Day Use Area – Picnic Area



Photo B-74. Live Oak Day Use Area – Picnic Area



Photo B-75. Live Oak Day Use Area – Picnic Area (broken picnic table)



Photo B-76. Live Oak Day Use Area – Graffiti on Rocks



Photo B-77. Live Oak Day Use Area – Paved Access Path



Photo B-78. Live Oak Day Use Area – River Access

APPENDIX C

Completed Recreation Site Inventory Forms

Copyright 2026 by Southern California Edison

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

KERN RIVER NO. 1
FERC 1930 PROJECT
RECREATION FACILITY CONDITION SITE ASSESSMENT FORM

Observed by: OSBORN + HUGHES Date/Time: 9/24/24 8:45am

Site Name: DEMOCRAT RAFT TAKEOUT GPS Coordinates: 35.530144438981, -118.46427180303

Brief Description of Site (accessibility, health and safety concerns):
Day use area w/ dirt parking lot, trash dumpster, pit toilets, 2 handicap parking, sign, covered picnic table (1)

Facility Type
☒ Day Use Area ☐ Picnic Area ☐ Boat Launching Area
☐ Informal Site ☒ Boat take out area

Road Access
Condition Description: N R (M) G (dirt) Road to upper parking area has some wash out/pot holes that could be repaired
☒ Paved access # lanes 1 (paved) Road to lower
☒ Unpaved access # lanes 1

Parking Lots:
Condition Description: N R (M) G upper (dirt) lower

Brief Description of Parking Lot:
dirt lot w/ 2 handicap spaces w/ shared "bump out", spaces were previously paved but now are dirt covered/uneven
boat drop off area is paved

Type	# Paved	# Estimated Gravel	Space Delineation
Universal Access Spaces	2 unsafe condition	0	☐ Painted ☒ Curbs ☒ Signage
Regular Spaces	0	20	☐ Painted ☐ Curbs ☐ Signage

NO marked spaces but could fit ~20 cars

1

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

Vehicle & Trailer Spaces X X ☐ Painted ☐ Curbs ☐ Signage
dirt lot could be used for trailers but no marked spots

Operations:

☐ Staffed ☒ Unstaffed ☐ Seasonal (From _____ To_____)
☐ Fee: (Site $____; Parking $____) ☐ Year Round

Operating Hours_____ Owner/Manager_____
Project Facility: _____ Within FERC Project boundary? Ø

2

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

Day Use Site Amenities (total # of all amenities per site; provide additional specifications on next page):

#	Type	Condition (N-replace, R-repair, M-maintain, G-good)	Compliant with FSORAG Guidelines?) Y/N
1	Picnic Shelter	M	N- no clear space around (4ft.)
1	Overlook	R- erosion + missing handrail	N - uneven surface + no clear space
1	Picnic Tables	G	Y
	Pedestrian Trail	M - veg removal - cracks	N - missing railing, cracks, erosion
1	Boating Prep Area	G	NA
1	Trash Receptacles	G - dented top	N - reach height
Ø	Grills	NA	NA
Ø	Fishing Pier/Platform	NA	NA
Ø	Firepit/ring	NA	NA
Ø	Fishing Prep Area	NA	NA
1	Safety Signage	G NA	NA
1	Restrooms	G - see notes on pg 5	Y
1	Information Kiosk	NA	NA
1	Informational Signage	G	Y
Ø	Benches	NA	NA
Ø	Dumping Station	NA	NA
Ø	Potable Water	NA	NA
Ø	Playground	NA	NA

Other (specify)_____

Boat Launch Facilities
Condition Description: some sand covering small area on hard surface.

☒ Hard surface ☐ Unimproved (informal) ☐ Gravel ☒ Carry In
☐ Universal Access ☐ Boat Prep Area 2 # of Lanes

Courtesy/Fishing Docks
Condition Description: NA

☐ Courtesy Dock ☐ Fishing Dock Dimensions:_____ ☐ Universal Access
☐ Courtesy Dock ☐ Fishing Dock Dimensions:_____ ☐ Universal Access

Trails (within the recreation area)
Condition Description: paved trail from ADA spots to pit toilet and to covered picnic is uneven, overgrown, and covered in pine needles.
Informal gravel trails to used areas
stair gravel trail connecting upper + lower - not UA

3

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

Type: paved Length (ft): 193 Condition: M ☐Universal Access NO
Type: gravel Length (ft): _____ Condition: M ☐Universal Access NO
Type: _____ Length (ft): _____ Condition: _____ ☐Universal Access

4

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

Interpretive/Site Information
Condition Description: day use sign @ entry off HWY, sign @ picnic table about fire danger, information sign

1 No. of Displays
☐ Boating Safety ☐ Invasive Species ☐ Fishing Regulations ☐ Fish Type
☐ Regional Events ☒ Other (specify) fire danger, entry sign, info sign

Signage
Condition Description: fire danger sign near picnic table

☐ Part 8 ☐ Directional ☒ Informational ☐ Other

Sanitation Facilities
Condition Description: 2 pit toilets, stocked w/ TP, TP on ground, overall clean

	# Flush	(# UA*)	# Portable	(# ADA)	Remarks
Unisex	Ø	(____)	2	(____)	pit toilet
Women	Ø	(____)		(____)	
Men	Ø	(____)		(____)	

UA = Universal Access

Observed Vegetation and Erosion Impacts
____ Cut trees for fires
____ Trampled vegetation Mowed areas
____ Trees damaged by people
____ Trees damaged by environment Areas of noticeable erosion

Description of Observations/Evidence of Vegetation Impacts: veg erosion, veg in upper lot is being driven over @ turn around

Description of Observations/Evidence of Erosion: erosion/wash out noticeable @ picnic area and stairs leading down to lower parking lot

Evidence of use at site: C, E, G, trash,
(C) Compaction, (E) Erosion, (G) Garbage, (GD) Ground disturbance, (HW) Human waste, (UI) Unauthorized improvements, (V) Vandalism, (VR) Vegetation removal, (O) Other (Specify)

5

SOUTHERN CALIFORNIA EDISON®

Energy for What's Ahead™

Evidence of Overcrowding: potential for parking on outer limits of upper lot boulders are being used for parking limits

(A) Anecdotal information, (FA) facility/amenity (C) capacity, (I) improper parking, (S) Signage, (SD) Site degradation, (U) Unauthorized sites, (W) Waiting lines, (O) Other (Specify)

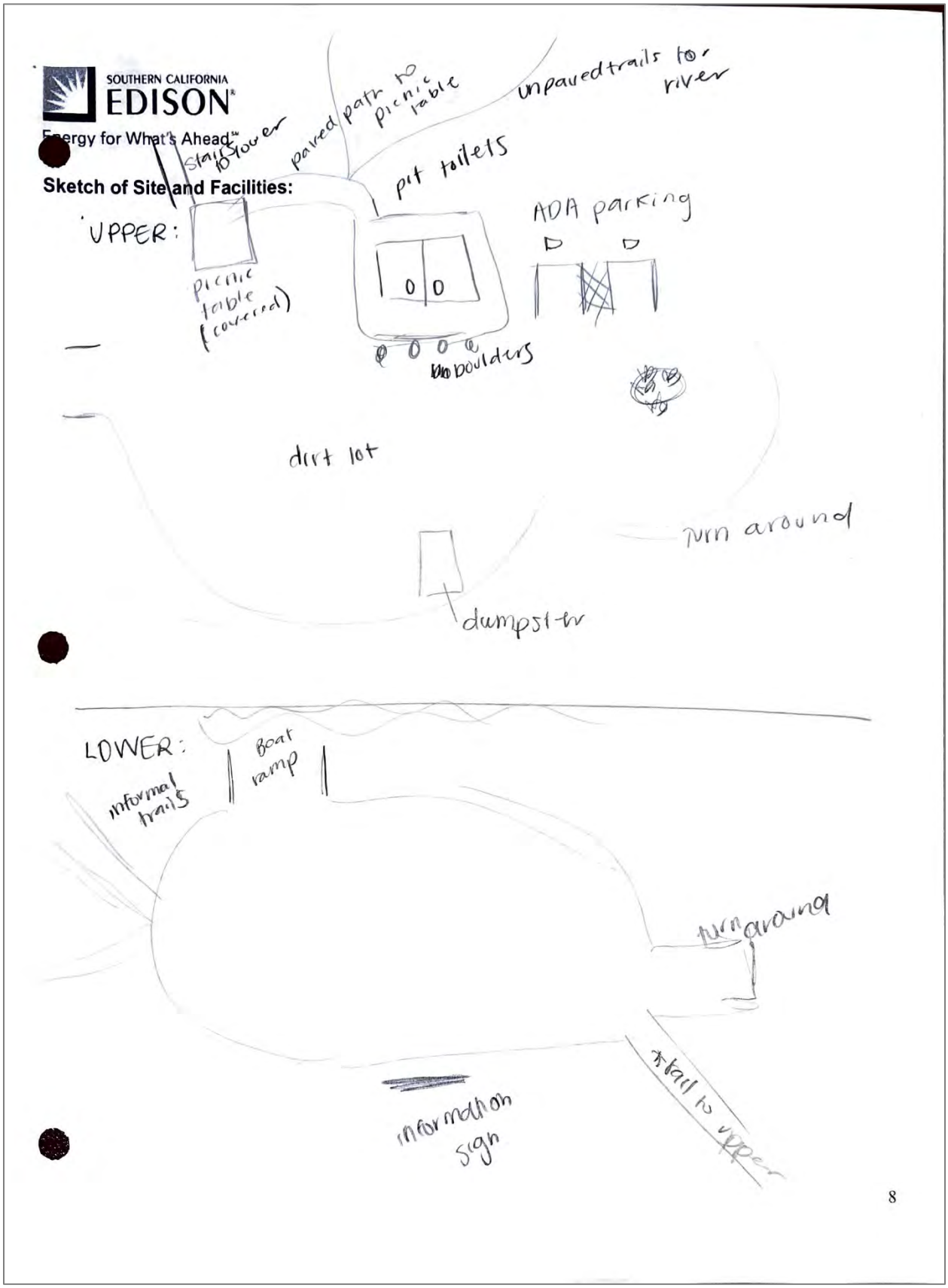
6

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

Notes (including general condition, any restrictions/alerts, such as boating use, invasive species, etc.):
NO invasive species, no safety signs, upper to lower not UA unless using car, overall good condition but does have erosion issues, some features not UA.

Photo number from ___ to ____

7


SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™
Sketch of Site and Facilities:
UPPER:
stairs to lower
paved path to picnic table
unpaved trails to river
pit toilets
ADA parking
picnic table (covered)
boulders
dirt lot
turn around
dumpster
LOWER:
informal trails
boat ramp
turn around
information sign
trail to upper
8

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

KERN RIVER NO. 1 PROJECT
DATA DICTIONARY

Conditional Ratings

- N: Needs replacement-is non-functional or has broken or missing components
- R: Needs repair-has structural damage or is in an obvious state of disrepair
- M: Needs maintenance- is in need of attention (i.e. cleaning or painting is needed)
- G: Good condition-is functional and well maintained

Anecdotal Information:

- Observations made by field staff (i.e. overflowing trash cans, tire tracks outside of delineated parking areas and access roads)

Facility Type:

- The primary use of the site

Road Access:

- The road in which is used to access/enter the site.

Parking Lot:

- The designated or observed area where vehicles park to access the facility.

Trash receptacles:

- Include all vessels designed to collect trash (i.e. trash cans, dumpsters)

Informational Kiosk:

- A display structure with multiple informational signs

9

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

KERN RIVER NO. 1
FERC 1930 PROJECT
RECREATION FACILITY CONDITION SITE ASSESSMENT FORM

Observed by: OSBORN + HUGHES Date/Time: 9/24 10:40

Site Name: Upper Richbar Picnic Area GPS Coordinates: 35.47627306 -118.7211234

Brief Description of Site (accessibility, health and safety concerns):

two parking lots, two restrooms (pit toilets), each pit toilet had one stall locked. overall lacking UA. one UA toilet, other door would not open. NO UA picnic tables. paved paths skinny and rough. Dirty pit toilets, trash all over site.

Facility Type

☒ Day Use Area ☒ Picnic Area ☐ Boat Launching Area
☐ Informal Site

Road Access
Condition Description: N R M (G) some potholes and uneven surfaces

☒ Paved access # lanes 1
☐ Unpaved access # lanes ____

Parking Lots:
Condition Description: N R M (G) some potholes and uneven surfaces

Brief Description of Parking Lot:

Right lot has some potholes and 2 ADA spots w/ one overgrown
Left lot (lot 2) good condition, painting in both lots are fading. 0 UA spots in lot 2

Type	# Paved	# Estimated Gravel	Space Delineation
Universal Access Spaces	2	0	☒ Painted ☐ Curbs ☒ Signage
Regular Spaces	~40	0	☒ Painted ☐ Curbs ☐ Signage

Not painted well - faded veg growing into some spots

Copyright 2026 by Southern California Edison

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

Vehicle & Trailer Spaces ___ ___ ☐ Painted ☐ Curbs ☐ Signage
None identified.

Operations:

☐ Staffed ☒ Unstaffed ☐ Seasonal (From _____ To _____)

☒ Fee: (Site $~~10~~ 12; Parking $~~12~~) ☐ Year Round

Operating Hours sunrise - sundown Owner/Manager _____

Project Facility: _____ Within FERC Project boundary? _____

2

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

Day Use Site Amenities (total # of all amenities per site; provide additional specifications on next page):

#	Type	Condition (N-replace, R-repair, M-maintain, G-good)	Compliant with FSORAG Guidelines?) Y/N
0	Picnic Shelter	NA	NA
0	Overlook	NA	NA
14	Picnic Tables	M/R missing benches	N - none on paved path
	Pedestrian Trail	M/G	N - too skinny, uneven, rocky
0	Boating Prep Area	NA	NA
9	Trash Receptacles	G - not overflowing	Y on paved areas, N dumpster
~10	Grills	M - trash ~~NA~~ rusty	N
0	Fishing Pier/Platform	NA	NA
0	Firepit/ring	NA	NA
0	Fishing Prep Area	NA	NA
1	Safety Signage	G - no water safety	Y
2	Restrooms	R - window broken, door won't open	N at least ones that were open
0	Information Kiosk	NA	NA
1	Informational Signage	G - ~~blurry~~	~~N~~ Y
0	Benches	NA	NA
0	Dumping Station	NA	NA
0	Potable Water	NA	NA
0	Playground	NA	NA

Other (specify)_____

Boat Launch Facilities
Condition Description: NA

☐ Hard surface ☐ Unimproved (informal) ☐ Gravel ☐ Carry In
☐ Universal Access ☐ Boat Prep Area _____ # of Lanes

Courtesy/Fishing Docks
Condition Description: NA

☐ Courtesy Dock ☐ Fishing Dock Dimensions:_____ ☐ Universal Access
☐ Courtesy Dock ☐ Fishing Dock Dimensions:_____ ☐ Universal Access

Trails (within the recreation area)
Condition Description:
one paved trail, splits to 2 areas, lots of informal "trails" to picnic areas, rocky uneven trails, overgrown, trash on trails,
paved trail not wide enough, rough and had "drop off" paved trail due to erosion

3

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

picnic overlook

Type: dirt paved Length (ft): 141 + 268 Condition: M/R ☐Universal Access NO
Type: _____ Length (ft): _____ Condition: _____ ☐Universal Access
Type: _____ Length (ft): _____ Condition: _____ ☐Universal Access

4

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

Interpretive/Site Information
Condition Description: one information sign @ rec area post, mostly fire + grass safety, no water safety

1 No. of Displays
☐ Boating Safety ☐ Invasive Species ☐ Fishing Regulations ☐ Fish Type
☐ Regional Events ☒ Other (specify) fire safety/rules

Signage
Condition Description: info/site sign @ entrance in good condition - no water safety

☐ Part 8 ☐ Directional ☒ Informational ☐ Other

Sanitation Facilities
Condition Description: 2 buildings w/ 2 "stalls". Each building had one locked. Messy, broken window, vandalism. Door won't open all the way for one building. paved path around each. Trash outside of each

	# Flush	(# UA*)	# Portable	(# ADA)	Remarks
Unisex		(NL)	PIT 2	(___)	
Women		(___)		(___)	
Men		(___)		(___)	

*UA = Universal Access

Observed Vegetation and Erosion Impacts
___ Cut trees for fires
X Trampled vegetation — on trails
___ Mowed areas
X Trees damaged by people — carving into trees
___ Trees damaged by environment
___ Areas of noticeable erosion

Description of Observations/Evidence of Vegetation Impacts:
carving on trees, some "trampling" on trails - just because they are skinny.

Description of Observations/Evidence of Erosion: Not terrible but @ paved path TO beach

Evidence of use at site: G!, HW, V, trash, UI - moving of table

(C) Compaction, (E) Erosion, (G) Garbage, (GD) Ground disturbance, (HW) Human waste, (UI) Unauthorized improvements, (V) Vandalism, (VR) Vegetation removal, (O) Other (Specify)

5

SOUTHERN CALIFORNIA EDISON®

Energy for What's Ahead℠

Evidence of Overcrowding:
(A) Anecdotal information, (FA) facility/amenity (C) capacity, (I) improper parking, (S) Signage, (SD) Site degradation, (U) Unauthorized sites, (W) Waiting lines, (O) Other (Specify)

beach areas - yes, lots of trash, toys, unauth. fires/ fire rings, SD,

6

SOUTHERN CALIFORNIA EDISON®

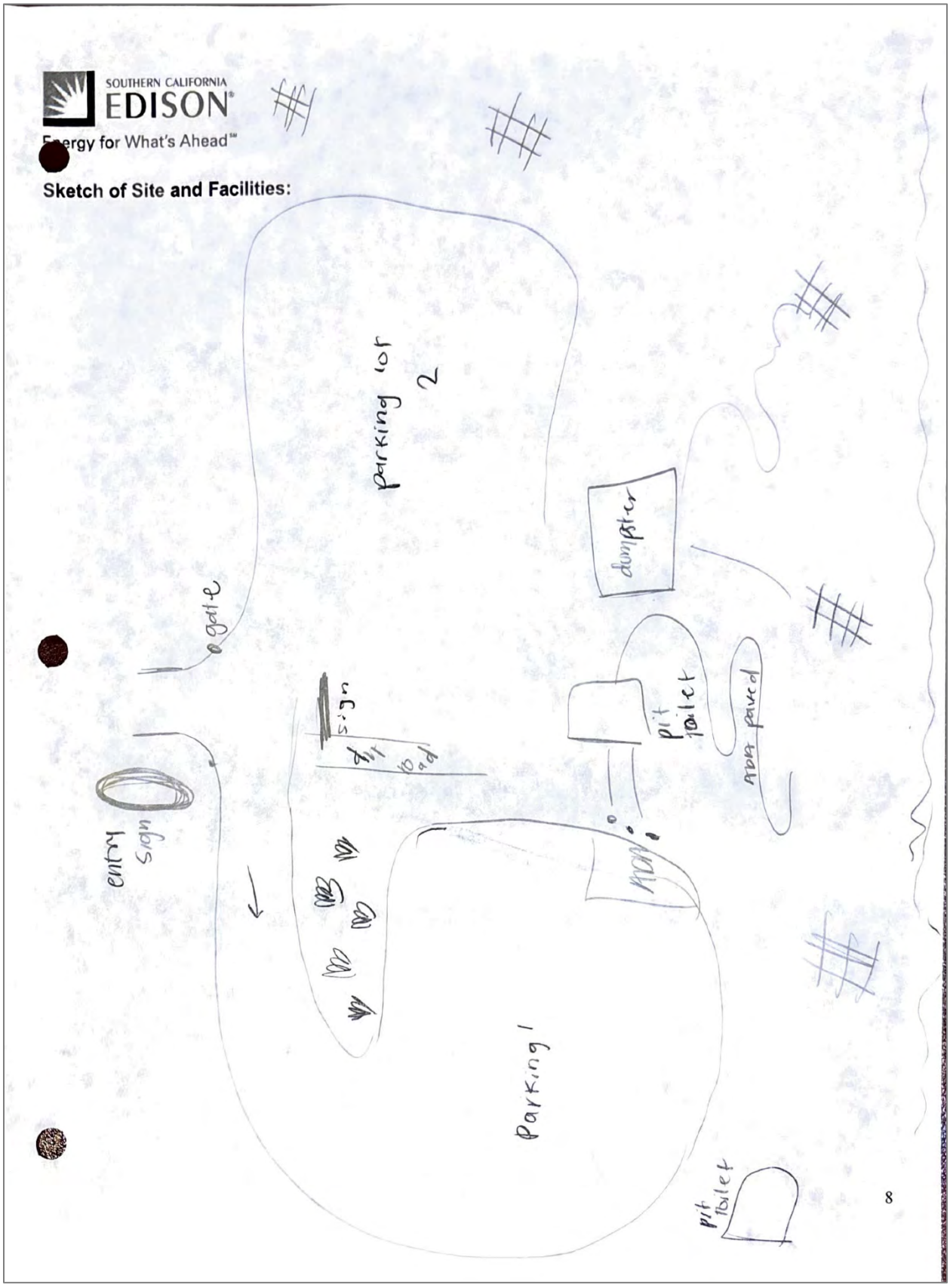
Energy for What's Ahead™

Notes (including general condition, any restrictions/alerts, such as boating use, invasive species, etc.):

UA picnic table moved onto beach, No invasive info, NO water safety info, trash everywhere even w/ large dumpster, NO UA picnic table, rocky trails, vandalism on pit toilets, trees, rocks, fabrics etc

Photo number from ___ to ___

7


SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™
Sketch of Site and Facilities:
parking for 2
gate
dumpster
sign
pit toilet
ADA paved
entry sign
Parking 1
pit toilet
8

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

KERN RIVER NO. 1 PROJECT
DATA DICTIONARY

Conditional Ratings

- N: Needs replacement-is non-functional or has broken or missing components
- R: Needs repair-has structural damage or is in an obvious state of disrepair
- M: Needs maintenance- is in need of attention (i.e. cleaning or painting is needed)
- G: Good condition-is functional and well maintained

Anecdotal Information:

- Observations made by field staff (i.e. overflowing trash cans, tire tracks outside of delineated parking areas and access roads)

Facility Type:

- The primary use of the site

Road Access:

- The road in which is used to access/enter the site.

arking Lot:

- The designated or observed area where vehicles park to access the facility.

Trash receptacles:

- Include all vessels designed to collect trash (i.e. trash cans, dumpsters)

Informational Kiosk:

- A display structure with multiple informational signs

9

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

KERN RIVER NO. 1
FERC 1930 PROJECT
RECREATION FACILITY CONDITION SITE ASSESSMENT FORM

Observed by: OSBORN + HUGHES Date/Time: 9/24 12:40

Site Name: Lower Richbar Day Use GPS Coordinates: 35.47692111 -118.7244619

Brief Description of Site (accessibility, health and safety concerns):

site has one parking lot and one pit toilet structure, 11 picnic sites, closed when assessment done, bathrooms locked-unable to get measurments, no trash, one UA trail, lots of informal trails, no info on sign

Facility Type

☒ Day Use Area ☒ Picnic Area ☐ Boat Launching Area
☐ Informal Site

Road Access

Condition Description: N R M (G)

☒ Paved access # lanes 1
☐ Unpaved access # lanes ____

Parking Lots:

Condition Description: N R M (G)

Brief Description of Parking Lot:

one UA spot and one old questionable UA spot. Roughly 10 standard parking spots, painting of lines is fading

Type	# Paved	# Estimated Gravel	Space Delineation
Universal Access Spaces	1?	___	☒ Painted ☐ Curbs ☒ Signage
Regular Spaces	~10	___	☒ Painted ☐ Curbs ☐ Signage

1

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

Vehicle & Trailer Spaces ___ ___ ☐ Painted ☐ Curbs ☐ Signage
None identified

Operations:

☐ Staffed ☒ Unstaffed ☐ Seasonal (From _____ To _____)

☒ Fee: (Site $___; Parking $___) ☐ Year Round

Operating Hours_____ Owner/Manager_____
Project Facility: _____ Within FERC Project boundary?_____

Fee post existed but no envelopes or signs for fee amount

2

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

Day Use Site Amenities (total # of all amenities per site; provide additional specifications on next page):

#	Type	Condition (N-replace, R-repair, M-maintain, G-good)	Compliant with FSORAG Guidelines?) Y/N
Ø	Picnic Shelter	NA	NA
Ø	Overlook	NA	NA
11	Picnic Tables	G	Y- one on paved path
4	Pedestrian Trail	M- one paved/bumpy M- informal trails	bumps but within standards
Ø	Boating Prep Area	NA	NA
Ø	Trash Receptacles	N- no trash but could be since closed	? unknown
~5	Grills	M-rusty	one - Y on paved access
Ø	Fishing Pier/Platform	NA	NA
3	Firepit/ring	G	N
Ø	Fishing Prep Area	NA	NA
1	Safety Signage	R - empty - no flyers into	Y
1	Restrooms	UNK	UNK
Ø	Information Kiosk	NA	NA
1	Informational Signage	R -empty - no info unit	Y
Ø	Benches	NA	NA
Ø	Dumping Station		
Ø	Potable Water		
Ø	Playground		

Other (specify)_____

Boat Launch Facilities
Condition Description: NA

☐ Hard surface ☐ Unimproved (informal) ☐ Gravel ☐ Carry In
☐ Universal Access ☐ Boat Prep Area ____ # of Lanes

Courtesy/Fishing Docks
Condition Description: NA

☐ Courtesy Dock ☐ Fishing Dock Dimensions:_____ ☐ Universal Access
☐ Courtesy Dock ☐ Fishing Dock Dimensions:_____ ☐ Universal Access

Trails (within the recreation area)
Condition Description:
paved trail was bumpy and uneven
lots of overgrown informal trails leading to river or picnic areas

3

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

Type: paved Length (ft): 70 Condition: M ☐Universal Access NO
Type: _____ Length (ft): _____ Condition: _____ ☐Universal Access
Type: _____ Length (ft): _____ Condition: _____ ☐Universal Access

uneven

4

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

Interpretive/Site Information
Condition Description: one display w/ no information - could be because site is "closed". Fee post was not filled w/ envelopes
1 No. of Displays
☐ Boating Safety ☐ Invasive Species ☐ Fishing Regulations ☐ Fish Type
☐ Regional Events ☐ Other (specify)

Signage
Condition Description: Informational sign was not in use. See notes above. No information

☐ Part 8 ☐ Directional ☒ Informational ☐ Other

Sanitation Facilities
Condition Description: Unknown condition - stalls were locked appeared UA, same structure as Democrat pit

	# Flush	(# UA*)	# ~~Portable~~	(# ADA)	Remarks
Unisex		(____)	X 2	(____)	
Women		(____)		(____)	
Men		(____)		(____)	

UA = Universal Access

Observed Vegetation and Erosion Impacts
X Cut trees for fires – one tree showing signs of burn, other
X Trampled vegetation Mowed areas – trees marked and cut on informal trails
___ Trees damaged by people – (carving) Vandalism
___ Trees damaged by environment Areas of noticeable erosion

Description of Observations/Evidence of Vegetation Impacts: Veg stepped on, on informal trails

Description of Observations/Evidence of Erosion:
No noticeable erosion

Evidence of use at site: _____
(C) Compaction, (E) Erosion, (G) Garbage, (GD) Ground disturbance, (HW) Human waste, (UI) Unauthorized improvements, (V) Vandalism, (VR) Vegetation removal, (O) Other (Specify)

5

SOUTHERN CALIFORNIA EDISON®

Energy for What's Ahead™

Evidence of Overcrowding: none but trash observed

(A) Anecdotal information, (FA) facility/amenity (C) capacity, (I) improper parking, (S) Signage, (SD) Site degradation, (U) Unauthorized sites, (W) Waiting lines, (O) Other (Specify)

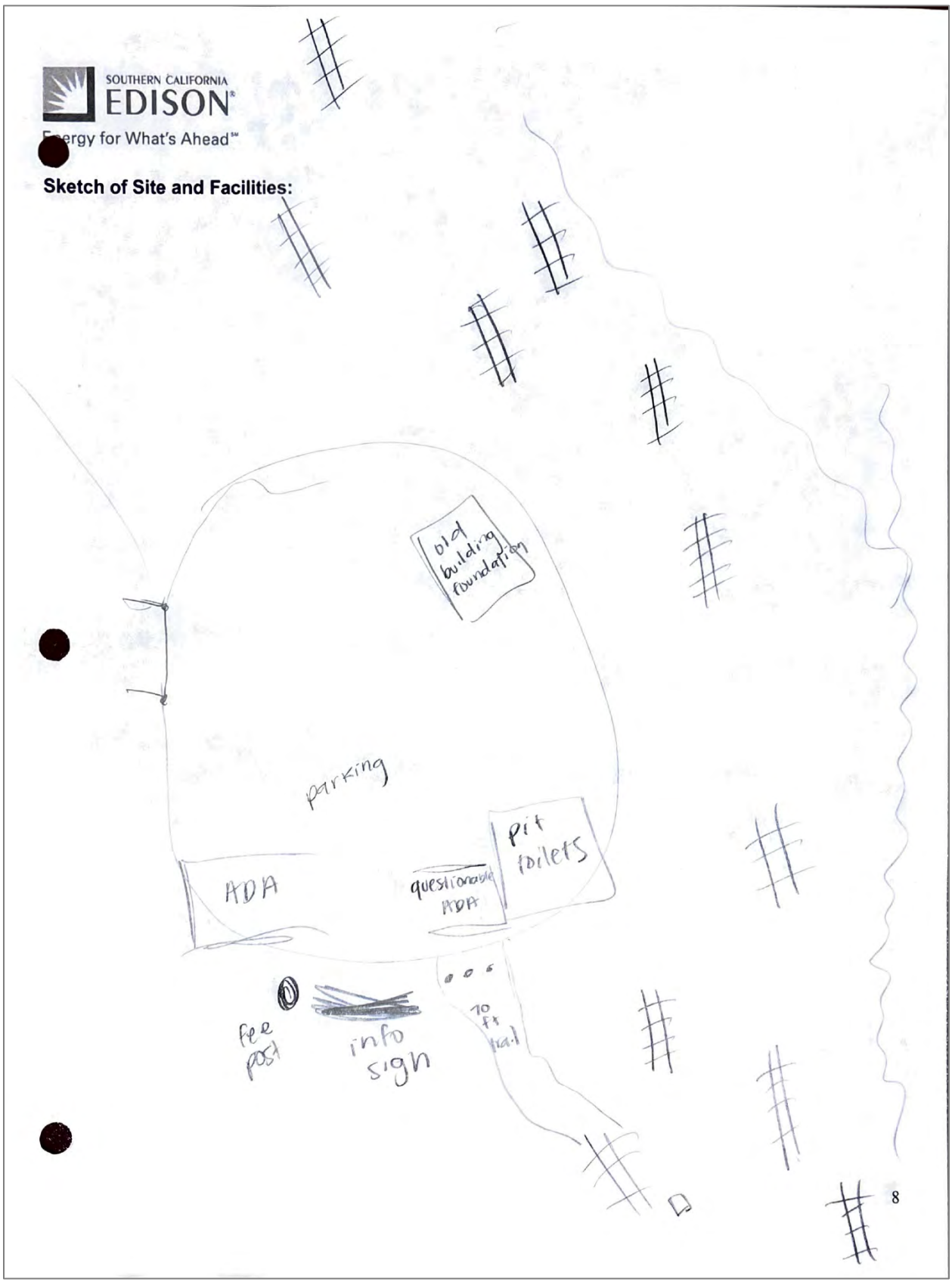
6

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

Notes (including general condition, any restrictions/alerts, such as boating use, invasive species, etc.):
vandalism, site locked, no trash, some degredation of wooden picnic tables, veg impact on informal trails

Photo number from ___ to ____

7


SOUTHERN CALIFORNIA
EDISON
Energy for What's Ahead℠
Sketch of Site and Facilities:
old building foundation
parking
ADA
questionable ADA
pit toilets
fee post
info sign
70 ft trail
8

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

KERN RIVER NO. 1 PROJECT
DATA DICTIONARY

Conditional Ratings
- N: Needs replacement-is non-functional or has broken or missing components
- R: Needs repair-has structural damage or is in an obvious state of disrepair
- M: Needs maintenance- is in need of attention (i.e. cleaning or painting is needed)
- G: Good condition-is functional and well maintained

Anecdotal Information:
- Observations made by field staff (i.e. overflowing trash cans, tire tracks outside of delineated parking areas and access roads)

Facility Type:
- The primary use of the site

Road Access:
- The road in which is used to access/enter the site.

Parking Lot:
- The designated or observed area where vehicles park to access the facility.

Trash receptacles:
- Include all vessels designed to collect trash (i.e. trash cans, dumpsters)

Informational Kiosk:
- A display structure with multiple informational signs

9

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

KERN RIVER NO. 1
FERC 1930 PROJECT
RECREATION FACILITY CONDITION SITE ASSESSMENT FORM

Observed by: OSBORN + HUGHES Date/Time: 9/24 1:37

Site Name: Live Oak Day Use GPS Coordinates: 35.479461, -118.731751

Brief Description of Site (accessibility, health and safety concerns):

one parking lot w/ one pit toilet structure, little trash, ~10 picnic sites w/ various grills, one table damaged/missing some grills missing, no info on signs and bathrooms locked - since site is closed, 3 ADA parking spots 16 spots total, less shade, farther from river

Facility Type

☒ Day Use Area ☒ Picnic Area ☐ Boat Launching Area
☐ Informal Site

Road Access

Condition Description: N R M (G)

☒ Paved access # lanes 1
☐ Unpaved access # lanes ____

Parking Lots:

Condition Description: N R M (G)

Brief Description of Parking Lot:

one parking lot paved w/ 3 ADA spots and 16 total 13 3 ada
striping/painting fading

Type	# Paved	# Estimated Gravel	Space Delineation
Universal Access Spaces	3	~~0~~	☒ Painted ☐ Curbs ☒ Signage
Regular Spaces	13	~~0~~	☒ Painted ☐ Curbs ☐ Signage

1

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

Vehicle & Trailer Spaces ___ ___ ☐ Painted ☐ Curbs ☐ Signage
None identified

Operations:

☐ Staffed ☒ Unstaffed
☒ Fee: (Site $___; Parking $___)

Operating Hours_____
Project Facility: _____

☒ Seasonal (From _____To_____)
☐ Year Round

Owner/Manager_____
Within FERC Project boundary?_____

unknown fee due to site closed for season

2

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

Day Use Site Amenities (total # of all amenities per site; provide additional specifications on next page):

#	Type	Condition (N-replace, R-repair, M-maintain, G-good)	Compliant with FSORAG Guidelines?) Y/N
1	Picnic Shelter	G	Y - 4ft rule good w/poles
Ø	Overlook	NA	NA
9	Picnic Tables	G - one missing	Y - 2 spots
	Pedestrian Trail	M < paved and gravel	Y+N ~~N~~ paved trail too steep other looked good
Ø	Boating Prep Area	NA	NA
Ø	Trash Receptacles	none but closed	None
3	Grills	G - some missing - just pole	Y - one 2 UA
Ø	Fishing Pier/Platform	NA	NA
Ø	Firepit/ring	NA	NA
Ø	Fishing Prep Area	NA	NA
2	Safety Signage	nothing on signs	Y
1	Restrooms	G but UNKNOWN	UNKNOWN
Ø	Information Kiosk	NA	NA
2	Informational Signage	none on signs	Y
Ø	Benches	NA	NA
Ø	Dumping Station	NA	NA
Ø	Potable Water	NA	NA
Ø	Playground	NA	NA

Other (specify)_____

Boat Launch Facilities
Condition Description: NA

☐ Hard surface ☐ Unimproved (informal) ☐ Gravel ☐ Carry In
☐ Universal Access ☐ Boat Prep Area ____ # of Lanes

Courtesy/Fishing Docks
Condition Description: NA

☐ Courtesy Dock ☐ Fishing Dock Dimensions:_____ ☐ Universal Access
☐ Courtesy Dock ☐ Fishing Dock Dimensions:_____ ☐ Universal Access

Trails (within the recreation area)
Condition Description:
one true UA paved trail and 2 short paved "trails" both too steep for UA. lots of informal trails to picnic areas and river, overgrown and rocky

3

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

Type: paved to JA Length (ft): 60 Condition: M/G ☒ Universal Access
Type: paved steep Length (ft): 6 Condition: M ☐ Universal Access N
Type: paved steep Length (ft): 29 Condition: M ☐ Universal Access N

4

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

Interpretive/Site Information
Condition Description: two sign boards but no info - closed for season

____ No. of Displays
☐ Boating Safety ☐ Invasive Species ☐ Fishing Regulations ☐ Fish Type
☐ Regional Events ☐ Other (specify)

Signage
Condition Description: entry sign, two sign boards but no info since site was closed

☐ Part 8 ☐ Directional ☐ Informational ☐ Other

Sanitation Facilities
Condition Description: one pit toilet structure but locked. appeared UA compliant but unknown

	# Flush	(# UA*)	# Portable pit	(# ADA)	Remarks
Unisex		(unk)	x 2	(unk)	
Women		(____)		(____)	
Men		(____)		(____)	

**UA = Universal Access*

Observed Vegetation and Erosion Impacts
__X__ Cut trees for fires one cut tree unknown reason
__X__ Trampled vegetation Mowed veg looked previously mowed on trails
____ areas
____ Trees damaged by people
____ Trees damaged by
____ environment Areas of noticeable erosion

Description of Observations/Evidence of Vegetation Impacts:
some trampled on trails that were overgrown

Description of Observations/Evidence of Erosion:
"side channel" but not true erosion

Evidence of use at site: C, G, V,
(C) Compaction, (E) Erosion, (G) Garbage, (GD) Ground disturbance, (HW) Human waste, (UI) Unauthorized improvements, (V) Vandalism, (VR) Vegetation removal, (O) Other (Specify)

5

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

Evidence of Overcrowding: hard to say w/ site closed
(A) Anecdotal information, (FA) facility/amenity (C) capacity, (I) improper parking, (S) Signage, (SD) Site degradation, (U) Unauthorized sites, (W) Waiting lines, (O) Other (Specify)

6

SOUTHERN CALIFORNIA EDISON®

Energy for What's Ahead℠

Notes (including general condition, any restrictions/alerts, such as boating use, invasive species, etc.):

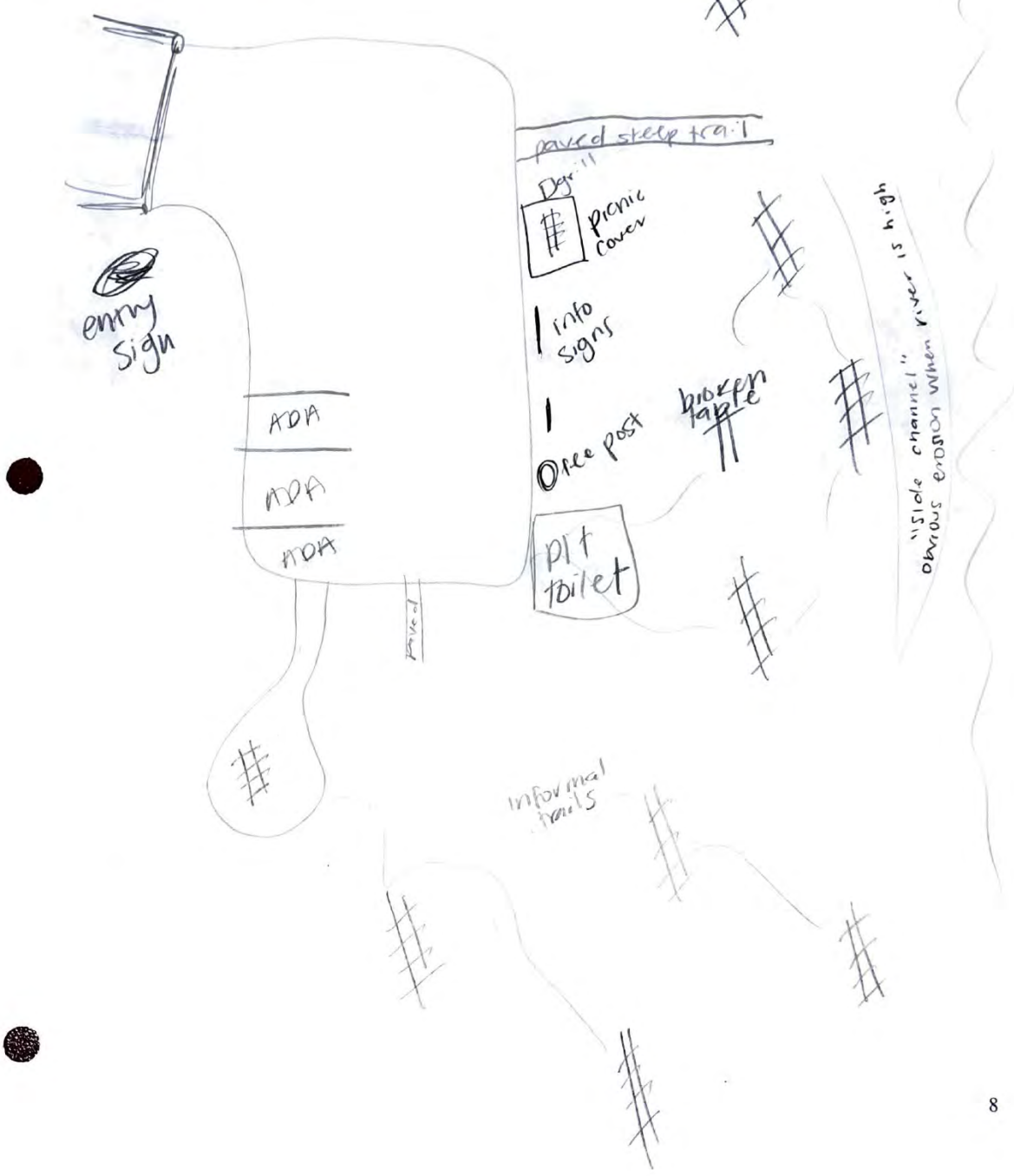
site closed, no info on signs, picnic tables damaged grills missing, farther from "beach" access, UA compliant/best out of all day use areas

Photo number from ___ to ___

7

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

Sketch of Site and Facilities:



SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead™

KERN RIVER NO. 1 PROJECT
DATA DICTIONARY

Conditional Ratings

- N: Needs replacement-is non-functional or has broken or missing components
- R: Needs repair-has structural damage or is in an obvious state of disrepair
- M: Needs maintenance- is in need of attention (i.e. cleaning or painting is needed)
- G: Good condition-is functional and well maintained

Anecdotal Information:

- Observations made by field staff (i.e. overflowing trash cans, tire tracks outside of delineated parking areas and access roads)

Facility Type:

- The primary use of the site

Road Access:

- The road in which is used to access/enter the site.

Parking Lot:

- The designated or observed area where vehicles park to access the facility.

Trash receptacles:

- Include all vessels designed to collect trash (i.e. trash cans, dumpsters)

Informational Kiosk:

- A display structure with multiple informational signs

9

APPENDIX H

REC 2 – RECREATION FACILITY USE ASSESSMENT TECHNICAL MEMORANDUM

Copyright 2026 Southern California Edison

REC 2 – RECREATION FACILITY USE ASSESSMENT TECHNICAL MEMORANDUM

KERN RIVER NO. 1 HYDROELECTRIC PROJECT
FERC PROJECT NO. 1930

PREPARED FOR:



March 2026

TABLE OF CONTENTS

1.0 Introduction 1

2.0 Study Objectives 1

3.0 Study Area and Study Sites 1

4.0 Methods 3

4.1 Study Plan Variances 3

4.2 Characterize Recreation Use at Developed Recreation Facilities and at Undeveloped Locations Identified as Potential River Access Points Along the Bypass Reach 4

4.3 Characterize Recreation Use at Select Project Trails 8

4.4 Estimate Future Recreation Use and Demand 9

4.5 Document Public Safety 9

5.0 Results Summary 9

5.1 Recreation Use at the Four Day-Use Areas and Undeveloped River Access Points 10

5.1.1 Vehicle Count: Data Summary 10

5.1.2 Day Use Survey Form Data Summary 11

5.2 Recreation Use at Project Trails 14

5.2.1 Trail Use 14

5.2.2 Trail Use Survey Form Data Summary 18

5.2.3 Impressions of Use 19

5.3 Future Recreation Use and Demand 19

5.3.1 Meeting Public Recreation Needs in the Vicinity of the Project 20

5.4 Public Safety 21

6.0 Study Specific Consultation 22

7.0 Outstanding Study Plan Elements 23

8.0 References 23

LIST OF TABLES

Table 5-1. Average Number of Vehicles Parked Per Day by Month 25
Table 5-2. Number of Parked Vehicles by Site on Weekends, Including Informal Parking Spots 26
Table 5-3. Number of Parked Vehicles by Site on Weekdays, Including Informal Parking Spots 27
Table 5-4. Number of Parked Vehicles by Site on Holidays, Including Informal Parking Spots 28
Table 5-5. Percentage of Available Parking Filled at Democrat Raft Take-Out Boating Site (22 Parking Spots) 29
Table 5-6. Percentage of Available Parking Filled at Upper Richbar Day Use Area (42 Parking Spots) 29
Table 5-7. Percentage of Available Parking Filled at Lower Richbar Day Use Area (11 Parking Spots) 29
Table 5-8. Percentage of Available Parking Filled at Live Oak Day Use Area (16 Parking Spots) 29
Table 5-9. Percentage of Available Parking Filled at Undeveloped River Access Points Along SR-178 (cumulative) 29
Table 5-10. Number of Respondents that Participated in the Survey by Day Use Site 30
Table 5-11. Number of Respondents that Participated in the Survey by River Access Site 30
Table 5-12. Day User Age Distribution by Percent 30
Table 5-13. Day User Ethnicity by Percent 30
Table 5-14. Day User Total Household Income by Percent 30
Table 5-15. Day User Primary Recreation Activity 31
Table 5-16. Day User Satisfaction by Percent 31
Table 5-17. Anglers' Tackle Type by Percent 32
Table 5-18. Fishing Frequency by Season 32
Table 5-19. Primary Reason for Fishing by Percentage 32

Table 5-20. Whitewater Boating Responses 32
Table 5-21. Monthly Trail Counts by Project Trail 32
Table 5-22. Project Trail Counts by Month 33
Table 5-23. Project Trail Weekend vs Weekday Total Counts and Averages by Project Trail 33
Table 5-24. Percentage of Survey Forms Collected by Location 33
Table 5-25. Previous Visits in the Last 12 Months by Trail (Self-Reported) 34
Table 5-26. Trail User Age Distribution by Percent 34
Table 5-27. Trail User Ethnicity by Percent 34
Table 5-28. Trail User Total Household Income by Percent 34
Table 5-29. Trail User Primary Visit Purpose 34

LIST OF FIGURES

Figure 5-1. Day Users Surveyed by Month, May 2024-January 2026 36
Figure 5-2. TrafX Trail Count Totals by Project Trail, November 15, 2024-November 23, 2025 (374 days) 36
Figure 5-3. TrafX Counts at Democrat Gage Trail November 15, 2024-November 23, 2025 37
Figure 5-4. TrafX Counts at Cow Flat Creek Trail November 15, 2024-November 23, 2025 38
Figure 5-5. TrafX Counts at Lucas Creek Trail November 15, 2024-November 23, 2025 39
Figure 5-6. TrafX Counts at Dougherty Creek Trail November 15, 2024-November 23, 2025 40
Figure 5-7. TrafX Counts at Stark Creek Trail November 15, 2024-November 23, 2025 41

LIST OF MAPS

Map 3-1. Location of Recreation Survey Sites 43
Map 3-1a. Location of Recreation Survey Sites 44
Map 3-1b. Location of Recreation Survey Sites 45
Map 3-1c. Location of Recreation Survey Sites 46
Map 3-1d. Location of Recreation Survey Sites 47
Map 3-1e. Location of Recreation Survey Sites 48
Map 3-1f. Location of Recreation Survey Sites 49
Map 3-1g. Location of Recreation Survey Sites 50

LIST OF APPENDICES

Appendix A. Day Use Survey Form (in English and Spanish)
Appendix B. Forest Service Approval for Use of Infrared Trail Cameras

LIST OF ACRONYMS

DLA	Draft License Application
EAP	Emergency Action Plan
FERC	Federal Energy Regulatory Commission
Forest Service	United States Forest Service
KR1	Kern River No. 1
NVUM	National Visitor Use Monitoring
Project	Kern River No. 1 Hydroelectric Project Relicensing, FERC Project No. 1930
QR Code	Quick Response Code
REC 2 TSP	REC 2 – Recreation Facility Use Assessment Technical Study Plan
SCE	Southern California Edison
SPD	Study Plan Determination
SR-178	State Route 178
TSP	Technical Study Plan
TWG	Technical Working Group

1.0 INTRODUCTION

This REC 2 – Recreation Facility Use Assessment Technical Memorandum provides the methods and findings of the REC 2 – Recreation Facility Use Assessment Technical Study Plan (REC 2 TSP). The REC 2 TSP was conducted in support of Southern California Edison's (SCE) Kern River No. 1 (KR1) Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 1930. The REC 2 TSP was included in SCE's Revised Study Plan submitted to FERC on February 13, 2024 (SCE 2024). In its March 14, 2024, Study Plan Determination (SPD), FERC approved the REC 2 TSP with modifications (FERC 2024).

The recreation facility use assessments began in May 2024 and were completed at the end of January 2026. Data collection and analysis through January 2026 is summarized below.

2.0 STUDY OBJECTIVES

The objectives of the recreation facility use assessment, as outlined in the REC 2 TSP (SCE 2024), include the following:

- Characterize recreation use at the developed public recreation facilities in the Project vicinity (non-Project facilities).
- Characterize dispersed recreation use at undeveloped sites along the bypass reach accessible from State Route 178 (SR-178) (non-Project facilities).
- Characterize recreation use along Project trails that provide access to the lower Kern River or to an existing United States Forest Service (Forest Service) trail in the vicinity of the Project.
- Estimate future recreation use in the vicinity of the Project using existing use data and published recreation trends information.
- Document potential public safety issues and existing programs and measures that are implemented by SCE to protect public health and safety.

3.0 STUDY AREA AND STUDY SITES

The study area includes the four developed day use areas in the vicinity of the Project (non-Project facilities), five undeveloped river access points along SR-178 (along the bypass reach)[1] (non-Project facilities), and five Project trails; a total of 14 sites. Refer to Maps 3-1a–g depicting the location of the following study sites.

[1] A bypass reach is a segment of a river downstream of a diversion facility where Project operations divert a portion of the water from the river.

The four non-Project developed day use facilities are:

- Democrat Raft Take-out Boating Site
- Upper Richbar Day Use Area
- Lower Richbar Day Use Area
- Live Oak Day Use Area

The five non-Project undeveloped river access points along SR-178 (from upstream to downstream):

- River Access Site 1 (Near SR-178 postmile KER 24.0)
- River Access Site 2 (Near SR-178 postmile KER 21.0)
- River Access Site 3 (Between SR-178 postmile KER 18.0 and KER 19.0)
- River Access Site 4 (Near SR-178 postmile KER 18.0)
- River Access Site 5 (Near SR-178 postmile KER 17.0)

The five Project trails[2] are:

- Democrat Gage Trail
- Cow Flat Creek Trail
- Lucas Creek Trail
- Dougherty Creek Trail
- Stark Creek Trail

[2] The REC 2 TSP included "Steel Flume Trail" as a Project trail that connects to the Powerhouse Trail. In August 2024, field staff confirmed that the portion of the Steel Flume Trail that connects to SR-178 is no longer present on the landscape (was not visible/identifiable).

4.0 METHODS

Study implementation followed the methods described in the REC 2 TSP (SCE 2024).

4.1 STUDY PLAN VARIANCES

There are three variances from the REC 2 TSP approved with modifications in FERC's SPD (FERC 2024):

- The schedule for implementation of the full study plan was extended compared to the schedule anticipated. This delay is associated with a later start date for the initiation of trail counts and survey boxes due to the Forest Service approvals required to install infrared trail cameras (model used were the TrafX trail counters) and survey boxes.

- The REC 2 TSP stated that survey technicians would use a form with questions for two user groups: day users and whitewater boaters. In practice, the survey form included a single set of questions for all day users, with a prompt asking whether respondents were whitewater boating. For those who answered "yes," the form included one follow-up question about how river flows affect their boating experience. The form did not include the full set of questions identified in the REC 3 – Whitewater Boating TSP. Those objectives were instead addressed through implementation of the REC 3 study, which involved an online structured interview survey and follow-up interviews with individuals experienced in boating the bypass reach. Results of that study are presented in the REC 3 – Whitewater Boating Technical Memorandum.

- The REC 2 TSP specified that, on each day vehicle counts were conducted, technicians would complete counts during two of three randomly selected shifts per day, with counts conducted twice per shift: once traveling west to east (upstream) on SR-178 and once traveling east to west (downstream). In practice, due to safety and timing constraints, technicians conducted counts once per shift Counts were initiated at the Democrat Raft Take-out Boating Site and continued at each consecutive site while traveling west (downstream) on SR-178 to the KR1 Powerhouse. Technicians then returned to the Democrat Raft Take-out Boating Site to prepare for the next shift. This approach ensured safe access to river-side (right side of the road) recreation areas, but resulted in one vehicle count per shift rather than two.

4.2 CHARACTERIZE RECREATION USE AT DEVELOPED RECREATION FACILITIES AND AT UNDEVELOPED LOCATIONS IDENTIFIED AS POTENTIAL RIVER ACCESS POINTS ALONG THE BYPASS REACH

To characterize recreation use at developed recreation facilities and at undeveloped locations identified as river access points along SR-178/the bypass reach, SCE has done the following:

- Utilized existing information to characterize likely recreation use activities undertaken by visitors at developed public recreation day use facilities and at undeveloped river access points along the SR-178.

- In collaboration with the Recreation Technical Working Group (TWG), confirmed five undeveloped river access points along the SR-178 at which to conduct vehicle counts and opportunistic in-person intercept surveys.

- In collaboration with the Recreation TWG, developed survey forms (in English and Spanish) to collect information from day users at developed recreation sites at the undeveloped river access points along SR-178. Refer to Appendix A for the day use survey forms.

Following the above steps, SCE initiated field surveys involving (1) on-the-ground vehicle counts and (2) opportunistic in-person intercept surveys (intercept surveys), at the five undeveloped river access points along SR-178. In addition, SCE installed a tamper-proof survey box at each of the day use facilities (four survey boxes in total). SCE initiated vehicle counts and intercept surveys on May 15, 2024. The vehicle counts and intercept surveys were implemented until the end of the survey period on April 13, 2025 (counts were conducted several times each month for one year). SCE installed the survey boxes on January 23, 2025 and boxes were maintained through January 25, 2026. The following describes the methodology used to conduct the vehicle counts and intercept surveys and provides additional information about the survey boxes.

- **Vehicle Counts:**

  – During the vehicle counts, the following information was collected: date, time, and number of vehicles parked at each facility.

  – The vehicle counts were conducted as follows:

    ➢ At developed recreation sites that are open year-round: Democrat Raft Take-out Boating Site and Upper Richbar Day Use Area

      ▪ Survey technicians counted the number of vehicles observed on four days per month (two randomly selected weekdays and two randomly selected weekend days) for one year, May 2024–April 2025 (total of 48 days).

- Survey technicians also counted the number of vehicles observed on Memorial Day Weekend (Saturday, May 25, 2024), Fourth of July Holiday (Thursday, July 4, 2024), and Labor Day Weekend (September 2, 2024), bringing the total days surveyed over the course of the study period to 51.

- Survey technicians worked in teams of two: one person driving and one person counting.

➢ At developed recreation sites that are open only for part of the year (generally May to October): Lower Richbar Day Use Area and Live Oak Day Use Area

- Survey technicians counted the number of vehicles observed on four days per month (two randomly selected weekdays and two randomly selected weekend days) when the sites were open.[3]

- Survey technicians also counted the number of vehicles observed on Memorial Day Weekend (Saturday, May 25, 2024), Fourth of July Holiday (Thursday, July 4, 2024), and Labor Day Weekend (September 2, 2024), bringing the total days surveyed over the course of the study period to 31.

- Survey technicians worked in teams of two: one person driving and one person counting.

➢ At the undeveloped river access points along SR-178:

- Survey technicians counted the number of vehicles observed on four days per month (two randomly selected weekdays and two randomly selected weekend days) for one year, May 2024–April 2025 (total of 48 days).

- Survey technicians also counted the number of vehicles observed on Memorial Day Weekend (Saturday, May 25, 2024), Fourth of July Holiday (Thursday, July 4, 2024), and Labor Day Weekend (September 2, 2024), bringing the total days surveyed over the course of the study period to 51.

- Survey technicians worked in teams of two: one person driving and one person counting.

[3] Lower Richbar Day Use Area and Live Oak Day Use Area were closed during the first three survey periods in May 2024 (May 15, 17 and 19). Both day use areas were open during vehicle counts and intercept surveys conducted on May 25, 2024 and during counts/intercept surveys conducted through late October. Both sites were closed during the first counts in November and remained closed through the last surveys conducted in April 2025. Both closed October 2025 through the end of the survey period.

- The selected days per month during which data was collected did not include days when it was raining, when substantive precipitation was forecast, or when SR-178 was closed.[4]

- On each day a vehicle count was conducted, the vehicle count was completed during two of three randomly selected shifts:

  - Shift 1 (7 a.m. to 11 a.m.)

  - Shift 2 (11 a.m. to 3 p.m.)

  - Shift 3 (3 p.m. to 7 p.m.)

– The vehicle count was conducted once per shift, with in a total of two vehicle counts conducted per site on each of the survey days.[5] Generally, survey technicians begin each shift at the Democrat Raft Take-out Boating Site and drive west (downstream).

- **Opportunistic in-person intercept surveys:**

  – Opportunistic in-person intercept surveys were conducted by two bilingual (Spanish/English) survey technicians. Opportunistic in-person surveys were conducted on the same day and using the same methodology as the vehicle counts (i.e., two of three randomly selected shifts/day), but by a different pair of survey technicians than those conducting the vehicle counts. Surveys were conducted using a survey intercept form (in Spanish and English).

  – Survey technicians opportunistically intercepted recreation users in parking lots or other safe-to-access locations during the vehicle counts to conduct surveys using the day use survey form. The following describes the methodology for conducting the surveys at both the developed recreation sites and the undeveloped river access points along SR-178.

    - At the developed day use sites:

      - The survey technicians parked at the developed recreation site and completed a walking circuit of the parking lot facilities (picnic tables and barbeques), and adjacent river locations to seek recreationists to participate in the survey.

[4] On May 15, 2024, vehicle counts were conducted at all sites just once (during one shift) due to a mid-day closure of SR-178 after a fire ignition up canyon from Democrat Dam.

[5] During some of the initial vehicle count survey days in May (May 15, 17 and 19) technicians counted vehicles more than twice per day at some sites (up to three times) and only once per day at some sites. By May 25, survey technicians had established a standard methodology for completing the counts (once per shift/ two shifts per day).

- Survey technicians remained at the site for at least 15 minutes if there were scant visitors present, and up to 30 minutes if the developed recreation area was busy. If a survey technician was conducting a survey that extended beyond the 30-minute period, the technician finished the survey before departing.

- If a recreationist declined to participate in the survey, the field technician recorded the declined survey and distributed a postcard-size version of the survey flyer (in English and Spanish) with an online access code (Quick Response Code or QR code).

➢ At the undeveloped river access points along SR-178:

- During each vehicle count shift, survey technicians conducted opportunistic in-person surveys once at each of the five locations if it was safe to pull to the shoulder to conduct the survey.

- If deemed safe, survey technicians would seek recreationists in and around the parking area and adjacent river locations to participate in the survey. If a recreationist declined to partake in the survey, the field technician recorded the declined survey and distributed a postcard-size version of the survey flyer (in English and Spanish) with an online access code (QR code).

- **Survey Boxes**

– SCE received approval from the Forest Service to install tamper-proof survey boxes (survey boxes) at each of the developed recreation sites on December 16, 2024. The survey boxes were installed January 23, 2025 and included self-survey forms in English and Spanish (refer to Appendix A). The box signage also included a QR code to allow visitors to complete the survey form online, if preferred. The survey boxes were maintained for over one year (367 days of data total). The survey box materials were removed after January 25, 2026, the final day of data collection from survey boxes.

4.3 CHARACTERIZE RECREATION USE AT SELECT PROJECT TRAILS

To characterize recreation use at select Project trails, SCE completed the following:

- In collaboration with the Recreation TWG, SCE confirmed five trailhead locations for the survey boxes.[6]

- In collaboration with the Recreation TWG, SCE developed survey forms (in English and Spanish) to collect information from trail users. Refer to Appendix A for the Project trails survey forms. SCE also developed a set of maps to include beneath the lid of each survey box to support accurate trail survey results.

- To characterize recreation use at select Project trails, SCE collected data via the following methods:

  – Temporary infrared trail cameras (TrafX trail counters): SCE installed TrafX trail counters on November 14, 2024, along each select Project trail within approximately 400 yards of the trailhead. SCE collected the TrafX trail counter data for over a year (374 days total). The TrafX trail counters were regularly serviced by SCE, and the data from each TrafX trail counter was downloaded one to two times a month for processing. TrafX counters were removed after November 23, 2025, the final day of data collection.

  – Self-survey boxes: Concurrent with the installation of the survey boxes at the four developed recreation sites (see Section 4.2), SCE installed survey boxes along each of the Project trails on January 23, 2025. The survey boxes included self-survey forms in English and in Spanish (refer to Appendix A), maps to orient trail users to their location relative to the questions on the survey forms, and signage to direct trail users to complete the survey form within the survey box. The signage also includes a QR code to allow visitors to complete the survey form online, if preferred. The survey boxes were maintained for over one year (367 days of data total). The survey box materials were removed after January 25, 2026, the final day of data collection from survey boxes.

  – Interviews: SCE contacted Sequoia National Forest personnel and other interested stakeholders who frequent the Project area to request their impressions of visitor use. Refer to Section 5.2.3.

[6] The five trails are: Democrat Gage Trail; Cow Flat Creek Trail; Lucas Creek Trail; Dougherty Creek Trail; and Stark Creek Trail. The trails leading up to the KR1 Forebay (Penstock/Forebay Trails across SR-178 from the KR1 Powerhouse) were considered as a location for installation of a trail survey box, but after further review, these trails were excluded as an installation location due to security and safety concerns. The Penstock/Forebay Trails are included on the Project trail survey form and in the survey box map included in the lid of each trail survey box so that individuals have the opportunity to note if they used those trails in the past.

4.4 ESTIMATE FUTURE RECREATION USE AND DEMAND

To estimate future recreation use and demand SCE:

- Utilized census data and information available in relevant federal, state, and local comprehensive plans (including the Statewide Comprehensive Outdoor Recreation Plan and supporting survey information) to identify population projections and to document outdoor recreation use trends and needs.

- Utilized the recreation use data collected in this study along with trends and population projections to estimate future recreation needs over the license period (assumed to be 50 years).

- Determined whether future public recreation needs can be met in the vicinity of the Project.

4.5 DOCUMENT PUBLIC SAFETY

To document public safety SCE:

- Identified and described existing programs and measures implemented by SCE to protect public health and safety (i.e., buoy lines, fencing, signage, and alarms).

- Identified whether there were recreation related safety incidents that have occurred in or adjacent to the Project boundary over the past ten years, by reviewing records maintained by FERC and the Forest Service, and by consulting with SCE staff.

5.0 RESULTS SUMMARY

This section describes the results from the following data gathering efforts:

- Vehicle counts at the four day-use areas and at the undeveloped river access points (May 2024 – April 2025).

- Survey data from the four day-use areas at the undeveloped river access points. This data is comprised of a complete year of intercept in-person surveys (May 2024- April 2025), as well as data from the survey-boxes and responses to QR codes attached to the survey boxes (January 2025-January 2026).

- Trail use and survey data from the TrafX trail counters installed on Project trails, as well as from surveys administered via the trailhead survey-boxes and responses to QR codes attached to the survey boxes (January 2025-January 2026).

5.1 RECREATION USE AT THE FOUR DAY-USE AREAS AND UNDEVELOPED RIVER ACCESS POINTS

Vehicle counts and day use surveys began in May 2024 and were conducted every month for a 12-month period, through April 2025. Surveys were conducted at least four times per month—two weekdays and two weekends—and were also conducted on the Saturday of Memorial Day weekend, on the Fourth of July, and on the Saturday of Labor Day weekend. The counts and surveys were conducted at:

- The four developed day use facilities: Democrat Raft Take-out Boating Site; Upper Richbar Day Use Area; Lower Richbar Day Use Area; and Live Oak Day Use Area
- The five undeveloped river access points along SR-178.

5.1.1 Vehicle Count: Data Summary

Survey technicians counted vehicles parked at one of four developed day use areas or at one of five undeveloped river access points along SR-178 on a total of 51 survey days between May 15, 2024, and April 13, 2025. A total of 864 vehicles were recorded during these vehicle counts, an average of 17 vehicles counted per day.[7]

Distribution of vehicles by weekday, weekend, and holiday: Vehicles were counted on 23 weekend days, 25 weekdays, and three holiday days. On average, 19 vehicles were counted on a weekend day, 6 vehicles were counted on a weekday, and 60 were counted on a holiday-weekend day. A total of seven vehicles counted over the survey period had boat racks on the vehicle.

Distribution of vehicles by month: Based only on weekend days and weekdays (not holiday days), more vehicles were counted on the average day in June than during the other months in the survey period. Table 5-1 provides the average number of vehicles counted per day by month, excluding holiday weekends.

Distribution of vehicles by location: More vehicles were parked at Upper Richbar Day Use Area than at other sites (36 percent of the total vehicles), followed by Democrat Raft Take-out Boating Site (24 percent of total vehicles), Lower Richbar (10 percent of total vehicles), and Live Oak (5 percent of total vehicles). Collectively, 26 percent of the total vehicles counted were parked at the five undeveloped river access points along SR-178. Table 5-2 illustrates the total number of vehicles parked at each developed day use facility and at each of the five undeveloped river access points along SR-178 on weekends, Table 5-3 illustrates the total number parked on weekdays, and Table 5-4 illustrates the total number parked on a holiday weekend.

Volume of vehicles compared to capacity: Across all developed recreation day use facilities, there are a total of 91 designated parking spaces (refer to REC 1 – Facility Condition Assessment for details on parking capacity per facility). Additionally, the five

[7] This total represents the aggregate of vehicle counts per site per day. On most days the vehicle count was completed at each site once per each of two shifts. For example: Shift 1, 7 a.m. to 11 a.m. and Shift 2, 11 a.m. to 3 p.m.

undeveloped river access points along SR-178 are estimated to accommodate up to 25 vehicles. Therefore, in total, surveyors tracked the occupancy of 116 parking spaces during their observations. Based on the average number of vehicles counted per survey day (17), 15 percent of the total parking capacity was occupied on an average day when vehicle counts occurred.

- At the Democrat Raft Take-out Boating Site, between 4 percent and 21 percent of the estimated parking spaces were filled on average (Table 5-5).
- At Upper Richbar Day Use Area, between 3 percent and 26 percent of the estimated parking spaces were filled on average (Table 5-6).
- At Lower Richbar Day Use Area, between 3 percent and 21 percent of the estimated parking spaces were filled on average (Table 5-7).
- At Live Oak Day Use Area, between 1 percent and 6 percent of the estimated parking spaces were filled on average (Table 5-8).
- Among the undeveloped river access points along SR-178, between 6 percent and 75 percent of the estimated parking spaces were filled on average (Table 5-9).

The data indicates that surveyors never observed any of the developed day use parking lots fill to capacity.

5.1.2 Day Use Survey Form Data Summary

From May 2024 to April 2025, 374 survey forms representing 1,251 individuals were completed by day users. In addition, from January 23, 2025, to January 25, 2026, 73 survey forms representing 167 individual day users were collected from the developed day use area self-survey boxes (and from QR Codes attached to the self-survey boxes). Therefore, a total of 447 surveys forms representing 1,418 individual day users were collected during the study.

The following summarizes the results of data collected either from the intercept in-person surveys, from QR Codes, or from physical forms between May 15, 2024 and January 25, 2026.

5.1.2.1 Results

Peak visitation during the in-person intercept surveys (May 2024-April 2025) occurred during the month of July, followed by September. The average group size of day users was three to four people. Figure 5-1 illustrates the number of day users surveyed by month and year.

Table 5-10 indicates the number of respondents who participated in the survey at each developed day use area, and Table 5-11 indicates the number of respondents who participated at each river access site. As shown, 41 percent of surveys at day use areas were completed by users encountered at the Democrat Raft Take-out Boating Site, 40 percent at Upper Richbar Day Use, 11 percent at Lower Richbar Day Use, and 8 percent at Live Oak Day Use. The breakdown of surveys completed by users encountered at river access sites is as follows: 7 percent at River Access Site 1; 11 percent at River Access Site 2; 19 percent at River Access Site 3; 33 percent at River Access Site River Access Site 4; and 30 percent at River Access Site 5.

On average, respondents reported they had visited the lower Kern River about 7 times over the last 12 months. Only 52 of the 447 survey respondents had no previous recreation trips in the last 12 months to the lower Kern River.

- **Demographics:** The survey results from May 2024 to January 2026 (from intercept surveys and self-survey boxes) yielded the following information about day users:

  – There was a wide age range of survey respondents, from under 16 to over 70, though more respondents indicated their age as between 30-39 years or between 40-49 years of age (24 percent and 23 percent, respectively) than other categories (Table 5-12).

  – Most respondents identified their ethnicity as White (47 percent) or Latino (45.8 percent), followed by Asian (5.3 percent), other ethnicity (1.8 percent), and Black (less than 1 percent) (Table 5-13).

  – Sixty-five percent (65 percent) of respondents indicated their total household income was between $41,000 and $80,000 (Table 5-14), while approximately 20 percent indicated their household income was less than $40,000, and approximately 14 percent indicated their household income was greater than $81,000.

  – Fifty-five percent (55 percent) of respondents elected to identify their home zip code. All zip codes but three (one in Kentucky, one in Colorado, and one in Washington) were within California. Of respondents who identified their home zip code, 62 percent indicated a zip code in the Bakersfield area (zip codes 93301-93390). An additional 9 percent were within the Lake Isabella/Kernville area (zip codes 93240 and 93238).

- **Primary Recreation Activity:** Picnicking was the most described primary recreation activity (39 percent), followed by fishing (20 percent), and hiking, walking, or trail use (19 percent). Twenty-six percent (26 percent) of respondents indicated they were participating in a water-related activity, primarily fishing (20 percent). Just 3 percent of respondents indicated their primary activity was whitewater rafting or boating (respondents were taking-out rafts or kayaks at the Democrat Raft Take-out Boating Site, refer to the "Whitewater Boating" discussion below), and 1 percent indicated their primary activity was swimming or wading. Of respondents who identified a water-related activity as their primary recreation activity that day, eight survey respondents reported that flows had a negative impact on their experience (25 people did not respond to how flows impacted their experience). Two of the surveys stated that flows were too low for ideal fishing, although they were still able to fish. Four people stated the flows were too low with no additional explanation, and two stated the flows were too high with no additional explanation. See Table 5-15 for a complete list of the day user primary activity by percentage.

- **Scenic Quality:** Ninety-four percent (94 percent) of respondents rated the scenic quality of the lower Kern River area in general as "good" or "very good". Three percent (3 percent) of respondents rated the scenic quality as "neutral", "poor", or "very poor". Three percent (3 percent) of respondents did not respond to this question.

- **Day User Satisfaction:** Most respondents listed their satisfaction in all areas as neutral, satisfied, or very satisfied. Primary complaints in satisfaction included cleanliness of bathrooms and maintenance of the road down to the Democrat Raft Take-out Boating Site. See Table 5-16 for the satisfaction of day users by percentage.

- **Anglers:** In the angler-specific portion of the survey, 148 of the 447 respondents indicated they had previously fished on the lower Kern River. Of the anglers surveyed, the majority used spin rods with bait or lures as their gear and tackle. Respondents fished most frequently during the fall (33 percent), and only slightly less frequently in the winter (30 percent) and spring (28 percent). Significantly fewer respondents indicated they fished in the summer, only 9 percent. Sixty-two percent (62 percent) of respondents indicated that while they may eat the fish they catch, they were primarily fishing for fun; while 38 percent of respondents indicated that while they enjoy fishing, they are primarily fishing for food. Fourteen surveys indicated that flows negatively affected an angler's experience. Table 5-17, Table 5-18, and Table 5-19 summarize responses to the angler-specific portion of the survey.

- **Whitewater Boating:** Five surveys were collected from individuals who indicated that whitewater boating was their primary recreation activity. All of these surveys were collected at the Democrat Raft Take-out Boating site, which is not a location identified by boaters to put-in to boat the bypass reach because of the need to portage around Democrat Dam. Two of the surveys were collected by survey technicians during intercept in-person surveys. One of these surveys represented a group of 28 people and the other a group of 9 people. Survey technicians confirmed these were rafting groups taking out at the site following a boating trip above the impoundment. Three surveys were collected at the Democrat Raft Take-out Boating site by self-reporting individuals in July 2025 (either via a physical form submitted in the self-survey box or via use of the QR code). One survey represented a group of seven and the other two surveys represented two different groups of four individuals on the same day. One of the surveys indicated the group was kayaking. Refer to Table 5-20 for the date, location and group size associated with each survey.

5.2 RECREATION USE AT PROJECT TRAILS

5.2.1 Trail Use

Trail use was characterized via (1) TrafX trail counters (infrared trail cameras) and (2) voluntary user surveys administered via the self-survey boxes installed at trailheads. TrafX trail counters were installed and became operational on November 15, 2024. TrafX counters were removed after November 23, 2025, the final day of data collection. Survey boxes were installed on January 23, 2025. The final full day of collection for survey forms was January 25, 2026.

Democrat Gage Trail is an out and back trail, and therefore each user is expected to pass the TrafX counter twice during a visit. This is likely the type of use along the other trails as well given the length and logistical challenges for a round-trip visit (e.g. would require travel for some distance along the Powerhouse Trail and along the highway for the return trip to a vehicle parked at the trailhead). Therefore, in general, it is reasonable to assume that two counts generally represent one individual. Trail counts (with the exception of the Stark Creek Trail) also include SCE personnel who use the trails to access infrastructure and perform trail maintenance. The approximate per-month use by SCE varies by trail and by season; details by trail are described in Sections 5.2.1.1 through 5.2.1.5 below. During a single visit, SCE personnel may pass the counter multiple times.

Over the 374-day period of trail counter operation, the Cow Flat Creek Trail recorded the highest use, followed by Stark Creek, Dougherty Creek, and Lucas Creek trails. The Democrat Gage Trail recorded the lowest use. Figure 5-2 illustrates total counts by trail. Monthly trail counts are summarized in Table 5-21, with aggregate monthly counts for all trails in Table 5-22. Table 5-23 provides average weekday and weekend counts by trail.

With the intention of collecting trail use data to accurately reflect real visitation patterns that provide a reliable basis for assessing recreational use, TrafX data were subjected to a quality assurance process. Outliers were identified and removed where clear anomalies

were present. For the purposes of this study, an anomaly is defined as a data point that deviates significantly from trail use patterns and is inconsistent with known visitation levels. Non-human TrafX count triggers identified during the study included wind-blown vegetation (i.e., branches passing in front of the infrared camera) and possible livestock movement.[8] In total, 2 percent of TrafX data was removed due to anomalous readings. Specifically:

- 14 days were removed from Democrat Gage Trail.
- 1 day from Cow Flat Creek Trail.
- 9 days from Lucas Creek Trail.
- 5 days from Dougherty Creek Trail.
- 9 days from Stark Creek Trail.

In cases where survey form data exceeded TrafX counts or where anomalous TrafX data were removed, data from corresponding hard copy survey forms were used to correct or replace the trail count values. Survey group sizes were doubled to represent a typical TrafX count of out-and-back traffic for consistency. These replacements accounted for less than one percent of the total TrafX trail count dataset.

5.2.1.1 Democrat Gage Trail

Refer to Figure 5-3 for a visualization of daily trail counts along the Democrat Gage Trail over time. Given the out-and-back nature of the Democrat Gage Trail—i.e., it does not provide a round-trip route—each user is expected to pass the TrafX counter twice during a visit. Therefore, two counts should generally be interpreted as representing one individual.

Across the dataset, the average daily trail count was 1.5, with a median of 2 and a mode of 0. Trail counts include SCE personnel who use the Democrat Gage Trail not for recreational purpose, but rather to access project infrastructure, conduct flow monitoring, and perform trail maintenance. On average, six to 12 SCE personnel use the trail each month. This includes hydrographers who typically visit 1–2 times per month and civil maintenance crews who visit about once per month. During a single visit, SCE personnel may pass the counter multiple times.

In mid-April, trail damage was observed at a location upstream of the TrafX counter, though the trail remained passable. SCE personnel fixed the trail in late April 2025.

[8] Branches that were suspected as causing count triggers on windy days were trimmed when identified. For example, user counts recorded along Dougherty Creek Trail exceeded 600 on 02/21/2025 and exceeded 1,500 on 02/22/2025. Branches suspected of causing these count triggers were trimmed on 2/26/2025; TrafX counts subsequently fell to four (4) on 02/27/2025.

5.2.1.2 Cow Flat Creek Trail

Refer to Figure 5-4 for a visualization of daily trail counts along the Cow Flat Creek Trail over time. Though the Cow Flat Creek Trail is not strictly an out-and-back trail because it connects to the Forest Service's Powerhouse Trail, it is likely that many users hiked up the trail and then back down during a single day, to, for example, regain access to their vehicle (likely parked near the trailhead). Therefore, it is reasonable to assume that many (or most) visitors passed the TrafX counter twice during a visit and that, therefore, two counts should often be interpreted as representing one individual.

Across the dataset, the average daily trail count was 3.4, the median count was 5, and the mode was 0. Trail counts include SCE personnel who use the Cow Flat Creek Trail to access infrastructure, conduct flow monitoring, and perform trail maintenance. Approximately four to 10 SCE personnel use the Cow Flat Creek Trail for non-recreational purposes each month, including hydrographers and civil maintenance crews. During a single visit, SCE personnel may pass the counter multiple times.

Cattle frequent the area above the counter on this trail but are not usually seen at or below the counter.

5.2.1.3 Lucas Creek Trail

Refer to Figure 5-5 for a visualization of daily trail counts along the Lucas Creek Trail over time. Like the Cow Flat Creek Trail, the Lucas Creek Trail is not strictly an out-and-back trail because it connects to the Forest Service's Powerhouse Trail. However, it is likely that many users hiked up the trail and then back down during a single day, to, for example, regain access to their vehicle (likely parked near the trailhead). Therefore, it is reasonable to assume that many (or most) visitors passed the TrafX counter twice during a visit and that, therefore, two counts should often be interpreted as representing one individual.

Across the dataset, the average daily trail count was 1.7, the median count was 2, and the mode was 0. Trail counts include SCE personnel who use the Lucas Creek Trail for non-recreational purposes, to monitor infrastructure and perform trail maintenance. Approximately two to six SCE personnel use the Lucas Creek Trail a month, including the civil maintenance crews. During a single visit, SCE personnel may pass the counter multiple times.

Cattle frequent the area below the counter and are likely captured to some degree in the trail counts at this location. The Lucas Creek Trail was likely used by fire personnel during the mitigation of the Democrat Fire that occurred in May 2025.

5.2.1.4 Dougherty Creek Trail

Refer to Figure 5-6 for a visualization of daily trail counts along the Dougherty Creek Trail over time. Across the dataset, the average daily trail count was 2.8, the median count was 3, and the mode was 0. Trail counts include SCE personnel who use the Dougherty Creek Trail to monitor infrastructure and maintain the trail. Approximately two to six SCE

personnel access the Dougherty Creek Trail a month, including the civil maintenance crews. During a single visit, SCE personnel may pass the counter multiple times.

Cattle frequent the area but are not usually seen at the counter location. Firefighters were observed using this location for training by survey technicians at the end of January 2025. A fFire occurred nearby in mid-August 2025, but the survey box and TrafX counter along Dougherty Creek Trail were unaffected.

5.2.1.5 Stark Creek Trail

Refer to Figure 5-7 for a visualization of daily trail counts along the Stark Creek Trail over time. The Stark Creek Trail extends north-south and parallel to SR-178 above the river. It begins at the terminus of Stark Creek Road and extends south for more than one mile before connecting to the Powerhouse Trail. The TrafX counter is not located along Stark Creek Trail, but along an informal (not maintained by SCE or the Forest Service) trail near the base of Stark Creek Road that provides direct access up to the Stark Creek Trail. The location for the TrafX counter was chosen with the intention of capturing the greatest number of trail users. The informal trail where the counter is located extends from the base of Stark Creek Road to the middle of Stark Creek Trail and provides a significantly more efficient route to access the Stark Creek Trail than heading up Stark Creek Road (0.82 mile) before heading south along the trail. Because of its location, users that walked or biked up Stark Creek Road as an alternative to using the informal trail are not captured by the TrafX counter data (however self-survey forms indicate some recreation users did travel up Stark Creek Road).

Trail counts are not assumed to include SCE personnel at this location; SCE is able to access the Stark Creek Trail via driving up Stark Creek Road (the road is gated, prohibiting public vehicles from access). SCE personnel that use the road to access Stark Creek Trail bypass the location of the TrafX counter.

Across the dataset, the average daily trail count was 3.1, the median count was 3 and the mode was 0. Cattle frequent the area above the TrafX counter but are not usually seen at the counter location. Firefighters were observed using this location for training by survey technicians at the end of January 2025. A fire occurred on the trail mid-August 2025. Following the fire survey technicians inspected the counter to confirm functionality. While the counter was still functioning, counts on August 19-22 (four days) were removed from the dataset due to soot affecting the effectiveness of the counter to record activity.

5.2.2 Trail Use Survey Form Data Summary

The self-survey boxes were installed at Project trailheads on January 23, 2025. Between installation and January 25, 2026, survey technicians collected or received 220 survey forms representing 541 individual day users. More than half of the survey forms collected (55 percent) were collected from users of Stark Creek Trail. Table 5-24 reflects the percentage of surveys collected by project trail location. Among respondents who provided information on trail use in the last 12-months, 30 percent of previous visits were at the Stark Creek Trail; followed by 19 percent at Dougherty Creek Trail; 18 percent at Cow Flat Creek Trail; and 16 percent at the Penstock/Forebay Trail (Table 5-25).

The following bullets summarize information about trail users based on survey forms over the course of the study year.

- **Group Size:** The average group size of project trail users was two to three people.
- **Demographics:**
  - Survey respondents ranged in age from under 16 to over 70. The age group sizes varied from 7 percent (for Under 16 and 70 plus) to 18 percent (50-59 age group) of the total individual day users. Refer to Table 5-26.
  - Most respondents identified their ethnicity as White (68 percent), followed by Latino (19 percent), Asian (4 percent), other ethnicity (4 percent), and Black (2 percent). Other ethnicities listed included Native American and mixed race. Refer to Table 5-27.
  - Fifty-five percent (55 percent) of respondents indicated their total household income was above $81,000, while approximately 27 percent indicated their household income was between $41,000 and $80,000, and approximately 15 percent indicated their household income was less than $40,000. Refer to Table 5-28.
  - Ninety-one percent (91 percent) of respondents indicated a home zip code within California. Seventy-two percent (72 percent) indicated a home zip code within the Bakersfield area (available zip codes 93301-93390). Two percent (2 percent) of respondents did not provide a home zip code.
- **User Activities:** Hiking or walking was described as 89 percent of respondents' main activity; followed by biking (2 percent), hiking with the purpose of birdwatching (1 percent) and no response on activity (8 percent). The average length of time respondents planned to use the trail was 2.4 hours. Sixteen percent (16 percent) of respondents reported using project trails to access another trail. Respondents reported visiting project trails in the last 12 months, most frequently during the spring (31 percent of visits), followed by the winter (27 percent of visits) and the fall (25 percent of visits). Fewer respondents indicated they used the project trails in the summer (17 percent of visits).

- **Trail Experience:** Most respondents rated their experience on their current trail as the same, better, or much better compared to other trails along the lower Kern River, regardless of which of the five trails they were on. Nineteen percent (19 percent) of respondents rated their experience on the trail as worse compared to other trails on the lower Kern River. Respondents consistently stated the reason for their rating was related to wanting more maintenance of and access to other trails on the lower Kern River. Eighty-nine percent (89 percent) of respondents would consider returning to the trail they accessed, and 9 percent of respondents did not answer whether they would return to the trail they accessed. Fifty-four percent (54 percent) of respondents would recommend improvements for the trail they accessed.

- **Purpose of Visit:** Twenty percent (21 percent) of respondents did not state what their main purpose of visit was. The most frequent reported main purpose was exercise (26 percent), followed by scenery or wildlife viewing (25 percent). For their secondary purpose of visit, most respondents stated exercise, scenery/wildlife viewing, and or time with family and friends (73 percent). Table 5-29 shows the primary purpose of respondents' visits by percent.

- **Surrounding Landscapes:** More than half of all respondents selected general scenery as the main scenic feature that attracted them to their trail of choice (53 percent), followed by scenic views (19 percent). In general, most respondents (80 percent) rated the scenic quality of the area as seen from the trail as good or very good.

5.2.3 Impressions of Use

During a REC TWG[9] Meeting on April 24, 2025, SCE reminded attendees of SCE's interest in collecting information about observations of trail use from individuals familiar with the area. SCE followed-up with an email to the REC TWG on April 29, 2025 requesting that TWG members familiar with the trails in the area indicate their interest in sharing their impressions and/or share contact information of others they know familiar with the area who would be interested in sharing their impressions. SCE sent a reminder email regarding the request to the REC TWG on May 14, 2025. No stakeholders responded to the email or otherwise reached out to share impressions of trail use.[10]

5.3 FUTURE RECREATION USE AND DEMAND

The Forest Service's National Visitor Use Monitoring (NVUM) program has two goals: (1) produce estimates of the volume of recreation visitation to national forests and grasslands and (2) produce descriptive information about that visitation, including activity

[9] The REC TWG includes individuals who work for government agencies including the Sequoia National Forest, National Park Service, and State Water Resources Control Board; individuals affiliated with groups and non-profit organizations, including American Rivers, Kern River Boaters and the Kern Gateway Trail Committee; individuals who are members of Tribal Nations; and individuals who are otherwise interested in the relicensing Project and/or the recreation opportunities (including angling opportunities) in the vicinity of the lower Kern River.

[10] SCE decided not to include SCE personnel familiar with the area (e.g. civil crews who regularly use the trails for operation and maintenance) to avoid potential conflicts of interest.

participation, demographics, visit duration, measures of satisfaction, and trip spending connected to the visit (Forest Service 2025a). The most recent visitor use report for the SQF (January 11, 2025) summarizes data collected during fiscal year 2016 (Forest Service 2025b). The following is a summary of results of that report.

Total visits to the SQF in fiscal year 2016 are estimated at approximately 777,000 individuals. Many people frequent more than one site during their visit, so estimates are further broken down by site visits. Site visits in 2016 totaled approximately 1.0 million. Compared to prior SQF NVUM data (available for 2006 and 2011) the total number of visits to the SQF increased over the decade (2006–2016) by approximately 21 percent (Forest Service 2022) and sets trend expectations that the number of forest visits will continue to rise over time. This expectation is supported by population growth projections for Kern County, where most visitors to the lower Kern River area originate (per data collected during the REC 2 study 69 percent of visitors to day-use sites and 72 percent of trail users are local to Kern County). Recent demographic forecasts suggest a modest increase in population of the county over the next quarter century. The household population of Kern County in 2024 was 890,000. This number is projected to increase to 998,000 by 2050, a 12 percent growth rate (Kern Council of Governments 2024). As such, it is reasonable to assume that the number of individuals heading to the lower Kern River canyon to recreate will also continue to grow moderately over time.

In 2016 the most frequented site or area associated with the SQF was general forest area (609,000 visits), followed by overnight use developed (223,000 visits), day-use developed (189,000 visits), and designated wilderness (25,000 visits). Site visits are further broken down by each activity in which the individual participated during that visit. The most common activities selected by survey participants were hiking/walking, relaxing, viewing natural features, and driving for pleasure. Of those, hiking/walking was chosen the most frequently as the main activity by survey participants.

5.3.1 Meeting Public Recreation Needs in the Vicinity of the Project

The three developed day-use areas along the bypass reach and the raft take-out site on the impoundment (four day-use sites in total) currently provide capacity to meet present recreation demands. REC 2 study results show that even on summer holiday weekends no site reached parking capacity and that, on average, only about 15 percent of available parking was occupied on monitored days (at least two weekend days and two weekdays each month from April 2024 through May 2025). Likewise, based on REC 2 survey data collected trails in the vicinity of the Project have light recreation use: use along Project trails averaged only one to three users per trail per day over the study period, indicating that current capacity is adequate and overuse is not an issue. As such, recreation amenities in the vicinity of the Project are adequate to meet current demand and foreseeable future demand (e.g., associated with a 12 percent increase in Kern County's population by 2050).

5.4 PUBLIC SAFETY

SCE maintains a Public Safety Plan for the Project that identifies the location of public safety measures and signage at Project facilities. The goal of the plan is to reduce the potential for any accidents near or within locations where SCE facilities are present. Key safety features identified in the plan were observed to be in working order during the 2024 and 2025 field seasons and include the following:

- In the area of Democrat Dam:
  - Chain link fences around the intake and sandbox and locked gates at the entry points to the intake flume walkway
  - Orange flotation boom barriers (boat barrier) in the impoundment 300 feet upstream from the dam (spanning 175 feet across the Kern River)
  - Emergency safety ropes parallel to the boat barrier. These ropes are suspended across the river 15 feet above the normal water line with cables and ropes that extend into the water
  - Signs discourage trespassing and warn of dangers associated with the drain vortex (at the intake), spillway, and tunnel
- In the area of the Forebay:
  - Chain link fences around the forebay infrastructure and locked gates at the entrance
  - Signs discourage trespassing and warn of potential water release dangers
- In the area of the Powerhouse:
  - Chain link fences around the Powerhouse and parking area and locked gates at the entrance
  - All buildings at the Powerhouse and Forebay Operations Area (across SR-178 from the Powerhouse) are locked
  - Signs discourage trespassing, and warn of the dangers associated with high voltage, loud noise, and alarms
- In the area of the Stark Flume:
  - A handrail is provided on both sides of the walkway adjacent to the flume
  - Signs discourage trespassing and warn of dangers associated with the flume infrastructure

- In the area of the Cow Creek Flume:
  - A handrail is provided on both sides of the walkway adjacent to the flume
  - Signs discourage trespassing and warn of dangers associated with the flume infrastructure

In addition, SCE maintains an Emergency Action Plan (EAP) for the Kern River No. 1 Forebay, Adit 17/18, and Stark Flume pursuant to 18 CFR § 12.20(a). The Project forebay is classified by FERC as having "significant" hazard potential due to the possibility for disruption of an important transportation artery (SR-178) in the event of an uncontrolled release of water. Democrat Dam is classified by FERC as having a "low" hazard potential. As such, SCE is exempt from filing an EAP for Democrat Dam.

The EAP defines responsibilities and provides procedures designed to identify unusual and unlikely conditions which may endanger the Project infrastructure. The EAP is intended to provide procedures to take mitigative action and to notify the appropriate emergency management officials of possible, impending, or actual failure of infrastructure. The plan may also be used to provide notification when flood releases can create major flooding.

There are no known records of injury or death to the public within the Project boundary within the last 10 years.

6.0 STUDY SPECIFIC CONSULTATION

The following study-specific consultation was conducted:

- **Day use area intercept survey form and Project Trail survey form:** In collaboration with the Recreation TWG, SCE developed survey forms (in English and Spanish) to collect information from (1) day users at developed and undeveloped river access points and (2) from visitors utilizing the select Project trails. Refer to Appendix A for the day use and Project trail survey forms.

- **Identification of undeveloped river access points to survey:** In collaboration with the Recreation TWG, SCE confirmed five undeveloped river access points along SR-178 at which to conduct vehicle counts and opportunistic in-person intercept surveys.

- **Survey boxes.** SCE received approval from the Forest Service to install survey boxes at each of the developed recreation sites and at trailheads on December 16, 2024 (refer to Appendix B). In collaboration with the Recreation TWG SCE confirmed the five trailheads at which to install the survey boxes.

- **Trail cameras**: SCE received approval from the Forest Service to install infrared trail cameras (model used were the TrafX trail counters) to monitor activity on the five Project trails on October 22, 2024 (refer to Appendix B).

7.0 OUTSTANDING STUDY PLAN ELEMENTS

The Recreation Facility Use Assessment is complete. There are no outstanding study elements.

8.0 REFERENCES

FERC (Federal Energy Regulatory Commission). 2024. Study Plan Determination for the Kern River No. 1 Hydroelectric Project. March 14.

Forest Service (United States Forest Service). 2022. Final Environmental Impact Statement for Revision of the Sequoia and Sierra National Forests Land Management Plans, Pre-objection Version. R5-MB-327-A. U.S. Department of Agriculture, Forest Service, Pacific Southwest Region. Available online: https://www.fs.usda.gov/project/?project=3375. Accessed October 2022.

———. 2025a. Forest Service – National Use Visitor Monitoring Program, webpage. Accessed September 2025. Available online: https://www.fs.usda.gov/about-agency/nvum.

———. 2025b. Forest Service – Visitor Use Report, Sequioa National Forest, National Visitor Use Monitoring Data collected FY 2016.

Kern Council of Governments. 2024. Regional Growth Forecast and Demographic Forecast, 2024-2050. Prepared by Placeworks for the Kern Council of Governments, April 18, 2024. Available online: https://www.kerncog.org/estimates-and-projections/.

SCE (Southern California Edison). 2024. Kern River No. 1 Hydroelectric Project (FERC Project No. 1930) Revised Study Plan. February 13.

TABLES

Table 5-1. Average Number of Vehicles Parked Per Day by Month

Month (May 2024–April 2025)	Average Number Vehicles Counted Per Day
May	19
June	23
July	16
August	20
September	20
October	22
November	9
December	8
January	9
February	8
March	10
April	9

Source: Survey data collected from May 2024 to April 2025.
Note: Average excludes vehicles counted during holiday weekend days.

Table 5-2. Number of Parked Vehicles by Site on Weekends, Including Informal Parking Spots

Month (May 2024–April 2025)	Total Vehicles	Site								
		Dem	URB	LRB	LO	RS1	RS2	RS3	RS4	RS5
May	49	4	25	5	1	3	4	0	7	0
June	64	13	19	11	4	0	0	6	6	5
July	50	11	17	6	3	5	2	1	1	4
August	57	11	17	9	5	0	2	4	4	5
September	48	11	18	8	4	0	0	1	4	2
October	50	17	20	4	2	0	0	0	3	4
November	19	9	5	0	0	1	1	0	2	1
December	19	6	4	0	0	2	4	0	0	3
January	21	3	6	0	2	1	1	2	5	1
February	20	4	5	1	1	1	1	1	5	1
March	22	6	8	3	1	0	1	0	0	3
April	24	3	2	4	0	0	4	2	0	9
May 2024–April 2025 Weekend Totals	**443**	**98**	**146**	**51**	**23**	**13**	**20**	**17**	**37**	**38**

Source: Survey data collected from May 2024 to April 2025.
Note: Three cars with boat racks were observed on weekends from May 2024-April 2025. Two at Democrat and one at River Access Site 4.
Key: Dem = Democrat Raft Take-out Boating Site
URB = Upper Richbar Day Use
LRB = Lower Richbar Day Use
LO = Live Oak Day Use
RS1 = River Access Site 1
RS2 = River Access Site 2
RS3 = River Access Site 3
RS4 = River Access Site 4
RS5 = River Access Site 5

Table 5-3. Number of Parked Vehicles by Site on Weekdays, Including Informal Parking Spots

Month (May 2024-April 2025)	Total Vehicles	Site								
		Dem	URB	LRB	LO	RS1	RS2	RS3	RS4	RS5
May	25	3	6	1	1	10	2	0	2	0
June	29	13	8	3	1	0	0	0	2	2
July	14	4	5	3	2	0	0	0	0	0
August	21	4	6	4	0	1	0	1	2	3
September	30	9	6	3	2	0	1	2	4	3
October	36	10	18	2	2	0	2	1	0	1
November	16	3	6	0	0	1	2	1	1	2
December	14	3	3	0	0	0	1	2	1	4
January	16	4	5	1	1	1	0	1	1	2
February	13	3	5	0	0	2	0	0	2	1
March	17	1	8	0	0	0	0	2	3	3
April	10	0	7	0	0	0	0	1	2	0
May 2024–April 2025 Weekday Totals	**241**	**57**	**83**	**17**	**9**	**15**	**8**	**11**	**20**	**21**

Source: Survey data collected from May 2024 to April 2025.
Note: Three cars with boat racks were observed on weekdays from May 2024-April 2025. One at Democrat and two at Upper Richbar.
Key: Dem = Democrat Raft Take-out Boating Site
URB = Upper Richbar Day Use
LRB = Lower Richbar Day Use
LO = Live Oak Day Use
RS1 = River Access Site 1
RS2 = River Access Site 2
RS3 = River Access Site 3
RS4 = River Access Site 4
RS5 = River Access Site 5

Table 5-4. Number of Parked Vehicles by Site on Holidays, Including Informal Parking Spots

Holiday	Total Vehicles	Site								
		Dem	URB	LRB	LO	RS1	RS2	RS3	RS4	RS5
Memorial Day Weekend (Saturday, May 25, 2024)	70	10	36	4	4	4	2	0	3	7
Fourth of July Holiday (Thursday, July 4, 2024)	79	30	30	9	3	1	0	0	3	3
Labor Day Weekend (Monday, September 2, 2024)	31	11	12	3	0	4	0	1	0	0
Holiday Totals	**180**	**51**	**78**	**16**	**7**	**9**	**2**	**1**	**6**	**10**

Source: Survey data collected from May 2024 to April 2025.
Note: One car with a boat rack was observed on July 4, 2024 at Democrat.
Key: Dem = Democrat Raft Take-out Boating Site
URB = Upper Richbar Day Use
LRB = Lower Richbar Day Use
LO = Live Oak Day Use
RS1 = River Access Site 1
RS2 = River Access Site 2
RS3 = River Access Site 3
RS4 = River Access Site 4
RS5 = River Access Site 5

Table 5-5. Percentage of Available Parking Filled at Democrat Raft Take-Out Boating Site (22 Parking Spots)

	Weekends	Weekdays	Holidays
Average Percentage of Parking Filled	9%	4%	21%
Maximum Percentage of Parking Filled	36%	14%	73%

Source: Survey data collected from May 2024 to April 2025.

Table 5-6. Percentage of Available Parking Filled at Upper Richbar Day Use Area (42 Parking Spots)

	Weekends	Weekdays	Holidays
Average Percentage of Parking Filled	7%	3%	26%
Maximum Percentage of Parking Filled	36%	10%	55%

Source: Survey data collected from May 2024 to April 2025.

Table 5-7. Percentage of Available Parking Filled at Lower Richbar Day Use Area (11 Parking Spots)

	Weekends	Weekdays	Holidays
Average Percentage of Parking Filled	8%	3%	21%
Maximum Percentage of Parking Filled	55%	27%	64%

Source: Survey data collected from May 2024 to April 2025.

Table 5-8. Percentage of Available Parking Filled at Live Oak Day Use Area (16 Parking Spots)

	Weekends	Weekdays	Holidays
Average Percentage of Parking Filled	2%	1%	6%
Maximum Percentage of Parking Filled	13%	6%	19%

Source: Survey data collected from May 2024 to April 2025.

Table 5-9. Percentage of Available Parking Filled at Undeveloped River Access Points Along SR-178 (cumulative)

	Weekends	Weekdays	Holidays
Average Percentage of Parking Filled	14%	8%	27%
Maximum Percentage of Parking Filled	133%	250%	150%

Source: Survey data collected from May 2024 to April 2025.
Note: Among the five undeveloped river access points along SR-178, there is an estimated capacity for 25 vehicles to park. Parking capacity estimates were surpassed at River Access Site 1 (parking capacity 2 vehicles) and River Access Site 3 (parking capacity 3 vehicles) on some survey days.

Table 5-10. Number of Respondents that Participated in the Survey by Day Use Site

Democrat Raft Take-out Boating Site		Upper Richbar Day Use Area		Lower Richbar Day Use Area		Live Oak Day Use Area	
People	**Percent**	**People**	**Percent**	**People**	**Percent**	**People**	**Percent**
547	41%	523	40%	151	11%	101	8%

Source: Survey data collected from May 2024 to January 2026.

Table 5-11. Number of Respondents that Participated in the Survey by River Access Site

River Access Site 1		River Access Site 2		River Access Site 3		River Access Site 4		River Access Site 5	
People	**Percent**	**People**	**Percent**	**People**	**Percent**	**People**	**Percent**	**People**	**Percent**
7	7%	11	11%	19	19%	34	33%	30	30%

Source: Survey data collected from May 2024 to April 2025. Data on River Access only collected by survey technicians.

Table 5-12. Day User Age Distribution by Percent

U16	16-19	20-29	30-39	40-49	50-59	60-69	70+
12%	8%	14%	24%	23%	14%	4%	1%

Source: Survey data collected from May 2024 to January 2026.

Table 5-13. Day User Ethnicity by Percent

Latino	White	Asian	Black	Other (Mixed Ethnicity)
45.8%	47.0%	5.3%	0.1%	1.8%

Source: Survey data collected from May 2024 to January 2026.

Table 5-14. Day User Total Household Income by Percent

Less than $40,000	$41,000-$80,000	$81,000 and above	Did not respond
20%	65%	14%	1%

Source: Survey data collected from May 2024 to January 2026.

Table 5-15. Day User Primary Recreation Activity

Type of Activity	Percentage of Day Users Participating in Activity	Number of Day Users Participating in Activity
Picnicking	39%	520
Fishing	20%	260
Hiking/Walking/Trail use	19%	257
Scenic Driving	15%	193
Whitewater boating/rafting	3%	37
Swimming/wading	1%	26
Viewing Wildlife	1%	20
No Response	1%	14

Source: Survey data collected from May 2024 to January 2026.

Table 5-16. Day User Satisfaction by Percent

Category	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
Overall satisfaction of your trip	0.9%	0.5%	0.9%	65.0%	32.7%
Satisfaction of your primary activity	0.7%	0.5%	1.1%	54.9%	42.8%
Cost of facility access fee	0.9%	0.7%	6.9%	58.9%	32.6%
River access	0.5%	1.1%	4.3%	61.0%	33.1%
Number of people encountered/crowdedness	0.7%	0%	4.8%	63.4%	31.1%
Available parking when you arrived	0.9%	0.5%	1.2%	62.5%	34.9%
Feeling of safety	0.7%	0.5%	2.8%	68.9%	27.1%
Adequacy of site access for persons with disabilities	1.1%	0.7%	10.2%	60.3%	27.7%
Scenery at this site/area	1.2%	0.2%	2.3%	64.6%	31.7%
Maintenance (physical condition) of facilities	1.8%	2.1%	24.9%	48.4%	22.8%
Cleanliness of facilities	1.4%	4.4%	28.6%	43.5%	22.1%
Access to restrooms, shower, and drinking water	1.2%	1.6%	17.9%	60.0%	19.3%
Informational/educational opportunities	1.4%	0.5%	14.4%	65.6%	18.1%
Flows in the river	0.2%	0.5%	4.9%	71.8%	22.6%

Source: Survey data collected from May 2024 to January 2026.

Table 5-17. Anglers' Tackle Type by Percent

Spin Fish with Lures	Spin Fish with Bait	Fly Fish
35%	40%	25%

Source: Survey data collected from May 2024 to January 2026.

Table 5-18. Fishing Frequency by Season

Spring (March–May)	Summer (June–August)	Fall (September–November)	Winter (December–February)
28%	9%	33%	30%

Source: Survey data collected from May 2024 to January 2026.

Table 5-19. Primary Reason for Fishing by Percentage

Food	Fun
38%	62%

Source: Survey data collected from May 2024 to January 2026.

Table 5-20. Whitewater Boating Responses

Survey Date	Recorded Primary Activity	Location	Group Size
6/25/24	Whitewater boating or rafting	Democrat Raft Take-out Boating Site	28
6/30/24	Whitewater boating or rafting	Democrat Raft Take-out Boating Site	9
7/5/25	Whitewater boating or rafting	Democrat Raft Take-out Boating Site	7
7/18/25	Whitewater boating or rafting	Democrat Raft Take-out Boating Site	4
7/18/25	Whitewater boating or rafting	Democrat Raft Take-out Boating Site	4

Source: Survey data collected from May 2024 to January 2026.

Table 5-21. Monthly Trail Counts by Project Trail

Month	Democrat Gage Trail	Cow Flat Creek Trail	Lucas Creek Trail	Dougherty Creek Trail	Stark Creek Trail
November 2024	24	45	18	19	7
December 2024	74	123	48	61	32
January 2025	111	177	53	62	40
February 2025	175	54	74	152	64
March 2025	249	141	138	200	117
April 2025	106	61	24	174	78
May 2025	39	94	53	211	52
June 2025	40	129	54	137	56
July 2025	43	57	29	98	19
August 2025	83	37	24	33	13
September 2025	33	27	10	55	30

Month	Democrat Gage Trail	Cow Flat Creek Trail	Lucas Creek Trail	Dougherty Creek Trail	Stark Creek Trail
October 2025	116	55	38	45	37
November 2025	57	35	51	34	12

Source: TrafX trail counts from November 15, 2024-November 23, 2025 (374 days).

Table 5-22. Project Trail Counts by Month

November 2024 to November 2025	Number of Counts on Project Trails
November 2024	113
December 2024	338
January 2025	443
February 2025	519
March 2025	845
April 2025	443
May 2025	449
June 2025	416
July 2025	246
August 2025	190
September 2025	155
October 2025	291
November 2025	189

Source: TrafX trail counts from November 15, 2024-November 23, 2025 (374 days).

Table 5-23. Project Trail Weekend vs Weekday Total Counts and Averages by Project Trail

Trail	Total Counts		Average Counts	
	Weekend	Weekday	Weekend	Weekday
Democrat Gage Trail	129	428	1.2	1.6
Cow Flat Creek Trail	541	740	5.0	2.8
Lucas Creek Trail	225	389	2.1	1.5
Dougherty Creek Trail	363	672	3.4	2.5
Stark Creek Trail	624	526	5.8	2.0

Source: TrafX trail counts from November 15, 2024-November 23, 2025 (374 days).

Table 5-24. Percentage of Survey Forms Collected by Location

Democrat Gage Trail	Cow Flat Creek Trail	Lucas Creek Trail	Dougherty Creek Trail	Stark Creek Trail
1%	17%	12%	15%	55%

Source: Survey data collected from January 2025 to January 2026.

Table 5-25. Previous Visits in the Last 12 Months by Trail (Self-Reported)

Democrat Gage Trail	Cow Flat Creek Trail	Lucas Creek Trail	Dougherty Creek Trail	Stark Creek Trail	Penstock/Forebay Trail
6%	18%	11%	19%	30%	16%

Source: Survey data collected from January 2025 to January 2026.

Table 5-26. Trail User Age Distribution by Percent

U16	16-19	20-29	30-39	40-49	50-59	60-69	70+
7%	9%	12%	17%	15%	18%	15%	7%

Source: Survey data collected from January 2025 to January 2026.

Table 5-27. Trail User Ethnicity by Percent

Latino	White	Asian	Black	Other Ethnicity
19%	68%	4%	2%	4%

Source: Survey data collected from January 2025 to January 2026.

Table 5-28. Trail User Total Household Income by Percent

Less than $40,000	$41,000-$80,000	$81,000 and above	Did not respond
15%	27%	55%	3%

Source: Survey data collected from January 2025 to January 2026.

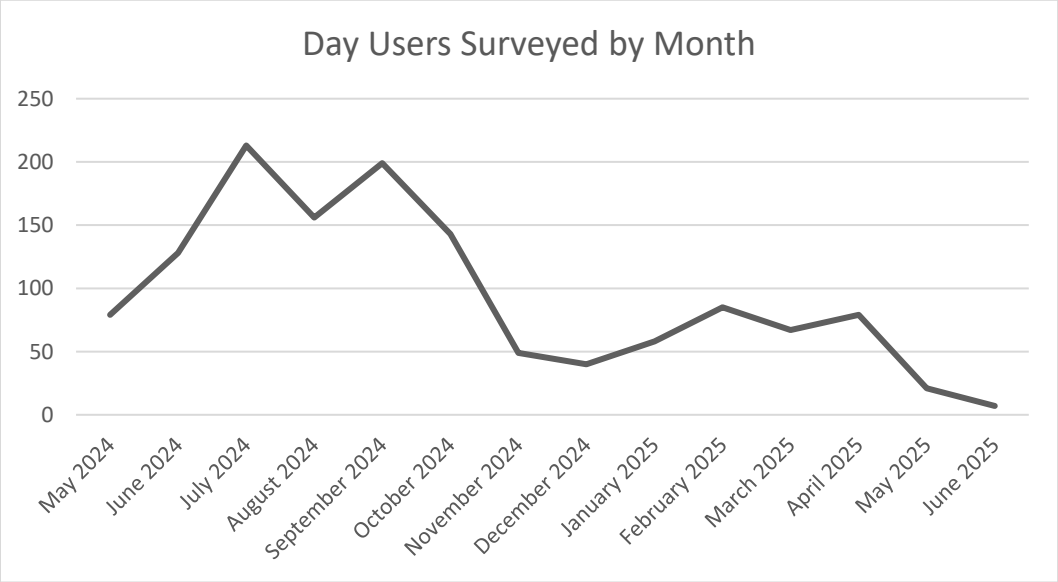
Table 5-29. Trail User Primary Visit Purpose

Primary Purpose of Visit	Percent of Trail Users
Exercise	26%
Viewing scenery/wildlife	25%
Spending time friends/family	13%
Exploring new areas/trails	11%
River access (Democrat Gage Trail only)	0.4%
Other	5%
No response to primary purpose	21%

Source: Survey data collected from January 2025 to January 2026.

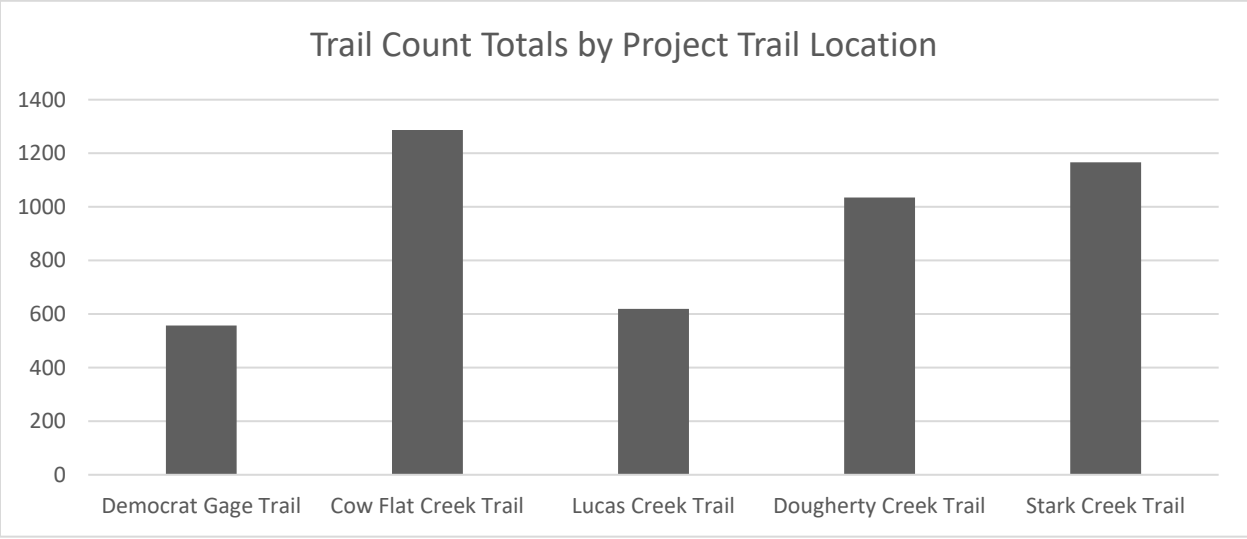
FIGURES

Figure 5-1. Day Users Surveyed by Month, May 2024-January 2026



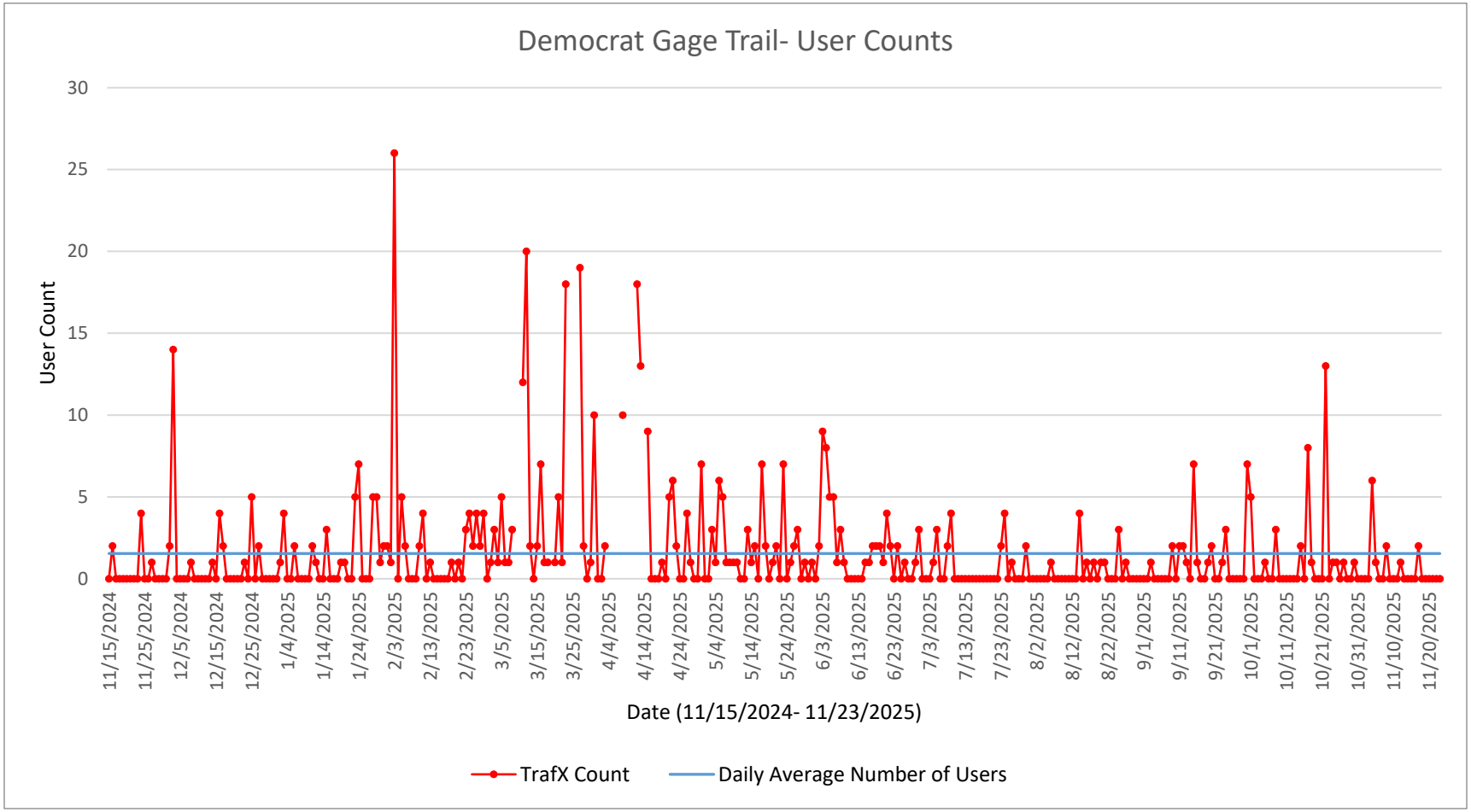
Source: Data collected via the intercept in-person survey process from May 2024 to April 2025, and from QR codes or physical forms January 2025 through January 2025.

Figure 5-2. TrafX Trail Count Totals by Project Trail, November 15, 2024-November 23, 2025 (374 days)



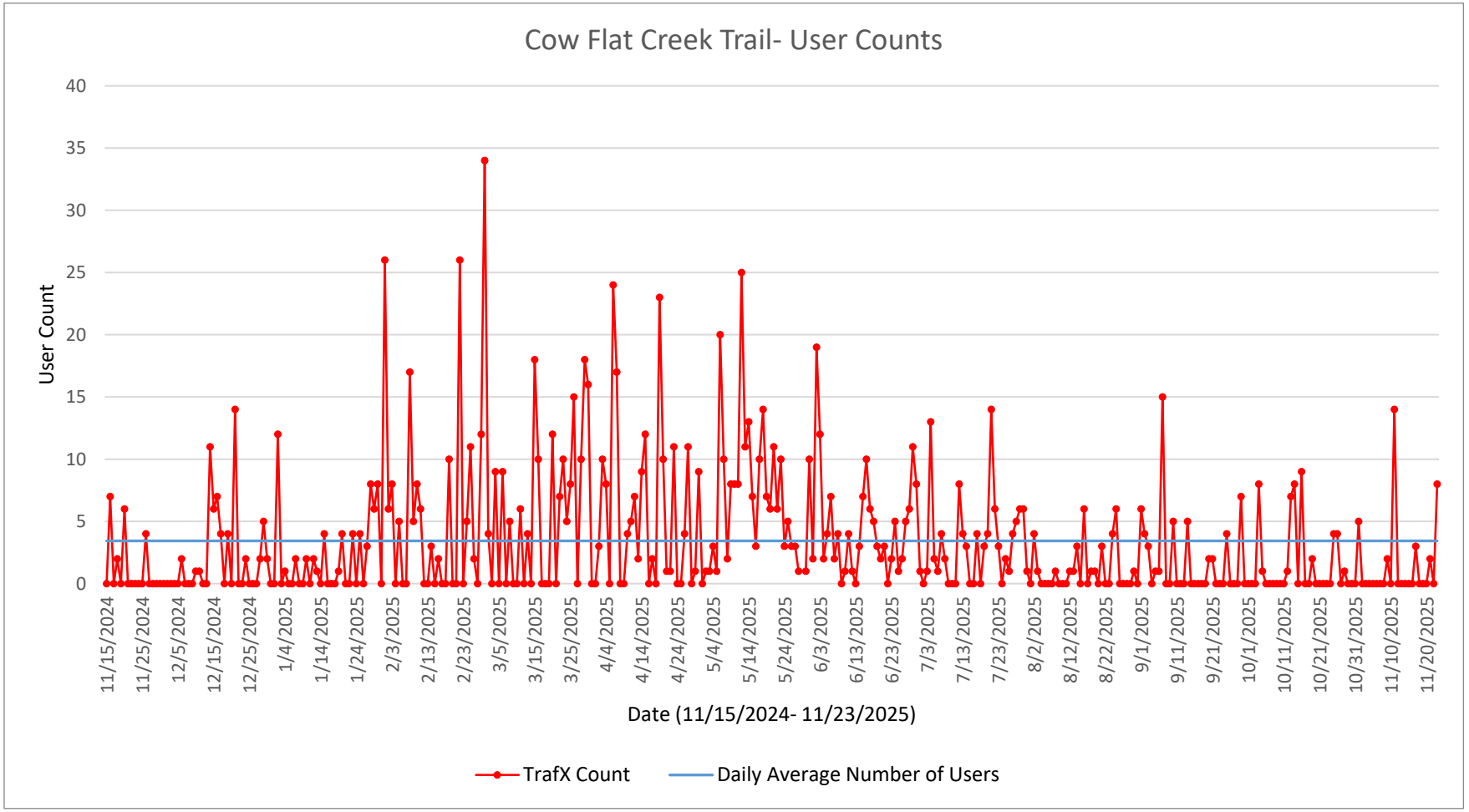
Source: TrafX trail counts from November 15, 2024-November 23, 2025 (374 days).

Figure 5-3. TrafX Counts at Democrat Gage Trail November 15, 2024-November 23, 2025



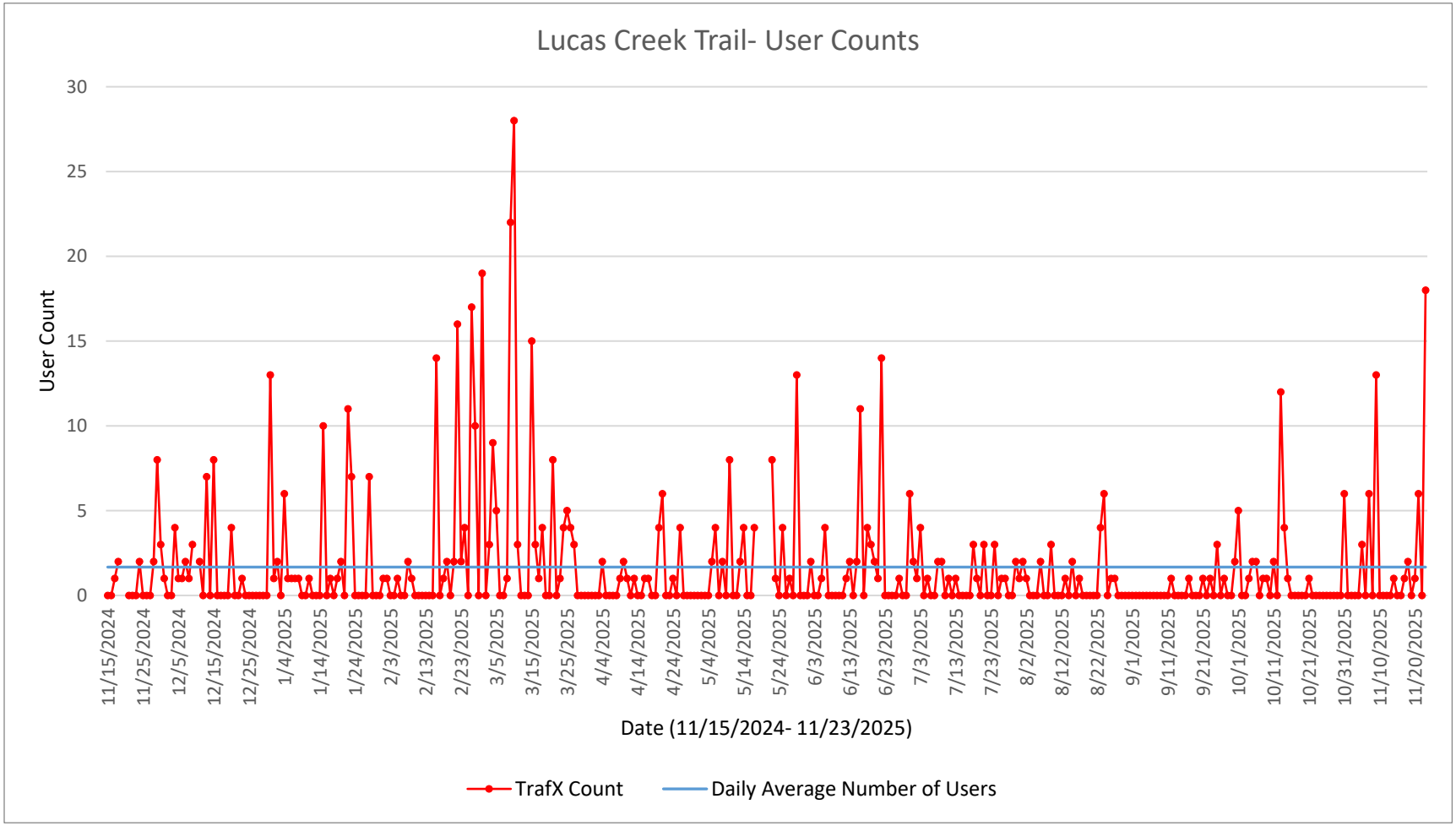
Source: TrafX trail counts from November 15, 2024- November 23, 2025 (374 days).
Note: Democrat Gage Trail does not provide a round-trip route—each user is expected to pass the TrafX counter twice during a visit, therefore, two counts should be interpreted as representing one individual. Trail counts include SCE personnel. On average, six to 12 SCE personnel use the trail each month. During a single visit, SCE personnel may pass the counter multiple times.

Figure 5-4. TrafX Counts at Cow Flat Creek Trail November 15, 2024-November 23, 2025



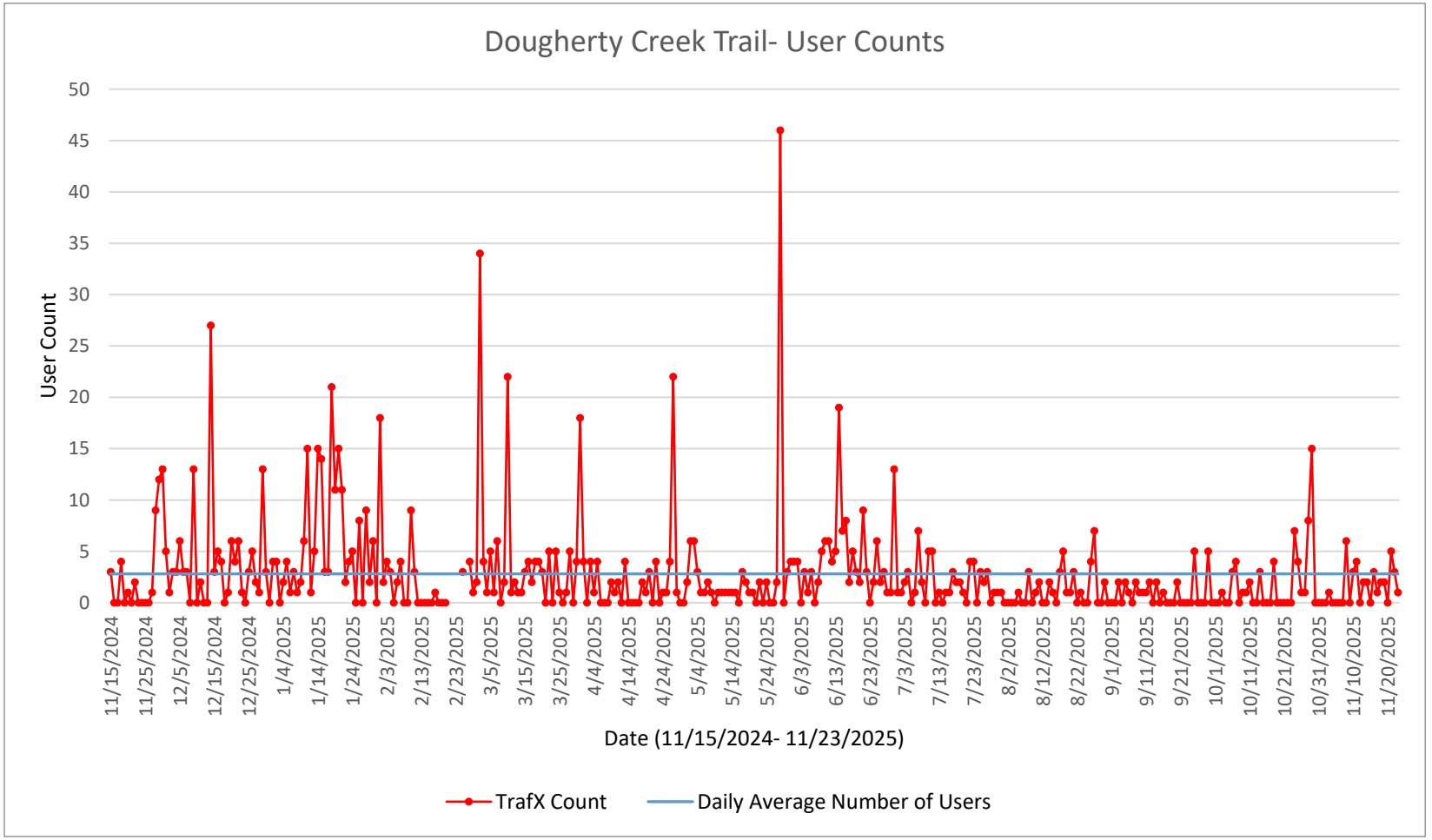
Source: TrafX trail counts from November 15, 2024-November 23, 2025 (374 days).
Note: Cow Flat Creek Trail is not strictly an out-and-back trail, however it is likely that many users hiked up the trail and then back down during a single day, therefore, two counts should often be interpreted as representing one individual. Trail counts include SCE personnel who use the trail. Approximately four to 10 SCE personnel use the Cow Flat Creek Trail a month. During a single visit, SCE personnel may pass the counter multiple times.

Figure 5-5. TrafX Counts at Lucas Creek Trail November 15, 2024-November 23, 2025



Source: TrafX trail counts from November 15, 2024-November 23, 2025 (374 days).
Note: Lucas Creek Trail is not strictly an out-and-back trail, however it is likely that many users hiked up the trail and then back down during a single day, therefore, two counts should often be interpreted as representing one individual. Trail counts include SCE personnel. Approximately two to six SCE personnel use the Lucas Creek Trail a month. During a single visit, SCE personnel may pass the counter multiple times.

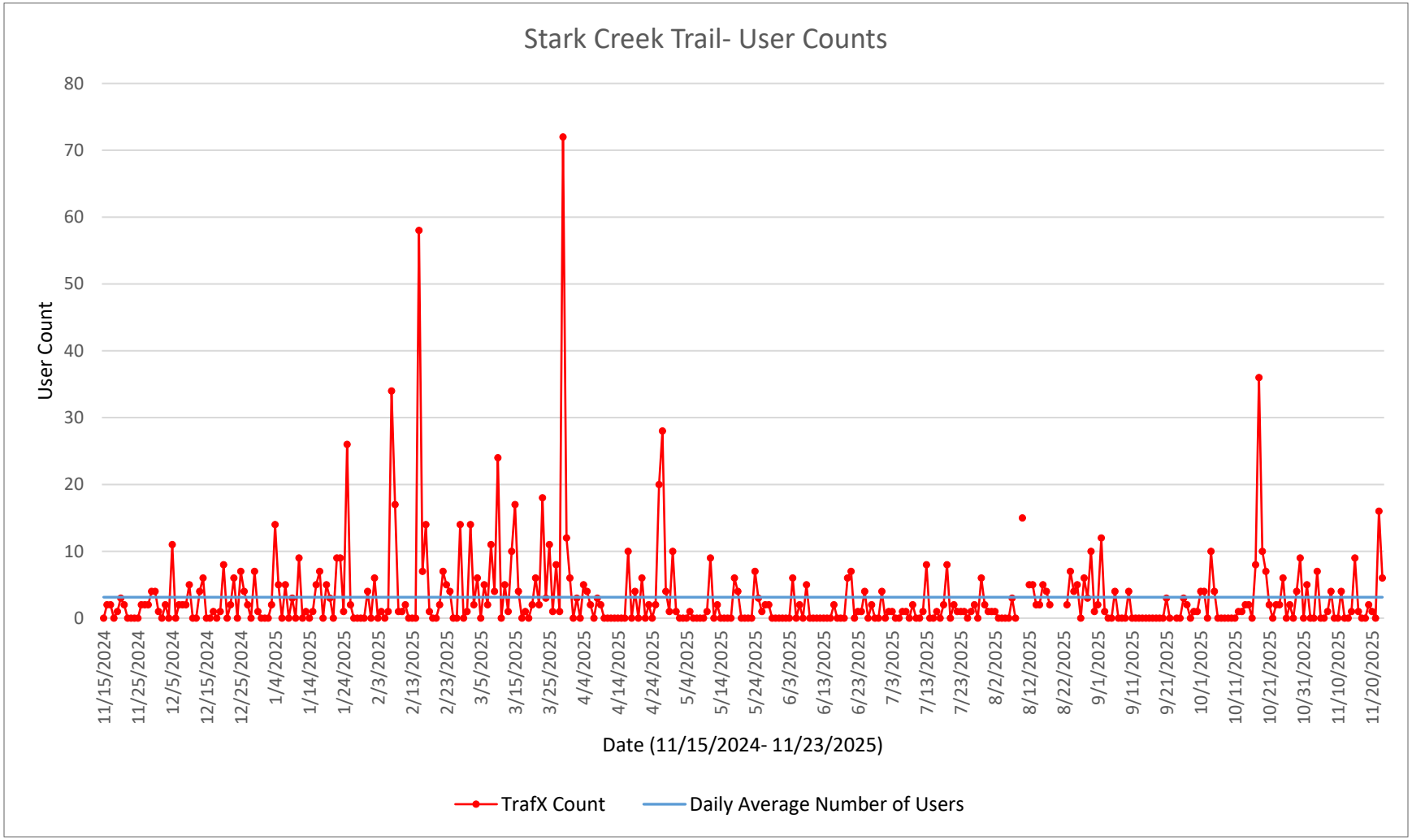
Figure 5-6. TrafX Counts at Dougherty Creek Trail November 15, 2024-November 23, 2025



Source: TrafX trail counts from November 15, 2024-November 23, 2025 (374 days).

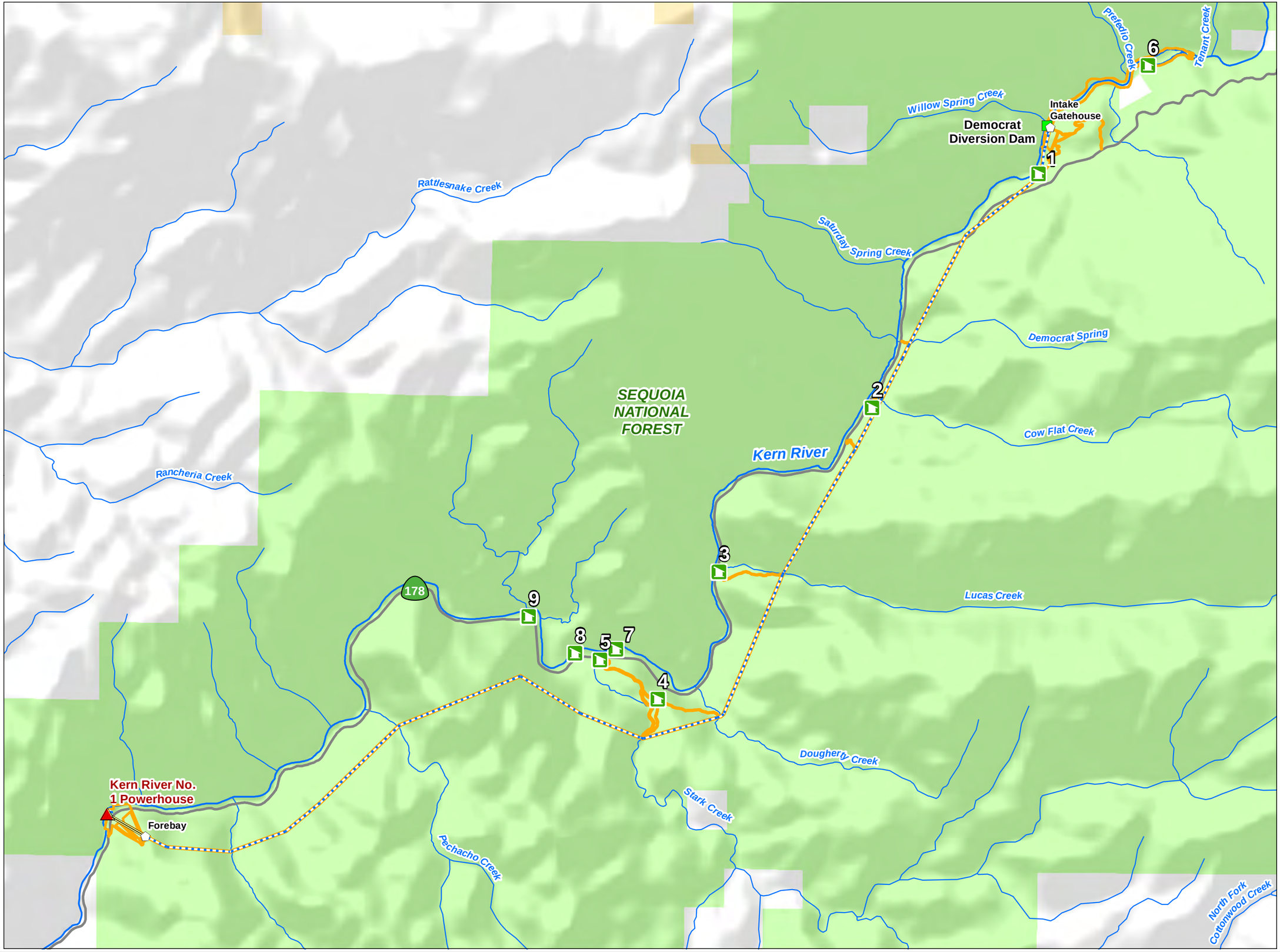
Note: Trail counts include SCE personnel. Approximately two to six SCE personnel use the Dougherty Creek Trail a month. During a single visit, SCE personnel may pass the counter multiple times.

Figure 5-7. TrafX Counts at Stark Creek Trail November 15, 2024-November 23, 2025



Source: TrafX trail counts from November 15, 2024-November 23, 2025 (374 days).
Note: Trail counts are assumed not to include SCE personnel.

MAPS



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Flowline
- Penstock
- FERC Boundary

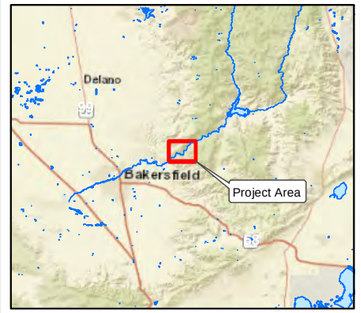
Other Features

- Watercourse
- Highway
- Self-Survey Box

Land Jurisdiction*

- U.S. Forest Service
- U.S. Bureau of Land Management
- Private (Blank)

*SOURCE: BLM 2021



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1

Location of Recreation Survey Sites

0 0.25 0.5
Miles

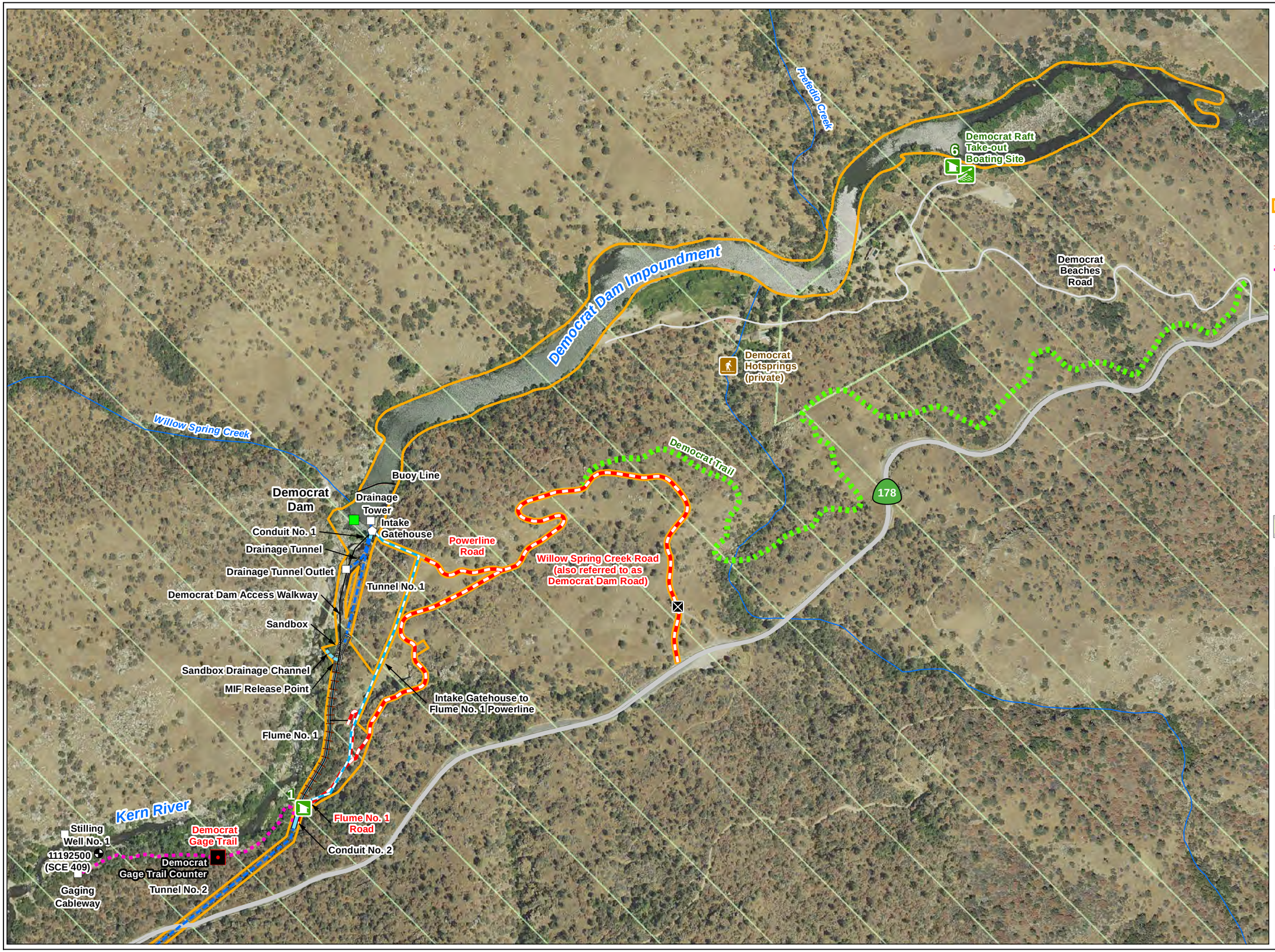
Projection: UTM Zone 11
Datum: NAD 83

Date: 8/1/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\GIS\237800343\map\Kern River 1\RecreationMaps\SCE_Kern1_SelfSurveyBoxes_17i11i_02.mxd

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication / Powerline
- FERC Boundary

Transportation

- Project Road
- Other Road
- Project Trail of Focus
- Gate

Other Features

- Watercourse
- SCE-identified Parking Areas with Potential River Access
- Self-Survey Box
- TrafX Counter

Forest Service Recreation Facilities

- Raft Takeout
- Day Use Area
- USFS System Trail

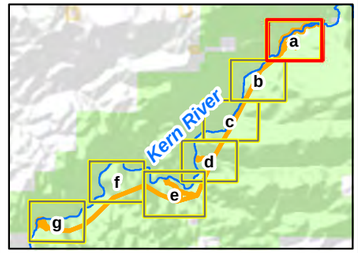
Private Recreation Facilities

- Democrat Hotsprings

Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1a

Location of Recreation Survey Sites

Date: 2/11/2026

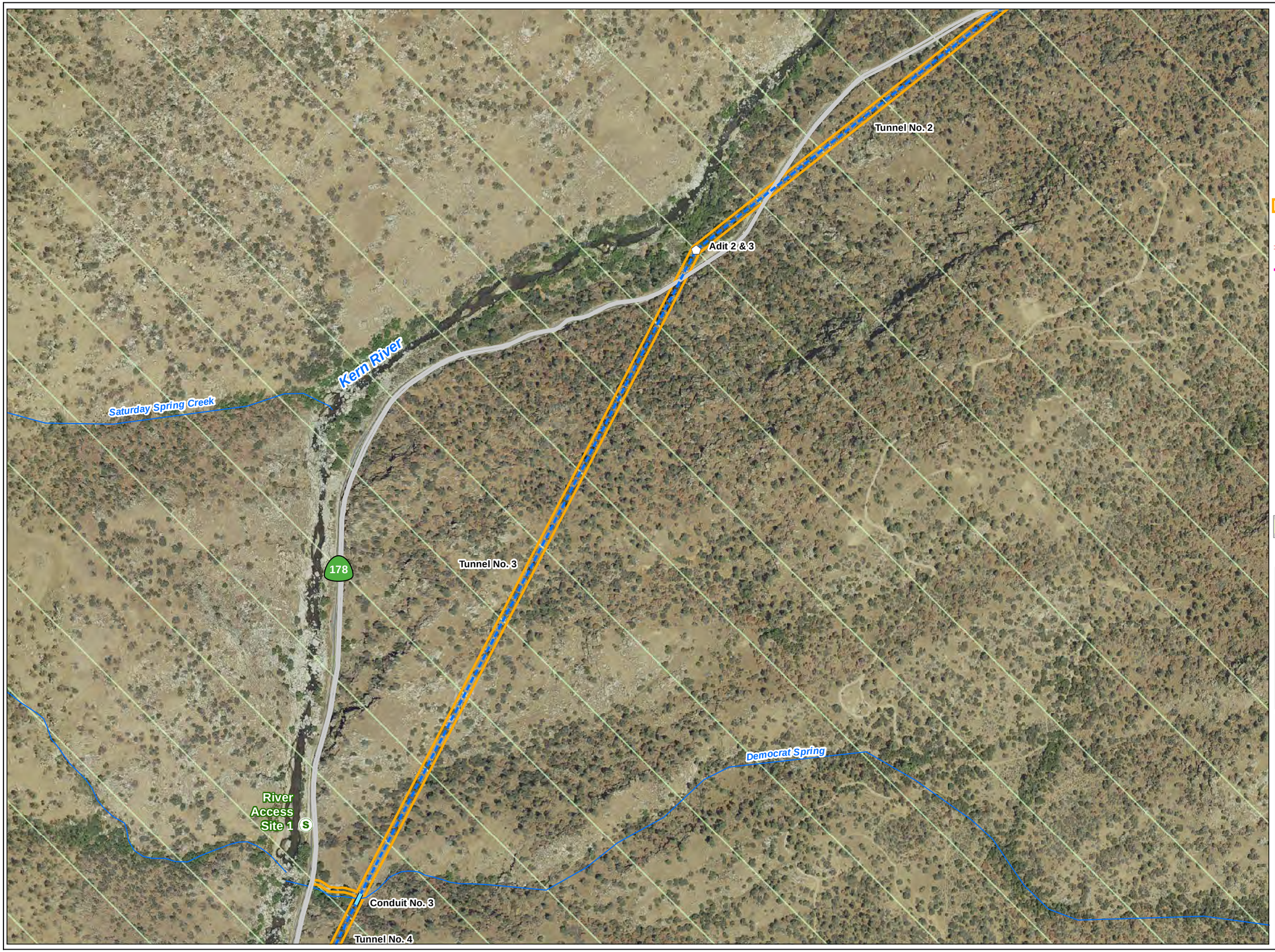
0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\GIS\237800343\map\Kern River 1\RecreationMaps\SCE_Kern1_ProjTrails_Focused_17i11i_06.mxd

Copyright 2026 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication / Powerline
- FERC Boundary

Transportation

- Project Road
- Other Road
- Project Trail of Focus
- Gate

Other Features

- Watercourse
- SCE-identified Parking Areas with Potential River Access
- Self-Survey Box
- TrafX Counter

Forest Service Recreation Facilities

- Raft Takeout
- Day Use Area
- USFS System Trail

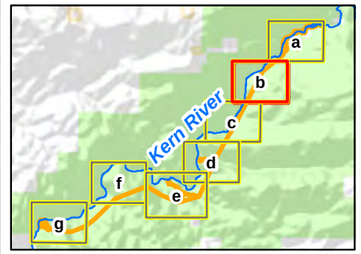
Private Recreation Facilities

- Democrat Hotsprings

Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1b

Location of Recreation Survey Sites

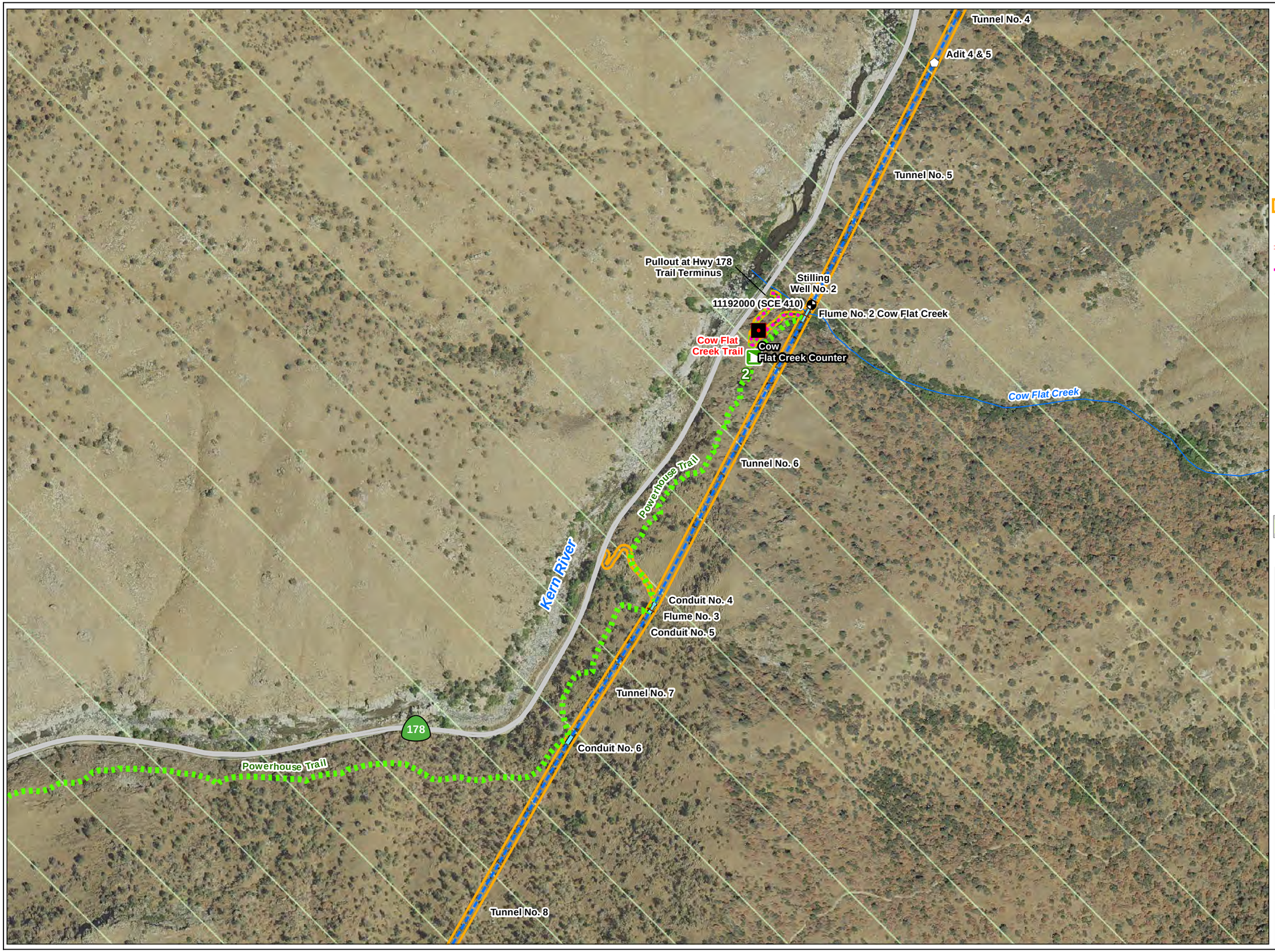
0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 2/11/2026

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2026 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication / Powerline
- FERC Boundary

Transportation

- Project Road
- Other Road
- Project Trail of Focus
- Gate

Other Features

- Watercourse
- SCE-identified Parking Areas with Potential River Access
- Self-Survey Box
- TrafX Counter

Forest Service Recreation Facilities

- Raft Takeout
- Day Use Area
- USFS System Trail

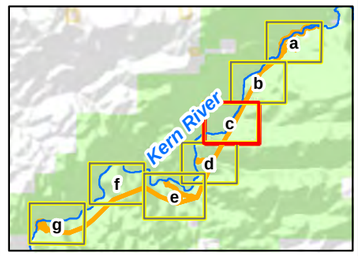
Private Recreation Facilities

- Democrat Hotsprings

Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1c

Location of Recreation Survey Sites

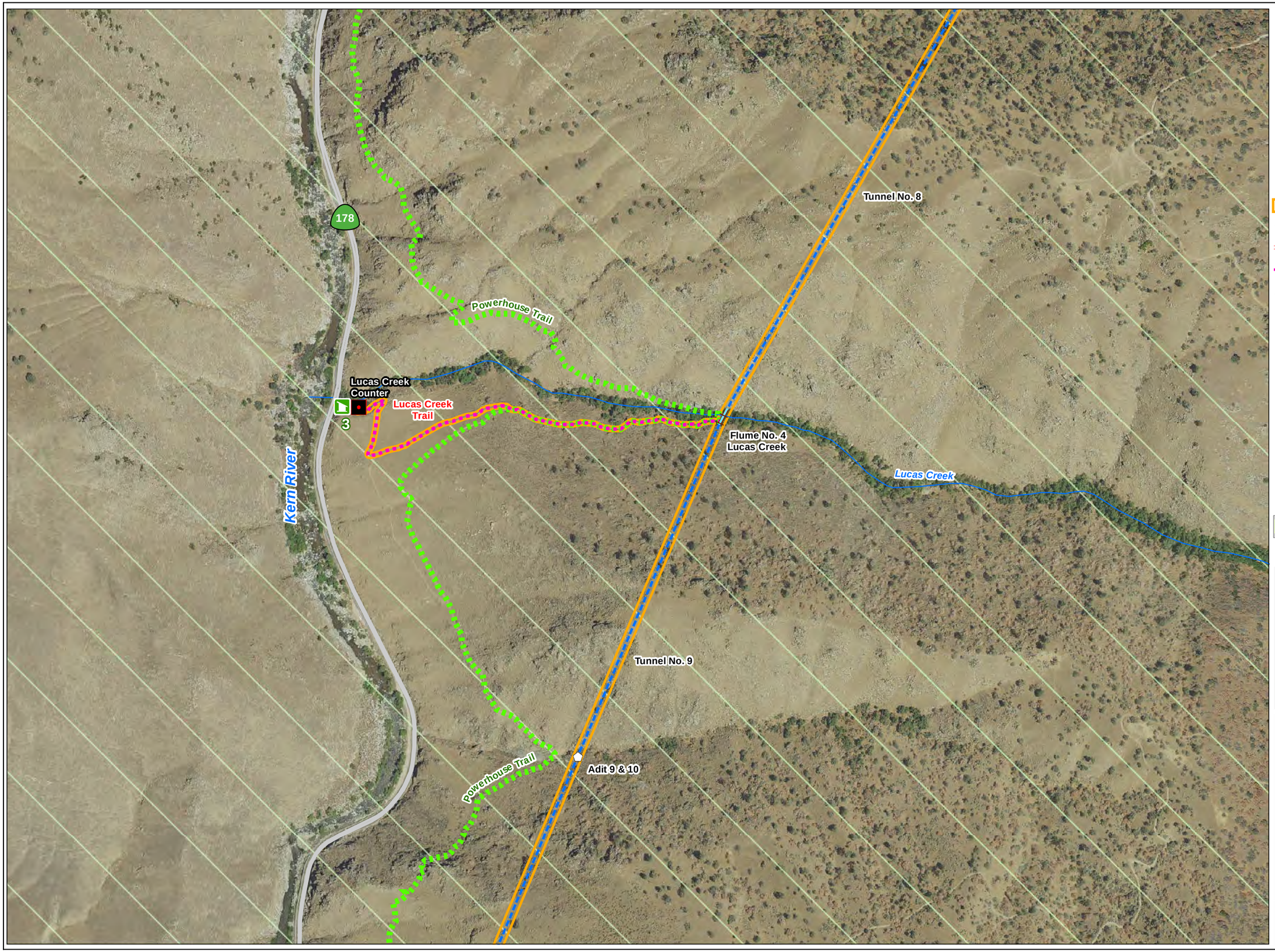
0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 2/11/2026

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2026 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication / Powerline
- FERC Boundary

Transportation

- Project Road
- Other Road
- Project Trail of Focus
- Gate

Other Features

- Watercourse
- SCE-identified Parking Areas with Potential River Access
- Self-Survey Box
- TrafX Counter

Forest Service Recreation Facilities

- Raft Takeout
- Day Use Area
- USFS System Trail

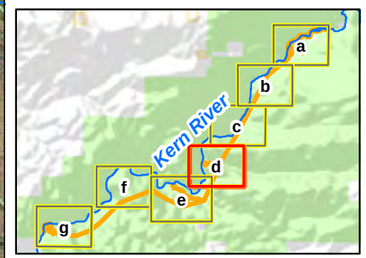
Private Recreation Facilities

- Democrat Hotsprings

Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1d

Location of Recreation Survey Sites

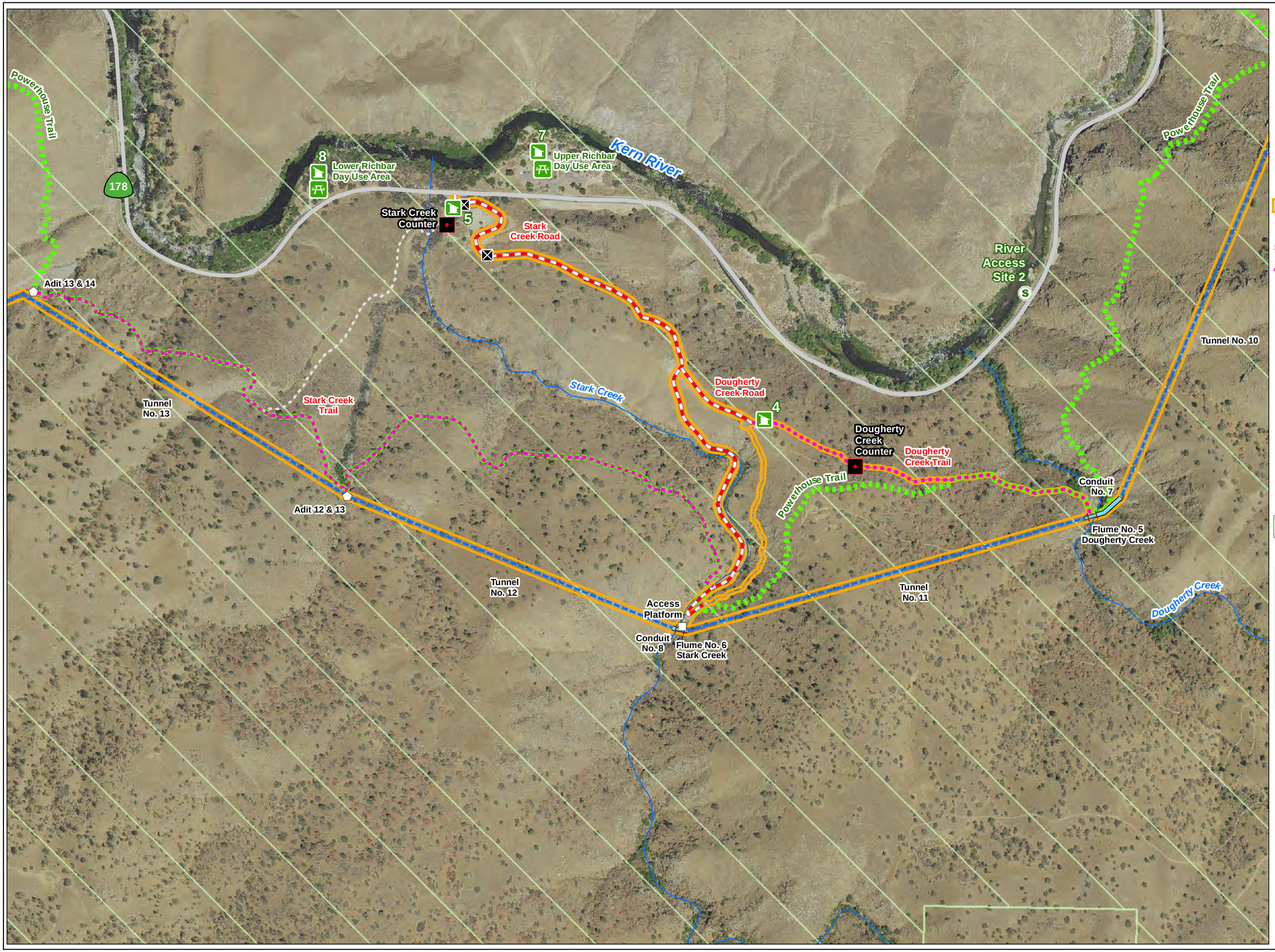
0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 2/11/2026

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2026 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication / Powerline
- FERC Boundary

Transportation

- Project Road
- Other Road
- Project Trail of Focus
- Gate

Other Features

- Watercourse
- SCE-identified Parking Areas with Potential River Access
- Self-Survey Box
- TrafX Counter

Forest Service Recreation Facilities

- Raft Takeout
- Day Use Area
- USFS System Trail

Private Recreation Facilities

- Democrat Hotsprings

Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1e

Location of Recreation Survey Sites

0 250 500
Feet

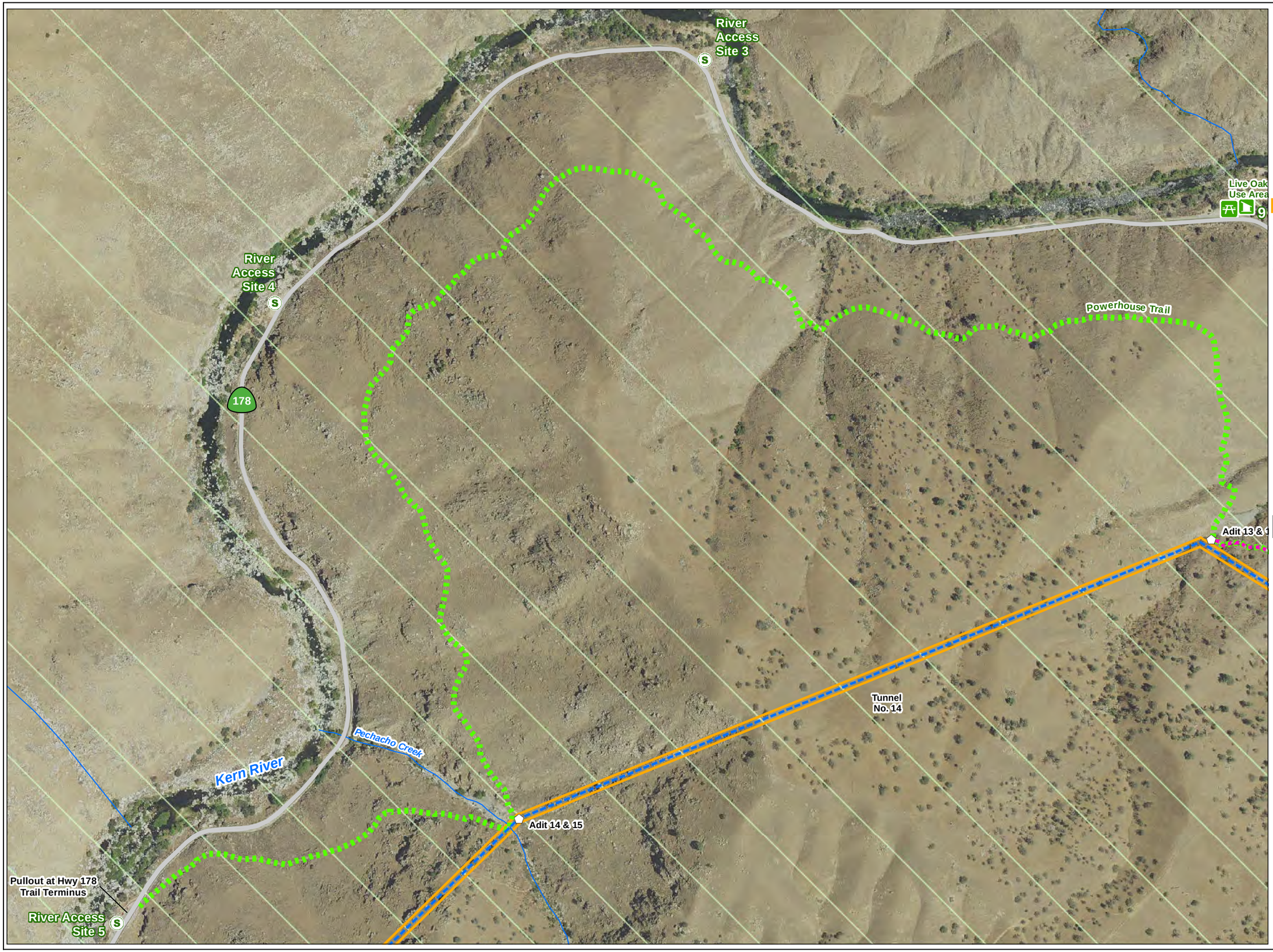
Projection: UTM Zone 11
Datum: NAD 83

Date: 2/11/2026

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\GIS\237800343\map\Kern River 1\RecreationMaps\SCE_Kern1_ProjTrails_Focused_17i11i_06.mxd

Copyright 2026 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication / Powerline
- FERC Boundary

Transportation

- Project Road
- Other Road
- Project Trail of Focus
- Gate

Other Features

- Watercourse
- SCE-identified Parking Areas with Potential River Access
- Self-Survey Box
- TrafX Counter

Forest Service Recreation Facilities

- Raft Takeout
- Day Use Area
- USFS System Trail

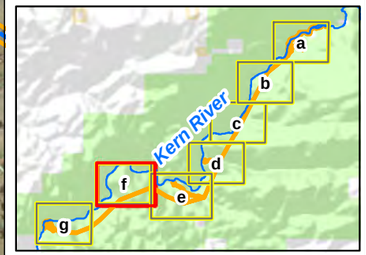
Private Recreation Facilities

- Democrat Hotsprings

Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1f

Location of Recreation Survey Sites

0 250 500
Feet

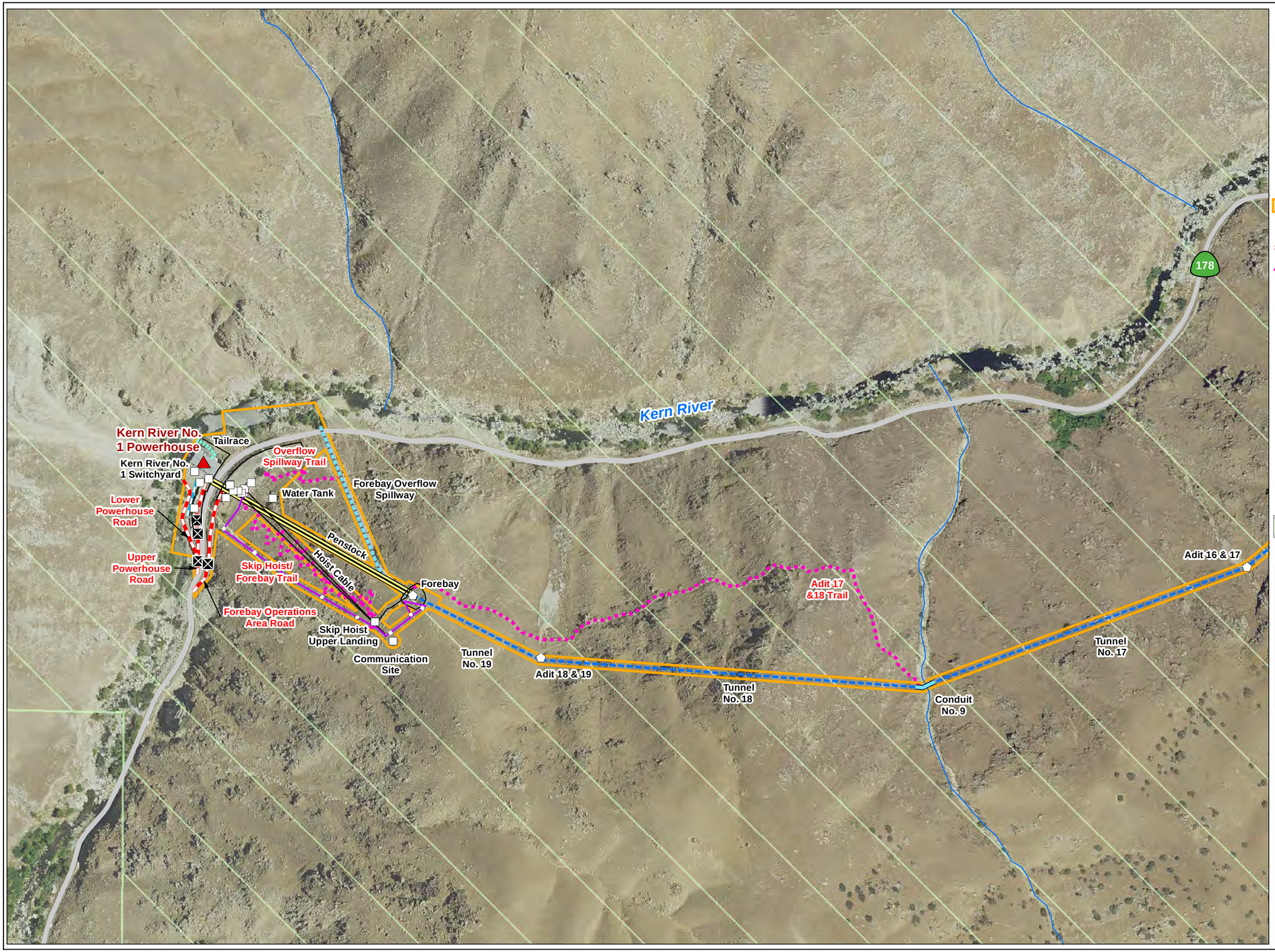
Projection: UTM Zone 11
Datum: NAD 83

Date: 2/11/2026

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\GIS\237800343\map\Kern River 1\RecreationMaps\SCE_Kern1_ProjTrails_Focused_17i11i_06.mxd

Copyright 2026 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication / Powerline
- FERC Boundary

Transportation

- Project Road
- Other Road
- Project Trail of Focus
- Gate

Other Features

- Watercourse
- SCE-identified Parking Areas with Potential River Access
- Self-Survey Box
- TrafX Counter

Forest Service Recreation Facilities

- Raft Takeout
- Day Use Area
- USFS System Trail

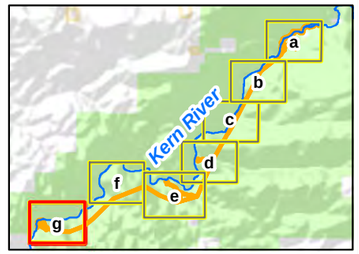
Private Recreation Facilities

- Democrat Hotsprings

Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1g

Location of Recreation Survey Sites

0 250 500
Feet

Date: 2/11/2026

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2026 by Southern California Edison Company

APPENDIX A

Day Use Survey Forms (English and Spanish)

Copyright 2026 by Southern California Edison

English

Kern River No. 1 Recreation Sites

Day-Use Survey (day use sites)

Kern River No. 1 Hydroelectric Project (FERC No. 1930)

Southern California Edison (SCE), in collaboration with the U.S. Forest Service is soliciting input from day users along the lower Kern River to better understand recreation use. This recreation study is part of the Federal Energy Regulatory Commission relicensing of the Kern River No.1 (P-1930) Hydroelectric Project. We request your help by completing the survey below. If you are traveling with multiple people, only one person in your party needs to fill out the survey. Participation is voluntary and responses will remain anonymous.

Date: _____ **Time at beginning of trip:** _____ **a.m./p.m.**

Select Current Day Use Facility Location:

☐ Democrat Raft Take-out Boating Site ☐ Upper Richbar Day Use Area
☐ Lower Richbar Day Use Area ☐ Live Oak Day Use Area

Section 1 – Demographics

1. What is your home zip code? _____
2. List the number of individuals in your group that fall within each of these age categories:

   ____ Under 16 ____ 16–19 ____ 20–29 ____ 30–39 ____ 40–49 ____ 50–59 ____ 60–69 ____ 70+
3. What is your ethnicity?
   ☐ Spanish/Latino Origin ☐ Black ☐ White ☐ Asian/Pacific Islander ☐ Other:_____
4. What is your total household income?
   ☐ Less than $40,000 ☐ $41,000–$80,000 ☐ 81,000 and above

Section 2 – User Activities

5. What is the primary recreation activity that you are undertaking today? Circle one.

   Fishing Hiking/Walking/Trail use Whitewater boating/rafting Swimming/wading

   Picnicking Scenic driving Viewing wildlife

Please write-in your secondary recreation activity (as applicable) and any activity you are undertaking not listed.

_____

6. How would you rate your overall satisfaction or dissatisfaction with your recreation experience today?

	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
1. Overall satisfaction of your trip					
2. Satisfaction of your primary activity					
3. Cost of facility access fees					
4. River access					
5. Number of people encountered/crowdedness					
6. Available parking when you arrived					
7. Feeling of safety					
8. Adequacy of site access for persons with disabilities					
9. Scenery at this site/area					
10. Maintenance (physical condition) of facilities					
11. Cleanliness of facilities					
12. Access to restroom/shower/drinking water					
13. Informational/educational opportunities					
14. Flows in the river					

Continue on the other side please →

If you marked Very Dissatisfied (1) or Dissatisfied (2) for any above, please explain:

_____

7. How many recreation trips have you made to the lower Kern River in the past 12 months?

   _____ trip(s) in the last 12 months

8. If you participated in a water-related activity, did the flows in the river affect your ability to participate? Circle one.

   YES (select reason below) **NO** flow did not affect planned activities **NA**-did not partake

   If yes, circle one: flow was too high flow was too low other explain:_____

Section 3 – Surrounding Landscapes

9. How would you rate the scenic quality of the lower Kern River area in general?

	Very Poor	Poor	Neutral	Good	Very Good
General scenic quality of area					

If your rating was Very Poor (1) or Poor (2), please explain:

_____

Section 3 Angling Experiences

10. Have you fished along the lower Kern River before?
    ☐ **Yes** (please respond to the following questions) ☐ **No** (survey complete)

    a. What type of fishing tackle do you typically use to fish in the lower Kern River? (Circle all that apply)

       Spin Fish with Lures Spin with Bait Fly Fish

    b. Do you fish for fun or to catch food to eat (check one)? If you plan to eat your fish but are mostly fishing for fun, circle **Fun**. If you enjoy fishing but are mostly fishing to catch food, circle **Food**.

       Food Fun

    c. What was your primary reason for selecting this location to fish?

       _____

    d. How often have you fished this reach, the lower Kern River, in each season over the past 12 months?

       ☐ Spring (March – May) # _____ ☐ Summer (June – August) # _____
       ☐ Fall (September – November) #_____ ☐ Winter (December – February) # _____

11. Have river flows affected your angling experience in the lower Kern River? Circle one.

    YES NO

12. If yes, please indicate in which season your experience has been affected and provide a reason.

    a. Spring (Mar–May) Reason: too low / too high / other:_____
    b. Summer (Jun–Aug) Reason: too low / too high / other:_____
    c. Fall (Sep–Nov) Reason: too low / too high / other:_____
    d. Winter (Dec–Feb) Reason: too low / too high / other:_____

English

Áreas de Recreación del Río Kern No. 1

Encuesta sobre uso diurno (lugares de uso diurno)

Proyecto Hidroeléctrico del Río Kern No. 1 (FERC No. 1930)

Southern California Edison (SCE), en colaboración con el Servicio Forestal de los Estados Unidos, está solicitando la opinión de los usuarios diurnos del río Kern para entender mejor su uso para fines recreativos. Este estudio de recreación es parte de la renovación de la licencia de la Comisión Federal Reguladora de Energía para el Proyecto Hidroeléctrico del Río Kern No.1 (P-1930). Solicitamos su ayuda respondiendo a la encuesta de abajo. Si su paseo es con varias personas, solo una persona de su grupo debe llenar la encuesta. La participación es voluntaria y las respuestas permanecerán en el anonimato.

Fecha: _____ **Hora al inicio del paseo:** _____ **a.m./p.m.**

Seleccione la actual ubicación de la instalación de uso diurno:

☐ Área de punto de llegada de balsas Democrat ☐ Zona de uso diurno Upper Richbar
☐ Zona de uso diurno Lower Richbar ☐ Zona de uso diurno Live Oak

Sección 1 – Datos demográficos

1. ¿Cuál es el código postal de su domicilio? _____
2. Indique el número de personas en su grupo que calzan dentro de cada una de estas categorías etarias:
   ____<16 ____16–19 ____20–29 ____30–39 ____40–49 ____50–59 ____60–69 ____ >70
3. ¿Cuál es su etnicidad?
   ☐ latina/hispana ☐ negra ☐ blanca ☐ asiática/isleña del Pacífico ☐ otra:_____
4. ¿Cuál es el ingreso total de su hogar?
   ☐ Menos de $40 000 ☐ $41 000–$80 000 ☐ $81 000 o más

Sección 2 – Actividades del usuario

5. ¿Cuál es la actividad recreativa principal que está realizando hoy? Encierre en un círculo una.

   Pesca Senderismo/caminata/uso de sendero Rafting/canotaje en rápidas

   Nado/vadeoPicnic Conducción escénica Observar la vida silvestre

Por favor, indique su actividad de recreación secundaria (según corresponda) y cualquier actividad que esté llevando a cabo no listada arriba._____

6. ¿Cómo calificaría su satisfacción o insatisfacción general respecto a su experiencia recreativa de hoy?

	Muy insatisfecho	Insatisfecho	Neutro	Satisfecho	Muy satisfecho
1. Satisfacción general de su paseo					
2. Satisfacción con su actividad principal					
3. Costo de entrada a instalaciones					
4. Acceso al río					
5. Número de personas que encontró/aglomeraciones					
6. Estacionamiento disponible al llegar					
7. Sensación de seguridad					
8. Adecuación del acceso al lugar para personas con discapacidad					
9. Paisaje en este lugar/zona					
10. Mantenimiento (estado físico) de las instalaciones					
11. Limpieza de las instalaciones					
12. Acceso a baños/duchas/agua potable					
13. Oportunidades informativas/educativas					
14. Caudales del río					

Continue on the other side please →

Si marcó Muy insatisfecho o Insatisfecho en cualquiera de las anteriores, por favor explique por qué:

_____

7. ¿Cuántos paseos recreativos a la parte baja del río Kern ha hecho en los últimos 12 meses?

   _____ paseo(s) en los últimos 12 meses

8. Si participó en una actividad asociada con agua, ¿los caudales del río afectaron su capacidad de participar? Encierre en un círculo una.

   SÍ (seleccione abajo el motivo) **NO,** el caudal no afectó las actividades planeadas **NA,** no participé

   Si respondió SÍ, encierre en un círculo una de estas opciones:

   El caudal era muy alto El caudal era muy bajo Otra (explicar):_____

Sección 3 – Paisajes circundantes

9. ¿Cómo calificaría la calidad escénica de la zona de la parte baja del río Kern en general?

	Muy mala	Mala	Neutro	Buena	Muy buena
Calidad escénica general de la zona					

i su calificación fue Muy mala o Mala, por favor explique por qué:

_____

Sección 3 Experiencias de pesca con caña

10. ¿Ha pescado antes a lo largo de la parte baja del río Kern?
    ☐ Sí (por favor, responda a las preguntas a continuación) ☐ No (aquí termina la encuesta)

    a. ¿Qué tipo de aparejos de pesca suele utilizar para pescar en la parte baja del río Kern? (Encierre en un círculo todos los que apliquen)

       Spinning con señuelos Spinning con carnada Mosca

    b. ¿Está pescando por diversión o para comer (marcar una)? Si piensa comer sus pescados pero mayormente está pescando por diversión, encierre en un círculo **Diversión**. Si le gusta la pesca, pero principalmente pesca para **comer**, encierre en un círculo **Comida**.

       Comida Diversión

    c. ¿Cuál fue la razón principal para elegir este lugar para pescar?

       _____

       ¿Con qué frecuencia ha pescado en este tramo de la parte baja del río Kern en cada temporada en los últimos 12 meses?

       ☐ Primavera (Mar–May) _____ veces ☐ Verano (Jun–Ago) _____ veces
       ☐ Otoño (Sep–Nov) _____ veces ☐ Invierno (Dic–Feb) _____ veces

11. El caudal del río ha afectado su experiencia de pesca en la parte baja del río Kern? Encierre en un círculo una.

    SÍ NO

12. Si respondió SÍ, indique en qué temporada se vio afectada su experiencia y señale el motivo.

    a. Primavera (Mar–May) Motivo: muy bajo / muy alto / otro:_____
    b. Verano (Jun–Ago) Motivo: muy bajo / muy alto / otro:_____
    c. Otoño (Sep–Nov) Motivo: muy bajo / muy alto / otro:_____
    d. Invierno (Dic–Feb) Motivo: muy bajo / muy alto / otro:_____

English

Kern River No. 1 Recreation Project Trails

Day-Use Survey (trails)

Kern River No. 1 Hydroelectric Project (FERC No. 1930)

Southern California Edison (SCE), in collaboration with the U.S. Forest Service is soliciting input from day users of trails along the lower Kern River to better understand recreation use. This recreation study is part of the Federal Energy Regulatory Commission relicensing of the Kern River No.1 (P-1930) Hydroelectric Project. We request your help by completing the survey below. If you are traveling with multiple people, only one person in your party needs to fill out the survey. Participation is voluntary and responses will remain anonymous.

Date: _____ **Time at beginning of trip:** _____ **a.m./p.m.**

Select Current Trail Location:

☐ Democrat Gage Trail ☐ Cow Flat Trail ☐ Lucas Creek Trail ☐ Dougherty Creek Trail
☐ Stark Creek Trail ☐ Penstock/Forebay Trails

Section 1 – Demographics

1. What is your home zip code? _____
2. List the number of individuals in your group that fall within each of these age categories:

   ____ Under 16 ____ 16–19 ____ 20–29 ____ 30–39 ____ 40–49 ____ 50–59 ____ 60–69 ____ 70+
3. What is your ethnicity?
   ☐ Spanish/Latino Origin ☐ Black ☐ White ☐ Asian/Pacific Islander ☐ Other:_____
4. What is your total household income?
   ☐ Less than $40,000 ☐ $41,000–$80,000 ☐ 81,000 and above

Section 2 – Trail Experience

5. How would you rate your experience on this trail compared to other trails along the lower Kern River?

	Much Worse	Worse	Same	Better	Much Better
Experience on this trail compared to other trails in the area					

6. What is the reason for your rating?

   _____
7. Would you consider returning to this trail ☐ YES ☐ NO

   What is the basis for your answer?

   _____
8. Are there any improvements that you would recommend for this trail? ☐ YES ☐ NO

   What improvements do you recommend?

   _____
9. Do you have any additional comments about the trail?

   _____

   _____

Section 3 – User Activities

Continue on the other side please →

10. On this trip are you? ☐ Hiking/Walking ☐ Biking ☐ Horseback Riding ☐ Other: _____

11. How long are you planning to hike today? _____

12. Are you using this trail to get to another trail today? If so, what other trail: _____

13. What is the purpose of your visit today? (Check only one main activity in the first column.)

Check only <u>one</u> main activity	Check all other activities	Type of activities
		Exercise
		Viewing scenery/wildlife
		Spending time with friends/family
		Exploring new areas/trails
		River access (Democrat Gage Trail only)
		Other (please specify below)

If you selected "other" please describe the recreation activity or activities that you are undertaking.

_____

14. In the last 12 months, have you utilized any of the trails listed in the table below (see map beneath lid of survey box)? If yes, please indicate in the table the number of times you visited each site during each season.

Trail	Number of Visits				
	Spring (Mar–May)	Summer (Jun–Aug)	Fall (Sep–Nov)	Winter (Dec–Feb)	Total #
Democrat Gage Trail					
Cow Flat Trail					
Dougherty Creek Trail					
Lucas Creek Trail					
Stark Creek Trail					
Penstock/Forebay Trails					

Section 3 – Surrounding Landscapes

15. What scenic feature most attracted you to this trail? Select top feature:

☐ General scenery such as rock outcrops, mountains, and valleys
☐ Views of the lower Kern River
☐ Scenery was not a consideration when selecting this location
☐ Other: _____

16. In general, how would you rate the scenic quality of the area as seen from the trail?

	Very Poor	Poor	Neutral	Good	Very Good
General scenic quality of area					

If your rating was Very Poor (1) or Poor (2), please explain:

_____

_____

Español

Senderos del Proyecto de Recreación del Río Kern No. 1

Encuesta sobre uso diurno (senderos)

Proyecto Hidroeléctrico del Río Kern No. 1 (FERC No. 1930)

Southern California Edison (SCE), en colaboración con el Servicio Forestal de los Estados Unidos, está solicitando la opinión de los usuarios diurnos de los senderos del río Kern para entender mejor su uso para fines recreativos. Este estudio de recreación es parte de la renovación de la licencia de la Comisión Federal Reguladora de Energía para el Proyecto Hidroeléctrico del Río Kern No.1 (P-1930). Solicitamos su ayuda respondiendo a la encuesta de abajo. Si recorre la zona con varias personas, solo una persona de su grupo debe llenar la encuesta. La participación es voluntaria y las respuestas permanecerán en el anonimato.

Fecha: _____ **Hora al inicio del paseo:** _____ **a.m./p.m.**

Seleccione la ubicación actual del sendero:

☐ Sendero Democrat Gage ☐ Sendero Cow Flat ☐ Sendero Lucas Creek ☐ Sendero Dougherty Creek
☐ Sendero Stark Creek ☐ Senderos Penstock/Forebay

Sección 1 – Datos demográficos

1. ¿Cuál es el código postal de su domicilio? _____
2. Indique el número de personas en su grupo que calzan dentro de cada una de estas categorías etarias:
   ____<16 ____16–19 ____20–29 ____30–39 ____40–49 ____50–59 ____60–69 ____ >70
3. ¿Cuál es su etnicidad?
   ☐ latina/hispana ☐ negra ☐ blanca ☐ asiática/isleña del Pacífico ☐ Otra: _____
4. ¿Cuál es el ingreso total de su hogar?
   ☐ Menos de $40 000 ☐ $41,000–$80,000 ☐ $81,000 o más

Sección 2 – Experiencia con los senderos

5. ¿Cómo calificaría su experiencia en este sendero en comparación con otros senderos a lo largo de la parte baja del río Kern?

	Mucho Peor	Peor	Igual	Mejor	Mucho Mejor
Experiencia en este sendero en comparación con otros senderos del área					

6. ¿Por qué motivo dio esa calificación?

   _____

7. ¿Consideraría regresar a este sendero? ☐ SÍ ☐ NO
   ¿En qué se basa su respuesta?

   _____

8. ¿Hay alguna mejora que recomendaría para este sendero? ☐ SÍ ☐ NO
   ¿Qué mejoras recomienda?

   _____

9. ¿Tiene algún comentario adicional sobre el sendero?

   _____

   _____

Sección 3 – Actividades del usuario

Continue on the other side please →

10. ¿Qué está haciendo en este paseo? ☐ Senderismo/caminata ☐ Ciclismo ☐ Cabalgata
    ☐ Otro: _____

11. ¿Cuánto tiempo tiene planeado caminar hoy? _____

12. ¿Está utilizando este sendero para llegar a otro hoy? De ser así, ¿cuál es el otro sendero?: _____

    _____

13. ¿Cuál es el propósito de su visita de hoy? (Marque solo una actividad principal en la primera columna)

Marque solo una actividad principal	Marque todas las demás actividades	Tipo de actividad
		Hacer ejercicio
		Observar el paisaje/la naturaleza
		Pasar tiempo con amigos/familia
		Explorar nuevas áreas/senderos
		Acceder al río (solo el sendero Democrat Gage)
		Otra (especifíquela a continuación)

Si seleccionó "Otra", describa la actividad o actividades recreativas que está realizando.

_____

14. En los últimos 12 meses, ¿ha utilizado alguno de los senderos indicados en la tabla de abajo (ver el mapa que está debajo de la tapa de la urna de la encuesta)? En caso afirmativo, indique en la tabla el número de veces que visitó cada lugar durante cada temporada.

Sendero	Número de visitas				
	Primavera (marzo–mayo)	Summer (Jun–Aug)	Primavera (marzo–mayo)	Winter (Dec–Feb)	Primavera (marzo–mayo)
Sendero Democrat Gage					
Sendero Cow Flat					
Sendero Dougherty Creek					
Sendero Lucas Creek					
Sendero Stark Creek					
Senderos de la tubería forzada/cámara de carga					

Sección 3 – Paisajes circundantes

15. ¿Qué elemento escénico le atrajo más a este sendero? Seleccione la principal:
    ☐ Paisaje general como afloramientos rocosos, montañas y valles
    ☐ Vistas de la parte baja del río Kern
    ☐ El paisaje no fue un factor que se consideró a la hora de seleccionar esta ubicación
    ☐ Otra: _____

16. En general, ¿cómo calificaría la calidad escénica del área que se ve desde el sendero?

	Muy mala	Mala	Neutra	Buena	Muy Buena
Calidad escénica general de la zona					

Si su calificación fue Muy mala o Mala, sírvase explicar por qué:

_____

_____

APPENDIX B

Forest Service Approval of Infrared Trail Camera Installation

USDA Forest Service

Sequoia National Forest
Giant Sequoia National Monument

220 East Morton Avenue
Porterville, CA 93257
559-784-1500
TDD: 559-781-6650
FAX: 559-781-4744
www.fs.usda.gov/sequoia/

File Code: 2720
Date: October 22, 2024

Meg Richardson
Hydro Relicensing Project Manager
2244 Walnut Grove Avenue
Rosemead, CA 91770

RE: **Kern River No. 1 Hydroelectric Project (P-1930) Relicensing: REC 2 – Recreation Facility Use Assessment Trail Camera Prop**

Dear Ms. Richardson:

I reviewed your proposal for the temporary installation of infrared cameras as a means of capturing trail use along the lower Kern. This data collection is need for the REC 2 - Recreation Facility Use Assessment Technical Study Plan (REC 2 TSP) for the Kern River No. 1 Hydroelectric Project Relicensing (Project) and was approved by FERC in March 2024.

The REC 2 TSP proposes the temporary installation of infrared cameras as a means of capturing trail use along the lower Kern River between the Democrat Dam impoundment (upstream) and the SCE KR1 Powerhouse (downstream). The temporary infrared cameras are located on United States Forest Service Sequoia National Forest (USFS-SQF) lands outside of the FERC Project boundary. At each of five Project trails (trails established by and/or used primarily by SCE to access Project infrastructure) one infrared camera is proposed to be installed by placing it on the ground within 400 yards of the trailhead at a discrete location. No ground disturbance is anticipated; trimming of ground cover may be required to ensure the infrared cameras capture recreation use. Infrared cameras are to be installed for one year. The objective is to characterize recreation use along Project trails that provide access to the lower Kern River or to an existing Forest Service trail in the vicinity of the Project.

As described, this proposal falls within a category of actions that are normally excluded from documentation in an environmental assessment (EA) or environmental impact statement (EIS) [40 CFR 1501.4 and 36 CFR 220.5(a)]. Decisions may be categorically excluded from documentation in an EIS or EA when they are within one of the categories identified by the U.S. Department of Agriculture in 7 CFR part 1b.3. This proposal falls within category 7 CFR 1b.3(a)(3) which includes inventories, research activities, and studies, such as resource inventories and routine data collection when such actions are clearly limited in context and intensity. Based on an assessment of resource conditions, there are no extraordinary circumstances that would preclude use of a categorical exclusion; therefore, the project is categorically excluded from documentation. A case file or decision memo is not required.

After reviewing your proposal for compliance with regulations found at 36 CFR 251.50(e), I have determined that your proposed use, as you have described, will have nominal effects on the lands,

resources, and programs of the National Forest, therefore a special use permit is not required.

If your proposed use changes from what you have described, please contact Special Use Permit Administrator Marie (Angie) Attencio at (760) 549-9978 so that we may determine whether your use continues to qualify for a permit waiver. Likewise, if any factor associated with National Forest System lands, resources, or programs (such as the discovery of an endangered species in the area) changes and there is no longer a basis for the nominal effects determination, I or someone from my office will contact you in writing to rescind the nominal effects determination. If this happens, there may be alternative mechanisms to permit your activity.

If you propose to conduct the same activity next year, please contact my office again to ensure that your use continues to qualify for a permit waiver.

As a reminder, your use must comply with all federal, state, and local laws, regulations, and policies. We ask that you pay special attention to current Kern River Ranger District fire restrictions. I recommend you carry a copy of this letter with you to verify that I have determined that your use, as described above, does not require a special use authorization.

Please contact my office if you have any questions or need additional information.

Sincerely,

ANTHONY EDWARDS Digitally signed by ANTHONY EDWARDS Date: 2024.10.22 22:59:53 -07'00'

ANTHONY EDWARDS
Forest Supervisor

cc: Brian Block/Acting District Ranger, Kern River Ranger District;
Billy Brown; Karen Miller

APPENDIX I

REC 3 – WHITEWATER BOATING TECHNICAL MEMORANDUM

Copyright 2026 Southern California Edison

REC 3 – WHITEWATER BOATING TECHNICAL MEMORANDUM

KERN RIVER NO. 1 HYDROELECTRIC PROJECT
FERC PROJECT NO. 1930

PREPARED FOR:



March 2026

TABLE OF CONTENTS

1.0 Introduction 4

2.0 Study Objectives 4

3.0 Study Area and Study Sites 4

3.1 Cadillacs Run 5

3.2 Richbar Run 5

3.3 Cataracts Run 5

4.0 Methods 6

4.1 Study Plan Variances 7

5.0 Level 1 Desktop Review Data Summary 7

5.1 Literature Review 7

5.1.1 Whitewater Opportunities in the Kern River Basin 8

5.1.2 Characterization of Whitewater Boating Use in the Bypass Reach 8

5.2 Hydrology Assessment 9

5.3 Project Facility Capabilities Description 9

5.4 Structured interviews 11

5.4.1 Online Survey 11

5.4.2 Follow-up Interviews 12

5.4.3 Structured Interview Results 13

5.5 Boatable Flow Opportunities 16

5.5.1 Cadillacs Run 17

5.5.2 Richbar Run 18

5.5.3 Cataracts Run 18

6.0 Conflicts of Whitewater Boating Flows with Other Recreation Uses 19

7.0 Study-Specific Consultation 20

8.0 Outstanding Study Plan Elements 20

9.0 References 21

LIST OF TABLES

Table 3-1. Scale of Whitewater Difficulty 24
Table 5-1. Whitewater Boating Opportunities in the Kern River Basin 25
Table 5-2. Cadillacs Run Boating Day "With-Project" Hydrology 28
Table 5-3. Cadillacs Run Boating Day "Without-Project" Hydrology 29
Table 5-4. Cadillacs Run Boating Day Difference: "With-Project" to "Without-Project" Hydrology 29
Table 5-5. Richbar Run Boating Day "With-Project" Hydrology 31
Table 5-6. Richbar Run Boating Day "Without-Project" Hydrology 32
Table 5-7. Richbar Run Boating Day Difference: "With-Project" to "Without-Project" Hydrology 33
Table 5-8. Cataracts Run Boating Day "With-Project" Hydrology 34
Table 5-9. Cataracts Run Boating Day "Without-Project" Hydrology 34
Table 5-10. Cataracts Run Boating Day Difference: "With-Project" to "Without-Project" Hydrology 35

LIST OF FIGURES

Figure 5-1. Richbar Run—Minimum Acceptable and Optimum Flow Preferences 37
Figure 5-2. Cadillacs Run—Minimum Acceptable and Optimum Flow Preferences 37
Figure 5-3. Cataracts Run—Minimum Acceptable and Optimum Flow Preferences 38
Figure 5-4. Kern River Inflow to Lake Isabella – Percent of Average by Year (2014–2024) 38
Figure 5-5. Cadillacs Run: Water Years 2014–2024 39
Figure 5-6. Richbar Run: Water Years 2014–2024 40
Figure 5-7. Cataracts Run: Water Years 2014–2024 41

LIST OF MAPS

Map 3-1. Lower Kern River Whitewater Runs 43
Map 3-2. Cadillacs Whitewater Run 44

Map 3-3. Richbar Whitewater Run 45
Map 3-4. Cataracts Whitewater Run 46

LIST OF APPENDICES

Appendix A. Questionnaire
Appendix B. Questionnaire Responses
Appendix C. List of Boaters SCE Attempted to Contact
Appendix D. Record of Boater Outreach
Appendix E. Annual and Monthly Frequency of Minimum Acceptable and Optimum Whitewater Flows Water Year 2014–2024 Under Current Project Operations and Without-Project Diversion

LIST OF ACRONYMS

ac-ft	acre-feet
avg	average
AQ 1 TM	AQ 1 – Hydrology Technical Memorandum
cfs	cubic feet per second
FERC	Federal Energy Regulatory Commission
Forest Service	United States Forest Service
ISR	Initial Study Report
KR1	Kern River No. 1
MW	megawatt
PAD	Pre-Application Document
Project	Kern River No. 1 Hydroelectric Project Relicensing, FERC Project No. 1930
Questionnaire	Structured Interview Questionnaire
REC 3 TSP	REC 3 – Whitewater Boating Technical Study Plan
SCE	Southern California Edison
SR-178	State Route 178
TWG	Technical Working Group
USGS	United States Geological Survey

1.0 INTRODUCTION

This REC 3 – Whitewater Boating Technical Memorandum provides the methods and findings of implementing the REC 3 – Whitewater Boating Technical Study Plan (REC 3 TSP). The REC 3 TSP was implemented in support of Southern California Edison's (SCE's) Kern River No. 1 (KR1) Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 1930. The REC 3 TSP was included in SCE's Revised Study Plan submitted to FERC on February 13, 2024 (SCE 2024). In its March 14, 2024, Study Plan Determination, FERC approved the REC 3 TSP without modifications (FERC 2024).

2.0 STUDY OBJECTIVES

The objectives of the whitewater boating study, as outlined in the REC 3 TSP (SCE 2024), include the following:

- Characterize the whitewater boating run in the KR1 bypass reach, including the length, whitewater difficulty, name of key rapids, and typical access locations for put-in and take-out.
- Identify and characterize access to whitewater boating along the bypass reach.
- Identify the range of flows (minimum acceptable and optimum) that would provide whitewater boating opportunities in the bypass reach for a variety of watercraft, including kayaks, rafts, packrafts, stand-up paddleboards, and body boards.
- Quantify the annual and monthly frequency with which minimum acceptable and optimum whitewater flows occur in the bypass reach under current Project operations and without-Project diversion for each watercraft type.
- Describe existing mechanisms for the dissemination of flow information to the public.
- Document potential conflicts of whitewater boating flows with other recreation uses.

3.0 STUDY AREA AND STUDY SITES

The study area is the Project's bypass reach[1] on the lower Kern River. The bypass reach is an approximately 10.2-mile reach of the lower Kern River from Democrat Dam downstream to the KR1 Powerhouse Tailrace. The bypass reach is characterized by swift-flowing water and difficult rapids.

Within the bypass reach are three recognized whitewater runs. From upstream to downstream, these are: (1) Cadillacs Run, (2) Richbar Run, and (3) Cataracts Run. Refer

[1] A bypass reach is a segment of a river downstream of a diversion facility where project operations result in the diversion of a portion of the water from the river.

to Map 3-1 for the locations of these runs. The bypass reach and thus the three runs are closely aligned with State Route 178 (SR-178), which facilitates access and egress from the river channel. The runs are considered advanced to expert skill-level runs with a whitewater difficulty rating of Class IV to Class V+ (American Whitewater 2009). The Scale of Whitewater Difficulty is presented in Table 3-1.

3.1 CADILLACS RUN

Cadillacs Run, the most upstream of the runs, starts below Democrat Dam and extends approximately 4.5 miles downstream (refer to Map 3-2). The run difficulty is Class V (Expert), and the average gradient is 87.1 feet/mile.

The put-in for this whitewater run requires an overland hike from SR-178 to a location just downstream Democrat Dam. Boaters could also put-in at the Democrat Raft Take-out Boating site, but they would then have to portage their boats around the dam. There are no developed trails or river access improvements along the run. The Cadillacs Run take-out, approximately 4.5 miles downstream of Democrat Dam, is not developed, and an overland hike is needed to access shuttle vehicles parked on SR-178. As an alternative to taking-out at the end of the run, boaters may continue 1 mile downstream to the Upper Richbar Day Use Area, a non-Project developed day use area adjacent to the river that has developed parking and other supporting amenities.

3.2 RICHBAR RUN

In roughly the middle of the bypass reach is the Richbar Run (refer to Map 3-3). This run starts at the end of the Cadillacs Run and extends downstream for 3 miles. The run difficulty is considered a Class IV (Intermediate–Advanced), and the average gradient is 52 feet/mile.

The put-in for this whitewater run is accessible via an overland hike from SR-178. There are no developed trail or river access improvements associated with the put-in. Boaters have several take-out options: the Lower Richbar Day Use Area (non-Project facility), the Live Oak Day Use Area (non-Project facility), or approximately 1 mile downstream of the Live Oak Day Use Area. Both the Lower Richbar Day Use Area and Live Oak Day Use Area provide direct river access, parking, and other amenities. For runs extending beyond the Live Oak Day Use Area, an overland hike is required to reach shuttle vehicles parked along SR-178.

3.3 CATARACTS RUN

Cataracts Run, the farthest downstream of the runs, starts at the end of the Richbar Run and extends for 2.8 miles (refer to Map 3-4). Of the three runs along the bypass reach, the Cataracts Run is considered the most difficult; it is rated a Class V+ (Expert) and has the steepest gradient, of 143.9 feet/mile.

The Lower Richbar Day Use Area (non-Project facility) or Live Oak Day Use Area (non-Project facility) both serve as the put-in for this whitewater run, though the run starts approximately 1 mile downstream of the Live Oak Day Use Area. The take-out is just

upstream of the KR1 Powerhouse and requires an overland hike from the river up to SR-178.

4.0 METHODS

The study was implemented in accordance with the REC 3 TSP (SCE 2024). The REC 3 TSP describes a study methodology aligned with *Flows and Recreation: A Guide to Studies for River Professionals* (Whittaker et al. 2005). The 2005 publication outlines a sequential framework to investigate flow-dependent whitewater boating opportunities using various investigative tools across three progressive levels of study. The three levels of study as described in the REC 3 TSP are:

- Level 1: Desktop Review
- Level 2: Limited Reconnaissance
- Level 3: On-water Whitewater Boating Assessment

The three levels of study increase data resolution as investigations progress from one level to the next. At each study level, the data are assessed to determine the need to progress to the next level of study. If, after completing a level of study, it is determined that additional data are needed to augment or refine the data collected, the next level of study is implemented. Conversely, if it is determined that the data collected are sufficient to address the study objectives, the study process would conclude at that point. This process allows the study team to effectively compile and assess relevant data and ensure applicability to the goals and objectives of the study. This approach also allows the sharing of data/findings across resource disciplines and with stakeholders as the study progresses.

The Level 1 Desktop Review consists of the following elements:

- Literature review to augment information included in Pre-Application Document (PAD) Section 11, Recreation Resources (SCE 2023).
- Hydrology assessment.
- Project facility capabilities description.
- Structured interviews.

The Level 2 Limited Reconnaissance, if conducted, would include a limited reconnaissance site visit with study participants consisting of agency staff and boaters to collect additional information, with the objective of increasing the precision of estimated boating flow ranges for the various watercraft types and knowledge of recreation use patterns.

The Level 3 On-water Whitewater Boating Assessment would only be conducted if results from the Level 1 Desktop Review and Level 2 Limited Reconnaissance were insufficient

to characterize flow preferences over a variety of watercraft types. If necessary, the Level 3 On-water Whitewater Boating Assessment would collect flow preference information directly from whitewater boaters for a variety of watercraft for the bypass reach using a single flow study.

The current level of assessment is Level 1 Desktop Review. Before proceeding to Level 2 Limited Reconnaissance, the information compiled as part of the Level 1 Desktop Review will be evaluated, and a decision on the need to proceed to Level 2 will be made.

4.1 STUDY PLAN VARIANCES

There are no variances from the REC 3 TSP approved in FERC's Study Plan Determination (FERC 2024).

5.0 LEVEL 1 DESKTOP REVIEW DATA SUMMARY

5.1 LITERATURE REVIEW

A literature review was conducted to verify and augment the information presented in SCE's PAD (SCE 2023). The literature review included reviewing existing studies/publications, whitewater guidebooks, magazine publications, and online river information sites, including:

- Sequoia National Forest Land and Resource Management Plan, Forest Plan (United States Forest Service [Forest Service] 1988).
- Application for New License, Kern River No. 1 Hydroelectric Project, FERC Project No. 1930 (SCE 1994).
- Kern River Whitewater Boating Study Kern River No. 1 Project: FERC No. 1930 (Lower Kern River 1996 Boating Study; WRC-Environmental 1996).
- Final Environmental Assessment for Hydropower License, Kern River No. 1 Hydroelectric Project, FERC Project No. 1930-014 (FERC 1998a).
- FERC Order Issuing New License (Major Project), FERC Project No. 1930-014 (FERC 1998b).
- Report on Five-Year Recreation Use Monitoring Study, Kern River No. 1 Hydroelectric Project – FERC No. 1930 (2005 Recreation Use Monitoring Study; TCW Economics 2005).
- Land Management Plan for the Sequoia National Forest, Pre-Objection Version (Forest Service 2023).
- The Best Whitewater in California (Holbeck and Stanley 1998).
- California Whitewater, A Guide to the Rivers (Cassady and Calhoun 1995).

Copyright 2026 by Southern California Edison

- Various state and federal agency websites.

5.1.1 Whitewater Opportunities in the Kern River Basin

There are a total of 22 whitewater runs ranging from Class I/II to Class V+ in difficulty in the Kern River Basin. Table 5-1 lists each of these whitewater runs (roughly from upstream to downstream) and identifies the name of the whitewater run, river name, put-in and take-out locations, run length, run gradient (feet/mile), and difficulty classification. The runs vary in length from 0.5 mile—a short run below Fairview Dam—to 39.9 miles for the longest run—the Headwaters of the Kern.[2] As with the variance in run length, there is a large difference in the gradients of the runs, with the highest gradient being 360 feet/mile and the lowest 14 feet/mile. Some of the short whitewater runs below Fairview Dam would most likely be combined to extend the length of the run.

5.1.2 Characterization of Whitewater Boating Use in the Bypass Reach

The bypass reach is a 10.2-mile section of the lower Kern River characterized by swift-flowing water and difficult rapids. The bypass reach is divided into three distinct runs: Cadillacs (Class V), Richbar (Class IV), and Cataracts (Class V+).

There are no developed put-in sites below Democrat Dam; however, the Richbar and Live Oak day use areas are used by boaters as put-in and/or take-out sites. SR-178 runs close to the river along this section. Locations along the road are used to access put-in and take-out locations along the river. The lowest take-out is at the KR1 Powerhouse.

The lower Kern River 1996 Boating Study (WRC-Environmental 1996) identifies the optimal flows for boating in the bypass reach as between 950 cubic feet per second (cfs) and 1,750 cfs, with a minimum flow requirement of 700 cfs to 2,350 cfs.[3] The whitewater boating web guide *California Creeks* (California Creeks 2024) reflects a relatively consistent recommendation for suggested boating flows for the reach: 600 cfs to 2,500 cfs.

Private boaters who boat the Kern River below Democrat Dam (the bypass reach) are not currently required to obtain a permit. There is no commercial whitewater boating in the bypass reach. Private boaters who use the lower Kern River above Democrat Dam are required to obtain annual permits from the Forest Service.

The 2005 Recreation Use Monitoring Study (TCW Economics 2005)[4] referenced data collected by Forest Service manifest forms to determine the number of boaters that run the bypass reach. The manifest forms are voluntary forms obtained at Forest Service offices or at designated popular put-ins and take-outs that boaters are encouraged to fill out prior to running the river. The manifest forms ask boaters to identify what part of the

[2] This 39.9-mile run represents a multi-day expedition with numerous portages and is not typically boated.

[3] 2,350 cfs appears to represent the “high flow” threshold in the lower Kern River 1996 Boating Study.

[4] Following release of the 2005 Recreation Use Monitoring Study, FERC determined that no additional monitoring or modifications to the Project’s existing operations were warranted or recommended, and therefore recreation monitoring was discontinued; the 2005 Recreation Use Monitoring Study is the most recent recreation monitoring study applicable to the Project (FERC 2006).

Kern River they will boat, the date of their run, and the number of people in their party. The current manifest form separates the lower Kern River into four distinct runs: the Jungle Run, the Miracle Run, the Big 5 Run, and the Cataracts Run. The Cataracts Run identified in the manifest forms is the Project bypass reach and comprises the Cadillacs Run, Richbar Run, and Cataracts Run.

Based on the data collected by the manifest forms and documented in the 2005 Recreation Use Monitoring Study, between three and seven boaters ran the Cataracts Run each year between 2001 and 2005. Boating use in the other runs along the Kern River during the same span of years ranged from several hundred boaters per year to more than 2,000 boaters per year.

The 2005 Recreation Use Monitoring Study suggested that the low boating use in the Project bypass reach compared to the other runs along the Kern River is due to the extreme difficulty of the rapids in the reach. However, because permits are not required to boat the bypass reach, and because no use data are collected for this section of the river, an accurate estimate of current use is not available. SCE assumes that boating use in the bypass reach has increased since 2005 due to an overall increase in whitewater boating activity and due to more advanced equipment and increased skill levels.

5.2 HYDROLOGY ASSESSMENT

The summation of hydrology in the bypass reach is presented in the AQ 1 – Hydrology Technical Memorandum (AQ 1 TM). The AQ 1 TM includes a summary of the frequency, timing, duration, and magnitude of flows, and the data are reported using mean, median, interquartile range, and exceedance metrics where applicable.

5.3 PROJECT FACILITY CAPABILITIES DESCRIPTION

The Project, completed in 1906, is operated in a run-of-river mode and has no water storage. Water captured at the Democrat Dam diversion structure is transported through a connecting flowline and penstock to the powerhouse and then returned to the river through the powerhouse tailrace 10.2 miles downstream.

The Project has diversion rights of 412 cfs, which is the maximum capacity of the diversion. The Project license requires a minimum instream flow of 50 cfs to be released to the bypass reach from June 1 to September 30 and 15 cfs released between October 1 and May 31, or inflow if lower than the seasonal flow requirement. The amount and timing of flow diverted is a function of releases from Lake Isabella, flowline and powerhouse capacities, and minimum instream flow requirements.

Water is diverted from the Kern River at Democrat Dam and directed through a concrete sandbox, where sediment settles out of the water before the water enters the Project's conveyance system, which comprises approximately 8.5 miles of tunnels, flumes, and conduits that run along the eastern side of the Kern River. Water within the conveyance system is directed to a small concrete forebay through a buried penstock and into the Project powerhouse. Water exiting the powerhouse enters a short tailrace and is returned

to the Kern River upstream of the Kern Canyon Project (FERC Project No. 178), owned by Kern and Tule Hydro LLC. The total installed capacity of the powerhouse is 26.3 megawatts (MW).

Democrat Dam is located on the Kern River approximately 10.2 miles upstream of the powerhouse. The dam is a 58-foot-high cyclopean-concrete overflow gravity dam. The crest of the dam is at an elevation of 1,913 feet, and approximately 29 feet is exposed above the stream bed. The crest of the dam also serves as a spillway and is designed to spill river flows that are not diverted for power production. The Democrat Dam Impoundment (also referred to as the “pond”) covers approximately 27 acres and has a gross storage capacity of 247 acre-feet (ac-ft) at an elevation of 1,913 feet. However, there is no usable storage at the diversion dam. Since Democrat Dam is a run-of-river dam and its whole crest is a spillway, the dam regularly spills, and the impoundment and tailwater levels are governed by natural flows in the Kern River. A 329-foot-long drainage tunnel with a 72-inch electric motor-operated sluice gate is located at the base of the dam.

The water conveyance system is designed to carry a maximum of 412 cfs under optimum conditions. Two intake gates to the water conveyance system are hydraulically operated and are automatically controlled by impoundment and flume water controllers. The diverted water flows under gravity from an elevation of approximately 1,913 feet at the diversion dam to the top of the penstock at an elevation of approximately 1,830 feet.

The Project forebay is a 45-foot-long, 33-foot-wide, and 11-foot-deep concrete gravity structure that impounds water (less than 1 ac-ft) to regulate flow to the powerhouse. Water enters the forebay via Tunnel No. 19 and flows into the primary of two reinforced-concrete bays. From the forebay, an approximately 1,693-foot-long buried steel penstock carries water to the powerhouse. To increase velocity and pressure, the inside diameter of the penstock decreases over the length of the pipe, with a diameter of approximately 108 inches at the forebay tapering down to approximately 71 inches at the powerhouse. The penstock conveys water to the turbines through a manifold system.

The powerhouse is an approximately 71-foot by 170-foot concrete structure located on the left bank of the Kern River. The powerhouse is normally unattended. Start-up and shutdown of the turbine/generator equipment is manually performed by the operators based at the Kern River No. 3 Powerhouse (FERC Project No. 2290). Water to the powerhouse is supplied from the forebay through a single penstock. Water exiting the powerhouse enters a tailrace before being returned to the river. The powerhouse contains four Allis-Chalmers turbines (double overhung, single-jet, impulse type) rated at a total of 43,000 horsepower. The four main generators are horizontal shaft General Electric units with a total installed capacity of 26,280 kilowatts or 26.3 MW.

5.4 STRUCTURED INTERVIEWS

Structured interviews were conducted with individuals from the whitewater boating community with direct experience boating the bypass reach. A Structured Interview Questionnaire (Questionnaire) was developed to support the structured interview process.

Individuals interviewed represented a range of skill levels and knowledge of the whitewater boating runs in the bypass reach. Interviews focused on gathering information about boaters' range of preferred flows (minimum acceptable and optimum whitewater flows) for respective watercraft; boaters' flow information needs; and boaters' whitewater use patterns. The structured interviews took place via a two-phased process: (1) online survey and (2) follow-up interviews with boaters.

The Questionnaire consisted of four sections.

- Section 1 requested boater demographic information and general information about skill level, types of watercraft used to run whitewater, use patterns, and flow information dissemination.

- Sections 2, 3, and 4 were questions pertaining to each of the whitewater runs in the bypass reach—Cadillacs Run, Richbar Run, and Cataracts Run, respectively. Questions were designed to collect information from boaters about use patterns, transit time, difficulty classification, changes to whitewater factors as a result of higher or lower flow, estimates of minimum acceptable and optimum flow, and access information.

The questions included in the Questionnaire are included in Appendix A.

5.4.1 Online Survey

The Questionnaire was made available as an online survey instrument for a 60-day period from September 20 to November 19, 2024. The KR1 Recreation Technical Working Group (Recreation TWG)—which includes individuals affiliated with American Whitewater and the Kern River Boaters—was notified that SCE was developing a Questionnaire in August 2024. When the Questionnaire became available on September 20, 2024, the Recreation TWG was notified and provided links to the Questionnaire. A follow-up notice was distributed to the Recreation TWG on October 29, 2024, as a reminder that the Questionnaire was available for completing online and to solicit their assistance in sharing the Questionnaire with individuals who may have direct whitewater experience boating the bypass reach. A total of five unique respondents completed the Questionnaire online during the 60-day online survey period.

5.4.2 Follow-up Interviews

Follow-up interviews with boaters were conducted in January of 2025. As specified in the REC 3 TSP, SCE notified the Recreation TWG that follow-up interviews were planned and requested the Recreation TWG provide names and contact information for boaters who have direct whitewater experience boating the bypass reach to include in the structured interview process.

Based on the nominations from the whitewater boating community, SCE developed a list of 26 boaters to be contacted as part of the structured interview process. SCE circulated this list to the Recreation TWG on December 18, 2024, for review and approval. There were no objections to this initial list of boaters, but some stakeholders did suggest additional individuals to add to the list. The final list of boaters that SCE indicated it would make an effort to contact for a structured interview was circulated to the Recreation TWG on January 2, 2025. There were no objections or additions to this final list of 35 unique boaters.[5] This list is presented in Appendix C.

Full contact information, including both email and phone number, was not available for all names on the list. Of the 35 names submitted, both email and phone information were available for 10, only a phone number was available for 8, only an email address was available for 13, and no information was available for 4. Five of the 35 boaters on the list were the individuals who had already completed the Questionnaire online during the 60-day online survey period.

Follow-up interviews began on January 11, 2025. All individuals with an email contact were sent an individualized email requesting confirmation that the person was interested in participating in the follow-up interview process, requesting their preferred phone number, and requesting a preferred date/time to conduct the interview. If only a phone contact was provided, a call was made requesting the same information. If an email response was not received or a phone call was not returned, at least one additional follow-up email was sent and/or a phone call was made to try to contact potential interviewees. In summary, all individuals were contacted at least twice, and all individuals for whom a phone number was provided were called at least once. The record of contact activity is presented in Appendix D (personal phone numbers and email addresses have been redacted for privacy).

Of the 35 names submitted, 9 people were successfully interviewed. In addition, two of the five boaters who had already completed the Questionnaire online during the 60-day survey period were successfully contacted for follow-up conversations. The Questionnaire was used to guide the interviews. Conversations with the two individuals who had already completed the survey online focused on revisiting and confirming their original responses.

[5] The list circulated to the Recreation TWG included 36 boaters; however, one of the boaters identified is an SCE employee; SCE made the determination to exclude SCE employees from the structured interview process due to potential conflicts of interest. Therefore, the final list of potential boaters to interview consisted of 35 unique boaters.

5.4.3 Structured Interview Results

In total, 14 unique respondents completed the structured interview process either by self-submitting their interview responses during the online survey period (5 respondents) or via follow-up interviews (9 respondents). All boaters who completed the structured interview process were kayakers, though one person also had experience boating the reach in a closed-deck canoe. Eleven of the 14 interview respondents indicated they boat the Cataracts Run, and 3 respondents said they boat the Richbar Run only. No respondent indicated that they typically boat the Cadillacs Run as a "stand-alone" run, though six of the boaters who completed the structured interview process indicated they have also boated the Cadillacs Run. Several respondents boating the Cataracts Run mentioned that they began their journey on the Cadillacs Run, approximately 2.5 miles downstream from Democrat Dam. They then proceeded through the Richbar Run, which some boaters referred to as the "warm-ups," before continuing to the Cataracts Run.

Completed Questionnaire responses are presented in Appendix B (personal contact information has been redacted for privacy).

5.4.3.1 Richbar Run

Eight boaters provided input about their experience boating the Richbar Run. The boaters interviewed identified as advanced to expedition-level boaters with a large variance in experience. One respondent said he had boated the Richbar Run once; another said he had boated the run 100+ times. All respondents indicated that the unique character of the whitewater was one of the reasons they chose to boat the run. One boater said he experiences a "big-water feel" on long non-technical rapids. One boater reported the run could be suitable for rafting. Two boaters indicated that they typically boat on weekends, while other boaters said they were not constrained with respect to when they could boat the run.

All boaters said they put-in upstream of the Upper Richbar Day Use Area and take-out at or near the Live Oak Day Use Area or downstream of the Live Oak Day Use Area near "nude beach." Access to the put-in was off SR-178, and take-out was accessed off SR-178 or from the Live Oak Day Use Area. Boaters indicated that there were no access constraints but said that parking space for the put-in and take-out along SR-178 is limited, and there are safety considerations associated with proximity to roadside traffic.

Boaters said they checked the flows on the Dreamflows[6] website and/or the US Army Corps of Engineers' website prior to boating the run. In general, boaters said they were

[6] Dreamflows is a fully automated system that polls the internet for stream and reservoir data and stores it in a database. It also estimates/computes the flows at some virtual gauge sites, based on the flows at other actual gauge sites. Around 5:00 p.m. it correlates all this flow data and uses it to create a daily report. Available online at: https://www.dreamflows.com.

satisfied with the availability of flow data; however, one boater indicated that having flow data forecasts would improve the dissemination of flow data.

Boaters rated the difficulty of the Richbar Run as a Class III/IV+. As would be expected, the perceived difficulty of the run increases with higher flow. A factor in this consideration is safety. At higher flows, there is less recovery time, and the potential consequences of a swim are increased. There was a wide range in the time taken to boat the section. Some boaters reported being able to complete the run in less than an hour, while others indicated requiring 3 to 4 hours to complete the run. This variance is likely associated with flows (e.g., 800 cfs vs. 3,000 cfs) as well as the boaters' objectives. For example, a boater passing through the Richbar Run on the way to the Cataracts Run may move through the reach quickly. Conversely, a boater may choose to extend their time on the run by playing, exploring route options, and/or guiding "new" boaters through the run.

Richbar Run Flow Preferences

The minimum acceptable flow[7] preferences of the eight boaters who provided input about their experience boating the Richbar Run ranged between 700 cfs and 1,600 cfs. The optimum flow preferences of these same boaters ranged between 1,000 cfs and 3,500 cfs. Flow preferences at the high end (3,000+ cfs) represent the flow preferences of one expedition-level boater who recognized his preferences are unlikely to represent those of other boaters, including other expedition-level boaters.

In large part, optimum flow considerations are heavily weighted to personal preferences. Some boaters seek out high-water with powerful hydraulics, and others prefer a more "technical" challenge. The considerations for minimum acceptable flow tend to be more concise, with an emphasis on "boatability," route availability, and low-water safety considerations such as pinning or the presence of "sieves[8]."

Figure 5-1 reflects the flow preferences for each of the eight boaters who responded to questions about flow preferences for the Richbar Run.

5.4.3.2 Cadillacs and Cataracts Runs

Boaters running these sections of river are expert to expedition-level boaters and are proficient at running Class V whitewater. The Cadillacs Run was not mentioned as a primary focus for boaters, and the boating considerations for this run are typically associated with the Cataracts Run. There was a wide range in experience of those boating these runs, with one respondent reporting having boated the Cataracts Run twice and another respondent reporting having boated the Cataracts Run more than 200 times. In general, most boaters are targeting the Cataracts Run and boat a section of the Cadillacs Run as part of the "warm-up." While at least one boater described putting in just below Democrat Dam, none of the boaters interviewed said that they set intentions to run

[7] The Questionnaire defined minimum acceptable flow as the flow a boater would return to boat the run.
[8] A sieve is a narrow, empty space through which water flows between two obstructions, usually rocks.

the Cadillacs Run only. That is, boaters putting in within the Cadillacs Run intended to run the river through Richbar and into the Cataracts Run.

For both runs, boaters interviewed indicated that the unique character and difficulty of the whitewater are the primary reasons to boat this section of the river. A unique aspect of the runs is the proximity of Class V/V+ whitewater to easy road access, which is not typically the case with Class V whitewater runs. In addition to the provision of relatively easy access to the run, the proximity of the road provides options should a boater need to terminate the run due to rescue/injury needs, changes in flow conditions, or, if they are having a "bad day." Most boaters indicated they are not constrained with respect to when they can boat the run and take advantage of boating opportunities when boatable flows are present.

Typically, boaters said they put-in upstream of the Upper Richbar Day Use Area, run the "warm-ups," and take-out above Triple-drop rapid. A few boaters reported that they proceed past Triple-drop rapid and take-out at the KR1 Powerhouse location. Access to the put-in and take-out was from SR-178. Boaters indicated that there were no access constraints, but as noted above, parking off SR-178 was limited. Additionally, there are safety considerations associated with proximity to roadside traffic, and there have been break-ins of vehicles parked for shuttling.

Boaters said they checked the flows on either the Dreamflows website, the US Army Corps of Engineers website, and/or contacted local boaters prior to boating the run. In general, they were satisfied with the availability of flow data; however, one boater reported that they perceived flow fluctuations while on-water. Similar to the Richbar Run, there was a wide range in time taken to boat the Cataracts and Cadillacs reaches of the river. Some boaters reported being able to complete a run in less than an hour, while others indicated requiring 3 to 4 hours to complete the run.

Boaters rated the difficulty of this run as a Class V/V+. As would be expected, the perceived difficulty of the run increases with higher flow. A factor in this consideration is safety. At higher flows, there is less recovery time, hydraulics are more powerful, and the consequences of a swim are increased. It should be noted that under any flow condition, a swim in Class V/V+ water is life-threatening and considered a serious situation. Too low a flow also presents a significant safety consideration with the potential of pinning or being "sieved" when there is not enough water to "fill-in" the channel.

Cataracts and Cadillacs Run Flow Preferences

In general, the minimum acceptable flow[9] for the Cadillacs Run is higher than the minimum acceptable flow for the Cataracts Run. The minimum acceptable flow preferences of the six boaters who provided input about their experiences boating the Cadillacs Run ranged between 1,000 cfs and 3,000 cfs. For the Cataracts Run, minimum acceptable flow preferences of the 11 boaters who provided input ranged between 500 cfs and 2,800 cfs. The optimum flow ranges for both runs were similar: for the Cadillacs Run, optimum flow preferences ranged between 1,500 cfs and 3,800 cfs, and

[9] The Questionnaire defined minimum acceptable flow as the flow a boater would return to boat the run.

for the Cataracts Run, optimum flow preferences ranged between 900 cfs and 2,800 cfs. For the Cataracts Run, of the 11 estimates for minimum acceptable flow, the preferences of eight boaters were between 600 cfs and 1,500 cfs (high and low flow estimates eliminated). The high-end minimum acceptable flow preference (2,800 cfs) represents the flow preference of one expedition-level boater who recognized his preferences are unlikely to represent those of other boaters, including other expedition-level boaters.

The considerations for minimum acceptable and optimum flow are determined by personal preferences and can differ considerably between boaters, especially with respect to estimates of optimum flow. As with most any run, the considerations for minimum acceptable flow tend to be more focused on "boatability," route availability, and low-water safety considerations such as pinning or the presence of "sieves." A factor contributing to the variance among flow preferences is the "evolution" of whitewater boating. Equipment and boater skill levels have expanded the "limits" of whitewater boating. What was once considered un-runnable due to difficulty and/or flow is now within the threshold of "expedition-level" boaters. This trend is evident on the lower Kern River as the "new" generation of boaters has pushed the limits on flows and routes.

Figure 5-2 reflects the flow preferences for each of the six boaters who responded to questions about flow preferences for the Cadillacs Run.

Figure 5-3 reflects the flow preferences for each of the 11 boaters who responded to questions about flow preferences for the Cataracts Run.

5.5 BOATABLE FLOW OPPORTUNITIES

The availability of boatable flows was calculated using the flow preference information collected from boater consultation (refer to Section 5.4, above), measured hourly flow data, and modeled hourly flow data.[10] Boatable flows were identified for each run using the flow preference thresholds specific to that run. Boating-day calculations were made for "with-project" hydrology using measured flow data, and "without-project" hydrology using modeled hydrology that "returned" project diversions back into the bypass reach (a maximum diversion of 412 cfs).

The hydrology data period of record (measured and modeled) was 11 water years, extending from 2014 to 2024. During this time period, there was a large variance of Kern River inflow to Lake Isabella, which has a direct influence on flows released from Lake Isabella into the bypass reach. During the period between 2014 and 2024, the California Department of Water Resources Bulletin 120 April 1 Forecast of Kern River inflow to Lake Isabella ranged from a low of 19% of average in 2015, to a high of 371% of average in 2023. Figure 5-4 presents the California Department of Water Resources Bulletin 120 April 1 Forecast of Kern River inflow to Lake Isabella

[10] Daily hydrology data is published by the United States Geological Survey (USGS) as USGS #11192000 - Kern River No 1 Conduit NR Democrat Springs CA and USGS #11192500 – Kern River NR Democrat Springs (River Only) CA. Hourly hydrology data is based on two SCE's gages (SCE is a USGS cooperator). Records are provided to USGS by SCE under the general supervision of the USGS in connection with FERC Project No. 2290.

Using the data identified above, a boating day was identified if there was flow in the bypass reach within the minimum boatable flow threshold and optimal boating flow threshold (specific for each run), for a minimum of four hours between 10:00 a.m. and 4:00 p.m.

The following sections present an overview of the boatable days, by run, for “with-project” and “without-project” hydrology between 2014 and 2024. This overview information includes, for each run, (1) a hydrograph for the complete period of record, and (2) a summary table presenting the annual number of boating days for the 11-year period of record for “with-project” and “without-project” hydrology.

A key finding resulting from boater consultation was that there is a large variance in boater preference for “minimum acceptable” and “optimal” flow thresholds. In the more pronounced cases, there was an overlap of one boater’s “optimal” with another boater’s “minimum.” To address flow suitability for different boater preferences and to examine how project operations affect these opportunities, Appendix E includes an examination of the number of days (by month and year) the river flowed within a more detailed set of intermediate flow ranges, providing a finer-grained view of flow conditions for each run. The figures and tables in Appendix E include separate hydrograph and summary tables for each year that illustrate the number of days with "boatable" flows, broken down by month and year, for each specific river run.

5.5.1 Cadillacs Run

The flow preferences of the boaters who provided input about their experiences boating the Cadillacs Run ranged between 1,000 cfs and 3,000 cfs for the minimum acceptable flow threshold, and between 1,500 and 3,800 cfs for the optimum flow threshold. Therefore, the boatable flow range used to calculate a boating day for the Cadillacs Run was 1,000 cfs to 3,800 cfs.

Figure 5-5 illustrates the hydrograph for the complete period of record, illustrating both “with-project” and “without-project” flows, and when the flow met the criteria for a Cadillacs Run boating day.

The annual number of Cadillacs Run boating days, by month, from 2014 to 2024 under current project operations, is presented in Table 5-2. For this period, the total number of boating days is 488, and the annual number of boating days ranged from 0 in multiple years (WY 2014, 2015, 2016, 2020, 2021, 2022), to a high of 143 in 2019 when inflow into Lake Isabella was 155% of average.

Table 5-3 presents the annual number of boating days by month from 2014 to 2024 using modeled “without-project” hydrology. For this period, the total number of boating days is 698, and the annual number of boating days ranged from 0 in multiple years to a modeled high of 179 in 2024 when inflow into Lake Isabella was 110% of average.

A decrease of 210 boating days was calculated when comparing “with-project” hydrology to “without-project” hydrology between water years 2014 and 2024. That is, there were 210 less boating days on the Cadillacs Run under the “with-project” hydrology scenario

than over the same period under the modeled "without-project" hydrology scenario. Table 5-4 presents the difference in the annual number of boating days, by month, from 2014 to 2024 when comparing "with-project" hydrology to "without-project" hydrology.

Refer to Appendix E for an analysis and illustration of the number of days—broken down by month and year—the Cadillacs Run experienced flows within three specific intermediate ranges (1,000–1,900 cfs, 1,900–2,800 cfs, and 2,800–3,800 cfs), under both "with-project" and "without-project" scenarios.

5.5.2 Richbar Run

The flow preferences of the boaters who provided input about their experiences boating the Richbar Run ranged between 700 cfs and 1,600 cfs for the minimum acceptable flow threshold, and between 1,000 and 3,500 cfs for the optimum flow threshold. Therefore, the boatable flow range used to calculate a boating day for the Richbar Run was 700 cfs to 3,500 cfs.

Figure 5-6 illustrates the hydrograph for the complete period of record, illustrating both "with-project" and "without-project" flows, and when the flow met the criteria for a Richbar Run boating day.

The annual number of Richbar Run boating days, by month, from 2014 to 2024 under current project operations is presented in Table 5-5. For this period, the total number of boating days is 649, and the annual number of boating days ranged from 0 in multiple years (WY 2014, 2015, 2016, 2021, 2022), to a high of 156 in 2019 when inflow into Lake Isabella was 155% of average.

Table 5-6 presents the annual number of boating days by month from 2014 to 2024 using modeled "without-project" hydrology. For this period, the total number of boating days is 912, and the annual number of boating days ranged from 0 in multiple years to a high of 157 in 2018 when inflow into Lake Isabella was 60% of average.

A decrease of 263 boating days was calculated when comparing "with-project" hydrology to "without-project" hydrology between water years 2014 and 2024. That is, there were 263 fewer boating days on the Richbar Run under the "with-project" hydrology scenario than over the same period under the modeled "without-project" hydrology scenario. Table 5-7 presents the difference in the annual number of boating days, by month, from 2014 to 2024 when comparing "with-project" hydrology to "without-project" hydrology.

Refer to Appendix E for an analysis and illustration of the number of days—broken down by month and year—the Richbar Run experienced flows within three specific intermediate ranges (700–1,600 cfs, 1,600–2,500 cfs, and 2,500–3,500 cfs), under both "with-project" and "without-project" scenarios.

5.5.3 Cataracts Run

The flow preferences of the boaters who provided input about their experiences boating the Cataracts Run ranged between 500 cfs and 2,800 cfs for the minimum acceptable

flow threshold, and between 900 and 3,800 cfs for the optimum flow threshold. Therefore, the boatable flow range used to calculate a boating day for the Cataracts Run was 500 cfs to 3,800 cfs.

Figure 5-7 illustrates the hydrograph for the complete period of record, illustrating both "with-project" and "without-project" flows, and when the flow met the criteria for a Cataracts Run boating day.

The annual number of Cataracts Run boating days, by month, from 2014 to 2024 under current project operations, is presented in Table 5-8. For this period, the total number of boating days is 844, and the annual number of boating days ranged from 0 in multiple years (WY 2014, 2015, 2021) to a high of 211 in 2024 when inflow into Lake Isabella was 110% of average.

Table 5-9 presents the annual number of boating days by month from 2014 to 2024 using modeled "without-project" hydrology. For this period, the total number of boating days is 1,152, and the annual number of boating days ranged from 0 in two years (WY 2014, 2015), to a modeled high of 292 in 2024 when inflow into Lake Isabella was 110% of average.

A decrease of 308 boating days was calculated when comparing "with-project" hydrology to "without-project" hydrology between water years 2014 and 2024. That is, there were 308 fewer boating days on the Cataracts Run under the "with-project" hydrology scenario than over the same period under the modeled "without-project" hydrology scenario. Table 5-10 presents the difference in the annual number of boating days, by month, from 2014 to 2024 when comparing "with-project" hydrology to "without-project" hydrology.

Refer to Appendix E for an analysis and illustration of the number of days—broken down by month and year—the Cataracts Run experienced flows within three specific intermediate ranges (500–1,600 cfs, 1,600–2,700 cfs, and 2,700–3,800 cfs), under both "with-project" and "without-project" scenarios.

6.0 CONFLICTS OF WHITEWATER BOATING FLOWS WITH OTHER RECREATION USES

Over the course of this study process, from literature research through boater consultation, no incidence or documentation of conflicts with whitewater boating flows or whitewater boaters was documented. In addition, the REC 2, Recreation Facility Use Assessment study included recreation user in-person intercept surveys conducted several times per month from May 2024 through April 2025 along the bypass reach. During this time period, survey technicians collected or received 374 survey forms representing 1,251 individual day users along the bypass reach. No survey respondents indicated they were whitewater boating the bypass reach. Further, of respondents who identified a water-related activity as their primary recreation activity that day, less than 1% indicated they were "dissatisfied" with flows in the river, compared to 22% who indicated they were "very satisfied" and 74% who indicated they were "satisfied". An

additional 4% indicated they were “neutral” in their perception of river flow as it related to their recreation activity.

A stakeholder raised a concern during the KR1 Initial Study Report meeting on March 19, 2025, about potential impacts to cultural resources from boaters accessing the river channel overland from SR-178. However, as the collected data indicates, whitewater boating in the bypass reach is infrequent and typically limited to a small group of expedition-level boaters during periods of boatable flows. Given this limited use, it is unlikely that boater access is contributing materially to ground disturbance affecting cultural resources. Further, typically, whitewater boaters are focused on accessing the river channel and getting “on-water” as quickly as possible. As such, little time is spent in the field, or on the riverbank, and there are minimal ground disturbing activities associated with access to the river channel and boating put-in and take-out activities.

7.0 STUDY-SPECIFIC CONSULTATION

The following study-specific consultation was conducted:

- **Nomination of whitewater boaters to interview:** Pursuant to the REC 3 TSP, SCE solicited the Recreation TWG (which includes members of the Kern River whitewater boating community) and other stakeholders to identify individuals to contact as part of the structured interview process. The resulting list of 35 names was inclusive—it included the names of all individuals suggested. The list also included the names of those individuals who had completed the Questionnaire online during the 60-day online survey period.

- **Follow-up interviews**: Boaters identified by the Recreation TWG were contacted, and follow-up interviews were conducted. The record of outreach is presented in Appendix D.

- **Distribution of Interim Technical Memo:** The REC 3 – Whitewater Boating Interim Technical Memo was electronically distributed to KR1 stakeholders (all stakeholders on the distribution list) for a 90-day review and comment period on February 28, 2025. The comment period concluded on May 29, 2025. During this period, SCE hosted the Initial Study Report (ISR) meeting on March 19, 2025, to discuss the progress of implementing FERC-approved studies, including the REC 3 – Whitewater Boating Study. During the meeting, results of the REC 3 study were presented and questions solicited. No stakeholder submitted any formal comments on the REC 3 study during or after the 90-day review period.

8.0 OUTSTANDING STUDY PLAN ELEMENTS

There are no outstanding study elements. All data needed to address the study plan objectives were collected during the Level 1 Desktop Assessment. Therefore, based on the study approach detailed in the approved REC 3 TSP, no further assessment is necessary to comprehensively address study objectives. The REC 3 – Whitewater Boating Study is complete.

9.0 REFERENCES

American Whitewater. 2009. Kern – Below Democrat to Kern No. 1 Powerhouse. Last updated January 12, 2009. Accessed December 2024. Available online: https://www.americanwhitewater.org/content/River/view/river-detail/222/main.

———. 2024. Kern River Cataracts of the Kern. Accessed December 2024. Available online: https://cacreeks.com/kern-xxx.htm.

California Creeks. 2024. Kern River Cataracts of the Kern. Accessed December 2024. Available online: https://cacreeks.com/kern-xxx.htm.

Cassady, J., and F. Calhoun. 1995. *California Whitewater: A Guide to the Rivers*. Third Edition.

FERC (Federal Energy Regulatory Commission). 1998a. *Final Environmental Assessment for Hydropower License, Kern River No. 1 Hydroelectric Project.* FERC Project No. 1930-014. June 17.

———. 1998b. Order Issuing New License (Major Project), Kern River No. 1 Hydroelectric Project. FERC Project No. 1930-014. June 16.

———. 2006. Project No. 1930-069, 070—California, Kern River No. 1 Project; Five-Year Recreation Use Report; Article 409. Letter from Lorance W. Yates, FERC Environmental Protection Specialist, to SCE (Attn. Mr. Russ W. Krieger). May 16, 2006.

———. 2024. Study Plan Determination for the Kern River No. 1 Hydroelectric Project. March 14.

Forest Service (United States Forest Service). 1988. *Sequoia National Forest Land and Resource Management Plan.* US Department of Agriculture, Forest Service, Sequoia National Forest. March 1988. Accessed October 2022. Available online: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5400303.pdf.

———. 2023 Land Management Plan for the Sequoia National Forest. Fresno, Kern, and Tulare Counties, California. R5-MB-330-A. U.S. Department of Agriculture, Forest Service, Pacific Southwest Region. Accessed: June 2025. Available online: https://www.fs.usda.gov/r05/sequoia/planning

Holbeck, L. and C. Stanley. 1998. *Best Whitewater in California, The Guide to 180 Runs.* 3rd edition, Watershed Books.

SCE (Southern California Edison). 1994. Application for New License for the Kern River No. 1 Hydroelectric Project, FERC Project No. 1930. Kern County, California. April 28.

——. 2023. Pre-*Application Document for the Kern River No. 1 Hydroelectric Project (FERC Project No. 1930)*. May 5.

——. 2024. Kern River No. 1 Hydroelectric Project (FERC Project No. 1930) Revised Study Plan. February 13.

TCW Economics. 2005. *Report on Five-Year Recreation Use Monitoring Study for the Kern River No. 1 Hydroelectric Project (FERC No. 1930).* Prepared for Southern California Edison, Hydro Generation Division, San Dimas, California. TCW Economics, Sacramento, California. December.

Whittaker, D., B. Shelby, and J. Gangemi. 2005. *Flows and Recreation: A Guide to Studies for River Professionals*. Hydropower Reform Coalition and National Park Service Hydropower Recreation Assistance Program, Washington, DC.

WRC-Environmental (in association with ENTRIX Inc. and Resource Decisions). 1996. *Kern River Whitewater Boating Study, Kern River No. 1 Project: FERC No. 1930*. Prepared for Southern California Edison. June.

TABLES

Table 3-1. Scale of Whitewater Difficulty

Class Rating	Skill Level	Description
I		Fast-moving water with riffles and small waves. Few obstructions, all obvious and easily missed with little training. Risk to swimmers is slight; self-rescue is easy.
II	**Novice**	Straightforward rapids with wide, clear channels that are evident without scouting. Occasional maneuvering may be required, but rocks and medium-sized waves are easily missed by trained paddlers. Swimmers are seldom injured, and group assistance, while helpful, is seldom needed. Rapids that are at the upper end of this difficulty range are designated “Class II+”.
III	**Intermediate**	Rapids with moderate, irregular waves that may be difficult to avoid and that can swamp an open canoe. Complex maneuvers in fast current and good boat control in tight passages or around ledges are often required; large waves or strainers may be present, but are easily avoided. Strong eddies and powerful current effects can be found, particularly on large-volume rivers. Scouting is advisable for inexperienced parties. Injuries while swimming are rare; self-rescue is usually easy, but group assistance may be required to avoid long swims. Rapids that are at the lower or upper end of this difficulty range are designated “Class III-” or “Class III+,” respectively.
IV	**Advanced**	Intense, powerful, but predictable rapids require precise boat handling in turbulent water. Depending on the character of the river, it may feature large, unavoidable waves and holes or constricted passages demanding fast maneuvers under pressure. A fast, reliable eddy turn may be needed to initiate maneuvers, scout rapids, or rest. Rapids may require “must” moves above dangerous hazards. Scouting may be necessary the first time down. Risk of injury to swimmers is moderate to high, and water conditions may make self-rescue difficult. Group assistance for rescue is often essential but requires practiced skills. A strong eskimo roll is highly recommended. Rapids that are at the lower or upper end of this difficulty range are designated “Class IV-” or “Class IV+,” respectively.
V	**Expert**	Extremely long, obstructed, or very violent rapids that expose a paddler to added risk. Drops may contain** large, unavoidable waves and holes or steep, congested chutes with complex, demanding routes. Rapids may continue for long distances between pools, demanding a high level of fitness. What eddies exist may be small, turbulent, or difficult to reach. At the high end of the scale, several of these factors may be combined. Scouting is recommended but may be difficult. Swims are dangerous, and rescue is often difficult even for experts. A very reliable eskimo roll, proper equipment, extensive experience, and practiced rescue skills are essential. Because of the large range of difficulty that exists beyond Class IV, Class V is an open-ended, multiple-level scale designated by Class V.0, V.1, V.2, etc. Each of these levels is an order of magnitude more difficult than the last. Example: increasing difficulty from Class V.0 to Class V.1 is a similar order of magnitude as increasing from Class IV to Class C.0.
VI	**Extreme and Exploratory Rapids**	These runs have almost never been attempted and often exemplify the extremes of difficulty, unpredictability, and danger. The consequences of errors are very severe, and rescue may be impossible. For teams of experts only, at favorable water levels, after close personal inspection and taking all precautions. After a Class VI rapid has been run many times, its rating may be changed to an appropriate Class V.x rating.

Source: American Whitewater 2024

Table 5-1. Whitewater Boating Opportunities in the Kern River Basin

Whitewater Run	River	Put-in	Take-out	Length of Run (miles)	Gradient (feet/mile)	Class Rating
Monache Meadows to Kennedy Meadows	South Fork Kern	4WD road into Monache Meadows	Kennedy Meadows	17	10–250	V
Kennedy Meadows to Long Valley	South Fork Kern	Kennedy Meadows	Long Valley trail about 2 miles to a Bureau of Land Management campground	22	250–200	V/V+
Headwaters of the Kern	Kern	23-mile hike to Junction Meadows	Forks of the Kern put-in trail	39.9	90 (avg)	V
Forks of the Kern	Kern	3.75-mile hike down Forks of the Kern Trail	Johnsondale Bridge	14.6	65 (avg)	V
Johnsondale Bridge	Kern	Johnsondale Bridge	Above Fairview Dam	2.4	52 (avg)	IV–V
Sidewinder/ Bombs Away	Kern	Below Fairview Dam	Roads End/ Calkins Put-in	0.5	80 (avg)	IV–V
Fairview	Kern	Roads End / Calkins	Calkins Flat	2.3	33 (avg)	III
Chamise Gorge	Kern	Calkins Flat	Above Upper Salmon Rapid	2.5	68 (avg)	IV–V
Salmon Falls	Kern	Below Lower Salmon Rapid	Ant Canyon	0.9	89 (avg)	VI
Gold Ledge	Kern	Ant Canyon	Corral Creek	3.1	66 (avg)	IV–V
Thunder Run	Kern	Corral Creek	Thunderbird Access or Camp 3	3.5	60 (avg)	V
Cable/Camp 3	Kern	Camp 3	Riverkern Beach	1.8	52 (avg)	IV
Riverkern Beach	Kern	Riverkern Beach	KR3 Powerhouse Put-in/Take-out	1	38 (avg)	II
Powerhouse/ “Lickety Split”	Kern	KR3 Powerhouse Put-in/Take-out	Riverside Park, Kernville	1.8	31 (avg)	II+–III

Whitewater Run	River	Put-in	Take-out	Length of Run (miles)	Gradient (feet/mile)	Class Rating
Rincon Camp to Kern River	Brush Creek	Sherman Pass Road about 1.5 miles to a large area designated as a helicopter landing pad	Confluence of Brush Creek with the Kern River	1.4	360 (avg)	IV–V
Jungle Run	Kern	Hwy-155 Bridge below Lake Isabella	Borel Powerhouse or Miracle Hot Springs	6–7	N/A	III
Miracle Run	Kern	Miracle Hot Springs area	Democrat Raft Take-out Boating Site (upstream of Democrat Dam)	11.2	30 (avg)	IV
Cadillacs	Kern	Overland hike from SR-178 downstream of Democrat Dam	Upper Richbar Day Use Area	4.5 +/-	87 (avg)	V
Richbar	Kern	Overland hike from SR-178	Lower Richbar Day Use Area, Live Oak Day Use Area, or 1 mile downstream of Live Oak Day Use Area	3 +/-	52 (avg)	IV
Cataracts	Kern	Lower Richbar Day Area or Live Oak Day Use Area	SR-178 upstream of Powerhouse No. 1	2.8 +/-	1,434 (avg)	V+
Rio Bravo/Boy Scout	Kern	Large parking area on the side of SR-178 across from the Pacific Gas and Electric Company power plant at the mouth of the canyon	River access parking area on the southwest side of Rancheria Road bridge	1.2	51 (avg)	IV

Whitewater Run	River	Put-in	Take-out	Length of Run (miles)	Gradient (feet/mile)	Class Rating
Hart Park	Kern	River access parking area on the southwest side of Rancheria Road bridge	A number of options for take-out at either Kern River State Park (Lake Ming) or at the Kern River County Park	7.3	14 (avg)	II

Note: Run lengths and gradients were obtained from published information or calculated from Google Earth imagery and are presented for comparative purposes only. Run lengths and elevational profiles were not topographically surveyed and, as such, should be considered approximate estimates of length and overall gradient.
Key: avg = average

Table 5-2. Cadillacs Run Boating Day "With-Project" Hydrology

With-Project Whitewater Boating Days (1,000-3,800 cfs)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
2014	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	10	18	0	6	0	0	18	25	1	78
2018	0	0	0	0	0	0	0	0	15	19	0	0	34
2019	0	0	0	0	0	1	30	29	11	31	30	11	143
2020	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	11	1	0	0	19	31	30	92
2024	31	15	0	0	0	0	0	14	28	31	22	0	141
Total													**488**

Key: cfs = cubic feet per second

Table 5-3. Cadillacs Run Boating Day "Without-Project" Hydrology

Without-Project Whitewater Boating Days (1,000–3,800 cfs)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
2014	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	10	18	0	2	0	0	15	31	16	92
2018	24	0	0	0	0	0	0	18	30	31	27	0	130
2019	0	0	0	0	0	2	30	26	3	31	31	28	151
2020	0	0	0	0	0	0	0	6	22	27	1	0	56
2021	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	10	1	0	1	18	31	29	90
2024	31	15	2	0	0	0	10	28	30	31	31	1	179
Total													**698**

Key: cfs = cubic feet per second

Table 5-4. Cadillacs Run Boating Day Difference: "With-Project" to "Without-Project" Hydrology

Difference With-Project - Without-Project Whitewater Boating Days (500–3,800 cfs)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
2014	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	4	0	0	3	-6	-15	-14
2018	-24	0	0	0	0	0	0	-18	-15	-12	-27	0	-96
2019	0	0	0	0	0	-1	0	3	8	0	-1	-17	-8
2020	0	0	0	0	0	0	0	-6	-22	-27	-1	0	-56
2021	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference With-Project - Without-Project Whitewater Boating Days (500–3,800 cfs)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
2023	0	0	0	0	0	1	0	0	-1	1	0	1	2
2024	0	0	-2	0	0	0	-10	-14	-2	0	-9	-1	-38
Total													**-210**

Key: cfs = cubic feet per second

Table 5-5. Richbar Run Boating Day "With-Project" Hydrology

With-Project Whitewater Boating Days (700–3,500 cfs)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
2014	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	15	21	0	3	0	0	15	31	9	94
2018	10	0	0	0	0	0	0	12	29	31	21	0	103
2019	0	0	0	0	0	2	30	27	8	31	31	27	156
2020	2	0	0	0	0	0	0	2	13	19	0	0	36
2021	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	10	1	0	1	18	31	29	90
2024	31	15	3	0	0	0	3	26	30	31	31	0	170
Total													**649**

Key: cfs = cubic feet per second

Table 5-6. Richbar Run Boating Day "Without-Project" Hydrology

Without-Project Whitewater Boating Days (700–3,500 cfs)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
2014	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	12	12	0	0	24
2017	0	0	0	15	21	0	0	0	0	12	31	30	109
2018	31	4	0	0	0	0	0	26	30	31	31	4	157
2019	0	0	0	0	0	6	30	21	1	27	31	30	146
2020	24	0	0	0	0	0	8	31	30	31	11	0	135
2021	0	0	0	0	0	0	0	0	3	0	0	0	3
2022	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	10	1	0	1	17	29	25	83
2024	31	30	10	0	0	11	30	31	30	31	31	20	255
Total													**912**

Key: cfs = cubic feet per second

Table 5-7. Richbar Run Boating Day Difference: "With-Project" to "Without-Project" Hydrology

Difference With-Project - Without-Project Whitewater Boating Days (700–3,500 cfs)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
2014	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	-12	-12	0	0	-24
2017	0	0	0	0	0	0	3	0	0	3	0	-21	-15
2018	-21	-4	0	0	0	0	0	-14	-1	0	-10	-4	-54
2019	0	0	0	0	0	-4	0	6	7	4	0	-3	10
2020	-22	0	0	0	0	0	-8	-29	-17	-12	-11	0	-99
2021	0	0	0	0	0	0	0	0	-3	0	0	0	-3
2022	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0	0	1	2	4	7
2024	0	-15	-7	0	0	-11	-27	-5	0	0	0	-20	-85
Total													**-263**

Key: cfs = cubic feet per second

Table 5-8. Cataracts Run Boating Day "With-Project" Hydrology

With-Project Whitewater Boating Days (500–3,800 cfs)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
2014	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	3	2	0	0	5
2017	0	0	0	23	22	0	6	0	0	18	31	26	126
2018	31	1	0	1	0	0	0	23	30	31	31	3	151
2019	0	0	0	0	0	2	30	29	11	31	31	30	164
2020	14	0	0	0	0	0	0	15	28	31	5	0	93
2021	0	0	0	0	0	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	12	1	0	1	19	31	30	94
2024	31	24	8	0	0	0	20	30	30	31	31	6	211
Total													**844**

Key: cfs = cubic feet per second

Table 5-9. Cataracts Run Boating Day "Without-Project" Hydrology

Without-Project Whitewater Boating Days (500–3,800 cfs)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
2014	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	30	31	22	0	83
2017	0	0	0	23	22	0	2	0	0	15	31	30	123
2018	31	4	0	1	0	0	2	31	30	31	31	12	173
2019	0	0	0	0	0	11	30	26	3	31	31	30	162
2020	30	0	24	3	0	0	16	31	30	31	22	0	187
2021	0	0	0	0	0	0	0	0	16	0	0	0	16
2022	0	0	0	0	0	0	0	1	9	7	0	0	17
2023	0	0	0	7	0	12	1	0	1	18	31	29	99
2024	31	30	20	10	0	18	30	31	30	31	31	30	292
Total													**1,152**

Key: cfs = cubic feet per second

Table 5-10. Cataracts Run Boating Day Difference: "With-Project" to "Without-Project" Hydrology

Difference With-Project - Without-Project Whitewater Boating Days (500–3,800 cfs)	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
2014	0	0	0	0	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	-27	-29	-22	0	-78
2017	0	0	0	0	0	0	4	0	0	3	0	-4	3
2018	0	-3	0	0	0	0	-2	-8	0	0	0	-9	-22
2019	0	0	0	0	0	-9	0	3	8	0	0	0	2
2020	-16	0	-24	-3	0	0	-16	-16	-2	0	-17	0	-94
2021	0	0	0	0	0	0	0	0	-16	0	0	0	-16
2022	0	0	0	0	0	0	0	-1	-9	-7	0	0	-17
2023	0	0	0	-7	0	0	0	0	0	1	0	1	-5
2024	0	-6	-12	-10	0	-18	-10	-1	0	0	0	-24	-81
Total													**-308**

Key: cfs = cubic feet per second

FIGURES

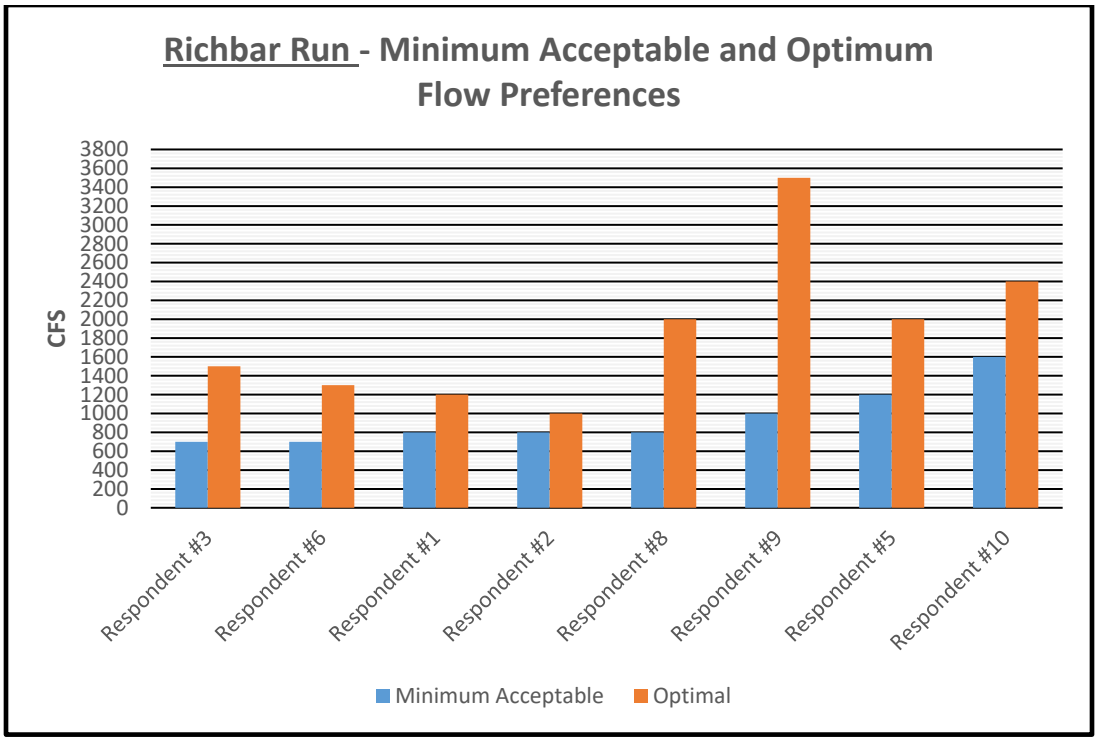


Figure 5-1. Richbar Run—Minimum Acceptable and Optimum Flow Preferences[11]

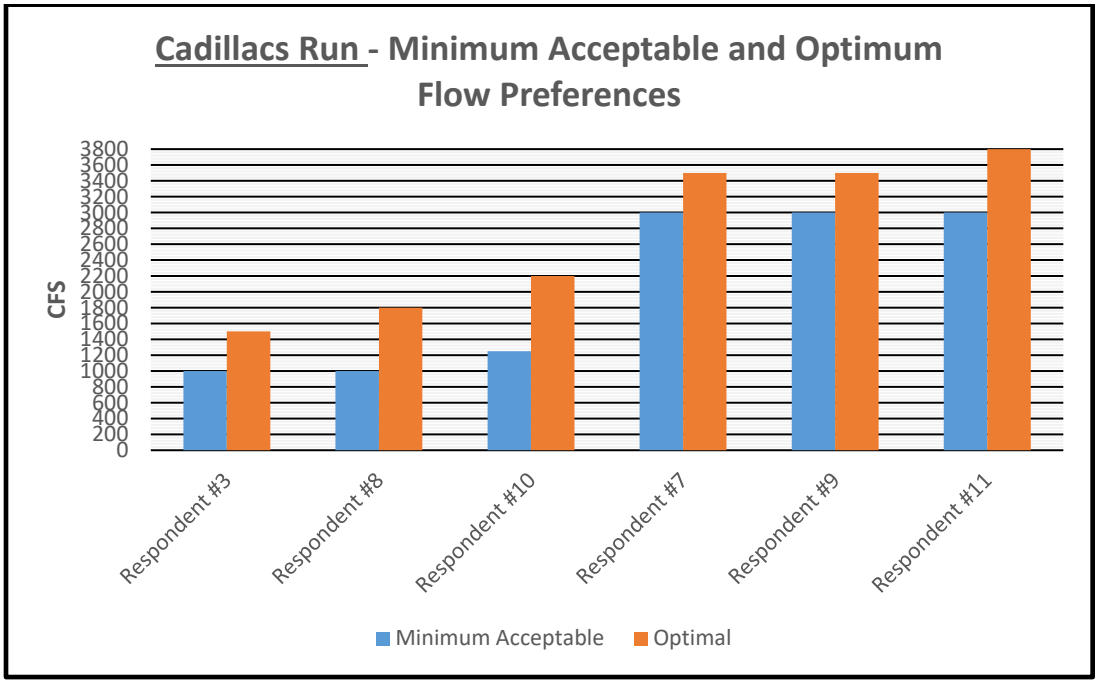


Figure 5-2. Cadillacs Run—Minimum Acceptable and Optimum Flow Preferences[12]

[11] The flow preference data presented is based on boater responses to structured interview questions.
[12] The flow preference data presented is based on boater responses to structured interview questions.

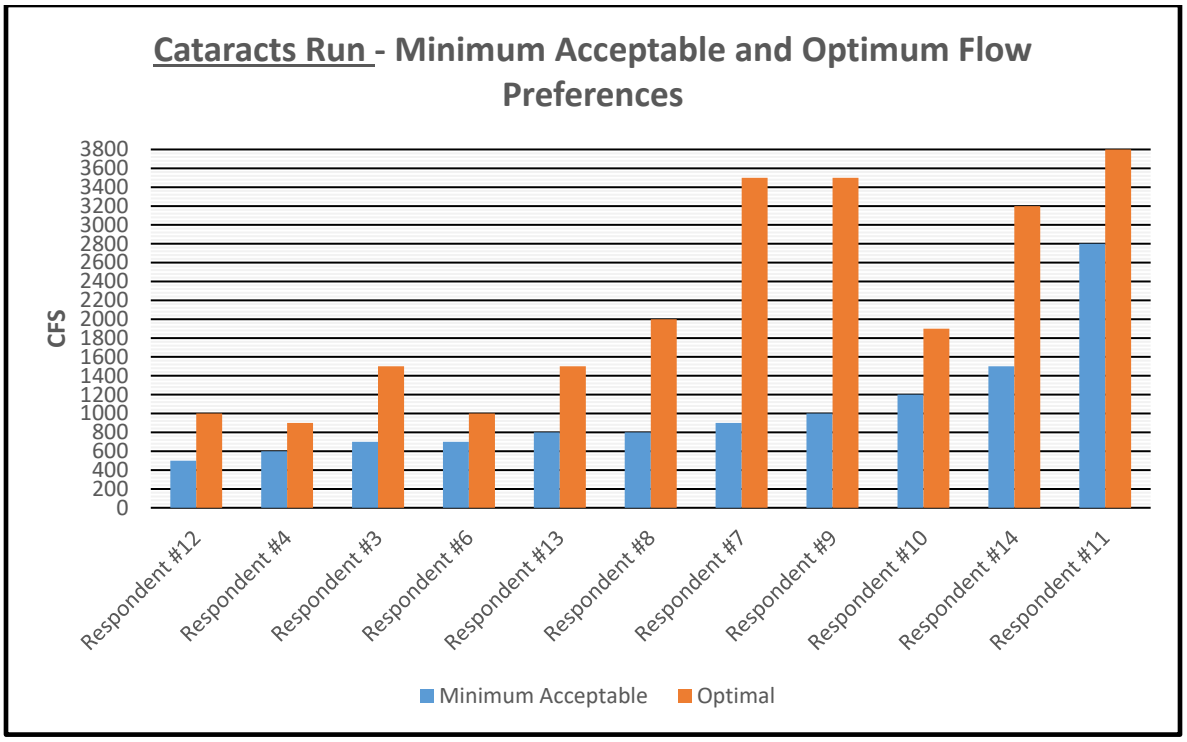


Figure 5-3. Cataracts Run—Minimum Acceptable and Optimum Flow Preferences[13]

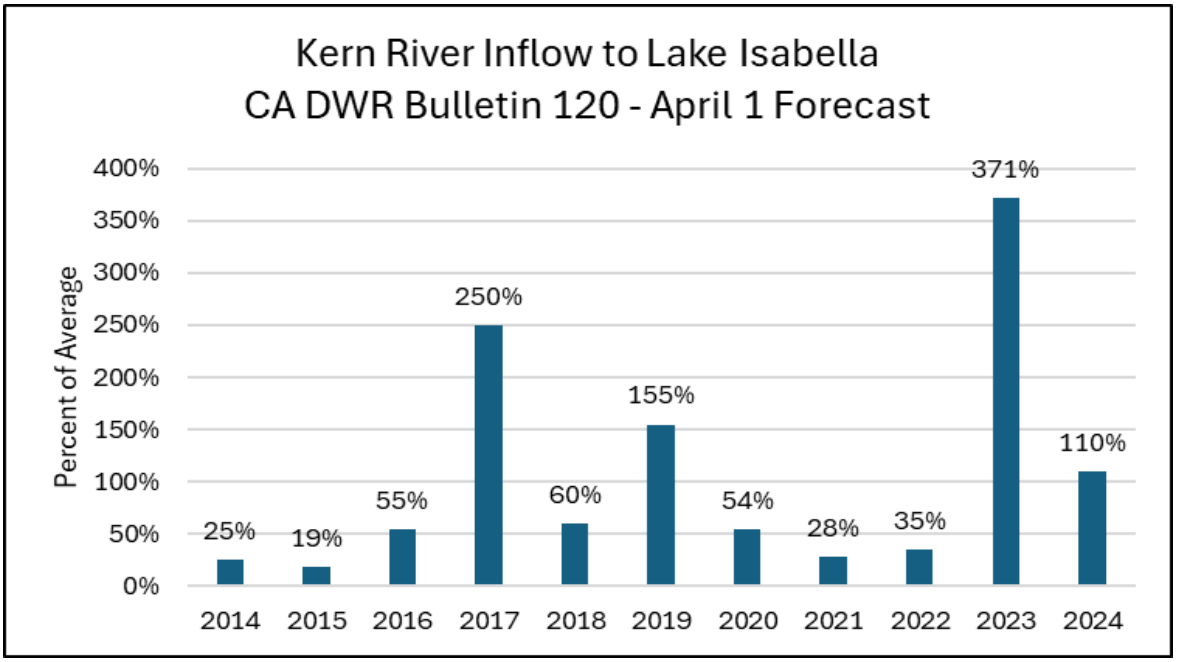


Figure 5-4. Kern River Inflow to Lake Isabella – Percent of Average by Year (2014–2024)

[13] The flow preference data presented is based on boater responses to structured interview questions.

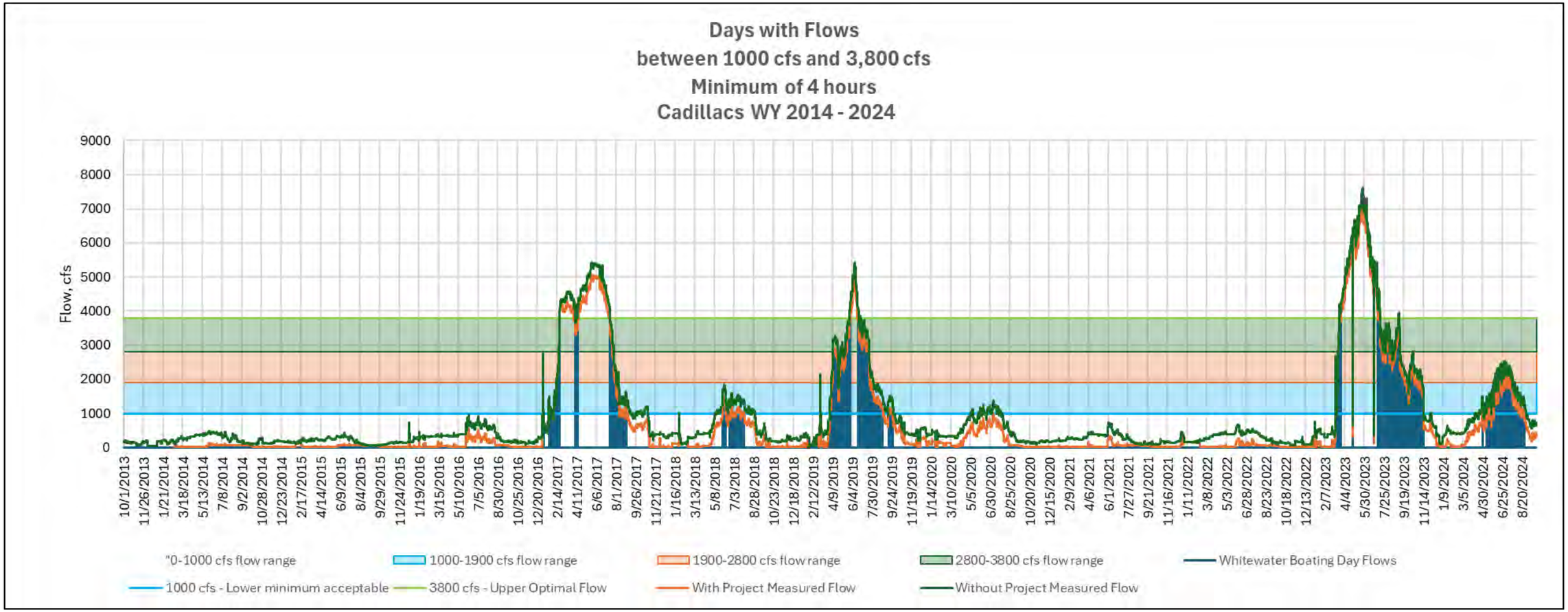


Figure 5-5. Cadillacs Run: Water Years 2014–2024

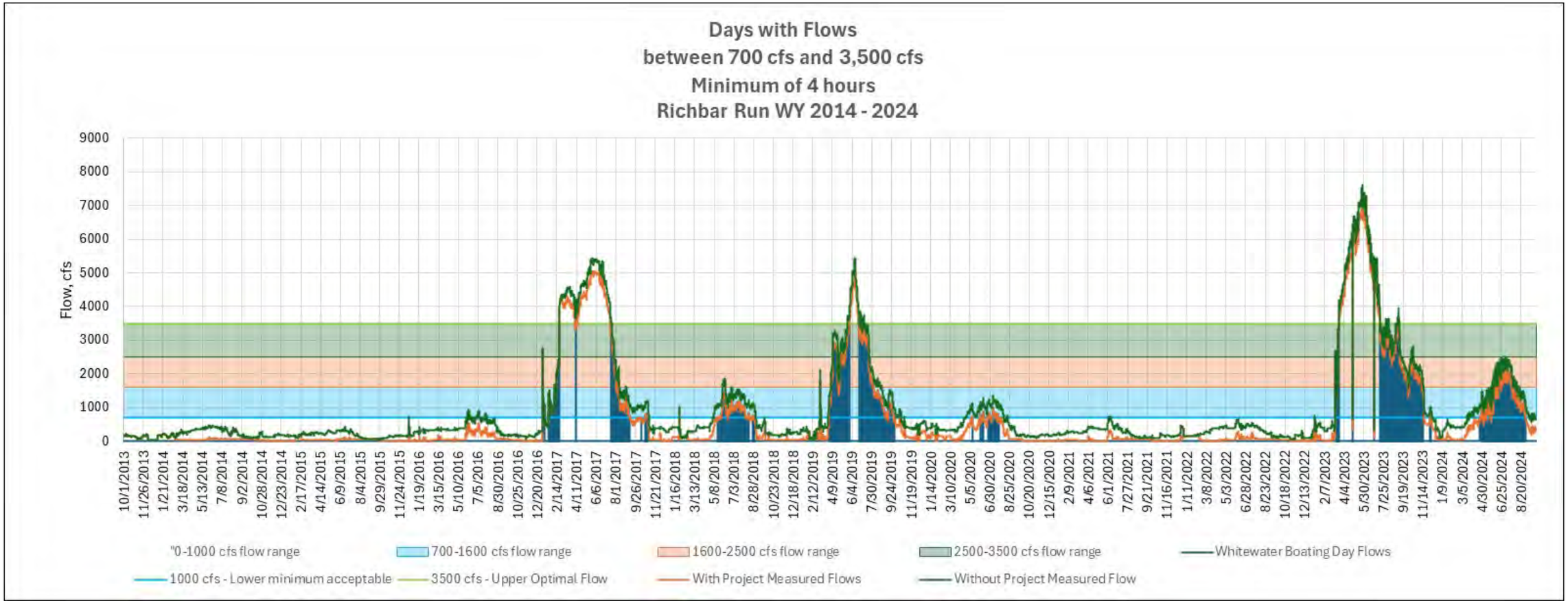


Figure 5-6. Richbar Run: Water Years 2014–2024

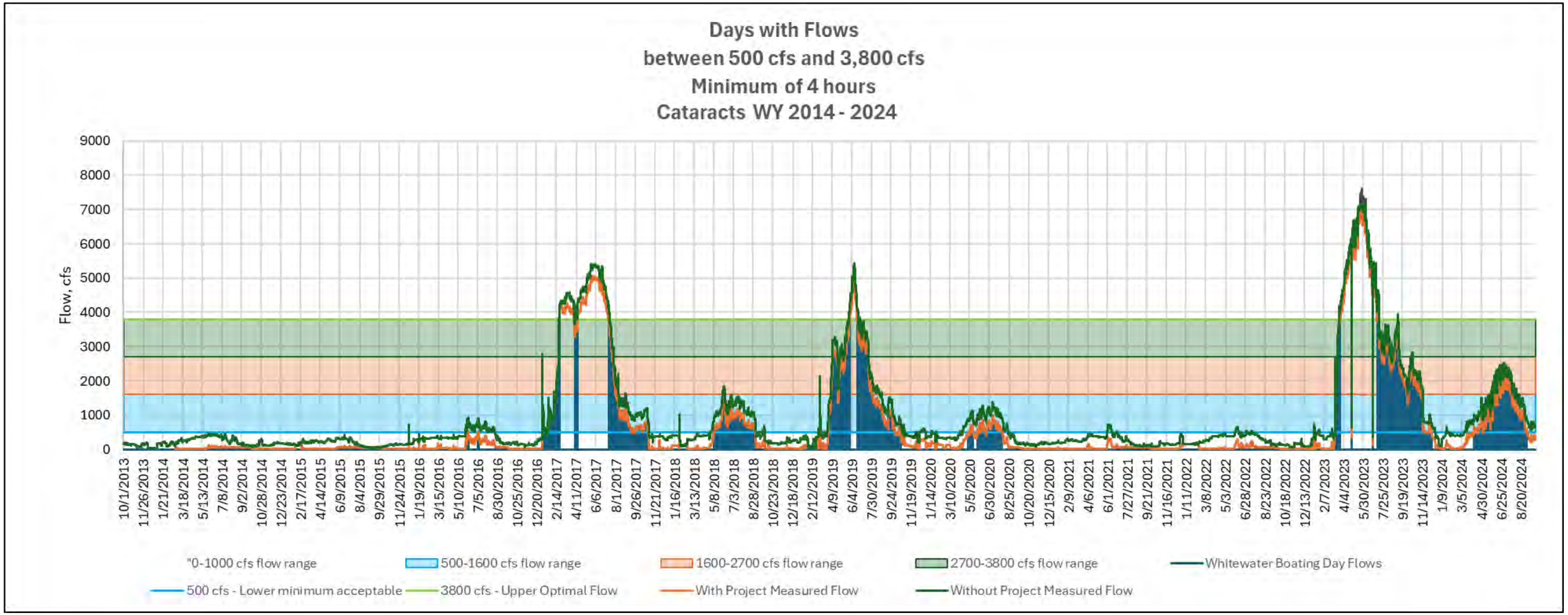
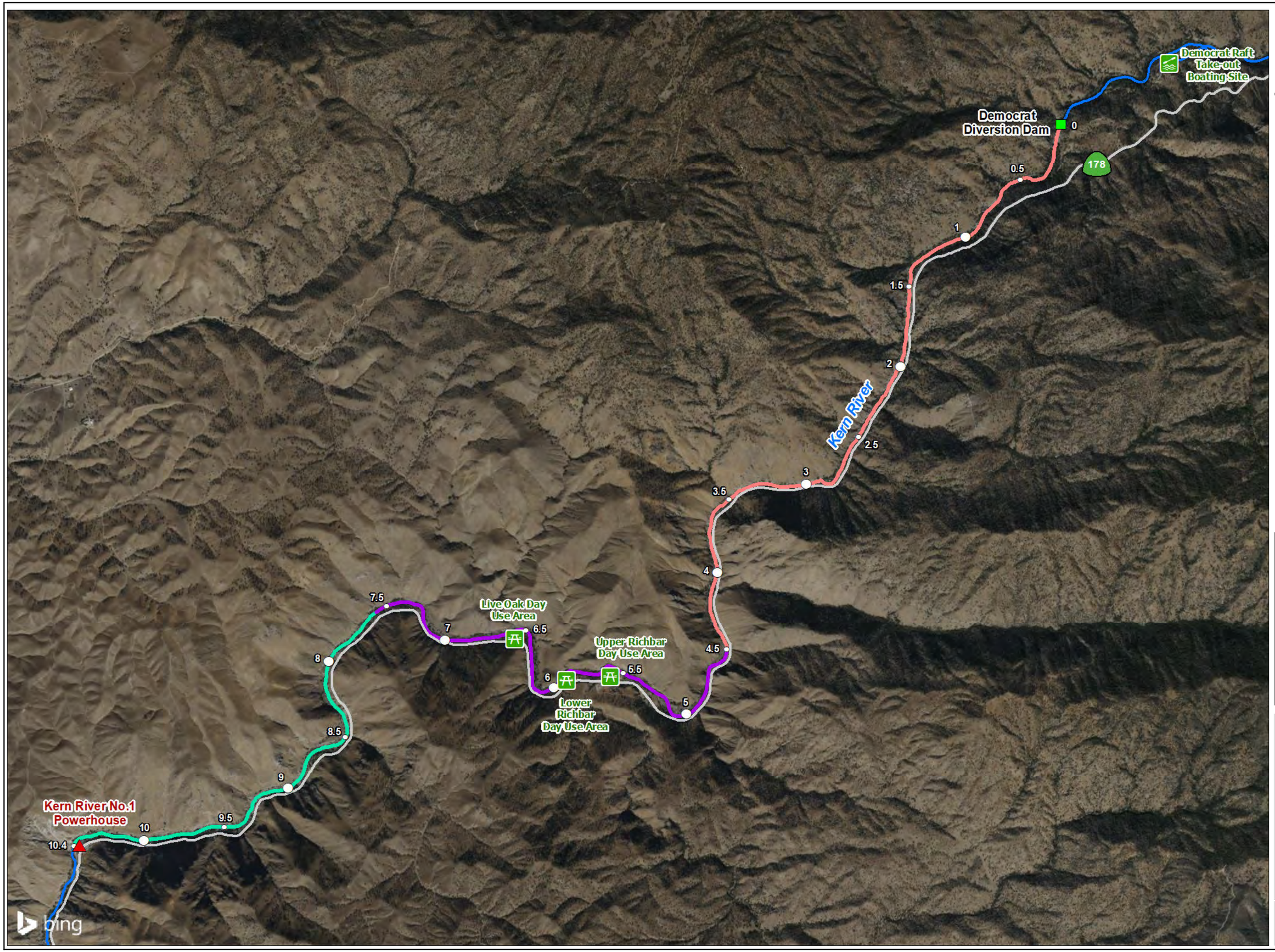


Figure 5-7. Cataracts Run: Water Years 2014–2024

MAPS



Facilities

- Dam
- Powerhouse

Transportation

- Major Road

Hydrology

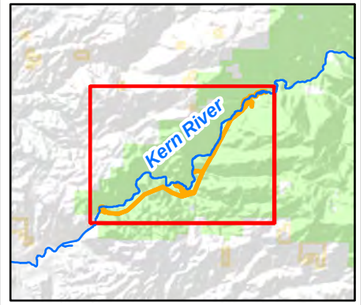
- Watercourse

Forest Service Recreation Sites

- Raft Takeout
- Day Use Area

White Water Runs

- Mile marker
- Half-mile Marker
- Cadillacs Run
- Richbar Run
- Cataracts Run



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-1

Whitewater Run Overview

0 1,500 3,000
Feet

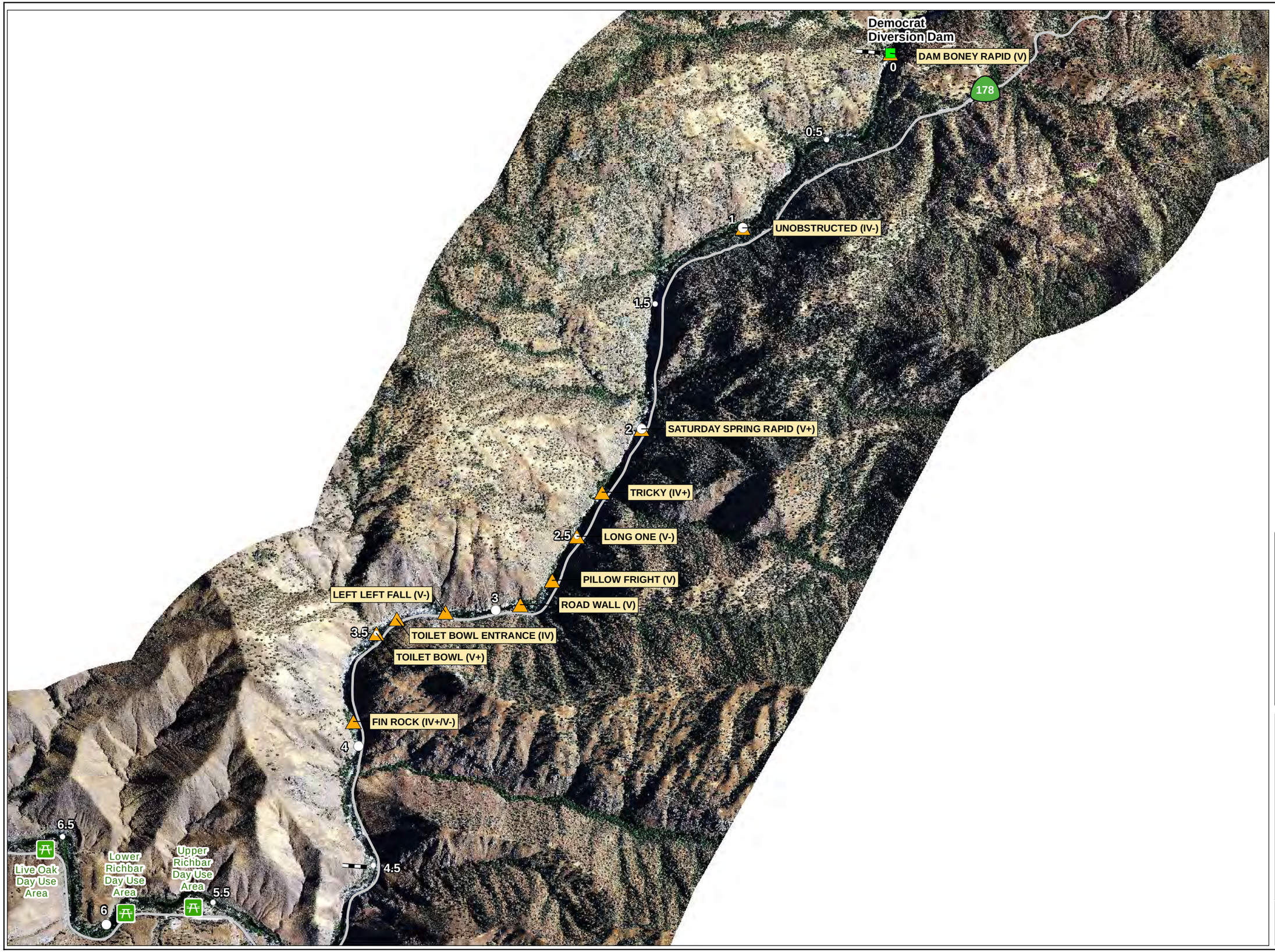
Date: 1/4/2025

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\Users\aclare\OneDrive - Stantec\Documents_CON01Data\gis_projects\237800343\03_data\gis_cad\map\Kern River 1\RecreationMaps\SCE_Kern1_WWOverview_17i11i_01.mxd

Copyright 2025 by Southern California Edison Company



Facilities

- Dam

Forest Service Recreation Sites

- Day Use Area

Transportation

- Other Road

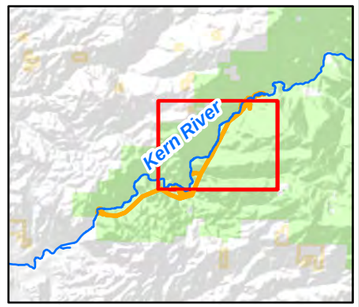
Other

- Rapid Location
- Extents of Run

Aerial Image: Eagle Imagery, 2020

Source: Rapid location and classification difficulty rating: California Creeks https://cacreeks.com/kern-xxx.htm

Notes: The rapid locations and classification difficulty ratings are based on publicly available information and subject to change. This information is presented to provide a general description of the whitewater run and SCE does not warrant the accuracy of the rapid locations and/or the classification difficulty



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-2

Cadillacs Whitewater Run

0 1,000 2,000
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 1/4/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\Users\aclare\OneDrive - Stantec\Documents_CON01Data\gis_projects\237800343\03_data\gis_cad\map\Kern River 1\RecreationMaps\SCE_Kern1_WWCadillacsRun_17i11i_01.mxd

Copyright 2025 by Southern California Edison Company



Forest Service Recreation Sites

Day Use Area

Transportation

Other Road

Other

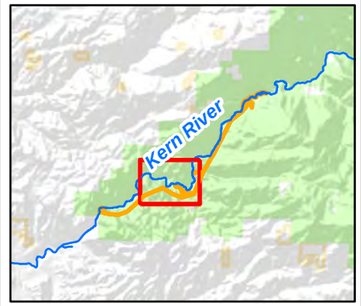
Rapid Location

Extents of Run

Aerial Imagery: Eagle Imagery, 2020

Source: Rapid location and classification difficulty rating: California Creeks https://cacreeks.com/kern-xxx.htm

Notes: The rapid locations and classification difficulty ratings are based on publicly available information and subject to change. This information is presented to provide a general description of the whitewater run and SCE does not warrant the accuracy of the rapid locations and/or the classification difficulty



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-3

Richbar Whitewater Run

0 500 1,000
Feet

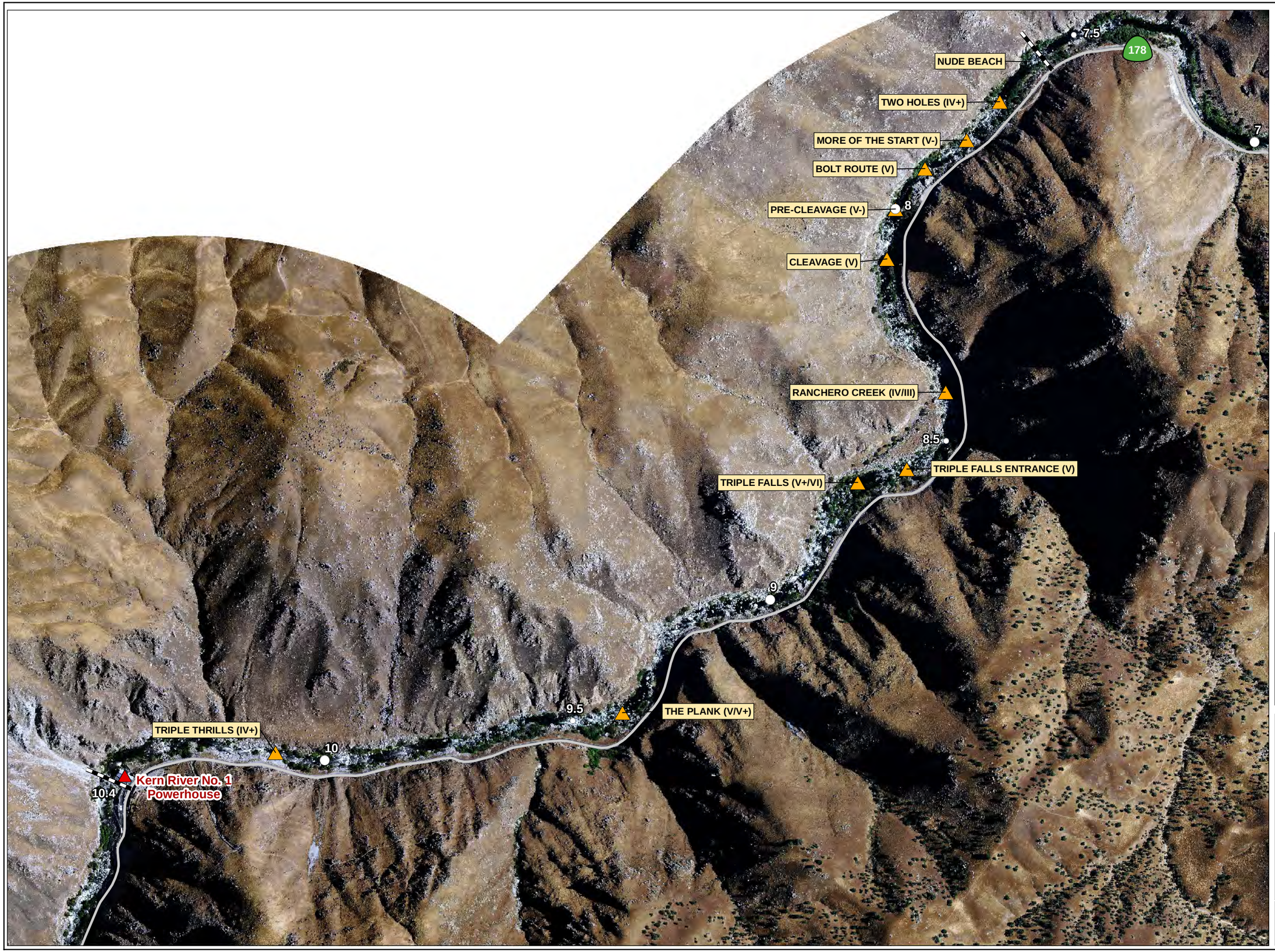
Projection: UTM Zone 11
Datum: NAD 83

Date: 1/4/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\Users\aclare\OneDrive - Stantec\Documents_CON01Data\gis_projects\237800343\03_data\gis_cad\map\Kern River 1\RecreationMaps\SCE_Kern1_WWRichbarRun_17i11i_01.mxd

Copyright 2025 by Southern California Edison Company



Facilities

- Powerhouse

Transportation

- Other Road

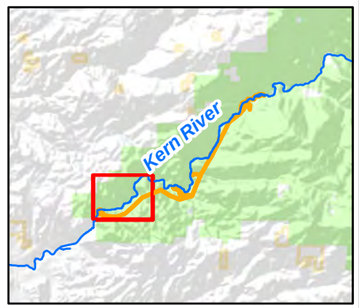
Other

- Rapid Location
- Extents of Run

Aerial Imagery: Eagle Imagery, 2020

Source: Rapid location and classification difficulty rating: California Creeks https://cacreeks.com/kern-xxx.htm

Notes: The rapid locations and classification difficulty ratings are based on publicly available information and subject to change. This information is presented to provide a general description of the whitewater run and SCE does not warrant the accuracy of the rapid locations and/or the classification difficulty



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 3-4

Cataracts Whitewater Run

0 500 1,000
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 1/4/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\Users\aclare\OneDrive - Stantec\Documents_CON01Data\gis_projects\237800343\03_data\gis_cad\map\Kern River 1\RecreationMaps\SCE_Kern1_WWCataractsRun_17i11i_01.mxd

Copyright 2025 by Southern California Edison Company

APPENDIX A

Questionnaire

Copyright 2026 by Southern California Edison

Whitewater Boating Survey

SOUTHERN CALIFORNIA EDISON®

Energy for What's Ahead℠

About this Survey

Southern California Edison (SCE) is the owner and operator of the Kern River No. 1 Hydroelectric (KR1) Project, Federal Energy Regulatory Commission (FERC) No. P-1930, which is currently undergoing a relicensing proceeding with FERC to renew its long-term operating license. This Structured Interview Questionnaire (Questionnaire) is part of the Level 1 Desktop Analysis identified in the REC 3 – Whitewater Boating Technical Study Plan (TSP) being conducted to support the relicensing process. The objective of this Questionnaire is to gather information to estimate the range of preferred flows (minimum acceptable and optimum whitewater flows) for respective watercraft; identify constraints, if any, for estimating range of preferred flows; flow information needs; and whitewater use patterns from individuals that have boated the Kern River between Democrat Diversion Dam and the Project Powerhouse. A map delineating the location of this section of the Kern River is provided at this link:

Project Location Map

This information will be used to determine, in consultation with resource agencies and the whitewater boating community, whether initiating the Level 2 Limited Reconnaissance is necessary to achieve the TSP objectives.

This Questionnaire should be completed only by those who have whitewater boating experience on sections of the Kern River between Democrat Diversion Dam and the KR1 Powerhouse.

If you have boated this section of the Kern River, please complete the Questionnaire to document your whitewater boating experience. The Questionnaire asks you to specify which whitewater segments you typically boat, what type of watercraft you use, when you typically boat, river access, and flow preferences. The Questionnaire is divided into four sections, with the first section requesting boater information, and the following sections addressing the different

whitewater runs within this stretch of river: 1) Cadillacs Run, 2) Richbar Run, and 3) Cataracts Run. The map provided at this link shows the locations of each whitewater run. Please complete the Questionnaire only for whitewater runs you have boated; leave blank the section(s) on which you do not have boating experience. The Questionnaire will take 20 to 30 minutes to complete. Your thoughtful responses will provide important information about whitewater boating on this stretch of river, your feedback is important. You only need to complete the structured interview Questionnaire one time. Thank you for participating in the structured interview Questionnaire. If you know of other boaters that have experience on this section of the Kern River between Democrat Diversion Dam and the KR1 Powerhouse, please encourage them to complete this structured interview Questionnaire.

Boater Information

First and Last Name

Email Address

Phone Number

Please provide the five-digit zip code for your primary address

What is your age? (choose one)

Under 18

18 – 19

20 – 29

30 – 39

40 – 49

50 – 59

60 or older

What is your gender? (choose one)

Female

Male

Non-binary

Choose not to answer

What would you rate your overall whitewater skill level? (choose one)

Intermediate (comfortable boating Class II-III)

Advanced (comfortable boating Class IV)

Expert (comfortable boating Class V)

Expedition (can boat Class V+/ first descents)

What type of watercraft do you have experience using on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? (check all that apply)

Whitewater kayak (K1 or K2)

Closed-deck canoe (C1 or C2)

Open canoe (OC1 or OC2)

Inflatable kayak (IK)

Paddle raft

Oar frame raft

Cataraft

Shredder

Other

What type of watercraft do you use the most to boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? (choose one)

Whitewater kayak (K1 or K2)

Closed-deck canoe (C1 or C2)

Open canoe (OC1 or OC2)

Inflatable kayak (IK)

Paddle raft

Oar frame raft

Cataraft

Shredder

Other

How many times have you run the section of Kern River between Democrat Diversion Dam and the KR1 Powerhouse? (choose one)

1 time

2 to 4 times

5 to 10 times

10 to 20 times

20+ times

How many boating trips per year do you typically make to the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? (choose one)

0 times annually

1 to 2 times annually

3 to 5 times annually

5 to 10 times annually

more than 10 times annually

When do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? (check all that apply)

Weekdays between 8 AM and 5 PM

Weekdays after 5 PM

Weekends

Holiday Weekends (not including holiday)

Holidays (not including associated weekend)

Which whitewater segments do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? Link to Project Location Map (choose one)

Cadillacs Run only

Richbar Run only

Cataracts Run only

Cadillacs and Richbar Runs

Richbar and Cataracts Runs

Cadillacs and Cataracts Runs

Cadillacs, Richbar, and Cataracts Runs

Do you check flow levels in advance to determine if flows are suitable before choosing to boat the river between Democrat Diversion Dam and the KR1 Powerhouse?

Yes

No

Where do you obtain flow information for the Kern River between Democrat Diversion Dam and the KR1 Powerhouse to determine if flows are suitable? (check all that apply)

American Whitewater website

Dreamflows website

SCE flow phone

US Army Corps webpage

Wait until I arrive at the river for direct observation

I do not check flow levels

Other source

Does the available flow information meet your needs?

Yes

No

If the available flow information does not meet your needs, what improvements could be made to keep you better informed of flow levels on the river segments between Democrat Diversion Dam and the KR1 Powerhouse?

The following sections gather information on the specific whitewater runs between Democrat Diversion Dam and the KR1 Powerhouse: Cadillacs Run, Richbar Run, and Cataracts Run.

Link to Project Location Map

Select the run for which you would like to provide information.

Please complete Questionnaire sections only on the runs you have boated. If you have not boated a run, skip to the next applicable section.

Section 1: CADILLACS RUN

Complete this section only if you have boated the Cadillacs Run

Link to Map of Run

What type of watercraft do you have experience using on this run? (check all that apply)

Whitewater kayak (K1 or K2)

Closed-deck canoe (C1 or C2)

Open canoe (OC1 or OC2)

Inflatable kayak (IK)

Paddle raft

Oar frame raft

Cataraft

Shredder

Other

Why do you choose to boat this run? (check all that apply)

Unique character of the whitewater

Whitewater difficulty

River access

Landscape and scenery

Closest boating to where I live

Other

How many times have you boated this section of the Kern River?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:

How long is a TYPICAL boating trip for you on this run? (choose one)

1 - 2 hours

3 - 4 hours

5 - 6 hours

> 6 hours

How would you rate the overall whitewater difficulty for this run? (choose one)

Class III

Class IV

Class IV+

Class V

Class V+

Not Sure

On a typical run, how many times do you portage? (choose one)

0 times

1-2 times

3-4 times

5+ times

How would the overall difficulty of the run change at a higher flow? (choose one)

No change

Less difficult

More difficult

Do not know

How would the following factors change at a higher flow? (check corresponding box)

Factor	Decline Considerably	Slightly Decline	No Change	Slightly Improve	Improve Considerably
Overall "boatability" of the run	☐	☐	☐	☐	☐
Challenging hydraulics	☐	☐	☐	☐	☐
Challenging technical boating	☐	☐	☐	☐	☐
Play opportunities	☐	☐	☐	☐	☐
Route options through rapids	☐	☐	☐	☐	☐
Ability to stop for scouting and portaging	☐	☐	☐	☐	☐
Number of scouts	☐	☐	☐	☐	☐
Difficulty to scout	☐	☐	☐	☐	☐
Number of portages	☐	☐	☐	☐	☐
Difficulty to portage	☐	☐	☐	☐	☐
Safety concerns	☐	☐	☐	☐	☐
Pace of travel	☐	☐	☐	☐	☐
Overall whitewater challenge	☐	☐	☐	☐	☐
Other: Click or tap here to enter text.	☐	☐	☐	☐	☐
Other: Click or tap here to enter text.	☐	☐	☐	☐	☐

How would the overall difficulty of the run change at a lower flow? (choose one)

No change

Less difficult

More difficult

Do not know

How would the following factors change at a lower flow? (check corresponding box)

Factor	Decline Considerably	Slightly Decline	No Change	Slightly Improve	Improve Considerably
Overall "boatability" of the run	☐	☐	☐	☐	☐
Challenging hydraulics	☐	☐	☐	☐	☐
Challenging technical boating	☐	☐	☐	☐	☐
Play opportunities	☐	☐	☐	☐	☐
Route options through rapids	☐	☐	☐	☐	☐
Ability to stop for scouting and portaging	☐	☐	☐	☐	☐
Number of scouts	☐	☐	☐	☐	☐
Difficulty to scout	☐	☐	☐	☐	☐
Number of portages	☐	☐	☐	☐	☐
Difficulty to portage	☐	☐	☐	☐	☐
Safety concerns	☐	☐	☐	☐	☐
Pace of travel	☐	☐	☐	☐	☐
Overall whitewater challenge	☐	☐	☐	☐	☐
Other: Click or tap here to enter text.	☐	☐	☐	☐	☐
Other: Click or tap here to enter text.	☐	☐	☐	☐	☐

The next two questions ask you to identify your flow preferences for your watercraft type. Please base your response on your experience and preferences.

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

Cannot make this determination

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

Cannot make this determination

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in? (choose one)

Developed river access site upstream of Democrat Diversion Dam

Trail downstream of Democrat Diversion Dam

Undeveloped access from Highway 178

Where do you TYPICALLY access the river for take-out? (choose one)

Undeveloped access from Highway 178

Richbar Picnic Area

Live Oak Day Use Area

Continue boating through the Richbar Run section to the Cataracts Run

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

Yes

No

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cadillacs whitewater run?

Section 2: RICHBAR RUN

Complete this section only if you have boated the Richbar Run

Link to Map of Run

What type of watercraft do you have experience using on this run? (check all that apply)

Whitewater kayak (K1 or K2)

Closed-deck canoe (C1 or C2)

Open canoe (OC1 or OC2)

Inflatable kayak (IK)

Paddle raft

Oar frame raft

Cataraft

Shredder

Other

Why do you choose to boat this run? (check all that apply)

Unique character of the whitewater

Whitewater difficulty

River access

Landscape and scenery

Closest boating to where I live

Other

How many times have you boated this section of the Kern River?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:

How long is a TYPICAL boating trip for you on this run? (choose one)

1 - 2 hours

3 - 4 hours

5 - 6 hours

> 6 hours

How would you rate the overall whitewater difficulty for this run? (choose one)

Class III

Class IV

Class IV+

Class V

Class V+

Not Sure

On a typical run, how many times do you portage? (choose one)

0 times

1-2 times

3-4 times

5+ times

How would the overall difficulty of the run change at a higher flow? (choose one)

No change

Less difficult

More difficult

Do not know

How would the following factors change at a higher flow? (check corresponding box)

Factor	Decline Considerably	Slightly Decline	No Change	Slightly Improve	Improve Considerably
Overall "boatability" of the run	☐	☐	☐	☐	☐
Challenging hydraulics	☐	☐	☐	☐	☐
Challenging technical boating	☐	☐	☐	☐	☐
Play opportunities	☐	☐	☐	☐	☐
Route options through rapids	☐	☐	☐	☐	☐
Ability to stop for scouting and portaging	☒	☐	☐	☐	☐
Number of scouts	☐	☐	☐	☐	☐
Difficulty to scout	☐	☐	☐	☐	☐
Number of portages	☐	☐	☐	☐	☐
Difficulty to portage	☐	☐	☐	☐	☐
Safety concerns	☐	☐	☐	☐	☐
Pace of travel	☐	☐	☐	☐	☐
Overall whitewater challenge	☐	☐	☐	☐	☐
Other: Click or tap here to enter text.	☐	☐	☐	☐	☐
Other: Click or tap here to enter text.	☐	☐	☐	☐	☐

How would the overall difficulty of the run change at a lower flow? (choose one)

No change

Less difficult

More difficult

Do not know

How would the following factors change at a lower flow? (check corresponding box)

Factor	Decline Considerably	Slightly Decline	No Change	Slightly Improve	Improve Considerably
Overall "boatability" of the run	☐	☐	☐	☐	☐
Challenging hydraulics	☐	☐	☐	☐	☐
Challenging technical boating	☐	☐	☐	☐	☐
Play opportunities	☐	☐	☐	☐	☐
Route options through rapids	☐	☐	☐	☐	☐
Ability to stop for scouting and portaging	☐	☐	☐	☐	☐
Number of scouts	☐	☐	☐	☐	☐
Difficulty to scout	☐	☐	☐	☐	☐
Number of portages	☐	☐	☐	☐	☐
Difficulty to portage	☐	☐	☐	☐	☐
Safety concerns	☐	☐	☐	☐	☐
Pace of travel	☐	☐	☐	☐	☐
Overall whitewater challenge	☐	☐	☐	☐	☐
Other: Click or tap here to enter text.	☐	☐	☐	☐	☐
Other: Click or tap here to enter text.	☐	☐	☐	☐	☐

The next two questions ask you to identify your flow preferences for your watercraft type. Please base your response on your experience and preferences.

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

Cannot make this determination

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

Cannot make this determination

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in? (choose one)

Undeveloped access from Highway 178 upstream of Upper Richbar day-use area

Upper Richbar day-use area

Undeveloped access downstream of Upper Richbar day-use area

Live Oak Day Use Area

Undeveloped access downstream of Live Oak Day-use area

Where do you TYPICALLY access the river for take-out? (choose one)

Undeveloped access from Highway 178

Upper Richbar Picnic Area

Live Oak Day Use Area

Undeveloped access downstream of Live Oak Day-use area

Continue boating through the Richbar Run section to the Cataracts Run

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

Yes

No

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Richbar whitewater run?

Section 3: CATARACTS RUN

Complete this section only if you have boated the Cataracts Run

Link to Map of Run

What type of watercraft do you have experience using on this run? (check all that apply)

Whitewater kayak (K1 or K2)

Closed-deck canoe (C1 or C2)

Open canoe (OC1 or OC2)

Inflatable kayak (IK)

Paddle raft

Oar frame raft

Cataraft

Shredder

Other

Why do you choose to boat this run? (check all that apply)

Unique character of the whitewater

Whitewater difficultyRiver access

Landscape and scenery

Closest boating to where I live

Other

How many times have you boated this section of the Kern River? (enter # of times)

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:

How long is a TYPICAL boating trip for you on this run? (choose one)

1 - 2 hours

3 - 4 hours

5 - 6 hours

> 6 hours

How would you rate the overall whitewater difficulty for this run? (choose one)

Class III

Class IV

Class IV+

Class V

Class V+

Not Sure

On a typical run, how many times do you portage? (choose one)

0 times

1-2 times

3-4 times

5+ times

How would the overall difficulty of the run change at a higher flow? (choose one)

No change

Less difficult

More difficult

Do not know

How would the following factors change at a higher flow? (check corresponding box)

Factor	Decline Considerably	Slightly Decline	No Change	Slightly Improve	Improve Considerably
Overall "boatability" of the run	☐	☐	☐	☐	☐
Challenging hydraulics	☐	☐	☐	☐	☐
Challenging technical boating	☐	☐	☐	☐	☐
Play opportunities	☐	☐	☐	☐	☐
Route options through rapids	☐	☐	☐	☐	☐
Ability to stop for scouting and portaging	☐	☐	☐	☐	☐
Number of scouts	☐	☐	☐	☐	☐
Difficulty to scout	☐	☐	☐	☐	☐
Number of portages	☐	☐	☐	☐	☐
Difficulty to portage	☐	☐	☐	☐	☐
Safety concerns	☐	☐	☐	☐	☐
Pace of travel	☐	☐	☐	☐	☐
Overall whitewater challenge	☐	☐	☐	☐	☐
Other: Click or tap here to enter text.	☐	☐	☐	☐	☐
Other: Click or tap here to enter text.	☐	☐	☐	☐	☐

How would the overall difficulty of the run change at a lower flow? (choose one)

No change

Less difficult

More difficult

Do not know

How would the following factors change at a lower flow? (check corresponding box)

Factor	Decline Considerably	Slightly Decline	No Change	Slightly Improve	Improve Considerably
Overall "boatability" of the run	☐	☐	☐	☐	☐
Challenging hydraulics	☐	☐	☐	☐	☐
Challenging technical boating	☐	☐	☐	☐	☐
Play opportunities	☐	☐	☐	☐	☐
Route options through rapids	☐	☐	☐	☐	☐
Ability to stop for scouting and portaging	☐	☐	☐	☐	☐
Number of scouts	☐	☐	☐	☐	☐
Difficulty to scout	☐	☐	☐	☐	☐
Number of portages	☐	☐	☐	☐	☐
Difficulty to portage	☐	☐	☐	☐	☐
Safety concerns	☐	☐	☐	☐	☐
Pace of travel	☐	☐	☐	☐	☐
Overall whitewater challenge	☐	☐	☐	☐	☐
Other: Click or tap here to enter text.	☐	☐	☐	☐	☐
Other: Click or tap here to enter text.	☐	☐	☐	☐	☐

The next two questions ask you to identify your flow preferences for your watercraft type. Please base your response on your experience and preferences.

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

Cannot make this determination

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

Cannot make this determination

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in? (choose one)

Developed river access site upstream of Democrat Diversion Dam

Trail downstream of Democrat Diversion Dam

Undeveloped access from Highway 178 upstream of Upper Richbar day-use area

Upper Richbar day-use area

Undeveloped access downstream of Upper Richbar day-use area

Live Oak Day Use Area

Undeveloped access downstream of Live Oak Day-use area

Where do you TYPICALLY access the river for take-out? (choose one)

Undeveloped access from Highway 178

KR1 Powerhouse

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

Yes

No

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cataracts whitewater run?

APPENDIX B

Questionnaire Responses

Copyright 2026 by Southern California Edison

Whitewater Boating Survey

Submitted By: Anonymous user

Submitted Time: November 1, 2024 8:57 AM

About this Survey

Boater Information

First and Last Name

Email Address

Phone Number

Please provide the five-digit zip code for your primary address

93,301

What is your age?

30 - 39

What is your gender?

Male

What would you rate your overal whitewater skill level?

Advanced (comfortable boating Class IV)

What type of watercraft do you have experience using on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

What type of watercraft do you use the most to boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

How many times have you run the section of Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

5 to 10 times

How many boating trips per year do you typically make to the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

5 to 10 times annually

When do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Weekdays between 8 AM and 5 PM, Weekdays after 5 PM, Weekends, Holiday Weekends (not including holiday), Holidays (not including associated weekend)

Which whitewater segments do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? Link to Project Location Map

Richbar Run only

Do you check flow levels in advance to determine if flows are suitable before choosing to boat the river between Democrat Diversion Dam and the KR1 Powerhouse?

Yes

Where do you obtain flow information for the Kern River between Democrat Diversion Dam and the KR1 Powerhouse to determine if flows are suitable?

Dreamflows website

Please specify

Does the available flow information meet your needs?
No

If the available flow information does not meet your needs, what improvements could be made to keep you better informed of flow levels on the river segments between Democrat Diversion Dam and the KR1 Powerhouse?
forecasted future flows

Section 1: CADILLACS RUN

What type of watercraft do you have experience using on this run?

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cadillacs whitewater run?

Section 2: RICHBAR RUN

What type of watercraft do you have experience using on this run?

Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?

Unique character of the whitewater, Whitewater difficulty, River access, Landscape and scenery, Closest boating to where I live

Please specify

How many times have you boated this section of the Kern River?

2

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:
August 25, 2024

Estimated flow:
800

Date:
June 2, 2024

Estimated flow:
800

How long is a TYPICAL boating trip for you on this run?
3 - 4 hours

How would you rate the overall whitewater difficulty for this run?
Class IV

On a typical run, how many times do you portage?
0 times

How would the overall difficulty of the run change at higher flows?
No change

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

improve_considerably

Challenging hydraulics

no_change

Challenging technical boating

no_change

Play opportunities

slightly_improve

Route options through rapids

improve_considerably

Ability to stop for scouting and portaging

no_change

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

no_change

Difficulty to portage

no_change

Safety concerns
decline_considerably

Pace of travel
slightly_improve

Overall whitewater challenge
slightly_improve

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
More difficult

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run
decline_considerably

Challenging hydraulics
no_change

Challenging technical boating
improve_considerably

Play opportunities
decline_considerably

Route options through rapids
decline_considerably

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
no_change

Difficulty to portage
no_change

Safety concerns
improve_considerably

Pace of travel
decline_considerably

Overall whitewater challenge
no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
800

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
1,200

Where do you TYPICALLY access the river for put-in?
Undeveloped access from Highway 178 upstream of Upper Richbar day-use area

Where do you TYPICALLY access the river for take-out?

Undeveloped access downstream of Live Oak Day-use area

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

Yes

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Richbar whitewater run?

The rapids become very rocky at flows below 800 and so any boating days where KR1 is taking the Richbar run below 800 it is reducing boatable days. This had a considerable impact in 2024 by reducing boatable days by probably 6 weeks

Section 3: CATARACTS RUN

What type of watercraft do you have experience using on this run?

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cataracts whitewater run?

Whitewater Boating Survey

Submitted By: Anonymous user

Submitted Time: November 3, 2024 7:30 PM

About this Survey

Boater Information

First and Last Name

Email Address

Phone Number

Please provide the five-digit zip code for your primary address

93,307

What is your age?

60 or older

What is your gender?

Male

What would you rate your overal whitewater skill level?

Advanced (comfortable boating Class IV)

What type of watercraft do you have experience using on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

What type of watercraft do you use the most to boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

How many times have you run the section of Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

20+ times

How many boating trips per year do you typically make to the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

When do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Weekdays after 5 PM, Weekends, Holiday Weekends (not including holiday), Holidays (not including associated weekend)

Which whitewater segments do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? Link to Project Location Map

Richbar Run only

Do you check flow levels in advance to determine if flows are suitable before choosing to boat the river between Democrat Diversion Dam and the KR1 Powerhouse?

Yes

Where do you obtain flow information for the Kern River between Democrat Diversion Dam and the KR1 Powerhouse to determine if flows are suitable?

Dreamflows website

Please specify

Does the available flow information meet your needs?
Yes

If the available flow information does not meet your needs, what improvements could be made to keep you better informed of flow levels on the river segments between Democrat Diversion Dam and the KR1 Powerhouse?

Section 1: CADILLACS RUN

What type of watercraft do you have experience using on this run?

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cadillacs whitewater run?

Section 2: RICHBAR RUN

What type of watercraft do you have experience using on this run?

Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?

Unique character of the whitewater, Whitewater difficulty, River access, Landscape and scenery, Closest boating to where I live

Please specify

How many times have you boated this section of the Kern River?

25

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:
1,000

How long is a TYPICAL boating trip for you on this run?
1 - 2 hours

How would you rate the overall whitewater difficulty for this run?
Class IV+

On a typical run, how many times do you portage?
1-2 times

How would the overall difficulty of the run change at higher flows?
More difficult

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run
slightly_decline

Challenging hydraulics
decline_considerably

Challenging technical boating
decline_considerably

Play opportunities
slightly_decline

Route options through rapids
slightly_decline

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
no_change

Difficulty to portage
no_change

Safety concerns
slightly_decline

Pace of travel
slightly_decline

Overall whitewater challenge
slightly_decline

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
Less difficult

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run
decline_considerably

Challenging hydraulics
decline_considerably

Challenging technical boating
decline_considerably

Play opportunities
decline_considerably

Route options through rapids
decline_considerably

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
no_change

Difficulty to portage
no_change

Safety concerns
no_change

Pace of travel
decline_considerably

Overall whitewater challenge
decline_considerably

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
800

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
1,000

Where do you TYPICALLY access the river for put-in?
Undeveloped access from Highway 178 upstream of Upper Richbar day-use area

Where do you TYPICALLY access the river for take-out?
Undeveloped access downstream of Live Oak Day-use area

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
Yes

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Richbar whitewater run?

Section 3: CATARACTS RUN

What type of watercraft do you have experience using on this run?

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cataracts whitewater run?

Whitewater Boating Survey

Submitted By: Anonymous user

Submitted Time: November 15, 2024 9:36 AM

About this Survey

Boater Information

First and Last Name

Email Address

Phone Number

Please provide the five-digit zip code for your primary address

93238

What is your age?

50 - 59

What is your gender?

Male

What would you rate your overal whitewater skill level?

Expedition (can boat Class V+/ first descents)

What type of watercraft do you have experience using on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

What type of watercraft do you use the most to boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

How many times have you run the section of Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

20+ times

How many boating trips per year do you typically make to the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

3 to 5 times annually

When do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Weekdays between 8 AM and 5 PM

Which whitewater segments do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? Link to Project Location Map

Richbar and Cataracts Runs

Do you check flow levels in advance to determine if flows are suitable before choosing to boat the river between Democrat Diversion Dam and the KR1 Powerhouse?

Yes

Where do you obtain flow information for the Kern River between Democrat Diversion Dam and the KR1 Powerhouse to determine if flows are suitable?

Dreamflows website

Please specify

Does the available flow information meet your needs?
Yes

If the available flow information does not meet your needs, what improvements could be made to keep you better informed of flow levels on the river segments between Democrat Diversion Dam and the KR1 Powerhouse?

Section 1: CADILLACS RUN

What type of watercraft do you have experience using on this run?
Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?
Unique character of the whitewater, Whitewater difficulty, River access, Landscape and scenery, Closest boating to where I live

Please specify

How many times have you boated this section of the Kern River?
5

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:
1,500

How long is a TYPICAL boating trip for you on this run?
1 - 2 hours

How would you rate the overall whitewater difficulty for this run?
Class V

On a typical run, how many times do you portage?
1-2 times

How would the overall difficulty of the run change at higher flows?
More difficult

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run
slightly_improve

Challenging hydraulics
slightly_decline

Challenging technical boating
no_change

Play opportunities
no_change

Route options through rapids
slightly_improve

Ability to stop for scouting and portaging
slightly_decline

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
slightly_improve

Difficulty to portage
no_change

Safety concerns
slightly_decline

Pace of travel
slightly_improve

Overall whitewater challenge
slightly_improve

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
No change

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run
decline_considerably

Challenging hydraulics
slightly_decline

Challenging technical boating
no_change

Play opportunities
no_change

Route options through rapids
slightly_decline

Ability to stop for scouting and portaging
slightly_improve

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
slightly_decline

Difficulty to portage
no_change

Safety concerns
no_change

Pace of travel
slightly_decline

Overall whitewater challenge
no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
1,000

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
1,500

Where do you TYPICALLY access the river for put-in?
Trail downstream of Democrat Diversion Dam

Where do you TYPICALLY access the river for take-out?
Continue boating through the Richbar Run section to the Cataracts Run

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
Yes

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cadillacs whitewater run?

There are several extremely rocky rapids on the Cadillacs that are unrunnable at low water

Section 2: RICHBAR RUN

What type of watercraft do you have experience using on this run?

Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?

River access

Please specify

How many times have you boated this section of the Kern River?

30

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:
1,500

How long is a TYPICAL boating trip for you on this run?
1 - 2 hours

How would you rate the overall whitewater difficulty for this run?
Class IV

On a typical run, how many times do you portage?
1-2 times

How would the overall difficulty of the run change at higher flows?
More difficult

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run
slightly_improve

Challenging hydraulics
slightly_improve

Challenging technical boating
no_change

Play opportunities
slightly_improve

Route options through rapids
slightly_improve

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
slightly_improve

Difficulty to portage
no_change

Safety concerns
no_change

Pace of travel
no_change

Overall whitewater challenge
no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
No change

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run
slightly_decline

Challenging hydraulics
slightly_decline

Challenging technical boating
slightly_decline

Play opportunities
slightly_decline

Route options through rapids
slightly_decline

Ability to stop for scouting and portaging

no_change

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

slightly_decline

Difficulty to portage

no_change

Safety concerns

no_change

Pace of travel

no_change

Overall whitewater challenge

no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
700

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
1,500

Where do you TYPICALLY access the river for put-in?
Undeveloped access from Highway 178 upstream of Upper Richbar day-use area

Where do you TYPICALLY access the river for take-out?
Continue boating through the Richbar Run section to the Cataracts Run

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
Yes

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Richbar whitewater run?

I typically put in below toilet bowl rapid and continue through the Cataracts. There are a few class IV+ and provides a good warmup for the Cataracts

Section 3: CATARACTS RUN

What type of watercraft do you have experience using on this run?

Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?

Unique character of the whitewater, Whitewater difficulty, River access, Landscape and scenery, Closest boating to where I live

Please specify

How many times have you boated this section of the Kern River?

30

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:
1,500

How long is a TYPICAL boating trip for you on this run?
1 - 2 hours

How would you rate the overall whitewater difficulty for this run?
Class V

On a typical run, how many times do you portage?
1-2 times

How would the overall difficulty of the run change at higher flows?
More difficult

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run
no_change

Challenging hydraulics
slightly_improve

Challenging technical boating
no_change

Play opportunities
no_change

Route options through rapids
slightly_improve

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
no_change

Difficulty to portage
no_change

Safety concerns
slightly_decline

Pace of travel
no_change

Overall whitewater challenge
no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
Less difficult

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run
decline_considerably

Challenging hydraulics
slightly_decline

Challenging technical boating
no_change

Play opportunities
slightly_decline

Route options through rapids
decline_considerably

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
slightly_decline

Difficulty to portage
no_change

Safety concerns
slightly_decline

Pace of travel
no_change

Overall whitewater challenge
slightly_decline

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
700

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
1,500

Where do you TYPICALLY access the river for put-in?
Undeveloped access from Highway 178 upstream of Upper Richbar day-use area

Where do you TYPICALLY access the river for take-out?
Undeveloped access from Highway 178

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
Yes

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cataracts whitewater run?

There are rapids that become unrunnable at low water due to sieves. I have a very hard cutoff on the low side due to several rapids that become dangerous/unpassable at low flows. That cutoff above triple drop is 700 CFS. You can run from triple drop down at somewhat lower flows, maybe down to 600 cfs

Whitewater Boating Survey

Submitted By: Anonymous user

Submitted Time: November 20, 2024 6:25 PM

About this Survey

Boater Information

First and Last Name

Email Address

Phone Number

Please provide the five-digit zip code for your primary address

93,238

What is your age?

50 - 59

What is your gender?

Male

What would you rate your overal whitewater skill level?

Expert (comfortable boating Class V)

What type of watercraft do you have experience using on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

What type of watercraft do you use the most to boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

How many times have you run the section of Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

5 to 10 times

How many boating trips per year do you typically make to the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

1 to 2 times annually

When do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Weekends

Which whitewater segments do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? Link to Project Location Map

Richbar and Cataracts Runs

Do you check flow levels in advance to determine if flows are suitable before choosing to boat the river between Democrat Diversion Dam and the KR1 Powerhouse?

Yes

Where do you obtain flow information for the Kern River between Democrat Diversion Dam and the KR1 Powerhouse to determine if flows are suitable?

Dreamflows website

Please specify

Does the available flow information meet your needs?
Yes

If the available flow information does not meet your needs, what improvements could be made to keep you better informed of flow levels on the river segments between Democrat Diversion Dam and the KR1 Powerhouse?

Section 1: CADILLACS RUN

What type of watercraft do you have experience using on this run?

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cadillacs whitewater run?

Section 2: RICHBAR RUN

What type of watercraft do you have experience using on this run?

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Richbar whitewater run?

Section 3: CATARACTS RUN

What type of watercraft do you have experience using on this run?

Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?

Unique character of the whitewater, Whitewater difficulty

Please specify

How many times have you boated this section of the Kern River?

6

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:

1,000

How long is a TYPICAL boating trip for you on this run?

1 - 2 hours

How would you rate the overall whitewater difficulty for this run?

Class V

On a typical run, how many times do you portage?

1-2 times

How would the overall difficulty of the run change at higher flows?

More difficult

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

decline_considerably

Challenging hydraulics

no_change

Challenging technical boating

decline_considerably

Play opportunities

no_change

Route options through rapids

decline_considerably

Ability to stop for scouting and portaging

decline_considerably

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

no_change

Difficulty to portage

no_change

Safety concerns

decline_considerably

Pace of travel

slightly_improve

Overall whitewater challenge

slightly_improve

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
Less difficult

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run
slightly_improve

Challenging hydraulics
slightly_improve

Challenging technical boating
no_change

Play opportunities
no_change

Route options through rapids
slightly_decline

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages

no_change

Difficulty to portage

no_change

Safety concerns

slightly_improve

Pace of travel

no_change

Overall whitewater challenge

slightly_decline

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
600

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
900

Where do you TYPICALLY access the river for put-in?
Undeveloped access from Highway 178 upstream of Upper Richbar day-use area

Where do you TYPICALLY access the river for take-out?
KR1 Powerhouse

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
Yes

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cataracts whitewater run?

Whitewater Boating Survey

Submitted By: Anonymous user

Submitted Time: November 21, 2024 11:12 AM

About this Survey

Boater Information

First and Last Name

Email Address

Phone Number

Please provide the five-digit zip code for your primary address

93,312

What is your age?

60 or older

What is your gender?

Male

What would you rate your overal whitewater skill level?

Advanced (comfortable boating Class IV)

What type of watercraft do you have experience using on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

What type of watercraft do you use the most to boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

How many times have you run the section of Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

5 to 10 times

How many boating trips per year do you typically make to the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

1 to 2 times annually

When do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Weekends

Which whitewater segments do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? Link to Project Location Map

Richbar Run only

Do you check flow levels in advance to determine if flows are suitable before choosing to boat the river between Democrat Diversion Dam and the KR1 Powerhouse?

Where do you obtain flow information for the Kern River between Democrat Diversion Dam and the KR1 Powerhouse to determine if flows are suitable?

Dreamflows website

Please specify

Does the available flow information meet your needs?
Yes

If the available flow information does not meet your needs, what improvements could be made to keep you better informed of flow levels on the river segments between Democrat Diversion Dam and the KR1 Powerhouse?

Section 1: CADILLACS RUN

What type of watercraft do you have experience using on this run?

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cadillacs whitewater run?

Section 2: RICHBAR RUN

What type of watercraft do you have experience using on this run?

Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?

Unique character of the whitewater, Whitewater difficulty, River access, Landscape and scenery, Closest boating to where I live

Please specify

How many times have you boated this section of the Kern River?

1

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:
800

How long is a TYPICAL boating trip for you on this run?
3 - 4 hours

How would you rate the overall whitewater difficulty for this run?
Class IV

On a typical run, how many times do you portage?
0 times

How would the overall difficulty of the run change at higher flows?
More difficult

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run
improve_considerably

Challenging hydraulics
slightly_improve

Challenging technical boating
slightly_improve

Play opportunities
improve_considerably

Route options through rapids
slightly_improve

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
no_change

Difficulty to portage
no_change

Safety concerns
improve_considerably

Pace of travel

Overall whitewater challenge
slightly_improve

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
More difficult

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run
decline_considerably

Challenging hydraulics
decline_considerably

Challenging technical boating
decline_considerably

Play opportunities
decline_considerably

Route options through rapids
decline_considerably

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
no_change

Difficulty to portage
no_change

Safety concerns
slightly_decline

Pace of travel
slightly_decline

Overall whitewater challenge
slightly_decline

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
1,200

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
2,000

Where do you TYPICALLY access the river for put-in?
Undeveloped access from Highway 178 upstream of Upper Richbar day-use area

Where do you TYPICALLY access the river for take-out?
Undeveloped access downstream of Live Oak Day-use area

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
Yes

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Richbar whitewater run?

Section 3: CATARACTS RUN

What type of watercraft do you have experience using on this run?

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cataracts whitewater run?

Whitewater Boating Survey

Submitted By: david.martinez@stantec.com_stantec

Submitted Time: January 13, 2025 11:34 AM

About this Survey

Boater Information

First and Last Name

Email Address

Phone Number

Please provide the five-digit zip code for your primary address

93,240

What is your age?

40 - 49

What is your gender?

Male

What would you rate your overal whitewater skill level?

Expert (comfortable boating Class V)

What type of watercraft do you have experience using on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

What type of watercraft do you use the most to boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

How many times have you run the section of Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

20+ times

How many boating trips per year do you typically make to the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

more than 10 times annually

When do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Weekends

Which whitewater segments do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? Link to Project Location Map

Richbar Run only

Do you check flow levels in advance to determine if flows are suitable before choosing to boat the river between Democrat Diversion Dam and the KR1 Powerhouse?

Yes

Where do you obtain flow information for the Kern River between Democrat Diversion Dam and the KR1 Powerhouse to determine if flows are suitable?

Dreamflows website, Wait until I arrive at the river for direct observation

Please specify

Does the available flow information meet your needs?
Yes

If the available flow information does not meet your needs, what improvements could be made to keep you better informed of flow levels on the river segments between Democrat Diversion Dam and the KR1 Powerhouse?

Section 1: CADILLACS RUN

What type of watercraft do you have experience using on this run?

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cadillacs whitewater run?

Section 2: RICHBAR RUN

What type of watercraft do you have experience using on this run?

Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?

Unique character of the whitewater

Please specify

How many times have you boated this section of the Kern River?

50

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:

How long is a TYPICAL boating trip for you on this run?
1 - 2 hours

How would you rate the overall whitewater difficulty for this run?
Class IV

On a typical run, how many times do you portage?
0 times

How would the overall difficulty of the run change at higher flows?
No change

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run
no_change

Challenging hydraulics
no_change

Challenging technical boating
slightly_decline

Play opportunities

Route options through rapids
slightly_improve

Ability to stop for scouting and portaging
slightly_decline

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
no_change

Difficulty to portage
no_change

Safety concerns
slightly_decline

Pace of travel
no_change

Overall whitewater challenge
no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
No change

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run
slightly_decline

Challenging hydraulics
slightly_decline

Challenging technical boating
slightly_improve

Play opportunities
slightly_decline

Route options through rapids
slightly_decline

Ability to stop for scouting and portaging
slightly_improve

Number of scouts
slightly_improve

Difficulty to scout
slightly_improve

Number of portages
slightly_improve

Difficulty to portage
no_change

Safety concerns
slightly_decline

Pace of travel
no_change

Overall whitewater challenge
no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
700

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
1,300

Where do you TYPICALLY access the river for put-in?
Undeveloped access from Highway 178 upstream of Upper Richbar day-use area

Where do you TYPICALLY access the river for take-out?
Undeveloped access downstream of Live Oak Day-use area

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
Yes

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Richbar whitewater run?

Vehicle security - If there is water it is great. Lot of bang for your buck. My run when upper section are not flowing. Provides a 4+ 5- option for stronger boaters. Allot more rapids in the section.

Section 3: CATARACTS RUN

What type of watercraft do you have experience using on this run?

Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?

Whitewater difficulty

Please specify

How many times have you boated this section of the Kern River?

2

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

Date:

Estimated flow:
700

How long is a TYPICAL boating trip for you on this run?
3 - 4 hours

How would you rate the overall whitewater difficulty for this run?
Class V+

On a typical run, how many times do you portage?
3-4 times

How would the overall difficulty of the run change at higher flows?
More difficult

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run
no_change

Challenging hydraulics
no_change

Challenging technical boating
no_change

Play opportunities
no_change

Route options through rapids

no_change

Ability to stop for scouting and portaging

no_change

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

no_change

Difficulty to portage

no_change

Safety concerns

no_change

Pace of travel

no_change

Overall whitewater challenge

no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
No change

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run
slightly_improve

Challenging hydraulics
no_change

Challenging technical boating
no_change

Play opportunities
no_change

Route options through rapids
no_change

Ability to stop for scouting and portaging
no_change

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

no_change

Difficulty to portage

no_change

Safety concerns

no_change

Pace of travel

no_change

Overall whitewater challenge

no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
700

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
1,000

Where do you TYPICALLY access the river for put-in?
Undeveloped access from Highway 178 upstream of Upper Richbar day-use area

Where do you TYPICALLY access the river for take-out?
KR1 Powerhouse

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
Yes

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cataracts whitewater run?

Whitewater Boating Survey

Submitted By: david.martinez@stantec.com_stantec

Submitted Time: January 22, 2025 3:24 PM

About this Survey

Boater Information

First and Last Name

Email Address

Phone Number

Please provide the five-digit zip code for your primary address

93,238

What is your age?

20 - 29

What is your gender?

Male

What would you rate your overal whitewater skill level?

Expedition (can boat Class V+/ first descents)

What type of watercraft do you have experience using on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

What type of watercraft do you use the most to boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

How many times have you run the section of Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

20+ times

How many boating trips per year do you typically make to the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

more than 10 times annually

When do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Weekdays between 8 AM and 5 PM, Weekdays after 5 PM, Weekends, Holiday Weekends (not including holiday), Holidays (not including associated weekend)

Which whitewater segments do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? Link to Project Location Map

Cadillacs, Richbar, and Cataracts Runs

Do you check flow levels in advance to determine if flows are suitable before choosing to boat the river between Democrat Diversion Dam and the KR1 Powerhouse?

Yes

Where do you obtain flow information for the Kern River between Democrat Diversion Dam and the KR1 Powerhouse to determine if flows are suitable?

Dreamflows website, US Army Corps webpage

Please specify

Does the available flow information meet your needs?
Yes

If the available flow information does not meet your needs, what improvements could be made to keep you better informed of flow levels on the river segments between Democrat Diversion Dam and the KR1 Powerhouse?

Section 1: CADILLACS RUN

What type of watercraft do you have experience using on this run?
Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?
Whitewater difficulty

Please specify

How many times have you boated this section of the Kern River?
100

What time frame have you boated this run?
2009 -2025

What is the estimated range of flows?
900 - 6000

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?
1 - 2 hours

How would you rate the overall whitewater difficulty for this run?
Class V+

On a typical run, how many times do you portage?
0 times

How would the overall difficulty of the run change at higher flows?
More difficult

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run
no_change

Challenging hydraulics
slightly_improve

Challenging technical boating

Play opportunities
slightly_decline

Route options through rapids

slightly_improve

Ability to stop for scouting and portaging

no_change

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

no_change

Difficulty to portage

no_change

Safety concerns

decline_considerably

Pace of travel

no_change

Overall whitewater challenge

no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
No change

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run
no_change

Challenging hydraulics
slightly_decline

Challenging technical boating
no_change

Play opportunities
no_change

Route options through rapids
slightly_improve

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
slightly_decline

Difficulty to portage
slightly_decline

Safety concerns
slightly_improve

Pace of travel
no_change

Overall whitewater challenge
slightly_decline

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
3,000

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
3,500

Where do you TYPICALLY access the river for put-in?
Undeveloped access from Highway 178

Where do you TYPICALLY access the river for take-out?
Continue boating through the Richbar Run section to the Cataracts Run

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
Yes

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cadillacs whitewater run?
Put-in is marginal. Small turn-out, no trail. Typically run from Toilet Bowl rapid in the Cadillacs section to Triple Drop (do not run) in the Cataract section. The take-out has the best access.

This reach includes the Richbar Section, but instream consideration in Richbar section do not influence decisions to run, difficulty of run, or satisfaction with boating experience.

Section 2: RICHBAR RUN

What type of watercraft do you have experience using on this run?

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Richbar whitewater run?

Section 3: CATARACTS RUN

What type of watercraft do you have experience using on this run?

Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?

Whitewater difficulty

Please specify

How many times have you boated this section of the Kern River?
200

What time frame have you boated this run?
2008 - 2025

What is the estimated range of flows?
900 - 6000

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?
1 - 2 hours

How would you rate the overall whitewater difficulty for this run?
Class V+

On a typical run, how many times do you portage?
1-2 times

How would the overall difficulty of the run change at higher flows?
More difficult

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run
no_change

Challenging hydraulics
slightly_improve

Challenging technical boating
no_change

Play opportunities
slightly_decline

Route options through rapids
no_change

Ability to stop for scouting and portaging
decline_considerably

Number of scouts
no_change

Difficulty to scout
decline_considerably

Number of portages
no_change

Difficulty to portage
no_change

Safety concerns
decline_considerably

Pace of travel
no_change

Overall whitewater challenge
slightly_improve

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
Less difficult

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run
no_change

Challenging hydraulics
slightly_decline

Challenging technical boating
slightly_improve

Play opportunities
no_change

Route options through rapids

no_change

Ability to stop for scouting and portaging

slightly_improve

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

no_change

Difficulty to portage

no_change

Safety concerns

improve_considerably

Pace of travel

no_change

Overall whitewater challenge

no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
900

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
3,500

Where do you TYPICALLY access the river for put-in?
Undeveloped access from Highway 178 upstream of Upper Richbar day-use area

Where do you TYPICALLY access the river for take-out?
Undeveloped access from Highway 178

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
Yes

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cataracts whitewater run?

highway 178 - can be scariest part of the run due to limited parking and close to the road. One of the most unique class V rivers for boatable flows 900 - 6000. "On the map", top 5 hardest runs in the world at high flows +3500 cfs. Most "new" Class V boaters think of boating this at flows around 3000 cfs

Whitewater Boating Survey

Submitted By: Patricia.Sussman@stantec.com_stantec

Submitted Time: January 23, 2025 10:47 AM

About this Survey

Boater Information

First and Last Name

Email Address

Phone Number

Please provide the five-digit zip code for your primary address

93,240

What is your age?

40 - 49

What is your gender?

Male

What would you rate your overal whitewater skill level?

Expedition (can boat Class V+/ first descents)

What type of watercraft do you have experience using on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

What type of watercraft do you use the most to boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

How many times have you run the section of Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

10 to 20 times

How many boating trips per year do you typically make to the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

3 to 5 times annually

When do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Weekdays between 8 AM and 5 PM

Which whitewater segments do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? Link to Project Location Map

Richbar and Cataracts Runs

Do you check flow levels in advance to determine if flows are suitable before choosing to boat the river between Democrat Diversion Dam and the KR1 Powerhouse?

Yes

Where do you obtain flow information for the Kern River between Democrat Diversion Dam and the KR1 Powerhouse to determine if flows are suitable?

Dreamflows website, US Army Corps webpage, Other source

Please specify

Primarily uses Army Corps webpage

Does the available flow information meet your needs?
Yes

If the available flow information does not meet your needs, what improvements could be made to keep you better informed of flow levels on the river segments between Democrat Diversion Dam and the KR1 Powerhouse?
Generally, meets it, but would be interested in understanding in real time what the diversion is (day by day).

Section 1: CADILLACS RUN

What type of watercraft do you have experience using on this run?
Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?
Unique character of the whitewater, Whitewater difficulty, River access, Closest boating to where I live

Please specify

How many times have you boated this section of the Kern River?
2

What time frame have you boated this run?
year 2003 both times

What is the estimated range of flows?
400 cfs first time; 1,000 cfs second time

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?
3 - 4 hours

How would you rate the overall whitewater difficulty for this run?
Class V+

On a typical run, how many times do you portage?
3-4 times

How would the overall difficulty of the run change at higher flows?
Less difficult

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run
slightly_improve

Challenging hydraulics
slightly_decline

Challenging technical boating
slightly_improve

Play opportunities
no_change

Route options through rapids
slightly_improve

Ability to stop for scouting and portaging
slightly_improve

Number of scouts
slightly_improve

Difficulty to scout
no_change

Number of portages
slightly_improve

Difficulty to portage
slightly_improve

Safety concerns
slightly_improve

Pace of travel
slightly_improve

Overall whitewater challenge

Other 1
no_change

Other 2
no_change

List other 1 factor

His reference point of 400 cfs, was a difficult flow to boat. Hard in different ways at lower flow; hard in different ways at higher flows; different safety concerns at higher flows than lower flows - both safety concerns. E

List other 2 factor

Easier to be naive and paddle something that you can't see at higher flows.

How would the overall difficulty of the run change at lower flows?

Do not know

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

slightly_decline

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

no_change

Other 2

List other 1 factor

water goes under rocks instead of over them at lower flows. Optimum flows 1,400-2,800 above 3,000 no go.

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
1,000

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
1,800

Where do you TYPICALLY access the river for put-in?
Developed river access site upstream of Democrat Diversion Dam

Where do you TYPICALLY access the river for take-out?
Undeveloped access from Highway 178

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
No

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.
Takeout yes; put in no. that is - the mile of flatwater to the dam and then having to portage the dam is not idea.

Do you have any other comments or information regarding your whitewater boating experience on the Cadillacs whitewater run?

Section 2: RICHBAR RUN

What type of watercraft do you have experience using on this run?

Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?

Unique character of the whitewater, Whitewater difficulty, River access, Landscape and scenery, Closest boating to where I live, Other

Please specify

something different

How many times have you boated this section of the Kern River?

12

What time frame have you boated this run?

Generally summer through early fall, but have boated in in the winter (anything from 1999 through now)

What is the estimated range of flows?

range between 600 and 2800 cfs

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?

1 - 2 hours

How would you rate the overall whitewater difficulty for this run?

Class IV

On a typical run, how many times do you portage?

1-2 times

How would the overall difficulty of the run change at higher flows?

No change

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

no_change

Challenging hydraulics

slightly_improve

Challenging technical boating

slightly_improve

Play opportunities

slightly_improve

Route options through rapids

slightly_improve

Ability to stop for scouting and portaging

no_change

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

no_change

Difficulty to portage

no_change

Safety concerns

no_change

Pace of travel

Overall whitewater challenge

slightly_improve

Other 1

no_change

Other 2

List other 1 factor

hydraulics get bigger at higher flows; lower water scraping over rocks but not as sievy as Cadillacs; Lucas creek falls portage

List other 2 factor

How would the overall difficulty of the run change at lower flows?
No change

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1
no_change

Other 2

List other 1 factor
see above. optimum flow 2000-2500

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
800

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
2,000

Where do you TYPICALLY access the river for put-in?
Undeveloped access from Highway 178 upstream of Upper Richbar day-use area

Where do you TYPICALLY access the river for take-out?
Undeveloped access downstream of Live Oak Day-use area

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
No

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.
Generally meet his needs - take out around the Nude Beach area could be improved. Describes it as dangerous - blind corner along SR-178, narrow road section, especially when you're hauling raft. Have to cross the street because the turnout is on the mountain side of the road.

Often boats into Cataracts - doesn't take out at Nude Beach.

Do you have any other comments or information regarding your whitewater boating experience on the Richbar whitewater run?
Sometimes the danger of lots of ropes in the water from day users. Day users string ropes across the river to cross the river.

Section 3: CATARACTS RUN

What type of watercraft do you have experience using on this run?

Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?

Unique character of the whitewater, Whitewater difficulty, River access, Landscape and scenery, Other

Please specify

It's worth it.

How many times have you boated this section of the Kern River?

20

What time frame have you boated this run?

1999- present; mid-summer through fall

What is the estimated range of flows?

750cfs - 2800

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?

1 - 2 hours

How would you rate the overall whitewater difficulty for this run?

Class V+

On a typical run, how many times do you portage?

1-2 times

How would the overall difficulty of the run change at higher flows?

Do not know

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

slightly_improve

Challenging hydraulics

slightly_improve

Challenging technical boating

no_change

Play opportunities

slightly_improve

Route options through rapids

slightly_improve

Ability to stop for scouting and portaging

no_change

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

no_change

Difficulty to portage

no_change

Safety concerns

slightly_decline

Pace of travel

Overall whitewater challenge

Other 1

no_change

Other 2

List other 1 factor

power gets bigger; hydraulics are bigger; 1500 and above is great. Above 3000 he wouldn't' run it.

List other 2 factor

How would the overall difficulty of the run change at lower flows?

More difficult

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

slightly_decline

Challenging hydraulics

slightly_decline

Challenging technical boating

slightly_improve

Play opportunities

no_change

Route options through rapids

slightly_decline

Ability to stop for scouting and portaging

no_change

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

slightly_decline

Difficulty to portage

Safety concerns

slightly_decline

Pace of travel

Overall whitewater challenge

Other 1

no_change

Other 2

List other 1 factor

Creeky, fun and technical at lower flows.; but you have to portage one of the rapids. Everything is creeky and technical and undercuts. Anything below 1000 is as dangerous as running it at 5000 because of your ability to stuff yourself into a sieve.

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

800

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
2,000

Where do you TYPICALLY access the river for put-in?
Undeveloped access downstream of Live Oak Day-use area

Where do you TYPICALLY access the river for take-out?
Undeveloped access from Highway 178

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
Yes

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cataracts whitewater run?
Generally, put in at Nude Beach. Take out: Sometimes portages triple drop (the first one with the hole and undercut), sometimes paddles through it. Also a good place to take out (at the Triple Falls Entrance Rapid entrance rapid). He often takes out here - maybe 2 miles of water to run from put in to take out. Still worth it. Take out and put in around Nude Beach could be improved - e.g. signage could help. Hasn't put in at Live Oak much - notes the gate is often locked.

Whitewater Boating Survey

Submitted By: Patricia.Sussman@stantec.com_stantec

Submitted Time: January 23, 2025 12:02 PM

About this Survey

Boater Information

First and Last Name

Email Address

Phone Number

Please provide the five-digit zip code for your primary address

95,630

What is your age?

20 - 29

What is your gender?

Male

What would you rate your overal whitewater skill level?

Expedition (can boat Class V+/ first descents)

What type of watercraft do you have experience using on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

What type of watercraft do you use the most to boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

How many times have you run the section of Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

20+ times

How many boating trips per year do you typically make to the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

3 to 5 times annually

When do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Weekends

Which whitewater segments do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? Link to Project Location Map

Richbar and Cataracts Runs

Do you check flow levels in advance to determine if flows are suitable before choosing to boat the river between Democrat Diversion Dam and the KR1 Powerhouse?

Yes

Where do you obtain flow information for the Kern River between Democrat Diversion Dam and the KR1 Powerhouse to determine if flows are suitable?

Dreamflows website

Please specify

Does the available flow information meet your needs?
Yes

If the available flow information does not meet your needs, what improvements could be made to keep you better informed of flow levels on the river segments between Democrat Diversion Dam and the KR1 Powerhouse?

Section 1: CADILLACS RUN

What type of watercraft do you have experience using on this run?
Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
3,000

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
3,500

Where do you TYPICALLY access the river for put-in?
Trail downstream of Democrat Diversion Dam

Where do you TYPICALLY access the river for take-out?
Continue boating through the Richbar Run section to the Cataracts Run

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cadillacs whitewater run?

Section 2: RICHBAR RUN

What type of watercraft do you have experience using on this run?
Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?
Unique character of the whitewater, Whitewater difficulty

Please specify

How many times have you boated this section of the Kern River?
100

What time frame have you boated this run?
earliest Feb latest September - he's only done this section as part of the Cataracts

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?
1 - 2 hours

How would you rate the overall whitewater difficulty for this run?
Class III

On a typical run, how many times do you portage?
0 times

How would the overall difficulty of the run change at higher flows?
More difficult

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
Less difficult

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
1,000

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
3,500

Where do you TYPICALLY access the river for put-in?
Undeveloped access from Highway 178 upstream of Upper Richbar day-use area

Where do you TYPICALLY access the river for take-out?
Continue boating through the Richbar Run section to the Cataracts Run

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

Yes

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Richbar whitewater run?

He has only run Richbar when he has run Cataracts. There is a portion of Richar Run that Johnny says he portages when the water is low. He doesn't portage Lucas Creek Falls. He runs that. He is an expedition/intense boater and recognizes most boaters prefer the lower kern at flows less than his preferred optimum flow.

Section 3: CATARACTS RUN

What type of watercraft do you have experience using on this run?

Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?

Unique character of the whitewater, Whitewater difficulty

Please specify

How many times have you boated this section of the Kern River?

100

What time frame have you boated this run?

2011 was when he first started running it. Still boats it. Seasonally earliest he's run it is Feb; latest he's run it is September

What is the estimated range of flows?

Lowest he's run it is around 1000 cfs. The highest he's run it is 5600 cfs

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?

1 - 2 hours

How would you rate the overall whitewater difficulty for this run?

Class V+

On a typical run, how many times do you portage?

0 times

How would the overall difficulty of the run change at higher flows?

More difficult

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

slightly_decline

Challenging hydraulics

improve_considerably

Challenging technical boating

improve_considerably

Play opportunities
slightly_decline

Route options through rapids
slightly_decline

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
no_change

Difficulty to portage
no_change

Safety concerns
no_change

Pace of travel
slightly_improve

Overall whitewater challenge
improve_considerably

Other 1

no_change

Other 2

no_change

List other 1 factor

His reference point is veryhigh flows 3300+; bigger, more challenging hydraulics at higher flows; a lot more technical at higher flows; dramatically harder at higher flows, less options at the higher flows; triple drop unrunnable at very high flows

List other 2 factor

safety concerns.. overall higher flows are more dangerous.

How would the overall difficulty of the run change at lower flows?

Less difficult

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

slightly_improve

Challenging hydraulics

Challenging technical boating

slightly_decline

Play opportunities

no_change

Route options through rapids
slightly_improve

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
no_change

Difficulty to portage
no_change

Safety concerns
no_change

Pace of travel
slightly_decline

Overall whitewater challenge
slightly_decline

Other 1
no_change

Other 2

List other 1 factor

less challenging hydraulics below 3300. As an overall whitewater run, not as challenging compared to flows at 3000+

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

1,000

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

3,500

Where do you TYPICALLY access the river for put-in?

Undeveloped access from Highway 178 upstream of Upper Richbar day-use area

Where do you TYPICALLY access the river for take-out?

Undeveloped access from Highway 178

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

Yes

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cataracts whitewater run?

Put it at Toilet bowl (above Richbar Run) and take out at Triple Drop/Triple Falls - sometimes he runs Triple Falls and sometimes takes out before (same as Mike Spradlin).

Whitewater Boating Survey

Submitted By: david.martinez@stantec.com_stantec

Submitted Time: January 23, 2025 2:01 PM

About this Survey

Boater Information

First and Last Name

Email Address

Phone Number

Please provide the five-digit zip code for your primary address

95,667

What is your age?

20 - 29

What is your gender?

Male

What would you rate your overal whitewater skill level?

Expedition (can boat Class V+/ first descents)

What type of watercraft do you have experience using on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

What type of watercraft do you use the most to boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

How many times have you run the section of Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

20+ times

How many boating trips per year do you typically make to the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

5 to 10 times annually

When do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Weekdays between 8 AM and 5 PM, Weekdays after 5 PM, Weekends, Holiday Weekends (not including holiday), Holidays (not including associated weekend)

Which whitewater segments do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? Link to Project Location Map

Cadillacs, Richbar, and Cataracts Runs

Do you check flow levels in advance to determine if flows are suitable before choosing to boat the river between Democrat Diversion Dam and the KR1 Powerhouse?

Yes

Where do you obtain flow information for the Kern River between Democrat Diversion Dam and the KR1 Powerhouse to determine if flows are suitable?

Dreamflows website, US Army Corps webpage

Please specify

Does the available flow information meet your needs?
Yes

If the available flow information does not meet your needs, what improvements could be made to keep you better informed of flow levels on the river segments between Democrat Diversion Dam and the KR1 Powerhouse?
seen flow fluctuation ... especially noticible in Catracts section

Section 1: CADILLACS RUN

What type of watercraft do you have experience using on this run?
Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?
Unique character of the whitewater, Whitewater difficulty

Please specify

How many times have you boated this section of the Kern River?
1

What time frame have you boated this run?
2024

What is the estimated range of flows?
2400

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?
1 - 2 hours

How would you rate the overall whitewater difficulty for this run?
Class V

On a typical run, how many times do you portage?
3-4 times

How would the overall difficulty of the run change at higher flows?
More difficult

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run
improve_considerably

Challenging hydraulics
improve_considerably

Challenging technical boating
decline_considerably

Play opportunities
no_change

Route options through rapids
improve_considerably

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
slightly_improve

Difficulty to portage
no_change

Safety concerns
slightly_decline

Pace of travel
no_change

Overall whitewater challenge
improve_considerably

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
Less difficult

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run
decline_considerably

Challenging hydraulics
slightly_decline

Challenging technical boating
slightly_improve

Play opportunities
slightly_decline

Route options through rapids
slightly_decline

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
no_change

Difficulty to portage
no_change

Safety concerns
decline_considerably

Pace of travel
no_change

Overall whitewater challenge
no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
1,250

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
2,200

Where do you TYPICALLY access the river for put-in?
Undeveloped access from Highway 178

Where do you TYPICALLY access the river for take-out?
Live Oak Day Use Area

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
No

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.
Put-in .... parking access is dangerous. Needs improved parking and trial. Take for "warm-ups" ok. Trails would be good.

Do you have any other comments or information regarding your whitewater boating experience on the Cadillacs whitewater run?

This section includes the "Warm-ups" from Toilet Bowl to Lucus Creek Falls. Class V Boaters typically put-in here to run the Cataracts section or meet up with class IV boaters to run Richbar. Run has a "big-water" feel. At 1500 cfs would rate a -V

Section 2: RICHBAR RUN

What type of watercraft do you have experience using on this run?

Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?

Unique character of the whitewater, Whitewater difficulty, Other

Please specify

rafting suitiable

How many times have you boated this section of the Kern River?

30

What time frame have you boated this run?

2023 - 2024

What is the estimated range of flows?

1600 - 3500

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?

1 - 2 hours

How would you rate the overall whitewater difficulty for this run?

Class IV

On a typical run, how many times do you portage?

0 times

How would the overall difficulty of the run change at higher flows?

More difficult

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

no_change

Challenging hydraulics

no_change

Challenging technical boating

no_change

Play opportunities

slightly_improve

Route options through rapids

slightly_improve

Ability to stop for scouting and portaging

no_change

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

no_change

Difficulty to portage

no_change

Safety concerns

improve_considerably

Pace of travel

improve_considerably

Overall whitewater challenge

slightly_improve

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
Less difficult

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run
no_change

Challenging hydraulics
no_change

Challenging technical boating
no_change

Play opportunities
decline_considerably

Route options through rapids
no_change

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages

no_change

Difficulty to portage

no_change

Safety concerns

slightly_decline

Pace of travel

slightly_decline

Overall whitewater challenge

no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
1,600

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
2,400

Where do you TYPICALLY access the river for put-in?
Undeveloped access from Highway 178 upstream of Upper Richbar day-use area

Where do you TYPICALLY access the river for take-out?
Undeveloped access downstream of Live Oak Day-use area

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
No

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.
Put in issues same as warm ups/Cadillacs

Do you have any other comments or information regarding your whitewater boating experience on the Richbar whitewater run?
One of the most important runs.... class 3+/4. flow 1600+. Great to bring class 4 boaters. Big-water feel, long non-technical rapids. Could be suitable for rafting. Two portages can lower class rating to III+, one at beginning and one at the end. Low flow safety concerns associated with in channel "road-blast", sharp rocks, pins

Section 3: CATARACTS RUN

What type of watercraft do you have experience using on this run?

Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?

Whitewater difficulty

Please specify

How many times have you boated this section of the Kern River?

40

What time frame have you boated this run?

2024

What is the estimated range of flows?

1400 -2500

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?

1 - 2 hours

How would you rate the overall whitewater difficulty for this run?

Class V

On a typical run, how many times do you portage?

1-2 times

How would the overall difficulty of the run change at higher flows?

More difficult

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

no_change

Challenging hydraulics

improve_considerably

Challenging technical boating

no_change

Play opportunities

improve_considerably

Route options through rapids

slightly_improve

Ability to stop for scouting and portaging

no_change

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

no_change

Difficulty to portage

no_change

Safety concerns

slightly_decline

Pace of travel

no_change

Overall whitewater challenge

slightly_improve

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

Less difficult

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

slightly_decline

Challenging hydraulics

slightly_decline

Challenging technical boating

no_change

Play opportunities

slightly_decline

Route options through rapids

slightly_decline

Ability to stop for scouting and portaging

no_change

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

slightly_decline

Difficulty to portage

no_change

Safety concerns
slightly_improve

Pace of travel
no_change

Overall whitewater challenge
slightly_decline

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
1,200

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
1,900

Where do you TYPICALLY access the river for put-in?
Undeveloped access from Highway 178 upstream of Upper Richbar day-use area

Where do you TYPICALLY access the river for take-out?
Undeveloped access from Highway 178

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
No

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.
KR1 powerhouse - you end up in a pond above the dam, access out steep and loose. No parking at KR1, need to walk on 178 - dangerous, and minimal parking

Do you have any other comments or information regarding your whitewater boating experience on the Cataracts whitewater run?
Section below Triple drop has two 5+ and rest is 5 - gets harder. Need more water in this section. Portages are hard. Same characteristics as upstream section. Take-out conditions at Triple Drop are much better than KR1.

1400 -1900 cfs -V
1900 - 2400 cfs V
+2500 cfs V+

Whitewater Boating Survey

Submitted By: david.martinez@stantec.com_stantec

Submitted Time: January 24, 2025 9:45 AM

About this Survey

Boater Information

First and Last Name

Email Address

Phone Number

Please provide the five-digit zip code for your primary address

83,702

What is your age?

40 - 49

What is your gender?

Male

What would you rate your overal whitewater skill level?

Expedition (can boat Class V+/ first descents)

What type of watercraft do you have experience using on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2), Closed-deck canoe (C1 or C2)

Please specify

What type of watercraft do you use the most to boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

How many times have you run the section of Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

20+ times

How many boating trips per year do you typically make to the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

more than 10 times annually

When do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Weekdays between 8 AM and 5 PM, Weekdays after 5 PM, Weekends, Holiday Weekends (not including holiday), Holidays (not including associated weekend)

Which whitewater segments do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? Link to Project Location Map

Cadillacs, Richbar, and Cataracts Runs

Do you check flow levels in advance to determine if flows are suitable before choosing to boat the river between Democrat Diversion Dam and the KR1 Powerhouse?

Yes

Where do you obtain flow information for the Kern River between Democrat Diversion Dam and the KR1 Powerhouse to determine if flows are suitable?

Dreamflows website, Other source

Please specify

Local boaters

Does the available flow information meet your needs?

Yes

If the available flow information does not meet your needs, what improvements could be made to keep you better informed of flow levels on the river segments between Democrat Diversion Dam and the KR1 Powerhouse?

Section 1: CADILLACS RUN

What type of watercraft do you have experience using on this run?

Whitewater kayak (K1 or K2), Closed-deck canoe (C1 or C2)

Please specify

Why do you choose to boat this run?

Unique character of the whitewater, Whitewater difficulty

Please specify

How many times have you boated this section of the Kern River?

30

What time frame have you boated this run?

2017 - 2024

What is the estimated range of flows?
3200 - 7200

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?
1 - 2 hours

How would you rate the overall whitewater difficulty for this run?
Class V+

On a typical run, how many times do you portage?
1-2 times

How would the overall difficulty of the run change at higher flows?
More difficult

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run
no_change

Challenging hydraulics
no_change

Challenging technical boating
no_change

Play opportunities
no_change

Route options through rapids

slightly_improve

Ability to stop for scouting and portaging

no_change

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

no_change

Difficulty to portage

no_change

Safety concerns

decline_considerably

Pace of travel

no_change

Overall whitewater challenge

no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

No change

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

no_change

Challenging hydraulics

no_change

Challenging technical boating

no_change

Play opportunities

no_change

Route options through rapids

slightly_decline

Ability to stop for scouting and portaging

no_change

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

no_change

Difficulty to portage

no_change

Safety concerns

slightly_improve

Pace of travel

no_change

Overall whitewater challenge

no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
3,000

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
3,800

Where do you TYPICALLY access the river for put-in?
Undeveloped access from Highway 178

Where do you TYPICALLY access the river for take-out?
Continue boating through the Richbar Run section to the Cataracts Run

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
No

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.
Parking is limited - roadside proximity is dangerous. Break-ins, more official parking would dissuade break-ins

Do you have any other comments or information regarding your whitewater boating experience on the Cadillacs whitewater run?

Section 2: RICHBAR RUN

What type of watercraft do you have experience using on this run?

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Richbar whitewater run?

Section 3: CATARACTS RUN

What type of watercraft do you have experience using on this run?
Whitewater kayak (K1 or K2), Closed-deck canoe (C1 or C2)

Please specify

Why do you choose to boat this run?
Unique character of the whitewater, Whitewater difficulty

Please specify

How many times have you boated this section of the Kern River?
30

What time frame have you boated this run?
2017 - 2024

What is the estimated range of flows?
3200 -7200

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?
Class V+

On a typical run, how many times do you portage?
1-2 times

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run
no_change

Challenging hydraulics
no_change

Challenging technical boating
no_change

Play opportunities
no_change

Route options through rapids
slightly_improve

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
no_change

Difficulty to portage
no_change

Safety concerns
decline_considerably

Pace of travel
no_change

Overall whitewater challenge
no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
No change

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run
no_change

Challenging hydraulics
no_change

Challenging technical boating
no_change

Play opportunities
no_change

Route options through rapids
slightly_decline

Ability to stop for scouting and portaging

no_change

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

no_change

Difficulty to portage

no_change

Safety concerns

slightly_improve

Pace of travel

no_change

Overall whitewater challenge

no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
2,800

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
3,800

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?
KR1 Powerhouse

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
Yes

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cataracts whitewater run?

Whitewater Boating Survey

Submitted By: david.martinez@stantec.com_stantec

Submitted Time: January 24, 2025 11:04 AM

About this Survey

Boater Information

First and Last Name

Email Address

Phone Number

Please provide the five-digit zip code for your primary address

92,117

What is your age?

50 - 59

What is your gender?

Male

What would you rate your overal whitewater skill level?

Expedition (can boat Class V+/ first descents)

What type of watercraft do you have experience using on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

What type of watercraft do you use the most to boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

How many times have you run the section of Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

10 to 20 times

How many boating trips per year do you typically make to the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

1 to 2 times annually

When do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Weekends, Holiday Weekends (not including holiday), Holidays (not including associated weekend)

Which whitewater segments do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? Link to Project Location Map

Cadillacs, Richbar, and Cataracts Runs

Do you check flow levels in advance to determine if flows are suitable before choosing to boat the river between Democrat Diversion Dam and the KR1 Powerhouse?

Yes

Where do you obtain flow information for the Kern River between Democrat Diversion Dam and the KR1 Powerhouse to determine if flows are suitable?

Dreamflows website

Please specify

Does the available flow information meet your needs?
Yes

If the available flow information does not meet your needs, what improvements could be made to keep you better informed of flow levels on the river segments between Democrat Diversion Dam and the KR1 Powerhouse?

Section 1: CADILLACS RUN

What type of watercraft do you have experience using on this run?

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cadillacs whitewater run?

Section 2: RICHBAR RUN

What type of watercraft do you have experience using on this run?

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Richbar whitewater run?

Section 3: CATARACTS RUN

What type of watercraft do you have experience using on this run?

Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?

Unique character of the whitewater, Whitewater difficulty, Closest boating to where I live

Please specify

How many times have you boated this section of the Kern River?
12

What time frame have you boated this run?
1994 - 2002

What is the estimated range of flows?
500 - 2500

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?
3 - 4 hours

How would you rate the overall whitewater difficulty for this run?
Class V+

On a typical run, how many times do you portage?
1-2 times

How would the overall difficulty of the run change at higher flows?
More difficult

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run
slightly_improve

Challenging hydraulics
slightly_decline

Challenging technical boating
slightly_decline

Play opportunities
no_change

Route options through rapids
slightly_improve

Ability to stop for scouting and portaging
slightly_decline

Number of scouts
slightly_decline

Difficulty to scout
slightly_decline

Number of portages
slightly_decline

Difficulty to portage
slightly_decline

Safety concerns
slightly_decline

Pace of travel
no_change

Overall whitewater challenge
no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
Less difficult

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run
slightly_decline

Challenging hydraulics
slightly_improve

Challenging technical boating
slightly_improve

Play opportunities
no_change

Route options through rapids
slightly_decline

Ability to stop for scouting and portaging
slightly_improve

Number of scouts
slightly_improve

Difficulty to scout
slightly_improve

Number of portages
slightly_improve

Difficulty to portage
slightly_improve

Safety concerns
slightly_improve

Pace of travel
no_change

Overall whitewater challenge
no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
500

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
1,000

Where do you TYPICALLY access the river for put-in?
Upper Richbar day-use area

Where do you TYPICALLY access the river for take-out?
Undeveloped access from Highway 178

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
No

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.
Limited roadside parking and roadside proximity safety issues

Do you have any other comments or information regarding your whitewater boating experience on the Cataracts whitewater run?

Whitewater Boating Survey

Submitted By: david.martinez@stantec.com_stantec

Submitted Time: January 27, 2025 12:10 PM

About this Survey

Boater Information

First and Last Name

Email Address

Phone Number

Please provide the five-digit zip code for your primary address

93,063

What is your age?

30 - 39

What is your gender?

Male

What would you rate your overal whitewater skill level?

Expert (comfortable boating Class V)

What type of watercraft do you have experience using on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

What type of watercraft do you use the most to boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

How many times have you run the section of Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

10 to 20 times

How many boating trips per year do you typically make to the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

3 to 5 times annually

When do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Weekdays between 8 AM and 5 PM, Weekdays after 5 PM, Weekends, Holiday Weekends (not including holiday), Holidays (not including associated weekend)

Which whitewater segments do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? Link to Project Location Map

Richbar and Cataracts Runs

Do you check flow levels in advance to determine if flows are suitable before choosing to boat the river between Democrat Diversion Dam and the KR1 Powerhouse?

Yes

Where do you obtain flow information for the Kern River between Democrat Diversion Dam and the KR1 Powerhouse to determine if flows are suitable?

Dreamflows website

Please specify

Does the available flow information meet your needs?
Yes

If the available flow information does not meet your needs, what improvements could be made to keep you better informed of flow levels on the river segments between Democrat Diversion Dam and the KR1 Powerhouse?

Section 1: CADILLACS RUN

What type of watercraft do you have experience using on this run?

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cadillacs whitewater run?

Section 2: RICHBAR RUN

What type of watercraft do you have experience using on this run?

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Richbar whitewater run?

Section 3: CATARACTS RUN

What type of watercraft do you have experience using on this run?
Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?
Unique character of the whitewater

Please specify

How many times have you boated this section of the Kern River?
10

What time frame have you boated this run?
2008 - 2021

What is the estimated range of flows?
900 - 2000

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?
1 - 2 hours

How would you rate the overall whitewater difficulty for this run?
Class V+

On a typical run, how many times do you portage?
1-2 times

How would the overall difficulty of the run change at higher flows?
More difficult

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run
slightly_improve

Challenging hydraulics
slightly_improve

Challenging technical boating
no_change

Play opportunities
slightly_decline

Route options through rapids
slightly_decline

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
no_change

Difficulty to portage
no_change

Safety concerns
no_change

Pace of travel
no_change

Overall whitewater challenge
no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
Less difficult

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run
slightly_decline

Challenging hydraulics
slightly_decline

Challenging technical boating
no_change

Play opportunities
slightly_improve

Route options through rapids
slightly_improve

Ability to stop for scouting and portaging

no_change

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

no_change

Difficulty to portage

no_change

Safety concerns

no_change

Pace of travel

no_change

Overall whitewater challenge

slightly_improve

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
800

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
1,500

Where do you TYPICALLY access the river for put-in?
Undeveloped access downstream of Upper Richbar day-use area

Where do you TYPICALLY access the river for take-out?
Undeveloped access from Highway 178

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
No

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Parking limited - safety concern associated with roadside proximity. Almost need a shuttle driver.

Do you have any other comments or information regarding your whitewater boating experience on the Cataracts whitewater run?

Super fun and challenging run. Can be boated when the Upper sections are no longer runnable.

Whitewater Boating Survey

Submitted By: david.martinez@stantec.com_stantec

Submitted Time: January 27, 2025 1:08 PM

About this Survey

Boater Information

First and Last Name

Email Address

Phone Number

Please provide the five-digit zip code for your primary address

83,702

What is your age?

20 - 29

What is your gender?

Male

What would you rate your overal whitewater skill level?

Expedition (can boat Class V+/ first descents)

What type of watercraft do you have experience using on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

What type of watercraft do you use the most to boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Whitewater kayak (K1 or K2)

Please specify

How many times have you run the section of Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

20+ times

How many boating trips per year do you typically make to the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

more than 10 times annually

When do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse?

Weekends, Holiday Weekends (not including holiday), Holidays (not including associated weekend)

Which whitewater segments do you typically boat on the Kern River between Democrat Diversion Dam and the KR1 Powerhouse? Link to Project Location Map

Cadillacs, Richbar, and Cataracts Runs

Do you check flow levels in advance to determine if flows are suitable before choosing to boat the river between Democrat Diversion Dam and the KR1 Powerhouse?

Yes

Where do you obtain flow information for the Kern River between Democrat Diversion Dam and the KR1 Powerhouse to determine if flows are suitable?

Dreamflows website

Please specify

Does the available flow information meet your needs?
Yes

If the available flow information does not meet your needs, what improvements could be made to keep you better informed of flow levels on the river segments between Democrat Diversion Dam and the KR1 Powerhouse?

Section 1: CADILLACS RUN

What type of watercraft do you have experience using on this run?

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Cadillacs whitewater run?

Section 2: RICHBAR RUN

What type of watercraft do you have experience using on this run?

Please specify

Why do you choose to boat this run?

Please specify

How many times have you boated this section of the Kern River?

What time frame have you boated this run?

What is the estimated range of flows?

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?

How would you rate the overall whitewater difficulty for this run?

On a typical run, how many times do you portage?

How would the overall difficulty of the run change at higher flows?

How would the following factors change at higher flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?

How would the following factors change at lower flows? (check corresponding box)

Overall "boatability" of the run

Challenging hydraulics

Challenging technical boating

Play opportunities

Route options through rapids

Ability to stop for scouting and portaging

Number of scouts

Difficulty to scout

Number of portages

Difficulty to portage

Safety concerns

Pace of travel

Overall whitewater challenge

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)

Where do you TYPICALLY access the river for put-in?

Where do you TYPICALLY access the river for take-out?

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

Do you have any other comments or information regarding your whitewater boating experience on the Richbar whitewater run?

Section 3: CATARACTS RUN

What type of watercraft do you have experience using on this run?

Whitewater kayak (K1 or K2)

Please specify

Why do you choose to boat this run?

Unique character of the whitewater, Whitewater difficulty, River access

Please specify

How many times have you boated this section of the Kern River?
30

What time frame have you boated this run?
2023 - 2024

What is the estimated range of flows?
2000 -4600

If possible, please provide the dates of your boating run and estimate of flow.

How long is a TYPICAL boating trip for you on this run?
1 - 2 hours

How would you rate the overall whitewater difficulty for this run?
Class V+

On a typical run, how many times do you portage?
0 times

How would the overall difficulty of the run change at higher flows?
No change

How would the following factors change at higher flows? (check corresponding box)
Overall "boatability" of the run
slightly_improve

Challenging hydraulics
slightly_improve

Challenging technical boating
no_change

Play opportunities

Route options through rapids
no_change

Ability to stop for scouting and portaging
no_change

Number of scouts
no_change

Difficulty to scout
no_change

Number of portages
no_change

Difficulty to portage
no_change

Safety concerns
no_change

Pace of travel
no_change

Overall whitewater challenge
no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

How would the overall difficulty of the run change at lower flows?
Less difficult

How would the following factors change at lower flows? (check corresponding box)
Overall "boatability" of the run
slightly_decline

Challenging hydraulics
slightly_decline

Challenging technical boating

Play opportunities

Route options through rapids
no_change

Ability to stop for scouting and portaging

no_change

Number of scouts

no_change

Difficulty to scout

no_change

Number of portages

no_change

Difficulty to portage

no_change

Safety concerns

no_change

Pace of travel

no_change

Overall whitewater challenge

no_change

Other 1

Other 2

List other 1 factor

List other 2 factor

Please estimate the minimum acceptable flow for this run. The minimum acceptable flow is defined as the flow you would return to boat this run.

cubic feet per second (cfs)
1,500

Please estimate your optimum flow for this run. The optimum flow is defined as your preferred flow for your watercraft.

cubic feet per second (cfs)
3,200

Where do you TYPICALLY access the river for put-in?
Undeveloped access from Highway 178 upstream of Upper Richbar day-use area

Where do you TYPICALLY access the river for take-out?
Undeveloped access from Highway 178

Do the river access locations you typically use meet your needs to access the respective river segments for whitewater boating?
No

If you indicated the river access locations you typically access do not meet your needs currently, please describe what river access needs are not being met by the existing developed and dispersed sites. In your response, try to describe the location and river access need.

limited parking, safety concerns road proximity, break-ins

Do you have any other comments or information regarding your whitewater boating experience on the Cataracts whitewater run?

One of top 3 in CA, maybe the best. Big water feel, technical, access. Ability to exit the river for rescue or "bad-day", etc.

APPENDIX C

List of Boaters SCE Attempted to Contact

Copyright 2026 by Southern California Edison

List of Boaters SCE Attempted to Contact for Follow-up Interviews as Part of the Structured Interview Process[1]

1. Alex Chong
2. Alex Morris
3. Amin Nikravan
4. Beth Jens
5. Brett Duxbury
6. Brett Valle
7. Brian Mauer
8. David Waner
9. Dean Bernsten
10. Dennis Rushing
11. Dominic Aguilera
12. Elizabeth Duxbury
13. Eric Giddens
14. Erik Almakov
15. Evan Moore
16. Gabe Elder
17. Geno Hacker
18. Gilbert Siegel
19. JD Batove
20. Jim Schrodt
21. Johnny Chase
22. Jonathan Yates
23. Kevin Smith
24. Kyle Rushing
25. Lynn Siodmak
26. Marc Vernon
27. Mike Spradlin
28. Paul Armes
29. Rebecca Giddens
30. Rocky Contos
31. Ryoichi Nakagawa
32. Spencer Josif
33. Tad Dennis
34. Taylor Blakeslee
35. Zach Bushling

[1] Derrick Tito was identified as a boater with direct experience boating the bypass reach; however, as an SCE employee, Mr. Tito was excluded from participating in the structured interview process based on SCE's interest in avoiding a potential conflict of interest. Robert Gomez Jr., Chairperson of the Tubatulabals Tribe, is not a boater but expressed interest in providing input. Follow-up with Mr. Gomez was pursued outside of the Structured Interview Survey process.

APPENDIX D

Record of Boater Outreach

Copyright 2026 by Southern California Edison

Table D-1. Record of Boater Outreach

No.	Name	Phone	Email	First Attempt		Second Attempt		Third Attempt (if made)		Questionnaire Completed? Yes/No
				Date	Description of Contact	Date	Description of Contact	Date	Description of Contact	
1	Alex Chong	No contact information	No contact information							No
2	Alex Morris			1/11/2025	Emailed	1/23/2025	Emailed			No
3	Amin Nikravan			1/11/2025	Emailed	1/23/2025	Emailed			No
4	Beth Jens			1/11/2025	Emailed	1/23/2025	Emailed			No
5	Brett Duxbury			1/14/2025	Emailed	1/22/2025	Called on 1/22/25—left voicemail	1/24/2025	Emailed	No
6	Brett Valle	No contact information	No contact information							No
7	Brian Mauer			1/11/2025	Emailed	1/23/2025	Emailed			No
8	David Waner			1/11/2025	Emailed	1/23/2025	Emailed			No
9	Dean Bernsten			1/14/2025	Emailed	1/23/2025	Emailed			No
10	Dennis Rushing			November 2024	Completed questionnaire already	1/24/2025	Called and left voicemail with request to call back at his convenience before 1/31/2025			Yes
11	Dominic Aguilera			1/14/2025	Responded to voicemail, follow-up interview planned	1/23/2025	Called on 1/23—completed survey			Yes
12	Elizabeth Duxbury			1/11/2025	Emailed	1/23/2025	Emailed			No
13	Eric Giddens			November 2024	Completed questionnaire already	1/24/2025	Interview complete			Yes
14	Erik Almakov			1/14/2025	Emailed	1/23/2025	Emailed	1/27/2025	Called and left voicemail with request to call back at his convenience before 1/31/2025	No
15	Evan Moore			1/22/2025	Called on 1/22—completed survey					Yes
16	Gabe Elder			1/27/2025	Called on 1/27—left voicemail	7/27/2025	Interview complete 1/27/25			Yes
17	Eugene Hacker (Gene)			1/11/2025	Responded to email; interviewed Eugene on 1/13/2025 @ 10:45					Yes
18	Gilbert Siegel			1/11/2025	Emailed	1/23/2025	Emailed			No
19	JD Batove	No Contact information	No Contact information							No
20	Jim Schrodt			November 2024	Completed questionnaire already	1/23/2025	Interview complete 1/23/2025			Yes

Copyright 2026 by Southern California Edison

No.	Name	Phone	Email	First Attempt		Second Attempt		Third Attempt (if made)		Questionnaire Completed? Yes/No
				Date	Description of Contact	Date	Description of Contact	Date	Description of Contact	
21	Johnny Chase			1/23/2025	Interview complete 1/23/2025					Yes
22	Jonathan Yates			November 2024	Completed questionnaire already	1/24/2025	Called and left voicemail with request to call back at his convenience before 1/31/2025			Yes
23	Kevin Smith			1/14/2025	Emailed	1/23/2025	Emailed			No
24	Kyle Rushing			1/14/2025	Emailed	1/23/2025	Emailed			No
25	Lynn Siodmak			1/14/2025	Emailed	1/23/2025	Emailed			No
26	Marc Vernon			November 2024	Completed questionnaire already	1/24/2025	Called and left voicemail with request to call back at his convenience before 1/31/2025			Yes
27	Mike Spradlin			1/23/2025	Interview complete 1/23/2025					Yes
28	Paul Armes	No Contact information	No Contact information							No
29	Rebecca Giddens			1/23/2025	Left voicemail 1/23/2025 (voicemail included request and call back number)		Left voicemail that included a reminder of the request and the callback number			No
30	Rocky Contos			1/14/2025	Responded 1/15; Dave will follow up on 1/24	1/24/2025	Called on 1/24—completed survey			Yes
31	Ryoichi Nakagawa			1/11/2025	Emailed	1/23/2025	Emailed			No
32	Spencer Josif					27-Jan	Called on 1/27—completed survey			Yes
33	Tad Dennis					1/24/2025	Called on 1/24—completed survey			Yes
34	Taylor Blakeslee			1/14/2025	Emailed	1/23/2025	Left voicemail with interview request and a callback number			No
35	Zach Bushling			1/23/2025	Left voicemail with interview request and callback number	1/28/2025	Left voicemail with interview request and callback number			No

Copyright 2026 by Southern California Edison

APPENDIX E

Annual and Monthly Frequency of Minimum Acceptable and Optimum Whitewater Flows Water Year 2014–2024 Under Current Project Operations and Without Project Diversion

Copyright 2026 by Southern California Edison

Appendix E provides information illustrating the flow of the lower Kern River by run (Cadillacs, Richbar, and Cataracts), water year (October 1 through September 30), and month from 2014 to 2024 under both current project operations and without project diversion.

A key finding resulting from boater consultation was that there is a large variance in boater preference for “minimum acceptable” and “optimal” flow thresholds. In the more pronounced cases, there was overlap of one boater’s “optimal” with another boater’s “minimum.” To address flow suitability for different boater preferences, and to examine how project operations affect these opportunities, the analysis for each run includes an examination of the number of days (by month and year) the river flowed within three intermediate flow ranges, providing a finer-grained view of flow conditions for each run.

The appendix is organized by run:

- Cadillacs Run, Water Years 2014–2024
- Richbar Run, Water Years 2014–2024
- Cataracts Run, Water Years 2014–2024

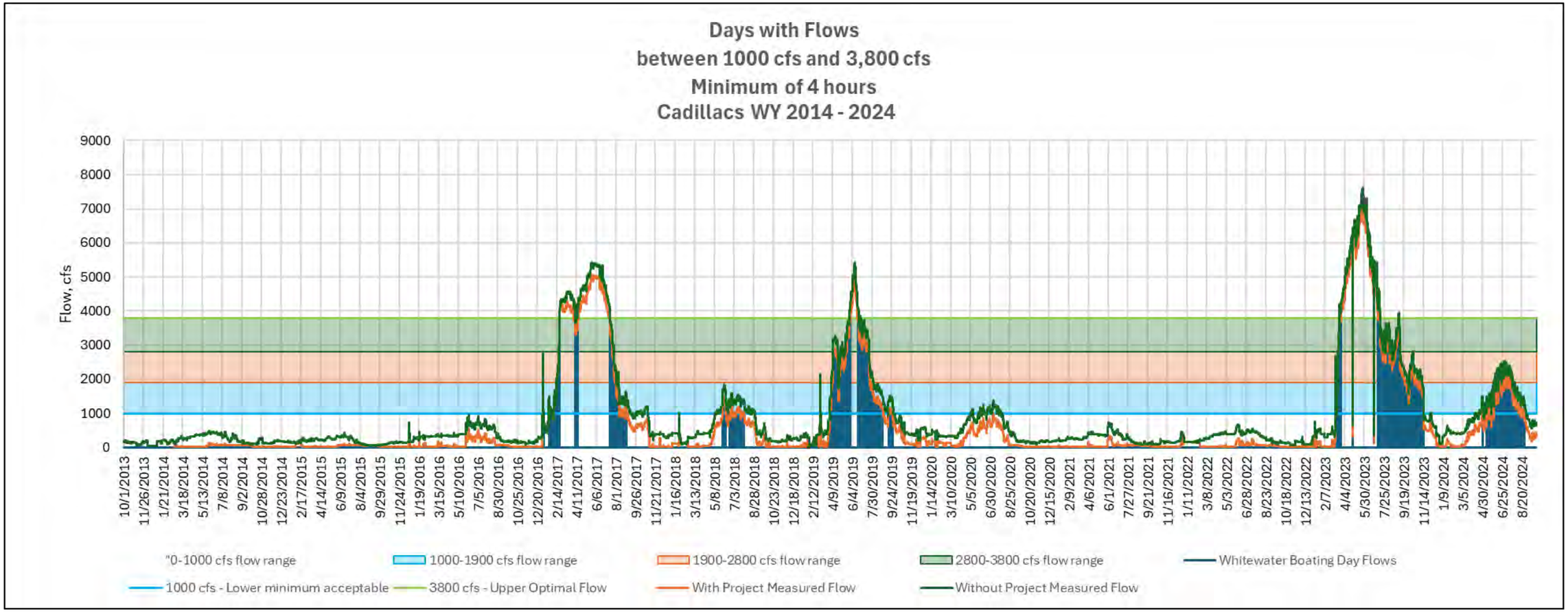
CADILLACS

The flow preferences of the boaters who provided input about their experiences boating the Cadillacs run ranged between 1,000 cubic feet per second (cfs) and 3,000 cfs for the minimum acceptable flow threshold, and between 1,500 and 3,800 cfs for the optimum flow threshold. Therefore, the boatable flow range used to calculate a boating-day for the Cadillacs run was 1,000 cfs to 3,800 cfs.

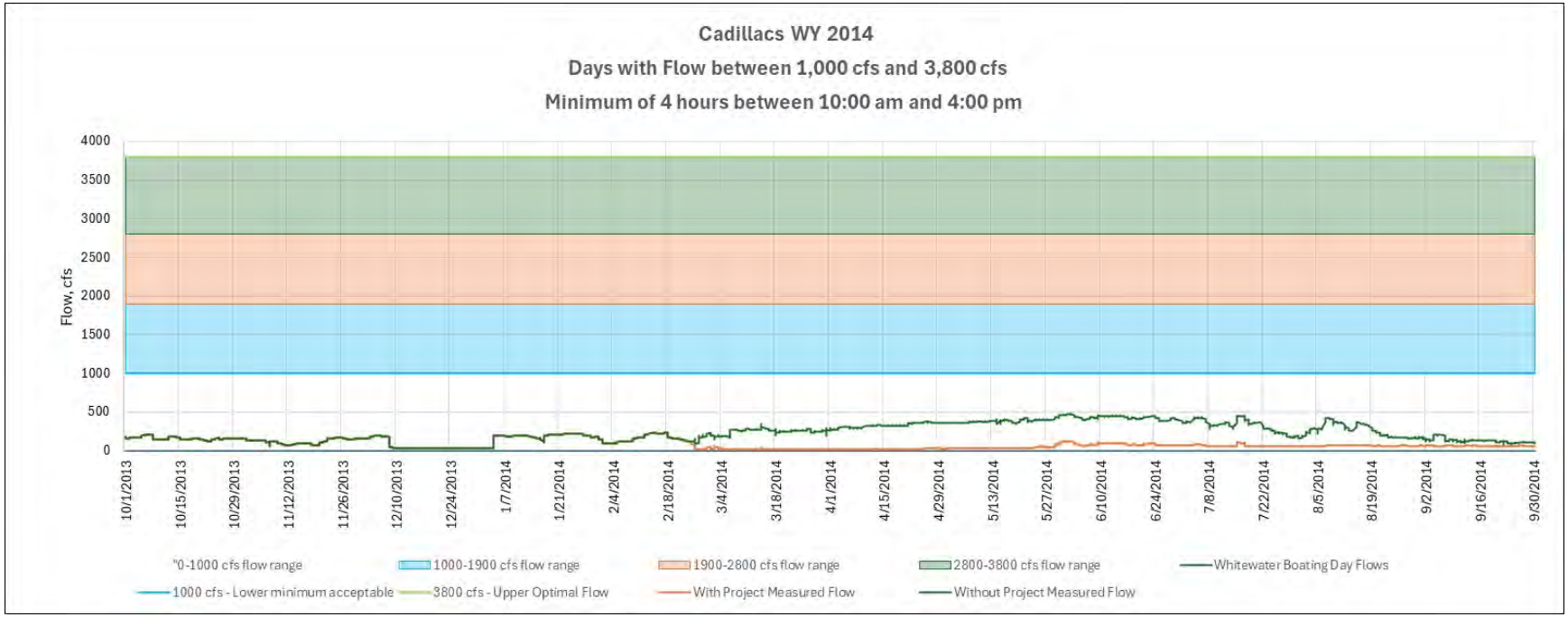
The following figures and tables include an overview that illustrates the hydrograph for the complete period of record (illustrating both “with-project” and “without-project”) and then separate hydrograph and summary tables for each year that illustrate the number of boatable days per year and by month for the Cadillacs Run, and provide additional information about flows within the following three specific intermediate ranges under both “with-project” and “without-project” scenarios:

- 1,000–1,900 cfs
- 1,900–2,800 cfs
- 2,800–3,800 cfs

CADILLACS RUN: WATER YEARS 2014–2024



CADILLACS RUN: WATER YEAR 2014

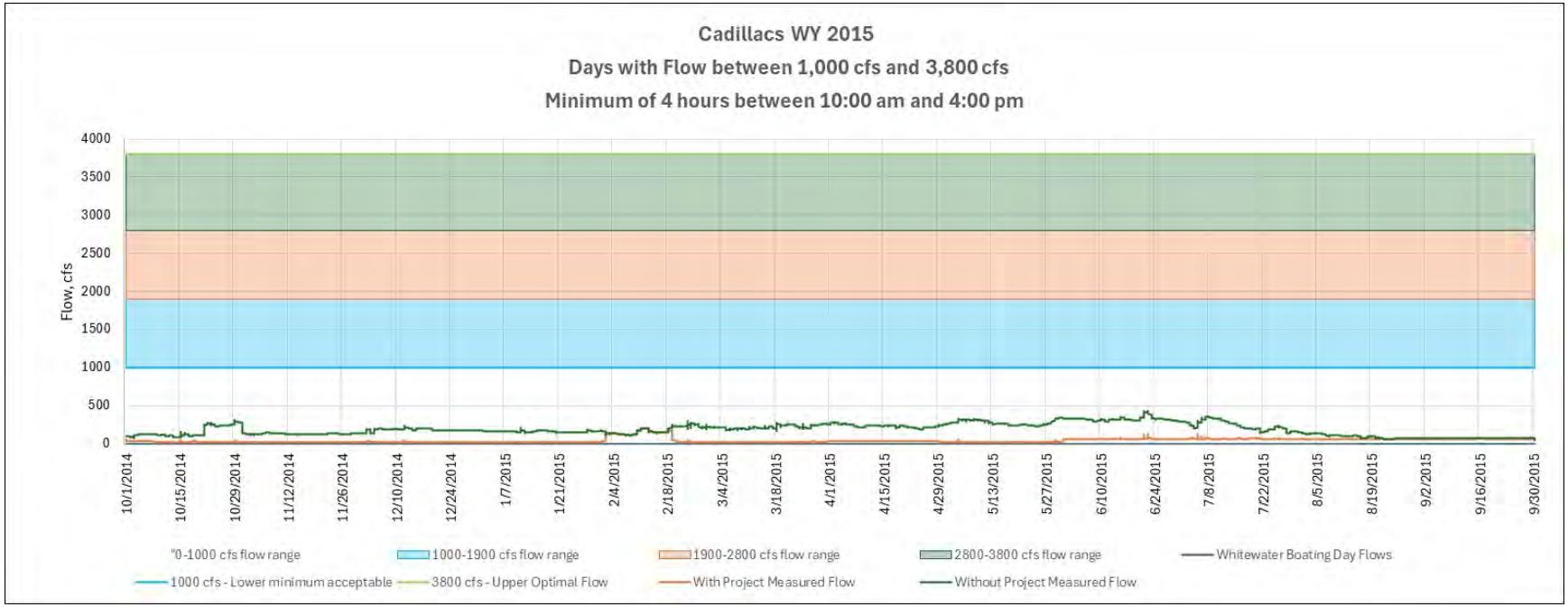


Cadillacs with Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	3	4	5	6	7	8	9	10	11	12	13	
Cadillacs with Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Cadillacs without Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Cadillacs without Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Difference: with Project - without Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

CADILLACS RUN: WATER YEAR 2015

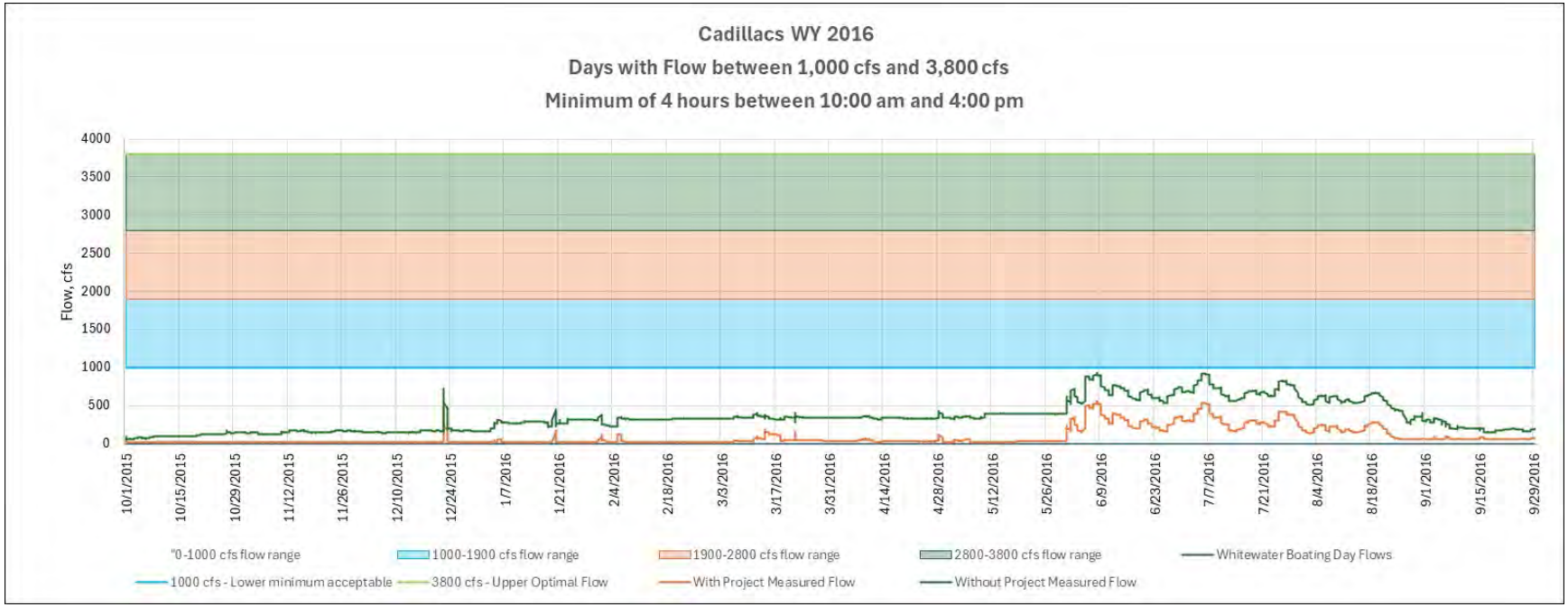


Cadillacs with Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	3	4	5	6	7	8	9	10	11	12	13	
Cadillacs with Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Cadillacs without Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Cadillacs without Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Difference: with Project - without Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

CADILLACS RUN: WATER YEAR 2016

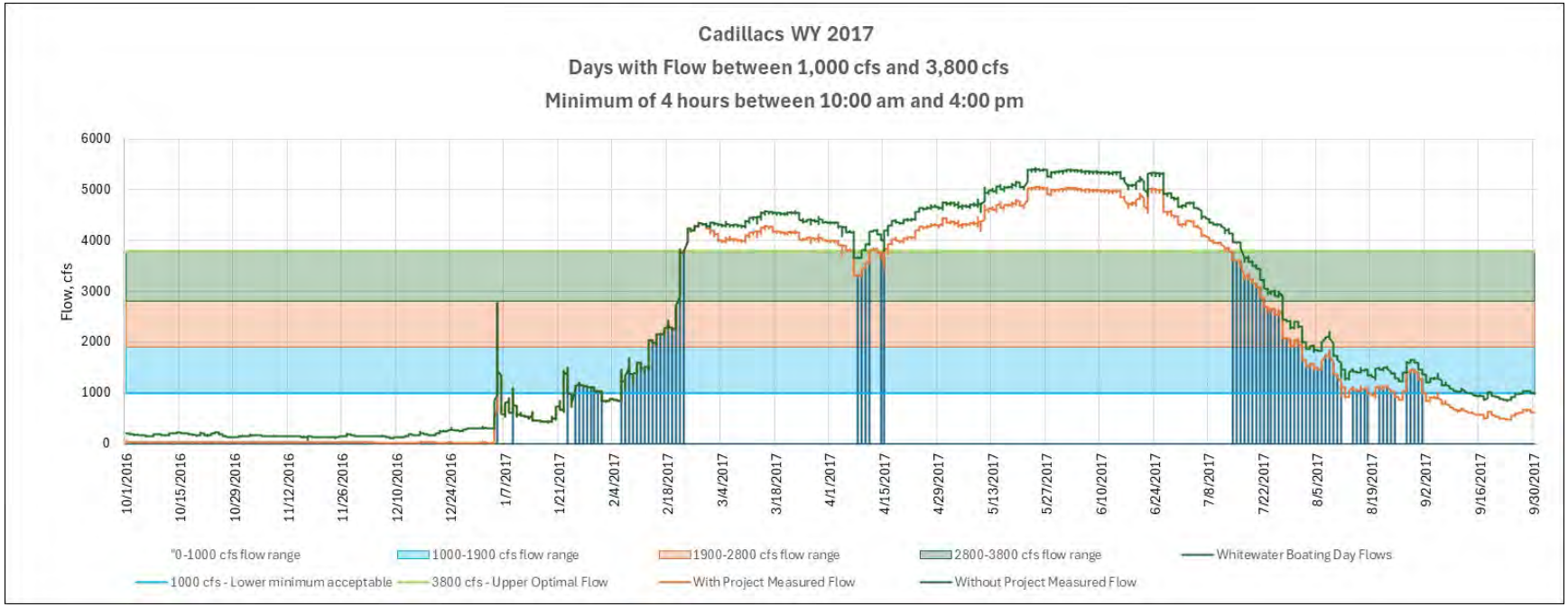


Cadillacs with Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	3	4	5	6	7	8	9	10	11	12	13	
Cadillacs with Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Cadillacs without Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Cadillacs without Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Difference: with Project - without Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

CADILLACS RUN: WATER YEAR 2017



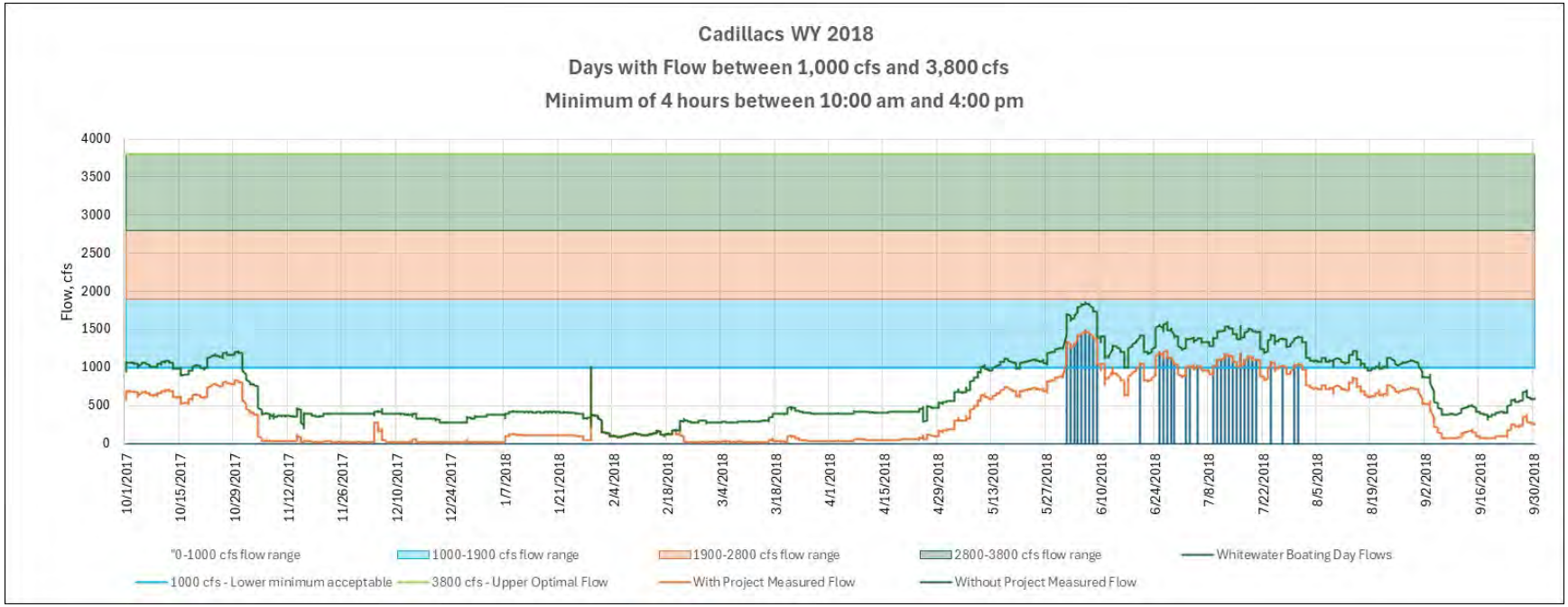
Cadillacs with Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	10	18	0	6	0	0	18	25	1	78
	2	3	4	5	6	7	8	9	10	11	12	13	
Cadillacs with Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	9	9	0	0	0	0	0	25	1	44
1900-2800 CFS	0	0	0	1	7	0	0	0	0	9	0	0	17
2800-3800 CFS	0	0	0	0	2	0	6	0	0	9	0	0	17

Cadillacs without Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	10	18	0	2	0	0	15	31	16	92
Cadillacs without Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	9	9	0	0	0	0	0	27	16	61
1900-2800 CFS	0	0	0	1	7	0	0	0	0	5	5	0	18
2800-3800 CFS	0	0	0	0	2	0	2	0	0	10	0	0	14

Difference: with Project - without Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	4	0	0	3	-6	-15	-14
Difference: with Project - without Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	0	0	-2	-15	-17
1900-2800 CFS	0	0	0	0	0	0	0	0	0	4	-5	0	-1
2800-3800 CFS	0	0	0	0	0	0	4	0	0	-1	0	0	3

Copyright 2026 by Southern California Edison

CADILLACS RUN: WATER YEAR 2018

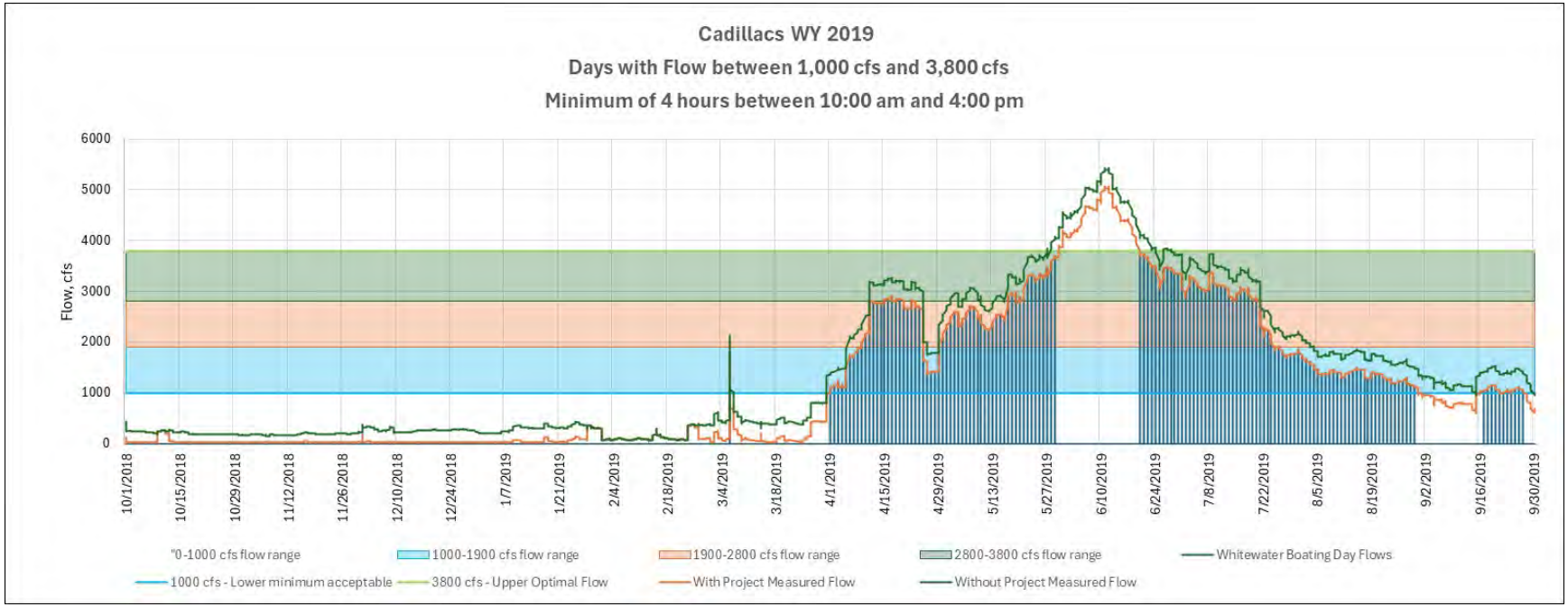


Cadillacs with Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	0	15	19	0	0	34
	2	3	4	5	6	7	8	9	10	11	12	13	
Cadillacs with Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	15	19	0	0	34
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Cadillacs without Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	24	0	0	0	0	0	0	18	30	31	27	0	130
Cadillacs without Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	24	0	0	0	0	0	0	18	30	31	27	0	130
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	-24	0	0	0	0	0	0	-18	-15	-12	-27	0	-96
Difference: with Project - without Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	-24	0	0	0	0	0	0	-18	-15	-12	-27	0	-96
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

CADILLACS RUN: WATER YEAR 2019



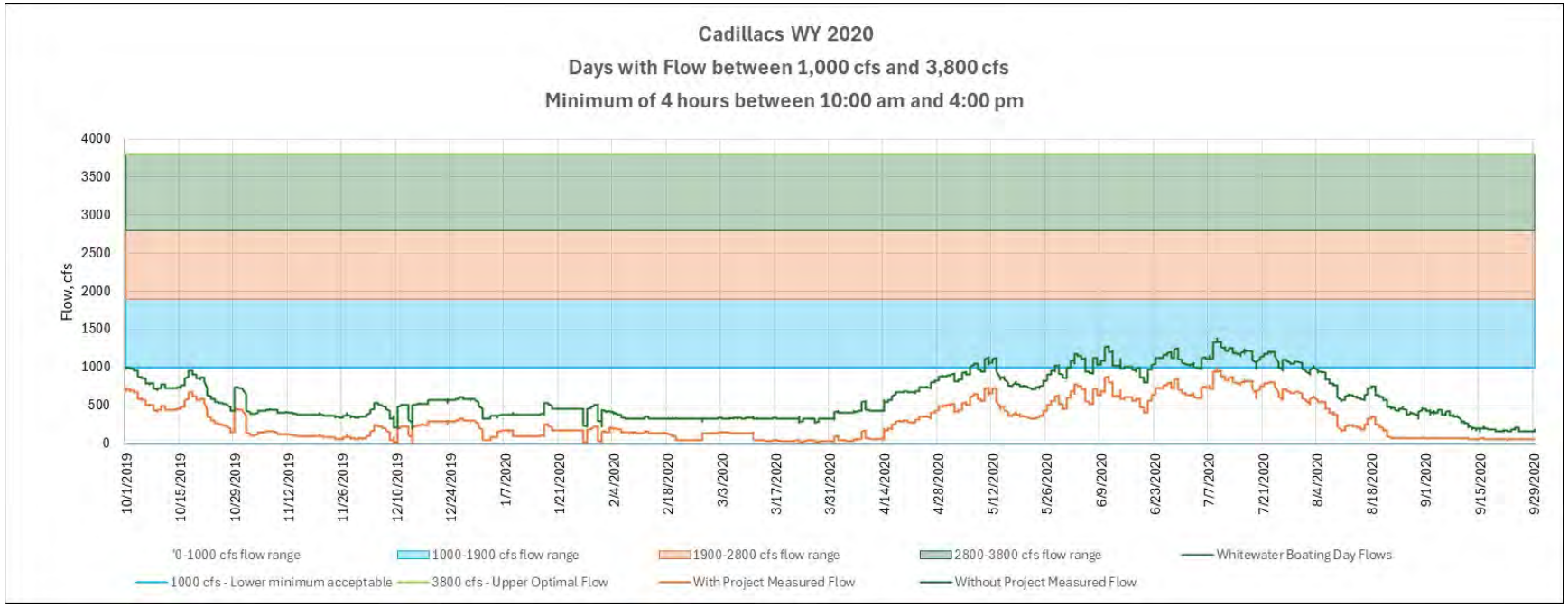
Cadillacs with Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	1	30	29	11	31	30	11	143
	2	3	4	5	6	7	8	9	10	11	12	13	
Cadillacs with Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	1	12	0	0	6	30	11	60
1900-2800 CFS	0	0	0	0	0	0	12	16	0	5	0	0	33
2800-3800 CFS	0	0	0	0	0	0	7	13	11	20	0	0	51

Cadillacs without Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	2	30	26	3	31	31	28	151
Cadillacs without Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	2	8	0	0	0	28	28	66
1900-2800 CFS	0	0	0	0	0	1	8	7	0	10	4	0	30
2800-3800 CFS	0	0	0	0	0	0	14	20	3	21	0	0	58

Difference: with Project - without Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	-1	0	3	8	0	-1	-17	-8
Difference: with Project - without Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	-1	4	0	0	6	2	-17	-6
1900-2800 CFS	0	0	0	0	0	-1	4	9	0	-5	-4	0	3
2800-3800 CFS	0	0	0	0	0	0	-7	-7	8	-1	0	0	-7

Copyright 2026 by Southern California Edison

CADILLACS RUN: WATER YEAR 2020

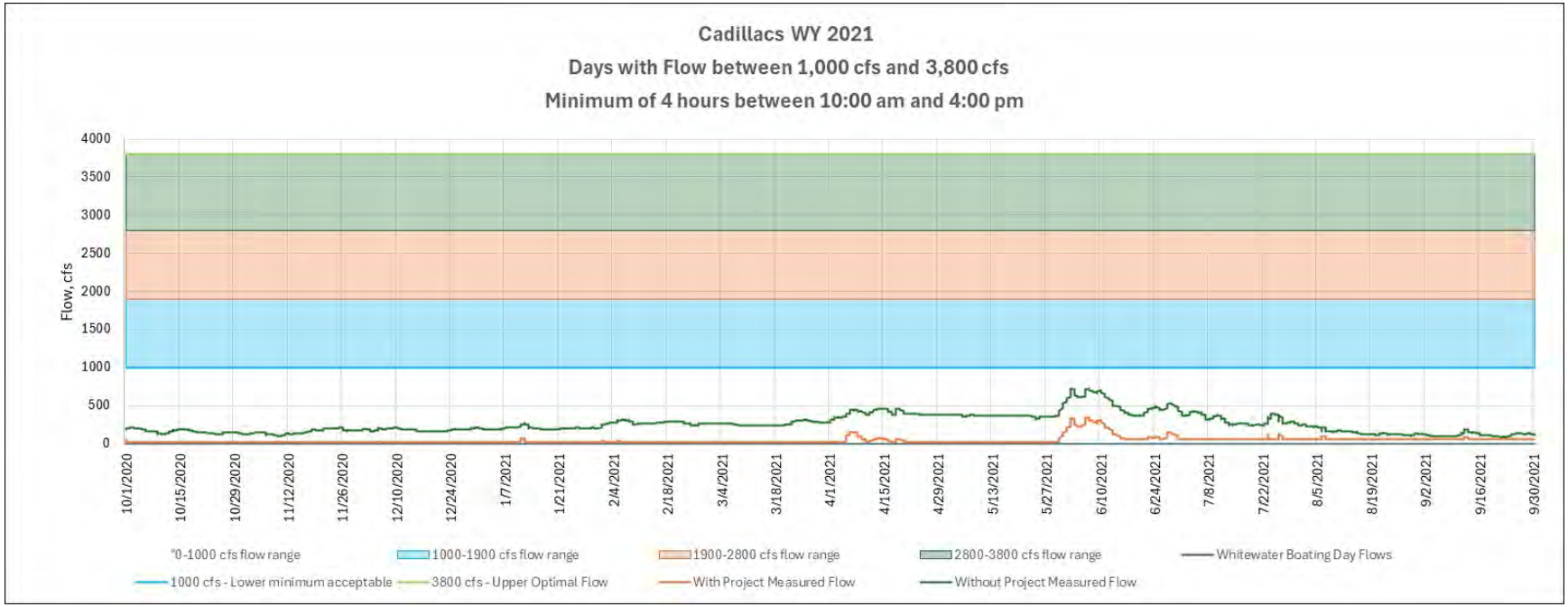


Cadillacs with Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	3	4	5	6	7	8	9	10	11	12	13	
Cadillacs with Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Cadillacs without Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	6	22	27	1	0	56
Cadillacs without Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	6	22	27	1	0	56
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	-6	-22	-27	-1	0	-56
Difference: with Project - without Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	-6	-22	-27	-1	0	-56
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

CADILLACS RUN: WATER YEAR 2021

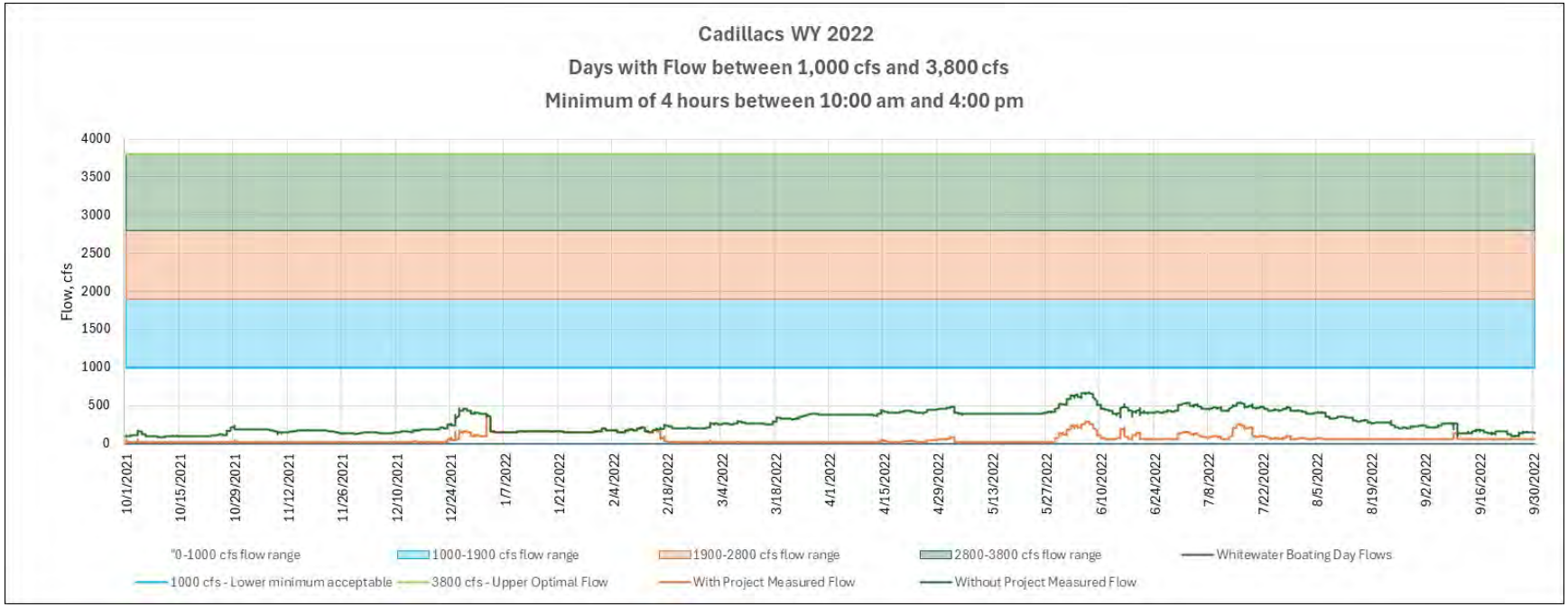


Cadillacs with Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	3	4	5	6	7	8	9	10	11	12	13	
Cadillacs with Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Cadillacs without Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Cadillacs without Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Difference: with Project - without Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

CADILLACS RUN: WATER YEAR 2022

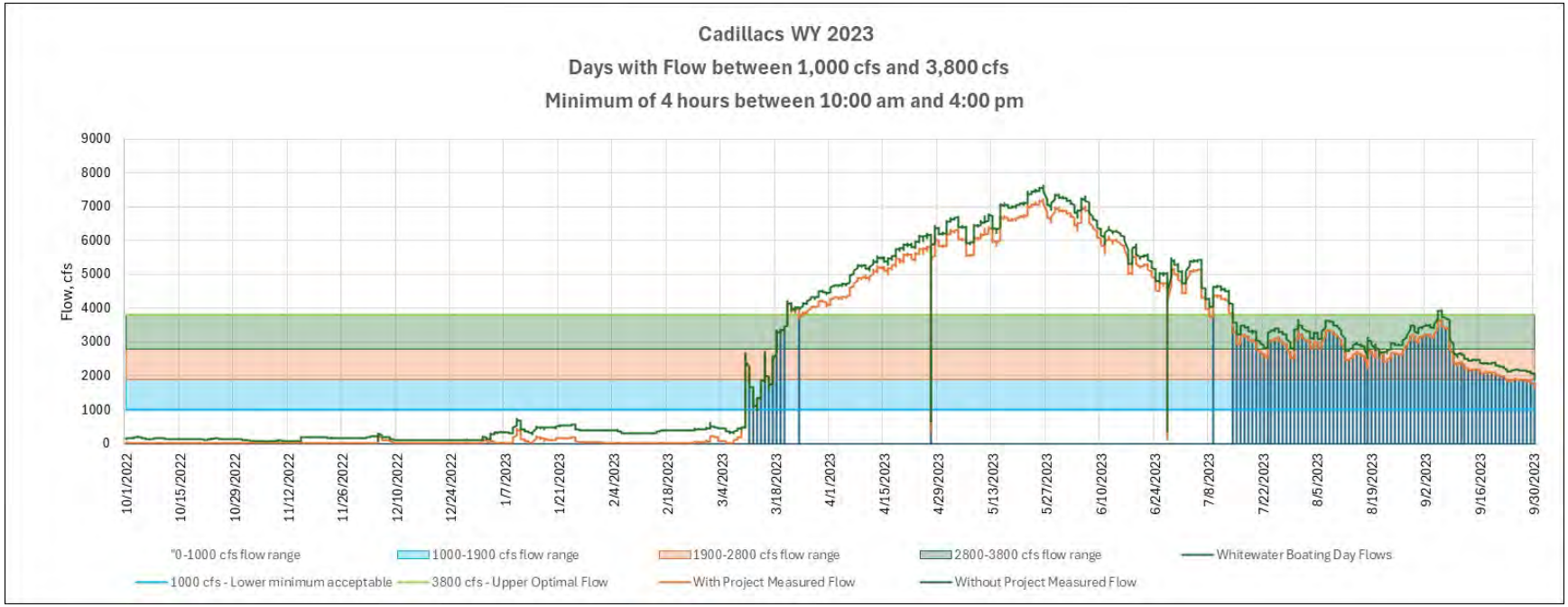


Cadillacs with Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	3	4	5	6	7	8	9	10	11	12	13	
Cadillacs with Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Cadillacs without Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Cadillacs without Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Difference: with Project - without Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1900-2800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

CADILLACS RUN: WATER YEAR 2023



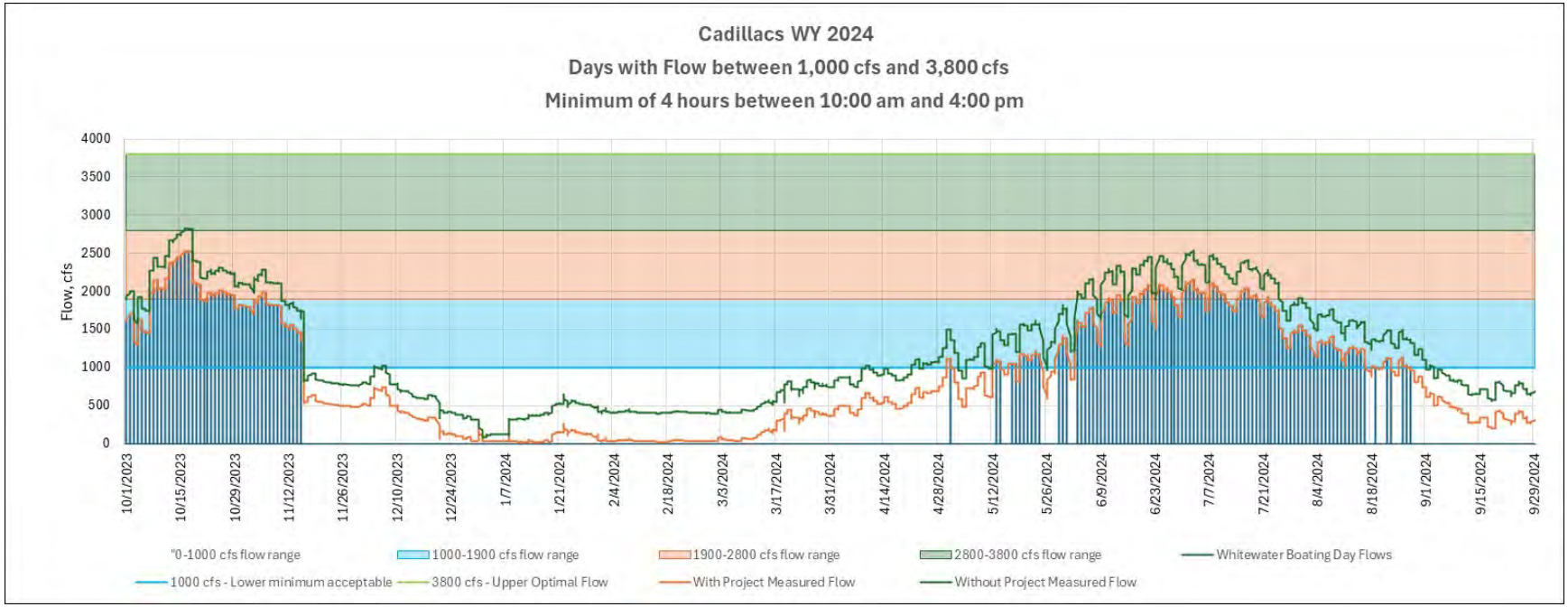
Cadillacs with Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	11	1	0	0	19	31	30	92
	2	3	4	5	6	7	8	9	10	11	12	13	
Cadillacs with Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	4	1	0	0	0	0	7	12
1900-2800 CFS	0	0	0	0	0	3	1	0	0	5	16	17	42
2800-3800 CFS	0	0	0	0	0	4	0	0	0	14	16	8	42

Cadillacs without Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	10	1	0	1	18	31	29	90
Cadillacs without Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	4	1	0	1	0	0	0	6
1900-2800 CFS	0	0	0	0	0	3	0	0	1	1	5	21	31
2800-3800 CFS	0	0	0	0	0	3	0	0	0	18	26	8	55

Difference: with Project - without Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	0	0	0	1	0	0	-1	1	0	1	2
Difference: with Project - without Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	0	0	0	0	0	0	0	0	-1	0	0	7	6
1900-2800 CFS	0	0	0	0	0	0	1	0	-1	4	11	-4	11
2800-3800 CFS	0	0	0	0	0	1	0	0	0	-4	-10	0	-13

Copyright 2026 by Southern California Edison

CADILLACS RUN: WATER YEAR 2024



Cadillacs with Project WY 2024	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	31	15	0	0	0	0	0	14	28	31	22	0	141
	2	3	4	5	6	7	8	9	10	11	12	13	
Cadillacs with Project WY 2024	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	11	13	0	0	0	0	0	14	20	16	22	0	96
1900-2800 CFS	20	2	0	0	0	0	0	0	9	16	0	0	47
2800-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Cadillacs without Project WY 2024	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	31	15	2	0	0	0	10	28	30	31	31	1	179
Cadillacs without Project WY 2024	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	3	5	2	0	0	0	10	28	7	6	31	1	93
1900-2800 CFS	26	10	0	0	0	0	0	0	25	26	0	0	87
2800-3800 CFS	3	0	0	0	0	0	0	0	0	0	0	0	3

Difference: with Project - without Project WY 2024	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (1000-3800 CFS)	0	0	-2	0	0	0	-10	-14	-2	0	-9	-1	-38
Difference: with Project - without Project WY 2024	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1000-1900 CFS	8	8	-2	0	0	0	-10	-14	13	10	-9	-1	3
1900-2800 CFS	-6	-8	0	0	0	0	0	0	-16	-10	0	0	-40
2800-3800 CFS	-3	0	0	0	0	0	0	0	0	0	0	0	-3

Copyright 2026 by Southern California Edison

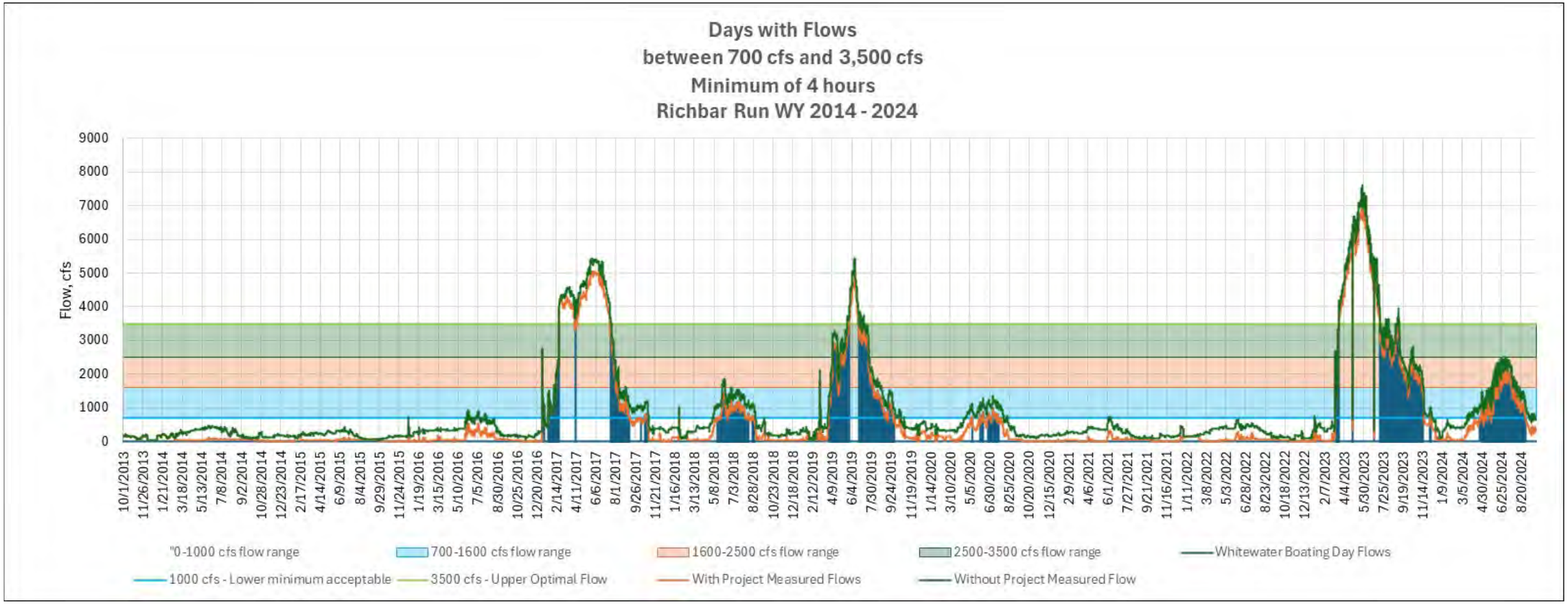
RICHBAR

The flow preferences of the boaters who provided input about their experiences boating the Richbar run ranged between 700 cfs and 1,600 cfs for the minimum acceptable flow threshold, and between 1,000 and 3,500 cfs for the optimum flow threshold. Therefore, the boatable flow range used to calculate a boating-day for the Richbar run was 700 cfs to 3,500 cfs.

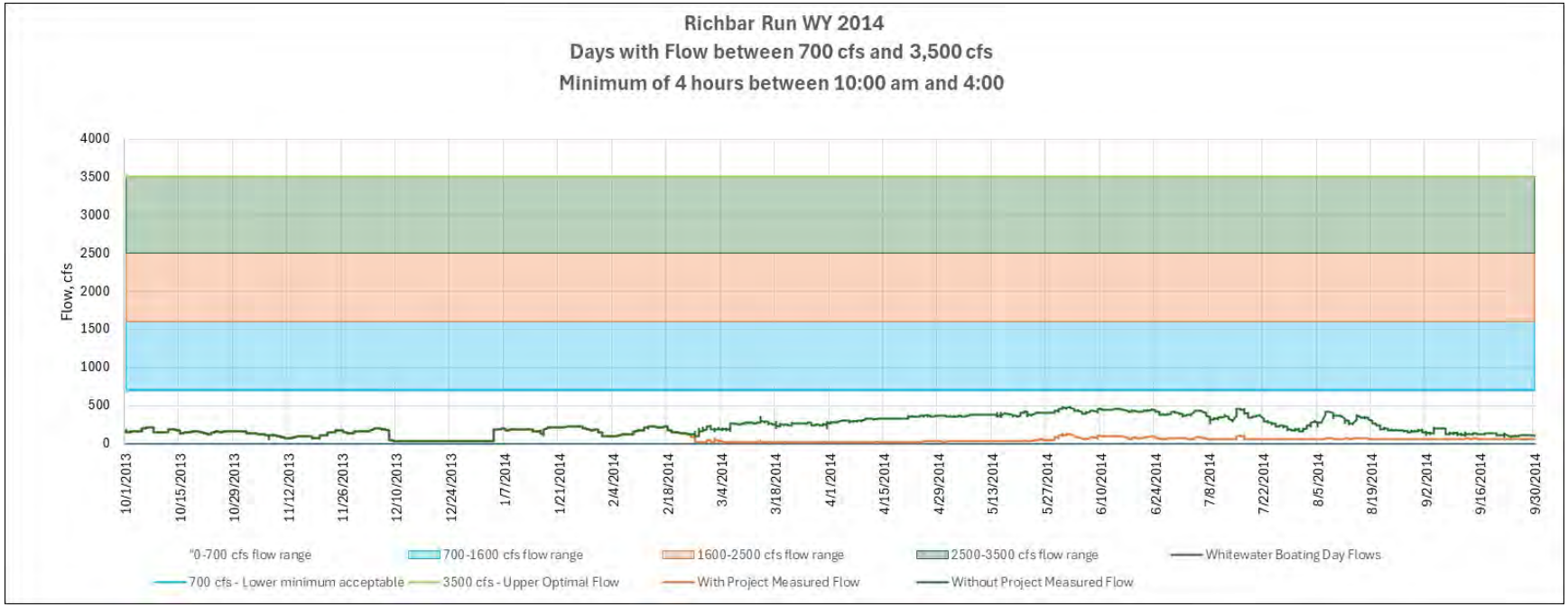
The following figures and tables include an overview that illustrates the hydrograph for the complete period of record (illustrating both “with-project” and “without-project”) and then separate hydrograph and summary tables for each year that illustrate the number of boatable days, per year and by month for the Richbar run, and provide additional information about flows within three specific intermediate ranges under both “with-project” and “without-project” scenarios:

- 700–1,600 cfs
- 1,600–2,500 cfs
- 2,500–3,500 cfs

RICHBAR RUN: WATER YEARS 2014–2024



RICHBAR RUN: WATER YEAR 2014

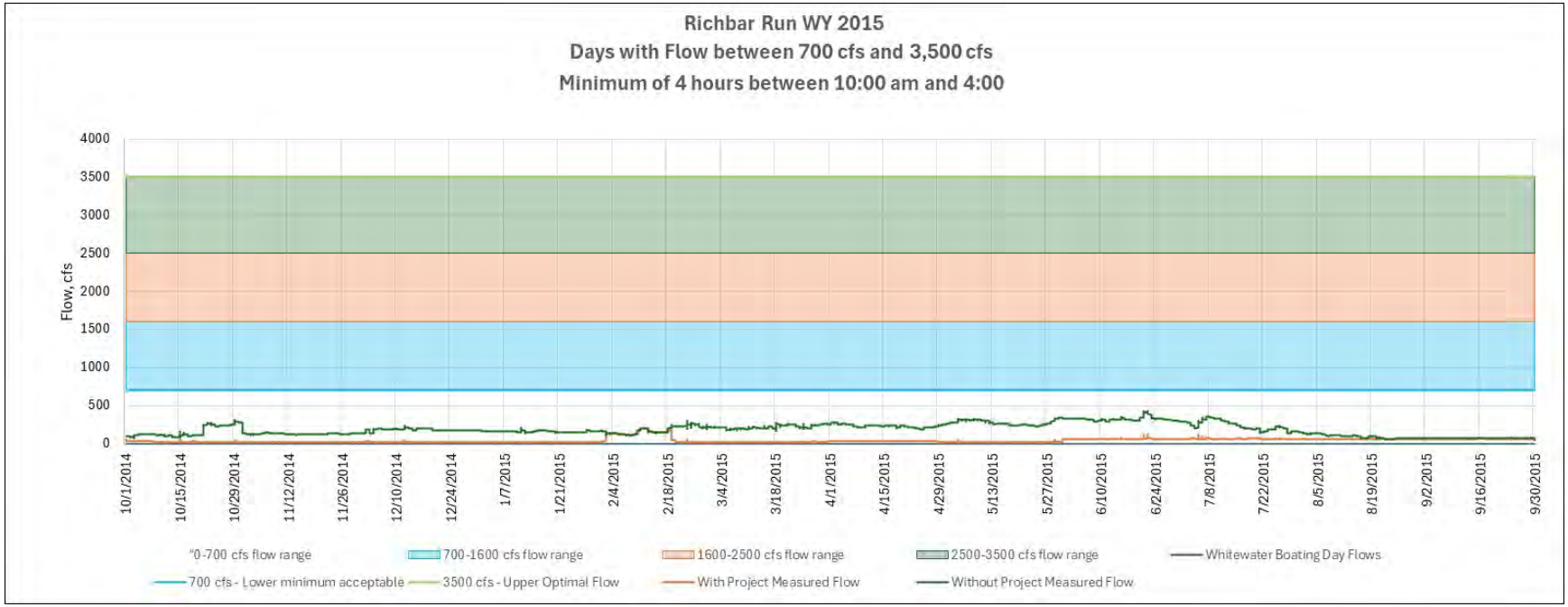


Richbar Run with Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	3	4	5	6	7	8	9	10	11	12	13	
Richbar Run with Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Richbar Run without Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Richbar Run without Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Difference: with Project - without Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

RICHBAR RUN: WATER YEAR 2015

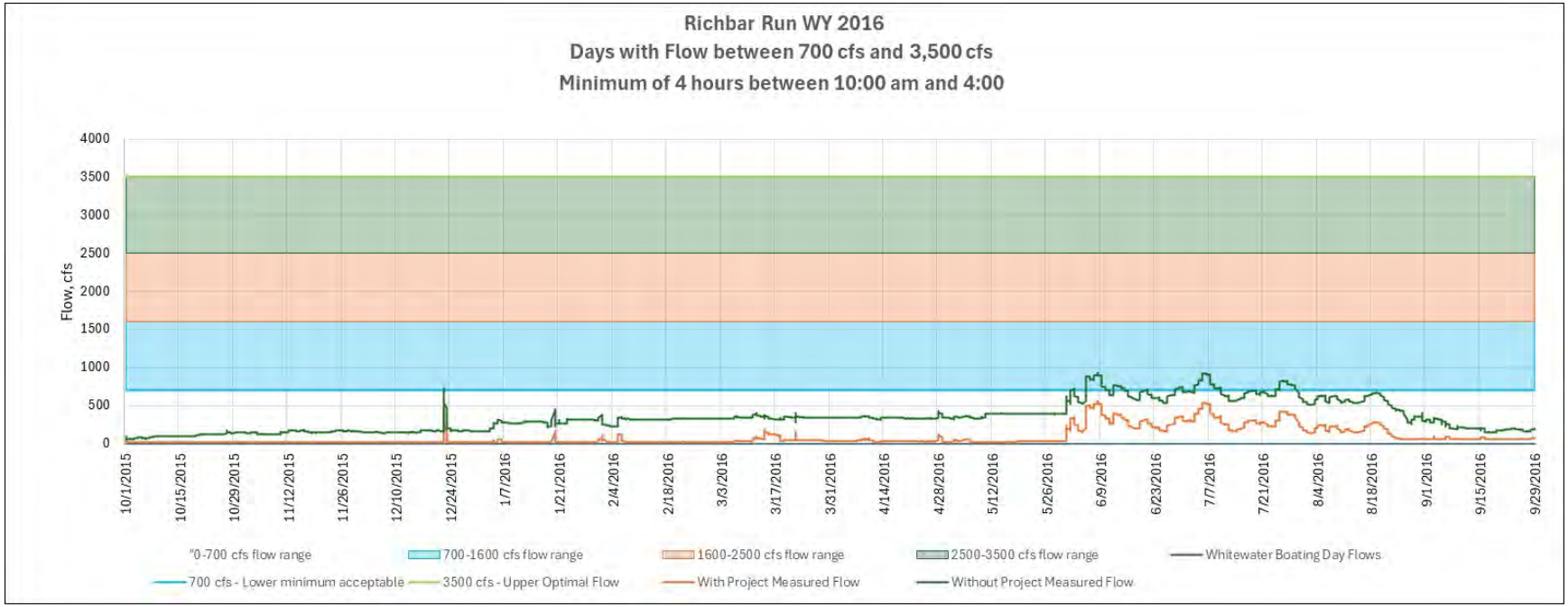


Richbar Run with Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	3	4	5	6	7	8	9	10	11	12	13	
Richbar Run with Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Richbar Run without Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Richbar Run without Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Difference: with Project - without Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

RICHBAR RUN: WATER YEAR 2016

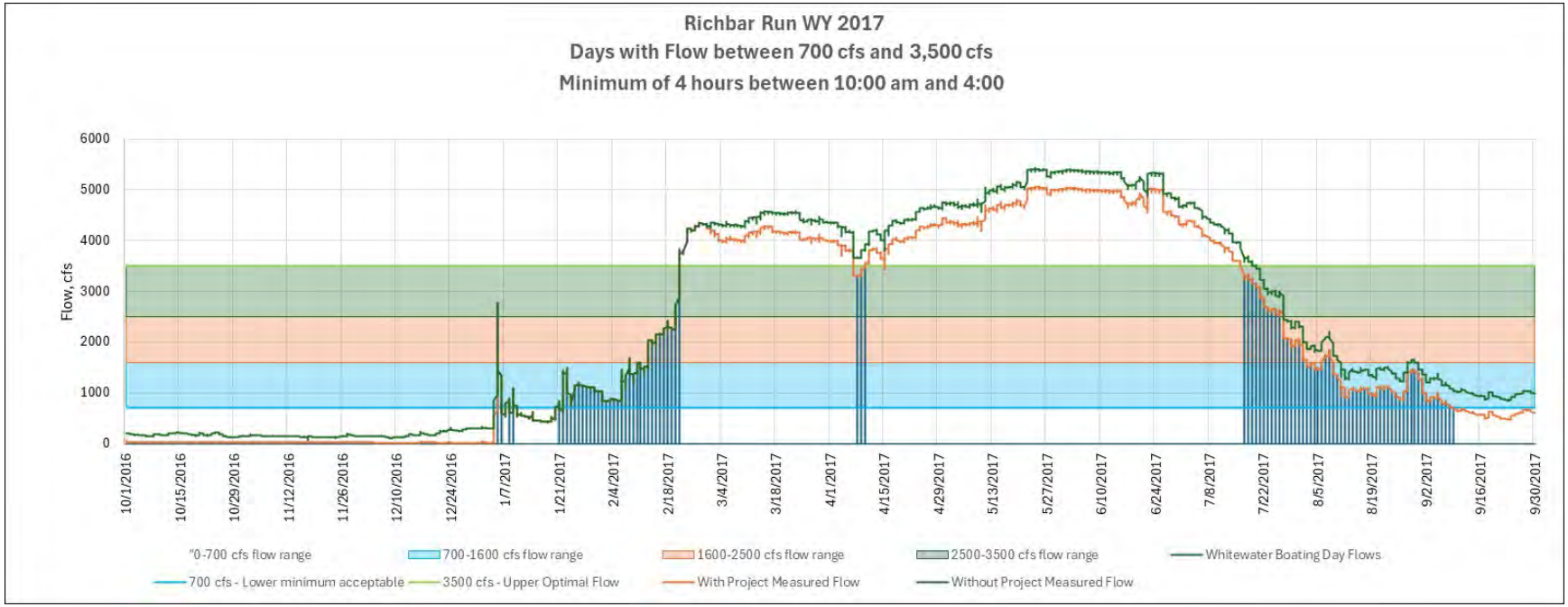


Richbar Run with Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	3	4	5	6	7	8	9	10	11	12	13	
Richbar Run with Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Richbar Run without Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	0	0	0	12	12	0	0	24
Richbar Run without Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	0	0	0	12	12	0	0	24
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	0	0	0	-12	-12	0	0	-24
Difference: with Project - without Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	0	0	0	-12	-12	0	0	-24
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

RICHBAR RUN: WATER YEAR 2017



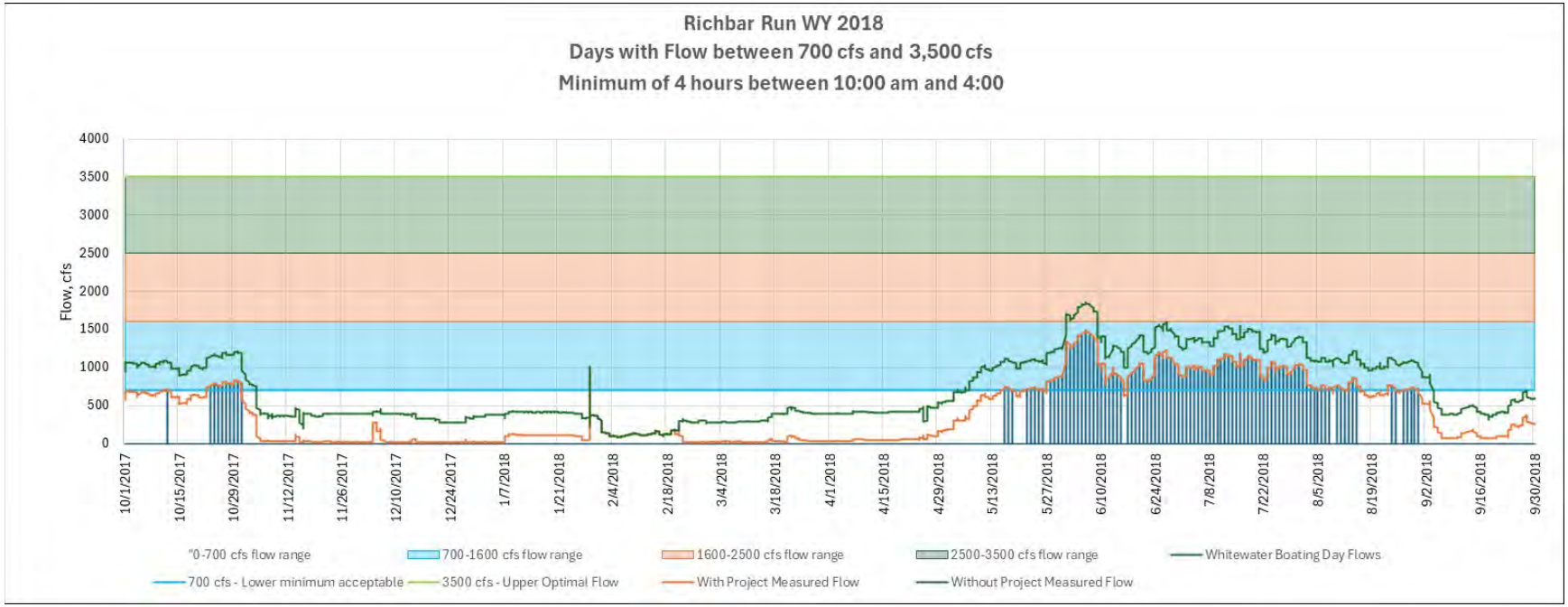
Richbar Run with Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	15	21	0	3	0	0	15	31	9	94
	2	3	4	5	6	7	8	9	10	11	12	13	
Richbar Run with Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	14	13	0	0	0	0	0	28	9	64
1600-2500 CFS	0	0	0	1	7	0	0	0	0	5	3	0	16
2500-3500 CFS	0	0	0	1	2	0	3	0	0	10	0	0	16

Richbar Run without Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	15	21	0	0	0	0	12	31	30	109
Richbar Run without Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	14	13	0	0	0	0	0	20	30	77
1600-2500 CFS	0	0	0	0	7	0	0	0	0	5	12	0	24
2500-3500 CFS	0	0	0	1	2	0	0	0	0	7	0	0	10

Difference: with Project - without Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	0	3	0	0	3	0	-21	-15
Difference: with Project - without Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	0	0	0	0	0	8	-21	-13
1600-2500 CFS	0	0	0	1	0	0	0	0	0	0	-9	0	-8
2500-3500 CFS	0	0	0	0	0	0	3	0	0	3	0	0	6

Copyright 2026 by Southern California Edison

RICHBAR RUN: WATER YEAR 2018



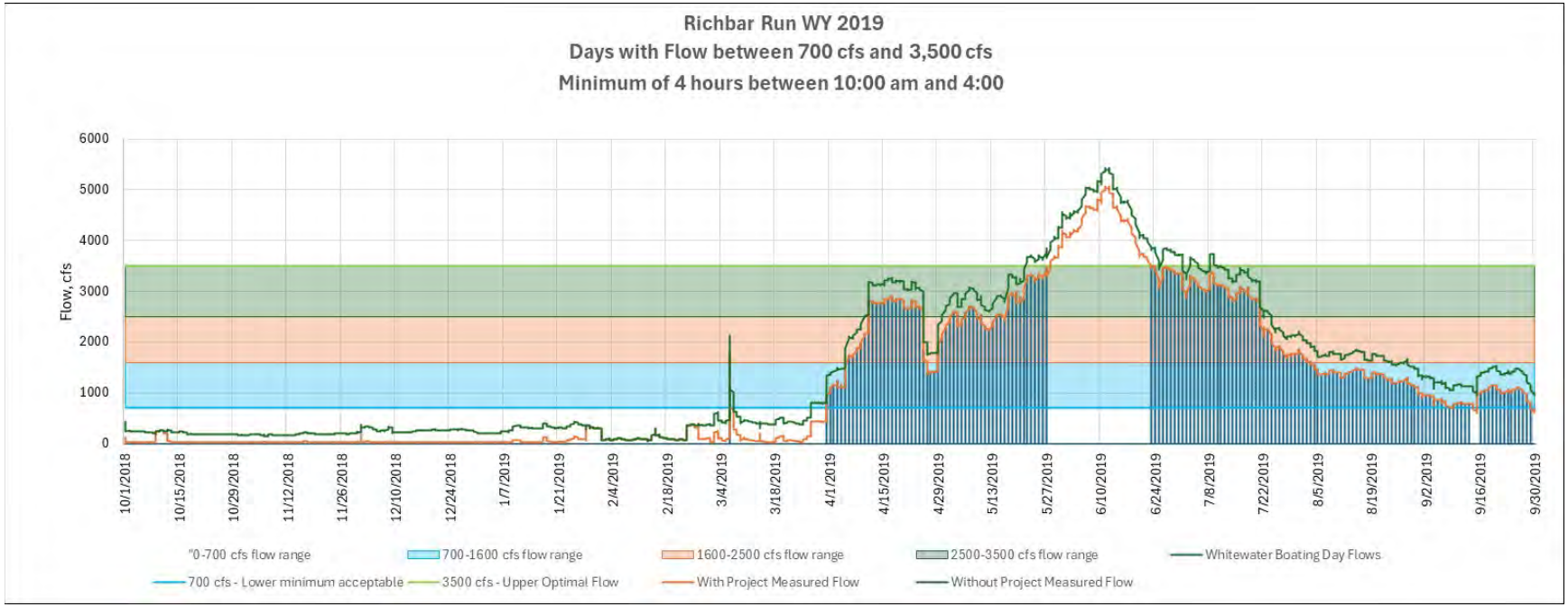
Richbar Run with Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	10	0	0	0	0	0	0	12	29	31	21	0	103
	2	3	4	5	6	7	8	9	10	11	12	13	
Richbar Run with Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	10	0	0	0	0	0	0	12	29	31	21	0	103
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Richbar Run without Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	31	4	0	0	0	0	0	26	30	31	31	4	157
Richbar Run without Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	31	4	0	0	0	0	0	26	22	31	31	4	149
1600-2500 CFS	0	0	0	0	0	0	0	0	8	0	0	0	8
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	-21	-4	0	0	0	0	0	-14	-1	0	-10	-4	-54
Difference: with Project - without Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	-21	-4	0	0	0	0	0	-14	7	0	-10	-4	-46
1600-2500 CFS	0	0	0	0	0	0	0	0	-8	0	0	0	-8
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Copyright 2026 by Southern California Edison

RICHBAR RUN: WATER YEAR 2019



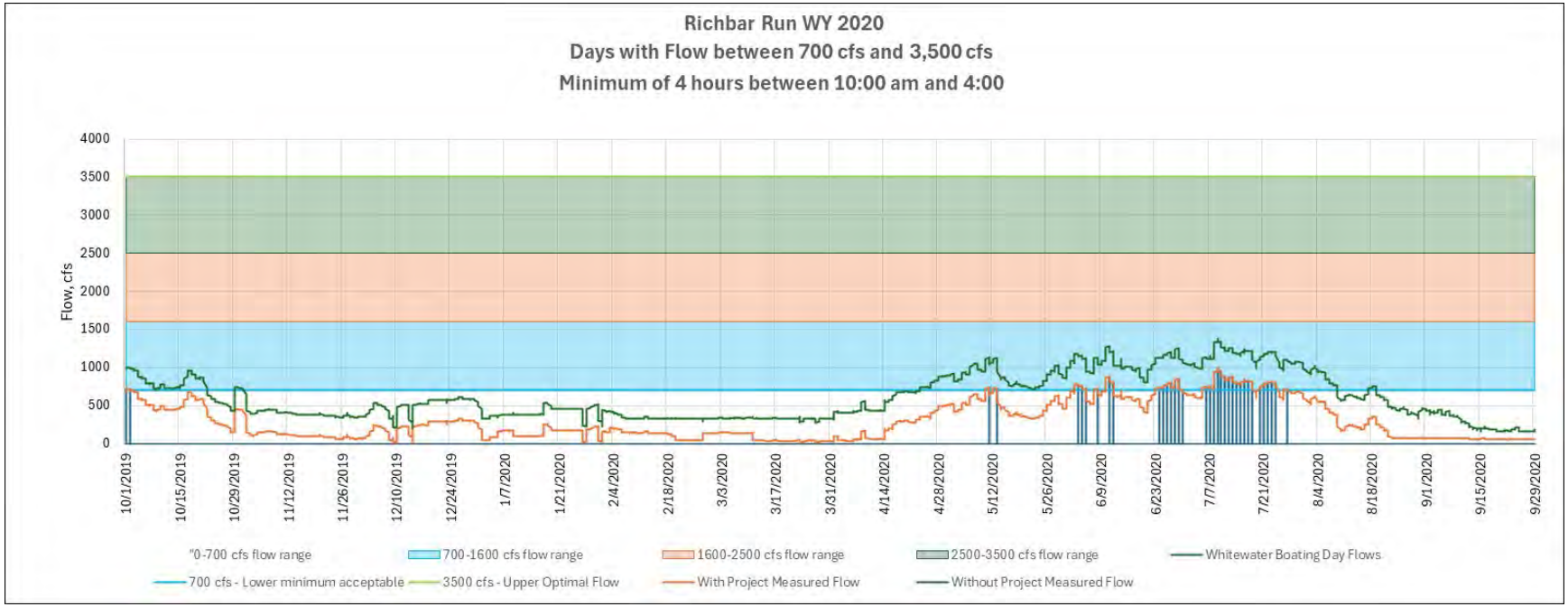
Richbar Run with Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	2	30	27	8	31	31	27	156
	2	3	4	5	6	7	8	9	10	11	12	13	
Richbar Run with Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	2	8	0	0	0	28	27	65
1600-2500 CFS	0	0	0	0	0	1	8	9	0	10	3	0	31
2500-3500 CFS	0	0	0	0	0	0	14	19	8	21	0	0	62

Richbar Run without Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	6	30	21	1	27	31	30	146
Richbar Run without Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	5	4	0	0	0	6	30	45
1600-2500 CFS	0	0	0	0	0	1	11	0	0	8	25	0	45
2500-3500 CFS	0	0	0	0	0	0	15	21	1	19	0	0	56

Difference: with Project - without Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	-4	0	6	7	4	0	-3	10
Difference: with Project - without Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	-3	4	0	0	0	22	-3	20
1600-2500 CFS	0	0	0	0	0	0	-3	9	0	2	-22	0	-14
2500-3500 CFS	0	0	0	0	0	0	-1	-2	7	2	0	0	6

Copyright 2026 by Southern California Edison

RICHBAR RUN: WATER YEAR 2020

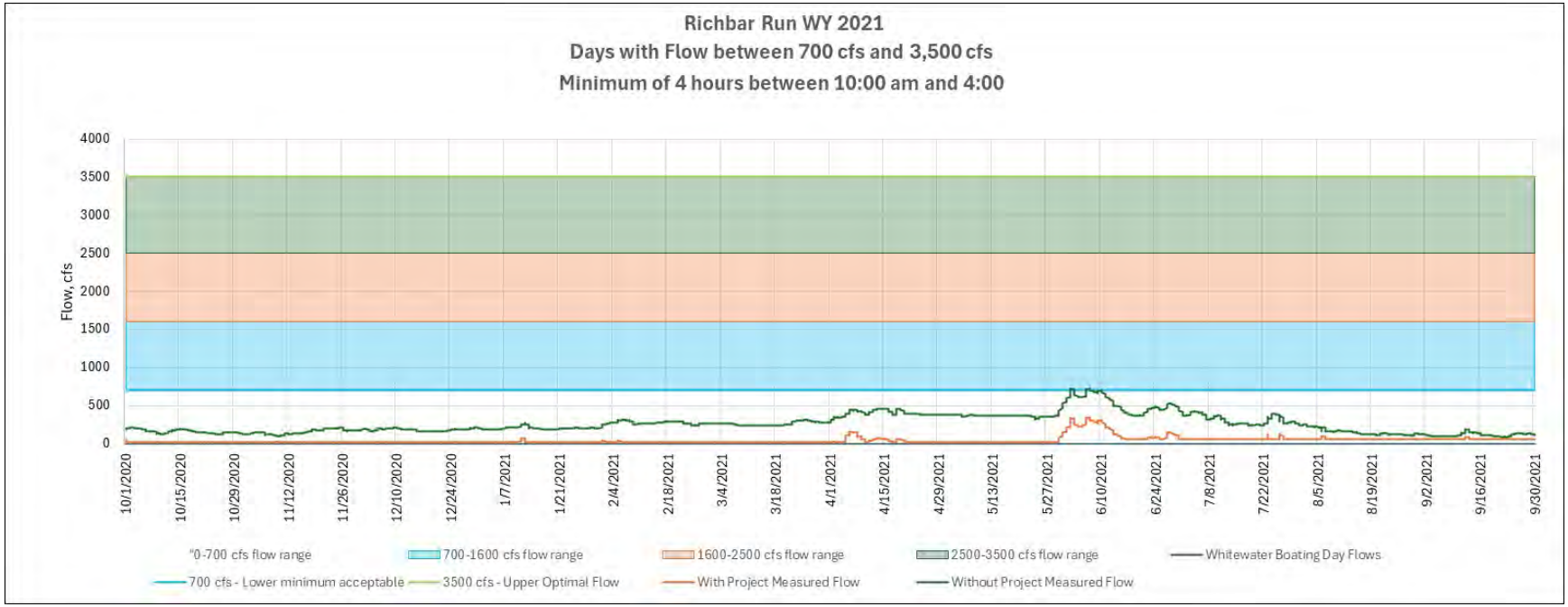


Richbar Run with Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	2	0	0	0	0	0	0	2	13	19	0	0	36
	2	3	4	5	6	7	8	9	10	11	12	13	
Richbar Run with Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	2	0	0	0	0	0	0	2	13	19	0	0	36
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Richbar Run without Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	24	0	0	0	0	0	8	31	30	31	11	0	135
Richbar Run without Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	24	0	0	0	0	0	8	31	30	31	11	0	135
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	-22	0	0	0	0	0	-8	-29	-17	-12	-11	0	-99
Difference: with Project - without Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	-22	0	0	0	0	0	-8	-29	-17	-12	-11	0	-99
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

RICHBAR RUN: WATER YEAR 2021

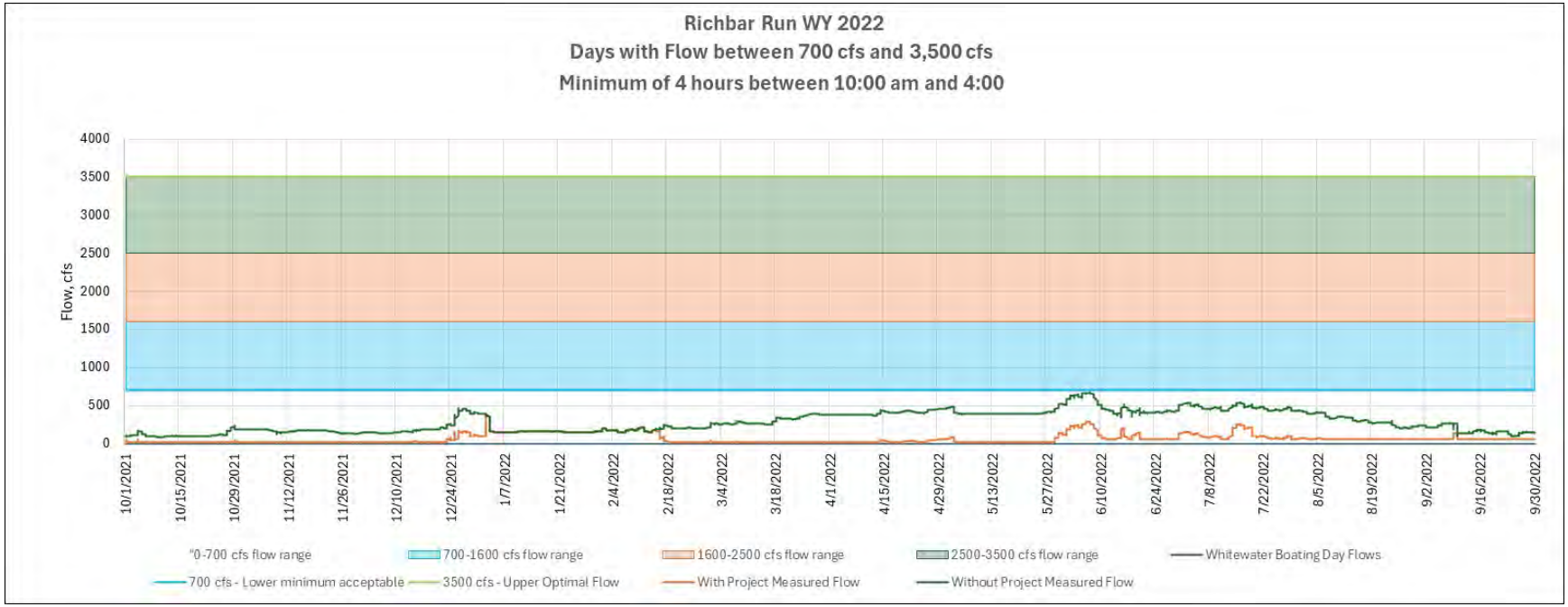


Richbar Run with Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	3	4	5	6	7	8	9	10	11	12	13	
Richbar Run with Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Richbar Run without Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	0	0	0	3	0	0	0	3
Richbar Run without Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	0	0	0	3	0	0	0	3
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	0	0	0	-3	0	0	0	-3
Difference: with Project - without Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	0	0	0	-3	0	0	0	-3
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

RICHBAR RUN: WATER YEAR 2022

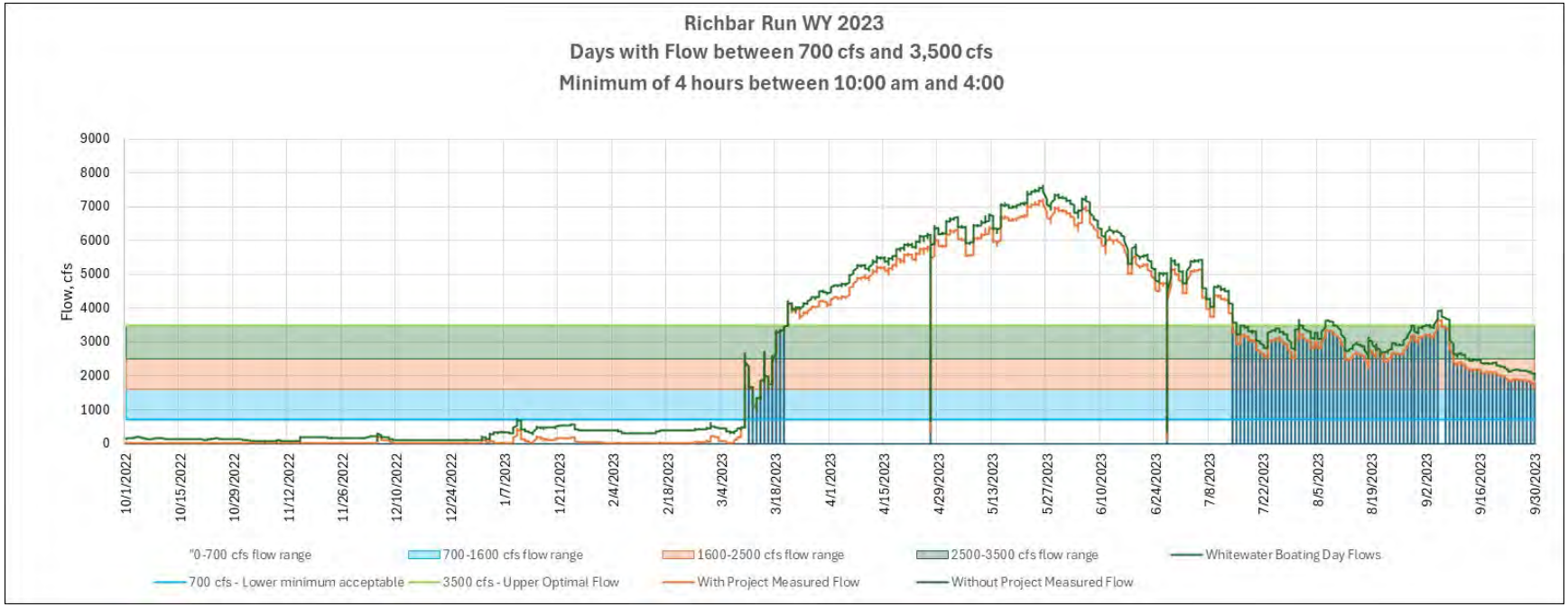


Richbar Run with Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	3	4	5	6	7	8	9	10	11	12	13	
Richbar Run with Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Richbar Run without Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Richbar Run without Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Difference: with Project - without Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2500-3500 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

RICHBAR RUN: WATER YEAR 2023



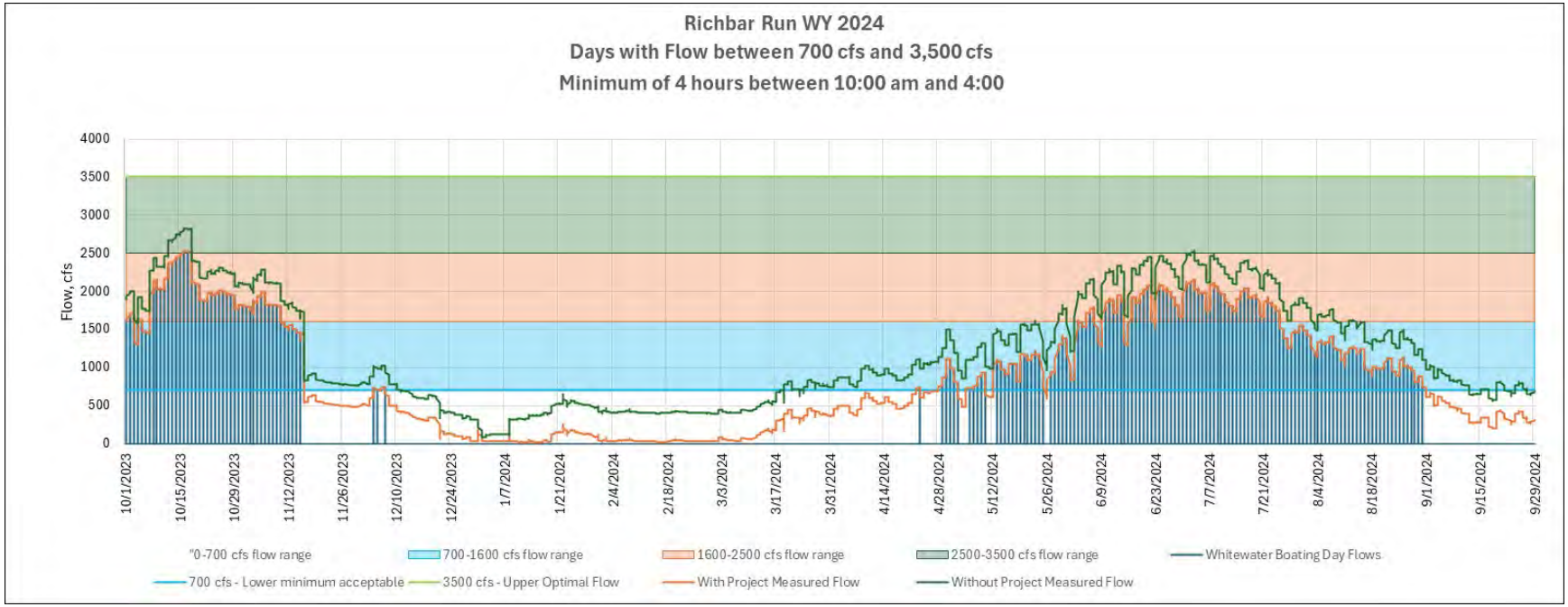
Richbar Run with Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	10	1	0	1	18	31	29	90
	2	3	4	5	6	7	8	9	10	11	12	13	
Richbar Run with Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	3	1	0	1	0	0	0	5
1600-2500 CFS	0	0	0	0	0	3	0	0	1	1	3	21	29
2500-3500 CFS	0	0	0	0	0	5	0	0	0	18	28	8	59

Richbar Run without Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	10	1	0	1	17	29	25	83
Richbar Run without Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	3	1	0	1	0	0	0	5
1600-2500 CFS	0	0	0	0	0	3	0	0	0	0	0	18	21
2500-3500 CFS	0	0	0	0	0	5	1	0	0	17	29	8	60

Difference: with Project - without Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	0	0	0	0	0	0	0	0	1	2	4	7
Difference: with Project - without Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2500 CFS	0	0	0	0	0	0	0	0	1	1	3	3	8
2500-3500 CFS	0	0	0	0	0	0	-1	0	0	1	-1	0	-1

Copyright 2026 by Southern California Edison

RICHBAR RUN: WATER YEAR 2024



Richbar Run with Project WY 2024	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	31	15	3	0	0	0	3	26	30	31	31	0	170
	2	3	4	5	6	7	8	9	10	11	12	13	
Richbar Run with Project WY 2024	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	3	5	3	0	0	0	3	26	9	6	31	0	86
1600-2500 CFS	27	10	0	0	0	0	0	0	22	25	0	0	84
2500-3500 CFS	3	0	0	0	0	0	0	0	0	0	0	0	3

Richbar Run without Project WY 2024	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	31	30	10	0	0	11	30	31	30	31	31	20	255
Richbar Run without Project WY 2024	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	0	15	10	0	0	11	30	28	2	0	24	20	140
1600-2500 CFS	26	15	0	0	0	0	0	4	28	31	8	0	112
2500-3500 CFS	7	0	0	0	0	0	0	0	0	1	0	0	8

Difference: with Project - without Project WY 2024	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (700-3500 CFS)	0	-15	-7	0	0	-11	-27	-5	0	0	0	-20	-85
Difference: with Project - without Project WY 2024	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
700-1600 CFS	3	-10	-7	0	0	-11	-27	-2	7	6	7	-20	-54
1600-2500 CFS	1	-5	0	0	0	0	0	-4	-6	-6	-8	0	-28
2500-3500 CFS	-4	0	0	0	0	0	0	0	0	-1	0	0	-5

Copyright 2026 by Southern California Edison

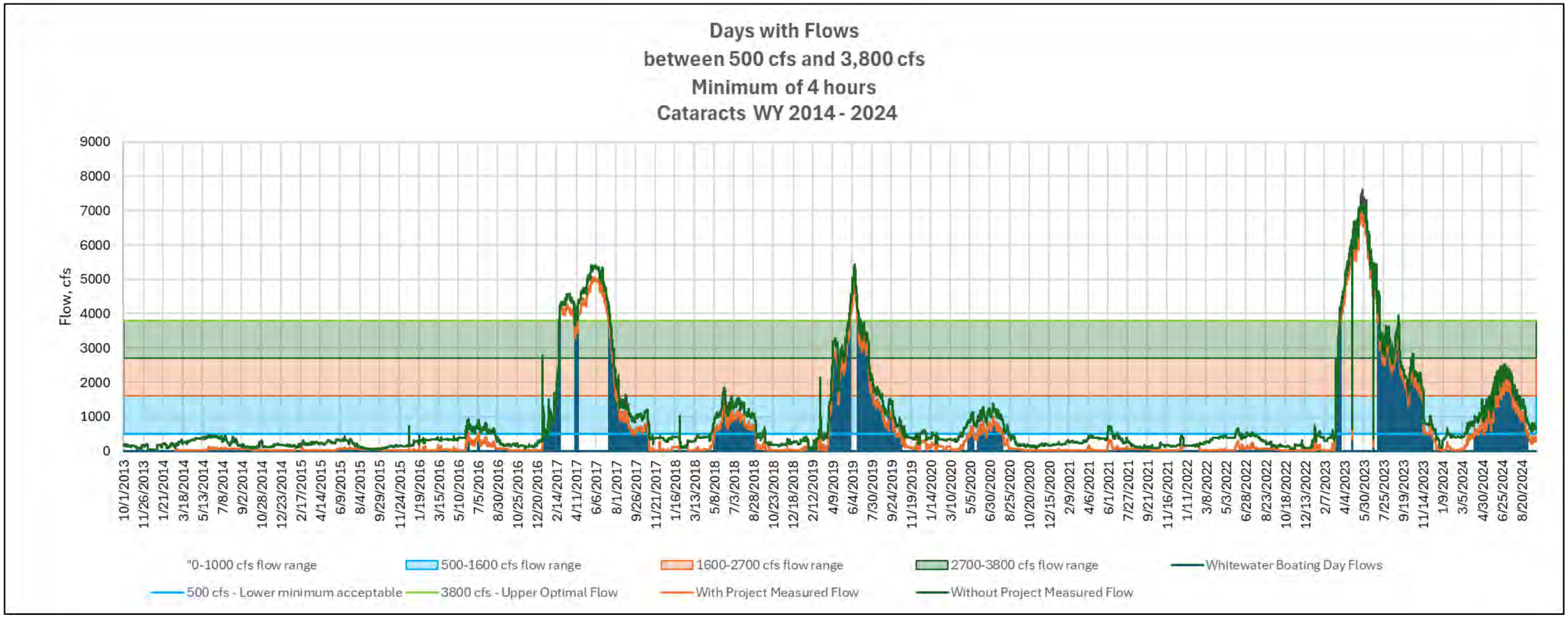
CATARACTS

The flow preferences of the boaters who provided input about their experiences boating the Cataracts run ranged between 500 cfs and 2,800 cfs for the minimum acceptable flow threshold, and between 900 and 3,800 cfs for the optimum flow threshold. Therefore, the boatable flow range used to calculate a boating-day for the Cataracts run was 500 cfs to 3,800 cfs.

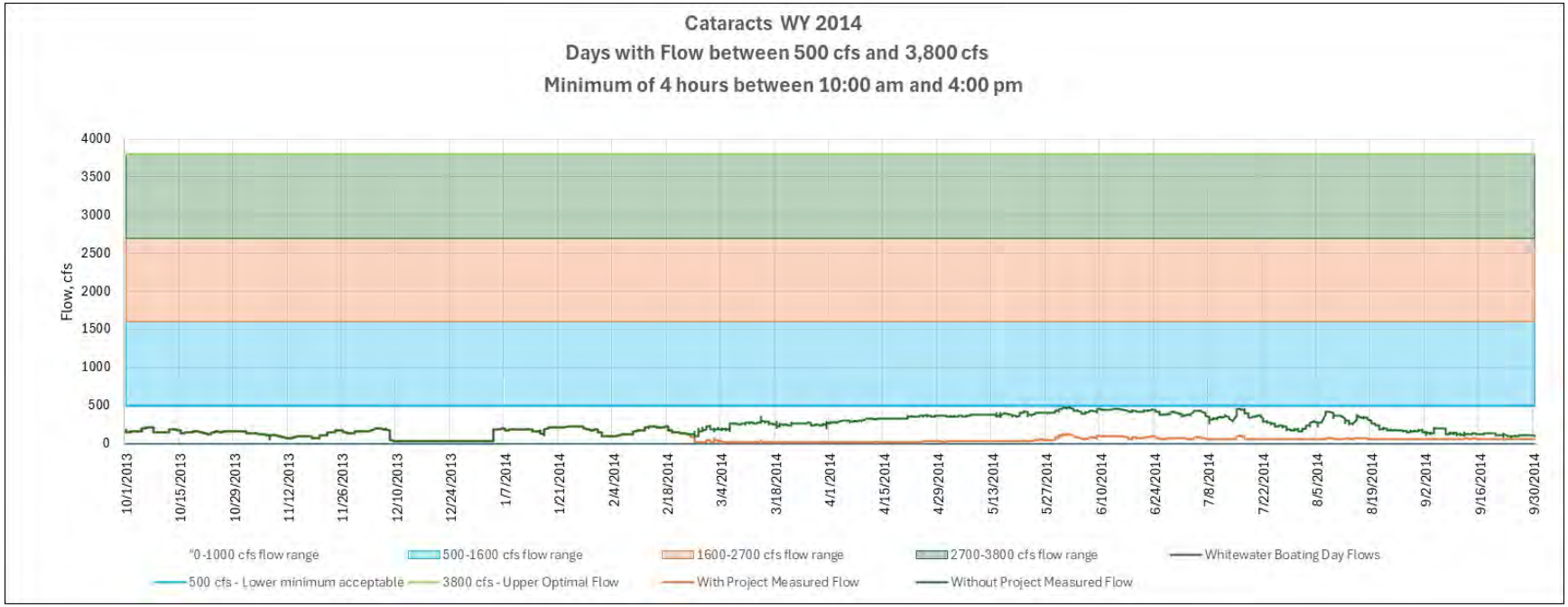
The following figures and tables include an overview that illustrates the hydrograph for the complete period of record (illustrating both “with-project” and “without-project”) and then separate hydrograph and summary tables for each year that illustrate the number of boatable days, per year and by month for the Cataracts fun, and provide additional information about flows within three specific intermediate ranges under both “with-project” and “without-project” scenarios:

- 500–1,600 cfs
- 1,600–2,700 cfs
- 2,700–3,800 cfs

CATARACTS RUN: WATER YEARS 2014–2024



CATARACTS RUN: WATER YEAR 2014



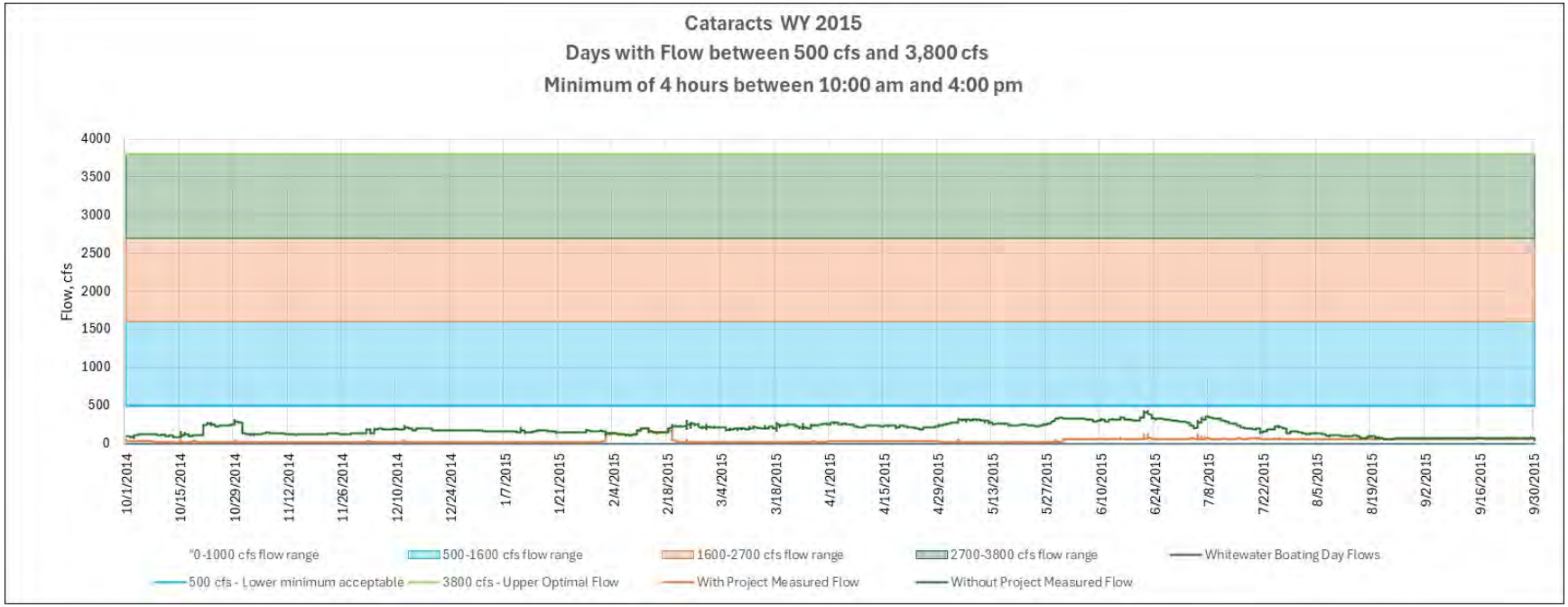
Cataracts with Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	3	4	5	6	7	8	9	10	11	12	13	
Cataracts with Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Cataracts without Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Cataracts without Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Difference: with Project - without Project WY 2014	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Copyright 2026 by Southern California Edison

CATARACTS RUN: WATER YEAR 2015



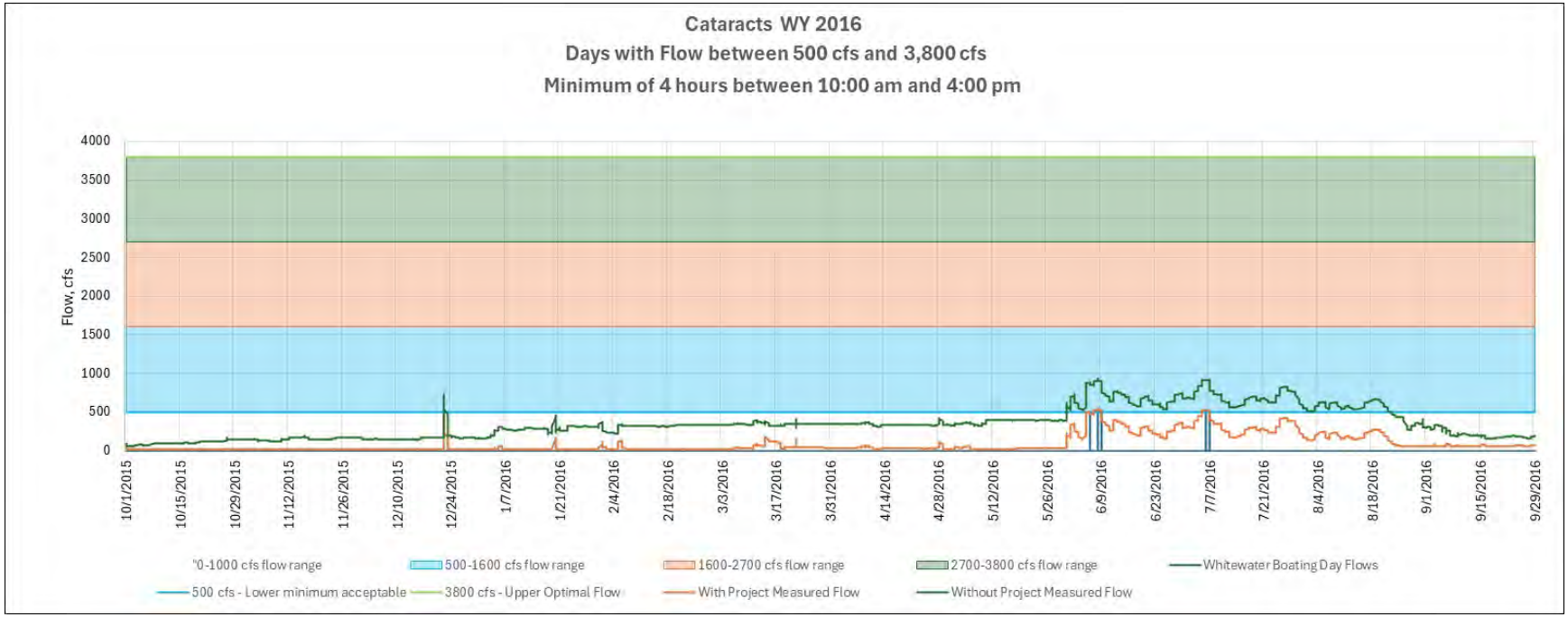
Cataracts with Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	3	4	5	6	7	8	9	10	11	12	13	
Cataracts with Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Cataracts without Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Cataracts without Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
Difference: with Project - without Project WY 2015	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Copyright 2026 by Southern California Edison

CATARACTS RUN: WATER YEAR 2016

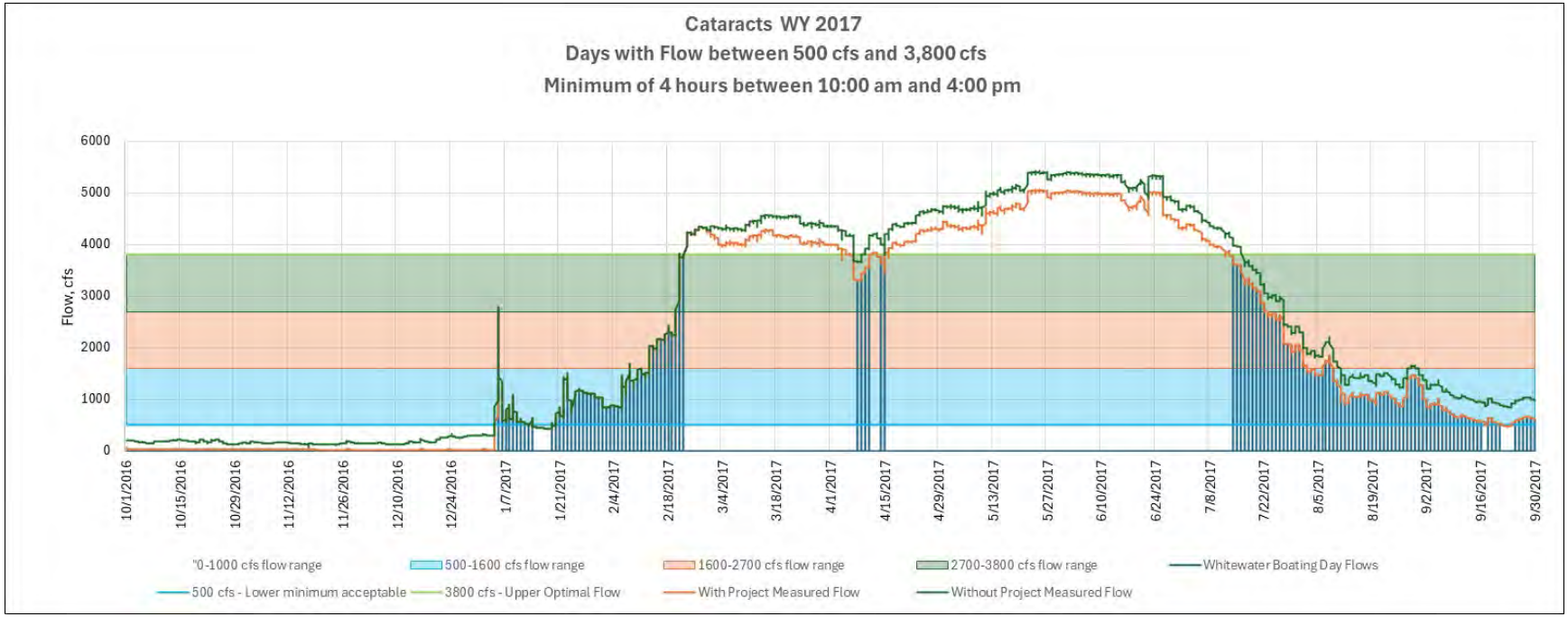


Cataracts with Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	0	0	0	3	2	0	0	5
	2	3	4	5	6	7	8	9	10	11	12	13	
Cataracts with Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	0	0	0	3	2	0	0	5
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Cataracts without Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	0	0	0	30	31	22	0	83
Cataracts without Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	0	0	0	30	31	22	0	83
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	0	0	0	-27	-29	-22	0	-78
Difference: with Project - without Project WY 2016	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	0	0	0	-27	-29	-22	0	-78
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

CATARACTS RUN: WATER YEAR 2017



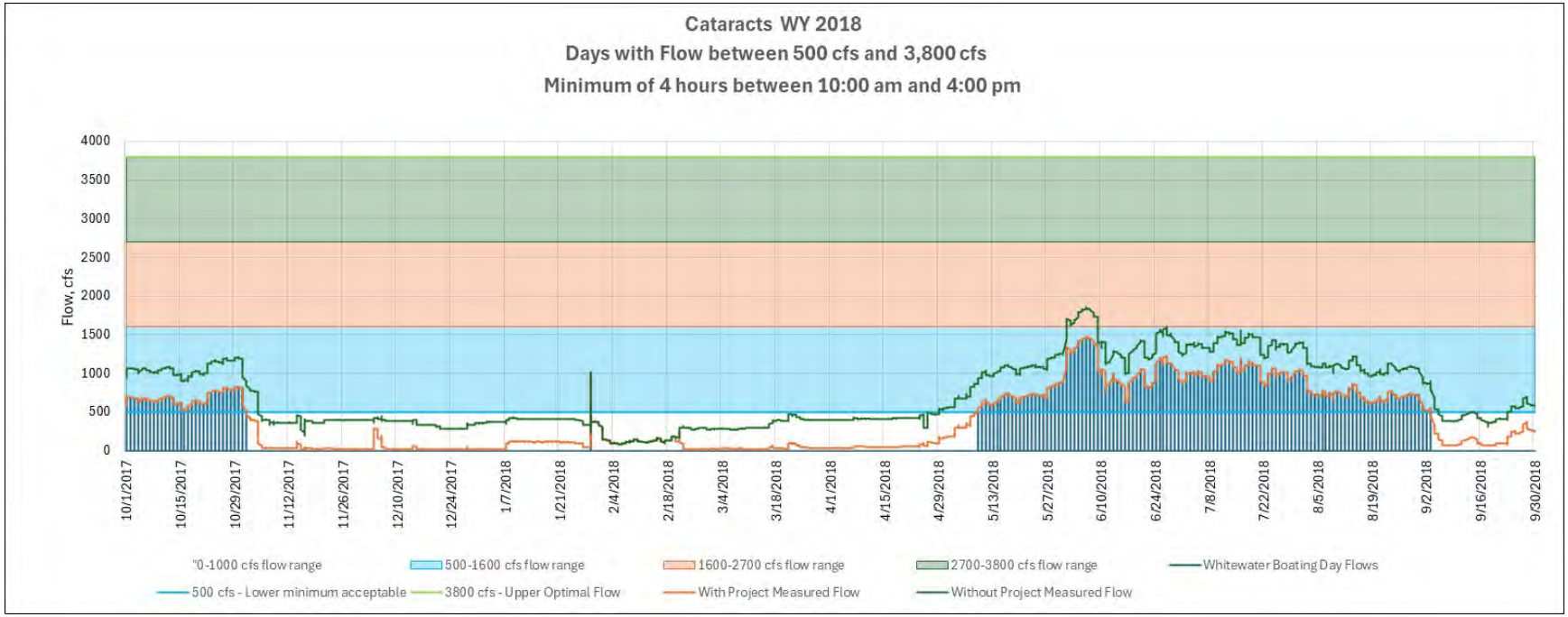
Cataracts with Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	23	22	0	6	0	0	18	31	26	126
	2	3	4	5	6	7	8	9	10	11	12	13	
Cataracts with Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	22	13	0	0	0	0	0	28	26	89
1600-2700 CFS	0	0	0	1	7	0	0	0	0	9	3	0	20
2700-3800 CFS	0	0	0	0	2	0	6	0	0	9	0	0	17

Cataracts without Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	23	22	0	2	0	0	15	31	30	123
Cataracts without Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	22	13	0	0	0	0	0	20	30	85
1600-2700 CFS	0	0	0	1	7	0	0	0	0	5	12	0	25
2700-3800 CFS	0	0	0	1	2	0	2	0	0	10	0	0	15

Difference: with Project - without Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	0	4	0	0	3	0	-4	3
Difference: with Project - without Project WY 2017	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	0	0	0	0	0	8	-4	4
1600-2700 CFS	0	0	0	0	0	0	0	0	0	4	-9	0	-5
2700-3800 CFS	0	0	0	-1	0	0	4	0	0	-1	0	0	2

Copyright 2026 by Southern California Edison

CATARACTS RUN: WATER YEAR 2018



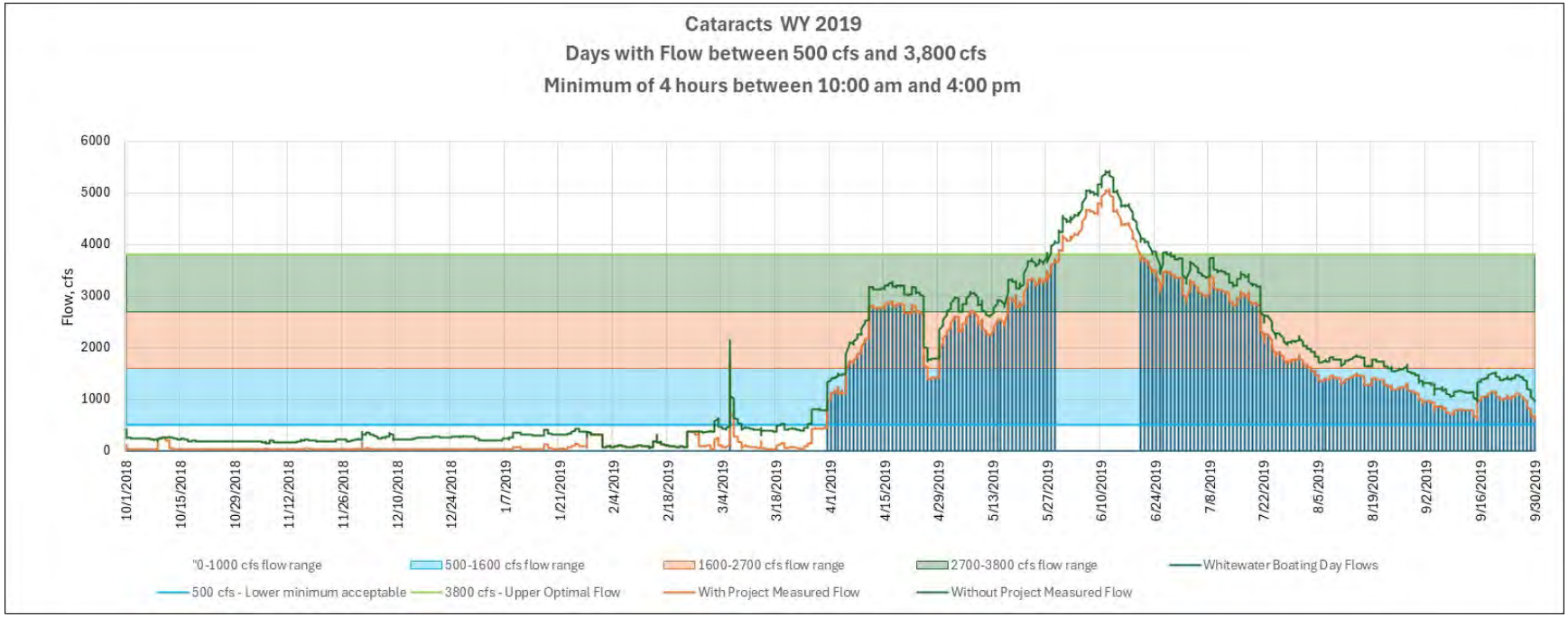
Cataracts with Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	31	1	0	1	0	0	0	23	30	31	31	3	151
	2	3	4	5	6	7	8	9	10	11	12	13	
Cataracts with Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	31	1	0	1	0	0	0	23	30	31	31	3	151
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Cataracts without Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	31	4	0	1	0	0	2	31	30	31	31	12	173
Cataracts without Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	31	4	0	1	0	0	2	31	22	31	31	12	165
1600-2700 CFS	0	0	0	0	0	0	0	0	8	0	0	0	8
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	-3	0	0	0	0	-2	-8	0	0	0	-9	-22
Difference: with Project - without Project WY 2018	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	-3	0	0	0	0	-2	-8	8	0	0	-9	-14
1600-2700 CFS	0	0	0	0	0	0	0	0	-8	0	0	0	-8
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Copyright 2026 by Southern California Edison

CATARACTS RUN: WATER YEAR 2019



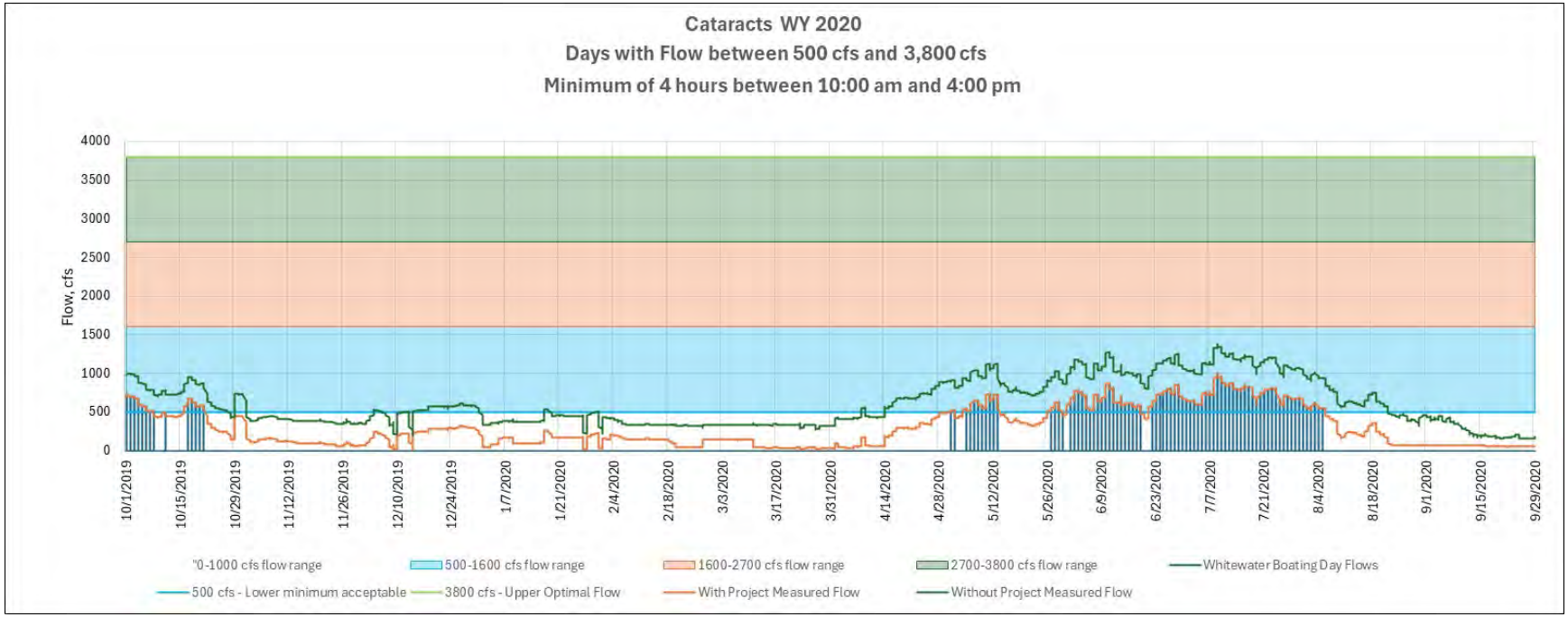
Cataracts with Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	2	30	29	11	31	31	30	164
	2	3	4	5	6	7	8	9	10	11	12	13	
Cataracts with Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	2	8	0	0	0	28	30	68
1600-2700 CFS	0	0	0	0	0	1	12	15	0	10	3	0	41
2700-3800 CFS	0	0	0	0	0	0	10	14	11	21	0	0	56

Cataracts without Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	11	30	26	3	31	31	30	162
Cataracts without Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	10	4	0	0	0	6	30	50
1600-2700 CFS	0	0	0	0	0	1	12	4	0	10	25	0	52
2700-3800 CFS	0	0	0	0	0	0	14	22	3	21	0	0	60

Difference: with Project - without Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	-9	0	3	8	0	0	0	2
Difference: with Project - without Project WY 2019	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	-8	4	0	0	0	22	0	18
1600-2700 CFS	0	0	0	0	0	0	0	11	0	0	-22	0	-11
2700-3800 CFS	0	0	0	0	0	0	-4	-8	8	0	0	0	-4

Copyright 2026 by Southern California Edison

CATARACTS RUN: WATER YEAR 2020



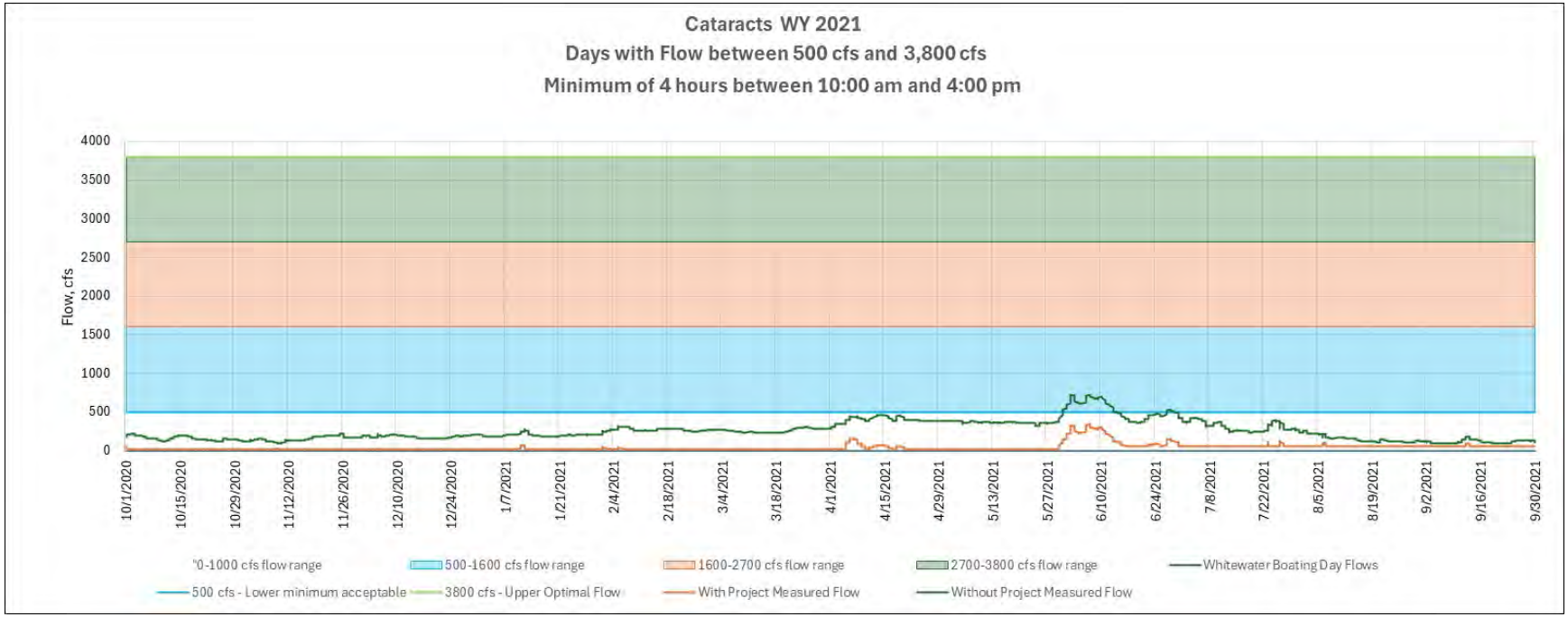
Cataracts with Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	14	0	0	0	0	0	0	15	28	31	5	0	93
	2	3	4	5	6	7	8	9	10	11	12	13	
Cataracts with Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	14	0	0	0	0	0	0	15	28	31	5	0	93
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Cataracts without Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	30	0	24	3	0	0	16	31	30	31	22	0	187
Cataracts without Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	30	0	24	3	0	0	16	31	30	31	22	0	187
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	-16	0	-24	-3	0	0	-16	-16	-2	0	-17	0	-94
Difference: with Project - without Project WY 2020	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	-16	0	-24	-3	0	0	-16	-16	-2	0	-17	0	-94
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Copyright 2026 by Southern California Edison

CATARACTS RUN: WATER YEAR 2021

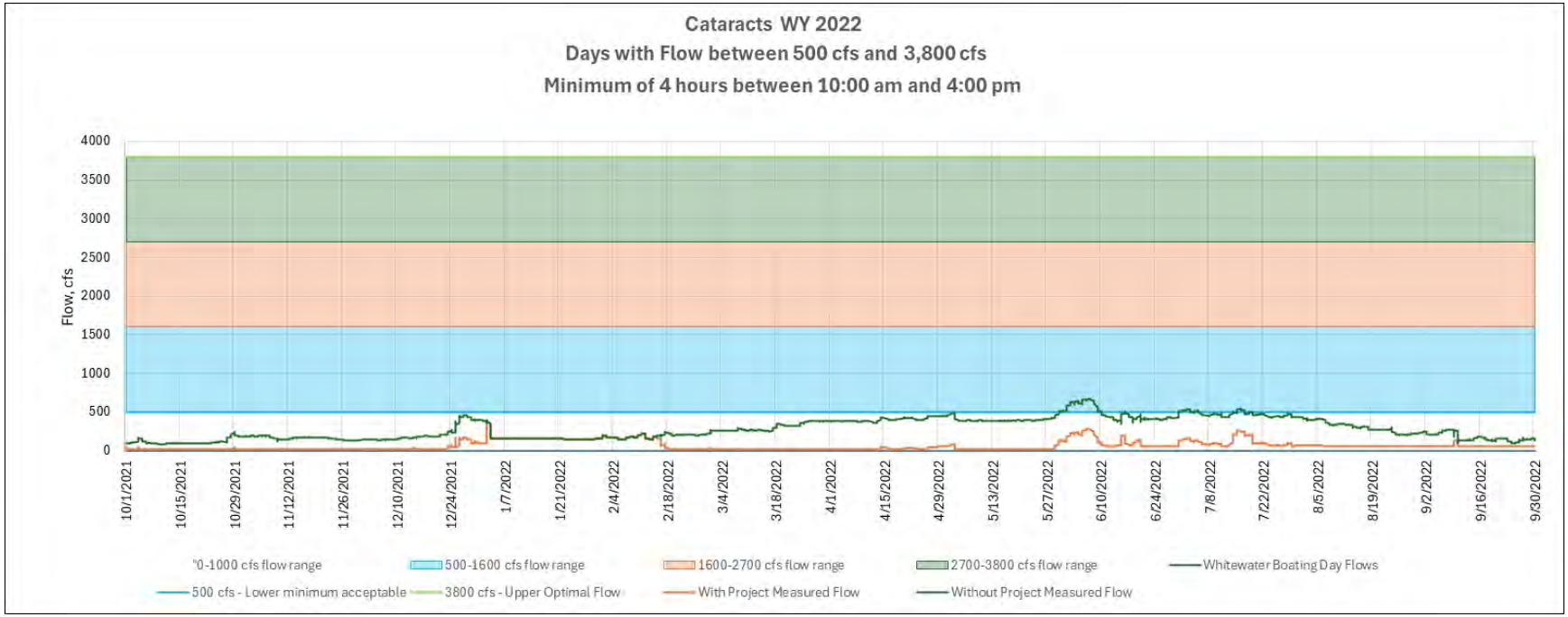


Cataracts with Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	3	4	5	6	7	8	9	10	11	12	13	
Cataracts with Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Cataracts without Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	0	0	0	16	0	0	0	16
Cataracts without Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	0	0	0	16	0	0	0	16
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	0	0	0	-16	0	0	0	-16
Difference: with Project - without Project WY 2021	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	0	0	0	-16	0	0	0	-16
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

CATARACTS RUN: WATER YEAR 2022

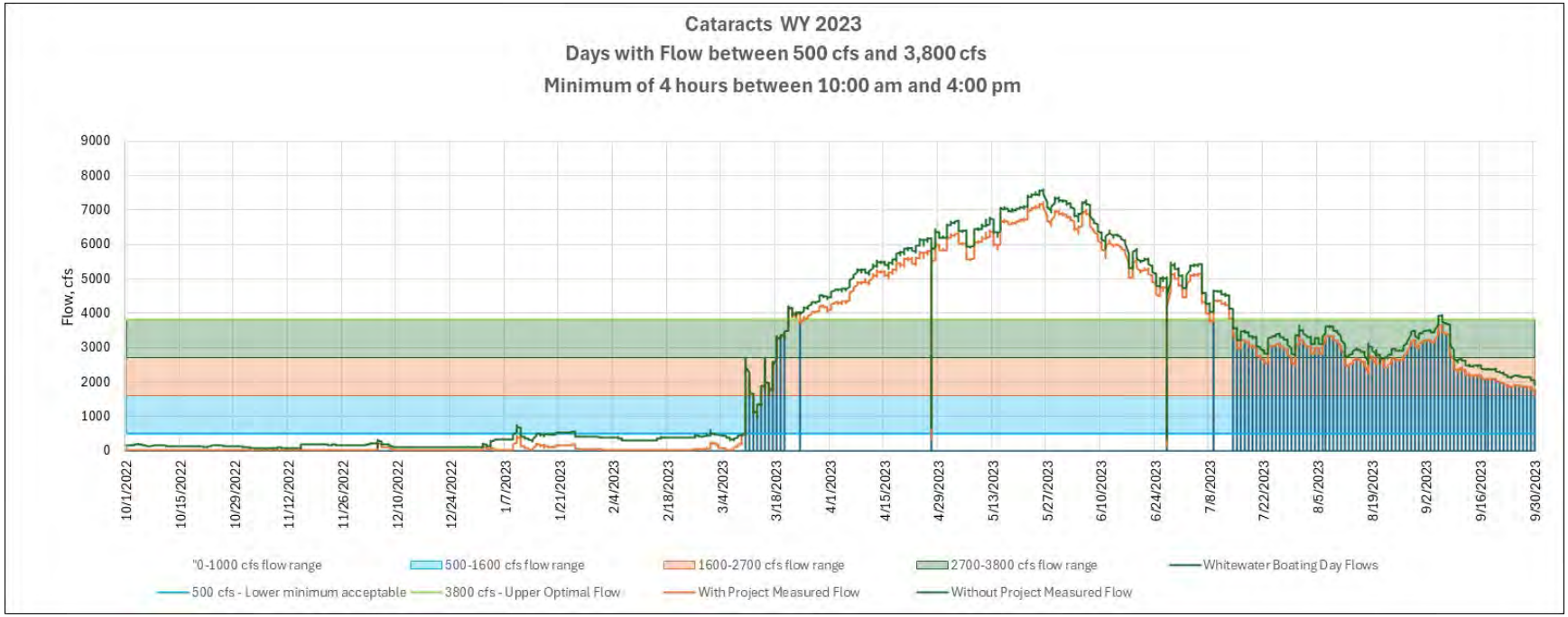


Cataracts with Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	3	4	5	6	7	8	9	10	11	12	13	
Cataracts with Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Cataracts without Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	0	0	1	9	7	0	0	17
Cataracts without Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	0	0	1	9	7	0	0	17
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Difference: with Project - without Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	0	0	-1	-9	-7	0	0	-17
Difference: with Project - without Project WY 2022	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	0	0	-1	-9	-7	0	0	-17
1600-2700 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

CATARACTS RUN: WATER YEAR 2023



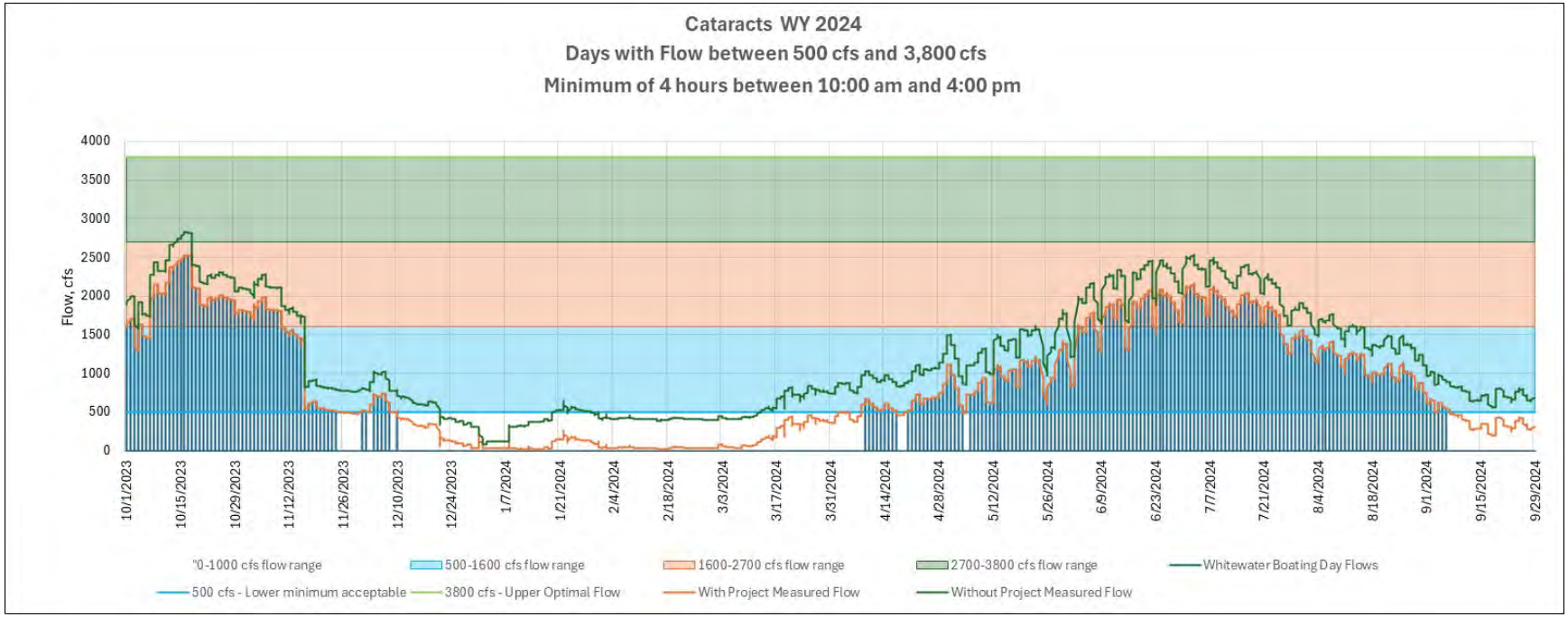
Cataracts with Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	0	0	12	1	0	1	19	31	30	94
	2	3	4	5	6	7	8	9	10	11	12	13	
Cataracts with Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	0	0	4	1	0	1	0	0	0	6
1600-2700 CFS	0	0	0	0	0	4	0	0	1	4	14	22	45
2700-3800 CFS	0	0	0	0	0	5	0	0	0	15	18	8	46

Cataracts without Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	7	0	12	1	0	1	18	31	29	99
Cataracts without Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	7	0	5	1	0	1	0	0	0	14
1600-2700 CFS	0	0	0	0	0	4	1	0	1	0	4	21	31
2700-3800 CFS	0	0	0	0	0	4	0	0	0	18	29	8	59

Difference: with Project - without Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Whitewater Boating Days (500-3800 CFS)	0	0	0	-7	0	0	0	0	0	1	0	1	-5
Difference: with Project - without Project WY 2023	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
500-1600 CFS	0	0	0	-7	0	-1	0	0	0	0	0	0	-8
1600-2700 CFS	0	0	0	0	0	0	-1	0	0	4	10	1	14
2700-3800 CFS	0	0	0	0	0	1	0	0	0	-3	-11	0	-13

Copyright 2026 by Southern California Edison

CATARACTS RUN: WATER YEAR 2024



Cataracts with Project WY 2024	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Total**
Whitewater Boating Days (500-3800 CFS)	31	24	8	0	0	0	20	30	30	31	31	6	211
	2	3	4	5	6	7	8	9	10	11	12	13	
Cataracts with Project WY 2024	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	
500-1600 CFS	3	14	8	0	0	0	20	30	9	6	31	6	127
1600-2700 CFS	29	10	0	0	0	0	0	0	22	25	0	0	86
2700-3800 CFS	0	0	0	0	0	0	0	0	0	0	0	0	0

Cataracts without Project WY 2024	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Total**
Whitewater Boating Days (500-3800 CFS)	31	30	20	10	0	18	30	31	30	31	31	30	292
Cataracts without Project WY 2024	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	
500-1600 CFS	0	15	20	10	0	18	30	28	2	0	24	30	177
1600-2700 CFS	27	15	0	0	0	0	0	4	28	31	8	0	113
2700-3800 CFS	5	0	0	0	0	0	0	0	0	0	0	0	5

Difference: with Project - without Project WY 2024	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Total**
Whitewater Boating Days (500-3800 CFS)	0	-6	-12	-10	0	-18	-10	-1	0	0	0	-24	-81
Difference: with Project - without Project WY 2024	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	
500-1600 CFS	3	-1	-12	-10	0	-18	-10	2	7	6	7	-24	-50
1600-2700 CFS	2	-5	0	0	0	0	0	-4	-6	-6	-8	0	-27
2700-3800 CFS	-5	0	0	0	0	0	0	0	0	0	0	0	-5

Copyright 2026 by Southern California Edison

APPENDIX J

TERR 1 – BOTANICAL RESOURCES TECHNICAL MEMORANDUM

Copyright 2026 Southern California Edison

TERR 1 – BOTANICAL RESOURCES TECHNICAL MEMORANDUM

KERN RIVER NO. 1 HYDROELECTRIC PROJECT
FERC PROJECT NO. 1930

PREPARED FOR:



March 2026

TABLE OF CONTENTS

1.0 Introduction 1

2.0 Study Objectives 1

3.0 Study Area 1

4.0 Methods 2

4.1 Study Plan Variances 2

4.2 Vegetation Alliances 2

4.2.1 Develop Preliminary Maps from Available CALVEG Data 2

4.2.2 Verify Preliminary CALVEG Data Using Aerial Photographs 3

4.2.3 Conduct Ground-Truthing of Vegetation Alliances 3

4.2.4 Develop Final CALVEG Vegetation Community Maps 4

4.3 Riparian Vegetation Alliances and Special Aquatic Features 4

4.3.1 Develop Preliminary Maps from Available Data 4

4.3.2 Conduct Ground-Truthing of Riparian Vegetation Alliances and Wetlands 4

4.3.3 Develop Final Riparian Vegetation Alliance and Special Aquatic Features 5

4.3.4 Characterize the Relationship Between Riparian Vegetation and Flow Conditions 5

4.4 Special-Status Plants 7

4.4.1 Develop Preliminary Information on Special-Status Plants in the Study Area 7

4.4.2 Conduct Special-Status Plant Surveys 8

4.4.3 Develop Final Special-Status Plant Maps 9

4.5 Non-Native Invasive Plants 9

4.5.1 Develop Preliminary Information on Non-Native Invasive Plants in the Study Area 9

4.5.2 Conduct Non-Native Invasive Plant Surveys 10

4.5.3 Develop Final Non-Native Invasive Species Maps 10

5.0 Results Summary 10

5.1 Vegetation Alliances and Wildlife Habitats 10

5.2 Riparian Vegetation Alliances and Special Aquatic Features 11

5.2.1 Characterize the Relationship Between Riparian Vegetation and Flow Conditions 12
5.3 Special-Status Plants 16
5.4 Non-Native Invasive Plants 17
6.0 Study Specific Consultation 18
7.0 Outstanding Study Plan Elements 18
8.0 References 18

LIST OF TABLES

Table 3-1. Kern River No. 1 Hydroelectric Project Facilities 24
Table 5-1. Kern River Bypass Reach Segments and Associated Cross-Sectional Transects 26
Table 5-2. Summary of Riparian Data Collected at Riparian Transects 27
Table 5-3. Dominant Woody Riparian Tree and Shrub Species Observed at Riparian Transects 28
Table 5-4. Riparian/Wetland Herbaceous and Graminoid Plants Observed at Riparian Transects 29
Table 5-5. Special-Status Plant Populations Identified During Botanical Surveys in the Study Area 31
Table 5-6. Non-Native Invasive Plant Populations Identified During Botanical Surveys in the Study Area 32

LIST OF FIGURES

Figure 5-1. Transect Locations (i.e., Cross Sections) at Representative Elevations along the Kern River Bypass Reach. 37
Figure 5-2. Average Percent Cover of Woody Species at Riparian Transects. 38
Figure 5-3. Frequency of Occurrence of Woody Species at Riparian Transects. 38

Figure 5-4. Flow recurrence interval for Existing Project and Without-Project Hydrology (1990–2023 average hourly flows). 39

LIST OF MAPS

Map 5-1a. Vegetation Alliances within 1 Mile around Kern River No. 1 Project Facilities 41

Map 5-1b. Vegetation Alliances within 1 Mile around Kern River No. 1 Project Facilities 42

Map 5-1c. Vegetation Alliances within 1 Mile around Kern River No. 1 Project Facilities 43

Map 5-2a. Riparian Alliances and Special Aquatic Features within the FERC Project Boundary, Along Project Access Trails, and Along the Kern River No. 1 Project Bypass Reach..... 44

Map 5-2b. Riparian Alliances and Special Aquatic Features within the FERC Project Boundary, Along Project Access Trails, and Along the Kern River No. 1 Project Bypass Reach..... 45

Map 5-2c. Riparian Alliances and Special Aquatic Features within the FERC Project Boundary, Along Project Access Trails, and Along the Kern River No. 1 Project Bypass Reach..... 46

Map 5-2d. Riparian Alliances and Special Aquatic Features within the FERC Project Boundary, Along Project Access Trails, and Along the Kern River No. 1 Project Bypass Reach..... 47

Map 5-2e. Riparian Alliances and Special Aquatic Features within the FERC Project Boundary, Along Project Access Trails, and Along the Kern River No. 1 Project Bypass Reach..... 48

Map 5-2f. Riparian Alliances and Special Aquatic Features within the FERC Project Boundary, Along Project Access Trails, and Along the Kern River No. 1 Project Bypass Reach..... 49

Map 5-2g. Riparian Alliances and Special Aquatic Features within the FERC Project Boundary, Along Project Access Trails, and Along the Kern River No. 1 Project Bypass Reach..... 50

Map 5-3a. Riparian Transects Along the Kern River No. 1 Project Bypass Reach 51

Map 5-3b. Riparian Transects Along the Kern River No. 1 Project Bypass Reach 52

Map 5-3c. Riparian Transects Along the Kern River No. 1 Project Bypass Reach 53

Map 5-3d. Riparian Transects Along the Kern River No. 1 Project Bypass Reach 54

Map 5-3e. Riparian Transects Along the Kern River No. 1 Project Bypass Reach 55

Map 5-3f. Riparian Transects Along the Kern River No. 1 Project Bypass Reach 56

Map 5-3g. Riparian Transects Along the Kern River No. 1 Project Bypass Reach 57

Map 5-3h. Riparian Transects Along the Kern River No. 1 Project Bypass Reach 58

Map 5-3i. Riparian Transects Along the Kern River No. 1 Project Bypass Reach 59

Map 5-3j. Riparian Transects Along the Kern River No. 1 Project Bypass Reach 60

Map 5-4a–g Special-Status Plants Within the FERC Project Boundary, Along Project Access Trails, and the Kern River No. 1 Project Bypass Reach (CONFIDENTIAL) 61

Map 5-5a. Non-Native Invasive Plants within the FERC Project Boundary, Along Project Access Trails, and Along the Kern River No. 1 Project Bypass Reach 62

Map 5-5b. Non-Native Invasive Plants within the FERC Project Boundary, Along Project Access Trails, and Along the Kern River No. 1 Project Bypass Reach 63

Map 5-5c. Non-Native Invasive Plants within the FERC Project Boundary, Along Project Access Trails, and Along the Kern River No. 1 Project Bypass Reach 64

Map 5-5d. Non-Native Invasive Plants within the FERC Project Boundary, Along Project Access Trails, and Along the Kern River No. 1 Project Bypass Reach 65

Map 5-5e. Non-Native Invasive Plants within the FERC Project Boundary, Along Project Access Trails, and Along the Kern River No. 1 Project Bypass Reach 66

Map 5-5f. Non-Native Invasive Plants within the FERC Project Boundary, Along Project Access Trails, and Along the Kern River No. 1 Project Bypass Reach 67

Map 5-5g. Non-Native Invasive Plants within the FERC Project Boundary, Along Project Access Trails, and Along the Kern River No. 1 Project Bypass Reach 68

LIST OF APPENDICES

Appendix A. Vegetation Alliances within 1 Mile of the Kern River No. 1 FERC Project Boundary

Appendix B. Representative Photographs of Bypass Reach Riparian Cross-Sectional Transects

Appendix C. Relationship Between Riparian Vegetation and Flow Conditions

Appendix D. Life History Strategies of Dominant Woody Riparian Species Found in the Bypass Reach

Appendix E. Timing of Flowering and Seed Dispersal for Common Woody Riparian Species in the Bypass Reach

Appendix F. Special-Status Plants Known to Occur or Potentially Occurring in the Study Area

Appendix G. Representative Photographs of Rose-Flowered Larkspur (*Delphinium purpusii*) Populations in the Study Area

Appendix H. CNDDB Forms for Rose-Flowered Larkspur (*Delphinium purpusii*) Populations in the Study Area (CONFIDENTIAL)

Appendix I. Comprehensive List of Plants Identified During Botanical Surveys in the Study Area

Appendix J. Non-Native Invasive Plants Potentially Occurring in the Study Area

Appendix K. Representative Photographs of Non-Native Invasive Plant Populations in the Study Area

LIST OF ACRONYMS

A3	Tilled Earth
A7	Agricultural Pond or Water Feature
BA	Barren
C1	Ultramafic Mixed Scrub Alliance
Cal-IPC	California Invasive Plant Council
CALVEG	Classification and Assessment with Landsat of Visible Ecological Groupings
CDFW	California Department of Fish and Wildlife
cfs	cubic feet per second
cm	centimeter(s)
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
DBH	diameter at breast height
FERC	Federal Energy Regulatory Commission
Forest Service	United States Forest Service
FSCC	Forest Service Species of Conservation Concern
GIS	Geographic Information System
GPS	Global Positioning System
HG	Annual Grasses and Forbs Alliance
IB	Urban-related Non-vegetated
IPaC	Information for Planning and Consultation
LANDSAT	land satellite
MCV	Manual of California Vegetation
ML	Baccharis (Riparian) Alliance
mm	millimeter(s)
NNIP	non-native invasive plant
NWI	National Wetlands Inventory
NX	Interior Mixed Hardwoods Alliance
PAD	Pre-Application Document
PD	Gray Pine Alliance
POR	period of record
Project	Kern River No. 1 Hydroelectric Project
QD	Blue Oak Alliance
QL	Valley Oak Alliance
QP	California Sycamore Alliance
QW	Interior Live Oak Alliance

RSP	Revised Study Plan
SCE	Southern California Edison
SPD	Study Plan Determination
SSP	special-status plant
SQF	Sequoia National Forest
sq ft	square feet
TM	Technical Memorandum
TSP	Technical Study Plan
TWG	Technical Working Group
USFWS	United States Fish and Wildlife Service
W1	River/Stream/Canal

1.0 INTRODUCTION

This TERR 1 – Botanical Resources Technical Memorandum (TM) provides the methods and findings of field surveys associated with the TERR 1 – Botanical Resources Technical Study Plan (TERR 1 TSP). The TERR 1 TSP was conducted in support of Southern California Edison's (SCE) Kern River No. 1 Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 1930. The TERR 1 TSP was included in SCE's Revised Study Plan (RSP) filed with FERC on February 13, 2024 (SCE 2024). In its March 14, 2024, Study Plan Determination (SPD), FERC approved the TERR 1 TSP with modifications (FERC 2024).

Data for the TERR 1 TM was collected from April 2024 through July 2025. Field sampling efforts and data analysis are complete and summarized below.

2.0 STUDY OBJECTIVES

The objectives of the botanical studies, as outlined in the TERR 1 TSP (SCE 2024), include the following:

- Document vegetation alliances adjacent to Project facilities.
- Document riparian vegetation alliances and wetlands adjacent to Project facilities and the bypass reach.
- Determine the relationship between riparian vegetation alliances and flow conditions in the bypass reach.
- Document special-status plant (SSP) populations at Project facilities.
- Document non-native invasive plant (NNIP) populations at Project facilities.

3.0 STUDY AREA

The extent of the study area for each study component is as follows:

- For vegetation alliances, the study area is 1 mile around Project facilities (see Table 3-1).
- For riparian vegetation alliances and special aquatic features,[1] the study area is the FERC Project boundary (excluding underground Project features and lands overlying the underground Project features); 10 feet on either side of Project access trails located outside the FERC Project boundary; and the bypass reach.

[1] Special aquatic features are defined as lakes, wet meadows, bogs, fens, wetlands, vernal pools, seeps, and springs.

- For the purposes of the SSP and NNIP studies, the study area is the FERC Project boundary (excluding underground Project features and lands overlying the underground Project features) and 10 feet on either side of Project access trails located outside the FERC Project boundary.

Studies were not conducted at locations where access is unsafe (e.g., where there is very steep terrain), or if areas were located on private property for which SCE was unable to obtain approval prior to implementation of the studies.

4.0 METHODS

Study implementation followed the methods described in the TERR 1 TSP (SCE 2024).

4.1 STUDY PLAN VARIANCES

There are no variances from the TERR 1 TSP approved in FERC's SPD (FERC 2024).

4.2 VEGETATION ALLIANCES

The study approach for documenting vegetation alliances in the vicinity of the Project included development of preliminary vegetation alliances maps from available Classification and Assessment with Landsat of Visible Ecological Groupings (CALVEG) data, verification of preliminary maps based on a review of Google Earth aerial photography, implementation of ground-truthing surveys, and development of final vegetation maps. Methods for each of these steps are described below.

4.2.1 Develop Preliminary Maps from Available CALVEG Data

The best available information on vegetation alliances in the study area was used to develop preliminary maps of vegetation alliances within 1 mile of Project facilities. Mapping of vegetation alliances utilized the CALVEG data for the study area (U.S Forest Service [Forest Service] 2014). The CALVEG system is used to classify existing vegetation present on federally managed forestlands based on land satellite (LANDSAT) color infrared satellite imagery. Data were verified using soil-vegetation maps and professional guidance from various sources statewide.

The term "alliance" is used in the CALVEG system and is defined as a uniform group of plant associations sharing one or more dominant or diagnostic overstory species. This term corresponds closely to what plant ecologists call a "community type" and foresters call a "forest type" or "stand." The term community is considered synonymous to the term "alliance" as defined by CALVEG.

Preliminary maps of CALVEG vegetation alliances are available in the Pre-Application Document (PAD), Section 3.6 (SCE 2023).

In addition, the California Natural Diversity Database (CNDDB) was queried to determine if any state-defined sensitive natural communities were present in the study area (CNDDB 2024). The California Department of Fish and Wildlife (CDFW) evaluates sensitive natural

communities at the Global (full natural range within and outside of California) and State (within California) levels resulting in a single G (global) and S (state rank) ranging from 1 (very rare and threatened) to 5 (demonstrably secure) (CDFW 2025). For the purposes of this study, a sensitive natural community is defined as a natural community with a state rank between S1–S3.

4.2.2 Verify Preliminary CALVEG Data Using Aerial Photographs

Pre-field verification of the preliminary vegetation community maps included a review of aerial photographs of the study area (Google 2024). CALVEG data polygons, as shown on the preliminary maps, were compared to aerial photography in Google Earth. Areas where CALVEG data did not appear to correspond to the aerial photographs were marked on hard-copy maps as areas requiring follow-up examination during ground-truthing surveys.

4.2.3 Conduct Ground-Truthing of Vegetation Alliances

Ground-truthing surveys for vegetation alliances were conducted in May 2024. Surveys were conducted in accessible areas identified for follow-up examination during pre-field verification of the preliminary maps, as described above.

Ground-truthing surveys were conducted by a team of two biologists. The following data were collected throughout the study area: date and surveyor names; coordinates and location or facility name; CALVEG vegetation community and field-assessed vegetation community (if different); general site summary; and wildlife species observed on the site. Ground-truthing surveys were not conducted in inaccessible areas. To the extent possible given the steep walls of the Kern Canyon, inaccessible areas were evaluated using aerial imagery review (Google 2024) and by scanning inaccessible areas on-the-ground from open vantage points, as appropriate.

Vegetation community type was verified by comparing dominant overstory species observed at each site with the dominant overstory species that characterize the vegetation community as described in the Vegetation Descriptions South Sierran Ecological Province CALVEG Zone 4 (Forest Service 2009a) and Vegetation Descriptions Central Valley Ecological Province CALVEG Zone 5 (Forest Service 2009b). For sites in which the CALVEG-designated vegetation community on the preliminary maps did not appear to be correct, the new vegetation community was noted, and hard-copy vegetation community maps were marked to indicate the extent of the field-corrected vegetation community.

Distinct patterns between aerial imagery characteristics and vegetation alliances observed during the ground-truthing survey were used to extrapolate vegetation alliances within 1 mile of the FERC Project boundary that were inaccessible and/or not visible from open vantage points. After returning from the field, such inaccessible areas were examined using high resolution Google Earth imagery and any vegetation alliances were corrected.

4.2.4 Develop Final CALVEG Vegetation Community Maps

Final maps of vegetation alliances were developed based on existing CALVEG data, review of Google Earth aerial photography, and ground-truth surveys. Refer to Section 5.0.

Hard-copy corrections to vegetation community maps completed during review of aerial photographs and ground-truthing surveys were digitized and incorporated into Geographic Information System (GIS) layers.

4.3 RIPARIAN VEGETATION ALLIANCES AND SPECIAL AQUATIC FEATURES

The study approach for documenting riparian vegetation alliances and special aquatic features in the vicinity of the Project included development of preliminary vegetation alliances maps, implementation of ground-truthing surveys, and development of final riparian and wetland vegetation maps. Methods for each of these steps are described below.

4.3.1 Develop Preliminary Maps from Available Data

In addition to using the CALVEG system (as described in Section 4.1 above), preliminary maps of riparian vegetation alliances and special aquatic features were compiled from the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Data (USFWS 2024a). The National Wetlands system is the official USFWS wetland classification system and the Federal standard for wetland classification. Wetlands are classified by trained analysts at the USFWS that identify and classify wetland habitats from aerial imagery. Riparian and wetland mapping within the vicinity of the Project was based on 1985 imagery.

Preliminary maps of these riparian vegetation alliances are available in the PAD, Section 4.9 (SCE 2023).

4.3.2 Conduct Ground-Truthing of Riparian Vegetation Alliances and Wetlands

Ground-truthing included documenting riparian alliances within the FERC Project boundary, 10 feet on either side of Project access trails located outside the FERC Project boundary, and the bypass reach. This ground-truthing was conducted in May 2024 during CALVEG ground-truthing surveys described above in Section 4.1.3. Documentation of small-scale vegetation alliances followed the Manual of California Vegetation (MCV) classification system (Sawyer et al. 2009), which defines vegetation alliances based on the dominant species present in the alliance. MCV classification is more suited to smaller-scale alliances that are associated with particular aspects and soil types, as is typically found in riparian and wetland communities.

Inaccessible areas were evaluated using aerial imagery review (Google 2024) and by scanning with binoculars from open vantage points, as appropriate.

Riparian and wetland alliances were then marked on either hard copy maps and/or were digitized on an iPad unit using the ArcGIS FieldMaps program.

4.3.3 Develop Final Riparian Vegetation Alliance and Special Aquatic Features

Final maps of riparian vegetation alliances and wetlands were developed based on existing CALVEG and NWI data, review of Google Earth aerial photography, and ground-truthing surveys. Refer to Section 5.0.

Hard-copy corrections to vegetation community maps completed during review of aerial photographs and ground-truthing surveys were digitized and incorporated into GIS layers.

4.3.4 Characterize the Relationship Between Riparian Vegetation and Flow Conditions

To characterize the relationship between riparian flow conditions, the following steps were conducted:

- First, 10 representative riparian cross-sectional transects along the bypass reach were sampled to obtain riparian vegetation metrics. Data collected at transects was modeled against stage-discharge relationships over a range of flows (high to low).

- After the model was developed, a summary of the relationship between existing inundation characteristics (e.g., timing, frequency, depth, and width of inundation) and the distribution of the dominant riparian species was developed.

- Finally, a discussion of hydrology in the bypass reach in relation to riparian vegetation recruitment and maintenance (for both existing Project and without Project) was developed. A discussion of the methods for each step is provided below.

4.3.4.1 Select Riparian Transects and Collect Field Data

Ten representative transects were selected to conduct riparian cross-section sampling after completion of field riparian mapping efforts along the bypass reach.

First, a desktop stream classification was conducted using Google Earth (Google Earth 2024) aerial imagery, and the bypass reach was divided into segments based on visible geomorphological characteristics (e.g., channel slope, stream width, and extent of the floodplain). Based on the initial assessment, four broad stream segments that captured the diversity of geomorphological conditions were defined. Riparian vegetation diversity is minimal along the bypass reach, and therefore this was a secondary consideration.

A field visit was conducted in May 2024 to determine the specific transect locations (within the broader stream segments). Transects were established in locations that exhibited appropriate hydrological conditions for flow measurement (refer to the AQ 1 TM) and that allowed for safe access. The lower Kern River is one of the most dangerous rivers for

swimmers in California because of the steep canyon walls and dangerous rapids systems (Class IV and V+), and therefore surveyor safety was prioritized. The transect start location on the river-left side was marked with iron rebar headpins and flagging. During transect establishment, the flows in the Kern River were too high to safely establish headpins on the river-right side.

Riparian vegetation metrics were collected at each of the transects in late September and early October 2024, when flows had receded enough for surveyors to attempt to cross the Kern River. 5- by 5-meter sampling plots were then placed along the transects (i.e., one on each bank), or more, depending on the width of the riparian corridor along the cross-section.

The following data was collected at each transect:

- Global Positioning System (GPS) coordinates of the headpins
- Photograph of the transect
- The total length of the transect (as measured by a meter tape strung between the headpins on each side of the river)
- The extent of riparian vegetation along the transect on either side of the river

The following data was collected within each 5- by 5-meter sampling plot along the transect:

  – GPS coordinates of the center point of the sampling plot

  – Photograph of the plot, looking towards the cross-section line

  – Percent cover for each dominant woody riparian trees/shrubs, by species

  – Age class for each dominant woody riparian trees/shrubs, by species. Age class structure was determined based on categories of shrub stem densities per individual and tree diameters, as follows:

    ➢ Young (Y): shrubs with less than 10 stems per individual or trees with dbh less than 3 inches

    ➢ Medium-aged (M): shrubs with between 10 and 60 stems per individual or trees with diameters at breast height (DBH) between 3 and 9 inches

    ➢ Old/Mature (O): shrubs with more than 60 stems per individual or trees with DBH greater than 9 inches

  – Percent cover for each dominant herbaceous plants (including herbs and graminoids), by species

– Size class of the substrate present (bedrock, boulder, cobble, gravel, sand, and silt)

A GIS map showing the location of the cross-sections and sampling plots was then developed. Lists and tables were then developed summarizing the species composition, distribution, and abundance across the bypass reach. Refer to Section 5.0.

4.3.4.2 Describe the Relationship Between Existing Inundation Characteristics and Riparian Distribution

To model the relationship between existing inundation characteristics and riparian distribution, stage-discharge relationships were developed at each of the transects over range of hydrologic flows (high to low) in coordination with the AQ 1 – Hydrology TM (SCE 2025). Specifically, stage-discharge points were collected at four representative flows on the transects. Both the Existing Project and Without-Project hydrology scenarios were modeled and these flows were then plotted against the elevation profile and riparian corridor width for each transect. Relationships between existing inundation characteristics and the distribution of dominant riparian species within the bypass reach were then summarized.

4.3.4.3 Describe Hydrology and Riparian Recruitment in the Bypass Reach

After the completion of the stage-discharge relationships, as described above, the patterns of inundation on the transects were compared to metrics of flowering, seed set, and recession rate tolerance, as described in the scientific literature for the dominant woody riparian species observed on the transects. Based on these results, a description of Project hydrology and riparian recruitment patterns was then developed.

4.4 SPECIAL-STATUS PLANTS

The study approach for documenting SSPs in the study area included development of preliminary information and conducting protocol SSP surveys. Each of these is described below.

4.4.1 Develop Preliminary Information on Special-Status Plants in the Study Area

Development of preliminary information on SSPs included compilation and review of relevant literature, databases and online resources, as well as consultation with resource agencies. The following sources were used to compile existing information on SSPs within the Kern River watershed:

- Kern River No. 1 Hydroelectric Project (FERC Project No. 1930) PAD, Volume 2 (SCE 2023)
- Sequoia National Forest (SQF) Species of Conservation Concern (FSCC) List (Forest Service 2023)

- California Natural Diversity Database (CNDDB) (CNDDB 2024)
- USFWS Information for Planning and Conservation (IPaC) online database (USFWS 2024b)
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants of California online database (CNPS 2024)

Existing species lists included in the PAD (SCE 2023) provided a basis for identification of known and potentially occurring SSPs. Occurrence maps and species lists included in the PAD were updated with current information obtained from the above-listed resources.

4.4.2 Conduct Special-Status Plant Surveys

The following describes the timing and methods for field surveys conducted to document the presence of SSPs.

4.4.2.1 Survey Timing

Field surveys were conducted at the proper time of year when rare, threatened, or endangered plants are evident and identifiable. Generally, this is when the plants are flowering. Based on the blooming periods for plants known or potentially occurring within the vicinity of the Project, an early season survey was conducted in April 2024, and late season surveys were conducted in late June/early July 2025.

The timing of surveys was verified based on reference population monitoring, which occurred immediately before each survey period. SCE consulted with resource agencies regarding the timing of surveys, as follows:

- SCE contacted the Terrestrial Technical Working Group (TWG) for the Project relicensing on March 28, 2024 to solicit input regarding target special-status species and potential reference populations to be monitored in advance of early season surveys. On April 16, 2024, SCE notified the Terrestrial TWG of the results of reference population monitoring and proposed timing of early season SSP surveys. No responses were received.
- SCE contacted the Terrestrial TWG again on July 8, 2024 regarding monitoring of reference populations prior to late season surveys. On July 18, 2024, SCE e-mailed the Terrestrial TWG the results of reference population monitoring and proposed timing of late season surveys. On August 29, 2024, SCE e-mailed the Terrestrial TWG that late season surveys were being postponed due to road closures, evacuations, and safety concerns associated with the Borel Fire. The SQF botanist acknowledged receipt of the August 29 email.
- SCE contacted the Terrestrial TWG on June 9, 2025 to obtain input regarding potential reference populations to be monitored in advance of late season surveys. On June 25, 2025, SCE notified the Terrestrial TWG of the results of reference

population monitoring and proposed timing of late season SSP surveys. No responses were received.

Survey Methods

Survey methods for SSPs followed procedures outlined in the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018).

Surveys were completed by two biologists implementing systematic field techniques (e.g., zigzag patterns, random meandering, and linear transects) to cover the entire study area, where accessible. Areas that could not be safely accessed (or where the owner did not grant permission to enter) were surveyed using binoculars, to the degree possible. Surveys were floristic in nature; that is, all species were identified to the level (i.e., genus, species, variety or subspecies) required to determine if that species was special status. Nomenclature followed *The Jepson Manual, Vascular Plants of California* (Baldwin et al. 2012), and a comprehensive list of species observed during field surveys was compiled.

Data collected for each population included: an estimate of the number of individuals present, digital photographs, GPS location, area (square feet), and a description of associated vegetation. If a SSP population was identified on the perimeter of the study area, the study area was expanded to document the full extent of the population.

Moss specimens were collected throughout the survey area and labeled with the date and collection location. Moss specimens were sent to a qualified bryologist for identification.

California Native Species Field Survey forms were developed for all SSP populations identified and submitted to the CNDDB.

4.4.3 Develop Final Special-Status Plant Maps

Following completion of surveys, GIS data were processed, and maps were developed to show the location of SSP populations in the study area. Refer to Section 5.0.

4.5 NON-NATIVE INVASIVE PLANTS

The approach for documenting NNIPs in the study area included development of preliminary information and conducting NNIP surveys. Each of these is described below.

4.5.1 Develop Preliminary Information on Non-Native Invasive Plants in the Study Area

A preliminary list of NNIPs potentially occurring in the vicinity of the Project was developed for the PAD (SCE 2023). This preliminary list, which included 154 species, was generated based on the California Invasive Plant Inventory (Inventory) (California Invasive Plant Council [Cal-IPC] 2022). Cal-IPC defines NNIPs as plants that (1) are not native to, yet can spread into, wildland ecosystems; and (2) that also displace native species, hybridize with native species, alter biological communities, or alter ecosystem processes (Cal-IPC

2022). The Inventory was queried for two parameters (i.e., Jepson geographic floristic province and general habitat types [grassland, riparian, woodland, and scrub habitat]). Prior to implementation of the TERR 1 botanical surveys, this list was refined based on updated information on CALVEG vegetation alliances in the study area, as well as Forest Service publications pertinent to the study area (Moore and Gerlach 2001).

SCE contacted the Terrestrial TWG by e-mail on March 28, 2024 to solicit input regarding target NNIPs. No responses were received.

4.5.2 Conduct Non-Native Invasive Plant Surveys

Focused NNIP surveys were conducted in conjunction with SSP surveys. The following data were collected for each NNIP population: species, location, area infested, and level of infestation. Levels of infestation were reported as: low (<5 percent cover); moderate (6–25 percent cover), and high (>25 percent cover). Areas that were surveyed and found to be weed-free were also identified. Each population was assigned a unique population ID (according to the criteria outlined above for SSPs), and areas of infestation were mapped with a hand-held GPS unit. Where possible, if an NNIP population was identified on the perimeter of the study area, the study area was expanded to document the full extent of the population.

4.5.3 Develop Final Non-Native Invasive Species Maps

Following completion of surveys, GIS data were processed, and maps were developed to show the location of NNIP populations in the study area. Refer to Section 5.0.

5.0 RESULTS SUMMARY

This section provides details on the results for documentation of vegetation alliances, riparian and wetland alliances, relationship between riparian vegetation alliances and flow conditions, SSPs, and NNIPs.

5.1 VEGETATION ALLIANCES AND WILDLIFE HABITATS

Preliminary vegetation alliance maps based on the existing CALVEG data for the study area were completed in 2023 and were included in the PAD (SCE 2023). Preliminary vegetation alliance maps were ground-truthed during wildlife reconnaissance surveys and evaluated against recent aerial imagery sources (Google Earth 2024).

A query of CNDDB yielded no sensitive natural communities identified in the study area (CNDDB 2024). Sensitive natural communities were identified during riparian vegetation mapping and are described further in Section 5.2, below. Ground-truthing identified several inconsistencies in the preliminary vegetation alliance maps that were corrected. Preliminary maps did not include California Sycamore (QP), Interior Live Oak (QW), Barren (BA), Urban-Related Bare Soil (IB), and Agriculture Pond or Water Feature (A7) alliances, which were subsequently identified during ground-truthing. For example, the tributary streams of Lucas Creek and Cow Flat Creek were identified as having riparian zones consisting of Baccharis Alliances (ML) and Valley Oak Alliances (QL), respectively,

on preliminary maps. Ground-truthing revealed that both tributaries supported California Sycamore (QP) vegetation alliances within the riparian zones of these creeks.

The ground-truthing identified 14 CALVEG alliances in the study area, including the following:

- Herb-dominated Alliances:
  - Annual Grasses and Forbs Alliance (HG)

- Shrub-dominated Alliances:
  - Ultramafic Mixed Scrub Alliance (C1)
  - Baccharis (Riparian) Alliance (ML)

- Tree-dominated Alliances:
  - Interior Mixed Hardwoods Alliance (NX)
  - Gray Pine Alliance (PD)
  - Blue Oak Alliance (QD)
  - Valley Oak Alliance (QL)
  - California Sycamore Alliance (QP)
  - Interior Live Oak Alliance (QW)

- Non-Vegetated Areas:
  - Tilled Earth (A3)
  - Barren (BA)
  - Urban-related Non-vegetated (IB)

- Aquatic Areas
  - Agriculture Pond or Water Feature (A7)
  - River/Stream/Canal (W1)

California sycamore dominated vegetation communities are considered a sensitive (G3 S3) natural community (CDFW 2025); therefore, California Sycamore Alliance (QP) would be considered a sensitive natural community.

Refer to Map 5-1 for the location of vegetation alliances in the study area and Appendix A for a detailed description of each of the CALVEG alliances identified in the study area.

5.2 RIPARIAN VEGETATION ALLIANCES AND SPECIAL AQUATIC FEATURES

Preliminary riparian alliance maps based on the existing CALVEG data for the study area were completed in 2023 and were included in the PAD (SCE 2023).

Special aquatic features are defined by the Forest Service to include lakes, ponds, meadows, wetlands, springs, and seeps (Forest Service 2004). Democrat Dam is the only lake in the study area. No other special aquatic features were identified during field surveys.

Five MCV riparian alliances were identified adjacent to the FERC Project boundary, 10 feet on either side of Project access trails located outside the FERC Project boundary, and the bypass reach during field surveys, including the following:

- *Baccharis salicifolia* Shrubland Alliance (mule-fat thickets) (G5 S4)
- *Platanus racemosa – Quercus agrifolia* Woodland Alliance (California sycamore – Pacific live oak riparian woodlands) (G3 S3)
- *Salix exigua* Shrubland Alliance (sandbar willow thickets) (G5 S4)
- *Salix lasiolepis* Shrubland Alliance (arroyo willow thickets) (G4 S4)
- *Salix lucida* ssp. *lasiandra* Woodland Alliance (shining willow groves) (G4 S3)

Two of these riparian communities, including *Platanus racemosa – Quercus agrifolia* Woodland Alliance (California sycamore – Pacific live oak riparian woodlands) and *Salix lucida* ssp. *lasiandra* Woodland Alliance (shining willow groves) have a state rank of S3 and are therefore considered sensitive natural communities.

The Kern River in the study area supports primarily the California sycamore – Pacific coast live oak woodland alliance.[2] This alliance is present along most of the bypass reach from the Kern River No. 1 Powerhouse to Democrat Dam. In addition, patches of shining willow grove mule-fat thicket were mapped along tributary creeks (Stark Creek and Dougherty Creek).

North of Democrat Dam, the riparian alliances included primarily feature mule-fat thickets intermixed with smaller patches of shining willow groves, sandbar willow thickets, and arroyo willow thickets.

Refer to Map 5-2 for the location of riparian alliances and special aquatic features in the study area and Appendix A for a detailed description of each of the MCV alliances identified in the study area.

5.2.1 Characterize the Relationship Between Riparian Vegetation and Flow Conditions

A summary of the structure and composition of the riparian community along the bypass reach sampled during this study is provided below.

[2] Oak trees in the study area were identified as interior live oak (*Quercus wislizenii*) based on the phenology of the trees on site. However, the MCV manual does not include a California sycamore – interior live oak riparian woodland alliance: it only includes the California sycamore – Pacific coast live oak riparian woodland alliance. Furthermore, MCV online maps that California sycamore – Pacific live oak riparian woodlands are present in the study area. Therefore, we have used the *Platanus racemosa – Quercus agrifolia* Woodland Alliance in our study results.

5.2.1.1 Select Riparian Transects and Collect Field Data

Refer to Map 5-3 for the location of the 10 riparian transects that were established to characterize riparian habitats along the bypass reach. Refer to Table 5-1 and Figure 5-1 for the four stream segments, 10 transect locations, and gradient for each segment. The average gradient of the Kern River between Democrat Dam to the Kern River No. 1 Powerhouse is 1.8 percent. Refer to Appendix B for representative photographs of each transect. Table 5-2 provides summary data on the total percent cover and species richness for woody riparian trees/shrubs and herbaceous/graminoid plants, as well as the age classes of woody riparian trees/shrubs, for each transect.

Note that field biologists did not attempt to access the far (river-left) side of the Kern River at transects KT1, KT2, KT3, and KT6 due to dangerous conditions at the time of the surveys (i.e., proximity to rapids, strong currents, undercurrents, and wide river sections). Conditions on the opposite bank were observed to the extent possible using binoculars to record species present and substrate composition.

Provided below is a more detailed characterization of woody and herbaceous vegetation documented along the riparian transects.

Woody Riparian Vegetation

Refer to Table 5-3 for a list of woody riparian species observed at each transect. Refer to Figure 5-2 for the average percent cover of woody riparian species across sampling plots. Refer to Figure 5-3 for the frequency that each woody riparian species was observed within the sampling plots.

Of the 11 shrub/tree species observed, California sycamore was the most common, being observed at 10 of 22 total plots and accounting for an average of 17.5 percent cover across the 18 accessible plots. The second most abundant species was the red willow, accounting for an average of 14.3 percent of the coverage area across accessible plots, but only being observed at four plots. Mule-fat and narrowleaf willow were also abundant accounting for an average of 11.6 percent and 10.7 percent coverage, respectively. Mule fat was observed at six plots and narrowleaf willow was recorded at three plots. Goodding's willow (*Salix gooddingii*) was the final willow species encountered appearing at only one plot and accounting for an average of 5.2 percent coverage. Other species observed included common buttonbush (*Cephalanthus occidentalis*), Fremont cottonwood (*Populus fremontii*), interior live oak (*Quercus wislizeni*), American black nightshade (*Solanum americanum*), tree tobacco (*Nicotiana glauca*), and Pacific poison oak (*Toxicodendron diversilobum*). On average, these species accounted for less than 3 percent coverage, although interestingly, common buttonbush was observed at seven plots, the second highest total. The remaining species occurred at 3 plots or less.

Woody species recorded using binoculars to view in inaccessible portions of the river include mule-fat, common buttonbush (*Cephalanthus occidentalis*), and California sycamore.

Herbaceous Vegetation

Refer to Table 5-4 for a list of the herbaceous and graminoid plant species observed by transect.

Swamp smartweed (*Persicaria hydropiperoides*) was the most encountered herbaceous species, being found at 10 transects and representing anywhere from 5 to 40 percent cover at these locations. Canadian horseweed (*Erigeron canadensis*) and marsh bristlegrass (*Setaria parviflora*) were both identified at eight plots. Canadian horseweed made up 60 percent of the herbaceous vegetation at plot KT6-1, but never represented more that 8 percent coverage at any other transects. Marsh bristlegrass represented 1 to 40 percent herbaceous cover at plots where present. Sacred thorn-apple (*Datura wrightii*) was the only other herbaceous plant to grow at more than four transects. While this species was found at six transects, it accounted for only 1 percent average coverage at all transects, with the exception of plot KT9-2 where it accounted for 40 percent coverage. In general, no herbaceous plants accounted for greater than 40 percent coverage at any one site, except for two instances. Lakeshore sedge (*Carex lenticularis*) represented 75 percent coverage at plot KT5-1 and the previously mentioned Canadian horseweed coverage at plot KT6-1.

Note that one species, ripgut brome (*Bromus diandrus)*, observed at two of the riparian transects is considered a non-native invasive species by the Sequoia National Forest (Forest Service 2025).

5.2.1.2 Describe the Relationship Between Existing Inundation Characteristics and Riparian Distribution

Stage-discharge data were collected at four flow rates (31 cubic feet per second [cfs], 272.6 cfs, 448.5 cfs, and 966 cfs). Plots of the regressions can be found in Appendix C, Figures C-1 through C-10. Refer to the AQ 1 – Hydrology TM for more information on flow modeling.

These stage-discharge models were used to calculate the 2-year recurrence flow to determine the amount of riparian habitat that is inundated at the left bank of each transect. The right bank of the transects was not modeled because high flows prevented safe access. At the 2-year recurrence flow, the riparian vegetation at nine of the 10 transects were at least partially inundated. Transect KT9 was the only transect that did not have inundation at the 2-year recurrence flow, but would be inundated at higher flows. Transects KT5, KT6, and KT10 had the highest rate of inundation at the 2-year recurrence flow. Refer to Figures C-11 through C-20 in Appendix C for the percent inundation under the Existing Project and Without-Project hydrology scenario on the left bank of each transect.

5.2.1.3 Describe Hydrology and Riparian Recruitment in the Bypass Reach

The patterns of riparian vegetation establishment and distribution along a river are created by the interaction of physical processes (e.g., flows of varying magnitudes, timing of flows, flow recession rates, flow and depth to water table variability, and sediment deposition) and the different life history characteristics of the dominant species. The

woody riparian species present along the bypass reach have many life history adaptations that promote their success under dynamic and episodic, yet seasonally predictable, hydrologic conditions.

High magnitude, infrequent flow events (scouring flows) maintain the channel by scouring banks and the channel bed, and are important for maintaining channel complexity. These events create areas for new colonization by riparian species and maintain the compositional and structural diversity of the riparian community. The scouring flows are also important for limiting encroachment of riparian vegetation into the channel by scouring vegetation along the channel margins, which reduce the potential for berm development and channel narrowing. Riparian species can also readily reproduce vegetatively from downed or abraded limbs, trunks, and root sprouts or from twig or root pieces deposited during a high flow event. This resiliency enables these species to rapidly re-establish following scouring flood events.

The magnitude, timing, and flow recession of spring flows (recruitment flows) are important determinants for successful regeneration and establishment of riparian species. For successful recruitment to occur, flows that coincide with the release of seeds with suitable recession rates are necessary to provide sufficient moisture to the seedlings and sprouts. This hydrology may occur in the same year as the scouring flow or may occur several years later (Mahoney and Rood 1998; Dixon 2003; Karrenberg 2002; Merritt et al. 2009; Stella et al. 2013). The dominant species in the bypass reaches, California sycamore and willows, release seeds in the early spring, timed with the natural snowmelt hydrograph at this elevation. These seeds are only viable for a short period of time (weeks), requiring suitable moisture and soil conditions to be present at the time of seed release. For seedlings to survive, flow recession rates mut be slow and groundwater must be available through the dry summer. Recession rates from the spring flows cannot exceed the root growth rates of the seedlings.

Results from studies in the literature indicate that seedlings typically survive down ramping rates that range from 0.4 to 1.6 inches per day, and up to3.9 inches per day, depending on factors such as species, substrate characteristics, and other sources of water (e.g., seeps, hillslope runoff, precipitation) (Braatne et al. 1996; Shafroth et al. 2017). Seedlings that establish too close to the channel where late summer and fall water is available are more susceptible to scouring and uprooting by subsequent high winter or spring flows. As a result, riparian vegetation often establishes in elevation zones where water is available during the drier months, but not too close to the base flow (summer and fall) channel where it is susceptible to damage by higher flows.

A summary of the life history strategies of the dominant woody riparian species present along the bypass reaches is provided in Appendix D. The timing of blooming and seed dispersal of these common species is summarized in Appendix E.

The relationship between hydrology and riparian vegetation recruitment and maintenance in the bypass reach is described below. Specifically, the frequency of high flows and flow recession rates are discussed in relation to important riparian recruitment and maintenance

metrics. The Existing Project hydrology and Without-Project hydrology scenarios are compared in detail in the AQ 1 – Hydrology TM (SCE 2025).

- **Frequency of High Flows for Riparian Recruitment:** Seed dispersal for the dominant woody riparian species occurs in spring. Over the period of record (POR) (1990–2023), inundation occurs in spring at all 10 of the transects under Existing Project hydrology scenario. Under the Without-Project hydrology scenario, approximately 30 to 40 percent more days are inundated during the spring seed set. However, as described below, the 2-year recurrence interval modeling indicates that Existing Project hydrology provides sufficient flow for dispersal and recruitment. Refer to Figures C-21 through C-30 in Appendix C for a comparison of inundation under Existing Project and Without-Project hydrology scenarios across all 10 riparian transects.

  The 2-year recurrence interval was also compared between Existing Project and Without-Project hydrology scenarios over the POR (1990–2023). The 2-year recurrence interval is an important metric to compare patterns of inundation that would allow regular dispersal and recruitment of riparian seedlings in the bypass reach. As shown on Figure 5-4, Existing Project and Without-Project hydrology scenarios show only minor differences in recruitment flows (1,331 cfs under Existing Project compared to 1,631 without Project). Therefore, Existing Project hydrology allows for sufficient flows for riparian recruitment.

- **Recession Rates for Riparian Maintenance:** Literature studies show that seedlings of dominant woody riparian species typically survive flow recession rates that range from 0.4 to 1.6 inches per day, and up to 3.9 inches per day depending on the substrate and alternative sources of water (e.g., seeps, hillslope runoff, precipitation [Braatne et al. 1996; Amlin and Rood 2002; Shafroth et al. 2017]). Recession rates under existing Project hydrology averaged much less than 1.6 inches per day, indicating that inundation is sufficient for the growth and maintenance of riparian vegetation. Refer to Figures C-31 through C-40 in Appendix C for the average yearly recession rates in dry, normal, and wet water years across all 10 riparian transects. These plots include reference lines that show a 1.6 inches per day recession rate.

5.3 SPECIAL-STATUS PLANTS

Based on the database and literature search, 16 SSP species were determined to have the potential to occur within the vicinity of the Project. This includes six SSPs documented as historically occurring within the FERC Project boundary, including rose-flowered larkspur (*Delphinium purpusii*), calico monkeyflower (*Diplacus [=Mimulus] pictus*), greenhorn fritillary (*Fritillaaria brandegeei*), Shevock's golden aster (*Heterotheca shevockii*), southern Sierra monardella (*Monardell lioides* ssp. *aenmonoides*), and Bakersfield cactus (*Opuntia treleasei*). These 16 species, listed in Appendix F, comprise the target species for the TERR 1 SSP surveys.

Early season botanical surveys were conducted April 25–29, 2024 and late season botanical surveys were conducted June 30–July 4, 2025. One special-status plant, rose-flowered larkspur, which is a Forest Service Species of Conservation Concern with a California Rare Plant Rank of 1B.3, was identified during the early season botanical surveys within the study area. Surveyors documented nine new populations of this species, ranging between approximately 1 to 1,800 square feet and supporting collectively a total of approximately 434 individuals. The populations documented did not coincide with previously reported populations. No additional SSPs were observed during the early season surveys or late season surveys.

Table 5-5 provides the unique population ID, total number of individuals, and approximate size in square feet for each rose-flowered larkspur population. Refer to Map 5-4 for the location of each population. Appendix G provides photographs of rose-flowered larkspur and typical habitat in the study area. Appendix H provides the California Native Species Field Survey Forms that were submitted to CNDDB.[3]

No other SSPs were observed. Refer to Appendix I for a list of all plants (including mosses) observed in the study area during the early season surveys.

5.4 NON-NATIVE INVASIVE PLANTS

Appendix J provides the refined list of 38 target NNIPs for the Project.

Five target NNIP species were identified during early season (April 2024) and late season (June/July 2025) botanical surveys in the study area, including:

- Red brome (*Bromus madritensis*) (Cal-IPC High) – 24 populations totaling approximately 499.4 acres.
- Cheatgrass (*Bromus tectorum*) (Cal-IPC High) – 10 populations totaling approximately 1.9 acre.
- Scotch thistle (*Onopordum acanthium*) (Cal-IPC High) – 34 populations totaling approximately 2.7 acres.
- Rabbitsfoot grass (*Polypogon monspeliensis*) (Cal-IPC Limited) – 18 populations totaling approximately 5.2 acre.
- Common mullein (*Verbascum thapsus*) (Cal-IPC Limited) – 17 populations totaling approximately 5.5 acres.

Table 5-6 provides a summary of the NNIP populations mapped within the study area including scientific name, common name, unique population ID, facility, level of infestation, and population size (in square feet). The location and extent of each NNIP

[3] Note that, based on guidance provided by CNDDB, populations located within 0.25 mile of each other should be reported on the same California Native Species Field Survey Form. Therefore, the three populations located along the Conduit No. 3 Trail have been included on one form.

population is depicted on Map 5-5. Photographs of representative NNIP populations are also provided in Appendix K.

6.0 STUDY SPECIFIC CONSULTATION

The following study specific consultations have been conducted:

- **March 28, 2024:** SCE's consultant e-mailed the Terrestrial TWG to obtain resource agency input on reference population surveys and the timing of early season botanical surveys described in the TERR 1 TSP, and to request the most recent lists of SSPs and NNIPs for the SQF. No responses were received.

- **April 16, 2024:** SCE's consultant e-mailed the Terrestrial TWG providing the results of early season reference population surveys and to confirm timing of botanical surveys. No responses were received.

- **July 8, 2024:** SCE's consultant e-mailed the Terrestrial TWG to obtain resource agency input on reference population surveys and the timing of late season botanical surveys described in the TERR 1 TSP. No responses were received.

- **July 18, 2024:** SCE's consultant e-mailed the Terrestrial TWG providing the results of late season reference population surveys and to confirm timing of botanical surveys. No responses were received.

- **August 29, 2024:** SCE's consultant e-mailed the Terrestrial TWG regarding postponement of late season surveys due to the ignition of the Borel Fire and associated area evacuations, road closures and public safety concerns. An acknowledgment was received from Anna Bonnette, SQF Botanist.

- **June 9, 2025:** SCE's consultant e-mailed the Terrestrial TWG to obtain resource agency input on reference population surveys and the timing of late season botanical surveys described in the TERR 1 TSP. No responses were received.

- **June 25, 2025:** SCE's consultant e-mailed the Terrestrial TWG providing the results of late season reference population surveys and to confirm timing of botanical surveys. No responses were received.

7.0 OUTSTANDING STUDY PLAN ELEMENTS

There are no outstanding study plan elements. The TERR 1 – Botanical Resources Study is complete.

8.0 REFERENCES

Amlin N.M., and S.B. Rood. 2002. Comparative tolerances of riparian willows and cottonwoods to water-table decline. Wetlands. 22(2):338–346. doi:10.1672/0277-5212(2002)022[0338:CTORWA] 2.0.CO;2.

Argus G.W. 2012a. *Salix laevigata* in Jepson Flora Project (eds.). Jepson eFlora. https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=42850, accessed on October 18, 2024.

Argus G.W. 2012b. *Salix exigua* var. *exigua*, in Jepson Flora Project (eds.) Jepson eFlora, https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=76039, accessed on November 01, 2023.

Argus G.W. 2012c. *Salix gooddingii*, in Jepson Flora Project (eds.) Jepson eFlora, https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=42825, accessed on November 01, 2023.

Baldwin, Bruce G. (Editor), Douglas Goldman (Editor), David J Keil (Editor), Robert Patterson (Editor), Thomas J. Rosatti (Editor). 2012. The Jepson Manual, Vascular Plants of California. Second Edition.

Bogler D. 2012. *Baccharis salicifolia* subsp. *salicifolia* in Jepson Flora Project (eds.). Jepson eFlora, https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=91889. accessed on October 18, 2024.

Bonner, F.T. 1974. *Cephalanthus occidentalis* L., common buttonbush. In: C.S Schopmeyer, tech. coord. Seeds of woody plants in the United States. United States Department of Agriculture Forest Service Agriculture Handbook 450, Washington, D.C. 883 p.

Braatne J.H., S.B. Rood, and P.E. Heilman. 1996. Life history, ecology and conservation of riparian cottonwoods in North America. *In:* Biology of *Populus* and its Implications for Management and Conservation. Eds. R.F. Stettler, H.D. Bradshaw, Jr., P.E. Heilman, and T.M. Hinkley. NRC Research Press, National Research Council of Canada, Ottawa, Ontario. Pp. 57-86.

Braudrick C., and B. Orr. 2021. Fillmore and Piru Basins Groundwater Dependent Ecosystems. Stillwater Sciences. FPBGSA Board Meeting.

Cal-IPC (California Invasive Plant Inventory). 2022. California Invasive Plant Inventory. Cal-IPC Publication 2006-02. California Invasive Plant Council: Berkeley, California. Available at: https://www.cal-ipc.org/.

CDFW (California Department of Fish and Wildlife). 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities. State of California, California Natural Resources Agency, Department of Fish and Wildlife. March 20, 2018.

———. 2025. California Natural Community List. Thursday, February 27, 2025.

CNPS (California Native Plant Society). 2024. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, California. Available at: https://www.rareplants.cnps.org.

CNDDB (California Natural Diversity Database). 2024. RareFind 5 [Internet]. California Department of Fish and Wildlife, Version 5.3.0.

Conner, K. 2004. *Cephalanthus occidentalis* L. in Wildland Shrubs of the United States and Its Territories: Thamnic Descriptions: Volume 1. Edited by Francis, J.K. USDA Forest Service. (IITF-GTR-26).

Dixon, M.D. 2003. Effects of flow pattern on riparian seedling recruitment on sandbars in the Wisconsin River, Wisconsin. Wetlands. 23(1): 125-139.

FERC (Federal Energy Regulatory Commission). 2024. Study Plan Determination for the Kern River No. 1 Hydroelectric Project. March 14.

Forest Service (United States Department of Agriculture - Forest Service). 2004. Sierra Nevada Forest Plan Amendment, Record of Decision.

———. 2009a. Vegetation Descriptions: South Sierran Ecological Province –CALVEG Zone 4. April 27, 2009.

———. 2009b. Vegetation Descriptions: Central Valley Ecological Province – CALVEG Zone 5. March 12, 2009.

———. 2014. CALVEG Geographic Information Systems (GIS) data and vegetation descriptions. South Sierran Ecological Province. Available at: http://www.fs.usda.gov/detail/r5/landmanagement/resourcemanagement/?cid=stelprdb5347192.

———. 2023. Sequoia National Forest List of Species of Conservation Concern.

———. 2025. List of Sequoia National Forest Non-Native Invasive Plants. November 2025.

Glenn, E., R. Tanner, S. Mendez, T. Kehret, D. Moore, J. Garcia, and C. Valdes. 1998. Growth rates, salt tolerance and water use characteristics of native and invasive riparian plants from the delta of the Colorado River, Mexico. Journal of Arid Environments. 40(3):281–294. doi:10.1006/jare.1998.0443.

Google. 2024. Google Earth Pro, version 7.3.6.9796. Available through https://www.google.com/earth/about/versions.

Hartwell, S., K. Morino, P.L. Nagler, and E.P. Glenn. 2010. On the irrigation requirements of cottonwood (*Populus fremontii* and *Populus deltoides* var. *wislizenii*) and willow (*Salix gooddingii*) grown in a desert environment. Journal of Arid Environments. 74(6):667–674. doi:10.1016/j.jaridenv.2009.12.007.

Karrenberg, S., P.J. Edwards, and J. Kollman. 2002. The life history of *Salicaceae* living in the active zone of floodplains. Freshwater Biology. 47:733-748.

Karrfalt R.P., and D.F. Olson. 2004. *Baccharis* L. in Wildland Shrubs of the United States and Its Territories: Thamnic Descriptions: Volume 1. Edited by Francis, J.K. USDA Forest Service. (IITF-GTR-26).

Kindschy, R.R. 1985. Response of Red Willow to Beaver Use in Southeastern Oregon. The Journal of Wildlife Management. 49(1):26. doi:10.2307/3801834.

Mahoney, J.M., and S.B. Rood. 1998. Streamflow requirements for cottonwood seedlings recruitment – an integrative model. Wetlands. 18:634-645.

McBride, J.R., and J. Strahan. 1984. Establishment and Survival of Woody Riparian Species on Gravel Bars of an Intermittent Stream. American Midland Naturalist. 112(2):235. doi:10.2307/2425430.

Merritt, D.M., M.L. Scott, N. Poff, G. Auble, and D. Lytle. 2009. Theory, methods and tools for determining environmental flows for riparian vegetation: riparian vegetation-flow response guilds. Freshwater Biology.

Preston, R.E., and L.T. Dempster. 2012. *Cephalanthus occidentalis*. in Jepson Flora Project (eds.) Jepson eFlora, https://ucjeps.berkeley.edu/eflora/eflora_display.php?tid=18612, accessed on October 18, 2024.

River Partners. 2008. Effects of Long Duration Flooding on Riparian Plant Species in Restoration Plantings. San Joaquin River National Wildlife Refuge, Stanislaus County, California. Prepared for the U.S. Fish and Wildlife Service. March 2008.

Roberts, M.D., D.R. Peterson, D.E. Jukkpla, and V.L. Snowden. 2002. A Pilot Investigation of Cottonwood Recruitment on the Sacramento River. The Nature Conservancy, Sacramento River Project.Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. A Manual of California Vegetation, Second Edition. California Native Plant Society, Sacramento, CA. 1300 pp.

SCE (Southern California Edison). 2023. Pre-Application Document for the Kern River No. 1 Hydroelectric Project (FERC Project No. 1930). May 5.

———. 2024. Kern River No. 1 Hydroelectric Project (FERC Project No. 1930) Revised Study Plan. February 13.

Shafroth, P.B., K.J. Schlatter, M. Gomez-Sapiens, E. Lundgren, M.R. Grabau, J. Ramirez-Hernandez, J.E. Rodriquez-Burgueno, and K.W. Flessa. 2017. A large-scale environmental flow experiment for riparian restoration in the Colorado River Delta. Ecological Engineering. 106: 645-660.

Stella, J.C., J.J. Battles, B.K. Orr, and J.R. McBride. 2006. Synchrony of seed dispersal, hydrology and local climate in a semi-arid river reach in California. Ecosystems 9:1200-1214.

(TNC) The Nature Conservancy. 1998. Sacramento River Project, Riparian Forest Restoration Manual. November 1998. Chico, California.

USDA-NRCS (U.S. Department of Agriculture Natural Resources Conservation Service). 2023. Sequoia National Forest List of Species of Conservation Concern.

———. 2024. The PLANTS Database (http://plants.usda.gov, 10/22/2024). National Plant Data Team, Greensboro, NC USA.

USFWS (United States Fish and Wildlife Service). 2024a. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Accessed April 2024 at: https://www.fws.gov/program/national-wetlands-inventory .

———. 2024b. Information for Planning and Consultation (IPaC). Accessed April 2024 at https://ipac.ecosphere.fws.gov/.

Young, J.A., and C.D. Clements. 2003. Seed germination of willow species from a desert riparian ecosystem. J. Range Manage. 56: 496-500.

TABLES

Table 3-1. Kern River No. 1 Hydroelectric Project Facilities

Diversion Dam
Democrat Dam
Impoundment
Democrat Dam Impoundment
Water Conveyance System
Sandbox
Tunnels, Flumes, Conduits, and Adits
Forebay
Forebay Overflow Spillway
Penstock
Powerhouse and Switchyard
Kern River No. 1 Powerhouse and Switchyard
Project Access Roads
Willow Spring Creek Road (also referred to as Democrat Dam Road)
Powerline Road
Flume No. 1 Road
Dougherty Creek Road
Stark Creek Road
Forebay Operations Area Road
Lower Powerhouse Road
Upper Powerhouse Road
Project Access Trails
Democrat Gage Trail[1]
Conduit No. 3 Trail
Cow Flat Creek Trail
Steel Flume Trail[2]
Lucas Creek Trail
Dougherty Creek Trail
Stark Creek Trail[2]
Adit 17 & 18 Trail[3]
Overflow Spillway Trail[3]
Skip Hoist / Forebay Trail[3]
Aerial Cable Upper Access Trail[2,3]
Communication and Power Lines
Intake Gatehouse to Flume No. 1 Powerline
Powerhouse to Forebay Communication / Powerline
Gages and Stilling Wells
Kern River near Democrat Springs (USGS Gage No. 11192500 / SCE Gage No. 409)
Kern River No. 1 Conduit near Democrat Springs (USGS Gage No. 11192000 / SCE Gage No. 410)

Kern River near Democrat Springs (USGS Gage No. 11192501; calculated 11192500+11192000)
Stilling Well No. 1
Stilling Well No. 2
Ancillary and Support Facilities
Democrat Dam Area
Buoy Line in Democrat Dam Impoundment
Democrat Dam Intake Gatehouse
Democrat Dam Drainage Tower
Democrat Dam Drainage Tunnel
Democrat Dam Drainage Tunnel Outlet
Democrat Dam Access Walkway
Sandbox Drainage Channel
Gaging Cableway
Water Conveyance
Flume No. 6 Access Platform
Forebay Operations Area
Old Admin Building
Garage No. 1
Garage No. 2
Old Ice House
Water Tank
Aerial Cable Tower
Skip Hoist House and Lower Landing
Skip Hoist Cables and Cart
Skip Hoist Upper Landing
Skip Hoist Upper Landing to Forebay Catwalk
Communication Site
Forebay Operations Area Perimeter Fence
Forebay Perimeter Fence
Powerhouse Area
Machine Shop
Office / Lunchroom
Restroom
Powerhouse and Switchyard Perimeter Fence

Notes: [1] Entirety of trail is outside the FERC Project boundary.
[2] A portion of the trail is outside the FERC Project boundary.
[3] Aerial Cable Upper Access Trail was not identified as a trail in the PAD. Consultation with SCE staff in 2024 confirmed that this trail is used for operation and maintenance.

Key: SCE = Southern California Edison
USGS = U.S. Geological Survey

Table 5-1. Kern River Bypass Reach Segments and Associated Cross-Sectional Transects

Stream Segment Location (Refer to Figure 5-1)	River Mile Start	Transect Nos. in Segment	Elevation (feet)	Gradient (%)
Segment 1	43.9	KT1, KT2	924	2.5
Segment 2	47	KT3, KT4, KT5	1,330	1.1
Segment 3	49.5	KT 6, KT7, KT8	1,470	1.8
Segment 4	52.9	KT9, KT10	1,798	1.0

Table 5-2. Summary of Riparian Data Collected at Riparian Transects

Transect Number	Plot Number	Woody Riparian Trees/Shrubs			Herbaceous/ Graminoid Plants		Substrates Present
		Total Percent Cover	Species Richness	Age Class Structure[1]	Total Percent Cover	Species Richness	
KT1[2]	KT1-1	110	2	Y, O	10	2	Boulder, Cobble, Gravel, Sand, Silt
KT2[2]	KT2-1	88	2	Y, M, O	1	1	Sand
	KT2-2	102	2	Y, M	7	3	Bedrock, Boulder, Cobble, Gravel, Sand, Silt
KT3[2]	KT3-1	90	1	Y	28	6	Boulder, Cobble, Sand
KT4	KT4-1	109	2	O	1	1	Boulder, Cobble, Sand
	KT4-2	36	3	Y, O	4	3	Boulder, Cobble, Gravel, Sand
KT5	KT5-1	40	2	Y, M	79	3	Boulder, Sand, Silt
	KT5-2	85	2	M, O	73	10	Bedrock, Cobble, Gravel, Sand, Silt
KT6[2]	KT6-1	46	3	O	76	10	Boulder, Gravel, Sand
KT7	KT7-1	98	1	O	35	1	Boulder
	KT7-2	35	2	M, O	31	5	Boulder, Gravel, Sand
KT8	KT8-1	99	2	M, O	0	0	Boulder, Cobble, Sand, Silt
	KT8-2	18	2	M, O	112	7	Boulder, Sand
KT9	KT9-1	25	1	M	4	8	Boulder, Sand, Silt
	KT9-2	0	0	NA	109	5	Boulder, Sand
KT10	KT10-1	100	1	O	<1	1	Boulder, Cobble, Gravel, Sand
	KT10-2	90	2	Y, O	40	2	Boulder, Gravel, Sand
	KT10-3	40	1	O	35	10	Bedrock, Boulder, Gravel, Sand

Notes: [1] Age class structure was determined based on categories or shrub stem densities per individual and tree diameters, as follows:

- Young (Y): Shrubs with less than 10 stems per individual or trees with DBH less than 3 inches
- Medium-aged (M): Shrubs with between 10 and 60 stems per individual or trees with dbhs between 3 and 9 inches
- Old/Mature (O): Shrubs with more than 60 stems per individual or trees with dbhs greater than 9 inches

[2] No plots were established on far side of river due to high flows.

Key: NA = not applicable

Table 5-3. Dominant Woody Riparian Tree and Shrub Species Observed at Riparian Transects

Species		NWI Indicator Status[1]	Riparian Transect (X = plant present at transect)									
Scientific Name	**Common Name**		**KT1**	**KT2**	**KT3**	**KT4**	**KT5**	**KT6**	**KT7**	**KT8**	**KT9**	**KT10**
Baccharis salicifolia	Mule-fat	FACW	X	X		X		X	X			
Cephalanthus occidentalis	Common buttonbush	OBL	X	X	X	X	X	X		X		
Nicotiana glauca	Tree tobacco	FAC				X						
Platanus racemosa	California sycamore	FACW	X		X		X	X	X		X	X
Populus fremontii	Fremont cottonwood	FAC+						X				
Quercus wislizeni	Interior live oak	NI				X		X				X
Salix exigua	Narrowleaf willow	FACW		X	X							
Salix gooddingii	Goodding's willow	FACW		X								
Salix laevigata	Red willow	FACW+					X			X		X
Solanum americanum	American black nightshade	FAC		X						X		
Toxicodendron diversilobum	Pacific poison oak	NI								X		
Total Number of Species			**3**	**5**	**3**	**4**	**3**	**5**	**2**	**4**	**1**	**3**

Notes: [1] NWI Wetland Indicator Status as per the National Wetland Plant List (U.S. Army Corps of Engineers 2020)
Key: FAC = Equally likely to occur in wetlands and non-wetlands
FACU = Usually occur in non-wetlands but occasionally found in wetlands
FACW = Usually occur in wetlands but occasionally found in non-wetlands
NI = Not included on the National Wetland Plant List.
NWI = National Wetland Inventory
OBL = Obligate wetland species only found in wetlands
UPL = Upland species not likely to occur in wetlands

Table 5-4. Riparian/Wetland Herbaceous and Graminoid Plants Observed at Riparian Transects

Species		NWI Indicator Status[1]	Riparian Transect (X = plant present at transect)									
Scientific Name	**Common Name**		**KT1**	**KT2**	**KT3**	**KT4**	**KT5**	**KT6**	**KT7**	**KT8**	**KT9**	**KT10**
Artemisia douglasiana	Douglas' sagewort	FAC+						X	X	X		
Avena barbata	Slender oat	NI					X					
Bromus diandrus	Ripgut brome[2]	NI					X					X
Carex lenticularis	Lakeshore sedge	OBL					X	X		X		
Cynodon dactylon	Bermudagrass	FACU			X						X	
cyperus eragrostis	Tall flatsedge	FACW					X					X
Datura wrightii	Sacred thorn-apple	NI		X		X		X			X	
Epilobium canum	Hummingbird trumpet	NI					X					X
Epilobium ciliatum	Fringed willowherb	FACW								X		
Erigeron canadensis	Canadian horseweed	NI		X	X		X	X	X		X	X
Euthamia occidentalis	Western goldentop	OBL		X						X		
Gnaphalium palustre	Western marsh cudweed	FACW			X	X						
Helenium puberulum	Rosilla	FACW						X				
Juncus	Unknown juncus	NI	X									
Juncus balticus	Mountain rush	FACW+					X					
Juncus mexicanus	Mexican rush	FACW			X							
Medicago lupulina	Black medick	FAC	X		X			X			X	
Melilotus albus	sweetclover	NI										X
Onopordum acanthium	Scotch cottonthistle	NI						X				

Species		NWI Indicator Status[1]	Riparian Transect (X = plant present at transect)									
Scientific Name	**Common Name**		**KT1**	**KT2**	**KT3**	**KT4**	**KT5**	**KT6**	**KT7**	**KT8**	**KT9**	**KT10**
Persicaria hydropiperoides	Swamp smartweed	NI	X	X	X		X	X		X	X	X
Phacelia egena	Kaweah River phacelia	NI									X	X
Polypogon maritimus	Mediterranean rabbitsfoot grass	OBL					X	X			X	X
Pseudognaphalium luteoalbum	Jersey cudweed	NI						X			X	X
Rumex crispus L.	Curly dock	FACW-						X				
Setaria parviflora	Marsh bristlegrass	FAC		X	X		X		X		X	X
Setaria viridis	Green bristlegrass	NI									X	
Solidago californica	California goldenrod	NI		X								
Urtica dioica	Stinging nettle	FACU				X	X			X		
Verbascum thapsus	Common mullein, Woolly mullein	NI		X				X	X			X
Xanthium strumarium	Rough cocklebur	FAC+					X			X		
Unknown plant	Unknown plant[3]	NI				X						
Poaceae	Unknown grass	NI							X		X	X
Total Number of Species			**3**	**7**	**7**	**4**	**12**	**12**	**5**	**7**	**11**	**12**

Notes: [1] NWI Wetland Indicator Status as per the National Wetland Plant List (U.S. Army Corps of Engineers 2020)
[2] This species is included on the Sequoia National Forest list of non-native invasive plant species dated November 2025.
[3] Plant lacked sufficient features to allow for identification.

Key: FAC = Equally likely to occur in wetlands and non-wetlands.
FACU = Usually occur in non-wetlands but occasionally found in wetlands
FACW = Usually occur in wetlands but occasionally found in non-wetlands.
NI = Not included on the National Wetland Plant List.
OBL = Obligate wetland species only found in wetlands.
UPL = Upland species not likely to occur in wetlands.

Table 5-5. Special-Status Plant Populations Identified During Botanical Surveys in the Study Area

Scientific Name	Final Map ID	Facility	Total Number of Individuals	Population Size (Square Feet)	Survey Date
Rose-flowered larkspur *(Delphinium purpusii)* Forest Service Species of Conservation Concern; California Rare Plant Rank 1B.3	DEPU_01	Conduit No. 3 Trail	35	75	4/26/2024
	DEPU_02	Conduit No. 3 Trail	17	40	4/26/2024
	DEPU_03	Conduit No. 3 Trail	16	60	4/26/2024
	DEPU_04	Flume No. 3	25	1,000	4/28/2024
	DEPU_05	Lucas Creek Trail	7	250	4/28/2024
	DEPU_06	Stark Creek Trail	1	1	4/27/2024
	DEPU_07	Dougherty Creek Trail	1	1	4/27/2024
	DEPU_08	Adit 14 & 15	12	150	4/29/2024
	DEPU_09	Overflow Spillway Trail	320	1,800	4/25/2024
Totals			**434**	**3,377**	

Notes: [1] Refer to Map 5-4 (Appendix A) for the location of each population in the Study Area.

Table 5-6. Non-Native Invasive Plant Populations Identified During Botanical Surveys in the Study Area

Final Map ID[1]	Facility	Level of Infestation[2]	Population Size (Square Feet)
Red brome *(Bromus madritensis ssp. rubens)* – Cal-IPC High			
BRMA_01	Kern River No. 1 Powerhouse and Switchyard	Mod	1,445,321
BRMA_02	Adit 17 & 18 Trail	Mod	202,000
BRMA_03	Adit 17 & 18 Trail	Mod	25,000
BRMA_04	Adit 18 & 19	Mod	10,000
BRMA_05	Adit 14 & 15	Mod	10,000
BRMA_06	Stark Creek Road	Mod	225,000
BRMA_07	Adit 12 & 13	Mod	10,000
BRMA_08	Stark Creek Road	Mod	0
BRMA_09	Lucas Creek Trail	Mod	68,233
BRMA_10	Flume No. 4 Lucas Creek	Mod	9,000
BRMA_11	Steel Flume Trail	Mod	24,812
BRMA_12	Conduit No. 6	Mod	5,600
BRMA_13	Steel Flume Trail	Mod	26,300
BRMA_14	Cow Flat Creek Trail	Mod	34,500
BRMA_15	Adit 4 & 5	Mod	10,000
BRMA_16	Conduit No. 3 Trail	Mod	31,268
BRMA_17	Adit 2 & 3	Mod	5,000
BRMA_18	Democrat Gauge Trail	Mod	76,879
BRMA_19	Flume No. 1	Low	105,074
BRMA_20	Powerline Road	Mod	19,828
BRMA_21	Willow Spring Creek Road (also referred to as Democrat Dam Road)	Mod	17,978,220
BRMA_22	Democrat Dam Impoundment	Low	742,231
BRMA_23	Democrat Dam Impoundment	Low	621,348
ONAC_BRTE_BRMA_POMO_VETH_01[3]	Democrat Dam Impoundment	Mod	70,000
		Total Size	**21,755,614 sq ft (499.4 acres)**
Cheatgrass *(Bromus tectorum)* – Cal-IPC High			
BRTE_01	Stark Creek Road	Low	3,000
BRTE_02	Stark Creek Road	Low	450
BRTE_03	Dougherty Creek Road	Low	600
BRTE_04	Dougherty Creek Trail	Low	25

Final Map ID[1]	Facility	Level of Infestation[2]	Population Size (Square Feet)
BRTE_05	Democrat Gage Trail	Low	75
BRTE_06	Willow Spring Creek Road (also referred to as Democrat Dam Road)	Low	1
BRTE_07	Democrat Gage Trail	Low	10,000
BRTE_08	Willow Spring Creek Road (also referred to as Democrat Dam Road)	Low	30
BRTE_09	Democrat Dam Impoundment	Low	5
ONAC_BRTE_BRMA_POMO_VETH_01[3]	Democrat Dam Impoundment	Low	70,000
		Total Size	**84,186 sq ft (1.9 acres)**
Scotch thistle *(Onopordum acanthium)* – Cal-IPC High			
ONAC_01	Forebay Operations Area Road	Low	750
ONAC_02	Water Tank	Low	200
ONAC_03	Kern River No. 1 Powerhouse and Switchyard	Mod	1,000
ONAC_04	Forebay Overflow Spillway	Low	1
ONAC_05	Overflow Spillway Trail	Low	20
ONAC_06	Overflow Spillway Trail	Low	4
ONAC_07	Forebay Overflow Spillway	Low	1
ONAC_08	Overflow Spillway Trail	Low	400
ONAC_09	Overflow Spillway Trail	Low	1
ONAC_10	Stark Creek Trail	Low	300
ONAC_11	Stark Creek Trail	Low	100
ONAC_12	Stark Creek Road	Low	1
ONAC_13	Stark Creek Road	Low	1
ONAC_14	Stark Creek Road	Low	400
ONAC_16	Steel Flume Trail	Low	4
ONAC_17	Steel Flume Trail	Low	100
ONAC_18	Cow Flat Creek Trail	Low	1
ONAC_19	Adit 4 & 5	Low	100
ONAC_20	MIF Release Point	Low	1500
ONAC_21	Flume No. 1	Low	9
ONAC_22	Flume No. 1	Low	43,560
ONAC_23	Flume No. 1	Low	4
ONAC_24	Flume No. 1	Low	20
ONAC_25	Flume No. 1 Powerline	Low	25
ONAC_26	Democrat Dam Impoundment	Low	6

Final Map ID[1]	Facility	Level of Infestation[2]	Population Size (Square Feet)
ONAC_28	Willow Spring Creek Road (also referred to as Democrat Dam Road)	Low	25
ONAC_29	Democrat Dam Impoundment	Low	1
ONAC_30	Democrat Dam Impoundment	Low	200
ONAC_31	Democrat Dam Impoundment	Low	1
ONAC_32	Democrat Dam Impoundment	Low	300
ONAC_33	Democrat Dam Impoundment	Low	2
ONAC_34	Democrat Dam Impoundment	Low	2
ONAC_35	Democrat Dam Impoundment	Low	2
ONAC_36	Kern River No. 1 Powerhouse and Switchyard	Low	4
ONAC_37	Kern River No. 1 Powerhouse and Switchyard	Low	2
ONAC_BRTE_BRMA_ POMO_VETH_01[3]	Democrat Dam Impoundment	Low	70,000
		Total Size	**119,049 sq ft (2.7 acres)**
Rabbitsfoot grass *(Polypogon monspeliensis)* – Cal-IPC Limited			
POMO_01	Kern River No. 1 Powerhouse and Switchyard	Low	150
POMO_02	Kern River No. 1 Powerhouse and Switchyard	Low	100
POMO_03	Democrat Dam Impoundment	Mod	400
POMO_04	Democrat Dam Impoundment	Low	30
POMO_05	Democrat Dam Impoundment	Low	225
POMO_06	Democrat Dam Impoundment	Low	180
POMO_07	Democrat Dam Impoundment	Low	4000
POMO_08	Democrat Dam Impoundment	Low	100
POMO_09	Democrat Dam Impoundment	Low	60
POMO_10	Democrat Dam Impoundment	Low	660
POMO_11	Democrat Dam Impoundment	Low	100
POMO_12	Democrat Dam Impoundment	Low	160
POMO_13	Democrat Dam Impoundment	Low	2
POMO_14	Dougherty Creek Trail	Low	120
POMO_15	Kern River No. 1 Powerhouse and Switchyard	Low	160
POMO_VETH_01[4]	Democrat Dam Impoundment	Mod	75,000
POMO_VETH_02[4]	Democrat Dam Impoundment	Low	75,000
POMO_VETH_03[4]	Democrat Dam Impoundment	Mod	360
POMO_VETH_04[4]	Democrat Dam Impoundment	Low	1000

Final Map ID[1]	Facility	Level of Infestation[2]	Population Size (Square Feet)
ONAC_BRTE_BRMA_ POMO_VETH_01[3]	Democrat Dam Impoundment	Low	70,000
		Total Size	**227,807 sq ft (5.2 acre)**
Common mullein *(Verbascum thapsus)* – Cal-IPC Limited			
VETH_01	Democrat Gage Trail	Mod	1,200
VETH_02	Democrat Dam Impoundment	Low	50
VETH_03	Democrat Dam Impoundment	Low	90
VETH_04	Democrat Dam Impoundment	Low	25
POMO_VETH_01[4]	Democrat Dam Impoundment	Mod	75,000
POMO_VETH_02[4]	Democrat Dam Impoundment	Low	75,000
VETH_07	Democrat Dam Impoundment	Low	100
VETH_08	Democrat Dam Impoundment	Low	16
VETH_09	Democrat Dam Impoundment	Low	16
VETH_10	Democrat Dam Impoundment	Low	660
VETH_12	Democrat Dam Impoundment	Low	400
VETH_13	Democrat Dam Impoundment	Mod	360
VETH_14	Democrat Dam Impoundment	Low	40
VETH_15	Democrat Dam Impoundment	Low	6
POMO_VETH_03[4]	Democrat Dam Impoundment	Mod	15,000
POMO_VETH_04[4]	Democrat Dam Impoundment	Low	1000
ONAC_BRTE_BRMA_ POMO_VETH_01[3]	Democrat Dam Impoundment	Low	70,000
		Total Size	**238,963 sq ft (5.5 acres)**

Notes: [1] Refer to Map 5-5 for the location of each individual/population in the Study Area.
[2] Level of Infestation
[3] The polygon represents a population comprising five NNIP species. While the original field ID was designated as ONAC_27, it has since been updated to consolidate all species within a single polygon.
[4] This population includes both POMO and VETH groups within a single polygon. While the original polygons had distinct field IDs, these have been modified to form compiled polygons

Key: Cal-IPC = California Invasive Plant Council
Low = <5% cover
Mod = 6–25% cover
High = >25% cover
sq ft = square feet

FIGURES

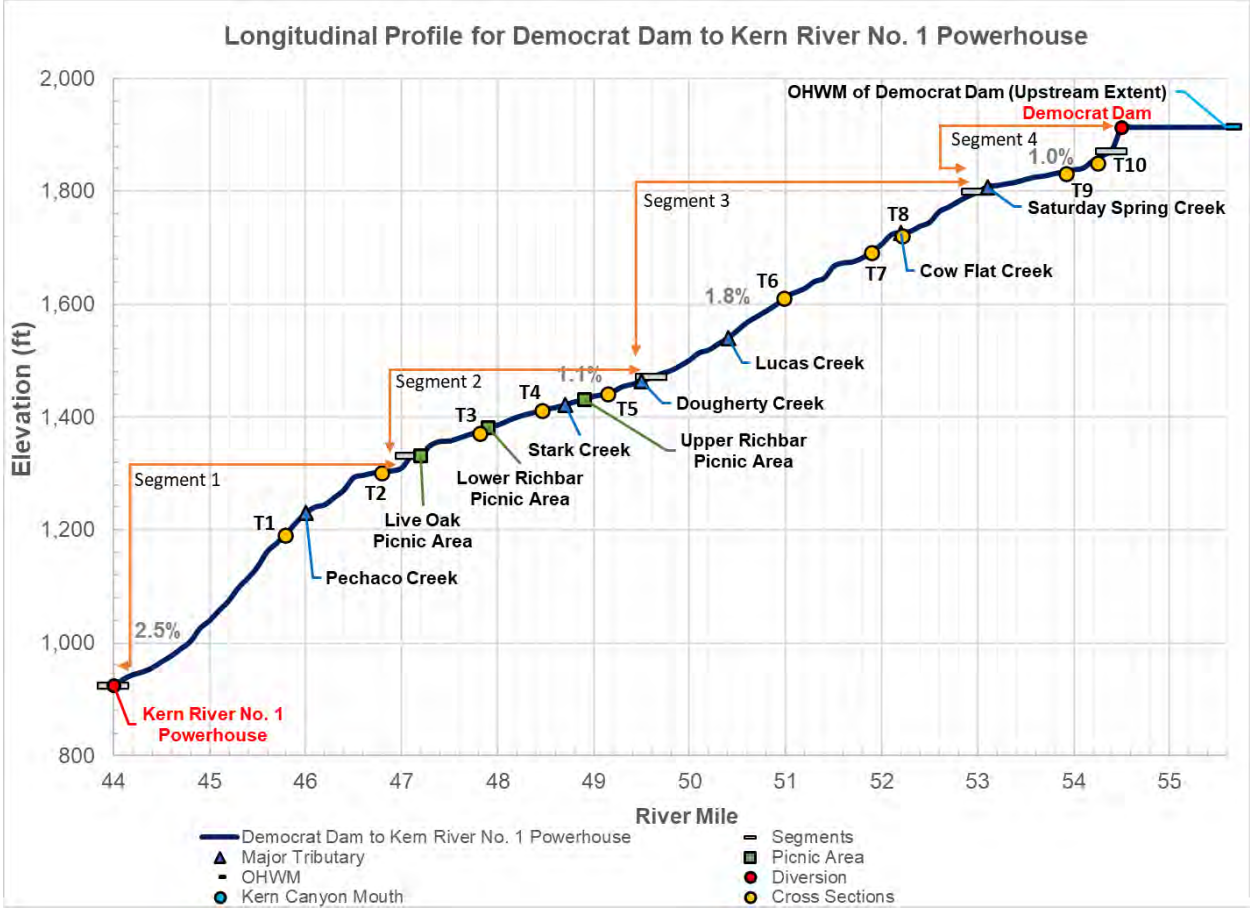


Figure 5-1. Transect Locations (i.e., Cross Sections) at Representative Elevations along the Kern River Bypass Reach.

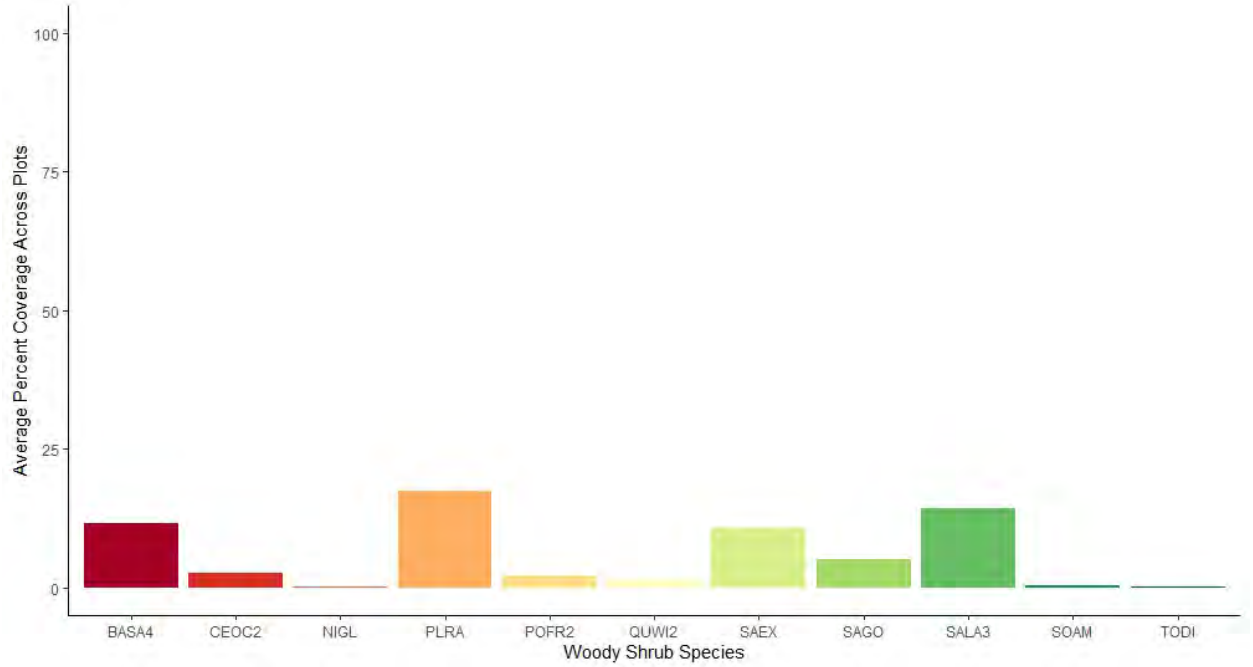


Figure 5-2. Average Percent Cover of Woody Species at Riparian Transects.

Species Codes: BASA4 = *Baccharis salicifolia*, CEOC2 = *Cephalanthus occidentalis*, NIGL = *Nicotiana glauca*, PLRA = *Platanus racemosa*, POFR2 = *Populus fremontii*, QUWI2 = *Quercus wislizeni*, SAEX = *Salix exigua*, SAGO = *Salix gooddingii*, SALA3 = *Salix laevigata*, SOAM = *Solanum americanum*, TODI = *Toxicodendron diversilobum*

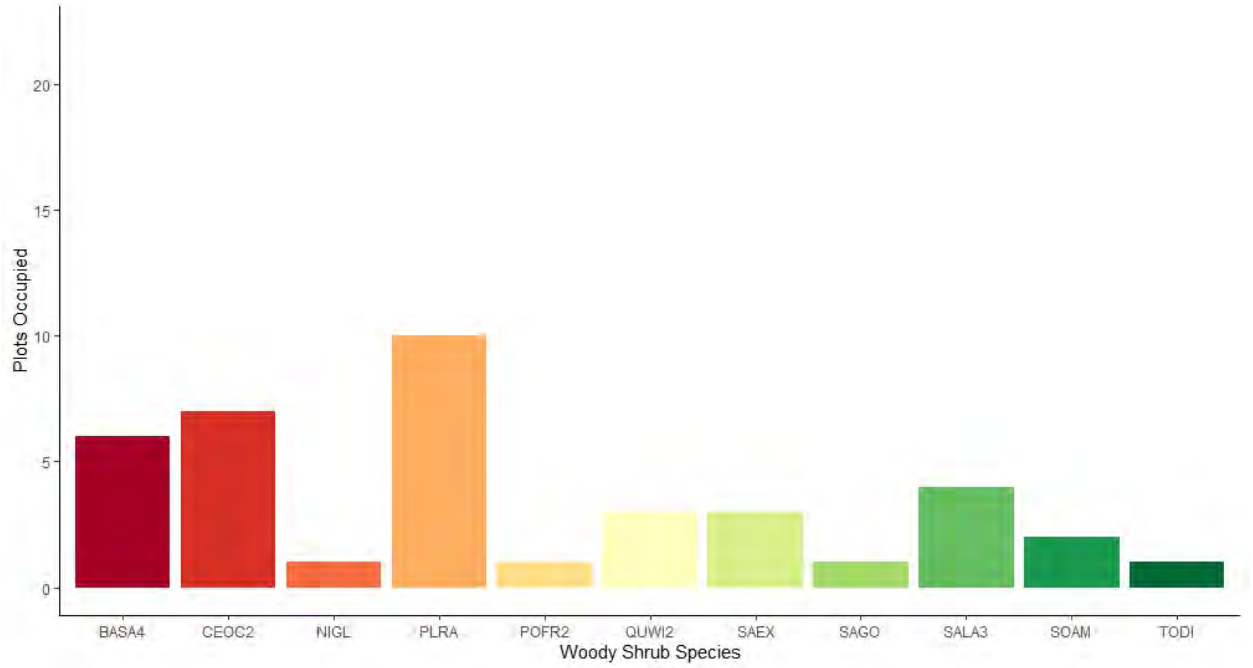


Figure 5-3. Frequency of Occurrence of Woody Species at Riparian Transects.

Species Codes: BASA4 = *Baccharis salicifolia*, CEOC2 = *Cephalanthus occidentalis*, NIGL = *Nicotiana glauca*, PLRA = *Platanus racemosa*, POFR2 = *Populus fremontii*, QUWI2 = *Quercus wislizeni*, SAEX = *Salix exigua*, SAGO = *Salix gooddingii*, SALA3 = *Salix laevigata*, SOAM = *Solanum americanum*, TODI = *Toxicodendron diversilobum*

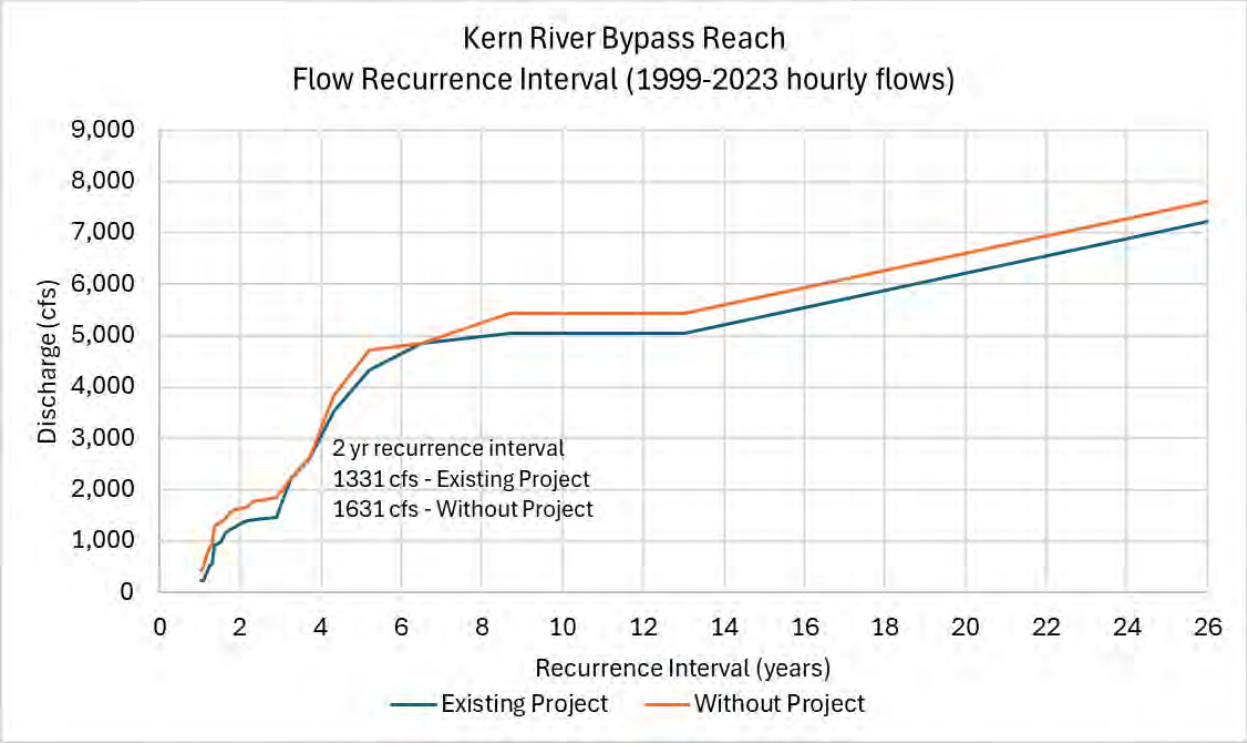
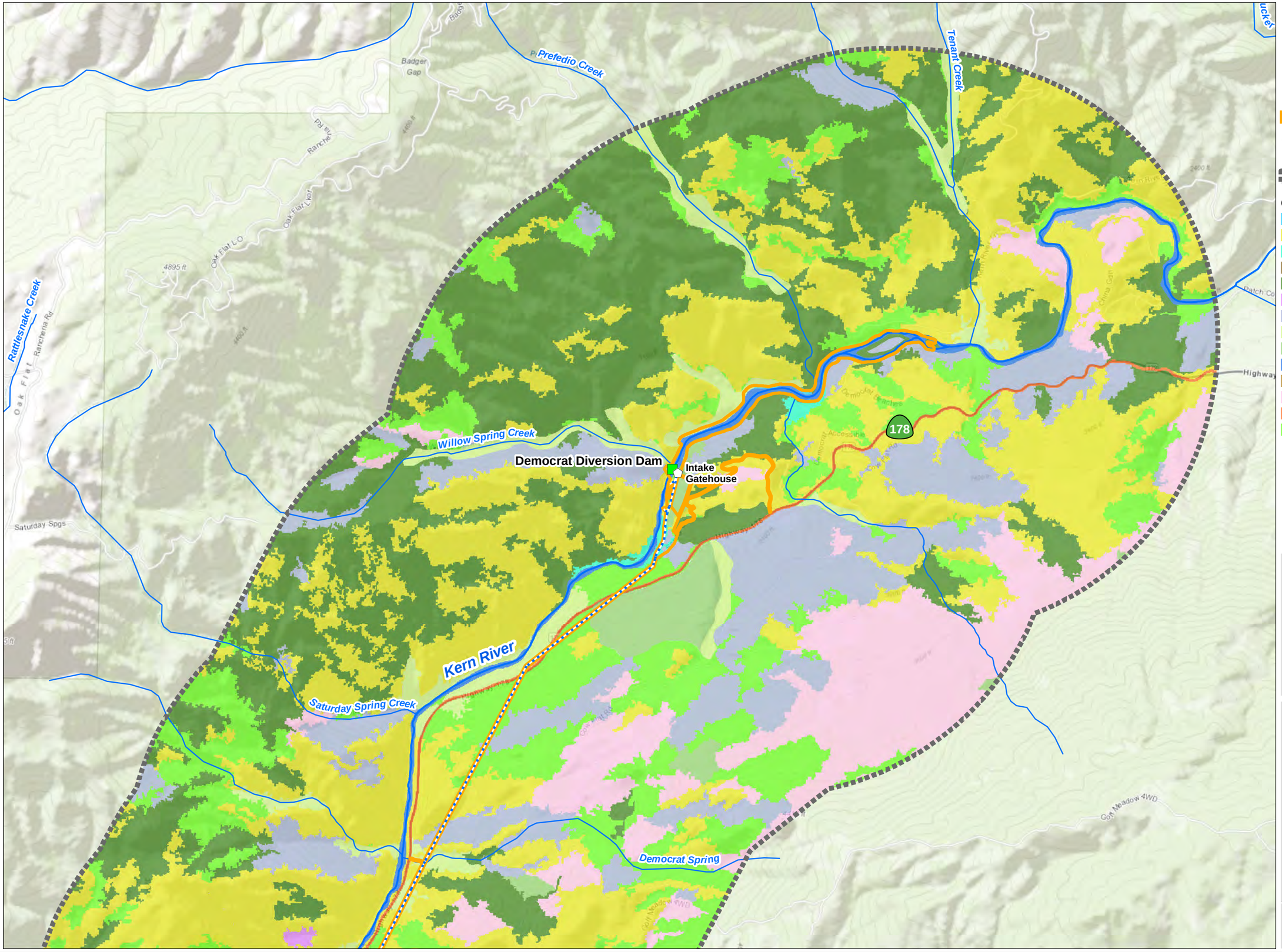


Figure 5-4. Flow recurrence interval for Existing Project and Without-Project Hydrology (1990–2023 average hourly flows).

MAPS



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Flowline
- Penstock
- FERC Boundary

Other Features

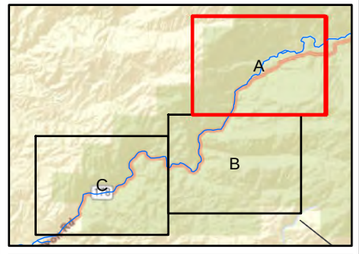
- Watercourse
- 1 Mile Buffer of FERC Boundary

CALVEG Vegetation Alliances*

- Agriculture Pond or Water Feature (A7)
- Annual Grasses and Forbs Alliance (HG)
- Baccharis (Riparian) Alliance (ML)
- Barren (BA)
- Blue Oak Alliance (QD)
- California Sycamore (QP)
- Gray Pine Alliance (PD)
- Interior Live Oak (QW)
- Interior Mixed Hardwood Alliance (NX)
- River/Stream/Canal (W1)
- Tilled Earth (A3)
- Ultramafic Mixed Shrub Alliance (C1)
- Urban-related Bare Soil (IB)
- Valley Oak Alliance (QL)

NOTE: Where terrain was visible with binoculars, biologists identified most QL polygons as being dominated by Quercus wislizeni (QW). We have changed polygons we were able to visually confirm, but it is quite likely remaining QL polygons are actually QW.

*SOURCE: Adapted from Existing Vegetation - CALVEG, USDA - FS, Region 5 - Central Valley, 2019



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-1A

Vegetation Alliances within 1 Mile Around Kern No. 1 Project Facilities

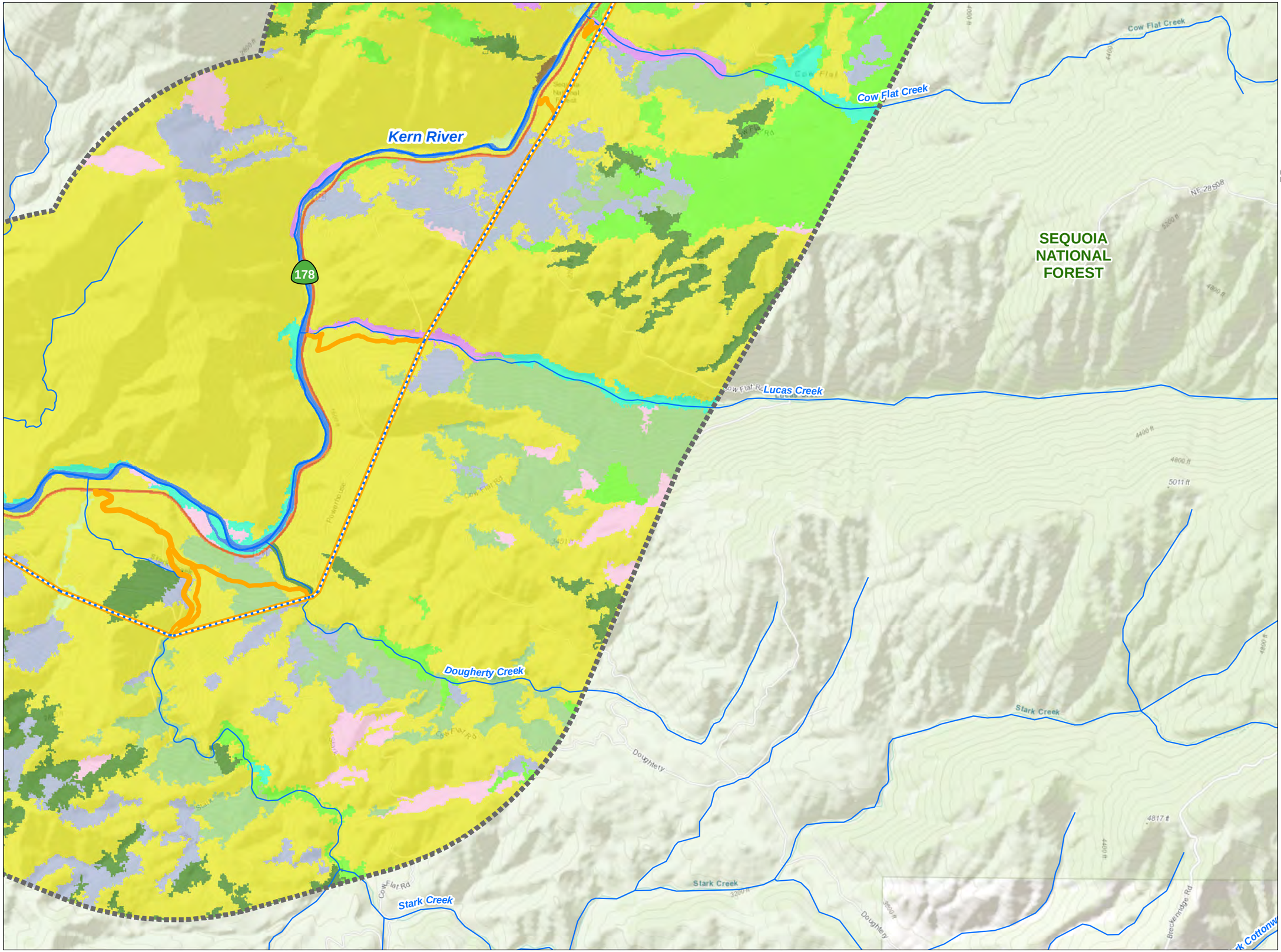
Date: 1/4/2025

0 0.125 0.25 Miles

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Flowline
- Penstock
- FERC Boundary

Other Features

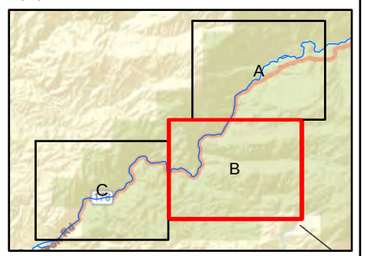
- Watercourse
- 1 Mile Buffer of FERC Boundary

CALVEG Vegetation Alliances*

- Agriculture Pond or Water Feature (A7)
- Annual Grasses and Forbs Alliance (HG)
- Baccharis (Riparian) Alliance (ML)
- Barren (BA)
- Blue Oak Alliance (QD)
- California Sycamore (QP)
- Gray Pine Alliance (PD)
- Interior Live Oak (QW)
- Interior Mixed Hardwood Alliance (NX)
- River/Stream/Canal (W1)
- Tilled Earth (A3)
- Ultramafic Mixed Shrub Alliance (C1)
- Urban-related Bare Soil (IB)
- Valley Oak Alliance (QL)

NOTE: Where terrain was visible with binoculars, biologists identified most QL polygons as being dominated by Quercus wislizeni (QW). We have changed polygons we were able to visually confirm, but it is quite likely remaining QL polygons are actually QW.

*SOURCE: Adapted from Existing Vegetation - CALVEG, USDA - FS, Region 5 - Central Valley, 2019



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-1B

Vegetation Alliances within 1 Mile Around Kern No. 1 Project Facilities

Date: 1/4/2025

0 0.125 0.25 Miles

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company

Kern River No. 1 Powerhouse
Forebay
Penstock
rose-flowered larkspur
178
Pechacho Creek
Sequoia National Forest

Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Flowline
- Penstock
- FERC Boundary

Other Features

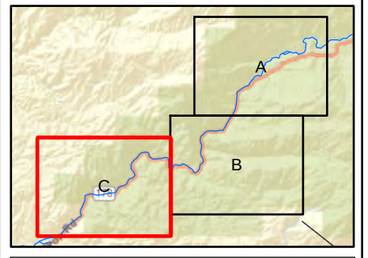
- Watercourse
- 1 Mile Buffer of FERC Boundary

CALVEG Vegetation Alliances*

- Agriculture Pond or Water Feature (A7)
- Annual Grasses and Forbs Alliance (HG)
- Baccharis (Riparian) Alliance (ML)
- Barren (BA)
- Blue Oak Alliance (QD)
- California Sycamore (QP)
- Gray Pine Alliance (PD)
- Interior Live Oak (QW)
- Interior Mixed Hardwood Alliance (NX)
- River/Stream/Canal (W1)
- Tilled Earth (A3)
- Ultramafic Mixed Shrub Alliance (C1)
- Urban-related Bare Soil (IB)
- Valley Oak Alliance (QL)

NOTE: Where terrain was visible with binoculars, biologists identified most QL polygons as being dominated by Quercus wislizeni (QW). We have changed polygons we were able to visually confirm, but it is quite likely remaining QL polygons are actually QW.

*SOURCE: Adapted from Existing Vegetation - CALVEG, USDA - FS, Region 5 - Central Valley, 2019



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-1C

Vegetation Alliances within 1 Mile Around Kern No. 1 Project Facilities

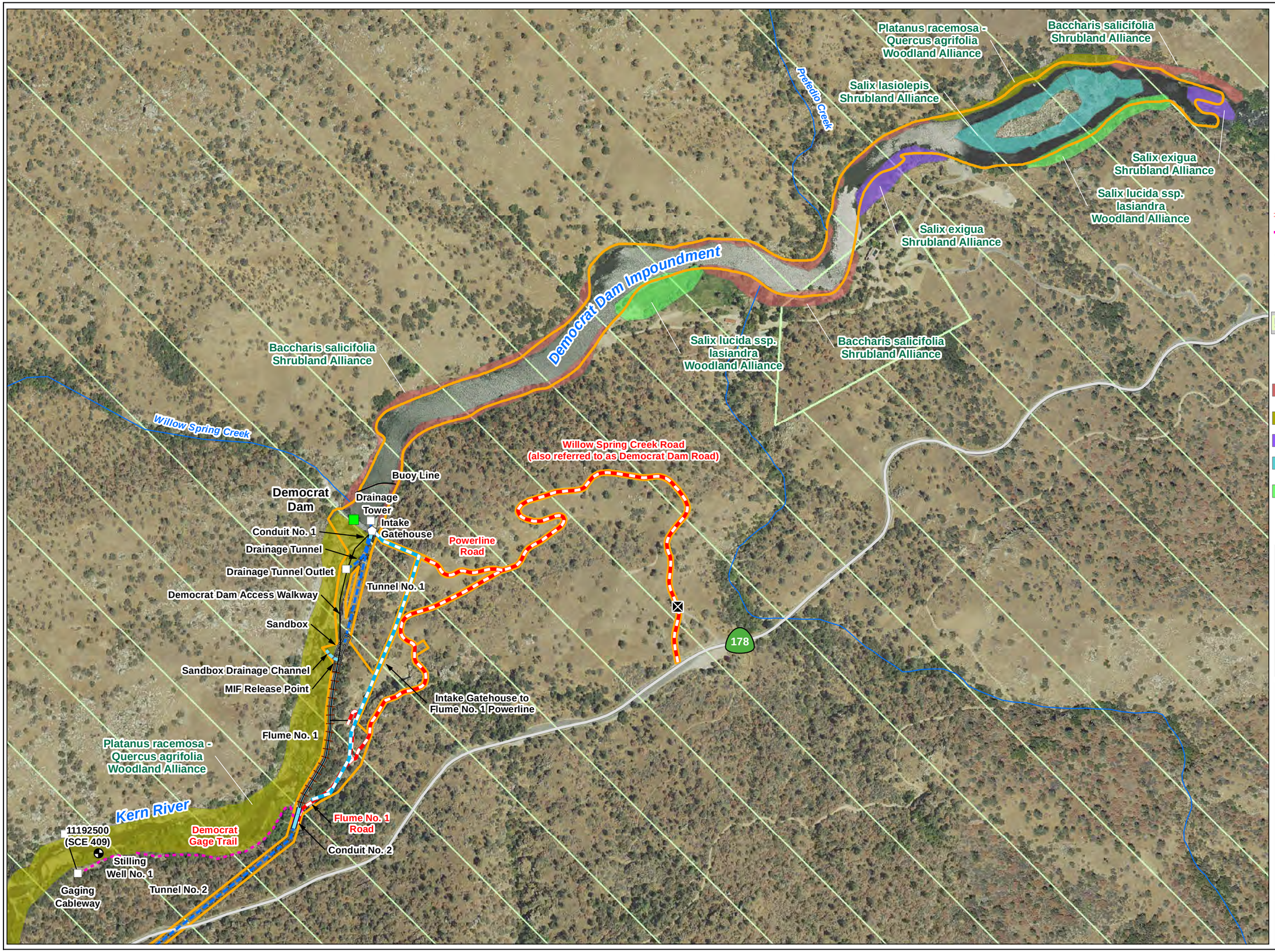
Date: 1/4/2025

0 0.125 0.25 Miles

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

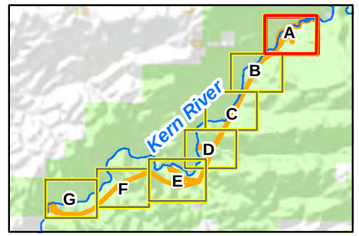
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Alliances

- Baccharis salicifolia Shrubland Alliance
- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance

Note: Other than Democrat Dam Impoundment and the Kern River, there were no Special Aquatic Features in the Study Area



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-2A

Riparian Alliances and Special Aquatic Features Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach.

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

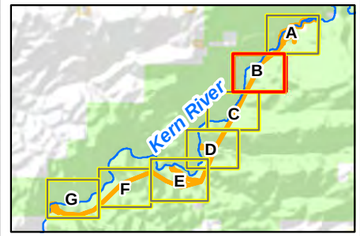
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Alliances

- Baccharis salicifolia Shrubland Alliance
- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance

Note: Other than Democrat Dam Impoundment and the Kern River, there were no Special Aquatic Features in the Study Area



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-2B

Riparian Alliances and Special Aquatic Features Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach.

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

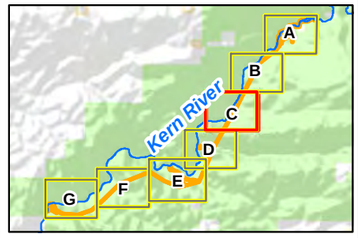
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Alliances

- Baccharis salicifolia Shrubland Alliance
- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance

Note: Other than Democrat Dam Impoundment and the Kern River, there were no Special Aquatic Features in the Study Area



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-2C

Riparian Alliances and Special Aquatic Features Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach.

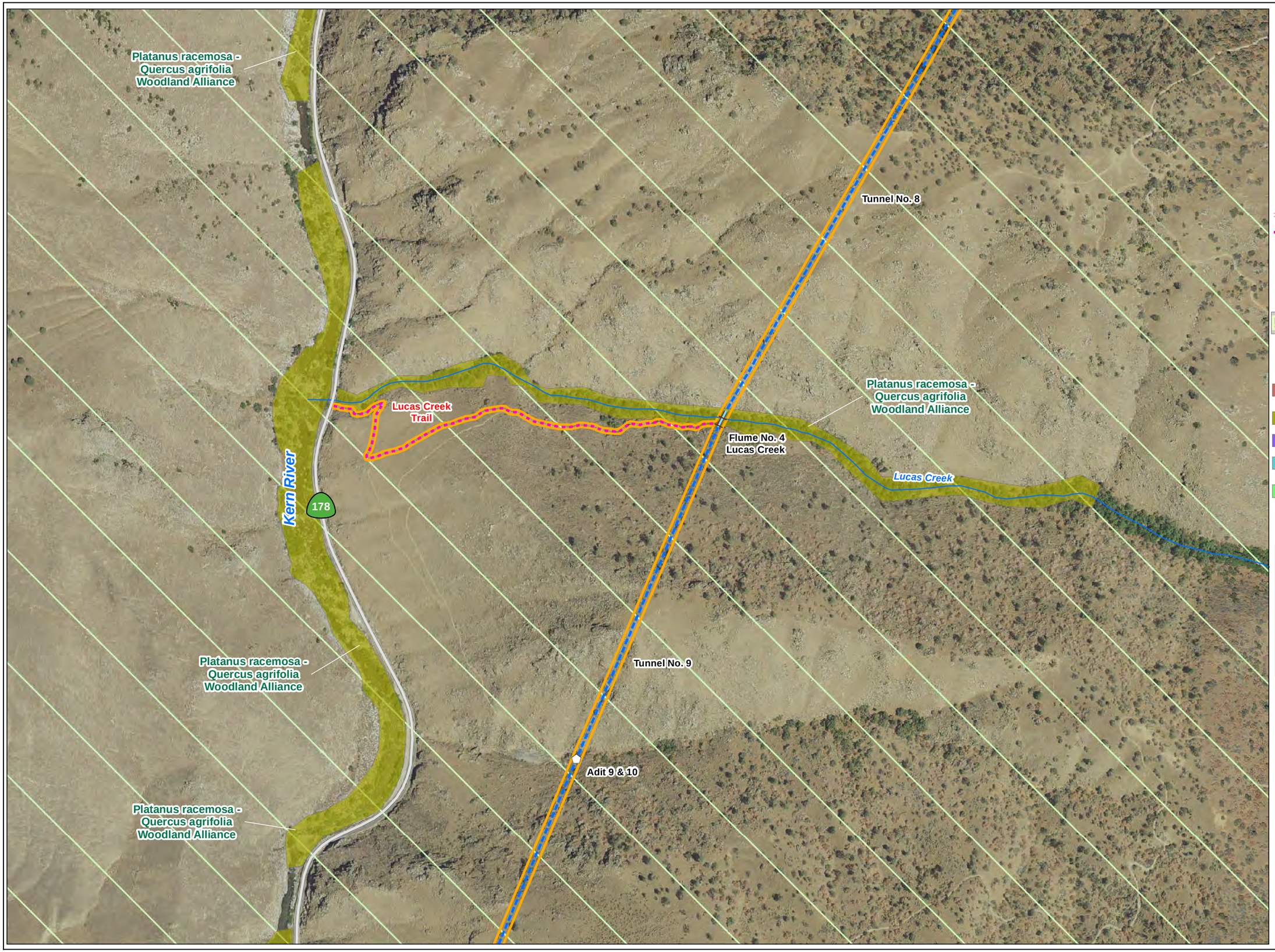
0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

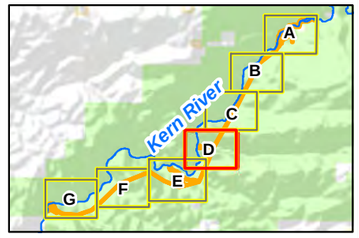
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Alliances

- Baccharis salicifolia Shrubland Alliance
- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance

Note: Other than Democrat Dam Impoundment and the Kern River, there were no Special Aquatic Features in the Study Area



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-2D

Riparian Alliances and Special Aquatic Features Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach.

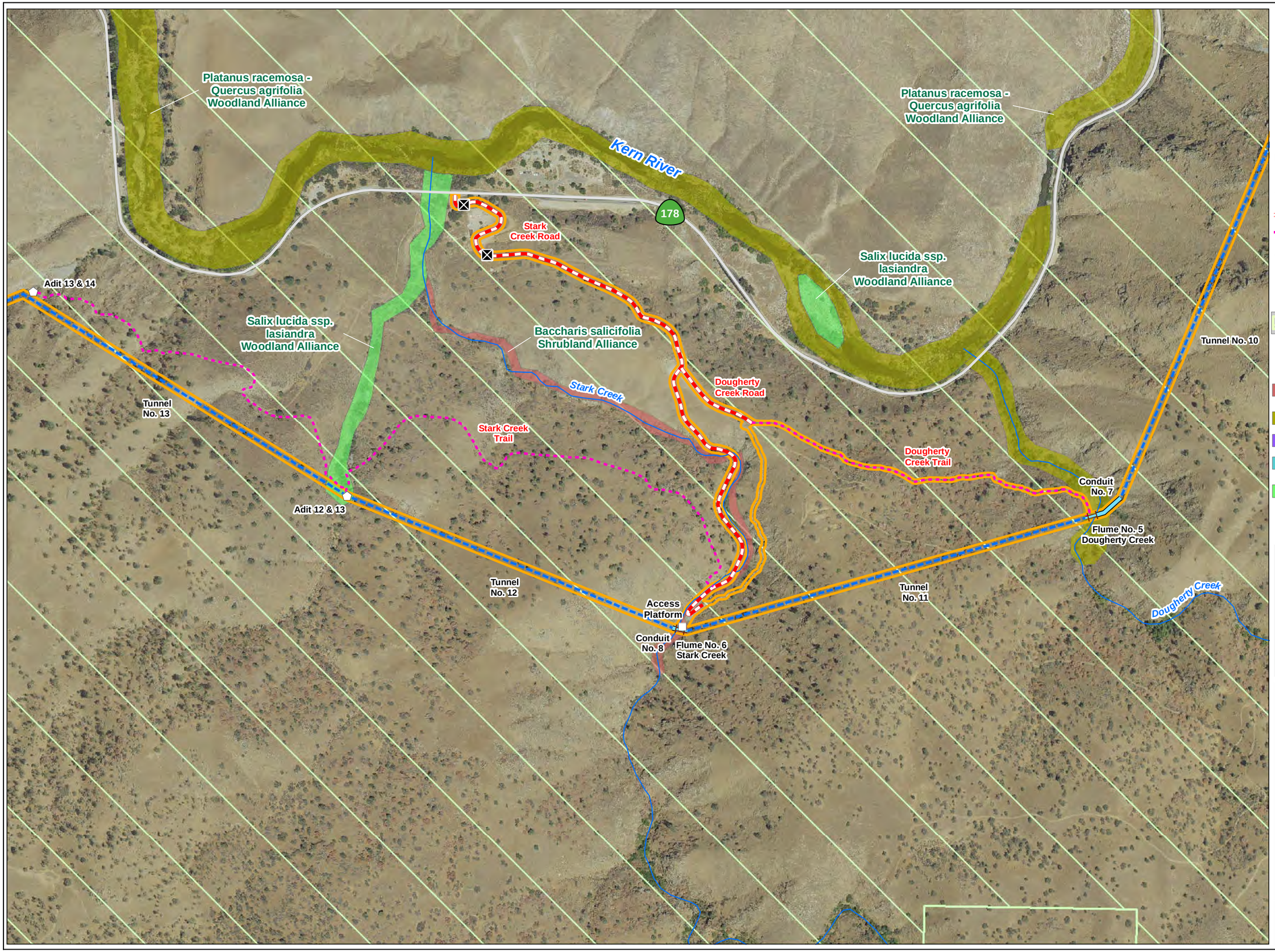
0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

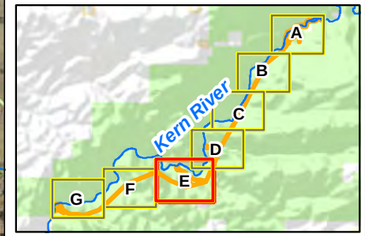
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Alliances

- Baccharis salicifolia Shrubland Alliance
- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance

Note: Other than Democrat Dam Impoundment and the Kern River, there were no Special Aquatic Features in the Study Area



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-2E

Riparian Alliances and Special Aquatic Features Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach.

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

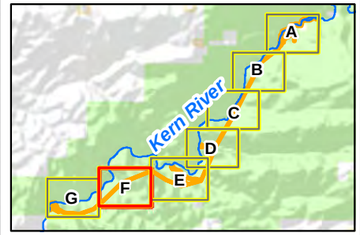
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Alliances

- Baccharis salicifolia Shrubland Alliance
- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance

Note: Other than Democrat Dam Impoundment and the Kern River, there were no Special Aquatic Features in the Study Area



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-2F

Riparian Alliances and Special Aquatic Features Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach.

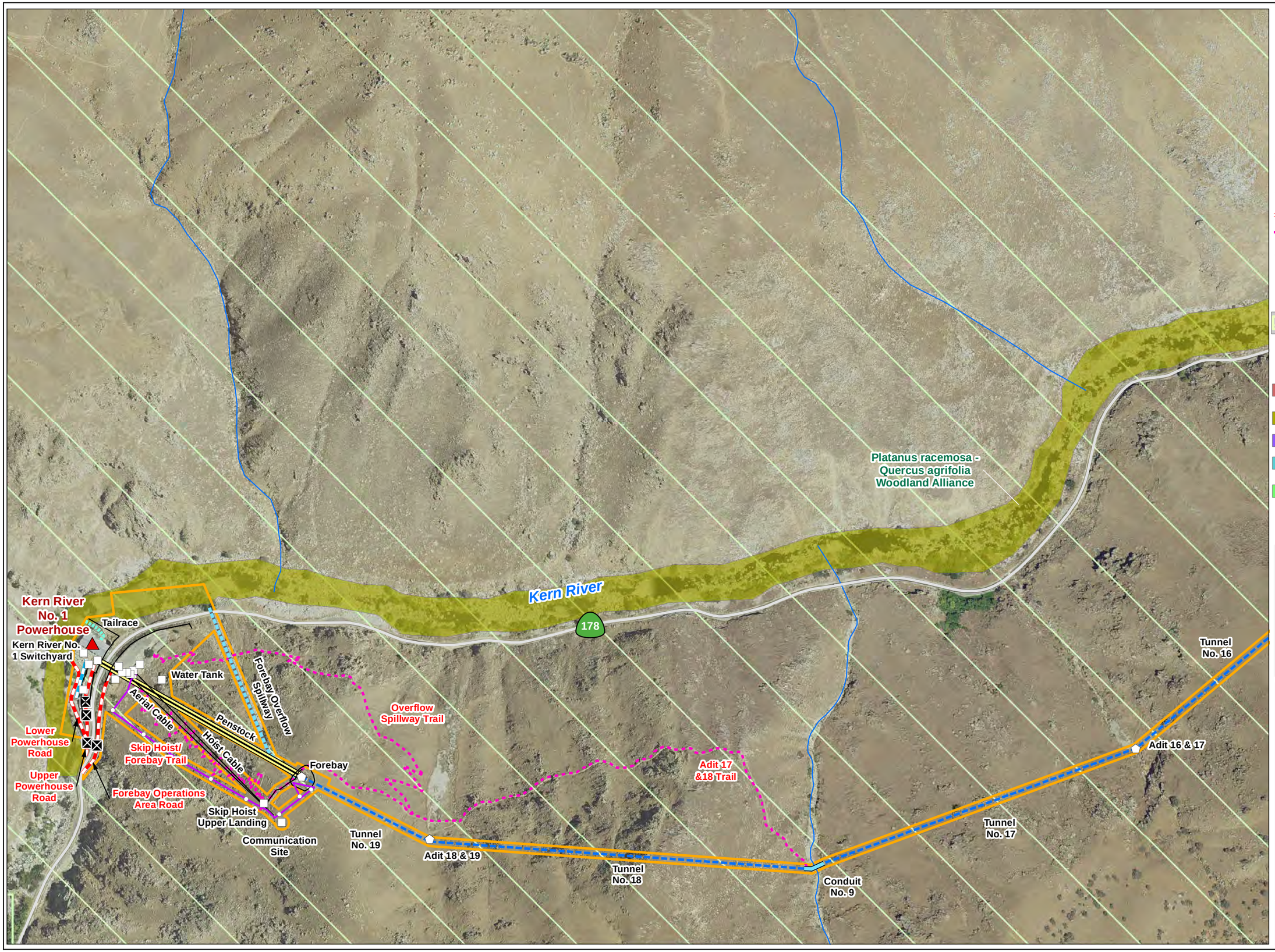
0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced orransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

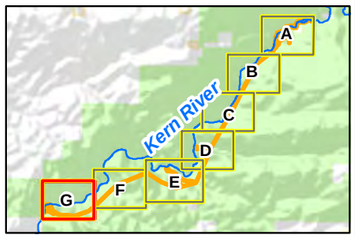
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Alliances

- Baccharis salicifolia Shrubland Alliance
- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance

Note: Other than Democrat Dam Impoundment and the Kern River, there were no Special Aquatic Features in the Study Area



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-2G

Riparian Alliances and Special Aquatic Features Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach.

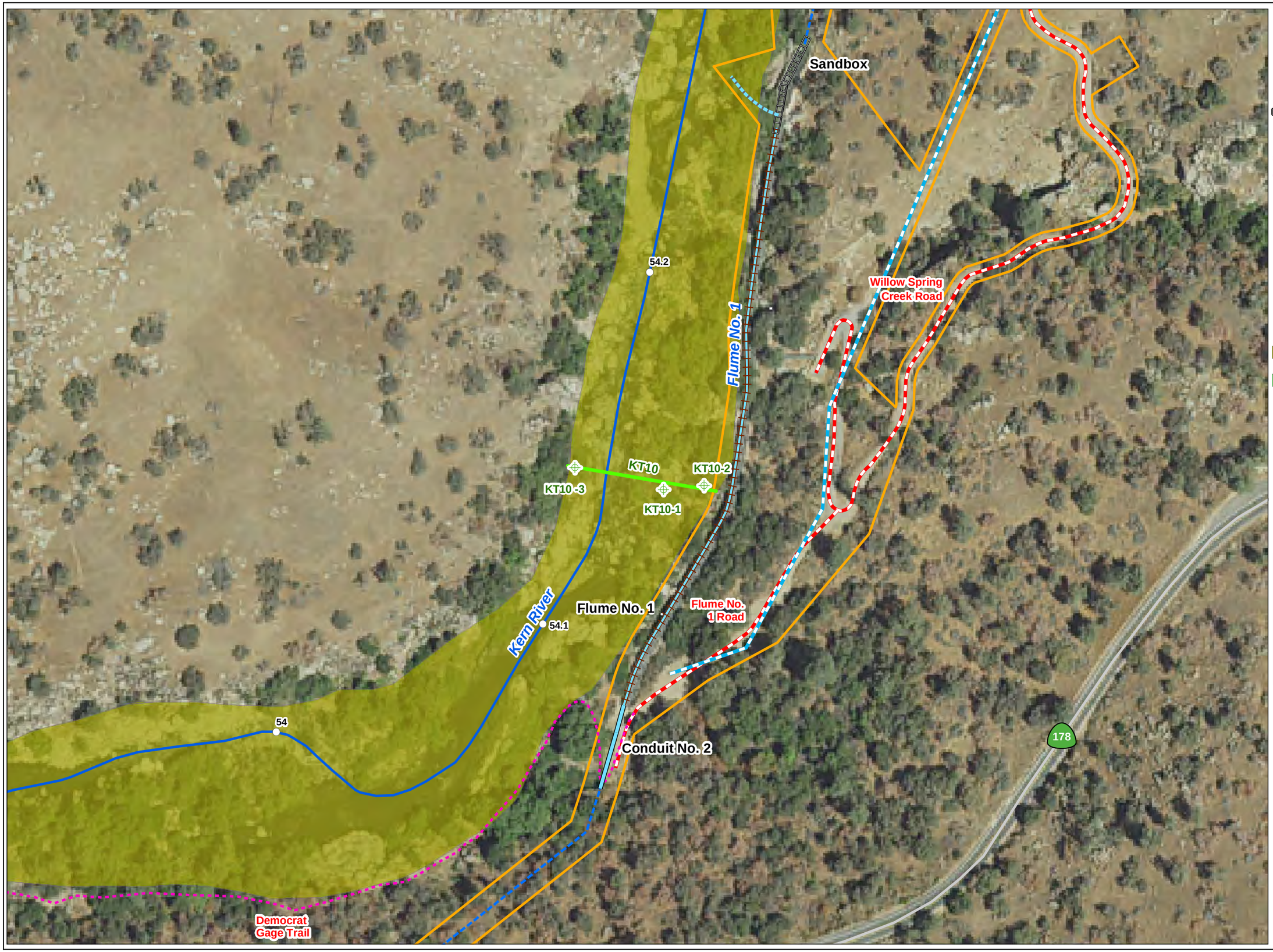
0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Gage
- Ancillary Facility
- Conduit
- Spillway
- Flume
- Tailrace
- Powerline
- Tunnel
- Sandbox
- FERC Boundary

Transportation

- Project Road
- Other Road
- Project Trail

Other Features

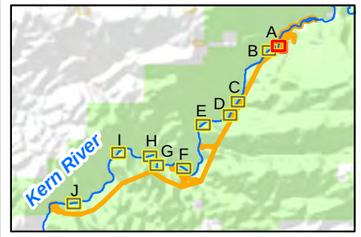
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3A

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\GIS\237800343\map\Kern River 1\TerrestrialMaps\BotanicalMaps\SCE_Kern1_RipCrTransects_17i11i_01.mxd

Copyright 2025 by Southern California Edison Company



Facilities

- Gage
- Ancillary Facility
- Conduit
- Spillway
- Flume
- Tailrace
- Powerline
- Tunnel
- Sandbox
- FERC Boundary

Transportation

- Project Road
- Other Road
- Project Trail

Other Features

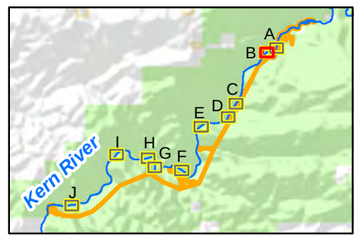
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3B

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\GIS\237800343\map\Kern River 1\TerrestrialMaps\BotanicalMaps\SCE_Kern1_RipCrTransects_17i11i_01.mxd

Copyright 2025 by Southern California Edison Company



Facilities

- Gage
- Conduit
- Flume
- Powerline
- Sandbox
- Ancillary Facility
- Spillway
- Tailrace
- Tunnel
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road

Other Features

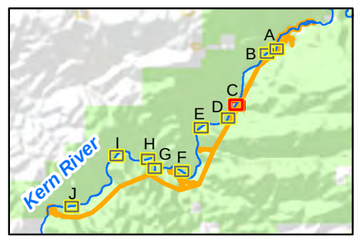
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3C

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

N
W E
S

0 75 150
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\GIS\237800343\map\Kern River 1\TerrestrialMaps\BotanicalMaps\SCE_Kern1_RipCrTransects_17i11i_01.mxd

Copyright 2025 by Southern California Edison Company



Facilities

- Gage
- Conduit
- Flume
- Powerline
- Sandbox
- Ancillary Facility
- Spillway
- Tailrace
- Tunnel
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road

Other Features

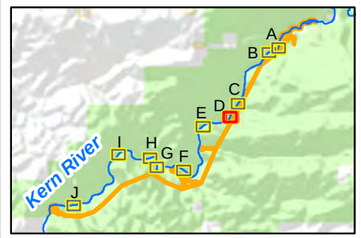
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3D

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\GIS\237800343\map\Kern River 1\TerrestrialMaps\BotanicalMaps\SCE_Kern1_RipCrTransects_17i11i_01.mxd

Copyright 2025 by Southern California Edison Company

The Kern River flows during the time of the survey made crossing too dangerous; therefore, a plot was only taken on one side of the river.

Kern River

51

50.9

KT6

KT6-1

178

50.8

Facilities

- Gage
- Conduit
- Flume
- Powerline
- Sandbox
- Ancillary Facility
- Spillway
- Tailrace
- Tunnel
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road

Other Features

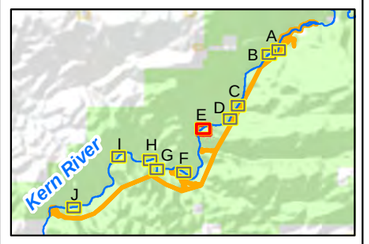
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3E

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Date: 10/30/2025

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\GIS\237800343\map\Kern River 1\TerrestrialMaps\BotanicalMaps\SCE_Kern1_RipCrTransects_17i11i_01.mxd

Copyright 2025 by Southern California Edison Company



Facilities

- Gage
- Conduit
- Flume
- Powerline
- Sandbox
- Ancillary Facility
- Spillway
- Tailrace
- Tunnel
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road

Other Features

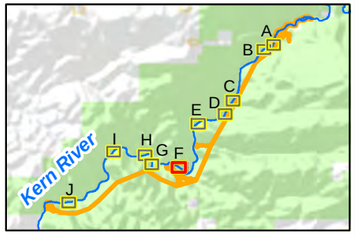
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3F

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Gage
- Conduit
- Flume
- Powerline
- Sandbox
- Ancillary Facility
- Spillway
- Tailrace
- Tunnel
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road

Other Features

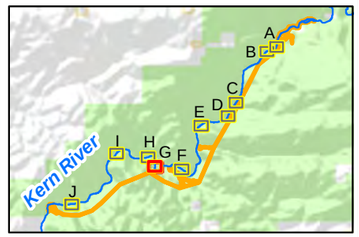
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3G

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\GIS\237800343\map\Kern River 1\TerrestrialMaps\BotanicalMaps\SCE_Kern1_RipCrTransects_17i11i_01.mxd

Copyright 2025 by Southern California Edison Company

The Kern River flows during the time of the survey made crossing too dangerous; therefore, a plot was only taken on one side of the river.

Kern River

47.6

47.7

47.8

47.9

48

KT3

KT3-1

178

Facilities

- Gage
- Conduit
- Flume
- Powerline
- Sandbox
- Ancillary Facility
- Spillway
- Tailrace
- Tunnel
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road

Other Features

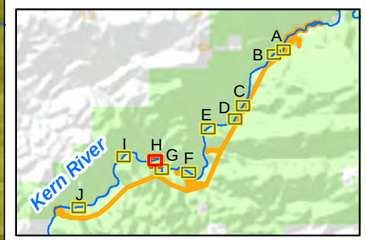
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3H

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\GIS\237800343\map\Kern River 1\TerrestrialMaps\BotanicalMaps\SCE_Kern1_RipCrTransects_17i11i_01.mxd

Copyright 2025 by Southern California Edison Company

The Kern River flows during the time of the survey made crossing too dangerous; therefore, a plot was only taken on one side of the river.

Kern River

KT2

KT2-1

KT2-2

178

46.9

46.8

46.7

46.6

Facilities

- Gage
- Conduit
- Flume
- Powerline
- Sandbox
- Ancillary Facility
- Spillway
- Tailrace
- Tunnel
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road

Other Features

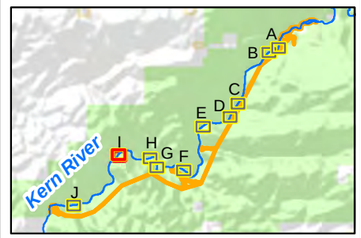
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3I

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Date: 10/30/2025

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\GIS\237800343\map\Kern River 1\TerrestrialMaps\BotanicalMaps\SCE_Kern1_RipCrTransects_17i11i_01.mxd

Copyright 2025 by Southern California Edison Company

The Kern River flows during the time of the survey made crossing too dangerous; therefore, a plot was only taken on one side of the river.

Kern River

KT1

KT1-1

44.4

44.5

44.6

44.7

178

Facilities

- Gage
- Ancillary Facility
- Conduit
- Spillway
- Flume
- Tailrace
- Powerline
- Tunnel
- Sandbox
- FERC Boundary

Transportation

- Project Road
- Other Road
- Project Trail

Other Features

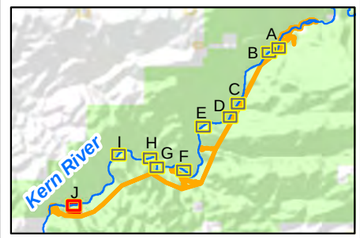
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3J

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

C:\GIS\237800343\map\Kern River 1\TerrestrialMaps\BotanicalMaps\SCE_Kern1_RipCrTransects_17i11i_01.mxd

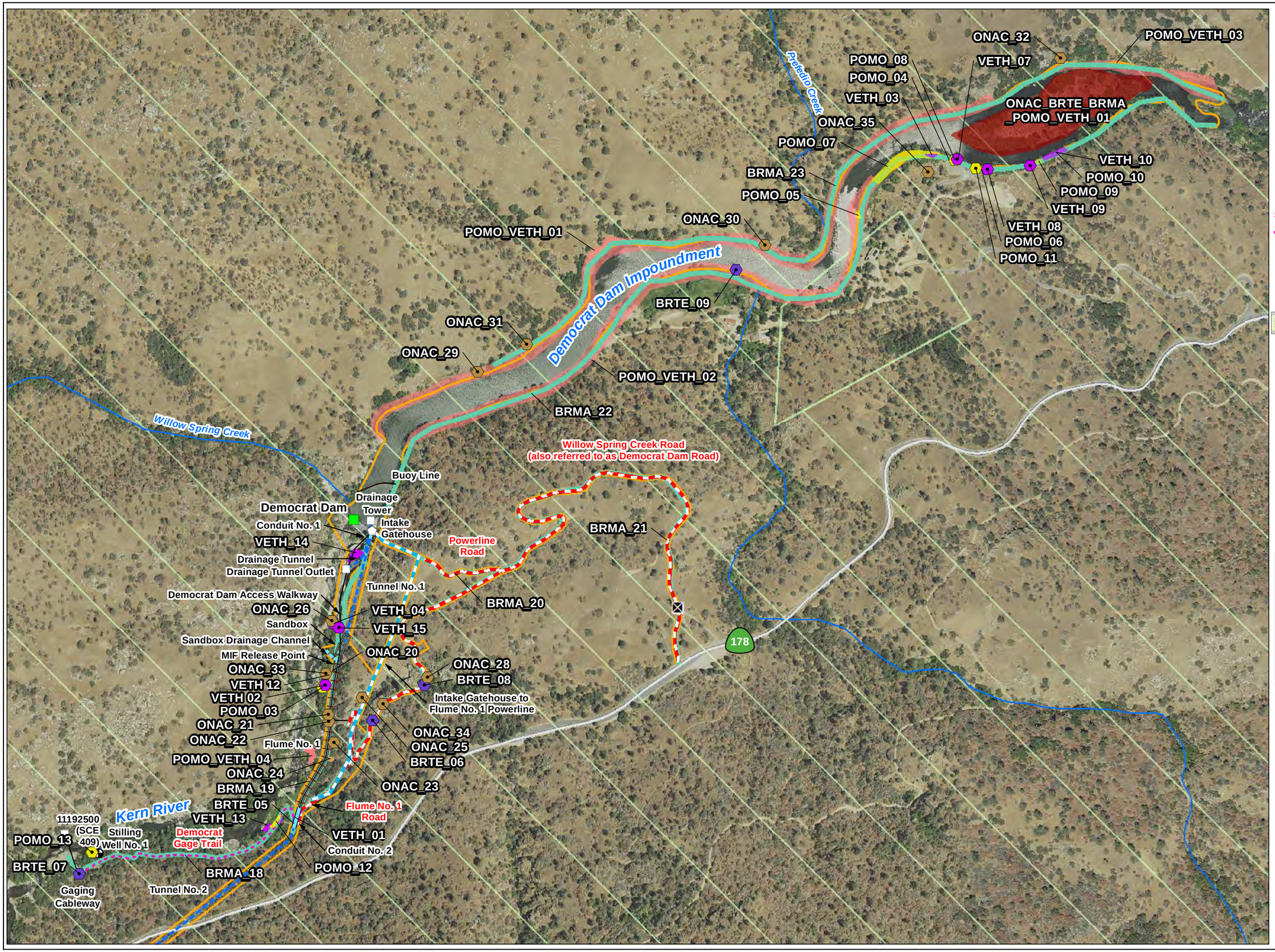
Copyright 2025 by Southern California Edison Company

CONFIDENTIAL INFORMATION

The following map is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of special-status biological resources and qualifies as Confidential Information (18 Code of Federal Regulations § 385.1112). Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings, visit: https://www.ferc.gov/foia.

Map 5-4a–g Special-Status Plants Within the FERC Project Boundary, Along Project Access Trails, and the Kern River No. 1 Project Bypass Reach (CONFIDENTIAL)

Map 5-4a–g will not be distributed to the general public. Documents containing Confidential Information may be requested by entities and organizations with jurisdiction over these resources. To request copies, please contact Meg Richardson, SCE Relicensing Project Manager at (626) 238-2902 / mary.m.richardson@sce.com; or Kadi Whiteside, SCE Relicensing Deputy Project Manager at (626) 807-3641 / karen.whiteside@sce.com.



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

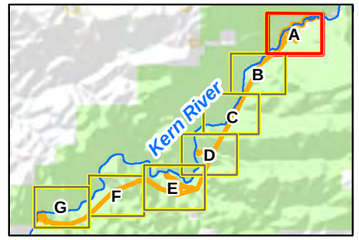
Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

Non-Native Invasive Plants

- BRMAR, red brome
- BRTE, cheatgrass
- ONAC, scotch thistle
- POMO, rabbitsfoot grass
- VETH, common mullein
- POMO & VETH
- ONAC, BRTE, BRMAR, POMO & VETH



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-5A

Non-Native Invasive Plants Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach

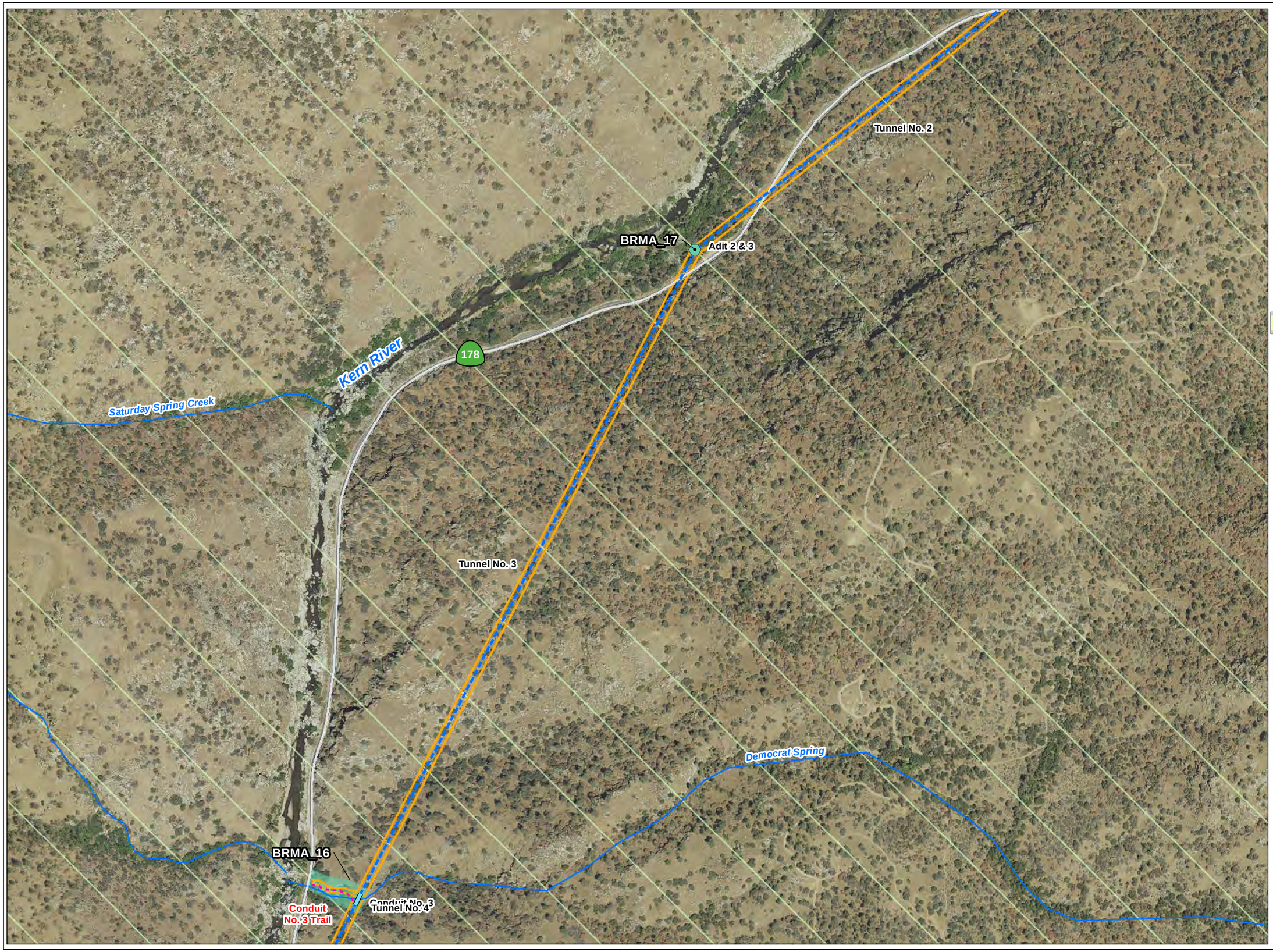
0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

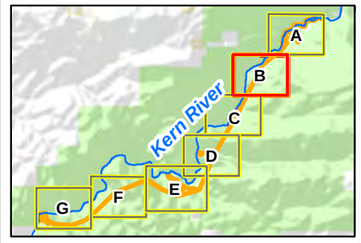
Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

Non-Native Invasive Plants

- BRMAR, red brome
- BRTE, cheatgrass
- ONAC, scotch thistle
- POMO, rabbitsfoot grass
- VETH, common mullein
- POMO & VETH
- ONAC, BRTE, BRMAR, POMO & VETH



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-5B

Non-Native Invasive Plants Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach

0 250 500
Feet

Date: 10/30/2025

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

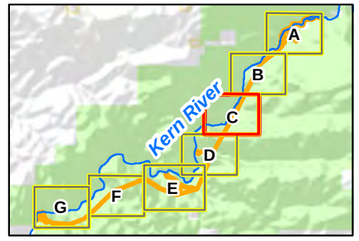
Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

Non-Native Invasive Plants

- BRMAR, red brome
- BRTE, cheatgrass
- ONAC, scotch thistle
- POMO, rabbitsfoot grass
- VETH, common mullein
- POMO & VETH
- ONAC, BRTE, BRMAR, POMO & VETH



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-5C

Non-Native Invasive Plants Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach

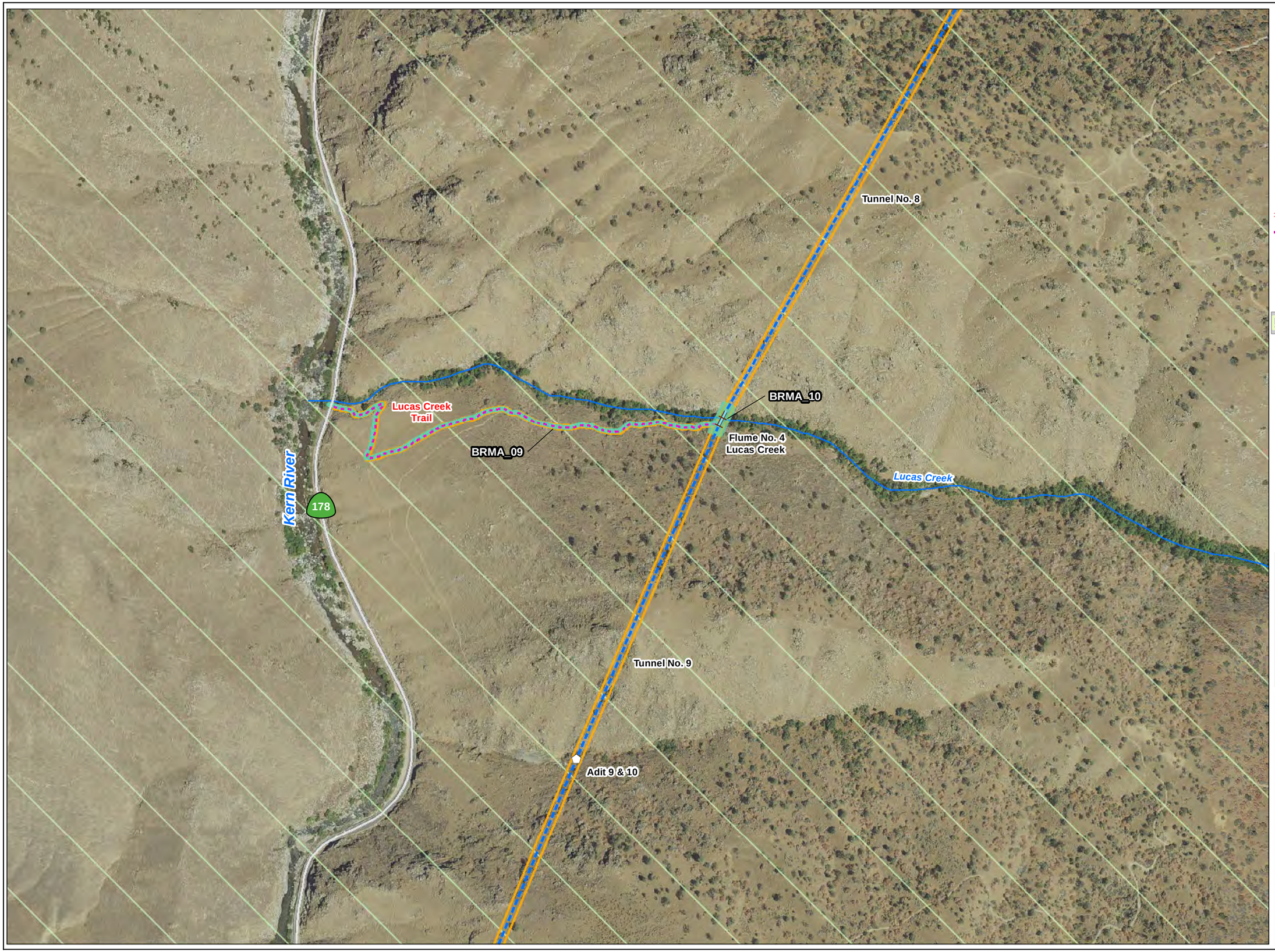
0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

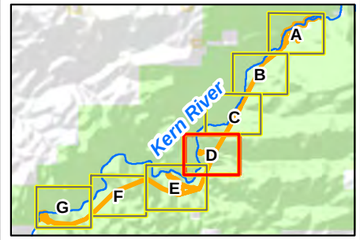
Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

Non-Native Invasive Plants

- BRMAR, red brome
- BRTE, cheatgrass
- ONAC, scotch thistle
- POMO, rabbitsfoot grass
- VETH, common mullein
- POMO & VETH
- ONAC, BRTE, BRMAR, POMO & VETH



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-5D

Non-Native Invasive Plants Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach

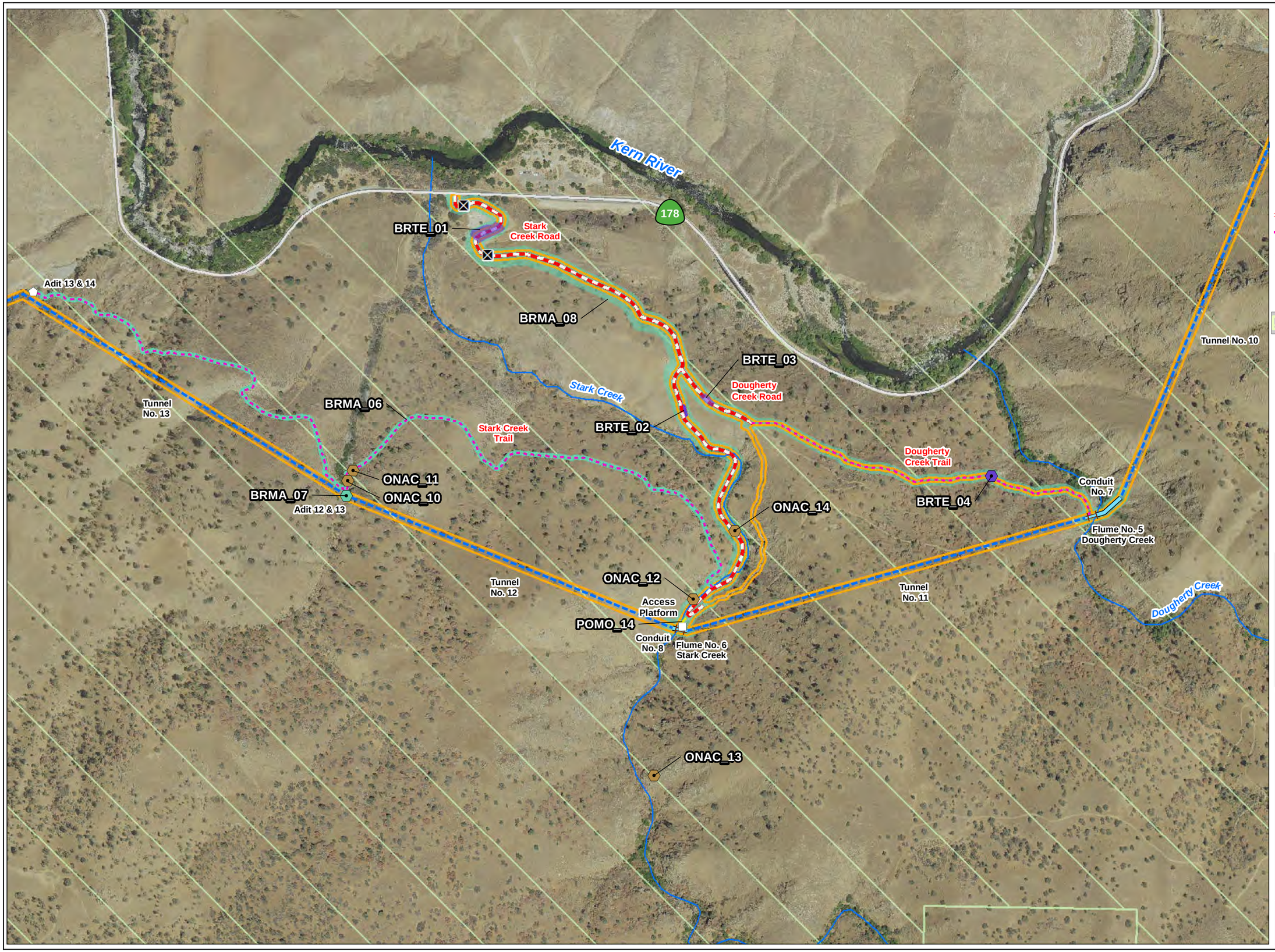
0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

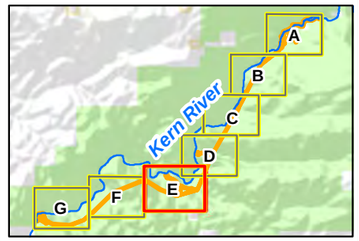
Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

Non-Native Invasive Plants

- BRMAR, red brome
- BRTE, cheatgrass
- ONAC, scotch thistle
- POMO, rabbitsfoot grass
- VETH, common mullein
- POMO & VETH
- ONAC, BRTE, BRMAR, POMO & VETH



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-5E

Non-Native Invasive Plants Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company

Kern River
Pechacho Creek
178
BRMA_05
Adit 14 & 15
Tunnel No. 14
Tunnel No. 15
Adit 15 & 16

Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

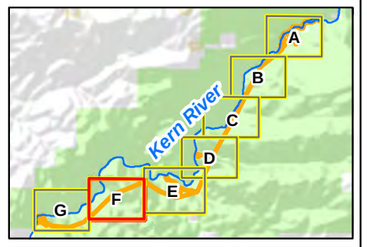
Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

Non-Native Invasive Plants

- BRMAR, red brome
- BRTE, cheatgrass
- ONAC, scotch thistle
- POMO, rabbitsfoot grass
- VETH, common mullein
- POMO & VETH
- ONAC, BRTE, BRMAR, POMO & VETH



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-5F

Non-Native Invasive Plants Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach

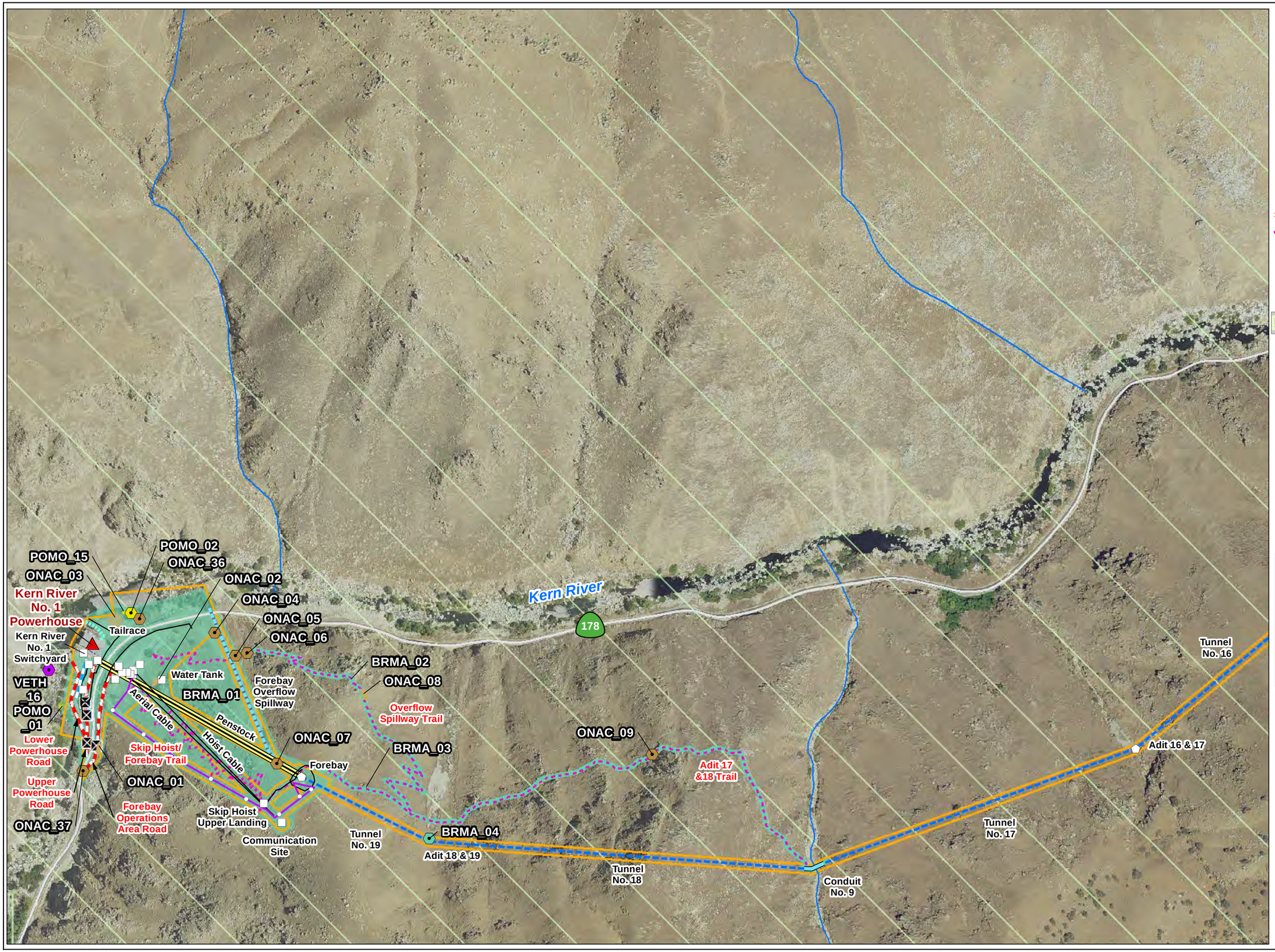
0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

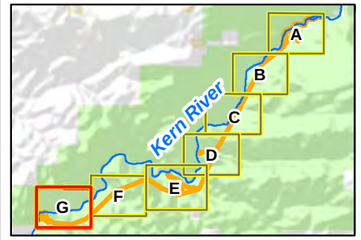
Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

Non-Native Invasive Plants

- BRMAR, red brome
- BRTE, cheatgrass
- ONAC, scotch thistle
- POMO, rabbitsfoot grass
- VETH, common mullein
- POMO & VETH
- ONAC, BRTE, BRMAR, POMO & VETH



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-5G

Non-Native Invasive Plants Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach

Date: 10/30/2025

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company

APPENDIX A

Vegetation Alliances within 1 Mile of the Kern River No. 1 FERC Project Boundary

Copyright 2026 by Southern California Edison

The following vegetation alliance descriptions are excerpted from *Vegetation Descriptions, South Sierran Ecological Province, CALVEG Zone 4* (U.S. Department of Agriculture – Forest Service, Region 5; April 27, 2009) and *Central Valley Ecological Province, CALVEG Zone 5* (U.S. Department of Agriculture – Forest Service, Region 5; March 12, 2009).

HERB-DOMINATED ALLIANCES

ANNUAL GRASSES AND FORBS ALLIANCE (HG)

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 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 (*Pinus 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 (2440 meters) or more. Great Basin species such as big sagebrush (*Artemisia tridentata*), rabbitbrush (*Chrysothamnus* spp.), singleleaf pinyon pine (*Pinus monophylla*) and Jeffrey pine (*Pinus jeffreyi*) are often found adjacent to these patches.

SHRUB-DOMINATED ALLIANCES

ULTRAMAFIC MIXED SCRUB ALLIANCE (C1)

This type is found on ultramafic soils and has been mapped very sparsely in the Ranges and Foothills Sections at elevations generally below about 2,400 feet (732 meters) in this zone. The Ultramafic Mixed Shrub Alliance consists of a mixture of shrubs such as wedgeleaf ceanothus (*Ceanothus cuneatus* var. *cuneatus*), leather oak (*Quercus durata*), musk brush (*Ceanothus jepsonii*), California coffeeberry (*Rhamnus californica* ssp. *occidentalis*), silk-tassel (*Garrya elliptica*, *Garrya congdonii*), and Siskiyou mat (*Ceanothus pumilus*).

BACCHARIS (RIPARIAN) ALLIANCE (ML)

This Alliance identifies one or more species of *Baccharis* that dominate riparian areas and wetlands. It has been mapped in a limited area along Caliente Creek and other sites in the Foothills Section at elevations between 1,000–2,200 feet (305–670 meters). Species that may be in this Alliance include mule mat (*Baccharis salicifolia*), marsh Baccharis (*Baccharis douglasii*), and squaw waterweed (*Baccharis sergiloides*). This Alliance is found adjacent to upland species such as interior live oak, gray pine, California buckeye, chaparral yucca (*Yucca whipplei*), and rabbitbrush in this area.

TREE-DOMINATED ALLIANCES

INTERIOR MIXED HARDWOODS ALLIANCE (NX)

A mixture of upland hardwoods with no clearly dominant species occurs very commonly in the Lower Batholith and Tehachapi - Piute Mountains Subsections and more rarely in five other subsections. This type has been mapped most often in the elevation range of about 1,000–6,000 feet (305–1830 meters). The mixture includes any combination of interior live oak (*Quercus wislizenii*), canyon live oak (*Quercus chrysolepis*), blue oak (*Quercus douglasii*), and/or California buckeye (*Aesculus californic*a), with Valley oak (*Quercus lobata*) or black oak (*Quercus kelloggii*) occurring less frequently. The occasional overstory conifers may include gray pine or Ponderosa pine. Lower-elevation shrubs in canopy openings such as wedgeleaf ceanothus and birchleaf mountain mahogany (*Cercocarpus betuloides*) may also be present onsite or in the vicinity.

GRAY PINE ALLIANCE (PD)

This alliance, dominated by gray pine, grows primarily in the foothills of the Sierra Nevada on steep, dry rocky canyons with south aspects, below about 4,200 feet. In the northern Sierra, it is found mainly in the Upper Foothill Metamorphic Belt and the Granitic and Metamorphic Foothills subsections. These sites are typically diverse in structure, with a mixture of hardwoods such as canyon live oak, interior live oak, and blue oak; and low-elevation chaparral shrubs such as wedgeleaf ceanothus and whiteleaf and common manzanitas. Patches of annual grasses are often found adjacent to grey pine stands.

BLUE OAK ALLIANCE (QD)

The Blue Oak Alliance occurs on shallow upland soils in foothill savannas adjacent to the western slopes of the Sierra Nevada. It has been mapped in five ecological units, most commonly in the Tehachapi – Piute Mountains, Lower Batholith and Upper Foothills Metamorphic Belt Subsections. Elevations where mapped are often in the 1000–5800 feet (305–1768 meters) range, highest towards the south. Blue oak naturally occurs in an oak-grass association on well drained, gentle slopes. Gray pine is the most common tree associate in this hillside type; interior live oak may also be a major hardwood occurring in close proximity to this type. Non-stump sprouting chaparral shrubs such as wedgeleaf ceanothus, manzanitas (Arctostaphylos spp.), coffeeberry, California buckwheat (*Eriogonum fasciculatum*) and poison oak (*Toxicodendron diversilobum*) are scattered throughout this Alliance, and chamise (*Adenostoma fasciculatum*) often occurs adjacent to these sites.

VALLEY OAK ALLIANCE (QL)

This alliance is dominated by Valley oak, a deeply rooting hardwood, which formerly occurred in pure stands of large trees with limited woody understory. These stands occurred on valley bottoms and in rolling slopes, generally below 2,000 feet (610 meters) in the north. The present distribution pattern of Valley Oak is along major stream courses and on the deep, rich loamy soils of their alluvial deposits in areas within and along the eastern and western fringes of this zone. It has been mapped occasionally as a dominant hardwood in

the three sections up to an elevation of about 5,000 feet (1,524 meters) and more rarely as an understory hardwood in Ponderosa pine and gray pine forests and woodlands. A few scattered interior and/or canyon live oaks can be found throughout this Alliance.

CALIFORNIA SYCAMORE ALLIANCE (QP)

California sycamore (*Platanus racemosa*) is a tall, fast-growing riparian tree that occurs from California to Baja California. Pure stands of it have been mapped sparsely in eight subsections of both the Coast and Ranges Sections in this zone and is found at low elevations, usually less than 1800 feet (548 meters). Common hardwood and shrub associates along these streams include Fremont cottonwood (*Populus fremontii*), willows (*Salix* spp.), white alder (*Alnus rhombifolia*), and coast live oak (*Quercus agrifolia*).

INTERIOR LIVE OAK ALLIANCE (QW)

Interior live oak (*Quercus wislizenii*), an evergreen, shade-tolerant upland hardwood, occurs from northern California to Baja California in two recognized varieties as a shrub (*Q. w. var. frutescens*) and a tree (*Q. w. var. wislizenii*). As a dominant hardwood in this alliance, it occurs both in interior valleys and seaward sides of the Coast Ranges, but generally is found in pure stands inland from the Coast Live Oak Alliance. Interior live oak typically associates with chamise (*Adenostoma fasciculatum*), blue oak (*Quercus douglasii*), and gray pine (*Pinus sabiniana*) in savanna-like stands on these sites. It has been mapped only sparsely in the Suisan Hills and Valleys and East Bay Hills – Mt. Diablo Subsections of the Coast Section at elevations below about 3600 feet (1098 meters).

NON-VEGETATED AREAS

TILLED EARTH (A3)

Agricultural lands may be mapped as barren and lacking vegetation on occasion, such as after harvesting and during seasons prior to crop growth. Some areas may be kept fallow during and after the growing season for various reasons such as conservation of moisture and nutrients in a crop rotation schedule.

BARREN (BA)

Landscapes generally devoid of vegetation as seen from a high-altitude image source such as aerial photography, are labeled as Barren. This category includes mappable landscape units in which surface lithology is dominant, such as exposed bedrock, cliffs, interior sandy or gypsum areas, and the like. It does not include areas considered as modified or developed, as in urban areas but quarries and open pit mine sites are included in the Barren category.

URBAN-RELATED BARE SOIL (IB)

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 construction. These sites have been mapped extensively in the Santa Maria Valley and adjoining sections of the South Coastal San Lucia Ranges Subsections, usually adjacent to agricultural areas, already established urbanized centers or paved areas of the landscape. California Sagebrush (*Artemisia californica*) and annual grasses and forbs may be present in the immediate vicinity of these sites.

AQUATIC AREAS

AGRICULTURE POND OR WATER FEATURE (A7)

Some artificially constructed water features on otherwise agricultural sites on farms, ranches and the like, are large enough to map and document. These sites include stock ponds, small reservoirs, large ditches and other utilitarian or recreational water features.

RIVER/STREAM/CANAL (W1)

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. 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) W2: Perennial Lakes and Ponds (natural lacustrine bodies) W3: Reservoirs (man-made lakes and ponds) W5: Playas (desert basin features) W6: Intermittent Stream Channel (seasonally flowing channeled waters) W8: Intermittent or Seasonal Lake or Pond (occasionally drained surface waters) W9: Exposed non-water features such as gravel, sand bars, etc.

APPENDIX B

Representative Photographs of Bypass Reach Riparian Cross-Sections

Copyright 2026 by Southern California Edison



Photo B-1. Representative photograph of riparian transect KT1 on the Kern River. Approximately 0.5 mile upstream of the Kern 1 power station.



Photo B-2. Representative photograph of riparian transect KT2 on the Kern River. Approximately 2.7 miles upstream of the Kern 1 power station.



Photo B-3. Representative photograph of riparian transect KT3 on the Kern River. Approximately 3.7 miles upstream of the Kern 1 power station.



Photo B-4. Representative photograph of riparian transect KT4 on the Kern River. Approximately 4 miles upstream of the Kern 1 power station.



Photo B-5. Representative photograph of riparian transect KT5 on the Kern River. Approximately 5 miles upstream of the Kern 1 power station.



Photo B-6. Representative photograph of riparian transect KT6 on the Kern River. Approximately 6.7 miles upstream of the Kern 1 power station.

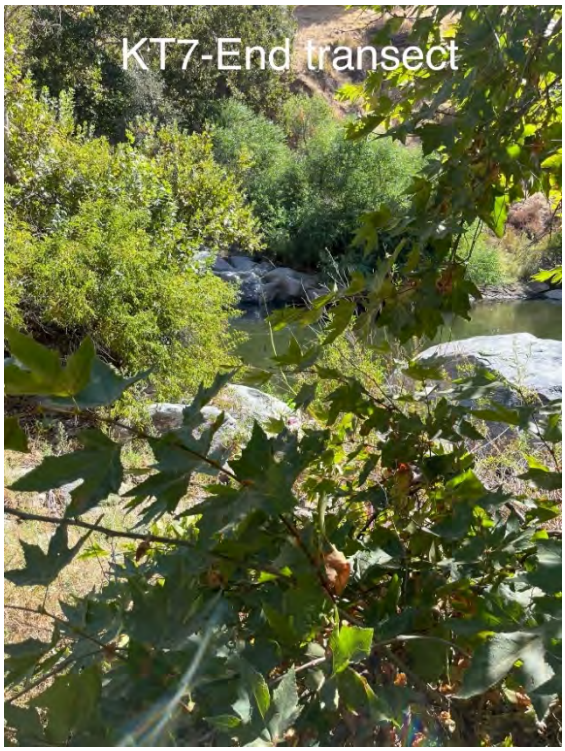


Photo B-7. Representative photograph of riparian transect KT7 on the Kern River. Approximately 7.5 miles upstream of the Kern 1 power station.



Photo B-8. Representative photograph of riparian transect KT8 on the Kern River. Approximately 7.9 miles upstream of the Kern 1 power station.



Photo B-9. Representative photograph of riparian transect KT9 on the Kern River. Approximately 9.6 miles upstream of the Kern 1 power station.



Photo B-10. Representative photograph of riparian transect KT10 on the Kern River. Approximately 9.9 miles upstream of the Kern 1 power station.

APPENDIX C

Relationship Between Riparian Vegetation and Flow Conditions

Copyright 2026 by Southern California Edison

The following figures show the results of the analysis of the relationship between the riparian vegetation and flow conditions.

Figures D-1 through D-10 provide a depiction of the relationship between water surface elevation and discharge (cubic feet per second [cfs]) at each of the ten transects.

Figures D-11 through D-20 show the percent inundation for the period of record (1990–2023) under the Existing Project and Without-Project hydrology scenarios.

Figures D-21 through D-30 show the average number of days of inundation at flows greater than 1,631 cfs (without-Project 2-year recurrence interval), for the Kern River below Democrat Dam at each of the riparian transects.

Figures D-31 through D-40 show the average yearly recession rate for a dry, normal, and wet water year at each riparian transect. The figures show recession rates of spring/early summer flows during the time of spring seed release and seed setting (during the receding limb of the hydrograph). Recession rates of 1.6 inches per day are represented as a dotted line on each graph.

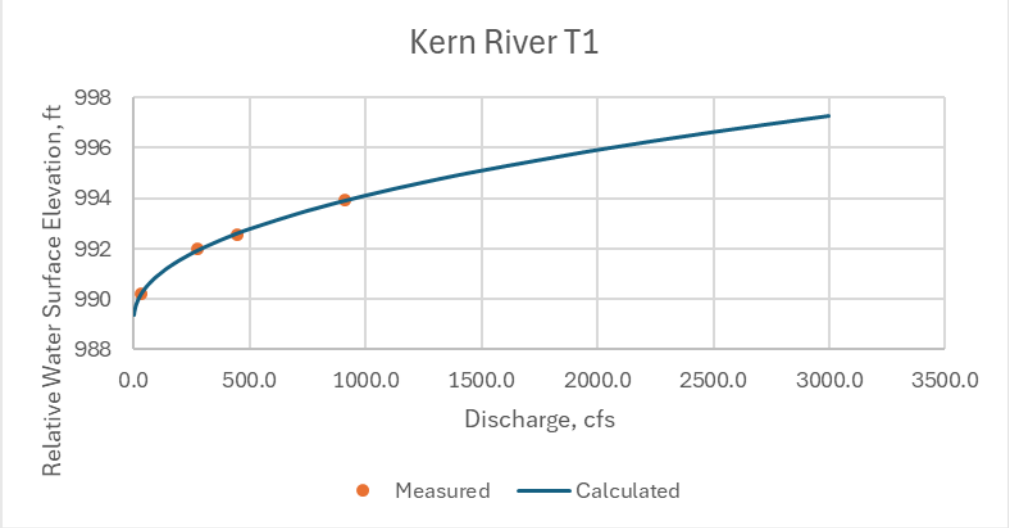


Figure C-1. Kern River stage-discharge regression for Riparian Transect KT1.

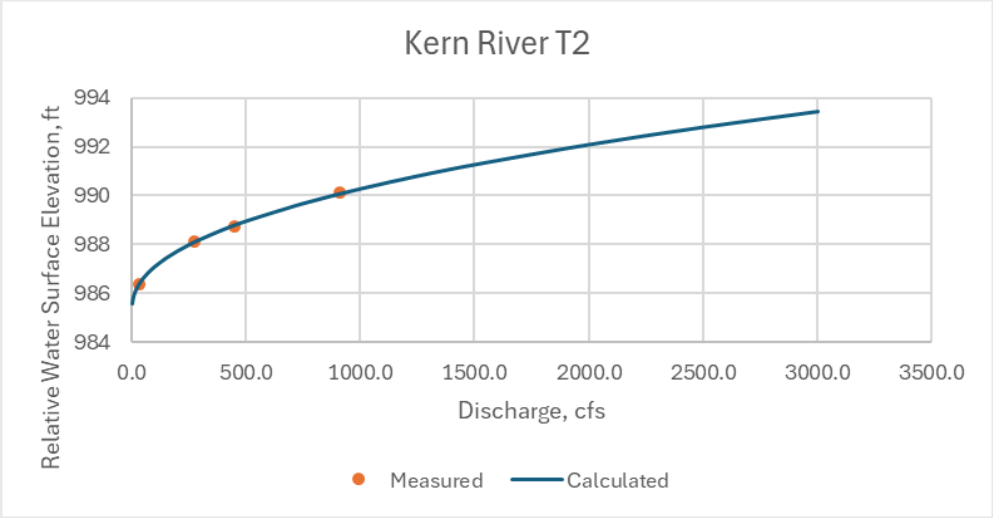


Figure C-2. Kern River stage-discharge regression for Riparian Transect KT2.

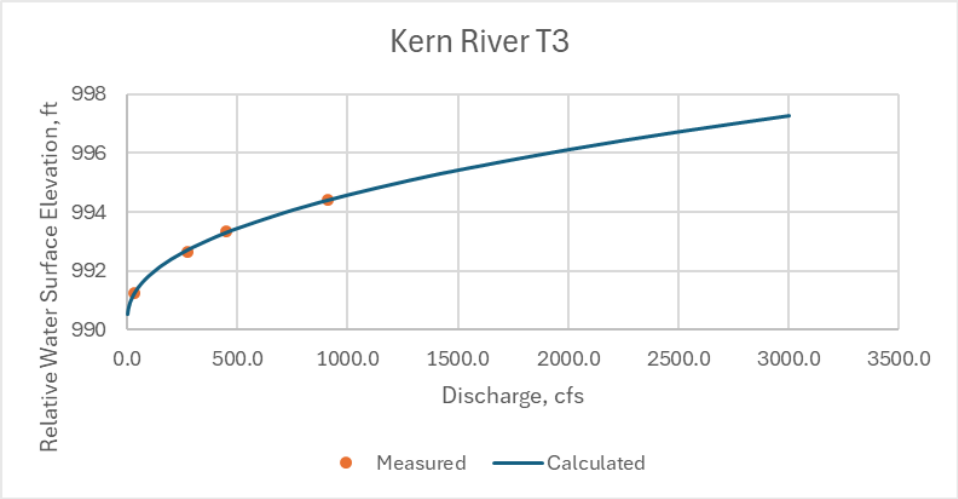


Figure C-3. Kern River stage-discharge regression for Riparian Transect KT3.

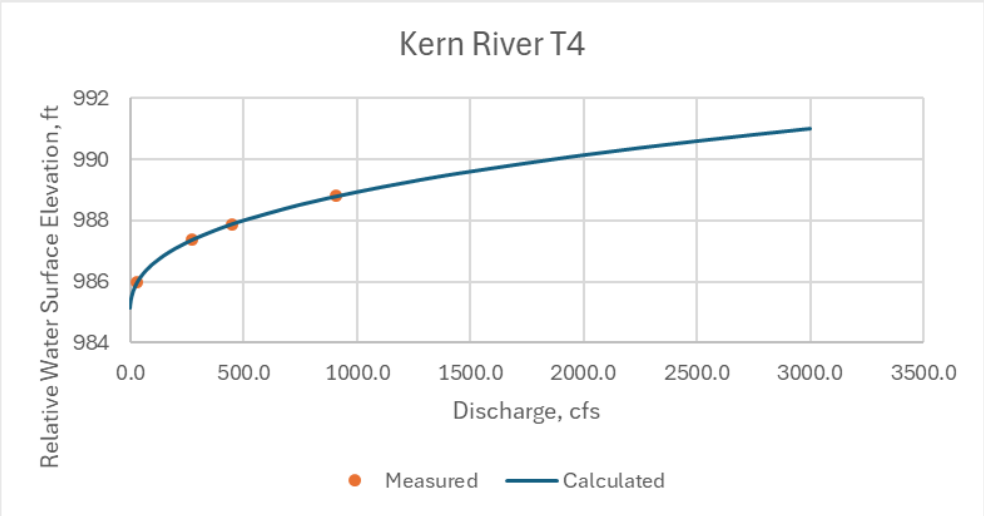


Figure C-4. Kern River stage-discharge regression for Riparian Transect KT4.

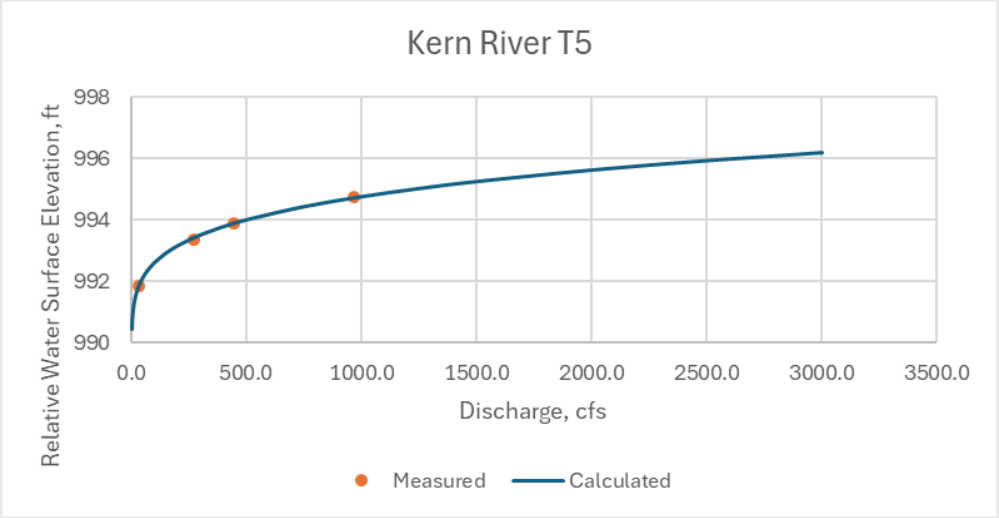


Figure C-5. Kern River stage-discharge regression for Riparian Transect KT5.

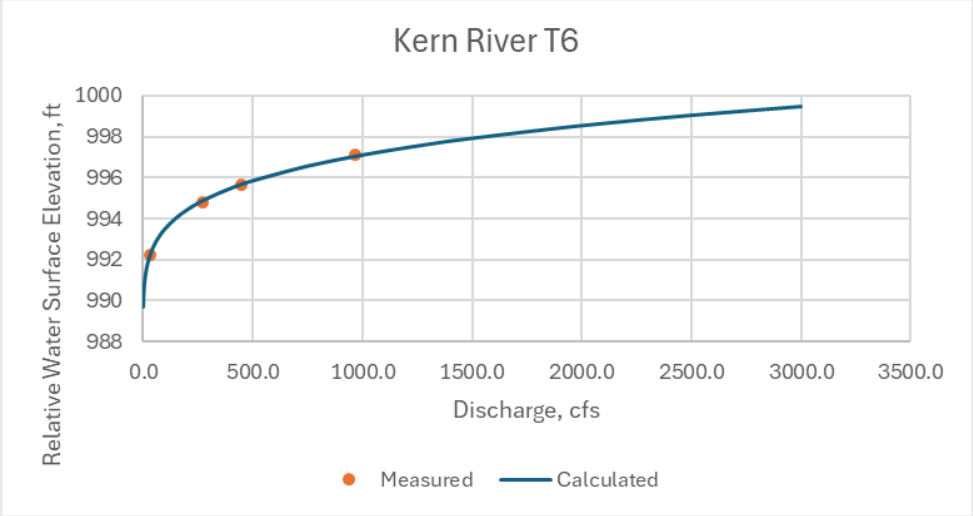


Figure C-6. Kern River stage-discharge regression for Riparian Transect KT6.

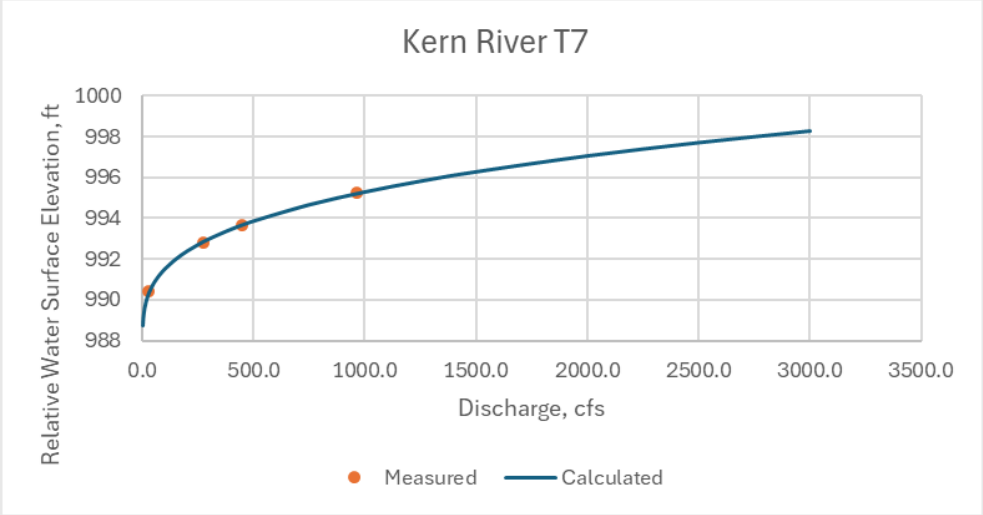


Figure C-7. Kern River stage-discharge regression for Riparian Transect KT7.

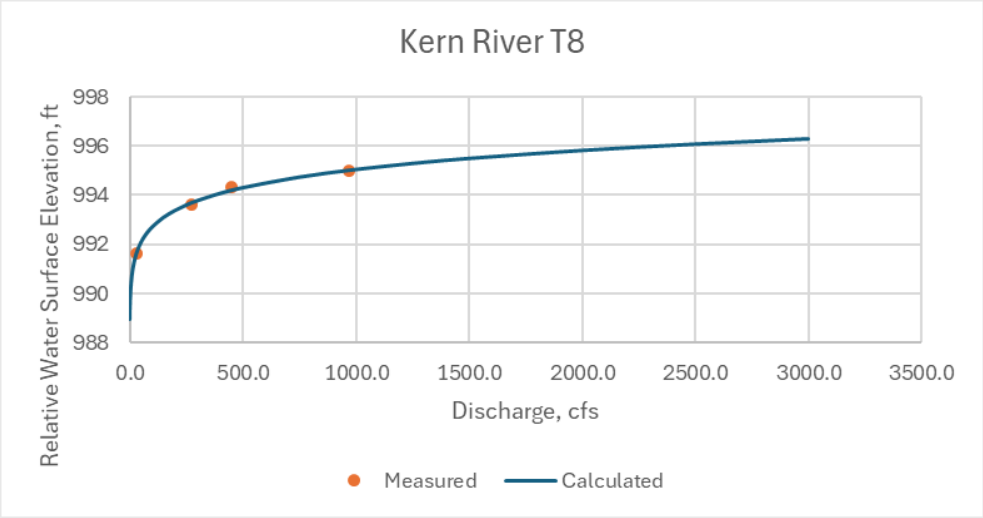


Figure C-8. Kern River stage-discharge regression for Riparian Transect KT8.

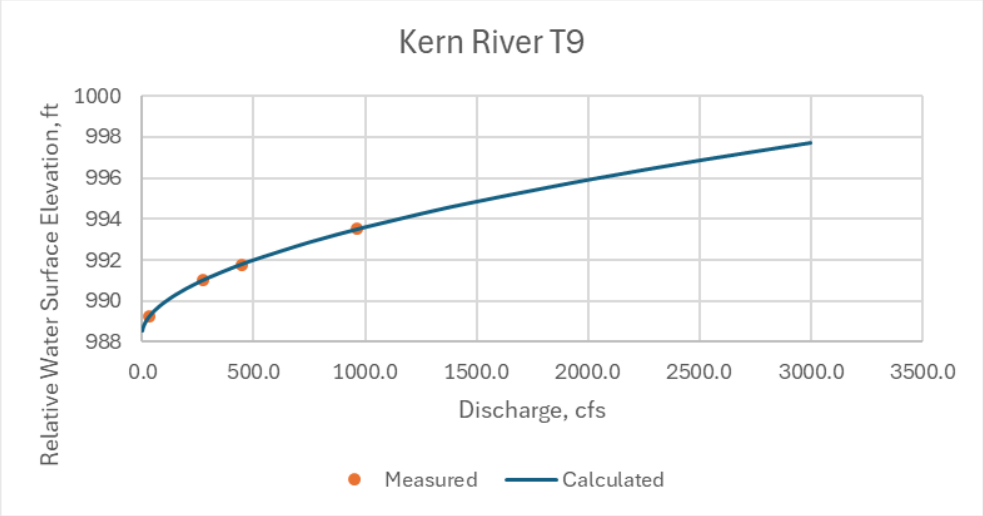


Figure C-9. Kern River stage-discharge regression for Riparian Transect KT9.

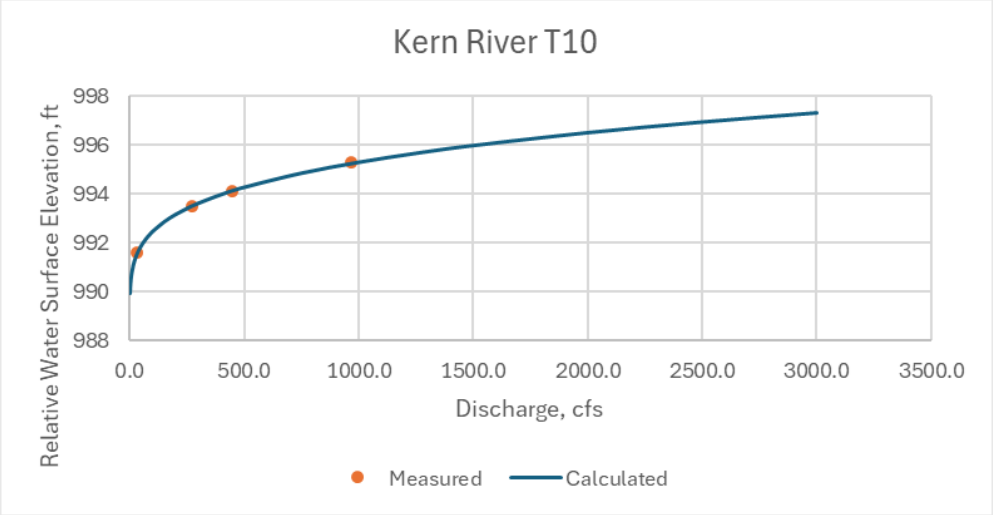


Figure C-10. Kern River stage-discharge regression for Riparian Transect KT10.

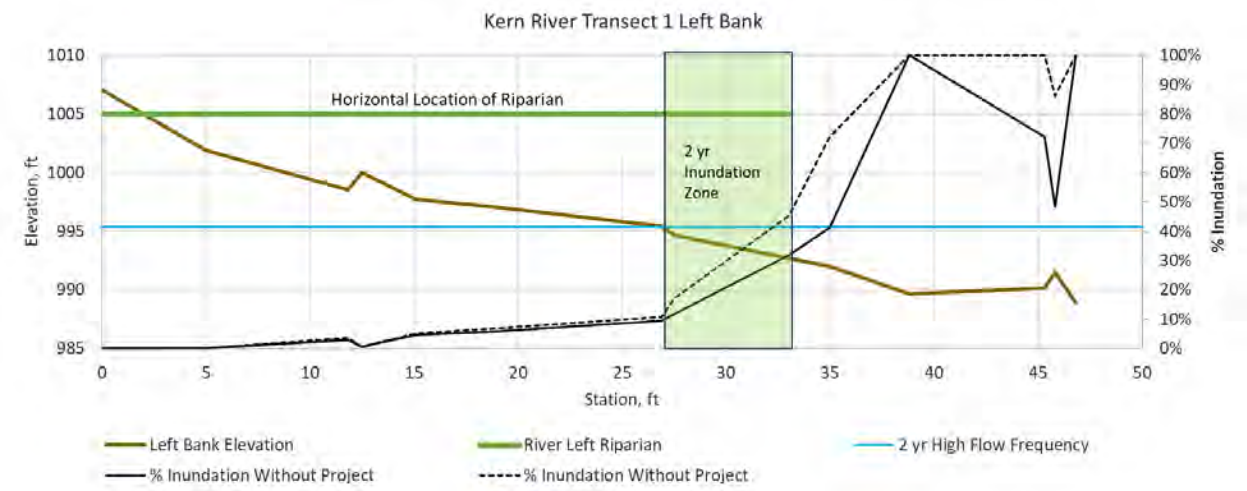


Figure C-11. Kern River inundation at Riparian Transect KT1, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

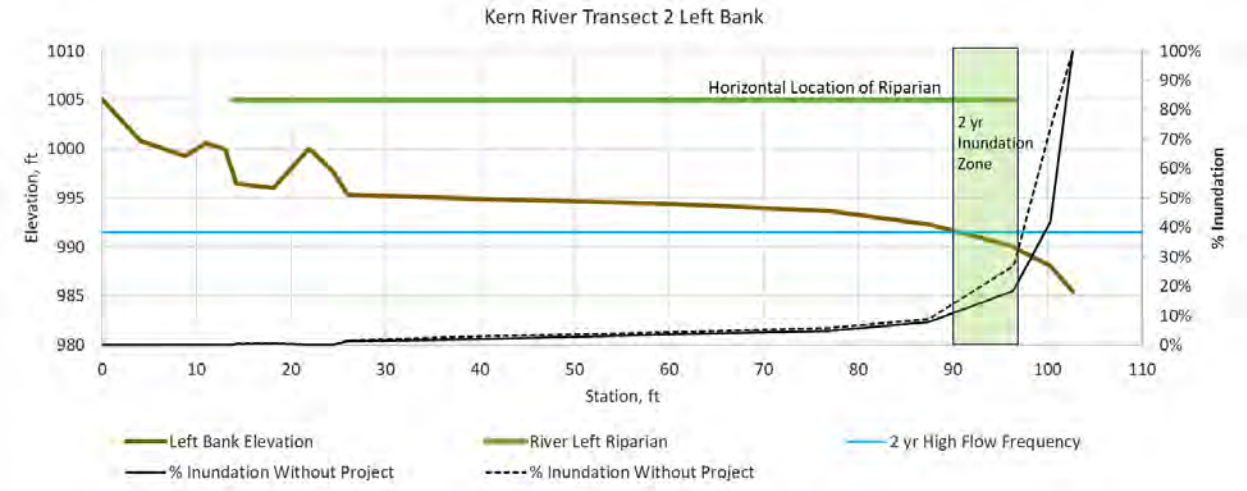


Figure C-12. Kern River inundation at Riparian Transect KT2, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

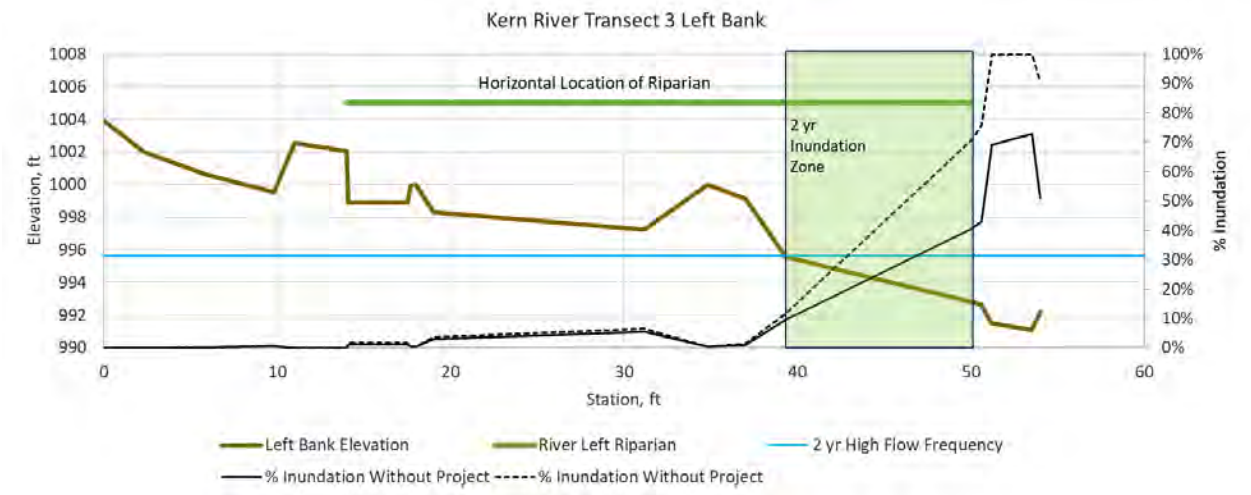


Figure C-13. Kern River inundation at Riparian Transect KT3, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

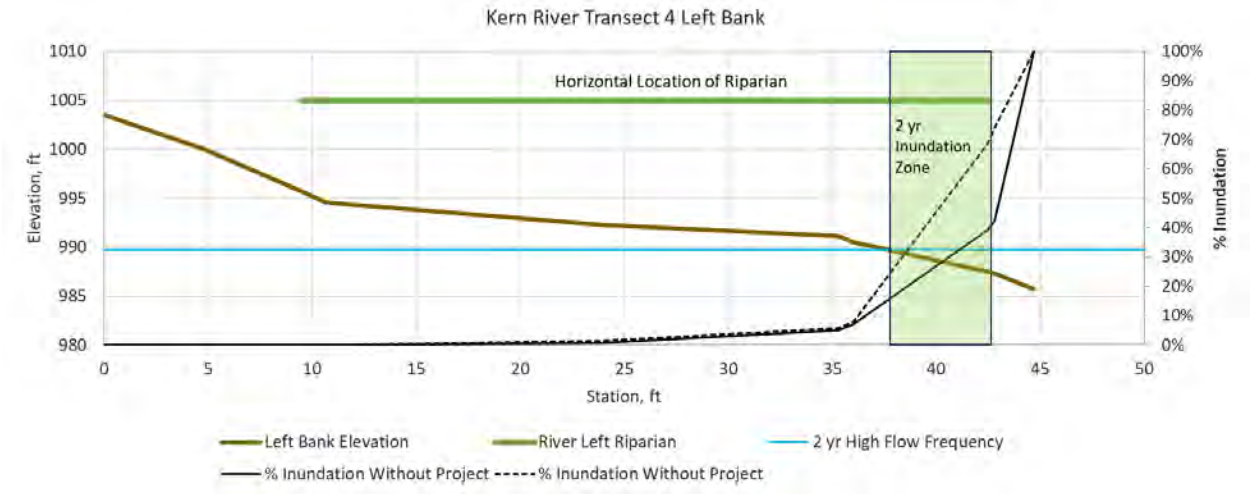


Figure C-14. Kern River inundation at Riparian Transect KT4, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

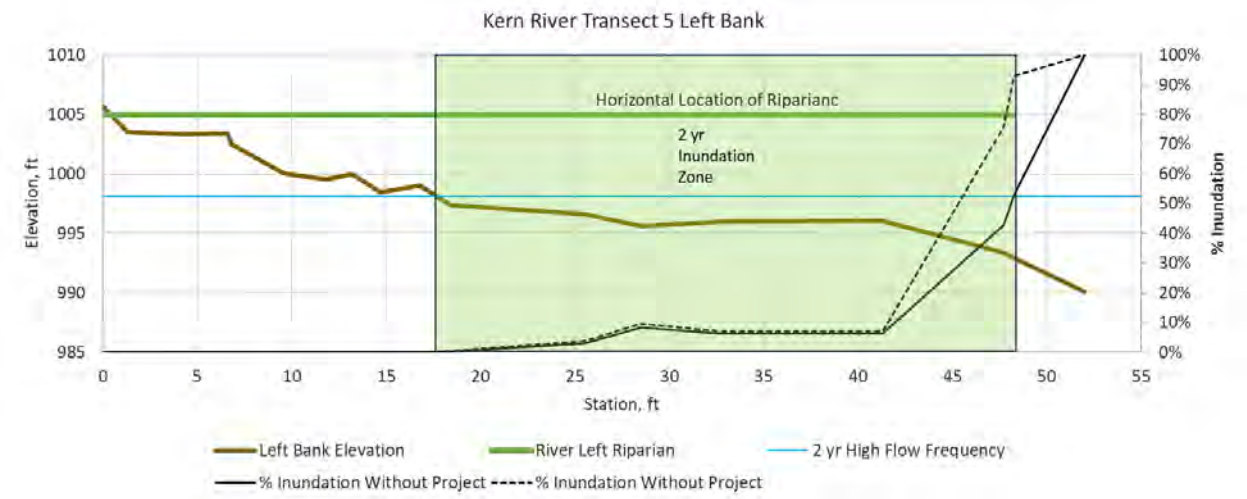


Figure C-15 Kern River inundation at Riparian Transect KT5, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

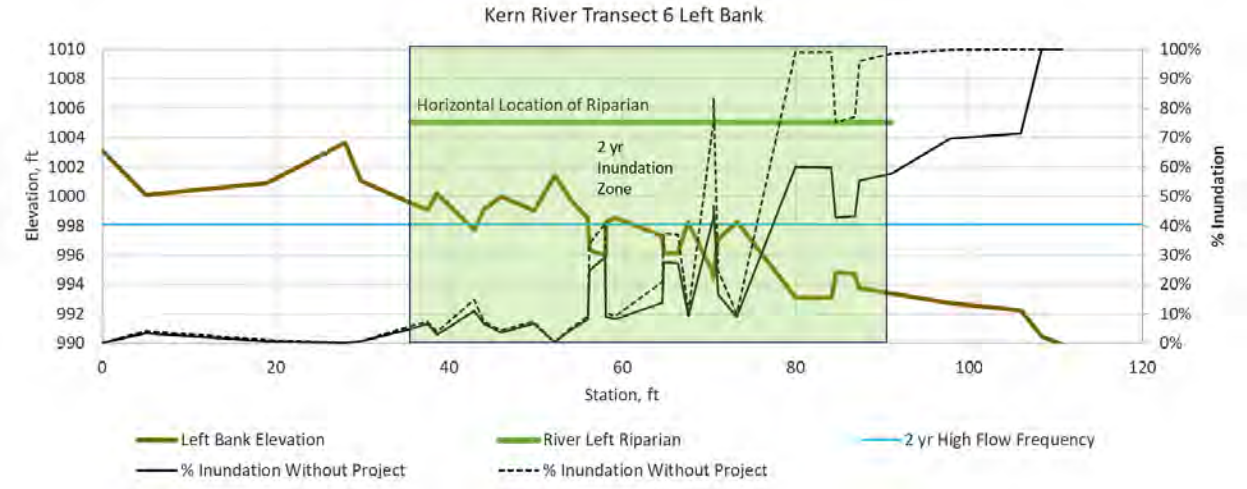


Figure C-16. Kern River inundation at Riparian Transect KT6, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

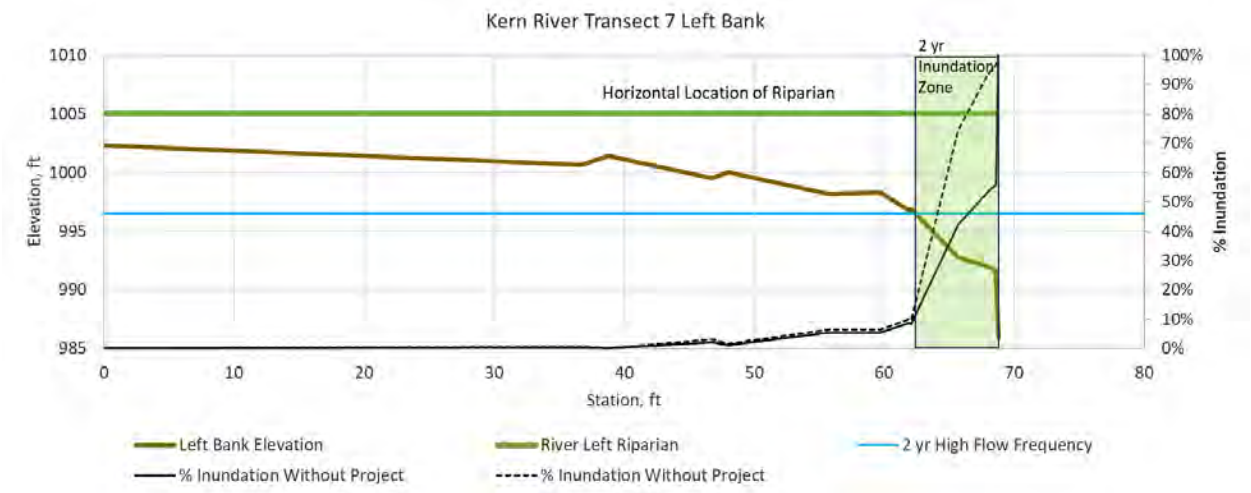


Figure C-17. Kern River inundation at Riparian Transect KT7, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

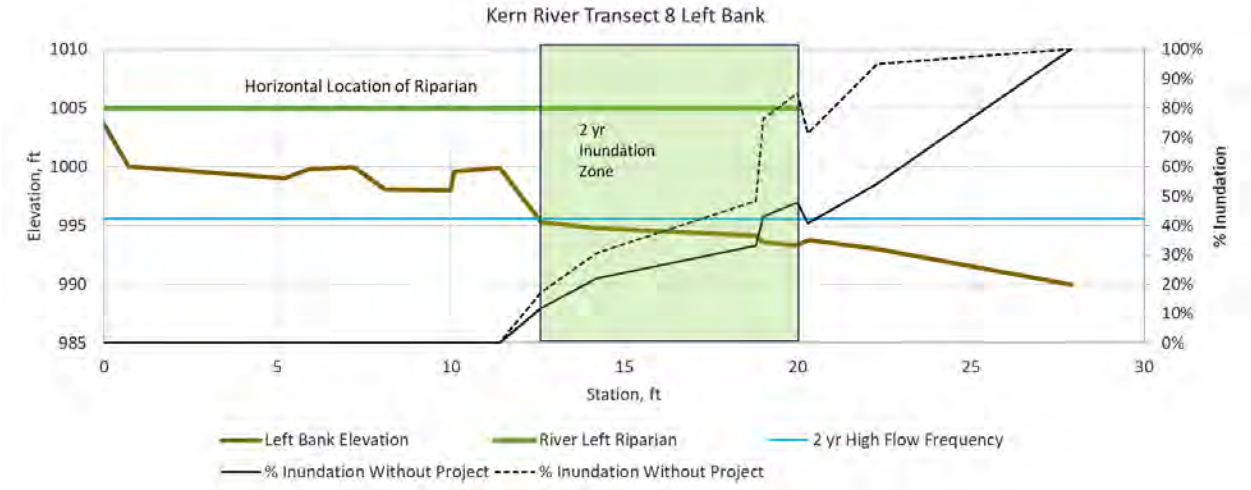


Figure C-18. Kern River inundation at Riparian Transect KT8, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

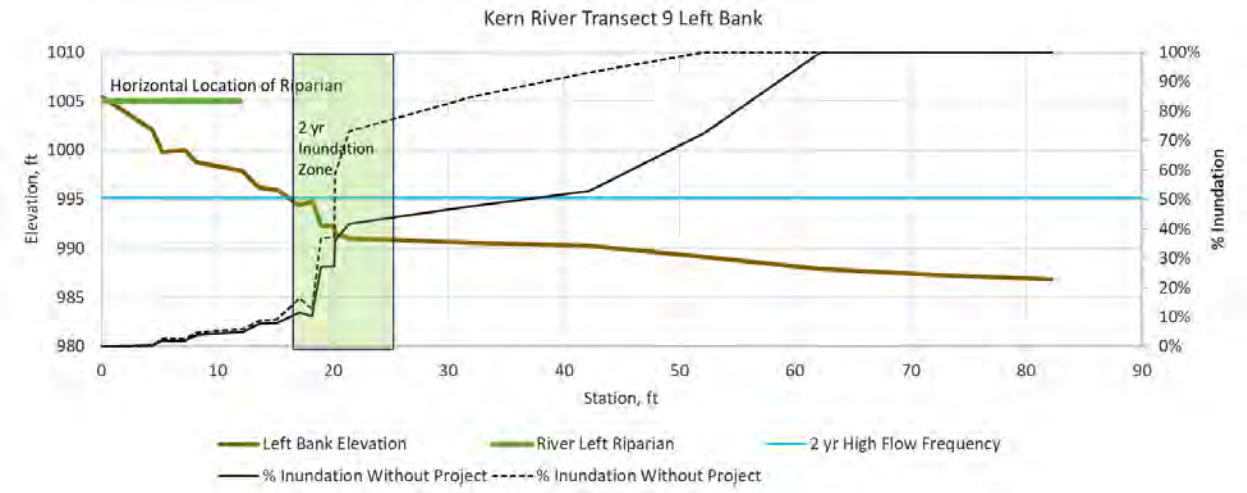


Figure C-19. Kern River inundation at Riparian Transect KT9, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

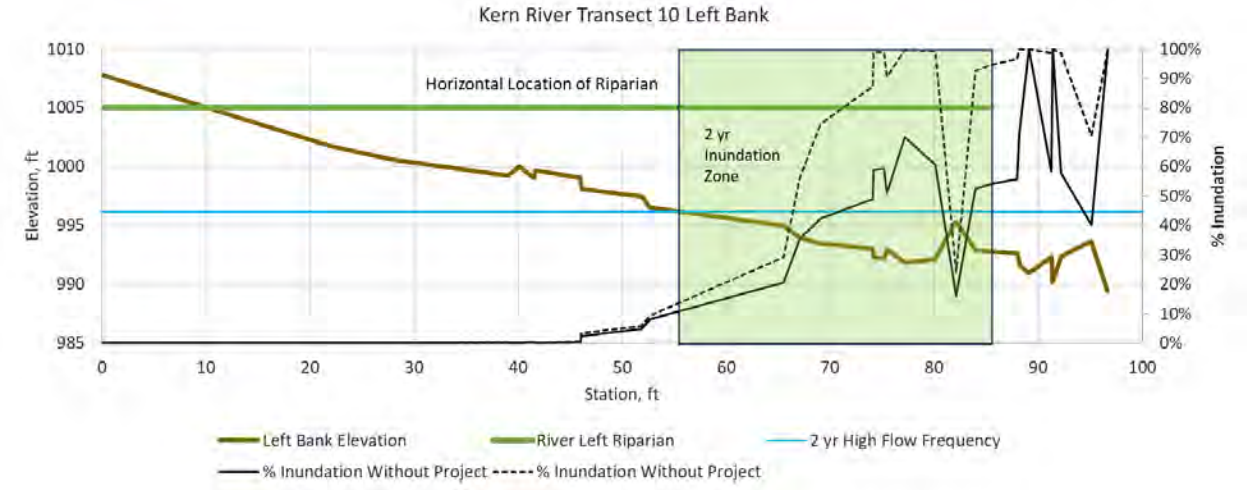


Figure C-20. Kern River inundation at Riparian Transect KT10, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

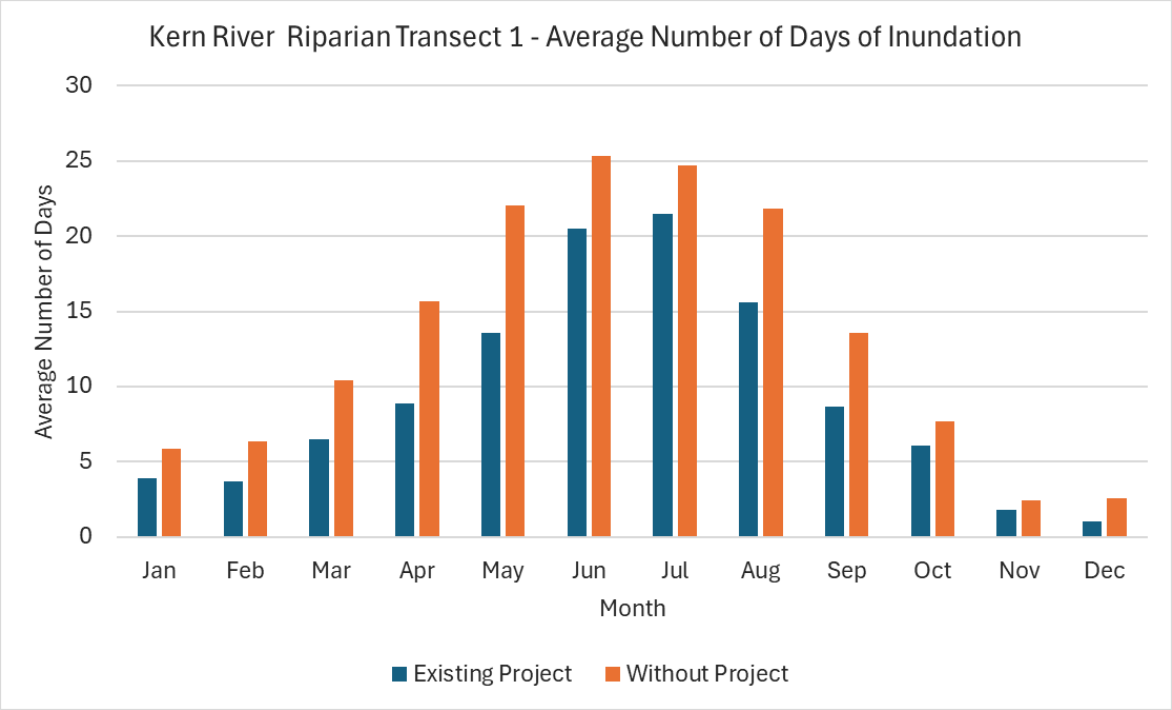


Figure C-21. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT1

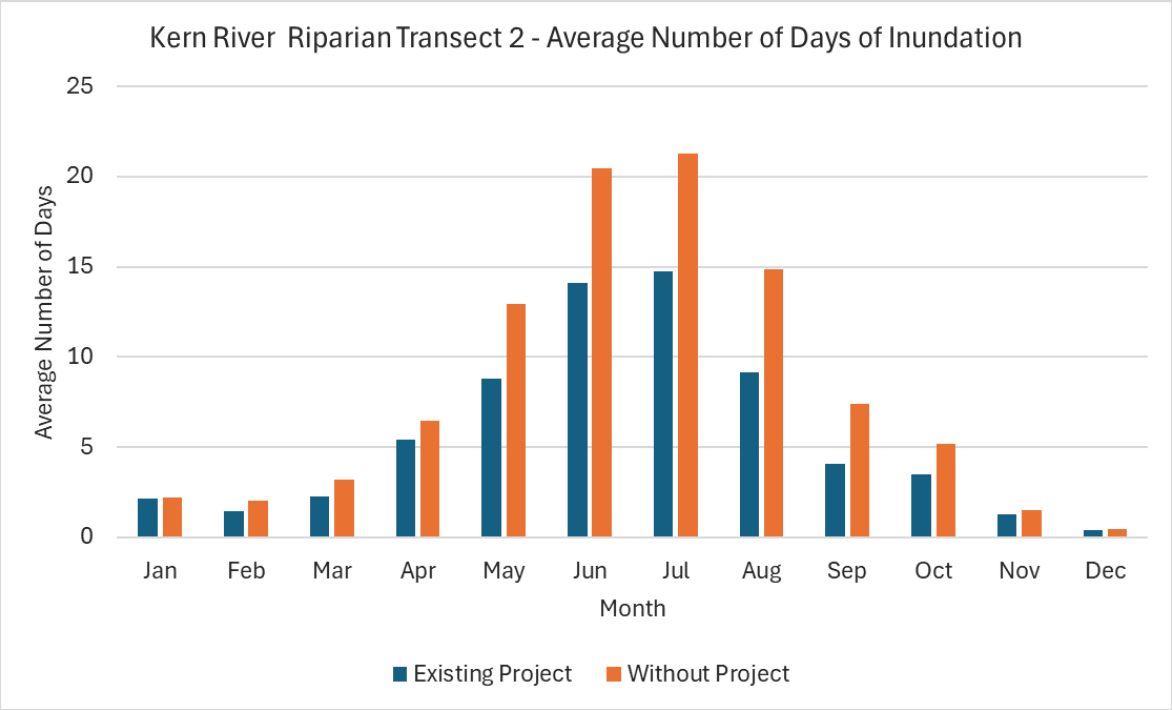


Figure C-22. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT2

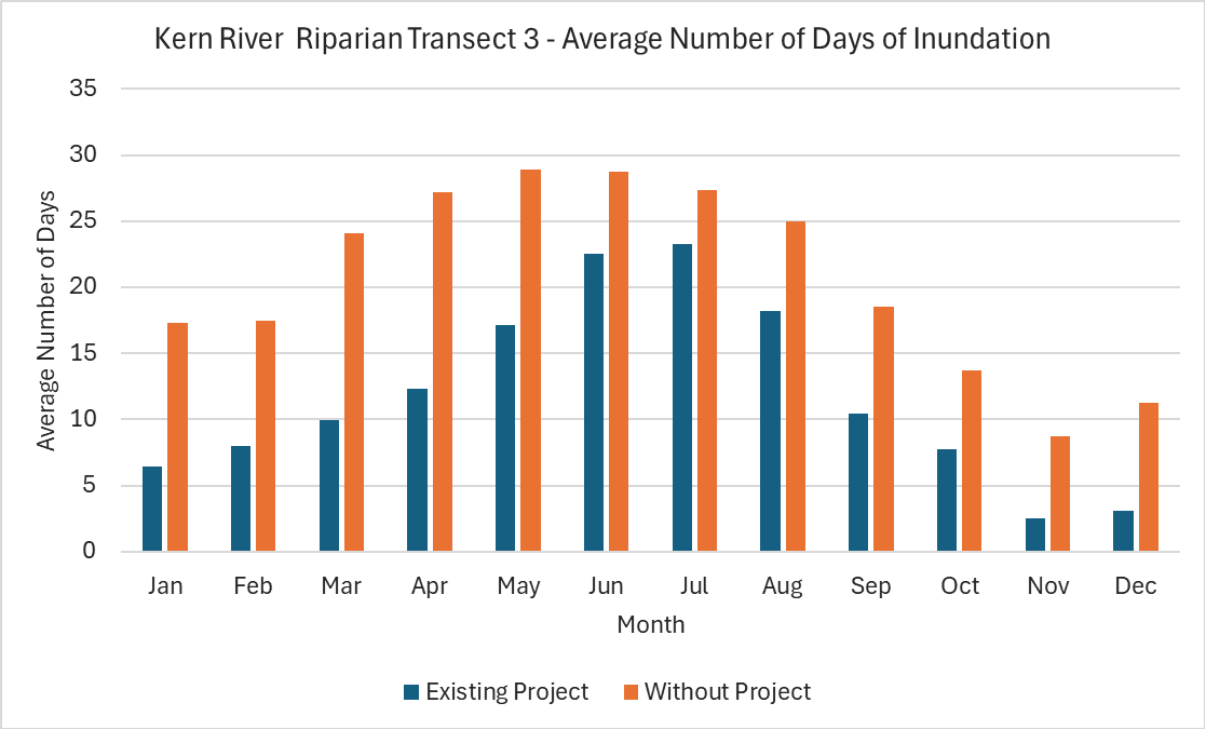


Figure C-23. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT3

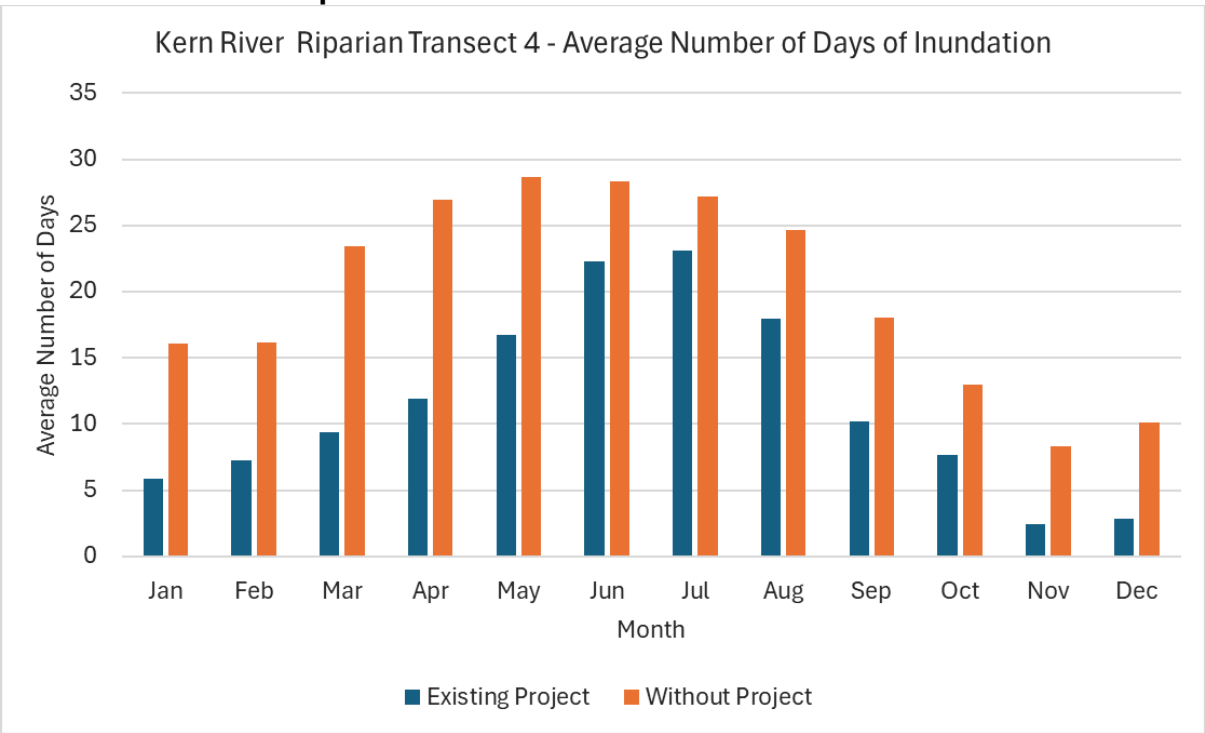


Figure C-24. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT4

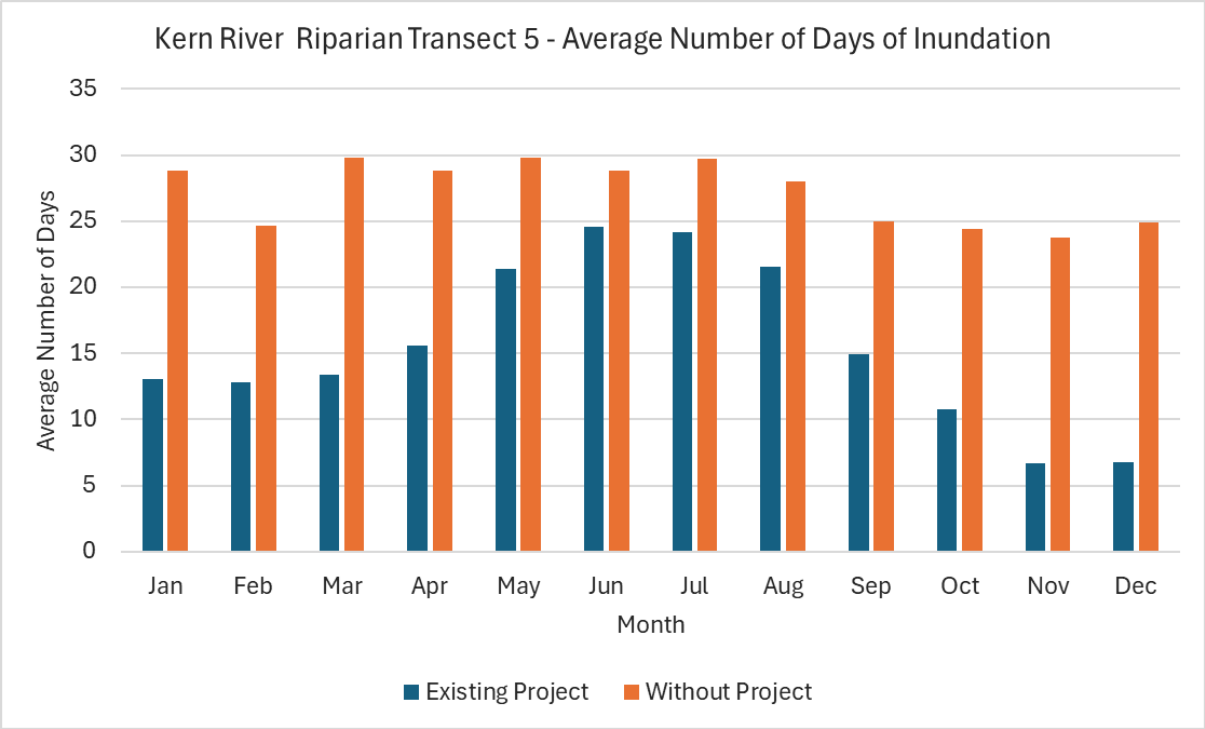


Figure C-25. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT5

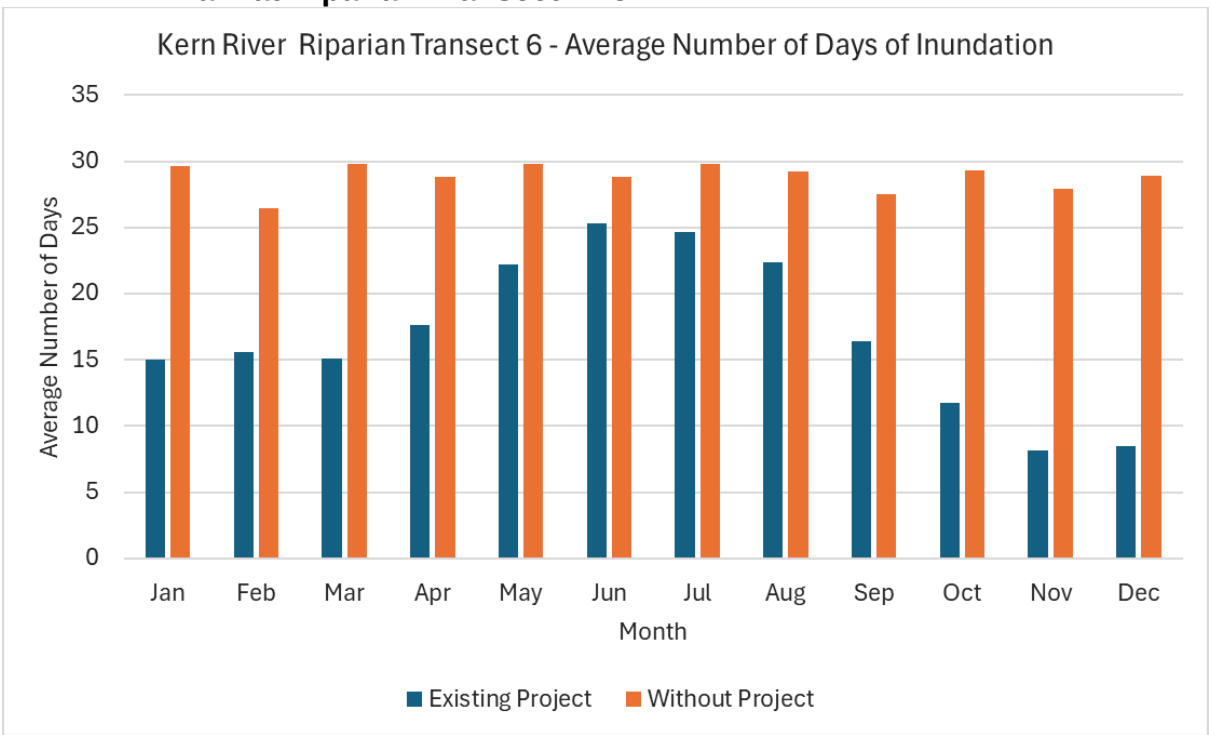


Figure C-26. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT6

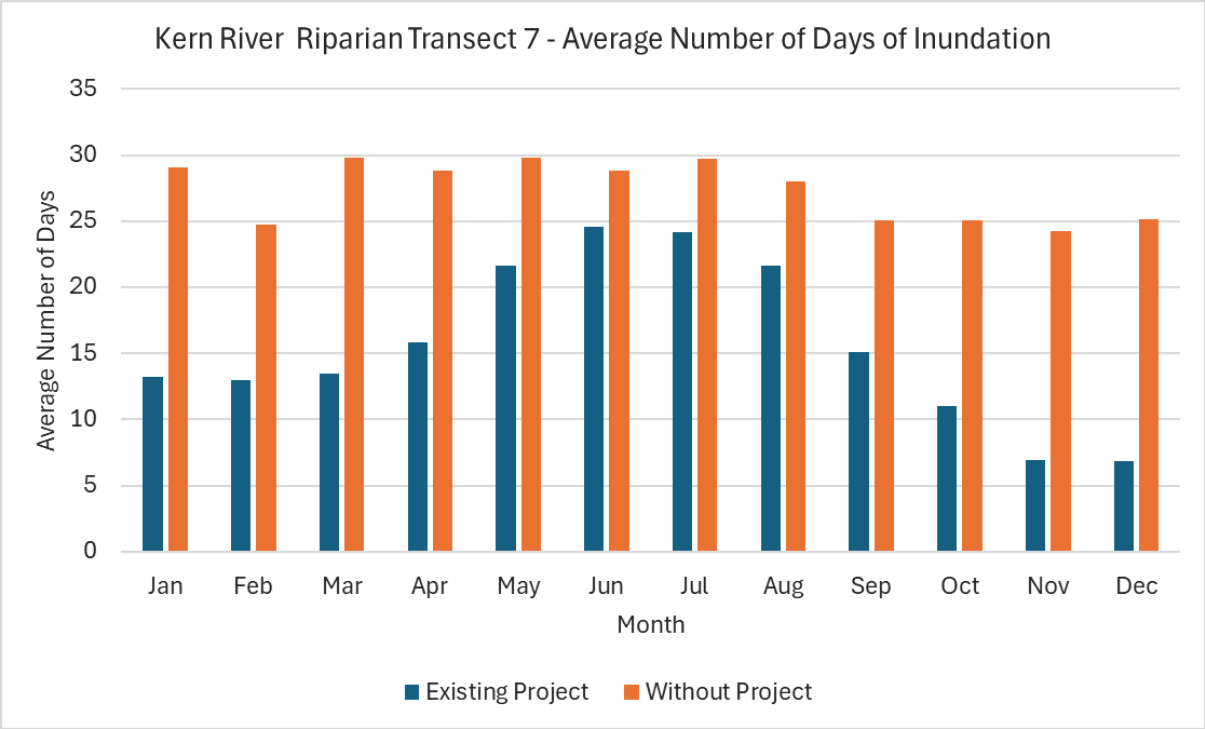


Figure C-27. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT7

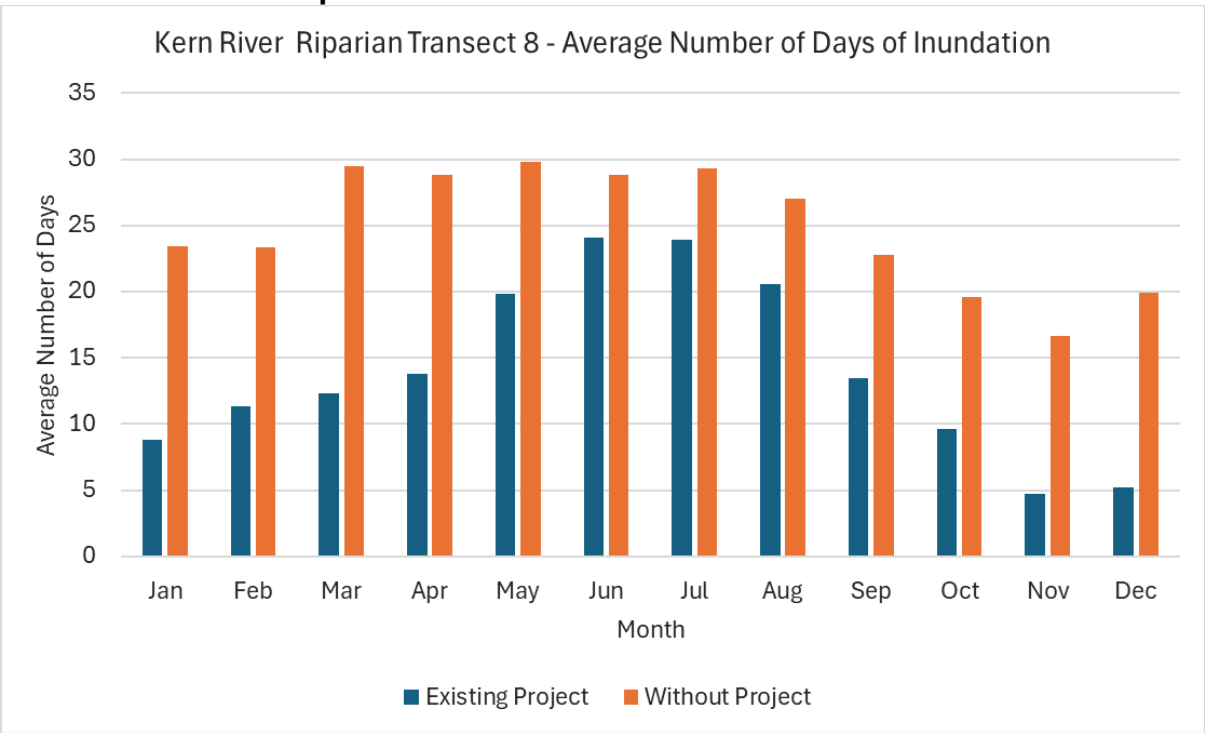


Figure C-28. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT8

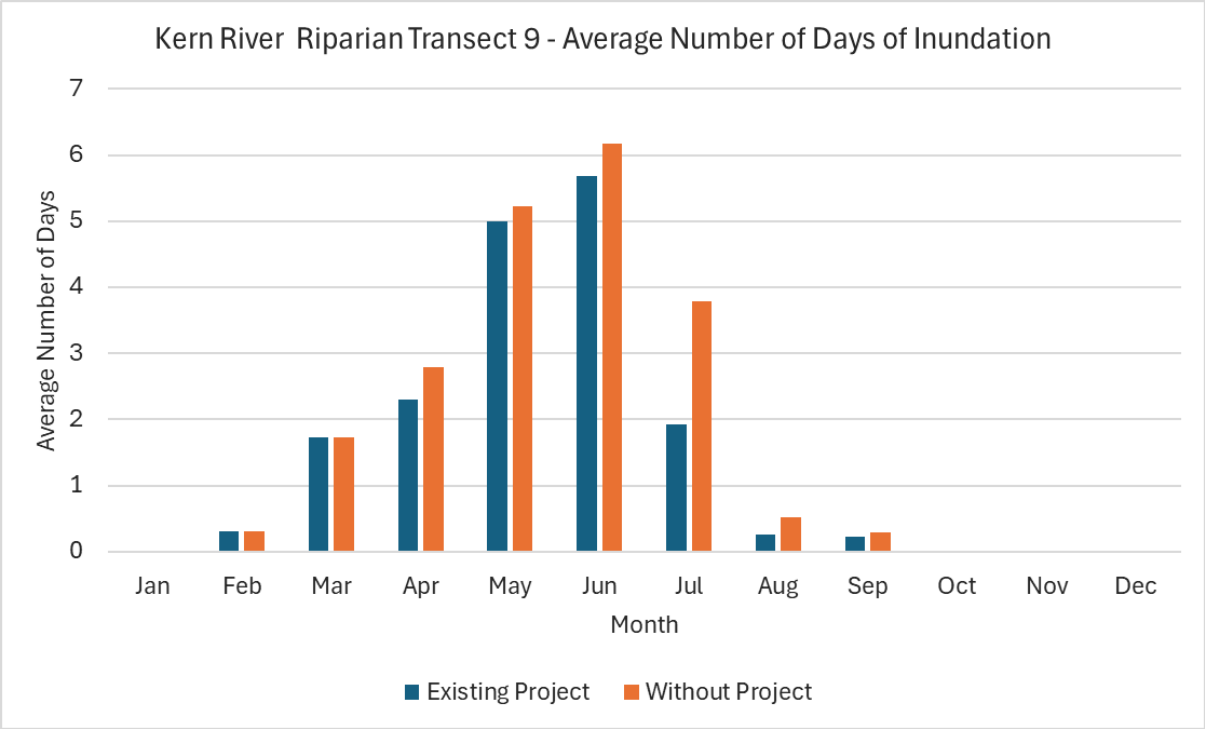


Figure C-29. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT9

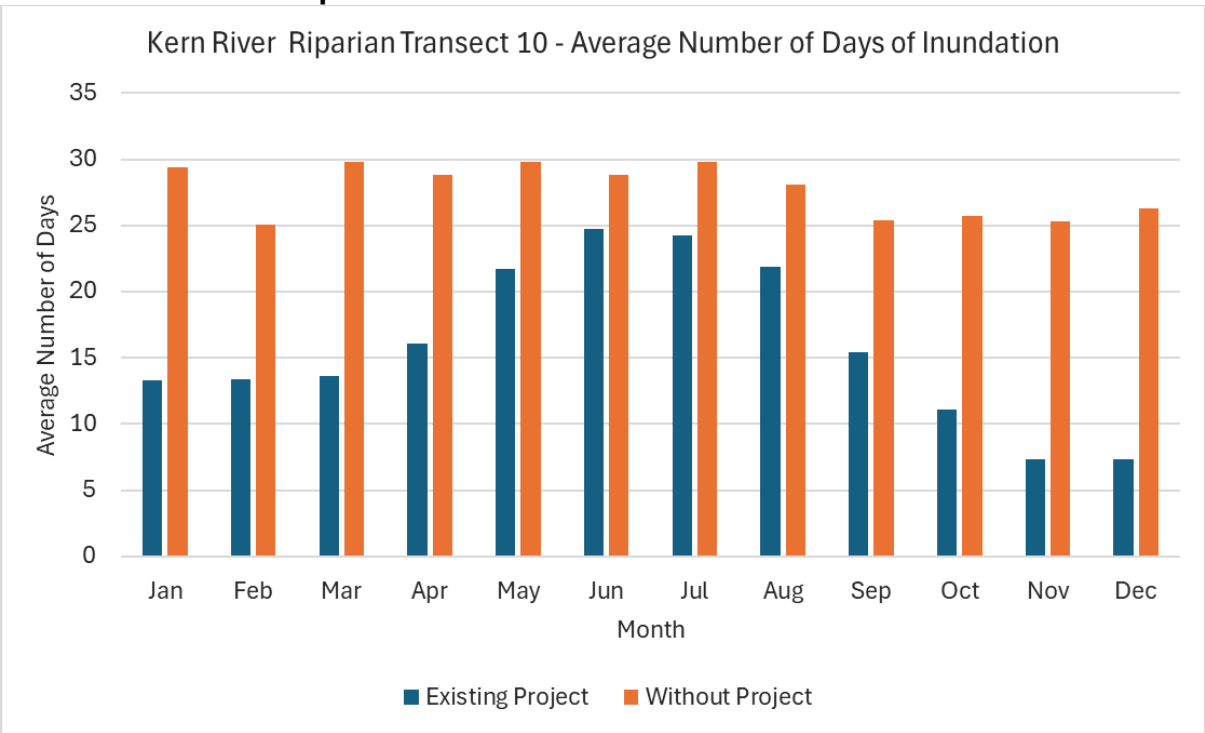
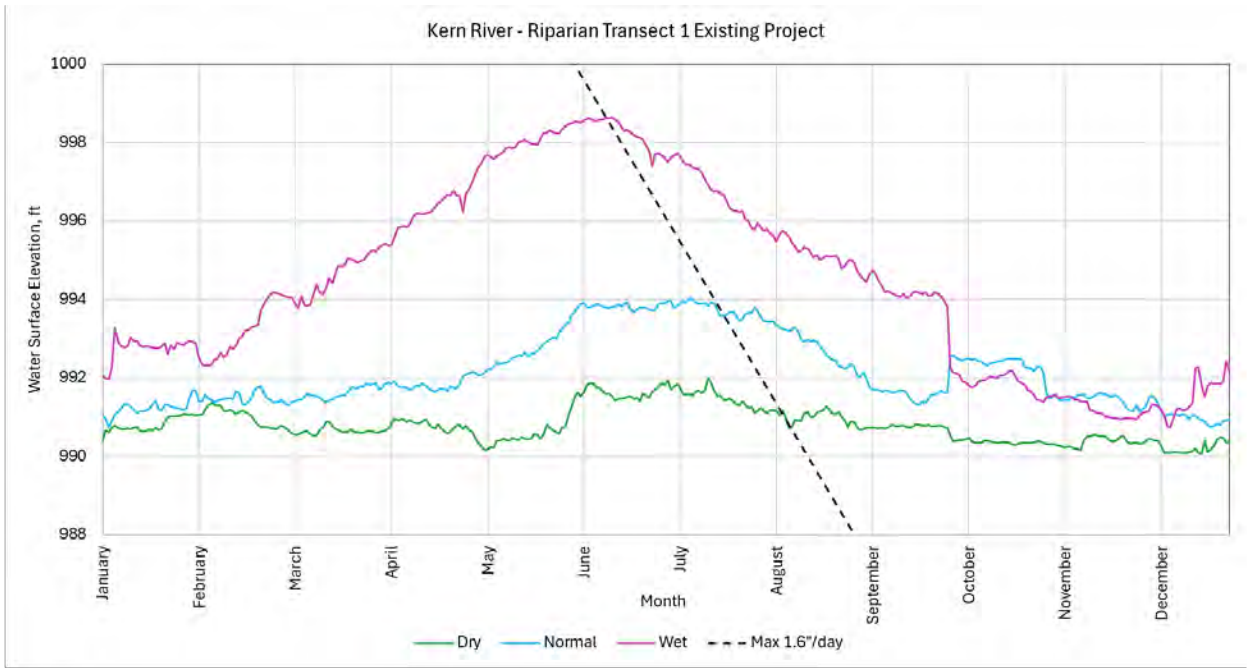


Figure C-30. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT10



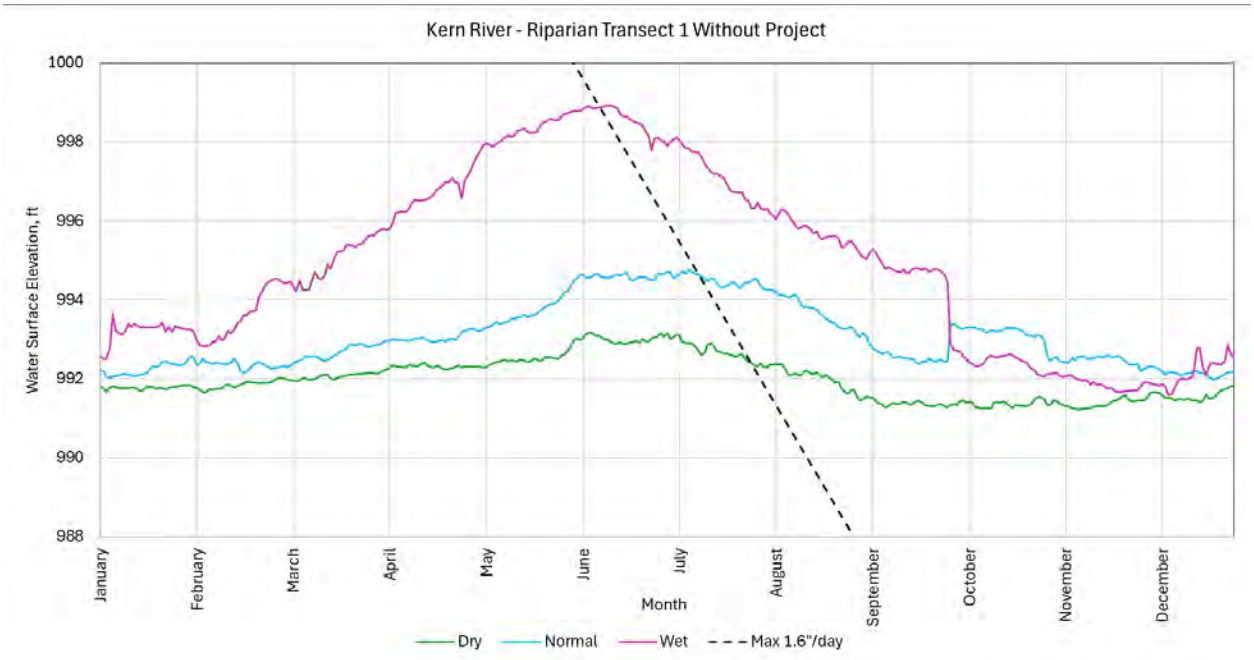
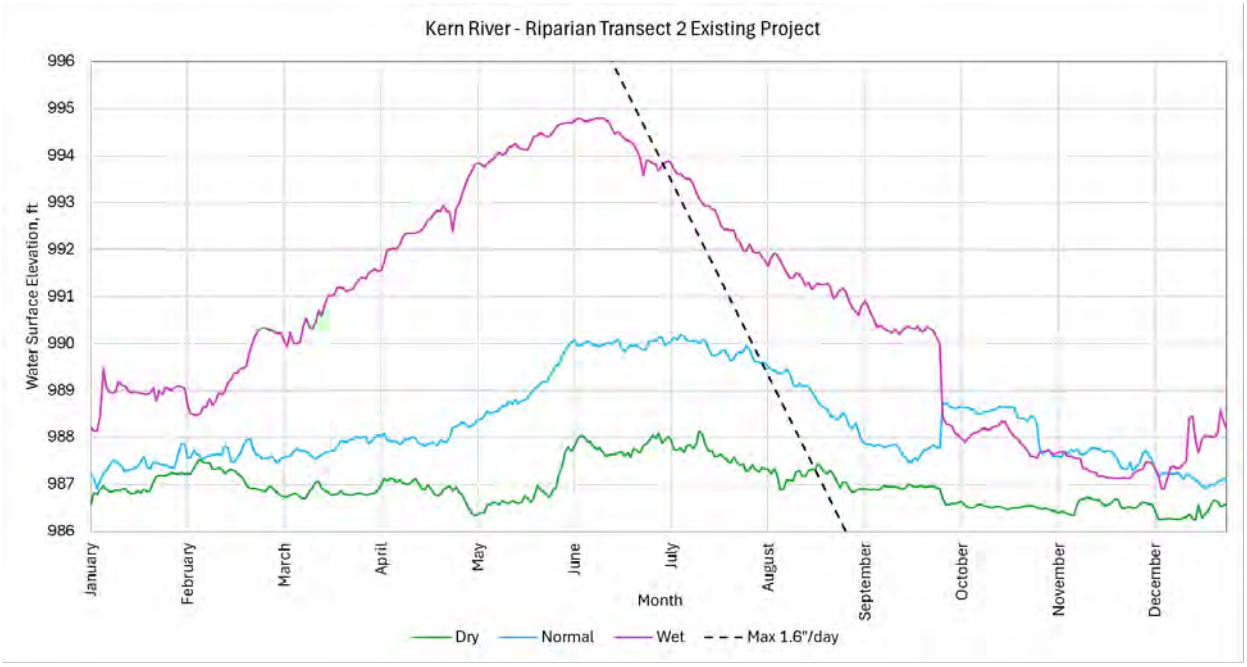


Figure C-31. Riparian Transect KT1 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.



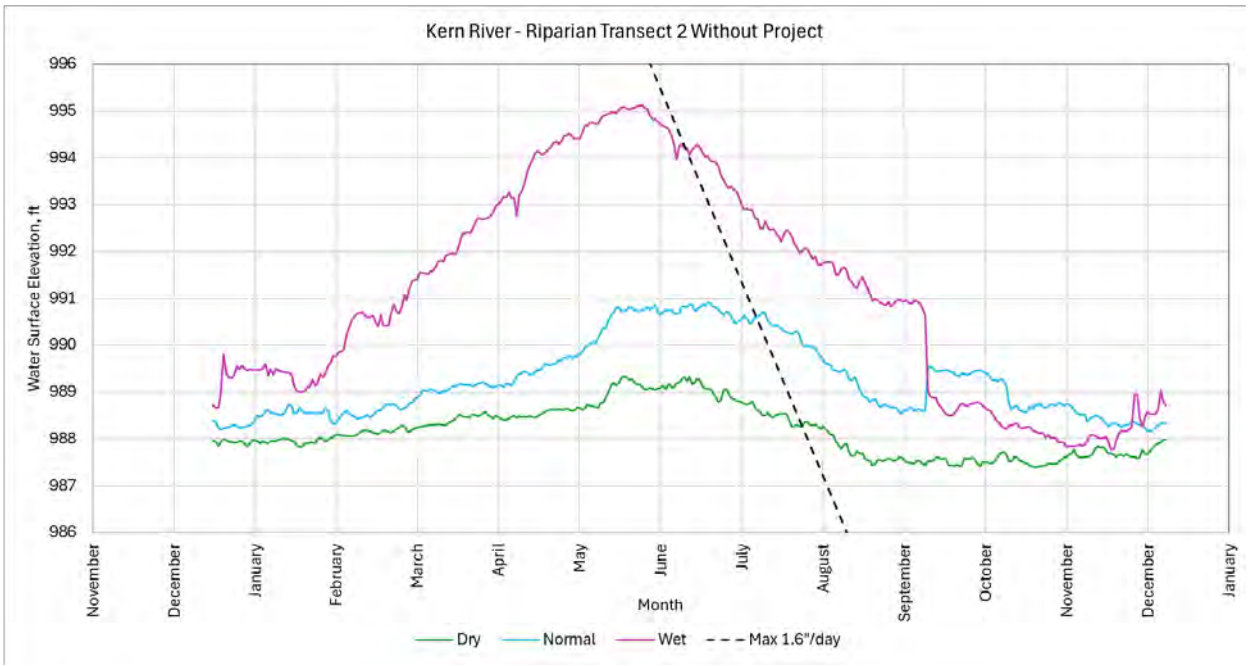


Figure C-32. Riparian Transect KT2 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.

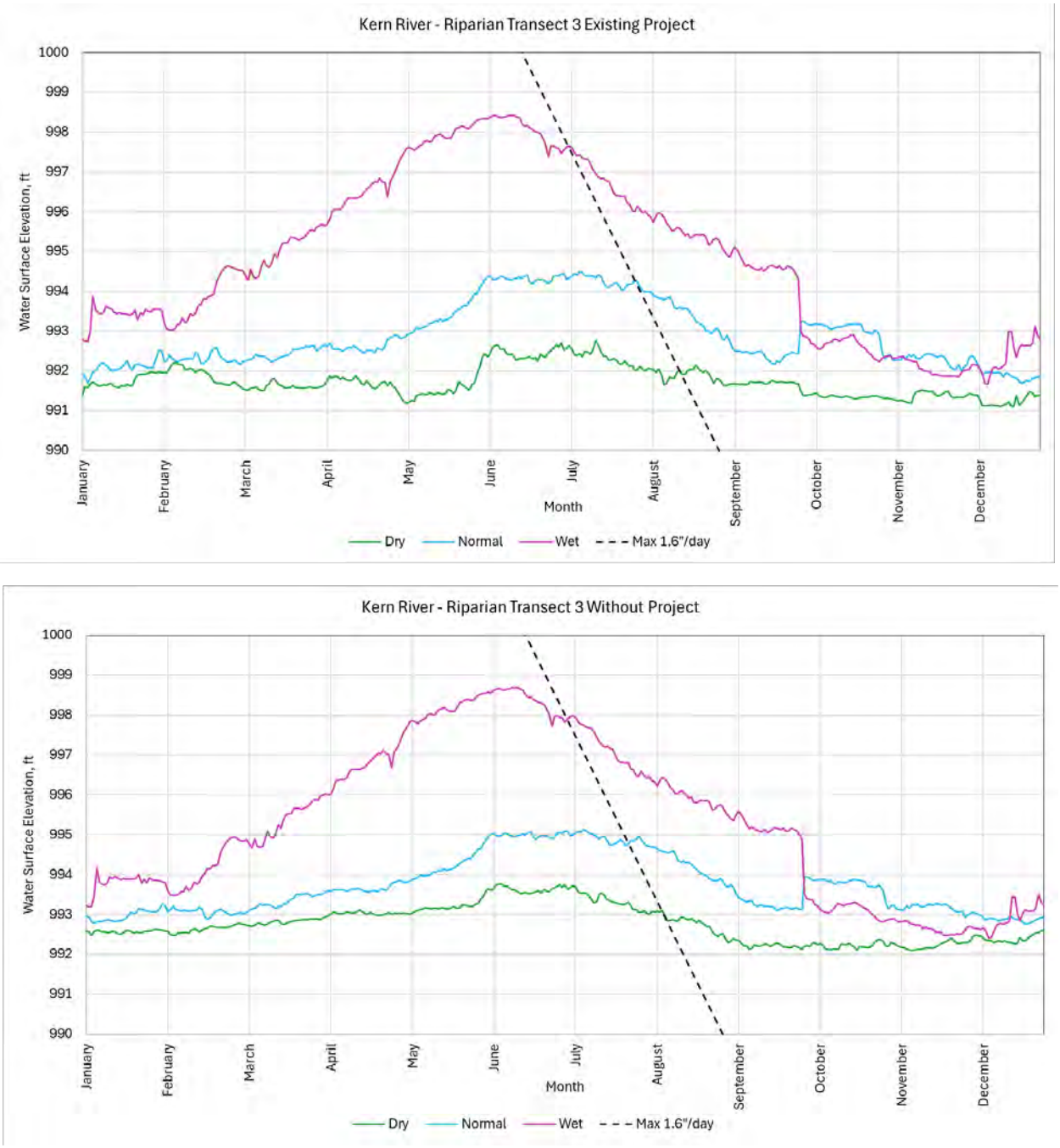


Figure C-33. Riparian Transect KT3 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.

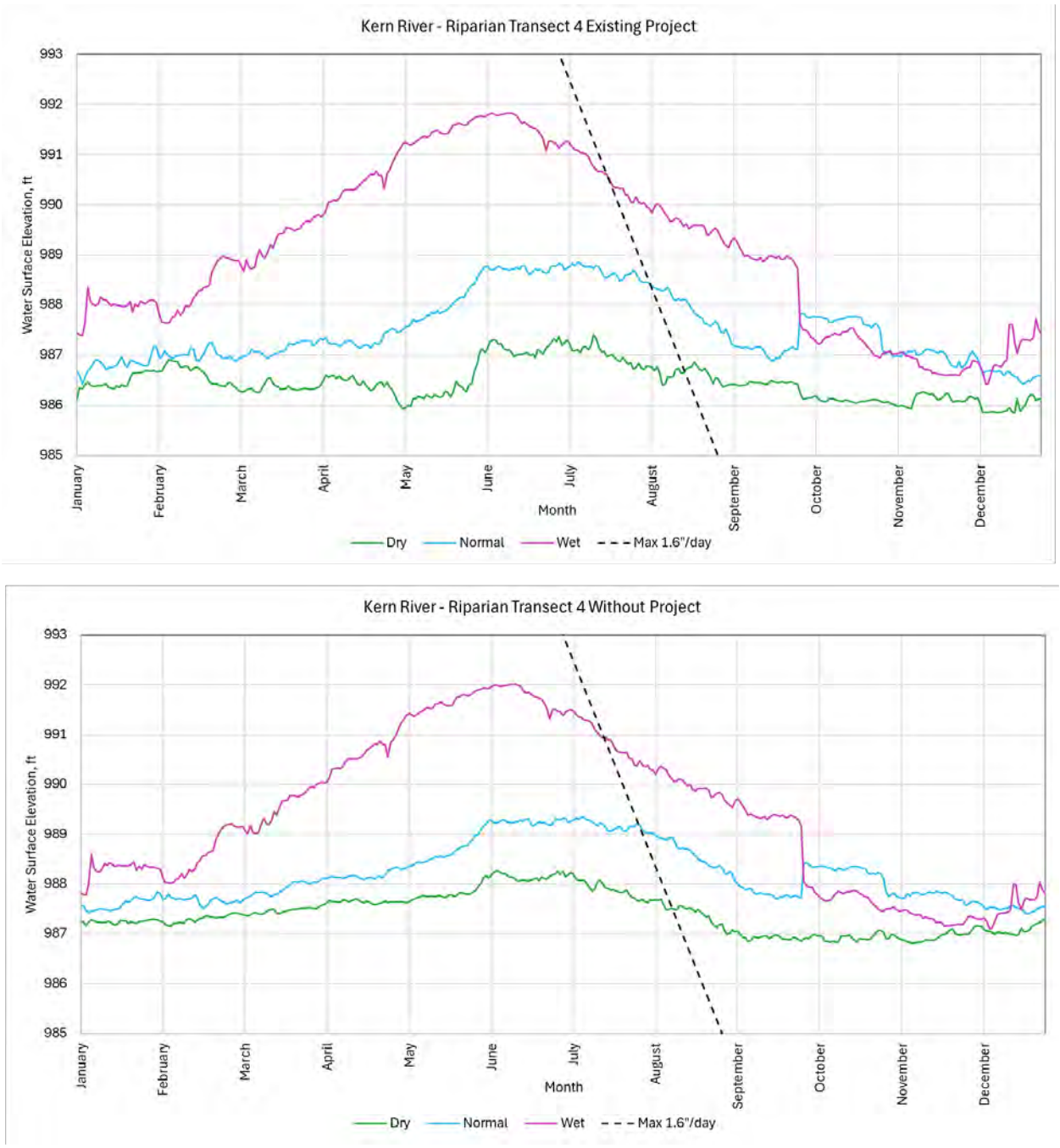


Figure C-34. Riparian Transect KT4 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.

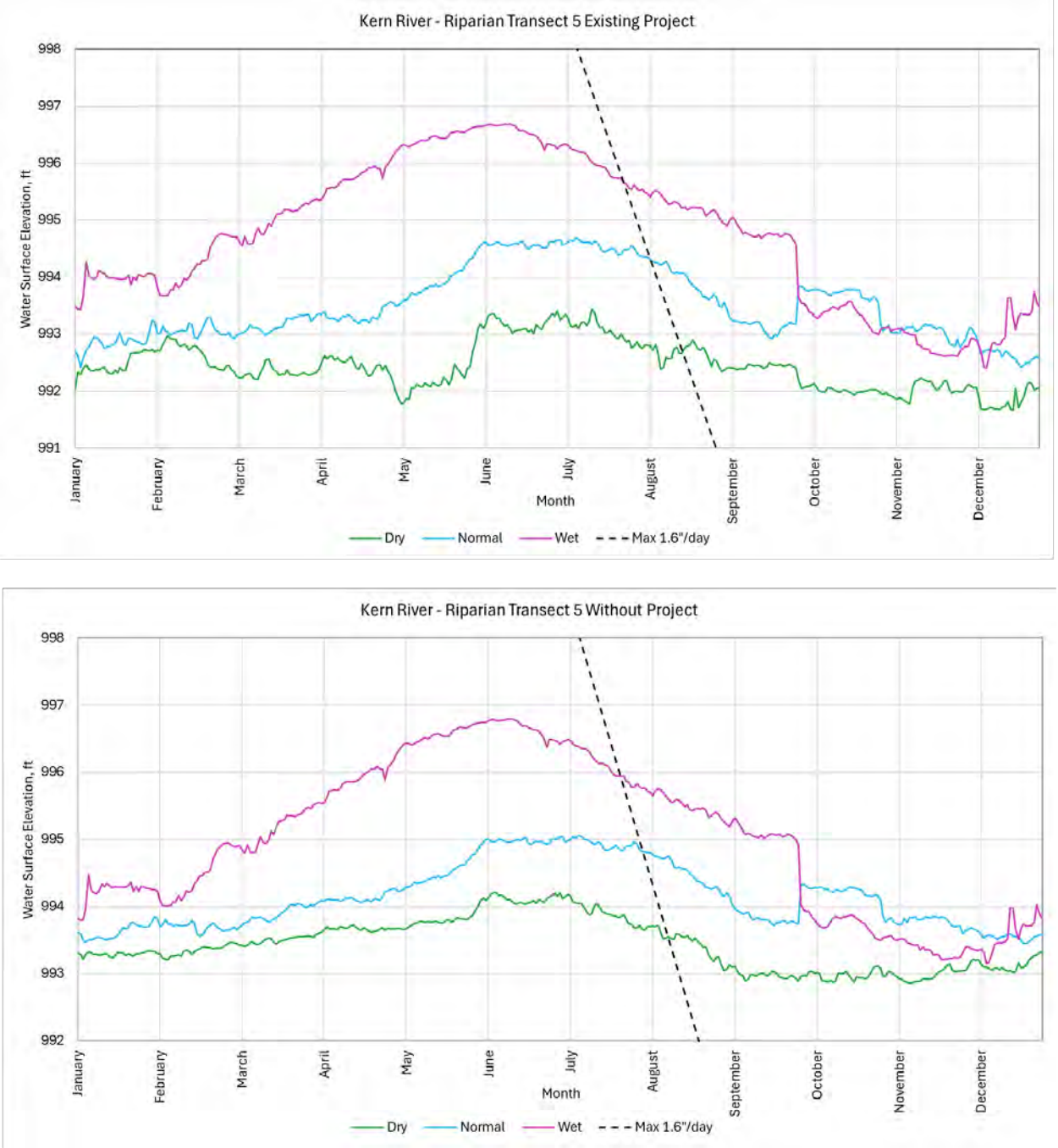


Figure C-35. Riparian Transect KT5 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.

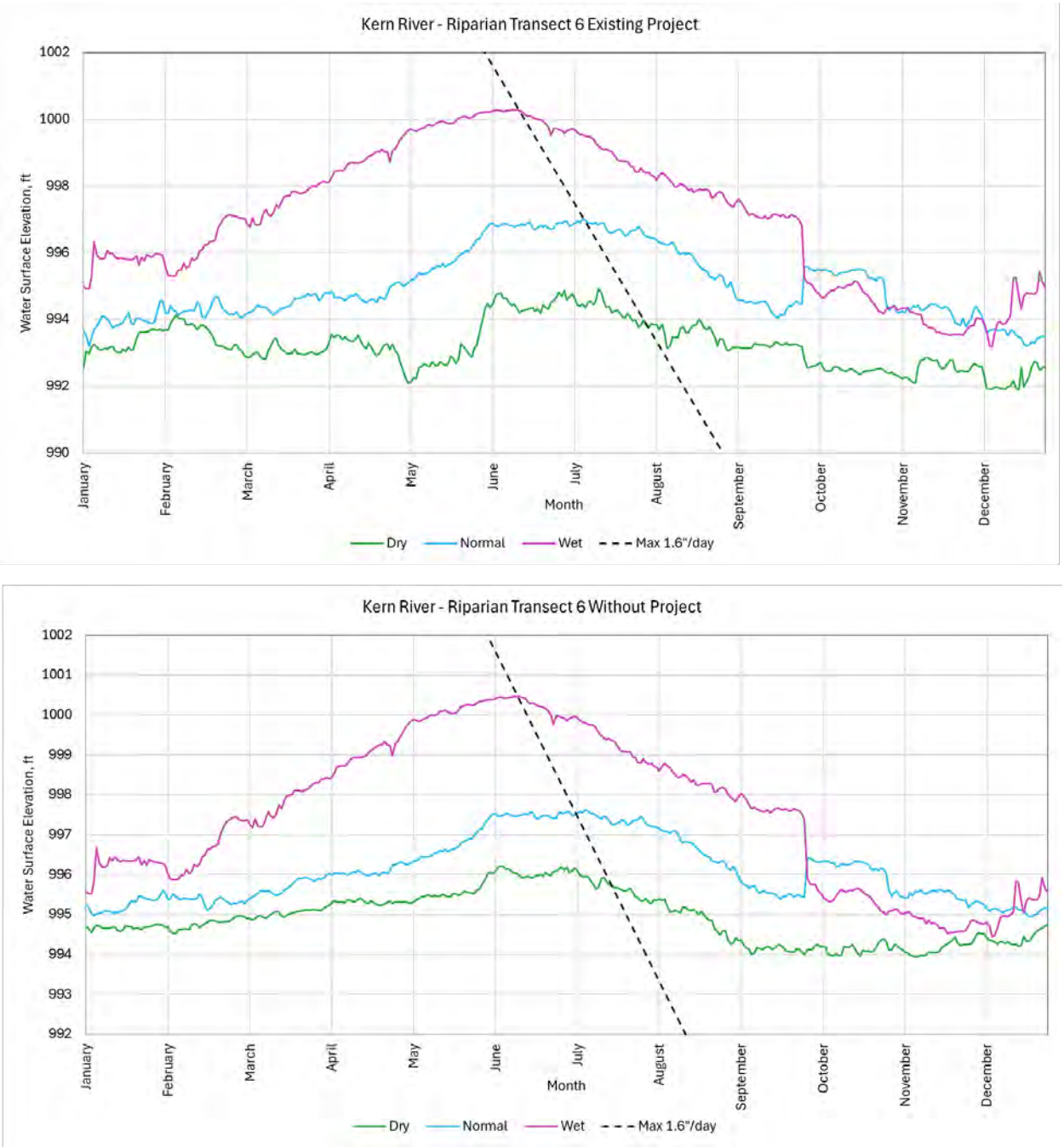


Figure C-36. Riparian Transect KT6 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.

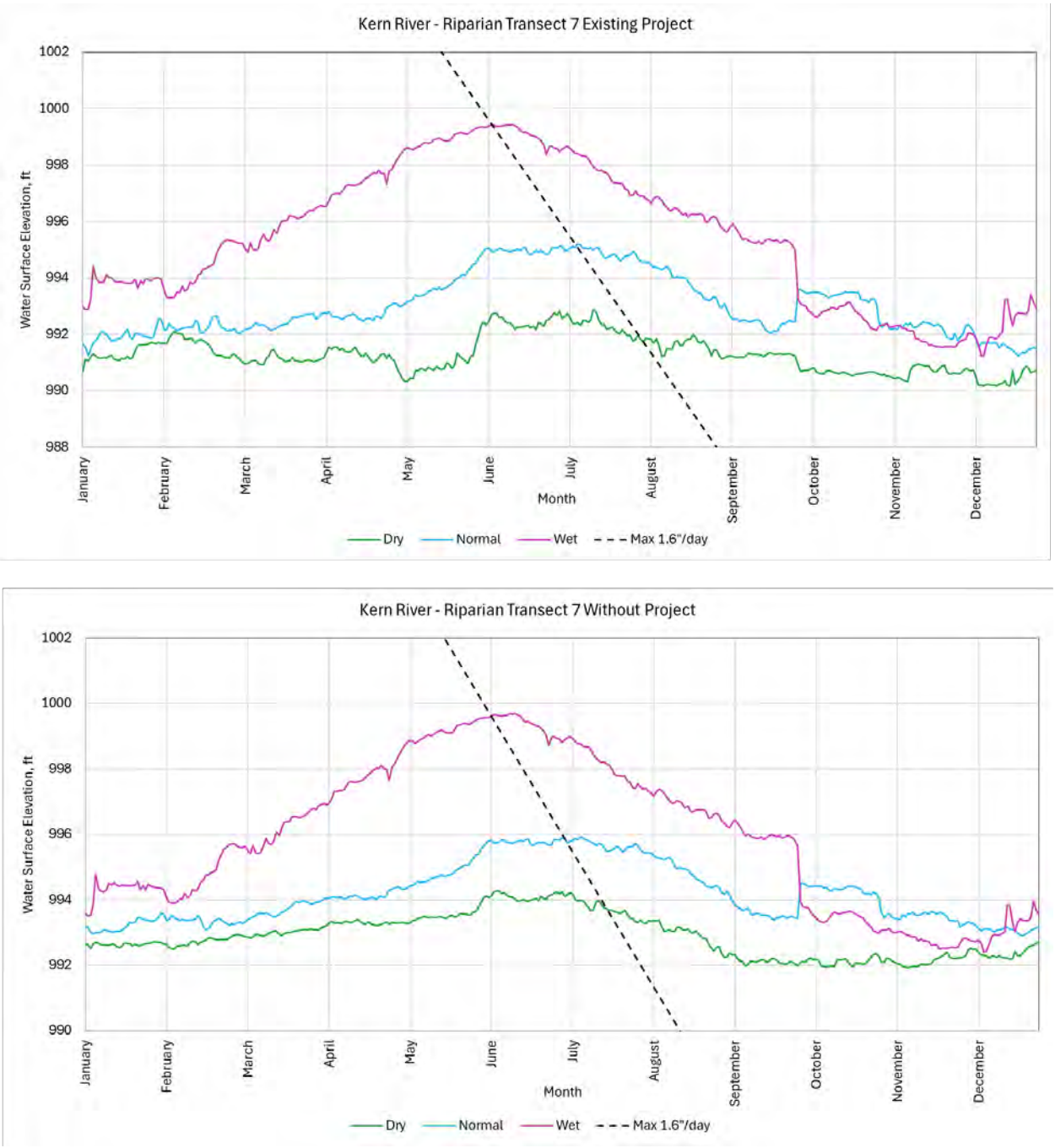


Figure C-37. Riparian Transect KT7 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.

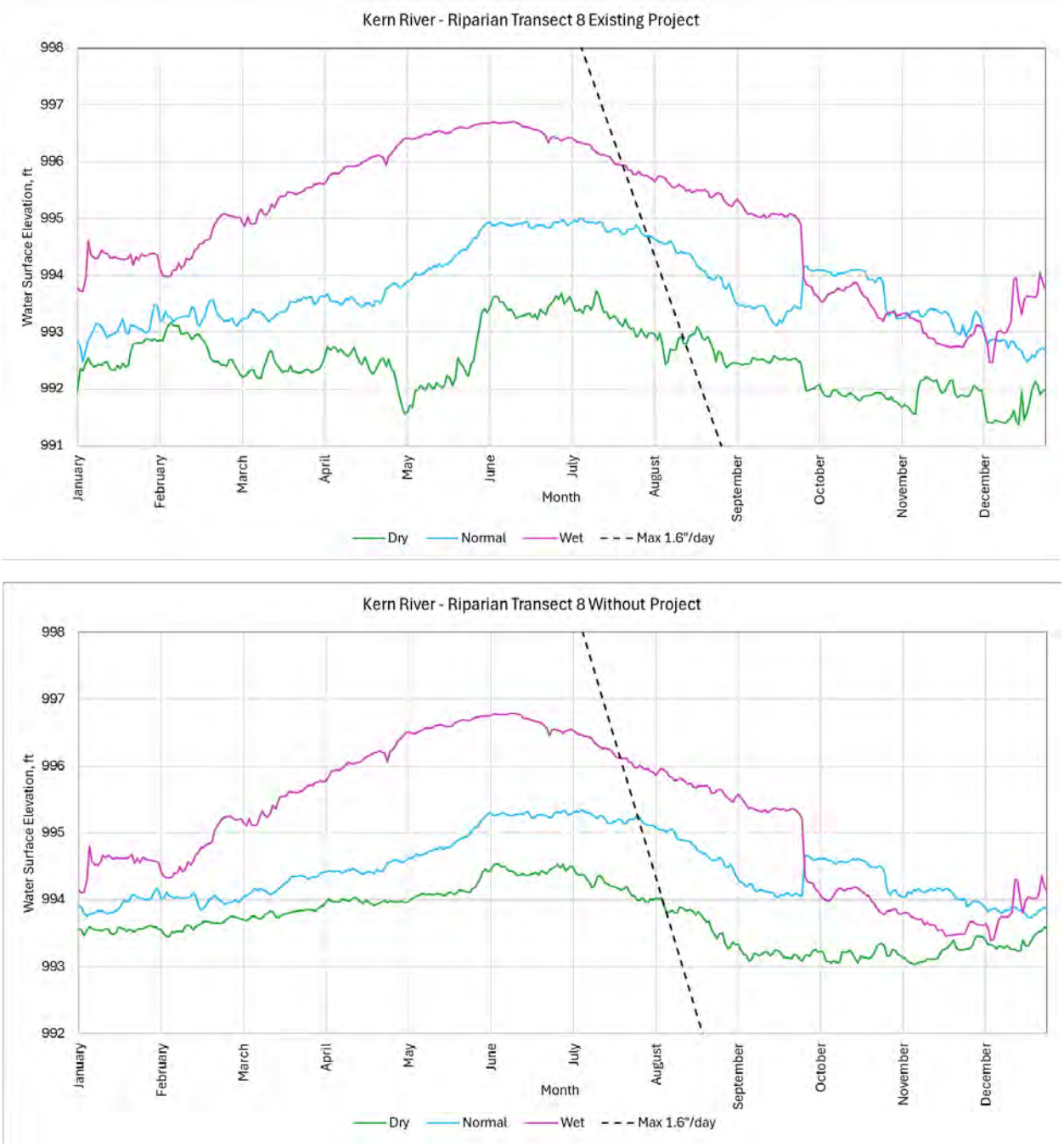


Figure C-38. Riparian Transect KT8 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.

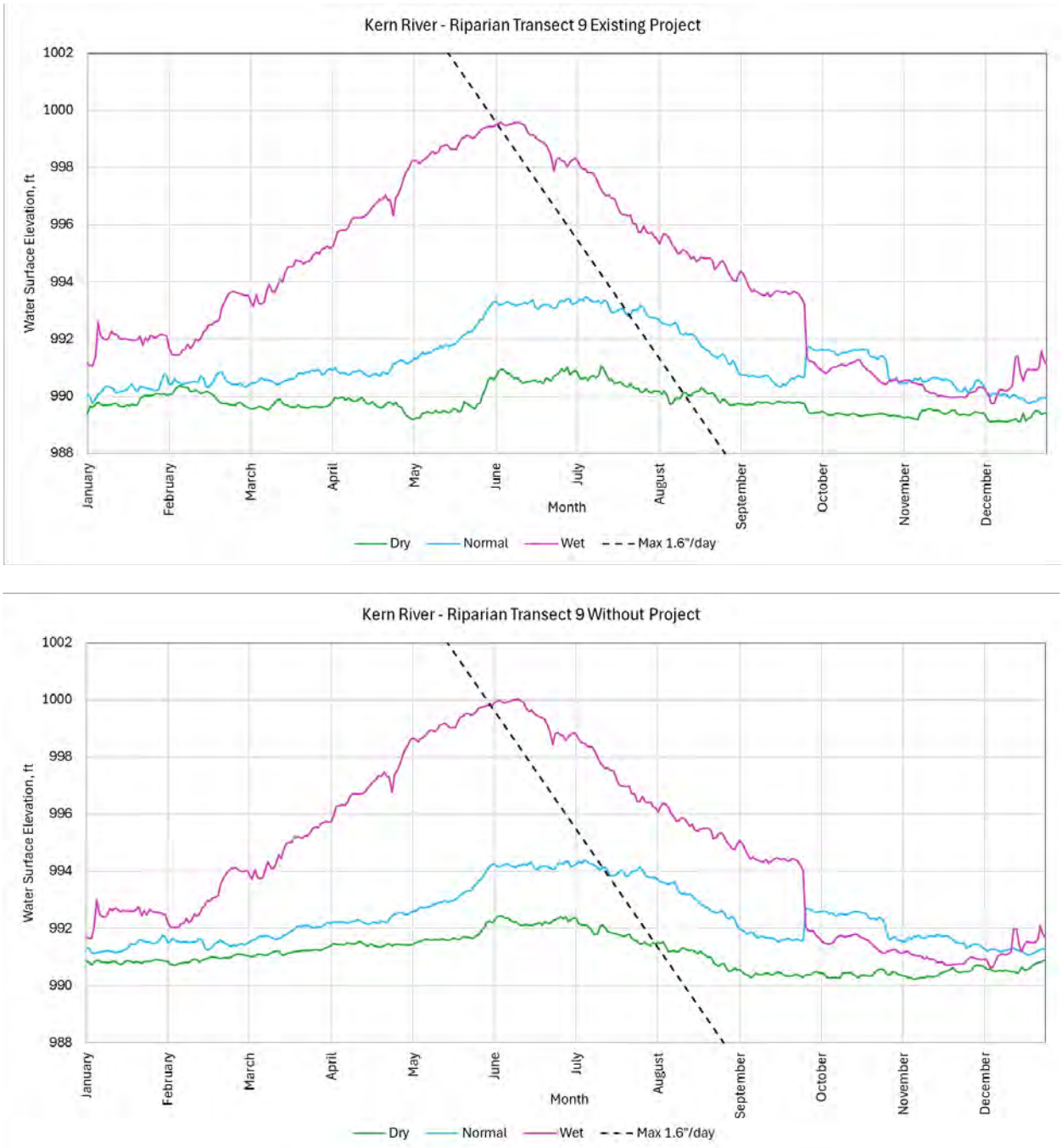
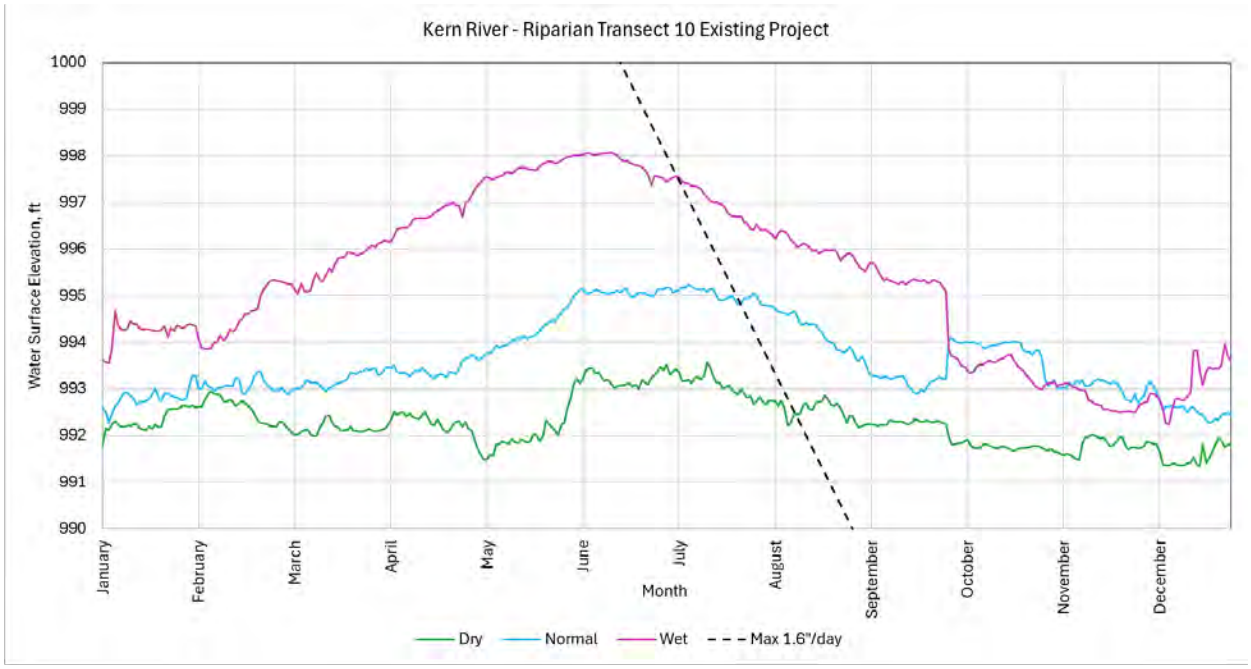


Figure C-39. Riparian Transect KT9 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.



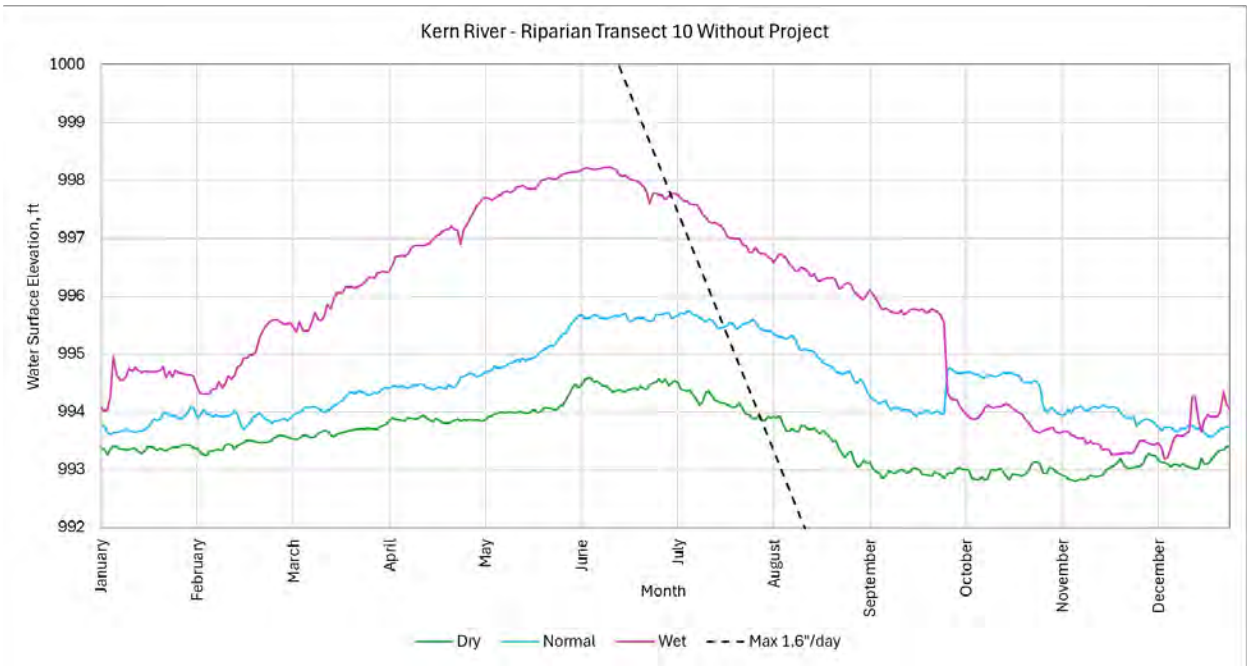


Figure C-40. Riparian Transect KT10 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.

APPENDIX D

Life History Strategies of Dominant Woody Riparian Species Found in the Bypass Reach

Copyright 2026 by Southern California Edison

Table D-1. Life History Strategies of Dominant Woody Riparian Species Found in the Bypass Reach

Attribute		Woody Species						
		Red willow (*Salix laevigata*)	**Narrowleaf willow (*Salix exigua)***	**Goodding's willow (*Salix gooddingii*)**	**Mule-fat (*Baccharis salicifolia*)**	**Common buttonbush (*Cephalanthus occidentalis*)**	**California sycamore (*Platanus racemosa*)**	**Fremont cottonwood (*Populus fremontii*)**
Seed Initiation[1]								
Reproduction	**Flowering Timing**	December to June (Argus 2012a)	March to June (Argus 2012b)	March to April (Argus 2012c)	May to July (Karrfalt and Olson 2008)	June to September (Preston and Dempster 2012)	February to April (Baldwin et al. 2012)	March to June (Stella et al. 2006)
	Seed Dispersal Timing	Spring (CNPS 2024)	May to early June (Young and Clements 2003)	June to July (Young and Clements 2003)	May to July (Karrfalt and Olson 2008)	Fall (USDA-NRCS 2024)	February to March (Baldwin et al. 2012)	March to July depends on location (Baldwin et al. 2012, Stella et al 2006)
	Seed Dispersal Agent[2]	Anemochoric and hydrochoric	Anemochoric and hydrochoric	Anemochoric and hydrochoric	Anemochoric and hydrochoric	Anemochoric and hydrochoric	Primarily anemochoric, also hydrochoric and zoochoric	Hydrochoric and anemochoric
	Asexual Traits	Sprouts from shoot buds on lateral roots (Kindschy 1985)	Sprouts from underground shoot buds on lateral roots (CNPS 2024)	Buds on large branches and trunks, and underground structures (CNPS 2024)	Buds on small branches (CNPS 2024)	Buds on small branches (CNPS 2024)	Can reproduce from root crown.	Crown breakage and flood-related disturbance (e.g. tree fall) (Braatne et al. 1996)
Germination and Establishment[3]	**Seed Viability (in natural conditions)**	Remain viable for around 30 days (McBride and Strahan 1984)	Seeds remain viable for an average of 44 days (Stella et al. 2006)	Seeds remain viable for an average of 31 days (Stella et al. 2006)	1 to 2 weeks (McBride and Strahan 1984)	Unknown (Conner 2004)	Not a limiting factor.	1 to 3 weeks (as cited in Braatne et al. 1996)
	Germination	Within 24 hours (Karrenberg et al. 2002)	12 to 24 hours under proper conditions (Nellessen 2004)	Within 24 hours (Karrenberg et al. 2002)	7 to 15 days (Karrfalt and Olson 2008)	24 hours (Bonner 1974)	Germinates quickly in moist conditions.	24 hours in moist, bare soil (Braatne et al. 1996)
	Seedling Root Growth Rate (and Recession Rate Associated with Establishment)	Recession rate of 1 to 2.5 centimeters (cm) per day (Amlin and Rood 2002)	Recession rate of 1 to 2.5 cm per day (Amlin and Rood 2002)	Recession rate of 1 to 2.5 cm per day (Amlin and Rood 2002)	Growth rate of 2.17 cm per day (Glenn et al. 1998)	Moderate (USDA-NRCS 2024)	Similar to cottonwoods	Seedling root growth rate: 4 to 12 millimeters (mm)/day (as cited in Braatne et al. 1996); can reach 40 cm length in 30 days (Braatne et al. 1996) Recession rate: 2.5 to 4 cm/day (up to 10 cm/day) (Mahoney and Rood 1998; Amlin and Rood 2002; Roberts et al. 2002; Stella et al. 2006)

Copyright 2026 by Southern California Edison

Attribute		Woody Species						
		Red willow (*Salix laevigata*)	**Narrowleaf willow (*Salix exigua)***	**Goodding's willow (*Salix gooddingii*)**	**Mule-fat (*Baccharis salicifolia*)**	**Common buttonbush (*Cephalanthus occidentalis*)**	**California sycamore (*Platanus racemosa*)**	**Fremont cottonwood (*Populus fremontii*)**
Dormant Season	**Rooting Depth of Sapling, first growing season**	40 to 60 cm (Karrenberg et al. 2002)	40 to 60 cm (Karrenberg et al. 2002)	40 to 60 cm (Karrenberg et al. 2002)	60 cm (Braudrick and Orr 2021)	35 cm (Tentative, found two plant store websites that said that, not primary sources)	Similar to cottonwoods	75 to 150 cm (Braatne et al. 1996)
Maturation[4]								
Age at Reproductive Maturity		2 years (CNPS 2024)	2 years (CNPS 2024)	2 years (CNPS 2024)	2 years (CNPS 2024)	2 years (CNPS 2024)	6 to 7 years	5 to 10 years (as cited in Braatne et al. 1996)
Rooting Depth of Mature Stands/Depth to Groundwater		Minimum 28 inches (USDA-NRCS 2024)	Minimum 20 inches (USDA-NRCS 2024)	Minimum 28 inches (USDA-NRCS 2024)	Minimum of 12 inches (USDA-NRCS 2024)	Minimum of 14 inches (USDA-NRCS 2024)	Less than 1m (USDA-NRCS 2024)	3 to 5+ meters (as cited in Braatne et al. 1996)
Lifespan		Stems survive 10 to 20 years (USDA-NRCS 2024)	Stems survive 10 to 20 years (USDA-NRCS 2024)	Stems survive 10 to 20 years (USDA-NRCS 2024)	Stems survive 10 to 20 years (USDA-NRCS 2024)	Stems survive 10 to 20 years (USDA-NRCS 2024)	200+ years	130+ years (as cited in Braatne et al. 1996)
Tree Height (mature tree)		Up to 4 meters (CNPS 2024)	2 to 4 meters (CNPS 2024)	Up to 30 meters (CNPS 2024)	Up to 3 meters (USDA-NRCS 2024)	Up to 6 meters (USDA-NRCS 2024)	20 to 35 meters (CNPS 2024)	12 to 35 meters (USDA-NRCS 2024)
DBH (mature tree)		10 to 15 cm (Hartwell et al. 2010)	Up to 13 cm (Nellessen 2004)	10 to 15 cm (Hartwell et al. 2010)	NA	NA	up to 1 meters (CNPS 2024)	30 to 150 cm (USDA-NRCS 2024)
Germination/Recruitment Microsite Characteristics								
Depth to Water Table or Elevation above Baseflow		Elevation above baseflow 0.6 to 3 meters (Mahoney and Rood 1998)	Elevation above baseflow 0.6 to 3 meters (Mahoney and Rood 1998)	Elevation above baseflow 0.6 to 3 meters (Mahoney and Rood 1998)	Elevation above baseflow 0.3 to 1.2 meters (River Partners 2008)	Elevation above baseflow 0.3 to 1.2 meters (River Partners 2008)	Maximum depth to water table, 1.5 to 4.5 meters (The Nature Conservancy [TNC] 1998)	Elevation above baseflow: 1 to 3 meters (Mahoney and Rood 1998; Roberts et al. 2002)
Substrate		Fine textured moist bare soil (CNPS 2024)	Fresh alluvium deposits with silt, sand, or gravelly soils (CNPS 2024)	Fine textured alluvium over subsurface of soils from silt to silty clay loam soil (USDA-NRCS 2024)	Adapted to course, medium, and fine soils (USDA-NRCS 2024)	Sandy, loamy sandy, or alluvial soil with a sandy or silty surface (USDA-NRCS 2024)	Sunny, coarse, medium textured substrate near water (USDA-NRCS 2024)	Bare, moist sandy, humous, or gravelly soils - with silts and clays.

Attribute	Woody Species						
	Red willow (*Salix laevigata*)	**Narrowleaf willow (*Salix exigua)***	**Goodding's willow (*Salix gooddingii*)**	**Mule-fat (*Baccharis salicifolia*)**	**Common buttonbush (*Cephalanthus occidentalis*)**	**California sycamore (*Platanus racemosa*)**	**Fremont cottonwood (*Populus fremontii*)**
Location on Floodplain	Lowland alluvial floodplains, shores, and bars (McBride and Strahan 1984)	Lowland alluvial floodplains, shores, and bars (Stella et al. 2006)	Lowland alluvial floodplains, shores, and bars (Stella et al. 2006)	Sand and gravel bars, alluvial surfaces near rivers and streams (McBride and Strahan 1984)	Lowland alluvial floodplains (USDA-NRCS 2024)	Sand and gravel bars, alluvial surfaces near rivers and streams (USDA-NRCS 2024)	Point bars, cut off channels, lower terraces

Notes: [1] Initiation refers to seed dispersal, germination, and initial seedling growth.
[2] Hydrochoric: water-dispersed; Anemochoric: wind-dispersed; Zoochoric: animal-dispersed.
[3] Establishment refers to the continued survival and growth of seedlings and saplings over several years until the tree or shrub reaches maturity.
[4] Maturity (sexual) occurs once a tree begins to flower and produce seed.

Key: cm = centimeter(s)
CNPS = California Native Plant Society
DBH = diameter at breast height
NA = Not Applicable
USDA-NRCS = U.S. Department of Agriculture Natural Resources Conservation Service

Copyright 2026 by Southern California Edison

APPENDIX E

Timing of Flowering and Seed Dispersal for Common Woody Riparian Species in the Bypass Reach

Copyright 2026 by Southern California Edison

Table E-1. Timing of Flowering and Seed Dispersal for Common Woody Riparian Species in the Bypass Reach

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
WILLOWS												
Goodding's Willow												
Flowering (Argus 2012c)												
Seed Dispersal (Young and Clements 2003)												
Red Willow												
Flowering (Argus 2012b)												
Seed Dispersal (USDA-NRCS 2024)												
Narrowleaf Willow												
Flowering (Argus 2012)												
Seed Dispersal (Young and Clements 2003)												
BACCHARIS												
Mule-fat												
Flowering (Karrfalt and Olson 2008)												
Seed Dispersal (Karrfalt and Olson 2008)												
CEPHALANTHUS												
Common Buttonbush												
Flowering (Preston and Dempster 2012)												
Seed Dispersal (USDA-NRCS 2024)												
SYCAMORE												
California Sycamore												
Flowering (Baldwin et al. 2012)												
Seed Dispersal (Baldwin et al. 2012)												

Copyright 2026 by Southern California Edison

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
COTTONWOODS												
Freemont Cottonwood												
Flowering (Stella et al. 2006)												
Seed Dispersal (Stella et al. 2006)												

APPENDIX F

Special-Status Plants Known to Occur or Potentially Occurring in the Study Area

Copyright 2026 by Southern California Edison

Table F-1. Special-Status Plants Known to Occur or Potentially Occurring in the Study Area

Scientific/Common Name	Federal/ State Status	Sequoia National Forest Status	CRPR	Blooming Period/ Fertile	Habitat	Likelihood for Occurrence
Known to Occur in the Vicinity of the Project						
Delphinium purpusii rose-flowered larkspur	–	FSCC	1B.3	April–May	A perennial herb that grows on rocky, often carbonate soils in chaparral, cismontane woodland, and pinyon and juniper woodland. Elevation: 1,000–4,470 feet.	**Known to occur.** • Nine populations of rose-flowered larkspur were identified in the study area during TERR 1 early season botanical surveys in April 2024. This includes: - Three small populations along the Conduit No. 3 Trail (DEPU_01–03); - One population along Flume No. 3 between Conduit No. 4 and 5 (DEPU_04); - One small population along the Lucas Creek Trail (DEPU_05); - A single individual along Stark Creek Trail (DEPU_06); - A single individual along Dougherty Creek Trail (DEPU_07) - A small population near Adit 14 & 15 (DEPU_08); and - A large population adjacent to the Overflow Spillway Trail east of the Kern No. 1 Forebay (DEPU_09). • CNDDB includes six additional prior records for rose-flowered larkspur located along Kern River in the vicinity of the Project[1]. An additional occurrence was recorded within the 1-mile buffer of the Project. These occurrences were recorded in 1933, 1969, 1972, 1982, 2005, and two occurrences in 2010.
May Potentially Occur in the Vicinity of the Project						
Calochortus striatus alkali mariposa lily	–	FSCC	1B.2	April–June	A perennial bulbiferous herb that grows on alkaline and mesic soils in chaparral, chenopod scrub, Mojavean desert scrub, and meadows and seeps. Elevation: 230–5,235 feet.	**May potentially occur.** The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025.
Camissonia integrifolia Kern River evening-primrose	–	FSCC	1B.3	April (May)	An annual herb that grows in chaparral and Mojavean desert scrub. Elevation: 2,295–3,935 feet.	**May potentially occur.** The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025.
Clarkia springvillensis Springville clarkia	FT/CE	–	1B.2	April–July	An annual herb that grows on granitic soils in chaparral, cismontane woodland, and valley and foothill grassland. Elevation: 805–4,005 feet.	**May potentially occur.** The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025.
Diplacus pictus (*Mimulus pictus*) calico monkeyflower	–	FSCC	1B.2	March–May	An annual herb found in granitic, disturbed areas in broad-leafed upland forest and cismontane woodland. Elevation: 330–4,770 feet.	**May potentially occur**. The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025. Based on review of FERC and Forest Service 1998, individuals were found north side of Kern River across from Democrat Hot Springs and near Richbar Day Use Area (*no GIS data available for this occurrence*). A CNDDB query yielded two records for this species in the vicinity of the Project: • A large polygon (1956) (generalized occurrence) encompassing Project facilities from the Lucas Creek Trail and downstream to Tunnel No. 14 northeast of Pacheco Creek; and • A 1983 detection adjacent to Democrat Dam Impoundment.

Copyright 2026 by Southern California Edison

Scientific/Common Name	Federal/ State Status	Sequoia National Forest Status	CRPR	Blooming Period/ Fertile	Habitat	Likelihood for Occurrence
Eriastrium tracyi Tracy's eriastrum	–	FSCC	3.2	May–July	An annual herb found in chaparral, cismontane woodland, and valley and foothill grassland. Elevation: 1,035–5,840 feet.	**May potentially occur.** The Project supports suitable habitat and is within the elevational range of this species. This species was not observed during botanical surveys in 2024 and 2025.
Eschscholzia lemmonii Tejon poppy	–	–	1B.1	March–May	An annual herb that grows in chenopod scrub and valley and foothill grassland. Elevation: 530–3,330 feet.	**May potentially occur.** The Project is within the geographic range and contains suitable habitat for this species. A CNDDB query yielded one record of this species located approximately 3 miles northwest of Kern River No. 1 Powerhouse. This species was not observed during botanical surveys in 2024 and 2025.
Fritillaria brandegeei Greenhorn fritillary	–	FSCC	1B.3	April–June	A perennial herb (bulbiferous) that found on granitic areas in lower montane coniferous forest. Elevation: 4,430–7,000 feet.	**May potentially occur**. The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025. A CNDDB query yielded one occurrence located near the confluence of Dougherty Creek and Kern River, in the vicinity of the Project. This occurrence was recorded in 1982.
Fritillaria striata striped adobe lily	CT	–	1B.1	February–April	A perennial herb (bulbiferous) that grows on clay soils in cismontane woodland and valley and foothill grassland. Elevation: 450–4,850 feet.	**May potentially occur.** The Project is within the geographic range and contains suitable habitat for this species. A CNDDB query yielded seven records within a 5-mile buffer of the Project. This species was not observed during botanical surveys in 2024 and 2025.
Hesperocyparis nevadensis Piute cypress	–	FSCC	1B.2	N/A	A perennial evergreen tree that grows in closed-cone coniferous forest, chaparral, cismontane woodland, and pinyon and juniper woodland. Elevation: 2,360–6,005 feet.	**May potentially occur.** The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025.
Heterotheca shevockii Shevock's golden aster	–	FSCC	1B.3	August–November	A perennial herb that grows in chaparral and cismontane woodland. Elevation: 760–3,000 feet.	**May potentially occur**. The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025. The query of NRIS/CNDDB query yielded two occurrences within the vicinity of the Project: • A 1996 detection adjacent to the Steel Flume trail (NRIS); and • A continuous polygon encompassing both sides of the Kern River from Conduit No 2 downstream to Tunnel No. 14 northeast of Pacheco Creek (CNDDB). Several USFS NRM records document occurrences of *Heterotheca shevockii* in the vicinity of the Project, including a 1996 record near the Steel Flume Trail and a more recent 2024 record provided in the LTBMU. However, the documented populations occur outside the botanical study area.
Leptosiphon serrulatus [= Linanthus serrulatus] Madera leptosiphon	–	–	1B.2	April–May	An annual herb that grows in cismontane woodland and lower montane coniferous forest. Elevation: 985–4,265 feet.	**May potentially occur**. The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025.
Monardella linoides ssp. *anemonoides* southern Sierra monardella	–	–	1B.3	June–August	A perennial herb found in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 2,200–8,040 feet.	**May potentially occur**. The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025. A CNDDB query yielded one occurrence in the vicinity of the Project, a generalized polygon encompassing the Democrat Diversion Dam impoundment and the Willow Spring Creek Road (also referred to as Democrat Dam Road). This occurrence was recorded in 1935.

Copyright 2026 by Southern California Edison

Scientific/Common Name	Federal/ State Status	Sequoia National Forest Status	CRPR	Blooming Period/ Fertile	Habitat	Likelihood for Occurrence
Navarretia setiloba Piute Mountains navarretia	–	–	1B.1	April–July	An annual herb that grows on clay or gravelly loam soils in cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland. Elevation: 950–7,000 feet.	**May potentially occur.** The Project supports suitable habitat and is within the elevational range of this species. This species was not observed during botanical surveys in 2024 and 2025. A CNDDB query yielded three records of this species within a 5-mile buffer of the Project.
Opuntia treleasei Bakersfield cactus	FE/CE	–	1B.1	April–May	A perennial cactus that grows on sandy or gravelly soils in chenopod scrub, cismontane woodland, and valley and foothill grassland. Elevation: 400–4,830 feet.	**May potentially occur.** The Project supports suitable habitat and is within the elevational range of this species. This species was not observed during botanical surveys in 2024 and 2025. A CNDDB query identified one occurrence in the vicinity of the Project along the Kern River approximately 0.25 mile west of Stark Creek Road, recorded in 2010. Occurrence information was updated to include a July 2024 USFS NRM record documenting an *Opuntia treleasei* population located outside the botanical study area.
Pseudobahia peirsonii San Joaquin adobe sunburst	FT/CE	–	1B.1	February–April	An annual herb that grows on adobe clay soils in cismontane woodland and valley and foothill grassland. Elevation: 295–2,670 feet.	**May potentially occur.** The Project supports suitable habitat and is within the elevational range of this species. A CNDDB query yielded three records within a 5-mile buffer of the Project. This species was not observed during botanical surveys in 2024 and 2025.
Stylocline citreolum oil neststraw	–	–	1B.1	March–April	An annual herb that grows on clay soils in chenopod scrub, coastal scrub, and valley and foothill grassland. Only known extant populations are from the interior coast ranges. Elevation: 170–1,330 feet.	**May potentially occur.** The Project supports suitable habitat and is within the elevational range of this species. This species was not observed during botanical surveys in 2024 and 2025.
Viburnum ellipticum oval-leaved viburnum	–	FSCC	2B.3	May–June	A perennial deciduous shrub that grows in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 705–4,595 feet.	**May potentially occur.** The Project supports suitable habitat and is within the elevational range of this species. This species was not observed during botanical surveys in 2024 and 2025.
Unlikely to Occur in the Vicinity of the Project						
Calochortus palmeri var. *palmeri* Palmer's mariposa-lily	–	FSCC	1B.2	April–July	A perennial bulbiferous herb that grows on mesic soils in chaparral, lower montane coniferous forests, and in meadows and seeps. Elevation 2,330–7,840 feet in elevation.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Caulanthus californicus California jewelflower	FE/CE	–	1B.1	February–May	An annual herb that grows on sandy soils in chenopod scrub, pinyon and juniper woodland, and valley and foothill grassland. Extirpated from the San Joaquin Valley, now known only from Santa Barbara canyon, Carrizo Plain, and the Kreyenhagen Hills. Elevation: 200–3,300 feet.	**Unlikely to occur.** The Project is outside of the geographic range for this species.
Cordylanthus eremicus ssp. *kernensis* Kern Plateau bird's-beak	–	FSCC	1B.3	July–September	A hemiparasitic annual herb that grows in Great Basin scrub, Joshua tree "woodland", pinyon and juniper woodland, and upper montane coniferous forest. Elevation: 5,495–9,845 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Eremalche parryi ssp. *kernensis* Kern mallow	FE	–	1B.2	January–May	An annual herb that grows on dry and open sandy to clay soils in chenopod scrub, pinyon and juniper woodland, and valley and foothill grassland; often found at edge of balds. Elevation: 230–4,300 feet.	**Unlikely to occur.** The Project is outside of the geographic range for this species.
Layia leucopappa Comanche Point layia	–	–	1B.1	March–April	An annual herb that grows in chenopod scrub and valley and foothill grassland, found only in Kern County. Elevation: 330–1,170 feet.	**Unlikely to occur.** The Project is outside of the geographic range for this species.

Copyright 2026 by Southern California Edison

Scientific/Common Name	Federal/ State Status	Sequoia National Forest Status	CRPR	Blooming Period/ Fertile	Habitat	Likelihood for Occurrence
Monolopia (=Lembertia) congdonii San Joaquin woolly-threads	FE	–	1B.2	February–May	An annual herb that grows in chenopod scrub and sandy valley and foothill grassland. Elevation: 200–2,670 feet.	**Unlikely to occur.** The Project is outside of the geographic range for this species. Populations in the lower Kern River are believed to be extirpated (USFWS 1998).
Streptanthus cordatus var. *piutensis* Piute Mountains jewel-flower	–	FSCC	1B.2	May–July	A perennial herb that grows on clay and metamorphic soils in broad-leafed upland forest, closed-cone coniferous forest, and pinyon and juniper woodland. Elevation: 3,595–5,990 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is outside of the elevational range of this species.
Symphyotrichum defoliatum San Bernardino aster	–	FSCC	1B.2	July–November	A perennial rhizomatous herb that grows on streambanks in cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, marshes and swamps, and valley and foothill grassland (vernally mesic). Elevation: 5–6,695 feet.	**Unlikely to occur.** The Project is outside of the geographic range for this species.
Astragalus ertterae Walker Pass milk-vetch	–	FSCC	1B.3	April–May	A perennial herb that grows on granitic, sandy soils in pinyon and juniper woodland. Elevation: 5,595–6,235 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Astragalus lentiginosus var. *kernensis* Kern Plateau milk-vetch	–	FSCC	1B.2	June–July	A perennial herb that grows on sandy soils in meadows and seeps, and subalpine coniferous forest. Elevation: 7,350–9,025 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Astragalus shevockii Little Kern (Shevock's) milk-vetch	–	FSCC	1B.3	June–July	A perennial herb that grows on granitic and sandy soils in upper montane coniferous forest. Elevation: 6,200–6,445 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Astragalus subvestitus Kern County milk-vetch	–	FSCC	4.3	June–July	A perennial herb that grows on gravelly and sandy soils in Great Basin scrub, meadows and seeps, and pinyon and juniper woodland. Elevation: 7,645–9,025 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Atriplex tularensis Bakersfield saltbush	CE	–	1A	June–October	An annual herb that grows in chenopod scrub. Elevation: 295–655 feet.	**Unlikely to occur.** The Project is outside of the geographic range for this species.
Boechera evadens hidden rockcress	–	FSCC	1B.3	May–August	A perennial herb that grows on rocky soils in upper montane coniferous forest. Elevation: 8,400–9,350 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Boechera tularensis Tulare rockcress	–	FSCC	1B.3	June–July	A perennial herb that grows along slopes and roadsides on rocky soils in subalpine coniferous forest and upper montane coniferous forest. Elevation: 5,990–10,990 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Botrychium crenulatum scalloped moonwort	–	FSCC	2B.2	June–September	A perennial rhizomatous herb that grows in bogs and ferns, lower montane coniferous forest, meadows and seeps, marshes and swamps (freshwater), and upper montane coniferous forest. Elevation: 4,160–10,760 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Calochortus westonii Shirley Meadows star-tulip (mariposa lily)	–	FSCC	1B.2	May–June	A perennial herb (bulbiferous) that grows on granitic soils in broad-leafed upland forest, lower montane coniferous forest, and meadows and seeps. Elevation: 4,920–6,905 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Calyptridium pygmaeum Pygmy pussypaws	–	FSCC	1B.2	June–August	An annual herb that grows on gravelly and sandy soils in subalpine coniferous forest and upper montane coniferous forest. Elevation: 6,495–10,205 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Carlquistia muirii Muir's tarplant	–	FSCC	1B.3	July–August	A perennial rhizomatous herb that grows on granitic soils in chaparral (montane), lower montane coniferous forest, and upper montane coniferous forest. Elevation: 2,475–8,205 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.

Scientific/Common Name	Federal/ State Status	Sequoia National Forest Status	CRPR	Blooming Period/ Fertile	Habitat	Likelihood for Occurrence
Cirsium crassicaule slough thistle	–	–	1B.1	May–August	An annual/perennial herb that grows in chenopod scrub, marshes, and swamps (sloughs), and riparian scrub. Elevation: 10–330 feet.	**Unlikely to occur.** The Project does not contain suitable habitat for this species.
Clarkia tembloriensis ssp. *calientensis* Vasek's Clarkia	–	–	1B.1	April	An annual herb that grows in valley and foothill grassland. Elevation: 900–1,640 feet.	**Unlikely to occur.** The Project is outside of the geographic range for this species.
Cryptantha incana Tulare cryptantha	–	FSCC	1B.3	July–August	An annual herb that grows on gravelly soils in lower montane coniferous forests. Elevation: 4,690–7,055 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Deinandra mohavensis Mojave tarplant	–	FSCC	1B.3	June–October	An annual herb that grows on mesic soils in chaparral, coastal scrub, and riparian scrub. Elevation: 2,100–5,250 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Delphinium inopinum Unexpected larkspur	–	FSCC	4.3	May–July	A perennial herb that grows on metamorphic and rocky soils in upper montane coniferous forests. Elevation: 6,200–9,185 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Dicentra nevadensis Sierra (Tulare County) bleeding heart	–	FSCC	4.3	June–August	A perennial rhizomatous herb that grows in alpine boulder and rock fields, and subalpine coniferous forest (gravelly, sandy, openings). Elevation: 7,220–10,005 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Erigeron aequifolius Hall's daisy (fleabane)	–	FSCC	1B.3	June–August	A perennial rhizomatous herb that grows on granitic and rocky soils in broad-leafed upland forest, lower montane coniferous forest, pinyon and juniper woodland, and upper montane coniferous forest. Elevation: 4,920–8,005 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Erigeron multiceps Kern River daisy	–	FSCC	1B.2	June–September	A perennial herb that grows in meadows and seeps and upper montane coniferous forest (openings). Elevation: 4,920–8,315 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Eriogonum breedlovei var. *breedlovei* Breedlove's (Piute) buckwheat	–	FSCC	1B.2	June–August	A perennial herb that grows on carbonate soils in pinyon and juniper woodland and upper montane coniferous forest. Elevation: 6,200–8,500 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Eriogonum ovalifolium var. *monarchense* monarch buckwheat	–	FSCC	1B.1	June–August	A perennial herb that grows on carbonate, rocky, and sandy soils in Mojavean desert scrub and pinyon and juniper woodland. Elevation: 5,905–5,955 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Erythranthe discolor Two-colored monkey flower	–	FSCC	4.2	May–July	An annual herb that grows on granitic soils in cismontane woodland, great basin scrub, lower montane coniferous forests, meadows and seeps, pinyon juniper woodland, and upper montane coniferous forests. Elevation: 4,495–8,105	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Gilia yorkii Boyden Cave gilia	–	FSCC	1B.1	May–July	An annual herb that grows on carbonate soils in chaparral and cismontane woodland. Elevation: 4,230–6,005 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Githopsis tenella tube flower bluecup	–	FSCC	1B.3	April–June	An annual herb that grows on mesic and serpentinite soils in chaparral and cismontane woodland. Elevation: 1,065–6,235 feet.	**Unlikely to occur.** The Project does not contain suitable habitat for this species.
Helodium blandowii Blandow's bog moss	–	FSCC	2B.2	N/A	A moss that grows on damp soil in meadows and seeps and subalpine coniferous forest. Elevation: 6,110–8,860 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.

Copyright 2026 by Southern California Edison

Scientific/Common Name	Federal/ State Status	Sequoia National Forest Status	CRPR	Blooming Period/ Fertile	Habitat	Likelihood for Occurrence
Heterotheca monarchensis Monarch golden aster	–	FSCC	1B.1	May–October	A perennial herb that grows on carbonate soils in cismontane woodland. Elevation: 3,595–6,070 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Horkelia tularensis Kern Plateau horkelia	–	FSCC	1B.3	June–August	A perennial herb that grows on rocky soils in upper montane coniferous forest. Elevation: 7,400–9,435 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Hulsea brevifolia short-leaved hulsea	–	FSCC	1B.2	May–August	A perennial herb that grows on granitic, gravelly, sandy, and volcanic soils in lower montane and upper montane coniferous forest. Elevation: 4,920–10,500 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Hulsea vestita ssp. *pygmaea*	–	FSCC	1B.3	June–October	A perennial herb that grows on granitic and gravelly soils in alpine boulder and rock field, and subalpine coniferous forests.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Ivesia campestris field ivesia	–	FSCC	1B.2	May–August	A perennial herb that grows in meadows and seeps (edges), subalpine coniferous forest, and upper montane coniferous forest. Elevation: 6,480–11,140 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Lewisia disepala Yosemite Lewisia	–	FSCC	1B.2	March–June	A perennial herb that grows on granitic and sandy soils in lower montane coniferous forest, pinyon and juniper woodland, and upper montane coniferous forest. Elevation: 3,395–11,485 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Madia radiata showy madia	–	–	1B.2	March–May	An annual herb that grows in cismontane woodland and valley and foothill grassland. Elevation: 80–3,985 feet.	**Unlikely to occur.** The Project is outside of the geographic range for this species.
Meesia uliginosa Meesia moss	–	FSCC	2B.2	July–October	A moss that grows in bogs and fens, meadows and seeps, subalpine coniferous forest, and upper montane coniferous forest. Elevation: 3,970–9,200 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Mielichhoferia shevockii Shevock's copper moss	–	FSCC	1B.2	N/A	A moss that grows in cismontane woodland (mesic, metamorphic, rock). Elevation: 2,460–4,595 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Navarretia peninsularis Baja navarretia	–	FSCC	1B.2	June–August	An annual herb that grows on mesic soils in chaparral (openings), lower montane coniferous forest, meadows and seeps, and pinyon and juniper woodland. Elevation: 4,920–7,545 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Nemacladus calcaratus Chimney Creek nemacladus	–	FSCC	1B.2	May–June	An annual herb that grows on flats and granitic soils in pinyon and juniper woodland. Elevation: 6,235–6,890 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Nemacladus twisselmannii Twisselmann's nemacladus	–	FSCC	1B.2	July	An annual herb that grows on granitic, sandy, or rocky soils in upper montane coniferous forest. Elevation: 7,350–8,040 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Oreonana purpurascens purple mountain-parsley	–	FSCC	1B.2	May–June	A perennial herb that grows on metamorphic soils in broad-leafed upland forest, subalpine coniferous forest, and upper montane coniferous forest. Elevation: 7,860–9,400 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Oreonana vestita Woolly mountain-parsley	–	FSCC	1B.3	March–September	A perennial herb that grows on gravelly and talus soils in lower montane coniferous forest, subalpine coniferous forest, and upper montane coniferous forest. Elevation: 5,300–11,485 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.

Scientific/Common Name	Federal/ State Status	Sequoia National Forest Status	CRPR	Blooming Period/ Fertile	Habitat	Likelihood for Occurrence
Orthotrichum spjutii Spjut's bristle moss	–	FSCC	1B.3	N/A	A moss that grows on granitic and rocky soils in lower montane coniferous forest, pinyon and juniper woodland, subalpine coniferous forest, and upper montane coniferous forest. Elevation: 6,890–7,875 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Phacelia nashiana Charlotte's phacelia	–	FSCC	1B.2	March–June	An annual herb that grows on granitic and sandy soils in Joshua tree "woodlands", Mojavean desert scrub, and pinyon and juniper woodland. Elevation: 1,970–7,220 feet.	**Unlikely to occur.** The Project does not contain suitable habitat for this species.
Phacelia novenmillensis Nine Mile Canyon phacelia	–	FSCC	1B.2	May–June	An annual herb that grows on gravelly and sandy soils in broad-leafed upland forest, cismontane woodland, pinyon and juniper woodland, and upper montane coniferous forest. Elevation: 5,395–8,660 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Ribes menziesii var. ixoderme aromatic canyon gooseberry	–	–	1B.2	April	A perennial deciduous scrub that grows in chaparral and cismontane woodland. Elevation: 2,000–3, 805 feet.	**Unlikely to occur.** The Project does not contain suitable habitat for this species.
Sidalcea multifida cut-leaf checkerbloom	–	FSCC	2B.3	May–September	A perennial herb that grows in Great Basin scrub, lower montane coniferous forest, meadows and seeps, and pinyon and juniper woodland. Elevation: 5,740–9,185 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Sidotheca caryophylloides chickweed oxytheca	–	FSCC	4.3	July–September	An annual herb that grows on sandy soil in lower montane coniferous forests. Elevation: 3,655–8,530 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Streptanthus fenestratus Tehipite Valley jewel-flower	–	FSCC	1B.1	May–July	An annual herb that grows in lower montane coniferous forest and upper montane coniferous forest. Elevation: 3,495–5,740 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Trifolium kingii ssp. *dedeckerae (T. dedeckerae)* Dedecker's clover	–	FSCC	1B.3	May–July	A perennial herb that grows on granitic and rocky soils in lower montane coniferous forest, pinyon and juniper woodland, subalpine coniferous forest, and upper montane coniferous forest. Elevation: 6,890–11,485 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.

Key: CNDDB = California Natural Diversity Database
CRPR = California Rare Plant Rank
NRIS = Natural Resource Information System

Federal Status
FC = Federal Candidate Species
FE = Federal Endangered
FT = Federal Threatened
FPD = Federal Proposed for Delisting
FPT, FPE = Federal Proposed Threatened/Endangered

Forest Service Status
FSCC = Sequoia National Forest Species of Conservation Concern

State Status
CFP = California Fully Protected
CSC = California Species of Special Concern
CCT, CCE = State Candidate Threatened/Endangered
CE = California Endangered
CT = California Threatened

CRPR = California Native Plant Society Rare Plant Rank
- CRPR 1B = rare, threatened or endangered in California and elsewhere
- CRPR 2B = rare in California but more common elsewhere
- 3 = need more information
- 4 = plants of limited distribution; a watch list
  - _.1 = Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
  - _.2 = Moderately threatened in California (20–80% occurrences threatened)
  - _.3 = Not very threatened in California (<20% of occurrences threatened or no current threats known)

Copyright 2026 by Southern California Edison

APPENDIX G

Representative Photographs of Rose-Flowered Larkspur (*Delphinium purpusii*) Populations in the Study Area

Copyright 2026 by Southern California Edison



Photo G-1. Rose-flowered larkspur (*Delphinium purpusii*) growing along a granite slope from population DEPU_01.



Photo G-2. Rose-flowered larkspur (*Delphinium purpusii*) growing along a granite slope below a conduit from population DEPU_03.



Photo G-3. Rose-flowered larkspur (*Delphinium purpusii*) growing along a granite slope from population DEPU_05.



Photo G-4. Rose-flowered larkspur (*Delphinium purpusii*) growing along a granite slope from population DEPU_06.



Photo G-5. Rose-flowered larkspur (*Delphinium purpusii*) growing on a rock wall from populations DEPU_07.



Photo G-6. Rose-flowered larkspur (*Delphinium purpusii*) growing on a rock wall near a flume from population DEPU_08.



Photo G-7. Rose-flowered larkspur (*Delphinium purpusii*) growing in granite cobble from population DEPU_09.

APPENDIX H

CNDDB Forms for Rose-Flowered Larkspur (*Delphinium purpusii*) Populations in the Study Area (CONFIDENTIAL)

Copyright 2025 by Southern California Edison

CONFIDENTIAL INFORMATION

The following appendix is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of special-status biological resources and qualifies as Confidential Information (18 Code of Federal Regulations § 385.1112). Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings, visit: https://www.ferc.gov/foia.

Appendix H CNDDB Forms for Rose-Flowered Larkspur (*Delphinium pupusii*) Populations in the Study Area (CONFIDENTIAL)

Appendix H will not be distributed to the general public. Documents containing Confidential Information may be requested by entities and organizations with jurisdiction over these resources. To request copies, please contact Meg Richardson, SCE Relicensing Project Manager at (626) 238-2902 / mary.m.richardson@sce.com; or Kadi Whiteside, SCE Relicensing Deputy Project Manager at (626) 807-3641 / karen.whiteside@sce.com.

APPENDIX I

Comprehensive List of Plants Identified During Botanical Surveys in the Study Area

Copyright 2026 by Southern California Edison

Table I-1. Comprehensive List of Plants Identified During Botanical Surveys in the Study Area

Scientific Name	Common Name	Native/ Non-Native	Family	Status
Special Status Species				
Delphinium purpusii	Kern county larkspur	Native	Ranunculaceae	California Rare Plant Rank 1B.3
Target Non-native Plant Species				
Bromus rubens	Red brome	Non-native	Poaceae	Cal-IPC rating: high
Bromus tectorum	Cheatgrass	Non-native	Poaceae	Cal-IPC rating: high
Onopordum acanthium	Scotch thistle	Non-native	Asteraceae	Cal-IPC rating: high
Polypogon monspeliensis	Rabbit foot grass	Non-native	Poaceae	Cal-IPC rating: limited
Verbascum thapsus	Common mullein	Non-native	Scrophulariaceae	Cal-IPC rating: limited
All Other Plant Species				
Achillea millefolium	Yarrow	Native	Asteraceae	–
Achyrachaena mollis	Blow wives	Native	Asteraceae	–
Acmipson procumbens var. *procumbens*	Silky California broom	Native	Fabaceae	–
Acmispon americanus var. *americanus*	Spanish lotus	Native	Fabaceae	–
Acmispon brachycarpus	Short podded lotus	Native	Fabaceae	–
Aesculus californica	California buckeye	Native	Sapindaceae	–
Allium peninsulare	Mexicali onion	Native	Alliaceae	–
Alnus rhombifolia	White alder	Native	Betulaceae	–
Amsinckia intermedia	Common fiddleneck	Native	Boraginaceae	–
Anemopsis californica	Yerba mansa	Native	Saururaceae	–
Aphyllon corymbosum	Flat topped broom rape	Native	Orobanchaceae	–
Artemisia douglasiana	California mugwort	Native	Asteraceae	–
Asclepias californica	California milkweed	Native	Apocynaceae	–

Copyright 2026 by Southern California Edison

Scientific Name	Common Name	Native/ Non-Native	Family	Status
Asclepias fascicularis	narrow leaf milkweed	Native	Apocynaceae	–
Avena barbata	Slim oat	Non-native	Poaceae	Cal-IPC rating: Moderate
Baccharis salicifolia	Mule fat	Native	Asteraceae	–
Balsamorhiza deltoidei	Deltoid balsam root	Native	Asteraceae	–
Boechera arcutata	Arching rockcress	Native	Brassicaceae	–
Bowlesia incana	Bowelesia	Native	Apiaceae	–
Brassica nigra	Black mustard	Non-native	Brassicaceae	Cal-IPC rating: High
Brickellia californica	California brickellia	Native	Asteraceae	–
Brodiaea elegans	Harvest brodiaea	Native	Themidaceae	–
Bromus diandrus	Ripgut brome	Non-native	Poaceae	Cal-IPC rating: Moderate
Calandrinia menziesi	Red maids	Native	Montiaceae	–
Calandrinia menziesii	Calandrinia	Native	Montiaceae	–
Calochortus venustus	Butterfly mariposa lily	Native	Liliaceae	–
Calystegia longipes	Piute morning glory	Native	Convolvulaceae	–
Camissonia contorta	Contorted sun cup	Native	Onagraceae	–
Capsella bursa-pastoris	Shepards purse	Native	Brassicaceae	–
Castilleja attenuata	Narrow-leaved owl's clover	Native	Fabaceae	–
Castilleja exerta	Owl's clover	Native	Fabaceae	–
Castilleja subinclusa ssp. *subinclua*	Long leaf paintbrush	Native	Fabaceae	–
Caulathus coulteri var. *coulteri*	Coulter’s jewel flower	Native	Brassicaceae	–
Celtis reticulata	Western hackberry	Native	Cannabaceae	–
Chaenactis glabriuscula var. *glabriuscula*	Common yellow chaenactis	Native	Asteraceae	–
Chenopodium californicum	California goosefoot	Native	Chenopodiaceae	–

Scientific Name	Common Name	Native/ Non-Native	Family	Status
Clarkia ungulata	Woodland clarkia	Native	Orobanchaceae	–
Claytonia parviflora	Narrow-leaved miner's lettuce	Native	Montiaceae	–
Claytonia perfoliate	Miner's lettuce	Native	Montiaceae	–
Collinsia concolor	Chinese houses	Native	Plantaginaceae	–
Collinsia heterophylla	Purple Chinese houses	Native	Plantaginaceae	–
Collinsia tinctora	Tincture plant	Native	Plantaginaceae	–
Croton setiger	Turkey-mullein	Native	Euphorbiaceae	–
Cryptantha flaccida	Beaked cryptantha	Native	Boraginaceae	–
Cryptantha muricata var*. muricata*	Showy prickly nut cryptantha	Native	Boraginaceae	–
Cucurbita palmata	Coyote melon	Native	Cucurbitaceae	–
Cylindropuntia echinocarpa	Silver cholla	Native	Cactaceae	–
Cyperus esculentus	Nut sedge	Native	Cyperaceae	–
Datura wrightii	Sacred datura	Native	Solanaceae	–
Delphinium graciletum	Meadow larkspur	Native	Ranunculaceae	–
Delphinium gypsonphilum	Gypsum loving larkspur	Native	Ranunculaceae	–
Diplacus grandiflorus	Sticky monkeyflower	Native	Phrymaceae	–
Dipterostemon capitatus	Blue dicks	Native	Themidaceae	–
Dudleya cymosa	Rock lettuce	Native	Crassulaceae	–
Encelia actoni	Acton brittlebush	Native	Asteraceae	–
Epilobium ciliatum ssp*. ciliatum*	Willow herb	Native	Onagraceae	–
Epilobium canum ssp*. canum*	California fuchsia	Native	Onagraceae	–
Eriogonum roseum	Wand buckwheat	Native	Polygonaceae	–
Eriophyllum lanatum	Wooly sunflower	Native	Asteraceae	–
Erysimum capitatum var. *capitatum*	Sand dune wallflower	Native	Onagraceae	–

Scientific Name	Common Name	Native/ Non-Native	Family	Status
Erythranthe guttata	Seep spring monkeyflower	Native	Phrymaceae	–
Erythranthe cardinalis	Cardinal monkey flower	Native	Phrymaceae	–
Erythranthe moschata	Musk monkeyflower	Native	Phrymaceae	–
Eschscholzia caespitosa	Tufted poppy	Native	Papaveraceae	–
Eschscholzia californica	California poppy	Native	Papaveraceae	–
Eschscholzia lobbii	Frying pan poppy	Native	Papaveraceae	–
Eucalyptus camaldulensis	Red gum	Non-native	Myrtaceae	Cal-IPC rating: Limited
Euthamia occidentalis	Western goldenrod	Native	Asteraceae	–
Fraxinus latifolia	Oregon ash	Native	Oleaceae	–
Gallium aparine	Common bedstraw	Native	Apiacaea	–
Gilia capitata ssp*. abrotanifolia*	Ball gilia	Native	Polemoniaceae	–
Gilia tricolor ssp*. diffus*	Birds eye gilia	Native	Polemoniaceae	–
Gnaphalium pulstre	Lowland cudweed	Native	Asteraceae	–
Helenium puberulum	Sneezeweed	Native	Asteraceae	–
Heliotropium curassavicum ssp*. oculatum*	Alkali heliotrope	Native	Heliotropiaceae	–
Hesperoyucca whipplei	Chaparral yucca	Native	Asparagaceae	–
Hieracium horridum	Shaggy hawkweed	Native	Asteraceae	–
Juncus balticus	Baltic rush	Native	Juncaceae	–
Juncus bufonius	Common toad rush	Native	Juncaceae	–
Lactuca serriola	Pricky lettuce	Non-native	Asteraceae	–
Lasthenia debilis	Greene's goldfields	Native	Asteraceae	–
Leptosiphon bicolor	True babystars	Native	Polemoniaceae	–
Leptosiphon ciliates	Whiskerbrush	Native	Polemoniaceae	–

Scientific Name	Common Name	Native/ Non-Native	Family	Status
Leptosiphon monatus	Mustang clover	Native	Polemoniaceae	–
Lithophragma affine	Common woodland star	Native	Saxifragaceae	–
Lithophragma heterophyllum	Woodland star	Native	Saxifragaceae	–
Lupinus albifrons var. *albifrons*	Silver bush lupine	Native	Fabaceae	–
Lupinus microcarpus	Chick lupine	Native	Fabaceae	–
Marah horrida	Sierra man-root	Native	Cucurbitaceae	–
Matricaria discoidea	Pineappleweed	Native	Asteraceae	–
Melilotus albus	White sweetclover	Non-native	Fabaceae	–
Melilotus indicus	Annual yellow sweetclover	Non-native	Fabaceae	–
Micranthes californica	California saxifrage	Native	Saxifragaceae	–
Mirabilis laevis var. *cedrosensis*	California four O' Clock	Native	Nyctaginaceae	–
Monardella odoratissima	Mountain monardella	Native	Lamiaceae	–
Nastrium officinale	Watercress	Native	Brassicaceae	–
Nemophila pulchilla var. *fremontii*	Fremont's nemophila	Native	Boraginaceae	–
Nicotiana glauca	Indian tobacco	Non-native	Solanaceae	Cal-IPC rating: Moderate
Oenothera californica	California primrose	Native	Onagraceae	–
Oenthera californicum	California evening primrose	Native	Onagraceae	–
Oenothera deltoides ssp. *cognata*	Desert lantern	Native	Onagraceae	–
Opuntia basilaris	Beavertail cactus	Native	Cactaceae	–
Orobanche uniflora	Single-leaved broomrape	Native	Orobanchaceae	–
Oxalis corniculata	Yellow sorrel	Non-native	Oxalidaceae	–
Papaver heterophyllum	Wind poppy	Native	Papaveraceae	–
Pellaea andromedifolia	Coffee fern	Native	Pteridaceae	–
Pellaea mucronata var. *californica*	Bird's foot fern	Native	Pteridaceae	–

Scientific Name	Common Name	Native/ Non-Native	Family	Status
Penstemon grinnelli var. *scrophulinoides*	Grinnell's beardtongue	Native	Plantaginaceae	–
Phacelia cicutaria var. *cicutaria*	Caterpillar phacelia	Native	Boraginaceae	–
Phacelia distens	Common phacelia	Native	Boraginaceae	–
Phacelia egena	Rock phacelia	Native	Boraginaceae	–
Pholistoma auritum var. *auritum*	Blue fiesta flower	Native	Hydrophyllaceae	–
Pinus sabiniana	Grey pine	Native	Pinaceae	–
Pinus sabiniana	Gray pine	Native	Pinaceae	–
Plagiobothrys tenellus	Slender popcorn flower	Native	Boraginaceae	–
Plantago lanceolata	English plantain	Non-native	Plantaginaceae	Cal-IPC rating: Limited
Plantago major	Common plantain	Non-native	Plantaginaceae	–
Platanus racemosa	California sycamore	Native	Platanaceae	–
Populus fremontii ssp. *fremontii*	Fremont cottonwood	Native	Salicaceae	–
Pseudognaphalium californicum	California cudweed	Native	Asteraceae	–
Punica granatum	Pomegranate	Non-native	Lythraceae	–
Quercas douglasii	Blue oak	Native	Fagaceae	–
Quercus agrifolia	Live oak	Native	Fagaceae	–
Quercus wislizeni	Interior live oak	Native	Fagaceae	–
Rafinesquia californica	California chicory	Native	Asteraceae	–
Ribes californicum	California gooseberry	Native	Grossulariaceae	–
Ribes roezlii	Sierra gooseberry	Native	Grossulariaceae	–
Ricinus communis	Castor	Non-native	Euphorbiaceae	Cal-IPC rating: Limited
Rorippa curvisiliqua	Curvepod yellowcress	Native	Brassicaceae	–
Rubus californica	California blackberry	Native	Rosaceae	–

Scientific Name	Common Name	Native/ Non-Native	Family	Status
Rumex conglomeratus	Green dock	Non-native	Polygonaceae	–
Salix exigua	Sandbar willow	Native	Salicaeae	–
Salvia columbariae	Chia	Native	Lamiaceae	–
Schoenoplectus californicus	Bullrush	Native	Cyperaceae	–
Scrophularia californica	California bee plant	Native	Scrophulariaceae	–
Solanum xanti	Purple nightshade	Native	Solanaceae	–
Sonchus asper	Spiny sow thistle	Non-native	Asteraceae	–
Stellaria media	Chickweed	Non-native	Caryophyllaceae	–
Stephanomeria pauciflora	Wire lettuce	Native	Asteraceae	–
Thalictrum fendleri	Meadow rue	Native	Ranunculaceae	–
Thyanocarpus curvipes	Lace pods	Native	Brassicaceae	–
Torilis arvensis	Hedge parsley	Non-native	Apiaceae	Cal-IPC rating: Moderate
Toxicodendron diversilobum	Poison oak	Native	Anacardiaceae	–
Trichostema lanceolatum	Vinegarweed	Native	Lamiaceae	–
Trifolium albopurpureum	Indian clover	Native	Fabaceae	–
Trifolium graciletum	Pin point clover	Native	Fabaceae	–
Trifolium oliganthum	Tomcat clover	Native	Fabaceae	–
Triteleia ixioides ssp. *scabra*	Foothill triteleia	Native	Themidaceae	–
Triteleia laxa	Ithuriel spears	Native	Themidaceae	–
Uropappus lindleyi	Silver puffs	Native	Asteraceae	–
Urtica dioica	Stinging nettle	Native	Urticaceae	–

Copyright 2026 by Southern California Edison

Scientific Name	Common Name	Native/ Non-Native	Family	Status
Verbascum blattaria	Moth mullein	Non-native	Scrophulariaceae	–
Veronica anagallis-aquatica	Water speedwell	Non-native	Plantaginaceae	–
Xanthium strumarium	Cocklebur	Native	Asteraceae	–

APPENDIX J

Non-Native Invasive Plants Potentially Occurring in the Study Area

Copyright 2026 by Southern California Edison

Table J-1. Non-Native Invasive Plants Potentially Occurring in the Study Area

Scientific Name	Common Name(s)	Cal-IPC Rating[1]	Species Code
Aegilops triuncialis	barb goatgrass	High	AETR
Arundo donax	giant reed	High	ARDO4
Brassica tournefortii	Sahara mustard	High	BRTO
Bromus madritensis ssp. rubens	red brome	High	BRMA
Bromus tectorum	cheatgrass	High	BRTE
Carduus pycnocephalus	Italian thistle	Moderate	CAPY2
Carthamus lanatus	woolly distaff thistle	High	CALA20
Centaurea solstitialis	yellow starthistle	High	CESO3
Centaurea stoebe ssp. micranthos	spotted knapweed	High	CESTM
Cirsium vulgare	bull thistle	Moderate	CIVU
Cortaderia jubata	jubatagrass	High	COJU2
Cortaderia selloana	pampasgrass	High	COSE4
Cytisus scoparius	Scotch broom	High	CYSC4
Delairea odorata	Cape-ivy	High	DEOD
Digitalis purpurea	foxglove	Limited	DIPU
Ehrharta calycina	purple veldtgrass	High	EHCA
Elymus caput-medusae	medusahead	High	ELCA13
Euphorbia virgata	Leafy spurge	Moderate	EUVI7
Genista monspessulana	French broom	High	GEMO2
Hedera helix	English ivy	High	HEHE
Lathyrus latifolius	Perennial pea	Watch	LALA4
Lepidium latifolium	perennial pepperweed	High	LELA2
Lythrum salicaria	purple loosestrife	High	LYSA2
Olea europaea	olive	Limited	OLEU
Oncosiphon pilulifer	stinknet	High	ONPI
Onopordum acanthium	Scotch thistle	High	ONAC
Poa pratensis	Kentucky bluegrass	Limited	POPR
Polypogon monspeliensis	rabbitsfoot grass	Limited	POMO5
Rubus armeniacus	Himalayan blackberry	High	RUAR9
Sesbania punicea	Rattlebox	High	SEPU7
Silybum marianum	milk thistle	Limited	SIMA3
Spartium junceum	Spanish broom	High	SPJU2
Tamarix chinensis	Chinese tamarisk	High	TACH2

Scientific Name	Common Name(s)	Cal-IPC Rating[1]	Species Code
Tamarix gallica	French tamarisk	High	TAGA
Tamarix parviflora	smallflower tamarisk	High	TAPA4
Tamarix ramosissima	saltcedar	High	TARA
Ulex europaeus	Gorse	High	ULEU
Verbascum thapsus	woolly mullein	Limited	VETH

NOTES:

[1] The Cal-IPC Invasive Plant Inventory categorizes plants as High, Moderate, or Limited, according to the degree of ecological impact in California (Cal-IPC 2022).

- **High** – 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** – 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** – 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.
- **Watch** – These species have been assessed as posing a high risk of becoming invasive in the future in California.

[2] The Cal-IPC Invasive Plant Inventory creates a query based on generalized habitat types. There is no crosswalk available between Cal-IPC habitat types and CALVEG alliances. Therefore, the habitat types that most closely matched CALVEG vegetation alliances in the Project vicinity were selected. These included the following: 1) grassland, vernal pools, meadows, and other herb communities; 2) riparian and bottomland habitat; 3) woodland habitat, and 4) scrub and chaparral.

APPENDIX K

Representative Photographs of Non-Native Invasive Plant Populations in the Study Area

Copyright 2026 by Southern California Edison



Photo K-1. Cheatgrass (*Bromus tectorum*) along the side of Stark Creek Road.



Photo K-2. Scotch thistle (*Onopordum acanthium*) along the Cow Flat Creek Trail



Photo K-3. Scotch thistle (*Onopordum acanthium*) near Flume No. 1



Photo K-4. Rabbitsfoot grass (*Polypogon monspeliensis*) along the riverbank near the Kern River No. 1 Powerhouse and Switchyard.



Photo K-5. Rabbitsfoot grass (*Polypogon monspeliensis*) near the Democrat Dam Impoundment.



Photo K-6. Common mullein (*Verbascum thapsus*) near Democrat Dam Impoundment.



Photo K-7. Common mullein (*Verbascum thapsus*) near Flume No. 1

APPENDIX K

TERR 2 – WILDLIFE RESOURCES TECHNICAL MEMORANDUM

Copyright 2026 Southern California Edison

TERR 2 – WILDLIFE RESOURCES TECHNICAL MEMORANDUM

KERN RIVER NO. 1 HYDROELECTRIC PROJECT
FERC PROJECT NO. 1930

PREPARED FOR:



March 2026

TABLE OF CONTENTS

1.0 Introduction 1

2.0 Study Objectives 1

3.0 Study Area 1

4.0 Methods 2

4.1 Document Special-Status Wildlife and Associated Habitats 2

4.1.1 Develop Preliminary Special-Status Wildlife Table and Maps 2

4.1.2 Conduct Wildlife Reconnaissance Survey 3

4.1.3 Evaluate Suitable Habitat for Special-Status Wildlife 4

4.1.4 Compile Incidental Observations 7

4.2 Evaluate Project Powerline Pole Configurations 7

4.2.1 Document Avian Electrocutions and Bird-Caused Outages 8

4.3 Evaluate Open-Air Segments of the Water Conveyance System 8

4.4 Conduct Special-Status Salamander Habitat Assessment and Visual Encounter Survey 9

4.4.1 Identify Suitable Habitat for Special-Status Salamanders 9

4.4.2 Visual Encounter Survey 11

4.5 Document Special-Status Bat Reproductive and Seasonal Use of Project Facilities 12

4.5.1 Identify Facilities Potentially Supporting Bat Roosts 12

4.5.2 Document Special-status Bat Reproductive Use of Project Facilities 13

4.5.3 Document Special-status Bat Seasonal Use of Project Facilities 14

5.0 Results Summary 14

5.1 Document Special-Status Wildlife and Associated Habitats 14

5.1.1 Conduct Wildlife Reconnaissance Surveys and Compile Incidental Wildlife Observations 15

5.1.2 Evaluate Habitat for Special-Status Wildlife 16

5.2 Evaluate Project Powerline Configurations 21

5.2.1 Document Avian Electrocutions and Bird-Caused Outages 21

5.3 Evaluate Open-Air Segments of the Water Conveyance System 21

5.4 Conduct Special-Status Salamander Habitat Assessment and Visual Encounter Survey 22
5.4.1 Identify Suitable Habitat for Special-Status Salamanders 22
5.4.2 Visual Encounter Survey Results 24
5.5 Document Special-Status Bat Reproductive and Seasonal Use of Project Facilities 25
5.5.1 Identify Facilities Potentially Supporting Bat Roosts 25
5.5.2 Conduct Roost Surveys 26
5.5.3 Document Special-Status Bat Seasonal Use of Project Facilities 29

6.0 Study Specific Consultation 29

7.0 Outstanding Study Plan Elements 29

8.0 References 30

LIST OF TABLES

Table 3-1. Kern River No. 1 Hydroelectric Project – Project Facilities 34
Table 5-1. Vegetation Alliances and Wildlife Habitats Occurring within 1 Mile of the Kern River No. 1 Hydroelectric Project FERC Boundary 37
Table 5-2. Special-Status Wildlife Species Known or Potentially Occurring in California Wildlife Habitats Relationships Wildlife Habitats 38
Table 5-3. Special-Status and Common Wildlife Species Observed in the Study Area during 2024 Technical Studies 41
Table 5-4. Milkweed Populations Identified in the Study Area 46
Table 5-5. Evaluation of Potentially Suitable Habitat for Western Spadefoot 47
Table 5-6. Larger Animal Burrows Identified in the Study Area 50
Table 5-7. Evaluation of Project Powerline Pole Configurations for Consistency with Avian Powerline Interaction Committee Guidelines 51
Table 5-8. Evaluation of Open-Air Segments of the Project Water Conveyance System 55
Table 5-9. Project Facilities within Special-Status Salamander Habitat 58
Table 5-10. Salamander Visual Encounter Survey Results 61

Table 5-11. Results of Preliminary Visual Field Assessment of Project Facilities with Potential to Support Bat Roosting Habitat 64
Table 5-12. Results of Bat Roost Surveys, by Geographic Area 68
Table 5-13. Summary of Special-Status and Common Bat Species and Associated Detection Methods 70

LIST OF MAPS

Map 5-1a. CWHR Habitats within 1 Mile of the Kern River Project..... 73
Map 5-1b. CWHR Habitats within 1 Mile of the Kern River Project..... 74
Map 5-1c. CWHR Habitats within 1 Mile of the Kern River Project..... 75
Map 5-2a–g Suitable Habitat and Observations of Special-Status Species within the Study Area (CONFIDENTIAL) 76
Map 5-3a–g Kern Canyon Slender Salamander Habitat within the Study Area and Observations During the 2025 Visual Encounter Survey (CONFIDENTIAL)..... 77
Map 5-4a–g Relictual Slender Salamander Habitat within the Study Area (CONFIDENTIAL)..... 78
Map 5-5a–g Yellow-Blotched Salamander Habitat within the Study Area and Observations During the 2025 Visual Encounter Survey (CONFIDENTIAL)..... 79
Map 5-6 Results of Special-Status Bat Reproductive and Seasonal Use Surveys (CONFIDENTIAL)..... 80

LIST OF APPENDICES

Appendix A. Representative Photographs of Potentially Suitable Habitat and Habitat Features for Special-Status Wildlife.
Appendix B. Photographs of Project Power Pole and Switchyard Energized Equipment Configurations.
Appendix C. Photographs of Open-Air Segments of the Project Water Conveyance System.
Appendix D. Special-Status Salamander Agency Consultation Record
Appendix E. Photographs of Representative Special-Status Salamander Habitat
Appendix F. Photographs of Special-Status Salamander VES Results (CONFIDENTIAL)

Appendix G. Photographs of Project Facilities Evaluated for the Potential to Support Bat Roosts.

LIST OF ACRONYMS

AGS	Annual Grassland
APLIC	Avian Power Line Interaction Committee
BAR	Barren
BCC	Birds of Conservation Concern
BOP	Blue Oak – Foothill Pine
BOW	Blue Oak Woodland
CALVEG	Classification and Assessment with Landsat of Visible Ecological Groupings
CC	California Candidate for Listing
CD	California Delisted
CDFW	California Department of Fish and Wildlife
CE	California Endangered
CFP	California Fully Protected
CNDDB	California Natural Diversity Database
CSC	California Species of Concern
CT	California Threatened
CWHR	California Wildlife Habitat Relationships
DNA	deoxyribonucleic acid
Eagle Act	Bald and Golden Eagle Protection Act
FD	Federal Delisted
FE	Federal Endangered
FERC	Federal Energy Regulatory Commission
Forest Service	United States Forest Service
FPE	Federal Proposed Endangered
FPT	Federal Proposed Threatened
FSCC	Forest Service Species of Conservation Concern
GIS	Geographic Information System
GPS	Global Positioning System

LAC	Lacustrine
MCH	Mixed Chaparral
MHW	Montane Hardwood
MRI	Montane Riparian
NRIS	Natural Resource Information System
PAD	Pre-Application Document
Project	Kern River No. 1 Hydroelectric Project
RIV	Riverine
SCE	Southern California Edison
SPD	Study Plan Determination
sq ft	square feet
TERR 2 TSP	TERR 2 – Wildlife Resources Technical Study Plan
TM	Technical Memorandum
TSP	Technical Study Plan
TWG	Technical Working Group
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VES	visual encounter survey
VOW	Valley Oak Woodland
VRI	Valley Foothill Riparian
WL	Watch List

1.0 INTRODUCTION

This TERR 2 – Wildlife Resources Technical Memorandum (TM) provides the methods and findings of field surveys associated with the TERR 2 – Wildlife Resources Technical Study Plan (TERR 2 TSP). The TERR 2 TSP was conducted in support of Southern California Edison's (SCE) Kern River No. 1 Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 1930. The TERR 2 TSP was included in SCE's Revised Study Plan filed with FERC on February 13, 2024 (SCE 2024). In its March 14, 2024, Study Plan Determination (SPD), FERC approved the TERR 2 TSP without modifications (FERC 2024).

Data for the TERR 2 TM was collected from April 2024 through July 2025. Field sampling efforts and data analysis are complete and summarized below.

2.0 STUDY OBJECTIVES

The objectives of the wildlife studies, as outlined in the TERR 2 TSP (SCE 2024), include the following:

- Identify special-status wildlife species potentially occurring in California Wildlife Habitat Relationships (CWHR) habitats documented as part of the TERR 1 – Botanical Resources TSP.

- Identify potential habitat for special-status salamanders within the FERC Project boundary (excluding underground Project features) and 10 feet on either side of Project access trails located outside the FERC Project boundary, and conduct visual encounter surveys (VES) to document their presence.

- Determine whether Project powerline pole configurations are consistent with guidelines for the avoidance of avian mortalities.

- Determine the potential for open-air segments of Project water conveyance system to entrap wildlife.

- Document use of Project facilities by special-status bats during reproduction and other seasonal use.

3.0 STUDY AREA

The extent of the study area for each study component is as follows:

- For identification of special-status wildlife species potentially occurring in CWHR habitats, the study area is 1 mile around Project facilities (see Table 3-1).

- For wildlife reconnaissance surveys, the study area is the FERC Project boundary (excluding underground Project features) and 10 feet on either side of Project access trails located outside the FERC Project boundary.

Copyright 2026 by Southern California Edison

- For the evaluation of consistency with guidelines for the avoidance of avian mortalities, the study area is Project powerlines.

- For the evaluation of potential wildlife entrapment, the study area is the sandbox and open-air segments of flumes and conduits along the water conveyance system.

- For special-status salamanders (Kern Canyon slender salamander, relictual slender salamander, and yellow-blotched salamander), the habitat assessment study area is the FERC Project boundary (excluding underground Project features) and 10 feet on either side of Project access trails located outside the FERC Project boundary. The VES study area is potential habitat identified during implementation of the habitat assessment. If habitats extend outside the habitat assessment study area, VES will include:

  – Potential habitat up to 100 feet outside the FERC Project boundary.

  – Potential habitat up to 100 feet outside of Project access trails located outside of the FERC Project boundary.

- For the special-status bat facility assessment, the study area is Project facilities (Table 3-1).

- For special-status bat reproductive and seasonal use surveys, the study area is the Project facilities potentially supporting bats.

Studies were not conducted at locations with no safe access (e.g., where there is very steep terrain) or on private property with no owner approval prior to implementation of the studies.

4.0 METHODS

Study implementation followed the methods described in the TERR 2 TSP (SCE 2024).

4.1 DOCUMENT SPECIAL-STATUS WILDLIFE AND ASSOCIATED HABITATS

The methods for identifying special-status wildlife and habitats within the study area included developing preliminary tables and maps of special-status species known to occur or potentially occurring in the study area, documenting the distribution of CWHR habitats, conducting field surveys, compiling other incidental wildlife data, and developing final tables and maps of special-status species known to occur or potentially occurring in the study area. The approach for each of these study elements is described below.

4.1.1 Develop Preliminary Special-Status Wildlife Table and Maps

Existing information from the TERR 1 – Botanical Resources TM (SCE 2025) detailing the location and extent of Classification and Assessment with Landsat of Visible Ecological Groupings (CALVEG) vegetation alliances was used to update Table 3.6-1

included in Section 3.6, Botanical and Wildlife Resources of the Preliminary Application Document (PAD) (SCE 2023). The CALVEG–CWHR Crosswalk (United States Forest Service [Forest Service] 2014), developed by the Forest Service and the California Department of Fish and Wildlife (CDFW), was used to determine which wildlife habitats are likely to be present based on existing vegetation alliances and forest structural characteristics. A Geographic Information System (GIS) map of wildlife habitats within the study area, overlain with information on Project facilities, was created.

CDFW's CWHR database was reviewed to develop a list of special-status wildlife species potentially occurring in each CWHR habitat (CDFW 2024a). The CWHR database uses a predictive model to determine the likelihood of the occurrence of animal species in any given geographical location based on ecological data included in the model, such as the life history and known distribution of an animal, existing vegetation, percent canopy cover, presence of water, and a number of other elements including landscape features.

A table was then developed listing each CWHR habitat in the study area and special-status species known or potentially occurring in the study area that may occur in each habitat.

4.1.2 Conduct Wildlife Reconnaissance Survey

Wildlife reconnaissance surveys were conducted to characterize wildlife usage of the study area. The surveys were conducted during the avian nesting season (March–June) to allow for the identification of any nests within the study area. The surveyors conducted the surveys between sunrise and sunset. Surveys were not conducted during weather conditions that would affect detectability (i.e., snow, sleet, or rain; high winds; extreme heat, etc.).

A team of biologists covered the entire study area on foot and focused on habitats potentially supporting special-status species. The methods used included zigzag and linear patterns, dependent on the survey area and the terrain. Zigzag patterns were used to cover more ground and worked well in larger habitat areas (e.g., grassland), while linear patterns worked well in narrow habitats (e.g., riparian). Areas that could not be accessed safely or where surveyors did not have permission to access were instead surveyed using high vantage points (when possible) to survey the area using binoculars and/or a spotting scope to the greatest degree possible.

Wildlife taxonomy for recording species was based on California's Wildlife, Volumes I, II, and III (Zeiner et al. 1988, 1990a, 1990b). All species were recorded as present if they were observed, species-specific vocalizations were heard, or if diagnostic field signs were found (e.g., scat, tracks, pellets). The following data was collected for each observation as applicable: the global positioning system (GPS) coordinates or a map markup; the type of observation (i.e., visual, auditory, scat); photographs (when possible); and the surrounding habitat and habitat conditions.

For each special-status species observed, a California Native Species Field Survey Form was completed and submitted to the California Natural Diversity Database (CNDDB).

Finally, an electronic database (Excel spreadsheet) of special-status wildlife observed was created for sharing collected data with resource agencies and interested stakeholders.

4.1.3 Evaluate Suitable Habitat for Special-Status Wildlife

Within CWHR habitats that were identified as providing suitable habitat for special-status wildlife, surveyors searched for and recorded additional information on any unique habitat features and structures. The following sections describe the additional data collected based on the species or suitable habitat types.

4.1.3.1 Monarch Butterfly

Breeding monarch butterflies (*Danaus plexippus;* Proposed for Listing as Federal Proposed Threatened [FPT]) require the presence of *Asclepias* (milkweed) species as a host plant. As part of the TERR 1 – Botanical Resources TSP, in order to document breeding habitat for monarch butterflies in the study area, botanists recorded the following data for each population of milkweed identified in the study area: GPS coordinates; the approximate size of population (in acres/square feet); and the estimated number of individuals.

4.1.3.2 Western Spadefoot

The western spadefoot (*Spea hammondi;* FPT, California Species of Concern [CSC]) requires both aquatic breeding habitat and terrestrial habitat to fulfill its life history. The United States Fish and Wildlife Service (USFWS) defines aquatic breeding habitat for spadefoots as water features such as vernal pools, ponds, ditches, or other ponded surface waters with the appropriate temperature and hydroperiod for breeding and rearing young, and that do not support non-native predators. In addition, the western spadefoot requires upland habitat adjacent and accessible to the water features it uses. Upland habitat includes grassland or grassland/scrub vegetation on gently sloped landscapes with the appropriate soil makeup to allow for the species to create burrows and refugia to avoid desiccation and provide cover (USFWS 2023).

Prior to reconnaissance surveys, biologists reviewed available resources, including United States Geological Survey (USGS) quadrangle maps and aerial photography of the study area, to determine the location of any mapped aquatic features that may represent breeding habitat for western spadefoot. In addition, biologists also identified smaller, unmapped aquatic features during implementation of reconnaissance surveys. The following data were recorded for each aquatic feature identified: GPS coordinates; photographs; a description of the water body and its suitability as breeding habitat; and a description of suitable upland habitat adjacent to the water body.

4.1.3.3 Terrestrial Reptiles

During reconnaissance surveys, biologists noted any small-scale features such as burrows or downed woody debris that may provide habitat for special-status terrestrial reptiles including, but not limited to, California legless lizard (*Anniella* spp.*;* CSC),

California glossy snake (*Arizona elegans occidentalis;* CSC), San Joaquin coachwhip (*Masticophis flagellum ruddocki;* CSC), and coast horned lizard (*Phrynosoma blainvillii;* CSC). The following data were collected for each special-status reptile observed in the study area: GPS coordinates; photographs; and a photograph of habitat where individual/population was observed.

4.1.3.4 Cliff-Nesting Birds

Cliff habitat in and immediately surrounding the study area that may potentially provide habitat for special-status cliff-nesting birds including, but not limited to, golden eagle (*Aquila chrysaetos;* Bald and Golden Eagle Protection Act [Eagle Act], USFWS Bird of Conservation Concern [BCC], California Fully Protected [CFP] and CDFW Watch List [WL]), prairie falcon (*Falco mexicanus;* WL), American peregrine falcon (*Falco peregrinum anatum;* Federal Delisted [FD], California Delisted [CD]), and California condor (*Gymnogyps californianus;* Federal Endangered [FE], California Endangered [CE], CFP) was mapped as part of the reconnaissance survey. Nest searches were conducted by using binoculars and/or spotting scopes to systematically scan large trees and suitable crevices on cliffs for large aggregations of stick nest material, whitewash, and/or prey remains that indicate the presence of raptors. Data collected for each nest observed included: a GPS coordinates/map markup; a photograph; a description of nest; the status of nest (active or inactive); the number of adults present; and the number of eggs/young (if visible).

4.1.3.5 Coniferous Forest Birds

During reconnaissance surveys, biologists documented habitat elements for special-status coniferous raptors and other birds including, but not limited to, American goshawk (*Astur atricapillus;* Forest Service Species of Conservation Concern [FSCC], CSC), Vaux's swift (*Chaetura vauxi;* CSC), bald eagle (*Haliaeetus leucocephalus;* FD, Eagle Act, FSCC, CE, CFP), and California spotted owl (*Strix occidentalis occidentalis;* FPT, BCC, FSCC, CSC). Habitat elements for these species include, but are not limited to, dense canopy cover, large trees, or snags with cavities; and substantial amounts of downed woody debris potentially supporting prey species (rodents) for goshawks and owls. Nest searches were conducted by using binoculars and/or spotting scopes to systematically scan large trees for aggregations of stick nest material, whitewash, and/or prey remains that indicate the presence of raptors. Data collected for each nest observation included: a GPS coordinates/map markup; a photograph; a description of nest; the status of nest (active or inactive); the number of adults present; the number of eggs/young (if visible).

4.1.3.6 Grassland/Shrubland Birds

During reconnaissance surveys, grasslands and shrub habitats in the study area were inspected for the presence of nests of special-status birds such as grasshopper sparrow (*Ammodramus savannarium;* CSC), northern harrier (*Circus hudsonius;* BCC, CSC), and loggerhead shrike (*Lanius ludovicianus;* CSC). Nest searches for grassland birds were conducted by meandering in grassland habitats and searching for evidence of

reproductive behaviors (i.e., singing males; adults carrying nesting materials, food, or fecal sacs; etc.) and tracking the adult birds to the nest location with binoculars. Data collected for each nest observed included: a GPS coordinates/map markup; a photograph; a description of nest; the status of nest (active or inactive); the number of adults present; and the number of eggs/young (if visible).

4.1.3.7 Riparian Birds

During reconnaissance surveys, riparian habitat in the study area was inspected for the presence of nests of special-status birds such as tricolored blackbird (*Agelaius tricolor;* BCC, FSCC, California Threatened [CT], CSC), southwestern willow flycatcher (*Empidonax traillii extimus;* FE, CE), yellow-breasted chat (*Icteria virens;* CSC), purple martin (*Progne subis;* CSC), and yellow warbler (*Setophaga petechia;* CSC). Evidence of reproductive behaviors (i.e., singing males; adults carrying nesting materials, food, or fecal sacs; etc.) was noted; and biologists followed the adult birds to the nest location with binoculars. Data collected for each nest observed included: a GPS coordinates/map markup; a photograph; a description of nest; the status of nest (active or inactive); the number of adults present; and the number of eggs/young (if visible).

4.1.3.8 Fossorial Denning Mammals

During reconnaissance surveys, open grassland and shrubland habitats in the study area were inspected for the presence of suitable soils and burrows that may potentially provide habitat for special-status fossorial denning mammals, including Tulare grasshopper mouse (*Onychomys torridus tularensis;* CSC), American badger (*Taxidea taxus;* CSC), or San Joaquin kit fox (*Vulpes macrotis mutica;* FE, CT).

The Tulare grasshopper mouse nests in small burrows that it excavates, or in burrows that have been abandoned by other rodents (Zeiner et al. 1988, 1990a, 1990b). Note that, during reconnaissance surveys, it was observed that small burrows suitable for a variety of rodent species including, but not limited to, grasshopper mice, were common and plentiful throughout the study area. Biologists did not collect individual data for these burrows, but noted and took photographs in areas where they were prevalent.

San Joaquin kit foxes are semi-fossorial and use dens throughout the year for daytime resting, predator avoidance, shelter, and rearing young (Grinnell et al. 1937; Koopman et al. 1998, cited in Cypher et al. 2023). San Joaquin kit foxes co-occur throughout their range with the more common and abundant California ground squirrel *(Otospermophilus beecheyi*). As described by Cypher et al. (2023), while the mean height, width, and circumference of burrows used by San Joaquin kit foxes are larger than those used by California ground squirrels, there is significant overlap in the total range of dimensional values of burrows used by both species. As stated previously, smaller burrows potentially used by rodents such as California ground squirrels were abundant throughout the study area. Where present, biologists conducted additional analysis prior to recording these burrows as potentially suitable habitat for San Joaquin kit foxes. The following factors were considered:

- Physical presence of California ground squirrels in or around the burrows;
- Whether surrounding habitats were typical of those preferred by San Joaquin kit foxes (flat, open areas with limited tree cover and low/sparse vegetation);
- Whether burrows showed modifications, such as being triangular (taller than wide), rather than round, or having soil being expelled from the burrow in one direction (as opposed as opposed to the standard rodent "skirt" of soil around ground squirrel burrows); and
- Other signs such as scat, trash, or kills at the burrow location.

Where possible, biologists looked in the burrows to try and determine if the burrows ended or collapsed, went deeper into the ground, or seemed to have chambers.

American badger excavate burrows for birthing sites, safe resting areas, food storage, and protection from the elements, in areas with dry, friable soils. They may also enlarge burrows of gophers, ground squirrels, or other prey species. Burrows typically have a large oval or elliptical entrance (approximately 8 to 12 inches wide) and have a mound of loose, freshly dug soil mounded at the entrance.

Biologists recorded the following data for larger burrows that may potentially provide habitat for special-status mammals such as San Joaquin kit fox or American badger: GPS coordinates; photograph; approximate dimensions of burrow; substrate conditions; and animal sign in vicinity of burrow (e.g., scat).

4.1.4 Compile Incidental Observations

Incidental observations of any special-status species during all field surveys conducted in support of the relicensing were recorded by each field team. Data collected for each of the incidental observations included: the date/time of observation; GPS coordinates/map markup (when possible); the species name; and the type of observation (e.g., visual or auditory). These data were incorporated into CNDDB forms and entered into the electronic database of special-status wildlife species and were reviewed for accuracy and reliability. Follow-up contact with the original observer was made to obtain additional information or clarification, as necessary.

4.2 Evaluate Project Powerline Pole Configurations

Field inspections were conducted in conjunction with reconnaissance surveys to document the configuration of Project powerline poles and energized equipment within the Kern No. 1 Powerhouse Switchyard. Accessible portions of these facilities were visited on foot, and photographs were taken of pole and equipment configurations, which were then evaluated against Avian Power Line Interaction Committee (APLIC) raptor-safe configuration guidelines.

In general, electrocution can occur when birds perch on, nest on, or collide with structures having: (1) uninsulated phase conductors separated by less than the wrist-to-wrist or

head-to-foot measurement of a bird; or (2) distances between grounded hardware (e.g., grounded wires, equipment, or guy wires) and any energized phase conductors (or other energized equipment) less than the wrist-to-wrist or head-to-foot measurement of a bird. APLIC recommends a conductor-to-conductor or conductor-to-grounded hardware distance of about 60 inches to accommodate the body dimensions of large birds such as bald and golden eagles (APLIC 2012). Therefore, the configuration of poles/energized equipment was evaluated according to the following criteria:

- Whether power lines are underground and/or insulated (and, therefore, pose no risk of electrocution);
- Whether the distance between uncovered phase conductors is less than 60 inches with no perch guard;
- Whether the distance between uncovered energized parts and grounded equipment on equipment poles is less than 60 inches; and
- Whether the pole contains uninsulated or partially insulated metal guy wires, jumper, or transformer cables.

4.2.1 Document Avian Electrocutions and Bird-Caused Outages

SCE monitors avian electrocutions and mortalities, as well as avian-caused outages, along Project powerlines as part of its corporate Avian Protection Program. Reports of mortalities are provided to resource agencies (e.g., CDFW and USFWS), as appropriate. SCE reviewed its avian incident records to determine whether any avian electrocutions, outages, or mortalities had been reported since filing of the PAD for the Kern River No. 1 Project (SCE 2023).

4.3 Evaluate Open-Air Segments of the Water Conveyance System

Surveyors reviewed the existing information (e.g., design drawings, aerial images, photographs, or drone footage) to determine the location of open-air segments of the water conveyance system (i.e., the sandbox and open-air segments of flumes and conduits); and then visited each open-air water conveyance structure on foot, to the degree possible, during implementation of reconnaissance surveys. Accessible facilities were photographed and assessed for the following to determine whether the facility is potentially accessible to mid- to large-size animals (e.g., fox, coyote, or deer) that may potentially become entrapped:

- Whether structure is fenced;
- Whether structure is elevated or at ground level;
- Whether structure is covered; and
- General notes on condition and accessibility, as applicable.

4.4 CONDUCT SPECIAL-STATUS SALAMANDER HABITAT ASSESSMENT AND VISUAL ENCOUNTER SURVEY

Based on preliminary habitat and occurrence information collected as part of development of the PAD (SCE 2023), there are three special-status salamanders with potential to occur in the study area, including the relictual slender salamander (*Batrachoseps relictus*) (Federal Proposed Endangered [FPE], CSC), Kern Canyon slender salamander (*Batrachoseps simatus*) (FPT, CT), and the yellow-blotched salamander (*Ensatina eschscholtzii croceater*) (FSCC, WL). The methods and results of the habitat and VES for special-status salamanders are provided below.

4.4.1 Identify Suitable Habitat for Special-Status Salamanders

The habitat assessment for special-status salamanders consisted of three primary steps. First, resource agencies and recognized experts were contacted to obtain additional information on known occurrences of salamanders and habitat characteristics (including microsites). Second, preliminary GIS maps of potential special-status salamander habitat were prepared based on a desktop review of existing information. Lastly, a field evaluation was conducted to ground-truth the preliminary maps of habitat and identify suitable microsites for each species. Each step is described further below.

4.4.1.1 Consult with Agencies and Recognized Salamander Experts

Prior to conducting the preliminary habitat mapping, the Terrestrial Technical Working Group (TWG) (which includes resource agencies and recognized experts) was contacted to obtain information on additional special-status salamander occurrences and habitat information (including microsites) in the study area.

4.4.1.2 Develop Preliminary Habitat Maps

Preliminary maps of potential Kern Canyon slender salamander, relictual slender salamander, and yellow-blotched salamander habitat (i.e., physical and biological features necessary for the conservation of these special-status salamanders) were developed based on a review of existing literature of occurrences and habitat.

Specifically, the following references were reviewed:

- Resource agency websites and databases (e.g., CNDDB) were reviewed to obtain any new data on Kern Canyon slender salamanders, relictual slender salamanders, and yellow-blotched salamanders known to occur or potentially occurring in the study area (CDFW 2024b);

- Endangered and Threatened Wildlife and Plants; 12-Month Finding for the Kern Plateau Salamander; Threatened Species Status With Section 4(d) Rule for the Kern Canyon Slender Salamander and Endangered Species Status for the Relictual Slender Salamander; Designation of Critical Habitat (Federal Register, Volume 87, No. 200, Pages 63155–63189) (USFWS 2022a);

- Species Status Assessment for the Relictual Slender Salamander (*Batrachoseps relictus*), Kern Canyon Slender Salamander (*Batrachoseps simatus*), and Kern Plateau Salamander (*Batrachoseps robustus*) (USFWS 2022b);

- Distribution, Natural History, and Conservation Status of the Relictual Slender Salamander (*Batrachoseps relictus*) (Moss et al. 2024);

- Comment letter to USFWS in response to proposed listing of the Kern Canyon and relictual slender salamanders (Jockusch et al. 2022); and

- Habitat Characteristics of Sites with Yellow-Blotched Salamanders (*Ensatina eschscholtzii croceator*) (Germano 2006);

A combination of sources were reviewed to prepare preliminary maps of special-status salamander habitat, including the following:

- Recent Google Earth imagery (Google 2024);

- Maps of CWHR vegetation communities developed as part of the TERR 1 – Botanical Resources TM (SCE 2025);

- Endangered and Threatened Wildlife and Plants; 12-Month Finding for the Kern Plateau Salamander; Threatened Species Status With Section 4(d) Rule for the Kern Canyon Slender Salamander and Endangered Species Status for the Relictual Slender Salamander; Designation of Critical Habitat (Federal Register, Volume 87, No. 200, Pages 63155–63189) (USFWS 2022a); and

- Known occurrences of Kern Canyon slender salamanders, relictual slender salamanders, and yellow-blotched salamanders from resource agency websites and databases (CDFW 2024b; Forest Service 2022).

Once these resources were compiled, preliminary GIS maps were developed that showed the study area in relation to proposed Critical Habitat, vegetation communities, and known occurrences.

4.4.1.3 Conduct Field Surveys and Develop Final Habitat Maps

Biologists ground-truthed the preliminary maps in the field to document potentially suitable habitat for each special-status salamander species, including the location of microsites not identified through existing information review or preliminary GIS habitat maps.

Biologists assessed the study area on foot, walking in a zig-zag pattern to identify the presence of microhabitats. In some areas, the biologists could not walk to the full extent of the study area due to the steep and dangerous terrain. In these areas, biologists used binoculars to scan the habitat to determine whether microsites suitable for special-status salamanders were present.

Special-status salamander habitat is defined at two scales. The first component of suitable habitat is the overall vegetation community types where special-status salamanders are known to occur (e.g., riparian woodland, annual grassland, etc.). The second component of suitable habitat is the presence of abundant microsites (e.g., cover objects, woody debris, rock outcroppings, etc.). Special-status salamanders are not likely to occur in vegetation community types unless these microsites are present. For example, Kern Canyon slender salamanders are known to occur in annual grasslands, but only when there are suitable rock outcroppings for cover elements. Therefore, annual grasslands without rock outcroppings were not considered suitable habitat.

When mapping habitat suitability within vegetation community types, the boundaries of suitable habitat were determined by using a 15-foot buffer around suitable microsites. The 15-foot buffer is a conservative estimate of the dispersal distances based on the physiology of the species and typical activity requirements (USFWS 2022b). Existing data on the dispersal distances of these special-status salamanders is not known due to their rarity and salamanders requiring specific conditions (i.e., suitable temperature, moist soil, and overcast or rainy weather) to be active because they are highly vulnerable to desiccation due to their permeable skin (USFWS 2022a).

Suitable habitat for special-status salamanders was documented on datasheets, map markups, and digitally through ArcGIS FieldMaps to collect GPS location information for each habitat. Habitats were given unique codes to denote the associated species and the habitat number.

Field data were processed and used to develop habitat maps for each species overlain on Project facilities. Tables developed to identify Project facilities located within the footprint of special-status salamander habitat and acreage of habitat present within the study area for each of the special-status salamander species was calculated.

During the ground-truthing, biologists followed decontamination guidelines consistent with the Declining Amphibian Task Force Fieldwork Code of Practice (USFWS 2005).

4.4.2 Visual Encounter Survey

A VES was conducted within suitable salamander habitat that was mapped as part of the habitat assessment. The VES was seasonally timed to maximize the potential for observing special-status slender salamanders based on the timeframes described in USFWS 2022a and as refined based on consultation with recognized salamander experts in the Kern River Canyon (E. Jockusch, pers. comm. 2023). The surveys were conducted within 2 days following a rain event when slender salamanders are generally easier to observe, and habitats are damp.

Surveys generally followed the methods described in Grover (2006) and included lifting, overturning, and carefully replacing objects such as rocks, boards, and debris; carefully searching leaf litter and under loose tree bark; and inspecting burrows and rock crevices. Aquatic habitat was surveyed by slowly walking the water’s edge, scanning for salamanders in water, and overturning cover objects in the water including woody debris

and leaf litter. Rock outcrops were searched with spotlights and shining lights into suitable crevices. Biologists took care to minimize disturbance to suitable habitat and animals during field surveys.

Slender salamanders were not handled but identified to species in the field to the extent possible based on Jockusch et al. (2012), Stebbins (2003), and other references. Individual salamanders were not collected for later identification, but photographs were taken to compare to known reference photographs. For each special-status salamander observed, the following data were obtained: GPS coordinates; a photograph of the individual and surrounding habitat; and a notation of diagnostics used in identification. A CNDDB form was developed to document all special-status species observations, and any observations were incorporated into the electronic database of special-status wildlife.

Biologists followed decontamination guidelines consistent with the Declining Amphibian Task Force Fieldwork Code of Practice (USFWS 2005).

Finally, a table was developed summarizing the results of surveys and a GIS map was developed to identify the location of any special-status species observed in relation to Project facilities.

4.5 Document Special-Status Bat Reproductive and Seasonal Use of Project Facilities

4.5.1 Identify Facilities Potentially Supporting Bat Roosts

An initial desktop assessment of potential bat roosting habitat at Project facilities was conducted through a desktop review of aerial imagery of the study area (Google Earth 2024), a review of existing photographs of the Project facilities, and descriptions of Project facilities from Section 2.0 of the PAD for the Kern River No. 1 Project (SCE 2023). Refer to Table 3-1 for a list of Project facilities reviewed. Potential bat roosting habitat criteria used for the initial assessment included the presence of vertical and roofed components, overhangs, crevices, and cave-like openings or features.

A preliminary visual field assessment was conducted in late May and early June 2024 at Project facilities identified as potentially supporting bat roosting habitat during the desktop review. The exterior of facility structures was visually inspected to assess the suitability of a structure for bat use. The interior of facilities was also inspected, where possible. Criteria used to assess suitability include the presence of appropriate crevice or cave-like features and appropriate thermal conditions. Bats prefer different thermal conditions for maternity roosting versus hibernacula.[1] Maternity roosts are usually found in microclimates with warmer thermal conditions and high solar exposure (Lausen and Barclay 2003), whereas hibernacula are usually found in areas with colder thermal conditions (Webb et al. 1996).

Both maternity roosts and hibernacula tend to be located in cracks, crevices, caves, or building interiors that offer more sheltered and protected conditions. Day and night roosts

[1] Hibernacula are defined as shelters used during the winter by hibernating or otherwise dormant animals.

may be placed in more open areas under overhangs (such as the eaves of rooftops). In addition, the facilities were examined to determine the accessibility of the structure to bats (e.g., presence of small cracks or openings for bats to enter the interior of the structure). Only those facilities having structures with vertical and roofed elements, abundant cracks and crevices, and/or appropriate thermal conditions were considered potential bat roosting habitat.

Data obtained for each of the evaluated Project facilities included, but was not limited to, the date and time of the survey; the name and location of facility; notation of features or structures that represent suitable habitat or reasons why facility is not considered suitable for roosting bats; photographs of the facility; and a description of surrounding environmental conditions.

4.5.2 Document Special-status Bat Reproductive Use of Project Facilities

Reproductive surveys include roost surveys, guano deoxyribonucleic acid (DNA) sampling, and acoustic sampling. Each of these surveys is described below.

4.5.2.1 Conduct Roost Surveys

In August 2024, biologists surveyed the Project facilities previously identified as potentially supporting bat roosts. Surveys were conducted during the maternal roosting period (June–August) when colonies may still be present, but after the critical sensitive period (i.e., parturition and early nursing period). Facilities were inspected on the exterior and interior (when accessible for bat roost signs (e.g., skeletons, dead young, placentas, guano deposits, urine staining, and culled insect parts) and/or live bats. To fully assess the facilities biologists utilized binoculars, flashlights, and blacklights, as needed.

If bats or indications of bats were observed, the following data were collected: the species (if determinable by visual survey); the roost type (day roost/night roost/maternal roost); the number of adults and/or juveniles; the signs observed; and the location and prevalence of signs (e.g., number of guano at location and/or the size of urine stain).

4.5.2.2 Sample Guano

Guano samples were collected at roost sites where fresh viable samples were present and bat species could not be identified visually during the roost survey. Biologists wore nitrate gloves collected samples with tweezers cleaned with a 70% isopropyl alcohol solution. The samples were stored in a stabilizing solution to prevent DNA degradation and submitted to the Genidaqs SM Molecular Biology and Genetics Lab (Cramer Fish Sciences) for DNA sequencing and species identification. DNA sequences were compared to species-specific genetic markers developed by Walker et al. (2016) and further verified by comparison to samples at the National Center for Biotechnology Information DNA sequence database.

A table and map were developed identifying the location of guano DNA sampling and sequencing results (i.e., species present).

4.5.2.3 Conduct Acoustic Sampling

Acoustic sampling (i.e., sampling of echolocation calls) was conducted during the reproductive season at potential flight corridors between potential roosting habitat and foraging habitat, and any additional locations where bats were detected during roost surveys but were not identified to species. The acoustic units were operated at the selected sites for five nights from sunset until sunrise between June and August. Acoustic sampling was conducted using full-spectrum Wildlife Acoustics SM4BAT-FS detector units (acoustic units). Sonogram files were processed using Kaleidoscope Pro 4.5.5 (Wildlife Acoustics), which auto-classifies each sonogram into tentative species determinations with 70 to 80 percent accuracy. The Anabat Insight software program was then used to further classify files and reduce the amount of time required to manually inspect sonograms. Finally, a qualified bat biologist reviewed the auto-classified sonograms to confirm species designations.

4.5.3 Document Special-status Bat Seasonal Use of Project Facilities

Additional acoustic sampling was conducted in October 2024 at those locations where active roosts were identified and/or within flight corridors between roost sites and potential foraging habitat to determine seasonal patterns of use. Refer to Section 4.5.2.3 for a description of acoustic sampling methods.

For all special-status bats observed during reproductive use and seasonal use, a CNDDB form was completed, and observations were added to the electronic database of special-status wildlife survey data.

5.0 RESULTS SUMMARY

5.1 DOCUMENT SPECIAL-STATUS WILDLIFE AND ASSOCIATED HABITATS

Based on the updated CALVEG–CWHR crosswalk developed for the study area (refer to Table 5-1), the following CWHR habitats were identified in the study area:

- Annual Grassland (AGS)
- Barren (BAR)
- Blue Oak - Foothill Pine (BOP)
- Blue Oak Woodland (BOW)
- Lacustrine (LAC)
- Mixed Chaparral (MCH)
- Montane Hardwood (MHW)
- Montane Riparian (MRI)

- Riverine (RIV)
- Valley Foothill Riparian (VRI)
- Valley Oak Woodland (VOW)

Refer to Map 5-1a–c for the location and distribution of these habitats within the study area.

Refer to Table 5-2 for CWHR habitats used by special-status species known or potentially occurring in the study area. Refer to the TERR 1 – Botanical Resources TM for information on sensitive habitats in the study area.

5.1.1 Conduct Wildlife Reconnaissance Surveys and Compile Incidental Wildlife Observations

Eight special-status wildlife species were observed during wildlife reconnaissance surveys conducted in late May and early June 2024. This includes bumblebee (*Bombus* spp.; candidate for listing under the California ESA [CC]); Swainson's hawk (*Buteo swansoni*; CT); golden eagle; bald eagle; white-headed woodpecker (*Dryobates albolarvatus*; BCC); savannah sparrow (*Passerculus sandwichensis*, BCC); oak titmouse (*Baelophus inornatus*, BCC); and Bullock's oriole (*Icterus bullockii*, BCC). Several of these species were also observed incidentally during other studies. Additional information on these sightings is provided in Section 5.1.2.

In addition, four special-status bats were observed as part of special-status bat studies conducted: pallid bat (*Antrozous pallidus*, CSC); western mastiff bat (*Eumops perotis californicus*, CSC); western red bat (*Lasiurus frantzii*, CSC); and fringed myotis (*Myotis thysanodes*; FSCC). Refer to Section 5.5 for additional information on these species in the study area.

The following six additional special-status species were observed incidentally during other technical studies: monarch butterfly; northwestern pond turtle (*Actinemys marmorata*; FPT, CSC); American peregrine falcon; golden eagle; northern harrier; and Lawrence's goldfinch (*Spinus lawrencei*, BCC). Refer to the AQ 3 – Fish Population Interim TM for additional information on the sightings of northwestern pond turtle. The remainder of the incidental sightings are discussed further in Section 5.1.2.

Common species or their sign observed during reconnaissance surveys included terrestrial reptiles such as the western fence lizard (*Sceloporus occidentalis*), western side-blotched lizard (*Uta stansburiana elegans*), southern alligator lizard (*Elgaria multicarinata*), California whiptail (*Aspidoscelis tigris munda*); raptors such as the red-tailed hawk (*Buteo jamaicensis*); songbirds such as song sparrow (*Melospiza melodia*), black phoebe (*Sayornis nigricans*), house finch (*Haemorhous mexicanus*); and mammals such as California ground squirrel, desert cottontail (*Sylvilagus audubonii*), and coyote (*Canis latrans*).

Refer to Table 5-3 for a list of all special-status and common wildlife species observed in the study area during wildlife reconnaissance surveys and other technical studies. Refer to Map 5-2 for the location of special-status wildlife species observed.

All special-status species observations were submitted to the CNDDB, as appropriate, per CDFW's CNDDB reporting guidelines (CDFW 2018). All special-status species observations were compiled into an electronic database, which is available upon request.

5.1.2 Evaluate Habitat for Special-Status Wildlife

Provided below are the results of the evaluation of potentially suitable habitat for special-status wildlife in the study area conducted as part of wildlife reconnaissance surveys.

5.1.2.1 Monarch Butterfly

Biologists documented ten populations of milkweed, including nine populations of California milkweed (*Asclepius californica*) and one population of narrowleaf milkweed (*Asclepias fascicularis*) in the study area that may provide breeding habitat for monarch butterflies. The largest population, located along the northwestern side of Willow Spring Creek Road (Democrat Dam Road), covered approximately 6,500 square feet, and included least 450 individuals. Additional smaller populations were documented along the Democrat Gage Trail (one individual), at the Democrat Dam Impoundment (one individual), along Stark Creek Trail (one individual), along Adit 17 & 18 Trail (one individual), along the Forebay Overflow Spillway (one individual), and along the Overflow Spillway Trail (four populations with a total of 11 individuals).

Two monarch butterflies were observed during TERR 1 botanical studies in the vicinity of the Democrat Dam impoundment. The first was observed in May 2024 on the island in the impoundment; and the second was observed during TERR 1 riparian studies conducted in October 2024 along the northern shore of the Kern River near the island. These observations were approximately 0.5 mile from the nearest milkweed population (along Willow Spring Creek Road).

Refer to Table 5-4 for location and population information for milkweed populations observed. Refer to Map 5-2 for the location of these milkweed populations. Refer to Appendix A (Photos 1–4) for representative photos of milkweed populations in the study area.

5.1.2.2 Western Spadefoot

During the desktop evaluation and in the field, biologists identified 15 locations that potentially supported suitable aquatic habitat for western spadefoot. Further evaluation of these sites during reconnaissance surveys indicated that six of the water bodies were potentially suitable for breeding western spadefoot (i.e., supported water for sufficient time to support breeding and did not support non-native predators). Of these six aquatic habitats, only three were also located adjacent to suitable upland habitats, defined as gently sloping grasslands with burrows for refugia. These three areas therefore represent suitable habitat for western spadefoot:

- An unnamed seep located along Willow Spring Creek Road (Democrat Dam Road) (Photo 5 in Appendix A) (WSF-1);

- Dougherty Creek in the vicinity of Flume No. 5 (Photo 6 in Appendix A) (WSF-2); and

- Stark Creek in the vicinity of Flume No. 6 (Photo 7 in Appendix A) (WSF-3).

No western spadefoot individuals were observed in the study area.

Refer to Table 5-5 for a summary of the results of the evaluation of suitable aquatic and upland habitats for western spadefoot. Refer to Appendix A (Photos 5–7) for photos and to Map 5-2 for the location of the three suitable habitat areas.

5.1.2.3 Terrestrial Reptiles

The soils of the study area are mostly composed of a coarse sandy loam with decomposed granite bedrock that is highly suitable for burrowing. Burrows are abundant throughout the study area, with a noticeable concentration of burrows along Stark Creek Trail, Dougherty Creek Trail, Lucas Creek Trail, and the beginning of Democrat Gage Trail. The shoulders along two roads, Stark Creek Road and Willow Spring Creek Road, also had large numbers of burrows.

Woody debris is common throughout the Project area where trees are present (i.e., in riparian areas), where deadfall is generally left in place.

Terrestrial reptiles were regularly seen sunning along the trails and roads before retreating into cracks in rocks or burrows. Ten common terrestrial reptile species were observed (in large numbers) in the study area, including western fence lizard, western side-blotched lizard, southern alligator lizard, California whiptail (*Aspidoscelis tigris munda*), , common garter snake (*Thamnophis sirtalis*), Sierra garter snake (*Thamnophis couchii*), Pacific gophersnake (*Pituophis catenifer catenifer*), California king snake (*Lampropeltis californiae*), and northern Pacific rattlesnake (*Crotalus oreganus oreganus*).

No special-status terrestrial reptile species were observed during wildlife reconnaissance surveys. One special-status reptile species, the California legless lizard (*Anniella* spp.), was observed during VES for special-status amphibians (refer to Section 5.4.2).

Refer to Appendix A, Photos 8–10, for photographs showing typical habitat for terrestrial reptile species in the study area.

5.1.2.4 Cliff-Nesting Birds

Approximately 3.7 miles of cliff habitat were mapped in the study area, primarily along the Kern River, near Conduit No. 2, and surrounding the Powerhouse and the Forebay Operations Area.

Two special-status birds that may nest on cliffs, the golden eagle and peregrine falcon, were observed in the study area:

- Golden eagles were observed in May 2024 soaring over the Project area twice, once during reconnaissance surveys and once incidentally during TERR 1 riparian surveys. A golden eagle was also observed in March 2025 during special-status salamander VES. All observations were in the vicinity of Stark Creek.

- A peregrine falcon was observed soaring along the Kern River during TERR 1 botanical surveys in April 2024.

One cliff nest, an active nest of a common raven (*Corvus corax*), was documented during reconnaissance surveys. The nest was located approximately 1,000 feet high, in a crevice on a cliff east of the Kern River No. 1 Powerhouse parking area, outside of the Project area. Two adults were observed feeding young. No cliff nests of special-status birds were documented.

Refer to Appendix A (Photos 11–12) for representative photographs of cliff habitat, and a photograph of the raven nest. Refer to Map 5-2 for the location of cliff-nesting habitat, nest location, and the observations of golden eagle and peregrine falcon in the study area.

5.1.2.5 Coniferous Forest Birds

No conifer-dominant CWHR wildlife habitats were mapped in the study area. One CWHR wildlife habitat, Blue Oak–Foothill Pine, which is present along Willow Spring Creek Road (Democrat Dam Road), Stark Creek Road and a portion of the Stark Creek Trail, includes conifers as a co-dominant (i.e., foothill pines [*Pinus sabiniana*]). However, this is an open woodland habitat type that does not provide suitable habitat for special-status forest-dwelling species such as California spotted owl or American goshawk, which typically select forest habitat with tall coniferous trees and dense canopy cover. Refer to Appendix A, Photo 13a and Photo 13b for representative photos of Blue Oak–Foothill Pine habitat in the study area.

Bald eagles typically select the largest available trees, typically conifers, within 1 mile of aquatic foraging habitats (USFWS 2007, Lehman 1980). Bald eagles are known to occur in the Project vicinity, and two observations were documented in the vicinity of the Democrat Dam impoundment during wildlife reconnaissance surveys in May 2024. However, while there are large conifer trees scattered along the Kern River in the study area, there are no known bald eagle nest territories and this species is not expected to nest in the study area.[2]

One special-status species, the white-headed woodpecker, which feeds heavily on pine seeds and is typically associated with old-growth conifer forests, was observed during the wildlife reconnaissance surveys along Willow Spring Creek Road. The area is dominated by annual grassland habitat, but also supports scattered large foothill pine trees that may provide a food source for this species.

[2] CDFW records indicate that there were no bald eagle nesting territories in Kern County during the period between 2000 to 2016 (CDFW 2016).

No other special-status coniferous forest birds, or their nests, were observed.

Refer to Map 5-2 for the location of the white-headed woodpecker observation in the study area.

5.1.2.6 Grassland/Shrubland Birds

Grassland habitats (i.e., Annual Grassland) and shrubland habitats (i.e., Mixed Chaparral) are predominant throughout the study area and surround many of the Project facilities. Blue Oak–Foothill Pine, Blue Oak Woodlands, and Valley Oak Woodlands are open woodland communities that also typically include grasses and shrubs in the understory. Grassland and shrubland birds were found throughout the study area where their preferred habitat was present. Refer to Map 5-2 for the location and distribution of Annual Grassland and Mixed Chaparral, as well as open woodland habitats in the study area; and to Appendix A, Photo 14a and 14b for representative photos of grassland habitat in the study area.

Special-status raptors observed flying over grassland habitats in the study area include:

- Golden eagle (refer to Section 5.1.2.4 for details); and
- Swainson's hawk, which was observed in the vicinity of Stark Creek in May 2024 during wildlife reconnaissance surveys.

Several special-status passerines that use grassland and shrubland habitats were also observed:

- Savannah sparrow, observed along Stark Creek Road during reconnaissance surveys in May 2024;
- Oak titmouse, observed along Stark Creek Road during reconnaissance surveys in June 2024; and
- Lawrence's goldfinch, observed along Lucas Creek in the vicinity of Flume No. 4 during TERR 1 botanical surveys in May 2024.

Refer to Map 5-2 for the location of special-status grassland and shrubland birds species observations in the study area.

5.1.2.7 Riparian Birds

CWHR riparian habitats in the study area include Montane Riparian and Valley Foothill Riparian. These habitats are concentrated along the Kern River and tributary streams—refer to Map 5-2 for the location and extent of these habitats in the study area. Fine-scale maps of riparian habitats are also provided in the TERR 1 – Botanical Resources TM. Streams that had observable active or seasonal water flow at the time of the surveys also had the largest and most robust riparian habitats. Additionally, riparian vegetation was observed in the vicinity of leaks in the water conveyance system (i.e., conduits or flumes).

Photographs of typical riparian habitat in the study area are provided in Appendix A (Photos 15–16).

Multiple incidences of one special-status riparian bird species, Bullock's oriole, were recorded, including evidence of breeding. During reconnaissance surveys in May 2024, the following observations were made of Bullock's oriole:

- One female was observed in the vicinity of Pechacho Creek along the (non-Project) trail to Adit 14 & 15. This bird was observed depositing nesting material into the cavity of a tree.

- A pair was seen in May 2024 along the vicinity of Pechacho Creek along the (non-Project) trail to Adit 14 & 15 displaying nesting behavior.

- Three mated pairs were seen in May 2024 along Dougherty Creek Trail showing territorial behavior and defending certain trees from other pairs. No nests were observed.

The following incidental Bullock's oriole observations were also recorded:

- One male was seen in May 2024 flying and foraging in oak trees along Stark Creek Trail near Conduit No. 8. No breeding behavior was exhibited.

- One female was seen in May 2024 flying and foraging in oak trees along Stark Creek Trail near Adit 12 and 13. No breeding behavior was exhibited.

- One male was observed flying in riparian vegetation and stopping to sing (precise location information is not available).

No other riparian bird species were observed in the study area.

Refer to Map 5-2 for the location of Bullock's oriole observations in the study area.

5.1.2.8 Fossorial Denning Mammals

As described in Section 5.1.2.3, soils in the study area are, in general, highly suitable for burrowing and small animal burrows are abundant, particularly along flat or less steeply sloped lands along Project access roads and trails. These burrows may provide suitable habitat for small rodents such as the Tulare grasshopper mouse. Refer to Appendix A (Photos 9–10), for photographs of typical habitat supporting small burrows in the study area.

Biologists identified seven larger burrows and dens in the Lucas Creek area that may potentially be used by other mammals in the study area. Several of these burrows had modifications that are typical of burrows used by San Joaquin kit fox. However, there were no signs of active use by this special-status species (e.g., presence of scat or prey remains). No American badger burrows were observed in the study area.

Refer to Table 5-6 for information on larger animal burrows observed in the study area. Refer to Map 5-2 for the locations of the large burrows, and to Appendix A, Photos 17–20 for representative photographs.

5.2 EVALUATE PROJECT POWERLINE CONFIGURATIONS

There are two powerlines in the study area, the Intake Gatehouse to Flume No. 1 Powerline and Kern River No. 1 Powerhouse to Forebay Communication/Powerline.

Sixteen different configurations were identified along the Intake Gatehouse to Flume No. 1 Powerline. Of these, 12 configurations had a distance between conductors of less than 60 inches, which may pose a potential risk for avian electrocution.

Twenty-five different configurations were identified along the Kern River No. 1 Powerhouse to Forebay Communication/Powerline. All of these configurations exhibited one or more of the following risks for potential avian electrocution:

- Distance between uncovered phase conductors is less than 60 inches with no perch guard;
- Distance between energized parts and grounded equipment of equipment towers/poles is less than 60 inches; and
- Tower/pole contains uninsulated or partially insulated metal guy wires, jumper, or transformer cables.

Finally, the Kern River No. 1 Switchyard has energized equipment at distances of less than 60 inches that may potentially be accessible to raptors. There are, however, crossbars over the equipment that may prohibit large raptors from entering and/or provide safe alternative perches for raptors.

Refer to Table 5-7 for details on the evaluation of pole configurations for consistency with APLIC guidelines, and to Appendix B for a photographic example of each configuration.

5.2.1 Document Avian Electrocutions and Bird-Caused Outages

SCE reviewed its avian incident records to determine whether any avian electrocutions, outages, or mortalities had been reported since publication of the PAD for the Kern River No. 1 Project (SCE 2023). There are no reports of avian electrocutions or mortalities, or of bird-caused outages, associated with the Project.

5.3 EVALUATE OPEN-AIR SEGMENTS OF THE WATER CONVEYANCE SYSTEM

During the desktop evaluation, biologists identified 12 open-air segments along Project water conveyance systems that may have some potential to entrap wildlife. Based on field examinations, of these 12 facilities, five flumes exhibited some potential for wildlife to become entrapped (Flume No. 2, Flume No. 3, Flume No. 4, Flume No. 5, and Flume No. 6). While all of these flumes are elevated and difficult to access from the ground level,

the flumes lack covers and may be accessible from the surrounding sloping landscape at the point where the flumes re-enter tunnels.

Refer to Table 5-8 for details on the evaluation of open-air segments of the water conveyance system, and to Appendix C for photographs of each open-air segment. The location of each segment is shown on Map 5-2.

5.4 CONDUCT SPECIAL-STATUS SALAMANDER HABITAT ASSESSMENT AND VISUAL ENCOUNTER SURVEY

5.4.1 Identify Suitable Habitat for Special-Status Salamanders

Based review of existing information, suitable habitat for relictual slender salamanders includes seeps, perennial springs, and streams in rocky habitat supporting limited tree cover of oaks, buckeyes, sycamores, pines, and firs (USFWS 2022b). This species is tightly associated with aquatic habitats compared to other slender salamanders, and is found in areas of reduced flow, such as side seeps and relatively flat terrain, but in contact with water or fully saturated soil (Jockusch et al. 2022).

Suitable habitat for Kern Canyon slender salamanders includes stream and seep margins within rocky narrow canyons supporting chapparal shrubs, sycamore, California buckeye, willow, Fremont cottonwood, interior live oak, canyon live oak, and foothill pine. The primary habitat of the species is associated with riparian habitats but the species may also utilize upland areas with moist microsite characteristics such as mesic rocky hillsides containing talus and scree with associated hydrophytic vegetation such as mosses, ferns, or herbaceous vegetation (Lannoo 2005, Jockusch 2021 pers. comm. in USFWS 2022b; Jockusch et al. 2022).

Suitable habitat for yellow-blotched salamander includes coniferous forest, deciduous forest, oak woodland, and chaparral under logs, bark, moss, leaf litter, talus, and animal burrows, often near streams and creeks (Forest Service 2019).

The results of consultation with agencies and recognized salamander experts, preliminary habitat mapping, and habitat ground-truthing surveys are provided below.

5.4.1.1 Consult with Agencies and Recognized Salamander Experts

The Terrestrial TWG was contacted on October 28, 2024 via email to obtain information on additional special-status salamander occurrences and habitat (including microsites) for special-status salamanders in the study. No responses were received.

On February 15, 2024 SCE Herpetology Program Manager Jack Goldfarb sent an email notification that two Kern Canyon slender salamanders were identified in the vicinity of SCE transmission lines (not part of the Kern River No. 1 Project) (J. Goldfarb, pers. comm. 2024). In addition, an email was received from Dr. Elizabeth Jockusch on March 20, 2025 with the coordinates for three observations of Kern Canyon slender salamander newly discovered and documented within the Kern Canyon in February/March 2024 (E. Jockusch, pers. comm. 2025). Two of these observations had been noted previously

by Jack Goldfarb. All three observations are located outside of the study area for special-status salamanders as described in this report, at least 0.15 mile south of the FERC Project boundary towards the mouth of the Kern Canyon. Refer to Appendix D for documentation of this consultation.

5.4.1.2 Develop Preliminary Habitat Maps, Conduct Field Surveys, and Develop Final Habitat Maps

This section provides the results of ground-truthing of preliminary habitat maps completed January 27–31, 2025.

Kern Canyon Slender Salamander

There are approximately 284 acres of Kern Canyon slender salamander habitat present in the study area (approximately 38 percent of the study area). Kern Canyon slender salamander habitat overlaps 57 Project facilities, including roads, trails, conduits, flumes, and many other facilities. Kern Canyon slender salamander habitat was also found in areas that lacked Project facilities such as along the Democrat Dam Impoundment.

Refer to Table 5-9 for a list of Project facilities that overlap Kern Canyon slender salamander habitat.

Refer to Map 5-3 for the location of Kern Canyon slender salamander habitat in relation to Project facilities and the Kern River No. 1 FERC Project boundary.

Refer to Appendix E for a photograph exhibit of representative Kern Canyon slender salamander habitat within the study area.

Relictual Slender Salamander

There are approximately 47 acres of relictual slender salamander habitat present in the study area (approximately 0.06 percent of study area), overlapping 32 Project facilities. Due to the relictual slender salamander's dependance on water, habitat for this species is restricted to areas where aquatic habitat is present. As such, habitat was typically found along creeks or where water conveyance system leaks were present.

Refer to Table 5-9 for a list of Project facilities within relictual slender salamander habitat.

Refer to Map 5-4 for the location of relictual slender salamander habitat in relation to Project facilities and the Kern River No. 1 FERC Project boundary.

Refer to Appendix E for a photograph exhibit of representative relictual slender salamander habitat within the study area.

Yellow-blotched Salamander

There are approximately 120 acres of yellow-blotched salamander habitat present in the study area (approximately 16 percent of study area) intersecting with 24 Project facilities.

Habitat for this species was found along roads, trails, conduits, flumes, and many other facilities.

Refer to Table 5-9 for a list of Project facilities within yellow-blotched salamander habitat.

Refer to Map 5-5 for the location of yellow-blotched salamander habitat in relation to Project facilities and the Kern River No. 1 FERC Project boundary.

Refer to Appendix E for a photograph exhibit of representative yellow-blotched salamander habitat within the study area.

5.4.2 Visual Encounter Survey Results

The VES for special-status salamanders was conducted March 3–6, 2025 in all accessible suitable habitats identified during the microhabitat assessment. Conditions were optimal for salamander surveys with a light consistent rain occurring the day before the survey began and during three of the four days of the survey.

Three special-status salamander individuals were observed during the survey, including:

- One observation of a Kern Canyon slender salamander[3] approximately 10 feet downslope of Stark Creek Trail on March 5, 2025. This salamander was found under a piece of wood near a talus slope approximately 52 feet downslope of Adit 13 &14 and the Stark Creek Trail. The location of this occurrence is shown on Map 5-3.

- One observation of a Kern Canyon slender salamander[3] on an un-named trail within the FERC Project boundary approximately 83 feet upslope of the Stark Creek Road on March 5, 2025. This salamander was found in a wooden stump on a steep rocky slope. The location of this occurrence is shown on Map 5-3.

- One observation of a yellow-blotched salamander adjacent to Flume No. 1 in the Democrat Dam area on March 3, 2025. This salamander was found under a piece of bark approximately 10 feet west of the flume in a wood pile. The location of this occurrence is shown on Map 5-5.

In addition, one special-status reptile, California legless lizard, was incidentally observed during special-status salamander surveys. Refer to Map 5-2 for the location of these observations.

[3] There is only potential for two slender salamander species in the area. Confirmation of the identification between Kern Canyon slender salamander and relictual slender salamander requires handling to count the number of costal grooves between adpressed limbs. Because these species require a handling permit, no salamanders were handled and the species identification cannot be confirmed. However, the habitat in which this individual was found (rocky, upland habitat) matches the description of Kern Canyon slender salamander rather than the relictual slender salamander (which are found in streams and riparian corridors), and therefore it is assumed this individual is a Kern Canyon slender salamander.

- Two California legless lizards were observed together under a metal sheet approximately 67 feet east of Flume No. 1.

- One California legless lizard was observed under a log approximately 60 feet east of Willow Spring Creek Road.

Refer to Table 5-10 for the results of the VES in each special-status species' microhabitat mapped during the habitat assessment, including location and microhabitat information for each special-status species observed.

Refer to Appendix F for photographs of each observation and photographs of the habitat where each salamander and lizard was found.

All special-status species observations were submitted to the CNDDB. All special-status species observations were compiled into an electronic database, which is available upon request.

5.5 DOCUMENT SPECIAL-STATUS BAT REPRODUCTIVE AND SEASONAL USE OF PROJECT FACILITIES

This section provides a discussion of the results of surveys conducted to provide information on bat reproductive and seasonal use of Project facilities. Fourteen bat species were detected during the surveys.

Four of these species were special status, including the pallid bat (detected on acoustic devices installed at Adit 13 &14); western mastiff bat (detected on acoustic units at Democrat Dam, Adit 13 & 14, and Kern River No. 1 Powerhouse; as well as day/night roosts along the Democrat Dam Access Walkway and at Stilling Well No. 2); western red bat (detected on acoustic devices installed at Democrat Dam, Adit 13 & 14, and the Kern River No. 1 Powerhouse); and fringed myotis (day/night roosts and acoustic detections at Adit 13 & 14).

Roosts of common bat species were identified at the Democrat Dam Access Walkway (night roosts); Stilling Well No. 2 (night roost); Lucas Creek Flume No. 4 (night roost); Adit 13 & 14 (day and night roosts); and the Kern River No. 1 Powerhouse (maternal, night, and day roosts). Refer below for additional details on bat roost and seasonal use surveys conducted in the study area.

5.5.1 Identify Facilities Potentially Supporting Bat Roosts

Provided below are the results of the initial desktop assessment and the visual assessment of Project facilities supporting potential bat roosting habitat.

During the initial desktop assessment of potential bat roosting habitat, it was determined that Democrat Dam, water conveyance facilities (i.e., flumes, conduits, and adits), the Kern River No. 1 Powerhouse, stilling wells, and ancillary and support facilities (e.g., buildings, walkways, water tanks) could potentially support bat roosts. Project facilities that were determined to lack structures that could be utilized by roosting bats

included impoundments, roads, trails, communication lines, and powerlines. Refer to Table 3-1 for facilities that were assessed during the initial desktop assessment as potentially supporting suitable habitat for roosting bats.

Following completion of the initial desktop assessment, biologists conducted a preliminary visual field assessment of 43 Project facilities to evaluate their suitability to provide habitat for roosting bats. Twenty-one facilities were determined to have elements that may support roosting bats. Four adits were unsafe to access by surveyors (Adit 2 & 3, Adit 4 & 5, Adit 9 & 10, and Adit 15 & 16) and were not inspected. In addition the interiors of several facilities (i.e., water tank, stilling wells, gage housing, and one additional adit) were inaccessible, and therefore only the exterior was inspected. Refer to Table 5-11 for a summary of the results of the visual assessment of accessible Project facilities identified during the desktop assessment as potentially supporting bat roosts. Appendix G provides photographs of the facilities evaluated during the preliminary visual field assessment.

5.5.2 Conduct Roost Surveys

Project facilities identified as potentially supporting roosting bats were surveyed July 7–16, 2024 to determine if signs of roosting were present. Of the 43 Project facilities evaluated, eight Project facilities were determined to support roosting bats (listed below from north to south).

- Democrat Dam Intake Gatehouse — Facility was determined to support a night roost[4] based on the quantity of guano present and the roosting features on the facility. Habitat to support the roost is present within the cracks between the building and the foundation. The foundation itself and the building also serve as night roosting habitat. No bats were present but guano was collected, analyzed, and determined to be Yuma myotis (*Myotis yumanensis*).

- Democrat Dam Access Walkway (and associated unnamed buildings) — Facility was determined to support one day roost[5] and three night roosts.

  – A large western mastiff bat day and night roost was observed in the rock cliff adjacent to the dam walkway. Guano was present and collected to confirm sight identification.

  – Two of the associated unnamed buildings contained guano in amounts that indicated they were utilized as night roosts. Guano was collected for analysis, which was identified as California myotis (*Myotis californicus*).

- Stilling Well No. 2 — Facility was determined to support a night roost based on the fresh guano present on exterior of the stilling well and surrounding walkway. The facility is likely used as a night roost while foraging nearby or after drinking from

[4] A night roost is a location where bats rest during the night in between excursions to forage for food or water.
[5] A day roost is a location where bats sleep or rest throughout the day when they are generally inactive.

the adjacent flume. Two guano samples were collected and identified two species, Yuma myotis and western mastiff bat.

- Flume No. 4 (Lucas Creek) — Facility was determined to support a night roost based on the large deposits of guano present on the flume under areas where mud nests (or mud buildup bats could utilize) were present on the flume. The surrounding riparian habitat and water from the flume makes the area suitable for bats and night roosting. Six samples of guano were collected. Three samples were identified as California myotis, two samples as Yuma myotis, and one sample as long-legged myotis (*Myotis volans*).

- Adit 13 & 14 — Facility was determined to support a day and night roost based on the amount of fresh guano found on the wooden door closing off the adit cave, the guano observed on the ground within the adit cave, and the adit cave itself being a location bats could roost during the heat of the day. Two samples of guano were collected but could not be genetically differentiated to identify the species. The three potential species identified are long-eared myotis (*Myotis evotis*), fringed myotis, and little brown bat (*Myotis lucifugus*).

- Kern River No. 1 Powerhouse — Facility was determined to support day, night, and maternity roosts[6]. Substantial amounts of guano and urine-staining were present in select areas on the exterior and interior of the Powerhouse indicating it is a primary multi-year roosting site throughout at least the spring and maternity season. The largest areas of urine staining and guano deposits were present in the Electrical Room with smaller, but still significant, concentrations in all four Transformer Bays and the Battery Room. One desiccated big brown bat (*Eptesicus fuscus*), a common bat, was found within the wet tunnel. Three guano samples were collected—one from the exterior and two from the interior—identified as Yuma myotis.

- Water Tank — Facility was determined to support a night roost. Suitable roosting habitat and guano was found in the area where the roof joins the wall. An additional larger roosting area was found within the narrow space between the building and the adjacent rock face where a large pile of guano was found on the ground. The later area could potentially be suitable for a day roost if the building and rocks do not get too hot. No bats were observed during the survey and the guano was too degraded for analysis.

- Garage No. 1 — Facility was determined to support a seasonal night roost based on the amount of guano present within the building where bats could gain access through a broken window. The age of the guano indicates that the facility is not extensively used so it is likely a seasonal roost before temperatures get too high.

[6] A maternity roost is a warm and safe location where female bats congregate together to birth and care for their young and stay until the pups are strong enough to leave their mothers. Maternity roost locations can also be used for day and night roosting outside the maternity season.

Refer to Table 5-12 for details on the roost survey results for all surveyed facilities.

5.5.2.1 Conduct Acoustic Sampling

Based on the results of the roost surveys conducted in July 2024, a total of three acoustic devices were installed, including one acoustic detector at the Democrat Dam area (on the Walkway), one near Adit 13 & 14, and one at the Kern River No. 1 Powerhouse. Refer to Map 5-6 for the location of each device.

Analysis of the sonogram files yielded a total of 12 bat species during the roost survey:

- pallid bat
- big brown bat
- western mastiff bat
- western red bat
- hoary bat (*Lasiurus cinereus*)
- silver-haired bat (*Lasionycteris noctivagans*)
- California myotis
- small-footed myotis (*Myotis ciliolabrum*)
- long-eared myotis
- Yuma myotis
- canyon bat (*Parastrellus hesperus*)
- Mexican free-tailed bat (*Tadarida brasiliensis*)

Of the 12 species detected, three of the species, the pallid bat (detected at Adit 13 & 14), western mastiff bat (detected on all devices), and western red bat (detected on all devices), are special-status bat species.

Refer to Table 5-13 for a list of each bat species observed during roost surveys and associated method of detection (e.g., visual, guano identification, or acoustic detection). Map 5-6 provides the location of special-status and common bat species observed during the surveys.

5.5.3 Document Special-Status Bat Seasonal Use of Project Facilities

In October 2024, biologists replaced the three acoustic devices as described in Section 5.5.2.1 (i.e., one at the Democrat Dam area (on the Walkway), one near Adit 13 & 14, and one at the Kern River No. 1 Powerhouse) to determine the seasonal usage of facilities by bats. Analysis of the sonogram files yielded a total of nine bat species:

- pallid bat
- western mastiff bat
- western red bat
- hoary bat
- California myotis
- fringed myotis
- Yuma myotis
- canyon bat
- Mexican free-tailed bat

Of the nine detected species, four species, pallid bat (detected at Adit 13 & 14), western mastiff bat (detected on all devices), western red bat (detected on all devices), and fringed myotis (detected at Adit 13 & 14), are special-status bat species.

Refer to Table 5-13 for a list of each bat species observed during seasonal use surveys. Map 5-6 provides the location of special-status and common bat species observed during the surveys.

All special-status species observations were submitted to the CNDDB. All special-status species observations were compiled into an electronic database, which is available upon request.

6.0 STUDY SPECIFIC CONSULTATION

No specific consultation is required for this study, and no consultation has been conducted to date.

7.0 OUTSTANDING STUDY PLAN ELEMENTS

There are no outstanding study plan elements. The TERR 2 – Wildlife Resources Study is complete.

8.0 REFERENCES

APLIC (Avian Power Line Interaction Committee). 2012. Reducing Avian Collision with Power Lines: The State of the Art in 2012. Edison Electric Institute and APLIC. Washington, D.C.

CDFW (California Department of Fish and Wildlife). 2016. Map of Known Nesting Territories 2000–2016. Available at https://wildlife.ca.gov/Conservation/Birds/Bald-Eagle

———. 2018. General Information for Submitting Avian Detections to the CNDDB. State of California, Department of Fish and Wildlife, Biogeographic Data Branch. July 2, 2018.

———. 2024a. California Wildlife Habitat Relationship System Database, Version 9.0 CWHR 2022

———. 2024b. California Natural Diversity Database. RareFind 5 [Internet]. California Department of Fish and Wildlife, Version 5.1.1.

Cypher, B., A. Gabaldon, F. Ruize Ponce, and E. Kelly. 2023. Comparison of San Joaquin Kit Fox Den and California Ground Squirrel Burrow Attributes. California Fish and Wildlife Journal 109:e17.

FERC (Federal Energy Regulatory Commission). 2024. Study Plan Determination for the Kern River No. 1 Hydroelectric Project. March 14.

Forest Service (United States Forest Service). 2014. GIS data and vegetation descriptions. South Sierran Ecological Province. Available at: https://www.fs.usda.gov/detail/r5/landmanagement/resourcemanagement/?cid=stelprdb5347192.

———. 2016. CALVEG Geographic Information Systems (GIS) data and vegetation descriptions. South Sierran Ecological Province. Available at: http://www.fs.usda.gov/detail/r5/landmanagement/resourcemanagement/?cid=stelprdb5347192.

———. 2019. Rationales for Animal Species Considered for Species of Conservation Concern, Sequoia National Forest. June 2019.

———. 2022. Natural Resource Information System (NRIS) Available at https://www.fs.usda.gov/

———. 2024. Calveg Crosswalk to CWHR. Available at: https://www.fs.usda.gov/detail/r5/landmanagement/resourcemanagement/?cid=fsbdev3_046735.

Germano, D. J. 2006. Habitat Characteristics of Sites with Yellow-Blotched Salamanders (*Ensatina eschscholtzii croceator*). Herpetological Conservation and Biology, 1(2):121-128.

Google. 2024. Aerial imagery of the Kern River No. 1 Project. Google Earth Pro, 7.3.6.9796 (64-bit). Published February 22, 2024. Accessed December 2024.

Grinnell, J., J.S. Dixon, and J.M. Linsdale. 1937. Furbearing Mammals of California. University of California Press, Berkeley, CA, USA.

Grover, M.C. 2006. Comparative Effectiveness of Nighttime Visual Encounter Surveys and Cover Object Searches in Detecting Salamanders. Herpetological Conservation and Biology 1(2):93-99.

Jockusch, E.L., I. Martinez-Solano, R.W. Hansen, and D.B. Wake. 2012. Morphological and molecular diversification of slender salamanders (Caudata: Plethodontidae: *Batrachoseps*) in southern Sierra Nevada of California with descriptions of two new species. Zootaxa 3190:1-30.

Jockusch, E.L., R.W. Hansen, C.D. Moss, and N. Van Gilder. 2022. Slender Salamander Comment Letter in response to proposed listing [USFWS 2022a]. December 18, 2022. 14 pp.

Koopman, M.E., J.H. Scrivner, and T.T. Kato. 1998. Patterns of den use by San Joaquin kit foxes. Journal of Wildlife Management 62:373–379.

Lannoo, M. 2005. Amphibian Declines: The Conservation Status of United States Species, First Edition. June 2005

Lausen, C.L. and R.M.R. Barclay. 2003. Thermoregulation and roost selection by reproductive female big brown bats (*Eptesicus fuscus*) roosting in rock crevices. Journal of Zoology, London 260: 235-244.

Lehman, R.N. 1980. A survey of selected habitat features of 95 bald eagle nest sites in California. California Department of Fish and Game. Wildlife Management Branch Administrative Report. 79–1. 23 p.

Moss, C.D., R.W. Hansen, N.R. Van Gilder, and E. L. Jockusch. 2024. Distribution, natural history, and conservation status of the relictual slander salamander (*Batrachoseps relictus*). Northwestern Naturalist 105: 32-47.

SCE (Southern California Edison). 2023. Pre-Application Document for the Kern River No. 1 Hydroelectric Project (FERC Project No. 1930). May 5.

———. 2024. Kern River No. 1 Hydroelectric Project (FERC Project No. 1930) Revised Study Plan. February 13.

——. 2025. Kern River No. 1 Hydroelectric Project (FERC Project No. 1930) TERR 1 – Botanical Resources Technical Memorandum. January 2025.

Stebbins, R.C. 2003. A Field Guide to Western Reptiles and Amphibians. Third Edition. Houghton Mifflin Company, Boston, MA, USA.

USFWS (United States Fish and Wildlife Service). 2005. The Declining Amphibian Task Force Fieldwork Code of Practice.

——. 2007. National Bald Eagle Management Guidelines. United States Fish and Wildlife Service. 23pp.

——. 2022a. Endangered and Threatened Wildlife and Plants; 12-Month Finding for the Kern Plateau Salamander; Threatened Species Status With Section 4(d) Rule for the Kern Canyon Slender Salamander and Endangered Species Status for the Relictual Slender Salamander; Designation of Critical Habitat (Federal Register, Volume 87, No. 200, Pages 63155 – 63189).

——. 2022b. Species Status Assessment for the Relictual Slender Salamander (*Batrachoseps relictus*), Kern Canyon Slender Salamander (*Batrachoseps simatus*), and Kern Plateau Salamander (*Batrachoseps robustus*).

——. 2023. Proposed Rule. Endangered and Threatened Wildlife and Plants: Threatened Status with Section 4(d) Rule for the Northern and Southern Distinct Population Segments of the Western Spadefoot. Federal Register, Volume 88, No. 232. Tuesday, December 5, 2023.

Walker, F.M., C.H.D. Williamson, D.E. Sanchez, C.J. Sobek, and C L. Chambers. 2016. Species From Feces: Order-Wide Identification of Chiroptera From Guano and Other Non-Invasive Genetic Samples. PLoS ONE 11(9): e0162342. doi:10.1371/journal.pone.0162342.

Webb, P.I., J.R. Speakman, and P.A. Racey. 1996. How hot is a hibernaculum? A review of the temperatures at which bats hibernate. Canadian Journal of Zoology 74: 761–765.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White (editors). 1988. California's wildlife Volume 1: amphibians and reptiles. State of California, The Resources Agency, Department of Fish and Game. Sacramento, CA. 272 pp.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White (editors). 1990a. California's wildlife Volume II: birds. State of California, The Resources Agency, Department of Fish and Game. Sacramento, CA. 732 pp.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White (editors). 1990b. California's wildlife Volume III: mammals. State of California, The Resources Agency, Department of Fish and Game. Sacramento, CA. 407 pp.

TABLES

Table 3-1. Kern River No. 1 Hydroelectric Project – Project Facilities

Diversion Dam
Democrat Dam
Impoundment
Democrat Dam Impoundment
Water Conveyance System
Sandbox
Tunnels, Flumes, Conduits, and Adits
Forebay
Forebay Overflow Spillway
Penstock
Powerhouse and Switchyard
Kern River No. 1 Powerhouse and Switchyard
Access Roads
Willow Spring Creek Road (also referred to as Democrat Dam Road)
Powerline Road
Flume No. 1 Road
Dougherty Creek Road
Stark Creek Road
Forebay Operations Area Road
Lower Powerhouse Road
Upper Powerhouse Road
Access Trails
Democrat Gage Trail
Conduit No. 3 Trail
Cow Flat Creek Trail
Steel Flume Trail
Lucas Creek Trail
Dougherty Creek Trail
Stark Creek Trail
Adit 17 & 18 Trail
Overflow Spillway Trail
Skip Hoist / Forebay Trail
Communication and Power Lines

Intake Gatehouse to Flume No. 1 Powerline
Powerhouse to Forebay Communication / Powerline
Gages and Stilling Wells
Kern River near Democrat Springs (USGS Gage No. 11192500 / SCE Gage No. 409)
Kern River No. 1 Conduit near Democrat Springs (USGS Gage No. 11192000 / SCE Gage No. 410)
Kern River near Democrat Springs (USGS Gage No. 11192501; calculated 11192500+11192000)
Stilling Well No. 1
Stilling Well No. 2
Ancillary and Support Facilities
Democrat Dam Area
Buoy Line in Democrat Dam Impoundment
Democrat Dam Intake Gatehouse
Democrat Dam Drainage Tower
Democrat Dam Drainage Tunnel
Democrat Dam Drainage Tunnel Outlet
Democrat Dam Access Walkway
Sandbox Drainage Channel
Gaging Cableway
Water Conveyance
Flume No. 6 Access Platform
Forebay Operations Area
Old Admin Building
Garage No. 1
Garage No. 2
Old Ice House
Water Tank
Aerial Cable Tower
Skip Hoist House and Lower Landing
Skip Hoist Cables and Cart
Skip Hoist Upper Landing
Skip Hoist Upper Landing to Forebay Catwalk
Communication Site
Forebay Operations Area Perimeter Fence
Forebay Perimeter Fence

Powerhouse Area
Machine Shop
Office / Lunchroom
Restroom
Powerhouse and Switchyard Perimeter Fence

Table 5-1. Vegetation Alliances and Wildlife Habitats Occurring within 1 Mile of the Kern River No. 1 Hydroelectric Project FERC Boundary

CALVEG Vegetation Alliance[1]	CALVEG Code	CWHR Wildlife Habitat[2]	CWHR Code
Herb-Dominated Alliances			
Annual Grasses and Forbs Alliance	HG	Annual Grassland	AGS
Shrub-Dominated Alliances			
Ultramafic Mixed Shrub Alliance	C1	Mixed Chaparral	MCH
Baccharis (Riparian) Alliance	ML	Montane Riparian	MRI
Tree-Dominated Alliances			
Interior Mixed Hardwoods Alliance	NX	Montane Hardwood	MHW
Gray Pine Alliance	PD	Blue Oak-Foothill Pine	BOP
Blue Oak Alliance	QD	Blue Oak Woodland	BOW
Valley Oak Alliance	QL	Valley Oak Woodland	VOW
California Sycamore	QP	Valley Foothill Riparian	VRI
Interior Live Oak	QW	Montane Hardwood	MHW
Non-Vegetated Areas			
Tilled Earth	A3	Barren	BAR
Barren	BA	Barren	BAR
Urban-related Bare Soil	IB	Barren	BAR
Aquatic Areas			
Agriculture Pond or Water Feature	A7	Lacustrine	LAC
River/Stream/Canal	W1	Riverine	RIV

Notes: [1] Source: Forest Service 2016.
[2] Source: Forest Service 2024.
[3] The *Baccharis* (riparian) alliance can be associated with desert riparian, montane riparian, and/or Valley foothill riparian CWHR wildlife habitat classifications.
Key: CALVEG = Classification and Assessment with Landsat of Visible Ecological Groupings
CWHR = California Wildlife Habitat Relationships

Table 5-2. Special-Status Wildlife Species Known or Potentially Occurring in California Wildlife Habitats Relationships Wildlife Habitats

Special-Status Wildlife																
Common Name	Scientific Name	Federal Status	Forest Service Status	State Status	Herb-dominated Habitats	Shrub-dominated Habitats		Tree-dominated Habitats					Non-vegetated Areas	Aquatic Areas	
					Annual Grassland	Mixed Chaparral	Montane Riparian	Montane Hardwood	Blue Oak-Foothill Pine	Blue Oak Woodland	Valley Oak Woodland	Valley Foothill Riparian	Barren	Lacustrine	Riverine
Invertebrates[1]															
monarch butterfly	*Danaus plexippus*	FPT	–	–	X	X	X	X	X	X	X	X			
bumblebee species	*Bombus* sp.	–	–	CC	X	X	X	X	X	X	X	X			
Amphibians															
Kern Canyon slender salamander	*Batrachoseps simatus*	FPT	–	CT		X	X	X	X	X	X	X			
relictual slender salamander	*Batrachoseps relictus*	FPE	–	CSC	X	X	X	X	X	X		X			X
yellow-blotched salamander	*Ensatina eschscholtzii croceator*	–	FSCC	WL		X	X	X	X	X	X	X		X	
western spadefoot	*Spea hammondii*	FPT	–	CSC	X	X			X	X	X			X	X
Reptiles															
northwestern pond turtle	*Actinemys marmorata*	FPT	–	CSC	X	X	X	X	X	X	X	X		X	X
coast horned lizard	*Phrynosoma blainvillii*	–	–	CSC	X	X			X	X	X	X			
California legless lizard	*Anniella* spp.	–	–	CSC		X			X	X	X	X			
California glossy snake	*Arizona elegans occidentalis*	–	–	CSC	X	X				X	X				
San Joaquin coachwhip	*Masticophis flagellum ruddocki*	–	–	CSC	X	X			X	X	X	X			
Sierra night lizard	*Xantusia vigilis*	–	–	CSC	X				X	X	X				
Birds															
American goshawk	*Accipiter atricapillus*	–	FSCC	CSC		X	X	X	X	X	X	X			
northern harrier	*Circus hudsonius*	BCC	–	CSC	X	X	X	X	X	X	X	X	X	X	X
California condor	*Gymnogyps californianus*	FE	–	CE, CFP	X	X	X	X	X	X	X		X	X	X
golden eagle	*Aquila chrysaetos*	Eagle Act	–	CFP	X	X	X	X	X	X	X	X	X		
bald eagle	*Haliaeetus leucocephalus*	FD, Eagle Act	FSCC	CE, CFP	X	X	X	X	X	X	X	X	X	X	X
Swainson’s hawk	*Buteo swainsoni*	–	–	CT	X	X		X	X	X	X	X	X		
American peregrine falcon	*Falco peregrinum anatum*	FD	–	CD, WL	X	X	X	X	X	X	X	X	X	X	X

Special-Status Wildlife																
Common Name	**Scientific Name**	**Federal Status**	**Forest Service Status**	**State Status**	**Herb-dominated Habitats**	**Shrub-dominated Habitats**		**Tree-dominated Habitats**					**Non-vegetated Areas**	**Aquatic Areas**	
					Annual Grassland	**Mixed Chaparral**	**Montane Riparian**	**Montane Hardwood**	**Blue Oak-Foothill Pine**	**Blue Oak Woodland**	**Valley Oak Woodland**	**Valley Foothill Riparian**	**Barren**	**Lacustrine**	**Riverine**
prairie falcon	*Falco mexicanus*	–	–	WL	X	X	X	X	X	X	X	X	X		
white-headed woodpecker	*Dryobates albolarvatus*	BCC	–	–			X	X							
savannah sparrow	*Passerculus sandwichensis*	BCC	–	–	X	X			X	X	X	X			
oak titmouse	*Baeolophus inornatus*	BCC	–	–		X	X	X	X	X	X	X			
Bullock’s oriole	*Icterus bullockii*	BCC	–	–		X	X	X	X	X	X	X			
Lawrence's goldfinch	*Spinus lawrencei*	BCC	–	–	X	X	X	X	X	X	X				
tricolored blackbird	*Agelaius tricolor*	BCC	FSCC	CSC	X							X			
grasshopper sparrow	*Ammodramus savannarum*	–	–	CSC	X										
Vaux’s swift	*Chaetura vauxi*	–	–	CSC		X	X	X	X			X		X	X
southwestern willow flycatcher	*Empidonax traillii extimus*	FE	FSCC	CFP			X					X			
yellow-breasted chat	*Icteria virens*	–	–	CSC			X					X			
loggerhead shrike	*Lanius ludovicianus*	–	–	CSC	X	X	X	X	X	X	X	X	X		
purple martin	*Progne subis*	–	–	CSC	X		X	X	X	X	X	X		X	X
yellow warbler	*Setophaga petechica*	–	–	CSC		X	X	X	X	X	X	X			
California spotted owl	*Strix occidentalis occidentalis*	BCC, FPT	FSCC	CSC			X	X	X			X			
Mammals															
pallid bat	*Antrozous pallidus*	–	–	CSC	X	X	X	X	X	X	X	X	X		X
Townsend’s big-eared bat	*Corynorhinus townsendii*	–	FSCC	CSC	X	X	X	X	X	X	X	X	X		X
western mastiff bat	*Eumops perotis californicus*	–	–	CSC	X	X	X	X	X	X	X	X	X		
fringed myotis	*Myotis thysanodes*	–	FSCC	–	X	X	X	X	X	X	X	X	X	X	X
spotted bat	*Euderma maculatum*	–	–	CSC	X	X	X		X	X	X	X			X
western red bat	*Lasiurus blossevillii*	–	–	CSC	X	X	X	X	X	X	X	X		X	X
Tulare grasshopper mouse	*Onychomys torridus tularensis*	–	–	CSC	X	X	X					X			

Special-Status Wildlife															
Common Name	Scientific Name	Federal Status	Forest Service Status	State Status	Herb-dominated Habitats	Shrub-dominated Habitats		Tree-dominated Habitats					Non-vegetated Areas	Aquatic Areas	
					Annual Grassland	Mixed Chaparral	Montane Riparian	Montane Hardwood	Blue Oak-Foothill Pine	Blue Oak Woodland	Valley Oak Woodland	Valley Foothill Riparian	Barren	Lacustrine	Riverine
ringtail	*Bassariscus astutus*	–	–	CFP	X	X	X	X	X	X	X	X	X		
American badger	*Taxidea taxus*	–	–	CSC	X	X	X	X	X	X	X	X	X		
San Joaquin kit fox	*Vulpes macrotis mutica*	FE	–	CT	X				X	X	X	X	X		

Notes: [1] Invertebrate preference for CWHR Wildlife Habitats was determined by reviewing existing literature on habitat preferences for each species and matching to CWHR descriptions. The CWHR system currently has no habitat associations for invertebrates.
Key: Federal Status
BCC = Bird of Conservation Concern
Eagle Act = Bald and Golden Eagle Protection Act
FC = Federal Candidate
FD = Federal Delisted
FE = Federal Endangered
FPT = Federal Proposed Threatened
FT = Federal Threatened
Forest Service Status
FSCC = Sequoia National Forest Service Species of Conservation Concern
State Status
CFP = California Fully Protected
CE = California Endangered
CD = California Delisted
CSC = California Species of Conservation Concern
CT = California Threatened
CC = California Candidate
WL = Watch List

Table 5-3. Special-Status and Common Wildlife Species Observed in the Study Area during 2024 Technical Studies

Common Name[1]	Scientific Name[1]	Status			Type of Detection				
		Federal	State	Forest Service	Visual/Auditory	Scat	Den/Bedding Area	Tracks/Feathers	Remains
Invertebrates – Butterflies									
Western tiger swallowtail	*Papilio rutulus*	–	–	–	X				
Common yellow swallowtail	*Papilio machaon*	–	–	–	X				
Pale swallowtail	*Papilio eurymedon*	–	–	–	X				
Cabbage white	*Pieris rapae*	–	–	–	X				
Monarch butterfly	***Danaus plexippus***	**FPT**	–	–	**X**				
Western white	*Pontia occidentalis*	–	–	–	X				
California sister	*Adelpha californica*	–	–	–	X				
Painted lady	*Vanessa cardui*	–	–	–	X				
Trapdoor spider species	*Ctenizidae* sp.	–	–	–	X				
Goldenrod crab spider	*Misumena vatia*	–	–	–	X				
Johnsons jumping spider	*Phidippus johnsoni*	–	–	–	X				
False tarantula species	*Theraphosidae* sp.	–	–	–	X				
Tarantula species	*Theraphosidae* sp.	–	–	–	X				
Scorpion species	*Scorpionidae* sp.	–	–	–	X				
Western honeybee	*Apis mellifera*	–	–	–	X				
Tarantula hawk species	*Pepsis* sp.	–	–	–	X				
Water strider species	*Gerridae*	–	–	–	X				
Yellowjacket	*Vespinae species*	–	–	–	X				
Bumblebee species[2]	***Bombus* sp.**	–	**CC**	–	**X**				
American ruby-spotted damsel	*Hetaerina americana*	–	–	–	X				
American bluet damsel	*Enallagma cyathigerum*	–	–	–	X				
Desert firetail	*Telebasis salva*	–	–	–	X				
Flame skimmer	*Libellula saturata*	–	–	–	X				
Widow skimmer	*Libellula luctuosa*	–	–	–	X				
Boxelder bug	*Boisea trivittata*	–	–	–	X				
Amphibians									
Sierran tree frog	*Pseudacris sierrae*	–	–	–	X				
American bullfrog	*Lithobates catesbeianus*	–	–	–	X				
Yellow-blotched salamander	***Ensatina eschscholtzii croceater***	–	**WL**	**FSCC**	**X**				
Kern Canyon slender salamander	***Batrachoseps simatus***	**FPT**	**CT**	–	**X**				

Common Name[1]	Scientific Name[1]	Status			Type of Detection				
		Federal	State	Forest Service	Visual/Auditory	Scat	Den/Bedding Area	Tracks/Feathers	Remains
Reptiles									
California legless lizard	***Anniella* spp.**	–	**CSC**	–	**X**				
Northwestern pond turtle[4]	***Actinemys marmorata***	**FPT**	**CSC**	–					**X**
Western fence lizard	*Sceloporus occidentalis*	–	–	–	X				
Western side-blotched lizard	*Uta stansburiana elegans*	–	–	–	X				
Southern alligator lizard	*Elgaria multicarinata*	–	–	–	X				
California whiptail	*Aspidoscelis tigris munda*	–	–	–	X				
Common garter snake	*Thamnophis sirtalis*	–	–	–	X				
Sierra garter snake	*Thamnophis couchii*	–	–	–	X				
Pacific gophersnake	*Pituophis catenifer catenifer*	–	–	–	X				
California king snake	*Lampropeltis californiae*	–	–	–	X				
Northern Pacific rattlesnake	*Crotalus oreganus oreganus*	–	–	–	X				
Birds									
Mallard	*Anas platyrhynchos*	–	–	–	X				
Common goldeneye	*Bucephala clangula*	–	–	–	X				
American coot	*Fulica americana*	–	–	–	X				
Double-crested cormorant	*Nannopterum auritum*	–	–	–	X				
Great blue heron	*Ardea herodias*	–	–	–	X				
Black-crowned night heron	*Nycticorax nycticorax*	–	–	–	X				
Greater yellowlegs	*Tringa melanoleuca*	–	–	–	X				
Turkey vulture	*Cathartes aura*	–	–	–	X				
Red-shouldered hawk	*Buteo lineatus*	–	–	–	X				
Red-tailed hawk	*Buteo jamaicensis*	–	–	–	X				
Swainson’s Hawk	***Buteo swainsoni***	–	**CT**	–	**X**				
Sharp-shinned hawk	*Accipiter striatus*	–	WL	–	**X**				
Northern harrier	***Circus hudsonius***	**BCC**	**CSC**	–	**X**				
Golden eagle	***Aquila chrysaetos***	**Eagle Act**	**CFP**	–	**X**				
Bald eagle	***Haliaeetus leucocephalus***	**FD, Eagle Act**	**CE, CFP**	**FSCC**	**X**				
Peregrine falcon	***Falco peregrinus***	**FD**	**CD, WL**	–	**X**				
American kestrel	*Falco sparverius*	–	–	–	X				
Anna’s hummingbird	*Calypte anna*	–	–	–	X				
Black-chinned hummingbird	*Archilochus alexandri*	–	–	–	X				
Ruby-throated hummingbird	*Archilochus colubris*	–	–	–	X				
Hairy woodpecker	*Picoides villosus*	–	–	–	X				
Northern flicker	*Colaptes auratus*	–	–	–	X				

Copyright 2026 by Southern California Edison

Common Name[1]	Scientific Name[1]	Status			Type of Detection				
		Federal	State	Forest Service	Visual/Auditory	Scat	Den/Bedding Area	Tracks/Feathers	Remains
White-headed woodpecker	***Dryobates albolarvatus***	**BCC**	–	–	**X**				
Acorn woodpecker	*Melanerpes formicivorus*	–	–	–	X				
Red-breasted sapsucker	*Sphyrapicus ruber*	–	–	–	X				
California scrub-jay	*Aphelocoma californica*	–	–	–	X				
Common raven	*Corvus corax*	–	–	–	X				
American crow	*Corvus brachyrhynchos*	–	–	–	X				
Northern mockingbird	*Mimus polyglottos*	–	–	–	X				
Sage thrasher	*Oreoscoptes montanus*	–	–	–	X				
Western meadowlark	*Sturnella neglecta*	–	–	–	X				
Cliff swallow	*Petrochelidon pyrrhonota*	–	–	–	X				
Barn swallow	*Hirundo rustica*	–	–	–	X				
Tree swallow	*Tachycineta bicolor*	–	–	–	X				
Northern-rough winged swallow	*Stelgidopteryx serripennis*	–	–	–	X				
White-throated swift	*Aeronautes saxatalis*	–	–	–	X				
Canyon wren	*Catherpes mexicanus*	–	–	–	X				
Bewick's wren	*Thryomanes bewickii*	–	–	–	X				
House wren	*Troglodytes aedon*	–	–	–	X				
Marsh wren	*Cistothorus palustris*	–	–	–	X				
Rock wren	*Salpinctes obsoletus*	–	–	–	X				
Orange-crowned warbler	*Leiothlypis celata*	–	–	–	X				
Yellow-rumped warbler	*Dendroica coronata*	–	–	–	X				
California towhee	*Melozone crissalis*	–	–	–	X				
Song sparrow	*Melospiza melodia*	–	–	–	X				
Rufous-crowned sparrow	*Aimophila ruficeps*	–	–	–	X				
White-crowned sparrow	*Zonotrichia leucophrys*	–	–	–	X				
Savannah sparrow	***Passerculus sandwichensis***	**BCC**	–	–	**X**				
Oak titmouse	***Baeolophus inornatus***	**BCC**	–	–	**X**				
Phainopepla	*Phainopepla nitens*	–	–	–	X				
European starling	*Sturnus vulgaris*	–	–	–	X				
Black phoebe	*Sayornis nigricans*	–	–	–	X				
Ash-throated flycatcher	*Myiarchus cinerascens*	–	–	–	X				
Western kingbird	*Tyrannus verticalis*	–	–	–	X				
Say's phoebe	*Sayornis saya*	–	–	–	X				
Western tanager	*Piranga ludoviciana*	–	–	–	X				
Scott's oriole	*Icterus parisorum*	–	–	–	X				

Copyright 2026 by Southern California Edison

Common Name[1]	Scientific Name[1]	Status			Type of Detection				
		Federal	State	Forest Service	Visual/Auditory	Scat	Den/Bedding Area	Tracks/Feathers	Remains
Bullock's oriole	***Icterus bullockii***	**BCC**	–	–	**X**				
California quail	*Callipepla californica*	–	–	–	X				
Mountain quail	*Oreortyx pictus*	–	–	–	X				
Mourning dove	*Zenaida macroura*	–	–	–	X				
Lawrence's goldfinch	***Spinus lawrencei***	**BCC**	–	–	**X**				
House finch	*Haemorhous mexicanus*	–	–	–	X				
Bushtit	*Psaltriparus minimus*	–	–	–	X				
Hermit thrush	*Catharus guttatus*	–	–	–	X				
Ruby-crowned kinglet	*Corthylio calendula*	–	–	–	X				
Dark-eyed junco	*Junco hyemalis*	–	–	–	X				
Hutton's vireo	*Vireo huttoni*	–	–	–	X				
Mammals									
California ground squirrel	*Otospermophilus beecheyi*	–	–	–	X				
Chipmunk	*Neotamias* spp.	–	–	–	X				
Woodrat species	*Neotama* spp.	–	–	–		X			
Deer mouse species	*Peromyscus* spp.	–	–	–	X				
American beaver	*Castor canadensis*	–	–	–	X				
Pallid bat	***Antrozous pallidus***	–	**CSC**	–	**X**				
Big brown bat	*Eptesicus fuscus*	–	–	–					X
Western mastiff bat	***Eumops perotis***	–	**CSC**	–	**X**	**X[5]**			
Western red bat	***Lasiurus blossevillii***	–	**CSC**	–	**X**				
Hoary bat	*Lasiurus cinereus*	–	–	–	X				
Silver-haired bat	*Lasionycteris noctivagans*	–	–	–	X				
California myotis	*Myotis californicus*	–	–	–	X	X[5]			
Western small-footed myotis	*Myotis ciliolabrum*	–	–	–	X				
Long-eared myotis	*Myotis evotis*	–	–	–	X	X[5]			
Little brown bat	*Myotis lucifugus*	–				X[5]			
Fringed myotis	***Myotis thysanodes***	–	–	**FSCC**	**X**	**X[5]**			
Long-legged myotis	*Myotis volans*	–	–	–		X[5]			
Yuma myotis	*Myotis yumanensis*	–	–	–	X	X[5]			
Canyon bat	*Parastrellus hesperus*	–	–	–	X				
Mexican free-tailed bat	*Tadarida brasiliensis*	–	–	–	X				
Desert cottontail	*Sylvilagus audubonii*	–	–	–	X				

Copyright 2026 by Southern California Edison

Common Name[1]	Scientific Name[1]	Status			Type of Detection				
		Federal	State	Forest Service	Visual/Auditory	Scat	Den/Bedding Area	Tracks/Feathers	Remains
Brush rabbit	*Sylvilagus bachmani*	–	–	–	X				
Coyote	*Canis latrans*	–	–	–	X	X			
Mule deer	*Odocoileus hemionus*	–	–	–	X				

Notes: [1]Special-status wildlife species are indicated in bold text.
[2] The bumblebees observed could not be identified to species. As some *Bombus* species are special-status, the observation in the table was noted to be CC.
[3] Confirmation of the identification between Kern Canyon slender salamander and relictual slender salamander requires handling to count the number of costal grooves between adpressed limbs. Because these species require a handling permit, no salamanders were handled and the species identification cannot be confirmed. However, the habitat in which this individual was found (rocky, upland habitat) matches the description of Kern Canyon slender salamander rather than the relictual slender salamander (which are found in streams and riparian corridors), and therefore it is assumed this individual is a Kern Canyon slender salamander.
[4] Refer to the AQ 3 TM for information on the incidental sighting of northwestern pond turtle in the study area.
[5] DNA sequence analysis, conducted by Genidaqs, could not confirm a guano sample to species but indicated this species as a possible result of origin of one or more guano sample collected in from a Project facility.

Key: Federal Status
BCC = Bird of Conservation Concern
Eagle Act = Bald and Golden Eagle Protection Act
FD = Federal Delisted
FE = Federal Endangered
FPT = Federal Proposed Threatened
FT = Federal Threatened
State Status
CC = California Candidate
CD = California Delisted
CE = California Endangered
CFP = California Fully Protected
CSC = California Species of Conservation Concern
CT = California Threatened
WL = Watch List
Forest Service Status
FSCC = Sequoia National Forest Species of Conservation Concern

Table 5-4. Milkweed Populations Identified in the Study Area

Photo/ Map ID	Nearest Facility	Coordinates	Milkweed Species	Number of Individuals	Population Size (sq ft)
ASC-1[1]	Willow Spring Creek Road (Democrat Dam Road)	35.5261228 -118.6687727	California milkweed (*Asclepias californica*)	450	6,500
ASC-2[1]	Democrat Gage Trail	35.519992556947, -118.679922563914	California milkweed (*Asclepias californica*)	4	20
ASC-3[1]	Overflow Spillway Trail	35.4600773 -118.7781727	California milkweed (*Asclepias californica*)	2	4
ASC-4[1]	Overflow Spillway Trail	35.4602382387254, -118.777604338439	California milkweed (*Asclepias californica*)	6	50
ASC-5[1]	Overflow Spillway Trail	35.4602208170834, -118.777577196741	California milkweed (*Asclepias californica*)	1	1
ASC-6[1]	Overflow Spillway Trail	35.470658436 -118.71213836	California milkweed (*Asclepias californica*)	1	1
ASC-7[1]	Stark Creek Trail	35.471236, -118.725959	California milkweed (*Asclepias californica*)	1	9
ASC-8[1]	Adit 17 & 18 Trail	35.458430, -118.774926	California milkweed (*Asclepias californica*)	4	2
ASC-9[1]	Forebay Overflow Spillway	35.458369, -118.775688	California milkweed (*Asclepias californica*)	1	2
ASF-10[2]	Democrat Dam Impoundment	35.530669, -118.665109	Narrow leaf milkweed (*Asclepias fascicularis*)	1	2

Notes: [1]ASC populations have been identified as California milkweed (Asclepias californica)
[2]ASF populations have been identified as Narrow leaf milkweed (*Asclepias fascicularis*)
Key: sq ft = square feet

Table 5-5. Evaluation of Potentially Suitable Habitat for Western Spadefoot

General Location and Aquatic Habitat	Coordinates	Aquatic Breeding Habitat Present[1]	Adjacent Upland Habitat Present[2]			Determination
			Grassland	Burrows	Terrain	
Willow Spring Creek Road (Democrat Dam Road) Unnamed Seep	35.522997 -118.673169	X	X	X	X	The location has potential to meet life history requirements. This location is marked as WSF-1 on Map 5-2a.
Democrat Gage Trail Conduit Leak	35.5209513 -118.6760348	–	X	X	X	The location does not meet life history requirements. Both suitable aquatic habitat and upland habitat are absent.
Conduit No. 3 Trail Democrat Spring	35.5052841 -118.6909485	–	X	–	–	The location does not meet life history requirements. Both suitable aquatic habitat and upland habitat are absent.
Conduit No. 3 Democrat Spring	35.5050696 -118.6901358	–	X	–	X	The location does not meet life history requirements. Both suitable aquatic habitat and upland habitat are absent.
Cow Flat Creek Trail Cow Flat Creek	35.5000945 -118.6939338	–	–	X	–	The location does not meet life history requirements. Both suitable aquatic habitat and upland habitat are absent.
Flume No. 2 Cow Flat Creek	35.4998639 -118.6932129	–	–	–	–	The location does not meet life history requirements. Both suitable aquatic habitat and upland habitat are absent.

Copyright 2026 by Southern California Edison

General Location and Aquatic Habitat	Coordinates	Aquatic Breeding Habitat Present[1]	Adjacent Upland Habitat Present[2]			Determination
			Grassland	Burrows	Terrain	
Flume No. 3 Flume Leak	35.4951871 -118.6960911	–	X	X	X	The location does not meet life history requirements. Suitable aquatic habitat is absent.
Lucas Creek Trail Lucas Creek	35.4837308 -118.7110152	–	–	X	X	The location does not meet life history requirements. Both suitable aquatic habitat and upland habitat are absent.
Flume No. 4 Lucas Creek	35.4836757 -118.7039398	X	–	–	–	The location does not meet life history requirements. Suitable upland habitat is absent.
Flume No. 5 Dougherty Creek	35.4702765 -118.7110418	X	X	X	X	The location has potential to meet life history requirements. Suitable aquatic breeding habitat may be present in a wet year. This location is marked as WSF-2 on Map 5-2d.
Stark Creek Road Stark Creek	35.4709413 -118.7183867	X	X	X	–	The location does not meet life history requirements. Suitable upland habitat is absent.
Flume No. 6 Stark Creek	35.4682469 -118.7196902	X	X	X	X	The location has potential to meet life history requirements. This location is marked as WSF-3 on Map 5-2d.
Adit 12 & 13 Unnamed Stream	35.4704176 -118.7265810	–	X	X	–	The location does not meet life history requirements. Both suitable aquatic habitat and upland habitat are absent.

General Location and Aquatic Habitat	Coordinates	Aquatic Breeding Habitat Present[1]	Adjacent Upland Habitat Present[2]			Determination
			Grassland	Burrows	Terrain	
Adit 14 & 15 Pechacho Creek	35.4690601 -118.7469687	X	X	X	–	The location does not meet life history requirements. Suitable upland habitat is absent.
Conduit No. 9 Unnamed Stream	35.4570861 -118.7657255	–	X	X	–	The location does not meet life history requirements. Both suitable aquatic habitat and upland habitat are absent.

Notes: Refer to Appendix A for photographs of each of the surveyed locations.

[1] Breeding habitat consists of ponded water in open flat or gently sloped areas without aquatic predators or vegetative cover where water is likely to be present long enough to allow for tadpole metamorphosis; and that does not support non-native predatory species. Water was not present in all locations at the time of the survey. However, indicator features were used to determine if the area could support aquatic breeding habitat in a wet year. If one or more of these indicators were present, the area was marked as containing suitable aquatic breeding habitat as such areas have potential to provide breeding habitat but it could not be confirmed or ruled out during the 2024 technical studies.

Indicator features included:

- Change in substrate (e.g. rock or gravel creek bed showing the path of water)
- Signs of water presence (e.g. staining on the rocks)
- Riparian or remnants of wetland vegetation present along the creek

[2] The suitability of upland habitat was only evaluated in areas adjacent to potential breeding habitat.

Table 5-6. Larger Animal Burrows Identified in the Study Area

Photo/ Map ID	Nearest Facility	Coordinates	Approximate Dimensions		Substrate Conditions	Animal Sign	Notes
			Entrance (inches; height × width)	Interior Depth (inches)			
BUR-1	Lucas Creek Trail	35.4832639 -118.7105667	4 x 3	7	Coarse sandy loam mixed with decomposed granite bedrock	None	The burrow tunnel turns and no chamber was seen.
BUR-2	Lucas Creek Trail	35.4832722 -118.7105639	3.5 x 4	3	Coarse sandy loam mixed with decomposed granite bedrock	None	The burrow is collapsed.
BUR-3	Lucas Creek Trail	35.4832667 -118.7105583	4 x 3.5	9	Coarse sandy loam mixed with decomposed granite bedrock	Soil disturbance and flattened grasses.	Wildlife may be moving to/from the burrow and possibly laying down around the entrance.
BUR-4	Lucas Creek Trail	35.4830333 -118.7103389	5.5 x 6	24	Coarse sandy loam mixed with decomposed granite bedrock	None	The burrow tunnel turns and no chamber was seen.
BUR-5	Lucas Creek Trail	35.4830778 -118.7101444	4.5 x 4.5	18	Coarse sandy loam mixed with decomposed granite bedrock	Soil disturbance and potential excavations.	The soil disturbance may be from unstable soils and not excavations. There are no other signs of occupancy.
BUR-6	Lucas Creek Trail	35.4831111 -118.7100444	4 X 3.5	24	Coarse sandy loam mixed with decomposed granite bedrock	None	The burrow does not exhibit signs of being occupied and is likely covered by grasses in the spring and summer.
BUR-7	Lucas Creek Trail	35.4832167 -118.7098028	6.5 x 5.5	36–48	Coarse sandy loam mixed with decomposed granite bedrock	None	The burrow does not exhibit signs of being occupied and is likely covered by grasses in the spring and summer.

Copyright 2026 by Southern California Edison

Table 5-7. Evaluation of Project Powerline Pole Configurations for Consistency with Avian Powerline Interaction Committee Guidelines

Powerline Name	Example Pole ID	Pole Configuration Type[a]	Evaluation Criteria					
			No Avian Electrocution Risk			Potential Risk for Avian Electrocution		
			Communication Lines are Insulated	Powerlines are Insulated	Communication/ Powerlines are Underground	Distance Between Conductors Is Less than 60 Inches	Distance Between Energized and Grounded Equipment on Equipment Poles Is Less than 60 Inches	Metal Guy Wires in Close Proximity to Energized Wires
Intake Gatehouse to Flume No. 1 Powerline	DPP – 1	Configuration 1: Single-Phase Single Circuit with Side-Mounting Configuration and Box – End Pole • Lines run from box near the base to pole top, loose wires twined into one line. • Pole top perch available • No crossarms • No phase cover	X	X	–	–	–	–
Intake Gatehouse to Flume No. 1 Powerline	DPP – 2	Configuration 2: Single-Phase to Three-Phase with Transformer and Underbuild Construction • Two wooden crossarms • Phase cover • No perch guard.	–	–	–	X	–	–
Intake Gatehouse to Flume No. 1 Powerline	DPP – 3	Configuration 3: Three-Phase Single-Circuit with Two Transformers and Underbuild Construction • Pole top perch available • Two wooden crossarms • No phase cover	–	–	–	X	–	–
Intake Gatehouse to Flume No. 1 Powerline	DPP – 4	Configuration 4: Three-Phase Single-Circuit Overmount • Single wooden crossarms • No phase covers • No perch guard	–	–	–	X	–	–
Intake Gatehouse to Flume No. 1 Powerline	DPP – 5	Configuration 5: Single-Phase Single-Circuit With Top Line • Single pole with single-phase line connected on the top. • Side mount • No loose wires.	X	X	–	–	–	–
Intake Gatehouse to Flume No. 1 Powerline	DPP – 6	Configuration 6: Three-Phase Single-Circuit Overmount with Two Close Crossbars • Two wooden crossarms • Phase cover on central line • No phase covers on end caps • No perch guard	–	–	–	X	–	–

Powerline Name	Example Pole ID	Pole Configuration Type[a]	Evaluation Criteria					
			No Avian Electrocution Risk			Potential Risk for Avian Electrocution		
			Communication Lines are Insulated	Powerlines are Insulated	Communication/ Powerlines are Underground	Distance Between Conductors Is Less than 60 Inches	Distance Between Energized and Grounded Equipment on Equipment Poles Is Less than 60 Inches	Metal Guy Wires in Close Proximity to Energized Wires
Intake Gatehouse to Flume No. 1 Powerline	DPP – 7 (+ 9 & 11)	Configuration 7: Three-Phase Single-Circuit Crossarm • One wooden crossarm • Phase cover on center line • No phase covers on end caps • No loose wires	–	–	–	X	–	–
Intake Gatehouse to Flume No. 1 Powerline	DPP – 8	Configuration 8: Three-Phase Single-Circuit Underline • Dual wooden crossarms • Pole top perch available • Wires undermount • No phase cover • No loose wires	–	–	–	X	–	–
Intake Gatehouse to Flume No. 1 Powerline	DPP – 10	Configuration 9: Three-Phase Single-Circuit Crossarm • Single wooden crossarm • Triangle deterrent between two close wires • No phase cover • No loose wires	–	–	–	X	–	–
Intake Gatehouse to Flume No. 1 Powerline	DPP – 12	Configuration 10: Three-Phase Distribution Corner • Two dual wooden crossarms allowing 90-degree directional turn • Phase covers • No loose wires	–	–	–	X	–	–
Intake Gatehouse to Flume No. 1 Powerline	DPP – 13	Configuration 11: Three-Phase Transformer Bank • Wooden crossarms • Transformers present • Phase covers • No loose wires	–	–	–	X	X	–
Intake Gatehouse to Flume No. 1 Powerline	DPP – 14	Configuration 12: Single-Phase Single-Circuit with Side-Mount • Pole top perch available • Side mount • No loose wires	X	X	–	–	–	–
Intake Gatehouse to Flume No. 1 Powerline	DPP – 16 (+ 17)	Configuration 13: Dual-Phase Single-Pole Side Mount • Pole top perch available • Loose wires • Insulated twined with uninsulated wires • Loose or looped wires	–	–	–	–	–	–

Powerline Name	Example Pole ID	Pole Configuration Type[a]	Evaluation Criteria					
			No Avian Electrocution Risk			Potential Risk for Avian Electrocution		
			Communication Lines are Insulated	Powerlines are Insulated	Communication/ Powerlines are Underground	Distance Between Conductors Is Less than 60 Inches	Distance Between Energized and Grounded Equipment on Equipment Poles Is Less than 60 Inches	Metal Guy Wires in Close Proximity to Energized Wires
Powerhouse to Forebay Communication / Powerline	PC – 1	Configuration 1: Two-Phase Transformer Bank • Dual wooden crossarms. • Some phase covers • Some wires insulated	–	–	–	X	X	X
Powerhouse to Forebay Communication / Powerline	PC – 2 (+ 3, 5, & 6)	Configuration 2: Three-Phase Single-Circuit Crossarm • One wooden crossarm • Phase cover on center line • No phase cover on endcaps • No loose wires	–	–	–	X	–	–
Powerhouse to Forebay Communication / Powerline	PC – 4	Configuration 3: Single-Phase Three-Circuit to Single-Circuit Crossarm • Two wooden crossarms in 90 degree relation • No phase covers • Secondary pole and lines next to main overhead line	–	–	–	X	–	X
Powerhouse to Forebay Communication / Powerline	PC – 7	Configuration 4: Three-Phase Single-Circuit Dual Crossarm • Dual crossarms (unconfirmed material) • Wires overmounted on uphill side and undermounted on downhill side • Phases covered on center line	–	–	–	X	X	–
Powerhouse to Forebay Communication / Powerline	PC – 9 (+ 10, 11, 12, 14, 16, 17, 18, & 20)	Configuration 5: Three-Phase Single-Circuit Low Crossarm • Pole top perch available but close to energized wire due to slope • One wooden crossarm or material undetermined crossarm • Phase cover on center line • No phase cover on endcaps	–	–	–	X	–	–
Powerhouse to Forebay Communication / Powerline	PC – 11 (+ 13 & 15)	Configuration 6: Three-Phase Single-Circuit High Crossarm • Pole top perch available but close to energized wire due to slope • One wooden crossarm • No phase covers	–	–	–	X	–	–
Powerhouse to Forebay Communication / Powerline	PC – 19	Configuration 7: Three-Phase Single-Circuit Distribution Corner with Multi-Directional Distribution • Dual wooden crossarms and single crossarm (material unconfirmed) • Jumper wires • One phase cover and nine uncovered phases	–	–	–	X	X	X

Powerline Name	Example Pole ID	Pole Configuration Type[a]	Evaluation Criteria					
			No Avian Electrocution Risk			Potential Risk for Avian Electrocution		
			Communication Lines are Insulated	Powerlines are Insulated	Communication/ Powerlines are Underground	Distance Between Conductors Is Less than 60 Inches	Distance Between Energized and Grounded Equipment on Equipment Poles Is Less than 60 Inches	Metal Guy Wires in Close Proximity to Energized Wires
Powerhouse to Forebay Communication / Powerline	PC – 21	Configuration 8: Three-Phase Single-Circuit Undermount • Two wooden crossarms • No phase covers • Some uninsulated. • Insulated lines running through piping along pole	–	–	–	X	X	–
Powerhouse to Forebay Communication / Powerline	PC – 23	Configuration 9: Single-Circuit Three-Phase Corner Distribution with Three Crossarms • Three wooden crossarms • Upper crossarm contains circuits connecting to additional poles • Middle crossarm connects to the line from the adjacent pole and leads to the top crossarm • Lower crossarm contains lines connecting from the middle line to the insulated lines leading to the piping along the pole to the ground. • Insulated lines leading to the ground all other lines uninsulated	–	–	–	X	–	X
Powerhouse to Forebay Communication / Powerline	PC – 24	Configuration 10:Three-Phase Single-Circuit with Two Transformers • Dual wooden crossarms on top of pole • Two transformers • Some phase covers	–	–	–	X	–	–
Powerhouse to Forebay Communication / Powerline	PC – 25	Configuration 11: Three-Phase Single-Circuit with Transformer • Single wooden crossarm on top of pole • One transformer • Some phase covers	–	–	–	X	–	–
Kern River No. 1 Switchyard	SY – 1	Configuration 1: Switchyard • Live high-voltage electrical current • No phase covers • Crossbars over switchyard may prohibit larger raptors from entering or serve as safe perches	–	–	–	X	–	–

Copyright 2026 by Southern California Edison

Table 5-8. Evaluation of Open-Air Segments of the Project Water Conveyance System

Project Facility	Photo No.	Evaluation (X = Feature is Present)			Notes
		Fenced	Elevated	Covered	
Democrat Dam Area – Map 2-3a					
Sandbox		X	X		Not accessible to wildlife • The sandbox is a concrete structure, approximate xx feet long and xx feet wide. • It is elevated above the ground by approximately xx feet. • Portions of the facility are fenced. • Facility may be accessible by mid-size wildlife.
Conduit No. 1				X	Not accessible to wildlife • The majority of the xx-foot long conduit is underground. • One above-ground concrete section (approximately xx feet) is covered with metal grating.
Flume No. 1/Conduit No. 2		X	X	X	Not accessible to wildlife • The entirety of the flume (approximately xx feet long) is elevated and inaccessible. • Small section of conduit at ground-level has been covered and fenced to prevent access.
Democrat Spring Area – Map 2-3b					
Conduit No. 3				X	Not accessible to wildlife • The open portion of this flume is covered with a metal plate.

Project Facility	Photo No.	Evaluation (X = Feature is Present)			Notes
		Fenced	Elevated	Covered	
Cow Flat Creek Area – Map 2-3c					
Flume No. 2 Cow Flat Creek			X		Potentially accessible to wildlife • The open portion of this flume is elevated approximately xx feet above ground level. • However, facility is not covered and could potentially be accessed from surrounding landscape at exit/entry points into tunnel
Flume No. 3			X		Potentially accessible to wildlife • The open portion of this flume is elevated approximately xx feet above ground level. • However, facility is not covered and could potentially be accessed from surrounding landscape at exit/entry points into tunnel
Conduit No. 6				X	Not accessible to wildlife • Facility is completely covered/underground.
Lucas Creek Area – Map 2-3d					
Flume No. 4 Lucas Creek			X		Potentially accessible to wildlife • The open portion of this flume spans a small canyon and is elevated a minimum of approximately 8 feet above ground level. • However, facility is not covered and could potentially be accessed from surrounding landscape at exit/entry points into tunnel.

Copyright 2026 by Southern California Edison

Project Facility	Photo No.	Evaluation (X = Feature is Present)			Notes
		Fenced	Elevated	Covered	
Stark Creek Area – Map 2-3e					
Flume No. 5 Dougherty Creek			X		Potentially accessible to wildlife • The open portion of this flume is elevated approximately 8 feet above ground level. • Facility is not covered and could potentially be accessed from surrounding landscape at exit/entry points into tunnel.
Flume No. 6 Stark Creek			X		Potentially accessible to wildlife • The open portion of this flume is elevated approximately 10 feet above ground level. • Facility is not covered and could potentially be accessed from surrounding landscape at entry point into tunnel.
Kern River No. 1 Powerhouse Area – Map 2-3g					
Conduit No. 9				X	Not accessible to wildlife • The majority of the conduit is underground. • One above-ground concrete section (approximately xx feet) is covered with metal plate to prevent access.
Forebay		X			Not accessible to wildlife • Facility has a perimeter fence and is not accessible to mid to large wildlife.

Table 5-9. Project Facilities within Special-Status Salamander Habitat

Project Facility	Habitat Present		
	Kern Canyon Slender Salamander	Relictual Slender Salamander	Yellow-blotched Salamander
Democrat Dam Area – Map 2-3a			
Intake Gatehouse to Flume No. 1 Powerline	X	X	X
Willow Spring Creek Road	X	X	X
Democrat Dam Access Walkway	X	X	X
Sandbox	X	X	X
Sandbox Drainage Channel	X	X	X
Flume No. 1	X	X	X
Flume No. 1 Road	X	X	X
Democrat Gage Trail	X	X	X
Conduit No. 2	X	X	X
Stilling Well No. 1	X		X
Gaging Cableway	X		X
Kern River near Democrat Springs (USGS Gate No. 11192500/SCE Gage No. 409)	X		X
Democrat Spring Area – Map 2-3b			
Conduit No. 3	X	X	X
Conduit No. 3 Trail	X	X	X
Cow Flat Creek Area – Map 2-3c			
Cow Flat Creek Trail	X	X	X
Flume No. 2 Cow Flat Creek	X	X	X
Stilling Well No. 2	X	X	X
Kern River No. 1 Conduit Near Democrat Springs (USGS Gage No. 1119200/SCE Gage No. 410)	X	X	X
Powerhouse Trail	X	X	X
Steel Flume Trail	X	X	X
Conduit No. 4	X	X	X
Conduit No. 5	X	X	X
Flume No. 3	X	X	X
Conduit No. 6	X		X

Project Facility	Habitat Present		
	Kern Canyon Slender Salamander	**Relictual Slender Salamander**	**Yellow-blotched Salamander**
Lucas Creek Area – Map 2-3d			
Lucas Creek Trail	X	X	
Flume No. 4 Lucas Creek	X	X	
Stark Creek Area – Map 2-3e			
Stark Creek Road	X	X	
Dougherty Creek Road	X	X	
Dougherty Creek Trail	X	X	
Conduit No. 7	X	X	
Flume No. 5 Dougherty Creek	X	X	
Flume No. 6 Stark Creek	X	X	
Conduit No. 8	X	X	
Flume No. 6 Access Platform	X	X	
Unnamed FERC Trail	X		
Stark Creek Trail	X	X	
Adit 12 & 13	X	X	
Adit 13 & 14	X		
Pechacho Creek Area – Map 2-3f			
Adit 14 & 15	X		
Kern River No. 1 Powerhouse Area – Map 2-3g			
Forebay Operations Area Road	X		
Skip Hoist / Forebay Trail	X		
Aerial Cable Tower	X		
Skip Hoist Cable	X		
Forebay Overflow Spillway	X		
Overflow Spillway Trail	X		
Water Tank	X		
Penstock	X		
Powerhouse to Forebay Communication / Powerline	X		
Forebay	X		
Skip Hoist Upper Landing	X		
Skip Hoist Upper Landing to Forebay Catwalk	X		
Communication Site	X		

Project Facility	Habitat Present		
	Kern Canyon Slender Salamander	**Relictual Slender Salamander**	**Yellow-blotched Salamander**
Adit 18 & 19	X		
Adit 17 & 18 Trail	X	X	
Conduit No. 9	X	X	
Forebay Operations Area Perimeter Fence	X		
Forebay Perimeter Fence	X		
Powerhouse and Switchyard Perimeter Fence	X		

Table 5-10. Salamander Visual Encounter Survey Results

Habitat Survey ID[1]	Date Surveyed	Time Surveyed[2]	Weather Conditions	Species Observation ID	Special-Status Species Observed	Species Status	Nearest Project Facility	Coordinates	Cover / Substrate	Incidental Observations	Notes
Democrat Dam Area – Map 2-3a											
KCSS_H_01	3/3/2025	Afternoon	Sunny/Cloudy	–	None	–	–	–	–	–	
KCSS_H_02	3/3/2025	Afternoon	Sunny/Cloudy	–	None	–	–	–	–	–	
KCSS_H_12	3/3/2025	Afternoon	Sunny	–	None	–	–	–	–	–	
KCSS_H_13	3/3/2025	Afternoon	Sunny	–	None	–	–	–	–	–	
KCSS_YBS_H_01	3/3/2025	Afternoon	Sunny	–	None	–	–	–	–	–	
KCSS_YBS_H_02	3/3/2025	1015	Overcast	YBS_01	Yellow-blotched salamander (*Ensatina eschscholtzii croceater*)	FSCC, WL	Flume No. 1	35.522296, -118.675376	Tree bark. Soil and leaf litter.	–	
		1145		CLL_01	California legless lizard (*Anniella* spp.)	CSC	Flume No. 1	35.522496, -118.675165	Sheet metal. Soft moist soil.		Both California legless lizards were found under the same cover.
				CLL_02	California legless lizard (*Anniella* spp.)						
KCSS_YBS_H_03	3/3/2025	Afternoon	Sunny	–	None	–	–	–	–	–	
KCSS_YBS_H_04	3/3/2025	Afternoon	Sunny	–	None	–	–	–	–	–	
KCSS_YBS_H_05	3/3/2025	Afternoon	Sunny	–	None	–	–	–	–	–	
KCSS_YBS_H_06	3/3/2025	Afternoon	Sunny	–	None	–	–	–	–	–	
RSS_H_01	3/3/2025	Afternoon	Overcast / Sunny	–	None	–	–	–	–	–	
RSS_H_02	3/3/2025	Afternoon	Overcast / Sunny	–	None	–	–	–	–	–	
RSS_H_03	3/3/2025	Afternoon	Overcast / Sunny	–	None	–	–	–	–	–	
RSS_H_10	3/3/2025	Morning	Overcast / Light Rain	–	None	–	–	–	–	–	
RSS_H_11	3/3/2025	Morning	Overcast / Light Rain	–	None	–	–	–	–	–	
RSS_H_12	3/3/2025	Morning	Overcast	–	None	–	–	–	–	–	
RSS_H_13	3/3/2025	Morning	Overcast	–	None	–	–	–	–	–	
RSS_H_14	3/3/2025	Morning	Overcast	CLL_03	California legless lizard (*Anniella* spp.)	CSC	Willow Spring Creek Road	35.523036, -118.673336	Bark shed from decomposing log. Soft moist soil.		
RSS_H_15	3/3/2025	Morning	Overcast	–	None	–	–	–	–	–	
YBS_H_01	3/3/2025	Afternoon	Sunny/Cloudy	–	None	–	–	–	–	Sierran tree frog (*Pseudacris sierra*)	
YBS_H_02	3/3/2025	Afternoon	Sunny/Cloudy	–	None	–	–	–	–	Sierran tree frog (*Pseudacris sierra*)	
YBS_H_03	3/3/2025	Afternoon	Sunny/Cloudy	–	None	–	–	–	–	–	

Habitat Survey ID[1]	Date Surveyed	Time Surveyed[2]	Weather Conditions	Species Observation ID	Special-Status Species Observed	Species Status	Nearest Project Facility	Coordinates	Cover / Substrate	Incidental Observations	Notes
Democrat Spring Area – Map 2-3b											
KCSS_RSS_YBS_H_01	3/4/2025	Morning	Sunny	–	None	–	–	–	–	–	
Cow Flat Creek Area – Map 2-3c											
KCSS_YBS_H_07	3/4/2025	Morning	Sunny	–	None	–	–	–	–	–	
RSS_H_16	3/4/2025	Morning	Sunny	–	None	–	–	–	–	–	
RSS_H_17	3/4/2025	Morning	Sunny	–	None	–	–	–	–	–	
Lucas Creek Area – Map 2-3d											
KCSS_H_10	3/5/2025	Morning	Overcast / Light Rain	–	None	–	–	–	–	–	
KCSS_H_11	3/5/2025	Morning	Sunny	–	None	–	–	–	–	–	
RSS_H_08	3/5/2025	Morning	Sunny	–	None	–	–	–	–	Sierran tree frog (*Pseudacris sierra*)	
RSS_H_09	3/5/2025	Morning	Sunny / Overcast	–	None	–	–	–	–	–	
Stark Creek Area – Map 2-3e											
KCSS_H_03	3/5/2025	1602	Overcast / Light Rain	KCSS_02	Kern Canyon Slender Salamander[3] *(Batrachoseps simatus)*	FPT, FSCC, CT	Unnamed FERC Trail, Stark Creek Road	35.468818, -118.718528	Log / Stump. Found within the decomposing bark of the stump when flipped.	–	
KCSS_H_04	3/5/2025	Morning	Overcast / Light Rain	–	None	–	–	–	–	–	
KCSS_H_05	3/5/2025	Morning	Overcast / Light Rain	–	None	–	–	–	–	–	
KCSS_H_06	3/5/2025	Morning	Overcast / Light Rain	–	None	–	–	–	–	–	
KCSS_H_07	3/5/2025	1235	Overcast / Light Rain	KCSS_01	Kern Canyon Slender Salamander[3] *(Batrachoseps simatus)*	FPT, CT	Adit 13 & 14	35.473858, -118.733081	Wooden board. Gravel and leaf litter.	Southern alligator lizard (*Elgaria multicarinata*)	
KCSS_H_08	3/5/2025	Afternoon	Overcast / Light Rain	–	None	–	–	–	–	–	
KCSS_H_09	3/6/2025	Afternoon	Sunny/Cloudy	–	None	–	–	–	–	–	
KCSS_RSS_H_01	3/5/2025	Afternoon	Light Rain	–	None	–	–	–	–	–	
RSS_H_04	3/5/2025	Morning	Overcast / Light Rain	–	None	–	–	–	–	–	
RSS_H_05	3/5/2025	Morning	Overcast / Light Rain	–	None	–	–	–	–	–	
RSS_H_06	3/5/2025	Afternoon	Overcast / Light Rain	–	None	–	–	–	–	–	
RSS_H_07	3/6/2025	Afternoon	Sunny	–	None	–	–	–	–	–	

Habitat Survey ID[1]	Date Surveyed	Time Surveyed[2]	Weather Conditions	Species Observation ID	Special-Status Species Observed	Species Status	Nearest Project Facility	Coordinates	Cover / Substrate	Incidental Observations	Notes
Pechacho Creek Area – Map 2-3f											
KCSS_H_15	3/4/2025	Afternoon	Sunny	–	None	–	–	–	–	–	
Kern River No. 1 Powerhouse Area – Map 2-3g											
KCSS_H_14	3/6/2025	Morning	Overcast / Light Rain	–	None	–	–	–	–	–	
KCSS_H_16	3/6/2025	Morning	Overcast	–	None	–	–	–	–	–	
KCSS_H_17	3/6/2025	Afternoon	Overcast / Sunny	–	None	–	–	–	–	–	
KCSS_H_18	3/6/2025	Morning	Overcast / Light Rain	–	None	–	–	–	–	–	
KCSS_H_19	3/6/2025	Morning	Overcast / Light Rain	–	None	–	–	–	–	Southern alligator lizard , Western fence lizard (*Sceloporus occidentalis*) , Bumblebee species (*Bombus* spp.)	
KCSS_H_20	3/6/2025	Morning / Afternoon	Overcast / Light Rain	–	None	–	–	–	–	Southern alligator lizard , Western fence lizard	
RSS_H_18	3/6/2025	Morning	Overcast / Rain	–	None	–	–	–	–	–	

Notes: [1] Habitats for each species were denoted with codes.
[2] Exact times were only recorded during the data collection for special-status species observations.
[3] Confirmation of the identification between Kern Canyon slender salamander and relictual slender salamander requires handling to count the number of costal grooves between adpressed limbs. Because these species require a handling permit, no salamanders were handled and the species identification cannot be confirmed. However, the habitat in which this individual was found (rocky, upland habitat) matches the description of Kern Canyon slender salamander rather than the relictual slender salamander (which are found in streams and riparian corridors), and therefore it is assumed this individual is a Kern Canyon slender salamander.

Key: KCSS = Kern Canyon slender salamander
RSS = Relictual slender salamander
YBS = Yellow-blotched salamander
Federal Status
FPT = Federal Proposed Threatened
State Status
CSC = California Species of Conservation Concern
CT = California Threatened
WL = Watch List
Forest Service Status
FSCC = Sequoia National Forest Species of Conservation Concern

Copyright 2026 by Southern California Edison

Table 5-11. Results of Preliminary Visual Field Assessment of Project Facilities with Potential to Support Bat Roosting Habitat

Project Facility	Potential Roost Habitat			Potential Roosting Habitat Present?	Notes	Surrounding Environmental Conditions	Photo ID[1]
	Vertical or Roofed Elements	Cracks/ Crevices	Appropriate Solar Exposure				
Democrat Dam Area – Map 2-3a							
Democrat Dam	X	–	–	No	The dam is regularly submerged by released water, so bats would likely avoid roosting on the face of the dam. While there are cracks and crevices on the face of them, water often flows from the cracks making them unusable for bats. The support buildings connected to the dam contain roofed elements; however these structures are too exposed to wind or rain making these areas unsuitable for roosting.	Riverine, Rockface/Cliffs	1
Democrat Dam Drainage Tower	X	–	–	No	The drainage tower is constructed of vertical steel, some roofed elements, with a concrete material base. However, this structure lacks cracks and crevices allowing entry to the interior. Existing roofed elements are too exposed to wind and rain and therefore lack appropriate thermal conditions for bat use.	Riverine, Rockface/Cliffs	2
Democrat Dam Intake Gatehouse	X	–	X	Yes	The intake gatehouse has some roofed and vertical elements and is constructed of textured concrete which could provide suitable roosting habitat.	Riverine, Rockface/Cliffs, Scattered Oak Trees	3
Democrat Dam Drainage Tunnel Outlet	X	–	X	Yes	The drainage tunnel outlet is a textured concrete structure with some vertical steel, and roofed elements. This structure could act as a potential night roost.	Riverine	4
Democrat Dam Access Walkway (& Unnamed Buildings)	X	–	X	Yes	The grated walkway is composed of steel and has high exposure to wind and rain that would likely prevent long-term use. It is connected to the surrounding rock face that is good habitat for night and day roosting because the rocks contain several cracks and crevices. The roofed elements and vertical structures on the associated buildings could potentially support night roosts.	Grassland, Riverine, Riparian, Oak Woodland, Rockface/Cliffs	5
Sandbox	–	–	X	No	The sandbox structure is an open water conveyance system. It is a concrete structure with no cracks or roofed elements that could support bat roosting.	Grassland, Riverine, Riparian, Oak Woodland, Rockface/Cliffs	6
Flume No. 1	X	–	–	No	This Project facility supports vertical structures and roofed elements but the vibration from the flow of water and cold metal would deter bats from roosting in the structure; therefore, this facility is not suitable for roosting.	Grassland, Riverine, Riparian, Oak Woodland, Rockface/Cliffs	7
Conduit No. 2	X	–	–	No	This conduit has vertical steel segments and a roofed metal crossbeam. However, the metal is not suitable for bats because it does not provide a surface for gripping and has no thermal insultation. Also, the high-water levels and fast flow within the facility would deter bats from roosting in the structure.	Grassland, Riverine, Riparian, Oak Woodland, Rockface/Cliffs	8
Stilling Well No. 1	X	–	–	No	The stilling well has some vertical and few roofed elements that may potentially be utilized by bats. However, the roofed elements are composed of smooth steel which do not provide a suitable gripping surface for roosting. Although the facility has solar exposure, the lack of insulation on the metal would make this structure too hot/cold for roosting.	Grassland, Riverine, Riparian, Oak Woodland, Rockface/Cliffs	9
Democrat Spring Area – Map 2-3b							
Conduit No. 3	–	–	X	No	This conduit is composed of concrete with no appropriately sized cracks and crevices and lacks roofed elements which bats could utilize for roosting.	Grassland, Shrubs, Oak Woodland, Rocky Outcrops	10

Project Facility	Potential Roost Habitat			Potential Roosting Habitat Present?	Notes	Surrounding Environmental Conditions	Photo ID[1]
	Vertical or Roofed Elements	Cracks/ Crevices	Appropriate Solar Exposure				
Cow Flat Creek Area – Map 2-3c							
Stilling Well No. 2	X	–	X	Yes	The stilling well has vertical and roofed elements and swallow nests on the structure and the nests contained appropriate thermal conditions for bat roosting. This facility could be used as a night roost.	Grassland, Shrubs, Riparian, Oak Woodland, Rocky Outcrops	11
Flume No. 2 Cow Flat Creek	X	–	X	Yes	The flume has vertical steel structures and roofed elements that could be suitable for roosting. Although the metal structure does not contain cracks or crevices and the metal is uninsulated, swallows nests that were constructed on the exterior indicate appropriate thermal conditions for bat roosting.	Grassland, Shrubs, Riparian, Oak Woodland, Rocky Outcrops	12
Conduit No. 4	X	–	–	No	Although the conduit has vertical structures, it lacks roofed elements or cracks and crevices that bats could use for roosting cover.	Grassland, Shrubs, Riparian, Oak Woodland, Rocky Outcrops	13
Conduit No. 5	X	–	–	No	Although the conduit has vertical structures, it lacks roofed elements or cracks and crevices that bats could use for roosting cover.	Grassland, Shrubs, Riparian, Oak Woodland, Rocky Outcrops	13
Flume No. 3	X	–	X	Yes	The flume is made of steel but has roofed elements (e.g., overhangs). Although the metal structure does not contain cracks or crevices and the metal is uninsulated, swallows nests that were constructed on the exterior indicate appropriate thermal conditions for bat roosting.	Grassland, Shrubs, Riparian, Oak Woodland Rocky Outcroppings	14
Conduit No. 6	X	–	–	No	Although the conduit has vertical structures, it lacks roofed elements or cracks and crevices that bats could use for roosting cover.	Grassland, Shrubs, Oak Woodland	15
Lucas Creek Area – Map 2-3d							
Flume No. 4 (Lucas Creek)	X	–	X	Yes	The flume has concrete bases and steel roofed elements that may be used by roosting bats, as well as appropriate thermal conditions.	Grassland, Shrubs, Riparian, Oak Woodland, Rocky Outcrops	16
Stark Creek Area – Map 2-3e							
Flume No. 5 Dougherty Creek	X	–	X	Yes	The flume has concrete bases, vertical roofed elements, and suitable thermal conditions for roosting bats	Grassland, Shrubs, Riparian, Oak Woodland, Rocky Outcrops	17
Conduit No. 7	X	X	X	Yes	The conduit is constructed of granite rocks with crevices that may be used by roosting bats.	Grassland, Shrubs, Riparian, Oak Woodland, Rocky Outcrops	17
Access Platform	X	–	–	No	The access platform has many wooden roofed elements but lacks cracks and crevices and has unsuitable thermal conditions.	Grassland, Chaparral, Riparian, Oak Woodland, Rocky Outcrops	18
Conduit No. 8	X	–	–	No	It contains vertical elements but lacks any crevices or roofed elements that could be used for bat roosting.	Grassland, Chaparral, Riparian, Oak Woodland, Rocky Outcrops	19
Flume No. 6 Stark Creek	X	–	X	Yes	The flume has vertical steel structures and roofed elements, as well as suitable thermal conditions for roosting bats.	Grassland, Chaparral, Riparian, Oak Woodland, Rocky Outcrops	19
Adit 12 & 13	X	X	–	No	The adit has a wooden door/covering with slats that are too tight for bats to enter the adit. The exterior of the adit door contains a small roofed element. However, this location is too exposed to rain and does not contain cracks/crevices suitable for roosting.	Grassland, Chaparral, Riparian, Oak Woodland, Rocky Outcrops	20
Adit 13 & 14	X	X	–	Yes	The interior of this adit was not accessible, therefore the exterior was inspected, and interior was viewed through cracks to the degree possible. The adit supports a cavern and crevices as well as vertical and roofed elements that may provide bats roosting sites.	Grassland, Chaparral, Montane Hardwood, Oak Woodland, Foothill Pine, Rocky Outcrops	21

Copyright 2026 by Southern California Edison

Project Facility	Potential Roost Habitat			Potential Roosting Habitat Present?	Notes	Surrounding Environmental Conditions	Photo ID[1]
	Vertical or Roofed Elements	Cracks/ Crevices	Appropriate Solar Exposure				
Pechacho Creek Area – Map 2-3f							
Adit 14 & 15	–	X	X	No	The adit is constructed of granite rocks and supports crevices. However, the adit is flush to the ground. Therefore, any crevices are too low to the ground and exposed to predators for roosting.	Grassland, Shrubs, Rocky Outcrops	22
Kern River No. 1 Powerhouse Area – Map 2-3g							
Conduit No. 9	–	–	X	No	The conduit is a concrete structure that is relatively low to the ground and is covered with a corrugated metal sheet. The exterior of the concrete has no cracks or crevices; therefore, the facility is not suitable for roosting.	Grassland, Shrubs, Rocky Outcrops	23
Adit 18 & 19	–	X	X	No	The adit is constructed of granite rocks and supports crevices. However, the adit is flush to the ground. Therefore, any crevices are too low to the ground and exposed to predators for roosting.	Grassland, Shrubs, Rocky Outcrops	24
Forebay	X	–	–	No	The forebay is an open water conveyance system supported at the base with concrete and containing steel grates and structures over the top. The metal portions of the structure are uninsulated and would heat/cool to temperature ranges unfavorable to bats. Concrete lacked cracks and crevices and the face of the concrete would be too exposed to high winds. Therefore, the facility is unsuitable for roosting.	Grassland, Shrubs, Rocky Outcrops	25
Communication Site	X	–	–	No	The communication site is a uninsulated metal structure that is frequently exposed to wind and rain and lacks suitable structures for roosting.	Grassland, Shrubs, Decomposed Granite	26
Skip Hoist Upper Landing	X	–	–	No	The skip hoist upper landing has vertical metal structures and a grated walkway. The uninsulated metal structure is exposed to the elements and would heat/cool to temperature ranges unfavorable to bats. Therefore, it is not suitable for roosting.	Grassland, Shrubs, Decomposed Granite, Rockface/Cliffs	27
Water Tank	X	–	X	Yes	The water tank has vertical structures and a textured concrete base that could act as suitable bat roost habitat.	Grassland, Shrubs, Rocky Outcrops, Rockface/Cliffs	28
Tailrace	–	–	–	No	The tailrace does not support suitable bat roost habitat because it does contain vertical elements, roofed elements, or cracks and crevices. The structure is too exposed to wind/rain to contain appropriate thermal conditions.	Developed, Grassland, Shrubs Rocky Outcrops, Rockface/Cliffs	29
Kern River No. 1 Powerhouse	X	X	X	Yes	The powerhouse contains exterior and interior roofed elements and appropriate thermal conditions. Bat roosting evidence (urine, feces) was observed during the facility evaluation.	Developed, Grassland, Shrubs Riverine, Rocky Outcrops, Rockface/Cliffs	30
Kern River No. 1 Switchyard	X	–	X	No	Although the switchyard structures contain vertical/roofed elements and solar exposure, the switchyard is comprised of energized metal components with extremely high voltage that would deter bats from roosting on the structures.	Developed, Grassland, Shrubs Riverine, Rocky Outcrops, Rockface/Cliffs	31
Aerial Cable Tower	–	–	X	No	The aerial cable tower does not represent appropriate bat roost habitat because it lacks vertical/roofed elements, cracks and crevices, and the uninsulated metal structure is exposed to the elements and would heat/cool to temperature ranges unfavorable to bats.	Developed, Grassland	32
Skip Hoist House and Lower Landing	X	–	X	Yes	The exterior of structure has roofed elements and vertical portions that could be suitable for bat roosts.	Developed, Grassland	33
Old Icehouse	X	–	X	Yes	The exterior of the structure has roofed elements and vertical portions that could be suitable for bat roosts. The interior of the structure is inaccessible to bats because there are no cracks/crevices that allow access.	Developed, Grassland	34
Garage No. 1	X	X	X	Yes	The external and interior portion of the garage has roofed elements and crevices where bats could roost.	Developed, Grassland	35

Copyright 2026 by Southern California Edison

Project Facility	Potential Roost Habitat			Potential Roosting Habitat Present?	Notes	Surrounding Environmental Conditions	Photo ID[1]
	Vertical or Roofed Elements	Cracks/ Crevices	Appropriate Solar Exposure				
Garage No. 2	X	X	X	Yes	The external portion of the garage has roofed elements and crevices where bats could roost. A broken window would also allow bats access to the interior of the facility.	Developed, Grassland	36
Old Admin Building	X	–	X	Yes	While there were broken windows on the building, the openings were not large enough for bats to safely enter. Therefore, the interior of the building would not be utilized by bats. The exterior contains roofed/vertical elements that could support bat roosts.	Developed, Grassland	37
Machine Shop	X	X	X	Yes	The machine shop has roofed elements, small crevices, and openings where bats could access the interior.	Developed	38
Restroom	X	–	X	Yes	The building is well-sealed building that would prevent access to the interior. The exterior of the structure contains roofed/vertical elements that could support night roosting.	Developed	39
Office/Lunchroom	X	–	X	Yes	The building is well-sealed building that would prevent access to the interior. The exterior of the structure contains roofed/vertical elements that could support night roosting.	Developed	40

Notes: [1] Refer to Appendix G. Photo Exhibit of Project Facilities Assessed for Supporting Bat Roosting Habitat.

Copyright 2026 by Southern California Edison

Table 5-12. Results of Bat Roost Surveys, by Geographic Area

Project Facilities	Interior Accessible for Survey?	Survey Results				Conclusion
		Visual Inspection	Guano Sampling	Roost Present	Species Utilizing Roost	
Democrat Dam Area						
Democrat Dam Intake Gatehouse	Yes	Guano present. No bats observed. Building well sealed.	Two samples collected and successfully analyzed to species.	Yes	**Yuma myotis**	• **Night roost present.** • Guano present near a gap between the building and the base indicating a roosting location.
Democrat Dam Drainage Tunnel Outlet	NA	No guano present. No bats observed.	–	No	–	• The exterior of the facility could be used for night roosting.
Democrat Dam Access Walkway	NA	Guano present. Bats observed.	Three samples collected and successfully analyzed to species.	Yes	**California myotis and western mastiff bat***	• **Active day and night roosts present.** • A day/night roost of least 40 **western mastiff bats** is in the cliff adjacent/connected to the walkway. • Unnamed buildings on the walkway support California myotis night **roosts**.
Cow Flat Creek Area						
Stilling Well No. 2	No	Guano present. No bats observed.	Two samples collected and successfully analyzed to species.	Yes	**Western mastiff bat* and Yuma myotis**	• **Night roost present.** • The facility may be used by bats after drinking from the adjacent flume or foraging in the riparian habitat.
Flume No. 2 Cow Flat Creek	NA	Guano present. No bats observed.	Incidental old guano found was not suitable for DNA analysis.	No	–	• The facility could be utilized for night roosting when swallow mud nests are present for bats to utilize, as was observed on Flume No. 4. • Guano was found on the walkway between Stilling Well No. 2 and Flume No. 2. • Flume No. 2 may be used as a water source for bats.
Flume No. 3	NA	No guano present. No bats observed.	–	No	–	• The facility could be utilized for night roosting when swallow mud nests are present for bats to utilize, as was observed on Flume No. 4.
Lucas Creek Area						
Flume No. 4 (Lucas Creek)	NA	Guano present. No bats observed.	Six samples were collected and successfully analyzed to species.	**Yes**	**California myotis, long-legged myotis, and Yuma myotis**	• **Night roost present.** • Roosts and guano are present in areas where old/failed swallow nests were on the flume. Bats are likely utilizing the mud areas, where they can grip, to roost at night while foraging.
Stark Creek Area						
Flume No. 5 (Dougherty Creek)	NA	No guano present. No bats observed.	–	No	–	• The facility could be utilized for night roosting when swallow mud nests are present for bats to utilize, as was observed on Flume No. 4.
Conduit No. 7	NA	No guano present. No bats observed.	–	No	–	• The exterior of the facility could be used for night roosting.
Flume No. 6 (Stark Creek)	NA	No guano present. No bats observed.	–	No	–	• The facility could be utilized for night roosting when swallow mud nests are present for bats to utilize, as was observed on Flume No. 4.
Conduit No. 8	NA	No guano present. No bats observed.	–	No	–	• The facility could be utilized for night roosting when swallow mud nests are present for bats to utilize, as was observed on Flume No. 4.
Adit 13 & 14	No	Guano present. No bats observed. Entry access for bats.	Two samples collected and DNA analysis indicated three potential species.	**Yes**	Guano analysis indicated three potential species: **long-eared myotis, fringed myotis***, or **little brown bat**.	• **Day and night roost present.** • The facility has potential to be utilized as a maternity roost but this could not be confirmed due to accessibility issues. • Guano present on adit door and within the cave interior.

Copyright 2026 by Southern California Edison

Project Facilities	Interior Accessible for Survey?	Survey Results				Conclusion
		Visual Inspection	Guano Sampling	Roost Present	Species Utilizing Roost	
Kern River No. 1 Powerhouse Area						
Kern River No. 1 Powerhouse	Yes	Guano present. One (dead) bat observed. Entry access for bats.	Three guano samples collected and successfully analyzed to species.	**Yes**	**Big brown bat** and **Yuma myotis**.	• **Night roost present. Seasonal day and maternity roost.** • Bat roosts are present inside and outside of the building. • Guano is present in rooms, hallways, stairwells, and corners. • Urine staining is also present.
Water Tank	No	Old guano present. No bats observed. Well-sealed building.	Guano pile too old for DNA analysis.	**Yes**	Undetermined	• **Night roost present.** • A roost is located on the exterior between the building and the rock cliff. • The interior is likely not utilized.
Skip Hoist House and Lower Landing	Yes	No guano present. No bats observed. Well-sealed building.	–	No	–	• The exterior of the facility could be used for night roosting. • Bats are not currently utilizing this facility as they likely prefer the Powerhouse.
Old Ice House	Yes	No guano present. No bats observed. Well-sealed building.	–	No	–	• The exterior of the facility could be used for night roosting. • Bats are not currently utilizing this facility as they likely prefer the Powerhouse.
Garage No. 1	Yes	Guano present. No bats observed. Entry access for bats.	Guano too old for analysis.	**Yes**	Undetermined	• **Night roost present (seasonal).** • The amount and condition of guano present indicates a small amount of intermittent use. The facility is likely used while bats are while foraging in the spring and early summer.
Garage No. 2	Yes	No guano present. No bats observed. Well-sealed building.	–	No	–	• The exterior of the facility could be used for night roosting. • Bats are not currently utilizing this facility as they likely prefer the Powerhouse.
Old Admin Building	Yes	No guano present. No bats observed. Entry access for bats.	–	No	–	• The exterior of the facility could be used for night roosting. • Bats are not currently utilizing this facility as they likely prefer the Powerhouse.
Machine Shop	Yes	No guano present. No bats observed. Well-sealed building.	–	No	–	• The exterior of the facility could be used for night roosting. • Bats are not currently utilizing this facility as they likely prefer the Powerhouse.
Restroom	Yes	No guano present. No bats observed. Well-sealed building.	–	No	–	• The exterior of the facility could be used for night roosting. • Bats are not currently utilizing this facility as they likely prefer the Powerhouse.
Office/Lunch Room	Yes	No guano present. No bats observed. Well-sealed building.	–	No	–	• The exterior of the facility could be used for night roosting. • Bats are not currently utilizing this facility as they likely prefer the Powerhouse.

Notes: Facilities in **bold** indicate the presence of a roost.
Key: * = Indicates a special-status bat species.

Table 5-13. Summary of Special-Status and Common Bat Species and Associated Detection Methods

Common Name	Scientific Name	Status	Facility Where Bat was Detected[1]	Survey Method/Detection Type					
				Roost Type			Reproductive Acoustic Detection(s)	Guano Detection(s)	Seasonal Acoustic Detection(s)
				Maternal	Day	Night			
Special-Status Bat Species									
Pallid bat (ANPA)	*Antrozous pallidus*	CSC	Stark Creek Area Acoustic Device				X		X
Western mastiff bat (EUPE)	*Eumops perotis*	CSC	Democrat Dam Area Acoustic Device				X		X
			Democrat Dam Access Walkway		X	X			
			Cow Creek - Stilling Well No. 2			X		X	
			Stark Creek Area Acoustic Device				X		X
			Kern River No. 1 Powerhouse Area Acoustic Device				X		X
Western red bat (LAFR)	*Lasiurus frantzii* – (formerly *blossevillii*)	CSC	Democrat Dam Area Acoustic Device				X		
			Stark Creek Area Acoustic Device				X		X
			Kern River No. 1 Powerhouse Area Acoustic Device				X		X
Fringed myotis (MYTH)	*Myotis thysanodes*	FSCC	Stark Creek Area Acoustic Device						X
			Stark Creek - Adit 13 & 14		X*	X*		X*	X
Common Bat Species									
Big brown bat (EPFU)	*Eptesicus fuscus*	–	Democrat Dam Area Acoustic Device				X		
			Kern River No. 1 Powerhouse Area Acoustic Device				X		
			Kern River No. 1 Powerhouse	X	X	X			
Hoary bat (LACI)	*Lasiurus cinereus*	–	Democrat Dam Area Acoustic Device				X		
Hoary bat (LACI)	*Lasiurus cinereus*	–	Stark Creek Area Acoustic Device				X		X
		–	Kern River No. 1 Powerhouse Area Acoustic Device						X
Silver-haired Bat (LANO)	*Lasionycteris noctivagans*	–	Kern River No. 1 Powerhouse Area Acoustic Device				X		
California myotis (MYCA)	*Myotis californicus*	–	Democrat Dam Area Acoustic Device				X		
			Democrat Dam Access Walkway			X		X	
			Lucas Creek - Flume No. 4 Lucas Creek			X		X	
			Stark Creek Area Acoustic Device				X		X
			Kern River No. 1 Powerhouse Area Acoustic Device				X		X
Small-footed Myotis (MYCI)	*Myotis ciliolabrum*	–	Democrat Dam Area Acoustic Device				X		
			Stark Creek Area Acoustic Device				X		
Long-eared Myotis (MYEV)	*Myotis evotis*	–	Stark Creek Area Acoustic Device				X		
			Stark Creek - Adit 13 & 14		X*	X*		X*	

Common Name	Scientific Name	Status	Facility Where Bat was Detected[1]	Survey Method/Detection Type					
				Roost Type			Reproductive Acoustic Detection(s)	Guano Detection(s)	Seasonal Acoustic Detection(s)
				Maternal	Day	Night			
Little brown bat (MYLU)	*Myotis lucifugus*	–	Stark Creek - Adit 13 & 14		X*	X*		X*	
Long-legged myotis (MYVO)	*Myotis volans*	–	Lucas Creek - Flume No. 4			X		X	
Yuma myotis (MYYU)	*Myotis yumanensis*	–	Democrat Dam Area Acoustic Device				X		
			Democrat Dam – Intake Gatehouse			X		X	
			Cow Flat Creek - Stilling Well No. 2			X		X	
			Lucas Creek - Flume No. 4			X		X	
			Stark Creek Area Acoustic Device				X		X
			Kern River No. 1 Powerhouse Area Acoustic Device				X		X
			Kern River No. 1 Powerhouse	X	X	X		X	
Canyon bat (PAHE)	*Parastrellus hesperus*	–	Democrat Dam Area Acoustic Device				X		
			Stark Creek Area Acoustic Device				X		X
			Kern River No. 1 Powerhouse Area Acoustic Device				X		X
Mexican free-tailed bat (TABR)	*Tadarida brasiliensis*	–	Democrat Dam Area Acoustic Device				X		
			Stark Creek Area Acoustic Device				X		X
			Kern River No. 1 Powerhouse Area Acoustic Device						X

Notes: [1] The acoustic devices at the Powerhouse and Democrat Dam covered multiple Project facilities.
Key: * = Indicates that the guano analysis indicated more than one potential species.

Democrat Dam Area Acoustic Device
- Democrat Dam (partial)
- Intake Gatehouse
- Drainage Tower
- Conduit No. 1
- Drainage Tunnel Outlet
- Democrat Dam Access Walkway
- Flume No. 1 (partial)

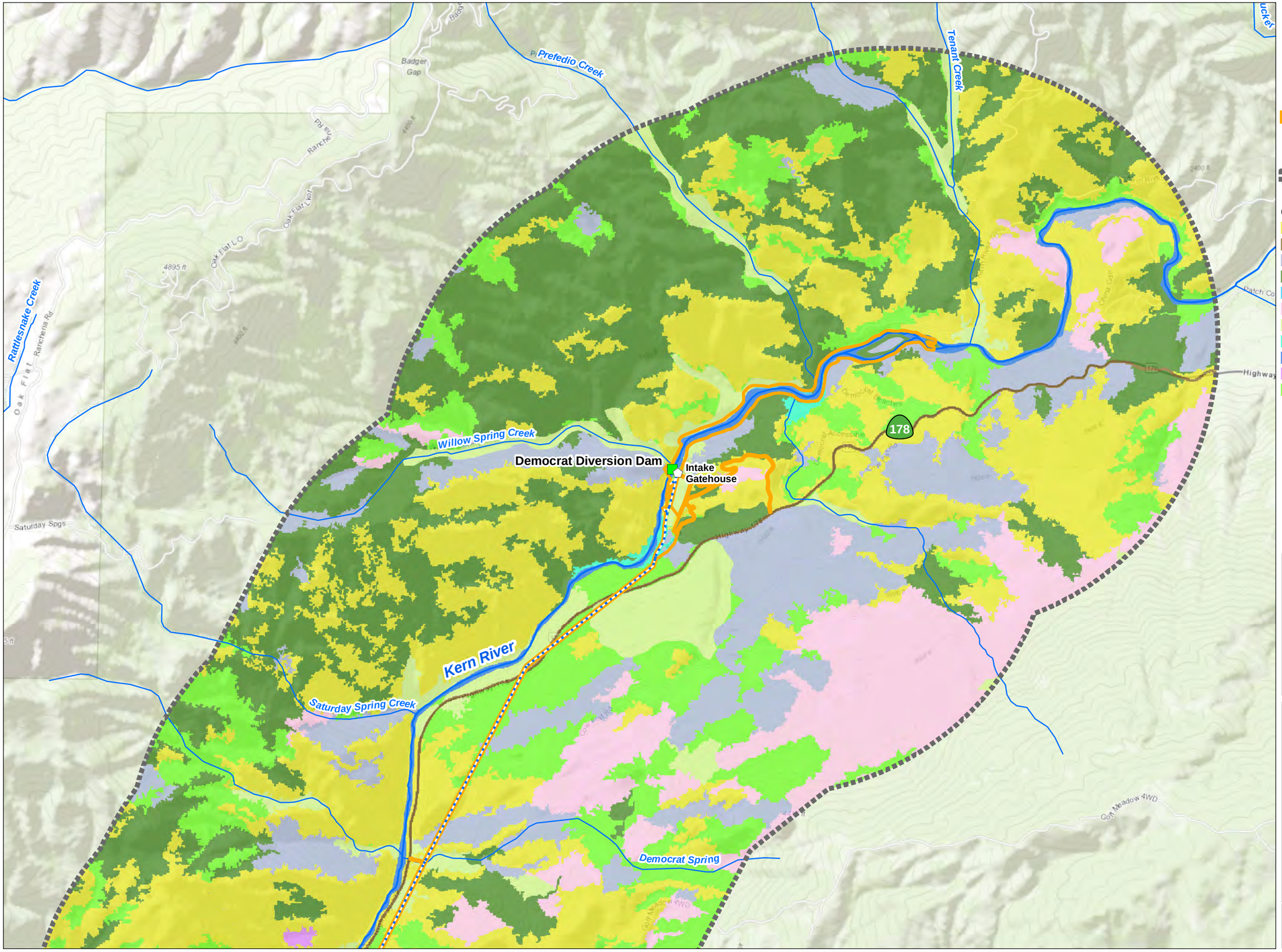
Kern River No. 1 Powerhouse Area Acoustic Device
- Kern River No. 1 Powerhouse
- Kern River No. 1 Switchyard
- Machine Shop
- Restroom
- Garage No. 1
- Garage No. 2
- Old Admin Building
- Old Ice House
- Skip Hoist House and Lower Landing

State Status
- CSC = California Species of Concern

Forest Service Status
- FSCC = Sequoia National Forest Species of Conservation Concern

Copyright 2026 by Southern California Edison

MAPS



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Flowline
- Penstock
- FERC Boundary

Other Features

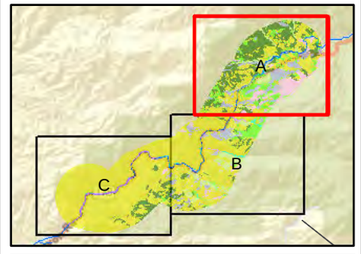
- Watercourse
- 1 Mile Buffer of FERC Boundary

CWHR Alliances*

- Annual Grassland (AGS)
- Barren (BAR)
- Blue Oak - Foothill Pine (BOP)
- Blue Oak Woodland (BOW)
- Lacustrine (LAC)
- Mixed Chaparral (MCH)
- Montane Hardwood (MHW)
- Montane Riparian (MRI)
- Riverine (RIV)
- Valley Foothill Riparian (VRI)
- Valley Oak Woodland (VOW)

NOTE: Where terrain was visible with binoculars, biologists identified most VOW polygons as being dominated by MHW. We have changed polygons we were able to visually confirm, but it is quite likely remaining VOW polygons are actually MHW.

*SOURCE: Adapted from Existing Vegetation - CALVEG, USDA - FS, Region 5 - Central Valley, 2019



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-1A

CWHR Habitats within 1 Mile of the Kern River Project

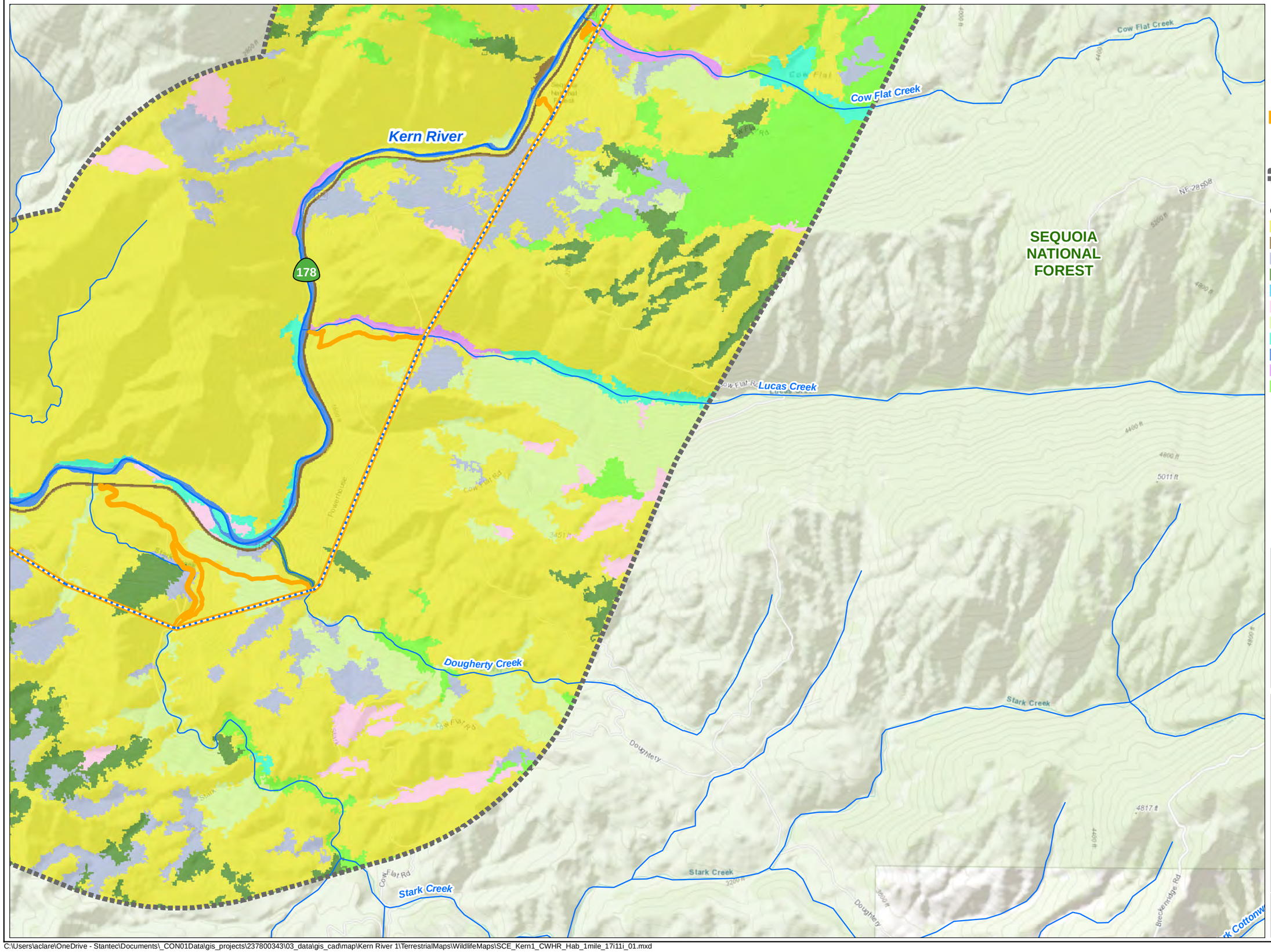
Date: 3/4/2025

0 0.125 0.25 Miles

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Flowline
- Penstock
- FERC Boundary

Other Features

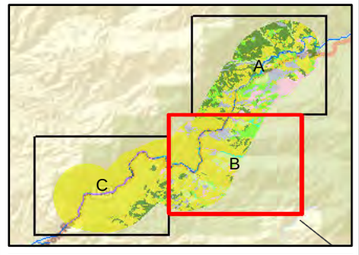
- Watercourse
- 1 Mile Buffer of FERC Boundary

CWHR Alliances*

- Annual Grassland (AGS)
- Barren (BAR)
- Blue Oak - Foothill Pine (BOP)
- Blue Oak Woodland (BOW)
- Lacustrine (LAC)
- Mixed Chaparral (MCH)
- Montane Hardwood (MHW)
- Montane Riparian (MRI)
- Riverine (RIV)
- Valley Foothill Riparian (VRI)
- Valley Oak Woodland (VOW)

NOTE: Where terrain was visible with binoculars, biologists identified most VOW polygons as being dominated by MHW. We have changed polygons we were able to visually confirm, but it is quite likely remaining VOW polygons are actually MHW.

*SOURCE: Adapted from Existing Vegetation - CALVEG, USDA - FS, Region 5 - Central Valley, 2019



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-1B

CWHR Habitats within 1 Mile of the Kern River Project

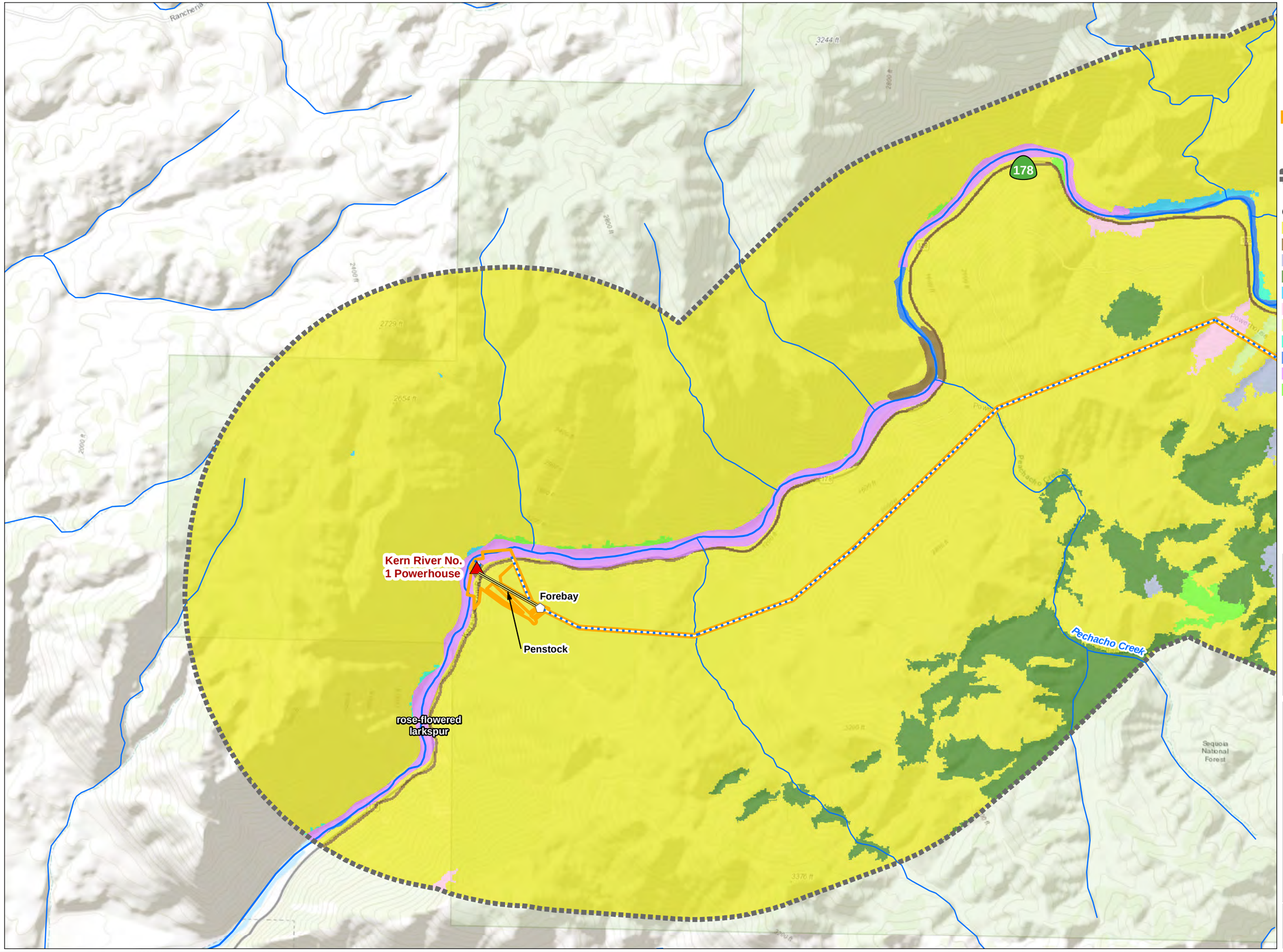
Date: 3/4/2025

0 0.125 0.25 Miles

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Flowline
- Penstock
- FERC Boundary

Other Features

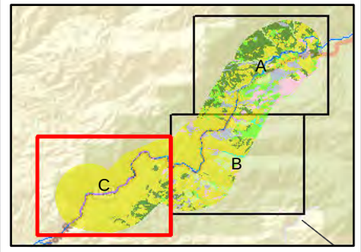
- Watercourse
- 1 Mile Buffer of FERC Boundary

CWHR Alliances*

- Annual Grassland (AGS)
- Barren (BAR)
- Blue Oak - Foothill Pine (BOP)
- Blue Oak Woodland (BOW)
- Lacustrine (LAC)
- Mixed Chaparral (MCH)
- Montane Hardwood (MHW)
- Montane Riparian (MRI)
- Riverine (RIV)
- Valley Foothill Riparian (VRI)
- Valley Oak Woodland (VOW)

NOTE: Where terrain was visible with binoculars, biologists identified most VOW polygons as being dominated by MHW. We have changed polygons we were able to visually confirm, but it is quite likely remaining VOW polygons are actually MHW.

*SOURCE: Adapted from Existing Vegetation - CALVEG, USDA - FS, Region 5 - Central Valley, 2019



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-1C

CWHR Habitats within 1 Mile of the Kern River Project

Date: 3/4/2025

0 0.125 0.25 Miles

Projection: UTM Zone 11
Datum: NAD 83

Southern California Edison (SCE) has no reason to believe that there are any inaccuracies or defects with information incorporated in this work and make no representations of any kind, including, but not limited to, the warranties of merchantability or fitness for a particular use, nor are any such warranties tobe implied, with respect to the information or data, furnished herein. No part of this map may be reproduced ortransmitted in any form or by any means, electronic or mechanical, including photocopying and recording system, except as expressly permitted in writing by SCE.

Copyright 2025 by Southern California Edison Company

CONFIDENTIAL INFORMATION

The following map is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of special-status biological resources and qualifies as Confidential Information (18 Code of Federal Regulations § 385.1112). Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings, visit: https://www.ferc.gov/foia.

Map 5-2a–g Suitable Habitat and Observations of Special-Status Species within the Study Area (CONFIDENTIAL)

Map 5-2a–g will not be distributed to the general public. Documents containing Confidential Information may be requested by entities and organizations with jurisdiction over these resources. To request copies, please contact Meg Richardson, SCE Relicensing Project Manager at (626) 238-2902 / mary.m.richardson@sce.com; or Kadi Whiteside, SCE Relicensing Deputy Project Manager at (626) 807-3641 / karen.whiteside@sce.com.

CONFIDENTIAL INFORMATION

The following map is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of special-status biological resources and qualifies as Confidential Information (18 Code of Federal Regulations § 385.1112). Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings, visit: https://www.ferc.gov/foia.

Map 5-3a–g Kern Canyon Slender Salamander Habitat within the Study Area and Observations During the 2025 Visual Encounter Survey (CONFIDENTIAL)

Map 5-3a–g will not be distributed to the general public. Documents containing Confidential Information may be requested by entities and organizations with jurisdiction over these resources. To request copies, please contact Meg Richardson, SCE Relicensing Project Manager at (626) 238-2902 / mary.m.richardson@sce.com; or Kadi Whiteside, SCE Relicensing Deputy Project Manager at (626) 807-3641 / karen.whiteside@sce.com.

CONFIDENTIAL INFORMATION

The following map is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of special-status biological resources and qualifies as Confidential Information (18 Code of Federal Regulations § 385.1112). Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings, visit: https://www.ferc.gov/foia.

Map 5-4a–g Relictual Slender Salamander Habitat within the Study Area (CONFIDENTIAL)

Map 5-4a–g will not be distributed to the general public. Documents containing Confidential Information may be requested by entities and organizations with jurisdiction over these resources. To request copies, please contact Meg Richardson, SCE Relicensing Project Manager at (626) 238-2902 / mary.m.richardson@sce.com; or Kadi Whiteside, SCE Relicensing Deputy Project Manager at (626) 807-3641 / karen.whiteside@sce.com.

CONFIDENTIAL INFORMATION

The following map is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of special-status biological resources and qualifies as Confidential Information (18 Code of Federal Regulations § 385.1112). Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings, visit: https://www.ferc.gov/foia.

Map 5-5a–g Yellow-Blotched Salamander Habitat within the Study Area and Observations During the 2025 Visual Encounter Survey (CONFIDENTIAL)

Map 5-5a–g will not be distributed to the general public. Documents containing Confidential Information may be requested by entities and organizations with jurisdiction over these resources. To request copies, please contact Meg Richardson, SCE Relicensing Project Manager at (626) 238-2902 / mary.m.richardson@sce.com; or Kadi Whiteside, SCE Relicensing Deputy Project Manager at (626) 807-3641 / karen.whiteside@sce.com.

CONFIDENTIAL INFORMATION

The following map is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of special-status biological resources and qualifies as Confidential Information (18 Code of Federal Regulations § 385.1112). Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings, visit: https://www.ferc.gov/foia.

Map 5-6 Results of Special-Status Bat Reproductive and Seasonal Use Surveys (CONFIDENTIAL)

Map 5-6 will not be distributed to the general public. Documents containing Confidential Information may be requested by entities and organizations with jurisdiction over these resources. To request copies, please contact Meg Richardson, SCE Relicensing Project Manager at (626) 238-2902 / mary.m.richardson@sce.com; or Kadi Whiteside, SCE Relicensing Deputy Project Manager at (626) 807-3641 / karen.whiteside@sce.com.

APPENDIX A

Representative Photographs of Potentially Suitable Habitat and Habitat Features for Special-Status Wildlife

Copyright 2026 by Southern California Edison



Photo A-1a, b. A large population of California milkweed (*Asclepias californica*) (Map ID ASC-1) found along Democrat Dam Road. This population is estimated to contain at least 70 individuals within approximately 6,500 square feet.



Photo A-2. A California milkweed identified along the Overflow Spillway Trail (Map ID ASC-3). This small population consists of two individuals within approximately 4 square feet.



Photo A-3. A small population of California milkweed individuals found along the Overflow Spillway Trail (Map ID ASC-4). This population consists of seven individuals within approximately 40 square feet.



Photo A-4. A California milkweed plant observed along the Overflow Spillway Trail (Map ID ASC-6). This population consists of only one individual and is approximately 1 square foot.



Photo A-5. Unnamed Seep along Willow Spring Creek Road: This location potentially meets the life history requirements for western spadefoot toad. Aquatic breeding habitat was present at the time of the survey and there is suitable upland habitat for adults.



Photo A-6. Dougherty Creek in the vicinity of Flume No. 5: This location has potential to meet the life history requirements for western spadefoot toad. Suitable upland habitat is present but there was not suitable aquatic habitat at the time of the survey. Dougherty Creek historically runs through the area so there potential that the area could support aquatic habitat in wetter years.



Photo A-7. Stark Creek in the vicinity of Flume No. 6: This location potentially meets the life history requirements for western spadefoot toad. Aquatic breeding habitat was present at the time of the survey and there is suitable upland habitat for adults.



Photo A-8. **Habitat for terrestrial reptiles was found throughout the Project area. Reptiles were most often seen on or along roads and trails where rock or vegetative cover was nearby. Both snakes and lizards were observed in areas with features similar to this photo (i.e. warm sunny areas, cracks in/between rocks, burrows, and vegetative cover).**



Photo A-9. **This photograph of Lucas Creek Trail shows another typical trail and the surrounding terrestrial reptile habitat within the Project area. This photo was taken after SCE mowing maintenance in July 2024. Burrows of varying size were found along the length of the trail.**



Photo A-10. Example of a typical variety of burrow sizes seen throughout the Project area. These burrows were observed along Lucas Creek Trail and provide habitat for terrestrial reptiles.

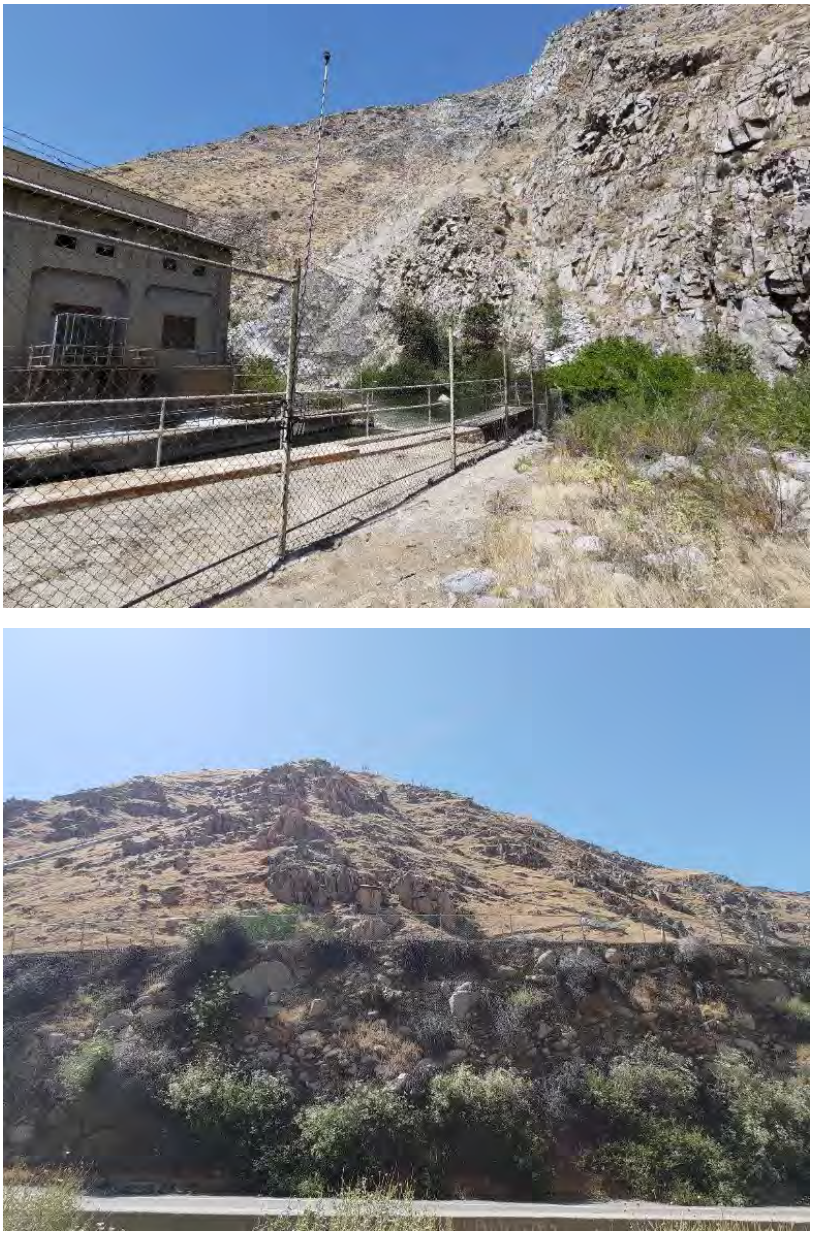


Photo A-11a, b. Examples of cliff habitat in the study area (near the Kern River Powerhouse and Skip Hoist/Forebay Trail, respectively).



Photo A-12. The common raven nest is located to the west of Upper Powerhouse Road on the cliff bordering the Kern River outside the FERC boundary. Two adults were observed feeding two young within the nest.





Photo A-13a, b. Photographs of typical Blue Oak–Foothill Pine CWHR habitat in the study area.



Photo A-14a, b. Photographs of typical Annual Grass CWHR habitat in the study area.



Photo A-15. Example of the Riverine and Valley Foothill Riparian habitats along the shores of the Kern River.



Photo A-16. Example of valley foothill riparian habitat within the Project area taken along Lucas Creek near Flume No. 4.



Photo A-17. This burrow complex (Map ID BUR-1, BUR-2, BUR-3) was found on Lucas Creek Trail. All the burrow entrances are approximately the same size ranging from three and a half to four inches tall and three to four inches wide. BUR-2 is collapsed and is only three inches deep. BUR-1 goes back approximately seven inches before turning while BUR-3 goes down approximately nine inches before turning. BUR-3 had some soil disturbance leading from the burrow and grass that was flattened around it indicating it may be active. No signs of kit fox habitation were observed.



Photo A-18. This burrow (Map ID Bur-4) was found along Lucas Creek Trail. The entrance is five and a half inches tall and six inches wide. The burrow goes back approximately two feet before turning and no chamber was visible. There were no indications the burrow is active.



Photo A-19. This burrow (Map ID BUR-5) was found on Lucas Creek Trail. The entrance is four and a half inches tall and four and a half inches wide. The burrow goes back approximately one and a half feet before turning so the den chamber size could not be determined. The soil disturbance may be from unstable soils and not excavations. There are no other signs of occupancy.



Photo A-20. This burrow (Map ID BUR-7) was found along Lucas Creek trail. The entrance is six and a half inches wide and five and a half inches tall. It is three to four feet deep with a visible chamber of approximately one foot by one foot. The burrow seems to have a second chamber that goes further and is part of a turn. There were no signs of occupation but the burrow is suitable size for kit fox. It is likely overgrown with grasses in the spring/summer.

APPENDIX B

Photographs of Project Power Pole and Switchyard Energized Equipment Configurations

Copyright 2026 by Southern California Edison



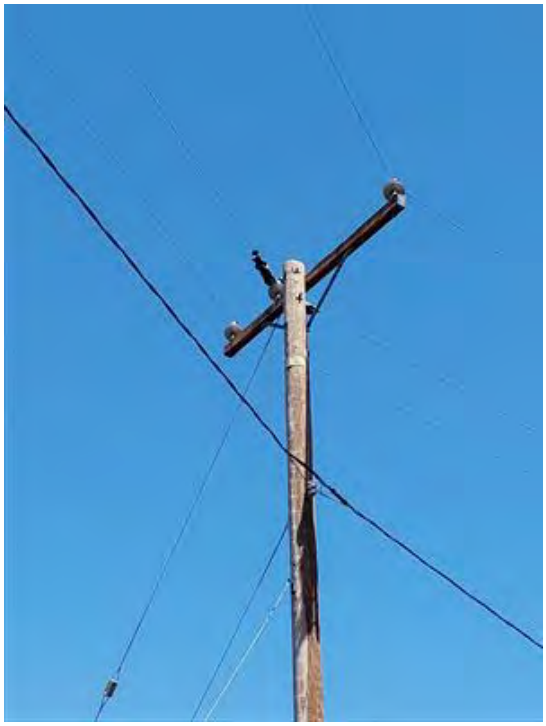
DPP-1. Configuration 1: Single-Phase Single Circuit with Side-Mounting Configuration and Box – End Pole



DPP-2. Configuration 2: Single-Phase to Three-Phase with Transformer and Underbuild Construction



DPP-3. Configuration 3: Three-Phase Single-Circuit with Two Transformers and Underbuild Construction



DPP-4. Configuration 4: Three-Phase Single-Circuit Overmount



DPP-5. Configuration 5: Single-Phase Single-Circuit With Top Line



DPP-6. Configuration 6: Three-Phase Single-Circuit Overmount with Two Close Crossbars



DPP-7. Configuration 7: Three-Phase Single-Circuit Crossarm



DPP-8. Configuration 8: Three-Phase Single-Circuit Underline



DPP-10. Configuration 9: Three-Phase Single-Circuit Crossarm



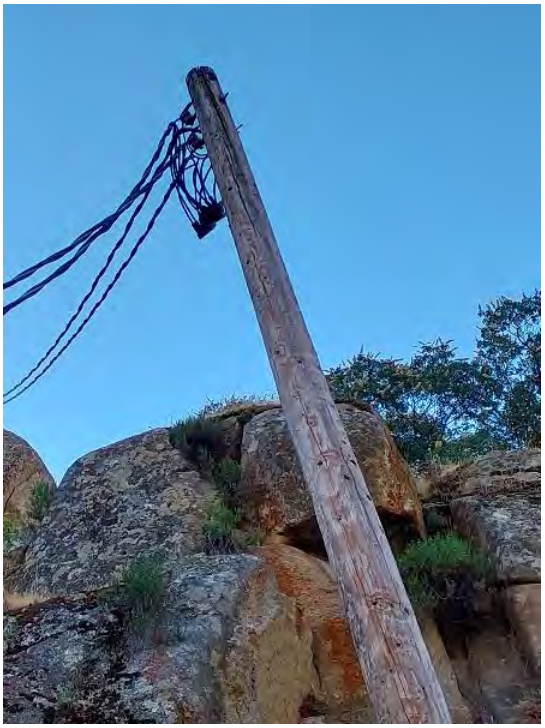
DPP-12. Configuration 10: Three-Phase Distribution Corner



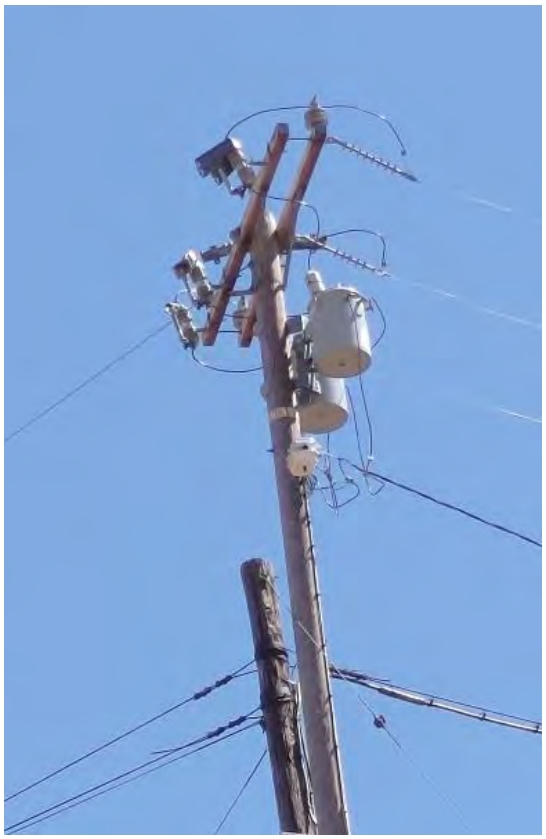
DPP-13. Configuration 11: Three-Phase Transformer Bank



DPP-14. Configuration 12: Single-Phase Single-Circuit with Side-Mount



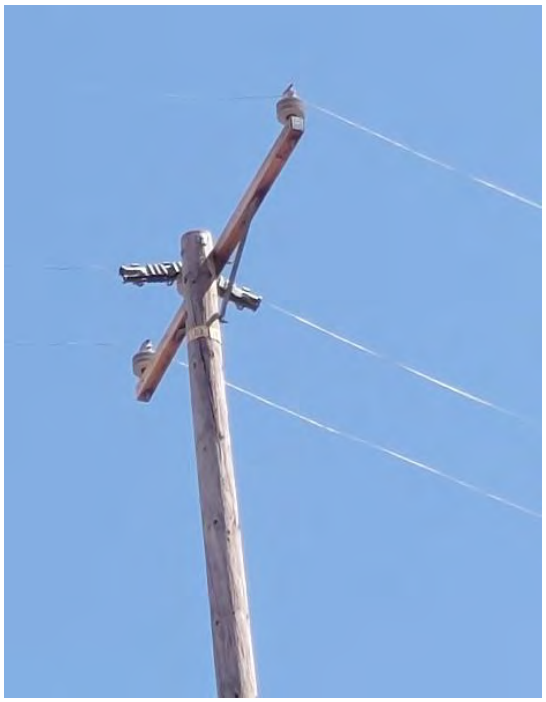
DPP-16. Configuration 13: Dual-Phase Single-Pole Side Mount



PC-1. Configuration 1: Two-Phase Transformer Bank



PC-2. Configuration 2: Three-Phase Single-Circuit Crossarm



PC-4. Configuration 3: Single-Phase Three-Circuit to Single-Circuit Crossarm



PC-7. Configuration 4: Three-Phase Single-Circuit Dual Crossarm



PC-9. Configuration 5: Three-Phase Single-Circuit Low Crossarm



PC-11. Configuration 6: Three-Phase Single-Circuit High Crossarm



PC-19. Configuration 7: Three-Phase Single-Circuit Distribution Corner with Multi-Directional Distribution



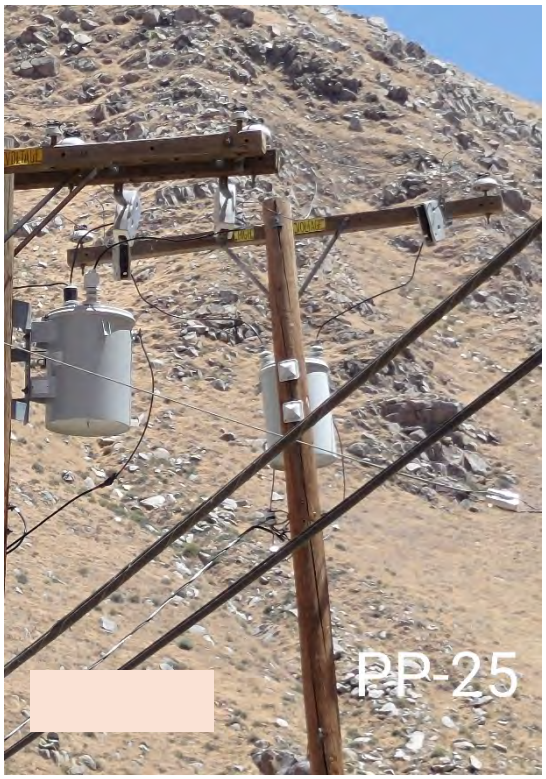
PC-21. Configuration 8: Three-Phase Single-Circuit Undermount



PC-23. Configuration 9: Single-Circuit Three-Phase Corner Distribution with Three Crossarms



PC-24. Configuration 10: Three-Phase Single-Circuit with Two Transformers



PC-25. Configuration 11: Three-Phase Single-Circuit with Transformer





SY-1. Configuration 1: Switchyard

APPENDIX C

Photographs of Open-Air Segments of the Project Water Conveyance System

Copyright 2026 by Southern California Edison

Democrat Dam Area – Map 5-2a



Photo C-1. Sandbox: Not accessible to wildlife. Access to the sandbox is limited by the height of the structure and the existing precautions (i.e., fencing).



Photo C-2. Conduit No. 1: Not accessible to wildlife. The majority of the facility is underground with one raised grate covered concrete section.





Photo C-3. Flume No. 1: Not accessible to wildlife. Access to the sandbox is limited by the height of the structure and the existing precautions (i.e., fencing).



Photo C-4. Conduit No. 2: Not accessible to wildlife. The small segment of conduit adjacent to Flume No. 1 is covered/fenced to prevent access.

Democrat Spring Area – Map 5-2b





Photo C-5. Conduit No. 3: Not accessible to wildlife. Access to the facility is prevented by existing precautions (i.e., metal covering).

Cow Flat Creek Area – Map 5-2c





Photo C-6. Flume No. 2 Cow Flat Creek: Potentially Accessible to Wildlife. Access to the facility is limited due to the structure's height and metal grate covered walkway. However, open portion of the flume is potentially accessible from the surrounding landscape.





Photo C-7. Flume No. 3: Potentially Accessible to Wildlife. Access to the facility is limited due to the structure's height and metal grate covered walkway. However, open portion of the flume is potentially accessible from the surrounding landscape.



Photo C-8. Conduit No. 6: Not Accessible to Wildlife. The conduit is entirely contained and is not a wildlife risk.

Lucas Creek Area – Map 5-2d





Photo C-9. Flume No. 4 Lucas Creek: Potentially Accessible to Wildlife. Access to the facility is limited due to the structure's height and metal grate covered walkway. However, open portion of the flume is potentially accessible from the surrounding landscape.

Stark Creek Area – Map 5-2e



Photo C-10. Stark Creek Area, Flume No. 5 Dougherty Creek: Potentially Accessible to Wildlife. Access to the facility is limited due to the structure's height and metal grate covered walkway. However, open portion of the flume is potentially accessible from the surrounding landscape.





Photo C-11. Flume No. 6 Stark Creek: Potentially Accessible to Wildlife. Access to the facility is limited due to the structure's height and metal grate covered walkway. However, open portion of the flume is potentially accessible from the surrounding landscape.

Kern River No. 1 Powerhouse Area – Map 5-2g



Photo C-12. Conduit No. 9: Not accessible to wildlife. Access to the facility is prevented by existing precautions (i.e., metal covering).





Photo C-13. Forebay: Not accessible to wildlife. Access to the facility is prevented by existing precautions (i.e., perimeter fencing).

APPENDIX D

Special-Status Salamander Agency Consultation Record

Copyright 2026 by Southern California Edison

From: Sara Reece
To: alyssa_l_walker@nps.gov; alyssa_wethy@nps.gov; bdunn1@csub.edu; brettduxbury@mac.com; carlos_flores@nps.gov; catherine_brown@nps.gov; dawn.alvarez@usda.gov; elizabeth_menchace@fws.gov; eric.lundgren@usda.gov; james.noss@waterboards.ca.gov; karen.miller@usda.gov; lariverbeach@gmail.com; lcarterrd@gmail.com; lifeplantatree555@hotmail.com; lilian_jones@contractor.nps.gov; monique.sanchez@usda.gov; Nicole.Holland@usda.gov; rgomez@tubatulabal.org; victor.aguirreorozco@usda.gov; William.Brown2@usda.gov; Barbara.Johnston@usda.gov; anna.bonnette@usda.gov; Abimael.Leon@wildlife.ca.gov; Abdulrahim.Chafi@usda.gov; richard_kuyper@fws.gov; anthony.edwards@usda.gov; brian.block@usda.gov; marie.attencio@usda.gov; elizabeth.jockusch@uconn.edu
Cc: mary.m.richardson@sce.com; cornelio.artienda@sce.com; martin.ostendorf@sce.com; audry.williams@sce.com; Marcus.D.Jones@sce.com; Daniel.Keverline@sce.com; Ramon.Anzaldo@sce.com; Janelle Nolan; Robyn Smith; kendra.ryan@stantec.com; Julie.Smith@stantec.com
Subject: Kern River No. 1 FERC Project P-1930 Terrestrial Working Group - Special-Status Salamanders
Date: Monday, October 28, 2024 12:47:00 PM

Greetings Kern River No. 1 FERC Project P-1930 Terrestrial Working Group, Agency Representatives, and Recognized Special-status Salamander Experts:

On behalf of the Southern California Edison (SCE) Project Team, the purpose of this e-mail is to consult with resource agencies and recognized experts on the special-status salamander survey as described in the TERR 2 – Wildlife Resources Technical Study Plan (TSP) for SCE's Kern River No. 1 Hydroelectric Project FERC Project No. 1930 (Project).

SCE is planning to conduct the special-status salamander habitat assessment in January 2025 and visual encounter surveys between February and March 2025 for three special-status salamanders that are known to occur in the vicinity of the Project, including Kern Canyon slender salamander (*Batrachoseps simatus*), relictual slender salamander (*Batrachoseps relictus*), and yellow-blotched salamander (*Ensatina eschscholtzii croceater*).

As required by the TERR 2 – Wildlife Resources TSP, SCE is to consult with resource agencies and recognized experts to obtain additional information on known occurrences and habitat (including microsites) for special-status salamanders in the study area. This information will supplement the information contained in Section 3.6, Botanical and Wildlife Resources of the Project's Preliminary Application Document (PAD). SCE is requesting any additional information be e-mailed to Meg Richardson, SCE Project Lead at mary.m.richardson@sce.com and to me, Sara Reece at Sara@JNA-Consulting.com by November 27, 2024.

Information and documents pertinent to the Project, including the PAD and TERR 2 – Wildlife Resources TSP, may be found on the Project's relicensing website located at https://www.sce.com/regulatory/hydro-licensing/kr1.

Thank you for your continued coordination and collaboration. We look forward to continuing to work with you on the implementation of the TERR – 2 Wildlife Resources TSP.

Sara Reece
Senior Consultant
(530) 802-3391
sara@jna-consulting.com
Janelle Nolan & associates

From: Sara Reece
To: elizabeth.jockusch@uconn.edu
Cc: Robyn Smith; Meg Richardson; Ryan, Kendra; Smith, Julie; Joshua Lowy
Subject: Southern California Edison Hydroelectric Project (FERC Project No. 1930) - TERR 2 Salamander Surveys
Date: Monday, January 6, 2025 10:20:00 AM
Attachments: SCE_Kern1_SS_SalamanderCriticalHab.pdf
SCE_Kern1_SS_SalamanderOcc.pdf

Hello Dr. Jockusch,

The purpose of this e-mail is to follow up with you regarding upcoming slender salamander surveys to be implemented for the Southern California Edison Company's (SCE) Kern River No. 1 Hydroelectric Project (FERC Project No. 1930). My colleague Robyn Smith communicated with you previously regarding *Batrachoseps simatus* and *B. relictus* habitat and appropriate survey timing/methods.

SCE is preparing to conduct habitat assessment surveys for *Batrachoseps simatus* and *B. relictus* in January 2025 and visual encounter surveys in either February or March 2025 (dependent on appropriate precipitation conditions). We are hoping to obtain any additional input on the following:

- Recent sightings or documented occurrences within this study area (see attached)
- Additional information on microhabitats where occurrences were identified (including photos)
- Daytime survey methods that can be employed in areas that are unsafe to survey at night (i.e., steep terrain, etc.)

We appreciate your help and communication!

Sara Reece
Senior Consultant
(530) 802-3391
sara@jna-consulting.com

Janelle Nolan

From: Jockusch, Elizabeth
To: Sara Reece
Cc: Robyn Smith; Meg Richardson; Ryan, Kendra; Smith, Julie; Joshua Lowy
Subject: Re: Southern California Edison Hydroelectric Project (FERC Project No. 1930) - TERR 2 Salamander Surveys
Date: Thursday, March 20, 2025 10:20:56 AM
Attachments: SCE_Kern1_SS_SalamanderCriticalHab.pdf, SCE_Kern1_SS_SalamanderOcc.pdf

Hi Sara and Robyn,
Here's the additional information about findings of *Batrachoseps simatus* that I mentioned yesterday that I just assumed had reached your team, since I got it via folks hired by SCE. These animals were found Feb. 12-March 1, 2024, all under cover objects during daytime surveys (and, exciting to me, in the kind of open habitat that *B. simatus* was found in when it was first discovered).

35.44177, -118.78932
35.45652, -118.78033
35.44327, -118.78806

As you noted at yesterday's hearing, the early winter weather was not at all good for salamander hunting. I'm hopeful that the recent rains will improve the outlook, at least for a little bit.
Regards,
Elizabeth

Elizabeth Jockusch
Ecology and Evolutionary Biology
University of Connecticut

On Jan 6, 2025, at 1:20 PM, Sara Reece <Sara@JNA-Consulting.com> wrote:

Message sent from a system outside of UConn.

Hello Dr. Jockusch,

The purpose of this e-mail is to follow up with you regarding upcoming slender salamander surveys to be implemented for the Southern California Edison Company's (SCE) Kern River No. 1 Hydroelectric Project (FERC Project No. 1930). My colleague Robyn Smith communicated with you previously regarding *Batrachoseps simatus* and *B. relictus* habitat and appropriate survey timing/methods.

SCE is preparing to conduct habitat assessment surveys for *Batrachoseps simatus* and *B. relictus* in January 2025 and visual encounter surveys in either February or March 2025 (dependent on appropriate precipitation conditions). We are hoping to obtain any additional input on the following:

- Recent sightings or documented occurrences within this study area (see attached)
- Additional information on microhabitats where occurrences were identified (including photos)
- Daytime survey methods that can be employed in areas that are unsafe to survey at night (i.e., steep terrain, etc.)

We appreciate your help and communication!

Sara Reece
Senior Consultant
(530) 802-3391
sara@jna-consulting.com

Janelle Nolan

APPENDIX E

Photographs of Representative Special-Status Salamander Habitat

Copyright 2026 by Southern California Edison



Photo E-1. An example of potential relictual slender salamander (*Batrachoseps relictus*) (FPE, CSC) habitat, dry during the assessment, observed within the Democrat Dam Impoundment area on January 27, 2025. This habitat was wet with slow flowing water and small pools at the time of the visual encounter survey. This photo shows that potential habitat can be dry during non-breeding periods.



Photo E-2. An example of potential relictual slender salamander habitat with water present observed along Willow Spring Creek Road during the visual encounter survey on March 3, 2025.



Photo E-3. An example of potential relictual slender salamander habitat observed at Flume No. 5 intersecting with Dougherty Creek observed during the habitat assessment on January 28, 2025.

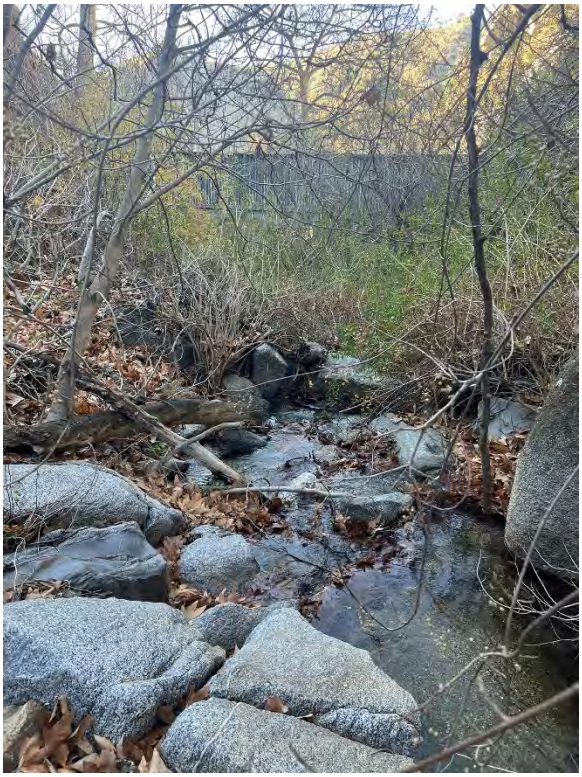


Photo E-4. Potential relictual slender salamander habitat with water present observed along Lucas Creek near Flume No. 4 during the visual encounter survey on January 28, 2025.



Photo E-5. An example of Kern Canyon slender salamander (*Batrachoseps simatus*) (FPT, CT) habitat observed east of the Kern River Powerhouse during the habitat assessment conducted on January 29, 2025.



Photo E-6. An example of potential Kern Canyon slender salamander habitat observed at Adit 14 & 15 during the habitat assessment on January 30, 2025.



Photo E-7. An example of potential Kern Canyon slender salamander habitat observed at Conduit No. 6 during the habitat assessment on January 29, 2025.



Photo E-8. An example of potential Kern Canyon slender salamander habitat observed along the Democrat Impoundment during the habitat assessment on January 27, 2025.



Photo E-9. An example of potential yellow-blotched salamander (*Ensatina eschscholtzii croceater*) (FSCC, WL) habitat found along the Democrat Dam Impoundment during the habitat assessment on January 27, 2025.



Photo E-10. Another example of potential yellow-blotched salamander habitat, found on the island within the Democrat Dam Impoundment during the habitat assessment on January 27, 2025.



Photo E-11. Potential yellow-blotched salamander habitat found along the Democrat Dam Impoundment during the habitat assessment on January 27, 2025.



Photo E-12. Potential yellow-blotched salamander habitat found along the Intake Gatehouse to Flume No. 1 Powerline boarding Willow Spring Creek Road, dry during the habitat assessment on January 27, 2025.

APPENDIX F

Photographs of Special-Status Salamander VES Results (CONFIDENTIAL)

Copyright 2026 by Southern California Edison

CONFIDENTIAL INFORMATION

The following appendix is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of special-status biological resources and qualifies as Confidential Information (18 Code of Federal Regulations § 385.1112). Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings, visit: https://www.ferc.gov/foia.

Appendix F Photographs of Special-Status Salamander VES Results (CONFIDENTIAL)

Appendix F will not be distributed to the general public. Documents containing Confidential Information may be requested by entities and organizations with jurisdiction over these resources. To request copies, please contact Meg Richardson, SCE Relicensing Project Manager at (626) 238-2902 / mary.m.richardson@sce.com; or Kadi Whiteside, SCE Relicensing Deputy Project Manager at (626) 807-3641 / karen.whiteside@sce.com.

APPENDIX G

Photographs of Project Facilities Evaluated for the Potential to Support Bat Roosts

Copyright 2026 by Southern California Edison

This appendix includes photos of all the Project facilities taken during the 2024 technical studies. Knowledge of bat habitat preferences and behavior were compared with the features of the Project facilities to determine if bats could use a facility for roosting. Active roosts or signs of roosts being present (e.g., guano or urine staining) during the field surveys further informed bat usage at each facility.

Democrat Dam Area – Map 5-2a



Photo G-1. Democrat Dam: The Democrat Dam is regularly submerged in the water and is not suitable habitat for roosting bats. The support buildings contain roofed elements but the wind exposure is too high for bat roosting and there are limited area bats can grasp for roosting.



Photo G-2. Drainage Tower: The drainage tower is constructed of vertical steel, some roofed elements, with a concrete material base. However, the structure is too exposed and there are no ways for bats to enter the interior. It is not suitable for roosting.



Photo G-3. Intake Gatehouse: This facility has roofed elements, vertical segments, and a base constructed of textured concrete. Guano was present on the concrete near a gap between the building and the base. This facility is utilized as a night roost.



Photo G-4. Drainage Tunnel Outlet: The drainage tunnel outlet is a textured concrete structure with some vertical steel, and roofed elements. This structure could act as a potential night roost. No guano or signs of roosting were observed. This facility is not currently being utilized by bats.



Photo G-5: Democrat Dam Access Walkway: The grated walkway is composed of steel and is exposed. It is not suitable habitat for maternity or day roosting. The roofed elements and vertical structures could potentially support bat roosts at night. The unnamed buildings on the walkway were found to have guano and are suitable night roosting habitat. An active western mastif bat colony is present adjacent to the walkway on a connected rock crevasse.



Photo G-6. Sandbox: This Project facility is an open water conveyance system. It is a concrete structure with no cracks or roofed elements that could support bat roosting. This facility is not suitable for roosting.



Photo G-7. Flume No. 1: This Project facility supports vertical structures and roofed elements but the vibration from the flow of water and cold metal makes utilization unlikely. This facility is not suitable for roosting.



Photo G-8. Conduit No. 2: This conduit has vertical steel segments and roofed a metal crossbeam. However, the metal is not suitable for bats and the high water levels and fast flow within the facility is not suitable for bat roosting.



Photo G-9. Stilling Well No. 1: Stilling well has some vertical and roofed elements but is composed of cold, slick steel. This facility is not suitable for roosting.

Democrat Spring Area – Map 5-2b



Photo G-10. Conduit No. 3: This facility is composed of solid concrete with no appropriate entry points. This facility is not suitable for roosting.

Cow Flat Creek Area – Map 2-3c



Photo G-11. Stilling Well No. 2: This facility has vertical and roofed elements. Two guano samples were collected from the exterior but there were no signs of interior use. The facility may be used by bats after drinking from the adjacent flume or foraging in the riparian habitat nearby. This facility is utilized as a night roost.



Photo G-12. Flume No. 2 Cow Flat Creek and Gauge 11192000 (SCE 410): The flume consists of metal with no point of attachment for bats and is filled with flowing water. Old guano was present along the walkway between the facility and Stilling Well No. 2. The facility is likely used as a water source but is not currently being used for roosting. The flume could be utilized for roosting if mud nests are present as observed on Flume No. 4 (Lucas Creek).



Photo G-13. Conduit No. 4/Conduit No. 5: The conduits are directly up and downstream of the flume have vertical structures but lack roofed elements or entry points for cover during roosting. These facilities are not suitable for roosting.



Photo G-14. Flume No. 3: The facility is an exposed steel structure with rapidly flowing water. This facility is not currently being used for roosting but is a potential water source. The flume could be utilized for roosting if swallow mud nests are present as was observed on Flume No. 4 (Lucas Creek). Bats are not currently utilizing this facility.



Photo G-15. Conduit No. 6: The conduit is entirely enclosed with concrete and eroded granite. The conduit has some crevices bats could utilize. However, the conduit is too close to the ground and potential predators. This facility is not suitable for roosting.

Lucas Creek Area – Map 2-3d



Photo G-16. Flume No. 4 Lucas Creek: The flume is made of metal and has steel roofed elements that bats could utilize for roosting under appropriate conditions. Large amounts of guano were found on the flume under old/failed swallow mud nests. Bats are likely utilizing the mud areas, where they can grip, to roost at night while foraging. This facility supports a night roost.

Stark Creek Area – Map 2-3e



Photo G-17. Flume No. 5 Dougherty Creek/Conduit No. 7: The flume is made of metal and has steel roofed elements that bats could utilize for roosting under appropriate conditions. It also has concrete in some areas which could be used for roosting. The flume could be utilized for roosting if swallow mud nests are present as was observed on Flume No. 4 (Lucas Creek). Bats are not currently utilizing this facility.



Photo G-18. Access Platform: The underside of the platform is very open with no good roosting locations on metal girders and wooden planks where bats could be sheltered. Cattle also often disturb this area passing under this location. This facility is not suitable for roosting.



Photo G-19. Flume No. 6 Stark Creek/Conduit No. 8: The flume is made of metal and largely not suitable habitat for roosting bats. The conduit is made of concrete with no cracks or areas that bats could utilize. The flume could be utilized for roosting if swallow mud nests are present as was observed on Flume No. 4 (Lucas Creek).



Photo G-20. Adit 12 & 13: The adit has a wooden door/covering and a small roofed element. However, it is too exposed to unfavorable weather conditions and does not contain areas with cover suitable for roosting. The riparian area surrounding adit could be suitable for tree roosting bats.



Photo G-21. Adit 13 & 14: The adit has an opening through a door into a cavern which has dark crevices where bats could roost. Guano present on adit door and within the interior. The interior could not be accessed to confirm interior roost status. This facility supports a night roost and a potential day and maternity roost.

Pechacho Creek Area – Map 2-3f



Photo G-22. Adit 14 & 15: This adit is a pile of granite rocks with some crevices and places that small bat species could potentially roost. Rocks flush to the ground without suitable entry points. The facility is not suitable for roosting

Kern River No. 1 Powerhouse Area – Map 2-3g



Photo G-23. Conduit No. 9: The concrete structure has a metal covering that bats could enter but it contains flowing water and is not suitable roosting habitat. The exterior has no cracks or crevices. The facility is not suitable for roosting.



Photo G-24. Adit 18 & 19: This adit is composed of a pile of granite rocks on a steep slope. Rocks too close to the ground and does not have suitable entry points for bats. The facility is not suitable for roosting.



Photo G-25. Forebay: The forebay is an open water conveyance system with steel grates and structures over the top. The structure is fully exposed to the sun and there are high winds. The facility is not suitable roosting habitat but could be used for foraging or hydration.



Photo G-26. Communication Site: The metal structure is highly exposed to the elements and lacks suitable roosting areas.



Photo G-27. Skip Hoist Upper Landing and Hoist Cable: The facility has vertical metal structures and a grated walkway. However, it is fully exposed to sun and high winds. The facility is not suitable for roosting.



Photo G-28. Water Tank: The water tank has vertical structures, overhangs, and a textured concrete base. The area where the roof joins the wall provides suitable night roosting habitat. A guano pile was found between water tank and rock wall. This facility supports a night roost and a potential day roost.



Photo G-29. Trailrace: The tailrace does not support suitable bat roost habitat. It is an open waterway and does not contain roosting elements though bats may drink from it.



Photo G-30. Kern River No. 1 Powerhouse: Bat roosts are present inside and outside of the building. There are rooms, hallways, stairwells, and corners where bat urine and feces were observed. The operations manager stated that bat activity is seen often. Big brown bat observed (dead). This facility supports an active night roost. It also supports a seasonal day and maternity roost.



Photo G-31. Kern River No. 1 Switchyard: The facility consists of active electrical equipment and potential roosting areas are highly exposed to the elements or electrical current. Facility is not suitable for roosting but bats may pass through to enter the Powerhouse.



Photo G-32. Aerial Cable Tower and Aerial Cable: The aerial cable tower does not represent appropriate bat roost habitat.

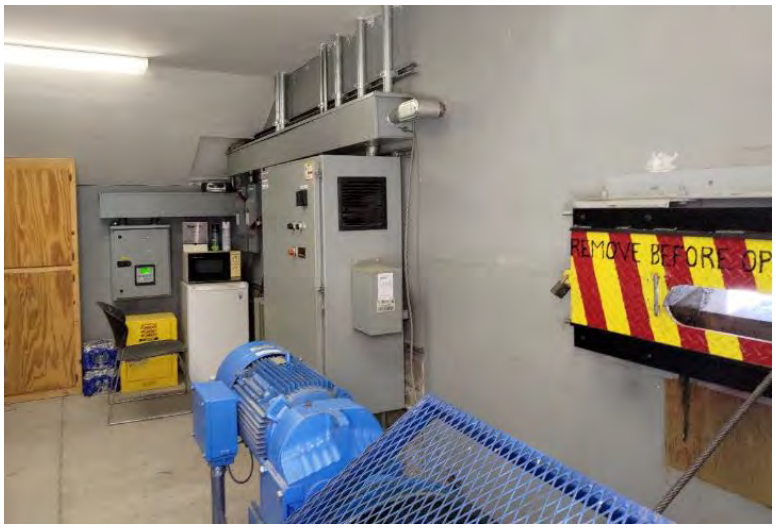


Photo G-33. Skip Hoist House and Lower Landing: The exterior of structure has roofed elements and vertical portions that could be suitable for bat roosts. There are no good entry points for bats. Bats are not currently utilizing this facility.



Photo G-34. Old Icehouse: The exterior of structure has roofed elements and vertical portions that could be suitable for bat roosts. There are no good entry points for bats. Bats are not currently utilizing this facility.



Photo G-35. Garage No. 1: The external portion of this building has roofed elements and some crevices where bats could roost. Not enough guano is present to indicate regular usage but it is likely seasonal night usage while foraging. This facility supports a potential night roost.



Photo G-36. Garage No. 2: The external portion of this building has roofed elements and some crevices where bats could roost. The interior also contains suitable roosting elements. Bats are not currently utilizing this facility



Photo G-37. Old Admin Building: The building contains suitable roosting elements but there are no good entry points to the interior. No roost is present. Bats are not currently utilizing this facility.



Photo G-38. Machine Shop: The machine shop has roofed elements, small crevices, and places where bats could get in and roost. No roost is present. Bats are not currently utilizing this facility.



Photo G-39. Restroom: The building contains suitable roosting elements but is well-sealed. No roost is present. Bats are not currently utilizing this facility.



Photo G-40. Office/Lunchroom: The inside of the structure is well-sealed and likely not utilized by bats. The external roofed/vertical portions may have potential for bats to roost overnight. No roost is present. Bats are not currently utilizing this facility.