Attachment A: **Addendum to REC-1 Whitewater Boating Interim Technical Memorandum: Level 3 Single Flow Survey Results**

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ADDENDUM TO REC-1 WHITEWATER BOATING INTERIM TECHNICAL MEMORANDUM: LEVEL 3 SINGLE FLOW SURVEY RESULTS

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

PREPARED FOR:

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead®

KERNVILLE, CALIFORNIA

March 2024

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LIST OF ACRONYMS AND ABBREVIATIONS

AW	American Whitewater
cfs	cubic feet per second
FERC	Federal Energy Regulatory Commission
IK	inflatable kayak
KR3	Kern River No. 3
NFKR	North Fork Kern River
Project	Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)
QR code	quick-response code
SCE	Southern California Edison
SPD	Study Plan Determination
SQF	Sequoia National Forest
SUP	standup paddleboard

1.0 INTRODUCTION

On October 9, 2023, Southern California Edison (SCE) filed an interim Technical Memorandum for the *REC-1 Whitewater Boating Study Plan* as part of its Initial Study Report (SCE, 2023) in support of the Kern River No. 3 (KR3) Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 2290. As outlined in the revised REC-1 Study Plan (SCE, 2022) and approved in FERC's Study Plan Determination (SPD) (FERC, 2022), the interim Technical Memorandum summarized data collected from November 2022 through September 2023 and included most of the Level 1 Desktop Review of Existing Information elements, which included a literature review, hydrology summary and Project facility evaluation, and information obtained during the Level 2 Limited Reconnaissance. The interim Technical Memorandum also included an overview of the Level 3 Intensive Study Single Flow Survey that was deployed in 2023 and a description of the outstanding tasks scheduled for 2024.

In response to Stakeholder comments on the Initial Study Report, SCE committed to providing an addendum in the first quarter of 2024 that included an analysis of the Level 1 structured interview questions and Level 3 single flow survey (SCE, 2024a). On March 1, 2024, SCE filed the results of the Level 1 Structured Interview Questionnaire in response to FERC's February 1, 2024 additional data request (SCE, 2024b). This report describes the results of the Level 3 single flow survey that was conducted in 2023.

2.0 STUDY GOALS AND OBJECTIVES

The goals of this study are to (1) document the whitewater boating opportunities and the range of whitewater boating flows in the approximately 16-mile bypass reach of the North Fork Kern River (NFKR) from Fairview Dam to the KR3 Powerhouse tailrace (i.e., the Fairview Dam Bypassed Reach) and from the KR3 Powerhouse to the Kern River Park in Kernville under current license conditions; (2) identify potential operational constraints on whitewater boating; and (3) evaluate public safety concerns associated with boating flows.

The study has the following objectives:

- Describe the whitewater boating segments in the NFKR from Fairview Dam to Kernville including the length, whitewater difficulty, name of key rapids, and typical access locations for put-in and take-out.

- Identify the range of flows (minimum acceptable and optimum) that would provide whitewater boating opportunities in each whitewater segment for a variety of watercraft including, kayaks, rafts, packrafts, stand-up paddleboards, and body boards.

- Quantify the annual frequency that minimum acceptable and optimum whitewater flows occur in each whitewater segment with Project operations and unimpaired flows for each watercraft type.

- Document potential conflicts of boating flows with other recreation users and identify strategies to mitigate those conflicts.

Refer to the *REC-1 Whitewater Study Interim Technical Memorandum* (SCE, 2023) and Request to File Study Results (SCE, 2024b) for additional information collected that supports these study goals and objectives.

3.0 STUDY AREA AND STUDY SITES

The study area includes the approximately 16-mile Fairview Dam Bypass Reach from Fairview Dam to the KR3 Powerhouse tailrace and the NFKR from the KR3 Powerhouse to the Riverside Park in Kernville. The Fairview Dam Bypass Reach contains eight whitewater segments ranging in whitewater difficulty from Class II to Class VI (Figure 3-1). The river can be accessed from multiple locations including designated and informal access locations.

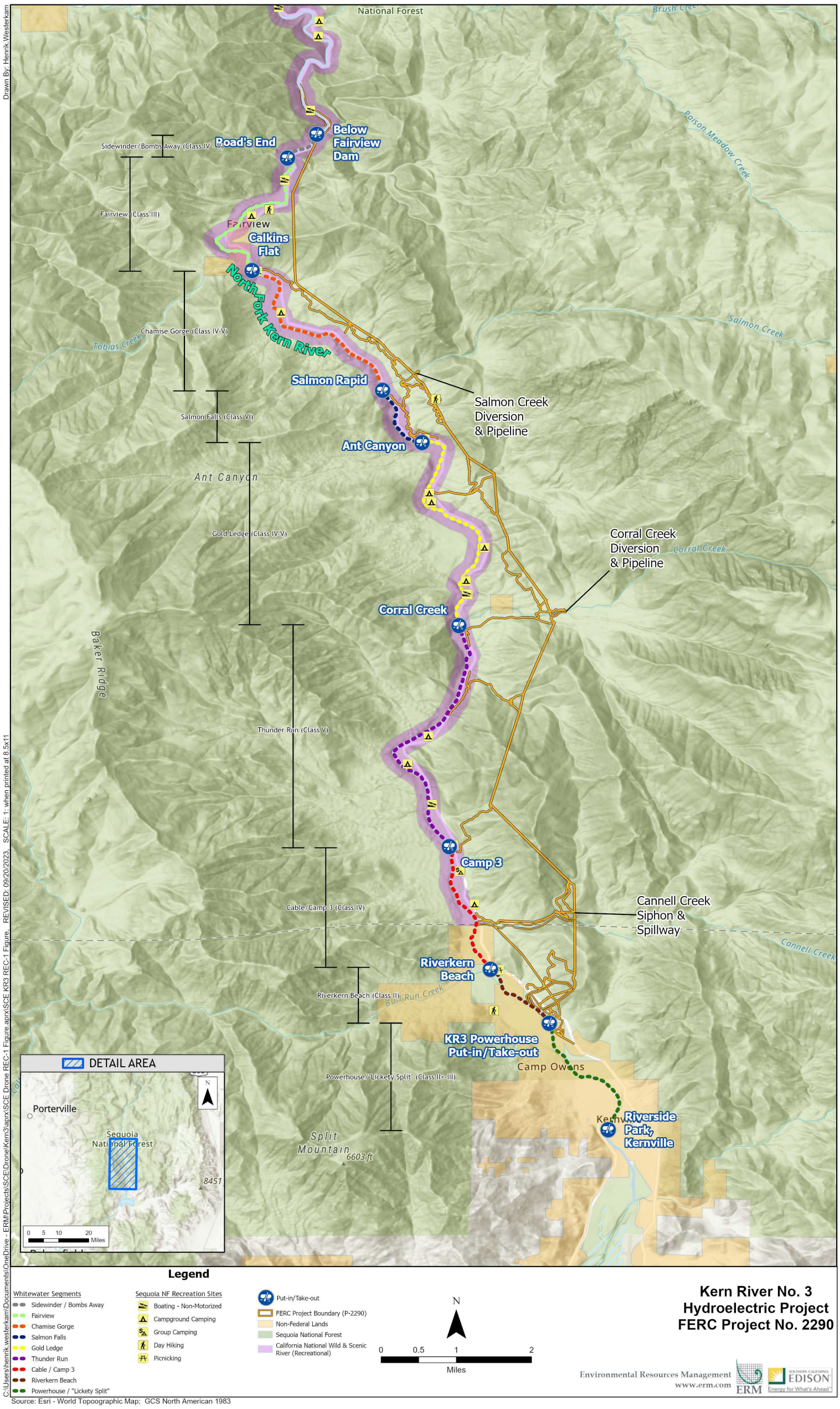

Figure 3-1. Whitewater Boating River Segments in the Study Area.

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4.0 METHODS

This addendum describes methods for the Level 3 Intensive Study. Please refer to the REC-1 interim Technical Memorandum (SCE, 2023) and Request to File Study Results (SCE, 2024b) for additional study methods related to Level 1 Desktop Review of Existing Information and Level 2 Limited Reconnaissance Site Visit.

The REC-1 Study follows the methods in *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 recreation opportunities using various investigative tools across three progressive levels of study. Progression through the framework affords a better understanding of the whitewater recreation opportunities and flow needs in each segment of the bypass reach. The three levels of study increase data resolution as investigations progress from one level to the next and share interim results earlier in the relicensing process across resource disciplines.

4.1. LEVEL 3: INTENSIVE STUDY

The Level 3 Intensive Study collects flow preference information directly from whitewater boaters for a variety of watercraft for the respective whitewater segments using a single flow survey for individual trips and a flow comparison survey for a range of flows. The combination of survey tools is designed to improve the precision of the data when developing flow preference curves for a variety of watercraft types for the respective whitewater segments from Fairview Dam to Riverside Park in Kernville. These survey tools are one of the approaches recommended by Whittaker et al. (2005) for the Level 3 Intensive Study. SCE's approach for Level 3 was outlined in the Revised Study Plan (SCE, 2022) and is summarized below. This approach is consistent with established scientific methods conducted by American Whitewater (AW) to collect flow preference information and recreation use patterns on rivers where a controlled flow study is not possible and/or that have unpredictable flow conditions (AW, 2017 and 2021).

The online single flow and flow comparison survey addresses the Project's infrastructure limitations and resolves the experimental design limitations of a controlled flow study at the Project. The single flow survey and flow comparison survey is not limited to the unpredictable snowpack and associated flows during the Integrated Licensing Process study period. For example, whitewater boaters can provide input immediately after completing individual boating trips using the single flow survey, which was used during 2023 and described in detail below. Similarly, boaters can complete the flow comparison survey based on their collective experience over the course of the study including past experiences over a wide range of water year types. Furthermore, the online single flow and flow comparison survey approach greatly expands the pool of study participants regardless of geographic location or schedule.

The elements of the Level 3 Intensive Study initiated in 2023 and continuing into 2024 are described below.

- Whitewater single flow survey (available online April 1 through December 31, 2023):
  - Boaters completed the single flow survey to evaluate individual flows shortly after experiencing them.
  - Posters containing the link to the single flow survey including a quick-response (QR) code were installed at river access locations and distributed to local retailers in Kernville as well as distributed electronically to local, regional, and national whitewater boating groups and accessible on the KR3 relicensing website.
- 2024 Level 3 Intensive Study implementation:
  - Provide enhanced flow opportunities targeting knowledge gaps in boater experience on the river segments in the Fairview Dam Bypass Reach;
  - Study participants complete an enhanced flow evaluation form rating the quality of whitewater boating opportunity for each enhanced flow opportunity boated;
  - Implement the whitewater flow comparison survey.

SCE will work with the boating community to compile a list of potential study participants prior to implementing flow enhancements. Any interested boater may sign up to participate in the evaluation of the flow enhancements. SCE will work with the boating community to compile a list of participants that are representative of the broader boating community, including watercraft, geographic location, skill level, and gender. However, full representation of the boating community may not be possible for all flow enhancement opportunities given the short notice that may occur. SCE will use the list of interested boaters to directly communicate information about the flow enhancement schedule and links to surveys to evaluate each flow enhancement. Documentation of the outreach efforts will be included in the final Technical Memorandum. Where possible, the Study REC-1 lead will observe targeted flow enhancement opportunities where sufficient notice is provided.

Boaters participating in the targeted flow enhancements will complete a flow evaluation survey for each enhanced flow. Upon completion of the range of flow enhancements, boaters will complete a flow comparison survey.

The whitewater flow comparison survey will be designed to obtain information on flow preferences between minimum acceptable and optimum flow for respective whitewater river segments from Fairview Dam to Riverside Park. Survey questions will ask respondents to rate the acceptability of a range of flows for each whitewater segment and watercraft type, timing of use, flow information needs, and comparison with other whitewater opportunities in the Kern River basin. Information collected in Levels 1 and 2 as well as the Level 3 single flow survey will be used to develop whitewater flow comparison survey. The link to the online whitewater flow comparison survey will be

distributed to local, regional, and national whitewater boating groups and accessible on the KR3 relicensing website.

SCE will develop minimum acceptable and optimum flow preference curves based on watercraft types used for respective river segments using data from the individual flow evaluations and the flow comparison survey. Data collected in the 2023 single flow survey will be cross-referenced with the results from the 2024 flow preference results. Results will be reported in the final Technical Memorandum.

- Conduct a whitewater focus group:
  - The Level 3 Intensive Study will include a focus group designed to gather information from boaters with direct experience on the whitewater river segments from Fairview Dam to Riverside Park. Focus group questions will prompt discussion on suitable range of flows for a variety of watercraft for each whitewater segment; navigability and whitewater difficulty across a range of flows; preferred whitewater segment(s) from Fairview Dam to Riverside Park; daily, weekly, and seasonal use patterns; flow information needs; river access; safety; other areas of concern; and uniqueness of the whitewater river segments compared to other opportunities in the region.
  - Focus group participants will be identified in advance and nominated collaboratively with the whitewater community. Selection will be based in part on knowledge of whitewater boating opportunities in the Kern River basin and direct experience on the river segments from Fairview Dam to Riverside Park. The focus group will include representation across watercraft types, commercial and non-commercial as well as the local boating community and boaters traveling to paddle on the bypass from outside the North Fork Kern watershed.
- Complete a hydrology analysis:
  - Quantify annual number of days of whitewater boating using flow preference curves developed from data collected in the online single flow and flow comparison survey and supplemented with information obtained in focus groups. Analysis will be done for respective watercraft in each whitewater segment under impaired and unimpaired hydrology in the Fairview Dam Bypass Reach.

Public safety concerns associated with whitewater boating flows will be documented using available information such as the Kernville Chamber of Commerce, SQF, California Department of Boating and Waterways, AW accident database and other FERC proceedings where whitewater releases occur. Potential measures to mitigate public safety concerns will also be described.

Potential recreation-use conflicts associated with whitewater boating flows will be identified where possible. Recreation uses occurring in and adjacent to the NFKR documented in the *REC-2 Recreation Facilities Use Assessment* Study (SCE, 2022) will be integrated into the REC-1 Updated Study Report. Potential flow-related conflicts will

be described based on REC-2 survey responses. Mitigation measures to reduce or manage recreation conflicts will be identified where appropriate.

5.0 DATA SUMMARY

The data summary in this addendum to the REC-1 interim Technical Memorandum is limited to the results for the Level 3 single flow survey (SCE, 2023).

5.1. LEVEL 3: INTENSIVE STUDY

The REC-1 Study Plan uses two approaches approved in the SPD (FERC, 2022) for the Level 3 Intensive Study: Multiple Flow Reconnaissance Assessment and Flow Comparison Survey. Both of these approaches are described in the Level 3 Intensive Study approaches described by Whittaker et al. (2005). SCE launched the Level 3 Multiple Flow Reconnaissance Assessment April 1, 2023, referring to it publicly as the Single Flow Survey so boaters would better understand the survey purpose.

This section summarizes the results from the Level 3 Intensive Study Single Flow Survey and provides recommendations for further implementing Level 3, including enhanced flow opportunities and the Flow Comparison Survey. The single flow survey analysis documents the composition of the survey participants and whitewater recreation use patterns across river segments during the survey.

5.1.1. SINGLE FLOW SURVEY ANALYSIS

SCE launched the Level 3 Intensive Study Single Flow Survey on April 1, 2023. A total of 404 responses were received, providing information on their whitewater boating trips on the NFKR. Single flow survey responses were distributed April, May, June, July, August, September, and October evaluating flows ranging from 250 cubic feet per second (cfs) in September to 8,500 cfs in May. Single flow surveys have been completed for all nine river segments using a variety of watercraft. The single flow survey remained open through December 31, 2023, allowing boaters to continue evaluating flows in the NFKR as the hydrograph decreased through the fall and early winter months. Information obtained in the single flow survey will be used to support and guide planning and implementation for the Level 3 Flow Comparison Survey in 2024.

A total of 91 individuals participated in the single flow survey. The single flow survey respondents included a mix of genders and skill levels of the whitewater boating community on the NFKR (Table 5.1-1). Sixty-eight percent of the respondents were male and 26 percent female. The majority of single flow respondents (51 percent) self-identified as possessing expert whitewater skills. Intermediate and advanced boaters comprised the next two largest groups of respondents: 22 and 24 percent, respectively. Novice boaters comprised only 3 percent of the respondents.

The single flow survey respondents were fairly evenly distributed across the 10-year age groups older than 29 years (Figure 5.1-1). Twelve percent of the respondents were between the age of 20 to 29. None of the survey respondents were younger than 20 years of age. The majority of single flow survey responses by far were for boating trips in

kayaks, followed in distant second by cataraft trips (Figure 5.1-2). Thirty-two percent of the respondents' primary residence was in the Kernville area between the community of Lake Isabella and Kernville (Figure 5.1-3). Los Angeles County and Orange County were represented by 21 percent and 5 percent of the respondents, respectively.

Table 5.1-1. Single Flow Survey Respondent Gender and Whitewater Skill Level.

Gender	Count		Skill Level			
	No.	% of Total	Novice	Intermediate	Advanced	Expert
Male	62	68%	1%	13%	19%	35%
Female	24	26%	2%	9%	3%	12%
Non-binary	0	0%	0%	0%	0%	0%
Choose not to answer	5	5%	0%	0%	2%	3%
Total	**91**	**100%**	**3%**	**22%**	**24%**	**51%**

Note: Total may not sum 100% due to rounding.

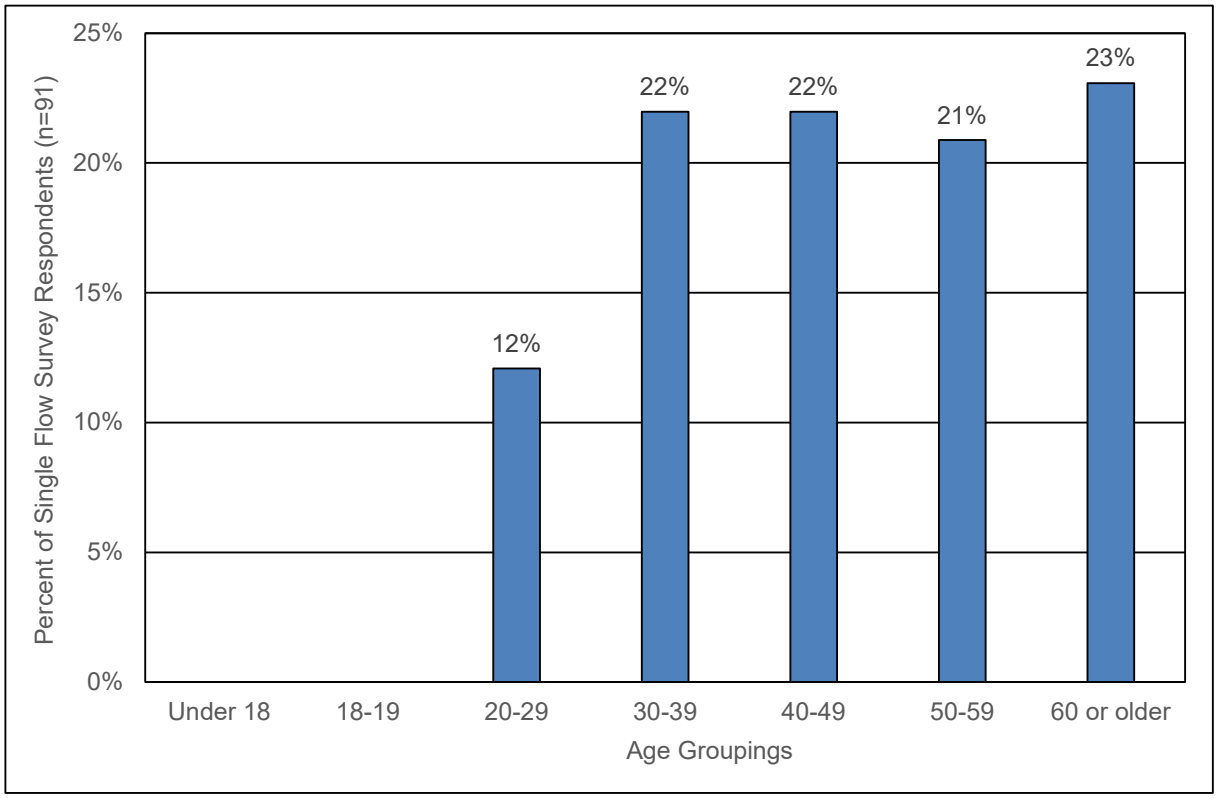
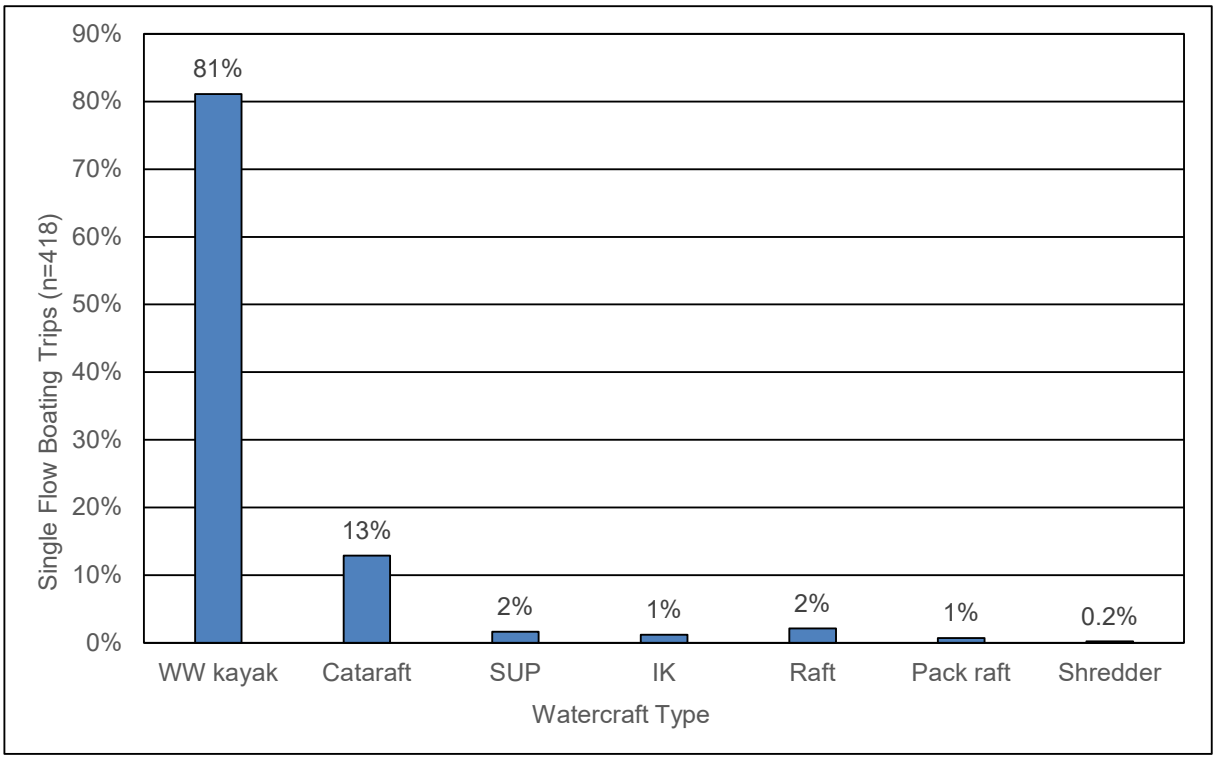


Figure 5.1-1. Single Flow Survey Respondent Age Range.



IK = inflatable kayak; SUP = standup paddleboard; WW = whitewater

Figure 5.1-2. Watercraft Types Used for Single Flow Survey Boating Trips.

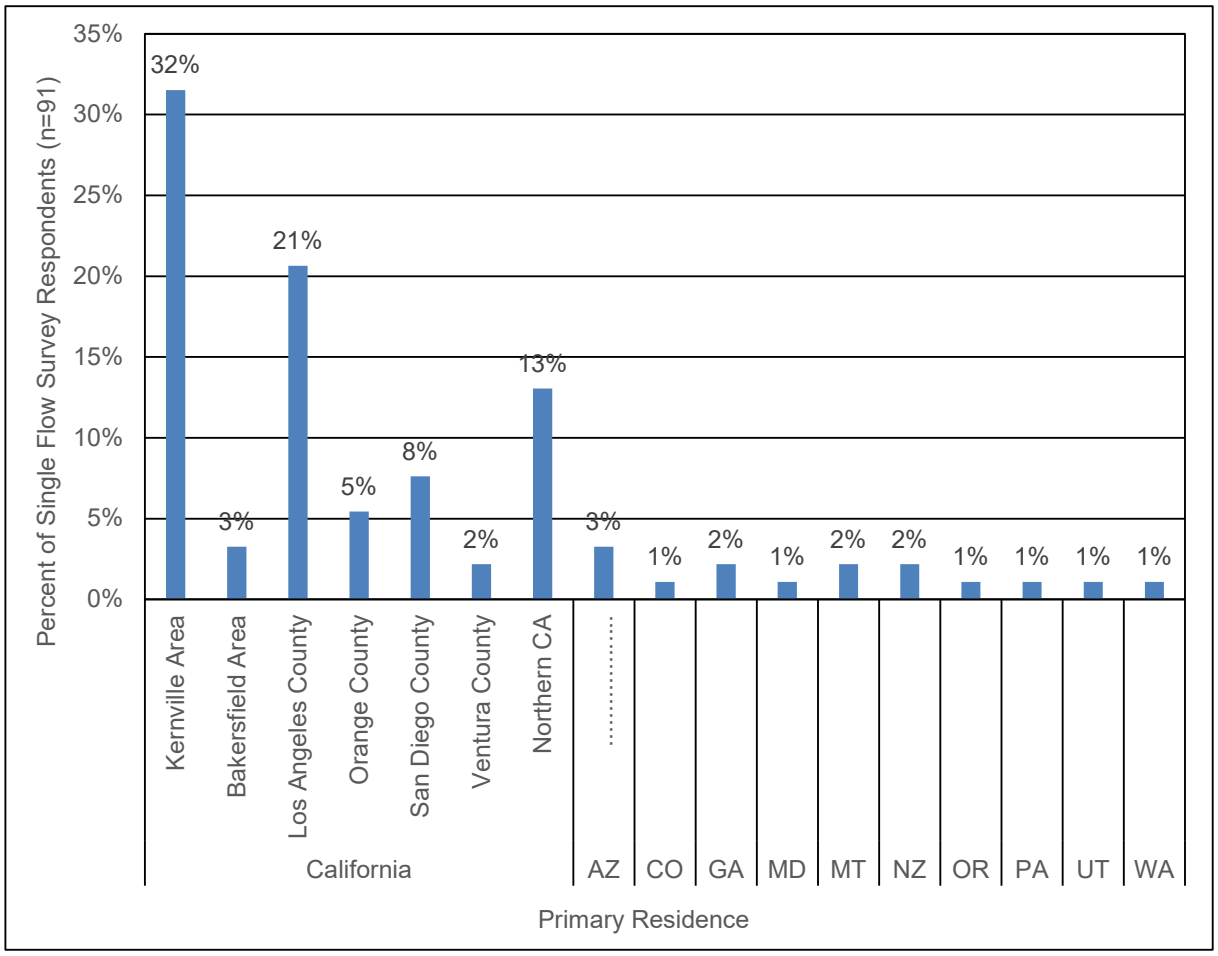


Figure 5.1-3. Single Flow Survey Respondent Primary Residence.

As noted above, the single flow survey was open from April 1 to December 31, 2023; a total of 404 single flow survey responses were completed during that time. The highest percentage of responses occurred in September (Figure 5.1-4), followed by April and August. Discharge in the bypass decreased in September from approximately 500 cfs at the start of the month to 107 cfs by the end of the month. One single flow survey was completed on October 14 for the Powerhouse segment by a boater in an inflatable kayak (IK). Discharge below the powerhouse was approximately 550 cfs for this IK trip. No other single flow surveys were completed in October, November, or December. Seven single flow survey respondents reported historic trips occurring in 1998 (1 response), 2019 (1 response), and 2022 (5 responses).

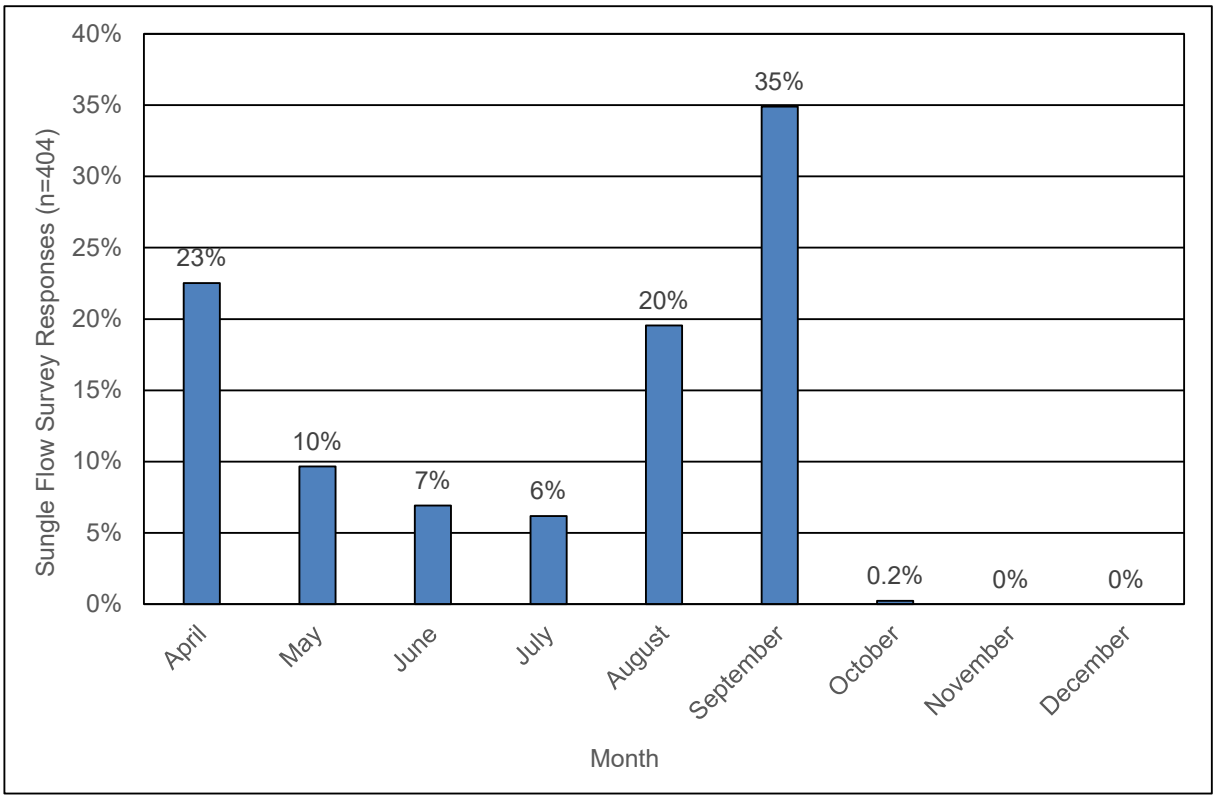


Figure 5.1-4. Single Flow Survey Monthly Responses Between April 1 and December 31, 2023.

Single flow survey respondents boated all nine river segments (Figure 5.1-5). The highest number of respondent trips were on the Powerhouse river segment, and the least were on the Sidewinder river segment (Table 5.1-2). Respondent trips were highest in the Chamise river segment when discharge in the bypass was less than 700 cfs. When flows were greater than 3,000 cfs, the vast majority of trips were on the Camp 3 / Cable run, Riverkern, and Powerhouse river segments.

Single flow survey respondents used a variety of watercraft types (Figure 5.1-6). Kayaks were the predominant watercraft used by respondents, comprising 81 percent of the single flow survey trips (Table 5.1-3). Kayaks were almost exclusively used when discharge was less than 700 cfs in the bypass.

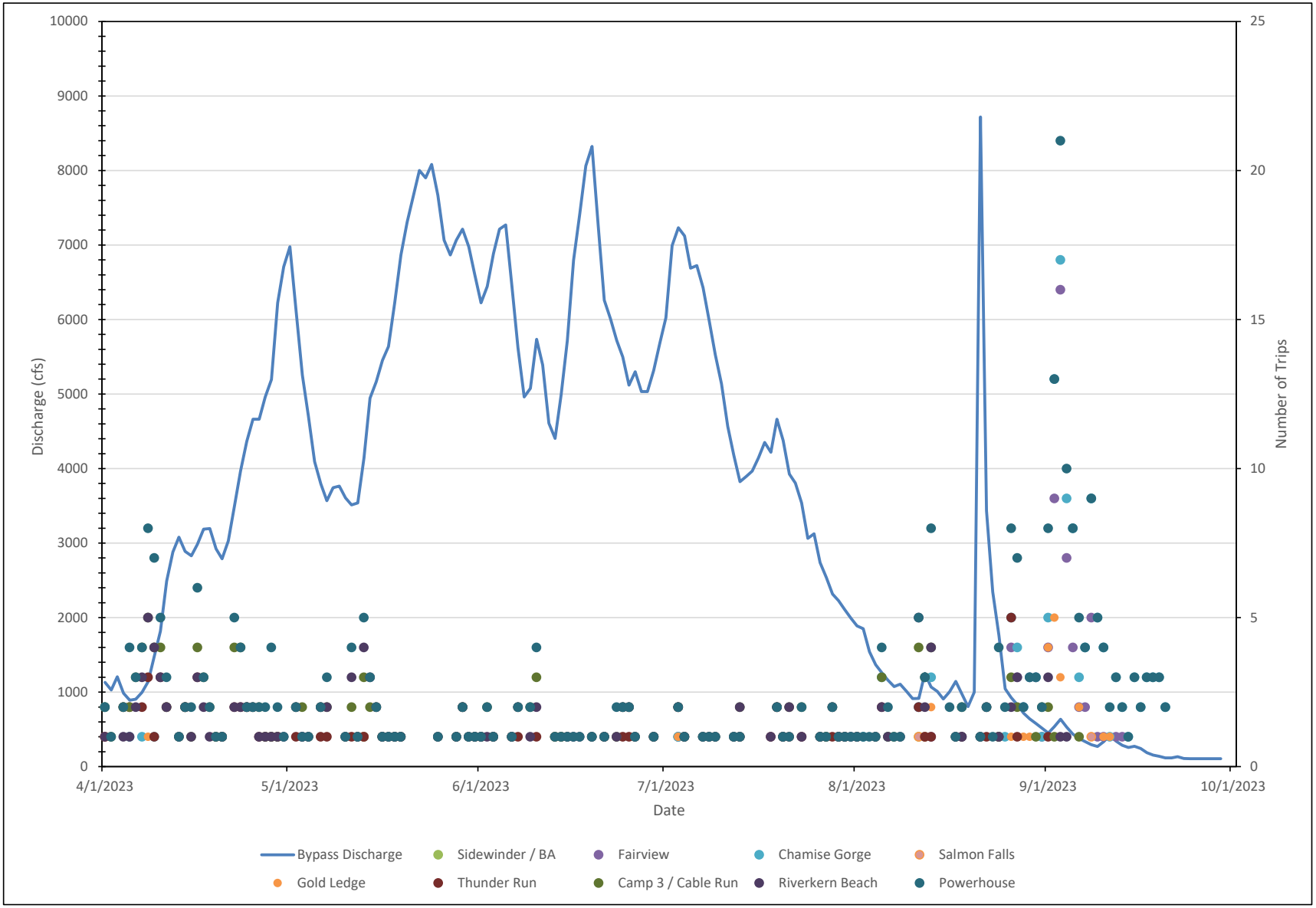
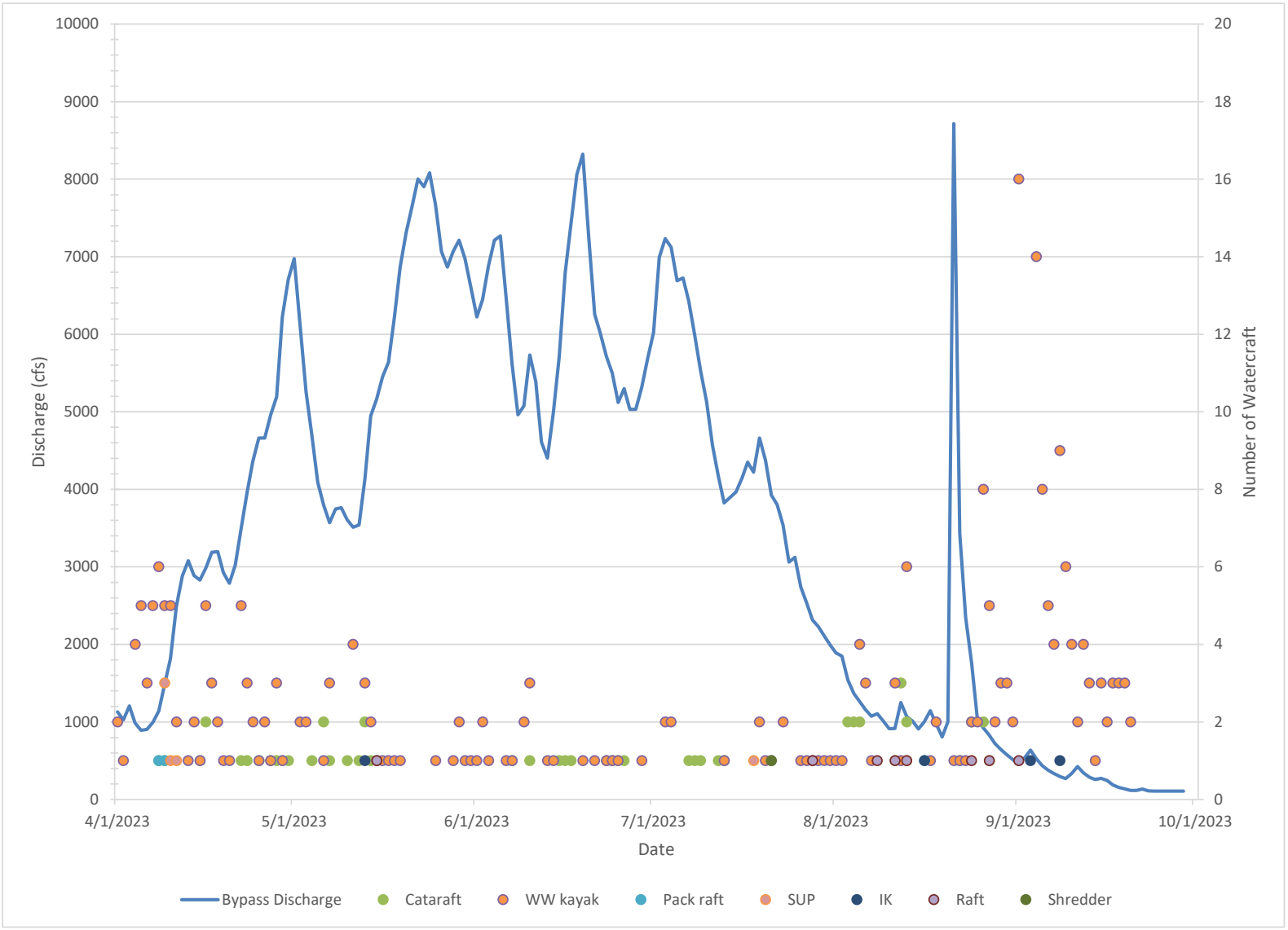


Figure 5.1-5. River Segments Boated by Single Flow Survey Respondents (n=404).

Table 5.1-2. River Segments Boated by Single Flow Survey Respondents Grouped by Discharge

Discharge Range (cfs)	Sidewinder	Fairview	Chamise	Salmon Falls	Gold Ledge	Thunder Run	Camp 3 / Cable Run	Riverkern	Powerhouse
>3,000	3	3	3	1	10	45	96	89	110
1,500–3,000	0	0	4	2	5	19	23	20	35
1,000–1,500	0	1	12	2	7	9	26	22	43
700–1,000	1	11	16	1	5	15	22	18	37
<700	0	60	107	1	20	1	7	5	119
Total per River Segment	4	75	142	7	47	89	174	154	344

cfs = cubic feet per second



cfs = cubic feet per second; IK = inflatable kayak; SUP = standup paddleboard; WW = whitewater

Figure 5.1-6. Watercraft Used by Single Flow Survey Respondents (n=404).

Table 5.1-3. Watercraft Used by Single Flow Survey Respondents Grouped by Discharge

Discharge Range (cfs)	Kayak	Cataraft	Packraft	SUP	IK	Raft	Shredder	Total
>3,000	21%	8%	0%	0.2%	0.2%	0.2%	0.2%	29%
1,500–3,000	7%	2%	0%	0.5%	0.0%	0.5%	0%	10%
1,000–1,500	8%	3%	0.7%	1.0%	0.2%	0.5%	0%	13%
700–1,000	9%	1%	0%	0.0%	0.0%	0.5%	0%	11%
<700	36%	0%	0%	0.0%	0.7%	0.2%	0%	37%
Total	**81%**	**13%**	**1%**	**2%**	**1%**	**2%**	**0.2%**	**100%**

cfs = cubic feet per second; IK = inflatable kayak; SUP = standup paddleboard
Note: Total may not sum 100% due to rounding.

Single flow survey respondents were asked to self-identify their whitewater boating skill level. The majority of single flow survey respondents self-identified as advanced and expert level boaters (Table 5.1-4). Novice boaters participated least in the single flow survey. Advanced boaters comprised the majority of the trips when discharge was less than 700 cfs in the bypass.

Table 5.1-4. Single Flow Survey Respondent Boating Skill Level Grouped by Discharge

Discharge Range (cfs)	Novice	Intermediate	Advanced	Expert	Total
>3000	0%	2%	11%	17%	29%
1,500–3,000	0%	1%	3%	5%	10%
1,000–1,500	0.5%	3%	5%	4.0%	13%
700–1,000	0%	1%	6%	3.0%	11%
<700	0.5%	3%	29%	5.0%	37%
Total	**1%**	**11%**	**54%**	**34%**	**100%**

cfs = cubic feet per second; SUP = standup paddleboard
Note: Total may not sum 100% due to rounding.

5.1.2. Level 3 Intensive Study Implementation Next Steps

In 2024, SCE proposes four flow enhancements (ranging from approximately 200 cfs up to 800 cfs) to collect flow evaluations from boaters rating the quality of whitewater boating opportunities. The range of flows proposed for the enhanced flow opportunities is based on boater input in the Level 1 Structured Interview Questionnaire and the Level 2 Limited Reconnaissance site visit (SCE, 2024a and 2024b), as well as the Level 3 Intensive Study Single Flow Survey responses. Providing enhanced flow opportunities targeting this range of flows will improve data resolution on the quality of the whitewater boating opportunities where knowledge gaps were previously identified. SCE is preparing to provide flow enhancements as conditions allow.

Study participants will have an opportunity to complete a final flow comparison survey to evaluate the quality of boating opportunities across a range of flows. The flow evaluation data collected in the Level 3 Intensive Study will be used to develop flow preference curves for each watercraft type for the respective river segments.

6.0 STUDY SPECIFIC CONSULTATION

No additional consultation has occurred in support of the REC-1 Study Plan.

7.0 OUTSTANDING STUDY PLAN ELEMENTS

The Level 3 Intensive Study is ongoing. The Level 3 flow comparison survey will be launched in spring/summer 2024. Refer to the Request to File Study Results (SCE, 2024b) for summary of remaining study elements. Results and an updated Technical Memorandum from the Level 3 flow comparison survey and remaining tasks outlined in Section 5.1, Level 3: Intensive Study, will be included in the Updated Study Report.

Date	Activity
Spring–Summer 2024	Implement Level 3 Intensive Study: Targeted Flow Enhancements and Flow Comparison Survey.
Fall 2024	Provide Level 3 results in the Updated Study Report

8.0 REFERENCES

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Attachment B: **REC-2 Recreation Facilities Use Assessment Interim Technical Memorandum: Summer Study Results**

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REC-2 RECREATION FACILITIES USE ASSESSMENT INTERIM TECHNICAL MEMORANDUM: SUMMER STUDY RESULTS

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

PREPARED FOR:

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead®

KERNVILLE, CALIFORNIA

March 2024

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LIST OF ACRONYMS AND ABBREVIATIONS

DUCG	day-use site adjacent to a developed campground
FERC	Federal Energy Regulatory Commission
ID	identification
ISR	Initial Study Report
KR3	Kern River No. 3
KRB	Kern River Boaters
N/A	not applicable
NDA	no data available
Project	Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)
QA/QC	quality assurance and quality control
QR code	quick-response code
RSP	Revised Study Plan
SCE	Southern California Edison
SPD	Study Plan Determination
SQF	Sequoia National Forest
TBD	to be determined
USFS	U.S. Forest Service

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1.0 INTRODUCTION

This updated Interim Technical Memorandum provides the methods and preliminary analysis of field surveys associated with Study *REC-2 Recreation Facilities Use Assessment* in support of Southern California Edison's (SCE) Kern River No. 3 (KR3) Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 2290. The REC-2 Study was included in SCE's Revised Study Plan (RSP) submitted on July 1, 2022 (SCE, 2022).

In the October 12, 2022, Study Plan Determination (SPD), FERC approved the REC-2 Study Plan with modifications (FERC, 2022). Specifically, FERC recommended that SCE adjust the study area to include the 1.9-mile reach of the North Fork Kern River (NFKR) upstream of the FERC Project Boundary, install trail cameras to collect recreation use data at each site in the study area, increase the number of on-site intercept survey days, extend the survey period to include a full calendar year from January 2023 through December 2023, recruit and deploy English- and Spanish-speaking surveyors, and include the U.S. Forest Service (USFS) Sequoia National Forest (SQF) modifications as well as FERC's modifications to the recreation user survey.

SCE conducted the study for one full calendar year (April 2023 through March 2024) to capture shoulder season (fall/spring) and winter recreation use in the Project Area. Visitor intercept survey spot and calibration counts were conducted on weekdays, weekends, and holiday weekends between April 2023 and March 2024. SCE is continuing to collect data and will conduct two additional weekday, two additional weekend, and one additional holiday weekend spot and calibration counts during the April 2024 through May 2024 period.

SCE filed an Interim Technical Memorandum as part of the Initial Study Report (ISR) on October 9, 2023 (SCE, 2023) and provided a summary of data collection efforts conducted between April 1, 2023, and September 30, 2023, as well as a summary of variances to the FERC-approved REC-2 Study Plan.

Per FERC's February 1, 2024, request, SCE filed a summary of spot count and calibration count data collected from April 1 to November 30, 2023. The purpose of the filing was to provide FERC the information to assess whether the calibration counts and additional spot counts adequately adjusted for the data gaps resulting from the removal of the trail cameras and provided sufficient information to analyze the use of the recreation facilities in lieu of the proposed trail cameras (SCE, 2024b). The filing included source data and high-level summary characterization of the number of vehicles, people and types of recreation activities observed during spot and calibration counts during the April 1 to November 30, 2023, period, broken out by season (spring, summer, and fall).

In SCE's Response to Stakeholder Comments on the ISR filing (SCE, 2024a), SCE agreed to provide additional information and preliminary results of the surveys to stakeholders outside of the Integrated Licensing Process reporting schedule. The structure of this report is similar to the previous Interim Technical Memorandum and provides the structure for the forthcoming Final Technical Memorandum that includes an

analysis of the spot count, calibration count, visitor intercept, and online survey data. The data and analysis presented as part of this updated Technical Memorandum includes preliminary results of the visitor intercept surveys from the peak summer-use period from Memorial Day, 2023, through Labor Day, 2023.

Data collection efforts for spot and calibration counts are ongoing through May 2024, and intercept and online surveys are being collected through the end of March 2024. Throughout the year-long surveys, SCE is conducting a quality assurance and quality control (QA/QC) review of data as it is collected (see Section 4.4). Analysis and reporting of the complete dataset and a discussion regarding future recreation needs will be included as part of the Final Technical Memorandum filed with the Draft License Application no later than July 3, 2024.

2.0 STUDY GOALS AND OBJECTIVES

The primary goal of the REC-2 Study is to collect information on recreation use within the FERC Project Boundary and along the Fairview Dam Bypass Reach[1], as well as those sites included in the approximately 1.9-mile reach above the FERC Project Boundary to the Johnsondale Bridge.

The objectives of the REC-2 Study, as outlined in the REC-2 Study Plan (SCE, 2022), include:

- Evaluate recreation use at recreation sites within the FERC Project Boundary and along the Fairview Dam Bypass Reach, including an assessment of the amount of recreation use each site receives (including percent of capacity) and the activities that occur at the site.

- Collect visitor feedback regarding their perception and experience at recreation facilities within the study area, including but not limited to facility condition, level of crowdedness, angling opportunities, and the scenic landscape.

- Estimate future recreational demand and needs, including the need for additional recreation facilities and access enhancements.

- Assess the consistency of current recreation opportunities with the laws, regulations, policies, and guidelines described in the Land Management Plan for the Sequoia National Forest (USFS, 2023).[2]

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

[2] The USFS has published a new Management Plan since the RSP and SPD has been issued. This study will review the new 2023 Management Plan in lieu of the 1988 Management Plan originally cited in the RSP.

3.0 STUDY AREA AND STUDY SITES

3.1. STUDY AREA

The study area and specific study sites include one SCE-owned FERC-approved site (KR3 Powerhouse Whitewater Put-in/Take-out), and 24 USFS-operated developed (formal) and dispersed (informal) campgrounds, day-use areas, and trailheads along the Fairview Dam Bypass Reach, as well as those sites included in the approximately 1.9-mile reach above the FERC Project Boundary to the Johnsondale Bridge. The locations are listed below and shown in Figure 3.1-1.

3.2. RECREATION STUDY SITES

The 25 recreation study sites include eight dispersed[3] camping areas, four developed campgrounds,[4] six day-use sites,[5] four day-use sites adjacent to developed campgrounds, and three trailhead sites.[6] The majority of the USFS-operated sites (20) are located along the Fairview Dam Bypass Reach, one USFS-operated site is located within the Project boundary (Willow Point Whitewater Take-out), and three sites (Johnsondale Bridge River Access, Brush Creek Dispersed Camping, and Limestone Campground) are located within the approximately 1.9-mile reach upstream of the Project boundary. Table 3.2-1 provides a summary of the study area sites (upstream to downstream) and site type.

[3] Dispersed camping is available free of charge, year-round, but has little or no amenities such as potable water, picnic tables, or fire pits, and trash or restroom services may only be seasonally available.

[4] Developed campgrounds require a fee. and provide amenities such as potable water, picnic tables, fire pit/rings, trash receptacles, and restrooms.

[5] Day-use sites are available free of charge and are open year-round.

[6] Trailhead sites are parking areas at the beginning of a trail or trail system.

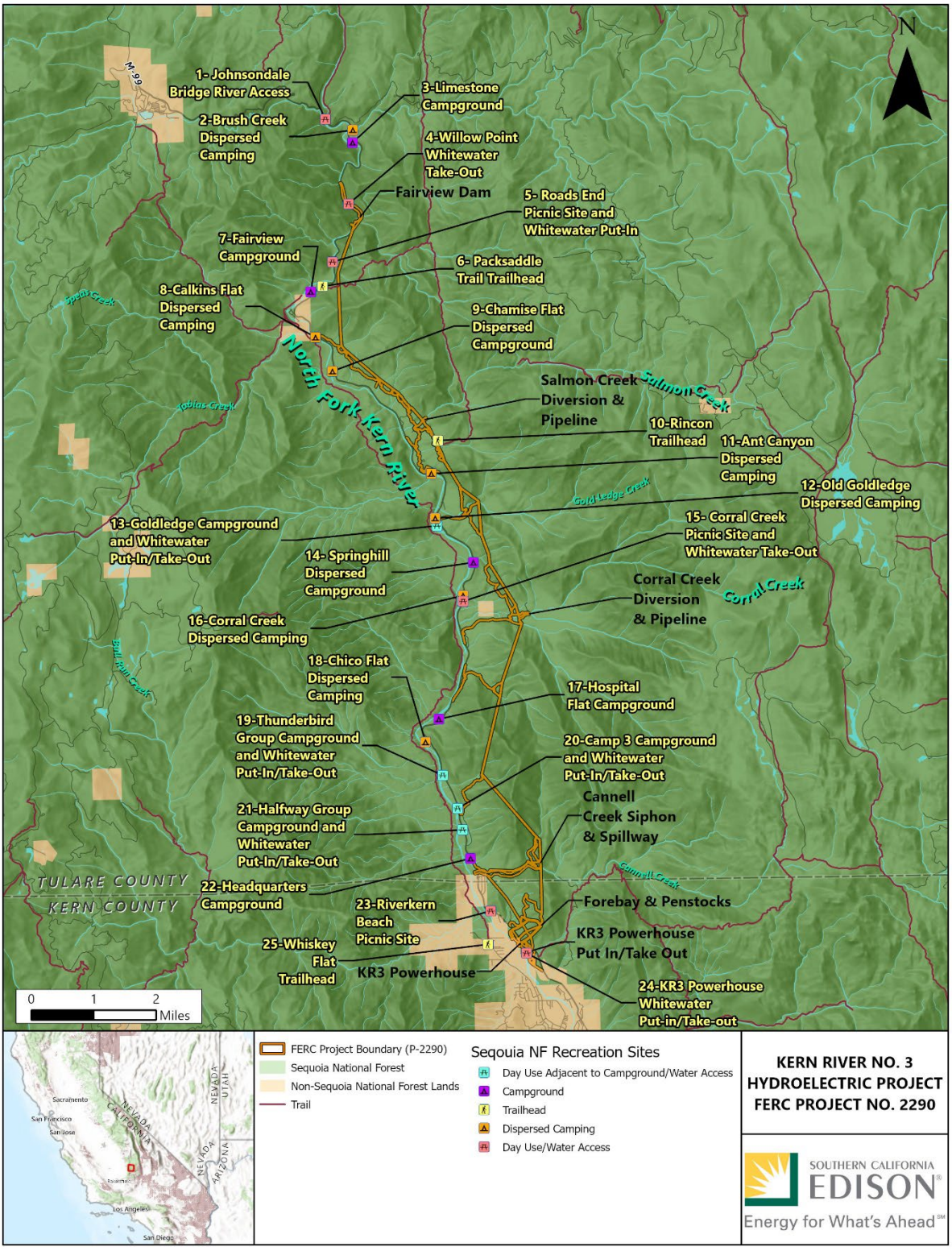

Figure 3.1-1. Recreation Study Sites within the Study Area.

Table 3.2-1. Recreation Study Sites

Site ID Number	Site Name	Site Type
1	Johnsondale Bridge River Access	Day Use
2	Brush Creek Dispersed Camping	Dispersed Camping
3	Limestone Campground	Developed Campground
4	Willow Point Whitewater Take-out	Day Use
5	Roads End Picnic Site and Whitewater Put-in	Day Use
6	Packsaddle Trail Trailhead	Trailhead
7	Fairview Campground	Developed Campground
8	Calkins Flat Dispersed Camping	Dispersed Camping
9	Chamise Dispersed Camping	Dispersed Camping
10	Rincon Trailhead	Trailhead
11	Ant Canyon Dispersed Camping	Dispersed Camping
12	Old Goldledge Dispersed Camping	Dispersed Camping
13	Goldledge Campground and Whitewater Put-in/Take-out	Day Use Adjacent to Developed Campgrounds
14	Springhill Dispersed Camping	Dispersed Camping
15	Corral Creek Picnic Site and Whitewater Take-out	Day Use
16	Corral Creek Dispersed Camping	Dispersed Camping
17	Hospital Flat Campground	Developed Campground
18	Chico Flat Dispersed Camping	Dispersed Camping
19	Thunderbird Group Campground and Whitewater Put-in/Take-out	Day Use Adjacent to Developed Campground
20	Camp 3 Campground and Whitewater Put-in/Take-out	Day Use Adjacent to Developed Campground
21	Halfway Group Campground and Whitewater Put-in/Take-out	Day Use Adjacent to Developed Campground
22	Headquarters Campground	Developed Campground
23	Riverkern Beach Picnic Site	Day Use
24	KR3 Powerhouse Whitewater Put-in/Take-out	Day Use (Project Recreation Site)
25	Whiskey Flat Trailhead	Trailhead

4.0 METHODS

4.1. DATA COLLECTION PERIOD AND SAMPLING DAYS

Implementation of the REC-2 Study relied on a combination of data collection methodologies, including visitor intercept surveys, online surveys, spot counts, and calibration counts. The primary study season extends from April 2023 through March 2024. Surveys will continue through the end of March 2024, and additional calibration and spot count data collection will continue through May 2024.

The visitor intercept surveys sampling schedule included 1 weekday, 1 weekend day, and 1 holiday weekend day (as applicable) per month between April 2023 and March 2024 for a total of 33 survey days[7]. The holiday weekend day surveyed included 1 of the 3 days of the holiday weekend (including Saturday and Sunday and either the Friday before or the Monday after) of Memorial Day (May 27 to 29, 2023), Juneteenth National Independence Day (June 17 to 19, 2023), Fourth of July (July 1 to 3, 2023), Labor Day (September 2 to 4, 2023), Thanksgiving (November 24 to 26, 2023), Christmas (December 23 to 25, 2023), New Year's Day (December 30, 2023, to January 1, 2024), Martin Luther King, Jr. Day (January 13 to 15, 2024), and President's Day (February 17 to 19, 2024). The weekday, weekend, and holiday sampling dates were selected randomly using R software (Version 4.2.2.; R Core Team, 2022), including 1 weekday, 1 weekend, and 1 holiday per month, as described above. As such, dates were entered into R as samples, and computer code was written to generate the random sampling date.

Following USFS SQF's request and subsequent decision to remove all cameras (see Section 4.7, *Study Plan Variances)* on May 24, 2023, SCE reviewed the study approach and revised the recreation use data collection to implement additional sampling days to include a spot count and a 2-hour calibration count. Intercept surveys were also conducted on these additional spot and calibration count days. A total of 23 days were added to the REC-2 Study.

On each of the additional sampling days, spot and calibration counts were conducted following a bus route method (Pollack et al., 1994) so that site use is counted at each recreation site at various times of the day, the starting recreation site, and the direction of travel (i.e., clockwise or counterclockwise) were selected randomly on the days of the spot count and calibration counts. The recreation sites were numbered 1 to 25, and a site number was selected randomly to begin each circuit. Each survey team was assigned recreation sites to visit, a start time, and direction of travel (clockwise or counterclockwise). Start times and direction of travel were randomly generated for each day.

SCE conducted intercept surveys and spot counts on 56 days, and calibration counts on 28 days during the April 2023 through March 2024 study period (Table 4.1-1). This

[7] In FERC's Study Plan Determination (SPD), a total of 35 survey days are identified (FERC, 2022). When SCE implemented the changes requested from FERC in the SPD, the number of days added up to 33 days. However, as indicated, SCE conducted a total of 56 survey days during the study period.

includes both the 33 survey days and an additional 23 intercept surveys and spot counts conducted during the calibration count days.

Table 4.1-1. Summary of Data Collection Days by Season and Type

Season	Study Time Period	Spot Count	Calibration Count	Intercept Survey Days
Spring	April 1 to May 26, 2023; March 1–31, 2024	8	6	8
Summer	May 27 to September 3, 2023	19	10	19
Fall	September 4 to November 30, 2023	13	6	13
Winter	December 1, 2023 to February 29, 2024	16	6	16
	Total	**56**	**28**	**56**

Table 4.1-2 summarizes the total number of intercept surveys, spot counts, and calibration counts conducted during the April 2023 through March 2024 by month, day type (weekday, weekend, and holiday) and by data collection type (intercept survey, spot count, and calibration count). In addition, as proposed in the ISR, SCE will conduct two additional weekday, two additional weekend, and one additional holiday spot and calibration counts during the April 2024 through May 2024 period. This will result in a total of 61 spot and calibration count days.

Table 4.1-2. Summary of Data Collection Days by Month and Type

Month	Day Type	Intercept Survey	Spot Count	Calibration Count[a]
April 2023	Weekday	1	1	1
	Weekend	1	1	1
	Holiday	0	0	0
May 2023	Weekday	1	1	1
	Weekend	1	1	1
	Holiday	1	1	1
June 2023	Weekday	2	2	1
	Weekend	2	2	1
	Holiday	2	2	1
July 2023	Weekday	2	2	1
	Weekend	2	2	1
	Holiday	2	2	1
August 2023	Weekday	2	2	1
	Weekend	2	2	1

Month	Day Type	Intercept Survey	Spot Count	Calibration Count[a]
	Holiday	0	0	0
September 2023	Weekday	2	2	1
	Weekend	2	2	1
	Holiday	2	2	1
October 2023	Weekday	2	2	1
	Weekend	2	2	1
	Holiday	0	0	0
November 2023	Weekday	2	2	1
	Weekend	2	2	1
	Holiday	1	1	0
December 2023	Weekday	2	2	1
	Weekend	2	2	1
	Holiday	2	2	0
January 2024	Weekday	2	2	1
	Weekend	2	2	1
	Holiday	1	1	0
February 2024	Weekday	2	2	1
	Weekend	2	2	1
	Holiday	1	1	0
March 2024	Weekday	2	2	1
	Weekend	2	2	1
	Holiday	0	0	0
Total	Weekday	22	22	12
	Weekend	22	22	12
	Holiday	12	12	4
Total		56	56	28

[a] Shaded calibration counts were conducted for a 1-hour duration; the remaining counts were conducted for a 2-hour duration.

4.2. VISITOR SURVEYS

4.2.1. INTERCEPT SURVEYS

SCE conducted visitor intercept surveys at the recreation sites within the study area when the site was open between April 2023 and March 2024. Concessionaire-hosted campgrounds are open seasonally, with day-use sites, dispersed camping areas, and trailheads typically open year-round[8].

SCE deployed survey technicians to implement the in-person visitor intercept survey. Staff approached recreationists at each recreation site and asked if they would be willing to be surveyed. All survey teams included a technician who was a bilingual English/Spanish speaker[9] and equipped with a handheld tablet with the survey questions populated in the Survey123 application. Hard copies of the survey, in both English and Spanish, were also available for recreationists to follow along with during the survey if requested to assist in easing any language barriers. A copy of the survey is provided in Appendix A.

Field technicians remained at each recreation site for a total of 1 hour, conducting as many interviews with recreationists as time allowed. Upon arrival at a site, field technicians would begin in the parking area and seek out recreationists to participate in the survey. If time allowed and all recreationists had been interviewed in the parking area, the field technicians would rove the extent of the recreation site to seek out additional recreationists. If a recreationist declined to partake in the survey, the field technician would record the declined survey in the Survey123 application and a postcard-size version of the survey flyer (in English and Spanish) with an online access code was distributed (Appendix B).

4.2.2. ONLINE SURVEYS

An online survey option was made available via a flyer with a quick-response code (QR code) advertised at all study sites. A link to the survey was also posted on the Project relicensing website (www.sce.com/kr3). Flyers were provided, in English and Spanish, with the QR code, to the USFS to post at the local USFS ranger district station on March 30, 2023, and again on May 8, 2023. In addition, SCE contacted local outfitters to post the survey link and/or flyer at the outfitters' businesses. SCE has also posted the survey flyer at local businesses in Kernville. The online survey was available for a 12-month

[8] Per the SQF website, campground dates are as follows: Limestone Campground, April 1 to October 31; Fairview Campground, April 1 to November 30; Goldledge Campground, May 15 to September 15; Hospital Flat Campground, May 15 to September 15; Thunderbird Group Campground, May 15 to September 15; and Camp 3 Campground, May 15 to September 15. Some sites delayed opening or were temporarily closed in the spring of 2023 due to high spring flows that damaged the sites. Open and closure dates will be noted in the final report.

[9] Field technicians noted the primary language of all respondents. If the primary language was noted as Spanish, field technicians translated for respondents on an as needed basis.

period (April 2023 to March 2024) in order to capture visitor use through the shoulder seasons (fall/spring) and the winter season. A copy of the flyer is in Appendix B.

The online survey followed the same structure and format as the in-person intercept surveys and collected recreation user demographics, activities, perception and experience, and feedback (conditions and needs). The data collected will be used to document recreation use (e.g., type, volume, and location) and assist in the development of recreation use estimates for the Project Area, similar to the visitor intercept surveys.

4.3. SPOT AND CALIBRATION COUNTS

4.3.1. SPOT COUNTS

To document recreation use and use patterns, spot counts were conducted concurrently with the visitor intercept surveys on weekdays, weekends, and holidays (as applicable) monthly. Spot counts were conducted at day-use sites, dispersed camping areas, trailheads and the day-use portions of sites located adjacent to campgrounds (see Section 3.2). Upon arrival at these locations, the field technician roamed the parking area and counted the number of vehicles and people observed. Spot counts were also conducted at developed campgrounds. At the developed campgrounds, the field technician roamed the campground counting the number of sites that were occupied.

Spot counts were conducted concurrently with the visitor intercept surveys, and therefore, sampling dates, start times, and direction of travel were selected using the methodology noted in Section 4.1. Spot counts were conducted for a total of 56 days in the April 2023 to March 2024 study period. During each spot count, a field technician took approximately 5 to 15 minutes to record the following information: date, time, weather conditions, number of vehicles observed in the recreation site parking area, state of origin for each license plate (no other identifying information), number of visitors observed at the site, and type of recreation activities observed. Data were collected in the Survey123 application based on the spot count form developed for this study (Appendix C).

4.3.2. CALIBRATION COUNTS

Between April 1 and May 28, 2023, SCE conducted 1--hour calibration counts at recreation sites[10] in the study area 1 weekday, 1 weekend day, and 1 holiday weekend day (Memorial Day) in April and May. Calibration counts included recording the following information: number of people observed, observed activities, number of vehicles and trailers, and time in and time out during the 1-hour count. Following USFS SQF's request and subsequent decision to remove all cameras (see Section 4.7, *Study Plan Variances)* on May 24, 2023, 2-hour calibration counts, and an additional spot count were added to

[10] Developed campgrounds were not included in calibration count data collection as the intent of a calibration count is to determine the site turnover rate. Use at developed campgrounds will be summarized based on actual use records kept by the USFS, once provided.

the REC-2 Study. On June 19, 2023, SCE began conducting and continues to conduct additional spot and calibration counts at each recreation site.

During each calibration count, the field technician arrives on-site and counts (1) all of the vehicles in the parking area at the start and end of the shift, (2) all vehicles that enter and exit the parking area, and (3) the number of persons observed per vehicle (when a group was seen and could be associated with a vehicle in the parking area). This information is used to determine the average vehicle trip length (turnover rate) at each recreation site and the average number of people per vehicle (or group size). Data were collected in the Survey123 application using the calibration count form developed for this study (Appendix D).

Refer to Section 4.1 for a discussion of the selection of sampling dates, start times, and directions for the intercept surveys. Additionally, dispersed campgrounds were randomly selected to be surveyed either at the beginning or the end of the shift in order to collect both morning and evening data for these sites. SCE has completed five 1-hour calibration count days and 23 2-hour calibration count days during the period April 2023 through March 2024. As proposed in the ISR, SCE will conduct two additional weekday, two additional weekend, and one additional holiday weekend spot and calibration count during the April 2024 through May 2024 period.

4.4. QUALITY ASSURANCE AND QUALITY CONTROL MEASURES

All field data (spot count and calibration data) and survey data (intercept and online surveys) collected as part of this study are subject to a rigorous multi-step QA/QC protocol to validate the dataset used in the recreation use analyses. The QA/QC protocol involves a multi-stage approach to ensure the integrity and accuracy of the data as follows:

- QC1 focuses on the basic validation of the data.
- QC2_1 is a more detailed examination of the data to identify and address outliers or suspect values. Data are examined to identify erroneously repeated data, data with questionable validity, or data that contain suspect information otherwise not captured.
- QC2_2 includes a cross-check for further corrections, with a subsequent commitment to changes made.
- QC3a entails a double-check of notes and corrections, followed by final calculations and the removal of marked entries, as applicable.
- QC3b serves as the last cleaning stage before performing a final review in R Studio, which involves the removal of erroneous columns and notes and the transformation of calculations into values through copy/paste. In R Studio, the frequencies of all variables are reviewed, and open-ended responses are consolidated.

4.5. USFS SQF Developed Campground Visitation Data

SCE is coordinating with the USFS SQF to obtain actual use records at the developed campgrounds. To the extent data is available, SCE will summarize this information in the Final Technical Memorandum.

4.6. Current Recreation Use and Density Estimates

The spot and calibration count data were analyzed to estimate recreation use at recreation sites[11] using the following calculation (Pollock et al., 1994):

Average Vehicle Count (by Month and Day Type) (spot count data)

X Average Group Size (calibration count data, online survey data, and visitor intercept survey data)

X Recreation Day[12] Length (12 hours assumed for day-use and 24 hours assumed for overnight use)

X Number of Days in the Population (by Season and Day Type)

÷ Average Trip Length (turnover rate) (calibration count data, online survey data, and visitor intercept survey data)

= Estimated Number of Recreation Days (by Season and Day Type)

Average recreation use was calculated using data collected from the visitor intercept surveys, online surveys, spot counts, and calibration counts. Recreation user day estimates based on vehicle counts used an average group size per vehicle calculated from the calibration counts. Estimates are categorized by site type and activity based on weekday, weekend, and holiday weekend, as well as by monthly total use.

The parking capacity for a recreation site was defined as the number of vehicles that can be parked at a recreation site at one time based on the number of available parking spaces associated with that site. Parking capacities for each site with a parking area were described in the Rec 3 Technical Memorandum.[13] To determine the capacity utilization (density analysis), the average number of vehicles observed on holiday and non-holiday weekends was identified from the spot counts. This was divided by the available parking capacity. The formula for determining capacity utilization is shown below.

[11] Developed campgrounds were not included in this assessment. Use at developed campgrounds will be summarized based on actual use records kept by the USFS, once provided.

[12] As defined by FERC, a recreation day is each visit by a person to the study site for recreational purposes during any portion of a 24-hour period.

[13] Site 1-Johnsondale Bridge River Access and Site 2-Brush Creek Dispersed Camping were not included in the REC-3 Study; however, as part of this analysis parking capacity was estimated from Google Earth imagery.

$$\left(\frac{Total\ Average\ Vehicles}{Parking\ Capacity}\right) * 100$$

A complete data analysis will be conducted following the field data collection efforts and the final results will be presented in the Final Technical Memorandum.

4.7. STUDY PLAN VARIANCES

Study implementation generally followed the methods described in SCE's RSP Package (SCE, 2022) and as amended by FERC in their SPD (FERC, 2022) with the following variances, as reported in the October 9, 2023, ISR Technical Memorandum.

4.7.1. TRAIL CAMERAS

FERC staff recommended that SCE install trail cameras to supplement in-person spot counts to collect additional recreation use data at each site in the study area (FERC, 2022). SCE evaluated each of the 25 recreation sites and identified several challenges to installing cameras at many of the sites. These challenges include limited suitable mounting locations that would provide a high vantage point to capture the entire site, obstructed lines of site due to the large size of many facilities or vegetation blocking parking areas, and the potential for vandalism if the camera was mounted too close to the ground. Due to these challenges, SCE proposed an alternative approach to the stakeholders via email on March 3, 2023, that included installing cameras at five different recreation locations where a suitable installation location was identified and the camera angle could capture all or most of the entire site, be mounted on an SCE transmission line pole (minimize theft and provided a high vantage point) and be camouflaged to minimize vandalism. Since cameras were only going to be placed at a sub-set of recreation sites, SCE added a 1-hour calibration count at all 25 sites to supplement the camera information.

Based on stakeholder consultation regarding camera installation at all sites consistent with FERC's SPD (Section 6.0, *Study-Specific Consultation*), SCE revised its approach and proceeded with installing cameras at all 25 recreation sites. On May 24, 2023, SCE received an email and letter from SQF via Advenco/ExplorUS (concessionaire) [personal communication, Public Services Staff Officer, SQF, May 24, 2023], stating that SCE must immediately remove all cameras—and signage about the cameras—from 11 SQF-owned recreation sites (i.e., developed campgrounds). The request from the concessionaire noted that California is a two-party consent state and also included other provisions under California Video Recording Law stating that it is illegal to film someone while they are in a location with any reasonable expectation of privacy, such as a bedroom, bathroom, locker room, fitting room, or medical office, and that this expectation could be expanded to a tent or campsite.

SCE immediately halted installation of the remaining cameras and subsequently took down all previously installed cameras. Cameras were removed between May 25, 2023, and June 16, 2023.

With the removal of all trail cameras, SCE revised the methodology to include 2-hour calibration counts and a spot count. The data collection is scheduled on different days than the visitor intercept surveys. This alternative methodology increased the amount of recreation use data collected and provided a comprehensive dataset to characterize recreation use and analyze environmental effects, thereby achieving a similar outcome to the trail cameras.

4.7.2. INTERCEPT SURVEYS

SCE incorporated FERC's recommended changes as described in the SPD (FERC, 2022), including those made by the USFS SQF; however, some questions were re-worded for clarity and consistency while retaining the overall intent of the question.

In the SPD, FERC recommended expanding data collection and visitor surveys for 1 full year, from January 2023 through December 2023. Based on the timing of the issuance of the SPD, SCE could not begin conducting surveys until April 2023 due to the increased level to coordinate and deploy field staff and make the recommended changes to the survey questionnaire. To collect 1 full calendar year of survey data SCE conducted the study from April 2023 through March 2024, including shoulder and winter recreation use in the Project Area.

Surveys were conducted during daylight hours (i.e., between sunrise and sunset) rather than from 7 a.m. to 7 p.m. on each survey day, as stated in SCE's RSP. SCE proposed to continue with the revised start and end time of surveys to be conducted between sunrise and sunset, especially as daylight hours are shorter during the fall and winter months.

In the RSP, SCE proposed conducting intercept surveys on two circuits, upper and lower canyons. In the SPD, FERC recommended adding recreation sites in the 1.9-mile reach above the FERC Project Boundary. Given the addition of sites, SCE reassessed the survey circuits and combined all sites into one circuit. With all the recreation sites combined into one circuit, each site was assigned a unique number (1–25) while maintaining the integrity of randomization by continuing to select a random starting site, time, and direction of travel, as noted in the RSP.

5.0 PRELIMINARY DATA SUMMARY

SCE is completing additional data collection efforts, therefore the analysis and preliminary information in this updated Interim Technical Memorandum focuses on the peak summer-use period of Memorial Day 2023 through Labor Day 2023. Placeholders are provided, as appropriate, identifying areas where data collection or analysis is still ongoing and where additional information will be provided in the complete REC-2 Final Technical Memorandum.

5.1. VISITOR INTERCEPT AND ONLINE SURVEYS

The visitor intercept surveys provide a variety of information for the Project Area including demographics, user experience, historical recreation use, aesthetics, angling experience, and user feedback. Table 5.1-1 identifies the number of intercept surveys completed per season during the study period.

Table 5.1-1. Number of Intercept Surveys Conducted

Season	Study Time Period	Intercept Surveys	Online Surveys	Total
Spring	April 1 to May 26, 2023; March 1–31, 2024	40/TBD	2/TBD	42/TBD
Summer	May 27 to September 3, 2023	558	10	568
Fall	September 4 to November 30, 2023	298	15	313
Winter	December 1, 2023 to February 29, 2024	TBD	TBD	TBD
	Total	**896**	**27**	**923**

TBD = to be determined (due to still ongoing data collection activities)

Between April 1 and November 30, 2023, a total of 1,270 surveys were attempted. Of those, 304 visitors refused to participate in the survey and 77 were determined to be duplicates and not included in the final analysis, leading to an intercept survey participation rate of approximately 70 percent, a total of 896 completed intercept surveys. During that time, a total of 27 online surveys were completed, for a combined total of 923 survey responses. For the preliminary analysis provided in this updated Interim Technical Memorandum, only those surveys completed during the summer period were analyzed, totaling 568 completed surveys (558 intercept and 10 online).

Data are presented based on recreation site type as outlined in Table 3.2-1. Respondents did not always provide responses to each question; therefore, the total responses for each question may be less than 568 responses and the number of responses received is provided for each question (Q), as appropriate.

5.1.1. VISITOR DEMOGRAPHICS

Of those who responded to this survey question, 97.0 percent of respondents indicated they were from California, and the remaining 3.0 percent were from Alaska, Colorado, Minnesota, Nevada, Oregon, or Texas (Table 5.1-2).

Table 5.1-2. Respondents Indicated Home Zip Code (Q1)

State	Responses	Percent
California	186	97.0
Alaska	1	0.5
Colorado	1	0.5

State	Responses	Percent
Minnesota	1	0.5
Nevada	1	0.5
Oregon	1	0.5
Texas	1	0.5
International	0	0.0
Total	**192**	**100.0**

When asked how far they traveled to get to the recreation site, the majority of respondents (67.1 percent) indicated they had traveled greater than 101 miles. Less than 10 percent of respondents indicated they had traveled less than 50 miles to visit the site (Table 5.1-3).

Table 5.1-3. Summary of Distance Traveled to Site (Q2)

Distance Traveled	Responses	Percent
0-25 miles	16	3.1
26-50 miles	35	6.8
51-75 miles	41	8.0
76-100 miles	76	15.0
>101 miles	343	67.1
Total	**511**	**100.0**

Of those surveyed, when asked about their age, the majority of the respondents ranged from 20 to 59 years old, with 56.6 percent indicating they were between 30-49 years old (Table 5.1-4).

Table 5.1-4. Respondents Indicated Age (Q3)

Age	Responses	Percent
<16 years	1	0.2
16-19 years	4	1.0
20-29 years	75	17.6
30-39 years	105	24.6
40-49 years	136	32.0
50-59 years	76	17.8
60-69 years	26	6.1
>70 years	3	0.7
Total	**426**	**100.0**

Table 5.1-5 summarizes responses received from questions 4 and 5 that asked how many people in their party were older than 18 years old and how many people in their party were under 18 years old. The overall average group size was 5.2 people with a median of 4 people and a maximum group size of 54 people. Based on the responses, approximately 73.8 percent of the people in their party were 18 or older, and the remaining 26.2 percent were under 18.

Table 5.1-5. Respondents Group Size and Age Category (Q4/Q5)

Age Group	Responses	Group Size				Total People
		Average	Median	Minimum	Maximum	
18 years or older	568	3.9	3	1	40	2,187
Under 18 years	564	1.4	0	0	36	776
Total	**568**	**5.2**	**4**	**1**	**54**	**2,963**

Respondents were asked to indicate what gender, if any, they identified as, with 43.1 percent of respondents reported being female and 56.3 percent of respondents reported being male (Table 5.1-6). The remaining 0.6 percent reported their gender as other or indicated that they prefer not to answer.

Table 5.1-6. Respondents Indicated Gender Identification (Q6)

Gender	Responses	Percent
Female	226	43.1
Male	295	56.3
Other	1	0.4
Prefer not to answer	2	0.2
Total	**524**	**100.0**

When asked to indicate their ethnicity, approximately 48.6 percent of respondents reported being Spanish/Latino, while 43.0 percent of respondents reported being White. The remaining respondents reported ethnicity of Asian/Pacific Islander, Native American, or Black (Table 5.1-7).

Table 5.1-7. Respondents Indicated Ethnicity (Q7)

Ethnicity	Responses	Percent
Asian/Pacific Islander	18	3.5
Black	1	0.2
Native American	4	0.8

Ethnicity	Responses	Percent
Spanish/Latino	253	48.6
White	223	43.0
Other	20	3.9
Total	**519**	**100**

When asked to indicate their total household income, the majority of respondents (73.1 percent) reported their total household income as being $80,000 or less. The remaining 26.9 percent indicated their total household income was greater than $81,000 (Table 5.1-8).

Table 5.1-8. Respondents Indicated Household Income (Q8)

Household Income	Responses	Percent
< $40k	56	14.4
$40k-80k	229	58.7
> $81k	105	26.9
Total	**390**	**100.0**

When asked to indicate their employment status, the majority of the respondents (74.6 percent) indicated they were employed full-time (Table 5.1-9).

Table 5.1-9. Respondents Indicated Employment Status (Q9)

Employment Status	Responses	Percent
Full-time	320	74.6
Homemaker	17	4.0
Part-time	30	7.0
Retired	27	6.3
Self-employed	21	4.9
Student	4	0.9
Unemployed	7	1.6
Other	3	0.7
Total	**429**	**100.0**

When asked what their primary occupation was, if employed, the majority of the respondents indicated their occupation was related to construction, education, service industry, healthcare/wellness, or the trades industry (Table 5.1-10).

Table 5.1-10. Respondents Indicated Occupation (Q10)

Occupation	Responses	Percent
Caregiver	11	2.7
Construction	36	8.8
Corporate	28	6.8
Education	35	8.6
Entertainment/Hospitality	5	1.2
Finance	8	2.0
Food/Drink/Service Industry	35	8.6
Healthcare/Wellness	36	8.8
Home/Yard Services	22	5.4
Military	2	0.5
Misc.	34	8.3
Municipal	8	2.0
Not Applicable	26	6.4
Retail	26	6.4
Retired	5	1.2
Sales	8	2.0
STEM (science, technology, engineering, and mathematics)	28	6.8
Trades	37	8.9
Transportation	19	4.6
Total	**409**	**100.0**

5.1.2. CURRENT TRIP INFORMATION AND EXPERIENCE

Table 5.1-11 summarizes responses of what type of day the respondents arrived at the recreation site by site type. Overall, during the summer season, 47.4 percent of respondents indicated arriving on a holiday, followed by weekends (36.3 percent), and the remaining 16.3 percent arrived during the weekday. The site types with the highest number of responses included the dispersed camping areas (40.8 percent) and day-use sites adjacent to developed campgrounds (20.8 percent).

Table 5.1-11. Summary of Respondents Arrival Day per Site Type (Q11)

Month	Type of Day	Number of Responses per Site Type						Total Responses	
		Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
May	Holiday	7	12	19	14	1	0	**53**	**9.3**
June	Holiday	8	8	22	8	4	1	**51**	**9.0**
	Weekday	0	4	5	4	1	0	**14**	**2.5**
	Weekend	8	11	36	11	1	1	**68**	**12.0**
July	Holiday	12	9	24	11	3	3	**62**	**10.9**
	Weekday	6	5	8	5	3	0	**27**	**4.8**
	Weekend	6	16	30	19	0	2	**73**	**12.9**
August	Weekday	12	7	22	6	0	2	**49**	**8.6**
	Weekend	13	12	22	17	0	1	**65**	**11.4**
September	Holiday	28	7	43	22	0	4	**104**	**18.2**
	Weekday	0	0	1	1	0	0	**2**	**0.4**
Total Responses		**100**	**91**	**232**	**118**	**13**	**14**	**568**	**100.0**
Percent Responses		**17.6**	16.0	**40.8**	**20.8**	2.3	2.5	100.0	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

Respondents were asked to indicate if the site they were surveyed at was their primary destination, with 72.9 percent indicating yes, the site they were visiting was their primary destination for their trip (Table 5.1-12). Of those surveyed, day-use sites were noted as not being the primary destination most frequently (47.0 percent).

Table 5.1-12. Respondents Primary Destination (Q12)

Primary Destination	Primary Destination per Site Type						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Total	Percent
Yes (%)	53.0	82.0	76.0	72.0	87.0	78.0	**256**	**72.9**
No (%)	47.0	18.0	24.0	28.0	13.0	22.0	**95**	**27.1**
Total Responses	**55**	**56**	**144**	**72**	**15**	**9**	**351**	**100.0**

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

Questions 13 and 14 both pertained to length of stay and have been combined and summarized in Table 5.1-13. The average days spent at a site was 4.4 days with a median of 4 days. The maximum length of stay was 55 days.

Table 5.1-13. Length of Stay by Site Type (Q13/Q14)

Site Type	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Powerhouse	Total
Responses	100	91	232	118	27	14	568
Average Days	3.4	4.8	4.6	4.7	2.9	2.2	4.4
Median Days	2	4	4	4	2	2	4
Minimum Days	1	1	1	1	1	1	1
Maximum Days	12	16	55	14	9	5	55

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

Respondents were asked to indicate their primary reason for selecting the recreation site location (Table 5.1-14). During the summer season, 26.1 percent of respondents indicated their primary reason for selecting the site was river access.

Table 5.1-14. Respondents Primary Reason for Selecting Site Location (Q15)

Improvement	Number of Responses per Site Type						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
Availability	1	5	7	10	1	0	**24**	**5.2**
Biking	0	0	1	0	1	0	**2**	**0.4**
Boating	5	0	1	3	0	2	**11**	**2.4**
Camping	3	4	18	10	0	0	**35**	**7.5**
Day Use	2	1	0	1	0	0	**4**	**0.9**
Family Trip	1	3	5	4	0	1	**14**	**3.0**
Fishing	7	2	0	0	0	1	**10**	**2.2**
Frequent Visitor	2	6	9	7	2	0	**26**	**5.6**
Hiking	3	0	2	0	15	0	**20**	**4.3**
Holiday/Vacation/ Special Occasion	3	2	2	3	0	2	**12**	**2.6**
Location	3	5	0	5	0	0	**13**	**2.8**
Misc.	5	9	26	8	2	0	**50**	**10.8**
Restrooms	0	0	0	1	0	0	**1**	**0.2**

Improvement	Number of Responses per Site Type						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
River Access	19	14	62	22	1	4	**122**	**26.1**
Scenery/Views	16	16	21	10	2	1	**66**	**14.2**
Spacious/Solitude	1	4	22	13	0	1	**41**	**8.8**
Recommended by others	1	5	7	1	0	0	**14**	**3.0**
Total Responses	**72**	**76**	**183**	**98**	**24**	**12**	**465**	**100.0**
Percent Responses	**15.5**	**16.3**	**39.4**	**21.1**	**5.2**	**2.6**	**100.0**	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

When asked to identify the primary activity they participated in that day while at the recreation site, 63.8 percent of respondents indicated that camping was their primary activity (Table 5.1-15). Those who indicated camping as their primary activity were surveyed at dispersed camping areas, developed campgrounds, and day-use sites adjacent to developed campgrounds. Activities identified in the other category include swimming, tubing, and managing the site. Two respondents provided no answer for their other activities.

Table 5.1-15. Respondents Primary Recreation Activity (Q16a)

Primary Activity	Primary Activity Type per Site Type (Number of Responses)						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
Biking	0	0	2	0	1	0	3	**0.6**
Camping	16	70	169	88	3	2	348	**63.8**
Fishing	7	2	3	1	0	3	16	**2.9**
Other	5	2	1	1	0	0	9	**1.7**
Photography/ Painting	1	1	0	0	0	1	3	**0.6**
Picnicking	8	1	9	2	0	1	21	**3.8**
Relaxing	21	4	19	11	1	4	60	**11.0**
Scenic Driving	1	0	1	0	0	0	2	**0.4**
Hiking/Walking/ Trail Use	12	4	11	3	20	0	50	**9.2**

Primary Activity	Primary Activity Type per Site Type (Number of Responses)						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
Viewing Scenery	5	1	6	3	0	1	16	**2.9**
Viewing Wildlife	1	0	1	0	0	0	2	**0.4**
Whitewater Boating/Rafting	6	0	3	4	0	2	15	**2.7**
Total Responses	**83**	**85**	**225**	**113**	**25**	**14**	545	**100.0**
Percent Responses	**15.2**	**15.6**	**41.3**	**20.7**	**4.6**	**2.6**	100.0	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

When asked what other activities (secondary activities) they participated in at the recreation site, the top three activities were relaxing (19.6 percent), camping (16.2 percent), and picnicking (14.6 percent). Activities identified in the other category include eating, swimming, exploring, tubing, and visiting the river (Table 5.1-16).

Table 5.1-16. Respondents Other Recreation Activities (Q16b)

Secondary Activity	Other Activity Type per Site Type (Number of Responses)						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
Biking	4	4	9	8	4	0	**29**	**1.6**
Camping	20	59	139	70	4	2	**294**	**16.2**
Fishing	16	15	12	9	0	3	**55**	**3.0**
Other	1	1	6	7	0	0	**15**	**0.8**
Photography/ Painting	11	19	49	30	1	1	**111**	**6.1**
Picnicking	34	44	119	62	1	5	**265**	**14.6**
Relaxing	45	64	155	75	7	8	**354**	**19.6**
Scenic Driving	16	20	45	20	1	2	**104**	**5.7**
Hiking/Walking/ Trail Use	20	41	94	46	14	4	**219**	**12.1**
Viewing Scenery	27	41	78	45	10	7	**208**	**11.5**
Viewing Wildlife	24	21	43	29	5	3	**125**	**6.9**

Secondary Activity	Other Activity Type per Site Type (Number of Responses)						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
Whitewater Boating/Rafting	7	8	7	11	0	2	**35**	**1.9**
Total Responses	**225**	**337**	**756**	**412**	**47**	**37**	**1,814**	**100.0**
Percent Responses	**12.4**	**18.6**	**41.7**	**22.7**	**2.6**	**2.0**	100.0	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

Respondents were asked if the flows in the NFKR affected their ability to participate in a water-related activity (Table 5.1-17). Of the respondents who indicated they participated in a water-related activity, approximately 65.7 percent indicated that the flow did not affect their planned water-related activities. Approximately 27.9 percent said the flow was too high, and 3.6 percent said that it was too low. Approximately 2.8 percent indicated that the flows affected their planned water-related activities in other ways; however, they did not provide more details.

Table 5.1-17. Effect of Flows on Activity (Q17)

Flow Effect	Flow Effect per Site Type (Number of Responses)						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
No Effect	30	22	76	26	4	7	165	**65.7**
Yes High	7	15	23	21	2	2	70	**27.9**
Yes Low	1	2	4	2	0	0	9	**3.6**
Yes Other	0	1	4	1	0	1	7	**2.8**
Total Responses	**38**	**40**	**107**	**50**	**6**	**10**	**251**	**100.0**
Percent Responses	15.1	15.9	42.7	19.9	2.4	4.0	100.0	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

When asked to identify their activity level, approximately 68.9 percent of respondents indicated moderate, followed by 21.5 percent high, and 9.6 percent low activity levels (Table 5.1-18).

Table 5.1-18. Respondents Indicated Activity Level (Q18)

Activity Level	Activity Level per Site Type (Number of Responses)						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
High	11	19	41	30	3	2	**106**	**21.5**
Low	8	11	15	13	0	0	**47**	**9.6**
Moderate	52	49	152	61	18	7	**339**	**68.9**
Total Responses	**71**	**79**	**208**	**104**	**21**	**9**	**492**	**100.0**
Percent Responses	**14.4**	**16.1**	**42.3**	**21.1**	**4.3**	**1.8**	**100.0**	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

Respondents were asked to identify how much they expected to spend or had spent in the local area during their entire trip (Table 5.1-19). The average amount spent per trip was $369, and the median amount spent was $300. Based on the data collected, on average, people who visited the developed campground trips spent more during their trip than any other site type.

Table 5.1-19. Respondents Trip Expenditures (Q19)

Site Type	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Total/ Average
Response Count	86	91	231	118	27	14	**567**
Mean	$364	$438	$368	$377	$206	$215	**$369**
Median	$300	$300	$300	$300	$200	$175	**$300**
Minimum	0	0	0	0	0	0	**0**
Maximum	$3,000	$5,000	$6,000	$2,000	$800	$1,000	**$6,000**

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

Respondents were asked how they would rate their overall satisfaction or dissatisfaction with their recreation experience that day on a scale of 1 to 5, with 1 indicating very dissatisfied and 5 indicating very satisfied. Respondents were also given a list of categories and asked to rate the importance of each to the overall quality of their recreation experience on this trip, with 1 being unimportant and 5 being very important (Table 5.1-20). During the summer season, satisfaction was between 4.1 and 4.7, indicating that respondents were satisfied to very satisfied across all categories. The overall importance rating for all experience categories is above 4, indicating that all of the categories are important or very important to the respondents.

Table 5.1-20. Average Respondents Overall Satisfaction Ratings (Q20)

Category	Responses [a]	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Total All Data	Overall Importance [b]
1. Overall satisfaction of your trip	561	4.8	4.6	4.7	4.6	4.7	4.8	4.7	4.7
2. Satisfaction of primary activity, as listed above in Q16	559	4.4	4.5	4.4	4.3	4.4	4.2	4.4	4.4
3. Cost of facility access fees	530	4.7	4.6	4.7	4.4	4.8	4.6	4.6	4.6
4. River access	553	4.4	4.3	4.3	4.3	4.3	4.6	4.3	4.3
5. Number of people encountered/ crowdedness	553	4.6	4.6	4.6	4.5	4.7	4.3	4.6	4.5
6. Available parking when you arrived	554	4.3	4.6	4.4	4.4	4.2	4.8	4.4	4.4
7. Feeling of safety	556	4.6	4.6	4.6	4.6	4.7	4.7	4.6	4.6
8. Adequacy of site access for persons with disabilities	524	3.9	4.0	4.3	4.0	4.2	4.0	4.1	4.1
9. Scenery at this site/area	553	4.7	4.6	4.7	4.6	4.6	4.7	4.6	4.7
10. Maintenance (physical condition) of facilities	555	4.4	4.2	4.4	4.2	4.2	4.3	4.3	4.3
11. Cleanliness of facilities	554	4.5	4.1	4.5	4.5	4.3	4.7	4.4	4.4
12. Access to restroom/shower/ drinking water	549	4.1	4.0	4.2	4.1	4.0	4.4	4.2	4.2
13. Informational/educational opportunities	545	4.3	4.2	4.5	4.2	4.6	4.7	4.4	4.3
14. Flows in the river	553	4.0	3.9	4.1	4.0	4.3	4.6	4.1	4.1

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

[a] Respondents rating of their overall satisfaction or dissatisfaction with their recreation experience that day on a scale of 1 to 5, with 1 indicating very dissatisfied and 5 indicating very satisfied.

[b] Respondents rating of the importance of each category to the overall quality of their recreation experience that day on a scale of 1 to 5, with 1 being unimportant and 5 being very important.

5.1.3. PAST RECREATION TRIPS

Respondents were asked to indicate the number of times they visited the recreation sites within the study area in the last 12 months and the length of time spent at the sites (Table 5.1-21). The two respondents that answered "other" noted that they had visited River's Edge in summer and fall, and all of the sites in the fall.

Table 5.1-21. Average Number of Visits in Last 12 Months (Q21)

Recreation Site Type	Responses	Average Number of Visits [a]				Total Average Number of Visits	Approximate Amount of Time On-Site (Days)
		Spring (March-May)	Summer (Jun-Aug)	Fall (Sept-Nov)	Winter (Dec-Feb)		
Day Use	11	1.3	2	1	1	**2.4**	**3.6**
Developed Campground	5	2	1	2	0	**2.0**	**10.2**
Dispersed Camping	17	2.5	2.5	1.7	2.5	**3.8**	**10.3**
Day-use Site adjacent to Developed Campground	5	0	1.8	0	0	**1.8**	**1.9**
Trailhead	1	3	0	0	0	**3**	**3**
KR3 Powerhouse Whitewater Put-in/Take-out	2	22	17	13	24	**64**	**1.3**
Other	2	0	2.5	1	0	**3**	**13**
Total average per season	**43**	**4.1**	**3.1**	**3.6**	**7.5**	**5.8**	**7.1**

[a] Based on summer visitor data only.

Respondents were asked to indicate their change in visitation to the area between the Fairview Dam and the KR3 Powerhouse in the last 12 months, and whether they had visited more, less, or about the same as the respondent normally would. The majority of respondents indicated they visited the same number of times (85.9 percent) (Table 5.1-22).

Table 5.1-22. Change in Visitation Last 12 Months (Q22)

Frequency of Visit Site	Percent Change in Visitation Last 12 Months per Site Type						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trailhead	KR3 Powerhouse	Number	Percent
Less	6	10	13	12	1	1	**43**	**11.4**
More	2	3	3	2	0	0	**10**	**2.7**
Same	45	46	148	61	15	8	**323**	**85.9**
Total Responses	**53**	**59**	**164**	**75**	**16**	**9**	**376**	**100.0**
Percent Responses	**14.1**	**15.7**	**43.6**	**19.9**	**4.3**	**2.4**	**100.0**	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

5.1.4. SURROUNDING LANDSCAPES

Respondents were asked to rate the scenic quality of the NFKR area in general on a scale of 1 to 5, with 1 indicating very poor and 5 indicating very good. The mean scenic quality rating at all site types is 4.6 with the exception of the KR3 Powerhouse Whitewater Put-in/Take-out, which has a mean scenic quality rating of 4.3. Those who rated the NFKR area's scenic quality as very poor or poor denoted that this was due to poor river flow, poor views, and impacts from fires (Table 5.1-23).

Table 5.1-23. Respondents Rating of Scenic Quality (Q23)

Scenic Quality Rating	Rating of Scenic Quality by Site Type (Number of Responses)						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trailhead	KR3 Powerhouse	Number	Percent
Mean	4.6	4.6	4.6	4.6	4.6	4.3	**4.6**	**N/A**
Median	5	5	5	5	5	4	**5**	**N/A**
1 Very Poor	0	0	0	0	0	0	**0**	0.0
2 Poor	1	1	1	0	0	0	**3**	0.6
3 Neutral	4	4	6	5	3	1	**23**	4.3
4 Good	20	28	61	35	4	7	**155**	28.8
5 Very Good	59	54	149	73	18	5	**358**	66.3
Total Responses	**84**	**87**	**217**	**113**	**25**	**13**	**539**	**100.0**
Percent Responses	**15.6**	**16.1**	**40.3**	**21.0**	**4.6**	**2.4**	**100.0**	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out; N/A = not applicable

Respondents were asked to identify the scenic feature that most attracted them to this area of the NFKR (Table 5.1-24). Approximately 60.7 percent of respondents indicated that the flows in the NFKR most attracted them to the area. Additionally, 32.7 percent of respondents noted that the general scenery, such as rock outcrops, mountains, and valleys most attracted them to the area. Scenic features identified as other included viewing wildlife and the river.

Table 5.1-24. Respondents Identified Key Scenic Features(Q24)

Rating Factor	Identified Key Scenic Feature per Site Type (Number of Responses)						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
General scenery such as rock outcrops, mountains and valleys	26	41	58	32	8	3	**168**	32.7
Flows in the NFKR	45	43	141	69	7	7	**312**	60.7
Scenery was not a consideration when selecting this location	2	0	7	2	5	0	**16**	3.1
Project infrastructure (flowline, powerhouse, dam, and Other built facilities)	1	1	5	3	0	0	**11**	2.1
Other	1	0	2	1	3	0	7	**1.4**
Total Responses	**75**	**85**	**213**	**107**	**23**	**11**	**514**	100.0
Percent Responses	14.6	16.5	41.5	20.8	4.5	2.1	100.0	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out; NFKR = North Fork Kern River

Respondents were asked to rate the scenic qualities in the area between Fairview Dam and the KR3 Powerhouse on a scale of 1 to 5, with 1 indicating very poor and 5 indicating very good, for: (1) general scenery such as rock outcrops, mountains and valleys (Table 5.1-25); (2) river flows between Fairview Dam and KR3 Powerhouse (Table 5.1-26), and (3) Project infrastructure (flowline, powerhouse, dam, other built facilities) (Table 5.1-27). For all three categories, respondents indicated primarily good or very good scenic qualities, with the average rating for all site types above 4 (good). Those who rated the scenic qualities as poor or very poor stated their reasons were related to the effects of heavy river flows, high water levels, and the presence of the Project facilities on the scenic quality of the site.

Table 5.1-25. Rating of General Scenic Qualities (Q25a)

Scenic Quality Rating	Rating of Scenic Quality by Site Type (Number of Responses)						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trailhead	KR3 Powerhouse	Number	Percent
Mean	4.7	4.8	4.7	4.6	4.6	4.9	**4.7**	**N/A**
Median	5	5	5	5	5	5	**5**	**N/A**
1 Very Poor	0	0	0	1	0	0	**1**	**0.2**
2 Poor	0	0	0	1	0	0	**1**	**0.2**
3 Neutral	2	2	3	3	2	0	**12**	**2.2**
4 Good	20	15	52	33	5	2	**127**	**23.4**
5 Very Good	61	69	166	76	18	12	**402**	**74.0**
Total Responses	**83**	**86**	**221**	**114**	**25**	**14**	**543**	**100.0**
Percent Responses	**15.3**	**15.8**	**40.7**	**21.0**	**4.6**	**2.6**	**100.0**	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out; N/A = not applicable

Table 5.1-26. Rating of North Fork Kern River Flows Scenic Qualities (Q25b)

Scenic Quality Rating	Rating of Scenic Quality of NFKR Flows by Site Type (Number of Responses)						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trailhead	KR3 Powerhouse	Number	Percent
Mean	4.3	4.4	4.4	4.3	4.6	4.1	**4.3**	**N/A**
Median	5	5	5	5	5	4	**5**	**N/A**
1 Very Poor	3	3	7	4	0	0	**17**	**3.2**
2 Poor	1	2	7	2	0	1	**13**	**2.4**
3 Neutral	11	7	8	13	2	1	**42**	**7.8**
4 Good	20	22	74	34	5	7	**162**	**30.1**
5 Very Good	48	50	123	60	18	5	**304**	**56.5**
Total Responses	**83**	**84**	**219**	**113**	**25**	**14**	**538**	**100.0**
Percent Responses	**15.4**	**15.6**	**40.8**	**21.0**	**4.6**	**2.6**	**100.0**	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out; N/A = not applicable; NFKR = North Fork Kern River

Table 5.1-27. Rating of Scenic Qualities Project Infrastructure (Q25c)

Scenic Quality Rating	Rating of Scenic Quality of Project Infrastructure by Site Type (Number of Responses)						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trailhead	KR3 Powerhouse	Number	Percent
Mean	4.7	4.5	4.6	4.4	4.6	4.4	**4.6**	**N/A**
Median	5	5	5	5	5	5	**5**	**N/A**
1 Very Poor	0	0	3	2	0	0	**5**	**0.9**
2 Poor	1	3	1	1	0	0	**6**	**1.1**
3 Neutral	5	9	7	12	1	2	**36**	**6.8**
4 Good	14	12	48	29	9	4	**116**	**21.9**
5 Very Good	61	57	160	66	15	8	**367**	**69.3**
Total Responses	**81**	**81**	**219**	**110**	**25**	**14**	**530**	**100.0**
Percent Responses	**15.3**	**15.3**	**41.3**	**20.8**	**4.7**	**2.6**	**100.0**	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out; N/A = not applicable

Respondents were asked how often they had visited the area to participate in scenic activities such as photography, painting, scenic driving, viewing scenery, and/or viewing wildlife. Of those surveyed, 67.7 percent of respondents indicated they had never visited the area to participate in scenic activities (Table 5.1-28). Of the 15.5 percent (71 respondents) who said they had visited the area for scenic activities in the past 12 months, the majority of visits were during the fall and winter months (Table 5.1-29).

Table 5.1-28. Visited in Last 12 Months for Scenic Activities (Q26)

Visited for Scenic Activity	Respondents Visited in Last 12 Months for Scenic Activity (Number of Responses)						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trailhead	KR3 Powerhouse	Number	Percent
First Time	9	13	34	17	2	2	**77**	**16.8**
Never	48	51	120	62	20	9	**310**	**67.7**
Yes	7	13	32	14	3	2	**71**	**15.5**
Total Responses	**64**	**77**	**186**	**93**	**25**	**13**	**458**	**100.0**
Percent Responses	**14.0**	**16.8**	**40.6**	**20.3**	**5.5**	**2.8**	**100.0**	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

Table 5.1-29. Average Number of Visits in Last 12 Months for Scenic Activities (Q26)

Season	Average Number of Visits Per Season			Total Responses		
	Mean	Median	Minimum	Maximum	Responses	Percent
Spring	2.8	2	1	24	55	36.0
Summer	2.4	1	1	24	60	39.2
Fall	4.2	1	1	36	26	17.0
Winter	4.0	2	1	24	12	7.8
Total	**N/A**	**N/A**	**N/A**	**N/A**	**153**	**100.0**

N/A = not applicable

5.1.5. ANGLING EXPERIENCES

Respondents were asked if they had fished along the Fairview Bypass Reach prior to this visit. Of the 568 people surveyed, 42 had previously fished along the Fairview Dam Bypass Reach, and 420 had not (Table 5.1-30). Of the 35 who had previously fished and responded to the survey question about type of fishing tackle used, 54.3 percent typically used spin fish with bait, 28.5 percent used spin fish with lures, 8.6 percent used fly fish, and 8.6 percent used both spin fish with bait and lures (Table 5.1.31).

Table 5.1-30. Respondents Fished along Fairview Dam Bypass Reach (Q27)

Prior Fishing Reach Visit	Responses	Percent
No	420	90.9
Yes	42	9.1
Total	**462**	**100.0**

Table 5.1-31. Type of Fishing Tackle (Q28)

Fishing Method	Responses	Percent
Spin Fish with Bait	19	54.3
Spin Fish with Lures	10	28.5
Spin Fish with Bait and Lures	3	8.6
Fly Fish	3	8.6
Total	**35**	**100.0**

Additionally, 87.5 percent of the respondents indicated they fished for fun, with the remaining indicating they fished for food (Table 5.1-32).

Table 5.1-32. Fishing for Fun or Food (Q29)

Fishing Reason	Responses	Percent
Fun	35	87.5
Food	5	12.5
Total	**40**	**100.0**

When asked what their primary reason was for selecting that specific site for angling activities, 27.8 percent of the respondents indicated the fishing (number of fish and success rate) was their primary reason (Table 5.1-33). Miscellaneous reasons accounted for 27.8 percent of responses and typically included rationale such as less crowding, recommended by a friend, or they were participating in camping as well.

Table 5.1-33. Primary Reason for Selecting Site for Angling Activities (Q30)

Reason Indicated	Reason for Selecting Site for Angling Activity (Number of Responses)						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
Fishing	2	2	4	2	0	0	**10**	**27.8**
Frequent Visitor	1	0	1	0	0	0	**2**	**5.6**
Miscellaneous	2	4	3	0	0	1	**10**	**27.8**
Proximity/ Convenient	3	1	0	1	0	0	**5**	**13.9**
River Access	0	0	3	1	1	0	**5**	**13.8**
Solitude	0	1	0	0	0	0	**1**	**2.8**
Water Levels	1	1	0	1	0	0	**3**	**8.3**
Total Responses	**9**	**9**	**11**	**5**	**1**	**1**	**36**	**100.0**
Percent Responses	**25.0**	**25.0**	**30.6**	**13.8**	**2.8**	**2.8**	**100.0**	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

When asked how often they fished the Fairview Dam Bypass Reach in each season over the past 12 months, respondents indicated they visited the most during the summer months with an average of 2.9 visits (Table 5.1-34).

Table 5.1-34. Average Number of Visits in Last 12 Months for Angling Activities (Q31)

Season	Average Number of Visits Per Season				Total Responses	
	Mean	Median	Minimum	Maximum	Responses	Percent
Spring	2.2	2	1	5	24	29.3
Summer	2.9	2	1	6	27	32.8
Fall	1.9	2	1	3	18	22.0
Winter	1.8	2	1	3	13	15.9
Total	**N/A**	**N/A**	**N/A**	**N/A**	**82**	**100.0**

N/A = not applicable

When asked if river flows affected their angling experience in the Fairview Dam Bypass Reach, 60.6 percent of respondents indicated that the river flows did not affect their angling experience (Table 5.1-35).

Table 5.1-35. Effects of River Flows on Angling Experiences (Q32a)

Yes/No	Effects of River Flows on Angling by Site Type (Number of Responses)						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
No	5	6	5	4	0	0	20	60.6
Yes	3	3	4	2	0	1	13	39.4
Total Responses	8	9	9	6	0	1	33	100.0
Percent Responses	24.2	27.3	27.3	18.2	0.0	3.0	100.0	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

Of those respondents that indicated river flows did affect their experience, 92.3 percent stated the season in which they were affected was summer and the primary reason was that river flows were too high (Table 5.1-36 and Table 5.1-37).

Table 5.1-36. Season When River Flows Affected Experience (Q32b)

Season	Effects of River Flows on Angling by Site Type (Number of Responses)						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
Spring	0	0	0	0	0	1	**1**	**7.7**
Summer	3	3	4	2	0	0	**12**	**92.3**
Fall	0	0	0	0	0	0	**0**	**0.0**
Winter	0	0	0	0	0	0	**0**	**0.0**
Total Responses	**3**	**3**	**4**	**2**	**0**	**1**	**13**	**100.0**

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

Table 5.1-37. Reason for River Flows Affected Experience (Q32c)

Reason	Reason River Flows Affected Experience by Site Type (Number of Responses)						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
Too Low	0	0	0	0	0	0	0	0.0
Too High	3	3	3	2	0	1	12	100.0
Other	0	0	0	0	0	0	0	0.0
Total Responses	**3**	**3**	**3**	**2**	**0**	**1**	**12**	**100.0**

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

Respondents were asked to rate (on a scale of 1 to 5, with 1 being very poor and 5 being very good) the conditions of their angling experience that day or on the day of their most recent angling between the Fairview Dam and the KR3 Powerhouse (Table 5.1-38). Approximately 64.9 percent of the respondents indicated the condition of their angling experience was very good. There were three very poor ratings received: one at a day-use site and two at developed campgrounds. Reasons provided for the very poor ratings were lack of fish during the respondent's first time fishing, flows were too high, and flows were too fast.

Table 5.1-38. Respondents Condition Rating of Angling Experience (Q33)

Rating	Rating of Angling Experience by Site Type (Number of Responses)						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
Mean	4.3	3.8	4.6	4.5		4.3	4.3	N/A
Median	5	4	5	5		4	5	N/A
1 Very Poor	1	2	0	0	0	0	3	8.1
2 Poor	0	0	0	0	0	0	0	0.0
3 Neutral	1	0	2	1	0	0	4	10.8
4 Good	0	4	0	0	0	2	6	16.2
5 Very Good	7	4	9	3	0	1	24	64.9
Total Responses	**9**	**10**	**11**	**4**	**0**	**3**	**37**	**100.0**
Percent Responses	24.3	27.0	29.8	10.8	0.0	8.1	100	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out; N/A = not applicable

5.1.6. USER FEEDBACK

Respondents were asked to provide any recommended improvements to the recreation site where they were surveyed (Table 5.1-39). 36.2 percent of respondents indicated they would like restrooms/sanitation features improved. Developed campgrounds, dispersed camping areas, and day-use sites adjacent to developed campgrounds all had a majority of respondents indicating they would like to see restrooms/sanitation improved. Miscellaneous responses from respondents included information such as the site was great, as well as suggestions to add electrical outlets, more bridges, and more frequent cleaning.

Table 5.1-39. Respondents Recommended Improvements (Q34)

Improvement	Number of Responses per Site Type						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
Accessibility	3	1	1	1	0	0	**6**	**1.1**
Emergency/ Safety	1	0	2	0	0	0	**3**	**0.6**
Fishing	3	0	1	2	0	1	**7**	**1.3**

Improvement	Number of Responses per Site Type						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
Landscaping	2	3	2	2	0	1	**10**	**1.8**
Miscellaneous	6	11	27	13	1	1	**59**	**11.0**
Playground	0	0	2	2	0	0	**4**	**0.7**
No/None	19	17	55	29	9	8	**137**	**25.6**
Benches/Tables/ Grills/Signage	16	13	47	12	4	0	**92**	**17.2**
Restrooms/ Sanitation	27	37	73	42	12	3	**194**	**36.2**
Parking/Paving/ Pathways	2	4	10	7	1	0	**24**	**4.5**
Total Responses	**79**	**86**	**220**	**110**	**27**	**14**	**536**	**100.0**
Percent Responses	**14.8**	**16.1**	**41.0**	**20.5**	**5.0**	**2.6**	**100.0**	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

Respondents were asked to suggest any recommended additional recreation facilities at the recreation site where they were surveyed (Table 5.1-40). Approximately 31.6 percent of respondents indicated they had no recommendations. Restrooms/sanitation was the most recommended addition at 33.6 percent of total responses (or 41.4 percent of the responses at dispersed camping areas). Miscellaneous responses from respondents included additional facilities such as better access to the river, playgrounds, and more facilities in general.

Table 5.1-40. Respondents Recommended Additional Recreation Facilities (Q35)

Recreation Facility	Number of Responses per Site Type						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
Campgrounds	1	4	4	4	0	1	**14**	**3.0**
Emergency/ Safety	1	1	0	0	0	0	**2**	**0.4**
Hiking trails	0	2	0	1	0	0	**3**	**0.6**
Miscellaneous	9	6	15	9	1	3	**43**	**9.1**
River Access	4	2	2	2	0	0	**10**	**2.1**

Recreation Facility	Number of Responses per Site Type						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
Trash/ Recycling	4	5	8	2	0	0	**19**	**4.0**
No/None	24	24	56	29	12	5	**150**	**31.6**
Benches/Tables/ Grills/Signage	5	8	28	9	7	0	**57**	**12.0**
Parking/Paving/ Pathways	1	2	9	2	0	3	**17**	**3.6**
Restrooms/ Sanitation	20	26	74	31	6	2	**159**	**33.6**
Total Responses	**69**	**80**	**196**	**89**	**26**	**14**	**474**	**100.0**
Percent Responses	**14.6**	**16.8**	**41.4**	**18.7**	**5.5**	**3.0**	**100.0**	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

When asked to provide any additional comments about the recreation site where they were surveyed, 43.6 percent of respondents indicated there were no additional comments to provide (Table 5.1-41). Benches/Tables/Grills/Signage and Restrooms/Sanitation received the most additional comments at dispersed camping areas. Miscellaneous responses from respondents covered a wide range of topics.

Table 5.1-41. Respondents Additional Comments (Q36)

Additional Comments	Number of Responses per Site Type						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
Accessibility	0	1	3	0	0	0	**4**	**0.9**
Emergency/ Safety	1	0	5	1	0	0	**7**	**1.5**
Miscellaneous	9	11	28	15	2	6	**71**	**15.2**
No/None	31	37	87	36	10	3	**204**	**43.6**
Trash/ Recycling	1	3	9	4	0	0	**17**	**3.6**
Benches/Tables/ Grills/Signage	10	8	32	10	8	1	**69**	**14.7**
Parking/Paving/ Pathways	4	5	6	1	2	0	**18**	**3.8**

Additional Comments	Number of Responses per Site Type						Total Responses	
	Day Use	Developed Campground	Dispersed Camping	DUCG	Trail head	KR3 Power house	Number	Percent
Restrooms/ Sanitation	9	14	33	14	5	3	**78**	**16.7**
Total Responses	**65**	**79**	**203**	**81**	**27**	**13**	**468**	**100.0**
Percent Responses	**13.9**	**16.8**	**43.4**	**17.3**	**5.8**	**2.8**	**100.0**	

DUCG = day-use site adjacent to a developed campground; KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

5.2. CURRENT RECREATION USE AND DENSITY ESTIMATES

5.2.1. RECREATION USE

The estimated recreation days, by site type, between Memorial Day 2023 and Labor Day 2023 are provided in Table 5.2-1 and is organized by each of the recreation site types (day use, day use adjacent to developed campground, dispersed camping, and trailhead). The data are further organized by type of day (weekday, weekend, holiday). During the summer season, there was an estimated total of 49,566 recreation days within the study area. The highest use, by site type, was seen at day-use areas with 27,220 recreation days. The most recreation days, by day type, were recorded on weekdays with 18,224 days.

Table 5.2-1. Recreation Days within the Project Area from Memorial Day 2023 to Labor Day 2023

Day type	Day Use	Dispersed Camping		Day Use Adjacent to Developed Campground		Trail head	KR3 Power house	Total
		Day Use	Campground Use	Day Use	Campground Use			
Total Weekday	12,410	1,740	1,182	575	NDA	1,716	778	**18,224**
Total Weekend	6,634	2,889	2,805	407	NDA	853	1,395	**14,580**
Total Holiday	8,177	1,737	2,035	340	NDA	1,463	1,500	**14,912**
Total Summer	27,220	6,366	6,023	1,322	NDA	4,032	3,673	**49,566**

NDA = no data available (Use at developed campgrounds will be summarized based on actual use records kept by the USFS, once provided); KR3 Powerhouse = KR3 Powerhouse Whitewater Put-in/Take-out

5.2.2. SITE DENSITY

During the summer season, the parking utilization on non-peak weekends was noted to be highest at the Johnsondale Bridge River Access site with 58.3 percent, followed by the Riverkern Beach Picnic site with 57.3 percent. During peak (holiday) weekends, parking capacity was shown to be greater than 100 percent utilization at Corral Creek Picnic Site and Whitewater Take-out, Whiskey Flat Trailhead, and Camp 3 Campground and Whitewater Put-in/Take-out.

Table 5.2-2. Estimated Parking Capacity within the Project Area from Memorial Day 2023 to Labor Day 2023

Site Number	Site Name	Site Type	Parking Capacity (Vehicle Spaces)	Non-Peak Weekend Parking Utilization (%)	Peak (Holiday) Parking Utilization (%)
1	Johnsondale Bridge River Access	Day Use	14	58.3	79.6
4	Willow Point Whitewater Take-out	Day Use	18	6.7	5.6
5	Roads End Picnic Site and Whitewater Put-in	Day Use	50	5.0	6.6
15	Corral Creek Picnic Site and Whitewater Take-out	Day Use	8	45.8	105.4
23	Riverkern Beach Picnic Site	Day Use	15	57.3	91.4
24	KR3 Powerhouse Whitewater Put-in/Take-out	Day Use	20	39.2	31.4
6	Packsaddle Trail Trailhead	Trailhead	18	14.8	15.9
10	Rincon Trailhead	Trailhead	4	12.5	65.0
25	Whiskey Flat Trailhead	Trailhead	5	53.3	108.6
2	Brush Creek Dispersed Camping	Dispersed Camping	107	7.6	18.2
8	Calkins Flat Dispersed Camping	Dispersed Camping	75	46.2	61.7
9	Chamise Dispersed Camping	Dispersed Camping	42	22.6	46.4
11	Ant Canyon Dispersed Camping	Dispersed Camping	28	53.6	95.2
12	Old Goldledge Dispersed Camping	Dispersed Camping	10	50.0	66.7

Site Number	Site Name	Site Type	Parking Capacity (Vehicle Spaces)	Non-Peak Weekend Parking Utilization (%)	Peak (Holiday) Parking Utilization (%)
14	Springhill Dispersed Camping	Dispersed Camping	100	55.0	35.5
16	Corral Creek Dispersed Camping	Dispersed Camping	42	40.1	80.2
18	Chico Flat Dispersed Camping	Dispersed Camping	50	23.7	62.0
13	Goldledge Campground and Whitewater Put-in/Take-out	Day Use adjacent to Developed Campground	18	33.3	35.7
19	Thunderbird Group Campground and Whitewater Put-in/Take-out	Day Use adjacent to Developed Campground	11	15.2	25.8
20	Camp 3 Campground and Whitewater Put-in/Take-out	Day Use adjacent to Developed Campground	15	48.9	130.5
21	Halfway Group Campground and Whitewater Put-in/Take-out	Day Use adjacent to Developed Campground	20	12.5	14.2

Sites 3, 7, 17 and 22 are USFS-developed campgrounds; therefore, a parking capacity analysis was not completed for these sites.

5.3. FUTURE RECREATION USE AND NEEDS ESTIMATES

The estimated projections of future recreation use will be developed using the average annual increase in population growth over the past 10 years, as reported by the U.S. Census Bureau. These estimates will be augmented with discussion of trends reported in *California's 2021–2025 Statewide Comprehensive Outdoor Recreation Plan* (CDPR, 2020); 2006, 2011, 2016, and 2021 (when available) National Visitor Use Monitoring program reports for SQF (USFS, 2006, 2011, 2018), and the Land Management Plan for the Sequoia National Forest (USFS, 2023). Estimated projections will be provided in 10-year intervals for the anticipated term of the license up to 50 years into the future.

Estimates of future Project-related recreational demand will rely on the results provided by the recreation use assessment and visitor surveys for user preferences and opinions on needs and crowding. The need for new recreation opportunities, new site development, or modification of existing recreation resources will be assessed based on the results of site capacity estimates and user surveys that provide user preferences and opinions on needs and crowding at each site and the Project as a whole. While it is acknowledged that future changes in the supply of recreation resources either in their quantity, accessibility, and/or quality may influence future demand and use, the demand

analysis undertaken for this study does not attempt to predict future changes or how they might specifically affect levels of use at Project facilities. Therefore, the demand analysis results should be viewed as a general guide of potential future recreation pressure developed for planning purposes only.

Following completion of the collection and analysis of the recreation use data, the estimated projections of future recreation use will be developed. Results will be provided in the Final Technical Memorandum.

5.4. CONSISTENCY WITH THE LAND MANAGEMENT PLAN FOR THE SEQUOIA NATIONAL FOREST

Following completion of the collection and analysis of the recreation use data, an assessment will be conducted of the consistency of current recreation opportunities with the laws, regulations, policies, and guidelines described in the Land Management Plan for the Sequoia National Forest (USFS, 2023). The USFS has published a new Management Plan since the RSP and SPD have been issued. This study will review the new 2023 Management Plan in lieu of the 1988 Management Plan originally cited in the RSP. Findings will be provided in the Final Technical Memorandum.

6.0 STUDY-SPECIFIC CONSULTATION

Prior to the installation of trail cameras, SCE sent a list, map, and description of the proposed camera locations to the SQF, National Parks Service, and Kern River Boaters (KRB) via email. The following summarizes the dates and provides a brief overview of the consultation. Documentation of correspondence will be included with the Final Technical Memorandum.

- March 3, 2023: SCE emailed SQF, the National Parks Service, and KRB approximately 1 month prior to camera installation of the five selected locations and the addition of 1-hour calibration counts to supplement data captured by the cameras.

- March 17, 2023: Email from KRB to SCE expressing their objection to the choice of camera sites as well as the number of cameras proposed to be installed.

- March 24, 2023: Email from SCE to KRB and other stakeholders on the email proposing to install an additional camera at a site located above the Fairview Dam and reiterated that in addition to the cameras, calibration counts would be conducted at all 25 sites.

- March 31, 2023: Email from KRB to SCE noting their concern about the number of sites as well as noting their thoughts on an increase in spot counts and survey days in addition to calibration counts in order to collect the amount of data they feel was requested by FERC in the SPD.

- May 4, 2023: In-person consultation with SQF District Ranger and SCE, discussing proposed camera locations at all 25 recreation sites, 24 of those being owned and

operated by SQF. Camera installation at all sites was verbally approved by the SQF District Ranger.

- May 24, 2023: Email from SQF Public Services Staff Officer, providing a letter from their concessionaire (Advenco/ExplorUS) requesting that SCE remove all cameras from their permitted recreation facilities (i.e., hosted campground).
- June 1, 2023: Phone call between SCE and FERC notifying FERC staff about the removal of cameras from the recreation facilities.
- August 21, 2023: Letter from SQF Forest Supervisor formally requesting removal of cameras from SQF campgrounds.

7.0 OUTSTANDING STUDY PLAN ELEMENTS

The study plan elements still in progress include:

- Spot counts and 2-hour calibration counts continue 1 weekday and 1 weekend day per month between April 2024 and May 2024.
- Data analysis of the remaining survey data, spot counts and calibration counts to include all other study seasons (spring, fall and winter).
- Obtain and analyze USFS SQF campground use data.
- Complete future recreation use and needs assessment, including historical recreation use trend analysis to the extent data is available.
- Complete consistency review with applicable USFS SQF land management plans.
- Prepare a Final Technical Memorandum summarizing the complete dataset to be included in the Draft License Application filing in July 2024.

7.1. ANTICIPATED SCHEDULE

The anticipated schedule to complete the remaining tasks is identified in Table 7.1-1.

Table 7.1-1. Schedule

Date	Activity
Spring 2024	Conduct monthly calibration counts with spot counts to document recreation use.
Spring/Summer 2024	Analyze complete dataset and prepare Final Technical Memorandum to be included in the Draft License Application.
July 2024	Include Final Technical Memorandum with Draft License Application filing.

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APPENDIX A
FINAL VISITOR INTERCEPT SURVEY

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Kern River No. 3 Recreational User Survey

Welcome to the recreation user survey for the Kern River No. 3 Hydroelectric Project (KR3 or Project), Federal Energy Regulatory Commission (FERC) Project No. 2290. The purpose of this survey is to gather information about recreation opportunities within the FERC Project Boundary and along the 16-mile reach of the North Fork Kern River (NFKR) between Fairview Dam and the KR3 Powerhouse (the Fairview Dam Bypass Reach).

Would you mind answering some survey questions? We anticipate this survey will take approximately 10 to 15 minutes.

The information you provide will help guide current and future management of recreation opportunities, sites, and facilities for visitors to the Project Area. Please use the map below to (re)familiarize yourself with the general recreation area before answering the survey questions, and feel free to encourage others to participate in this survey.

[P*rovide a separate hard copy of the map to respondents, if relevant.*]

Any information you provide us today will remain anonymous. If at any time there is a question you prefer not to answer, feel free to skip that question and move to the next. The survey is broken out into the following sections:

- Section 1 - Demographics
- Section 2 - Current Trip Information and Experience
- Section 3 - Past Recreation Trips
- Section 4 - Surrounding Landscapes
- Section 5 - Angling Experiences
- Section 6 - User Feedback

Recreation User Survey
Kern River No. 3 Hydroelectric Project (FERC No. 2290)

Clerk: _____ Site: _____ Date: _____

Time:_____a.m./p.m.

Weather: ☐ Sunny ☐ Partly Cloudy ☐ Cloudy ☐ Light Rain ☐ Heavy Rain

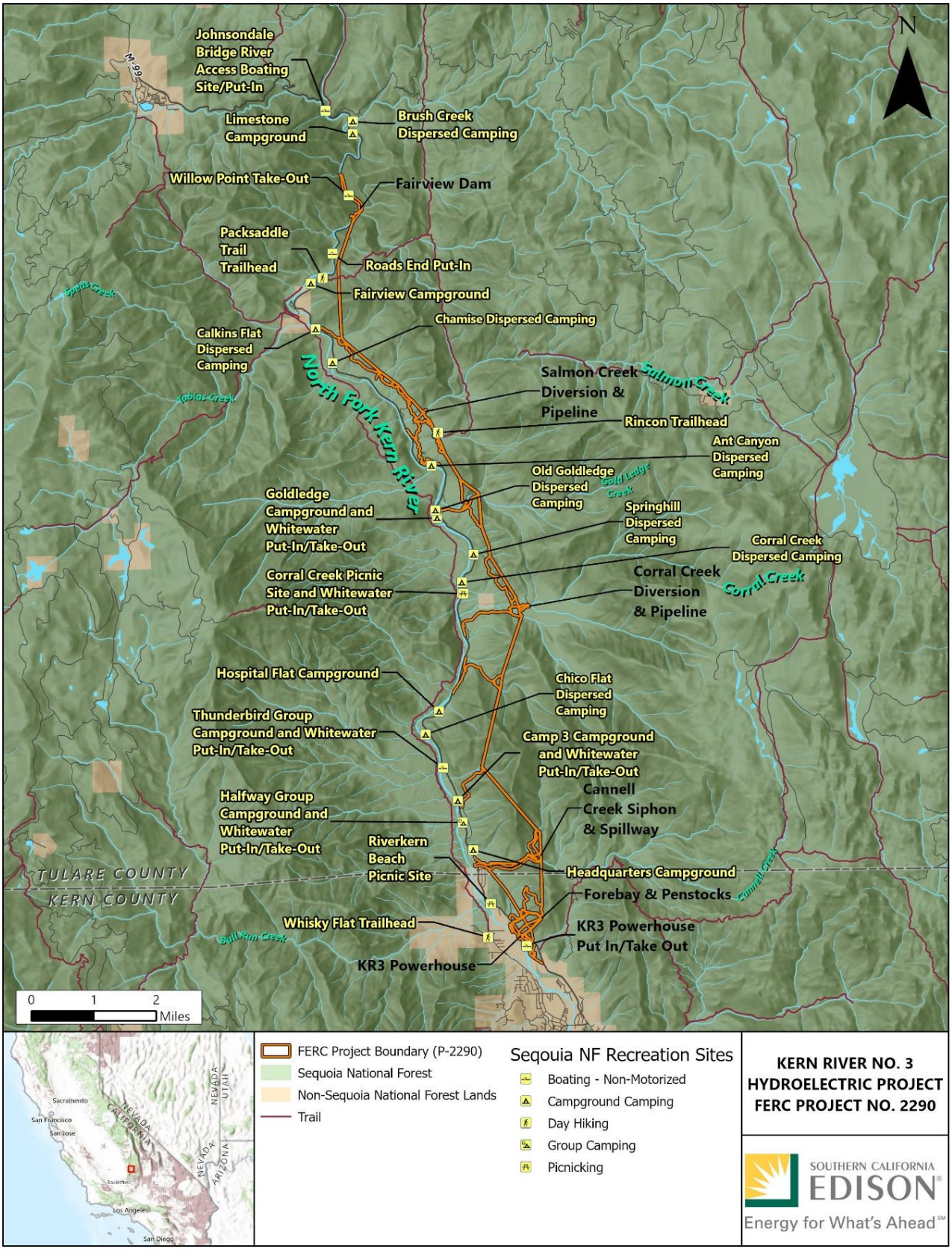
RESPONDENT REFUSED INTERVIEW: ☐

NUMBER OF PEOPLE IN VEHICLE: _____

RESPONDENT'S PRIMARY LANGUAGE: _____

VEHICLE HAS WATERCRAFT RACK: ☐

RESPONDENT HAS BEEN INTERVIEWED AT THIS SITE PREVIOUSLY: ☐



Section 1 – Demographics

1. What is your home zip code? _____

2. How far did you travel to get to this site today?
   ☐ 0–25 miles ☐ 26–50 miles ☐ 51–75 miles ☐ 76–100 miles ☐ 101+ miles

3. What is your age?
   ☐ Under 16 ☐ 16–19 ☐ 20–29 ☐ 30–39 ☐ 40–49 ☐ 50–59 ☐ 60–69 ☐ 70+

4. Including yourself, how many people 18 or older are in your party today?
   _____ person/people

5. Including yourself, how many people under 18 are in your party today?
   _____ person/people

6. What gender, if any, do you identify as (open ended)? _____

7. What is your ethnicity?
   a. Spanish/Latino Origin
   b. Black
   c. White
   d. Asian/Pacific Islander
   e. Other

8. What is your total household income?
   a. Less than $40,000
   b. $41,000–$80,000
   c. $81,000 and above

9. What best describes your employment status?
   a. Full-time
   b. Part-time
   c. Unemployed
   d. Self-employed
   e. Homemaker
   f. Student
   g. Retired
   h. Other: _____

10. If employed, what is your occupation? _____

Section 2 – Current Trip Information and Experience

11. What day did you arrive at this recreation site?

    Date: _____

12. Is this site the primary destination for your trip? ☐ YES ☐ NO

13. How many days have you been on this recreation trip, including today?

    _____ day(s)

14. How many total days do you expect your trip to last?

    _____ day(s)

15. What was your primary reason for selecting this location?

    _____

16. What is the primary recreation activity that you participated in today at this recreation site? *(Please read the list to respondents. Check only one main activity in the first column.)* What other activities did you participate in today at this recreation site? *(Check all that apply in the second column.)*

Check Only ONE Main Activity	Check All Other Activities	Types of Activities
☐	☐	*a)* biking
☐	☐	*b)* camping
☐	☐	*c)* fishing
☐	☐	d) hiking/walking/trail use
☐	☐	*e)* whitewater boating/rafting
☐	☐	*f)* photography/painting
☐	☐	*g)* picnicking
☐	☐	*h)* relaxing
☐	☐	*i)* scenic driving
☐	☐	*j)* viewing scenery
☐	☐	*k)* viewing wildlife
☐	☐	*l)* other (please specify) _____

17. If you participated in a water-related activity, did the flows in the North Fork Kern River affect your ability participate?

    YES (select one): ☐ flow was too high ☐ flow was too low

    ☐ other (explain) _____

    ☐ NO: flow did not affect planned activities

    ☐ N/A: did not partake in water-related activity

18. How would you describe your weekly physical activity? (Select one)

    Low weekly activity **Moderate weekly activity** **High weekly activity**

19. The following question will be used to help estimate how recreation spending contributes to the local community, businesses, and economy. Your answer will be kept confidential.

    For your whole trip, how much do you expect to / did you spend in the local area*?

    $_____

    *Local includes towns within 50 miles, including Johnsondale, Roads End, Kernville, Wofford Heights, Mountain Mesa, Lake Isabella, South Lake, Weldon. *Please do not include expenditures at any other locations outside this area*. Include everything you bought (lodging, food, gas, equipment rentals/fees, etc.) or expect to buy before you go home. If there is more than one person in the party, please provide the <u>total</u> cost for your party, even if someone else paid for you, or you paid for someone else.

20. How would you rate your overall satisfaction or dissatisfaction with your recreation experience today on a scale of 1 to 5, with 1 indicating very dissatisfied and 5 indicating very satisfied? If not applicable, check N/A.

Next, rate the importance of each item to the overall quality of your recreation experience on this trip in the far-right column, with 1 being unimportant and 5 being very important.

	1 Very Dissatisfied	2 Dissatisfied	3 Neutral	4 Satisfied	5 Very Satisfied	N/A	Importance (1–5)
1. Overall satisfaction of your trip							
2. Satisfaction of your primary activity, as listed above in Q.16							
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							

If you marked Very Dissatisfied (1) or Dissatisfied (2) for any above, please explain:

_____

Section 3 – Past Recreation Trips

21. In the last 12 months, have you visited any of the recreation sites listed in the table below? If yes, please indicate in the table the number of times you visited each site during each season; about how much time you typically spent at the site using minutes or hours; and the primary reason for your visit to the site(s).

    If you visited other sites between Johhsondale Bridge and the Kern River No. 3 Powerhouse not listed below, please list the site and complete the table.

Recreation Site	Number of Visits					Approximate Time On-site	Reason for Visit
	Spring (March–May)	Summer (Jun–Aug)	Fall (Sept–Nov)	Winter (Dec–Feb)	Total #		
Johnsondale Bridge River Access							
Brush Creek Dispersed Campground							
Limestone Campground							
Willow Point Whitewater Take-out							
Roads End Picnic Site and Whitewater Put-in							
Packsaddle Trail Trailhead							
Fairview Campground							
Whiskey Flat Trailhead							
Calkins Flat Dispersed Camping							
Chamise Dispersed Camping							
Rincon Trailhead							
Ant Canyon Dispersed Camping							
Old Goldledge Dispersed Camping							
Goldledge Campground and Whitewater Put-in/Take-out							
Springhill Dispersed Camping							
Corral Creek Picnic Site and Whitewater Take-out							
Corral Creek Dispersed Camping							
Hospital Flat Campground							
Chico Flat Dispersed Camping							

Recreation Site	Number of Visits					Approximate Time On-site	Reason for Visit
	Spring (March–May)	Summer (Jun–Aug)	Fall (Sept–Nov)	Winter (Dec–Feb)	Total #		
Thunderbird Group Campground and Whitewater Put-in/Take-out							
Camp 3 Campground and Whitewater Put-in/Take-out							
Halfway Group Campground and Whitewater Put-in/Take-out							
Headquarters Campground							
Riverkern Beach Picnic Site							
KR3 Powerhouse Whitewater Put-in/Take-out							
Other:							

22. In the last 12 months, have you visited the area between the Fairview Dam and the Kern River No. 3 Powerhouse more, less, or about the same as you normally would? (Select one)

More **About the same** **Less**

What is the primary reason for the answer you gave?

_____

Section 4 – Surrounding Landscapes

23. How would you rate the scenic quality of the NFKR area in general on a scale of 1-5, with 1 indicating very poor and 5 indicating very good?

Scenic Features	1 Very Poor	2 Poor	3 Neutral	4 Good	5 Very Good
General Scenic quality of NFKR area					

If you rated Very Poor (1) or Poor (2), please explain:

_____

24. What is the scenic feature that most attracted you to this area of the NFKR? Select top feature:

    a. General scenery such as rock outcrops, mountains and valleys
    b. Flows in the North Fork Kern River
    c. Project infrastructure (flowline, Powerhouse, Dam, other built facilities)
    d. Other: please provide: _____
    e. Scenery was not a consideration when selecting this location

25. How would you rate the following scenic qualities in the area between Fairview Dam and the Kern River No. 3 Powerhouse on a scale of 1 to 5, with 1 indicating very poor and 5 indicating very good?

Scenic Features	1 Very Poor	2 Poor	3 Neutral	4 Good	5 Very Good
General scenery such as rock outcrops, mountains and valleys					
River flows between Fairview Dam and KR3 Powerhouse					
Project infrastructure (flowline, Powerhouse, Dam, other built facilities)					

If you rated Very Poor (1) or Poor (2) for any above, please explain:

_____

26. Over the past 12 months, how often have you visited the area to partake in photography, painting, scenic driving, viewing scenery, and/or viewing wildlife?

    a. Never _____
    b. This is my first time _____
    c. Spring (March–May) #____
    d. Summer (June–August) #_____
    e. Fall (September–November) #_____
    f. Winter (December–February) #_____

Section 5 – Angling Experiences

27. Have you fished along the Fairview Dam Bypass Reach before?

☐ YES (please respond to the following 5 questions)

☐ NO (skip to Section 6)

28. What type of fishing tackle do you typically use to fish in the Fairview Dam Bypass Reach? (Select all that apply)

Spin fish with Lures **Spin fish with Bait** **Fly fish**

29. Are you fishing for fun or to catch food to eat (circle one)? If you are planning to eat your fish but are mostly fishing for fun, please choose **Fun**. If you enjoy fishing but are mostly fishing to catch food, please choose **Food**.

Food **Fun**

30. What was your primary reason for selecting this location to fish?

_____

31. How often have you fished the Fairview Dam Bypass Reach in each season over the past 12 months?

    a. Spring (March–May) #____
    b. Summer (June–August) #_____
    c. Fall (September–November) #_____
    d. Winter (December–February) #_____

32. Have river flows affected your angling experience in the Fairview Dam Bypass Reach? ☐ YES ☐ NO

    If yes, please indicate in which season your experience has been affected and provide reason.

    a. Spring (March–May) ____ Reason: too low / too high / other: _____
    b. Summer (June–Aug) _____ Reason: too low / too high / other: _____
    c. Fall (Sept–Nov) _____ Reason: too low / too high / other: _____
    d. Winter (Dec–Feb) _____ Reason: too low / too high / other: _____

33. On a scale of 1 to 5, with 1 being very poor and 5 being very good, how would you rate the conditions of your angling experience today or on the day of your most recent angling experience between the Fairview Dam and the Kern River No. 3 Powerhouse.

Fishing Experience	1 Very Poor	2 Poor	3 Neutral	4 Good	5 Very Good
Presence of angling features/habitats (pools, runs, riffles, etc.) to fish					
Ability to access angling features/habitats for preferred fishing					
Speed of river flow					

If you rated Very Poor (1) or Poor (2) for any above, please explain:

_____

Section 6 – User Feedback

34. Are there any improvements that you would recommend for this site?

☐ YES

☐ NO

If yes, what improvements do you recommend?

_____

35. Do you believe that any additional recreation facilities (such as more single-family campgrounds, group campgrounds, parking areas, bathrooms, hiking trails, river launching areas, river access, information kiosks, etc.) are needed in the area between the Fairview Dam and the Kern River No. 3 Powerhouse?

If yes, please describe:

_____

36. Do you have any additional comments about this recreation site, including comments on existing or needed recreation facilities? (Please be as specific as possible.)

_____

_____

THANK YOU FOR YOUR HELP! WE APPRECIATE YOUR TIME TODAY

APPENDIX B
ONLINE SURVEY FLYER

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Recreation User Survey

Southern California Edison (SCE) is conducting a Recreation Study as part of the Federal Energy Regulatory Commission relicensing of the Kern River No. 3 (P-2290) Hydroelectric Project. The survey can be completed on your mobile device or computer. Participation is voluntary and responses will remain anonymous.

The online survey can be accessed at:

www.SCE.com/kr3

or

The survey will be available from April 1, 2023, through March 31, 2024. Please only complete one survey per individual.

Thank you in advance for your participation!

Encuesta de usuarios de recreación

Southern California Edison (SCE) está realizando un estudio de recreación como parte de la renovación de la licencia de la Comisión Federal Reguladora de Energía del Proyecto Hidroeléctrico Kern River No. 3 (P-2290). La encuesta se puede completar en su dispositivo móvil o computadora. La participación es voluntaria y las respuestas permanecerán anónimas.

Se puede acceder a la encuesta en línea en:

www.SCE.com/kr3

o

La encuesta estará disponible desde el 1 de abril de 2023 hasta el 31 de marzo de 2024. Complete solo una encuesta por individuo.

¡Gracias de antemano por tu participación!

Recreation User Survey

Southern California Edison (SCE) is conducting a Recreation Study as part of the Federal Energy Regulatory Commission relicensing of the Kern River No. 3 (P-2290) Hydroelectric Project. The survey can be completed on your mobile device or computer. Participation is voluntary and responses will remain anonymous.

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www.SCE.com/kr3

o

La encuesta estará disponible desde el 1 de abril de 2023 hasta el 31 de marzo de 2024. Complete solo una encuesta por individuo.

¡Gracias de antemano por tu participación!

APPENDIX C
FINAL SPOT COUNT FORMS

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Date _____ **Temp** _____ **Observer Initials** _____

Weather Sunny Part Cloudy Cloudy Light Rain Heavy Rain (Note any weather changes during site visits)

Site Location	Time Hour/Min AM or PM	No. of Vehicles	Vehicle State Origin	Type/Number of Boat(s)*			No. of People Participating in											Total No. of People at Site	Comments/ General Description
				Individual Kayak	Commercial Boat	Other Watercraft	Biking	Camping	Fishing	Hiking/walking/trail use	White-water boating/rafting	Boating (non-motorized	Photography	Picnicking	Relaxing	Viewing Scenery	Viewing Wildlife	Other	

*as observed from water's edge approximately 50-100 feet upstream and downstream

Contact Information:

Additional notes/comments:

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APPENDIX D
FINAL CALIBRATION COUNT FORM

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Calibration Form						Site Name:														
Staff Person:			Date:			Time Start:					Time End:									
						Start Count:					End Count:									
Weekend or Weekday?						# of people participating in activity during visit														
Vehicle Description	License Plate	Trailer Y/N	Time in	Time out	Total # of People	Motor Boating	Non motor boating	Whitewater Boating	Camping	Fishing	Picnic	Walk/ Jog/ Hike	Hunt	Ride Horses	Ride Bikes	Sight See	Swim	Birding	Other Rec Use	Non Rec Use

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APPENDIX E
CONSULTATION LOG
(to be provided in Final Technical Memorandum)

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Attachment C: Addendum to OPS-1 Water Conveyance Assessment Interim Technical Memorandum: Tunnel Stability

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ADDENDUM TO OPS-1 WATER CONVEYANCE ASSESSMENT
INTERIM TECHNICAL MEMORANDUM: TUNNEL STABILITY

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

PREPARED FOR:

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead®

KERNVILLE, CALIFORNIA

March 2024

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LIST OF ACRONYMS AND ABBREVIATIONS

CEII	Critical Energy Infrastructure Information
cfs	cubic feet per second
FERC	Federal Energy Regulatory Commission
KR3	Kern River No. 3
Project	Kern River No. 3 Hydroelectric Project (FERC Project No. 2290)
SCE	Southern California Edison

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1.0 INTRODUCTION

Southern California Edison (SCE) filed an interim Technical Memorandum associated with the Study *OPS-1 Water Conveyance Assessment* as part of its Initial Study Report on October 9, 2023 (SCE, 2023), in support of SCE's Kern River No. 3 (KR3) Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 2290. The interim Technical Memorandum included the analysis and results from the Phase 1 desktop analysis and Phase 2 hydraulic assessment.

In response to Stakeholder comments on the Initial Study Report filed January 9, 2024 (SCE, 2024), SCE committed to providing an addendum in the first quarter of 2024 that included the results of the Phase 2 structural integrity assessment. The findings and recommendations provided as part of this Phase 2 analysis are summarized below.

The OPS-1 Study was conducted with support from engineering firms MarshWagner and Kleinschmidt Associates, who have documented expertise in hydropower, hydraulic analyses, and tunnels/underground structures. MarshWagner led the evaluation of tunnel and lining integrity based on their desktop review of documentation available on the tunnel design and construction and supported by tunnel hydraulic characteristics developed by Kleinschmidt Associates.

A site visit was not conducted, and all analyses were based on available information on the geology, tunnel design and construction, and hydraulic flow data.

2.0 STUDY GOALS AND OBJECTIVES

The objectives of the study, as outlined in OPS-1 Study Plan (SCE, 2022), include:

- Conduct an engineering review and evaluation of current water conveyance conditions (e.g., hydrostatic pressure, flow depth) under varying flow conditions.
- Identify guidelines for future operational conditions using current Project information and industry best practices to maintain water conveyance system integrity.

3.0 STUDY AREA AND STUDY SITES

The study area includes the approximately 13 miles of water conveyance infrastructure that runs along the eastern hillslope above the North Fork Kern River between Fairview Dam and the KR3 Forebay. The water conveyance infrastructure included in the analysis and described herein was limited to tunnels, open and covered aboveground flumes, a steel siphon, and a regulated pressure flume.

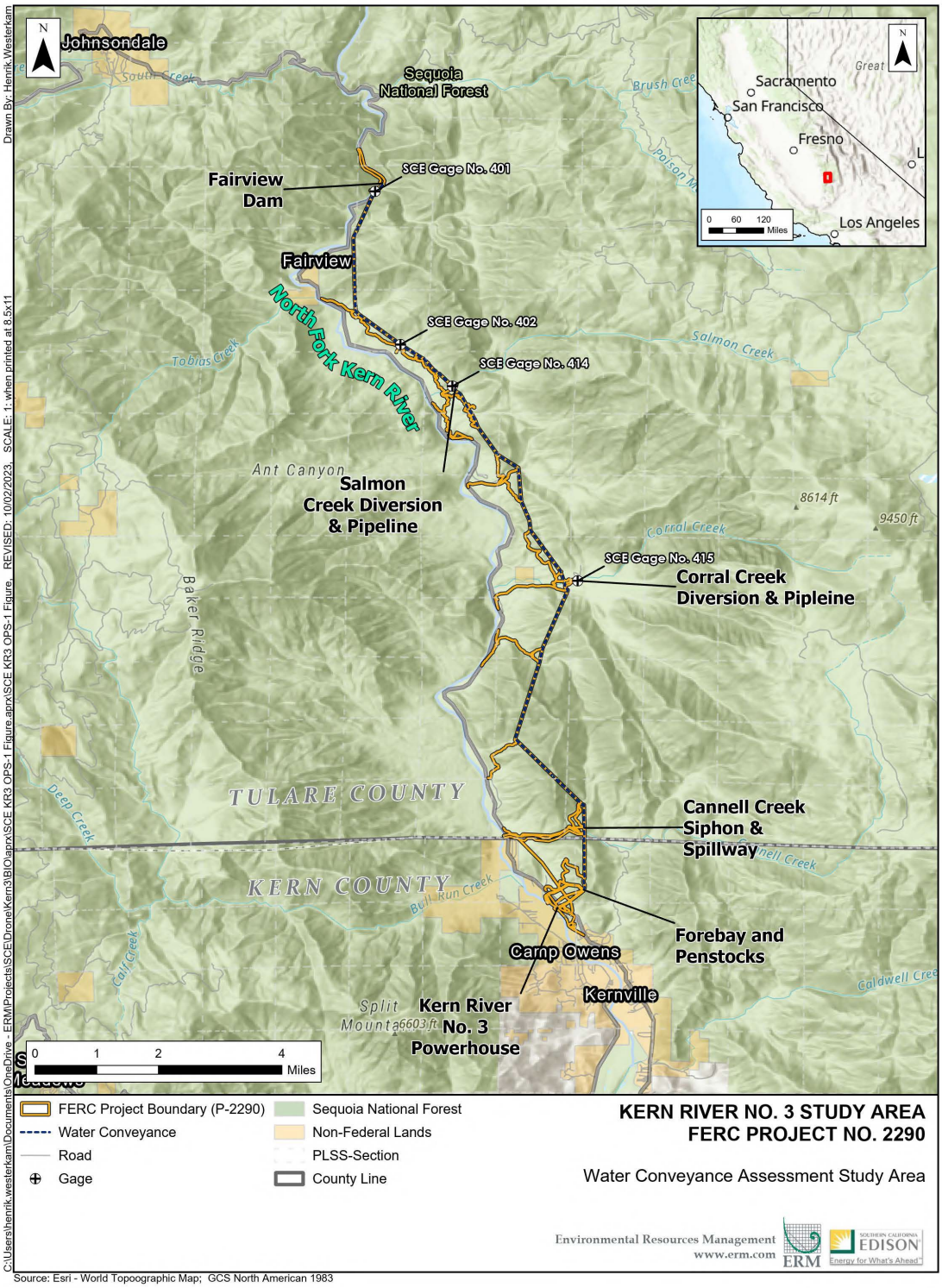

Figure 3-1. Water Conveyance Assessment Study Area.

4.0 DATA SUMMARY

4.1. STRUCTURAL INTEGRITY ASSESSMENT

This study evaluates tunnel conditions (i.e., stability of the tunnel lining) when water levels are decreased and presents recommendations for the continued operation of the underground tunnel sections of the water conveyance. The analysis was conducted using (1) results of hydraulic calculations presented in the *OPS-1 Water Conveyance Assessment Interim Technical Memorandum* prepared by Kleinschmidt (SCE, 2023), (2) information on the tunnel presented in a tunnel inspection and evaluation report prepared by Woodward-Clyde (WCC, 1998), and (3) SCE maintenance and inspection documents.

A summary of the structural integrity assessment results and recommendations is below. Additional details are presented in a separate hydraulic assessment Technical Memorandum, including calculations for the upward pressure differential on the invert due to a flow reduction (Appendix A, filed as CEII).

4.1.1. REPORT FINDINGS AND CONCLUSIONS

Hydropower conveyances are subject to continuous flow changes due to the operation of the hydroelectric equipment. These usual variations are typically not considered detrimental to the stability of the tunnel conveyances. However, recent research (Neupane et al., 2020; Neupane and Panthi 2021) indicates that variation of pressures in the power conveyance can result in changes in the rock mass pore pressure leading to “fatigue” of the rock mass. This is an active research area, and it would be difficult to quantify the effect for the Project, but there is sufficient information to ascertain that variations in water level in the power conveyance could lead to unfavorable tunnel conditions over the long-term.

The purpose of the concrete tunnel wall and floor lining is to provide a smooth surface to convey flows efficiently through the tunnel, rather than serve as an integral piece of tunnel stability. The tunnel invert (i.e., the floor of the tunnel) is probably susceptible to effects from rapid changes in tunnel flows over time, as the concrete lining was likely cast on top of tunnel muck, which typically has less adhesion and contact with the concrete lining material. A simple estimate of the upward pressure differential on the invert (uplift) due to a flow reduction (draw down rate) of 50 cubic feet per second (cfs) per hour (0.5 foot of water level drop per hour) results in an invert slab at the verge of “floating,” increasing the potential for the concrete floor to break apart and be mobilized within the tunnel (calculations provided in Appendix A). This is a reasonable but conservative estimate. If parts of the tunnel invert were cleaned before casting the floor slab, then there would be adhesion between the concrete and the rock and the tunnel floor slab could withstand higher differential uplift pressures and faster draw down rates. If the tunnel lining invert fails and the conveyance flowline is not maintained, the broken concrete pieces could be mobilized by the flow and slowly migrate downstream, which could result in reduced tunnel capacity and functionality.

SCE operates the tunnel with a constant flow when feasible, but flow reductions greater than 50 cfs per hour have occurred in the past (e.g., unplanned drop in flow due to generating unit tripping or planned flow adjustments to comply with license conditions). Observations from routine (monthly and annual) inspections of the conveyance flowline have not documented excessive leaking, cracking, or broken concrete along the floor. Additionally, periodic inspection of the "rock trap"[1] located upstream of the Cannel Creek siphon have not noted any large pieces of concrete.

Conclusions and recommendations for continued operation of the water conveyance to mitigate potential long-term effects of water level changes include:

- The tunnel lining, specifically the tunnel invert is potentially the most susceptible for cracking and uplift of concrete fragments during tunnel dewatering and subsequent mobilization further down the tunnel.
- While current operational practices have not observed uplift of tunnel invert sections, rapid changes in depth of flow, specifically reducing flow in the conveyance, could have an unfavorable effect on the long-term integrity of section of the tunnel invert.
- The KR3 water conveyance should be operated at near-constant flows. If flow reduction is necessary, a ramping rate of 50 cfs per hour or less is recommended when operationally feasible to mitigate long-term potential impacts on the lining invert.
- No constraints on ramping rates to increase the flow in the water conveyance were found necessary for tunnel floor integrity.

5.0 REFERENCES

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Neupane, B., and K.K. Panthi. 2021. "Evaluation on the Effect of Pressure Transients on Rock Joints in Unlined Hydropower Tunnels Using Numerical Simulation." *Rock Mechanics and Rock Engineering* 54: 2975–2994.

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WCC (Woodward – Clyde Consultants). 1998, Reconnaissance Inspection and Evaluation of Kern River No. 3 Tunnels, prepared for SCE.

[1] The rock trap collects large rocks or material entrained within the conveyance flowline.

APPENDIX A
OPS-1 WATER CONVEYANCE ASSESSMENT: TUNNEL STABILITY
(FILED AS CEII)

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Attachment D: Distribution List

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FERC Project No. 2290 Official Service List (retrieved February 28, 2024)

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