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**LIST OF ACRONYMS**

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CFR	Code of Federal Regulations
FERC or Commission	Federal Energy Regulatory Commission
PAD	Pre-Application Document
Project	Kaweah Project
SCE	Southern California Edison Company
SD	Supporting Document
TSR	Technical Study Report

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## 8.0 ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

### 8.1 INTRODUCTION

This section follows the Federal Energy Regulatory Commission's (FERC or Commission) content requirements at Title 18 of the Code of Federal Regulations (CFR) §5.18(b)(5)(ii)(B), which specify that "the applicant must present the results of its studies conducted under the approved study plan by resource area and use the data generated by the studies to evaluate the beneficial and adverse environmental effects of its proposed project. This section must also include, if applicable, a description of any anticipated continuing environmental impacts of continued operation of the project, and the incremental impact of proposed new development of projects works or changes in project operation. This analysis must be based on the information filed in the Pre-Application Document (PAD) provided for in §5.6, developed under the applicant's approved study plan, and other appropriate information, and otherwise developed or obtained by the Applicant." In addition, as required under §5.18(b), this section follows the Commission's "Preparing Environmental Documents: Guidelines for Applicants, Contractors, and Staff."

This environmental analysis is based on information included in Southern California Edison Company's (SCE) PAD for the Kaweah Project (Project); Section 7 – Affected Environment of the License Application; Technical Study Reports (TSR; Supporting Document A [SD A]); and supplemental analysis and modeling completed in Sections 8.2–8.14 of the License Application.

The following subsections include an analysis (by resource area) of ongoing and new environmental effects (beneficial and adverse) of continued operation and maintenance of the Project under the Proposed Action (Section 4). Table 8.1-1 identifies resource areas potentially affected by Project operations and maintenance under the Proposed Action. In the evaluation of incremental effects, environmental conditions under the Proposed Action were compared to the baseline environmental condition<sup>1</sup> in the No-Action Alternative.

The effects determination for each resource area considers new environmental measures, management and monitoring plans, and programs included under the Proposed Action. The following effects determinations were used in the analysis:

- **No Effect** – Implementation of the Proposed Action will continue to protect and maintain a resource.
- **Negligible Effect** – Implementation of the Proposed Action will have a negligible effect to a resource or the implementation of new environmental measures, plans, and/or programs reduces the effect to a negligible level.

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<sup>1</sup> The baseline environmental condition are those that would exist for each resource area if the Project were continued to be operated and maintained according to the current FERC license.

- **Adverse Effect** – Implementation of the Proposed Action will have a significant effect to a resource that may be reduced, but not to a negligible level, through implementation of new environmental measures, plans, and/or programs.
- **Beneficial Effect (Enhancement)** – Implementation of the Proposed Action including new environmental measures, plans, and/or programs benefits the resource.

This section is organized as follows:

- 8.1 – Introduction
- 8.2 – Water Use and Hydrology Environmental Effects
- 8.3 – Water Quality Environmental Effects
- 8.4 – Fish and Aquatic Resources Environmental Effects
- 8.5 – Botanical and Wildlife Resources Environmental Effects
- 8.6 – Geology and Soils Environmental Effects
- 8.7 – Geomorphology Environmental Effects
- 8.8 – Riparian Resources Environmental Effects
- 8.9 – Land Use Environmental Effects
- 8.10 – Recreation Resources Environmental Effects
- 8.11 – Aesthetic Resources Environmental Effects
- 8.12 – Cultural Resources Environmental Effects
- 8.13 – Tribal Resources Environmental Effects
- 8.14 – Socioeconomic Environmental Effects

## **TABLES**

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**Table 8.1-1. Resource Areas Potentially Affected by Project Operation and Maintenance under the Proposed Action**

Proposed Action		Resource Areas Potentially Affected												
		Water Use and Hydrology	Water Quality	Fish and Aquatic	Botanical and Wildlife	Geology and Soils	Geomorphology	Riparian	Land Use	Recreation	Aesthetics (Visual/Noise)	Cultural (Pre-historic/Historic)	Tribal	Socioeconomics
FERC Project Boundary	FERC Project boundary (modified)								X			X		
Project Operations	Minimum instream flow releases (modified)	X	X	X	X		X	X		X	X			X
	Ramping rates (modified)	X	X	X	X		X	X		X				
	Forebay spills (ongoing)	X	X	X		X	X				X			
	Draining of flowline and forebay during Project outages <sup>1</sup> (ongoing)	X	X	X		X	X							
Project Maintenance	Powerhouse maintenance (ongoing)				X							X		
	Flowline maintenance													
	• Repair of flumes, canals, and support structures (ongoing)				X	X				X		X		
	• Repair of wildlife bridges and escape ramps (ongoing)				X									
	• Removal of algae and large woody debris (ongoing)		X											
	Vegetation management <sup>2</sup> (modified)		X	X	X	X		X				X	X	

		Resource Areas Potentially Affected												
		Water Use and Hydrology	Water Quality	Fish and Aquatic	Botanical and Wildlife	Geology and Soils	Geomorphology	Riparian	Land Use	Recreation	Aesthetics (Visual/Noise)	Cultural (Pre-historic/Historic)	Tribal	Socioeconomics
Proposed Action														
Project Maintenance (continued)	Pest management (ongoing)				X									
	Sediment management													
	• Sediment removal/flushing at Kaweah No. 1 Sandbox (ongoing)		X	X	X	X	X							
	• Sediment removal/flushing at Kaweah No. 1 Forebay Tank (ongoing)		X	X	X	X	X							
	• Sediment removal/flushing at Kaweah No. 2 Forebay (ongoing)		X	X	X	X	X							
	• Sediment removal at Kaweah No. 2 Diversion Intake (ongoing)		X	X	X	X	X							
	• Sediment removal at Kaweah No. 3 Forebay (ongoing)		X	X	X	X	X							
	Road and trail maintenance (modified)		X	X	X	X		X		X		X	X	
	Transmission, power, and communication line maintenance													
	• Pole maintenance and replacement (ongoing)				X							X	X	
	• Vegetation clearance (ongoing)		X	X	X	X		X				X	X	



Proposed Action		Resource Areas Potentially Affected												
		Water Use and Hydrology	Water Quality	Fish and Aquatic	Botanical and Wildlife	Geology and Soils	Geomorphology	Riparian	Land Use	Recreation	Aesthetics (Visual/Noise)	Cultural (Pre-historic/Historic)	Tribal	Socioeconomics
Recreation Enhancements	Addition of trash receptacle and Porta-Potty at Kaweah No. 2 Powerhouse River Access Parking Area (new)									X	X	X		X
	Dissemination of real-time flow information on a publicly-accessible website (new)									X				
Environmental Programs	Environmental Training Program			X	X			X				X	X	

<sup>1</sup> Project outage could occur as part of annual maintenance activities or due to the lack of available water for generation.

<sup>2</sup> This includes vegetation management at all Project facilities with the exception of transmission, power, and communication lines.

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**LIST OF ACRONYMS**

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cfs	cubic feet per second
FERC or Commission	Federal Energy Regulatory Commission
IFM	Instream Flow Measure
MIF	minimum instream flow
Project	Kaweah Project
SCE	Southern California Edison Company
SGMP	Stream Gaging Monitoring Plan

## 8.2 WATER USE AND HYDROLOGY ENVIRONMENTAL EFFECTS

This section describes potential effects to water use and hydrology under the Proposed Action for Southern California Edison Company's (SCE) Kaweah Project (Project). Section 3.0 – No-Action Alternative provides a description of current routine operation and maintenance activities and Section 4.0 – Proposed Action identifies changes from the No-Action Alternative. Potential effects to water use and hydrology were identified based on continued operation of the Project under the Proposed Action. Effects to water use hydrology under the Proposed Action are evaluated relative to ongoing and changes in Project operations affecting:

- Hydrology in bypass reaches;
- Beneficial uses and existing water rights;
- Existing operating agreements and contracts;
- Consumptive water deliveries (existing or future) and power generation; and
- Stream gaging stations.

A discussion of the potential effects to water use and hydrology that could occur as a result of implementation of the Proposed Action, considering new environmental measures, management and monitoring plans, and programs is provided below. Unavoidable adverse effects are also discussed at the end of this section.

### 8.2.1 Hydrology

The Proposed Action results in modifications to Project operations associated with the Instream Flow Measure (IFM) new minimum instream flows (MIF) and modified ramping rates (Appendix 4-A, Section 4.1.1). In general, the Proposed Action provides higher minimum instream flows and the same down-ramping rates compared to the No-Action Alternative, but modified (faster) up-ramping rates. Flows through the powerhouses are lower (average annual generation loss) from implementation of the new minimum instream flow measure (Appendix 4-A, Section 4.1.1). The Proposed Action includes ongoing actions including forebay spills and draining of flowlines and forebays that occur during Project operations, outages, and maintenance. These activities would cause periodic changes in discharge in the Kaweah River via increased flow in natural channels from the forebays.

The potential effects of changes in Project operations on hydrology in the Kaweah River and East Fork Kaweah River (bypass reaches) are described in the following sections.

#### 8.2.1.1 Minimum Instream Flows

In the Kaweah River under the Proposed Action, during dry years the MIF is doubled between December and January and in July, but remains unchanged for the remaining months of the year (Appendix 4-A, Section 4.1.1) (Table 8.2-1A). In normal years, the

MIF in the Kaweah River remains unchanged, except for near doubling during the month of September. In the event that natural inflow into the Kaweah No. 2 Diversion Pool is insufficient to meet both the MIF releases and pre-1914 consumptive water right delivery obligations (3 cubic feet per second [cfs]) into the Kaweah No. 2 Flowline, the MIF release requirement would be reduced to natural inflow minus 3 cfs. This explicitly maintains consumptive water rights deliveries, whereas, under the No-Action Alternative, temporary flow modification/variance requests were required to maintain consumptive water rights deliveries.

In the East Fork Kaweah River under the Proposed Action, during Dry Years MIF remain unchanged and during Normal Years the MIF is doubled (Appendix 4-A, Section 4.1.1) (Table 8.2-1B). In the event that natural inflow into the Kaweah No. 1 Diversion Pool is insufficient to meet both the MIF releases and pre-1914 consumptive water right delivery obligations (1 cfs) into the Kaweah No. 1 Flowline, the MIF release requirement would be reduced to natural inflow minus 1 cfs. This explicitly maintains consumptive water rights deliveries, whereas, under the No-Action Alternative, temporary flow variance requests were required to maintain consumptive water rights deliveries.

Overall, with implementation of the Proposed Action and the IFM, the amount of flow available for diversion would be decreased during various months and water year types. The amount of decrease results in approximately 6.0%, and 0.8% decrease in power generation at the Kaweah No. 1 and Kaweah No. 2 powerhouses, respectively (Section 4.0 – Proposed Action). Conversely, the water would increase flows in the bypass reaches (Section 8.4 – Fish and Aquatic Resources). The new IFM, would preserve water for diversion for consumptive water rights explicitly (see Section 8.2.4.1); whereas, historically minimum flow modification/variances were required. The Proposed Action would generally benefit hydrology in the bypass reaches and have an adverse effect on hydrology available for generation (Section 8.2.4.2).

### **8.2.1.2 Ramping Rates**

Under the Proposed Action, down-ramping rates at both the Kaweah No. 1 and Kaweah No. 2 diversions as a result of Project diversions would be no more than 30% of the existing streamflow per hour consistent with the No-Action Alternative. At the Kaweah No. 1 Diversion, up-ramping rates as a result of Project diversions would, as a natural consequence of the maximum Kaweah No. 1 Flowline capacity (24 cfs), not increase greater than the 24 cfs per hour (Appendix 4-A). At the Kaweah No. 2 Diversion, up-ramping rates would not increase greater than 25 cfs per hour when the existing streamflow is <40 cfs and, as a natural consequence of the maximum Kaweah No. 1 Flowline capacity (87 cfs), would not increase greater than 87 cfs per hour when the existing streamflow is ≥40 cfs (Appendix 4-A). The Proposed Action would have no effect on the timing of initiation of diversions compared to the No-Action Alternative, because the same down-ramping rates are in both alternatives. The Proposed Action would require less time for SCE to shut down diversions compared to the No-Action Alternative. This change only occurs periodically during the year and only affects a few hours of flow; therefore, Proposed Action changes to ramping rates would have negligible effects on hydrology.

### **8.2.1.3 Forebays/Forebay Tank Spills**

Under the Proposed Action, forebay spills and draining of flowlines and forebays during Project outages, maintenance, and sediment management would continue to be implemented. In the event of an unplanned powerhouse outage (i.e., unit trips), water in the flowlines continues to flow (drain) into the forebays/forebay tank until the diversion is turned out (closed). Water entering the forebays/forebay tank can either be: (1) passed through the generating units at the powerhouse (if operational); (2) released through the powerhouse bypass valve (if present); or (3) released from each forebay/forebay tank via Project spillway chutes that direct the overflow into natural channels for conveyance to the Kaweah River (refer to Section 7.6 – Geology and Soils). These activities would cause periodic and increases in discharge in the Kaweah River via increased flow in natural channels that route spills from the forebays. These flows would only moderately increase discharge. The Proposed Action spills and draining of flowlines and forebays would not change compared to the No-Action Alternative and would have no effect on hydrology.

### **8.2.1.4 Powerhouses**

Under the Proposed Action, flow diverted into the Kaweah No. 1 and Kaweah No. 2 flowlines (and therefore the Kaweah No. 1 and Kaweah No. 2 Powerhouses) would be reduced to meet MIF. Pre-1914 water rights flow requirements would remain unchanged. Flow to the Kaweah No. 3 Powerhouse would not change under the Proposed Action. Flow data for the Kaweah No. 1 and No. 2 Flowlines under the No-Action and Proposed Action Alternatives are summarized in Table 8.2-2 and Figures 8.2-1A and 8.2-1B, including the average, minimum, and maximum flow and 20%, 50%, 80%, and the difference in flow exceedance by month from 1994–2018. In general, the effects on diversion flows are most prominent during periods of low flow when MIF and pre-1914 water rights flow requirements and the hydrograph begin to intersect. The average difference in diversion flow by month in the Kaweah No. 2 Flowline ranges from 3.0 to 5.7 cfs less flow diverted under the Proposed Action. Similarly, for the Kaweah No. 1 Flowline, the average difference by month in flow diverted ranges from 0.9 to 4.7 less cfs diverted under the Proposed Action. The Proposed Action would have an adverse effect on generation at Project powerhouses.

## **8.2.2 Beneficial Uses and Existing Water Rights**

The Proposed Action includes modifications to Project operations that could affect beneficial uses or existing water rights. These potential effects are described below.

### **8.2.2.1 Beneficial Uses**

The Kaweah River and Project is located in the Tulare Lake Basin. Existing and potential beneficial uses that apply to surface waters within the Kaweah River Watershed are identified in Water Quality Control Plan (Basin Plan) for the Tulare Lake Basin Second Edition (Revised May 2018 [with Approved Amendments]) (CRWQCB 2018). Beneficial uses identified in the Basin Plan that pertain to the Project include: (1) municipal and domestic supply; (2) agricultural supply; (3) hydropower generation; (4) water contact

recreation; (5) non-contact water recreation; (6) cold freshwater habitat; (7) warm freshwater habitat; (8) spawning, reproduction, and/or early development habitat for fisheries; and (9) wildlife habitat.

New environmental measures, management and monitoring plans, and programs included under the Proposed Action (Appendix 4-A) were specifically developed to maintain/protect municipal, domestic, agricultural water supply, water contact recreation; non-contact water recreation; and enhance cold and warm freshwater fish habitat; spawning, reproduction and/or early development habitat for fisheries; and wildlife habitat. Implementation of the Proposed Action enhances aquatic habitat (Section 8.4 – Fish and Aquatic Resources) through increased instream flows; however, results in reduced power generation (Section 8.2.4.2). Overall, while the Proposed Action makes minor adjustments in some resources, beneficial uses are protected (no effect).

### **8.2.2.2 Existing Water Rights**

Under the Proposed Action, SCE would continue to operate the Project consistent with stipulations in its existing water rights (Section 3.5.2.1 – No-Action Alternative). Therefore, the Proposed Action has no effect on existing water rights.

### **8.2.3 Existing Operating and Water Delivery Agreements**

Operating and water delivery agreements affecting Project operations identified under the No-Action Alternative would remain unchanged under the Proposed Action. Therefore, the Proposed Action has no effect on existing operating agreements or contracts.

### **8.2.4 Consumptive Water Deliveries and Power Generation**

Changes in operations resulting from implementation of the Proposed Action have the potential to affect consumptive water deliveries and power generation. The potential effects of each of these are discussed below.

#### **8.2.4.1 Consumptive Water Deliveries**

Operation of the Project is subject to reservations made in various deeds and indentures (Section 3.5.2.2 – No-Action Alternative). SCE must maintain a continuous flow up to a maximum of 1 cfs in the Kaweah No. 1 Flowline to deliver water to local users consistent with existing agreements that date back to 1898 (pre-1914 consumptive water rights). SCE must maintain a continuous flow up to a maximum of 3 cfs in the Kaweah No. 2 Flowline to deliver water to local users consistent with existing water supply agreements that date back to 1903 (pre-1914 consumptive water rights). These agreements are maintained under the Proposed Action. Specifically, under the Proposed Action, the IFM explicitly changes MIF requirements to stipulate that in the event that natural inflow into the Kaweah No. 1 Diversion or Kaweah No. 2 Diversion is insufficient to meet both the MIF releases and pre-1914 consumptive water right delivery obligations, the MIF release becomes the natural inflow minus the consumptive water rights amounts for each location. Under the No-Action Alternative, during dry years/months when MIFs and consumptive water deliveries are potentially in conflict, SCE must obtain a flow



modification/variance from the Federal Energy Regulatory Commission (FERC or Commission) to maintain the consumptive water deliveries. The Proposed Action makes it easier to maintain required consumptive deliveries, which is a beneficial effect related to the process of maintaining consumptive water deliveries.

#### **8.2.4.2 Power Generation**

Overall Project generation would be reduced under the Proposed Action compared to the No-Action Alternative as a result of implementation of the IFM minimum instream flow schedule. The IFM affects generation at the Kaweah No. 1 and No. 2 powerhouses only. Kaweah No. 3 Powerhouse remains unchanged. Under the Proposed Action, compared to the No-Action Alternative, the Project's annual average generation (1992–2018) decreases 6.0% at Kaweah No. 1 Powerhouse and 0.8% at Kaweah No. 2 Powerhouse (Table 8.2-3). Annual average generation under the Proposed Action decreases by 664 megawatt hours as compared to the No-Action Alternative (Table 8.2-3) and this is considered an adverse effect.

#### **8.2.5 Stream Gaging Stations**

The Proposed Action includes a Stream Gaging Monitoring Plan (SGMP) (Appendix 4-A, Section 4.1.2) that (1) identifies and describes Project gages used to document compliance with MIF and ramping rate requirements, pre-1914 consumptive water right delivery obligations, and dissemination of real-time flow information to the public (not present in the No-Action Alternative); (2) provides for protocols for operation and maintenance of the gages; and (3) protocols for reporting of compliance. Hence, under the Proposed Action, the SGMP would provide a beneficial effect on stream gaging used to document Project compliance.

#### **8.2.6 Conclusions – Water Use**

Changes in Project operations under the Proposed Action maintain current and future water use, as follows:

- Enhances Kaweah and East Fork Kaweah hydrology;
- Protects existing beneficial uses and existing water rights;
- Maintains current operating agreements and contracts;
- Protects pre-1914 consumptive water supply;
- Reduces power generation to provide environmental benefits; and
- Maintains or improves instream flow monitoring capabilities.

The Proposed Action has negligible effects on water use compared to the No-Action Alternative.

### **8.2.7 Unavoidable Adverse Effects**

The Proposed Action results in unavoidable adverse effect to Project generation.

### **8.2.8 Literature Cited**

CRWQCB (California Regional Water Quality Control Board) Central Valley Region. 2018. Water Quality Control Plan for the Tulare Lake Basin Second Edition. Revised May 2018. Available at: [https://www.waterboards.ca.gov/centralvalley/water\\_issues/basin\\_plans/tlbp\\_201805.pdf](https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/tlbp_201805.pdf).

## **TABLES**

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**Table 8.2-1A. Minimum Instream Flow Schedule Under the Proposed Action for the Kaweah River Downstream of the Kaweah No. 2 Diversion**

<b>Kaweah River Downstream of Kaweah No. 2 Diversion Dam</b>		
<b>Month</b>	<b>Minimum Instream Flow by Water Year Type (cfs)<sup>1</sup></b>	
	<b>Dry</b>	<b>Normal</b>
Jan	20 or NF - 3 cfs	20 or NF - 3 cfs
Feb	20 or NF - 3 cfs	20 or NF - 3 cfs
Mar	20 or NF - 3 cfs	30 or NF - 3 cfs
Apr	30 or NF - 3 cfs	30 or NF - 3 cfs
May	30 or NF - 3 cfs	30 or NF - 3 cfs
Jun	30 or NF - 3 cfs	30 or NF - 3 cfs
Jul	20 or NF - 3 cfs	20 or NF - 3 cfs
Aug	10 or NF - 3 cfs	20 or NF - 3 cfs
Sept	5 or NF - 3 cfs	20 or NF - 3 cfs
Oct	5 or NF - 3 cfs	11 or NF - 3 cfs
Nov	5 or NF - 3 cfs	11 or NF - 3 cfs
Dec	10 or NF - 3 cfs	11 or NF - 3 cfs

<sup>1</sup>: NF - 3 cfs: Natural flow to the Kaweah No. 2 Diversion Pool minus the pre-1914 consumptive water right delivery obligation of 3 cfs.

**Table 8.2-1B. Minimum Instream Flow Schedule Under the Proposed Action for the East Fork Kaweah River Downstream of the Kaweah No. 1 Diversion**

<b>East Fork of Kaweah River Downstream of Kaweah No. 1 Diversion Dam</b>		
<b>Month</b>	<b>Minimum Instream Flow by Water Year Type (cfs)<sup>1</sup></b>	
	<b>Dry</b>	<b>Normal</b>
Jan	5 or NF - 1 cfs	10 or NF - 1 cfs
Feb	5 or NF - 1 cfs	10 or NF - 1 cfs
Mar	10 or NF - 1 cfs	20 or NF - 1 cfs
Apr	10 or NF - 1 cfs	20 or NF - 1 cfs
May	10 or NF - 1 cfs	20 or NF - 1 cfs
Jun	10 or NF - 1 cfs	20 or NF - 1 cfs
Jul	10 or NF - 1 cfs	20 or NF - 1 cfs
Aug	5 or NF - 1 cfs	20 or NF - 1 cfs
Sept	5 or NF - 1 cfs	20 or NF - 1 cfs
Oct	5 or NF - 1 cfs	10 or NF - 1 cfs
Nov	5 or NF - 1 cfs	10 or NF - 1 cfs
Dec	5 or NF - 1 cfs	10 or NF - 1 cfs

1. NF - 1 cfs: Natural flow to the Kaweah No. 1 Diversion Pool minus the pre-1914 consumptive water right delivery obligation of 1 cfs.

**Table 8.2-2. Flow Exceedance for the Kaweah No. 2 and No. 1 Flowlines under the No-Action and Proposed-Action and the Difference as a Result of Proposed Action Minimum Instream Flows**

Month	Daily Exceedance Flows by Month (cfs)					Maximum, Minimum, and Average Daily Flows (cfs)		
	10%	20%	50%	80%	90%	Max	Min	Avg
<b>No-Action Kaweah No. 2 Flowline (USGS Gage No. 11208570 + SCE Gage 204a) (1994-2002 and 2002-2018)</b>								
Oct	35.0	22.0	4.4	2.1	1.6	97.0	0.3	13.1
Nov	74.0	58.0	21.0	2.5	1.6	89.0	0.7	29.2
Dec	78.0	70.0	40.0	14.0	3.6	91.0	0.8	41.4
Jan	82.0	79.0	52.0	13.0	2.6	90.0	0.0	47.2
Feb	84.0	82.4	74.0	40.0	5.0	90.0	1.0	63.1
Mar	87.0	85.0	79.0	67.0	30.4	92.0	0.1	70.8
Apr	87.5	85.5	81.0	70.0	63.0	96.0	0.2	75.8
May	87.0	85.5	81.0	72.0	69.0	95.0	12.0	78.1
Jun	87.0	85.0	79.0	68.0	56.0	94.0	6.9	73.9
Jul	86.0	83.0	69.0	28.0	8.9	97.0	0.7	56.8
Aug	82.0	70.0	9.7	2.6	2.1	90.0	0.0	27.7
Sep	53.0	26.9	4.8	2.2	1.8	90.0	0.0	15.8
<b>Proposed-Action Kaweah No. 2 Flowline (USGS Gage No. 11208570 + SCE Gage 204a) (1994-2002 and 2002-2018)</b>								
Oct	32.0	19.0	0.0	0.0	0.0	94.0	0.0	9.2
Nov	71.0	55.0	17.0	0.0	0.0	86.0	0.0	25.4
Dec	75.0	66.2	36.1	0.0	0.0	88.0	0.0	37.5
Jan	79.0	76.0	48.0	0.0	0.0	87.0	0.0	43.1
Feb	81.0	79.4	71.0	37.0	0.0	87.0	0.0	59.8
Mar	84.0	82.0	76.0	64.0	27.4	89.0	0.0	67.7
Apr	84.5	82.5	78.0	67.0	60.0	93.0	0.0	72.7
May	84.0	82.5	78.0	69.0	66.0	92.0	0.0	75.1
Jun	84.0	82.0	76.0	65.0	53.0	91.0	0.0	70.8
Jul	83.0	80.0	66.0	21.0	0.0	94.0	0.0	52.3
Aug	79.0	67.0	0.0	0.0	0.0	87.0	0.0	23.8
Sep	42.1	18.0	0.0	0.0	0.0	87.0	0.0	10.1
<b>Flow Difference between No-Action and Proposed-Action Kaweah No. 2 Flowline</b>								
Oct	-3.0	-3.0	-4.4	-2.1	-1.6	-3.0	-0.3	-3.9
Nov	-3.0	-3.0	-4.0	-2.5	-1.6	-3.0	-0.7	-3.9
Dec	-3.0	-3.8	-4.0	-14.0	-3.6	-3.0	-0.8	-3.9
Jan	-3.0	-3.0	-4.0	-13.0	-2.6	-3.0	0.0	-4.1
Feb	-3.0	-3.0	-3.0	-3.0	-5.0	-3.0	-1.0	-3.2

Month	Daily Exceedance Flows by Month (cfs)					Maximum, Minimum, and Average Daily Flows (cfs)		
	10%	20%	50%	80%	90%	Max	Min	Avg
Mar	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-0.1	-3.1
Apr	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-0.2	-3.1
May	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-12.0	-3.0
Jun	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-6.9	-3.1
Jul	-3.0	-3.0	-3.0	-7.0	-8.9	-3.0	-0.7	-4.5
Aug	-3.0	-3.0	-9.7	-2.6	-2.1	-3.0	0.0	-3.9
Sep	-10.9	-8.9	-4.8	-2.2	-1.8	-3.0	0.0	-5.7
<b>No-Action Kaweah No. 1 Flowline (USGS Gage No. 11208720 and SCE Gage 202) (WY 1994-2002 and 2002-2018)</b>								
Oct	18.9	13.8	4.0	0.8	0.2	26.0	0.0	6.8
Nov	19.0	16.6	11.0	1.0	0.7	23.3	0.0	10.0
Dec	21.2	19.6	13.0	4.7	0.5	24.0	0.0	12.3
Jan	22.0	21.2	16.0	6.2	0.8	24.0	0.0	14.0
Feb	22.3	21.5	19.0	13.0	5.7	24.0	0.0	16.6
Mar	23.0	22.0	19.0	13.0	4.3	25.0	0.0	16.9
Apr	23.5	22.9	19.0	16.0	8.1	24.4	0.0	18.1
May	23.8	23.0	19.0	16.0	13.4	24.7	0.0	18.4
Jun	23.6	23.0	19.1	12.0	3.3	25.1	0.0	17.2
Jul	22.8	21.0	17.0	7.6	0.7	26.0	0.0	14.7
Aug	21.0	20.0	11.0	2.5	0.7	24.0	0.0	11.6
Sep	20.7	18.3	6.8	0.6	0.4	24.0	0.0	9.1
<b>Proposed-Action Kaweah No. 1 Flowline (USGS Gage No. 11208720 and SCE Gage 202) (WY 1994-2002 and 2002-2018)</b>								
Oct	17.5	12.0	0.0	0.0	0.0	25.0	0.0	5.1
Nov	18.0	15.0	8.5	0.0	0.0	22.3	0.0	8.3
Dec	20.0	18.1	10.7	3.7	0.0	23.0	0.0	10.9
Jan	21.0	20.1	14.4	5.2	0.0	23.0	0.0	12.8
Feb	21.3	20.5	18.0	11.8	4.7	23.0	0.0	15.6
Mar	22.0	21.0	18.0	12.0	3.3	24.0	0.0	16.0
Apr	22.5	21.9	18.0	15.0	7.1	23.4	0.0	17.1
May	22.8	22.0	18.0	15.0	12.4	23.7	0.0	17.5
Jun	22.6	22.0	18.1	11.0	0.0	24.1	0.0	16.3
Jul	21.7	20.0	16.0	3.0	0.0	25.0	0.0	12.9
Aug	19.8	17.9	4.6	0.0	0.0	23.0	0.0	7.5
Sep	17.4	10.6	0.0	0.0	0.0	23.0	0.0	4.4



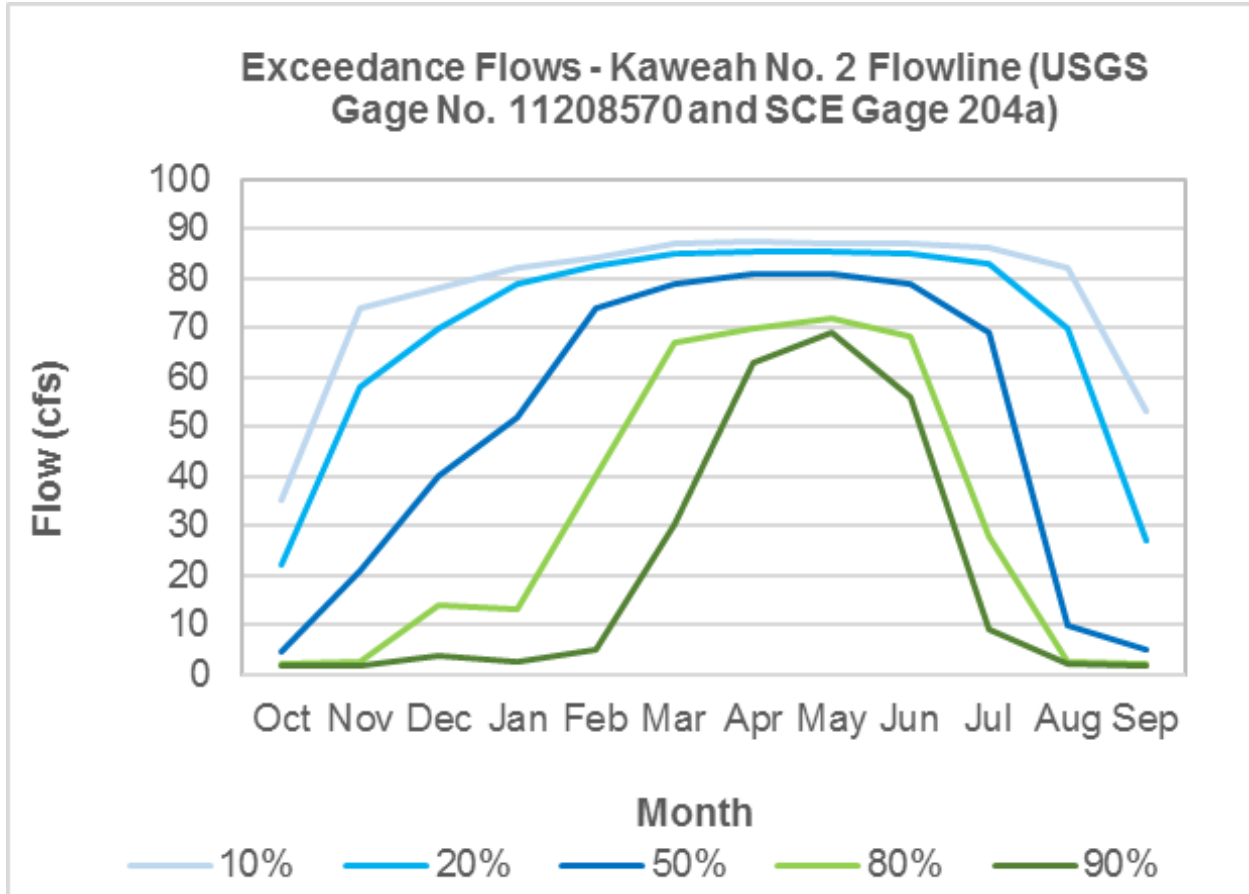
Month	Daily Exceedance Flows by Month (cfs)					Maximum, Minimum, and Average Daily Flows (cfs)		
	10%	20%	50%	80%	90%	Max	Min	Avg
<b>Flow Difference between No-Action and Proposed-Action Kaweah No. 1 Flowline</b>								
Oct	-1.4	-1.8	-4.0	-0.8	-0.2	-1.0	0.0	-1.7
Nov	-1.0	-1.6	-2.5	-1.0	-0.7	-1.0	0.0	-1.7
Dec	-1.2	-1.5	-2.3	-1.0	-0.5	-1.0	0.0	-1.4
Jan	-1.0	-1.1	-1.6	-1.0	-0.8	-1.0	0.0	-1.2
Feb	-1.0	-1.0	-1.0	-1.2	-1.0	-1.0	0.0	-1.0
Mar	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	0.0	-1.0
Apr	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	0.0	-1.0
May	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	0.0	-0.9
Jun	-1.0	-1.0	-1.0	-1.0	-3.3	-1.0	0.0	-0.9
Jul	-1.1	-1.0	-1.0	-4.6	-0.7	-1.0	0.0	-1.8
Aug	-1.2	-2.1	-6.4	-2.5	-0.7	-1.0	0.0	-4.1
Sep	-3.3	-7.6	-6.8	-0.6	-0.4	-1.0	0.0	-4.7

**Table 8.2-3. Change in Net Generation at the Kaweah No. 1, No. 2, and No. 3 Powerhouses as a Result of Reduced Diversion due to MIF and Pre-1914 Water Rights Flow Requirements**

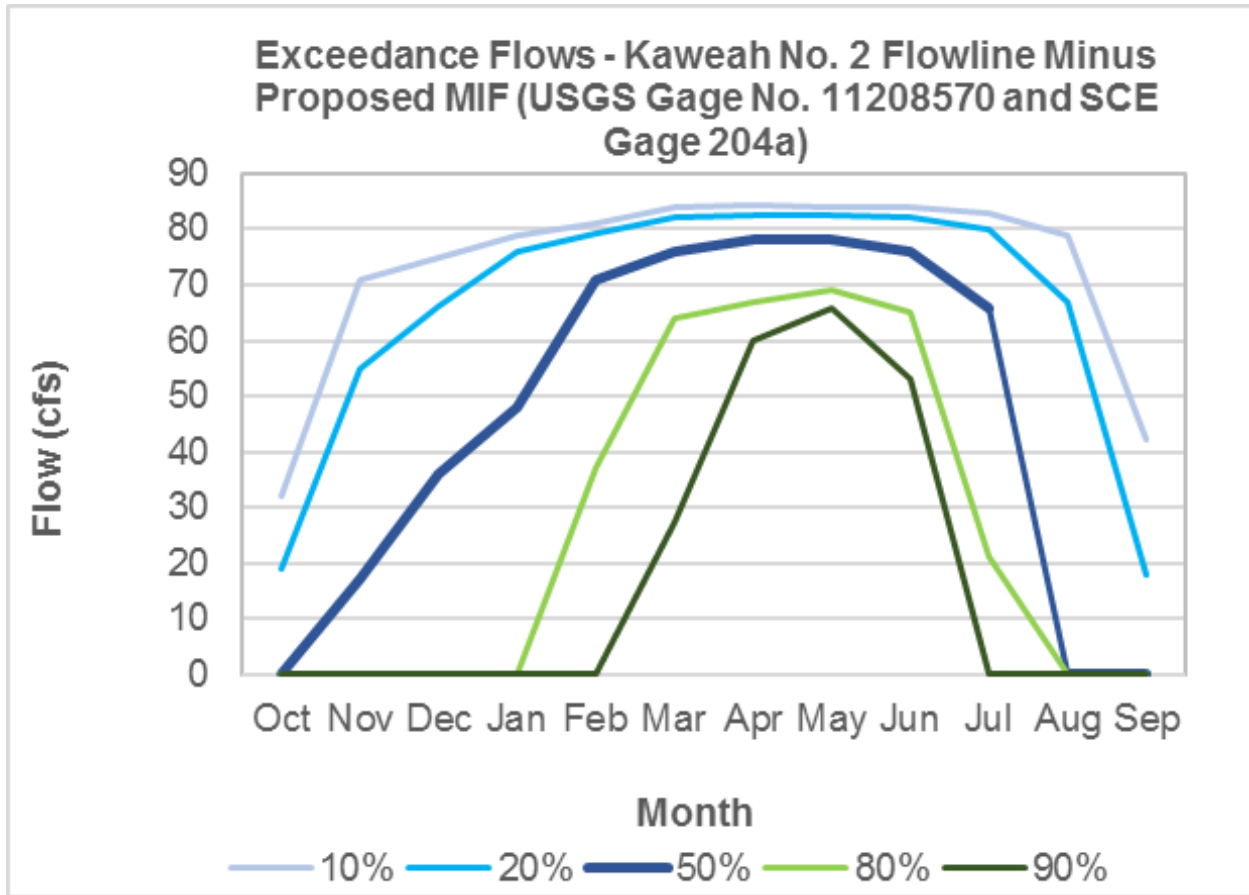
Year	Net Generation (MWh)			
	Powerhouse			Project Total
	Kaweah No. 1	Kaweah No. 2	Kaweah No. 3	
Average Annual Generation, No-Action (1992–2018)	9,732	10,236	19,156	39,124
Average Annual Generation, Proposed Action	9,149	10,155	19,156	38,460
Generation Loss	-583 (6.0%)	-81 (0.8%)	0 (0%)	-664 (1.7%)

## FIGURES

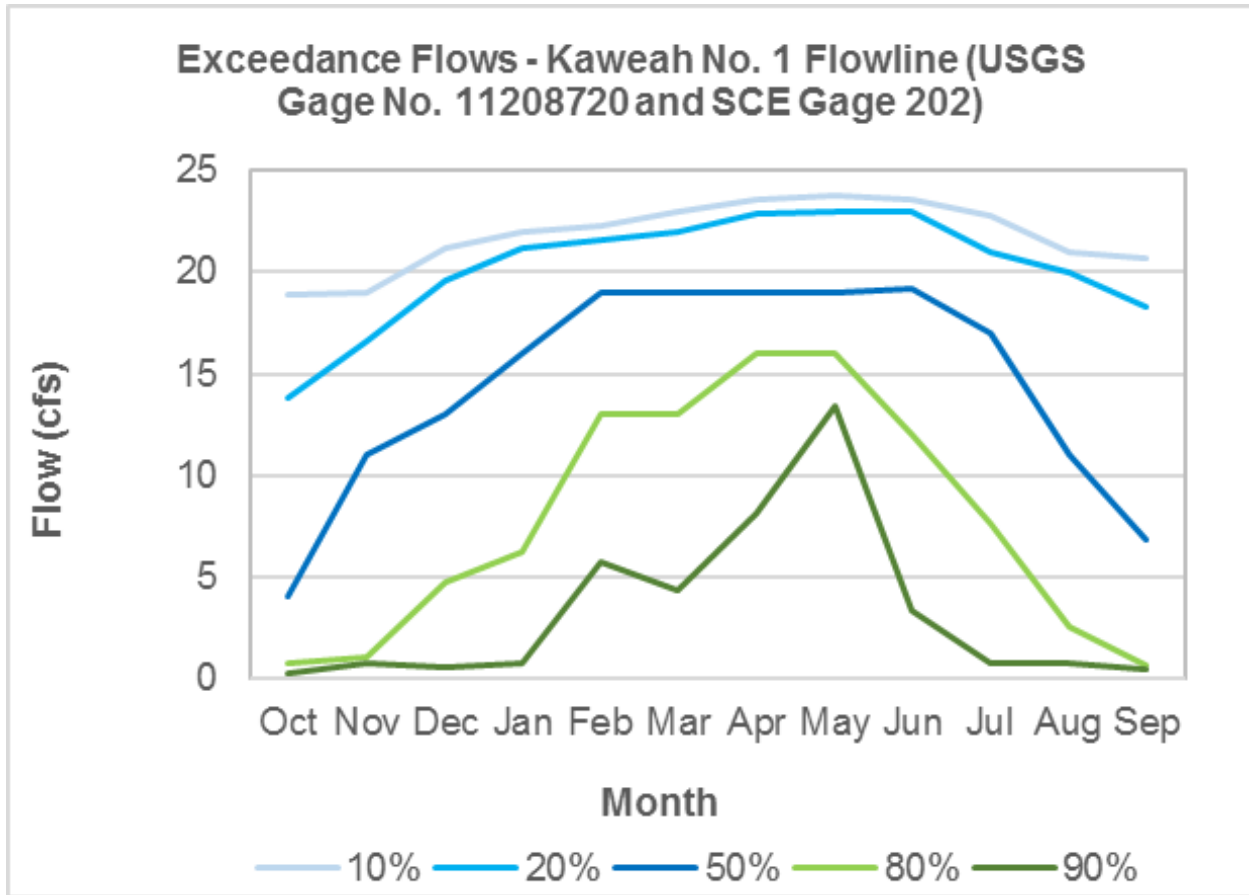
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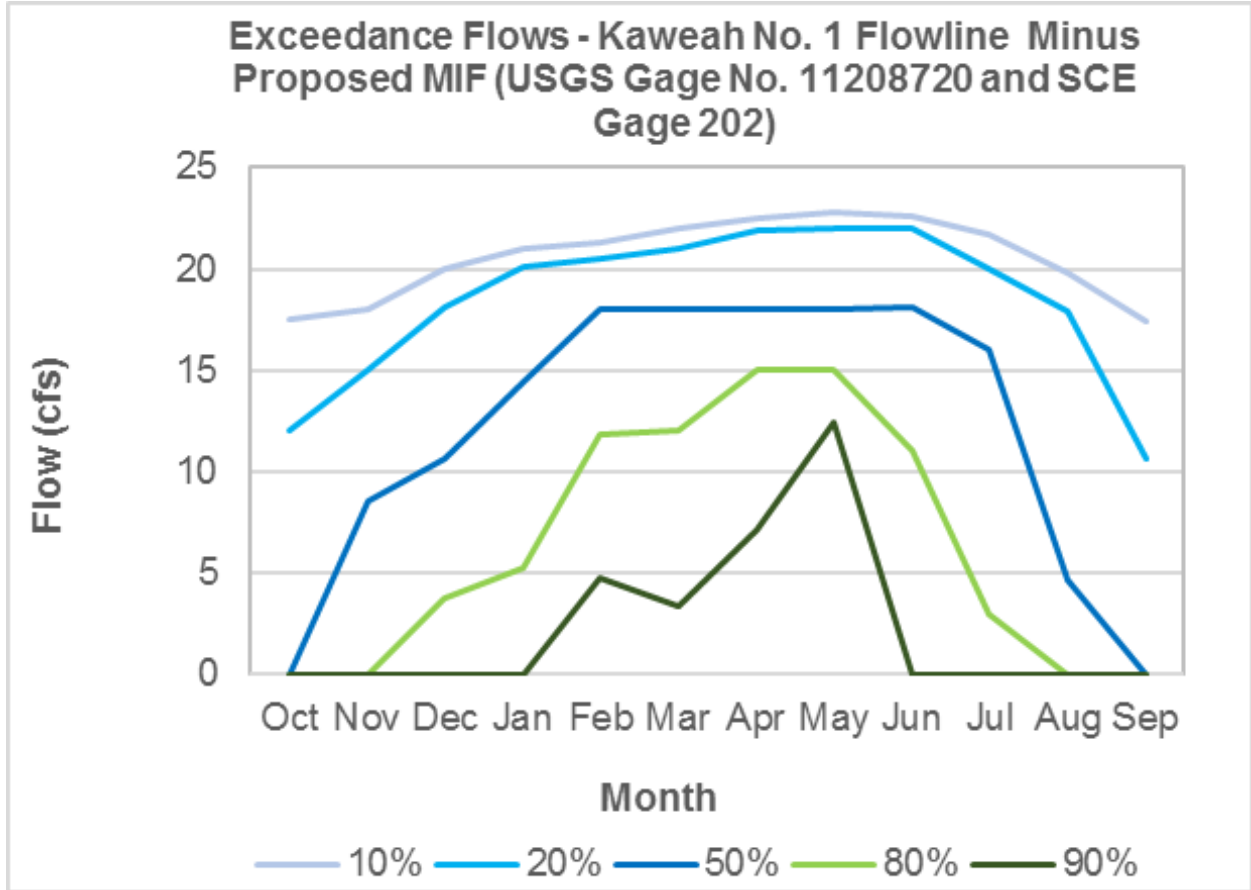
**Figure 8.2-1 A-1. Monthly Exceedance Flows (10%, 20%, 50%, 80%, and 90%) in the Kaweah No. 2 Flowline (WY 1994-2018) Under the No-Action Alternative.**



**Figure 8.2-1 A-2. Monthly Exceedance Flows (10%, 20%, 50%, 80%, and 90%) in the Kaweah No. 2 Flowline (WY 1994-2018) Under the Proposed Action Alternative.**



**Figure 8.2-1 B-1. Monthly Exceedance Flows (10%, 20%, 50%, 80%, and 90%) in the Kaweah No. 1 Flowline (WY 1994-2018) Under the No-Action Alternative.**



**Figure 8.2-1 B-2. Monthly Exceedance Flows (10%, 20%, 50%, 80%, and 90%) in the Kaweah No. 1 Flowline (WY 1994-2018) Under the Proposed Action Alternative.**



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**LIST OF ACRONYMS**

BLM	Bureau of Land Management
cfs	cubic feet per second
FERC or Commission	Federal Energy Regulatory Commission
IFM	Instream Flow Measure
Project	Kaweah Project
RTMP	Road and Trail Management Plan
SCE	Southern California Edison Company
SMECP	Sediment Management and Erosion Control Plan
VIPMP	Vegetation and Integrated Pest Management Plan
WQMP	Water Quality Monitoring Plan
WTMP	Water Temperature Monitoring Plan

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### 8.3 WATER QUALITY ENVIRONMENTAL EFFECTS

This section describes potential effects to water quality under the Proposed Action for Southern California Edison Company's (SCE) Kaweah Project (Project). Section 3.0 – No-Action Alternative provides a description of current routine operations and maintenance activities and Section 4.0 – Proposed Action identifies Proposed Action changes from the No-Action Alternative. Potential effects to water quality were identified based on continued operation and maintenance of the Project under the Proposed Action.

Potential effects to water quality are evaluated for the following components of the Proposed Action:

- Project Operations
  - Minimum instream flow releases and ramping rates
  - Forebay spills and draining of flowlines and forebays during Project outages
- Project Maintenance
  - Algae and large woody debris removal
  - Vegetation management
  - Sediment at Project facilities
  - Road and trail maintenance

A description of potential effects to water quality from implementation of the Proposed Action, considering new environmental measures; management and monitoring plans; and programs, is provided below. Unavoidable adverse effects are also discussed at the end of this section.

Appendix 4-A includes a detailed description of new environmental measures; management and monitoring plans; and environmental programs included under the Proposed Action to address potential effects to aquatic resources, including:

- Instream Flow Measure (IFM) (Appendix 4-A, Section 4.1.1)
- Sediment Management and Erosion Control Plan (SMECP) (Appendix 4-A, Section 4.1.3)
- Water Temperature Monitoring Plan (WTMP) (Appendix 4-A, Section 4.1.6)
- Water Quality Monitoring Plan (WQMP) (Appendix 4-A, Section 4.1.7)

- Vegetation and Integrated Pest Management Plan (VIPMP) (Appendix 4-A, Section 4.5.2)
- Project Road and Trail Management Plan (RTMP) (Appendix 4-A, Section 4.3.1)

### **8.3.1 Project Operations**

#### **8.3.1.1 Instream Flows and Ramping Rates**

Under the Proposed Action, maximum diversion of water from the Kaweah River and East Fork Kaweah River would be the same as the No-Action Alternative (diversions of up to 87 cubic feet per second [cfs] at Kaweah No. 2 Diversion and 24 cfs at Kaweah No. 1 Diversion). The Proposed Action IFM provides higher minimum instream flows (Figure 8.3-1) in the bypass reaches (Table 8.3-1) during some select dry months and water year types. As a result of the increased minimum instream flows in the Proposed Action, less water would be diverted and more water would remain in the Kaweah River and East Fork Kaweah River. The modified minimum instream flows would slightly improve summer/fall low flow season water temperatures in the Kaweah River and East Fork Kaweah River compared to existing conditions (No-Action Alternative). These effects are discussed in Section 8.4.1.2 Effects Analysis for Riverine Aquatic Habitat.

The increased minimum instream flows during low-flow periods may slightly benefit water quality, but in general, water quality would remain similar to existing conditions. Section 7.3.4.2 showed that under existing conditions water quality is good and meets all applicable water quality standards in the bypass reaches except that during the high-flow season, several water quality samples in the Kaweah River bypass reaches and comparison reaches exhibited low alkalinity (<20 mg/L). This appears to be a natural condition of the Watershed during spring high-flow conditions when snowmelt and rainfall runoff have little opportunity to pick up calcium carbonate from the basin geology. Also, there were three ammonia samples in bypass reaches during the summer low-flow sampling period that exceeded water quality criteria. Because the Project does not have operations that would typically affect ammonia, the source could potentially be septic systems from homes along the river (Section 7.3 – Water Quality). The increased minimum instream flows may slightly improve water quality in the low-flow periods through dilution. In general, however, conservative water quality constituents that are present in the source water upstream of the Project (e.g., pH, alkalinity, turbidity) would remain the same in the bypass reaches regardless of the increased minimum instream flow. The Proposed Action also includes implementation of water temperature (WTMP) and water quality (WQMP) monitoring plans and a SMECP. Implementation of the Proposed Action, which includes the IFM (i.e., increased minimum instream flows), WTMP, WQMP, and SMECP would have a beneficial effect relative to monitoring and maintaining existing water quality in the bypass reaches.

Under the Proposed Action, instream flow up-ramping rates would be changed compared to the No-Action Alternative. The Proposed Action IFM modified up-ramping rates, however, would make essentially no change to daily average flows, but rather to a few hours of hourly flows periodically when flowline diversions are modified. It is anticipated

that the Proposed Action, which includes the IFM modified up-ramping rates, WTMP, WQMP, and SMECP would have no effect on water quality in the bypass reaches with respect to up-ramping rates.

### **8.3.1.2 Forebay Spills and Flowline/Forebay Draining**

Under the Proposed Action, SCE would continue to implement ongoing Project operations that have the potential to affect water quality in the Kaweah River or East Fork Kaweah River as a result of spills from the Kaweah No. 1, No. 2, and No. 3 forebays or releases from gates on the Kaweah No. 1, No. 2, and No. 3 flowlines. These activities could cause erosion to occur in natural channels associated with these facilities and transport of sediment and turbidity from these channels into the Kaweah River, as described below.

Forebay spills and draining of flowlines and forebays during planned Project outages would continue to occur as described under the No-Action Alternative. In the event of an unplanned powerhouse outage (i.e., unit trips), water in the flowlines continues to flow (drain) into the forebays until the diversion is turned out (closed). Water entering the forebays can either be: (1) passed through the generating units at the powerhouse (if operational); (2) released through the powerhouse bypass valve (if present); or (3) released from each forebay via Project spillways/spillway chutes that direct the overflow into natural channels for conveyance to the Kaweah River (refer to Section 7.6 – Geology and Soils).

Use of these concrete lined spill chutes and natural channels during spills and opening low-level outlets to drain flowlines and forebays has occurred for decades. Initial scour to bedrock (removal of fine sediments) in these channels has long since stabilized the channels, including vegetation, and the stable channels are not likely to change in the future. Because of the stable nature of the channels, little if any sediment or turbidity is mobilize during these routine operational events. Any sediment or turbidity mobilized during spills and operations activities is very small relative to background in the Kaweah River during most times of the year. Furthermore, the volume of sediment or turbidity to reach the river channel is localized to a specific river section. A smaller amount of sediment or turbidity mobilized, if any, actually enters the main river due to deposition in low gradient or slow velocity portions of the natural channels or margin of the river channel. Also, typically the relative volume of water spilled is small compared to the river flow.

Drainage of the largest forebay, Kaweah No. 3 Forebay, could result in entrainment of sediment that has settled in the forebay. To prevent any entrainment of sediment and turbidity, the SMECP requires that water drained from the forebay would be slowly metered to minimize sediment disturbance in the forebay pool and minimize the rate of water discharge to the natural channel and the Kaweah River. The SMECP also requires that sediment management activities meet the turbidity and sediment (suspended sediment load and suspended sediment discharge) criteria in the Water Quality Control Plan for the Tulare Lake Basin.

Under the Proposed Action, forebay spills and draining of flowlines and forebays would continue to be implemented as described in the SMECP. This plan memorializes existing operations and sediment management activities, including methods to minimize erosion and sediment/turbidity entrainment in the natural channels. The SMECP also requires that sediment management activities meet the turbidity and sediment (suspended sediment load and suspended sediment discharge) criteria in the Water Quality Control Plan for the Tulare Lake Basin. Therefore, continued use of natural channels for Project operations that would be implemented under the Proposed Action would have a negligible effect on water quality, particularly turbidity.

### **8.3.2 Project Maintenance**

#### **8.3.2.1 Flowline Maintenance (Algae and Woody Debris)**

As part of routine operation of the Project, SCE conducts physical structure inspections of all flowlines up to three times per year (spring, summer, and fall) and after large storm events. Operational inspections are completed monthly to look for leakage and debris build-up (i.e., woody debris and algae). Flowline maintenance and repairs are made on an as-needed basis and include removal of woody debris and use of a mechanical machine with brushes for removal of algae on Kaweah No. 1 Flowline. Algae can build up in the Kaweah No. 1 Flowline causing water to be displaced and damage the facility. The mechanical machine with brushes is inserted at the top of the flowline (or other appropriate location along the flowline depending on build-up) and removed at the forebay tank. Algae sticks to the brush as it moves through the flowline. The brush is power washed following removal and reused, as needed. Potentially, the algae and/or woody debris removal could affect water quality.

The brushing of algae at the Kaweah No. 1 Flowline happens periodically and the algae that is brushed either sticks to the brush and is later removed or moves along the flowline and enters the forebay tank and spills and/or goes through the powerhouse into the river. The algae is natural material similar to that that grows in the Kaweah River or East Fork Kaweah River and is “alive” and represents no biological oxygen demand such as might occur with dead/extensively decomposed organic material. The large woody debris that is removed is small material that can enter the flowline through the intake trash rack or debris that falls from adjacent vegetation along the flowline. It is not large woody debris of the nature that provides habitat in the Kaweah River or East Fork Kaweah River and the removal would not affect water quality. Implementation of the Proposed Action, including ongoing flowline maintenance operations would have negligible effect on water quality.

### **8.3.2.2 Vegetation and Pest Management**

SCE would implement the VIPMP to maintain access to and protect Project facilities; and provide for worker/public health and safety. Vegetation management includes application of herbicides.

Application of herbicides has the potential to adversely affect water quality in the Kaweah River and East Fork Kaweah River if these chemicals enter the water. However, implementation of the measures in the VIPMP, such as avoiding herbicide use within 50 feet of streams or drainages; avoiding herbicide use when there is a 50% or greater chance of precipitation within 48 hours; and avoiding herbicide use when winds are greater than 5 mile per hour would prevent adverse effects to water quality. Implementation of the Proposed Action, including the VIPMP, would have negligible effect on water quality.

### **8.3.2.3 Sediment Management**

Under the Proposed Action, SCE would continue to conduct sediment management activities at the Kaweah No. 1 Intake Sandbox, Kaweah No. 1 Forebay Tank, Kaweah No. 2 Intake, Kaweah No. 2 Forebay, and Kaweah No. 3 Forebay. Methods for sediment removal and disposition are designed to be protective of water quality and downstream aquatic resources. The SMECP includes compliance with turbidity and sediment (suspended sediment load and suspended sediment discharge) criteria in the Water Quality Control Plan for the Tulare Lake Basin. Sediment management activities at each location and their potential effects on water quality are discussed in the following sections.

#### **Sediment Removal and Flushing at Kaweah No. 1 Intake Sandbox and Kaweah No. 2 Intake**

Under the Proposed Action, sediment management activities would continue to be implemented at Project facilities to prevent deposits of sediment from building up or blocking Project flowlines and intakes as described under the No-Action Alternative. Sediment management activities include sediment removal/flushing at the Kaweah No. 1 Intake Sandbox and sediment removal at the Kaweah No. 2 Intake. These activities could affect water quality, particularly turbidity, in the bypass reaches.

As described in the SMECP, at the Kaweah No. 1 Intake Sandbox, the low-level outlet would be routinely opened during high flows to minimize accumulation of sand/fine sediment and transport it back into the active stream channel. If larger substrate becomes trapped in the sandbox, it would be removed and placed along the margin of the active channel during the fall maintenance outage where it can be entrained into the channel during high-flow events. At the Kaweah No. 2 Intake, during high-flow events, large boulders and rocks accumulate on the intake grate obstructing flow into the intake and, at times, allowing sediment to build up near the intake. When necessary, this rock debris would be removed and placed downstream of the diversion structure to improve flow into the intake and prevent facility damage.

Sediment management at the intake structures and sand trap would generally occur during high flows when natural sediment transporting processes are typically occurring. The amount of sediment/turbidity removed from the Kaweah No. 1 Intake Sandbox would be very small compared to the natural sediment transport in the East Fork Kaweah River and the turbidity would be similar to that in the East Fork Kaweah River (the sand deposited in the sand trap and flushed would produce very limited turbidity). Removed sediment at the Kaweah No. 2 Intake would be placed adjacent to the natural channel to allow for routing during high flows. The relatively small amount of coarse material cleared would produce very limited turbidity (temporally and spatially). Sediment management activities would be implemented according to methods outlined in the SMECP, including compliance with turbidity and sediment (suspended sediment load and suspended sediment discharge) criteria in the Water Quality Control Plan for the Tulare Lake Basin.

With implementation of the Proposed Action, which includes the SMECP to protect facilities and environmental resources, sediment management activities at the Kaweah No. 1 Intake Sandbox and Kaweah No. 2 Intake would have a negligible effect on water quality.

### **Kaweah No. 1, No. 2, and No. 3 Forebay Sediment Removal**

Under the Proposed Action, sediment management activities would continue to be implemented at Project facilities to prevent deposits of sediment from building in the Kaweah No. 1 and No. 2 forebays as described under the No-Action Alternative. Sediment management activities include routinely opening low-level outlets in the forebay to minimize any sediment build-up and draining water from the forebay prior to sediment removal. These activities could affect water quality, particularly turbidity, in the bypass reaches.

As described in the SMECP, the low-level outlet in the Kaweah No. 1 Forebay Tank would be routinely opened during routine operations to minimize accumulations of sand/fine sediment in the bottom of the tank and transport it into an adjacent natural channel. Any large materials remaining in the bottom of the tank would be removed during the fall maintenance outage and placed in the adjacent natural channel where it would be transported during storm events.

Several low-level outlets in the Kaweah No. 2 Forebay would be routinely opened during routine operations to minimize accumulation of sand/fine sediment from the bottom of the forebay and transport it into natural channels. Any large build-up of material would be removed during the fall maintenance outage and placed in the adjacent natural channel where it would be transported during storm events.

Accumulated sediment in the Kaweah No. 3 Forebay would be removed with heavy equipment approximately every five years, or as needed. Prior to sediment removal, water in the forebay would be lowered, first by passing water via the penstock through the Kaweah No. 3 Powerhouse. As the forebay water level approaches the elevation of the intake structure, diversion through the powerhouse would be discontinued and the remainder of the water would be released through the forebay's low-level outlet. The



outlet would be opened no more 15% of its operating range to allow water to slowly drain from the forebay and minimize entrainment of the sediment deposit near the drain. The water released from the low-level outlet enters a short concrete chute that discharges into an adjacent natural channel. Sediment removal with heavy equipment would occur once the sediment in the bottom of the forebay dries. Disposition of removed sediment would be identified in consultation with the Bureau of Land Management (BLM).

Sediment removal at the forebays has the potential to affect water quality through released of water that includes sediment/turbidity via Project low-level outlets that direct water into natural channels for conveyance to the Kaweah River (refer to Section 7.6 – Geology and Soils). The amount of sediment/turbidity released from the forebays is anticipated to be small (i.e., routine release frequency). The SMECP requires that sediment management will comply with turbidity and sediment (suspended sediment load and suspended sediment discharge) criteria in the Water Quality Control Plan for the Tulare Lake Basin. In addition, as discussed in Section 8.3.2.2, use of the concrete-lined chutes and natural channels during opening of low-level outlets at the forebays has occurred for decades. Initial scour to bedrock (removal of fine sediments) in these channels has long since stabilized the channels, including vegetation, and the stable channels are not likely to change in the future. Because of the stable nature of the channels, little if any sediment or turbidity is mobilize during these routine operational events. Any sediment or turbidity mobilized during these routine operation activities is very small relative to background in the Kaweah River during most times of the year. Furthermore, the volume of sediment or turbidity to reach the river channel is localized to a specific section of river. A smaller amount of sediment or turbidity mobilized, if any, actually enters the main river due to deposition in low gradient or slow velocity portions of the discharge channels or margin of the river channel. Also, typically the relative volume of water spilled is small compared to the river flow.

Under the Proposed Action, forebay releases of water and sediment would continue to be implemented as described in the SMECP. This plan memorializes existing operations and sediment management activities, including methods to minimize erosion within the natural channels and requires compliance with turbidity and sediment (suspended sediment load and suspended sediment discharge) criteria in the Water Quality Control Plan for the Tulare Lake Basin. Therefore, continued release of flows into the natural channels for Project sediment maintenance implemented under the Proposed Action would have a negligible effect on water quality, particularly turbidity.

#### **8.3.2.4 Road and Trail Maintenance**

SCE would implement a Project RTMP to maintain access to Project facilities, protect worker/public health and safety, and minimize erosion and sedimentation. Project road maintenance includes inspection of Project roads during routine operation and maintenance of Project facilities to identify the need for minor or major road maintenance. Minor road maintenance includes debris removal; basic repairs, including filling of potholes; maintenance of erosion control features such as culverts, drains, ditches, and water bars; repair, replacement, or installation of access control features such as posts, cables, rails, gates, and barrier rock; bridge deck replacement; and repair and

replacement of signage. Major road maintenance includes installation or replacement of culverts and other drainage features; grading; sealing; and resurfacing. Project trail maintenance consists of inspection of Project trails during routine operation and maintenance of Project facilities, including debris removal; repairs of the trail surface, minor brushing; maintenance of erosion control features; repair, replacement, or installation of access control structures; and repair and replacement of signage.

Road and trail maintenance activities have the potential to adversely affect water quality in the Kaweah River and East Fork Kaweah River if the activities disturb soils or if spilled chemicals associated with the work enter the water. However, implementation of the measures in the RTMP, such as adhering to the Tulare County or BLM standards; consulting Tulare County or BLM, as appropriate, to review and modify proposed best management practices and environmental measures; and obtaining all necessary permits and approvals prior to work, would prevent adverse effects to water quality. The Proposed Action would have negligible effect on water quality in the Kaweah River and East Fork Kaweah River.

### **8.3.3 Conclusions – Water Quality**

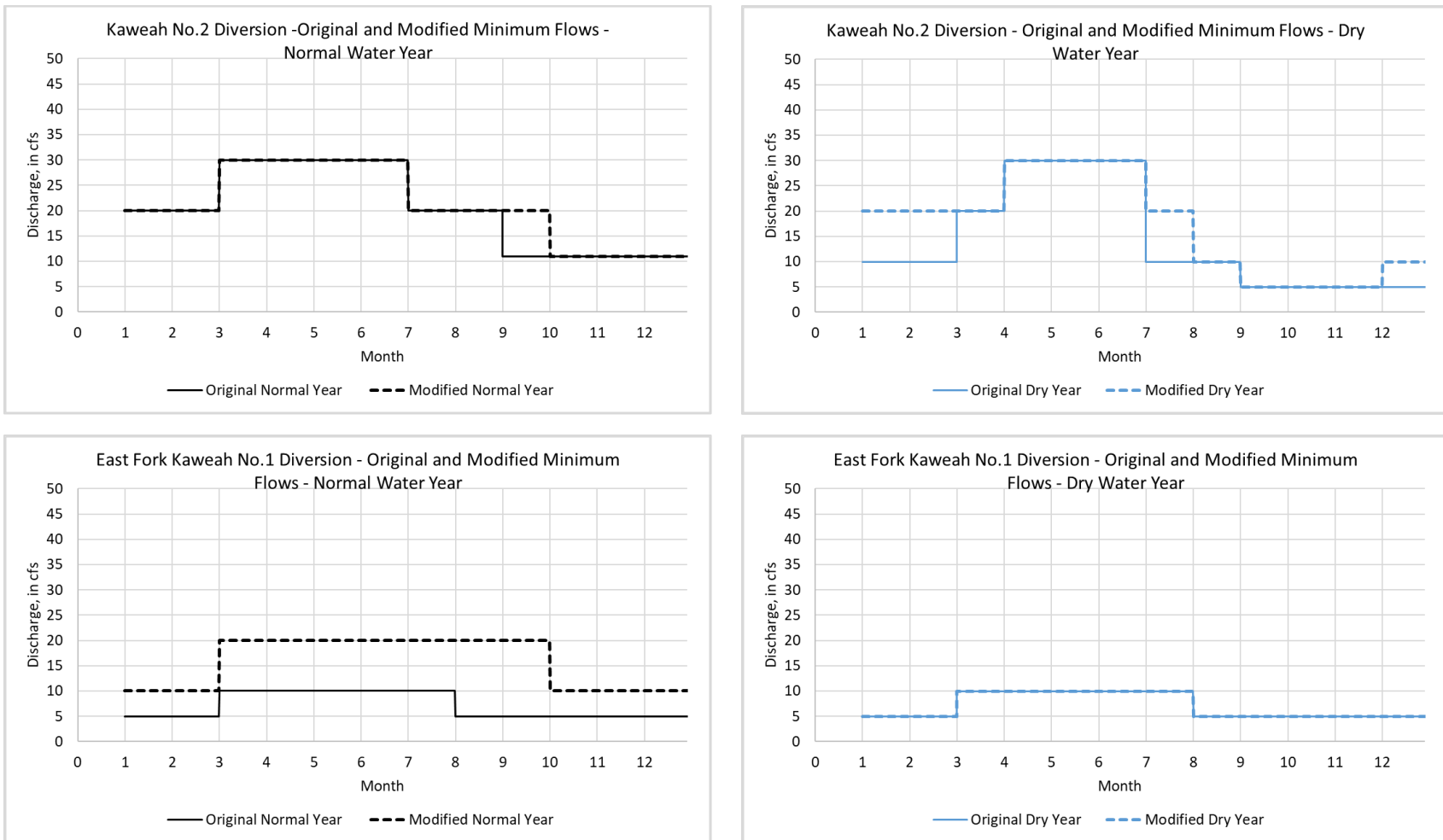
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### **8.3.4 Unavoidable Adverse Effects**

There are no unavoidable adverse effects to water quality under the Proposed Action.

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**LIST OF ACRONYMS**

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°C	degrees Celsius
cfs	cubic feet per second
ESM	Entrainment Study Measure
ETP	Environmental Training Program
FERC or Commission	Federal Energy Regulatory Commission
FPMP	Fish Population Monitoring Plan
FYLF	Foothill Yellow-Legged Frog
GIS	Geographic Information System
IBI	Index of Biotic Integrity
IFM	Instream Flow Measure
km	kilometer
Project	Kaweah Project
RTMP	Road and Trail Management Plan
SCE	Southern California Edison Company
SD	Supporting Document
SMECP	Sediment Management and Erosion Control Plan
TPCLMM	Transmission, Power, and Communication Line Maintenance Measure
TSR	Technical Study Report
VIPMP	Vegetation and Integrated Pest Management Plan
WPT	Western Pond Turtle
WQMP	Water Quality Monitoring Plan
WTMP	Water Temperature Monitoring Plan

## 8.4 FISH AND AQUATIC RESOURCES ENVIRONMENTAL EFFECTS

This section describes potential effects to fish and aquatic resources under the Proposed Action for Southern California Edison Company's (SCE) Kaweah Project (Project). Section 3.0 – No-Action Alternative provides a description of current routine operation and maintenance activities. Section 4.0 – Proposed Action identifies changes from the No-Action Alternative, including new environmental measures; management and monitoring plans; and environmental programs. Potential effects to fish and aquatic resources are identified based on operation and maintenance of the Project under the Proposed Action compared to the No-Action Alternative.

Potential effects to fish and aquatic resources, which consists of: (1) riverine physical habitat (e.g., depth, velocity, water temperature), (2) riverine aquatic community (algae, macroinvertebrates), (3) riverine fish, and (4) special status-species, are evaluated for the following (Table 8.4-1):

- Project Operations
  - Minimum instream flow releases
  - Ramping rates
  - Forebay spills
  - Draining of flowlines and forebays during Project outages
  - Diversions and power generation
- Project Maintenance
  - Vegetation management
  - Pest management
  - Sediment Management at Project facilities
  - Road and trail maintenance
  - Transmission, power, and communication line vegetation clearance
- Environmental Program
  - Environmental Training Program

A discussion of potential effects to fish and aquatic resources (riverine habitat, riverine aquatic community, riverine fish, and special-status species) from implementing the Proposed Action, which includes new environmental measures; management and monitoring plans; and environmental programs, is provided below. Unavoidable adverse effects are also discussed at the end of this section.

Appendix 4-A includes a detailed description of new environmental measures; management and monitoring plans; and environmental programs included under the Proposed Action to address potential effects to aquatic resources, including:

- Instream Flow Measure (IFM) (Appendix 4-A, Section 4.1.1)
- Sediment Management and Erosion Control Plan (SMECP) (Appendix 4-A, Section 4.1.3)
- Fish Population Monitoring Plan (FPMP) (Appendix 4-A, Section 4.1.4)
- Entrainment Study Measures (ESM) (Appendix 4-A, Section 4.1.5)
- Water Temperature Monitoring Plan (WTMP) (Appendix 4-A, Section 4.1.6)
- Water Quality Monitoring Plan (WQMP) (Appendix 4-A, Section 4.1.7)
- Vegetation and Integrated Pest Management Plan (VIPMP) (Appendix 4-A, Section 4.5.2)
- Environmental Training Program (ETP) (Appendix 4-A, Section 4.6.1)

## **8.4.1 Effects to Riverine Aquatic Habitat**

### **8.4.1.1 Project Activities that May Affect Riverine Aquatic Habitat**

Under the Proposed Action, the following Project activities may affect riverine aquatic habitat (Table 8.4-1):

- Project Operations
  - Minimum Instream Flows – Modified instream flow could affect the hydrology, water temperature/water quality, channel geomorphology/sediment, and riparian vegetation that provide aquatic habitat for aquatic species.
  - Ramping Rates – Modified ramping rates could affect the hydrology and riparian vegetation that provide aquatic habitat for aquatic species.
  - Forebay Spills – Ongoing forebay spills could affect water quality (turbidity) in the bypass reaches that provides aquatic habitat.

- Draining of Flowlines and Forebays during Project Outages – Ongoing drainage of flowlines and forebays during Project outages could affect water quality, algae and benthic macroinvertebrates, and fish.
- Diversions and Generation – Modified water diversion and generation could affect hydrology, water temperature, water quality, riparian vegetation, algae, benthic macroinvertebrates, bypass reach wetted perimeter/productivity, bypass reach fish physical habitat, entrainment, and special-status species.
- Project Maintenance
  - Vegetation Management – Modified vegetation management through the direct removal of vegetation or herbicide application at Project facilities and as a part of power line or communication line maintenance could affect the abundance of riparian vegetation, water quality, and potentially aquatic habitat and species.
  - Sediment Management – Ongoing sediment management at the Kaweah No. 1 Diversion Sandbox, Kaweah No. 1 Forebay, Kaweah No. 2 Diversion Intake and Forebay, and at the Kaweah No. 3 Forebay, could affect water quality in the bypass reaches and aquatic species.
- Environmental Programs
  - Environmental Training Program – The environmental training program to educate Licensee personnel and contractors (as appropriate) about special-status biological species could affect special-status aquatic species.

#### **8.4.1.2 Effects Analysis for Riverine Aquatic Habitat**

##### **Hydrology**

Under the Proposed Action, maximum diversion of water from the Kaweah River and East Fork Kaweah would be the same as the No-Action Alternative (diversions of up to 87 cubic feet per second [cfs] at Kaweah No. 2 Diversion and 24 cfs at Kaweah No. 1 Diversion). The Proposed Action IFM provides higher minimum instream flows (Table 8.4-2; Figure 8.4-1) that would result in increased flows in the bypass reaches (Table 8.4-3) during some select dry months and water year types. In the East Fork Kaweah, minimum instream flows are increased in all months in normal water year types, but remain unchanged in dry water year types. In the Kaweah River, minimum instream flows are modified in November in Normal water year types and in January, February, July, and December of Dry water year types. Figures 8.4-2, 8.4-3, 8.4-4, and 8.4-5 show flow exceedance plots for each month in each of the bypass reaches for existing (No-Action Alternative), unimpaired, and modified (Proposed Action) hydrology. The Proposed Action IFM modified ramping rates would make essentially no change to daily average flows, but rather it would make minor changes to hourly flows when flowline diversions are modified. The Proposed Action hydrology effects on aquatic species habitat are addressed below in Sections 8.4.2 Effects on Riverine Aquatic Community and

Section 8.4.3 Effects on Riverine Fish. Implementation of the Proposed Action, which includes the modified IFM with increases in minimum instream flows and modified ramping rates would have a beneficial effect on hydrology in the bypass reaches.

### **Water Temperature and Water Quality**

The bypass reaches are relatively short (Kaweah River 4.1 miles, East Fork Kaweah River 4.7 miles) and all of the diverted water for Project generation re-enters the rivers downstream of each powerhouse. In addition, during most dry water years, diversions are turned off during the warmest water temperature months (July, August, September). At that time, water temperature is naturally warm (>70 degrees Fahrenheit) and generally suitable for warm water fish (Figure 7.4-7 and 7.4-9). During the winter and spring/early summer water temperatures are cold and/or flows are higher and the Project doesn't affect water temperature. In a dry year like 2018, the modeled (AQ 4 – Water Temperature Technical Study Report [TSR] [SCE 2019a; Supporting Document A (SD A)]) existing temperature conditions, are nearly identical to the unimpaired temperature conditions (Figures 8.4.6a-b). The Proposed Action also includes the IFM with modified instream flows (increases in flow).

There is limited opportunity for the Project to affect water temperature. The only time the Proposed Action has the potential to affect water temperature in the bypass reaches is during the summer / early winter season in years when air temperatures are warm and inflows to the Project are high enough to allow diversion of flow from the bypass reaches. Water temperature modeling using the 2018 calibrated water temperature model (AQ 4 – Water Temperature TSR [SCE 2019a; SD A]) with flows like those that occurred in 2003, when July through December diversions were occurring (a drier Normal water year type) indicates that almost no change occurred in the Kaweah River bypass reaches, except a small amount of warming in November through January (average 0.45 degrees Celsius [°C] Kaweah River above the Kaweah No. 1 Powerhouse), compared to unimpaired conditions. In the East Fork Kaweah River a very small amount of warming occurred August through December (average 0.17°C) under existing conditions compared to unimpaired conditions (Figure 8.4-6b). With implementation of the IFM in the Proposed Action, however, the water temperatures in the East Fork Kaweah River cool a small amount compared to existing (No-Action) (Figure 8.4-6c) (August and September average temperature decreases 0.14°C). Implementation of the Proposed Action and IFM (increased minimum flows) would result in a small beneficial effect to water temperature (cooler water temperature) in the bypass reaches compared to existing conditions (No-Action Alternative).

With respect to water quality, under existing conditions water quality is good and meets all applicable water quality standards except that during the high-flow season, several water quality samples in the Kaweah River bypass reaches and comparison reaches exhibited low alkalinity (<20 mg/L). This appears to be a natural condition of the Watershed during spring high-flow conditions when snowmelt and rainfall runoff have little opportunity to pick up calcium carbonate from the basin geology. Also, there were three ammonia samples in bypass reaches during the summer low-flow sampling that exceeded water quality criteria. Because the Project does not have operations that would typically



affect ammonia, the source could potentially be septic systems from homes along the river (Section 7.3 – Water Quality).

The Proposed Action includes the SMECP that maintains sediment and erosion practices to insure that turbidity from sediment management does not affect water quality in the bypass reaches. Under the Proposed Action, therefore, water quality is expected to be similar to existing conditions or slightly improved as a result of the increased minimum flows during the low-flow months due to the IFM.

Overall, implementation of the Proposed Action, which includes increased instream flows as a result of the IFM; implementation of the SMECP; and implementation of the WTMP and WQMP that require periodic water temperature and water quality monitoring, would result in a beneficial effect (enhancement) of water temperature and water quality in the bypass reaches.

### **Channel Geomorphology and Sediment**

Under existing conditions, which includes activities in the SMECP, the channel geomorphology and sediment transport conditions in the bypass reaches are similar to unimpaired conditions (Section 7.4.5.3). The Proposed Action would not affect either beneficially or negatively the range of flows that affect channel geomorphology or sediment transport conditions. Existing spawning gravels are suitably clean of fine sediment to provide high quality spawning and pools have limited buildup of fine sediment and would continue similarly under the Proposed Action. High-flow channel maintenance flows would continue to occur in the bypass reaches. With implementation of the Proposed Action, including the SMECP, there would be no effect on channel geomorphology and sediment in the bypass reaches.

### **Riparian Vegetation**

The hydrology, minimum instream flows and down ramping rates (IFM), under the Proposed Action would maintain and provide greater protection to riparian resources in the bypass reaches associated with the Project. Implementation of the avoidance and protection measures in the VIPMP, SMECP, Project Road and Trail Management Plan (RTMP), and Transmission, Power, and Communication Line Maintenance Measure (TPCLMM) and the ETP under the Proposed Action provide for enhanced management of and protection of riparian resources and wetland habitat during maintenance activities. Overall the Proposed Action with implementation of the IFM, VIPMP, SMECP, RTMP, TPCLMM, and ETP would benefit riparian vegetation and wetland habitat along approximately 8.8 miles of rivers associated with the Project (Section 8.8.3 Riparian Resource Environmental Effects).

#### **8.4.1.3 Conclusion – Riverine Aquatic Habitat**

The Proposed Action would maintain and/or enhance (beneficially effect) the riverine aquatic habitat (hydrology, water temperature and water quality, channel geomorphology and sediment, and riparian vegetation) in the bypass reaches.

## **8.4.2 Effects to the Riverine Aquatic Community**

### **8.4.2.1 Project Activities that May Affect the Riverine Aquatic Community**

Under the Proposed Action, the operations and maintenance activities that may potentially affect the riverine aquatic community are the same as those discussed in Section 8.4.1.1 related to riverine aquatic habitat (hydrology, water temperature and water quality, channel geomorphology and sediment, and riparian vegetation) (Table 8.4-1). Overall, it was found in Section 8.4.1.4 that the Proposed Action would maintain and/or enhance (beneficially effect) the riverine aquatic habitat (hydrology, water temperature and water quality, channel geomorphology and sediment, and riparian vegetation) in the bypass reaches.

### **8.4.2.2 Effects Analysis for the Riverine Aquatic Community**

#### **Algae and Benthic Macroinvertebrates**

Under existing conditions (No-Action Alternative) algae abundance was moderate and nuisance algae were not observed. There was no obvious difference between algae coverage in the bypass reaches and the comparison reaches (Section 7.4.7.1 Benthic Algae; AQ 3 – TSR [SCE 2019c; SD A]). Average summer/fall drift density of benthic macroinvertebrates was similar between comparison and bypass reaches (Figure 7.4-12). Drift density appeared to increase in a downstream direction, irrespectively whether the sample was upstream of the bypass reaches, within the bypass reaches, or downstream of the bypass reaches. Benthic macroinvertebrate sampling metric results and Index of Biotic Integrity (IBI) scores were also similar between the comparison and bypass reaches (Table 7.4-10). Kaweah River comparison reaches had IBI scores of 35 and 37 and Kaweah River bypass reaches had similar scores that ranged from 31 to 40. The East Fork Kaweah River comparison reach had an IBI score of 36 and East Fork Kaweah River bypass reaches had similar IBI scores of 40 and 42. The Proposed Action, including implementation of the IFM, with increases in instream flows and wetted perimeter (see below), and the SMECP, WTMP, WQMP, VIPMP, and ETP would benefit riverine aquatic habitat compared to existing conditions (Section 8.4.1.4) (also see Bypass Reach Wetted Perimeter below); therefore, the Proposed Action would maintain and/or have a beneficial effect on algae and benthic macroinvertebrates.

#### **Bypass Reach Wetted Perimeter**

Implementation of the Proposed Action, which includes the modified IFM with increases in minimum instream flows would have a beneficial effect on hydrology in the bypass reaches. Appendix 8.4-A shows the monthly exceedance plots for wetted perimeter for each month in the bypass reaches for existing (No-Action Alternative), unimpaired, and modified (Proposed Action) hydrology. Table 8.4-4 shows a summary of the exceedance plots by month, including the difference between the Proposed Action and existing conditions both in terms of percent of wetted perimeter and lineal feet of wetted perimeter. Figures 8.4-7, 8.4-8, 8.4-9, and 8.4-10 show percent of unimpaired flow exceedance plots for wetted perimeter for each month in the bypass reaches for the modified (Proposed

Action) hydrology. The percent of unimpaired wetted perimeter for the Proposed Action hydrology is approximately 80% (or greater). With the modified IFM, the Proposed Action has improved wetted perimeter in the upper Kaweah River reach (KR DS PH3) during the months of January, February, July, September, and December compared to existing conditions (No-Action Alternative) (Table 8.4-4). In the downstream reach above Kaweah No. 1 Powerhouse (KR US PH1) the Proposed Action has increased wetted perimeter during the months of January, February, July, August, September, November and December compared to existing (No-Action Alternative) and in the farthest downstream reach (KR US PH2) there is an improvement January, July, September, and December (Table 8.4-4). In the East Fork Kaweah River, wetted perimeter has increased under the Proposed Action during January, February, July, August, September, October, November and December (Table 8.4-4). Wetted perimeter increases are on the order of a few percent to 18 percent (typically in the low exceedances below 50%). The Proposed Action would have a beneficial effect on wetted perimeter, which provides habitat for benthic species (algae and macroinvertebrates).

#### **8.4.2.3 Conclusion – Riverine Aquatic Community**

The Proposed Action, including implementation of the IFM, SMECP, WTMP, WQMP, VIPMP, and ETP, would have a beneficial effect on the Riverine Aquatic Community (algae, benthic macroinvertebrates, wetted perimeter) in the bypass reaches.

### **8.4.3 Effects to Riverine Fish**

#### **8.4.3.1 Project Activities that May Affect Riverine Fish**

Under the Proposed Action, the operations and maintenance activities that may potentially affect the riverine fish are the same as those discussed in Section 8.4.1.1 related to riverine aquatic habitat (Table 8.4-1). Overall, it was found in Section 8.4.1.4 that the Proposed Action would maintain and/or enhance (beneficially effect) the riverine aquatic habitat (hydrology, water temperature and water quality, channel geomorphology and sediment, and riparian vegetation) in the bypass reaches.

#### **8.4.3.2 Effects Analysis for Riverine Fish**

##### **Distribution and Diversity**

The Proposed Action would maintain the existing (No-Action Alternative) spatial distribution of fish species in the bypass reaches. The existing distribution of minnow species (Sacramento pikeminnow, hardhead), Sacramento suckers, rainbow trout and other species is primarily determined by water temperature and physical barriers in the study area (e.g., natural barriers in the East Fork Kaweah River) (Section 7.4.9.1; Table 7.4-1; AQ 2 – Fish Population TSR [SCE 2019b; SD A]). Hardhead and Sacramento pikeminnow were captured at all sampling sites in the Kaweah River and at the lowest elevation sampling site on the East Fork Kaweah River. It is likely that natural barriers limit the upstream distribution of these species in the East Fork Kaweah River. Sacramento suckers were found throughout the Kaweah and East Fork Kaweah River sampling sites. Rainbow trout were only found in the upper three sampling sites on the

Kaweah River, and at all of the East Fork Kaweah River study sites. Likely warm summer water temperature due to the low elevation of the bypass reaches limits the downstream trout distribution in the Kaweah River and affects the abundance in other reaches. Smallmouth bass were found in the lower three Kaweah River sites and lower East Fork Kaweah River site. California roach were found at the two upper sites on the Kaweah River and the two lower sites on the East Fork Kaweah River. The Proposed Action would have limited effect on water temperature (Section 8.4.1.3) and would not affect barriers; therefore, the Proposed Action would have no effect on the distribution and diversity of riverine fishes in the bypass reaches.

### **Growth/Condition/Abundance/Timing**

Fish growth and condition in the bypass reaches is primarily determined by water temperature/quality and food availability (productivity). Abundance is primarily controlled by food availability and the availability of physical habitat. Life history timing is primarily controlled by water temperature. The Proposed Action enhances productivity potential (Section 8.4.2.3) and essentially maintains water temperature and water quality (Section 8.4.1.3). Rearing habitat availability in all river reaches is enhanced under the Proposed Action (see below). Therefore, under the Proposed Action, the growth, condition, and abundance of fish would be enhanced in the bypass reaches and the timing of life history functions would remain unchanged.

Down ramping rates, if extreme could affect abundance of fish via stranding of fish or dewatering of redds. There is very little down ramping that occurs as a result of the Project with respect to temporal frequency or flow magnitude. Periodically, when flowline diversions are increased during the year (Kaweah No. 1 and No. 2 Diversions), flows would decrease in the bypass reaches. The Proposed Action IFM requires, however, that ramping in the river, as a result of diversion, is limited to 30% or less of the stream flow per hour. This causes a change in stage of <0.1 to 0.3 feet per hour in the range of flows that the Project can operate (87 cfs at Kaweah No. 2 Diversion and 24 cfs at Kaweah No. 1 Diversion) (Section 7.4.5.1). This down-ramping rate is protective of fish and would avoid redd stranding. The Proposed Action also includes the FPMP, SMECP, WTMP, WQMP, and ETP that would require monitoring of fish populations, sediment management, water temperature monitoring, water quality monitoring, and environmental training. Overall, implementation of the Proposed Action would have a beneficial effect on fish growth, condition, and abundance and no effect on life history timing.

### **Bypass Reach Physical Habitat**

Habitat versus flow relationships for each of the bypass reaches and each species and life stage are discussed in Section 7.4.9.6. Hardhead/Sacramento pikeminnow adult, Sacramento sucker adult, and rainbow trout adult habitat versus flow relationships were very similar and typically reached a maximum at the highest discharges, thus these were the most limiting species/life stages in terms of habitat flow requirements. Because of the natural warm water temperature in the vicinity of the Project and special-status of hardhead, hardhead / Sacramento pikeminnow adult habitat was used to focus the flow analysis in the bypass reaches; however, other species/life stages were also taken into

consideration. A habitat time series analyses (1994–2018) of existing (No-Action Alternative), unimpaired flow, and modified conditions (Proposed Action) is provided here for each of the bypass reaches to show the difference between the Proposed Action and existing (No-Action Alternative) and/or natural habitat potential (unimpaired habitat). Figures 8.4-11, 8.4-12, and 8.4-13 show percent of unimpaired hardhead and Sacramento pikeminnow adult habitat exceedance plots for each month in each of the Kaweah River bypass reaches. Figure 8.4-14 shows the percent of unimpaired habitat exceedance plots for the combined Kaweah River bypass reaches. Figure 8.4-15 shows the percent of unimpaired habitat exceedance plots for the East Fork Kaweah River bypass reach. For the combined Kaweah River bypass reaches and for the East Fork Kaweah bypass reach, the Proposed Action percent of unimpaired habitat is approximately 80% or greater in the warm water temperature months (June, July, August, September, October) and generally 70% or greater in the cool water temperature months (November through May). In addition, the amount of Proposed Action habitat is greater than under existing conditions (No-Action Alternative) due to the enhanced minimum instream flows in the IFM. Tables 8.4-5 and 8.4-6a-e show the difference between the Proposed Action habitat versus the existing conditions habitat time series plots in terms of percent change and amount of habitat change (feet<sup>2</sup>/1000 feet). Proposed Action changes in habitat can also be observed by comparing Figures 8.4-11 through 8.4-15 to Figures 7.4-30 through 7.4-34). Implementation of the Proposed Action, including the IFM, would have a beneficial effect on adult hardhead and Sacramento pikeminnow physical habitat in the bypass reaches.

Table 8.4-5 and Tables 8.4-6a-e also show the effect of the Proposed Action on physical habitat for all species and life stages compared to existing conditions. Appendix 8.4-B shows the effect of the Proposed Action on physical habitat for all species and life stages compared to unimpaired conditions. In general, with the Proposed Action habitat is increased for all species and life stages during the drier months July through February compared to the existing conditions and the Proposed Action provides a large proportion of the habitat that would have been present under unimpaired conditions. Implementation of the Proposed Action, including the IFM, would have a beneficial effect on the physical habitat of other fish species (e.g., Sacramento sucker, rainbow trout) and life stages in the bypass reaches in addition to the benefits to hardhead habitat identified above.

## Entrainment

Potential entrainment of fish into the Kaweah No. 1 and No. 2 Flowlines and Kaweah No. 1, No. 2, and No. 3 powerhouses is discussed in Section 7.4.11.3. The AQ 9 – Entrainment Study is currently being conducted. Sampling to date has shown very little entrainment (only one juvenile pikeminnow, approximately 35 millimeters, was captured in the Kaweah No. 2 Flowline during 72 hours of drift and fyke net sampling) and anecdotal information from maintenance workers and field biologists' observations indicate that entrainment is very low. The Proposed Action does not change the diversions or diversion timing and does not change the diversions amounts appreciably (slight decrease due to the IFM); therefore, the Proposed Action would have no effect on entrainment of fish compared to existing conditions (No-Action Alternative).

### **8.4.3.3 Conclusion – Riverine Fish**

The Proposed Action, including implementation of the IFM, SMECP, WTMP, WQMP, VIPMP, ETP, FPMP, and ESM would have a beneficial effect on riverine fish in the bypass reaches.

### **8.4.4 Effects to Special-Status Species**

#### **8.4.4.1 Project Activities that May Affect Special-Status Species**

Under the Proposed Action, the operations and maintenance activities that potentially could affect special-status species are generally the same as those discussed in Section 8.4.1.1 related to riverine aquatic habitat (Table 8.4-1). Overall, it was found in Section 8.4.1.4 that the Proposed Action would maintain and/or enhance (beneficially effect) the riverine aquatic habitat (hydrology, water temperature and water quality, channel geomorphology and sediment, and riparian vegetation) in the bypass reaches.

#### **8.4.4.2 Effects Analysis for Special-Status Species**

##### **Hardhead**

Hardhead distribution and abundance in the study area was discussed in Sections 7.4.9.1 and 7.4.9.4, respectively and Section 7.4.12.1. The Proposed Action effects on fish in general, and hardhead in particular, are discussed in Section 8.4.3. During Project sampling, hardhead were present in low to moderate abundance in the bypass and comparison reaches on the Kaweah River (KR US PH3, KR DS PH3, KR US PH1, KR US PH2, KR DS PH2) and in the lowest reach of the East Fork Kaweah River (EF US Confl). The Proposed Action, including implementation of the IFM, SMECP, WTMP, WQMP, VIPMP, ETP, FPMP and ESM, would have a beneficial effect on Riverine Aquatic Habitat (Section 8.4.1.3), the Riverine Aquatic Community (Section 8.4.2.3), and Riverine Fish, particularly hardhead and hardhead habitat (Section 8.4.3), compared to the existing conditions (No-Action Alternative).

##### **Foothill-Yellow Legged Frog**

Historical data and extensive foothill yellow-legged frog (FYLF) sampling as part of AQ 7 – Special-Status Amphibians and Aquatic Reptiles TSR (SCE 2019c; SD A) are discussed in Sections 7.4.10 and 7.4.12.2. FYLF were not observed during the surveys conducted in the study area. In the reaches where FYLF might have been expected to be present based on physical habitat, bullfrogs were found (competitors/predators of FYLF). It is highly unlikely that FYLF exist in the study area (or Kaweah River Watershed), given the dominance of bullfrogs in the lower elevation reaches, the absence of permanently flowing tributaries in the higher elevation study reaches, and the position of the Watershed downwind of areas in the Central Valley where pesticide use is heavy (Sections 7.4.10 and 7.4.12.2). FYLF are not known to be extant in the Kaweah River Watershed (Sections 7.4.10). The Proposed Action would generally improve aquatic habitat in the bypass reaches; however, because FYLF are not extant in the Watershed, the Proposed Action would have no effect on FYLF.

## Western Pond Turtle

Western pond turtle (WPT) are discussed in Section 7.4.12.3. Study sites (AQ 7 – Special-Status Amphibians and Aquatic Reptiles TSR [SCE 2019c; SD A]; Section 7.4.10) were surveyed for WPT and potential sightings of WPT during implementation of other aquatic technical studies were recorded (AQ 1 – Instream Flow TSR mesohabitat mapping and field data collection [SCE 2019d; SD A], AQ 2 – Fish Population TSR [SCE 2019b; SD A], and the AQ 3 – Macroinvertebrates TSR [SCE 2019e; SD A]). No WPT were encountered either in the water or on land during the three surveys conducted by the amphibian/reptile surveyors. No incidental observations of WPT occurred during the other aquatic studies. There are, however, recent observations of WPT near the study area from two locations in Sequoia National Park. One population occupies pools in the permanently flowing reaches of the North Fork Kaweah near the confluence with Yucca Creek approximately 12 kilometers (km) upstream of the study area. The other is in Sycamore Creek, an intermittent tributary of the Middle Fork Kaweah approximately 1 km from the study area (see Section 7.4.12.3).

Geographic Information System (GIS) analysis indicates that potential WPT nesting habitat exists in a narrow patchy corridor along the Kaweah River and East Fork Kaweah River corridors. During field studies, no evidence of nesting activity was observed in the study area. Near Project facilities, we did identify potential nesting habitat with suitable substrate on the north side of the river upstream of the Kaweah No. 2 Diversion. There is also potential nesting habitat with suitable substrate on the north side of the river near the Kaweah No. 2 Powerhouse. The Proposed Action SMECP and ESM would protect these areas from unnecessary disturbance during Project maintenance. The Proposed Action, including the IFM, SMECP, WTMP, WQMP, VIPM, and ETP, would generally improve aquatic habitat in the bypass reaches, however, it is anticipated that the Proposed Action would have negligible effect on WPT compared to existing conditions (No-Action Alternative).

### 8.4.4.3 Conclusion – Special-Status Species

The Proposed Action, including implementation of the IFM, SMECP, WTMP, WQMP, VIPMP, and ETP would have a beneficial effect on hardhead in the bypass reaches, no effect on FYLF (not extant), and negligible effect on WPT compared to existing conditions (No-Action Alternative).

### 8.4.5 Unavoidable Adverse Effects

There are no unavoidable adverse effects to fish and aquatic resources under the Proposed Action.

#### **8.4.6 Literature Cited**

- SCE. 2019a. AQ 4 – Water Temperature Technical Study Report, Kaweah Project. December. Available in SCE’s Application for New License, Supporting Document A.
- SCE. 2019b. AQ 2 – Fish Population Technical Study Report, Kaweah Project. December. Available in SCE’s Application for New License, Supporting Document A.
- SCE. 2019c. AQ 7 – Special-status Amphibians and Aquatic Reptiles Technical Study Report, Kaweah Project. December. Available in SCE’s Application for New License, Supporting Document A.
- SCE. 2019d. AQ 1 – Instream Flow Technical Study Report, Kaweah Project. December. Available in SCE’s Application for New License, Supporting Document A.
- SCE. 2019e. AQ 3 – Macroinvertebrates Technical Study Report, Kaweah Project. December. Available in SCE’s Application for New License, Supporting Document A.



## **TABLES**

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**Table 8.4-1. Fish and Aquatic Resources Potentially Affected by Ongoing and Modified Project Operation and Maintenance under the Proposed Action**

Proposed Action		Fish and Aquatic Species												
		Riverine Physical Habitat				Riverine Aquatic Community		Riverine Fish				Special-Status Species		
		Hydrology	Water Temperature and Water Quality	Channel Geomorphology and Sediment	Riparian Vegetation	Algae and Benthic Macroinvertebrates	Bypass Reach Wetted Perimeter Productivity	Distribution and Diversity	Growth / Condition / Abundance / Timing	Bypass Reach Physical Habitat	Entrainment	Hardhead	Foothill Yellow-legged Frog	Western Pond Turtle
Project Operations	Minimum instream flows (modified)	X	X	X	X	X	X	X	X	X		X	X	X
	Ramping rates (modified)	X			X	X			X			X	X	X
	Forebay spills (ongoing)		X			X			X			X		
	Draining of flowlines and forebays during Project outages <sup>1</sup> (ongoing)		X			X			X			X		
	Diversions and Generation (ongoing)	X	X		X	X	X			X	X	X	X	X
Project Maintenance	Vegetation management <sup>2</sup> (modified)		X		X	X						X	X	X
	Sediment removal/flushing at Kaweah No. 1 Sandbox (ongoing)		X			X			X			X	X	X
	Sediment removal/flushing at Kaweah No. 1 Forebay Tank (ongoing)		X			X			X			X	X	X
	Sediment removal/flushing at Kaweah No. 2 Forebay (ongoing)		X			X			X			X	X	X
	Sediment removal/flushing at Kaweah No. 2 Diversion Intake (ongoing)		X			X			X			X	X	X
	Sediment removal at Kaweah No. 3 Forebay (ongoing)		X			X			X			X	X	X
	Road and trail maintenance (modified)		X			X								
Line Maintenance Vegetation clearance (modified)				X				X			X	X	X	
Environmental Programs	Environmental Training Program (modified)										X	X	X	

**Table 8.4-2. Existing (No-Action Alternative) Minimum Flow Requirements Versus the Modified Minimum Flow Requirements (Proposed Action)**

Month	Existing (No-Action Alternative)		Modified (Proposed Action Alternative)	
	Normal Year (cfs)	Dry Year (cfs)	Normal Year (cfs)	Dry Year (cfs)
<b>Kaweah River</b>				
January	20	10	20	20
February	20	10	20	20
March	30	20	30	20
April	30	30	30	30
May	30	30	30	30
June	30	30	30	30
July	20	10	20	20
August	20	10	20	10
September	11	5	20	5
October	11	5	11	5
November	11	5	11	5
December	11	5	11	10
<b>East Fork Kaweah River</b>				
January	5	5	10	5
February	5	5	10	5
March	10	10	20	10
April	10	10	20	10
May	10	10	20	10
June	10	10	20	10
July	10	10	20	10
August	5	5	20	5
September	5	5	20	5
October	5	5	10	5
November	5	5	10	5
December	5	5	10	5

Note that minimum instream flows are as shown above or Natural Flow - 3 cfs, whichever is lower. A total of 3 cfs is required to meet SCE's pre-1914 consumptive water right delivery obligation.

**Table 8.4-3. Bypass and Comparison Reaches in the Study Area**

<b>Study Reach</b>	<b>Site ID</b>	<b>Bypass Reaches</b>	<b>Comparison Reaches (upstream or downstream of the Project)</b>
Kaweah River Upstream of Kaweah No. 3 Powerhouse	KR US PH3		X
Kaweah River Downstream of Kaweah No. 3 Powerhouse and Upstream of the East Fork Kaweah River Confluence	KR DS PH3	X	
Kaweah River Downstream of East Fork Kaweah Confluence and Upstream of Kaweah No. 1 Powerhouse	KR US PH1	X	
Kaweah River Downstream of Kaweah No. 1 Powerhouse and Upstream of Kaweah No. 2 Powerhouse	KR US PH2	X	
Kaweah River Downstream of Kaweah No. 2 Powerhouse	KR DS PH2		X
East Fork Kaweah River Upstream of the Kaweah No. 1 Diversion	EF US K1 Div		X
East Fork Kaweah River Downstream of the Kaweah No. 1 Diversion	EF DS K1 Div	X	
East Fork Kaweah River Upstream of Confluence with Kaweah River	EF US Confl	X	

**Table 8.4-4. Summary of Time Series Exceedance Changes in Wetted Perimeter for the Proposed Action Compared to Existing Conditions (1994-2018). The First Number in each Cell is the Percent Change in Wetted Perimeter and the Second Number in Parentheses is the Change in Wetted Perimeter in Feet.**

Kaweah River Downstream of Kaweah No. 3 Powerhouse and Upstream of the East Fork Kaweah River Confluence												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	8.0 (4)	9.1 (4)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	11.8 (5)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	6.6 (3)
95	9.1 (4)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	9.5 (4)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	5.8 (2)
90	6.0 (3)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	7.7 (4)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.9 (1)
75	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.5 (1)	3.0 (1)	0.0 (0)	0.0 (0)	0.0 (0)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	7.2 (3)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.7 (2)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.9 (0)	0.2 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.2 (1)	0.1 (0)	3.2 (1)	0.0 (0)	0.1 (0)	0.5 (0)
Kaweah River Downstream of East Fork Kaweah Confluence and Upstream of Kaweah No. 1 Powerhouse												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	4.9 (3)	5.2 (3)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	6.2 (4)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	6.9 (4)
95	5.1 (3)	0.2 (0)	0.1 (0)	0.0 (0)	0.0 (0)	0.0 (0)	4.2 (3)	0.0 (0)	0.0 (0)	0.0 (0)	3.8 (2)	6.1 (3)
90	3.7 (2)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.5 (2)	0.0 (0)	0.0 (0)	0.0 (0)	3.5 (2)	3.3 (2)
75	0.3 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.4 (2)	1.8 (1)	3.1 (2)	1.3 (1)	0.5 (0)	0.6 (0)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.9 (3)	6.7 (4)	1.2 (1)	0.1 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.3 (0)	5.1 (3)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.9 (1)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.6 (0)	0.1 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.8 (1)	1.5 (1)	3.7 (2)	0.5 (0)	0.6 (0)	0.8 (1)
Kaweah River Downstream of Kaweah No. 1 Powerhouse and Upstream of Kaweah No. 2 Powerhouse												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	1.5 (1)	0.2 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.5 (1)	0.0 (0)	0.0 (0)	0.0 (0)	0.7 (0)	1.5 (1)
95	5.4 (3)	0.2 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.7 (1)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.3 (1)
90	3.0 (2)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.1 (2)	0.1 (0)	0.0 (0)	0.1 (0)	0.5 (0)	1.4 (1)
75	0.1 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.4 (0)	0.6 (0)	1.2 (1)	0.0 (0)	0.0 (0)	0.6 (0)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.4 (1)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.1 (1)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.0 (1)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.7 (0)	0.2 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.2 (1)	7.0 (3)	8.9 (3)	1.8 (1)	1.6 (1)	1.2 (0)
East Fork Kaweah River Upstream of the Confluence with Kaweah River												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	5.3 (2)	3.3 (1)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.8 (0)	0.2 (0)	0.0 (0)	4.6 (1)	6.2 (2)
95	1.6 (1)	3.3 (1)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (0)	1.2 (0)	1.2 (0)	3.7 (1)	1.8 (1)
90	4.9 (2)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.1 (1)	2.1 (1)	1.9 (1)	3.0 (1)	3.9 (1)	2.3 (1)
75	0.3 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	6.1 (3)	8.5 (3)	6.2 (2)	6.3 (2)	6.4 (2)	4.7 (2)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	18.0 (8)	17.5 (7)	0.7 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	14.3 (6)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.7 (0)	0.2 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.2 (1)	7.0 (3)	8.9 (3)	1.8 (1)	1.6 (1)	1.2 (0)

Note: The average is calculated from all daily data 1994-2018 and is not the average of the exceedance values in the table.

**Table 8.4-5. Changes in Fish Species / Lifestage Physical Habitat in each Bypass Reach under the Proposed Action Compared to Existing Conditions (No-Action Alternative)**

Month / Reach	Species / Life Stage							
	HHAD	HHJUV	SSAD	SSJUV	RBAD	RBJUV	RBFRY	RBSPAWN
<b>Kaweah River Downstream of Kaweah No. 3 Powerhouse (KR DS PH3)</b>								
January	+	+	+	+	+	+		
February	+		+		+	+		
March								
April								
May								
June								
July	+	+	+	+	+	+	+	
August	+				+	+		
September	+	+	+	+	+	+	+	
October								
November	+	+			+	+		
December	+	+	+	+	+	+	+	
<b>Kaweah River Upstream of Kaweah No. 1 Powerhouse (KR US PH1)</b>								
January	+	+	+	+	+	+		
February	+	+	+	+	+	+		
March								
April								
May								
June								
July	+	+	+	+	+	+	--	
August	+	+	+	+	+	+	--	
September	+	+	+	+	+	+	--	
October	+	+	+	+	+	+	+	
November	+	+	+	+	+	+	+	
December	+	+	+	+	+	+	+	
<b>Kaweah River Upstream of Kaweah No. 2 Powerhouse (KR US PH2)</b>								
January	+	+	+	+	+	+		
February								
March								
April								
May								
June								
July	+	+	+	+	+	+		
August								
September	+	+	+	+	+	+		
October								

Month / Reach	Species / Life Stage							
	HHAD	HHJUV	SSAD	SSJUV	RBAD	RBJUV	RBFRY	RBSPAWN
November								
December	+		+	+	+	+		
<b>East Fork Kaweah River Upstream of Confluence with Kaweah River (EF US CONFL KR)</b>								
January	+	+	+	+	+	+		
February	+	+	+		+	+		
March								
April								
May								
June								
July	+	+	+	+	+	+	+	
August	+	+	+	+	+	+	+	
September	+	+	+	+	+	+	+	
October	+	+	+	+	+	+	+	
November	+	+	+	+	+	+	+	
December	+	+	+	+	+	+	+	

+ = increase - see Table 8.4-6

- = decrease - see Table 8.4-6

blank = no change

HHAD = Hardhead Adult

HHJUV = Hardhead Juvenile

RBAD = Rainbow Trout Adult

RBFRY = Rainbow Fry

RBJUV = Rainbow Trout Juvenile

RBSPAWN = Rainbow Trout Spawning.

SSAD = Sacramento Sucker Adult

SSJUV = Sacramento Sucker Juvenile



**Table 8.4-6a. Summary of Time Series Exceedance Changes in Fish Species / Lifestage Physical Habitat in the Kaweah River Downstream of Kaweah No. 3 Powerhouse and Upstream of the East Fork Kaweah River Confluence Reach for the Proposed Action Compared to Existing Conditions. The First Number in each Cell is the Percent Change in Habitat and the Second Number in Parentheses is the Change in Habitat (ft<sup>2</sup> / 1000 ft).**

WUA % Difference of Proposed and Existing (WUA ft <sup>2</sup> )												
Hardhead and Sacramento Pikeminnow Adult												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	12.1 (2208)	12.7 (2457)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	15.8 (3012)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	10.6 (1661)
95	12.7 (2457)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	12.3 (2339)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	9.3 (1456)
90	8.0 (1548)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	10.7 (2061)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	4.6 (741)
75	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.2 (612)	4.6 (792)	0.0 (0)	0.0 (0)	0.0 (0)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	10.1 (1927)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	4.8 (919)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	1.2 (287)	0.3 (66)	0.0 (8)	0.0 (13)	0.0 (5)	0.0 (5)	1.7 (401)	0.2 (49)	4.8 (887)	0.1 (12)	0.2 (44)	0.8 (175)
Hardhead and Sacramento Pikeminnow Juvenile												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
95	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	5.7 (1599)
90	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	4.4 (1258)	4.8 (1355)
75	1.8 (580)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.0 (572)	1.0 (316)	2.7 (799)	0.0 (0)	0.0 (0)	0.0 (0)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	5.2 (1636)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.1 (671)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.7 (219)	0.1 (46)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.0 (303)	0.1 (25)	2.3 (716)	0.0 (8)	0.2 (51)	0.5 (157)
Sacramento Sucker Adult												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	8.8 (2350)	9.7 (2698)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	12.7 (3540)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	7.1 (1696)
95	9.7 (2698)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	10.1 (2825)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	6.2 (1487)
90	6.2 (1732)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	8.2 (2277)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.2 (774)
75	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.5 (700)	3.3 (842)	0.0 (0)	0.0 (0)	0.0 (0)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	7.7 (2115)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.8 (1050)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.9 (311)	0.2 (67)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.3 (439)	0.1 (36)	3.4 (922)	0.0 (0)	0.1 (27)	0.6 (169)
Sacramento Sucker Juvenile												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
95	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
90	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	4.3 (1313)	4.9 (1474)
75	2.4 (780)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.7 (207)	1.3 (416)	0.0 (0)	0.0 (0)	0.0 (0)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.0 (661)	0.0 (0)	4.3 (1390)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.9 (630)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.6 (178)	0.1 (38)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.8 (244)	0.1 (21)	1.8 (569)	0.0 (2)	0.1 (36)	0.4 (126)
Rainbow Trout Spawning												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
95	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
90	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
75	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Rainbow Trout Adult												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	18.2 (2484)	16.5 (2416)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	18.2 (2484)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	18.3 (1945)
95	20.7 (3187)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	14.1 (1982)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	16.0 (1705)
90	13.8 (2133)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	18.1 (2801)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	8.2 (920)
75	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	5.6 (864)	8.1 (1031)	0.0 (0)	0.0 (0)	0.0 (0)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	17.1 (2599)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	8.4 (1297)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	1.8 (367)	0.4 (84)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.6 (503)	0.3 (44)	7.8 (1132)	0.0 (0)	0.2 (32)	1.2 (195)
Rainbow Trout Juvenile												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
95	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	12.6 (2342)
90	7.1 (1482)	3.9 (817)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	6.4 (1226)	8.1 (1502)
75	1.5 (340)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	13.0 (2984)	1.5 (335)	4.8 (998)	0.0 (0)	0.0 (0)	0.0 (0)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	10.1 (2293)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	4.4 (1006)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	1.3 (310)	0.3 (63)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.9 (423)	0.2 (47)	4.6 (999)	0.0 (6)	0.3 (64)	0.9 (212)
Rainbow Trout Fry												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
95	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
90	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
75	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.6 (143)	0.0 (0)	0.0 (0)	2.8 (707)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.0 (523)	0.0 (0)	0.9 (238)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (-2)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (-2)	0.0 (-2)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (-10)	-0.1 (-18)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	-0.2 (-48)	-0.1 (-17)	-0.1 (-14)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (-3)	0.0 (-3)	0.0 (1)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (6)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (1)	0.0 (0)	0.1 (22)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.1 (24)	0.0 (3)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.2 (31)	0.0 (-4)	0.3 (86)	0.0 (1)	0.1 (14)	0.3 (62)

Note: The average is calculated from all daily data 1994-2018 and is not the average of the exceedance values in the table.

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**Table 8.4-6b. Summary of Time Series Exceedance Changes in Fish Species / Lifestage Physical Habitat in the Kaweah River Downstream of East Fork Kaweah Confluence and Upstream of Kaweah No. 1 Powerhouse Reach for the Proposed Action Compared to Existing Conditions. The First Number in each Cell is the Percent Change in Habitat and the Second Number in Parentheses is the Change in Habitat (ft<sup>2</sup> / 1000 ft).**

WUA % Difference of Proposed and Existing (WUA ft <sup>2</sup> )												
Hardhead and Sacramento Pikeminnow Adult												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	9.4 (1708)	10.0 (1910)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	11.8 (2358)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	9.7 (1525)
95	9.9 (1874)	0.4 (82)	0.2 (60)	0.0 (0)	0.0 (0)	0.0 (0)	7.7 (1553)	0.0 (0)	0.0 (0)	0.0 (0)	5.1 (782)	9.2 (1460)
90	7.1 (1387)	0.0 (6)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	6.6 (1356)	0.0 (0)	0.0 (0)	0.0 (0)	6.6 (1137)	6.4 (1080)
75	0.7 (148)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	5.5 (1241)	3.4 (658)	5.9 (1057)	2.4 (423)	1.1 (189)	1.2 (220)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	8.6 (1922)	12.7 (2602)	2.4 (446)	0.1 (26)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.7 (165)	10.6 (2334)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	5.0 (1200)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	1.1 (286)	0.2 (64)	0.0 (3)	0.0 (0)	0.0 (0)	0.0 (2)	1.7 (462)	3.3 (746)	7.6 (1539)	0.9 (188)	1.0 (208)	1.2 (266)
Hardhead and Sacramento Pikeminnow Juvenile												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	0.0 (0)	5.0 (1664)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	5.7 (1772)
95	5.5 (1915)	1.4 (485)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.8 (871)	5.5 (1729)
90	4.6 (1652)	0.6 (205)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.3 (813)	0.0 (0)	0.0 (0)	0.0 (0)	4.8 (1622)	4.6 (1516)
75	1.9 (691)	0.1 (52)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.6 (941)	1.4 (516)	4.4 (1502)	1.7 (587)	0.7 (228)	0.9 (307)
50	0.1 (27)	0.0 (16)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.7 (252)	2.6 (972)	8.2 (3070)	2.0 (721)	0.2 (88)	0.0 (18)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.0 (380)	2.9 (1129)	4.7 (1833)	0.0 (0)	0.0 (0)	0.2 (63)
10	0.0 (0)	0.0 (0)	0.0 (-6)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (25)	0.2 (74)	3.0 (1208)	0.0 (0)	0.0 (7)	0.0 (0)
5	0.0 (-5)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (-4)	0.1 (22)	0.7 (291)	0.0 (0)	0.0 (16)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (19)	-0.2 (-62)	0.0 (0)	0.1 (29)	0.0 (0)
Average	1.0 (360)	0.3 (103)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.0 (393)	1.7 (623)	4.4 (1593)	0.8 (277)	0.8 (274)	0.9 (346)
Sacramento Sucker Adult												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	8.3 (2590)	8.9 (2883)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	10.5 (3543)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	8.4 (2287)
95	8.8 (2832)	0.4 (124)	0.2 (105)	0.0 (0)	0.0 (0)	0.0 (0)	6.9 (2327)	0.0 (0)	0.0 (0)	0.0 (0)	4.4 (1170)	8.0 (2197)
90	6.3 (2085)	0.0 (9)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	5.9 (2030)	0.0 (0)	0.0 (0)	0.0 (0)	5.8 (1729)	5.6 (1642)
75	0.6 (223)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	5.0 (1897)	3.0 (985)	5.3 (1605)	2.1 (643)	0.9 (284)	1.1 (332)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	7.8 (2904)	11.3 (3907)	2.1 (672)	0.1 (39)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.6 (232)	9.5 (3510)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	4.6 (1830)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	1.0 (431)	0.2 (97)	0.0 (4)	0.0 (0)	0.0 (0)	0.0 (3)	1.5 (696)	3.0 (1128)	6.8 (2318)	0.8 (285)	0.9 (314)	1.1 (401)
Sacramento Sucker Juvenile												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.3 (1179)
95	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.2 (1147)	5.9 (2191)
90	0.3 (117)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (2)	0.0 (0)	0.0 (0)	3.8 (1475)	3.3 (1240)
75	1.5 (607)	0.1 (38)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (29)	3.4 (1372)	1.6 (650)	1.2 (496)	1.2 (475)
50	1.6 (668)	0.3 (134)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.1 (1319)	1.8 (758)	5.6 (2389)	1.4 (573)	0.1 (32)	0.6 (235)
25	0.1 (55)	0.0 (3)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.7 (288)	1.3 (549)	3.5 (1504)	0.0 (1)	0.0 (-12)	0.0 (0)
10	0.0 (16)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.2 (85)	1.1 (470)	1.2 (534)	0.0 (0)	0.0 (0)	0.1 (54)
5	0.0 (0)	0.0 (0)	0.0 (-3)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (-3)	0.6 (278)	0.9 (397)	0.0 (0)	0.0 (-4)	0.0 (0)
1	0.0 (0)	0.0 (0)	-0.1 (-27)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (14)	0.1 (35)	0.0 (0)	0.0 (1)	0.0 (0)
Average	0.8 (309)	0.2 (71)	0.0 (-1)	0.0 (0)	0.0 (0)	0.0 (0)	0.6 (260)	0.9 (370)	2.9 (1203)	0.6 (248)	0.7 (275)	1.0 (396)
Rainbow Trout Spawning												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
95	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
90	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
75	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Rainbow Trout Adult												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	16.5 (2518)	17.1 (2836)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	19.4 (3447)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	19.6 (2258)
95	17.1 (2791)	0.6 (115)	0.3 (83)	0.0 (0)	0.0 (0)	0.0 (0)	12.4 (2223)	0.0 (0)	0.0 (0)	0.0 (0)	10.6 (1163)	18.1 (2152)
90	12.0 (2037)	0.0 (8)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	10.3 (1891)	0.0 (0)	0.0 (0)	0.0 (0)	11.9 (1653)	11.7 (1570)
75	1.0 (198)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	7.7 (1653)	5.5 (936)	10.6 (1547)	4.3 (615)	1.9 (284)	2.2 (332)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	12.3 (2567)	20.3 (3747)	4.2 (671)	0.2 (37)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.9 (225)	15.3 (3154)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	6.9 (1623)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	1.6 (417)	0.3 (94)	0.0 (4)	0.0 (0)	0.0 (0)	0.0 (3)	2.4 (640)	4.7 (1011)	11.9 (2159)	1.6 (278)	1.6 (303)	1.9 (389)
Rainbow Trout Juvenile												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	0.9 (251)	11.1 (3303)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	13.1 (3239)
95	9.9 (2997)	2.7 (846)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	7.2 (1718)	11.9 (2991)
90	6.6 (2006)	0.1 (40)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	6.8 (2160)	0.0 (0)	0.0 (0)	0.0 (0)	7.4 (2056)	7.2 (1934)
75	0.1 (35)	0.2 (64)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.6 (207)	3.0 (939)	6.5 (1864)	2.7 (765)	0.8 (226)	1.0 (284)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.6 (546)	4.1 (1374)	11.4 (3698)	2.4 (715)	0.3 (106)	0.0 (3)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.6 (198)	2.7 (940)	7.1 (2390)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (7)	0.2 (55)	0.0 (11)	3.2 (1139)	0.0 (0)	0.1 (23)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (6)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (5)	0.6 (211)	0.0 (0)	0.0 (2)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (5)	-0.1 (-54)	0.0 (0)	0.0 (7)	0.0 (0)
Average	1.2 (415)	0.5 (154)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.5 (487)	2.3 (762)	6.2 (1928)	1.0 (312)	1.1 (358)	1.6 (495)
Rainbow Trout Fry												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
95	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
90	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	-0.4 (-127)	0.0 (0)	0.0 (0)	0.0 (0)
75	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	-0.5 (-182)	-0.6 (-199)	0.0 (0)	1.0 (351)	0.0 (0)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	-1.7 (-626)	-1.9 (-673)	0.7 (248)	0.8 (282)	0.4 (133)
25	0.2 (84)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	-1.2 (-427)	-0.8 (-311)	-0.2 (-58)	0.1 (24)	0.0 (0)	0.1 (31)
10	0.1 (39)	0.0 (11)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	-0.4 (-134)	-0.2 (-76)	-0.1 (-21)	0.1 (31)	0.0 (5)	0.0 (0)
5	0.1 (27)	0.3 (121)	-0.2 (-54)	0.0 (0)	0.0 (0)	0.0 (0)	-0.2 (-65)	-0.1 (-21)	0.0 (-18)	0.0 (10)	0.0 (-4)	0.0 (-7)
1	0.0 (16)	0.0 (-9)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	-0.2 (-87)	0.0 (0)	0.0 (-4)	0.0 (11)	0.0 (0)	0.0 (0)
Average	0.1 (26)	0.0 (6)	0.0 (-3)	0.0 (0)	0.0 (0)	0.0 (-2)	-0.4 (-124)	-0.8 (-272)	-0.7 (-244)	0.2 (64)	0.3 (1	

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**Table 8.4-6c. Summary of Time Series Exceedance Changes in Fish Species / Lifestage Physical Habitat in the Kaweah River Downstream of Kaweah No. 1 Powerhouse and Upstream of Kaweah No. 2 Powerhouse Reach for the Proposed Action compared to Existing Conditions (No-Action Alternative) ); Percent Habitat (ft<sup>2</sup>/1000 ft)**

WUA % Difference of Proposed and Existing (WUA ft <sup>2</sup> )												
Hardhead and Sacramento Pikeminnow Adult												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	2.5 (282)	0.3 (39)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.5 (423)	0.0 (0)	0.0 (0)	0.0 (0)	1.3 (136)	2.3 (255)
95	7.5 (915)	0.5 (66)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.7 (472)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (7)	1.9 (217)
90	4.1 (525)	0.1 (11)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	4.2 (548)	0.1 (12)	0.0 (0)	0.1 (10)	0.7 (75)	2.0 (237)
75	0.3 (48)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.9 (123)	0.9 (110)	2.1 (226)	0.0 (0)	0.0 (6)	0.8 (101)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.4 (426)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.6 (368)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.1 (323)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.6 (99)	0.0 (8)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.7 (113)	0.1 (17)	2.2 (276)	0.0 (1)	0.1 (16)	0.3 (48)
Hardhead and Sacramento Pikeminnow Juvenile												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	1.3 (248)	0.2 (32)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.5 (308)	0.0 (0)	0.0 (0)	0.0 (0)	0.7 (133)	1.0 (184)
95	2.7 (546)	0.1 (14)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.0 (414)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (3)	0.5 (99)
90	2.3 (470)	0.4 (78)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.5 (520)	0.1 (12)	0.0 (0)	0.1 (10)	0.2 (34)	0.6 (111)
75	0.4 (88)	0.0 (2)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.9 (193)	0.4 (89)	1.2 (222)	0.0 (0)	0.0 (5)	0.4 (85)
50	0.1 (12)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.3 (64)	0.0 (0)	1.7 (347)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.4 (95)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.0 (224)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.5 (342)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.3 (76)	0.0 (8)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.5 (105)	0.1 (12)	1.1 (226)	0.0 (2)	0.1 (11)	0.1 (32)
Sacramento Sucker Adult												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	2.5 (506)	0.3 (70)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.4 (742)	0.0 (0)	0.0 (0)	0.0 (0)	1.3 (248)	2.2 (447)
95	7.2 (1569)	0.4 (108)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.9 (888)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (12)	1.7 (364)
90	4.4 (1004)	0.1 (20)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	4.7 (1118)	0.1 (22)	0.0 (0)	0.1 (19)	0.6 (125)	1.9 (398)
75	0.3 (76)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.8 (211)	0.9 (195)	2.1 (413)	0.0 (0)	0.0 (10)	0.8 (185)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.4 (758)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.3 (579)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.2 (602)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.6 (175)	0.0 (14)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.7 (211)	0.1 (30)	2.2 (501)	0.0 (2)	0.1 (27)	0.3 (84)
Sacramento Sucker Juvenile												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	0.6 (138)	0.1 (16)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.7 (170)	0.7 (161)
95	0.2 (38)	0.0 (8)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (11)	0.2 (41)
90	0.1 (28)	0.0 (11)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (15)	0.0 (0)	0.1 (13)	0.0 (9)	0.2 (41)
75	0.8 (194)	0.1 (34)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.0 (248)	0.2 (56)	1.2 (283)	0.0 (0)	0.2 (52)	0.5 (132)
50	0.2 (49)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.4 (112)	0.0 (0)	1.6 (403)	0.0 (0)	0.0 (3)	0.1 (29)
25	0.0 (2)	0.0 (7)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (1)	0.0 (0)	1.0 (274)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (1)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (3)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (-1)	0.0 (1)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (-1)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (-1)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.3 (88)	0.1 (16)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.3 (83)	0.1 (17)	0.8 (206)	0.0 (2)	0.1 (15)	0.2 (46)
Rainbow Trout Spawning												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
95	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
90	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
75	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Rainbow Trout Adult												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	4.7 (393)	0.5 (54)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	5.9 (579)	0.0 (0)	0.0 (0)	0.0 (0)	2.5 (191)	4.2 (352)
95	12.7 (1242)	0.7 (84)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	6.3 (661)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (10)	3.3 (293)
90	7.0 (739)	0.1 (14)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	7.2 (789)	0.2 (17)	0.0 (0)	0.2 (14)	1.1 (101)	3.4 (319)
75	0.5 (60)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.3 (157)	1.6 (150)	4.0 (318)	0.0 (0)	0.1 (8)	1.4 (140)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	5.8 (585)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.8 (459)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.0 (421)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.9 (135)	0.1 (11)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.9 (156)	0.2 (24)	3.7 (376)	0.0 (1)	0.2 (21)	0.5 (65)
Rainbow Trout Juvenile												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	2.3 (388)	0.3 (49)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.0 (533)	0.0 (0)	0.0 (0)	0.0 (0)	1.2 (189)	2.1 (344)
95	6.5 (1170)	0.2 (43)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.2 (594)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (9)	1.6 (282)
90	3.5 (663)	0.0 (8)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.6 (694)	0.1 (17)	0.0 (0)	0.1 (14)	0.6 (97)	1.7 (308)
75	0.1 (27)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.4 (78)	0.8 (137)	1.9 (315)	0.0 (0)	0.0 (7)	0.7 (126)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (12)	0.0 (0)	2.9 (531)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.0 (203)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.8 (173)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.1 (231)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.6 (121)	0.0 (7)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.6 (125)	0.1 (22)	1.7 (307)	0.0 (2)	0.1 (21)	0.3 (61)
Rainbow Trout Fry												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
95	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
90	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	-0.3 (-54)	0.0 (0)	0.0 (0)	0.0 (0)
75	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	-0.3 (-66)	0.1 (19)	0.1 (24)	0.0 (0)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (13)	0.2 (47)	0.0 (0)	0.1 (13)	0.0 (7)
25	0.2 (37)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	-0.4 (-81)	0.0 (4)	0.0 (7)	0.0 (0)	0.0 (0)	0.1 (12)
10	0.1 (22)	0.0 (-10)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (31)	0.0 (0)	0.1 (23)	0.0 (0)	0.0 (0)	0.0 (4)
5	0.0 (-7)	0.1 (22)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (19)	0.0 (0)	0.1 (30)	0.0 (0)	0.0 (0)	0.0 (2)
1	0.0 (-3)	-0.1 (-26)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (7)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.0 (9)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	-0.1 (-11)	0.0 (3)	-0.1 (-11)	0.0 (1)	0.0 (5)	0.0 (8)

Note: The average is calculated from all daily data 1994-2018 and is not the average of the exceedance values in the table.

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**Table 8.4-6d. Summary of Time Series Exceedance Changes in Fish Species / Lifestage Physical Habitat in the Kaweah River Combined Reach for the Proposed Action Compared to Existing Conditions (No-Action Alternative). The First Number in each Cell is the Percent Change in Habitat and the Second Number in Parentheses is the Change in Habitat (ft<sup>2</sup> / 1000 ft).**

WUA % Difference of Proposed and Existing (WUA ft <sup>2</sup> )												
Hardhead and Sacramento Pikeminnow Adult												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	6.1 (941)	7.4 (1219)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	9.5 (1584)	0.3 (38)	0.0 (0)	0.0 (0)	0.0 (0)	7.5 (1048)
95	9.3 (1518)	0.5 (80)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (21)	7.3 (1240)	0.0 (0)	0.0 (0)	0.0 (0)	2.2 (295)	6.8 (971)
90	6.3 (1041)	0.0 (5)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	5.8 (997)	0.0 (0)	0.0 (0)	0.0 (0)	4.3 (632)	3.4 (497)
75	0.6 (111)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.3 (620)	3.2 (530)	3.2 (475)	1.2 (178)	0.9 (139)	0.2 (32)
50	0.0 (5)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	4.8 (874)	9.7 (1642)	1.0 (161)	0.2 (28)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.3 (54)	7.8 (1446)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	4.3 (848)	0.0 (0)	0.2 (40)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.9 (205)	0.2 (41)	0.0 (2)	0.0 (0)	0.0 (0)	0.0 (0)	1.3 (306)	1.9 (360)	5.5 (927)	0.5 (88)	0.6 (106)	0.8 (162)

Note: The average is calculated from all daily data 1994-2018 and is not the average of the exceedance values in the table.

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**Table 8.4-6e. Summary of Time Series Exceedance Changes in Fish Species / Lifestage Physical Habitat in the East Fork Kaweah River for the Proposed Action Compared to Existing Conditions (No-Action Alternative). The First Number in each Cell is the Percent Change in Habitat and the Second Number in Parentheses is the Change in Habitat (ft<sup>2</sup> / 1000 ft).**

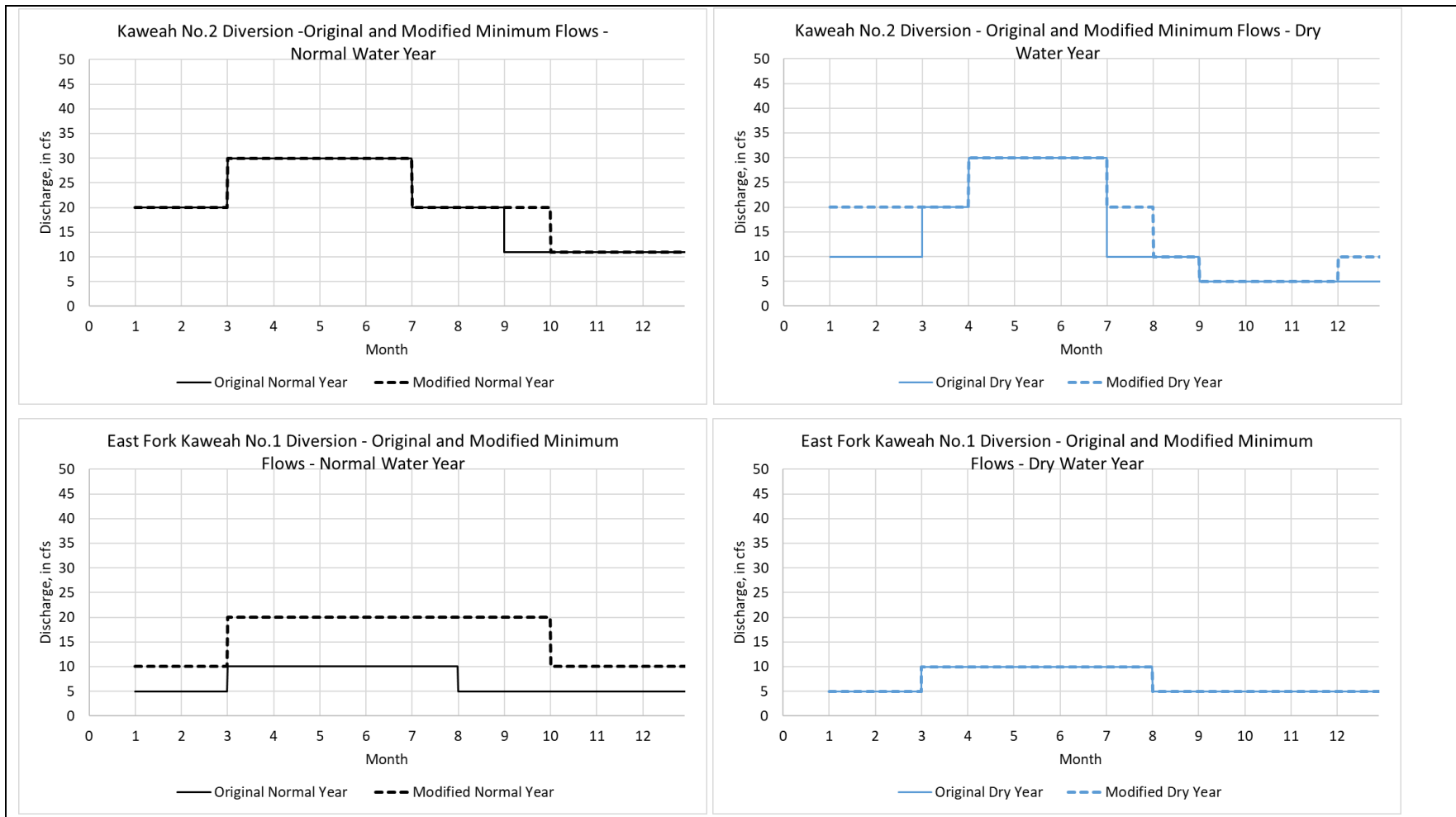
WUA % Difference of Proposed and Existing (WUA ft <sup>2</sup> )												
Hardhead and Sacramento Pikeminnow Adult												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	8.6 (710)	5.1 (424)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.4 (108)	0.3 (26)	0.0 (0)	8.0 (621)	10.7 (839)
95	2.5 (211)	4.6 (438)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (11)	2.0 (162)	2.0 (157)	5.9 (488)	2.8 (230)
90	7.4 (683)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.2 (333)	3.4 (279)	3.0 (246)	4.6 (385)	6.0 (516)	3.6 (300)
75	0.3 (33)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	9.5 (1177)	12.5 (1190)	9.4 (864)	9.5 (889)	9.3 (888)	6.7 (643)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	20.1 (2400)	19.6 (2169)	0.8 (78)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	17.6 (2176)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.9 (126)	0.3 (42)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (2)	1.4 (219)	8.1 (996)	11.0 (1202)	2.5 (264)	2.3 (254)	1.7 (201)
Hardhead and Sacramento Pikeminnow Juvenile												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	4.2 (763)	1.9 (350)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.8 (138)	0.2 (34)	0.0 (0)	4.4 (793)	5.9 (1071)
95	0.9 (174)	1.9 (365)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (9)	1.1 (207)	1.1 (200)	2.6 (477)	1.1 (206)
90	2.9 (564)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.4 (294)	1.3 (230)	1.1 (203)	1.7 (318)	2.3 (427)	1.3 (248)
75	0.2 (29)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	5.0 (1097)	5.1 (985)	3.7 (715)	3.8 (735)	3.8 (737)	2.8 (535)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	10.0 (2153)	9.1 (1881)	0.3 (67)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	9.0 (1979)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.5 (111)	0.2 (35)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (1)	0.9 (200)	4.1 (880)	5.1 (1061)	1.1 (223)	1.1 (222)	0.9 (181)
Sacramento Sucker Adult												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	6.7 (944)	3.8 (544)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.1 (148)	0.3 (36)	0.0 (0)	6.3 (849)	8.4 (1147)
95	1.9 (271)	3.6 (570)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (14)	1.6 (222)	1.6 (214)	4.5 (641)	2.1 (299)
90	5.7 (877)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.7 (466)	2.5 (358)	2.2 (316)	3.5 (495)	4.6 (663)	2.7 (385)
75	0.3 (47)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	8.6 (1693)	9.7 (1531)	7.3 (1111)	7.4 (1143)	7.3 (1147)	5.3 (833)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	17.7 (3386)	16.6 (2967)	0.7 (106)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	15.6 (3091)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.7 (164)	0.2 (54)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (2)	1.2 (312)	6.9 (1375)	9.3 (1655)	2.0 (342)	1.9 (329)	1.4 (262)
Sacramento Sucker Juvenile												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	1.4 (287)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.6 (126)	0.2 (31)	0.0 (0)	3.6 (721)	4.3 (868)
95	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (20)	0.9 (188)	0.8 (163)	1.8 (366)	0.8 (169)
90	2.5 (515)	1.8 (395)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.0 (216)	1.0 (202)	1.5 (317)	2.2 (457)	1.2 (240)
75	1.9 (422)	0.0 (0)	0.0 (1)	0.0 (0)	0.0 (0)	0.0 (0)	0.3 (74)	3.7 (807)	3.3 (710)	3.2 (680)	3.6 (781)	2.7 (577)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	4.2 (1037)	9.4 (2239)	9.1 (2113)	0.5 (102)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	3.0 (735)	9.1 (2251)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.4 (104)	0.1 (32)	0.0 (3)	0.0 (0)	0.0 (0)	0.0 (1)	1.0 (228)	4.1 (976)	5.1 (1170)	1.0 (224)	1.0 (222)	0.8 (176)
Rainbow Trout Spawning												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
95	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
90	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
75	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Rainbow Trout Adult												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	14.0 (814)	8.5 (503)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.3 (120)	0.6 (30)	0.0 (0)	13.3 (692)	17.4 (935)
95	4.1 (250)	7.1 (527)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.2 (13)	3.3 (181)	3.3 (175)	9.8 (568)	4.8 (271)
90	11.7 (810)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	5.0 (434)	5.6 (331)	5.1 (292)	7.8 (457)	9.8 (613)	5.9 (356)
75	0.6 (43)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	14.9 (1674)	19.3 (1415)	14.9 (1026)	14.8 (1056)	14.4 (1061)	10.4 (770)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	30.5 (3212)	29.5 (2759)	1.3 (99)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	26.5 (2976)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	1.2 (150)	0.3 (50)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (2)	2.0 (302)	12.0 (1300)	16.9 (1565)	3.7 (314)	3.3 (301)	2.3 (238)
Rainbow Trout Juvenile												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	9.6 (1183)	5.1 (644)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.7 (193)	0.4 (47)	0.0 (0)	9.6 (1109)	12.7 (1498)
95	2.5 (320)	4.5 (651)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.1 (17)	2.4 (290)	2.4 (280)	6.3 (785)	2.9 (359)
90	7.5 (1037)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	2.7 (414)	3.4 (423)	3.0 (373)	4.7 (585)	6.1 (784)	3.6 (456)
75	0.3 (41)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	7.4 (1320)	12.6 (1802)	9.5 (1313)	9.6 (1351)	9.3 (1334)	6.7 (962)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	16.8 (2896)	17.6 (2856)	0.7 (104)	0.0 (0)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	14.4 (2561)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	1.1 (194)	0.3 (63)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (2)	1.3 (255)	7.6 (1279)	9.8 (1552)	2.6 (400)	2.5 (388)	1.9 (311)
Rainbow Trout Fry												
Exceedance	January	February	March	April	May	June	July	August	September	October	November	December
99	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.3 (56)	0.0 (0)	0.0 (0)	0.0 (0)
95	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.4 (67)	0.2 (37)	1.4 (248)	0.0 (0)
90	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.2 (31)	0.3 (46)	0.4 (69)	0.5 (87)	1.0 (179)
75	0.2 (44)	0.6 (114)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.5 (84)	0.7 (134)	0.8 (140)	1.0 (186)	1.1 (199)
50	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	1.1 (214)	4.6 (854)	4.7 (888)	0.3 (53)	0.1 (12)	0.0 (0)
25	0.0 (0)	0.0 (0)	0.1 (12)	0.0 (0)	0.0 (0)	0.0 (0)	2.9 (574)	6.6 (1303)	7.5 (1491)	0.0 (0)	0.0 (0)	0.0 (0)
10	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.2 (38)	0.0 (0)	1.3 (256)	1.3 (265)	0.0 (0)	0.0 (0)	0.0 (0)
5	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
1	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
Average	0.1 (25)	0.0 (7)	0.0 (2)	0.0 (0)	0.0 (0)	0.0 (1)	0.9 (157)	2.8 (519)	3.3 (616)	0.3 (52)	0.3 (53)	0.2 (44)

Note: The average is calculated from all

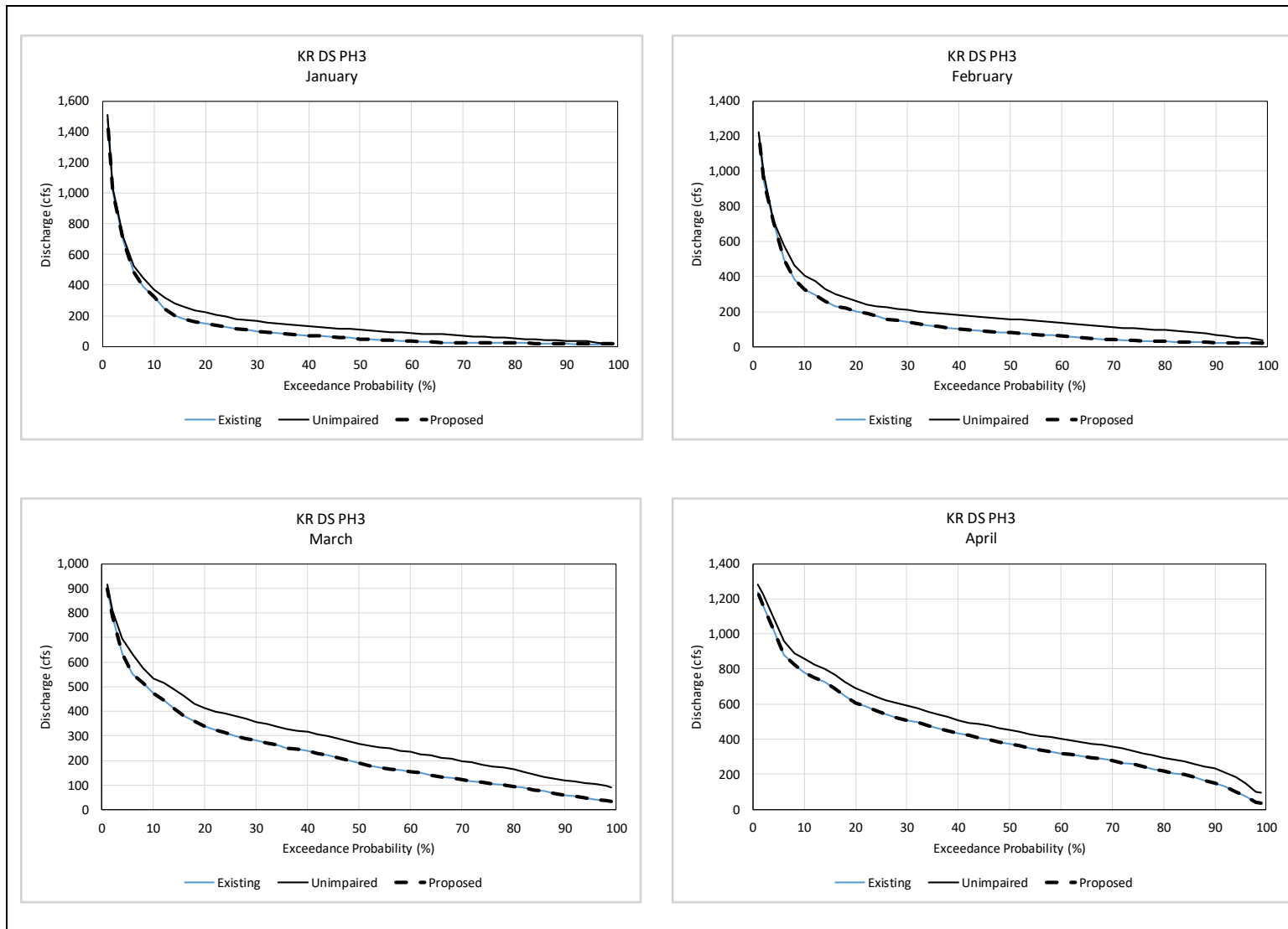
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## FIGURES

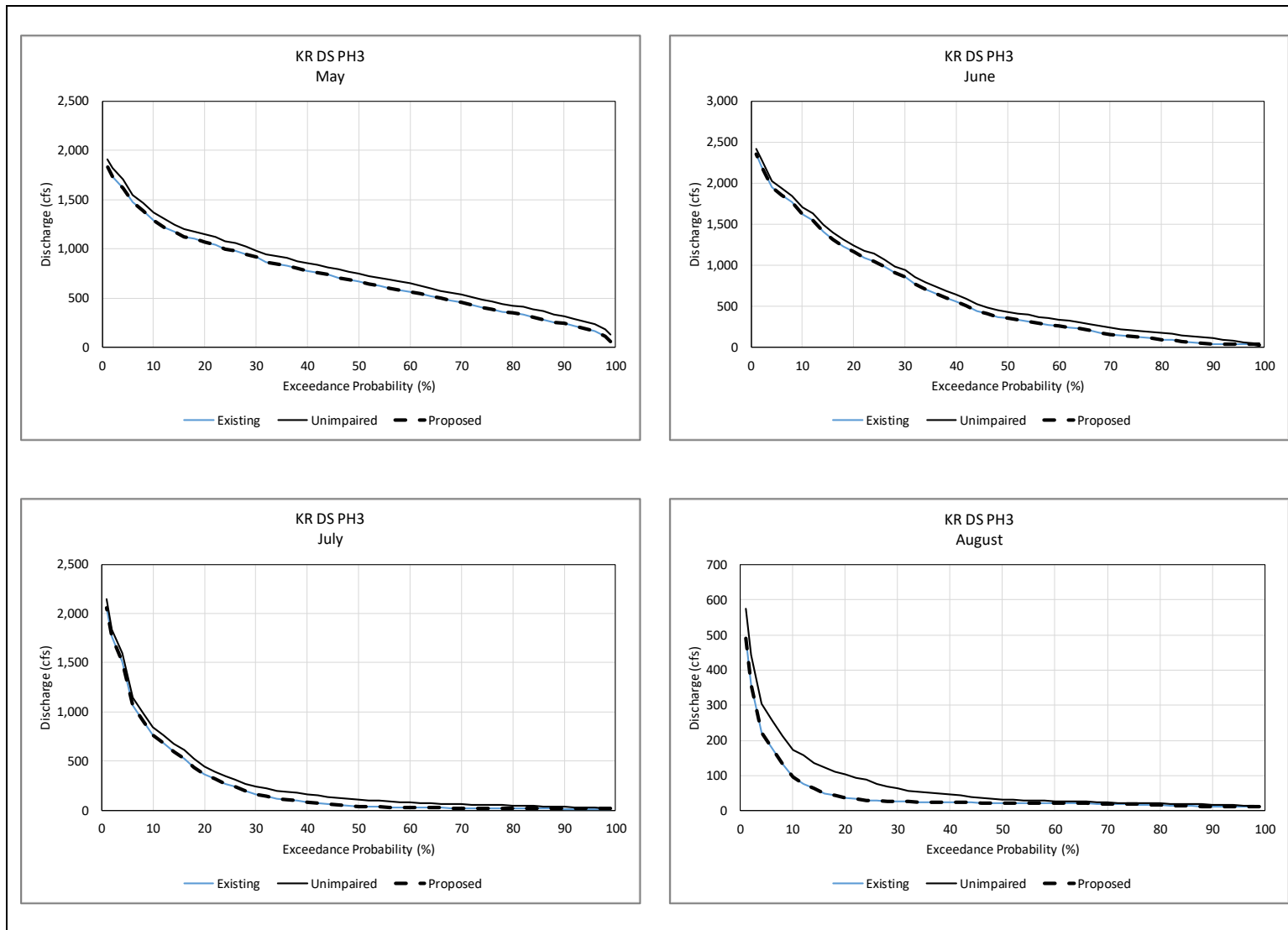
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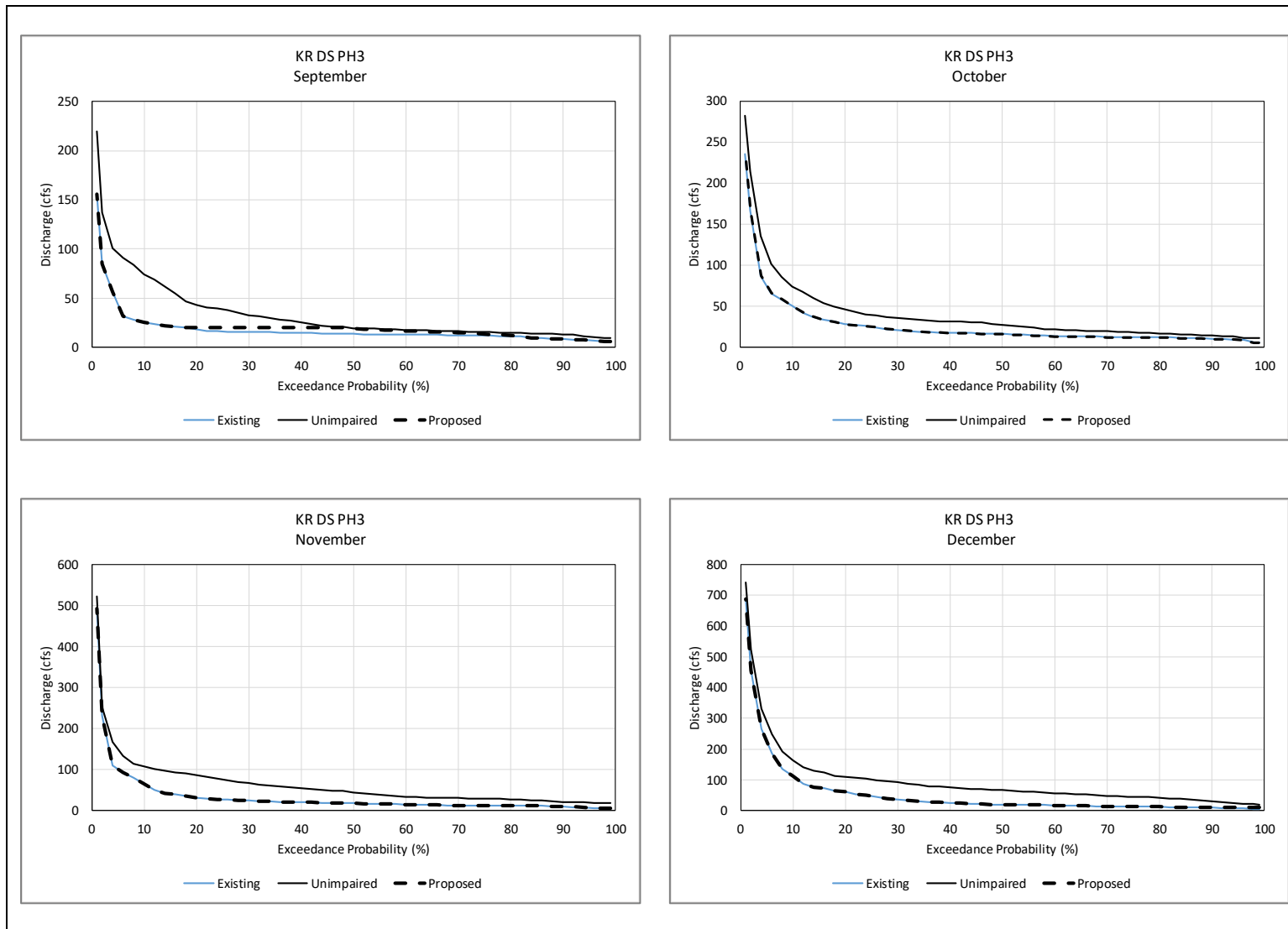
**Figure 8.4-1. Comparison of Kaweah No. 2 Diversion (top) and East Fork Kaweah No. 1 Diversion (bottom) existing (No-Action Alternative) and modified minimum flows (cfs) (Proposed Action Alternative) (left – normal water year, right – dry water year)**



**Figure 8.4-2. Kaweah River Downstream of Kaweah No. 3 Powerhouse and Upstream of the East Fork Kaweah River Confluence Flow Exceedance Plots (1994-2018) Comparing Existing, Unimpaired, and Proposed Flows**

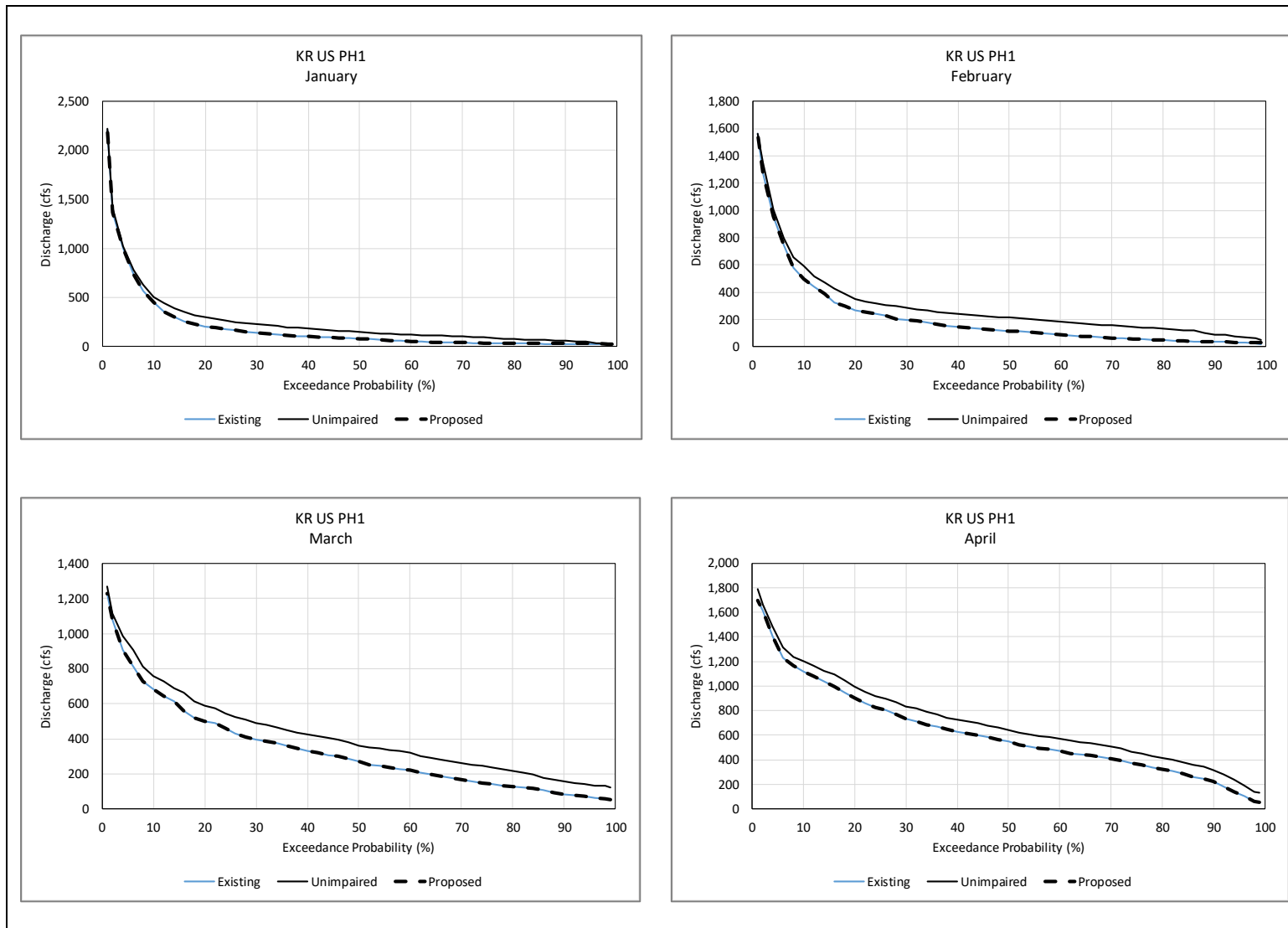


**Figure 8.4-2. (continued) Kaweah River Downstream of Kaweah No. 3 Powerhouse and Upstream of the East Fork Kaweah River Confluence Flow Exceedance Plots (1994-2018) Comparing Existing, Unimpaired, and Proposed Flows**

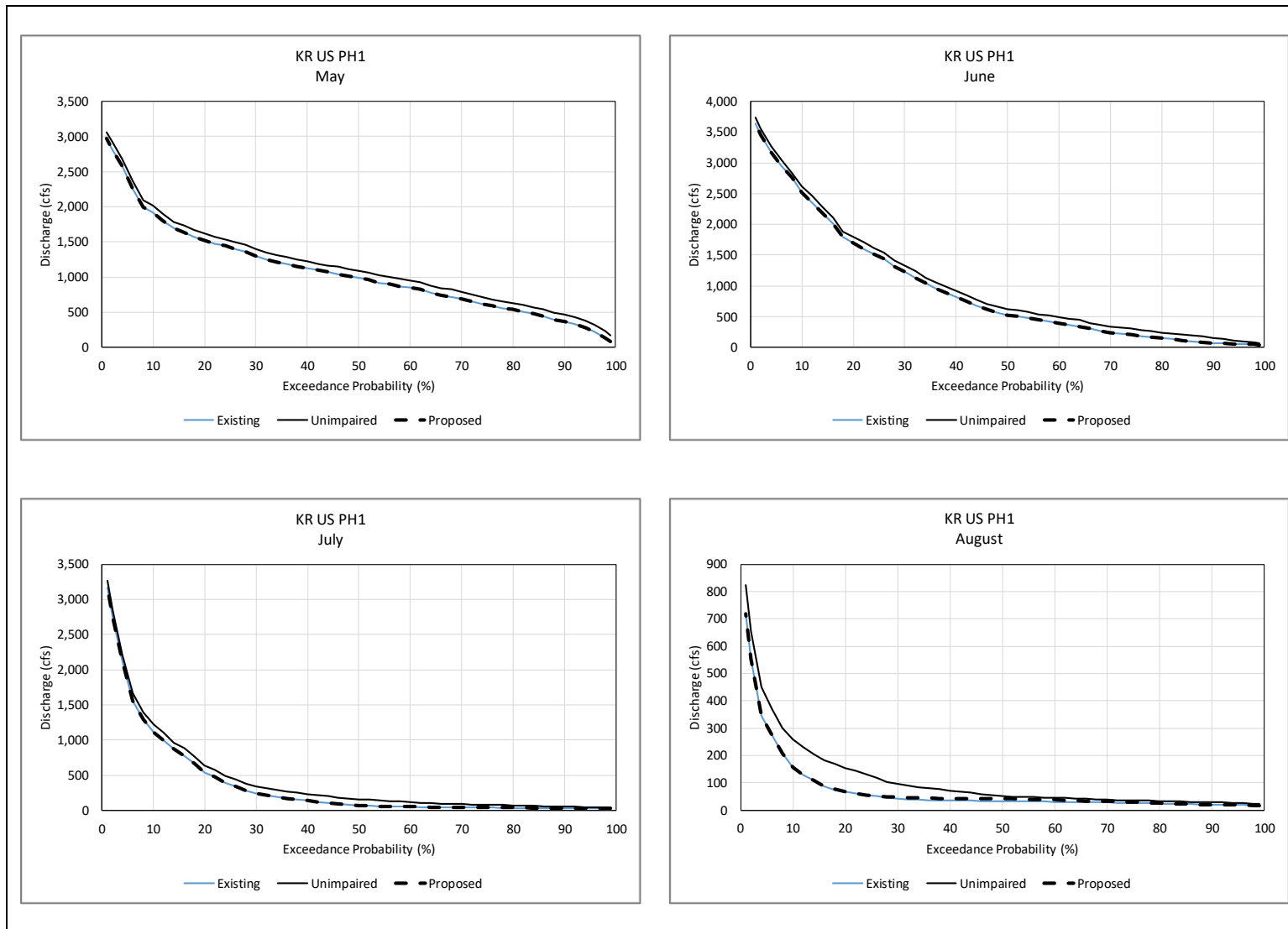


**Figure 8.4-2. (continued) Kaweah River Downstream of Kaweah No. 3 Powerhouse and Upstream of the East Fork Kaweah River Confluence Flow Exceedance Plots (1994-2018) Comparing Existing, Unimpaired, and Proposed Flows**

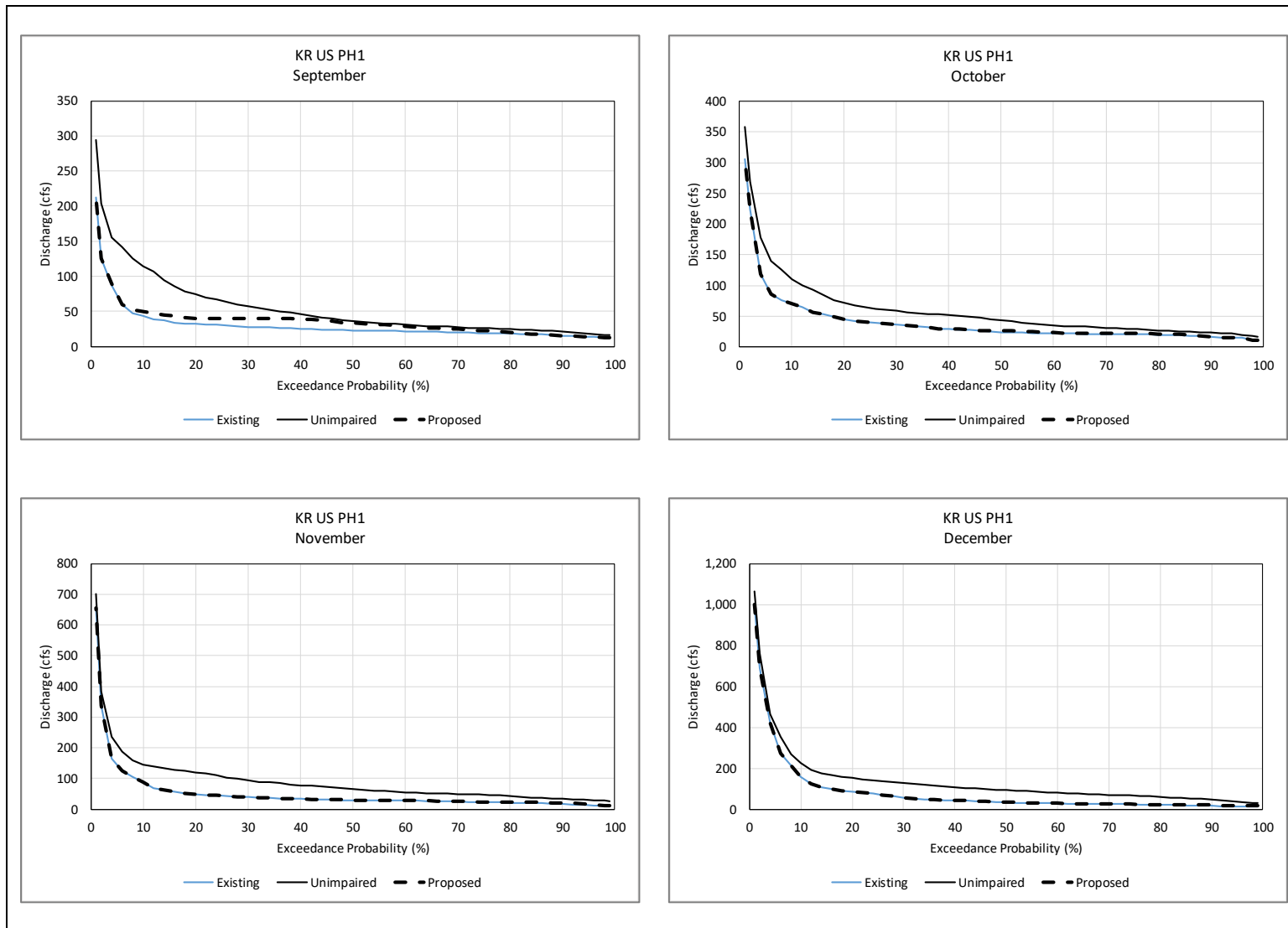




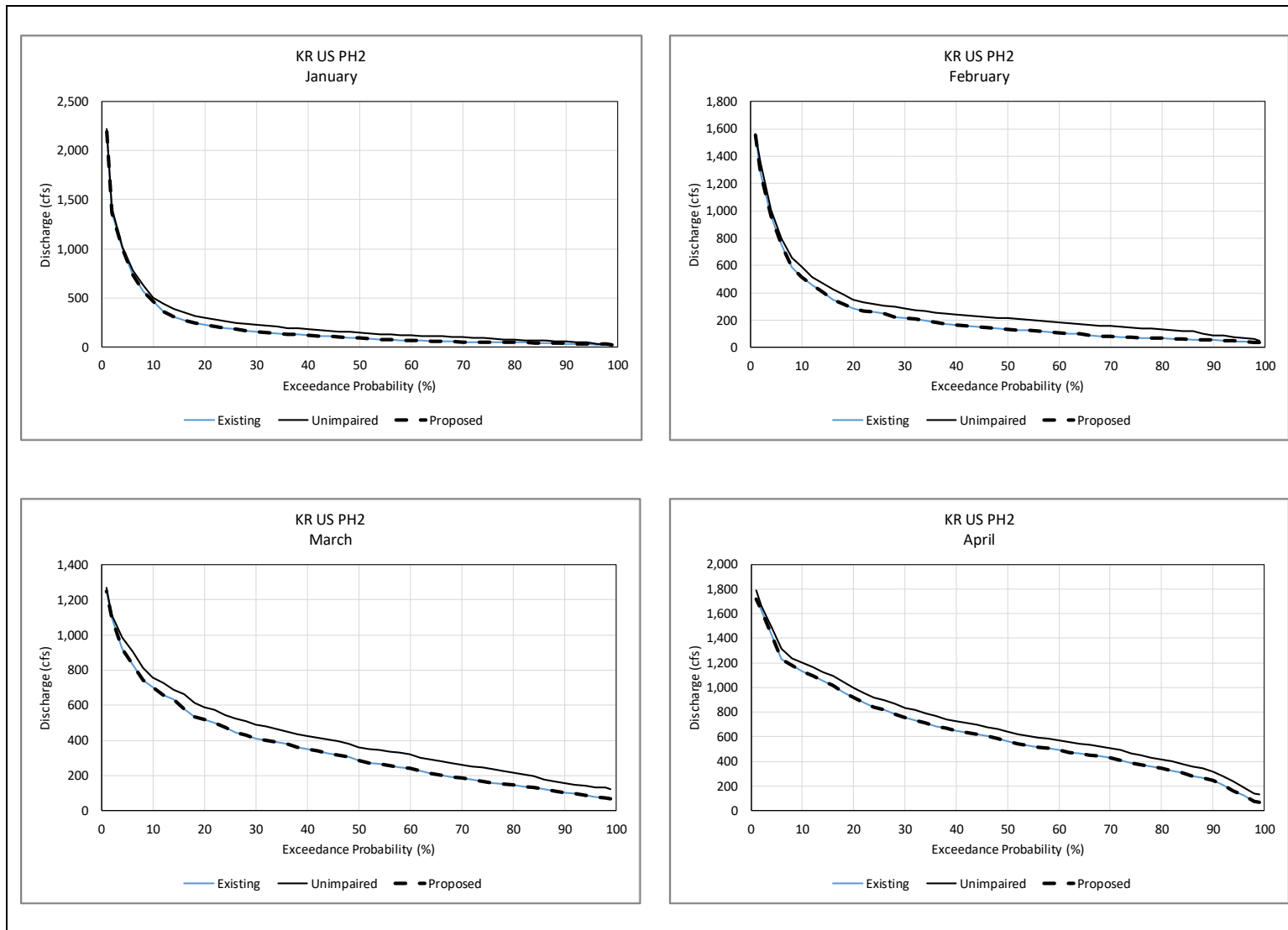
**Figure 8.4-3. Kaweah River Downstream of the East Fork Kaweah River Confluence and Upstream of Kaweah No.1 Powerhouse Flow Exceedance Plots (1994-2018) Comparing Existing, Unimpaired, and Proposed Flows**



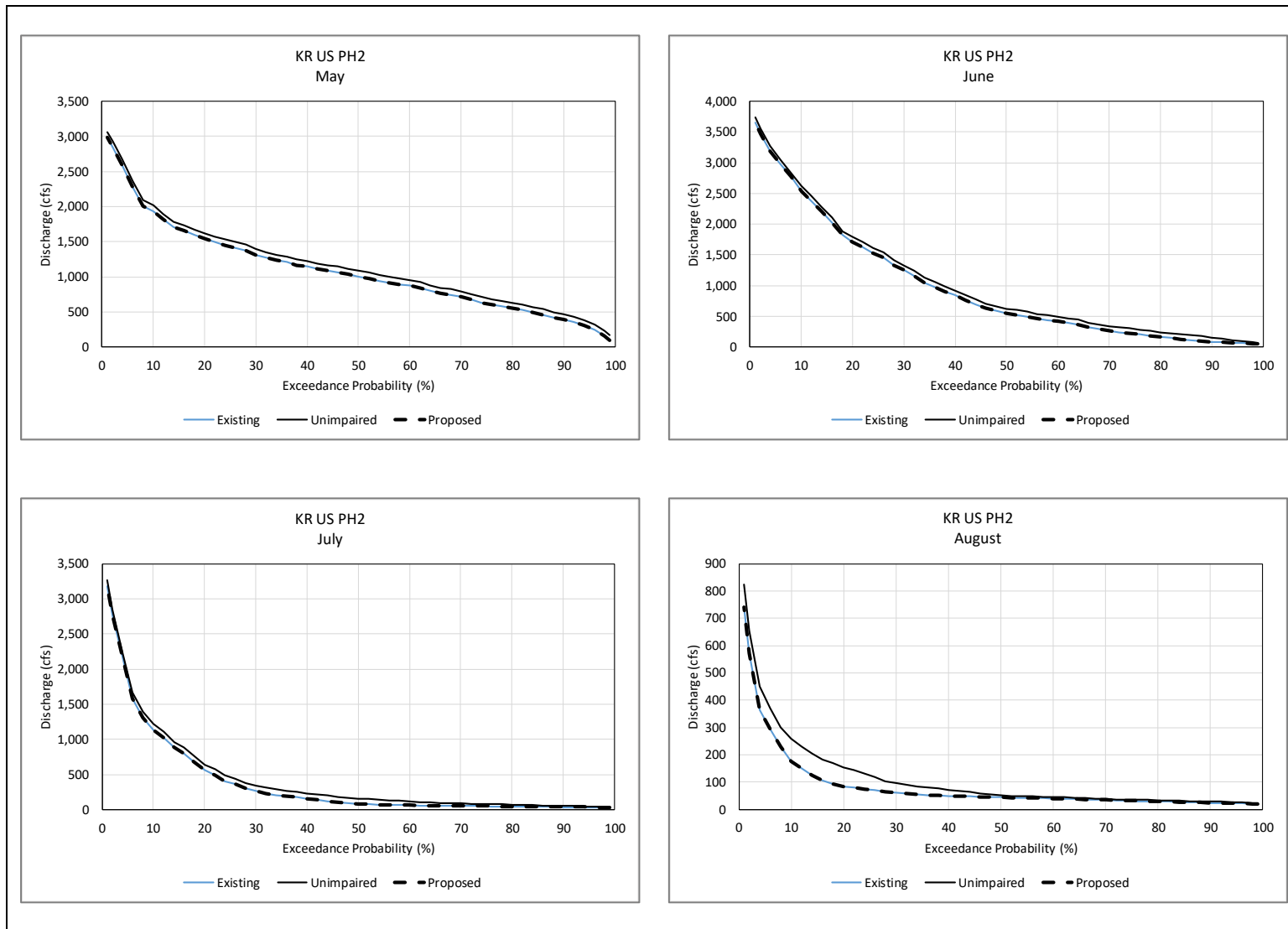
**Figure 8.4-3. (continued) Kaweah River Downstream of the East Fork Kaweah River Confluence and Upstream of Kaweah No.1 Powerhouse Flow Exceedance Plots (1994-2018) Comparing Existing, Unimpaired, and Proposed Flows**



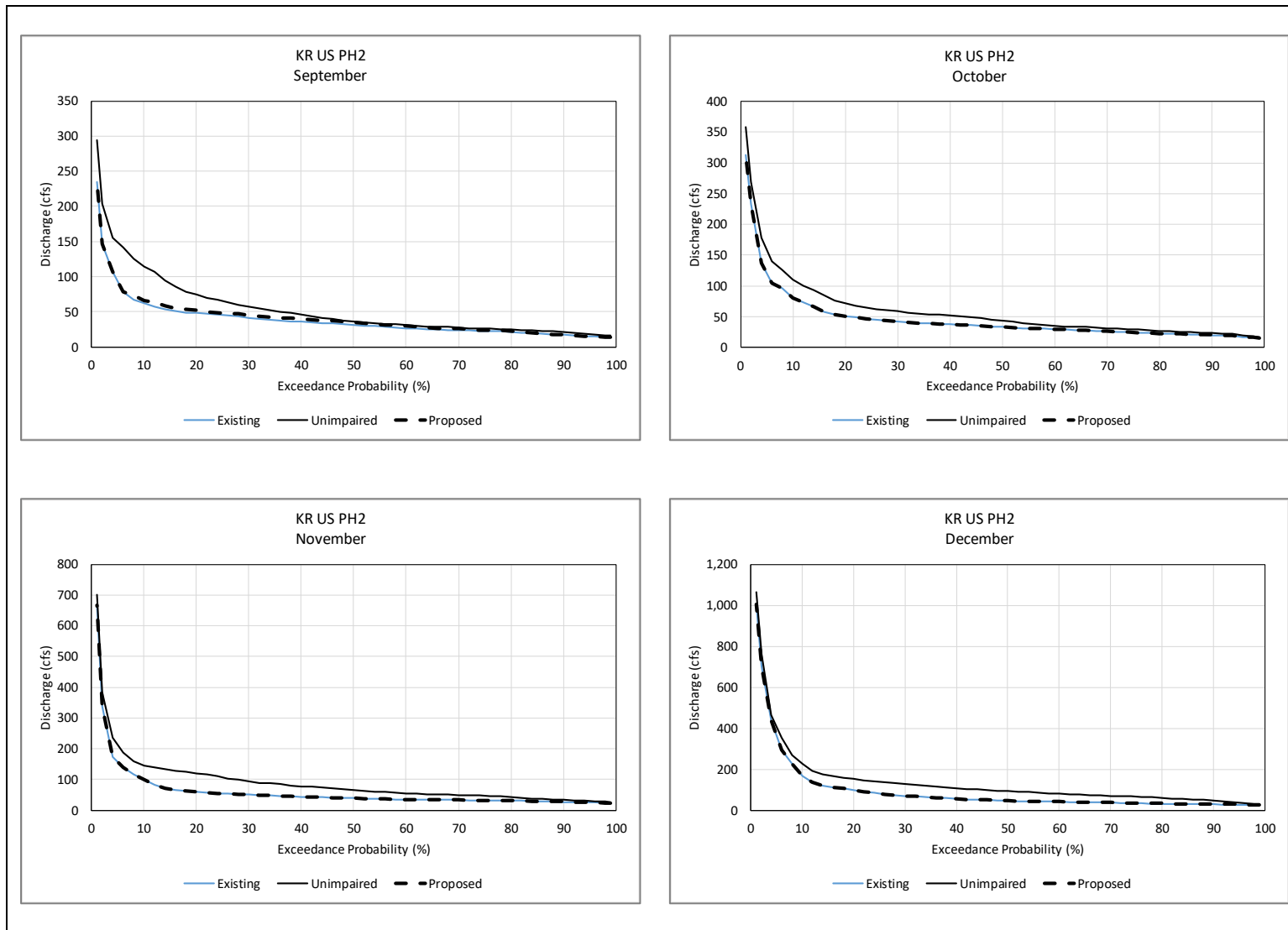
**Figure 8.4-3. (continued) Kaweah River Downstream of the East Fork Kaweah River Confluence and Upstream of Kaweah No.1 Powerhouse Flow Exceedance Plots (1994-2018) Comparing Existing, Unimpaired, and Proposed Flows**



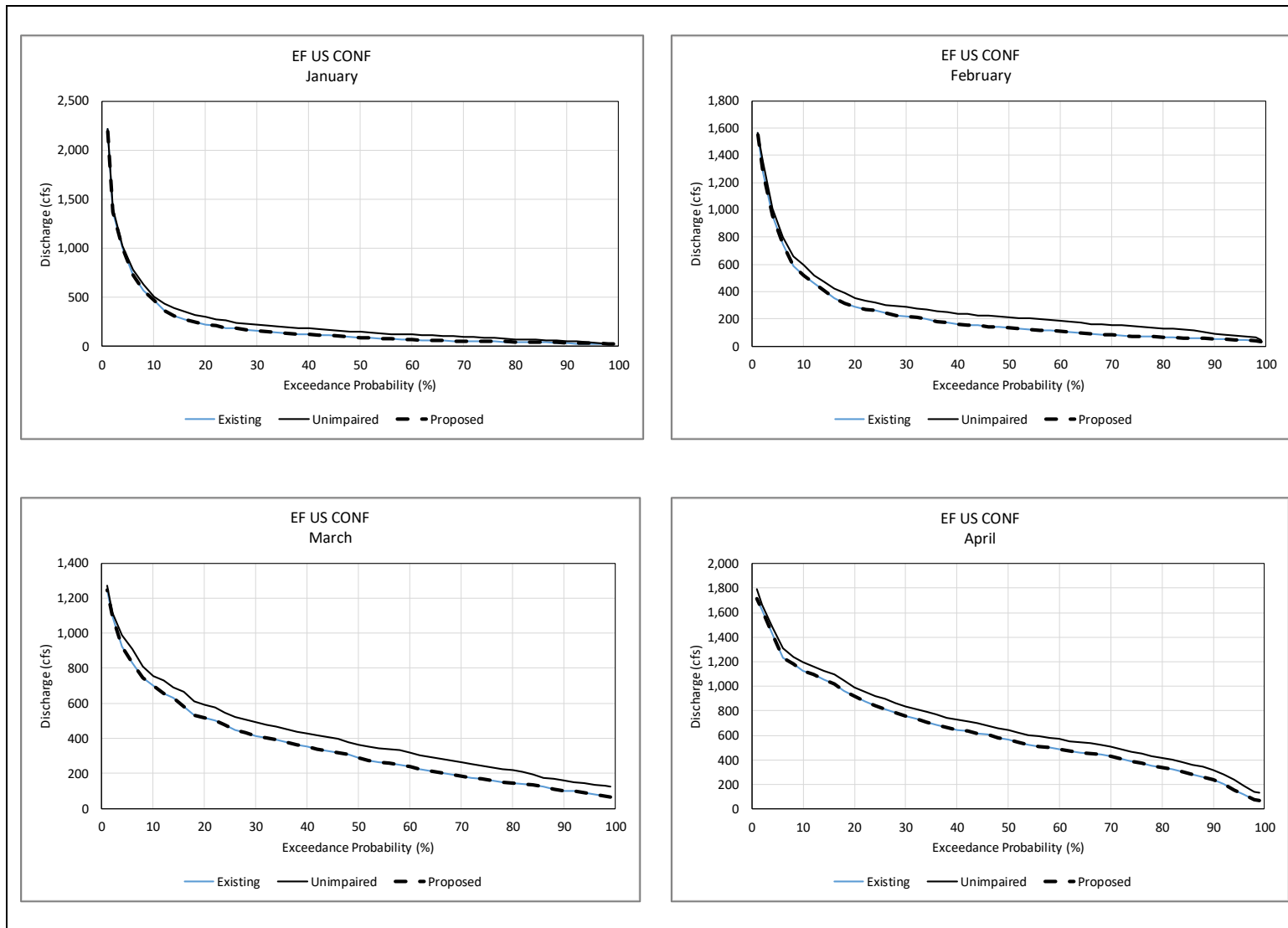
**Figure 8.4-4. Kaweah River Downstream of Kaweah No.1 Powerhouse and Upstream of Kaweah No.2 Powerhouse Flow Exceedance Plots (1994-2018) Comparing Existing, Unimpaired, and Proposed Flows**



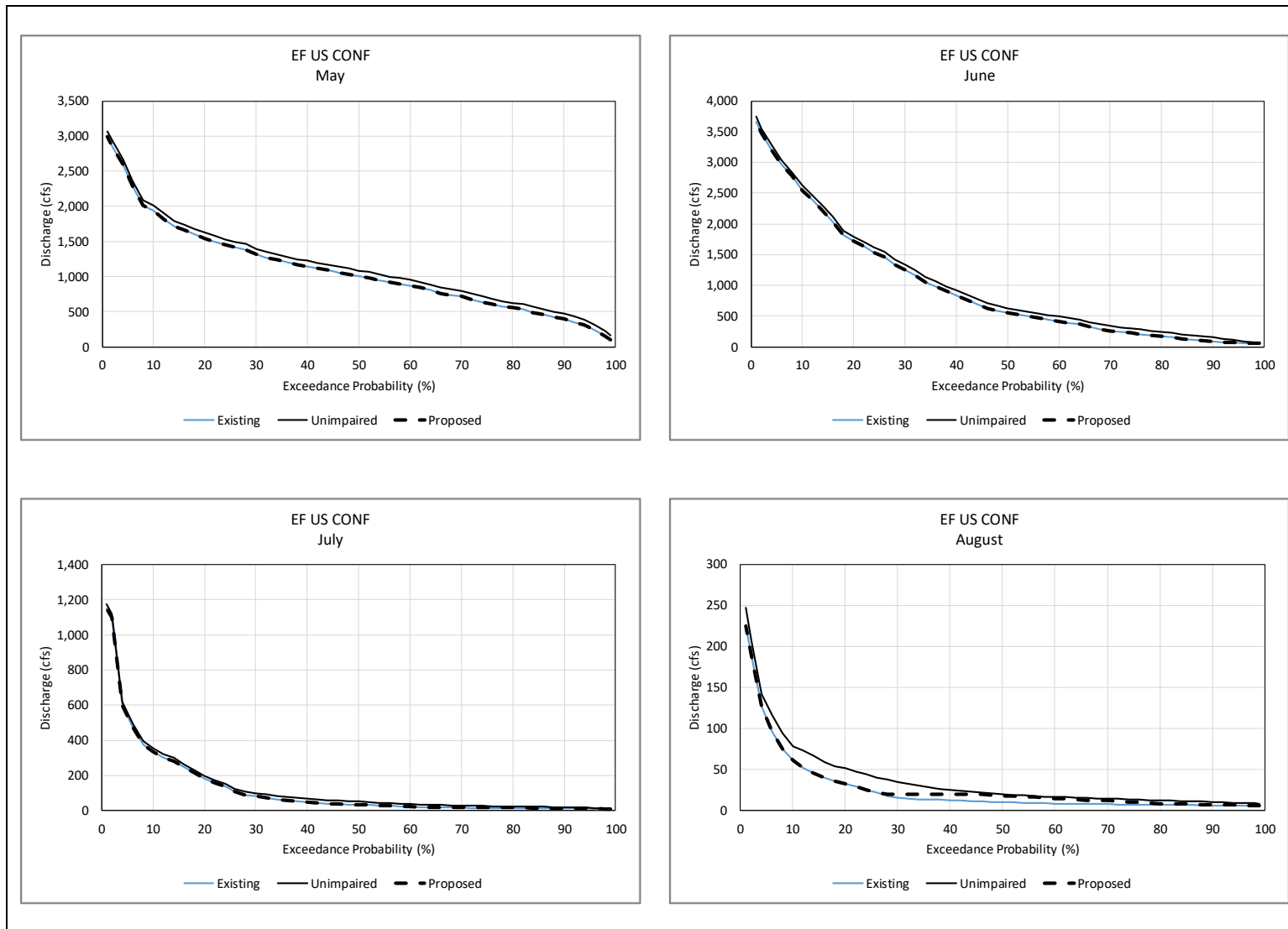
**Figure 8.4-4. (continued) Kaweah River Downstream of Kaweah No.1 Powerhouse and Upstream of Kaweah No.2 Powerhouse Flow Exceedance Plots (1994-2018) Comparing Existing, Unimpaired, and Proposed Flows**



**Figure 8.4-4. (continued) Kaweah River Downstream of Kaweah No.1 Powerhouse and Upstream of Kaweah No.2 Powerhouse Flow Exceedance Plots (1994-2018) Comparing Existing, Unimpaired, and Proposed Flows**

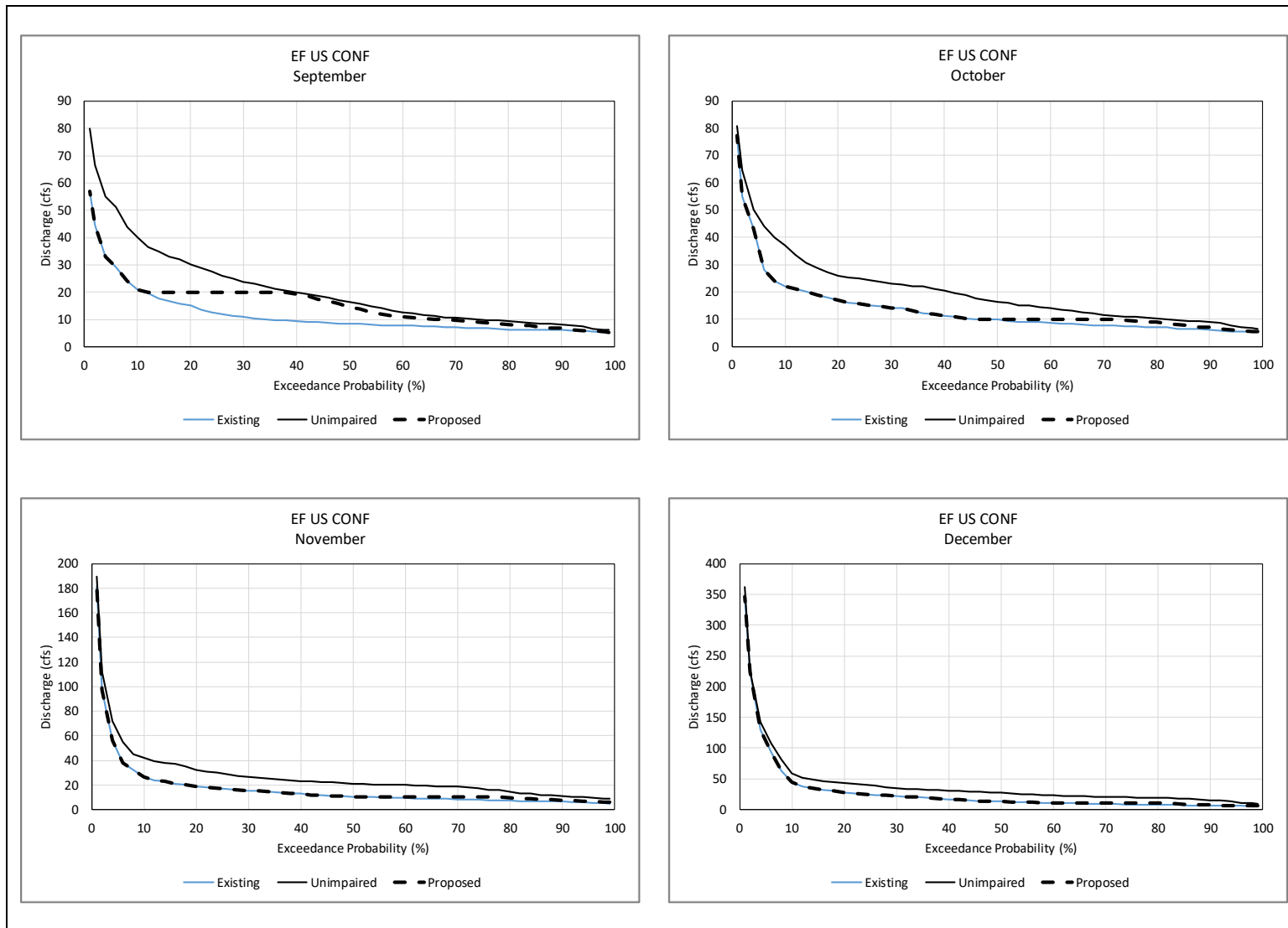


**Figure 8.4-5. East Fork Kaweah River Upstream of Kaweah River Confluence Flow Exceedance Plots (1994-2018) Comparing Existing, Unimpaired, and Proposed Flows**

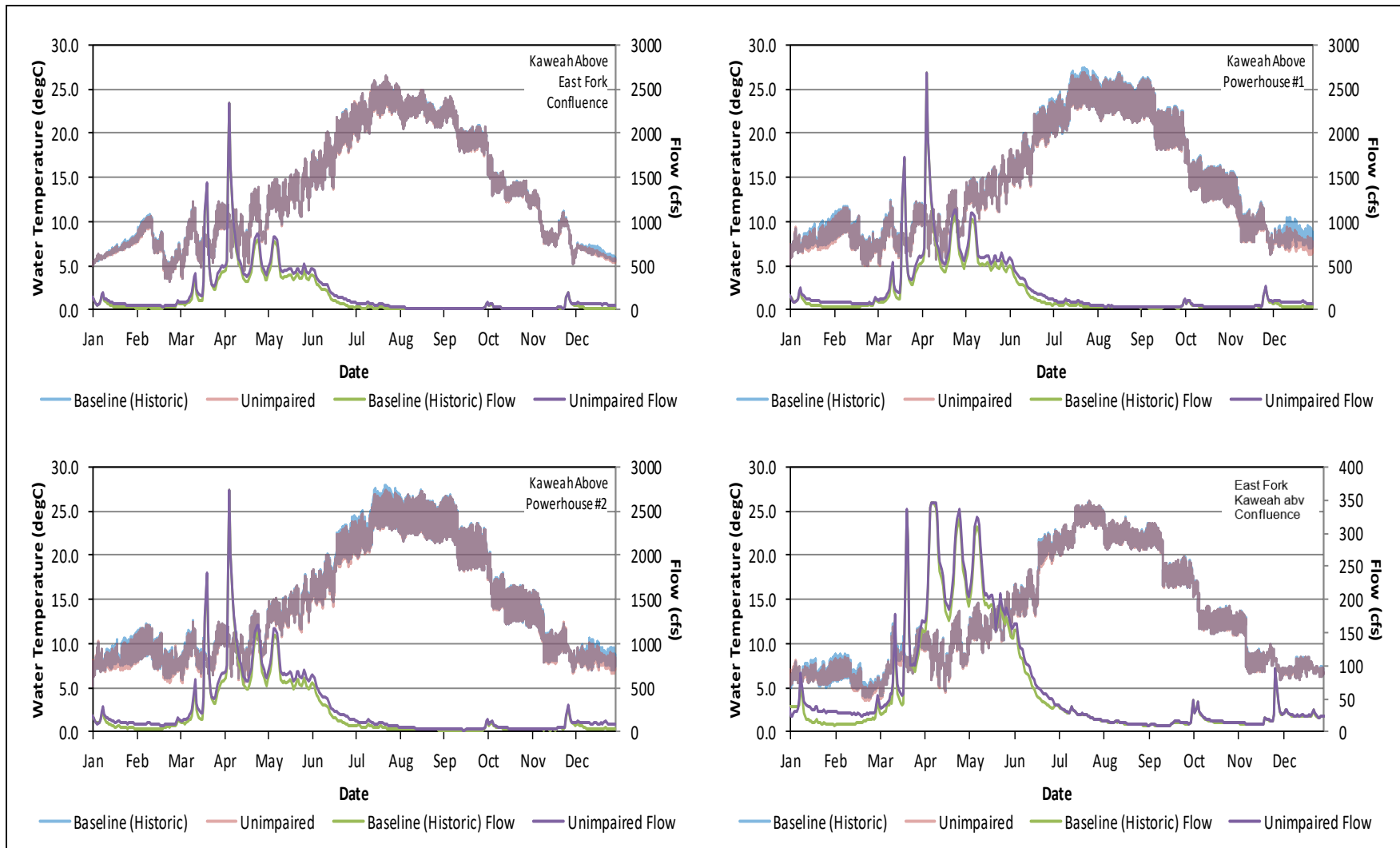


**Figure 8.4-5. (continued) East Fork Kaweah River Upstream of Kaweah River Confluence Flow Exceedance Plots (1994-2018) Comparing Existing, Unimpaired, and Proposed Flows**

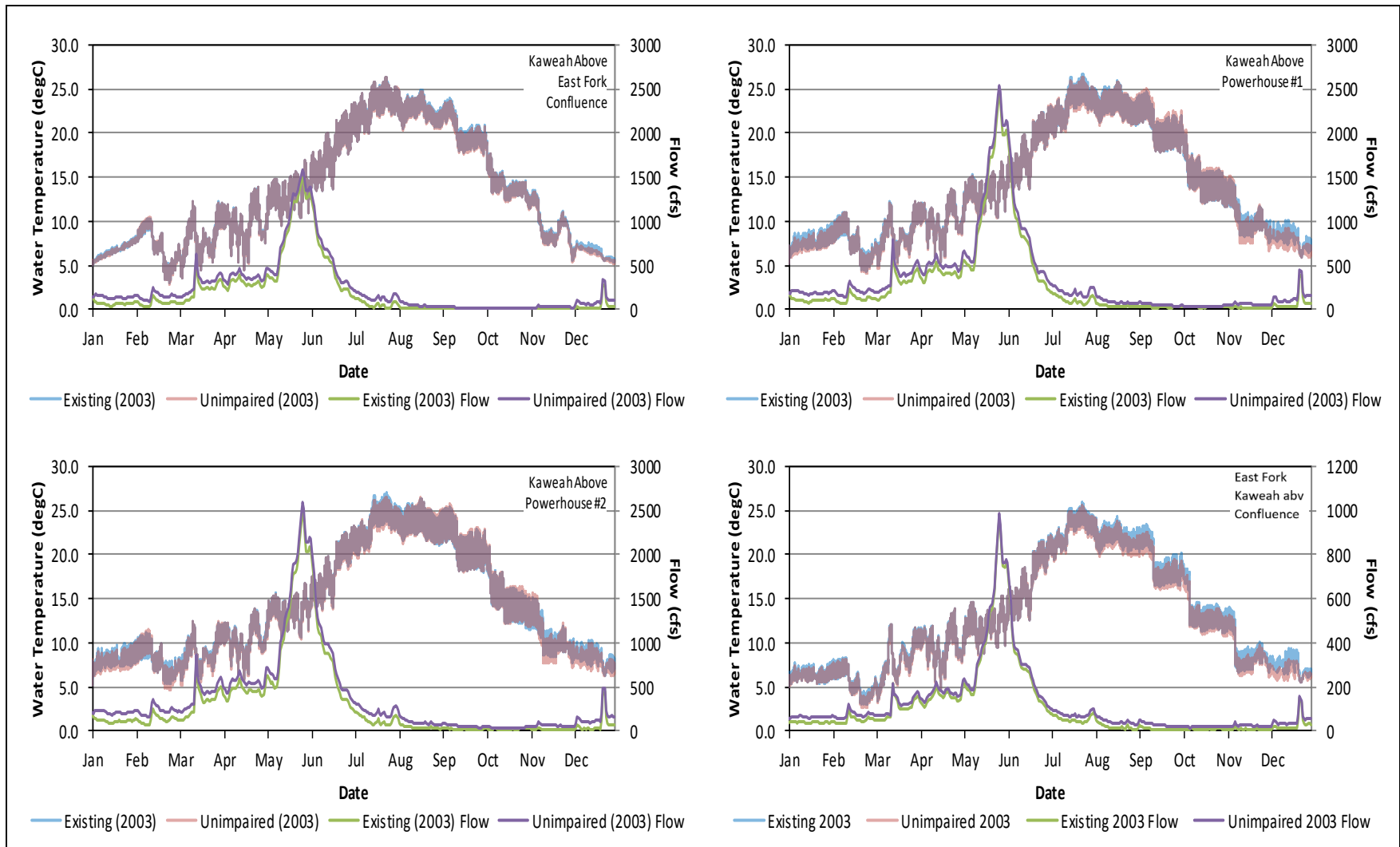




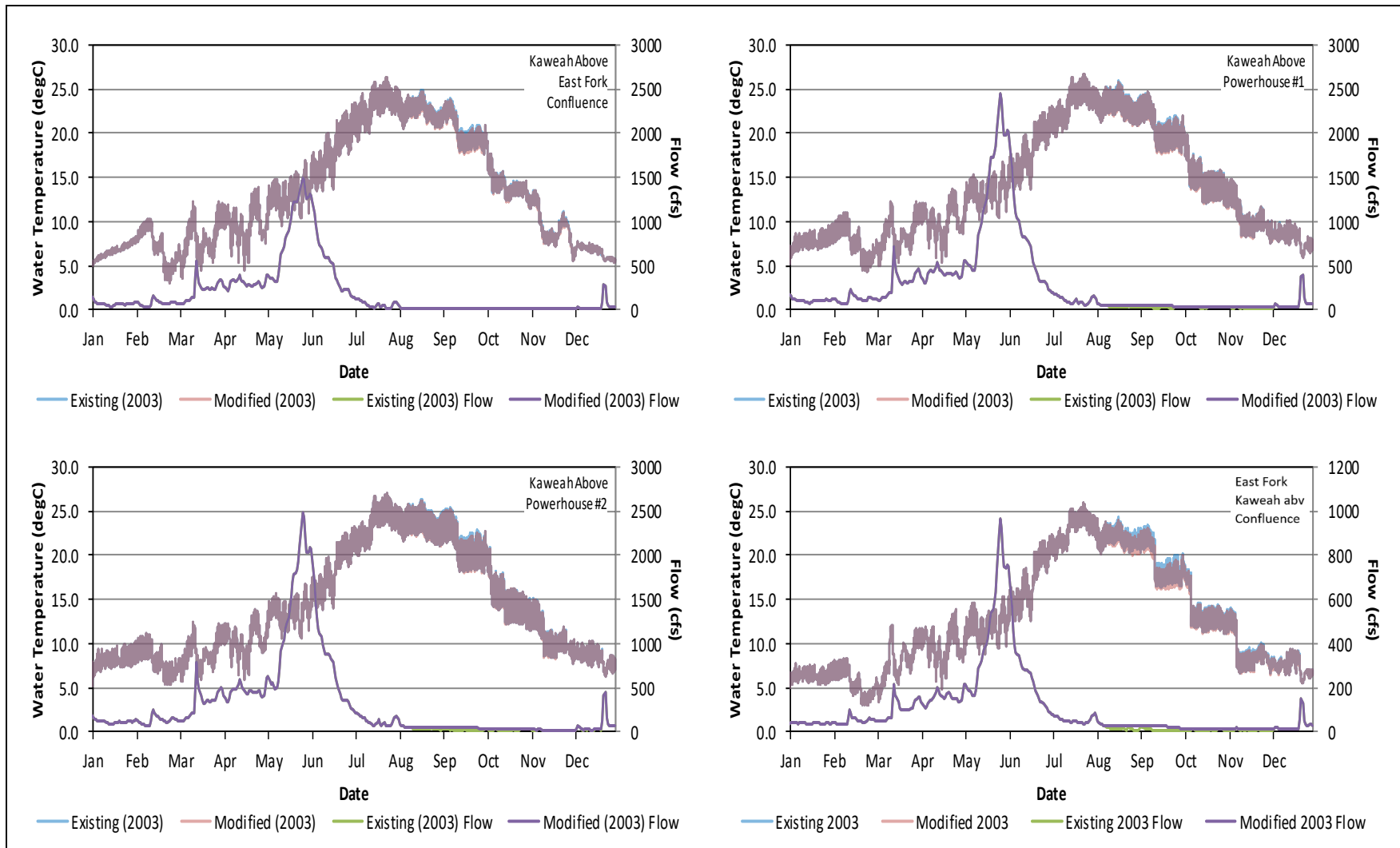
**Figure 8.4-5. (continued) East Fork Kaweah River Upstream of Kaweah River Confluence Flow Exceedance Plots (1994-2018) Comparing Existing, Unimpaired, and Proposed Flows**



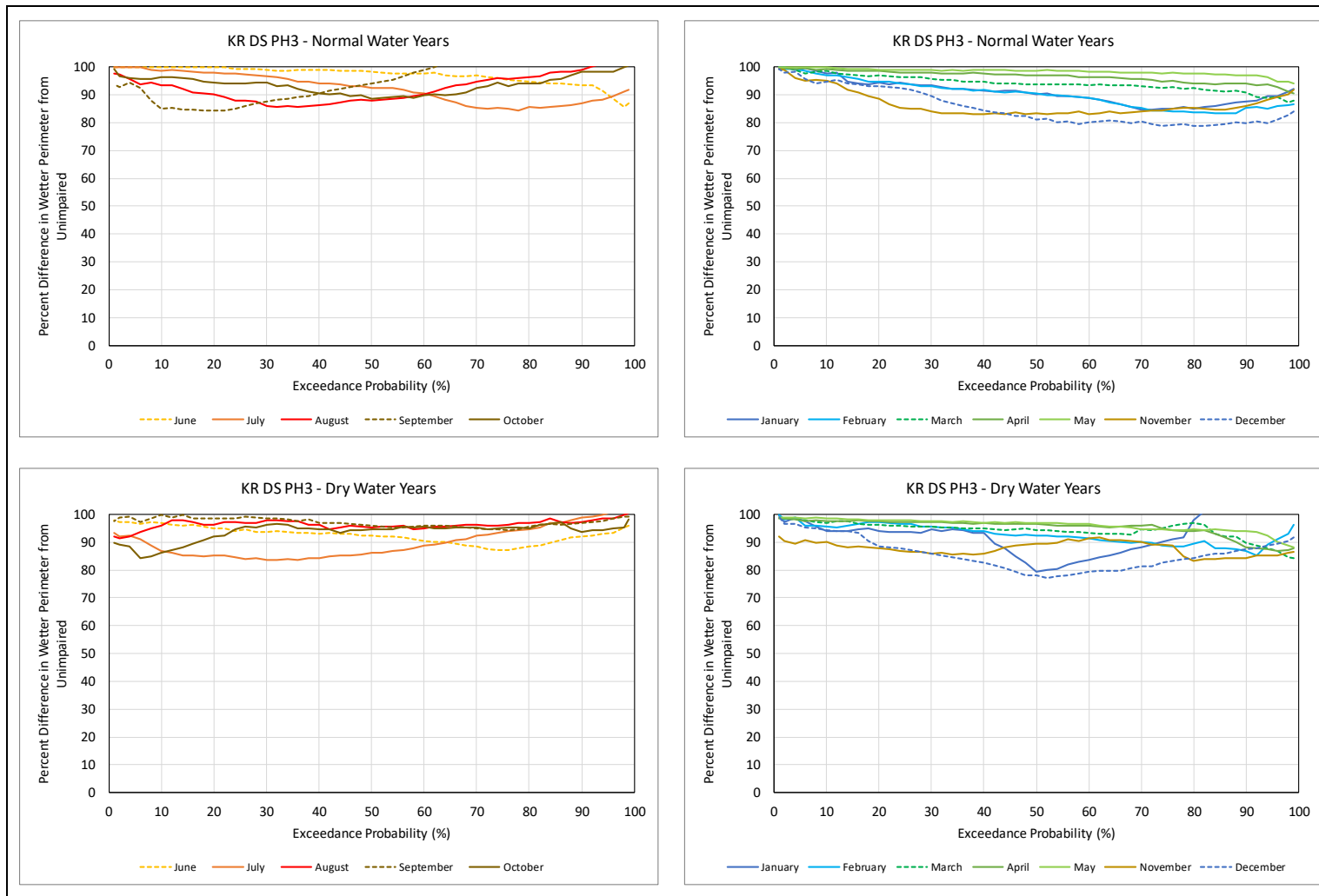
**Figure 8.4-6a. Hourly Water Temperature and Daily Average Flow Results for the Baseline (Historic) and Unimpaired Simulations for the Kaweah River and East Fork of the Kaweah River, January 1 – December 31, 2018 (reaches are indicated in the figures)**



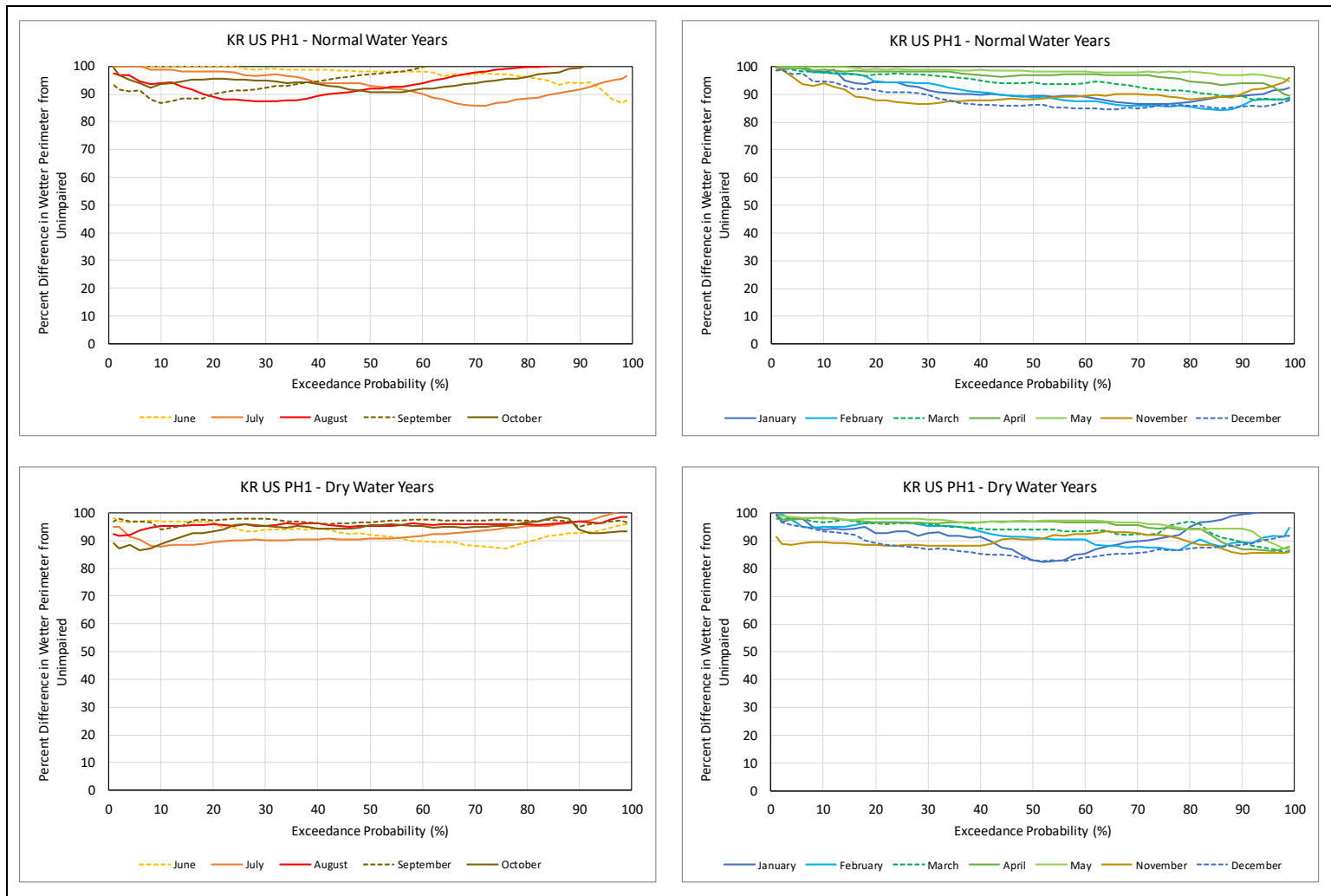
**Figure 8.4-6b. Hourly Water Temperature and Daily Average Flow Results for the Existing (Historic) and Unimpaired Simulations for the Kaweah River and East Fork of the Kaweah River, January 1 – December 31, 2003 (reaches are indicated in the figures)**



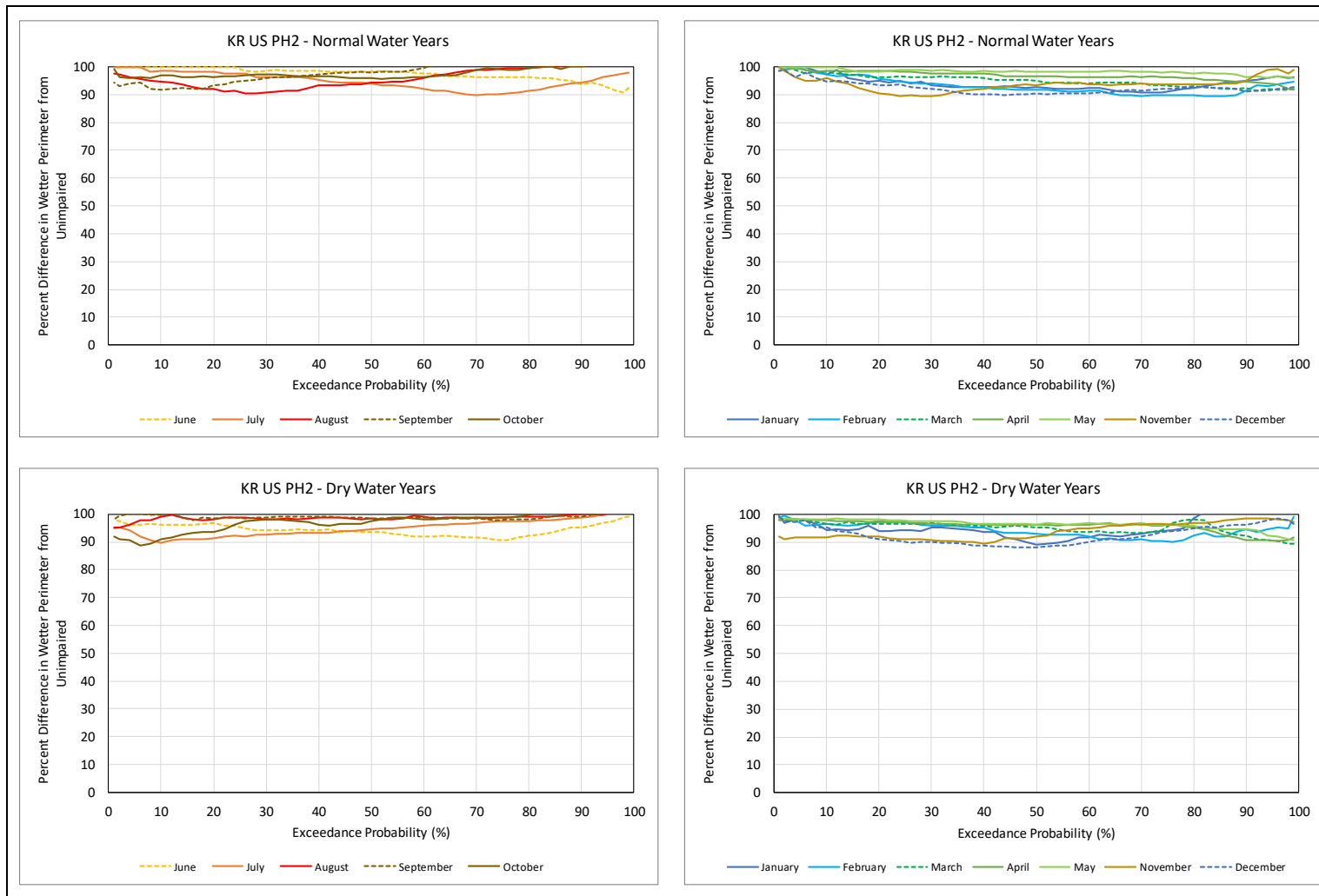
**Figure 8.4-6c. Hourly Water Temperature and Daily Average Flow Results for the Existing (Historic) and Modified Simulations for the Kaweah River and East Fork of the Kaweah River, January 1 – December 31, 2003 (reaches are indicated in the figures)**



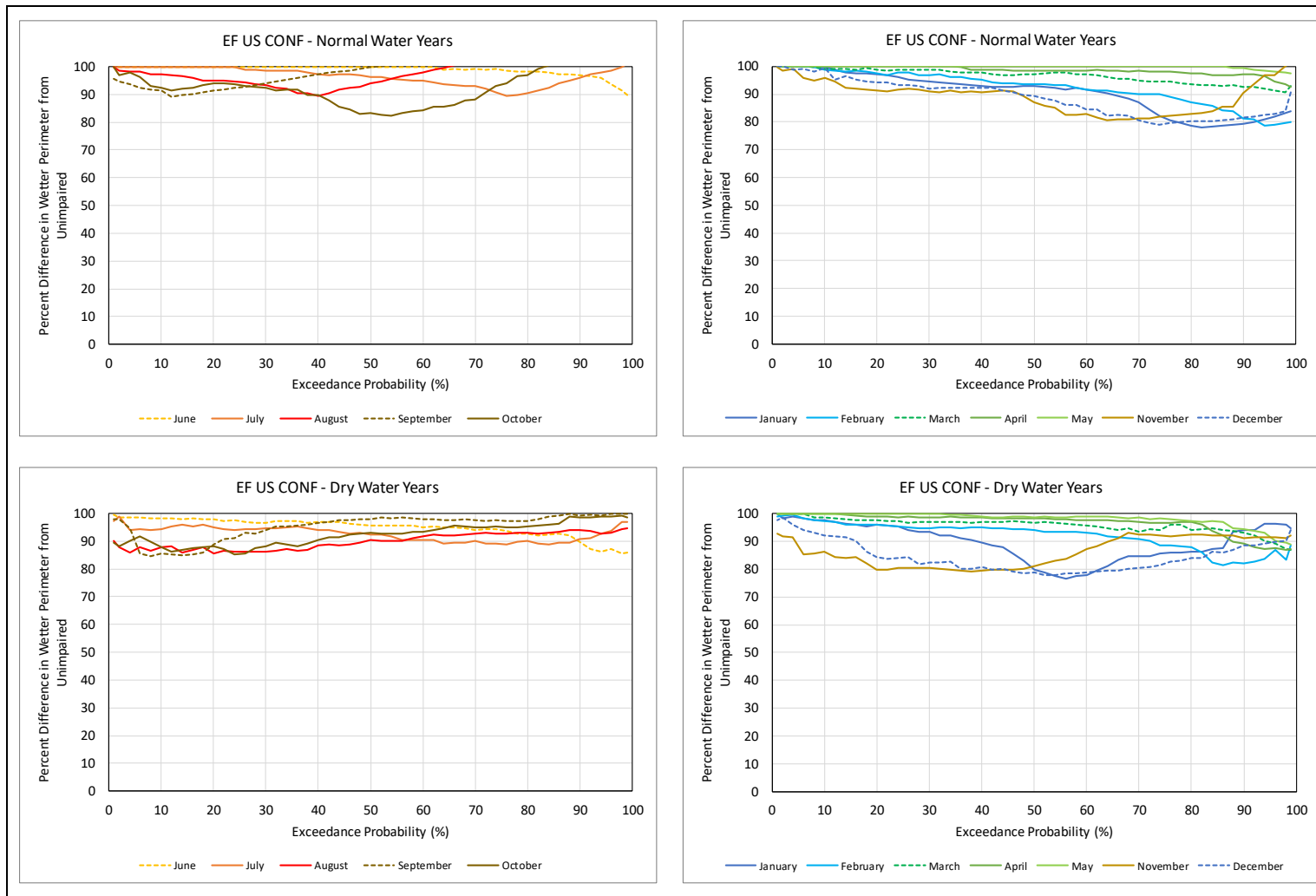
**Figure 8.4-7. Kaweah River Downstream of Kaweah No. 3 Powerhouse and Upstream of the East Fork Kaweah River Confluence Wetted Perimeter Percent of Unimpaired Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



**Figure 8.4-8. Kaweah River Downstream of East Fork Kaweah Confluence and Upstream of Kaweah No. 1 Powerhouse Wetted Perimeter Percent of Unimpaired Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**

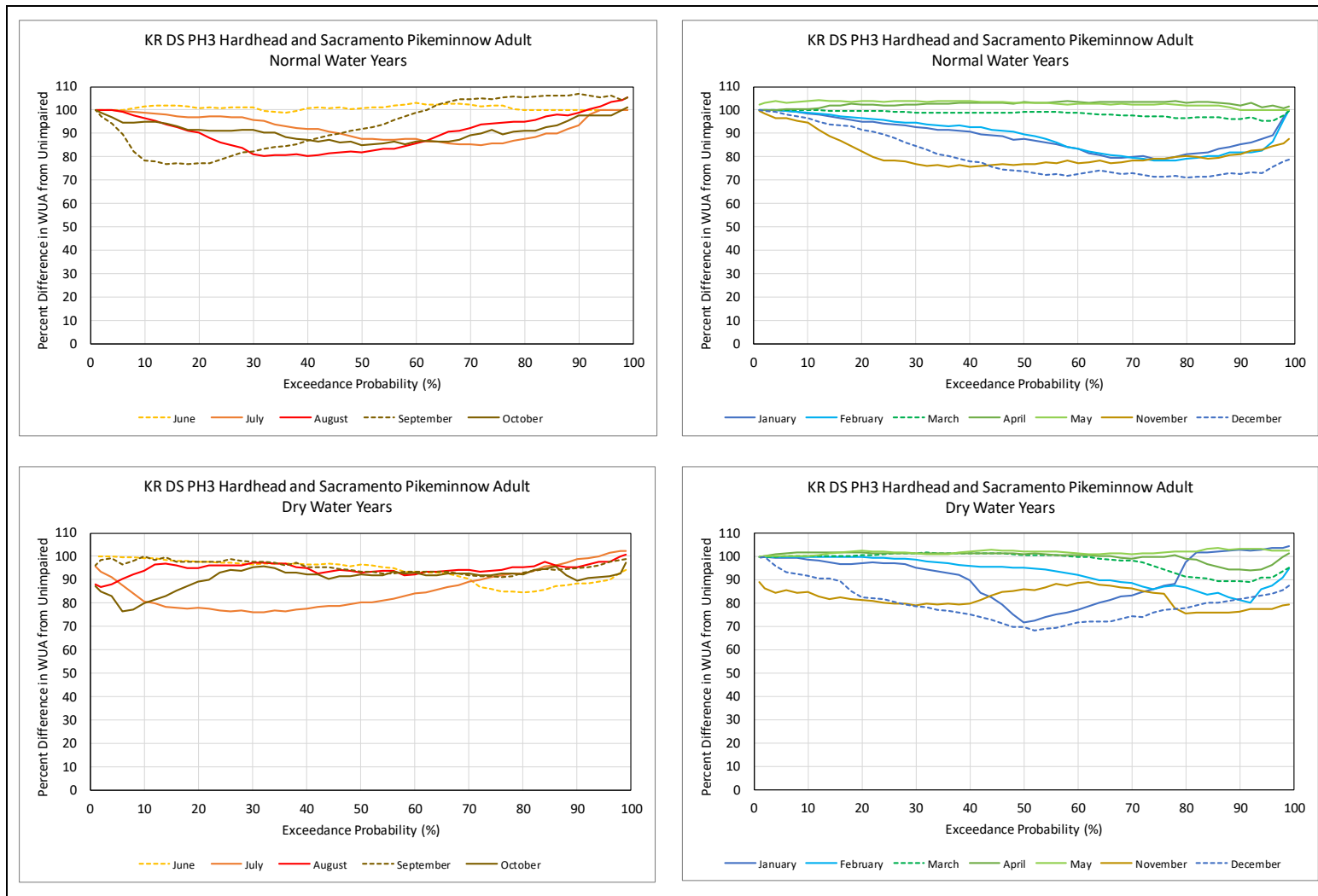


**Figure 8.4-9. Kaweah River Downstream of Kaweah No. 1 Powerhouse and Upstream of Kaweah No. 2 Powerhouse Wetted Perimeter Habitat Percent of Unimpaired Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**

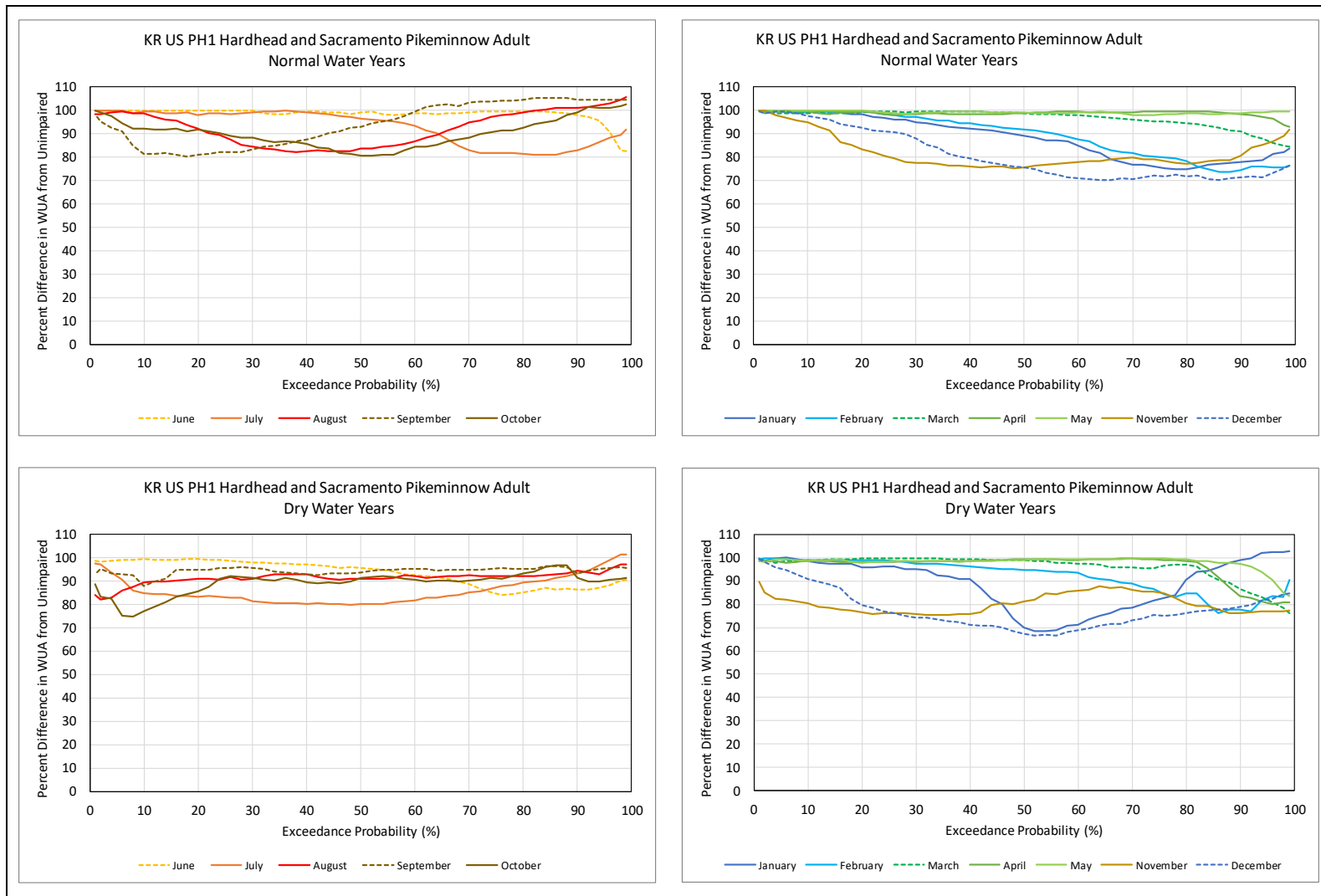


**Figure 8.4-10. East Fork Kaweah River Upstream of the Confluence with Kaweah River Wetted Perimeter Percent of Unimpaired Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**

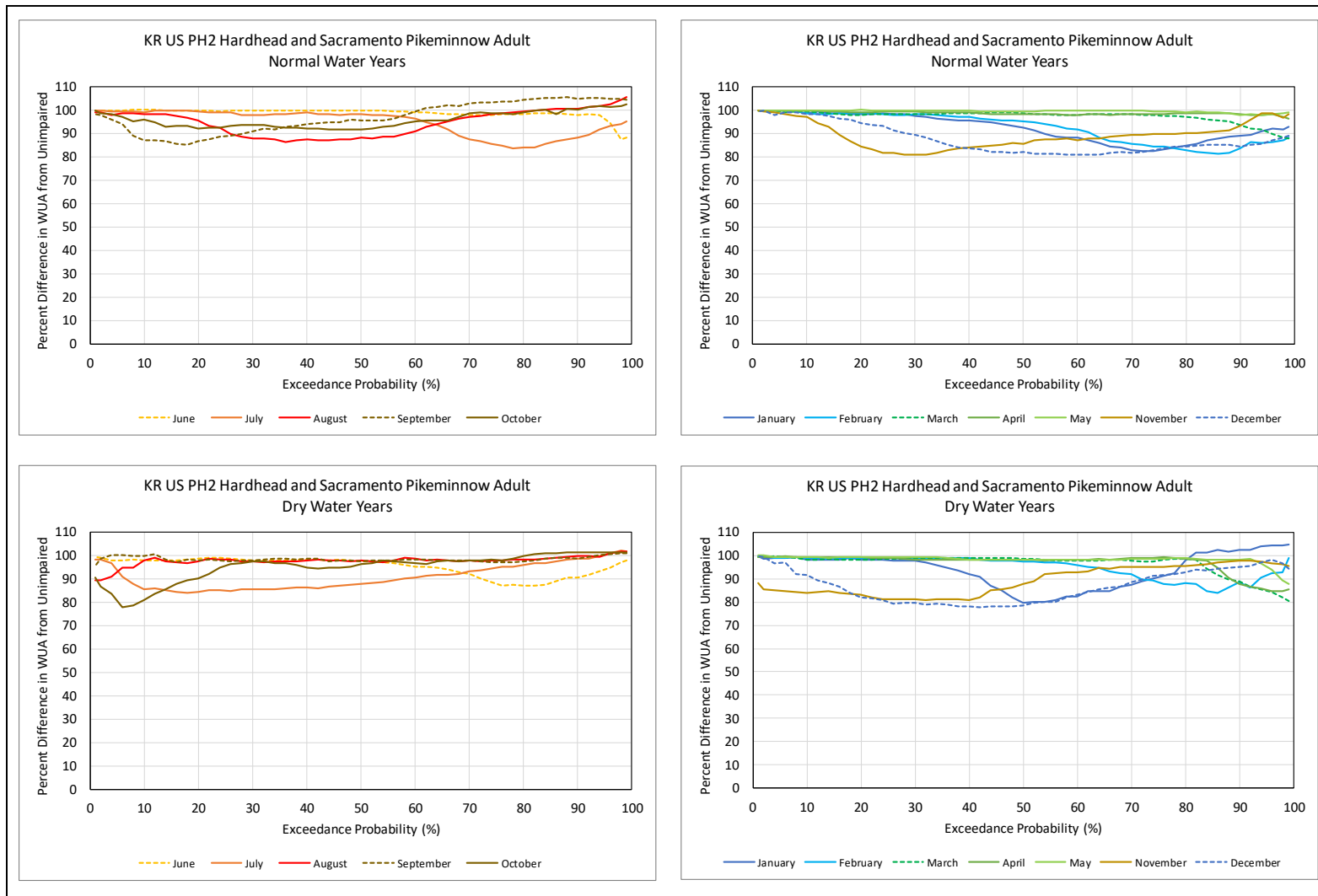




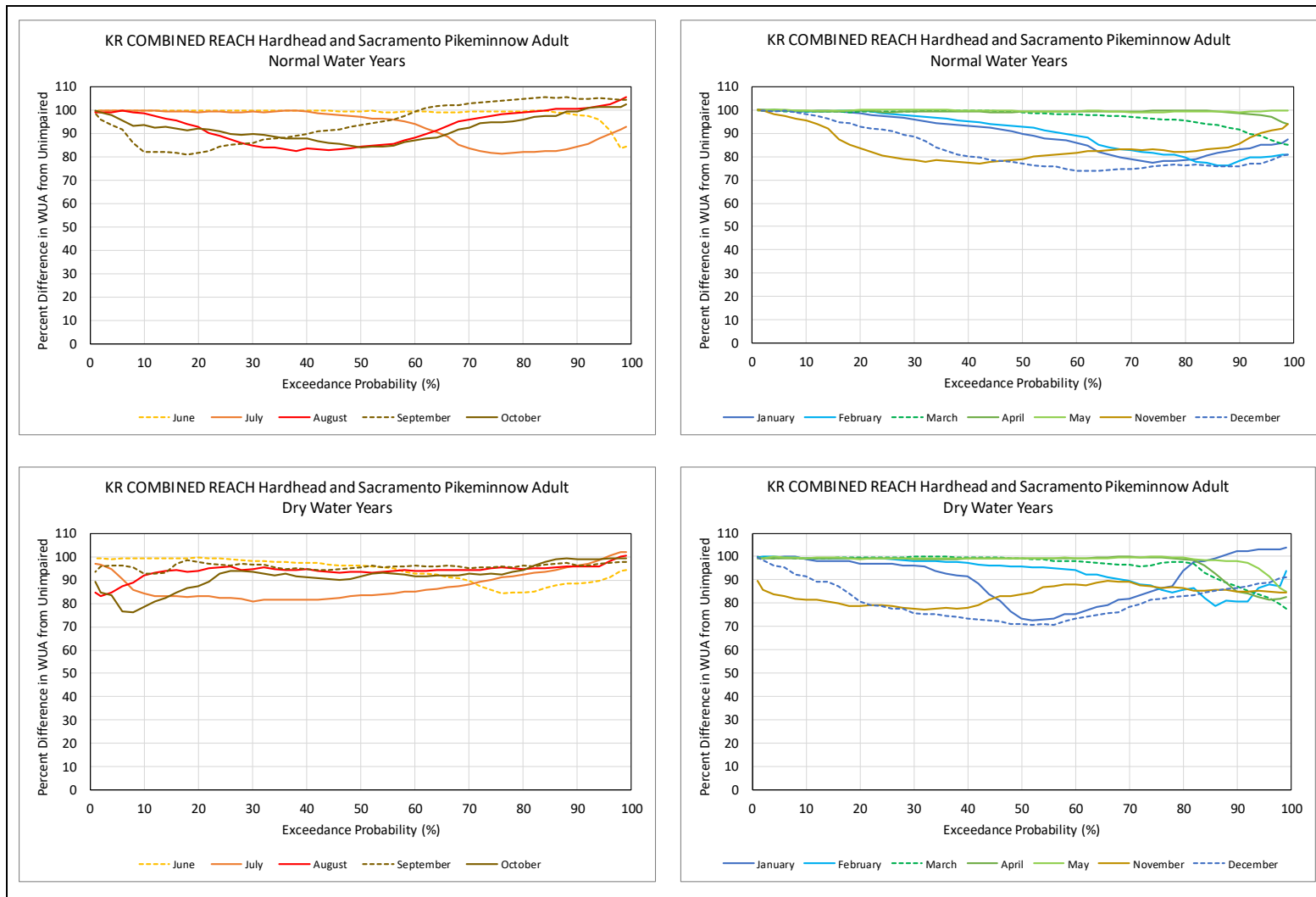
**Figure 8.4-11. Kaweah River Downstream of Kaweah No. 3 Powerhouse and Upstream of the East Fork Kaweah River Confluence Hardhead and Sacramento Pikeminnow Adult Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



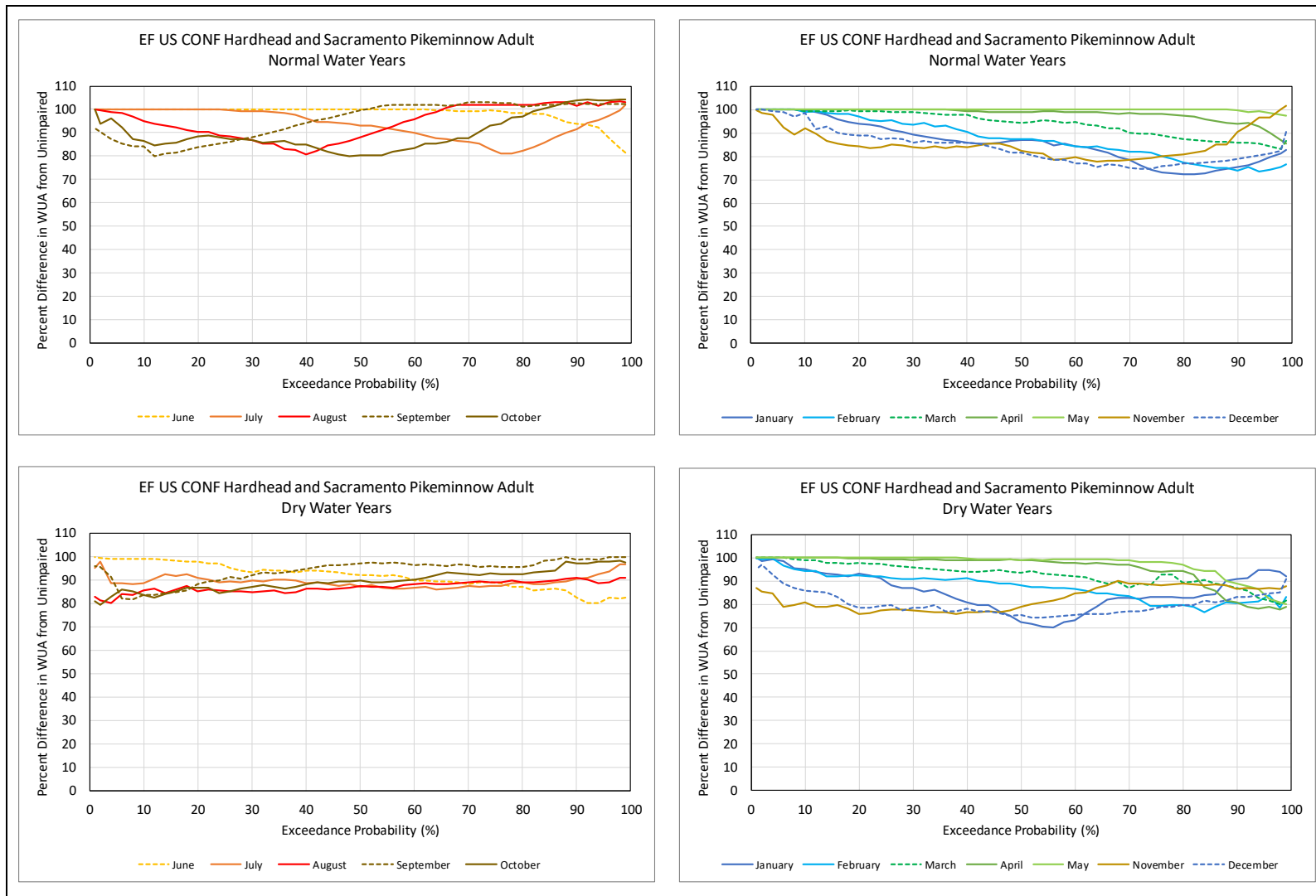
**Figure 8.4-12. Kaweah River Downstream of East Fork Kaweah Confluence and Upstream of Kaweah No. 1 Powerhouse Hardhead and Sacramento Pikeminnow Adult Habitat Percent of Unimpaired Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



**Figure 8.4-13. Kaweah River Downstream of Kaweah No. 1 Powerhouse and Upstream of Kaweah No. 2 Powerhouse Hardhead and Sacramento Pikeminnow Adult Habitat Percent of Unimpaired Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



**Figure 8.4-14. Kaweah River Combined Reaches Hardhead and Sacramento Pikeminnow Adult Habitat Percent of Unimpaired Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



**Figure 8.4-15. East Fork Kaweah River Upstream of the Confluence with Kaweah River Hardhead and Sacramento Pikeminnow Adult Habitat Percent of Unimpaired Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**

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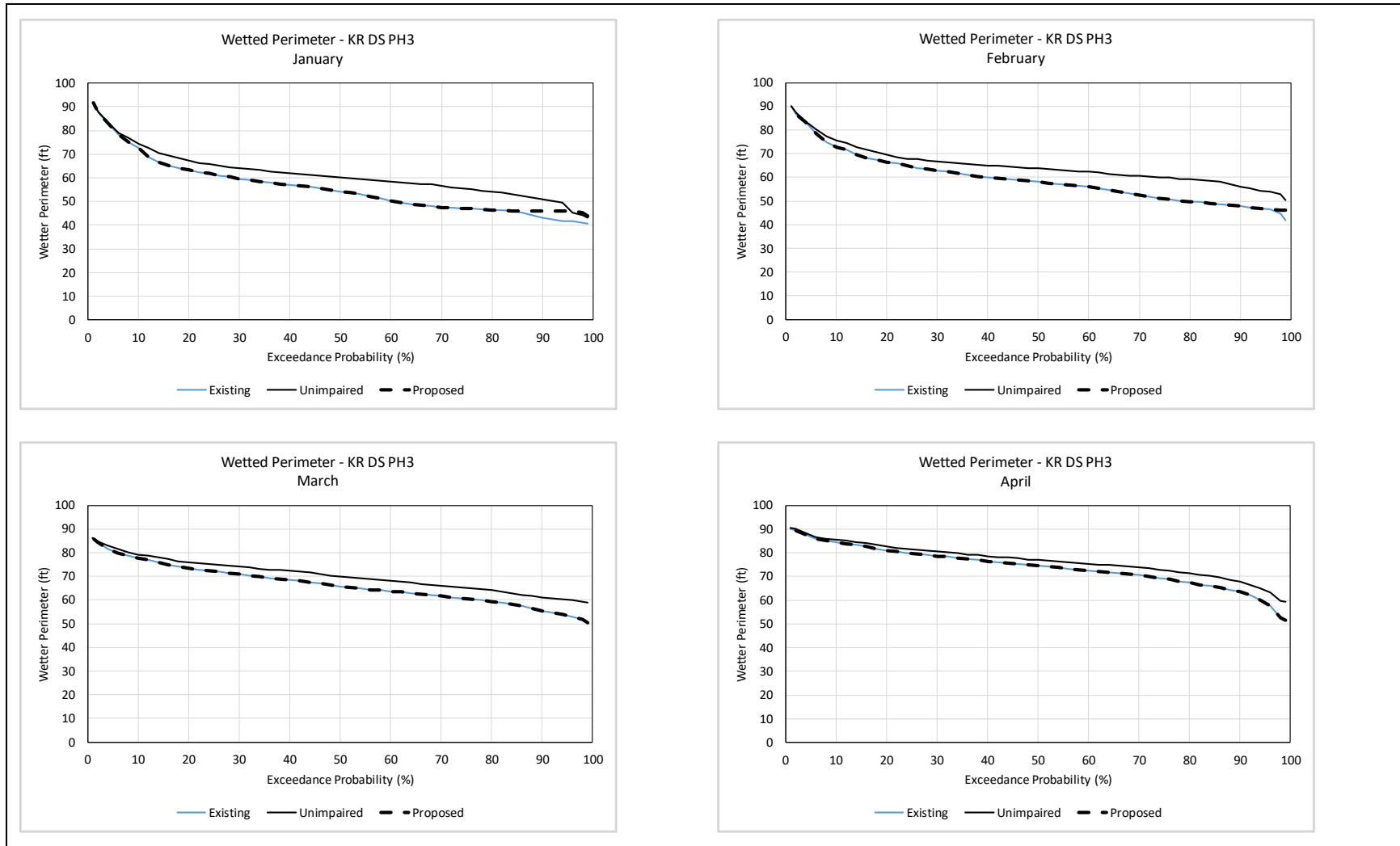
## **APPENDIX 8.4-A**

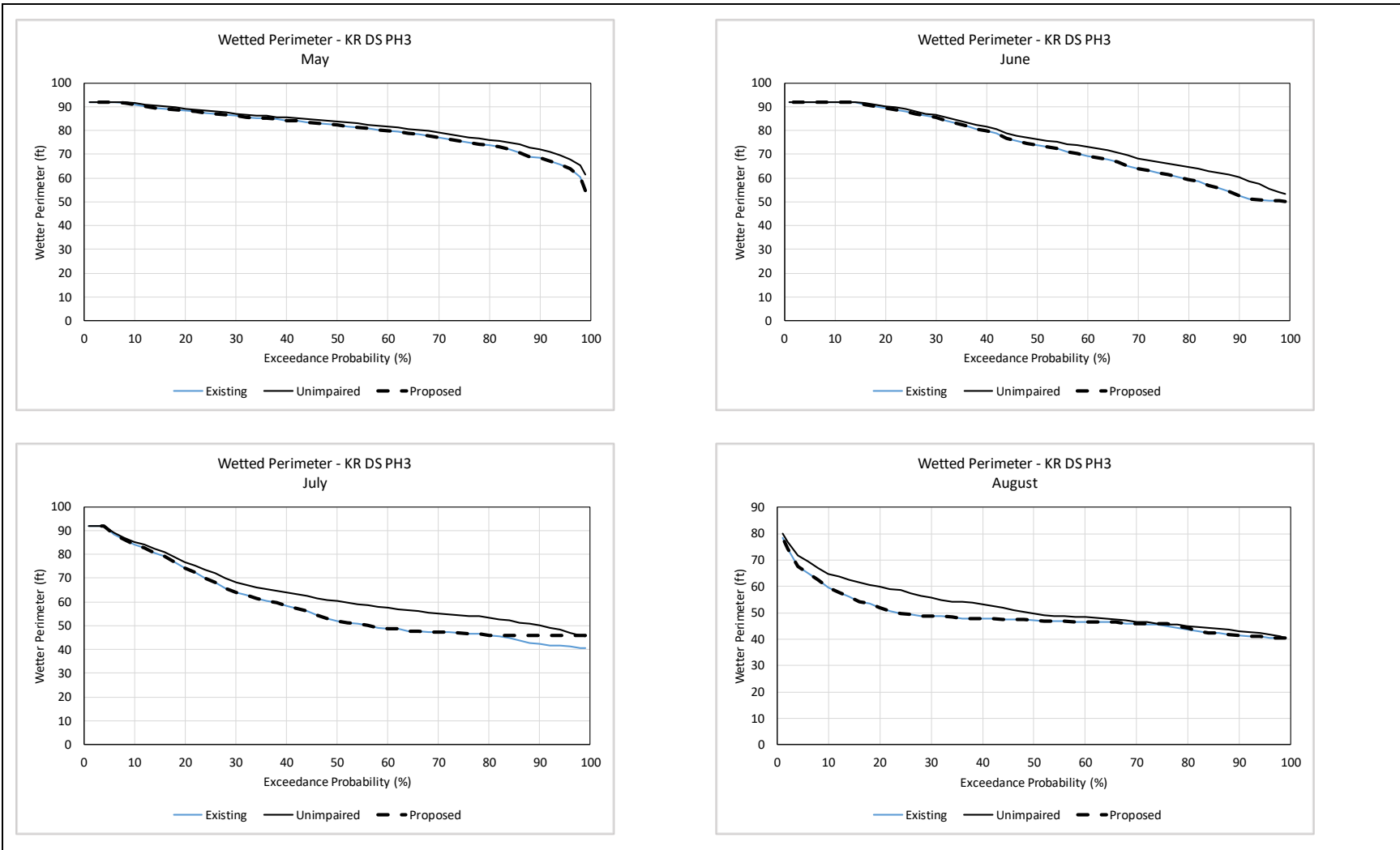
### **Wetted Perimeter Monthly Exceedance Plots**

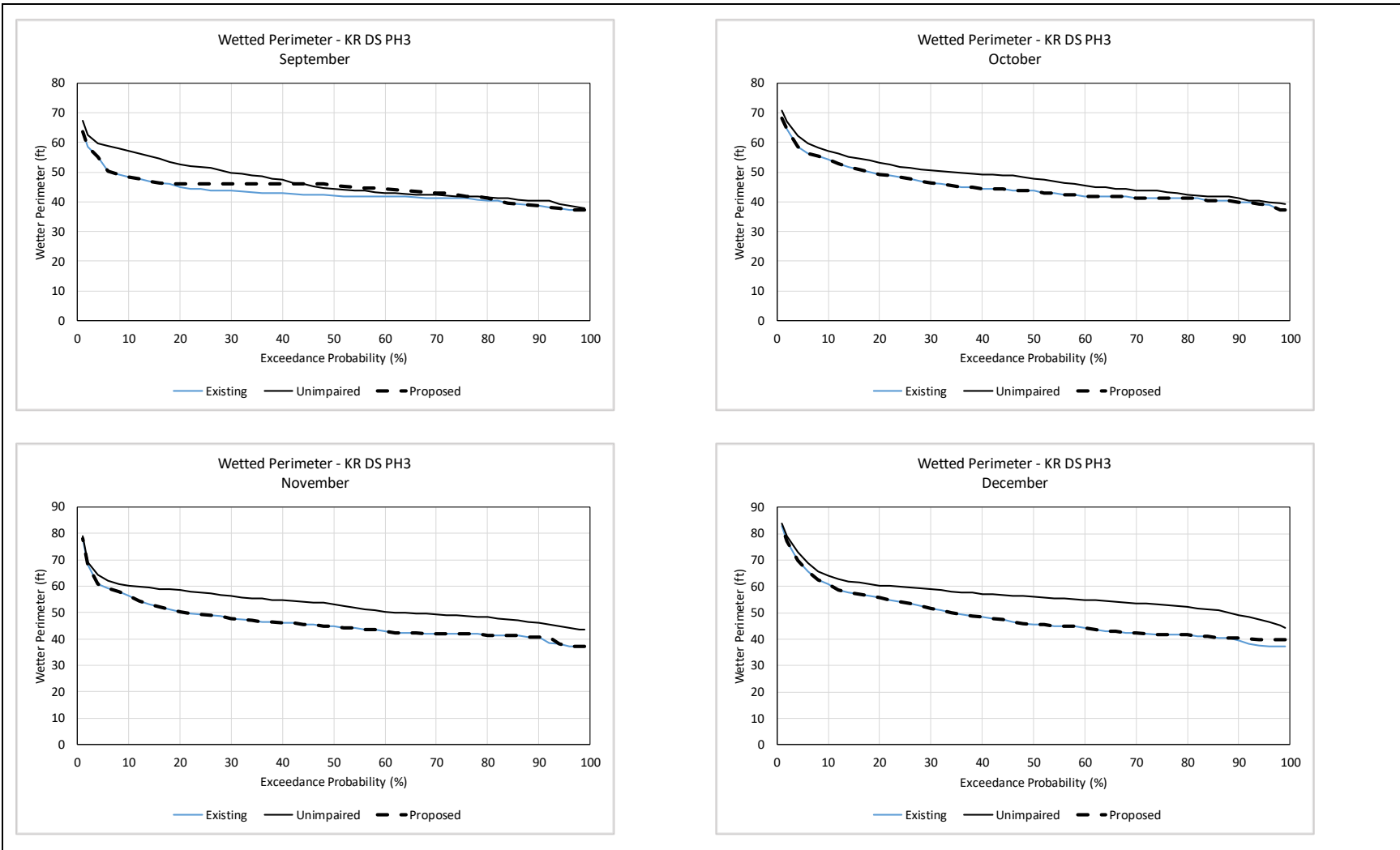
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**Figure A8.4-1. Kaweah River Downstream of Kaweah No. 3 Powerhouse and Upstream of the East Fork Kaweah River Confluence Wetted Perimeter Exceedance Plots (1994-2018) Comparing Existing, Unimpaired, and Proposed Action Wetted Perimeters**

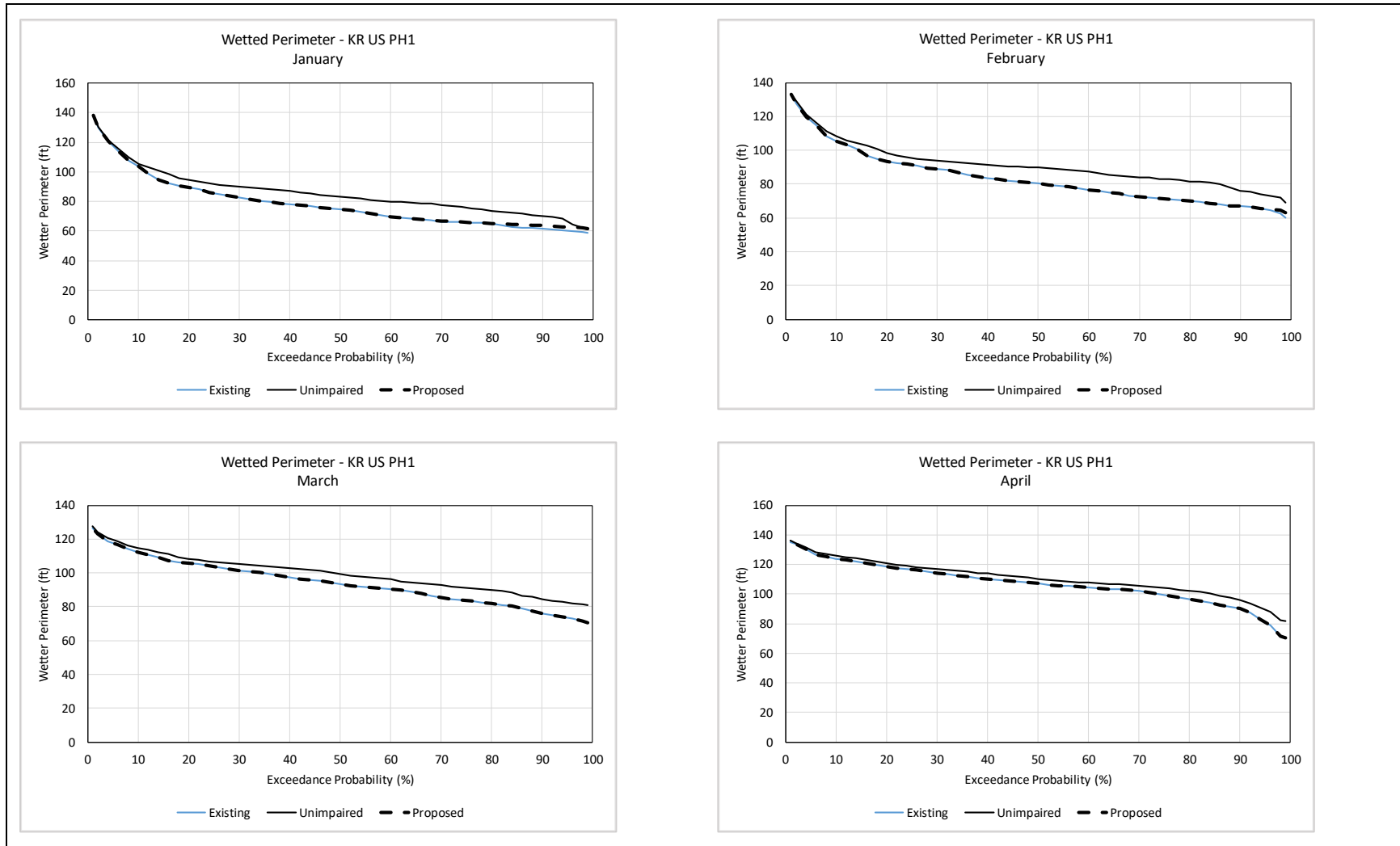


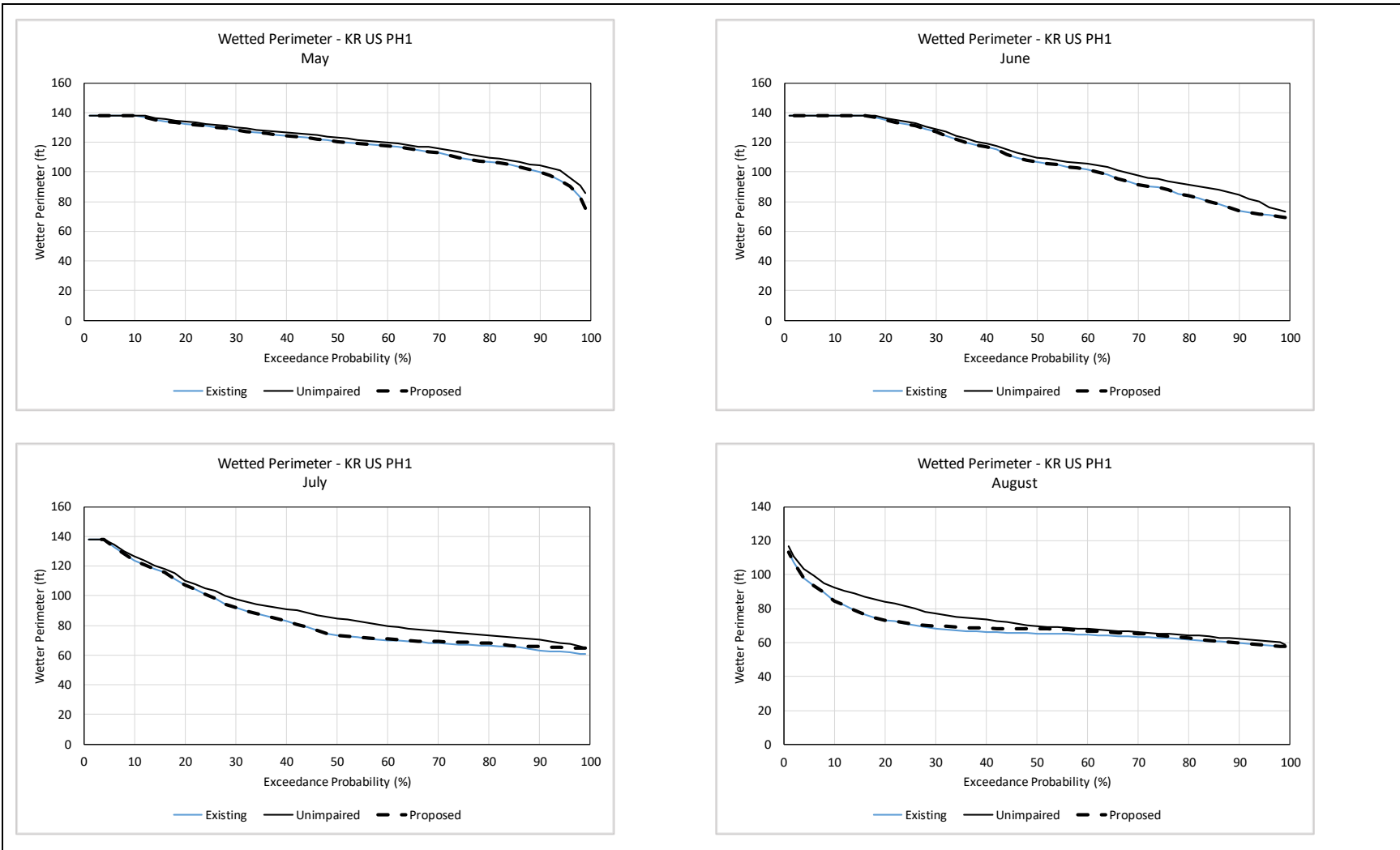


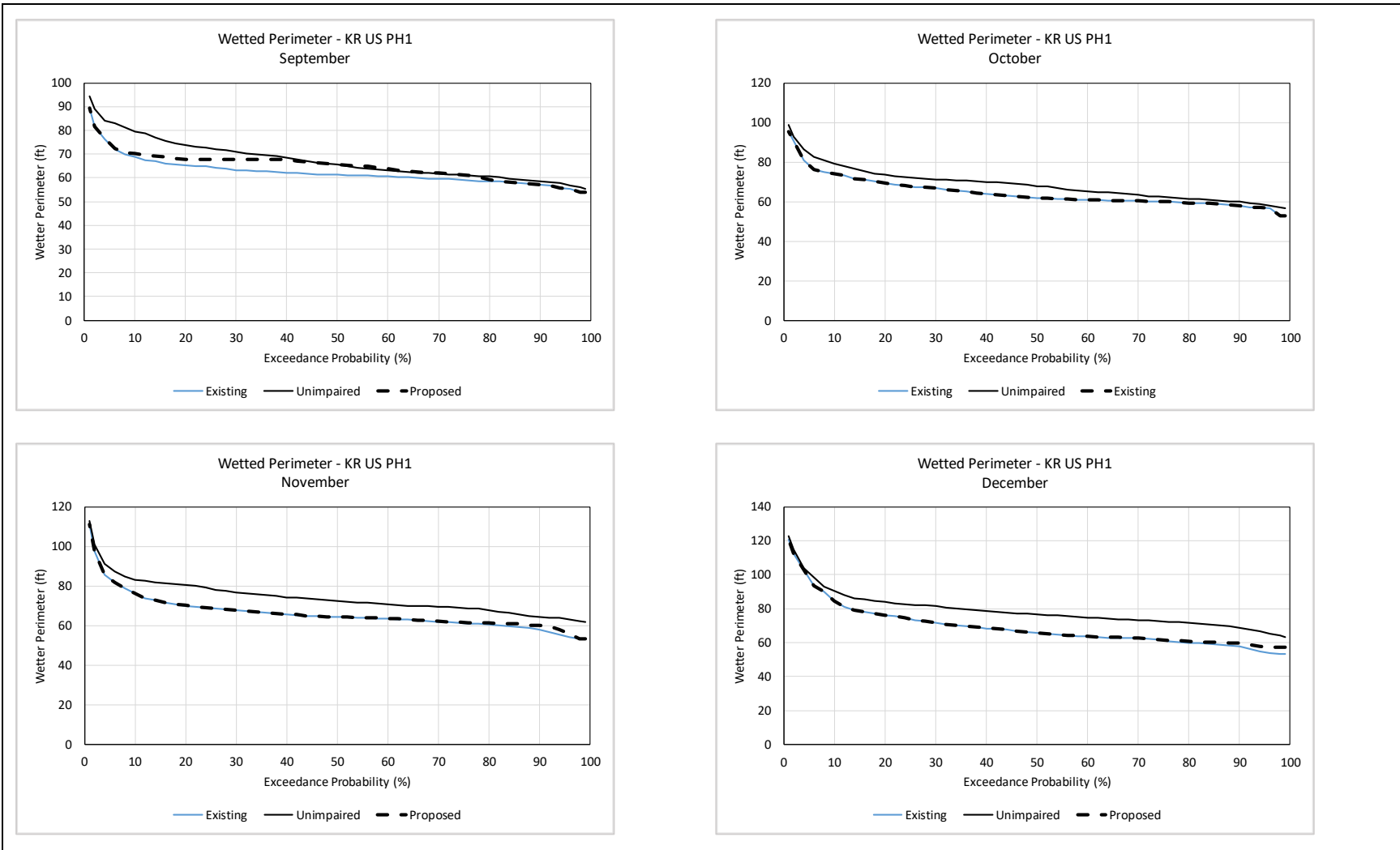


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**Figure A8.4-2. Kaweah River Downstream of the East Fork Kaweah River Confluence and Upstream of Kaweah No.1 Powerhouse Wetted Perimeter Exceedance Plots (1994-2018) Comparing Existing, Unimpaired, and Proposed Action Wetted Perimeters**



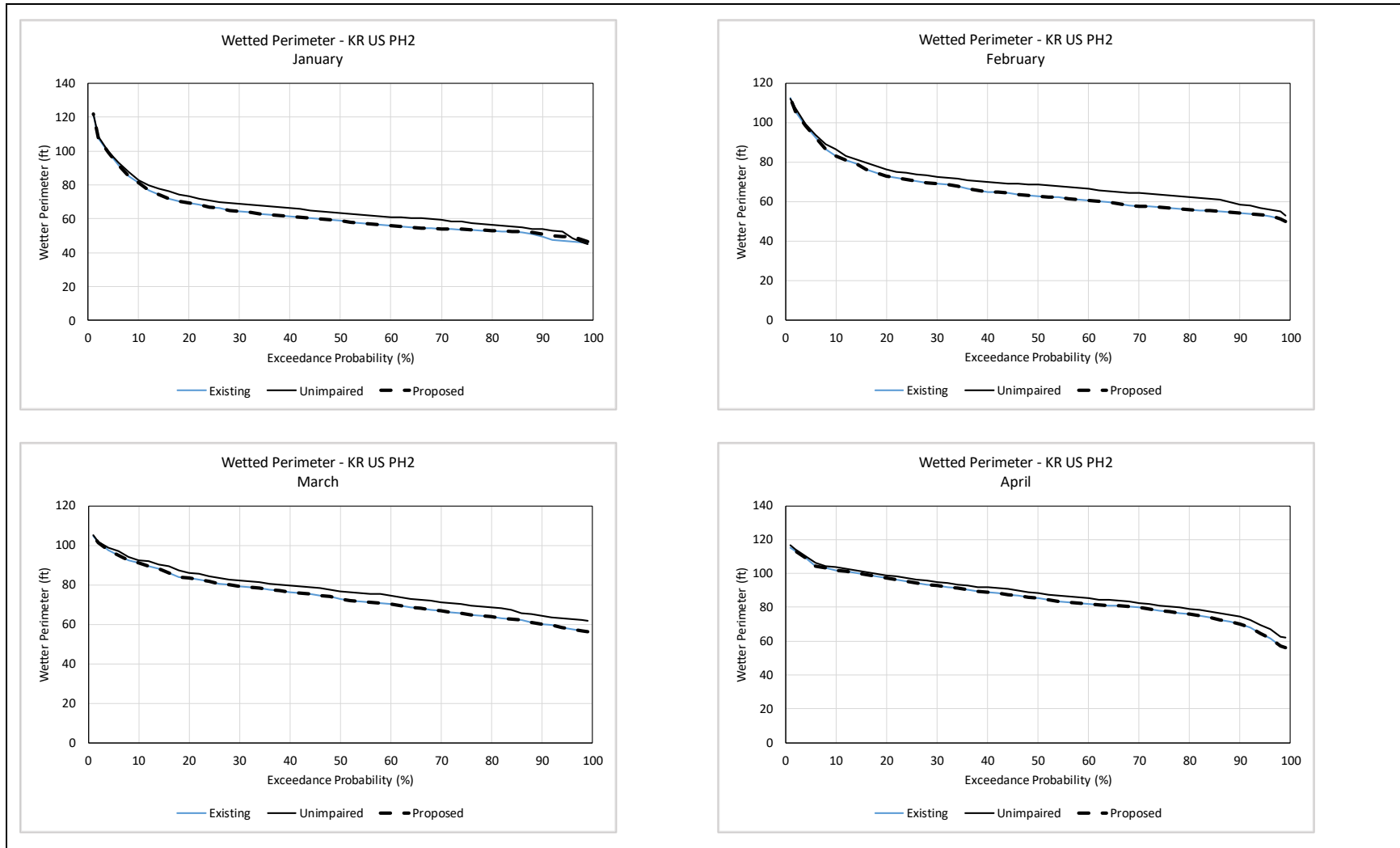


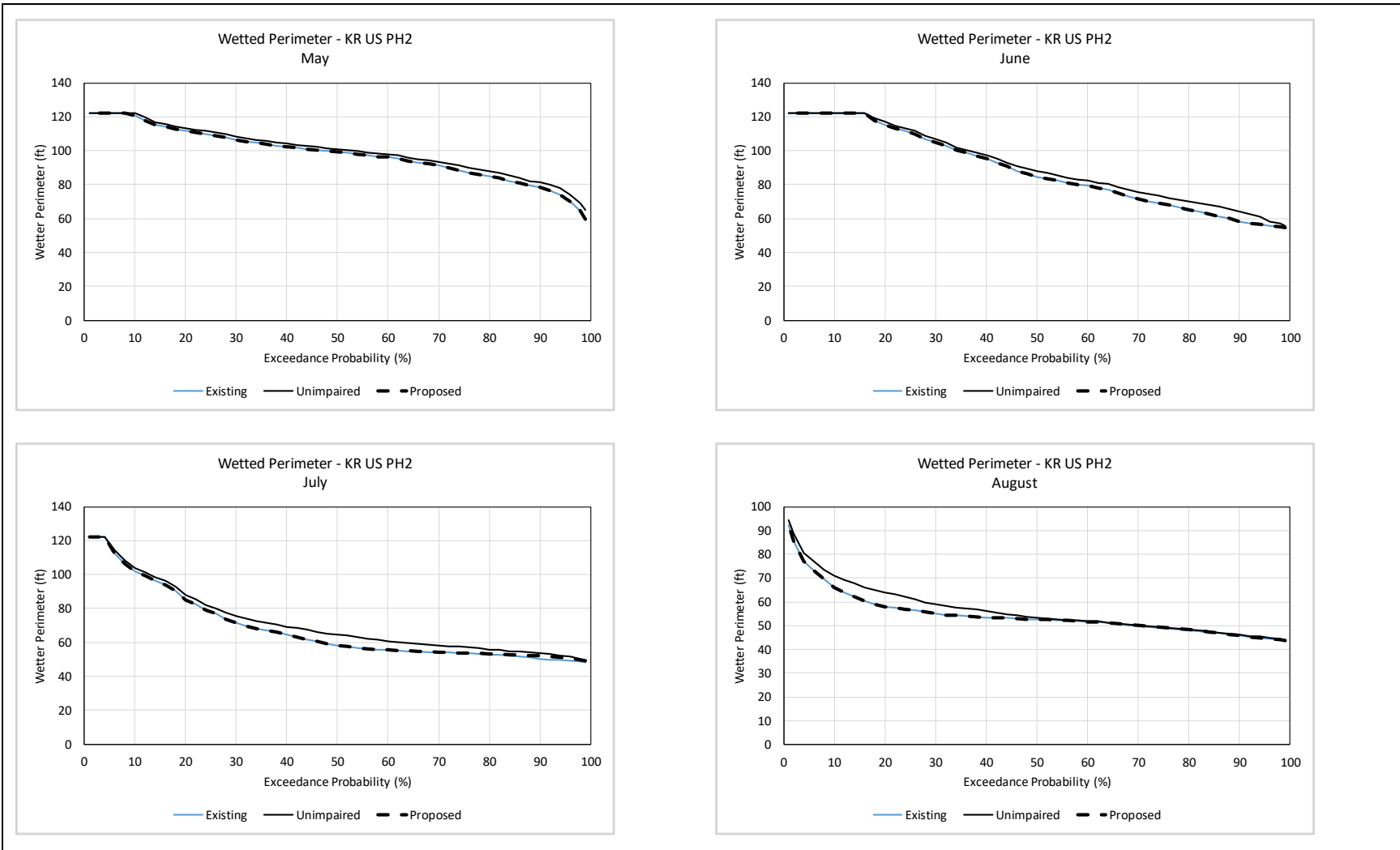


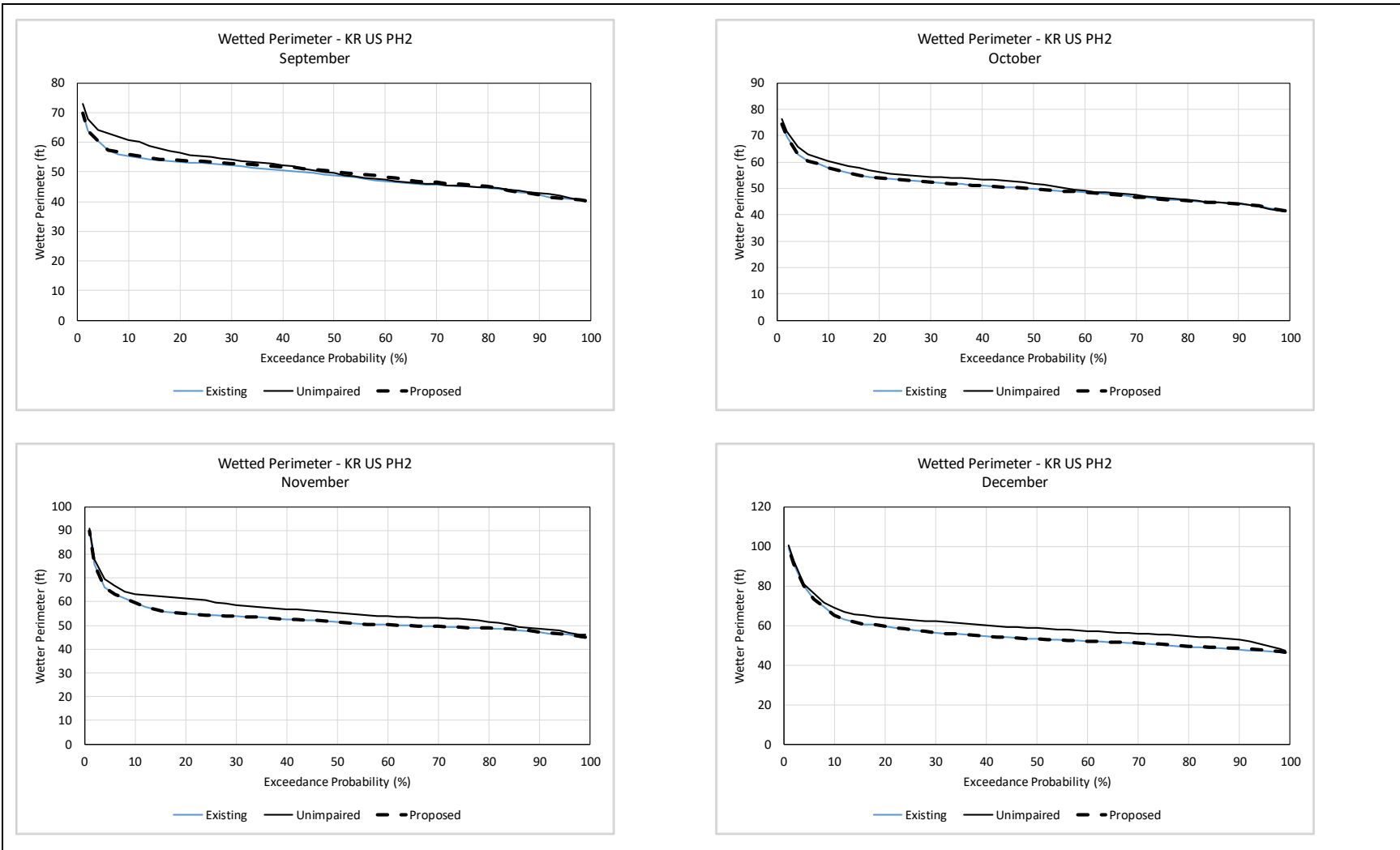
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**Figure A8.4-3. Kaweah River Downstream of Kaweah No.1 Powerhouse and Upstream of Kaweah No.2 Powerhouse Wetted Perimeter Exceedance Plots (1994-2018) Comparing Existing, Unimpaired, and Proposed Action Wetted Perimeters**

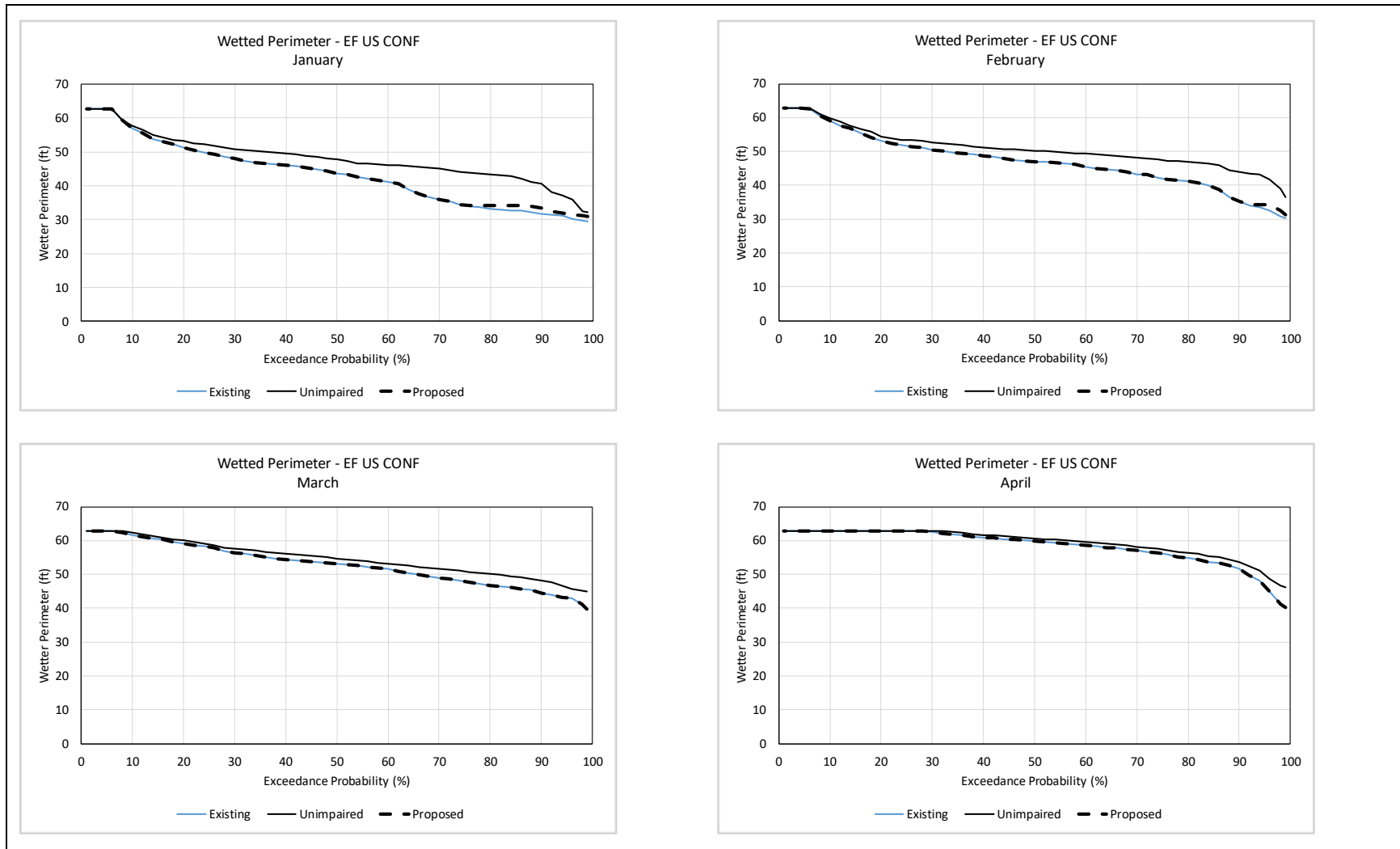


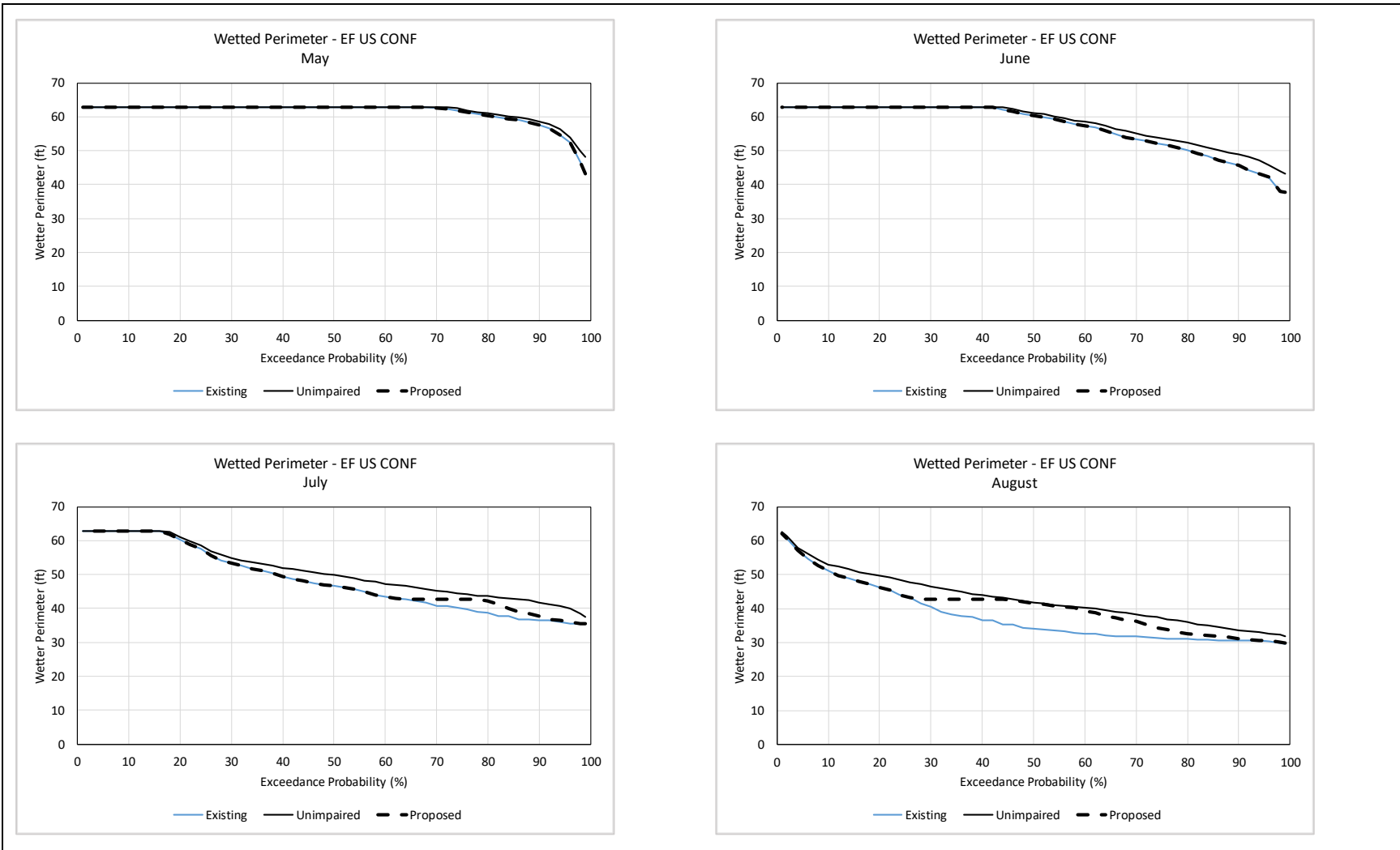


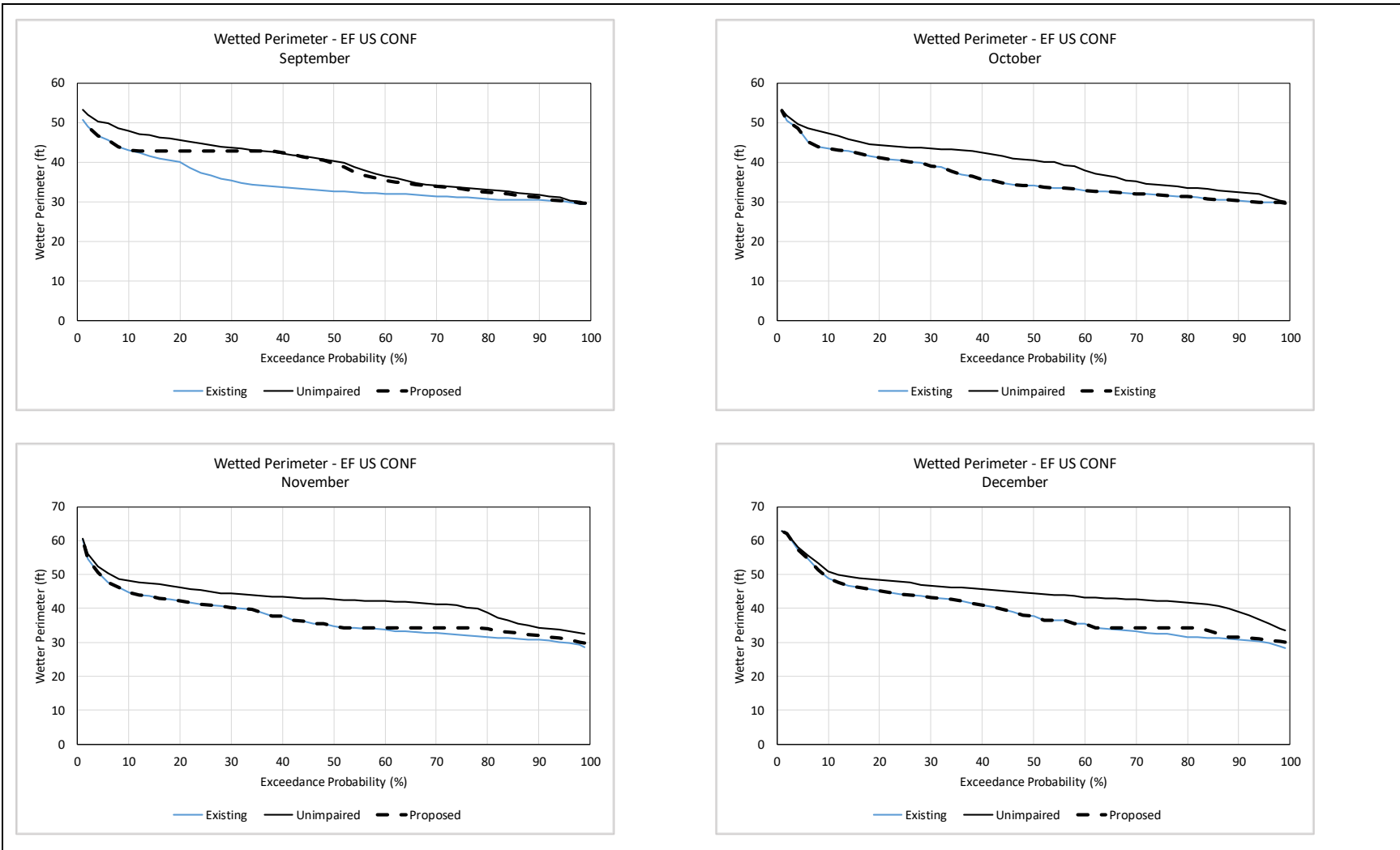


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**Figure A8.4-4. East Fork Kaweah River Upstream of Kaweah River Confluence Wetted Perimeter Exceedance Plots (1994-2018) Comparing Existing, Unimpaired, and Proposed Action Wetted Perimeters**







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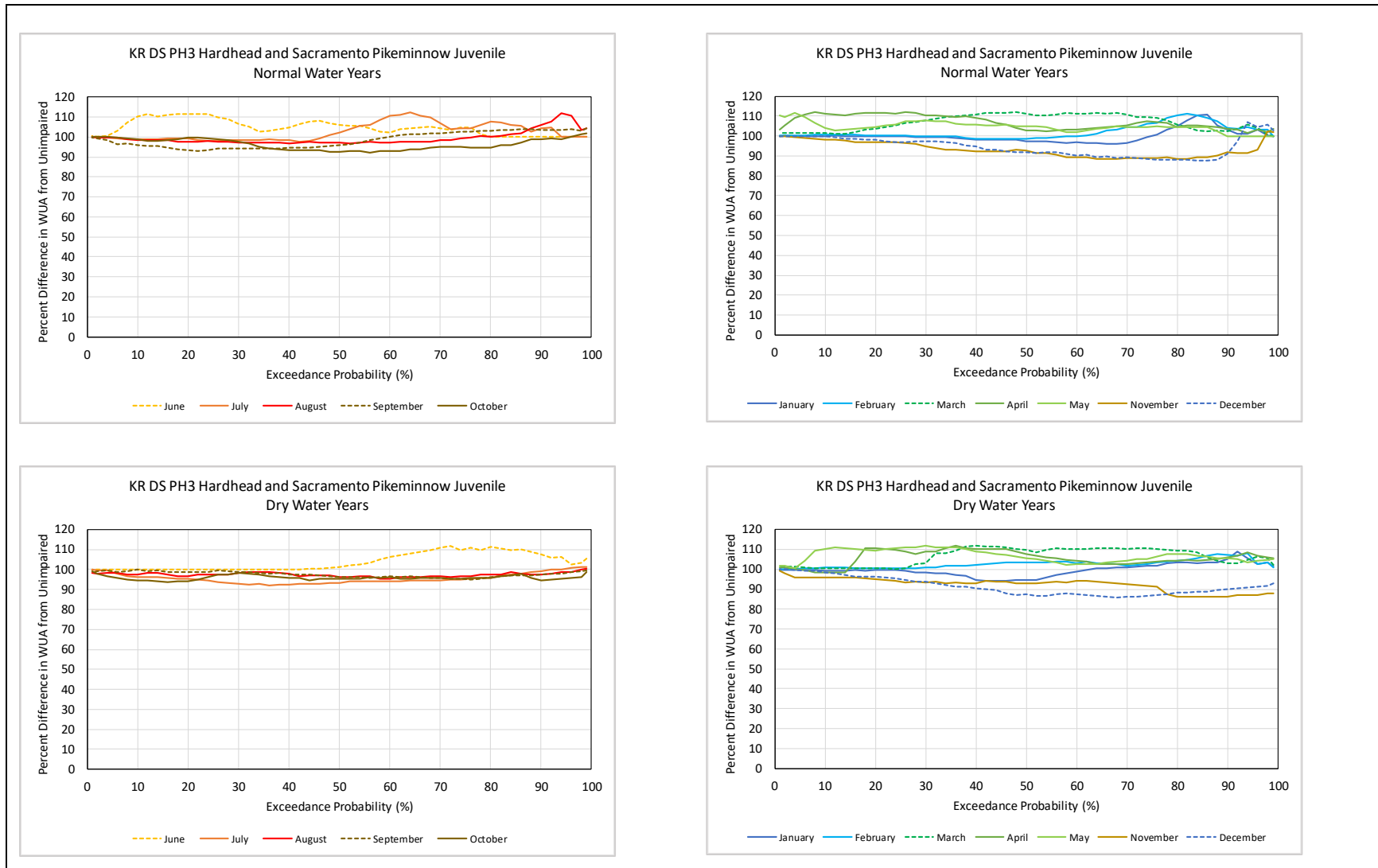


## **APPENDIX 8.4-B**

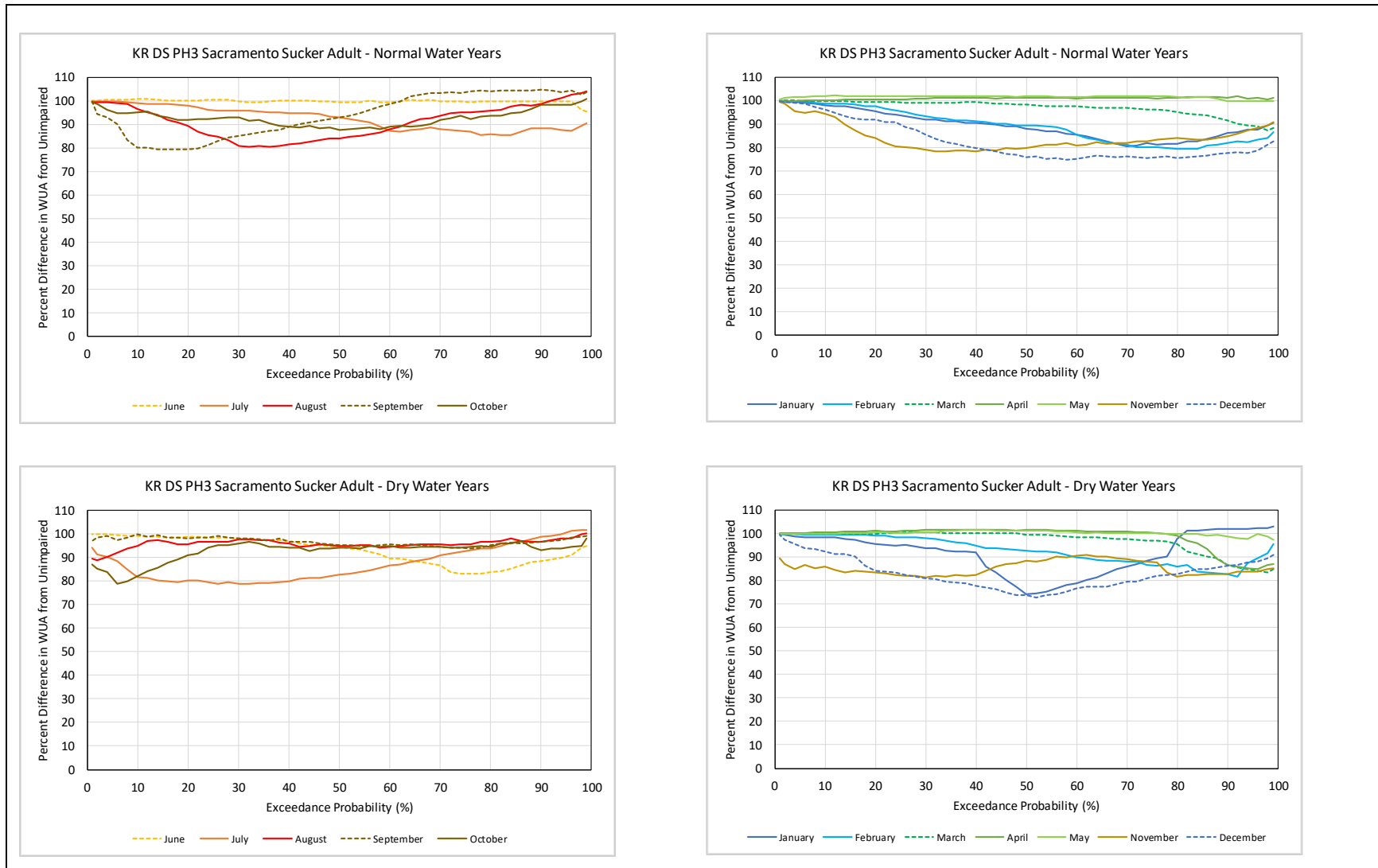
### **Weighted Usable Area Percent of Unimpaired Habitat Exceedance Plots**

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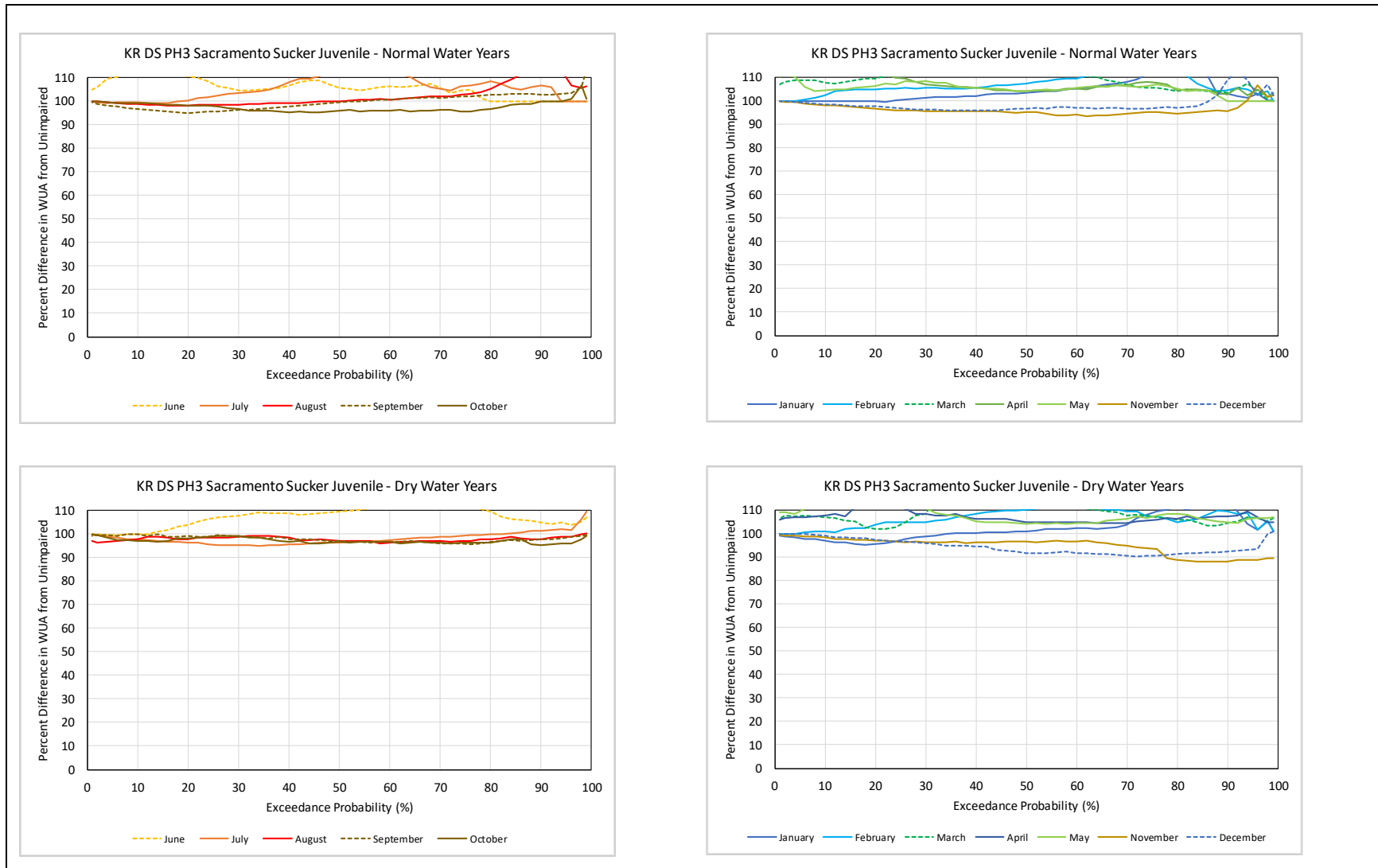
**Figure B8.4-1. Kaweah River Downstream of Kaweah No. 3 Powerhouse and Upstream of the East Fork Kaweah River Confluence Hardhead and Sacramento Pikeminnow Juvenile Habitat Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



**Figure B8.4-2. Kaweah River Downstream of Kaweah No. 3 Powerhouse and Upstream of the East Fork Kaweah River Confluence Sacramento Sucker Adult Habitat Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



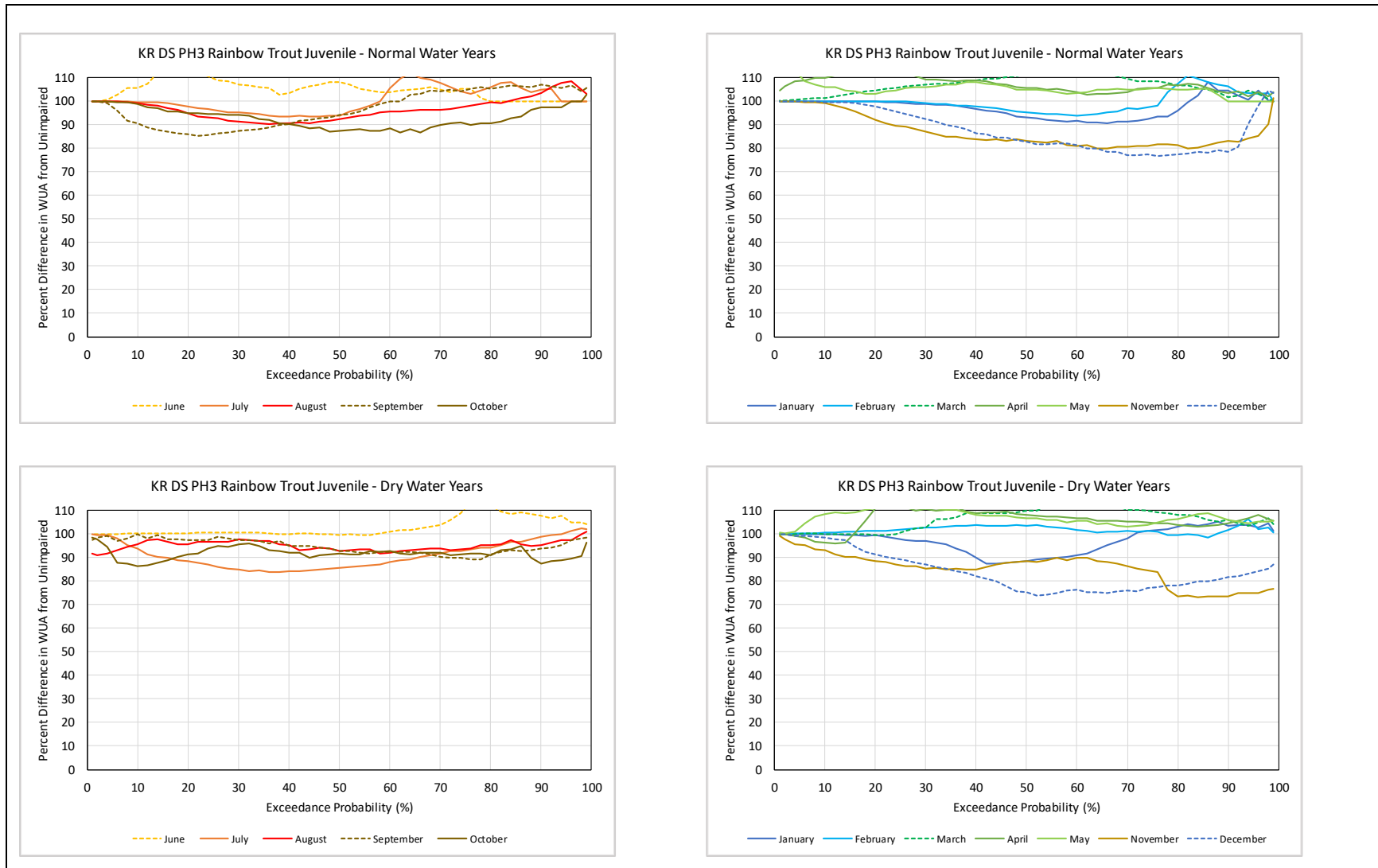
**Figure B8.4-3. Kaweah River Downstream of Kaweah No. 3 Powerhouse and Upstream of the East Fork Kaweah River Confluence Sacramento Sucker Juvenile Habitat Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



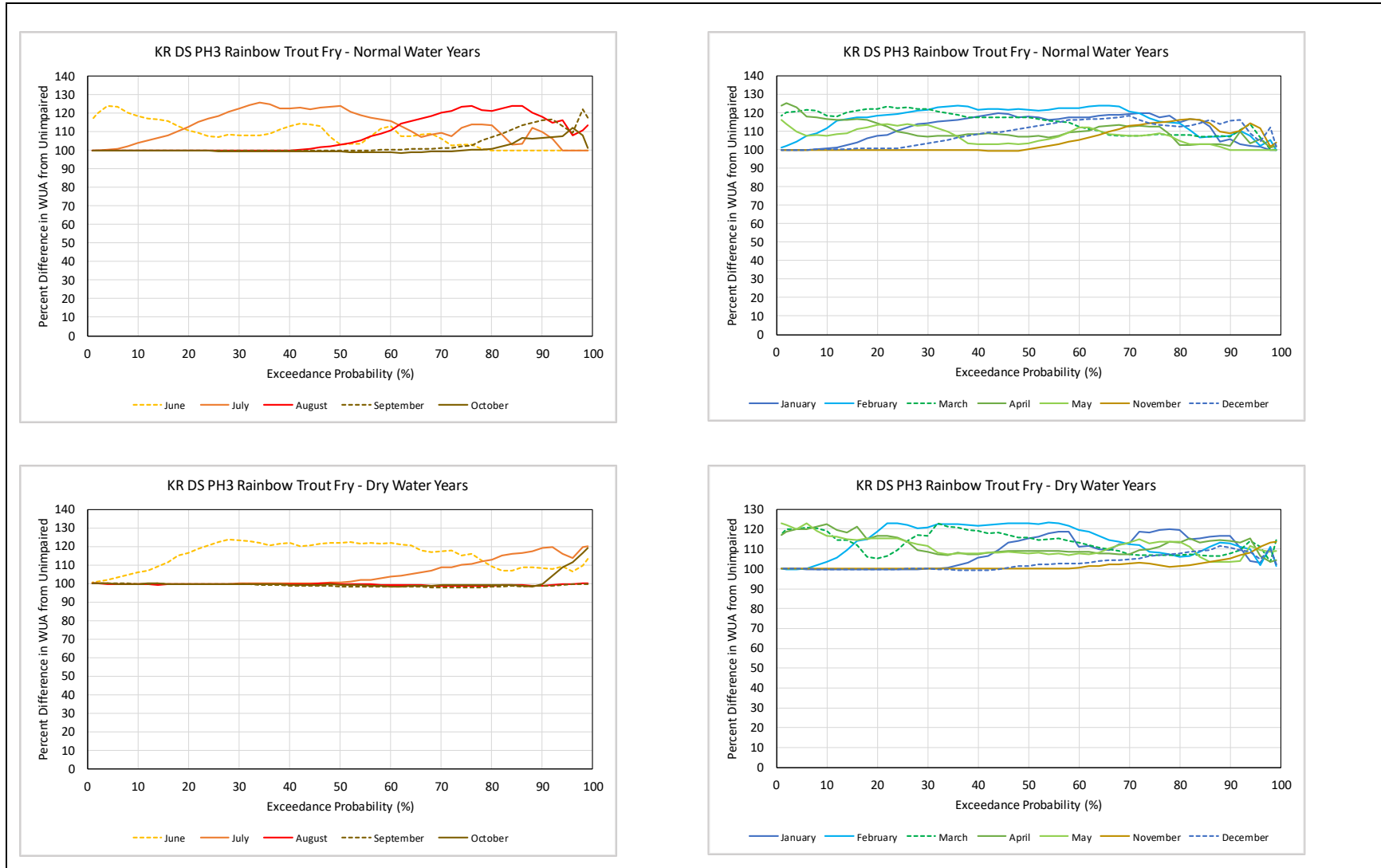
**Figure B8.4-4. Kaweah River Downstream of Kaweah No. 3 Powerhouse and Upstream of the East Fork Kaweah River Confluence Rainbow Adult Habitat Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



**Figure B8.4-5. Kaweah River Downstream of Kaweah No. 3 Powerhouse and Upstream of the East Fork Kaweah River Confluence Rainbow Adult Juvenile Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



**Figure B8.4-6. Kaweah River Downstream of Kaweah No. 3 Powerhouse and Upstream of the East Fork Kaweah River Confluence Rainbow Adult Fry Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**

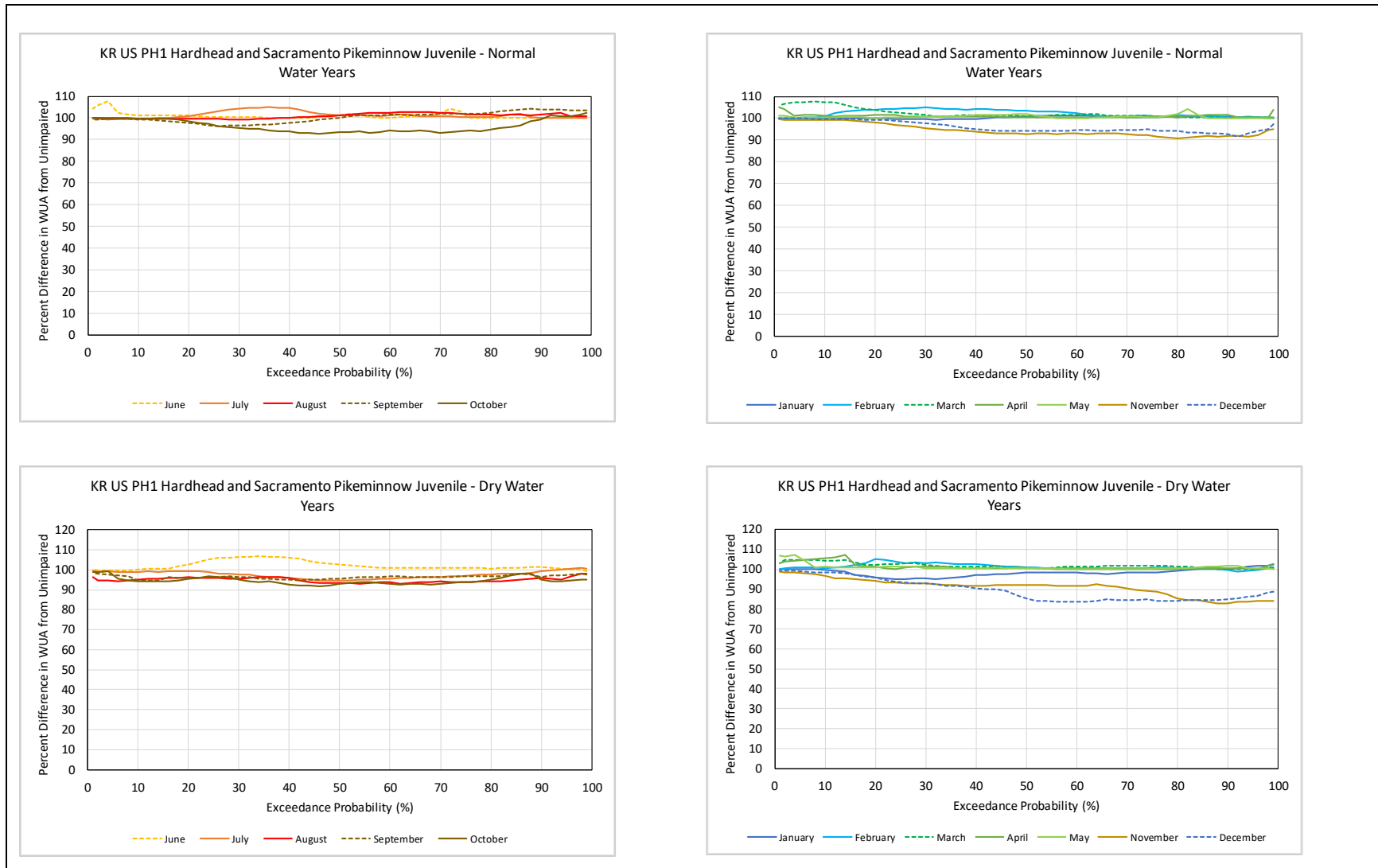




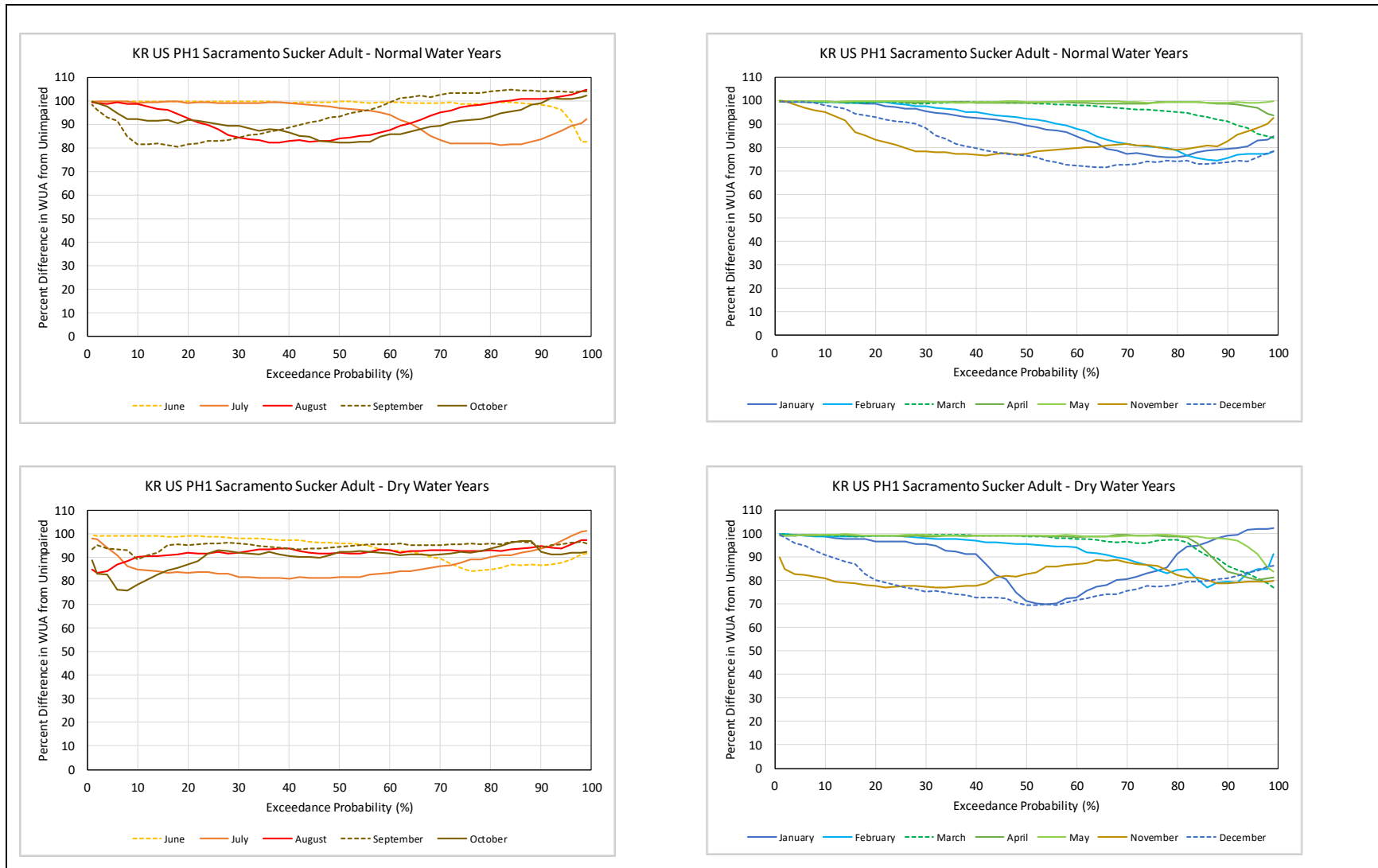
**Figure B8.4-7. Kaweah River Downstream of Kaweah No. 3 Powerhouse and Upstream of the East Fork Kaweah River Confluence Rainbow Adult Spawning Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) using Proposed Action Minimum Instream Flows**



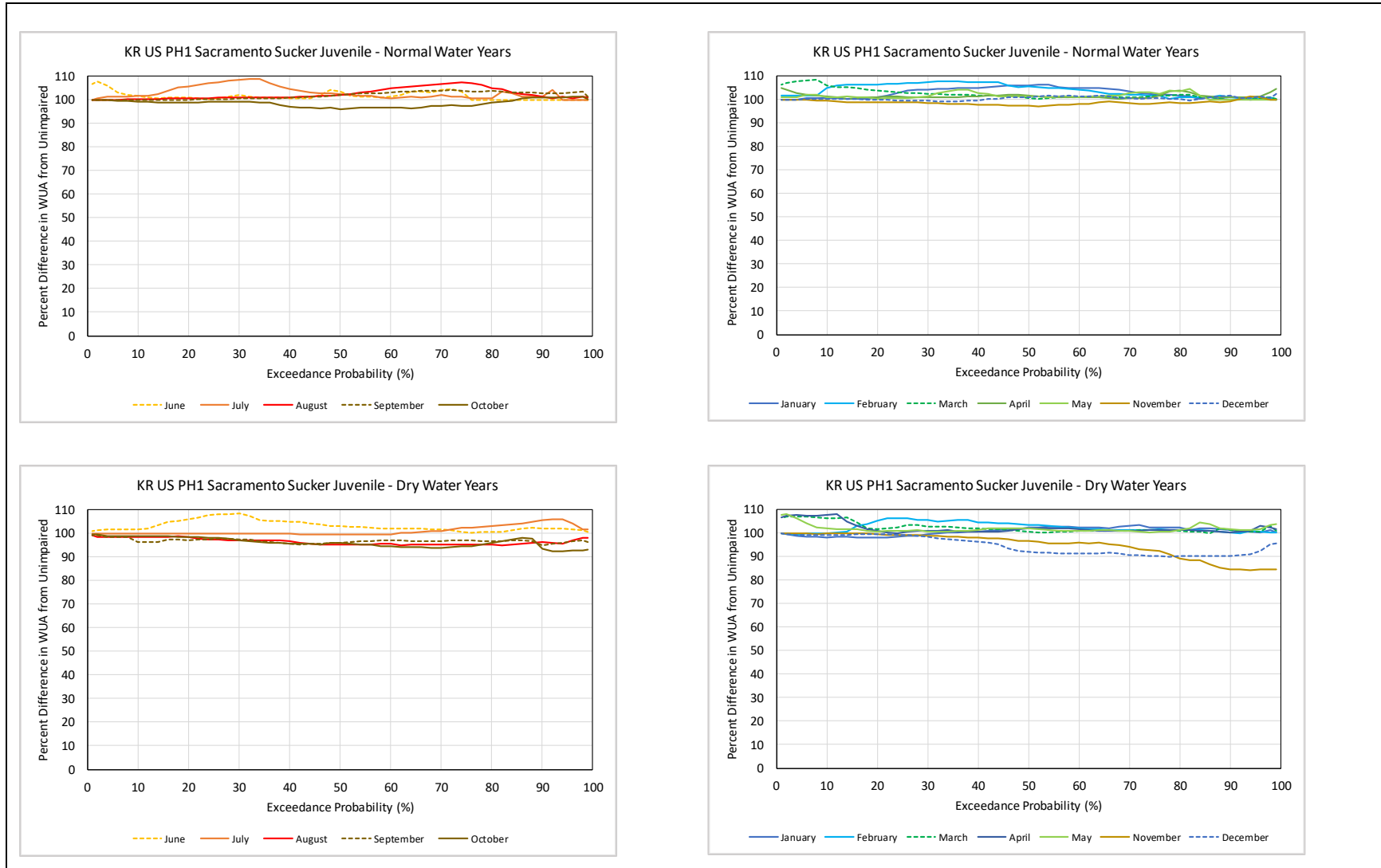
**Figure B8.4-8. Kaweah River Downstream of East Fork Kaweah Confluence and Upstream of Kaweah No. 1 Powerhouse Hardhead and Sacramento Pikeminnow Juvenile Habitat Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



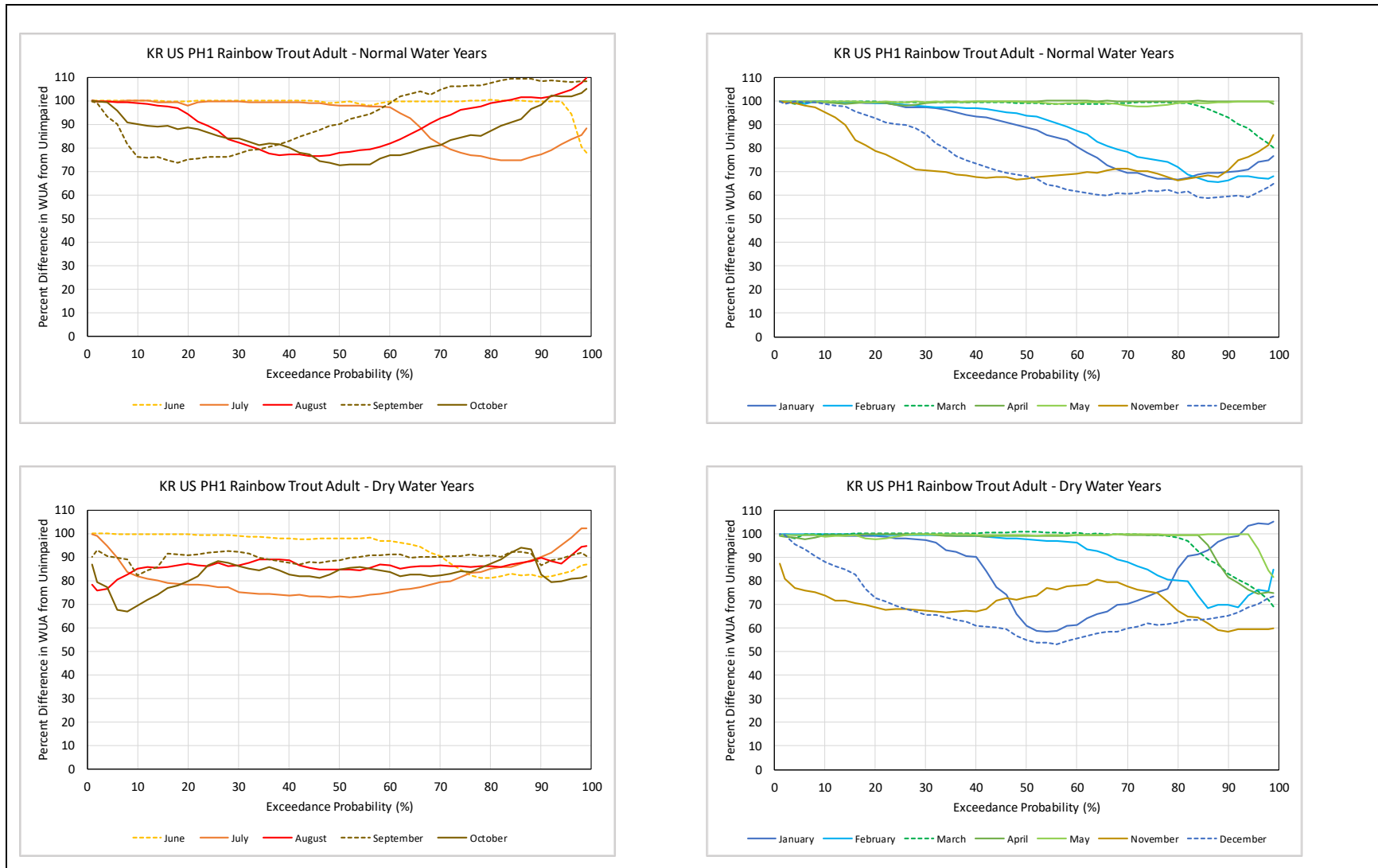
**Figure B8.4-9. Kaweah River Downstream of East Fork Kaweah Confluence and Upstream of Kaweah No. 1 Powerhouse Sacramento Sucker Adult Habitat Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



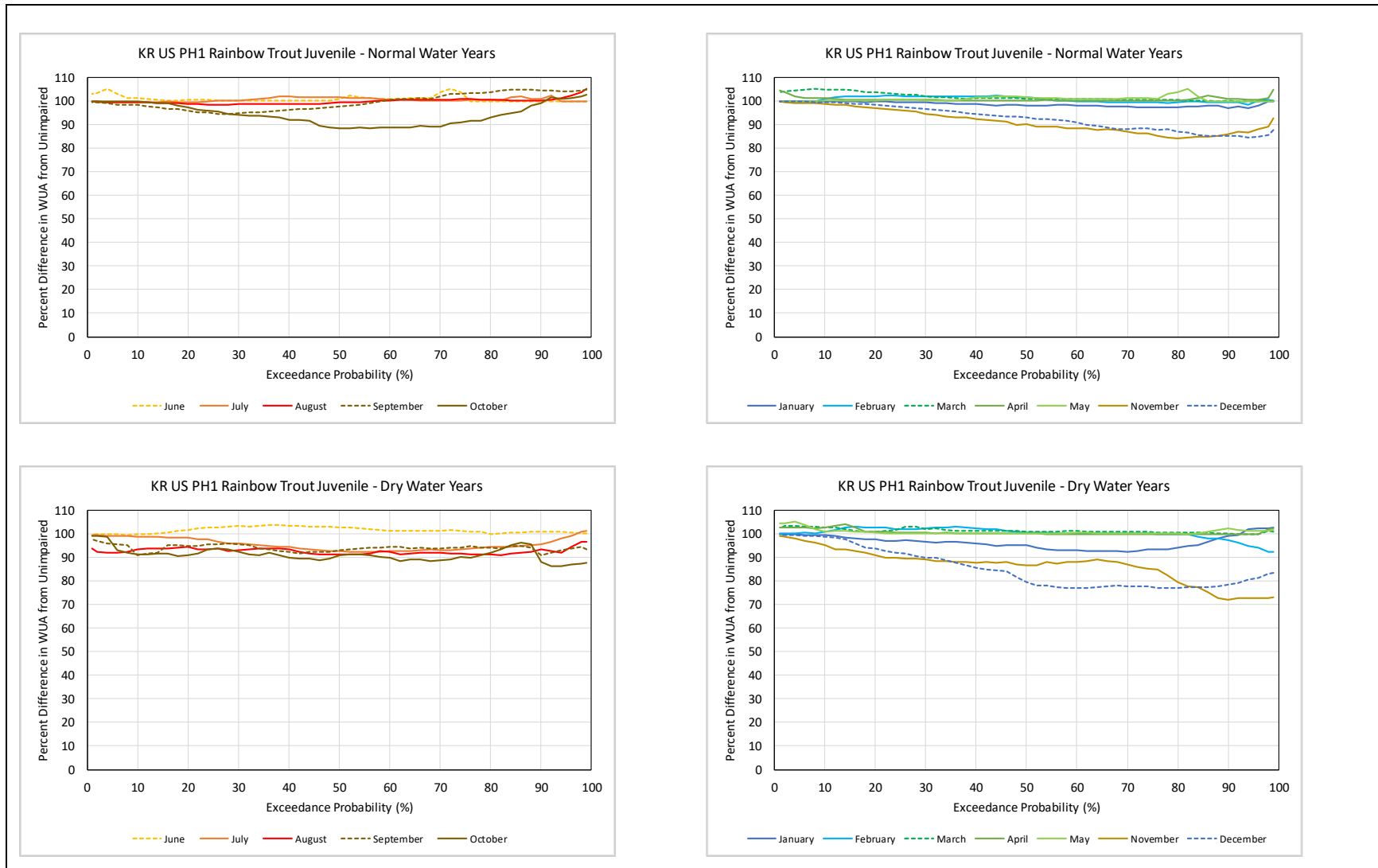
**Figure B8.4-10. Kaweah River Downstream of East Fork Kaweah Confluence and Upstream of Kaweah No. 1 Powerhouse Sacramento Sucker Juvenile Habitat Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



**Figure B8.4-11. Kaweah River Downstream of East Fork Kaweah Confluence and Upstream of Kaweah No. 1 Powerhouse Rainbow Adult Habitat Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



**Figure B8.4-12. Kaweah River Downstream of East Fork Kaweah Confluence and Upstream of Kaweah No. 1 Powerhouse Rainbow Adult Juvenile Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



**Figure B8.4-13. Kaweah River Downstream of East Fork Kaweah Confluence and Upstream of Kaweah No. 1 Powerhouse Rainbow Adult Fry Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**

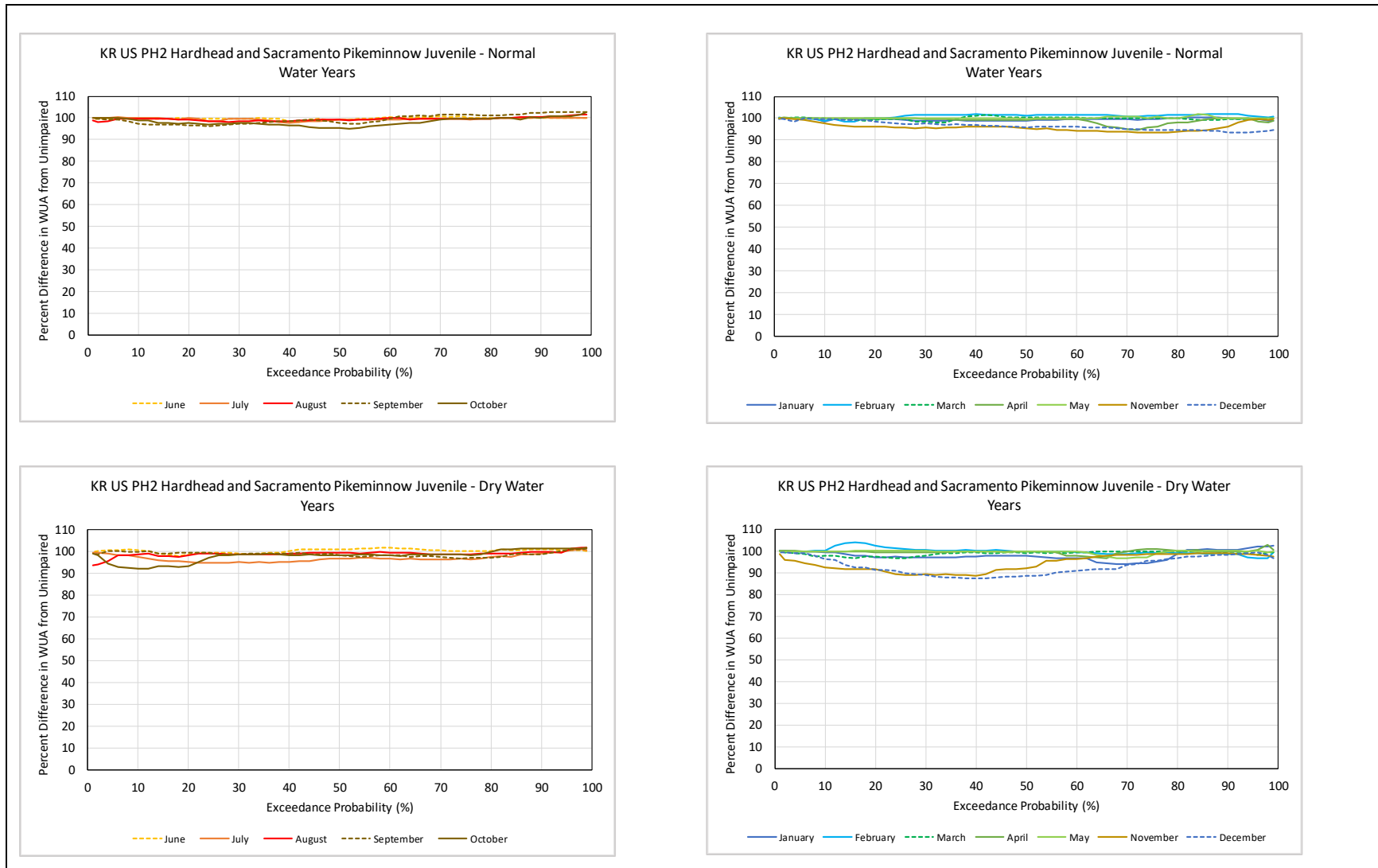


**Figure B8.4-14. Kaweah River Downstream of East Fork Kaweah Confluence and Upstream of Kaweah No. 1 Powerhouse Rainbow Adult Spawning Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) using Proposed Action Minimum Instream Flows**

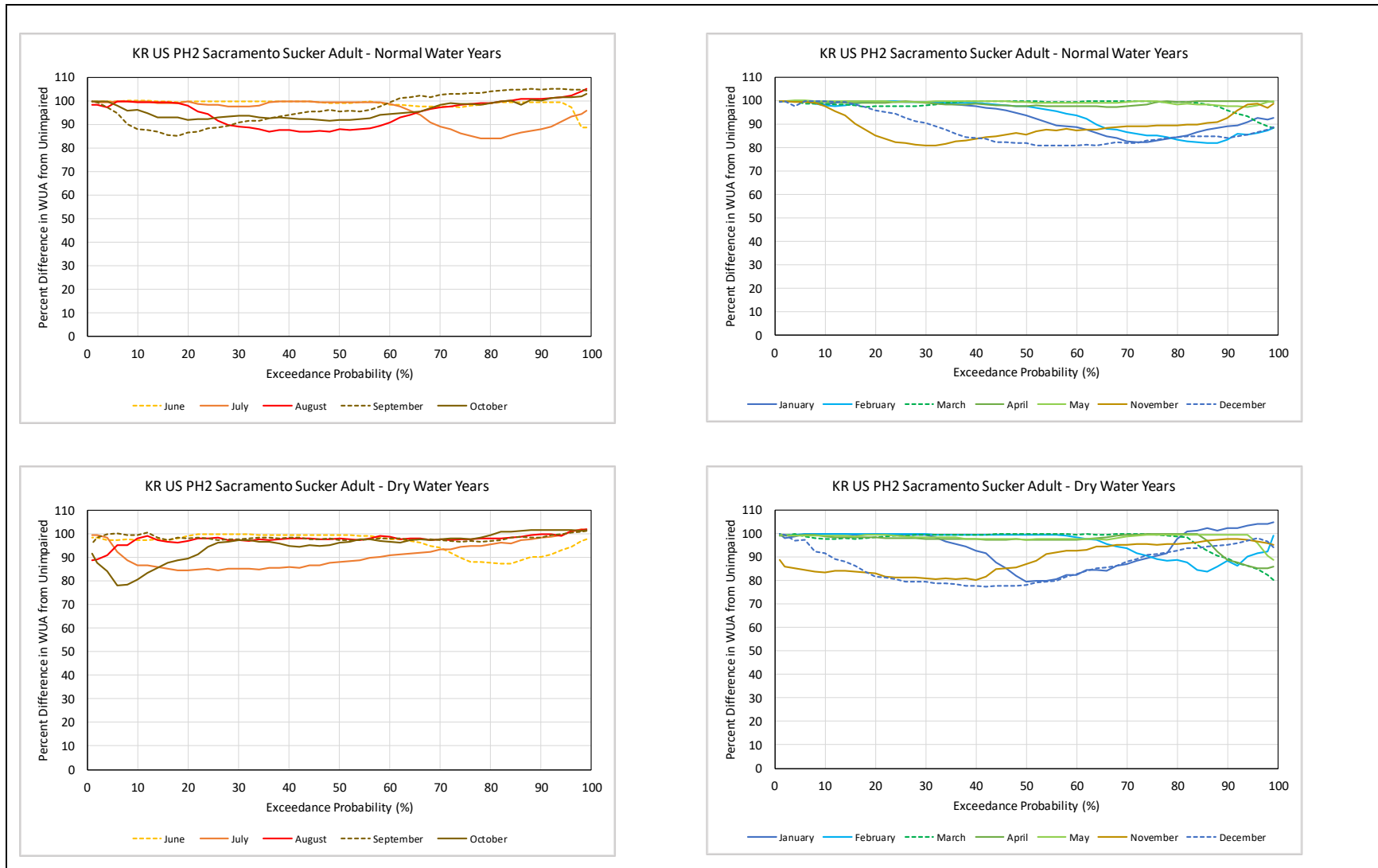




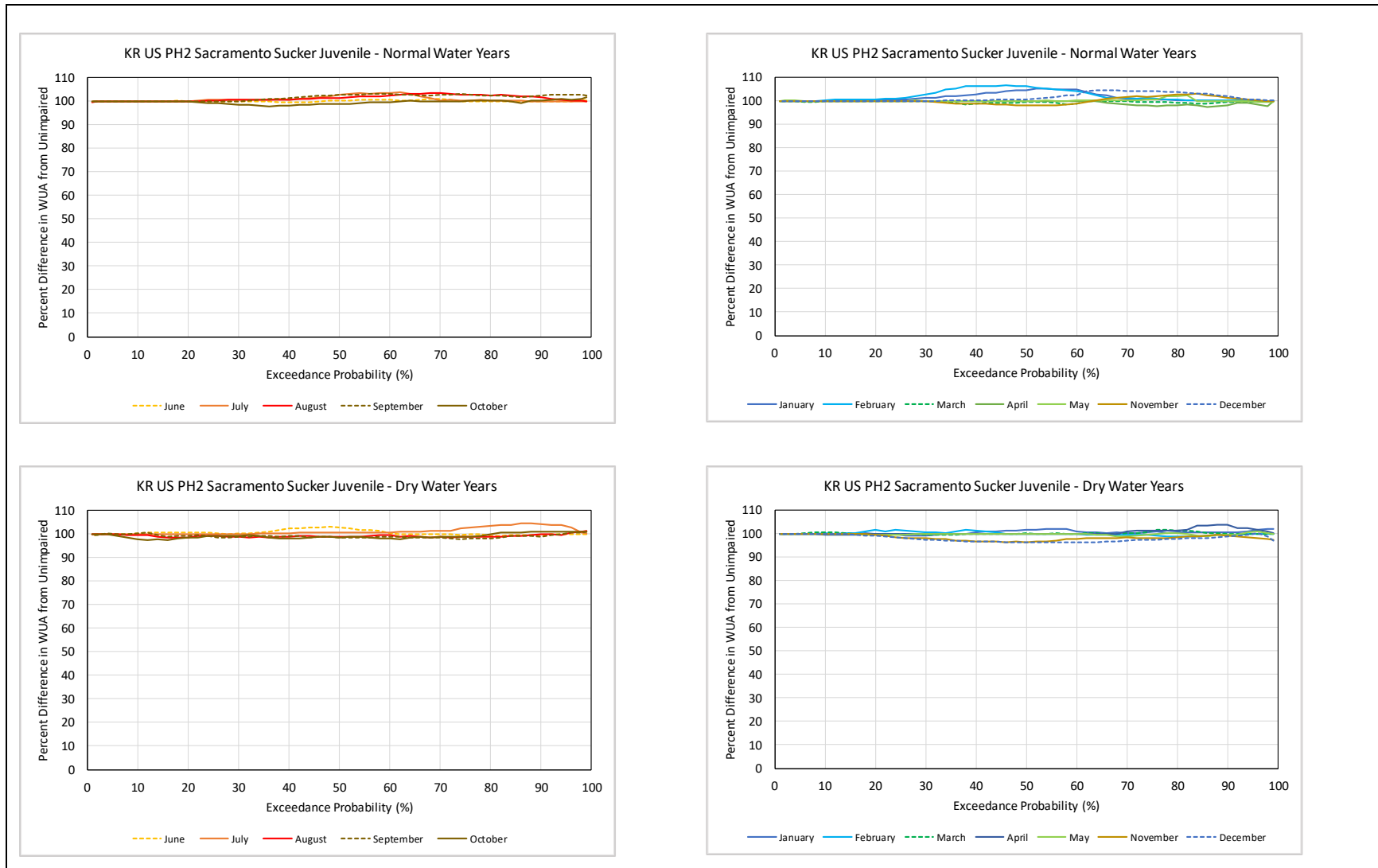
**Figure B8.4-15. Kaweah River Downstream of Kaweah No. 1 Powerhouse and Upstream of Kaweah No. 2 Powerhouse Hardhead and Sacramento Pikeminnow Juvenile Habitat Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



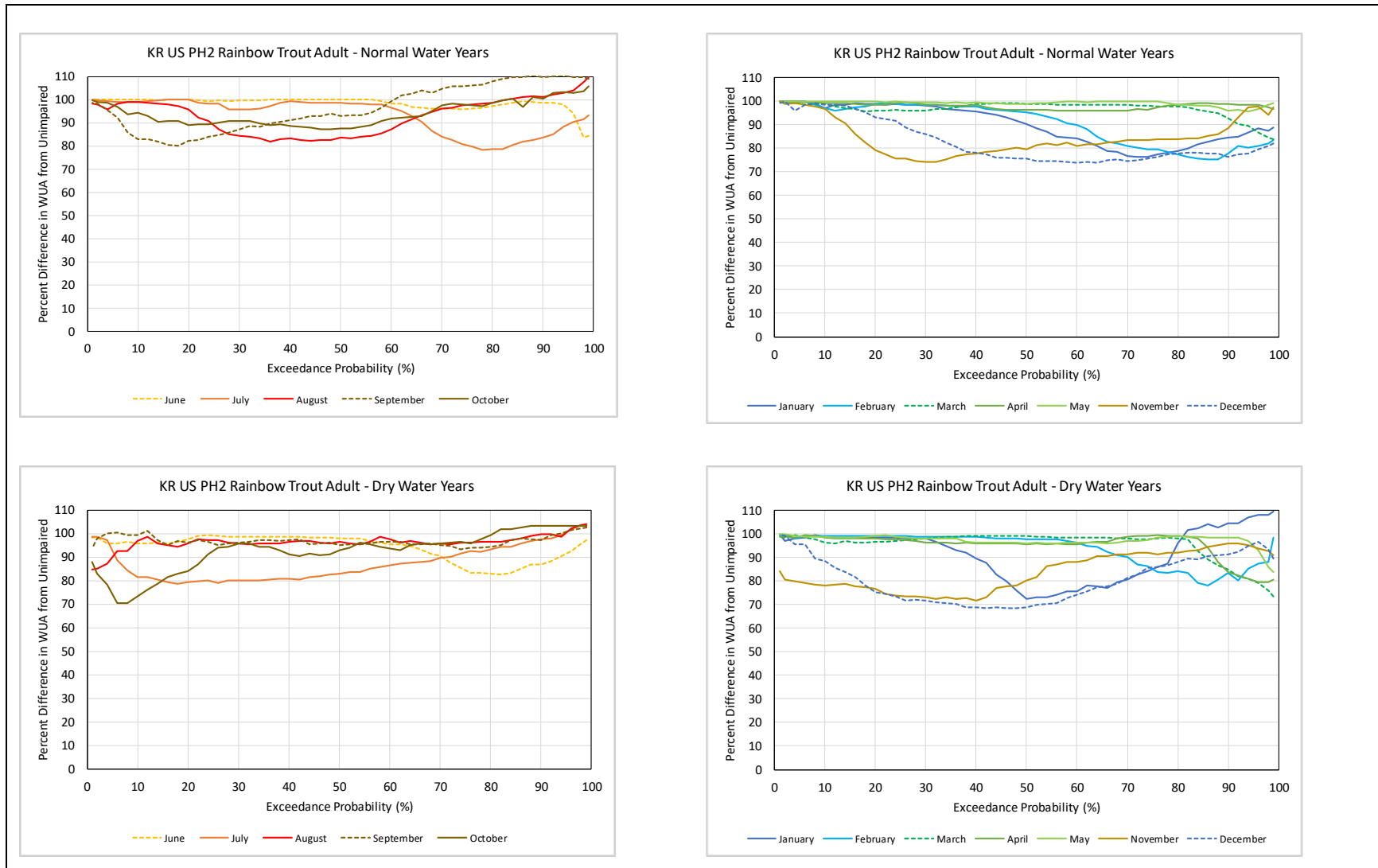
**Figure B8.4-16. Kaweah River Downstream of Kaweah No. 1 Powerhouse and Upstream of Kaweah No. 2 Powerhouse Sacramento Sucker Adult Habitat Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



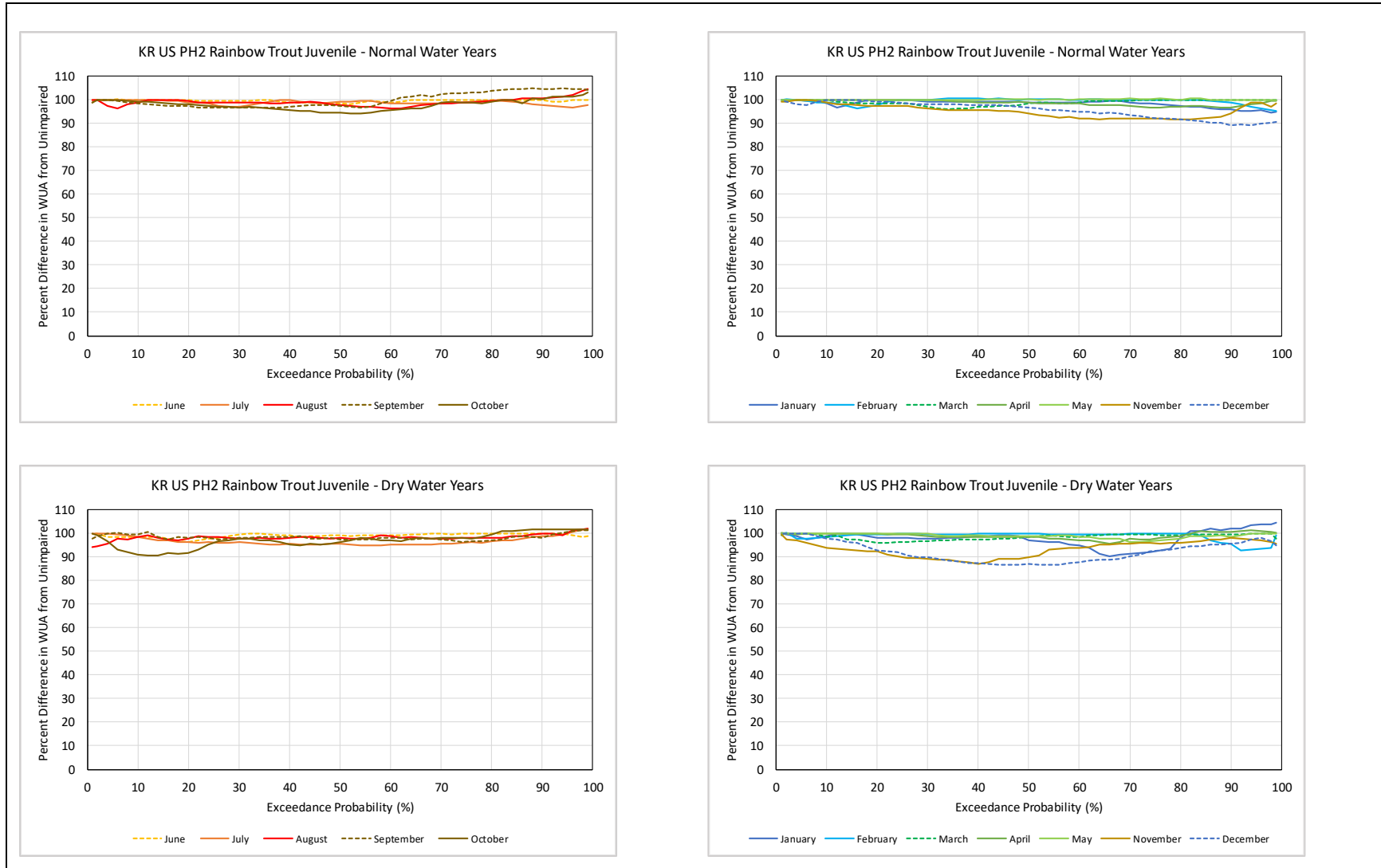
**Figure B8.4-17. Kaweah River Downstream of Kaweah No. 1 Powerhouse and Upstream of Kaweah No. 2 Powerhouse Sacramento Sucker Juvenile Habitat Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



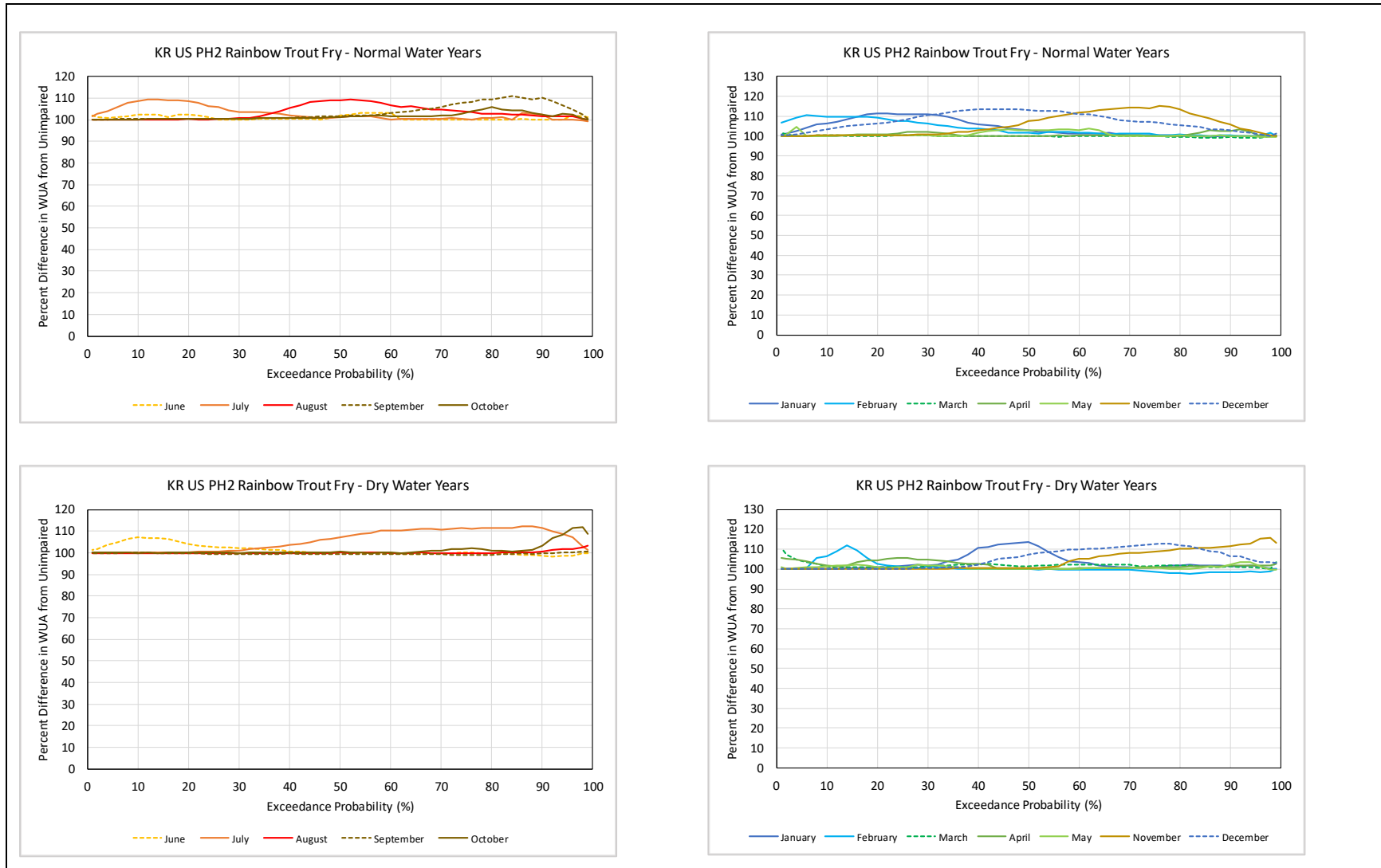
**Figure B8.4-18. Kaweah River Downstream of Kaweah No. 1 Powerhouse and Upstream of Kaweah No. 2 Powerhouse Rainbow Adult Habitat Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



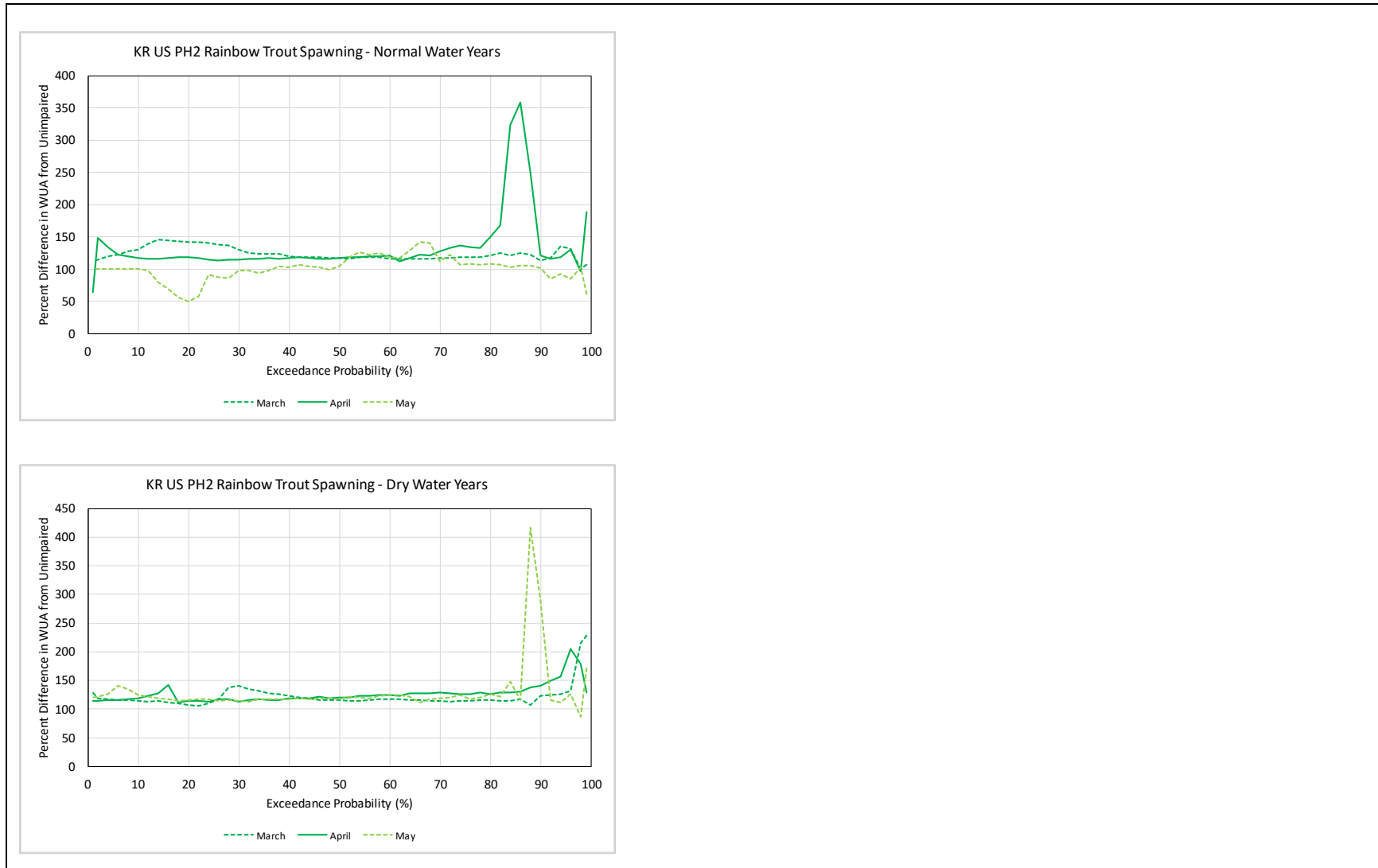
**Figure B8.4-19. Kaweah River Downstream of Kaweah No. 1 Powerhouse and Upstream of Kaweah No. 2 Powerhouse Rainbow Adult Juvenile Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



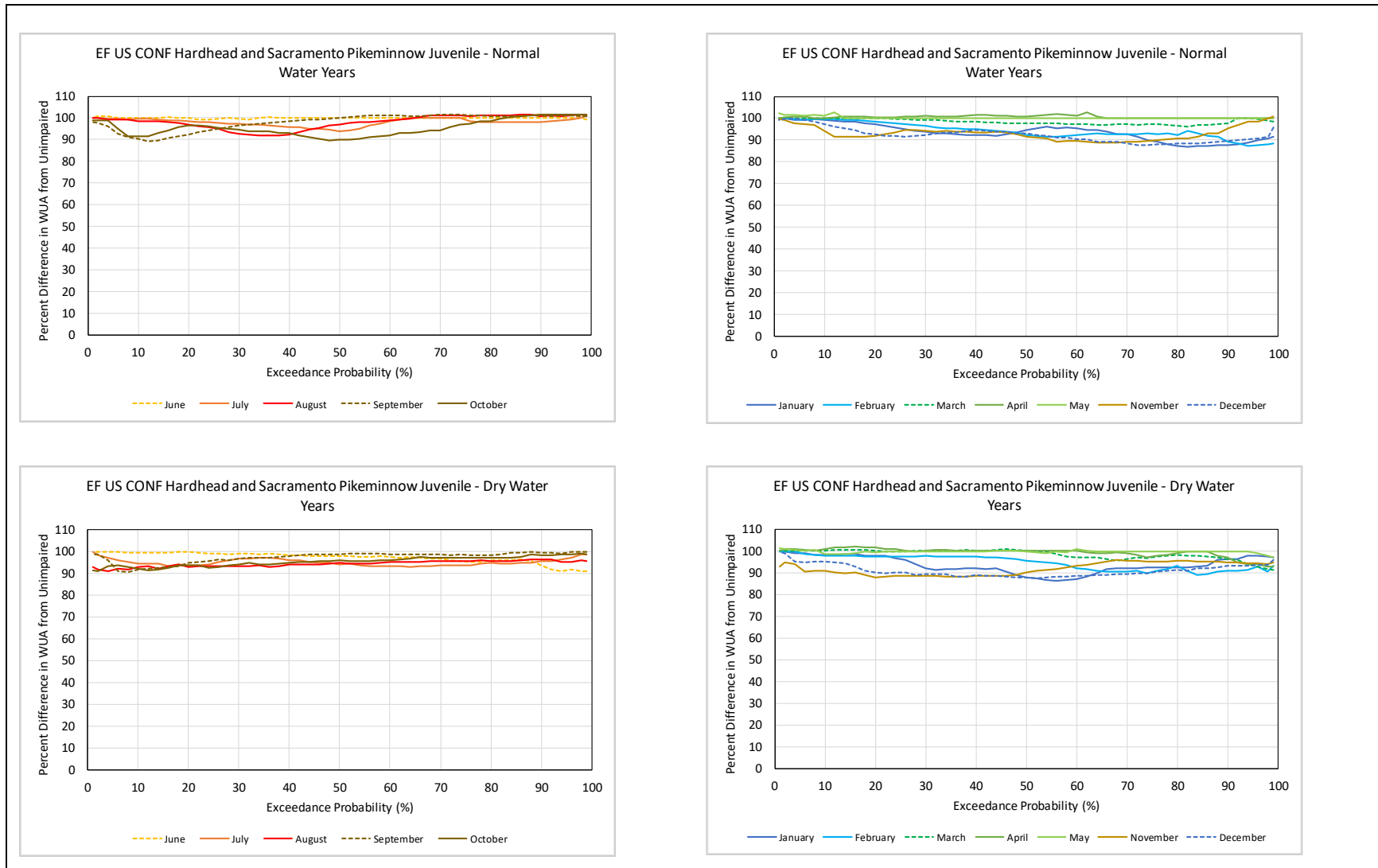
**Figure B8.4-20. Kaweah River Downstream of Kaweah No. 1 Powerhouse and Upstream of Kaweah No. 2 Powerhouse Rainbow Adult Fry Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



**Figure B8.4-21. Kaweah River Downstream of Kaweah No. 1 Powerhouse and Upstream of Kaweah No. 2 Powerhouse Rainbow Adult Spawning Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) using Proposed Action Minimum Instream Flows**

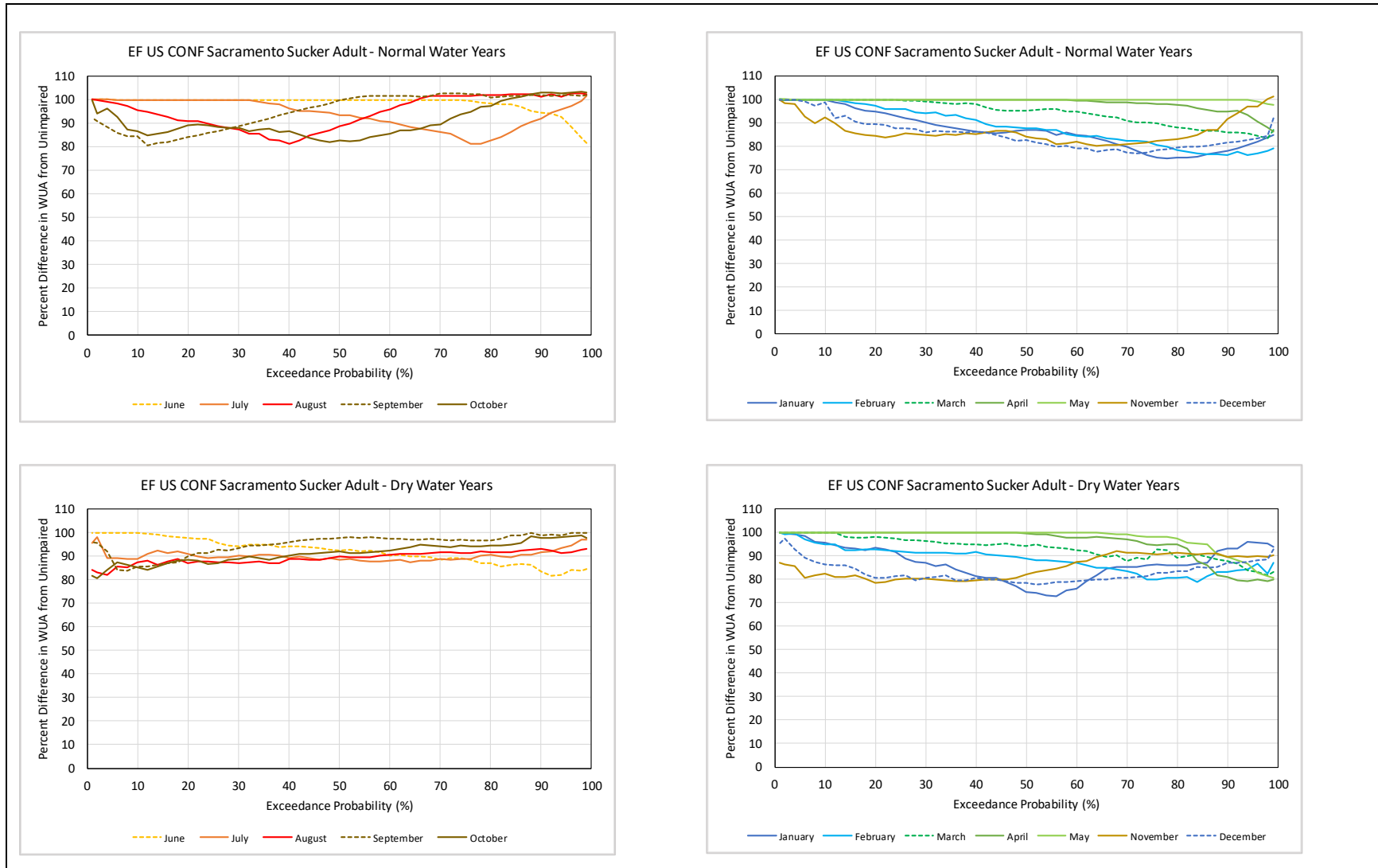


**Figure B8.4-22. East Fork Kaweah River Upstream of the Confluence with Kaweah River Hardhead and Sacramento Pikeminnow Juvenile Habitat Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**

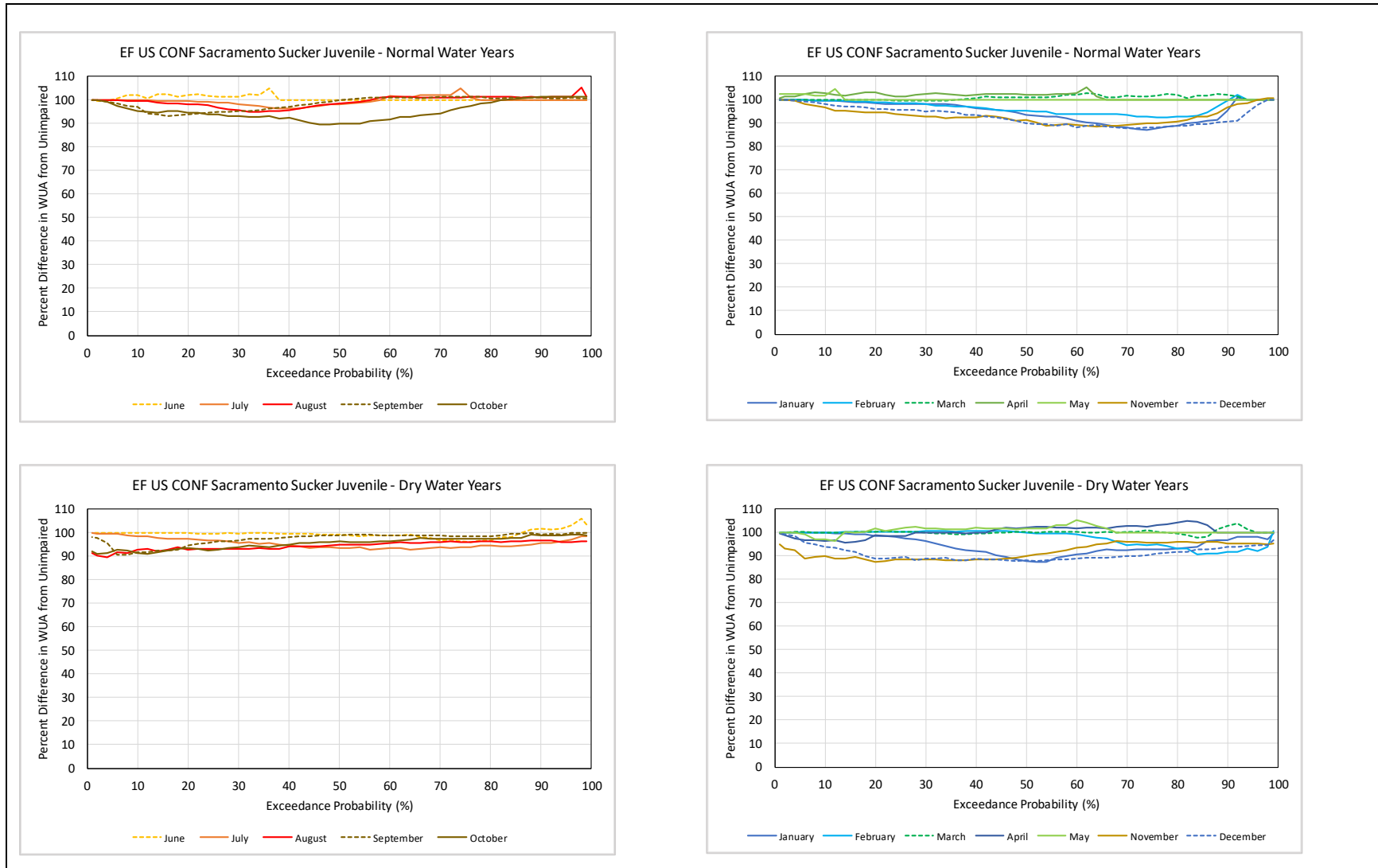




**Figure B8.4-23. East Fork Kaweah River Upstream of the Confluence with Kaweah River Sacramento Sucker Adult Habitat Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



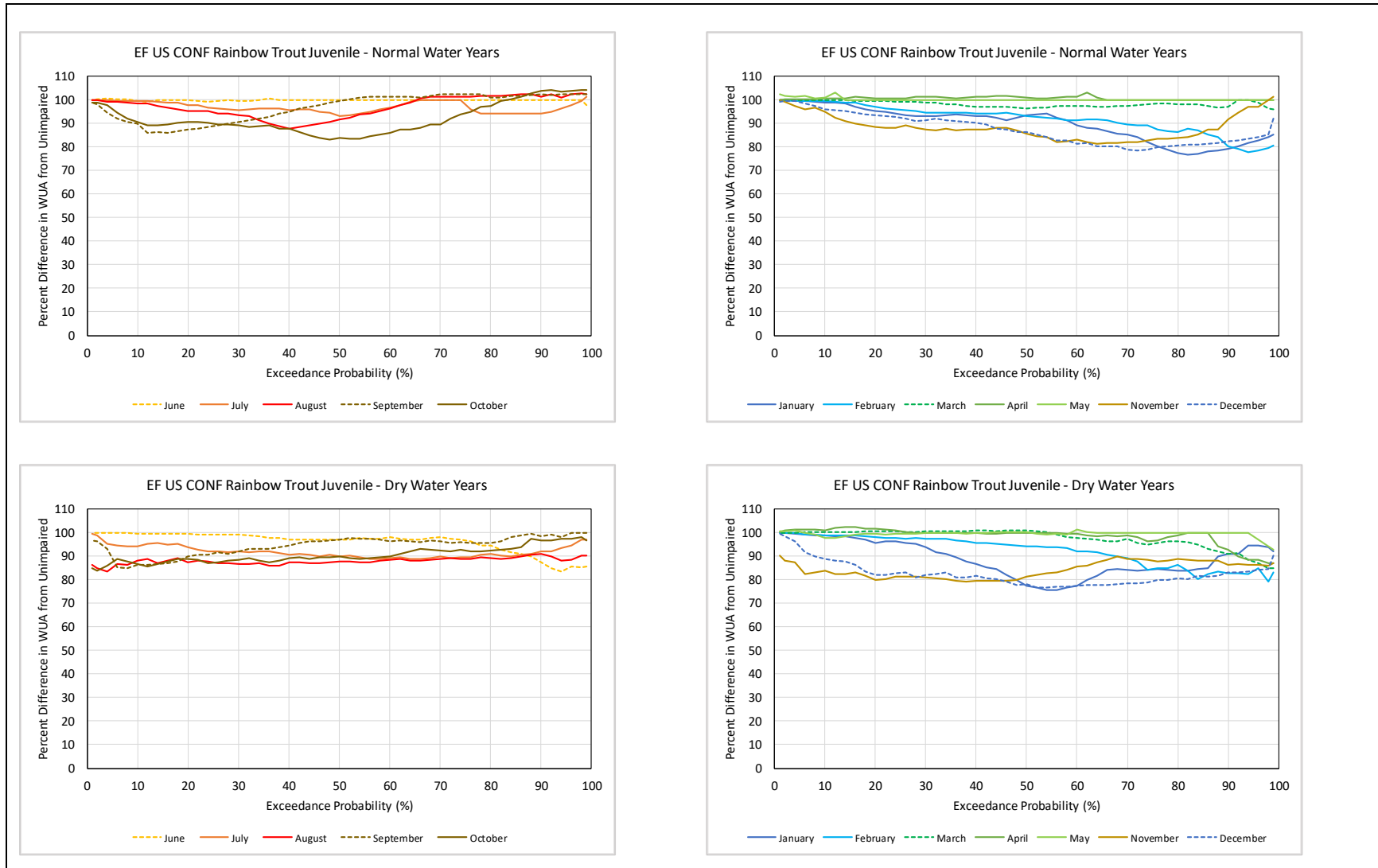
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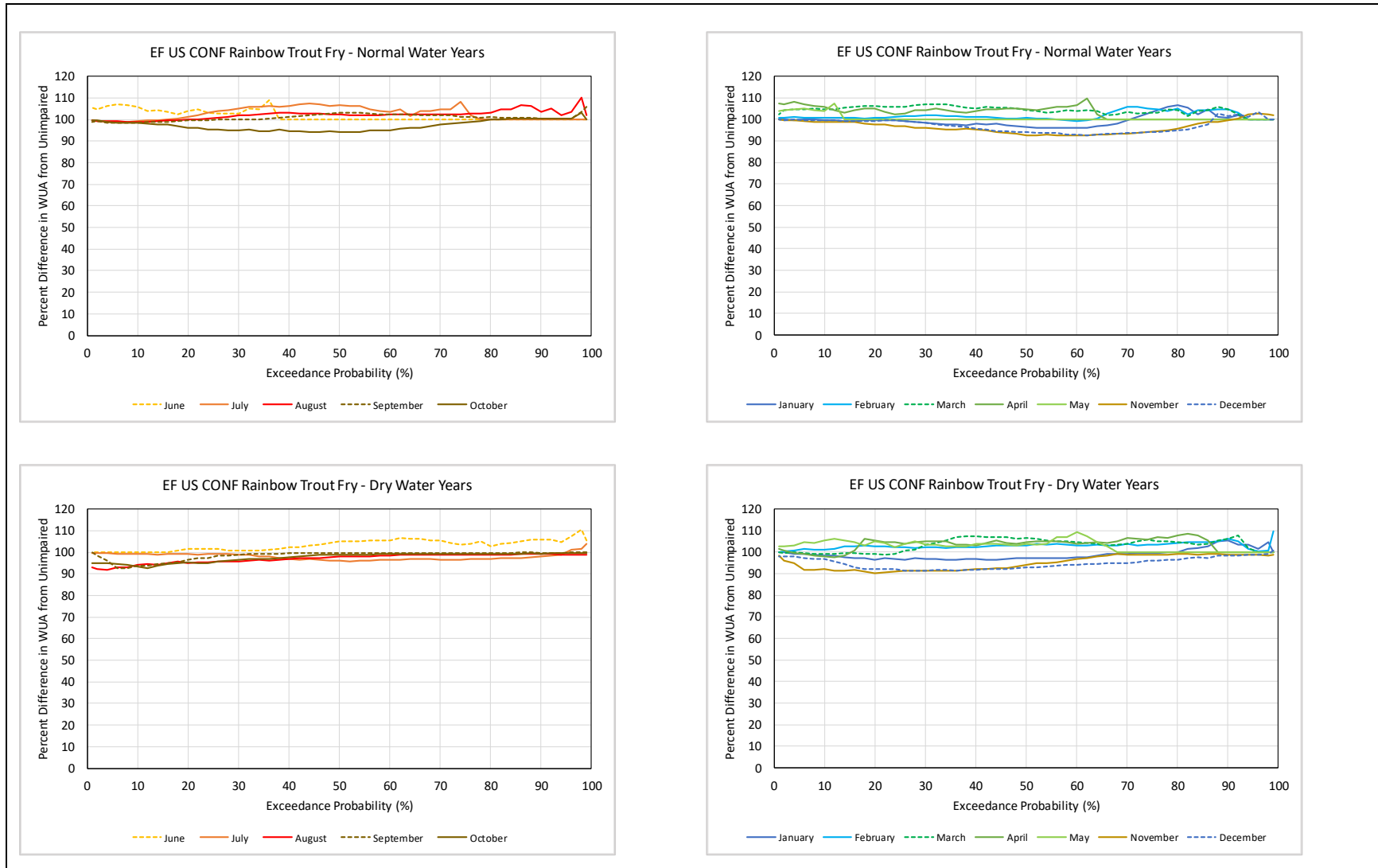
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**Figure B8.4-26. East Fork Kaweah River Upstream of the Confluence with Kaweah River Rainbow Adult Juvenile Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



**Figure B8.4-27. East Fork Kaweah River Upstream of the Confluence with Kaweah River Rainbow Adult Fry Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) (warm water temperature months, left, cool water temperature months, right) using Proposed Action Minimum Instream Flows**



**Figure B8.4-28. East Fork Kaweah River Upstream of the Confluence with Kaweah River Rainbow Adult Spawning Percent of Unimpaired Habitat Exceedance Plots (1994-2018) for Normal (top) and Dry Water Year Types (bottom) using Proposed Action Minimum Instream Flows**



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**LIST OF ACRONYMS**

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AMMP	Avian Mortality and Monitoring Plan
APLIC	Avian Power Line Interaction Committee
BCC	Bird of Conservation Concern
BLM	Bureau of Land Management
BLMS	Bureau of Land Management Sensitive
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CFP	California Fully Protected
cfs	cubic feet per second
CRPR	California Rare Plant Rank
DPS	Distinct Population Segment
ESA	Federal Endangered Species Act
ETP	Environmental Training Program
FE	Federal Endangered
FERC or Commission	Federal Energy Regulatory Commission
FPT	Federal Proposed Threatened
ft/hr	foot/feet per hour
MIF	minimum instream flow
NNIP	Non-Native Invasive Plant
PCA	Pest Control Advisor
Project	Kaweah Project
PUP	Pesticide Use Permit
SCE	Southern California Edison Company
SD	Supporting Document
SE	State Endangered
SMECP	Sediment Management and Erosion Control Plan
SPPMP	Special-Status Plant Protection and Monitoring Plan
SSC	State Species of Concern
ST	State Threatened
TPCLMM	Transmission, Power, Communication Line Maintenance Measure
TSR	Technical Study Report
USFWS	U.S. Fish and Wildlife Service
VIPMP	Vegetation and Integrated Pest Management Plan
WL	Watch List
WMMP	Wildlife Mortality Monitoring Plan



## **8.5 BOTANICAL AND WILDLIFE RESOURCES ENVIRONMENTAL EFFECTS**

This section describes the potential effects to botanical and wildlife resources (including rare, threatened, and endangered terrestrial species) under the Proposed Action for Southern California Edison Company's (SCE) Kaweah Project (Project). Section 3.0 – No-Action Alternative provides a description of current routine operation and maintenance activities and Section 4.0 – Proposed Action identifies changes from the No-Action Alternative.

Potential effects to botanical and wildlife resources have been identified based on continued operation and maintenance of the Project, including modified ramping rates and increased minimum instream flows (MIF). Specifically, effects on botanical and wildlife resources include potential loss or degradation of habitat, loss of individuals, and/or disturbance during critical periods.

Effects on botanical and wildlife resources are evaluated in this analysis based on the resources present in the study area and activities to be implemented under the Proposed Action. Section 8.5.1 provides an analysis of potential effects of the Proposed Action to special-status plant species. Section 8.5.2 provides an analysis of potential effects of the Proposed Action to special-status wildlife species and game species, grouped taxonomically. Measures incorporated into the Proposed Action would protect, maintain, and/or enhance special-status botanical and wildlife resources as well as common wildlife species.

Effects to botanical and wildlife resources are evaluated as follows:

### **Potential Effects to Special-Status Plant Species**

- Potential loss of upland special-status plants or degradation of habitat from:
  - Flowline maintenance
  - Vegetation management
  - Road and trail maintenance
  - Vegetation clearance associated with transmission, power, and communication line maintenance
- Potential effects to riparian special-status plants or their habitat resulting from:
  - Changes in Project operations (MIF releases and ramping rates)
  - Vegetation management
  - Vegetation clearance associated with transmission, power, and communication line maintenance

## Potential Effects to Special-Status Wildlife Species

- Potential effects to special-status raptors and other birds:
  - Effects to aquatic-foraging habitat for osprey resulting from:
    - Changes in Project operations (MIF releases and ramping rates)
    - Sediment management
    - Vegetation management (herbicide use)
  - Effects to golden eagles or other raptors in upland foraging habitats
  - Effects to riparian songbirds or their habitat resulting from:
    - Changes in Project operations (MIF releases and ramping rates)
    - Vegetation management
    - Transmission, power, and communication line maintenance
  - Electrocutation of raptors or other birds on Project transmission lines or power lines
  - Secondary poisoning of scavengers resulting from pesticide use
- Potential effects to special-status bats:
  - Potential disturbance of bat roosts from maintenance activities within Project facilities
  - Effects to aquatic-foraging habitat resulting from:
    - Changes in Project operations (MIF releases and ramping rates)
    - Sediment management
    - Vegetation management (herbicide use)
- Potential effects to special-status mammals and game mammals:
  - Secondary poisoning of scavengers resulting from ongoing pesticide use
  - Drowning of mammals in Project flowlines

Potential effects to special-status aquatic species are discussed in Section 8.4 – Fish and Aquatic Resources. Potential effects to riparian resources are identified in Section 8.8 – Riparian Resources.

A discussion of the potential effects to botanical and wildlife resources that could occur as a result of implementation of the Proposed Action, considering new environmental measures; management and monitoring plans; and programs is provided below. Unavoidable adverse effects are also discussed at the end of this section.

### **8.5.1 Effects to Special-Status Plant Species**

The following sections describe potential Project effects on upland and riparian special-status plant species. The study area for special-status plants is defined as the Federal Energy Regulatory Commission (FERC or Commission) Project boundary where operations and/or maintenance activities are conducted, plus a protective buffer. Refer to Table 7.6-2 for a list of plant species known to occur or potentially occurring in the study area, and their status and habitat requirements.

No plants or mosses listed under the federal Endangered Species Act (ESA) or California Statue ESA (CESA) have been identified in the study area.

#### **8.5.1.1 Effects to Upland Plant Species Resulting from Project Maintenance**

One upland plant species considered sensitive by the Bureau of Land Management (BLM), Munz's iris (*Iris munzii* [BLMS, California Rare Plant Rank (CRPR) 1B.3]), was documented during TERR 1 special-status plant surveys (TERR 1 – Botanical Resources Technical Study Report [TSR] [TERR 1 – TSR]) (SCE 2019a; Supporting Document A [SD A]). Provided below is a description of potential effects on Munz's iris, as well as other upland species, from implementation of Project maintenance activities under the Proposed Action.

#### **Munz's Iris**

Populations of Munz's iris were documented at the following locations:

- Twenty-eight populations along the Kaweah No. 1 Flowline;
- One population near the Kaweah No. 1 Flowline Access Road – Upper Pine; and
- One population along the Kaweah No. 1 Flowline Access Road – Slick Rock.

Under the Proposed Action, SCE would continue to implement several Project maintenance activities that may potentially affect Munz's iris individuals:

- Flowline maintenance – repair of wooden support structures, if required along the Kaweah No. 1 Flowline on land known to support the species, could affect individual Munz' iris as a result of ground disturbance.
- Vegetation management – trimming of vegetation by hand or with equipment along the Kaweah No. 1 Flowline, the Kaweah No. 1 Flowline Access Road – Upper Pine, or the Kaweah No. 1 Flowline Access Road – Slick Rock, as well as limited

application of herbicides, could result in direct loss of Munz's iris individuals or degradation of habitat.

- Road maintenance – maintenance or repair of the Kaweah No. 1 Flowline Access Road – Upper Pine or the Kaweah No. 1 Flowline Access Road – Slick Rock could result in loss of Munz's iris individuals along the shoulder of the roads.

Under the Proposed Action, SCE would implement the following new measure described in Appendix 4-A, Section 4.5.3 – Special-Status Plant Protection and Monitoring Plan (SPPMP) to minimize the potential for effects to known populations:

- SCE will observe a minimum 5-foot protective buffer around known populations of Munz's iris.

Munz's iris is a perennial plant with rhizomes, or modified underground stems, which grow horizontally and retain the ability to allow new shoots to grow upwards. New rhizomes are developed immediately before and after flowering which occurs in April; therefore, the sensitive period for this plant is March through May. If vegetation management or other maintenance activities within 5 feet of these populations is necessary for public health and safety, the work will be implemented June through February, outside the plant's sensitive period.

The following measures described in Appendix 4-A, Section 4.5.2 – Vegetation and Integrated Pest Management Plan (VIPMP) would further minimize the potential for effects to these populations:

- On BLM-owned lands, herbicides will be applied in accordance with a BLM-approved Pesticide Use Permit (PUP). On SCE-owned lands, herbicides will be applied in accordance with a Tulare County-approved PUP.
  - Each PUP will define the pesticide that can be used, species to be treated, treatment methods, treatment sites, and rates of application.

Finally, use of vehicles and foot traffic associated with maintenance activities could degrade habitat for Munz' iris through the introduction or spread of non-native invasive plants (NNIP). Under the Proposed Action, the Licensee would implement the following new measure from the VIPMP to reduce the spread or introduction of NNIPs:

- Licensee will wash heavy equipment previously used on non-paved surfaces, outside of the watershed, with power or high-pressure washers to remove soil, seeds, vegetation, or other seed-bearing material before using on Project operation and maintenance activities.

Finally, the SPPMP requires implementation of protocol-level botanical surveys in Year 2 following license issuance and every 10 years thereafter. The results of the surveys, including the location and size of known populations of Munz's iris, and any proposed avoidance and protection measures to protect the populations, would be provided to U.S.

Fish and Wildlife Service (USFWS), BLM and California Department of Fish and Wildlife (CDFW) for review. Upon agency approval, these measures would be implemented as part of ongoing Project maintenance.

With implementation of measures described in the VIPMP and SPPMP, effects to Munz's iris under the Proposed Action would be negligible.

### **Other Upland Special-Status Plants**

Under the Proposed Action, SCE would continue to implement flowline maintenance, vegetation management; and road and trail maintenance as described under the No-Action Alternative. In addition, as memorialized in Appendix 4-A, Section 4.5.6 – Transmission, Power, and Communication Lines Maintenance Measure (TPCLMM), under the Proposed Action SCE would continue to implement vegetation clearance within 15 feet on either side of transmission, power, and communication lines. Implementation of these Project maintenance activities could potentially affect newly identified upland special-status plant individuals or populations identified over the term of the new license.

As described above, the SPPMP would be implemented as part of the Proposed Action. This plan requires the following measures to minimize the potential for effects to new upland special-status plant populations identified over the term of the license:

- Protocol-level botanical surveys would be required in Year 2 following license issuance and every 10 years thereafter.
- A minimum 5-foot protective buffer will be established around any special-status plant populations identified during these surveys. No Project maintenance activities that may potentially affect the plants will be implemented within the protective buffer (e.g., vegetation management, road and trail maintenance, and vegetation clearance associated with transmission, power, and communication line maintenance).
- If Project maintenance activities are necessary within the buffer to protect public health and safety, alternate measures will be developed in consultation with the appropriate resource agencies, considering the species, location, and nature of work to be implemented.

In addition, under the Proposed Action, the VIPMP would minimize the potential for degradation of habitat for special-status plants through implementation of a new measure to reduce the spread or introduction of NNIPs:

- Licensee will wash heavy equipment previously used on non-paved surfaces, outside of the watershed, with power or high-pressure washers to remove soil, seeds, vegetation, or other seed-bearing material before using on Project operation and maintenance activities.

With implementation of new measures described in the VIPMP and SPPMP, effects to other upland special-status plants identified during the term of the license would be negligible.

#### **8.5.1.2 Effects to Special-Status Riparian Plant or Moss Species Resulting from Project Operations and Maintenance**

No special-status riparian plants or mosses were identified in the study area during botanical studies conducted for the TERR 1 – TSR, or in riparian sampling areas along bypass reaches (refer to Section 8.8 – Riparian Resources). Three special-status riparian plant species may potentially occur in the bypass reaches—watershield (*Brasenia schreberi* [CRPR 2B.3]), American manna grass (*Glyceria glandis* [CRPR 2B.3]), and Holzinger’s orthotrichum moss (*Orthotrichum holzingeri* [CRPR 1B.3]). Additionally, special-status riparian plants or mosses may be identified during special-status plant inventory surveys that would be conducted over the term of the new license. Potential effects to special-status plants and mosses resulting from changes in Project operations or from implementation of Project maintenance activities are described below.

#### **Project Operations**

The Proposed Action includes modifications to ramping rates and to MIF releases that could potentially affect riparian resources (refer to Section 8.8 – Riparian Resources), including special-status riparian plants and mosses.

Under the No-Action Alternative, the Licensee operates flows below the Kaweah No. 1 and No. 2 diversion dams and Kaweah No. 1 and No. 2 powerhouses such that they are not altered at a rate greater than 30% of the existing streamflow per hour. In the bypass reaches, this results in average stage changes as shown in Section 7.4, Figures 7.4-2, 7.4-3, 7.4-4, and 7.4-5.

As indicated, under the current FERC license the up-ramping rates are on the order of <0.1 to <0.3 foot/hour. The down-ramping rates are approximately <0.1 to 0.3 foot/hour in the range of flows that the Project can operate (24 cubic feet per second [cfs] at Kaweah No. 1 Diversion and 87 cfs at Kaweah No. 2 Diversion).

Under the Proposed Action, ramping rates will be modified as described in Appendix 4-A, Section 4.1.1 – Instream Flow Measures. Down ramping will be implemented consistent with current operations, but up ramping will be modified to provide for flexibility in operation of Project powerhouses. Under the Proposed Action, the modified up-ramping rate in the Kaweah River will range from 0.2 to 1.0 foot/hour and from approximately 0.1 to 1.0 foot/hour on the East Fork Kaweah River, depending on flow.

Under the Proposed Action, MIF releases would be increased in select months and water years as compared to the No-Action Alternative, which would enhance habitat for aquatic species and better simulate a more natural hydrograph.

Modified up-ramping rates under the Proposed Action would maintain riparian resources; and increased MIFs would maintain/enhance riparian resources. In addition, the

Proposed Action would maintain channel conditions and riparian communities along and within the channel by maintaining the frequency of high magnitude events. The Proposed Action would also maintain conditions suitable for riparian recruitment by maintaining the same magnitude, frequency, timing, and recession rates of spring recruitment flows as under the No-Action Alternative (SCE 2019a and 2019b). Overall, operations under the Proposed Action would maintain/enhance riparian resources. Therefore, proposed changes in Project operations would indirectly benefit special-status riparian plants and mosses identified over the term of the new license by maintaining/enhancing riparian habitat.

## **Project Maintenance**

Under the Proposed Action, SCE would continue to implement vegetation management as memorialized in the VIPMP. In addition, SCE would continue to conduct vegetation clearing within 15 feet on either side of transmission, power, and communication lines. Vegetation management/vegetation clearance would be conducted at locations along linear Project facilities (i.e., roads, trails, and transmission, power, and communication lines) that intersect the Kaweah River or other drainages and ponds at several locations. Removal of vegetation as part of the VIPMP and TPCLMM could therefore potentially affect any new special-status riparian plants or mosses that may be identified over the term of the new license.

As described above, the SPPMP would be implemented as part of the Proposed Action. This plan requires the following measures that would minimize the potential for effects to any new special-status riparian plant or moss populations identified over the term of the license:

- Protocol-level botanical surveys would be required in Year 2 following license issuance and every 10 years thereafter.
- A minimum 5-foot protective buffer will be established around any special-status plant or moss populations identified during these surveys. No Project maintenance activities that may potentially affect the plants will be implemented within the protective buffer (e.g., vegetation management, road and trail maintenance, and vegetation clearance associated with transmission, power, and communication line maintenance).
- If Project maintenance activities are necessary within the buffer to protect public health and safety, alternate measures will be developed in consultation with the appropriate resource agencies, considering the species, location, and nature of work to be implemented.

Measures included in the VIPMP would provide additional protection to riparian special-status plant and moss populations:

- Riparian vegetation would not be removed. If removal of riparian vegetation is required to protect worker/public safety and Project facilities, SCE will consult with appropriate resource agencies and obtain approvals prior to removal.
- On BLM-owned lands, herbicides will be applied in accordance with a BLM-approved PUP. On SCE-owned lands, herbicides will be applied in accordance with a Tulare County-approved PUP.
  - Each PUP will define the herbicide that can be used, species to be treated, treatment methods, treatments sites, and rates of application.
- To minimize the risk of herbicides inadvertently entering waters, no herbicides will be applied within 50 feet of streams or drainages.
- Herbicide applications shall not occur when weather parameters exceed label requirements, during precipitation, or when there is a forecast of greater than a 50% chance of precipitation in the next 48 hours.
- Herbicide use will be limited to days when measured wind conditions are less than 5 mph and shall be applied in a downwind direction from adjacent trees or shrubs.

Finally, under the Proposed Action, the VIPMP would minimize the potential for degradation of habitat for riparian special-status plants through implementation of a new measure to reduce the spread or introduction of to reduce the spread or introduction of NNIPs:

- Licensee will wash heavy equipment previously used on non-paved surfaces, outside of the watershed, with power or high-pressure washers to remove soil, seeds, vegetation, or other seed-bearing material before using on Project operation and maintenance activities

With implementation of new measures described in the VIPMP and SPPMP, effects to riparian special-status plants identified during the term of the license would be negligible.

### **8.5.1.3 Additional Measures for the Protection of Special-Status Plants**

Under the No-Action Alternative, SCE implements the Environmental Training Program (ETP) to educate Project personnel regarding special-status species potentially present in the study area, as well as measures required to avoid or minimize effects to these species and their habitats. As memorialized in Appendix 4-A, Section 4.6.1, SCE would continue to implement the ETP as part of the Proposed Action. The Licensee would review and update the ETP annually, prior March 1 each year, to account for any changes in resources status. Continued implementation of the ETP would benefit special-status plants by ensuring awareness, and thus improving the effectiveness, of measures to



avoid or minimize effects to species as described in the VIPMP (Appendix 4-A, Section 4.5.2); and the SPPMP (Appendix 4-A, Section 4.5.3).

#### **8.5.1.4 Conclusion – Special-Status Plants**

As described above, the Proposed Action would have a negligible effect on special-status plants with implementation of measures, management plans and ETPs described in Appendix 4-A. A summary of measures and programs that would protect special-status plants is provided below.

- Changes in Project operations (ramping rates and increased MIFs)
- Measures included in the SPPMP, including:
  - Conducting protocol-level botanical surveys in Year 2 following license issuance and every 10 years thereafter
  - Implementation of protective buffers around known populations, or new populations identified over the term of the new license
- Measures included in the VIPMP, including:
  - Restrictions on the timing, location, and method of herbicide applications
  - Measures to reduce the introduction and spread of NNIPs
- Continued training of Project personnel through implementation of the ETP

#### **8.5.2 Effects to Terrestrial Wildlife Species**

The following section provides an analysis of potential effects of the Proposed Action on special-status wildlife and game species, grouped to include taxonomically similar species: birds/raptors, bats, and mammals (including game mammals). The study area for special-status wildlife (excluding bats) includes the FERC Project boundary where operations and/or maintenance activities are conducted, plus a protective buffer. Refer to Table 7.5-2 for the survey area by facility type. The study area for special-status bats includes facilities listed on Table 7.5-6.

Refer to Table 7.5-7 and 7.5-8 for a list of wildlife species known to occur or potentially occurring in the study area, their status, and habitat requirements.

A description of the potential effects of the Proposed Action on special-status wildlife and game mammals resulting from Project operations and maintenance, as well as measures proposed to minimize the potential effects and/or benefit species, is provided below.

### 8.5.2.1 Effects to Special-Status Raptors and Other Birds

No raptors or other birds listed under the ESA or CESA are known to occur in the study area.

As described in Section 7.5.3.2, two special-status raptors, osprey (*Pandion haliaetus* [Watch List (WL)]) and golden eagle (*Aquila chrysaetos* [BLMS, Bird of Conservation Concern (BCC), California Fully Protected (CFP), WL]) were observed in the study area. The study area does not provide suitable nesting habitat for these species. However, osprey may forage along riverine and lacustrine habitats; and golden eagles may forage in grasslands in the study area.

In addition, one non-raptorial special-status bird, yellow warbler (*Dendroica petechia* [BCC, State Species of Concern (SSC)]), was observed in the study area during surveys conducted for the TERR 2 – Wildlife Resources TSR (TERR 2 – TSR) (SCE 2019b; SD A). Suitable breeding habitat for this species occurs along the East Fork Kaweah River and Kaweah River in riparian habitats.

Because osprey, golden eagle, and yellow warbler are known to occur in the study area, the analysis is focused on these species. However, the measures described would also provide protection for other special-status bird species that may potentially be present in the study area over the term of the new license.

Potential effects to special-status birds resulting from implementation of the Proposed Action include:

- Degradation of aquatic-foraging habitat resulting from changes in Project operations, sediment management, or herbicide use;
- Alteration of grassland or other upland foraging habitats resulting from vegetation management or vegetation clearance associated with Project transmission, power, or communication line maintenance;
- Modification of riparian habitat resulting from changes in Project operations, vegetation management, and vegetation clearing associated with Project transmission, power, or communication line maintenance;
- Electrocution of raptors on Project transmission or power lines; and
- Secondary poisoning of raptors resulting from pesticide use.

Each of these potential effects are discussed below.

## Effects to Aquatic-Foraging Raptors or Other Birds

Osprey or other aquatic-foraging bird species such as bald eagle (*Haliaeetus leucocephalus* [Delisted under the ESA and CESA; BCC, CFP]) and black swift (*Cypseloides niger* [BCC, SSC]) could potentially forage in bypass reaches. Operations and maintenance activities implemented under the Proposed Action that could potentially degrade aquatic-foraging habitats by affecting water quantity or quality, with subsequent effects to aquatic prey species. Each of these potential effects are discussed below.

### *PROJECT OPERATIONS*

The Proposed Action includes modifications to ramping rates and to MIF releases. These changes in hydrology could potentially affect the distribution and abundance of aquatic prey species, indirectly affecting osprey or other aquatic-foraging birds.

As described previously, under the Proposed Action, the Licensee would implement down-ramping consistent with current operations, and would modify up-ramping rates to provide for improved flexibility in operation of Project powerhouses. Under the Proposed Action, MIF releases would be increased in select months and water years as compared to the No-Action Alternative, which would enhance habitat for aquatic species and better simulate a more natural hydrograph.

Modified up-ramping rates under the Proposed Action would maintain the distribution or abundance of fish or other aquatic species; and increased MIFs would maintain/enhance aquatic resources (refer to Section 8.4). Maintenance/enhancement of aquatic macroinvertebrate and fish populations in bypass reaches would, in turn maintain/enhance habitat for aquatic-foraging birds and their prey base.

Therefore, changes in operations would enhance aquatic-foraging habitat for osprey and other aquatic-foraging birds.

### *PROJECT MAINTENANCE*

Under the Proposed Action, the Licensee would continue to remove sediment deposited in Project flowlines and forebays. These activities are memorialized in Appendix 4-A, Section 4.1.3 – Sediment Management and Erosion Control Plan (SMECP). The SMECP establishes methods for removal of sediments that protects water quality and downstream aquatic resources. These measures include, but are not limited to, routine opening of low-level outlets to minimize accumulations of sand and fine sediments; removal of rock debris to prevent build-up of sediment and facility damage; and release of sediments during high-flow events. The SMECP also includes protocols to reduce the potential for an failure of the Kaweah No. 1 and No. 2 flowlines, and measures to be implemented in the event of a failure. With implementation of the SMECP, any impacts to water quality associated with sediment management would be negligible.

Under the Proposed Action, SCE would continue to use herbicides as part of vegetation management and vegetation clearance. The following measures included in the VIPMP would minimize the potential for contamination of aquatic habitats resulting from use of herbicides:

- On BLM-owned lands, herbicides will be applied in accordance with a BLM-approved PUP. On SCE-owned lands, herbicides will be applied in accordance with a Tulare County-approved PUP.
  - Each PUP will define the herbicide that can be used, species to be treated, treatment methods, treatments sites, and rates of application.
- To minimize the risk of herbicides inadvertently entering waters, no herbicides will be applied within 50 feet of streams or drainages.
- Herbicide applications shall not occur when weather parameters exceed label requirements, during precipitation, or when there is a forecast of greater than a 50% chance of precipitation in the next 48 hours.
- Herbicide use will be limited to days when measured wind conditions are less than 5 mph and shall be applied in a downwind direction from adjacent trees or shrubs.

With implementation of measures described in the SMECP and the VIPMP, effects to aquatic-foraging habitat resulting from implementation of Project maintenance activities would be negligible.

### **Effects to Raptors in Upland Foraging Habitats**

Under the Proposed Action, SCE would continue to implement vegetation management as described under the No-Action Alternative. In addition, vegetation would continue to be cleared within 15 feet on either side of Project transmission, power, and communication line. Golden eagles or other special-status raptors including, but not limited to, California condor (*Gymnogyps californianus* [Federal Endangered (FE), State Endangered (SE), CFP]), northern harrier (*Circus cyaneus* [SSC]), white-tailed kite (*Elanus leucurus* [BLMS, CFP]), and short-eared owl (*Asio flammeus* [SSC]) could potentially forage in grasslands in the study area, and could potentially be affected by these activities. However, as described in Table 3.7 (Section 3.4.4, No-Action Alternative) vegetation is removed only within a specified work buffer immediately adjacent to developed Project facilities. These buffers represent the area required to protect and maintain Project facilities, and provide for human health and safety.

Considering that vegetation management and clearing is conducted only within small areas immediately adjacent to developed facilities and would not result in a change in habitat condition or quality, any effects to golden eagles or other upland foraging raptors would be negligible.

## Effects to Riparian-Nesting Birds

Yellow warblers and other riparian-nesting bird species such as willow flycatcher (*Empidonax traillii* [BCC]) and southwest willow flycatcher (*Empidonax traillii extimus* [FE, SE]) may be present in riparian habitats along the Kaweah River, East Fork Kaweah, or other drainages or water features in the study area. Operations and maintenance activities implemented under the Proposed Action could potentially result in the loss or degradation of riparian habitat for these species. Each of these potential effects are described below.

### *PROJECT OPERATIONS*

As described above, the Proposed Action includes modifications to ramping rates and to MIF releases. Modified up-ramping rates under the Proposed Action would maintain riparian resources; and increased MIFs would maintain/enhance riparian resources. In addition, the Proposed Action would maintain channel conditions and riparian communities along and within the channel. The Proposed Action would also maintain conditions suitable for riparian recruitment by maintaining the same magnitude, frequency, timing, and recession rates of spring recruitment flows as under the No-Action Alternative (SCE 2019a and 2019b). Overall, operations under the Proposed Action would enhance riparian resources. Therefore, implementation of changes in operations under the Proposed Action would benefit riparian-nesting songbirds by enhancing riparian resources.

### *PROJECT MAINTENANCE*

Under the Proposed Action, SCE would continue to implement vegetation management activities described under the No-Action Alternative and memorialized in the VIPMP. In addition, as described in the TPCLMM, SCE would continue to conduct vegetation clearing within 15 feet on either side of transmission, power, and communication lines. Removal of vegetation as part of the VIPMP and the TPCLMM could potentially result in removal of riparian habitat for yellow warbler and riparian-nesting species. Specifically, vegetation management/vegetation clearance would be conducted along linear Project facilities (i.e., roads, trails, and transmission, power, and communication lines) that intersect the Kaweah River and other drainages and ponds at several locations. Implementation of vegetation management/clearance at these locations could potentially result in removal of riparian vegetation over the term of the license.

However, as described above, measures included in the VIPMP would protect riparian habitat; thereby protecting and maintaining nesting habitat for riparian-nesting birds:

- Riparian vegetation will not be removed. If removal of riparian vegetation is required to protect worker/public safety and Project facilities, SCE will consult with appropriate resource agencies and obtain approvals prior to removal.

- On BLM-owned lands, herbicides will be applied in accordance with a BLM-approved PUP. On SCE-owned lands, herbicides will be applied in accordance with a Tulare County-approved PUP.
  - Each PUP will define the herbicide that can be used, species to be treated, treatment methods, treatments sites, and rates of application.
- To minimize the risk of herbicides inadvertently entering waters, no herbicides will be applied within 50 feet of streams or drainages.
- Herbicide applications shall not occur when weather parameters exceed label requirements, during precipitation, or when there is a forecast of greater than a 50% chance of precipitation in the next 48 hours.
- Herbicide use will be limited to days when measured wind conditions are less than 5 mph and shall be applied in a downwind direction from adjacent trees or shrubs.

Finally, under the Proposed Action, the VIPMP would minimize the potential for degradation of habitat for riparian habitat through implementation of a new measure to reduce the spread or introduction of to reduce the spread or introduction of NNIPs:

- Licensee will wash heavy equipment previously used on non-paved surfaces, outside of the watershed, with power or high-pressure washers to remove soil, seeds, vegetation, or other seed-bearing material before using on Project operation and maintenance activities

With implementation of new measures described in the VIPMP, effects to riparian nesting birds would be negligible.

Overall, the Proposed Action would benefit riparian nesting birds by increasing MIFs; thus enhancing riparian habitats.

### **Electrocution of Birds on Project Transmission or Power Lines**

Under existing conditions (No-Action Alternative), several Project transmission line and power line poles have design elements that may pose a potential risk for raptor electrocution. Refer to the Transmission Line Evaluation in the TERR 2 – TSR (SCE 2019b).

Though some lines and poles may pose a potential risk, based on a review of Avian Mortality Reports submitted to FERC as required by License Article 412, there have been no documented avian mortalities on Project transmission and power lines during monitoring since 1993 (TERR 2 – TSR) (SCE 2019b). However, there is still some potential for raptors or other birds to be electrocuted on Project transmission and power lines or poles that do not have raptor-safe configurations.

Under the Proposed Action, SCE would continue to monitor avian mortalities along Project transmission and power lines. As memorialized in Appendix 4-A, Section 4.5.4 – Avian Mortality Monitoring Plan (AMMP), the following measures would be implemented to monitoring avian mortality:

- The Licensee will monitor for avian mortality on Project transmission lines, transmission tap lines, and power lines in conjunction with routine operation and maintenance of the Project.
  - If an avian mortality is identified, the following data will be obtained and provided to SCE’s Avian Protection Specialist:
    - Location and date
    - Avian species affected
    - Photographs of the pole and adjacent poles, and associated structure numbers
  - SCE’s Avian Protection Specialist will provide notification within 5 days of the mortality discovery to the following agencies:
    - CDFW
    - USFWS, if the species is federally listed
    - BLM, if the species is a BLM sensitive species and is found on BLM lands

Results of monitoring will be submitted to USFWS, BLM, and CDFW annually for review and comment.

Under the No-Action Alternative, existing power poles and powerlines are replaced as necessary (i.e., when they are damaged or have exceeded their usable lifespan) using traditional design configurations (TERR 2 – TSR) (SCE 2019b). Under the Proposed Action, SCE would implement measures described in the TPCLMM (Appendix 4-A, Section 4.5.6). These measures include:

- Evaluation of any transmission line, transmission tap line, or power line involved in the electrocution of a protected raptor to determine the most feasible approach to eliminate the specified mortality risk through retrofitting the structure with raptor-safe equipment or replacing the structure with a raptor-safe pole configuration. The evaluation will be completed in consultation with the appropriate resource agencies (e.g., CDFW, USFWS, and BLM) and agreed upon measures will be implemented by the Licensee.

- Use of raptor-safe powerline design configurations described in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (Avian Powerline Interaction Committee [APLIC] 2006) when replacing existing towers, poles, phase conductors, and associated equipment. Table TPCLMM-1 in Appendix 4-A provides a list of Project transmission lines, transmission tap lines, and power lines with one or more design elements that pose a risk for avian electrocution.

Considering that there are no documented avian mortalities, and with implementation of measures included in the AMMP and the Transmission, Power and Communication Line Maintenance Measure, effects to special-status raptors or other birds resulting from electrocution on Project transmission or power lines would be negligible.

### **Secondary Poisoning of Raptors**

Under the Proposed Action, SCE would continue to administer rodenticides to control pests as described under No-Action Alternative. Raptors could potentially be poisoned through consumption of rats or other prey contaminated by rodenticides.

As memorialized in the VIPMP (Appendix 4-A, Section 4.5.2), use of rodenticides would be limited to the interior of or within the perimeter fencing of powerhouses, switchyards, and at the Kaweah No. 1 Powerhouse Campus facilities. Interiors of facilities are inaccessible to raptors; and switchyards and areas within the perimeter fences around these facilities provide limited, if any, foraging habitat. The VIPMP also requires rodenticide applications to be implemented by a licensed pest control advisor (PCA). This ensures proper placement and dosage of rodenticides to minimize the potential for secondary poisoning.

Within implementation of pesticides as described in the VIPMP, any potential for effects to special-status raptors from secondary poisoning would be negligible.

#### **8.5.2.2 Effects to Special-Status Bats**

No bat species listed under the ESA or CESA are known to occur in the study area.

Several other special-status bat species were observed in the study area, including pallid bat (*Antrozous pallidus* [BLMS, SSC]), Townsend's big-eared bat (*Corynorhinus townsendii* [BLMS, SSC]), spotted bat (*Euderma maculatum* [BLMS, SSC]), western red bat (*Lasiurus blossevillii* [SSC]), western small-footed myotis (*Myotis ciliolabrum* [BLMS]), long-eared myotis (*Myotis evotis* [BLMS]), fringed myotis (*Myotis thysanodes* [BLMS]), Yuma myotis (*Myotis yumanensis* [BLMS]), and western mastiff bat (*Eumops perotis californicus* [BLMS, SSC]). Of these, Yuma myotis were observed day-roosting inside the Kaweah No. 2 Powerhouse, and a night roost was observed on a maintenance building near the Kaweah No. 3 Powerhouse. Western small-footed myotis are suspected to day roost inside the Kaweah No. 2 Powerhouse and a day roost was observed inside a maintenance building on the Kaweah No. 1 Powerhouse campus. Refer to Table 7.5-8 for more detailed locations of each special-status bat species in relation to Project facilities.



Special-status bats could potentially be disturbed by ongoing maintenance within the Kaweah No. 2 Powerhouse, and the Kaweah No. 1 Powerhouse campus maintenance buildings where roosts are present. Changes in Project operations, sediment management, and herbicide use could also affect aquatic-foraging habitat. Each of these potential effects is described below.

### **Disturbance of Special-Status Bat Roosts**

Under the Proposed Action, SCE would continue to inspect powerhouses and appurtenances on a regular basis. Minor maintenance and repairs to powerhouses or powerhouse campus structures are made on an as-need basis. Maintenance repairs that affect structures near walls and ceilings (i.e., painting or power washing) could potentially disturb western small-footed myotis and Yuma myotis day or night roosts. To protect special-status bat roosts, SCE would implement new measures described in Appendix 4-A, Section 4.5.1, Special-Status Bat Protection Measure. These include:

- In locations with day roosts, maintenance activities at the roost site will be conducted after dusk.
- In locations with night roosts, maintenance activities at the roost site will be conducted in the daylight hours.
- If it is necessary to implement the maintenance during restricted time periods (identified above), the Licensee will inspect the site prior to conducting the work. If no bats are present and the roost areas are unoccupied, the maintenance activities will proceed as planned. If bats are present, a qualified biologist will temporarily exclude the bats (using passive exclusion methods) until the maintenance work has been completed. The Licensee will consult with BLM and CDFW and obtain approval of the proposed exclusion method.

Implementation of these measures would protect western small-footed myotis, Yuma myotis, and any other special-status bat roosts identified during the term of the license.

### **Effects to Aquatic-Foraging Habitat for Special-Status Bats**

#### *PROJECT OPERATIONS*

As described above, the Proposed Action includes modifications to ramping rates and to MIF releases. These changes could potentially affect the foraging habitat for special-status bats and the distribution and abundance of prey species.

Modified up-ramping rates under the Proposed Action would maintain/enhance the distribution or abundance of macroinvertebrate prey species; and increased MIFs would enhance aquatic resources (refer to Section 8.4). Maintenance/enhancement of aquatic macroinvertebrate populations in the bypass reaches would, in turn maintain/enhance habitat for aquatic-foraging bats and their prey base.

Therefore, changes in operations would benefit aquatic-foraging habitat for special-status bats.

#### *PROJECT MAINTENANCE*

Under the Proposed Action, the Licensee would continue to remove sediment deposited in Project flowlines and forebays. These activities are memorialized in the SMECP (Appendix 4-A, Section 4.1.3).

The SMECP establishes methods for removal of sediments that protects water quality and downstream aquatic resources. These measures include, but are not limited to, routine opening of low-level outlets to minimize accumulations of sand and fine sediments; removal of rock debris to prevent build-up of sediment and facility damage; and release of sediments during high-flow events. The SMECP also includes protocols to reduce the potential for a failure in the Kaweah No. 1 and No. 2 flowlines, and measures to be implemented in the event of a failure. With implementation of the SMECP, any impacts to water quality associated with sediment management would be negligible.

Under the Proposed Action, SCE would continue to use herbicides as part of vegetation management and vegetation clearance. The following measures included in the VIPMP would minimize the potential for contamination of aquatic habitats resulting from use of herbicides:

- On BLM-owned lands, herbicides will be applied in accordance with a BLM-approved PUP. On SCE-owned lands, herbicides will be applied in accordance with a Tulare County-approved PUP.
  - Each PUP will define the herbicide that can be used, species to be treated, treatment methods, treatments sites, and rates of application.
- To minimize the risk of herbicides inadvertently entering waters, no herbicides will be applied within 50 feet of streams or drainages.
- Herbicide applications shall not occur when weather parameters exceed label requirements, during precipitation, or when there is a forecast of greater than a 50% chance of precipitation in the next 48 hours.
- Herbicide use will be limited to days when measured wind conditions are less than 5 mph and shall be applied in a downwind direction from adjacent trees or shrubs.

With implementation of measures described in the SMECP and the VIPMP, effects to aquatic-foraging for special-status bats resulting from implementation of Project maintenance activities would be negligible.

### 8.5.2.2 Effects to Special-Status Mammals and Game Mammals

The presence of one special-status mammal, ringtail (*Bassariscus astutus* [CFP]), was detected in 2018 during studies conducted in support of Project relicensing. Fisher (*Pekania pennanti* [Federal Proposed Threatened (FPT), BLMS, State Threatened [ST], SSC]) and (American badger (*Taxidea taxus* [SSC]) may also potentially occur in the study area.

Game mammals known or potentially occurring the Kaweah study area include mule deer, desert cottontail (*Sylvilagus audubonii*), western gray squirrel (*Sciurus griseus*), gray fox (*Urocyon cinereoargenteus*), black bear (*Ursus americanus*), American mink (*Mustela vison*), , raccoon (*Procyon lotor*), bobcat (*Lynx rufus*), mule deer (*Odocoileus hemionus*), and wild pig (*Sus scrofa*).

Potential Project effects to special-status mammals and game mammals including secondary poisoning of scavengers from rodenticide application; and drowning in Project flowlines. Each of these potential effects is described below.

#### Secondary Poisoning

Under the Proposed Action, SCE would continue to administer rodenticides to control pests as described under No-Action Alternative. Special-status mammals such as ringtail or fisher, as well as other scavengers such as gray fox or raccoon, could potentially be poisoned through consumption of rodents that may have ingested rodenticides.

As memorialized in the VIPMP (Appendix 4-A, Section 4.5.2), use of rodenticides would be limited to the interior of or within the perimeter fencing of powerhouses, switchyards, and at the Kaweah No. 1 Powerhouse Campus facilities. Interiors of facilities are generally inaccessible to mammals; and switchyards and areas within the perimeter fences around these facilities provide limited, if any, foraging habitat. The VIPMP also rodenticide applications to be implemented by a licensed PCA. This ensures proper placement and dosage of rodenticides to minimize the potential for secondary poisoning.

Within implementation of pesticides as described in the VIPMP, any potential for effects to mammalian scavengers from secondary poisoning would be negligible.

#### Drowning in Project Flowlines

As described in Section 7.5.3.3, one of the two mule deer herds present in the study area, the Kaweah Herd, is migratory. This herd spends the majority of the year in higher-elevation areas in the Sequoia National Park and moves down to lower-elevation areas (including portions of the study area) during the winter. Project flowlines historically represented a potential barrier to movement for migratory mule deer and other wildlife. Drowning of mule deer and other wildlife in Project flowlines was identified by agencies as a resource issue during the previous relicensing (FERC 1991). A total of 142 mule deer drowned in the Kaweah No. 2 and Kaweah No. 3 flowlines in the period from 1964 to 1989 (an average of 6 per year). Under the No-Action Alternative, SCE has complied with License Articles 408 and 409 of the current FERC license to minimize wildlife

drowning in the Kaweah No. 2 and Kaweah No. 3 flowlines (FERC 1992). The articles required modification, relocation, and/or rebuilding of existing foot and wildlife bridges, constructing new wildlife bridges, and installation of hazers and flashers at existing escape ramps. These improvements were implemented between 1994 and 1996.

In compliance with License Article 410, SCE has monitored wildlife drownings since 1993. Since implementation of the measures in Articles 408 and 409, there has been a significant decline in wildlife mortality, particularly in the last 10 years of monitoring (between 1 and 6 mortalities in a given year). Refer to Figure 7.5-1 for the number of wildlife mortalities in Project flowlines since 1991.

Monitoring of wildlife bridges along the Kaweah No.2 and Kaweah No. 3 was conducted in the spring and fall of 2018 to evaluate whether mule deer and other species were successfully using the wildlife bridges. Refer to Table 7.5-10 for a list of all species and the number observed during flowline monitoring. Eight species were observed crossing wildlife bridges, including mule deer, bobcat, coyote, gray fox, black bear, striped skunk, western spotted skunk, and raccoon. No special-status wildlife species were observed during monitoring.

Under the Proposed Action, SCE would continue to implement measures to enhance movement of wildlife and to prevent and monitor wildlife drownings as described under the No-Action Alternative (Section 3.4). These measures, which are memorialized in Appendix 4-A, Section 4.5.5 – Wildlife Mortality Monitoring Plan (WMMP), include:

- Recording wildlife mortality during regular inspections of the Kaweah No. 2 and No. 3 flowlines and their associated forebays; and
- Documenting the condition of wildlife bridges, escape ramps, and escape fencing, hazers/flashers during routine operation and maintenance activities and implementing required maintenance activities, as needed.

Results of monitoring, inspection, and repair of facilities would be provided to USFWS and CDFW annually for review and comment.

Implementation of the WMMP would continue to facilitate the movement of mule deer and other game mammals while minimizing the potential for wildlife drownings, and would have a beneficial effect on special-status mammals and game mammals, including mule deer, over the term of the new license.

### **8.5.2.3 Additional Measures for the Protection of Special-Status Wildlife**

Under the No-Action Alternative, SCE implements the ETP to educate Project personnel regarding special-status species potentially present in the study area, as well as measures required to avoid or minimize effects to these species and their habitats. As memorialized in Appendix 4-A, Section 4.6.1, SCE would continue to implement the ETP as part of the Proposed Action. The Licensee will review and update the ETP annually, prior March 1 each year, to account for any changes in resources status. Continued implementation of the ETP would benefit special-status wildlife by ensuring awareness,

and thus improving the effectiveness, of measures to avoid or minimize effects to species described in the Special-Status Bat Protection Measures (Appendix 4-A, Section 4.5.1); the VIPMP (Appendix 4-A, Section 4.5.2); the AMMP (Appendix 4-A, Section 4.5.4); the WMMP (Appendix 4-A, Section 4.5.5); and the TPCLMM (Appendix 4-A, Section 4.5.6).

#### **8.5.2.4 Conclusions – Special-Status Wildlife**

This section provides an overall effect conclusion by species or group of species associated with implementation of the Proposed Action.

##### *SPECIAL-STATUS BIRDS*

The Proposed Action would have a negligible effect on special-status raptors and other special-status birds with implementation of measures, management plans and ETPs described in Appendix 4-A. A summary of measures and programs that would protect special-status birds is provided below.

- Changes in Project operations (ramping rates and increased MIFs).
- Measures included in the SMECP, including restrictions on the timing and method of sediment management.
- Measures included in the VIPMP, including restrictions on the timing, location, and methods for herbicide and pesticide applications.
- Measures included in the AMMP, including:
  - Requirements for ongoing monitoring and reporting of Project-related avian mortalities;
  - Identification of transmission or power poles involved in an avian mortality.
- Implementation of the TPCLMM, including evaluation and replacement of transmission or power poles involved in an avian mortality using raptor-safe design configurations.
- Continued training of Project personnel through implementation of the ETP.

### *SPECIAL-STATUS BATS*

The Proposed Action would have a negligible effect on special-status bat with implementation of measures, management plans and ETPs described in Appendix 4-A. A summary of measures and programs that would protect special-status bats is provided below.

- Changes in Project operations (ramping rates and increased MIFs).
- Measures included in the SMECP, including restrictions on the timing and method of sediment management.
- Measures included in the Special-Status Bat Protection Measure, including:
  - Restrictions on the timing of maintenance of activities potentially affecting day and night roosts;  
  
Site inspections prior to conducting maintenance activities and determining if roosts are occupied. If roosts are occupied, SCE will consult with BLM and CDFW to obtain approval to temporarily exclude the bats until the maintenance work has been completed.
- Measures included in the VIPMP, including restrictions on the timing, location, and methods for herbicide applications.
- Continued training of Project personnel through implementation of the ETP.

### *SPECIAL-STATUS MAMMALS*

The Proposed Action would have a negligible effect on special-status mammals and game mammals with implementation of measures, management plans and ETPs described in Appendix 4-A. A summary of measures and programs that would protect special-status mammals and game mammals is provided below.

- Measures included in the VIPMP, including restrictions on the timing, location, and methods for pesticide applications.
- Measures included in the WMMP, including continued monitoring of wildlife mortalities and inspection and maintenance of wildlife bridges, escape ramps, escape fencing, and hazers/flashers along Project flowlines.
- Continued training of Project personnel through implementation of the ETP.

### 8.5.3 Threatened and Endangered Species

This section provides information on species listed as endangered or threatened under the ESA, as well as species proposed for listing as endangered or threatened, or candidates for proposal (referred to in this section as “federally listed” species).

Table 7.5-7 provides a list of the 16 federally listed species under the jurisdiction of USFWS. Of these species, 13 were eliminated from analysis because the study area is outside the known geographic range of the species and/or does not contain suitable habitat for the species. The remaining three species (two birds and one mammal), are not known to occur in the study area but may potentially occur based on historical occurrences and presence of suitable habitat. A brief discussion of each species is provided below.

#### 8.5.3.1 California Condor

The California condor is listed as endangered under the ESA. There is one record for this species outside the study area, which documents a roosting area located approximately 4.5 miles to the southwest of the Kaweah No. 2 Powerhouse. This species is not known to breed, but may potentially forage, in the study area. Refer to Table 7.5-7 for details.

This species is found mostly below 9,000 feet in open rangelands in the mountain ranges surrounding the southern San Joaquin Valley. As shown in Table 7.5.1, there are approximately 985 acres of annual grasslands and 172 acres of barren lands within 1 mile of the study area that represent suitable foraging habitat for California condor.

There is no Critical Habitat for California condor in the study area; therefore, the Proposed Action would have no effect on Critical Habitat. The closest Critical Habitat is located west of the study area near Kaweah Lake.

Recovery for the species is described in *The Recovery Plan for the California Condor* (USFWS 1996). There are no current recovery actions applicable to the Proposed Action or the study area.

Refer to Section 8.5.2.1 and 8.5.2.3 for a discussion of potential direct and indirect effects to raptors resulting from implementation of the Proposed Action, as well as proposed measures to minimize the potential for effects. There are no interrelated actions or interdependent actions associated with the Proposed Action that would affect California condor. With incorporation of measures described in Section 8.5.2.1 and 8.5.2.3, any effects to California condor would be negligible.

### **8.5.3.2 Southwestern Willow Flycatcher**

The southwestern willow flycatcher is listed as endangered under the ESA. The study area is located outside the breeding range for this species, but individuals may be present during the non-breeding season. Refer to Table 7.5-7 for details.

This species is found in wet meadow and montane riparian habitats at elevations ranging from 2,000 to 8,500 feet in elevation. It most often occurs in broad, open river valleys or large mountain meadows with lush growth of shrubby willows. As shown in Table 7.5.1, there are approximately 363 acres of montane riparian habitat and 103 acres of valley foothill riparian habitat within 1 mile of the study area. In the vicinity of the Kaweah Project, the distribution and abundance of riparian vegetation is limited by the narrow valley bottoms with limited floodplain development and alluvial deposits, steep side slopes, and prevalence of bedrock and coarse substrate along long sections of the river.

There is no Critical Habitat for southwestern willow flycatcher in the study area; therefore, the Proposed Action would have no effect on Critical Habitat. The closest Critical Habitat is located in Kern County.

Recovery for the species is described in *The Final Recovery Plan for the Southwest Willow Flycatcher* (USFWS 2002). The study area is not located within designated recovery units for the species, and there are no current recovery actions applicable to the Proposed Action or the study area.

Refer to Section 8.5.2.1 and 8.5.2.3 for a discussion of potential direct and indirect effects to riparian birds resulting from implementation of the Proposed Action, as well as proposed measures to minimize the potential for effects. There are no interrelated actions or interdependent actions associated with the Proposed Action that would affect southwestern willow flycatcher. With incorporation of measures described in Section 8.5.2.1 and 8.5.2.3, any effects to southwestern willow flycatcher would be negligible.

### **8.5.3.3 Fisher**

As described above, one mammal, the fisher, that is proposed for listing as threatened under the ESA (West Coast Distinct Population Segment [DPS]) may potentially occur in suitable habitat in the study area. There are several records for this species within 5 miles of the study area. Refer to Table 7.5-7 for details.

This species is typically found in large areas of mature, dense conifer forest (e.g., red fir, lodgepole pine, ponderosa pine, mixed conifer, and Jeffery pine forests) with snags and greater than 50% canopy closure, from sea level to 8,000 feet above mean sea level (msl). Mature conifer forest habitat is very limited in the study area. As shown in Table 7.5.1, only 2 acres of conifer habitat (i.e., Sierran mixed conifer) habitat have been mapped within 1 mile of the FERC boundary. Given that the fisher is a shy and secretive animal, and considering the limited amount of habitat in the study area and proximity to human activity, this species is unlikely to den, but may forage in the study area.



Because this species is still currently only proposed for listing, there is no designated Critical Habitat for the species, and no recovery plan has been developed.

Refer to Section 8.5.2.2 and 8.5.2.3 for a discussion of potential direct and indirect effects to mammals resulting from implementation of the Proposed Action, as well as proposed measures to minimize the potential for effects. There are no interrelated actions or interdependent actions associated with the Proposed Action that would affect fisher. With incorporation of measures described in Section 8.5.2.2 and 8.5.2.3, any effects to fisher would be negligible.

#### **8.5.4 Unavoidable Adverse Effects**

There are no unavoidable adverse effects to botanical and wildlife resources under the Proposed Action.

#### **8.5.5 Literature Cited**

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**LIST OF ACRONYMS**


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BLM	Bureau of Land Management
BMP	Best Management Practices
FERC or Commission	Federal Energy Regulatory Commission
Project	Kaweah Project
PUP	Pesticide Use Proposal
RTMP	Road and Trail Management Plan
SCE	Southern California Edison Company
SMECP	Sediment Management and Erosion Control Plan
VIPMP	Vegetation and Integrated Pest Management Plan

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## 8.6 GEOLOGY AND SOILS ENVIRONMENTAL EFFECTS

This section describes potential effects to geology and soils under the Proposed Action for Southern California Edison Company's (SCE) Kaweah Project (Project). Section 3.0 – No-Action Alternative provides a description of current routine operation and maintenance activities and Section 4.0 – Proposed Action identifies changes from the No-Action Alternative. Potential effects to geology and soils were identified based on continued operation and maintenance of the Project under the Proposed Action.

The following potential effects to geology and soils were evaluated:

- Potential effects from ongoing operation and maintenance activities that could result in erosion in natural channels and hillslope instability, including:
  - Forebay spills<sup>1</sup>;
  - Utilizing low-level outlets to drain forebays during Project outages and to conduct sediment management.
- Potential effects on channel topography as a result of sediment management activities at the Kaweah No. 1 and No. 2 intakes.
- Potential effects from erosion as a result of flowline failure.
- Potential effects to soil stability due to disturbance and erosion associated with road and trail maintenance.
- Potential soil contamination from implementation of vegetation and pest management activities (herbicide and pesticide use).

A description of potential effects on flows in the bypass reaches<sup>2</sup> under the Proposed Action is presented in Section 8.2 – Water Use and Hydrology. Potential effects on channel morphology and sediment processes are discussed in Section 8.7 – Geomorphology.

A discussion of the potential effects to geology and soils that could occur as a result of implementation of the Proposed Action, considering new environmental measures; management and monitoring plans; and programs is provided below. Unavoidable adverse effects are also discussed at the end of this section.

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<sup>1</sup> Project forebays include the Kaweah No. 1 Forebay Tank, Kaweah No. 2 Forebay, and Kaweah No. 3 Forebay.

<sup>2</sup> A bypass reach is a segment of a river downstream of a diversion facility where Project operations result in the diversion of a portion of the water from that reach.

### **8.6.1.1 Effects on Natural Channel and Hillslope Stability from Ongoing Project Operation and Maintenance Activities**

Under the Proposed Action, SCE would continue to implement Project operation and maintenance activities as described under the No-Action Alternative. Ongoing operation and maintenance activities that have the potential to affect natural channel and hillslope stability include: (1) spills from Project forebays; and (2) utilizing low-level outlets to drain forebays during Project outages and sediment management. These activities could cause erosion to occur in natural channels associated with these facilities and affect hillslope stability, as described below.

Under the Proposed Action, forebay spills and draining of flowlines and forebays during Project outages and sediment management would continue to be implemented, as described under the No-Action Alternative. Specifically, in the event of an unplanned powerhouse outage (i.e., unit trips), water in the flowlines continues to flow (drain) into the forebays until the diversion is turned out (closed). Water entering the forebays can either be: (1) passed through the generating units at the powerhouse (if operational); (2) released through the powerhouse bypass valve (if present); or (3) released from each forebay via Project spillways/spillway chutes that direct the overflow into natural channels for conveyance to the Kaweah River (refer to Section 7.6 – Geology and Soils).

Under the Proposed Action, draining of the flowlines and forebays during planned Project outages and sediment management, which includes opening low-level outlets to release water and flush sand and fine sediment from the facilities and into natural channels would continue to be implemented, as described under the No-Action Alternative.

Inherent channel and hillslope stability in the vicinity of the Kaweah Project is controlled by the geologic setting and process history. The Project facilities are situated on highly-resistant granitic rock. Unconsolidated sediments in the watershed are generally limited to surface soils, and recent alluvium deposited in the stream and river courses and associated terraces. Forebay spills associated with powerhouse outages, forebay and flowline maintenance, and/or other operational or maintenance practices occur into adjacent bedrock-bounded natural channels. Use of these channels has occurred for decades and initial scour to bedrock and associated hillslope adjustment has long since stabilized and is not likely to change due to periodic spills or use of low-level outlets to drain forebays for operation and maintenance activities.

Under the Proposed Action, forebay spills and sediment management activities would continue to be implemented as described in the Sediment Management and Erosion Control Plan (SMECP) (Appendix 4-A, Section 4.1.3). This plan memorializes existing sediment management activities, including methods to minimize erosion within the natural channels that could affect channel and hillslope stability. In particular, due to the size of the Kaweah No. 3 Forebay, water drained from the forebay would be slowly metered to minimize sediment disturbance in the forebay pool and the volume of water discharged to the natural channel and the Kaweah River. Therefore, continued use of natural channels for Project operation and maintenance activities that would be implemented under the Proposed Action would have a negligible effect on natural channel and hillslope stability.

### **8.6.2 Effects on Natural Channel Topography as a Result of Sediment Management Activities at the Kaweah No. 1 and No. 2 Intakes**

Under the Proposed Action, sediment management activities would continue to be implemented at Project facilities to prevent deposits of sediment from building up or blocking Project flowlines and intakes as described under the No-Action Alternative. Sediment management activities include sediment removal/flushing at the Kaweah No. 1 Intake Sandbox and sediment removal at the Kaweah No. 2 Intake. These activities could affect natural channel topography by altering sediment transport and deposition processes in the bypass reaches.

As described in the SMECP, at the Kaweah No. 1 Intake Sandbox, the low-level outlet at the sandbox would be routinely opened during high flows to minimize accumulation of sand/fine sediment and transport it back into the active stream channel. If larger substrate becomes trapped in the sandbox, it would be removed and placed along the margin of the active channel during the fall maintenance outage where it can be entrained into the channel during high-flow events. At the Kaweah No. 2 Intake, during high-flow events, large boulders and rocks accumulate on the intake grate obstructing flow into the intake and, at times, allowing sediment to build up near the intake. When necessary, this rock debris would be removed and placed downstream of the diversion structure to improve flow into the intake and prevent facility damage.

Sediment management at intakes would occur during high flows when natural sediment transporting processes are typically occurring. Removed sediment would be placed adjacent to the natural channel to allow for entrainment and routing during high flows. Generally the volume of sediment removed is relatively small, is composed of native material, and any effects on natural topography would be temporary.

Therefore, continued sediment management activities that would be implemented under the Proposed Action would have a negligible effect on natural channel topography in the bypass reaches.

### **8.6.3 Effects from Erosion as a Result of Flowline Failure**

The Project utilizes flowlines to transport water from diversion intakes to powerhouses. Accidental flowline breaks have the potential to erode hillslopes adjacent to the break. Under the Proposed Action, SCE would implement the SMECP (Appendix 4-A, Section 4.1.3). This plan memorializes sediment management activities, and inspection protocols and measures to be implemented in the event of a flowline failure on the Kaweah No. 1 or No. 2 flowlines. These protocols define routine inspections, identify potential maintenance issues, and define an approach to address the flowline failure or canal break considering engineering design and environmental resource protection.

Inspection protocols and measures included in the SMECP would continue to provide clear steps for timely repair of the flowline and to address any erosion in consultation with resource agencies. Therefore, effects are considered negligible.

#### **8.6.4 Effect on Soil Stability Due to Road and Trail Maintenance**

Under the Proposed Action, Project roads and trails would continue to be regularly inspected and maintained during normal Project operations to maintain access to Project facilities, protect worker/public health and safety, and minimize erosion and sedimentation. Road and trail maintenance activities could have an effect on soil stability depending on work implemented and the location.

As described in the Road and Trail Management Plan (RTMP) (Appendix 4-A, Section 4.3.1), implementation of major road and trail maintenance would be implemented in accordance with either Tulare County or Bureau of Land Management (BLM) standards depending on land jurisdiction and in consultation with the respective agency, as applicable. This consultation would include review of measures to protect environmental and cultural resources, and Best Management Practices (BMP). BMPs would include measures to protect against potential soil instability, erosion, and sedimentation as a result of the activity. In addition, as applicable, resource agency permits and approvals would be obtained prior to implementation of the maintenance activity.

Therefore, continued road and trail maintenance activities that would be implemented under the Proposed Action would have a negligible effect on soil stability.

##### **8.6.4.1 Effects on Soil Contamination Due to Vegetation and Pest Management**

Under the Proposed Action, vegetation management, including the use of herbicides, would continue to be implemented at Project facilities consistent with the No-Action Alternative. Soils could potentially be contaminated as a result of application of herbicides.

As described in the Vegetation and Pest Management Plan (VIPMP) (Appendix 4-A, Section 4.5.2), herbicide application on BLM lands would be conducted in accordance with a BLM-approved Pesticide Use Permit (PUP), and herbicide application on private lands would be implemented in accordance with a Tulare County-approved PUP. Each PUP defines the herbicides that can be used, species to be treated, treatment methods, treatments sites, and rates of application.

Therefore, continued vegetation management activities, including the use of herbicides, that would be implemented under the Proposed Action would have a negligible effect on soils.

#### **8.6.5 Unavoidable Adverse Effects**

There are no unavoidable adverse effects to geology and soils under the Proposed Action.



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**LIST OF ACRONYMS**


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cfs	cubic feet per second
FERC or Commission Project	Federal Energy Regulatory Commission Kaweah Project
SCE	Southern California Edison Company
SMECP	Sediment Management and Erosion Control Plan

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## 8.7 GEOMORPHOLOGY ENVIRONMENTAL EFFECTS

This section describes potential effects to channel geomorphology (sediment supply, channel morphology, and sediment conditions) under the Proposed Action for Southern California Edison Company's (SCE) Kaweah Project (Project). Section 3.0 – No-Action Alternative provides a description of current routine operation and maintenance activities and Section 4.0 – Proposed Action identifies changes from the No-Action Alternative. Potential effects to channel geomorphology were identified based on continued operation and maintenance of the Project under the Proposed Action.

The following potential effects to channel geomorphology were evaluated:

- Potential effects on channel geomorphology in the bypass reaches<sup>1</sup> associated with changes in Project operations, including:
  - Minimum instream flow releases; and
  - Ramping rates.
- Potential effects from ongoing operation and maintenance activities that could result in erosion and sediment transport from natural channels into the Kaweah River, including:
  - Forebay spills<sup>2</sup>; and
  - Utilizing low-level outlets to drain forebays during Project outages and to conduct sediment management.
- Potential effects on channel geomorphology as a result of sediment management activities at the Kaweah No. 1 and No. 2 intakes.

A description of potential effects on flows in the bypass reaches under the Proposed Action is presented in Section 8.2, and effects to geology and soils associated with operation and maintenance of the Project is presented in Section 8.6.

A discussion of the potential effects to channel geomorphology that could occur as a result of implementation of the Proposed Action, considering new environmental measures; management and monitoring plans; and programs is provided below. Unavoidable adverse effects are also discussed at the end of this section.

<sup>1</sup> A bypass reach is a segment of a river downstream of a diversion facility where Project operations result in the diversion of a portion of the water from that reach.

<sup>2</sup> Project forebays include the Kaweah No. 1 Forebay Tank, Kaweah No. 2 Forebay, and Kaweah No. 3 Forebay.

## **8.7.1 Effects on Channel Geomorphology Due to Changes in Project Operations**

Under the Proposed Action, minimum instream flow releases would be increased during select months and water years to enhance habitat for aquatic species and to better simulate a more natural hydrograph. In addition, ramping rates would be modified under the Proposed Action to allow for greater flexibility in operating the Kaweah No. 1 and No. 2 powerhouses. Potential effects to channel geomorphology that could occur as a result of these modifications are discussed below. Detailed information about the minimum instream flows and ramping rates that would occur under the Proposed Action are available in Appendix 4-A, Section 4.1.1 – Instream Flow Measures.

### **8.7.1.1 Minimum Instream Flow Releases**

Under the Proposed Action, changes in minimum instream flows has the potential to affect channel geomorphology in the bypass reaches by altering the timing of initiation or cessation of sediment transport. Changes to minimum instream flows would modestly increase baseline flows, but would remain well below the threshold for incipient motion for all sediment size classes and would have no effect on geomorphology. Therefore, the modified minimum instream flow releases that would be implemented under the Proposed Action would have a negligible effect on channel geomorphology on the bypass reaches.

### **8.7.1.2 Ramping Rates**

Under the Proposed Action, changes in up-ramping rates has the potential to effect channel geomorphology in the bypass reaches by altering the timing of initiation or cessation of sediment transport. Under the Proposed Action down-ramping rates at both the Kaweah No. 1 and Kaweah No. 2 diversions would be no more than 30% of the existing streamflow per hour. At the Kaweah No. 1 Diversion, up-ramping rates would not increase greater than 24 cubic feet per second (cfs) per hour. At the Kaweah No. 2 Diversion, up-ramping rates would not increase greater than 25 cfs per hour when the existing streamflow is  $\leq 40$  cfs. When flows are  $\geq 40$  cfs there is no up-ramping requirement.

During periods when sediment transport is occurring, the rate changes in discharge attributable of down ramping at the Kaweah No. 1 and No. 2 diversions relative to discharge in the bypass reaches would have a negligible effect on sediment transport processes. Similarly, during periods of sediment transport, up-ramping rates at both the Kaweah No. 1 and No. 2 diversions are small relative to discharge in the bypass reaches and would have a negligible effect on sediment transport processes. Therefore, the modified ramping rates that would be implemented under the Proposed Action would have a negligible effect on channel geomorphology on the bypass reaches.

## 8.7.2 Effects on Channel Geomorphology from Ongoing Project Operation and Maintenance Activities

Under the Proposed Action, SCE would continue to implement Project operation and maintenance activities as described under the No-Action Alternative. Ongoing operation and maintenance activities that have the potential to affect channel geomorphology in the Kaweah River include: (1) spills from the Kaweah No. 1, No. 2, and No. 3 forebays; and (2) utilizing low-level outlets to drain the Kaweah No. 1, No. 2, and No. 3 flowlines and forebays during planned Project outages and sediment management. These activities could cause erosion to occur in natural channels associated with these facilities and transport of sediment from these channels into the Kaweah River, as described below.

Under the Proposed Action, forebay spills and draining of flowlines and forebays during planned Project outages and sediment management would continue to be implemented, as described under the No-Action Alternative. In the event of an unplanned powerhouse outage (i.e., unit trips), water in the flowlines continues to flow (drain) into the forebays until the diversion is turned out (closed). Water entering the forebays can either be: (1) passed through the generating units at the powerhouse (if operational); (2) released through the powerhouse bypass valve (if present); or (3) released from each forebay via Project spillways/spillway chutes that direct the overflow into natural channels for conveyance to the Kaweah River (refer to Section 7.6 – Geology and Soils).

Under the Proposed Action, draining of the flowlines and forebays during Project outages and sediment management, which includes opening low-level outlets to release water and flush sand and fine sediment from the facilities and into natural channels would continue to be implemented, as described under the No-Action Alternative.

Use of these natural channels during spills and opening low-level outlets to drain flowlines and forebays has occurred for decades. Initial scour to bedrock in these channels has long since stabilized and is not likely to change. In addition, the total volume of sediment mobilized during spills and operations activities is small relative to background sediment volume of the Kaweah River. Furthermore, the volume of sediment to reach the river channel is smaller than the total mobilized, if any. The relative volume of water discharged compared to the river is small and the sediment transport capacity would not be affected.

Under the Proposed Action, forebay spills and sediment management activities would continue to be implemented as described in the Sediment Management and Erosion Control Plan (SMECP) (Appendix 4-A, Section 4.1.3). This plan memorializes existing sediment management activities, including methods to minimize erosion within the natural channels. In particular, due to the size of the Kaweah No. 3 Forebay, water drained from the forebay would be slowly metered to minimize sediment disturbance in the forebay pool and the volume of water discharged to the natural channel and the Kaweah River. Therefore, continued use of natural channels for Project operation and maintenance activities that would be implemented under the Proposed Action would have a negligible effect on channel geomorphology in the Kaweah River.

### **8.7.3 Effects on Channel Geomorphology from Sediment Management Activities at the Kaweah No. 1 and No. 2 Intakes**

Under the Proposed Action, sediment management activities would continue to be implemented at Project facilities to prevent deposits of sediment from building up or blocking Project flowlines and intakes as described under the No-Action Alternative. Sediment management activities include sediment removal/flushing at the Kaweah No. 1 Intake Sandbox and sediment removal at the Kaweah No. 2 Intake. These activities could alter sediment transport and deposition processes in the bypass reaches.

As described in the SMECP, at the Kaweah No. 1 Intake Sandbox, the low-level outlet at the sandbox would be routinely opened during high flows to minimize accumulation of sand/fine sediment and transport it back into the active stream channel. If larger substrate becomes trapped in the sandbox, it would be removed and placed along the margin of the active channel during the fall maintenance outage where it can be entrained into the channel during high-flow events. At the Kaweah No. 2 Intake, during high-flow events, large boulders and rocks accumulate on the intake grate obstructing flow into the intake and, at times, allowing sediment to build up near the intake. When necessary, this rock debris would be removed and placed downstream of the diversion structure to improve flow into the intake and prevent facility damage.

Sediment management at intake structures would occur during high flows when natural sediment transporting processes are typically occurring. Removed sediment would be placed adjacent to the natural channel to allow for entrainment and routing during high flows. The relatively small amount of coarse material cleared would be re-incorporated into the background bedload volume, maintaining sediment transport and deposition processes in the bypass reaches.

Therefore, continued sediment management activities that would be implemented under the Proposed Action would have a negligible effect on channel geomorphology in the bypass reaches.

### **8.7.4 Unavoidable Adverse Effects**

There are no unavoidable adverse effects to geomorphology under the Proposed Action.

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**LIST OF ACRONYMS**


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BLM	Bureau of Land Management
BMP	Best Management Practices
cfs	cubic feet per second
FERC or Commission Project	Federal Energy Regulatory Commission Kaweah Project
PUP	Pesticide Use Proposal
RTMP	Road and Trail Management Plan
SCE	Southern California Edison Company
TPCLMM	Transmission, Power, Communication Line Maintenance Measure
VIPMP	Vegetation and Integrated Pest Management Plan

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## 8.8 RIPARIAN RESOURCES ENVIRONMENTAL EFFECTS

This section describes the potential effects to riparian resources, including wetland habitat, under the Proposed Action for Southern California Edison Company's (SCE) Kaweah Project (Project). Impacts on riparian resources and wetland habitat are evaluated in this analysis based on the resources present in the study area, and activities to be implemented under the Proposed Action. The study area is defined as the bypass reaches<sup>1</sup> and lands within the Federal Energy Regulatory Commission (FERC or Commission) Project boundary where operations and/or maintenance activities are conducted, plus a protective buffer. Section 3.0 – No-Action Alternative provides a description of current routine operation and maintenance activities and Section 4.0 – Proposed Action identifies changes from the No-Action Alternative.

The following potential effects to riparian resources and wetland habitat were evaluated:

- Potential effects on the abundance and distribution of riparian vegetation in the bypass reaches from changes in Project operations, including:
  - Down-ramping rates; and
  - Minimum instream flow releases.
- Direct loss of riparian vegetation and wetland habitat from Project maintenance activities, including:
  - Vegetation management;
  - Road and trail maintenance; and
  - Transmission, power, and communication line maintenance.

Potential effects of the Proposed Action on flows in the bypass reaches are discussed in Section 8.2 – Water Use and Hydrology. Potential effects on channel morphology and sediment processes are discussed in Section 8.5 – Geomorphology. Potential effects on aquatic species are discussed in Section 8.4 – Fish and Aquatic Resources. Potential effects on special-status plants and mosses that have the potential to occur in riparian and wetland habitats are identified in Section 8.5 – Botanical and Wildlife Resources.

A description of potential effects to riparian resources and wetland habitat from implementation of the Proposed Action, considering new environmental measures; management and monitoring plans; and programs is provided below. Unavoidable adverse effects are also discussed at the end of this section.

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<sup>1</sup> A bypass reach is a segment of a river downstream of a diversion facility where Project operations result in the diversion of a portion of the water from that reach.

### **8.8.1 Effects on the Abundance and Distribution of Riparian Vegetation in Bypass Reaches from Changes in Project Operations**

Riparian vegetation patterns (i.e., distribution, abundance, community composition, and age class structure) in the vicinity of the Kaweah Project are largely controlled by the geomorphic characteristics of the watershed and the hydrologic regime. In the Kaweah Project study area, the distribution and abundance of riparian vegetation are limited by the narrow valley bottoms with limited floodplain development and alluvial deposits, steep side slopes, and prevalence of bedrock and coarse substrate along long sections of the river (reference). In reaches where the valley bottom broadens, riparian vegetation establishes on the floodplain and channel bars.

Riparian vegetation patterns also reflect the recent hydrologic regime, which influences recruitment and establishment of vegetation. Flows can affect the formation of geomorphic landforms (e.g., floodplains and bars), the quantity and quality of substrate available for supporting riparian vegetation (e.g., recruitment sites), transport of seeds and stems, and viability of riparian vegetation once established. Flow attributes that are important for maintaining the distribution and structural and compositional complexity of riparian species include: (1) the frequency of high magnitude scouring or “re-setting” flows; (2) the frequency, magnitude, and timing of seed setting flows (recruitment flows); (3) hydrograph shape/recession rates of spring flows; and (4) inter-annual variability. Flow attributes during ecologically-sensitive time periods for riparian species (i.e., seed release, initial establishment, growing season) are particularly important for maintaining riparian resources. Riparian vegetation often establishes in elevation zones where water is available during the drier months and the plants are not too close the channel and susceptible to damage by high flows.

The Proposed Action includes modifications to ramping rates and to minimum instream flow releases in the bypass reaches (Appendix 4-A, Section 4.1.1 – Instream Flow Measures). Provided below is an analysis of potential effects of these actions on riparian and wetland resources. The Proposed Action would maintain the frequency of high magnitude flow events that maintain riparian vegetation consistent with the No-Action Alternative.

#### **8.8.1.1 Ramping Rates**

The existing FERC license (No-Action Alternative) requires SCE to operate the Kaweah No. 1 and No. 2 diversion dams and the Kaweah No. 1 and No. 2 powerhouses such that they do not alter stream flows downstream of the facilities at a rate greater than 30% of the existing streamflow per hour. This condition applies to down ramp and up ramp rates. Under the No-Action Alternative, natural high flow events occurred during spring snowmelt downstream of the Project diversions (bypass reaches). Typically recession rates were less than 1 inch per day during the recruitment period (seed establishment and growing season) and always less than the maximum rate identified in the literature (e.g., 3.9 inches per day) (Braatne et al. 1996; Amlin and Rood 2002; Shaforth et al. 2017; SCE 2019a) necessary to provide riparian seedling recruitment (Section 7.8.2.1 and AQ 1 – TSR [SCE 2019a, SD A]). The Project operations (No-Action Alternative), including the ramping rates, maintained riparian recruitment process.

Under the Proposed Action, down ramping rates in the Instream Flow Measure, downstream of the Kaweah No. 1 and No. 2 diversion dams, will remain the same as those in the No-Action Alternative (30% of the existing streamflow per hour). The diversions are also the locations that control down ramping below the powerhouses. Under the Proposed Action, therefore, high flow events will continue to occur during spring snowmelt in all of the bypass reaches and recession rates will continue to be typically less than 1 inch per day during the recruitment period (seed establishment and growing season) and always less than the maximum rate identified in the literature (e.g., 3.9 inches per day), necessary to provide riparian seedling recruitment

Therefore, the Proposed Action would maintain riparian resources in the bypass reaches by maintaining conditions suitable for riparian recruitment, including the magnitude, frequency, timing, and down-ramp rates of spring flows, consistent with the No-Action Alternative (SCE 2019a and 2019b).

#### **8.8.1.2 Minimum Instream Flow Releases**

Under the No-Action Alternative, minimum instream flows are required in the bypass reaches. These requirements are provided in Table 3-8 in Section 3.0 – No-Action Alternative. The minimum instream flows under the No-Action Alternative in the Kaweah River bypass reach are based on a dry/normal year type designation. In the East Fork Kaweah River bypass reach, the minimum instream flows are the same for both dry and normal years. Instream flow requirements on the Kaweah River and East Fork Kaweah River are higher in spring and early summer, and lower in the fall and winter.

Under the Proposed Action, minimum instream flow releases would be increased during select months and water years to enhance instream habitat and to better simulate a more natural hydrograph, as summarized in Table 8.8-1. Monthly minimum instream flow requirements in dry and normal years are the same or greater than those under the No-Action Alternative. Greater minimum instream flows at the end of the dry summer would maintain/enhance riparian resources along the bypass reaches by increasing the potential for water availability during the driest months of the year that can limit riparian vegetation health and survival. In the Kaweah River, July instream flow requirements are 10 cubic feet per second (cfs) greater under the Proposed Action Alternative in dry years and 9 cfs greater in normal years compared to the No-Action Alternative. In the East Fork Kaweah River, minimum instream flow requirements are 10 cfs greater in July, 15 cfs greater in August and September, and 5 cfs greater in October under the Proposed Action than the No-Action Alternative. Therefore, the minimum instream flows under the Proposed Action would maintain/enhance riparian resources in the bypass reaches.

### **8.8.2 Direct Loss of Riparian Vegetation and Wetland Habitat during Project Maintenance**

Under the Proposed Action, vegetation management and clearance, and road and trail maintenance could result in loss of riparian vegetation and wetland habitat.

Under the Proposed Action, SCE would continue to implement vegetation management as memorialized in the Vegetation and Integrated Pest Management Plan (VIPMP), included in Appendix 4-A, Section 4.5.2. In addition, SCE would continue to conduct vegetation clearance within 15 feet on either side of transmission, power, and communication as described in the Transmission, Power, and Communication Line Maintenance Measure (TPCLMM), included in Appendix 4-A, Section 4.5.6. Vegetation management/vegetation clearance would be conducted at locations along linear Project facilities (i.e., roads, trails, and transmission, power, and communication lines) that intersect the Kaweah River or other drainages and ponds at several locations. Removal of vegetation as part of the VIPMP and the TPCLMM could potentially remove riparian vegetation and wetland habitat.

Under the Proposed Action, SCE would continue to implement road and trail maintenance as memorialized in the Project Road and Trail Management Plan (RTMP) included in Appendix 4-A, Section 4.3.1. Road maintenance including repair, installation, or replacement of culverts and other drainage features could result in effects on riparian vegetation or wetland habitat.

Under the Proposed Action, SCE would continue to implement measures to protect riparian vegetation and wetland habitat during maintenance activities as described in the VIPMP, TPCLMM, and RTMP, including:

Measures to reduce potential effects to riparian vegetation and wetland habitat during vegetation maintenance, including:

- Vegetation removal will be limited to the identified buffer areas determined to be necessary to protect human health and safety.
- Riparian vegetation will not be removed. If removal of riparian vegetation is required to protect worker/public safety and Project facilities, SCE will consult with appropriate resource agencies and obtain approvals prior to removal.
- The Licensee to consult annually with U.S. Bureau of Land Management (BLM) and/or Tulare County prior to vegetation maintenance to discuss the method, location, and timing of activities and Best Management Practices (BMP) and measures, as appropriate, for the protection of environmental resources, including riparian vegetation and wetland habitat.

Measures to reduce potential effects from use of herbicides, including:

- On BLM-owned lands, herbicides will be applied in accordance with a BLM-approved Pesticide Use Proposal (PUP). On SCE-owned lands, herbicides will be applied in accordance with a Tulare County-approved PUP.
  - Each PUP will define the herbicide that can be used, species to be treated, treatment methods, treatments sites, and rates of application.
- To minimize the risk of herbicides inadvertently entering waters, no herbicides will be applied within 50 feet of streams or drainages.
- Herbicide applications shall not occur when weather parameters exceed label requirements, during precipitation, or when there is a forecast of greater than a 50% chance of precipitation in the next 48 hours.
- Herbicide use will be limited to days when measured wind conditions are less than 5 miles per hour and shall be applied in a downwind direction from adjacent trees or shrubs.

Measures to reduce potential effects to riparian vegetation and wetland habitat during road and trail maintenance, including:

- All necessary permits and approvals will be obtained prior to implementation of major road maintenance (e.g., U.S. Army Corps of Engineers 404 Permit, State Water Board 401 Water Quality Certification, and California Department of Fish and Wildlife Streambed Alteration Agreement). If required, all measures and conditions established by resource agencies in these permits and agreements will be implemented as part of major road maintenance.

Finally, under the Proposed Action, the VIPMP would minimize the potential for degradation of riparian and wetland habitat through implementation of a new measure to reduce the spread or introduction of non-native invasive plants:

- Licensee will wash heavy equipment previously used on non-paved surfaces, outside of the watershed, with power or high-pressure washers to remove soil, seeds, vegetation, or other seed bearing material before using on Project operation and maintenance activities.

Overall, the Proposed Action would enhance riparian resources by increasing minimum instream flows (base flows); thus benefiting riparian vegetation and wetland habitats along 8.8 miles of bypass reaches. Therefore, with implementation of the VIPMP, TPCLMM, and RTMP effects from maintenance activities under the Proposed Action would be considered negligible.

### **8.8.3 Conclusion – Riparian Resources**

Overall, the Proposed Action would enhance riparian vegetation along approximately 4.1 miles of the Kaweah River and 4.7 miles of the East Fork Kaweah River. The minimum instream flows under the Proposed Action would maintain/enhance riparian resources in the bypass reaches. Continued implementation of the measures in the VIPMP, TPCLMM, and RTMP, and the environmental training program under the Proposed Action protects riparian vegetation and wetland habitat during maintenance activities. In addition implementation of new measures to prevent the spread or introduction of noxious weed would benefit riparian and wetland habitat. Overall, the Proposed Action would enhance riparian resources and wetland habitats.

### **8.8.4 Unavoidable Adverse Effects**

There are no unavoidable adverse effects to riparian resources under the Proposed Action.

### **8.8.5 Literature Cited**

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- SCE. 2019b. AQ 5 – Geomorphology Technical Study Report, Kaweah Project. December. Available in SCE's Application for New License, Supporting Document A.
- Shafroth, P.B., K.J. Schlatter, M. Gomez-Sapiens, E. Lundgren, M.R. Grabau, J. Ramirez-Hernandez, J.E. Rodriguez-Burgueno, and K.W. Flessa. 2017. A large-scale environmental flow experiment for riparian restoration in the Colorado River Delta. *Ecological Engineering*. 106: 645-660.

## **TABLES**

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**Table 8.8-1. Comparison of Existing Minimum Flow Requirements and Modified Minimum Flow Requirements**

Month	No-Action Alternative		Proposed Action	
	Normal Year (cfs)	Dry Year (cfs)	Normal Year (cfs)	Dry Year (cfs)
<b>Kaweah River</b>				
January	20	10	20	20
February	20	10	20	20
March	30	20	30	20
April	30	30	30	30
May	30	30	30	30
June	30	30	30	30
July	20	10	20	20
August	20	10	20	10
September	11	5	20	5
October	11	5	11	5
November	11	5	11	5
December	11	5	11	10
<b>East Fork Kaweah River</b>				
January	5	5	10	5
February	5	5	10	5
March	10	10	20	10
April	10	10	20	10
May	10	10	20	10
June	10	10	20	10
July	10	10	20	10
August	5	5	20	5
September	5	5	20	5
October	5	5	10	5
November	5	5	10	5
December	5	5	10	5

Note: The minimum instream flows are as shown above or Natural Flow - 3 cfs, whichever is lower. A total of 3 cfs is required to meet SCE's pre-1914 consumptive water right delivery obligation.

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**LIST OF ACRONYMS**


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BLM	Bureau of Land Management
ERMA	Extensive Recreation Management Area
FERC or Commission	Federal Energy Regulatory Commission
GIS	Geographic Information System
Project	Kaweah Project
RMP	Resource Management Plan
SCE	Southern California Edison Company

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## **8.9 LAND USE ENVIRONMENTAL EFFECTS**

This section describes the potential effects related to land use and management under the Proposed Action for Southern California Edison Company's (SCE) Kaweah Project (Project). Section 3.0 – No-Action Alternative provides a description of current routine operation and maintenance activities and Section 4.0 – Proposed Action identifies changes from the No-Action Alternative. Potential effects related to land use and management were identified based on continued operation and maintenance of the Project under the Proposed Action.

The following potential effects related to land use and management were evaluated:

- Potential effects that could occur as a result of Federal Energy Regulatory Commission (FERC or Commission) boundary modifications, including those related to:
  - Land management and jurisdiction;
  - Private property rights;
  - Conflicts with land management plans and policies;
  - Land use designations; and
  - Specially designated areas.

A discussion of the potential effects related to land use and management that could occur as a result of implementation of the Proposed Action, considering new environmental measures; management and monitoring plans; and programs is provided below. Unavoidable adverse effects are discussed at the end of this section.

### **8.9.1 FERC Project Boundary Modifications**

Under the Proposed Action, the FERC Project boundary would be modified to: (1) include all lands necessary for operation and maintenance of the Project; (2) remove lands no longer necessary for operation and maintenance of the Project; and (3) correct known errors in the current Exhibit G for the Project. Specific FERC Project boundary modifications that would occur under the Proposed Action are described in detail in Section 4.0 – Proposed Action and graphically depicted on Maps 4-1a through 4-1h. Detailed maps and specific parcel and acreage information are provided in Exhibits A and G of the License Application. Potential effects related to land use and management that could occur as a result of the proposed FERC boundary modifications are discussed below.

### **8.9.1.1 Land Management and Jurisdiction**

The FERC Project boundary is an administrative marker that delineates the lands that are necessary for operation and maintenance of the Project and for other project purposes, such as protection of environmental resources, as designated in the Project license (FERC 2012). Under both the No-Action and Proposed Action alternatives, the land that is encompassed by the FERC Project boundary would be under FERC jurisdiction and therefore would be subject to all of the terms and conditions of the new license. Conversely, land that lies outside of the FERC Project boundary would not be under FERC jurisdiction, but would be managed according to existing Tulare County and Bureau of Land Management (BLM) plans and policies. Adjustments to the Project boundary would provide an overall benefit by ensuring that only those lands necessary for the safe and efficient operation and maintenance of the Project are included within the FERC Project boundary.

### **8.9.1.2 Private Property Rights**

The current FERC Project boundary encompasses private land that is owned by SCE, private land owned by other private parties, and public land managed by the BLM. Under the Proposed Action, the proportion of private and public lands that are encompassed by the FERC Project boundary would change slightly, but land ownership (and jurisdiction) would not change.

The presence of a FERC Project boundary has no effect on private property rights (FERC 2012). Whatever rights private property owners currently have (e.g., rights acquired in fee title, easements and rights-of-way) would continue whether their land is located within or outside the FERC Project boundary. Therefore, the FERC Project boundary modifications that would be implemented under the Proposed Action would have no effect on private property rights.

### **8.9.1.3 Potential Conflicts with Land Management Plans and Policies**

Private land located within or outside of the FERC Project boundary is subject to the provisions contained in the Tulare County General Plan (Tulare County 2012). Private land within the Three Rivers Urban Development Boundary is also subject to the Three Rivers Community Plan 2018 Update (Tulare County 2018). Public lands under BLM management, whether inside or outside of the FERC Project boundary, are subject to the goals, objectives, and management actions contained in the Bakersfield Field Office Resource Management Plan (Bakersfield RMP) (BLM 2014). An overview of these plans and how they relate to the Project is provided in the LAND 1 – Land Use Technical Study Report (SCE 2019), which is included in Supporting Document A (SD A).

Operation and maintenance of the Project is consistent with the goals, objectives, policies and management measures outlined in the above reference plans. Furthermore operation and maintenance of the Project does not conflict with any existing or planned land uses outlined in these plans. Under the Proposed Action, operation and maintenance of the Project would continue to conform to the goals, objectives, policies

and measures outlined in the BLM's Bakersfield RMP, the Tulare County General Plan and the Three Rivers Community Plan 2018 Update. Therefore, the Proposed Action would have no effect related to established land management plans and policies.

#### **8.9.1.4 Land Use Designations**

Land use designations would not change as a result of adding or removing land to the FERC Project boundary. All lands that would be added to, or removed from, the FERC Project boundary would continue to maintain the same land use designations identified in the Tulare County General Plan (Tulare County 2012) and the Three Rivers Community Plan 2018 Update (Tulare County 2018), depending upon location. Similarly, land uses identified in the BLM's Bakersfield RMP (BLM 2014) would not change. Land uses that are allowed under the No-Action Alternative would continue to be allowed under the Proposed Action. Therefore, the Proposed Action would have no effect on land use designations.

#### **8.9.1.5 Specially Designated Areas**

Some Project roads and trails are located within the BLM's Case Mountain Extensive Recreation Management Area (ERMA), which is managed in accordance with the BLM's Bakersfield RMP (BLM 2014). Otherwise, no other Project facilities are located within a Specially Designated Area such as a Wilderness Area. In addition, none of the bypass reaches have been found suitable, eligible or designated as Wild and Scenic under either the California or National Wild and Scenic River acts. Project roads and trails that are located within the Case Mountain ERMA would continue to be operated and maintained in a manner that is consistent with the goals and objectives established for the Case Mountain ERMA, regardless of the FERC Project boundary modifications. Therefore, the Proposed Action would have no effect on Specially Designated Areas.

#### **8.9.2 Other Land Use Issues**

The BLM allows livestock grazing on BLM-administered lands in the Kaweah River Watershed, including certain lands in the vicinity of the Project. Map 7.9-2 shows the grazing allotments present within the Watershed based on Geographic Information System (GIS) data published by the BLM (BLM 2016). An allotment is a designated area of land available for livestock grazing.

The BLM and/or private parties have erected fencing in various locations to contain livestock to designated allotments. SCE is not responsible for installing or maintaining non-Project fencing associated with BLM livestock grazing allotments. Cattle grazing in the vicinity of the Kaweah No. 3 Forebay is contributing to erosion below the forebay. Accordingly, and consistent with 18 Code of Federal Regulations Part 12, SCE installed a fence to keep cattle away from the forebay to protect the structural integrity of this facility. This fence is considered a Project fence and is referred to as the Kaweah No. 3 Forebay Fence.

At the request of the BLM, and consistent with the LAND 3 – Land Use Technical Study Plan, SCE mapped the location and documented the condition of non-Project fencing in the vicinity of the Kaweah No. 2 and Kaweah No. 3 flowlines (including the associated forebays) and along a 1.5-mile long section of Craig Ranch Road. The results of this effort are depicted on Maps LAND 3-1a-k in the LAND 3 – Technical Study Report (SD A). As indicated on these maps, the existing non-Project fencing that was mapped as part of the study effort is fragmented, discontinuous, and generally in fair to poor condition because it is not being maintained by the BLM or private property owners.

As stated in SCE’s previous filings, SCE does not believe that the Project flowlines effect cattle grazing opportunities or other uses on BLM land. As shown on Map 7.9-2, only small portions of the Project flowlines intersect or cross BLM grazing allotments. The Kaweah No. 1 Flowline borders the northeast corner of a cattle allotment. However, the entire Kaweah No. 1 flowline is elevated and is therefore not considered a hazard to cattle or impediment to grazing. The Kaweah No. 2 Flowline intersects one boundary corner of a cattle allotment, and the flowline is elevated in that location. A small portion of the Kaweah No. 3 Flowline bisects the far west corner of a grazing allotment, but this portion of the flowline traverses a steep slope that is not conducive to cattle grazing.

As previously stated, SCE does not believe it should be responsible for erecting or maintaining non-Project fencing along the Project flowlines. It is unreasonable for the BLM to expect SCE to control land uses on BLM land and/or private property, or to maintain non-Project fencing to reduce operational costs for private parties leasing grazing rights from the BLM.

### **8.9.3 Unavoidable Adverse Effects**

There are no unavoidable adverse effects to land use or management under the Proposed Action.

### **8.9.4 Literature Cited**

BLM (U.S. Bureau of Land Management). 2014. Bakersfield Field Office Resource Management Plan. December. Available at: [https://eplanning.blm.gov/epl-front-office/projects/lup/70273/92254/111143/Bakersfield\\_ROD-ARMP.pdf](https://eplanning.blm.gov/epl-front-office/projects/lup/70273/92254/111143/Bakersfield_ROD-ARMP.pdf).

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**LIST OF ACRONYMS**

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ADA	American’s with Disabilities Act
BLM	Bureau of Land Management
cfs	cubic feet per second
ERMA	Extensive Recreation Management Area
FERC or Commission	Federal Energy Regulatory Commission
Project	Kaweah Project
RTMP	Road and Trail Management Plan
SCE	Southern California Edison Company
SMECP	Sediment Management and Erosion Control Plan
TSP	Technical Study Plan
USGS	U.S. Geological Survey
WBFG	Whitewater Boating Focus Group

## 8.10 RECREATION RESOURCES ENVIRONMENTAL EFFECTS

This section describes the potential effects to recreation resources under the Proposed Action for Southern California Edison Company's (SCE) Kaweah Project (Project). Section 3.0 – No-Action Alternative provides a description of current routine operation and maintenance activities and Section 4.0 – Proposed Action identifies changes from the No-Action Alternative. Potential effects to recreation resources were identified based on continued operation and maintenance of the Project under the Proposed Action.

The following potential effects to recreation resources were evaluated:

- Potential effects to stream-based recreation opportunities, including whitewater boating, that could occur as a result of the following modifications to Project operations:
  - Minimum instream flow releases; and
  - Ramping rates.
- Potential effects to recreation visitors that could occur as a result of ongoing Project maintenance activities, including:
  - Maintenance of the Kaweah No. 2 Flowline; and
  - Maintenance of the Kaweah No. 1 Forebay Road.
- Benefits that would occur as a result of recreation enhancements included in the Proposed Action, including:
  - The addition of a trash receptacle and Porta-Potty at Kaweah No. 2 Powerhouse River Access Parking Area; and
  - Dissemination of real-time flow information.

A discussion of the potential effects to recreation resources that could occur as a result of implementation of the Proposed Action, considering new environmental measures; management and monitoring plans; and programs is provided below. Unavoidable adverse effects are discussed at the end of this section.

### 8.10.1 Effects to Stream-Based Recreation Opportunities from Modifications to Project Operations

Under the Proposed Action, minimum instream flow releases will be increased during select months and water years to enhance habitat for aquatic species and to better simulate a more natural hydrograph. In addition, ramping rates will be modified under the Proposed Action to allow greater flexibility in powerhouse operations. Potential effects to stream-based recreation opportunities that could occur as a result of these modifications are discussed below. Detailed information about the minimum instream flows and

ramping rates that would occur under the Proposed Action is available in Appendix 4-A, Section 4.1.1 – Instream Flow Measures.

### **8.10.1.1 Minimum Instream Flow Releases**

The current Project license requires SCE to release minimum instream flows below the Kaweah No. 1 and Kaweah No. 2 diversion dams according to a schedule that varies by month and water-year type. Under the Proposed Action, minimum instream flow releases will be increased compared to the No-Action Alternative during select months and water years as summarized on Table 8.10-1. Potential effects related to recreation that could occur as a result of the modifications to minimum instream flows are discussed in the following.

#### **Stream-Based Recreation**

The modified minimum instream flow releases that will occur under the Proposed Action are specifically designed to enhance habitat for aquatic species and to better simulate a more natural hydrograph. In general, enhancing habitat for aquatic species enhances recreation opportunities by improving angling success. Similarly, a hydrograph that more closely mimics natural conditions generally enhances aesthetic conditions, which improves recreation experience for all user groups, including anglers, swimmers/waders, and whitewater boaters. Therefore, the modified instream flows that will occur under the Proposed Action will have an overall beneficial effect to recreation resources.

#### **Whitewater Boating Opportunities**

Whitewater boating occurs on the Kaweah River and the East Fork Kaweah River. As documented in Section 7.10, three runs are located in the bypass reaches (i.e., below the Project diversions), as follows:

- **Park Boundary Run.** This run is located on the Kaweah River and extends 0.6 mile from just below the Kaweah No. 2 Diversion Dam to the East Fork confluence.
- **Gateway Bridge Run.** This run is located on the Kaweah River and extends 3.1 miles from the East Fork Kaweah River Confluence to Dinely Bridge.
- **Lower East Fork Run.** This run is located on the East Fork Kaweah River and extends 4.3 miles from the Oak Grove Bridge to its confluence with the Kaweah River.

Boatable flow ranges for the Gateway Bridge Run and the Lower East Fork Run were identified using information contained in existing whitewater guide books, augmented by information developed in consultation with a Whitewater Boating Focus Group (WBFG) that was convened on April 3, 2018, in Three Rivers, California in association with the REC 2 – Whitewater Boating Technical Study Plan (TSP) (SCE 2017). A boatable flow range was not established for the Park Boundary Run because, although it can be boated as a “stand-alone” run, it is typically boated in combination with the upstream Ash

Mountain run or the downstream Gateway Bridge Run. The boatable flow range for the Park Boundary Run is assumed to be consistent with the downstream Gateway Bridge Run (SCE 2019a). The boatable flow ranges for the Gateway Bridge Run and Lower East Fork Run are as follows:

- Gateway Bridge Run
  - Boatable flow range for Rafts = 500 to 3,000 cubic feet per second (cfs)
  - Boatable flow range for Kayaks = 300 to 3,000 cfs
- Lower East Fork Run
  - Boatable flow range for kayaks = 80 to 400 cfs
  - This run is not typically boated in rafts due to the difficulty of the run and required portages. As such, a boatable flow range for rafts was not established.

The boatable flow ranges identified above were used in conjunction with hydrologic information developed in association with the REC 2 – TSP (SCE 2017) to estimate the number of boating opportunity days for different watercraft for the Gateway Bridge Run and the Lower East Fork Run under the following conditions:

- Unimpaired – represents conditions without the Project;
- Existing (No-Action Alternative) – represents existing conditions with current minimum instream flows; and
- Proposed (Proposed Action Alternative) – represents flow conditions with modified minimum instream flows.

The following analysis was conducted using a period of record extending from May 10, 1994, through May 9, 2017 (24 water years), and the results were organized by dry and normal water year types. The analytical results are summarized in the following tables:

- Table 8.10-2 summarizes the average, minimum, and maximum number of boating opportunity days under unimpaired, existing, and proposed conditions for the Gateway Bridge Run for rafting and kayaking.
- Table 8.10-3 summarizes the average, minimum, and maximum number of boating opportunity days under unimpaired, existing, and proposed conditions for the Lower East Fork Run for kayaking.
- Table 8.10-4 summarizes the number of boating opportunity days by year for the Gateway Bridge Run (rafts).

- Table 8.10-5 summarizes the number of boating opportunity days by year for the Gateway Bridge Run (kayaks).
- Table 8.10-6 summarizes the number of boating opportunity days by year for the Lower East Fork Run (kayaks).

As shown on Table 8.10-2, for both rafts and kayaks, the average, minimum, and maximum number of boating opportunity days available on the Gateway Bridge Run under unimpaired conditions (i.e., No Project) are higher than the number of boating days available under both the No-Action and Proposed Action alternatives during both normal and dry water-year types. Similarly, as shown on Table 8.10-3, the average, minimum, and maximum number of boating opportunity days available for kayaking on the Lower East Fork Run under unimpaired conditions (i.e., No Project) are higher than the number of boating days available under both the No-Action and Proposed Action alternatives during both normal and dry water-year types. This occurs because, under both the No-Action and Proposed Action alternatives, water is diverted into the flowlines, which sometimes reduces instream flow to levels that fall below the whitewater boating flow thresholds. However, as shown on Tables 8.10-4, 8.10-5, and 8.10-6, numerous whitewater boating opportunity days are available on both the Gateway Bridge and Lower East Fork Runs during both dry and normal water types under both the No-Action and Proposed Action alternatives.

As shown on the above referenced tables, there is no difference between the number of available boating opportunity days when comparing the No-Action and Proposed Action alternatives. The number of boating opportunity days is the same under both scenarios. This occurs because the changes to minimum instream flow occur at flows that are well below the whitewater boating range. Therefore, the differences between minimum flows under the No-Action Alternative and the Proposed Action do not factor into a whitewater boating day. The modified minimum instream flow releases that will be implemented under the Proposed Action will have no effect on whitewater boating opportunities.

#### **8.10.1.2 Modified Ramping Rates**

The existing Federal Energy Regulatory Commission (FERC or Commission) license for the Project requires SCE to operate flows below the Kaweah No. 1 and No. 2 diversion dams and the Kaweah No. 1 and No. 2 powerhouses such that they are not altered at a rate greater than 30% of the existing streamflow per hour. In the bypass reaches, this results in average stage changes as shown in Figures 7.4-2, 7.4-3, 7.4-4, and 7.4-5. As indicated, under the current FERC license the up-ramping rates are on the order of <0.1 to <0.3 foot/hour. The down ramping rates are approximately <0.1 to 0.3 foot/hour in the range of flows that the Project can operate (24 cfs at Kaweah No. 1 Diversion and 87 cfs at Kaweah No. 2 Diversion).

Under the Proposed Action, ramping rates will be modified as described in Appendix 4-A, Section 4.1.1 – Instream Flow Measures. Down ramping will be implemented consistent with current operations, but up ramping will be modified to provide for flexibility in operation of Project powerhouses. Under the Proposed Action, the modified up-ramping



rate in the Kaweah River will range from 0.2 to 1.0 foot/hour and from approximately 0.1 to 1.0 foot/hour on the East Fork Kaweah River, depending on flow (Figure 8.10-1).

The up-ramping rates on both the Kaweah River and the East Fork Kaweah River were established with consideration to stream-based recreation. Specifically, the up-ramping rate was established to provide for a stage change of  $\leq 1.0$  foot/hour. This up-ramping rate preserves instream recreation opportunities and is considered acceptable for instream recreation users (e.g., swimmer, waders, and boaters). Furthermore, it is consistent with up-ramping rates that have been established in other relicensing proceedings.

Because the modified up-ramp rate under the Proposed Action is within the range acceptable for recreation, and is consistent with other rates established for similar hydroelectric projects, implementation of the modified up-ramp rate would have a negligible effect on recreation resources.

## **8.10.2 Effects to Recreation Visitors from Project Maintenance Activities**

Under the Proposed Action, SCE will continue to maintain Project flowlines and Project roads and trails as described in Section 3.0 – No-Action Alternative. Potential effects related to recreation that could occur as a result of Project maintenance activities are discussed in the following.

### **8.10.2.1 Kaweah No. 2 Flowline Maintenance**

The Project does not include any recreation trails. However, access trails are located on both sides of the concrete sections of the Kaweah No. 2 Flowline. These trails are not formally developed for recreation purposes but SCE does not prohibit the general public from using these trails. SCE has observed the general public using the access trails that parallel both sides of the Kaweah No. 2 Flowline for walking, hiking, and occasionally mountain biking. Photographs captured by six game cameras located along the flowline confirmed that the trails along the Kaweah No. 2 Flowline are used for recreation purposes (SCE 2019b). As discussed in the REC 1 – Technical Study Report (SCE 2019b), the photographs captured by the game cameras indicate that the access trails are primarily used by local residents who were observed repeatedly using the trails to exercise and walk their dogs. These residents can access the flowline trails from private property that is present along nearly the entire length of the flowline.

Under the Proposed Action, the Project flowlines will continue to be maintained following routine inspections. Maintenance of the Kaweah No. 2 Flowline may temporarily disrupt people using the trails that parallel the flowline for recreation purposes. However, no new maintenance activities along the flowline or adjacent trails are included under the Proposed Action. Recreation visitors who use the Kaweah No. 2 Flowline access trails will experience the same level of maintenance that currently occurs under the No-Action Alternative. Therefore, implementation of the Proposed Action will have no effect on recreation visitors using the access trails along the Kaweah No. 2 Flowline for recreation purposes.

### **8.10.2.2 Flowline Failure Prevention**

Under the Proposed Action, SCE will implement a Sediment Management and Erosion Control Plan (SMECP) as described in Appendix 4-A, Section 4.1.3. This plan memorializes sediment management activities, inspection protocols, and measures that SCE will implement to reduce the possibility of a flowline failure. In addition, the SMECP identified an approach to address flowline failure or canal breaks considering engineering design and environmental resource protection.

A flowline failure would temporarily disrupt recreation along the Kaweah No. 2 Flowline access trails while the flowline is repaired. Implementation of the SMECP will continue to reduce the potential for flowline failures thereby reducing the possibility of disrupting recreation visitors who use the flowline access trails for recreation purposes. The SMECP provides inspection protocols and measures that would continue to provide a process for timely repair of the flowline, limiting disruptions to recreation users, should they occur. Therefore, implementation of the Proposed Action, including the SMECP, would have a negligible effect on recreation resources.

### **8.10.2.3 Kaweah No. 1 Forebay Road Maintenance**

Recreation visitors have been observed using the Kaweah No. 1 Forebay Road for recreation purposes, including walking, hiking, mountain biking, and horseback riding. Photographs captured by a game camera located along the Kaweah No. 1 Forebay Road confirmed that the road is used for recreation purposes (SCE 2019b). The Kaweah No. 1 Forebay Road is located within the Bureau of Land Management's (BLM) Case Mountain Extensive Recreation Management Area (ERMA). The road is not formally developed for recreation purposes. However, SCE does not prohibit the general public from using the road for non-motorized recreation activities. The road is gated to prevent vehicular access by the general public.

Under the Proposed Action, SCE will continue to regularly inspect and maintain the Project roads during normal Project operations. Minor repairs will be conducted on an as-needed basis and major repairs will be implemented annually during late summer/fall. In addition, under the Proposed Action, SCE will implement a Road and Trail Management Plan (RTMP) as described in Appendix 4-A, Section 4.3.1. This plan memorializes road and trail maintenance activities and includes new consultation and reporting requirements associated with major road and trail maintenance activities. Specifically, SCE will consult with the BLM and/or Tulare County (depending upon jurisdiction) prior to implementing major road maintenance to ensure it is implemented in accordance with applicable agency standards with consideration to the type and level of use that occurs along the road. Because the Kaweah No. 1 Forebay Road crosses land under BLM jurisdiction, SCE will consult with the BLM prior to implementing major maintenance activities on this road to ensure compatibility with BLM management objectives, including those pertaining to non-motorized recreation use.

Maintenance of the Kaweah No. 1 Forebay Road may temporarily disrupt people using the road for recreation purposes. However, no new maintenance activities along the road are included under the Proposed Action. Accordingly, recreation visitors who use the Kaweah No. 1 Forebay Road for recreation purposes will experience the same level of maintenance that currently occurs under the No-Action Alternative. In addition, implementation of the RTMP will ensure that the road is maintained at a level that is consistent with the BLM's goals and objectives for the Case Mountain ERMA. Therefore, implementation of the Proposed Action will have no effect on recreation visitors using the Kaweah No. 1 Forebay Road for recreation purposes.

### **8.10.3 Benefits of Recreation Enhancements**

The Proposed Action includes two measures that are designed to enhance recreation conditions and opportunities over the term of the new license:

- Kaweah No. 2 Powerhouse River Access Parking Area Measure
- Dissemination of Real-time Flow Information Measure

These measures are described in Appendix 4-A, Section 4.4.1. The recreation benefits associated with these measures are discussed below.

Per requests by the National Park Service and American Whitewater, SCE explored options to facilitate public access to the Kaweah River from land owned by SCE in the vicinity of the Kaweah No. 1, Kaweah No. 2, and Kaweah No. 3 powerhouses (SCE 2019a). However, SCE determined that providing river access at the Kaweah No. 1 and Kaweah No. 3 powerhouses is not viable and providing additional access at the Kaweah No. 2 Powerhouse is not warranted for the reasons identified in Appendix 14-A – Stakeholder Comments on Draft License Application and Associated Responses.

#### **8.10.3.1 Addition of a Trash Receptacle and Porta-Potty at Kaweah No. 2 Powerhouse River Access Parking Area**

The Project does not include any developed recreation facilities. However, SCE maintains a small parking area adjacent to the Kaweah No. 2 Powerhouse and allows the public to use this parking area on a limited basis. The Kaweah No. 2 Powerhouse River Access Parking Area is paved with six striped parking stalls, one of which is identified as disabled accessible. Other than signage, the parking area does not currently include any amenities. This parking area is typically used by recreation visitors who park in the lot then walk to a small beach known locally as “Edison Beach”, located approximately 400 feet southeast of the parking lot, on the northeast bank of the Kaweah River. Edison Beach is not a formally developed recreation facility.

The Proposed Action includes implementation of the Kaweah No. 2 Powerhouse River Access Parking Area Enhancement Measure. This measure requires SCE to continue to maintain the Kaweah No. 2 Powerhouse River Access Parking Area and allow the general public to use the parking area on a limited basis. Current use restrictions will remain in effect out of respect for nearby private property owners, and to help minimize the potential

for conflicts between recreation visitors and private property owners. In addition, to enhance recreation experience and to protect environmental resources, this measure requires SCE to install an American's with Disabilities Act (ADA) compliant portable restroom (also known as a Porta-Potty) and an animal resistant trash receptacle at the Kaweah No. 2 Powerhouse River Access Parking Area within one year of license issuance. To ensure that these features are clean and in good working order, SCE will inspect and maintain the portable bathroom and the garbage receptacle once weekly, or more frequently if use levels warrant. Installing a portable restroom and garbage receptacle will address local concerns regarding sanitation while enhancing the experience of recreation visitors. Accordingly, implementation of the Proposed Action, including the Kaweah No. 2 Powerhouse River Access Parking Area Enhancement Measure, will have a beneficial effect to recreation resources.

### **8.10.3.2 Dissemination of Real-Time Flow Information**

According to WBFG participants, flow information that is currently available to the public on Dreamflows<sup>1</sup> is not sufficient to determine whether boating flows are available in the bypass reaches. The WBFG participants indicated that providing additional real-time flow information on the bypass reaches would enhance their ability to take advantage of the existing whitewater boating opportunities within the bypass reaches, as well as other river reaches within the Kaweah River Watershed.

The Proposed Action includes implementation of the Dissemination of Real-time Flow Information Measure. This measure requires SCE to provide real-time flow information to the public, using data collected at the following two U.S. Geological Survey (USGS) stream gages located on the East Fork Kaweah River and Kaweah River, respectively, downstream of the Project diversions:

- East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)
- Kaweah River below Conduit No. 2 near Hammond CA (USGS Gage No. 11208600) (SCE Gage No. 203)

The data collected at these two gages will be provided to the public on a new website to be developed and maintained by SCE. The data provided on the Licensee's website will show the most recent seven days of flow information in 1-hour increments.

Implementation of the Dissemination of Real-time Flow Information Measure will enhance stream-based recreation opportunities on the Kaweah River and on the East Fork Kaweah River. Stream-based recreation users will be able to utilize the real-time flow data for trip planning and scheduling purposes. Whitewater boaters in particular will be able to utilize the real-time flow data to determine when boating flows are available so they can take advantage of the whitewater boating opportunities on the bypass reaches.

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<sup>1</sup> A website commonly used by whitewater boaters to obtain flow information on whitewater boating runs ([www.dreamflows.com/graphs/day.103.php](http://www.dreamflows.com/graphs/day.103.php)).

Accordingly, implementation of the Proposed Action, including the Dissemination of Real-time Flow Information Measure, will have a beneficial effect to recreation resources.

#### **8.10.4 Conclusions – Recreation Resources**

Implementation of the Proposed Action would maintain/enhance recreation resources compared to the No-Action Alternative. Specifically:

- Changes in minimum instream flows under the Proposed Action would enhance recreation opportunities and experience for all user groups, including anglers, swimmers/waders, and whitewater boaters.
- Modifying the up-ramp rate would have a negligible effect on recreation resources because the modified up-ramp rate under the Proposed Action is within the range that is acceptable for recreation, and is consistent with other ramping rates established for similar hydroelectric projects.
- Implementation of the SMECP would maintain trail opportunities along the Kaweah No. 2 Flowline by minimizing the potential for flowline failures, thereby reducing the possibility of disrupting recreation visitors who use the flowline access trails for recreation purposes.
- Continued maintenance of the Kaweah No. 1 Forebay Road would maintain non-motorized trail opportunities for the general public.
- Recreation enhancements that would occur under the Proposed Action would enhance recreation experience and opportunities on the Kaweah River, while addressing local concerns regarding sanitation.
- The provision of real-time flow information that would occur under the Proposed Action will enhance recreation opportunities by providing information that can be used by whitewater boaters and other stream-based recreation users for trip planning and scheduling purposes.

#### **8.10.5 Unavoidable Adverse Effects**

There are no unavoidable adverse effects to recreation resources under the Proposed Action.

### **8.10.6 Literature Cited**

SCE (Southern California Edison Company). 2017. Revised Study Plan for the Kaweah Project. September.

SCE. 2019a. REC 2 – Whitewater Boating Technical Study Report, Kaweah Project. December. Available in SCE's Application for New License, Supporting Document A.

SCE. 2019b. REC 1 – Recreation Resources Technical Study Report, Kaweah Project. December. Available in SCE's Application for New License, Supporting Document A.

## **TABLES**

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**Table 8.10-1. Existing Minimum Flow Requirements versus Modified Minimum Flow Requirements**

Month	Existing (No-Action Alternative)		Modified (Proposed Action Alternative)	
	Normal Year (cfs)	Dry Year (cfs)	Normal Year (cfs)	Dry Year (cfs)
<b>Kaweah River</b>				
January	20	10	20	20
February	20	10	20	20
March	30	20	30	20
April	30	30	30	30
May	30	30	30	30
June	30	30	30	30
July	20	10	20	20
August	20	10	20	10
September	11	5	20	5
October	11	5	11	5
November	11	5	11	5
December	11	5	11	10
<b>East Fork Kaweah River</b>				
January	5	5	10	5
February	5	5	10	5
March	10	10	20	10
April	10	10	20	10
May	10	10	20	10
June	10	10	20	10
July	10	10	20	10
August	5	5	20	5
September	5	5	20	5
October	5	5	10	5
November	5	5	10	5
December	5	5	10	5

Note that minimum instream flows are as shown above or Natural Flow - 3 cfs, whichever is lower. A total of 3 cfs is required to meet SCE's pre-1914 consumptive water right delivery obligation.

**Table 8.10-2. Number of Boating Days Under Unimpaired, Existing, and Proposed Conditions – Gateway Bridge Run**

Water-year Type	Number of Boating Days			Difference between Unimpaired and Existing / Proposed
	No Project (Unimpaired)	No-Action Alternative (Existing)	Proposed Action (Proposed)	
<b>Rafting (500 to 3,000 cfs)</b>				
<b>Normal Year</b>				
Average	103	90	90	-13
Minimum	32	28	28	-4
Maximum	181	157	157	-24
<b>Dry Year</b>				
Average	54	41	41	-13
Minimum	11	6	6	-5
Maximum	101	86	86	-15
<b>Kayaking (300 to 3,000 cfs)</b>				
<b>Normal Year</b>				
Average	139	122	122	-18
Minimum	76	52	52	-24
Maximum	226	212	212	-14
<b>Dry Year</b>				
Average	94	73	73	-21
Minimum	28	19	19	-9
Maximum	134	108	108	-26

**Table 8.10-3. Number of Boating Days Under Unimpaired, Existing, and Proposed Conditions – Lower East Fork Run**

Water-year Type	Number of Boating Days			Difference between Unimpaired and Existing / Proposed
	No Project (Unimpaired)	No-Action Alternative (Existing)	Proposed Action (Proposed)	
<b>Kayaking (80 to 400 cfs)</b>				
<b>Normal Year</b>				
Average	115	104	104	-11
Minimum	39	37	37	-2
Maximum	186	183	183	-3
<b>Dry Year</b>				
Average	89	76	76	-13
Minimum	27	24	24	-3
Maximum	124	103	103	-21

**Table 8.10-4. Boating Opportunity Days by Year – Gateway Bridge Run (Rafts)**

Year	Water Type Year	Boating Opportunity Days per Year <sup>1</sup>		
		No Project (Unimpaired)	No-Action Alternative (Existing)	Proposed Action (Proposed)
1994	Dry	101	86	86
1995	Normal	163	149	149
1996	Normal	181	148	148
1997	Normal	113	107	107
1998	Normal	85	75	75
1999	Dry	84	60	60
2000	Normal	78	62	62
2001	Normal	70	57	57
2002	Normal	84	52	52
2003	Normal	95	78	78
2004	Dry	77	54	54
2005	Normal	127	116	116
2006	Normal	87	72	72
2007	Dry	51	43	43
2008	Normal	79	69	69
2009	Normal	85	56	56
2010	Normal	140	133	133
2011	Normal	102	100	100
2012	Normal	32	28	28
2013	Dry	16	11	11
2014	Dry	11	6	6
2015	Dry	39	29	29
2016	Normal	163	157	157
2017	Normal	67	71	71

<sup>1</sup> Flow range used for computation is 500 cfs to 3,000 cfs, the boating flow range for rafting the Gateway Bridge Run.

**Table 8.10-5. Boating Opportunity Days by Year – Gateway Bridge Run (Kayaks)**

Year	Water Type Year	Boating Opportunity Days per Year <sup>1</sup>		
		No Project (Unimpaired)	No-Action Alternative (Existing)	Proposed Action (Proposed)
1994	Dry	134	108	108
1995	Normal	195	191	191
1996	Normal	226	212	212
1997	Normal	166	140	140
1998	Normal	113	103	103
1999	Dry	120	103	103
2000	Normal	100	85	85
2001	Normal	95	79	79
2002	Normal	113	105	105
2003	Normal	123	115	115
2004	Dry	118	92	92
2005	Normal	163	139	139
2006	Normal	138	106	106
2007	Dry	108	71	71
2008	Normal	126	103	103
2009	Normal	133	116	116
2010	Normal	205	159	159
2011	Normal	141	118	118
2012	Normal	76	52	52
2013	Dry	58	43	43
2014	Dry	28	19	19
2015	Dry	93	74	74
2016	Normal	175	170	170
2017	Normal	82	79	79

<sup>1</sup> Flow range used for computation is 300 cfs to 3,000 cfs, the boating flow range for kayaking the Gateway Bridge Run.

**Table 8.10-6. Boating Opportunity Days by Year – Lower East Fork Run (Kayaks)**

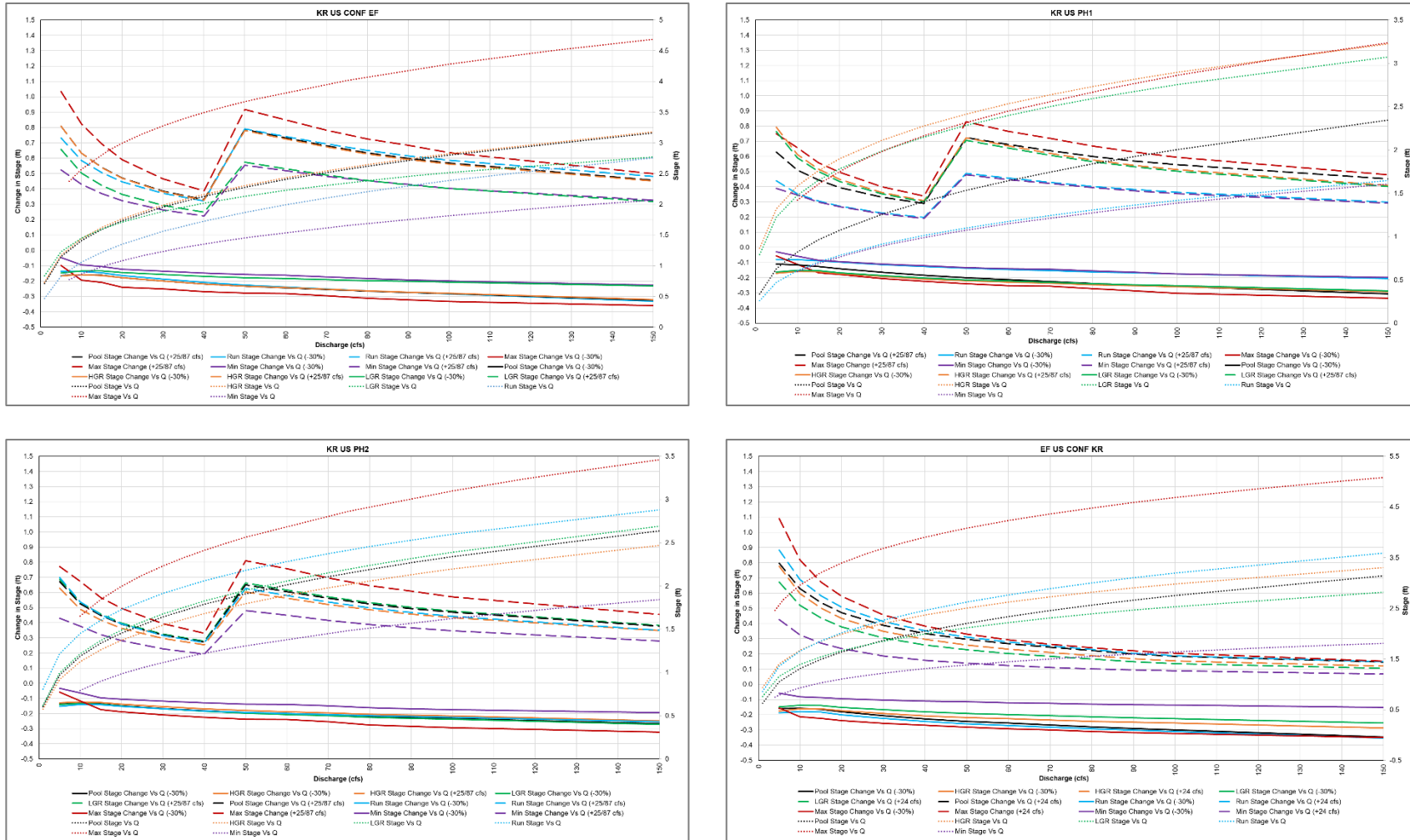
Year	Water Type Year	Boating Opportunity Days per Year <sup>1</sup>		
		No Project (Unimpaired)	No-Action Alternative (Existing)	Proposed Action (Proposed)
1994	Dry	124	99	99
1995	Normal	133	131	131
1996	Normal	186	183	183
1997	Normal	149	128	128
1998	Normal	86	75	75
1999	Dry	111	103	103
2000	Normal	91	78	78
2001	Normal	93	80	80
2002	Normal	118	112	112
2003	Normal	107	97	97
2004	Dry	115	98	98
2005	Normal	114	107	107
2006	Normal	94	75	75
2007	Dry	105	88	88
2008	Normal	112	99	99
2009	Normal	118	116	116
2010	Normal	185	145	145
2011	Normal	101	92	92
2012	Normal	78	58	58
2013	Dry	59	46	46
2014	Dry	27	24	24
2015	Dry	83	73	73
2016	Normal	147	147	147
2017	Normal	39	37	37

<sup>1</sup> Flow range used for computation is 80 to 400 cfs, the boating flow range for kayaking the Lower East Fork Run.

## FIGURES

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**Figure 8.10-1. Stage changes in the Kaweah River Reaches Downstream of Kaweah No. 2 Diversion (KR US CONF EF, KR US PH1, KR US PH2) and in the East Fork Kaweah River (EF US CONF KR) Based on the Proposed Action Modified Up-Ramp Rate of 25 cfs/hr when Flows are <40 cfs and the Down Ramp Rate of 30% of Existing Streamflow per Hour.**

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**LIST OF ACRONYMS**


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ADA	American’s with Disabilities Act
cfs	cubic feet per second
dB	decibels
FERC or Commission	Federal Energy Regulatory Commission
L <sub>90</sub>	A-weighted sound level equaled or exceeded 90%
L <sub>eq</sub>	equivalent continuous sound level
Project	Kaweah Project
SCE	Southern California Edison Company
SD	Supporting Document
SNP	Sequoia National Park
TSR	Technical Study Report

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## **8.11 AESTHETIC RESOURCES ENVIRONMENTAL EFFECTS**

This section describes the potential effects related to aesthetic resources under the Proposed Action for Southern California Edison Company's (SCE) Kaweah Project (Project). Section 3.0 – No-Action Alternative provides a description of current routine operation and maintenance activities and Section 4.0 – Proposed Action identifies changes from the No-Action Alternative. Potential effects to aesthetic resources were identified based on continued operation and maintenance of the Project under the Proposed Action.

The following potential effects to aesthetic resources were evaluated:

- Effects to aesthetic resources that could occur as a result of Project operations, including:
  - Modifications to minimum instream flow releases; and
  - Spills from the Kaweah No. 3 Forebay.
- Effects to aesthetic resources that could occur as a result of recreation enhancements, including the addition of a trash receptacle and Porta-Potty at the Kaweah No. 2 Powerhouse River Access Parking Area.

A discussion of the potential effects to aesthetic resources that could occur as a result of implementation of the Proposed Action, considering new environmental measures; management and monitoring plans; and programs is provided below. Unavoidable adverse effects are discussed at the end of this section.

### **8.11.1 Effects to Aesthetic Resources from Project Operations**

This section discusses potential effects to aesthetic resources that could occur as a result of modifications to Project operations.

#### **8.11.1.1 Modified Minimum Instream Flow Releases**

The current Project license requires SCE to release minimum instream flows below the Kaweah No. 1 and Kaweah No. 2 diversion dams according to a schedule that varies by month and water year type. Under the Proposed Action, minimum instream flow releases would be increased compared to the No-Action Alternative during select months and water years as summarized on Table 8.4-2.

The modified minimum instream flow releases would result in higher water levels in the Kaweah River during September of normal water years and during January, February, July, and December of dry water years compared to the No-Action Alternative. On the East Fork Kaweah River, modified instream flow releases would result in higher flows during all months of normal water years compared to the No-Action Alternative. Higher instream flows would maintain and/or improve riparian vegetation in the Kaweah River and East Fork Kaweah River. Accordingly, increasing the minimum instream flows and

improving riparian vegetation would enhance overall visual quality along both the Kaweah River and East Fork Kaweah River. Therefore, the modified instream flows that would occur under the Proposed Action would have an overall beneficial effect to aesthetic resources.

#### **8.11.1.2 Spills from the Kaweah No. 3 Forebay**

The short segment of the Kaweah No. 3 Flowline under Federal Energy Regulatory Commission (FERC or Commission) jurisdiction consists of a 2,975-foot long concrete box flume that terminates at the Kaweah No. 3 Forebay, which is an embankment forebay with a capacity of approximately 11 acre-feet. Under the No-Action Alternative, in the event of an unplanned powerhouse outage (i.e., unit trips), overflow from the Kaweah No. 3 Forebay is directed down slope through an approximately 75-foot long concrete-lined spillway chute that begins at the upstream end of the forebay and terminates at a natural channel (Map 7.6-7). The channel drains to the Kaweah River (within the Sequoia National Park [SNP]).

Per the request of the National Park Service, SCE documented visual conditions at the natural channel under “no-spill” and near-maximum spill (92 cubic feet per second [cfs]) scenarios as viewed from the Foothill Visitor Center Picnic Area on May 31, 2018. In addition, SCE simultaneously documented noise conditions from the Indian Head River Trailhead Parking Area and the Foothill Visitor Center Picnic Area. Both of these facilities are located within the SNP. The study methods and results are documented in the LAND 2 – Technical Study Report (TSR), which is available in Supporting Document A (SD A).

As documented in the LAND 2 – TSR, the natural channel (referred to as the East Spillway Channel in the LAND 2 – TSR) is not visually discernable from the Foothill Visitor Center Picnic Area under the no-spill condition, mainly due to the viewing angle, and the long viewing distance between the visitor center and the natural channel. Conversely, the natural channel is visible from the Foothill Visitor Center Picnic Area under the maximum spill scenario due to the contrast between the white color of the water relative to the adjacent vegetation and the linear nature of the natural channel. However, overall the contrast rating is considered “weak” due to the long viewing distance between the natural channel and the viewing area (Key Observation Point 4 for this study), and because the vegetation along the channel disrupts the linear nature of the channel, thereby reducing overall visual contrast. In general, with a flow of 92 cfs, the channel appears as a natural waterfall. Lower flows would be less discernable.

During the spill study, noise levels at the Foothill Visitor Center Picnic Area were generally dominated by noise associated with vehicle traffic on Highway 198 and the nearby parking area and occasional voices and aircraft. Residual background noise levels, as defined by the  $L_{90}$  statistical descriptor were 4.8 decibels (dB) higher during the period the spill event was occurring. This change is generally perceivable by the human ear. However, noise associated with the spill event only increased overall noise levels (as defined by the  $L_{eq}$ ) by approximately 2.5 dB during the period the spill event was occurring. Refer to the LAND 2 – TSR for definitions of the  $L_{90}$  and  $L_{eq}$  descriptors.

The spill/release was neither visible nor audible at the Indian Head River Trailhead Parking Area. Noise levels at the Indian Head River Trailhead Parking Area were generally dominated by noise associated with the flow of the Kaweah River. Other sources of noise observed during the measurement period including traffic noise associated with vehicles on Highway 198, as well as human voices and vehicle activities within the parking area and nearby trailhead.

The Proposed Action does not involve any changes to Project operations or to the capacity of the Kaweah No. 3 Flowline or the Kaweah No. 3 Forebay. Therefore, spill events from the Kaweah No. 3 Forebay would continue to occur at the same approximate frequency, duration, and magnitude as they do now. During spill events, visitors using the Foothill Visitor Center would continue to periodically observe and hear water cascading down the natural channel, particularly during a maximum spill event. However, based on the LAND 2 study results, the change in noise levels during a maximum spill event would only be slightly discernable above background noise levels, if at all. Similarly, water cascading down the hillside would be noticeable but not visually obtrusive. Therefore, implementation of the Proposed Action would have no effect on existing aesthetic resources.

### **8.11.2 Effects to Aesthetic Resources from Recreation Enhancements**

The Project does not include any developed recreation facilities. However, SCE maintains a small parking area adjacent to the Kaweah No. 2 Powerhouse and allows the public to use this parking area on a limited basis. The parking area, referred to as the Kaweah No. 2 Powerhouse River Access Parking Area, is paved and striped but does not include amenities such as a bathroom or garbage receptacles. This parking area is typically used by recreation visitors who park in the lot then walk to a small beach known locally as “Edison Beach”, located approximately 400 feet southeast of the parking lot, on the northeast bank of the Kaweah River. Edison Beach is not a formally developed recreation facility.

The Proposed Action includes implementation of the Kaweah No. 2 Powerhouse River Access Parking Area Enhancement Measure (Appendix 4-A, Section 4.4.1). This measure requires SCE to continue to maintain the Kaweah No. 2 Powerhouse River Access Parking Area and allow the general public to use the parking area on a limited basis. In addition, to enhance recreation experience and to protect environmental resources, this measure requires SCE to install an American’s with Disabilities Act (ADA) compliant portable restroom (also known as a Porta-Potty) and an animal resistant trash receptacle at the Kaweah No. 2 Powerhouse River Access Parking Area within one year of license issuance.

To reduce visual contrast, both the restroom and the trash receptacle would be painted brown, tan, or green to blend with the surrounding environment. Providing a bathroom and garbage receptacle would improve aesthetic conditions at the Kaweah No. 2 River Access Parking and near Edison Beach by containing garbage and human waste. Accordingly, implementation of the Proposed Action, including the Kaweah No. 2

Powerhouse River Access Parking Area Enhancement Measure, would have a beneficial effect on aesthetic resources.

### **8.11.3 Conclusions – Aesthetic Resources**

Implementation of the Proposed Action would enhance and/or maintain visual resources compared to the No-Action Alternative. Specifically:

- Changes to minimum instream flows under the Proposed Action would result in more water in the river and healthier riparian vegetation which would enhance scenic quality.
- Recreation enhancements that would occur under the Proposed Action would enhance scenic quality by containing garbage and human waste.
- Under the Proposed Action, the Kaweah No. 3 Forebay would continue to periodically spill. However, adverse effects to aesthetic resources from spills are considered negligible because the change in noise levels during a maximum spill event is only slightly discernable above background noise levels, and because water cascading down the hillside is not visually obtrusive.

### **8.11.4 Unavoidable Adverse Effects**

There are no unavoidable adverse effects to aesthetic resources under the Proposed Action.



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**LIST OF ACRONYMS**


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APE	Area of Potential Effects
CFR	Code of Federal Regulations
FERC or Commission	Federal Energy Regulatory Commission
HPMP	Historic Properties Management Plan
Project	Kaweah Project
NHPA	National Register of Historic Places
NPS	National Park Service
NRHP	National Register of Historic Places
Project	Kaweah Project
SCE	Southern California Edison Company
SD	Supporting Document
SNP	Sequoia National Park
SUP	Special Use Permit
TSR	Technical Study Report

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## 8.12 CULTURAL RESOURCES ENVIRONMENTAL EFFECTS

This section describes potential effects to cultural resources under the Proposed Action for Southern California Edison Company's (SCE) Kaweah Project (Project). Section 3.0 – No-Action Alternative provides a description of current routine operation and maintenance activities and Section 4.0 – Proposed Action identifies changes from the No-Action Alternative. Potential effects to cultural resources were identified based on continued operation and maintenance of the Project under the Proposed Action. A description of potential effects to tribal resources associated with operation and maintenance of the Project under the Proposed Action is presented in Section 8.13 – Tribal Resources.

For the purposes of this section, cultural resources are identified as human-made objects, features, sites, buildings, structures, and/or districts in the Project Area of Potential Effects (APE). The Project APE for cultural resources is defined as the Federal Energy Regulatory Commission (FERC or Commission) boundary and any associated facilities outside the FERC boundary and a defined buffer area, depending upon facility type. For further details on the Project APE, refer to Section 7.12 – Cultural Resources and the CUL 1 – Archaeology and Built Environment Technical Study Reports (TSR), included in Supporting Document A (SD A) (SCE 2019a and SCE 2019b).

For the purposes of this section and as defined by Section 106 of the National Historic Preservation Act (NHPA) (Section 106), historic properties are defined as cultural resources that are listed in, or eligible for listing, in the National Register of Historic Places (NRHP). For a description of cultural resources and historic properties in the Project APE, refer to Section 7.12 and the CUL 1 – Archaeology and Built Environment TSRs (SCE 2019a and SCE 2019b), included in SD A.

The analysis of environmental effects under the Proposed Action is limited to cultural resources within the Project APE under FERC jurisdiction. The analysis does not include those SCE facilities (non-FERC) that are located outside of the Project boundary on lands located within the Sequoia National Park (SNP) and operated and managed under a Special Use Permit (SUP) issued by the National Park Service (NPS) (refer to Appendix 3-A).

The following potential effects to cultural resources in the Project APE were evaluated:

- Potential effects from FERC Project boundary modifications.
- Potential inadvertent damage or destruction during Project maintenance activities, including:
  - Repair/maintenance activities at the Kaweah No. 3 Powerhouse<sup>1</sup>;
  - Repair/maintenance of flumes, canals, and support structures;

<sup>1</sup> The Kaweah No. 3 Powerhouse is a component of the Kaweah No. 3 Hydroelectric System Historic District.

- Vegetation management;
- Road and trail maintenance; and
- Transmission, power, and communication line maintenance.
- Potential damage or destruction from continued public use of the Kaweah No. 2 Powerhouse River Access Parking Area.

A discussion of the potential effects to cultural resources that could occur as a result of implementation of the Proposed Action, considering new environmental measures; management and monitoring plans; and programs is provided below. Unavoidable adverse effects are also discussed at the end of this section.

As discussed in Section 8.1, effects are classified as no effect, negligible effect, adverse effect, or beneficial effect. For the purposes of this section, adverse effects are defined as those effects that will alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, workmanship, materials, feeling, setting, and association, as defined in 36 Code of Federal Regulations (CFR) Part 800.

### **8.12.1 Potential Effects from FERC Project Boundary Modifications**

Under the Proposed Action, the FERC Project boundary would be modified to: (1) include all lands necessary for operation and maintenance of the Project; (2) remove lands no longer necessary for operation and maintenance of the Project; and (3) correct known errors in the current Exhibit G for the Project. Refer to Section 4.1 for a description of the FERC boundary modifications and Maps 4-1a through 4-1h.

Specifically, the FERC Project boundary would be increased to include existing Project facilities that are currently outside the boundary. These existing facilities are included in the Project APE and were previously surveyed and inventoried as part of the CUL 1 – Archaeology TSR.

In addition, the FERC boundary would be decreased to remove communication line and road corridors that are remnants of the original Project which have been removed and/or replaced by newer technology and are no longer in existence. Two known sites are adjacent to a road corridor that is being removed from management, no ground disturbance or actual road removal is proposed – one resource is a historic-era isolate, and the other resource was a historic-era resource that has been destroyed by the property owner and no longer constitutes a site.

The Proposed Action includes development and implementation of a Historic Properties Management Plan (HPMP). The HPMP would guide the management, documentation, treatment and protection of unevaluated cultural resources and historic properties in the Project APE in accordance with Section 106. The HPMP would stipulate avoidance and protection measures to implement prior to any Project operation and maintenance activities that could affect historic properties and unevaluated cultural resources in the

Project APE. The HPMP would also require that any unevaluated cultural resources that may be affected by Project operations be evaluated for the NRHP to determine historic property status. Lastly, the HPMP would stipulate consultation processes for the resolution of any adverse effects that are identified.

Under the Proposed Action, cultural resources and historic properties within the Project APE would be managed by the HPMP in compliance with Section 106. Therefore, FERC boundary modifications would have no effect on cultural resources or historic properties.

### **8.12.2 Potential Inadvertent Damage or Destruction during Project Maintenance Activities**

Under the Proposed Action, Project maintenance activities that have the potential to cause inadvertent damage or destruction of historic properties and/or unevaluated cultural resources include: (1) repair/maintenance activities at the Kaweah No. 3 Powerhouse (component of the Kaweah No. 3 Historic District); (2) repair of flumes, canals, and support structures (including components of the Kaweah No. 3 Historic District); (3) road and trail maintenance; and (4) transmission, power, and communication line maintenance. These activities could result in inadvertent damage or destruction of historic properties and/or unevaluated cultural resources, as described below.

#### **8.12.2.1 Repair/Maintenance Activities at the Kaweah No. 3 Powerhouse**

The NRHP-eligible Kaweah No. 3 Hydroelectric System Historic District historic property includes Kaweah No. 3 Powerhouse<sup>2</sup>, which could be affected by ongoing Project maintenance activities should such maintenance physically undermine any of the character defining features that convey the significance of the Powerhouse and the District, including the building's industrial Classical Revival mass, fenestration, ornamentation, and design (refer to the CUL 1 – Built Environment TSR in SD A for full listing of Kaweah No. 3 Hydroelectric System Historic District character defining features). Such maintenance and repair could include replacement and/or reconfiguration of fenestration, resurfacing of exterior walls, or addition of interior or exterior utility features.

#### **8.12.2.2 Repair of Flumes, Canals, and Support Structures**

Under the Proposed Action, necessary repairs to Project flumes, canals, and support structures, including hand-patching of concrete, and repair of wood support structures, would continue to occur on an as-needed basis.

Cultural resources in the Project APE including archaeological sites P-54-004755, P-54-004616, P-54-004698, P-54-004696, P-54-004695, P-54-004693, P-54-4694, K-ALK-001, P-54-004762, P-54-004763, P-54-004764, and P-54-004765, P-54-004761 are located adjacent to or in close proximity to Project flowlines, canals, or support structures, and as such ongoing maintenance and repair of these flowlines has the potential to affect cultural resources through inadvertent damage or destruction to the sites.

<sup>2</sup> The Kaweah No. 1 and No. 2 powerhouses are not part of the historic district and potential effects to resources adjacent to these sites are covered under routine maintenance activities.

Additionally, the NRHP-eligible Kaweah No. 3 Hydroelectric System Historic District historic property includes Kaweah No. 3 Flowline and Kaweah No. 3 Forebay, which could be affected by Project maintenance should such maintenance undermine any of the character defining features that convey the significance of the facilities or of the district. Character defining features of the Kaweah No. 3 Flowline include its winding concrete ditch and flume infrastructure, stone wall foundational structure undergirding select portions, and board formed concrete slabs. Character defining features of the Kaweah No. 3 Forebay include its concrete lined forebay pool and its utilitarian control gates and spillway (refer to the CUL 1 – Built Environment TSR in SD A for full listing of Kaweah No. 3 Hydroelectric System Historic District character defining features).

### **8.12.2.3 Vegetation Management**

Under the Proposed Action, vegetation management would include ongoing vegetation trimming by hand, herbicide use, and hazard tree removal, and implementation of new measures to reduce the spread or introduction of noxious weeds (Appendix 4-A, Section 4.5.2, Vegetation and Integrated Pest Management Plan).

These vegetation management activities have the potential to affect cultural resources through inadvertent damage or destruction to archaeological cultural resources that may be adjacent to clearance or management areas. Such affects could stem from site encroachment by management crews, damage from hazard tree felling, or ground disturbance associated with vegetation removal.

### **8.12.2.4 Road and Trail Maintenance**

Under the Proposed Action, Project access roads and trails would continue to be regularly inspected and repaired on an as-needed basis. Minor Project road maintenance generally includes, but is not limited to, the following types of activities: debris removal; basic repairs, including filing of potholes; maintenance of erosion control features such as culverts, drains, ditches, and water bars; repair, replacement, or installation of access control structures such as posts, cables, rails, gates, and barrier rock; and repair and replacement of signage. Major Project road maintenance generally includes, but is not limited to, the following types of activities: placement or replacement of culverts and other drainage features; bridge deck replacement; grading; sealing; resurfacing; and road replacement.

Cultural resources in the Project APE including archaeological sites P-54-000278, P-54-004693, P-54-004694, P-54-004754, CM-SSDV-2016-01, CM-SSDV-2016-02, and K-MMR-006 are located adjacent or in close proximity to Project roads, and as such ongoing maintenance and repair of these access facilities has the potential to affect cultural resources through inadvertent damage or destruction to archaeological sites. Such efforts could stem from site encroachment by management crews or ground disturbance associated with necessary repairs.

### 8.12.2.5 Transmission, Power, and Communication Line Maintenance

The Proposed Action includes ongoing transmission, power, and communication line maintenance activities, including pole maintenance and replacement of damaged poles on an as-needed basis. New poles are placed in, or immediately adjacent to previously existing holes, using line trucks.

Cultural resources in the Project APE including NRHP-eligible archaeological historic property P-54-000232, NRHP-eligible archaeological historic property P-54-001480/H, and unevaluated archaeological site P-54-004342 are located in transmission line corridors and in close proximity to utility poles and as such have the potential to be affected by pole replacement.

### 8.12.2.6 Conclusion – Project Maintenance Activities

As described above, the Proposed Action includes implementation of an HPMP that would guide the treatment and protection of unevaluated cultural resources and historic properties in the Project APE. Management measures in the HPMP would include:

- NRHP evaluation of any unevaluated cultural resources that may be affected by adjacent maintenance activities;
- Avoidance measures, including establishment of buffers and protective barriers;
- Periodic site condition monitoring and monitoring of Project activities that have the potential to affect historic properties;
- Procedures to be implemented in the event a previously unknown cultural resource is identified;
- Stipulations that any maintenance work related to contributing elements of the Kaweah No. 3 Hydroelectric System Historic District would adhere to the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (36 CFR Part 68) (NPS 2017); and
- Requirements for consultation under Section 106 to address any adverse effects to identified historic properties.

Additionally, under the Proposed Action, an annual environmental training program would be administered to educate personnel and contractors about cultural resources in the vicinity of the Project and measures to protect these resources during routine operation and maintenance activities.

Under the Proposed Action, potential effects to cultural resources associated with Project maintenance activities would be managed by the HPMP in compliance with Section 106. Additionally, implementation of the environmental training program would enhance management of and protect cultural resources in the Project APE during maintenance

activities. Therefore, implementation of the Proposed Action would have no effect on cultural resources.

### **8.12.3 Potential Damage or Destruction from use of the Kaweah No. 2 Powerhouse River Access Parking Area**

The Project does not include any developed recreation facilities. However, SCE maintains a small parking area adjacent to the Kaweah No. 2 Powerhouse and allows the public to use this parking area on a limited basis. The Kaweah No. 2 Powerhouse River Access Parking Area is paved with six striped parking stalls, one of which is identified as disabled accessible. Other than signage, the parking area does not currently include any amenities. This parking area is typically used by recreation visitors who park in the lot then walk to a small beach known locally as “Edison Beach”, located approximately 400 feet southeast of the parking lot, on the northeast bank of the Kaweah River. Edison Beach is not a formally developed recreation facility. Continued use of the parking area and beach has the potential to impact site P-54-004758.

The Proposed Action includes implementation of the Kaweah No. 2 Powerhouse River Access Parking Area Enhancement Measure (Appendix 4-A, Section 4.4.1). This measure requires SCE to continue to maintain the Kaweah No. 2 Powerhouse River Access Parking Area and allow the general public to use the parking area on a limited basis.

Under the Proposed Action, potential effects to site P-54-004758 associated with use of the Kaweah No. 2 Powerhouse River Access Parking Area and the adjacent Edison Beach area, would be managed by the HPMP in compliance with Section 106. Therefore, implementation of the Proposed Action would have no effect on this resource.

### **8.12.4 Unavoidable Adverse Effects**

There are no unavoidable adverse effects to cultural resources or historic properties under the Proposed Action.

### **8.12.5 Literature Cited**

- NPS (National Park Service). 2017. Secretary of the Interior’s Standards for the Treatment of Historic Properties, with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings.
- SCE (Southern California Edison Company). 1992. Cultural Resources Management Plan for Southern California Edison Company’s Kaweah Hydroelectric Project, Tulare County, California, FERC Project No. 298. November.
- SCE. 2019a. CUL 1 – Cultural Resources Archaeology Technical Study Report, Kaweah Project. December. Available in SCE’s Application for New License, Supporting Document A.
- SCE. 2019b. CUL 1 – Cultural Resources Built Environment Technical Study Report, Kaweah Project. December. Available in SCE’s Application for New License, Supporting Document A.



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**LIST OF ACRONYMS**

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APE	Area of Potential Effects
FERC or Commission	Federal Energy Regulatory Commission
HPMP	Historic Properties Management Plan
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
Project	Kaweah Project
SCE	Southern California Edison Company
SD	Supporting Document
TCP	Traditional Cultural Property
TSR	Technical Study Report

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## **8.13 TRIBAL RESOURCES ENVIRONMENTAL EFFECTS**

This section describes potential effects to tribal resources under the Proposed Action for Southern California Edison Company's (SCE) Kaweah Project (Project). Potential effects to tribal resources were identified based on continued operation and maintenance of the Project under the Proposed Action. A description of potential effects to cultural resources associated with operation and maintenance of the Project under the Proposed Action is presented in Section 8.12.

For the purposes of this section, tribal resources are identified as properties to which consulting Native American tribes ascribe traditional religious and cultural significance in the Project Area of Potential Effects (APE). Tribal resources that are listed in, or eligible for listing in, the National Register of Historic Places (NRHP) are identified as Traditional Cultural Properties (TCP). For the purposes of this section and as defined by Section 106 of the National Historic Preservation Act (NHPA), TCPs are historic properties. For a description of tribal resource identification efforts in the Project APE, refer to Section 7.13 and the CUL 1 – Ethnographic Technical Study Report (TSR) included in Supporting Document A (SD A) (SCE 2019).

Potential effects to tribal resources in the Project APE were evaluated as follows:

- Effects to Tribal Lands
- Effects to Tribal Agreements
- Effects to Tribal Resources and TCPs

As discussed in Section 8.1, effects are classified as no effect, negligible effect, adverse effect, or beneficial effect. For the purposes of this section, adverse effects are defined as those effects that will alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, workmanship, materials, feeling, setting, and association, as defined in 36 Code of Federal Regulations Part 800 (36 Code of Federal Regulations Part 800).

A description of potential effects to tribal resources from implementation of the Proposed Action, considering new environmental measures; management and monitoring plans; and programs is provided below. Unavoidable adverse effects are also discussed at the end of this section.

### **8.13.1 Tribal Lands**

No federally recognized tribal lands are located within or near the existing Federal Energy Regulatory Commission (FERC or Commission) Project boundary or within the Proposed FERC Project boundary. Therefore, implementation of the Proposed Action would have no effect on tribal lands.

### **8.13.2 Tribal Agreements**

There are no known agreements between federally recognized tribes or other entities that have a connection to the operation and maintenance of the Project apart from the trust responsibilities accorded to tribes acknowledged by agencies of the United States. Therefore, implementation of the Proposed Action would have no effect on tribal agreements.

### **8.13.3 Tribal Resources and Traditional Cultural Properties**

As discussed in Section 7.13 and detailed in CUL 1 – Ethnographic TSR included in SD A (SCE 2019), comprehensive outreach and consultation with federally-recognized and non-federally recognized tribes did not identify any tribal resources or TCPs in the Project APE.

While no tribal resources or TCPs have been identified in the Project APE, maintenance activities associated with continued operation and maintenance of the Project, including vegetation management; road and trail maintenance; and transmission, power, and communication line maintenance have the potential to affect tribal resources and/or TCPs if any such resources are identified in the future.

If tribal resources or TCPs are identified within the Project APE over the term of the new license, protection measures would be implemented as part of an Historic Properties Management Plan (HPMP) (refer to Appendix 4-A, Section 4.2.1). Specifically, the HPMP would include stipulations regarding the management and protection of a tribal resources or TCPs; documentation and evaluation requirements; treatment and protection measures; and consultation protocol related to any identified tribal resource or TCP. Ongoing maintenance activities would have no effect on tribal resources and TCPs with implementation of the HPMP.

Additionally, under the Proposed Action, an annual environmental training program would be administered to educate personnel and contractors about cultural resources, including tribal resources, in the vicinity of the Project and measures to protect these resources during routine maintenance activities. Implementation of the environmental training program would result in a beneficial effect on tribal resources.

### **8.13.4 Unavoidable Adverse Effects**

There are no unavoidable adverse effects to tribal resources under the Proposed Action.

### **8.13.5 Literature Cited**

SCE (Southern California Edison Company). 2019. CUL 1 – Cultural Resources Ethnographic Technical Study Report, Kaweah Project. December. Available in SCE's Application for New License, Supporting Document A.

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**LIST OF ACRONYMS**

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Project	Kaweah Project
SCE	Southern California Edison Company

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## **8.14 SOCIOECONOMICS ENVIRONMENTAL EFFECTS**

This section describes potential effects to socioeconomics under the Proposed Action for the Southern California Edison Company's (SCE) Kaweah Project (Project). Potential effects to socioeconomic resources were evaluated based on continued operation and maintenance of the Project under the Proposed Action.

Potential effects to socioeconomics were evaluated as follows:

- Changes in workforce;
- Changes in housing demand and real estate/property tax base;
- Demand for public services;
- Effects on local and regional economy and local and state tax revenue;
- Displacement of residences/business establishments and effects on property value; and
- Effects on low-income and minority populations (environmental justice).

A description of potential effects to socioeconomics from implementation of the Proposed Action, considering new environmental measures; management and monitoring plans; and programs is provided below. Unavoidable adverse effects are also discussed at the end of this section.

### **8.14.1 Changes in Workforce**

Under the Proposed Action, the workforce associated with the Project would not change. There are no new facilities or modifications to existing facilities included under the Proposed Action that would result in the need for a temporary workforce or additional full-time personnel. The existing SCE workforce of 11 full-time personnel is sufficient to operate and maintain the Project over the term of the new license. Implementation of the Proposed Action would have no effect on Project workforce.

### **8.14.2 Changes in Housing Demand and Real Estate/Property Tax Base**

The workforce necessary to operate and maintain the Project over the term of the new license would not change. As a result, implementation of the Proposed Action would have no effect on housing demand, or the real estate/property tax base in the local community.

### **8.14.3 Demand for Public Services**

The demand for public services including law enforcement and public safety; fire protection; emergency services/response; road maintenance and repairs; and educational facilities does not measurably increase under the Proposed Action. No additional temporary or full-time workers would be added to SCE's workforce creating demand for public services. Installation of the new Porta-Potty and trash receptacle at the Kaweah No. 2 Powerhouse River Access Parking Area would require periodic pumping and disposal, however, implementation of this recreation enhancement would have a negligible effect on public services.

### **8.14.4 Effects on Local and Regional Economy and Local and State Tax Revenue**

The Project's contribution to the local and regional economy would remain relatively unchanged, as no new facilities or modifications to existing facilities are proposed, and the current SCE workforce is sufficient to operate and maintain the Project over the term of the new license. Environmental measures to be implemented under the Proposed Action would require periodic monitoring of resources and facilities. These activities would occur once every 5 or 10 years depending on the measure and involve SCE's consultant visiting the Project to conduct monitoring activities. This would result in a benefit to the local economy and increase local tax revenue.

Under the Proposed Action, implementation of the Instream Flow Measure (Appendix 4-A, Section 4.1.1) reduces average annual generation would be reduced by 6.0% at the Kaweah No. 1 Powerhouse and 0.8% at the Kaweah No. 2 Powerhouse. This equates to a reduction of approximately \$50,000 in Project value per year. In addition, increased maintenance requirements under the Proposed Action would further reduce net Project revenue (Section 4.0). Overall, these changes would have a negligible effect on the local/regional economy and local/state tax revenue.

### **8.14.5 Displacement of Residences/Business Establishments and Effects on Property Value**

The Project is located proximate to the unincorporated town of Three Rivers, a rural, commercial-tourist area with a population of approximately 2,200 people. The Project facilities are located on private property and public lands administered by the U.S. Bureau of Land Management. There are private residences and businesses located in the vicinity of the Project, and several Project facilities cross private parcels via easement/agreement with the land owner.

There are no new facilities or modifications to existing facilities included under the Proposed Action that would result in the displacement of residences/businesses in the Project vicinity. Further, minor changes in operation and maintenance activities and enhancements included under the Proposed Action would not affect residences/businesses or property values.



#### **8.14.6 Effects on Low-income and Minority Populations (Environmental Justice)**

Environmental justice effects occur if low-income or minority populations incur a disproportionately high share of adverse socioeconomic effects caused by implementation of an action. Implementation of the Proposed Action would not result in adverse socioeconomic effects. Therefore, there are no effects related to environmental justice.

#### **8.14.7 Unavoidable Adverse Effects**

There are no unavoidable adverse effects to socioeconomic under the Proposed Action.

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**LIST OF ACRONYMS**


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ac-ft	acre-foot/feet
BLM	Bureau of Land Management
CAMX	California-Mexico Power Area
CCAR	California climate Action Registry
CEC	California energy Commission
CH <sub>4</sub>	methane
CO <sub>2</sub>	carbon dioxide
CO <sub>2e</sub>	carbon dioxide equivalents
eGrid	Emissions and Generation Resource Integrated Database
EPA	U.S. Environmental Protection Agency
ESM	Entrainment Study Measure
ETP	Environmental Training Program
FERC or Commission	Federal Energy Regulatory Commission
FPMP	Fish Population Monitoring Plan
GHG	greenhouse gases
GWP	global warming potential
IFM	Instream Flow Measure
IPCC	Intergovernmental Panel on Climate Change
IRP	Integrated Resource Plans
mg/L	milligrams per liter
MT	metric tons
MW	megawatts
MWh	megawatt hours
N <sub>2</sub> O	nitrous oxide
NEPA	National Environmental Policy Act
NPS	National Park Service
PAD	Pre-Application document
Project	Kaweah Project
SB	Senate Bill
SCE	Southern California Edison Company
SMECP	Sediment Management and Erosion Control Plan
SNP	Sequoia National Park
SUP	special Use Permit
USACE	United States Army Corps of Engineers
Watershed	Kaweah River Watershed
WECC	Western Electricity Coordination Council
WQMP	Water Quality Monitoring Plan
WTMP	Water Temperature Monitoring Plan

## 9.0 CUMULATIVE EFFECTS ANALYSIS

The regulations implementing the National Environmental Policy Act (NEPA) define a cumulative effect as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR § 1508.7). Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time, including hydropower development.

The Proposed Action is operation and maintenance of the Kaweah Project (Project), with increased minimum instream flows, modified ramping rates, and implementation of new environmental programs and measures as described in Section 4.0 – Proposed Action.

Projects/actions considered in this cumulative effects analysis include:

- Operation and management of non-Federal Energy Regulatory Commission (FERC or Commission) facilities by Southern California Edison Company (SCE) located in the Sequoia National Park (SNP) that are not subject to a FERC License. This includes the upper portion of the Kaweah No. 1 and the Kaweah No. 3 developments, that are operated under a Special Use Permit (SUP) (Permit PWR-SEKI-6000-2016-015) issued to SCE by the National Park Service (NPS). Refer to Section 3.0 – No-Action Alternative for a detailed description of elements of the developments both within and outside of FERC jurisdiction. The following briefly describes SCE’s non-FERC facilities.
  - Upper portion of the Kaweah No. 1 Development – The upper portion of the Kaweah No. 1 Development includes four small reservoirs—Eagle Lake, Lady Franklin Lake, Crystal Lake, and Upper Monarch Lake (collectively referred to as the Mineral King Lakes)—that release water during the late summer and fall months to augment flows in the East Fork Kaweah River and generating capacity of the Kaweah No. 1 Powerhouse.
  - Upper portion of the Kaweah No. 3 Development – The upper portion of the Kaweah No. 3 Development, includes the Middle Fork and Marble Fork diversion dams, and water conveyance system (Kaweah No. 3 Flowline) that divert water from the Middle Fork and Marble Fork river reaches to the Kaweah No. 3 Powerhouse.
- Operations and management of SNP – The SNP is managed by the NPS to protect the greater Sierran ecosystem, including the sequoia groves and high Sierra regions of the parks, and its natural evolution, and to provide appropriate opportunities for present and future generations to experience and understand park resources and value. SNP borders the Kaweah Project to the north and east.

- Management of federal land by Bureau of Land Management (BLM) – BLM manages federal lands located both within the FERC Project boundary and immediately adjacent to the Project to protect resources consistent with the Bakersfield Field Office Resource Management Plan.
- Operations and maintenance of the Terminus Dam and Lake Kaweah – The U.S. Army Corps of Engineers (USACE) operates and maintains Terminus Dam and Lake Kaweah. The Dam is located on the Kaweah River approximately 10 miles downstream of the Project. Terminus Dam was constructed in 1962 for flood control and irrigation purposes. During the spring runoff season, the reservoir stores up to 185,000 acre-feet (ac-ft) of water. Downstream of Terminus Dam, the Kaweah River flows are diverted for irrigation of adjacent farmlands. The Terminus Power Plant (FERC Project No. 3947), completed in 1992 by the Kaweah River Power Authority, generates hydroelectricity at the dam. The power plant is jointly managed by Tulare Irrigation District and the Kaweah Delta Water Conservation District. The power plant has a capacity of 20.09 megawatts (FERC 2003a, 2003b).

### **9.10.1 Target Resources**

The target resources considered for inclusion in the cumulative impact analysis were identified based on FERC's Scoping Document 2 (FERC 2017) and a review of the technical information developed in support of this Application for New License (License Application). For this analysis, target resources that may be cumulatively affected by the incremental actions of the Project, in combination with other past, present, and reasonably foreseeable future actions, include water use (hydrology), water quality (water temperature and dissolved oxygen), and aquatic resources (aquatic habitat, fish, and entrainment).

### **9.10.2 Geographic Scope**

The geographic scope for the cumulative impact analysis defines the physical limits or boundaries of the effects on target resources from implementation of the Proposed Action when considering effects from other projects/actions. The geographic scope of analysis for cumulatively affected resources is defined by the physical limits or boundaries of: (1) the Proposed Action's effect on the resources; and (2) contributing effects from other hydropower and non-hydropower activities within the Kaweah River Basin. The geographic scope appropriate for evaluating cumulative effects for the Project is the:

- Kaweah River from Terminus Dam upstream to the confluence with the Middle Fork Kaweah River and Marble Fork Kaweah River;
- Middle Fork Kaweah River from the confluence with the Kaweah River upstream to the Middle Fork Diversion Dam;

- Marble Fork Kaweah River from the confluence with the Kaweah River upstream to the Marble Fork Diversion Dam; and
- East Fork Kaweah River from the confluence with the Kaweah River upstream to the confluence with tributaries receiving water from the Mineral King Lakes.

### **9.10.3 Temporal Scope**

The temporal scope for the cumulative impact analysis defines the length of time analyzed when evaluating resource effects of the Proposed Action in the context of past, present, and reasonably foreseeable future actions. Evaluations of past and future actions are limited by the amount of available information for each target resource and by information defining future projects and actions. Based on the anticipated term of the new license for the Kaweah Project, the temporal scope used for the analysis of reasonably foreseeable future actions is 50 years.

## **9.11 CUMULATIVE EFFECTS ON WATER RESOURCES**

### **9.11.1 Water Use (Hydrology)**

Information on the hydrologic effects of operations of the Kaweah Project is provided in Section 4.0 – Proposed Action, Sections 7.2 – Water Use and Hydrology Affected Environment, 8.2 – Water Use and Hydrology Environmental Effects, and SCE’s Pre-Application Document (PAD). Other water projects/actions, in addition to the Kaweah Project, that affect hydrology in the Kaweah River Watershed (Watershed) include the following:

- Operation of SCE’s non-FERC facilities located within the SNP – SCE’s non-FERC facilities have: (1) resulted in run-of-the-river diversion of water from the Marble Fork and Middle Fork Kaweah rivers, which create bypass reaches, and, then re-entry of the water back into the Kaweah River at the Kaweah No. 3 Powerhouse; and (2) allow for temporary storage of a small amount of headwater flow (1,152 ac-ft) in Mineral King Lakes located in the upper East Fork Kaweah Watershed and subsequent annual release of the water into the East Fork Kaweah River in late summer/fall.
- USACE’s Terminus Dam and Kaweah Lake – USACE operation and maintenance of Terminus Dam and Lake Kaweah impounds water for irrigation and flood control.

A discussion of the cumulative effects of these projects/actions on hydrology in the Kaweah River is provided below.

SCE’s Kaweah Project operational effects, as modified under the Proposed Action, on hydrology are analyzed in Section 8.2 – Water Use and Hydrology. The Proposed Action affects a relatively small portion of the Watershed (4.1 miles of the Kaweah River and 4.7 miles of the East Fork Kaweah River). The Proposed Action includes the Instream Flow Measure (IFM) (new minimum instream flows and modified ramping rates), and continued forebay spills and flowline draining during Project outages and sediment

management. The IFM increases minimum flows in the bypass reaches and provides for a better environmental balance of water use between power generation and environmental flow. Under the Proposed Action, there is an approximately 6.0% and 0.8% decrease in water available for power generation at the Kaweah No. 1 and Kaweah No. 2 powerhouses, respectively. This results in a commensurate increase in flows and habitat in the bypass reaches (Section 8.4 – Fish and Aquatic Resources). The IFM also maintains pre-1914 consumptive water right deliveries of 1 cubic foot per second (cfs) and 3 cfs in the Kaweah No. 1 and No. 2 flowlines, respectively. This reduces the need for flow modifications/variances in years when natural flows are too low to meet both minimum flows and consumptive water rights requirements.

Ramping rates in the IFM protect environmental resources (Section 8.4 – Fish and Aquatic Resources) and public safety (Section 8.10 – Recreation Resources), but have limited hydrology effects (only modify flows over a few hours at a time), and do not significantly affect water available for generation or water supply. Forebay spills and draining of flowlines and forebays during Project outages and sediment management are the same under the No-Action and Proposed Action. Because the Project does not include storage and is composed of run-of-the-river diversions, downstream of the Project (downstream of Kaweah No. 2 Powerhouse), essentially full natural hydrology exists in the Kaweah River; and natural seasonal patterns of high and low flow are not altered.

SCE's non-FERC facilities located within the SNP on the Marble Fork and Middle Fork Kaweah rivers include run-of-the-river water diversions, which bypass 0.58 mile of the Marble Fork, 0.87 mile of the Middle Fork Kaweah River, and 3.57 miles of the Kaweah River. Diverted water re-enters the Kaweah River at the Kaweah No. 3 Powerhouse. Up to 80 cfs may be diverted into flowlines and re-enter the river. Natural seasonal patterns of high and low flow are not altered. The amount of flow in the upstream bypass reaches, related to environmental and recreational hydrology resources, is governed by requirements in NPS SUP.

SCE's non-FERC Mineral King Lakes storage in the SNP affect flows in the East Fork Kaweah River a very small amount. The lakes store up to 1,152 ac-ft in the spring and that water is released into the East Fork Kaweah River in late summer/fall. These flows may be diverted at the Kaweah No. 1 Diversion and re-enter the Kaweah River at the Kaweah No. 1 Powerhouse. The amount of flow change in the East Fork Kaweah River due to storage in the Mineral King Lakes is small.

USACE's Terminus Dam/Lake Kaweah is located approximately 10 miles downstream of the Kaweah Project. During the spring runoff season, the reservoir stores up to 185,000 ac-ft of water. Water is released from the dam by the USACE for flood control and to meet irrigation needs. Downstream of Terminus Dam, the Kaweah River flows are diverted for irrigation of adjacent farmlands. Water releases serve multiple local water districts, including the Tulare Irrigation District and the Kaweah Delta Water Conservation District, and urban areas, including the cities of Tulare and Visalia. The Terminus Power Plant, completed in 1992 by the Kaweah River Power Authority, generates hydroelectricity at the dam. The power plant is jointly managed by Tulare Irrigation District



and the Kaweah Delta Water Conservation District, and the electricity is distributed by SCE. The power plant has a capacity of 20.09 megawatts (FERC 2003a, 2003b).

Overall, in the Watershed, there is no cumulative effect on hydrology. Flow into Kaweah Lake is not affected and water supply in Kaweah Lake and flood control are unaffected by the Proposed Action. The Proposed Action in combination with other projects/actions in the Basin would not cumulatively effect hydrology in the Kaweah River and East Fork Kaweah River.

### **9.11.2 Water Quality (Temperature and Dissolved Oxygen)**

Overall, operations of the SCE's Kaweah Project (No-Action Alternative) do not affect water quality, in particular, dissolved oxygen, and only minimally affect water temperature. The Proposed Action slightly improves water temperature in the bypass reaches. The Proposed Action IFM provides higher minimum instream flows (Section 8.4 – Fish and Aquatic Resources) in the bypass reaches during select dry months and water year types. As a result of the increased minimum instream flows, less water is diverted, and more water remains in the Kaweah River and East Fork Kaweah River. The modified minimum instream flows slightly improve summer/fall low flow season water temperatures in the bypass reaches compared to existing conditions (No-Action Alternative) (Section 8.4 – Fish and Aquatic Resources).

Under existing conditions water quality is good and meets all applicable water quality standards (e.g., oxygen) in the bypass reaches (Section 7.3.4.2) except that during the high-flow season, several water quality samples in the Kaweah River bypass reaches and comparison reaches exhibited low alkalinity (<20 mg/L). This appears to be a natural condition of the Watershed during spring high-flow conditions when snowmelt and rainfall runoff have little opportunity to pick up calcium carbonate from the basin geology. Also, there were three ammonia samples in the bypass reaches during the summer low-flow sampling period that exceeded water quality criteria. Because the Project does not have operations that would typically affect ammonia, the source could potentially be septic systems from homes along the river (Section 7.3 – Water Quality). The increased minimum instream flows may slightly improve water quality in the low-flow periods through dilution. The Proposed Action also includes implementation of water temperature (WTMP) and water quality (WQMP) monitoring plans.

SCE's non-FERC facilities located within the SNP on the Marble Fork and Middle Fork Kaweah rivers include run-of-the-river water diversions, similar to the Kaweah Project. The diversion and re-entry of water back into the Kaweah River at Kaweah No. 3 Powerhouse does not affect dissolved oxygen in the rivers (dissolved oxygen would be naturally saturated from the open flowlines and rivers). It is anticipated, that similar to the Kaweah Project, the diversions and bypass reaches may have a very small effect on water temperature (very slight increase in the warm months when diversions are occurring). During the driest months and water year types diversions would cease and water temperature would be unaffected.

SCE's non-FERC Mineral King Lakes storage in the SNP affect flows in the East Fork Kaweah River (a very small amount) in late summer/fall. The increased flows in late summer/fall could potentially have a small beneficial effect (cooling) on East Fork Kaweah River water temperature upstream of the Kaweah No. 1 Diversion and downstream of the Kaweah No. 1 Powerhouse in the Kaweah River. Water in the bypass reaches and other river reaches would maintain high dissolved oxygen levels.

USACE's Terminus Dam/Lake Kaweah impounds water, and typical of storage reservoirs, it is anticipated that the reservoir creates a warm epilimnion and cooler hypolimnion during the summer/early fall season that creates warm water conditions suitable for warm water fishes and a cooler water conditions suitable for cool water fishes (assuming oxygen is not depleted). Dissolved oxygen and water temperature inflows to Lake Kaweah would not be altered from existing conditions; therefore, the oxygen and temperature stratification dynamics that are currently occurring in the reservoir would remain unchanged.

The Proposed Action, including the IFM, WTMP, and WQMP measures in combination with other projects/actions in the Watershed, would have no effect on dissolved oxygen/water quality. There would be small local beneficial effect on water temperature in the bypass reaches, but overall a negligible effect on water temperature in the larger Kaweah River, downstream or upstream of the Kaweah Project, compared to the No-Action Alternative.

## **9.12 CUMULATIVE EFFECTS ON AQUATIC RESOURCES**

### **9.12.1 Aquatic Habitat**

The Proposed Action, with the IFM increased minimum instream flows in the bypass reaches, would have a beneficial effect on aquatic habitat in the bypass reaches. There would be a small benefit in water temperature (slightly cooler) and a benefit to aquatic physical habitat for both wetted perimeter (algae and benthic macroinvertebrates) and habitat for the dominate fishes in the bypass reaches (hardhead, Sacramento pikeminnow, Sacramento sucker, and rainbow trout) (Sections 8.4.1 and 8.4.2). Other physical habitat features such as sediment/spawning gravels and riparian vegetation would remain suitable and similar to existing conditions (No-Action Alternative). The Proposed Action WTMP and WQMP measures would also require periodic monitoring of water temperature and water quality. The Sediment Management and Erosion Control Plan (SMECP) would maintain suitable water quality during Project operations and maintenance activities.

SCE's non-FERC facilities located within the SNP on the Marble Fork and Middle Fork Kaweah rivers include run-of-the-river water diversions similar to the Kaweah Project. Aquatic habitat in the bypass reaches is governed by minimum instream flow requirements in the NPS SUP. Relative aquatic habitat amounts, compared to unimpaired habitat, is similar to those in the bypass reaches (e.g., a high percentage of the unimpaired habitat).

SCE's non-FERC Mineral King Lakes storage in the SNP affects flows in the East Fork Kaweah River, a very small amount, in late summer/fall. The increased flows in late summer/fall could potentially have a small beneficial effect on aquatic habitat on East Fork Kaweah River upstream of the Kaweah No. 1 Diversion and downstream of the Kaweah No. 1 Powerhouse in the Kaweah River during the low flow season compared to unimpaired conditions.

USACE's Terminus Dam/Lake Kaweah impounds water and creates a warm epilimnion during the summer/early fall season, which provides warm water conditions for transition zone and warm water fish community and provides a cool hypolimnion for cold-water species (i.e., trout). Inflows to Lake Kaweah would not be altered from existing conditions; therefore, the amount of aquatic habitat present in the reservoir would remain the same.

The Proposed Action, including the IFM, WTMP, WQMP, and SMECP measures in combination with other projects/actions in the Watershed, would have a beneficial effect on aquatic habitat in the Kaweah River and East Fork Kaweah rivers compared to the No-Action Alternative.

### **9.12.2 Resident Fish**

The existing conditions (No-Action Alternative) within the study area exhibit a distribution and diversity of resident fish species typical of Sierra Nevada transition zone fisheries (Section 7.4 – Fish and Aquatic Resources). This includes primarily minnow species (hardhead and Sacramento pikeminnow), Sacramento suckers, and rainbow trout (Section 7.4 – Fish and Aquatic Resources). The growth, condition, abundance, and timing of fishes observed in the Project area was similar to those in other west slope Sierra streams and there were no observable differences in abundance (or other factors) in the bypass reaches compared to the comparison reaches. The Proposed Action, with the IFM increased minimum instream flows and modified ramping rates, Fish Population Monitoring Plan (FPMP), SMECP, WTMP, WQMP and Environmental Training Program (ETP) would provide beneficial effects to resident fish species compared to the No-Action Alternative.

SCE's non-FERC facilities located within the SNP on the Marble Fork and Middle Fork Kaweah rivers include bypass reaches, similar to the Kaweah Project. Resident fish species distribution and abundance are similar to those in the bypass reaches, except the higher elevation streams have cooler water temperature and have a higher abundance of trout compared to the study area. Also, within these bypass reaches, the upstream distribution limit of transition minnow species (hardhead and Sacramento pikeminnow) occurs.

SCE's non-FERC Mineral King Lakes storage in the SNP affects flows in the East Fork Kaweah River a very small amount in late summer/fall, and has a negligible effect on the distribution and abundance of fish in the East Fork Kaweah River.

USACE's Terminus Dam/Lake Kaweah creates a warm epilimnion during the summer/early fall season, which provides warm water conditions suitable for transition and warm water fishes. It is anticipated that a suite of warm water fishes (e.g., centrarchids) inhabit the reservoir. Likely, some cooler water fishes also exist in the reservoir. Lake Kaweah would not be altered from existing conditions due to the Proposed Action; therefore, the fishes currently occurring in the reservoir would remain the same.

The Proposed Action, including the IFM, FPMP, SMECP, WTMP, WQMP, and ETP in combination with other projects/actions in the Watershed, would have a beneficial effect on fish in the Kaweah River and East Fork Kaweah rivers compared to the No-Action Alternative.

### **9.12.3 Entrainment**

Under existing conditions (No-Action Alternative), potential entrainment of fish into the Kaweah No. 1 and No. 2 flowlines and Kaweah No. 1, No. 2, and No. 3 powerhouses is discussed in Section 7.4.11.3. The AQ 9 – Entrainment Technical Study is currently being conducted. Sampling to date has shown very little entrainment (only one juvenile pikeminnow, approximately 35 millimeters, was captured in the Kaweah No. 2 Flowline during 72 hours of drift and fyke net sampling) and anecdotal information from maintenance workers and field biologists' observations indicate that entrainment is very low. The Proposed Action does not change the diversions or diversion timing and does not change the diversion amounts appreciably (slight decrease due to the IFM); therefore, the Proposed Action would have no effect on entrainment of fish compared to existing conditions (No-Action Alternative).

SCE's non-FERC facilities located within the SNP on the Marble Fork and Middle Fork Kaweah rivers include two diversions and the Kaweah No. 3 Powerhouse. Entrainment sampling to date for the Kaweah Project has found no entrainment (no fish were captured in Kaweah No. 3 Flowline during 72 hours of drift net sampling) and anecdotal information from maintenance workers and field biologists' observations indicate that entrainment at the facilities in the SNP is also very low.

SCE's non-FERC Mineral King Lakes storage in the SNP slightly changes the timing of diversions in the East Fork Kaweah River, but does not affect the amount of diversion. It is anticipated that the Project does not significantly affect entrainment of fish.

USACE's Terminus Dam/Lake Kaweah creates habitat for various species of fish. Entrainment of fish could occur at the hydropower facility at Terminus Dam. Conditions in Lake Kaweah would not be altered by the Proposed Action; therefore, any potential entrainment in the reservoir would continue to occur.

The Proposed Action, including the Entrainment Study Measure (ESM) in combination with other projects/actions in the Watershed, would not affect fish entrainment in the Kaweah River and East Fork Kaweah rivers compared to the No-Action Alternative.

### 9.13 CUMULATIVE EFFECTS ON GLOBAL CLIMATE CHANGE (GREENHOUSE GAS EMISSIONS)

Global climate change is the common nomenclature used to describe an increase in the average temperature of the Earth's atmosphere and oceans, and its projected continuation. The causes of global climate change have been linked to both natural processes and human actions. Gases that trap heat in the atmosphere are often called greenhouse gases (GHG). The greenhouse effect traps heat in the troposphere through a threefold process: short-wave radiation emitted by the sun is absorbed by the earth; the earth emits a portion of this energy in the form of long-wave radiation; and GHGs in the upper atmosphere absorb this long-wave radiation and emit it into space and back toward the earth. This "trapping" of the long-wave (thermal) radiation emitted back toward the earth is the underlying process of the greenhouse effect. According to the Intergovernmental Panel on Climate Change (IPCC), global increase in GHG emissions are primarily associated with fossil fuel combustion and industrial processes, as a result of global, economic, and population growth (IPCC 2014). Furthermore, it is estimated that human activities have caused a 1 degree Celsius (°C) increase above pre-industrial levels with global warming estimated to reach 1.5°C between 2030 and 2052, if the current GHG emissions rates continue (IPCC 2018).

Principal GHGs include carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and fluorinated gases (i.e., hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride). Some GHGs, such as CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O, can occur naturally and are emitted into the atmosphere through natural processes and human activities.

The potential heat trapping ability of each GHG varies substantially. To account for these differences in warming effect, GHGs are defined by their global warming potential (GWP). The GWP value for a GHG depends on the time span over which it is calculated and on how the gas concentration decays in the atmosphere over time. For that reason, slightly different GWP values appear in scientific literature. This impact assessment is based on the GWP values for a 100-year time horizon as provided in the IPCC Fourth Assessment Report. Under this methodology, the GWP of CO<sub>2</sub> is set to 1, the GWP of CH<sub>4</sub> is 25, and the GWP of N<sub>2</sub>O is 298.

In this analysis, GHGs are reported as carbon dioxide equivalents (CO<sub>2</sub>e) to measure their relative potency. CO<sub>2</sub>e takes into account the relative potency of the non-CO<sub>2</sub> GHGs and converts quantities to an equivalent amount of CO<sub>2</sub>, so that all emissions are reported as a single quantity.

This analysis focuses on the potential incremental (cumulative) effects of the Proposed Action on GHG emissions within California considering legislation developed in the state to address global warming from past and current projects and reasonably foreseeable future projects. At present, the State of California is the controlling legal authority on GHG emissions. The following compares GHG emission between the No-Action Alternative and Proposed Action in context with other SCE hydroelectric projects.

The Project, under the No-Action Alternative, generates electricity via renewable, hydroelectric power. Hydroelectric power from the Project is produced at three Project powerhouses with a total installed capacity of 8.85 megawatts (MW) and an annual average energy production of 39,124 megawatt hours (MWh)<sup>1</sup> under the No-Action Alternative.

Conventional hydroelectric generation is a reliable, efficient, economical, and less-polluting source of energy resulting in low GHG emissions. Although considered a small hydroelectric project, energy from the Project is used to meet California's energy demand, renewable energy goals, and provide a source of energy with low GHG emissions. The Project's hydroelectric facilities do not produce GHG emissions, rather the Project produces an "offset" in terms of the GHGs that would otherwise be generated by more CO<sub>2</sub> intense energy sources (i.e., natural gas). As shown in Table 9-1, existing Project generation results in a total offset of 9,404 metric tons (MT) CO<sub>2e</sub> annually.

Under the Proposed Action, overall Project generation would be reduced by 6.0% at the Kaweah No. 1 Powerhouse and 0.8% at the Kaweah No. 2 Powerhouse due to higher instream flow releases in new environmental measures proposed by SCE (Section 4, Appendix 4-A). This equates to an annual generation loss of 664 MWh and results in an overall annual average energy production of 38,460 MWh. Project generation under the Proposed Action results in a total offset of 9,245 MT CO<sub>2e</sub> annually. A difference of 160 MT CO<sub>2e</sub> annually between the No-Action and the Proposed Action Alternative (Table 9-1). Appendix 9-A provides a description of the methodology used to determine the effect of this loss in generation on GHGs.

The Kaweah Project falls under SCE's small hydropower portfolio. As such, the offset loss that would occur under the Proposed Action is minor in comparison to larger hydropower projects like the Big Creeks Nos. 2A, 8, and Eastwood Hydroelectric Project (FERC Project No. 67) with installed capacity of 373 MW, and Big Creek No. 3 Hydroelectric Project (FERC Project No. 120) with installed capacity of 165 MW.

Although relatively small compared to other SCE hydropower projects, power generated by the Project would offset negative impacts associated with non-renewable energy sources. The slight reduction in net GHG emissions offsets under the Proposed Action would have a negligible effect on global climate change. While SCE would have to replace the loss of generation under the Proposed Action, any replacement generation would be consistent with current legislative mandates adopted by the State of California requiring reduction in statewide GHG emissions from current levels. These include:

- **Senate Bill 32 (SB 32):** On September 8, 2016, former governor Jerry Brown signed Senate Bill (SB) 32 that extends the state's target to reduce GHG emissions. The bill mandates a 40% reduction in GHG emissions below 1990 levels by 2030 and essentially builds upon the Assembly Bill (AB) 32 GHG reduction target to reduce GHG to 1990 levels by 2020. To achieve the SB 32 reductions the plan is to increase renewable energy use, improve energy

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<sup>1</sup> Period of record used to determine annual average energy production was 1992–2018.

efficiency, get more zero emissions vehicles on California's roadways, and curb emissions from key industries (State of California 2019).

- **SB 350:** Signed into law in 2015, SB 350 increases California's renewable electricity procurement requirements from 33% by 2020 to 50% by 2030. This will increase the use of Renewables Portfolio Standard eligible resources, including solar, wind, biomass, geothermal, and others. SB 350 requires the state to double statewide energy efficiency savings in electricity and natural gas end uses by 2030.
- **SB 100:** Signed into law in 2018, SB 100 increases California's renewable electricity procurement requirements from 50% by 2030, with the passage of SB 350, to 50% by 2026, 60% by 2030, and ultimately 100% carbon free resources by 2045.

To help ensure the renewable electricity requirements of SB 350 and SB 100 are met and GHG emission reductions in SB 32 are realized, large utilities are required to develop and submit Integrated Resource Plans (IRP). These IRPs detail how each utility will meet their customers resource needs, reduce greenhouse gas emissions and ramp up the deployment of clean energy resources (CEC 2019).

Despite the loss of generation associated with implementation of the Proposed Action, the Project would continue to produce electric energy with low GHG emissions and operation of the Project would continue to provide a valuable offset for GHGs. The Project's continued operation, even considering the loss of generation, helps California move toward a lower carbon future and meet the goals of SB 32 and SB 350. In addition, SCE would have to replace any loss of generation from the Project with an alternative source that has low GHG emissions to comply with current legislative requirements. Therefore, impacts of the Proposed Action on GHG emissions and the resulting effect on global warming, when considering other projects/actions, are negligible.

No unavoidable cumulative adverse effects to climate change have been identified under the Proposed Action.

#### **9.14 UNAVOIDABLE ADVERSE EFFECTS**

No unavoidable cumulative adverse effects have been identified under the Proposed Action.

## 9.15 LITERATURE CITED

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## **TABLES**

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**Table 9-1. Estimated Annual Hydroelectric Generation Offsets - Greenhouse Gas Emissions**

Greenhouse Gas Emissions	GWP Coefficient	Emission Factors		Generation Offset		
		GHG lbs/MW-hr	GWP lbs/MW-hr	Generation MW-hrs/yr	GHG tonnes/yr	CO <sub>2</sub> eqv tonnes/yr
<b>Existing</b>						
Carbon Dioxide (GHG - CO <sub>2</sub> )	1	527.90	527.90	39,124	9,368	9,368
Methane (GHG - CH <sub>4</sub> )	25	0.0330	0.83	39,124	0.59	15
Nitrous Oxide (GHG - N <sub>2</sub> O)	298	0.0040	1.19	39,124	0.07	21
Carbon Dioxide Equivalents (CO <sub>2</sub> eqv)			529.92	39,124		<b>9,404</b>
<b>With Project</b>						
Carbon Dioxide (GHG - CO <sub>2</sub> )	1	527.90	527.90	38,460	9,209	9,209
Methane (GHG - CH <sub>4</sub> )	25	0.0330	0.83	38,460	0.58	14
Nitrous Oxide (GHG - N <sub>2</sub> O)	298	0.0040	1.19	38,460	0.07	21
Carbon Dioxide Equivalents (CO <sub>2</sub> eqv)			529.92	38,460		<b>9,245</b>
<b>Decrease in Total GHG Offsets</b>						<b>-160</b>

Source: CCAR 2009

Notes:

Global Warming Potentials (GWP) per IPCC Fourth Assessment Report (SAR)

GHG Emission Factors per eGRID Summary Tables 2016

GWP factors = GWP x GHG factors (respectively)

Estimated Proposed Project generation = 38,460 MW-hrs/yr

Less existing No-Action generation = 39,124 MW-hrs/yr

Estimated change in generation = (664) MW-hrs/yr

Generation offset is increase in GHG emissions elsewhere due to loss of hydroelectric generation output under Proposed Action

Offset units are metric tonnes (1,000 kilograms or 2,204.6 pounds)

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## **APPENDIX 9-A**

### **Methodology to Determine Effect of Loss of Generation on Greenhouse Gases**

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The following describes the methodology used to determine the effect of this loss in generation on GHGs. A loss of generation capacity would have to be made up for by other electric energy retailers (i.e., purchased on the market) to meet demand. Electricity purchased on the California grid could include a variety of generation sources, including non-renewable (fossil fuel) sources, which generate GHGs, as well as renewable sources with negligible GHG emissions. To estimate the equivalent amount of GHGs produced by replacement electric generation, the methodology presented in the California Climate Action Registry (CCAR 2009) was used. This methodology is based on a database for GHGs associated with electric production (Emissions and Generation Resource Integrated Database, or eGRID) developed for the United States Environmental Protection Agency (EPA). The eGRID database is a globally recognized source of emissions data for electric power generated in the United States. eGRID is widely used for many other applications, such as EPA's Power Profiler and Carbon Footprint Tools, indirect emissions under the World Resources Institute, the Climate Registry, California Climate Action Registry, EPA Climate Leaders protocols, and many non-governmental organization tools and methodologies.

The eGrid divides the United States into regions and sub-regions. The region for California (California-Mexico Power Area [CAMX]) is a sub-region within the Western Electricity Coordination Council (WECC) area. The eGrid contains the most recent emissions operating data for California from all electricity providers, including coal and gas-fired power plants, cogeneration, biomass, solar, geothermal, nuclear, wind, hydroelectric, and other sources. Emissions are reported for three GHGs: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O). The eGRID provides total output emission rates, as pounds per megawatt hour (lb/MWh), for CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O. The total output emission rates are the appropriate value to use for carbon foot printing and to assign an emissions value from the consumption of purchased electricity (EPA 2016). These output emissions rates were then converted to carbon dioxide equivalents, using the global warming potential (GWP) factors presented in IPCC (2014).

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**LIST OF ACRONYMS**

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Project	Kaweah Project
SCE	Southern California Edison Company

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## 10.0 ENVIRONMENTAL ANALYSIS OF OTHER ALTERNATIVES

In the Application for New License, the following alternatives were considered:

- No-Action Alternative; and
- Southern California Edison Company's (SCE) Proposed Action.

The No-Action Alternative is defined as the alternative under which the Kaweah Project (Project), as currently configured, will continue to be operated and maintained under the terms and conditions of the existing license, without modification. That is, Project operation and maintenance will not be subject to any new or different protection, mitigation, or enhancement measures. Continued operation and maintenance of the Project in this fashion will not alter the existing environment as it is described under the resource-specific subsections in Section 7.0 – Affected Environment. Accordingly, implementation of the No-Action Alternative will have no environmental effects, and as such, is considered the baseline for the purposes of this environmental analysis.

SCE's Proposed Action considers input from state and federal resource agencies, Native American Tribes, non-governmental organizations, members of the public (collectively referred to as stakeholders) acquired during consultation activities completed for the relicensing of the Project (refer to Chapter 14.0 – Consultation Documentation). The Proposed Action includes: Project boundary modifications; changes to Project operations and maintenance; recreation enhancements; and implementation of new environmental measures, management and monitoring plans, and programs designed to protect, maintain, or enhance environmental and cultural resources over the term of the new license. Environmental analysis of the Proposed Action is provided in Sections 8.1 through 8.14.

To date, no formal alternatives have been proposed by stakeholders for consideration in the Application for New License.

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**LIST OF ACRONYMS**


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FERC or Commission	Federal Energy Regulatory Commission
MWh	megawatt hours
Project	Kaweah Project
SCE	Southern California Edison Company

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## **11.0 ECONOMIC ANALYSIS**

As specified in the Federal Energy Regulatory Commission's (FERC or Commission) content requirements at 18 CFR §5.18(b)(5)(ii)(E), this section compares costs associated with the No-Action Alternative (existing condition) with costs associated with the Proposed Action for the Kaweah Project (Project). This analysis includes a comparison of economic benefits; costs of new environmental measures, management and monitoring plans, and programs; and power generation between the alternatives. Costs are provided in 2018 United States dollars and the analyses are based on a new license with a 50-year term being granted. Table 11-1 provides a summary of the assumptions used to prepare this economic analysis.

### **11.1 NO-ACTION ALTERNATIVE**

The No-Action Alternative represents the existing condition and is described in Section 3.0. Under this alternative, there will be no change in the current operation or maintenance of the Project. Southern California Edison Company (SCE) will not provide any additional environmental programs or measures above those provided in the existing license. The annualized operating cost of the existing Project is approximately \$3,853,085 (Table 11-2).

### **11.2 PROPOSED ACTION ALTERNATIVE**

The Proposed Action includes implementation of new environmental measures, management and monitoring plans, and programs, as described in Section 4.0. The annualized operating costs associated with the Proposed Action are \$4,037,965 (Table 11-3).

#### **11.2.1 New Environmental Measures, Management and Monitoring Plans, and Programs**

Under the Proposed Action, new environmental measures, management and monitoring plans, and programs will be implemented, which are designed to protect or enhance environmental and cultural resources over the term of the new license. The annualized costs associated with implementation of the new environmental measures, plans and programs are \$184,880. This includes additional operation and maintenance costs and capital and one-time costs associated with their implementation. A summary of these costs is included in Table 11-4.

### **11.3 COMPARISON OF ANNUAL PROJECT BENEFITS AND COSTS**

Under the No-Action Alternative, the Project will continue to generate an annual average of 39,124 megawatt hours (MWh) of electricity, which results in a gross annual benefit of \$2,081,134. Under the Proposed Action, the Project will produce an annual average of 38,460 MWh of electricity (an annual average energy generation loss of 664 MWh compared to the No-Action Alternative or a reduction of 1.7%). This results in a gross annual benefit of \$2,050,590 (Table 11-5).

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## **TABLES**

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**Table 11-1. Summary of Assumptions Used in the Economic Analysis**

<b>Assumption</b>	<b>Value</b>
Base Year for Costs and Benefits	2018
2018 Energy Value (\$/MWh)	\$46.00
2018 Capacity Value (\$/kW-year)	\$31.80
Period of Analysis	50 Years <sup>1</sup>
In-Service Period	2023 <sup>1</sup>
Federal Tax Method <sup>2</sup>	150% DB 20 Years
State Tax Method <sup>2</sup>	200% DB 50 Years
Incremental Cost of Capital	7.61%
Capitalized Interest Rate for Tax	4.15%
Escalation Rates	GDP Index

<sup>1</sup> SCE is requesting a 50-year license term for the Kaweah Project. Assuming a January 1, 2023 in-service period, this results in a new license expiration of December 31, 2072.

<sup>2</sup> State and Federal income taxes are computed for all of the SCE Hydro assets combined and no amount is specifically designated for this individual project.

**Table 11-2. No-Action Alternative – Costs Associated with the Kaweah Project**

<b>Cost Component</b>	<b>Annual Cost (2018\$)</b>
Capital Cost <sup>1</sup>	\$0
New Environmental Measures <sup>2</sup>	\$0
Operation and Maintenance (O&M) <sup>3</sup>	\$1,663,455
Depreciation <sup>4</sup>	\$1,384,730
Property Tax <sup>5</sup>	\$241,900
Administrative and General (A&G)	\$563,000
<b>Total Expenses</b>	<b>\$3,853,085</b>

<sup>1</sup> Any capital costs associated with existing Kaweah facilities are included in Operation and Maintenance.

<sup>2</sup> Any existing environmental measures are included in Operation and Maintenance.

<sup>3</sup> This amount represents average Operation and Maintenance expenses for the five-year period 2014-2018.

<sup>4</sup> This amount represents the actual depreciation for the year 2018.

<sup>5</sup> This amount represents the actual property tax for the year 2018.

**Table 11-3. Proposed Action Alternative – Costs Associated with the Kaweah Project**

<b>Cost Component</b>	<b>Annual Cost (2018\$)</b>
Capital Cost (modified/new facilities) <sup>1</sup>	\$700
New Environmental Measures <sup>2</sup>	\$184,180
Operation and Maintenance (O&M) <sup>3</sup>	\$1,663,455
Depreciation <sup>4</sup>	\$1,384,730
Property Tax <sup>5</sup>	\$241,900
Administrative and General (A&G)	\$563,000
<b>Total Expenses</b>	<b>\$4,037,965</b>

<sup>1</sup> This amount represents capital costs annualized over the term of the new license for new recreation enhancements.

<sup>2</sup> This amount represents the new environmental measures costs annualized over the term of the new license.

<sup>3</sup> This amount represents average Operation and Maintenance expenses for the five-year period 2014-2018.

<sup>4</sup> This amount represents the actual depreciation for the year 2018.

<sup>5</sup> This amount represents the actual property tax for the year 2018.

**Table 11-4. Proposed Action – Cost of New Environmental Measures, Management and Monitoring Plans, and Programs for the Kaweah Project**

<b>New Environmental Measure, Management and Monitoring Plans, and Programs</b>	<b>Total Capital and One-time Costs (2018\$)</b>	<b>Total Environmental Measures Costs (2018\$)</b>	<b>Total Annualized Costs<sup>1</sup> (2018\$)</b>
<b>Aquatic Resources</b>			
Instream Flow Measures (MIF and Ramping) (modified)		\$1,000,000	\$20,000
Stream Gaging Monitoring Plan (modified)		\$1,000,000	\$20,000
Sediment Management and Erosion Control Plan (ongoing)		\$0	\$0
Fish Population Monitoring Plan (new)		\$900,000	\$18,000
Entrainment Measure (new)		\$100,000	\$2,000
Water Temperature Monitoring Plan (new)		\$650,000	\$13,000
Water Quality Monitoring Plan (new)		\$650,000	\$13,000
<i>Subtotal</i>	<i>\$0</i>	<i>\$4,300,000</i>	<i>\$86,000</i>
<b>Cultural Resources</b>			
Historic Properties Management Plan (modified)		\$1,684,000	\$33,680
<i>Subtotal</i>	<i>\$0</i>	<i>\$1,684,000</i>	<i>\$33,680</i>
<b>Land Resources</b>			
Project Road and Trail Management Plan (modified)		\$750,000	\$15,000
<i>Subtotal</i>	<i>\$0</i>	<i>\$750,000</i>	<i>\$15,000</i>
<b>Recreation Resources</b>			
Recreation Enhancement Measures (new)	\$25,000	\$375,000	\$8,000
Dissemination of Real-time Flow Information (new)	\$10,000	\$600,000	\$12,200
<i>Subtotal</i>	<i>\$35,000</i>	<i>\$975,000</i>	<i>\$20,200</i>

New Environmental Measure, Management and Monitoring Plans, and Programs	Total Capital and One-time Costs (2018\$)	Total Environmental Measures Costs (2018\$)	Total Annualized Costs <sup>1</sup> (2018\$)
<b>Terrestrial Resources</b>			
Special-status Bat Protection Measure (ongoing)		\$0	\$0
Vegetation and Integrated Pest Management Plan (modified)		\$750,000	\$15,000
Special-status Plant Protection and Monitoring Plan (new)		\$750,000	\$15,000
Avian Mortality Monitoring Plan (ongoing)		\$0	\$0
Wildlife Mortality Monitoring Plan (ongoing)		\$0	\$0
Transmission, Power, and Communication Line Maintenance Measure (ongoing)		\$0	\$0
<i>Subtotal</i>	<i>\$0</i>	<i>\$1,500,000</i>	<i>\$30,000</i>
<b>Environmental Training</b>			
Environmental Training Program (ongoing)	\$0	\$0	\$0
<i>Subtotal</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>
<b>TOTAL</b>	<b>\$35,000</b>	<b>\$9,209,000</b>	<b>\$184,880</b>

<sup>1</sup> Total one-time capital costs plus total environmental measures costs annualized over the term of the new license (50 years).

**Table 11-5. Comparison of Annual Project Benefits and Costs for the No-Action and Proposed Action Alternatives**

<b>Item</b>	<b>No-Action Alternative (2018\$)</b>	<b>Proposed Action Alternative (2018\$)</b>
Dependable Operating Capacity (MW)	8.85	8.85
Average Annual Energy Production (MWh) <sup>1</sup>	39,124	38,460
Annual Energy Production Benefit (\$)	\$1,799,704	\$1,769,160
Annual Capacity Benefit (\$)	\$281,430	\$281,430
Gross Annual Benefit (\$)	\$2,081,134	\$2,050,590
Annual Cost (\$)	\$3,853,085	\$4,037,965
Reduction in Net Annual Benefit (\$) <sup>2</sup>		\$215,424
Reduction in Annual Energy Production (MWh) <sup>3</sup>		664
Reduction of Annual Energy Production (%) <sup>4</sup>		1.70%

<sup>1</sup> The average annual energy for the No-Action Alternative is a 27-year average (1992-2018) calculated from the actual generation for the three Kaweah Project powerhouses. The average annual energy for the Proposed Action reflects the reduced generation that would have occurred if the new measures were in effect.

<sup>2</sup> The reduction in net annual energy benefits is a result of implementation of new environmental measures, management and monitoring plans, and programs (\$184,880) plus the reduction in generation (\$30,544).

<sup>3</sup> The reduction in annual energy is calculated by subtracting the average annual energy production under the Proposed Action from the average annual energy production under the No-Action Alternative.

<sup>4</sup> The percent reduction of annual energy is calculated by dividing the reduction in annual energy produced under the Proposed Action by the average annual energy produced under the No-Action Alternative.



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**LIST OF ACRONYMS**

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BLM	Bureau of Land Management
CDFG	California Department of Fish and Game (now known as CDFW)
CDFW	California Department of Fish and Wildlife (formerly known as CDFG)
COLD	Freshwater Habitat
DCU	Deer Conservation Units
EIS	Environmental Impact Statement
FERC or Commission	Federal Energy Regulatory Commission
FPA	Federal Power Act
FRSH	Freshwater Replenishment
IRWMP	Integrated Regional Water Management Plan
MUN	Municipal and Domestic Supply
MWh	megawatt hours
NPS	National Park Service
NRI	Nationwide Rivers Inventory
ORV	outstandingly remarkable value
POW	Hydropower Generation
Project	Kaweah Project
RARE	Rare, Threatened, or Endangered Species
REC-1	Water Contact Recreation
REC-2	Non-Contact Water Recreation
RMP	Resource Management Plan
ROD	Record of Decision
SCE	Southern California Edison Company
SNP	Sequoia National Park
SPWN	Spawning, Reproduction, and/or Early Development
SUP	Special Use Permit
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
W&SR	Wild and Scenic Rivers
WARM	Warm Freshwater Habitat
WILD	Wildlife Habitat

## 12.0 CONCLUSIONS AND RECOMMENDATIONS

This section compares the developmental and non-developmental effects of the Proposed Action and the No-Action Alternative for the Kaweah Project (Project); identifies the recommended alternative; summarizes unavoidable adverse effects; discusses the recommendations of fish and wildlife agencies; and describes the Project's consistency with comprehensive plans.

### 12.1 COMPARISON OF ALTERNATIVES

This section includes a comparison of the developmental and non-developmental effects (resource conditions) resulting from operation and maintenance of the Project under the Proposed Action and the No-Action Alternative.

#### 12.1.1 Proposed Action

Overall, the Proposed Action protects and enhances resource conditions in the vicinity of the Kaweah Project. The key consideration in developing the Proposed Action was to ensure that future operation and maintenance of the Project protects power generation, consumptive water supply, and system capability and reliability, while maintaining and enhancing environmental and cultural resources in the Project vicinity. Resource effects under the Proposed Action are described in detail in Section 8.0 – Environmental Effects.

Under the Proposed Action, ongoing Project operation and maintenance activities are memorialized in environmental measures; management and monitoring plans; and programs (collectively referred to as measures) which are designed to protect, maintain, or enhance environmental and cultural resources over the term of the new license (Section 4, Appendix 4-A). The measures also include new resource protection measures; new monitoring requirements; new resource agency consultation and reporting requirements; and improved compliance mechanisms compared to the No-Action Alternative.

The Project's annual average energy generation (1992–2018) under the No-Action Alternative is 39,124 megawatt hours (MWh); and it is estimated that the annual average energy generation under the Proposed Action will be 38,460 MWh. This annual average loss of generation (adverse effect) under the Proposed Action (6.0% at the Kaweah No. 1 Powerhouse and 0.8% at the Kaweah No. 2 Powerhouse) is a result of new instream flow measures developed to benefit resources in the Kaweah River Watershed.

The Proposed Action results in a benefit to resources compared to the No-Action Alternative, as identified below.

#### Water Use and Hydrology

- Protects pre-1914 consumptive water rights users' water supply.
- Maintains existing water uses and water rights.
- Maintains beneficial uses as defined by State Water Resources Control Board.

## **Water Quality**

- Enhances water quality in the bypass reaches.
- Protects water quality during Project maintenance.
- Requires periodic water quality monitoring.

## **Aquatic Resources**

- Restores a portion of the low flow natural hydrograph (late summer/fall/early winter low flows) in the bypass reaches.
- Enhances aquatic habitat during the low flow period (late summer/fall/early winter low flows) in the bypass reaches, which enhances the aquatic community (fish and macroinvertebrates).
- Maintains sediment supply and transport in the bypass reaches.
- Maintains/enhances healthy stream channel conditions (substrate, channel dimensions, riparian vegetation).
- Protects special-status aquatic species and their habitat (hardhead and western pond turtle).
- Requires periodic fish population monitoring.
- Requires periodic water temperature monitoring.
- Formally commits to completion of the entrainment study.

## **Botanical and Wildlife Resources**

- Protects populations of Munz's iris.
- Requires periodic botanical surveys and reporting.
- Reduces the potential spread or introduction of non-native invasive plants.
- Maintains/enhances habitat for riparian special-status plants and riparian-nesting birds.
- Reduces the potential risk of raptor electrocutions.
- Maintains/enhances aquatic foraging habitat for special-status raptors and bats.

- Protects special-status bats roosting in the interior of Project facilities.
- Maintains protective measures and habitat connectivity for special-status and game mammals along Project flowlines (i.e., wildlife bridges, escape ramps, escape fencing, and hazers).

### **Geology and Soils**

- Maintains natural channel and hillslope stability.
- Maintains natural channel topography in the bypass reaches.

### **Geomorphology**

- Maintains channel forming flows (scouring flows).
- Maintains channel geomorphology.

### **Riparian Resources**

- Maintains conditions suitable for riparian recruitment.
- Maintains/enhances riparian and wetland habitats along the bypass reach.
- Reduces the potential spread or introduction of non-native invasive plant species to riparian and wetland habitats.

### **Land Use and Management**

- Ensures that only land that is necessary for operation and maintenance of the Project is encompassed by the Federal Energy Regulatory Commission (FERC or Commission) Project boundary.
- Maintains consistency with established land management plans and policies, and land use designations.
- Maintains consistency with the Bureau of Land Management's (BLM) goals and objectives for the Case Mountain Extensive Recreation Management Area.

### **Recreation Resources**

- Enhances recreation opportunities by providing modified instream minimum flows that will benefit aquatic resources, riparian vegetation, water quality and overall visual quality, all of which are associated with a positive recreation experience.
- Maintains whitewater boating opportunities and other stream-based recreation opportunities in the bypass reaches.

- Maintains and enhances trail use opportunities along the Kaweah No. 2 Flowline.
- Maintains non-motorized trail use opportunities on the Kaweah No. 1 Forebay Road.
- Maintains recreation opportunities on the Kaweah River by continuing to provide parking for river access at the Kaweah No. 2 Powerhouse River Access Parking Area.
- Enhances recreation opportunities and experience at the Kaweah No. 2 Powerhouse River Access Parking Area through installation of recreation enhancements, including a portable bathroom and trash receptacle.
- Enhances stream-based recreation opportunities by providing real-time flow information that can be used by whitewater boaters and other stream-based recreation users for trip planning and scheduling purposes.

### **Aesthetic Resources**

- Enhances visual quality by providing modified minimum instream flows and maintaining/enhancing riparian habitat and water quality, which are associated with scenic quality.
- Enhances visual quality by providing a bathroom and trash receptacle at the Powerhouse No. 2 River Access Parking Area, which will reduce litter and contain human waste and garbage.

### **Cultural and Tribal Resources**

- Maintains tribal resources and Traditional Cultural Properties.
- Maintains involvement of Project stakeholders, including Native American Tribes.
- Establishes clear protocols for protection and management of cultural resources, including protection, identification, and National Register of Historic Places evaluation.
- Establishes protocols for environmental review of Project operations and maintenance activities to ensure protection of cultural resources.
- Maintains public and worker education.
- Requires periodic resource condition monitoring and reporting.

### **Socioeconomics**

- Maintains the local/regional economy and local/state tax revenue.

### **12.1.2 No-Action Alternative**

The No-Action Alternative maintains the existing baseline conditions, with no additional benefits to resources (status quo). The Kaweah Project would continue to operate under the current license conditions. No new environmental or cultural measures would be implemented.

## **12.1 RECOMMENDED ALTERNATIVE**

Section 4(e) of the Federal Power Act (FPA) requires the FERC to, in addition to the power and development purposes for which licenses are issued, give equal consideration to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement, of fish and wildlife (including related spawning grounds and habitat); the protection of recreational opportunities; and the preservation of other aspects of environmental quality. Further, Section 10(a) of the FPA requires that a project, as licensed, be in the judgment of the Commission, best adapted to a comprehensive plan for improving or developing a waterway for beneficial public purposes. The following describes the basis for selecting the Proposed Action as the preferred alternative.

The Commission could choose the No-Action Alternative, with a few additional mitigation measures, as the preferred alternative. The status quo would be maintained and resources in the area would remain at current conditions, without any additional degradation, and existing power generation would be maintained. However, the Proposed Action is better adapted to a comprehensive plan for improving or developing a waterway for beneficial public purposes based on the Commission's mandate under the FPA. The Proposed Action results in a better balance between developmental and non-developmental resources compared to the No-Action Alternative.

The Proposed Action is recommended as the preferred alternative because: (1) issuance of a new hydropower license by the Commission will allow Southern California Edison Company (SCE) to continue operating the Kaweah Project as a beneficial and dependable source of clean renewable electric energy; and (2) the recommended measures will protect, maintain, or enhance environmental and cultural resources in the vicinity of the Project.

## **12.2 UNAVOIDABLE ADVERSE EFFECTS**

There are no unavoidable adverse effects to environmental resources as a result of implementation of the Proposed Action (refer to Section 8.0 – Environmental Effects). However, there is an unavoidable adverse effect related to Project generation.

## **12.3 RECOMMENDATIONS OF FISH AND WILDLIFE AGENCIES**

The Proposed Action considers input from federal and state resource agencies, Native American Tribes, non-governmental organizations, members of the public (collectively referred to as Project stakeholders) acquired during consultation activities completed for relicensing of the Project. No formal recommendations from fish and wildlife agencies

have been submitted to date. Therefore, the Proposed Action represents only SCE's recommended protection, mitigation, and enhancement measures.

## **12.4 CONSISTENCY WITH COMPREHENSIVE PLANS**

Section 10(a)(2)(A) of the FPA, 16 U.S.C. Section 803 (a)(2)(A), requires FERC to consider the extent to which a project is consistent with federal and state comprehensive plans for improving, developing, and conserving the waterways associated with a project.

The following sections identify the comprehensive plans that are relevant to the relicensing of the Project, based on a review of FERC's List of Comprehensive Plans (List) dated May 2019 (FERC 2019) and other documents. This section summarizes the content of each relevant comprehensive plan, discusses the plans applicability to the Project, and provides a statement of the Project's consistency with each plan. The purpose of the evaluation is to ensure that operation and maintenance of the Project under the Proposed Action is consistent with pertinent goals and objectives outlined in each comprehensive plan.

The Draft Application for New License was submitted to resource agencies and Tribes for a 90-day comment period to allow review of the consistency determinations. To date, no comments were received related to the consistency determinations included in this Application for New License.

### **12.4.1 Relevant Plans from FERC's List of Comprehensive Plans**

The FERC's List includes six plans, which are relevant to the Kaweah Project. These plans are identified below. In some cases, updated versions of the plans identified in FERC's List were available and are used in this document. Planning documents that have been updated since FERC published their List are identified with an asterisk (\*). The FERC List includes the following plans:

- Bureau of Land Management. 2014. Bakersfield Field Office Resource Management Plan. Department of the Interior. Bakersfield, California. December 2014.
- California Department of Fish and Game\*. 2007. California Wildlife: Conservation Challenges, California's Wildlife Action Plan. Sacramento, California. 2007.
- California Department of Fish and Game. 2003. Strategic Plan for Trout Management: A Plan for 2004 and Beyond. Sacramento, California. November 2003.
- California State Water Resources Control Board. 2018. Water Quality Control Plan for the Tulare Lake Basin. Sacramento, California. May 2018.



- Department of the Army Corps of Engineers. Sacramento District. 1996. Kaweah River Basin Investigation: Final Feasibility Report and Final Environmental Impact Statement. Sacramento, California. September 1996.
- National Park Service. The Nationwide Rivers Inventory. Department of the Interior, Washington, DC. 1993.

#### **12.4.1.1 Bakersfield Field Office Resource Management Plan**

The BLM, Bakersfield Field Office Record of Decision (ROD), and Approved Resource Management Plan (RMP) (BLM 2014) provides broad-scale direction for the future management of BLM-administered public lands and resources located in an eight-county region of southern-central California. The RMP Planning Area encompasses about 17 million acres throughout Kings, San Luis Obispo, Santa Barbara, Tulare, Ventura, Madera, eastern Fresno, and western Kern counties. The BLM Bakersfield Field Office is directly responsible for the management of approximately 400,000 acres of public land and 1.2 million acres of federal mineral estate (i.e., the Bakersfield Decision Area). The decisions included in the Bakersfield Field Office ROD and RMP supersede previous planning documents for this region, including the 1997 Caliente RMP and its subsequent amendments.

The RMP presents desired outcomes – expressed in terms of goals and objectives for resource conductions and uses, and establishes the allowable uses, management actions, and special designations that will enable the BLM to achieve the desired outcomes. The RMP guides the Bakersfield Field Office in the implementation of all its subsequent management actions and site-specific activities.

The Bakersfield Field Office RMP is applicable to the Kaweah Project as it provides management directives for lands administered by the BLM in the vicinity of the Project. Related goals and objectives contained in the RMP include enhancement, protection, and preservation of biological, cultural, visual, water, and recreation resources, as well as, management of livestock grazing, areas of critical environmental concern, wilderness study areas, and wild and scenic rivers.

Implementation of the Proposed Action, including new environmental measures; management and monitoring plans; and programs, supports management direction, goals, and objectives contained in the Bakersfield Field Office RMP, and therefore is consistent with the Bakersfield Field Office RMP.

#### **12.4.1.2 California Wildlife: Conservation Challenges, California's Wildlife Action Plan**

In 2000, Congress enacted the State Wildlife Grants Program to support state programs that broadly benefit wildlife and habitats but particularly “species of greatest conservation need”. As a requirement for receiving funding under this program, state wildlife agencies were to have submitted a Wildlife Action Plan (comprehensive wildlife conservation strategy) to the U.S. Fish and Wildlife Service (USFWS) in 2005. The California

Department of Fish and Game (CDFG, now known as California Department of Fish and Wildlife [CDFW] as of 2013), in partnership with the Wildlife Health Center, University of California, Davis, directed the development of California's Wildlife Action Plan.

To meet current requirements of the grant program CDFW (formerly CDFG), released the first comprehensive update of the plan in 2015 (CDFW 2015a). The revised plan includes updated statewide and regional conservation actions based on current stressors and circumstances. Statewide actions are those actions that are important across most or all regions. Regional actions are based on the state's physiographic characteristics (i.e., watersheds and vegetation communities) coupled with the consideration of wildlife and natural resources management areas of responsibility. The regional approach facilitated the discussion of habitats, ecosystems, and conservation issues at a scale appropriate for conservation planning and compatible with resource management jurisdictions and decision-making authorities. The Kaweah Project is located within the Sierra Nevada regional province, proximate to the Central Valley province, identified in the plan.

Implementation of the Proposed Action, including new environmental measures; management and monitoring plans; and programs, is consistent with the statewide and regional actions contained in California's 2015 Wildlife Action Plan intended to restore and conserve California's wildlife.

#### **12.4.1.3 Strategic Plan for Trout Management: A Plan for 2004 and Beyond**

This plan was developed to identify key issues and concerns relative to non-anadromous salmonid resources and fisheries in California, and to develop goals and strategies to address these issues. The scope of the plan includes all resident forms of salmonids. The goals and strategies articulated in the plan were developed around two main themes that reflect the general mission of CDFW: (1) habitat and native species protection and management; and (2) public use, including recreational angling. The plan calls for an ecosystem (watershed) approach for trout resource management, the protection and restoration of cold-water ecosystems, and improved education and communication with landowners and managers, as well as maintaining and enhancing trout angling opportunities statewide and improved effectiveness of how hatchery trout are utilized. The plan also includes strategies to improve and update trout resource status and recreational use information, strategies for using hatchery-produced trout more efficiently, and strategies for integrating educational opportunities to improve the general public's interest and understanding of trout related resources. The plan identifies changes in direction for trout management that include a broader view and appreciation of the aquatic ecosystem.

While there are no trout management plans/programs that apply specifically to the Kaweah River Watershed, rainbow trout and brown trout are present in the vicinity of the Project.

The environmental measures included in the Proposed Action were designed to benefit fish populations and habitats in the river reaches associated with the Project. Implementation of the Proposed Action is consistent with management strategies outlined in the Strategic Plan for Trout Management.

#### **12.4.1.4 Water Quality Control Plan for the Tulare Lake Basin**

Water quality control plans, or basin plans, contain California's administrative policies and procedures for protecting state waters. Basin plans are required by the state Porter-Cologne Water Quality Control Act (California Water Code Section 13240). In addition, Section 303 of the federal Clean Water Act requires states to adopt water quality standards that “consist of the designated uses of the navigable waters involved and the water quality criteria for such waters based upon such uses.”

Each of California's nine regional water quality control boards must formulate and adopt a basin plan for all areas within its region. The basin plans must conform with statewide policy set forth by the legislature and by the State Water Resources Control Board. Basin plans consist of designated beneficial uses to be protected, water quality objectives to protect those uses, and a program of implementation needed for achieving the objectives.

Beneficial uses, together with their corresponding water quality objectives, meet federal regulatory criteria for water quality standards. Hence, California's basin plans serve as regulatory references for meeting both State and federal requirements for water quality control.

The Water Quality Control Plan for the Tulare Lake Basin (CVRWQB 2018) covers the Project area and identifies eighteen surface water beneficial uses. Of those, the following ten are applicable to the Kaweah River above Lake Kaweah:

- **Municipal and Domestic Supply (MUN)** – Uses of water for community, military, or individual water supply systems, including, but not limited to, drinking water supply.
- **Hydropower Generation (POW)** – Uses of water for hydropower generation.
- **Water Contact Recreation (REC-1)** – Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.
- **Non-Contact Water Recreation (REC-2)** – Uses of water for recreational activities involving proximity to water, but where there is generally no body contact with water, nor any likelihood of ingestion of water. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

- **Warm Freshwater Habitat (WARM)** – Uses of water that support warm water ecosystems, including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates. WARM includes support for reproduction and early development of warm water fish.
- **Cold Freshwater Habitat (COLD)** – Uses of water that support cold-water ecosystems, including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
- **Wildlife Habitat (WILD)** – Uses of water that support terrestrial or wetland ecosystems, including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.
- **Rare, Threatened, or Endangered Species (RARE)** – Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.
- **Spawning, Reproduction, and/or Early Development (SPWN)** – Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish. SPWN shall be limited to cold-water fisheries.
- **Freshwater Replenishment (FRSH)** – Uses of water for natural or artificial maintenance of surface water quantity or quality.

The Basin Plan also provides a list of water quality objectives that set limits or levels of water quality constituents or characteristics that are established for the protection of the beneficial uses of the river. The achievement of these objectives depends on applying them to controllable water quality factors. The applicant is responsible for (1) identifying the water quality impacts caused by controllable factors from operation of the Project, and (2) recommending measures that may be reasonably applied to control impacts to beneficial uses (including water quality). The water quality parameters identified for waters in the basin include ammonia, bacteria, biostimulatory substances, chemical constituents, color, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, salinity, sediment, settleable material, suspended material, tastes and odors, temperature, toxicity, and turbidity.

The environmental measures included in the Proposed Action were designed to protect beneficial uses and meet water quality objectives as defined in the Basin Plan. Implementation of the Proposed Action is consistent with the goals and management direction included in the updated Basin Plan.

#### **12.4.1.5 Kaweah River Basin Investigation: Final Feasibility Report and Final Environmental Impact Statement**

The FERC's List cites the 1996 Kaweah River Basin Investigation: Final Feasibility Report and Final Environmental Impact Statement (EIS), published in December 1996 by the U.S. Army Corps of Engineers (USACE) (USACE 1996). The purpose of the study was to determine if there was a feasible flood control and water resources project in the Kaweah River Basin. The study area included the Terminus Dam and Kaweah River Basin (including Lake Kaweah and its watershed) and downstream areas. Terminus Dam and Reservoir (Lake Kaweah) are a multi-purpose dam and reservoir completed by the USACE in 1962 to provide flood control and irrigation water supply storage. The study investigated the feasibility of providing: (1) increased flood protection to the downstream area which includes the City of Visalia and agricultural land, and (2) increased upstream storage for irrigation water supply. The study concluded that enlarging the existing Lake Kaweah by constructing a 21-foot-high concrete ogee across the spillway at Terminus Dam and widening it by 148 feet produced the greatest net annual benefits by increasing flood protection to downstream areas, creating additional storage for irrigation water, and minimizing environmental impacts.

The study identifies SCE's Kaweah Project as being located 10 miles upstream from Terminus Dam, however, states that the regulatory storage capacity of the Kaweah Project is small and does not affect the operation of Terminus Dam.

The Proposed Action does not include additional facilities or increased generation or storage that would affect inflow or operation of USACE's of Terminus Dam and Lake Kaweah. Further, the environmental measures included in the Proposed Action were designed to protect and maintain downstream resources. Implementation of the Proposed Action is consistent with conclusions and recommendations included in the Kaweah River Basin Investigation: Final Feasibility Report and Final EIS.

#### **12.4.1.6 The Nationwide Rivers Inventory**

The National Park Service (NPS) has compiled and maintains a Nationwide Rivers Inventory (NRI), a register of river segments that potentially qualify as national wild, scenic, or recreational river areas. The NRI is a listing of more than 3,200 free-flowing river segments in the United States that are believed to possess one or more "outstandingly remarkable" natural or cultural values judged to be at least regionally significant. Under a 1979 Presidential directive and related Council on Environmental Quality Procedures, all federal agencies must seek to avoid or mitigate actions that would adversely affect NRI segments (NPS 2017).

In order to meet the criteria for "outstandingly remarkable", a river value must be a unique, rare, or exemplary feature that is significant at a comparative regional or national scale. The eligibility criteria set minimum thresholds and are designed to foster greater consistency within federal river-administering agencies. There are nine eligibility criteria used to assess a river's status, these include: scenery, recreation, geology, fish, wildlife, prehistory, history, cultural, and other values.

The NRI identifies the Marble Fork of the Kaweah River (15 miles) and the Middle Fork of the Kaweah River (19 miles) with potential classification as recreationally important rivers, and wild and scenic river segments for those sections of the river within Sequoia National Park (SNP). Both forks of the Kaweah River have been on the NRI listing since 1993 (NPS 2017).

While not identified on the NRI, a 2006 study by the NPS also found the East Fork Kaweah River from its headwaters to the SNP boundary and the South Fork Kaweah River from its headwaters to the SNP boundary as eligible and suitable for inclusion in the National Wild and Scenic Rivers (W&SR) System (NPS 2006).

All of the river segments identified above are located outside of the existing Project boundary. Implementation of the Proposed Action, including new environmental measures; management and monitoring plans; and programs, will not result in any changes in status or management of eligible or suitable river segments. All eligible river segments in the vicinity of the Project will continue to be managed to protect the outstandingly remarkable values (ORV) that cause them to be considered eligible. Implementation of the Proposed Action is consistent with the NRI.

#### **12.4.2 Other Relevant Documents**

Six additional planning documents that are not included on FERC's List have also been identified as being relevant to the Project, including:

- California Department of Fish and Wildlife. 2015. California Deer Conservation and Management Plan. Public Review Draft, March 2015.
- California Department of Forestry and Fire Protection. 2014. Tulare Unit Strategic Fire Plan.
- Southern Sierra Regional Water Management Group. 2014. Southern Sierra Integrated Regional Water Management Plan. Prepared by Provost & Pritchard Consulting Group in cooperation with Sequoia Riverlands Trust, Kamansky's Ecological Consulting, and GEOS Institute. November 2014.
- Tulare County. 2018. Three Rivers Community Plan Draft. Tulare County, California.
- Tulare County. 2012. Tulare County General Plan 2030. Tulare County, California.
- United States Department of the Interior, National Park Service. 2006. Final General Management Plan and Comprehensive River Management Plan / Environmental Impact Statement, Sequoia and Kings Canyon National Parks, Middle and South Forks of the Kings River and North Fork of the Kern River, September 2006.

### **12.4.2.1 California Deer Conservation and Management Plan**

The California Deer Conservation and Management Plan (public draft) (CDFW 2015b) provides deer population and conservation unit management objectives for lands across California. The Plan was prepared as an update to the CDFG's 1976 deer management plan — "A Plan for California Deer" (CDFG 1976). The Plan provides a framework for updating deer management based on areas called Deer Conservation Units (DCU). This landscape level approach to deer planning replaces herd units with larger DCU's. Using this approach the Department proposes categorizing California deer herd units into 10 DCUs. Unlike the original deer herd boundaries, management at the DCU level will focus on conservation and management at larger scales. The Plan is considered pertinent to the Kaweah Project because the Project is situated within the Sierra Nevada DCU.

The overarching goal of the Plan is conserving the state's deer populations and their habitats. Specific sub-goals identified in the Plan include development of: (1) DCU plans; (2) updated population management objectives; (3) habitat conservation objectives; (4) research, monitoring and adaptive management objectives; and (5) outreach objectives.

The environmental measures included in the Proposed Action were designed to protect wildlife resources in the Project vicinity. Implementation of the Proposed Action is consistent with the goals and management direction included in the California Deer Conservation and Management Plan.

### **12.4.2.2 Tulare Unit Strategic Fire Plan**

The Tulare Unit is 1 of 21 administrative units within CAL FIRE. The Tulare Unit is located in central California and provides fire protection in the vicinity of the Project. The Tulare Unit Strategic Fire Plan (CAL FIRE 2018), was developed to reduce firefighting cost and property loss, increase public and firefighter safety, minimize wildfire risk to communities, and contribute to ecosystem health. The Tulare Unit Strategic Fire Plan is considered pertinent to the Kaweah Project because it contains fire management direction for the land around and within the Project boundary. Key goals and objectives identified in the plan include:

- Support the implementation and maintenance of defensible space inspections around structures.
- Analyze trends in fire cause and focus prevention and education efforts to modify behaviors and effect change to reduce ignitions within Tulare County.
- Continually evaluate the success in achieving the 95% threshold of keeping fires less than 10 acres in size.
- Identify and evaluate wildland fire hazards and recognize assets at risk, collecting and analyzing data to determine fuel reduction projects and other projects.

- Support the availability and utilization of CAL FIRE resources, as well as public and private sector resources for fuels management activities, including ongoing maintenance.
- Assist landowners and local government in the evaluation of the need to retain and utilize features developed during fire suppression efforts, taking into consideration those identified in previous planning efforts.

The environmental measures included in the Proposed Action support the goals and objectives identified in the Tulare Unit Strategic Fire Plan. Continued operation and maintenance of the Project includes extension of SCE's existing fire prevention and suppression policies, including creating defensible space around Project facilities, establishment of procedures in the event of a fire, and conducting safety training. Implementation of the Proposed Action is consistent with the goals included in the Tulare Unit Strategic Fire Plan.

#### **12.4.2.3 Southern Sierra Integrated Regional Water Management Plan**

The Southern Sierra Integrated Regional Water Management Plan (IRWMP) (SSRWMP 2018) address water management in the Southern Sierra Region. The Southern Sierra Region covers approximately 6,195 square miles, and includes the foothills and mountain headwater regions of the Kern, Poso, White, Tule, Kaweah, Kings and San Joaquin River watersheds. The Southern Sierra IRWMP is considered pertinent to the Project because it includes the Kaweah River Watershed.

The IRWMP documents regional and local data, issues, water-related objectives, resource management strategies, and collaborative efforts. The IRWMP includes seven broad goals, including: (1) improve water supply management; (2) protect and improve water quality; (3) perform integrated flood management; (4) improve watershed and environmental resource management; (5) expand stakeholder education; (6) protect unique/important environmental resources; and (7) reduce energy consumption and greenhouse gas emissions.

Implementation of the Proposed Action, including new environmental measures; management and monitoring plans; and programs, is consistent with the goals, objectives, and management strategies included in the Southern Sierra IRWMP.

#### **12.4.2.4 Three Rivers Community Plan**

The Three Rivers Community Plan (Tulare County 2018) is considered pertinent to the Kaweah Project because it contains management direction regarding the Project area.

The Three Rivers Community Plan, in combination with the Tulare County General Plan, is designed to satisfy the requirements of the California Planning and Zoning law by setting forth the goals, policies, assumptions, guidelines, standards, and implementation measures for the planning area. The Three Rivers Community Plan was adopted in 1980 and updated in 2018. The planning area comprises approximately 21,000 acres, including the Project area.



The goals and policies described in the Three Rivers Community Plan relevant to the Kaweah Project include topics such as maintaining water supply and quality, flood control, riparian habitat management, protecting visual access to and the character of Tulare County's scenic rivers, and maintaining open space character, among many others.

Implementation of the Proposed Action, including new environmental measures; management and monitoring plans; and programs, is consistent with the goals and policies included in the Three Rivers Community Plan.

#### **12.4.2.5 Tulare County General Plan 2030**

The Tulare County General Plan 2030 (Tulare County 2012) is considered relevant because the Kaweah Project is located within Tulare County. The Tulare County General Plan includes information regarding land uses in the vicinity of the Kaweah Project and management goals and policies relevant to the Project area.

The General Plan provides an overall framework for development and protection of the County's natural and cultural resources, and is designed to comply with various state regulations and policies for land use and development. The General Plan consists of a general county-wide plan, and a set of more detailed community plans covering specific areas of the unincorporated county. The Three Rivers Community Plan, described above, is an example of a community plan that provides detailed focus on the specific geographic region in which the Kaweah Project is primarily located.

Implementation of the Proposed Action, including new environmental measures; management and monitoring plans; and programs, is consistent with the goals and policies identified in the Tulare County General Plan.

#### **12.4.2.6 Final General Management Plan and Comprehensive River Management Plan / Environmental Impact Statement**

The Project makes use of several non-FERC facilities located in SNP that are not subject to the FERC License. All facilities located within SNP are currently operated under a Special Use Permit (SUP) (Permit No. PWR-SEKI-6000-2016-015) issued to SCE by the NPS. The current SUP expires on September 8, 2026. Facilities operated under the SUP include portions of the Kaweah No. 1 and No. 3 developments, as described below and shown on Map 3-1.

- **Kaweah No. 1** – The upper portion of the Kaweah No. 1 Development near the Mineral King Area, including four small lakes—Eagle Lake, Lady Franklin Lake, Crystal Lake, and Upper Monarch Lake (collectively referred to as the Mineral King Lakes)—that release water during the late summer and fall months to augment flows in the East Fork Kaweah River and generating capacity of the Kaweah No. 1 Powerhouse during periods of low flow. The Mineral King Lakes were originally constructed between 1903 and 1905 on public lands that were subsequently included in the Sierra National Forest, and were part of the original license. However in 1978, that portion of Sierra National Forest was added to SNP. The

enabling legislation empowered the NPS to issue SUPs for the continued use of the reservoirs.

- **Kaweah No. 3** – The upper portion of the Kaweah No. 3 Development, including the Middle Fork and Marble Fork Kaweah River diversion dams, and a water conveyance system (Kaweah No. 3 Flowline) that diverts water from these structures to the Kaweah No. 3 Powerhouse. All but the last 2,580 feet of the flowline is located in the SNP and is not part of the FERC License. The Middle Fork and Marble Fork diversions and flowline were constructed within the SNP by permission of the NPS between 1907 and 1913 in exchange for the construction of a park road and annual payments. Select components of the Kaweah No. 3 development appear eligible for listing in the National Register of Historic Places as contributors to the Kaweah No. 3 Hydroelectric System Historic District.

The General Management Plan provides general management direction for Sequoia and Kings Canyon National Parks, and the Comprehensive River Management Plan provides direction and overall guidance on the management of lands and uses within portions of the Middle and South Forks of the Kings River and the North Fork of the Kern River (NPS 2006).

The document discusses evaluation of the five forks of the Kaweah River (North, Marble, Middle, East, and South) as to their eligibility and suitability for inclusion in the National W&SR System. All of the rivers except the North Fork of the Kaweah were determined to be eligible. The document acknowledges the presence of hydroelectric facilities within the SNP on the Marble and Middle Forks of the Kaweah River, and on tributaries of the East Fork of the Kaweah, and the SUP that those facilities are managed under. Further, the document considers preservation associated with the Kaweah No. 3 Hydroelectric System Historic District.

Implementation of the Proposed Action, including new environmental measures; management and monitoring plans; and programs, is consistent with the management prescriptions identified in the Final General Management Plan and Comprehensive River Management Plan.

## **12.5 LITERATURE CITED**

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### **13.0 FINDING OF NO SIGNIFICANT IMPACT**

Continuing to operate and maintain the Kaweah Project with the recommended environmental measures; management and monitoring plans; and programs (collectively referred to as measures) included under the Proposed Action will not be a major federal action significantly affecting the quality of the environment. Furthermore, implementation of the measures included in the Proposed Action will result in greater resource protection and enhance environmental resources as compared to baseline conditions (No-Action Alternative). These measures are provided in Section 4.0, Appendix 4-A.

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**LIST OF ACRONYMS**

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ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
BLM	Bureau of Land Management
CDEC	California Data Exchange Center
CDFW	California Department of Fish and Wildlife
CEII	Critical Energy Infrastructure Information
CFR	Code of Federal Regulations
CTR	California Toxics Rule
DLA	Draft License Application
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FERC or Commission	Federal Energy Regulatory Commission
FLA	Final License Application
HPMP	Historic Properties Management Plan
IBI	Index of Biological Integrity
IFM	Instream Flow Measure
MOA	Memorandum of Agreement
NAHC	Native American Heritage Commission
NGO	Non-Governmental Organization
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NPS	National Park Service
NRHP	National Register of Historic Places
PA	Programmatic Agreement
PAD	Pre-Application Document
Project	Kaweah Project
PSP	Proposed Study Plan
RMP	Resource Management Plan
RSP	Revised Study Plan
SCE	Southern California Edison Company
SD1	Scoping Document 1
SD2	Scoping Document 2
SHPO	State Historic Preservation Officer
SMECP	Sediment Management and Erosion Control Plan
SNP	Sequoia National Park
SUP	Special Use Permit
TSP	Technical Study Plan

TSR	Technical Study Report
TWG	Technical Working Group
USFWS	U.S. Fish and Wildlife Service

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## 14.0 CONSULTATION DOCUMENTATION

This section describes Southern California Edison Company's (SCE) consultation efforts completed for the relicensing of the Kaweah Project (Project), organized by the following categories:

- Early Outreach Activities
- Pre-Application Document (PAD) Development and Distribution
- Federal Energy Regulatory Commission (FERC or Commission) Scoping
- Study Plan Development and FERC Study Plan Determination
- Technical Study Implementation
- Endangered Species Act – Section 7 Informal Consultation
- National Historic Preservation Act – Section 106 Informal Consultation
- Draft License Application Development and Distribution
- Final License Application Development and Distribution

Documents referred to in this section are available on either SCE's relicensing website at [www.sce.com/kaweah](http://www.sce.com/kaweah) or FERC's eLibrary at [www.ferc.gov/docs-filing/elibrary.asp](http://www.ferc.gov/docs-filing/elibrary.asp) under Docket P-298.

As required in Title 18 of the Code of Federal Regulations (CFR) §5.18(b)(5)(G), Table 14-1 identifies the name and address of every federal, state, and interstate resource agency, Native American Tribe, or member of the public that SCE consulted during preparation of this Application for New License for the Kaweah Project.

Table 14-2 includes a list of resource agency and stakeholder meeting dates and topics that are identified throughout this section.

### 14.1 EARLY OUTREACH ACTIVITIES

SCE initiated early outreach activities in 2015. Early outreach activities involved: meeting with individual state and federal resource agencies; conducting meetings with stakeholders, including resource agencies, non-governmental organizations (NGO), members of the public, and Native American Tribes; and establishing a publicly accessible website. The intent of these early outreach activities was to identify potential stakeholders and understand their resource interests; provide information related to the FERC relicensing process; describe Project facilities and operations; solicit existing resource information; and provide a mechanism to distribute Project information, reports, and meeting materials.

## **14.2 PRE-APPLICATION DOCUMENT DEVELOPMENT AND DISTRIBUTION**

On December 14, 2016, SCE filed a Notice of Intent (NOI) and PAD with the FERC. The PAD provided FERC, federal and state agencies, and other interested parties with background information related to Project facilities, operations, and maintenance activities; summarized existing, relevant, and reasonably available information; defined pertinent Project issues; and identified potential study needs. The PAD also included fifteen draft Technical Study Plans (TSP) that SCE determined were needed to address issues for which existing information was potentially inadequate.

## **14.3 FEDERAL ENERGY REGULATORY COMMISSION SCOPING**

On February 10, 2017, the FERC issued a Notice of Commencement of Pre-Filing Process and Scoping Document 1 (SD1) for the Project. SD1 provided interested parties with FERC's preliminary list of issues and alternatives to be addressed in an Environmental Assessment analyzing potential conditions of a new Project license. Additionally, FERC requested that any party interested in providing comments on the PAD and SD1 and/or submitting formal study requests do so by April 13, 2017, in accordance with a 60-day comment period. During the comment period, FERC conducted public scoping meetings (am/pm) in Visalia, California on March 14, 2017, and a site visit on March 15, 2017. Four comment letters were submitted, which included information and study requests. The FERC revised SD1 based on oral comments received at the scoping meetings and written comments received through the scoping process. FERC issued Scoping Document 2 (SD2) on May 18, 2017.

## **14.4 STUDY PLAN DEVELOPMENT AND FERC STUDY PLAN DETERMINATION**

The PAD included 15 TSPs for the relicensing of the Project. Based on study requests filed as part of the FERC scoping process, SCE revised one study plan (REC 1 – Recreation Resources) and added two plans (REC 2 – Whitewater Boating and LAND 3 – Land Use). All other study plans remained unchanged from the PAD submittal. On May 24, 2017, SCE filed a Proposed Study Plan (PSP) with FERC that included 17 study plans for the Project. The deadline to file comments on the PSP ended August 28, 2017. During the comment period, SCE conducted a study plan meeting in Visalia, California on June 21, 2017, with stakeholders to: (1) clarify SCE's Proposed Study Plan; (2) discuss information gathering or study requests from stakeholders; and (3) attempt to resolve any outstanding issues with respect to SCE's PSP.

Three comments were filed on the PSP; however, they did not result in revisions to any of the study plans. Therefore, on September 19, 2017, SCE filed a Revised Study Plan (RSP) that stated that the PSP, without revision, constituted its RSP. No comments were filed on the RSP during the 15-day comment period. The FERC subsequently issued a Study Plan Determination on October 24, 2017, approving all study plans for the Project.

## 14.5 TECHNICAL STUDY IMPLEMENTATION

In early 2018, SCE began consultation with resource agencies and interested stakeholders related to implementation of the TSPs. This consultation included establishing Technical Working Groups (TWG) and e-mail/telephone communication to obtain input on study implementation or resource specific information from agencies. Table 14-3 identifies TWG meeting dates and general discussion topics. SCE began implementing the approved TSPs in 2018.

Study progress was documented in two reports as follows:

- October 18, 2018 – Initial Study Report which documented overall progress through September 30, 2018
- October 23, 2019 – Updated Study Report which document overall progress through September 30, 2019

As required, the study reports summarized SCE's overall progress in implementing the studies, variances from the TSPs, modifications to ongoing studies, and new studies proposed by SCE.

Each study report was filed with FERC and stakeholders were concurrently notified of their availability for review. Within 15 days of each filing, SCE held a meeting to discuss the contents of the study reports and to address comments regarding study plan implementation. These meetings were held in Visalia, California on the following dates:

- November 1, 2018 – Initial Study Report Meeting
- November 6, 2019 – Updated Study Report Meeting

The meeting discussions were documented in meeting summaries, which were filed with FERC within 15 days of each meeting. Stakeholders were concurrently notified of their availability for a 30-day review on the following dates:

- November 15, 2018 – Initial Study Report Meeting Summary

Three comments were filed on the Initial Study Report Meeting Summary. SCE responded to comments in a filing with FERC dated January 23, 2019. As a result of this process SCE conducted two additional meetings (November 15 and December 4) with the Aquatic TWG to discuss modifications to the AQ 9 – Entrainment Study. Modifications to the plan were agreed to by the Aquatic TWG and SCE filed a revised plan with FERC on December 12, 2018.

- November 20, 2019 – Updated Study Report Meeting Summary

Based on discussion during the Updated Study Report Meeting, SCE conducted two additional meetings (December 3 and December 10) with the Aquatic TWG to discuss results of the AQ 9 – Entrainment Study to date and options for completing the study. The deadline to file comments on the Updated Study Report Meeting Summary is December 23, 2019.

#### **14.5.1 Technical Study Reports**

Technical Study Reports (TSR) were developed for each study and distributed to stakeholders for a 90-day review period.<sup>1</sup> Each TSR includes a description of the study objectives; study area; approach and methods; data analysis; and results. Draft TSRs were posted to the Project’s relicensing website and stakeholders were notified of their availability for review. Comments received have been addressed in the TSRs included in Supporting Document A of this License Application. A schedule showing when each Draft TSR was distributed to stakeholders is provided in Table 14-4.

#### **14.6 ENDANGERED SPECIES ACT – SECTION 7 INFORMAL CONSULTATION**

Pursuant to Section 7 of the federal Endangered Species Act (ESA), consultation with the U.S. Fish and Wildlife Service (USFWS) is required when implementation of a project may affect the continued existence of a federally listed species. Species are defined as threatened or endangered by USFWS if they are listed in Title 50 of the CFRs (§§17.11 or 17.12). SCE’s Section 7 consultation efforts are summarized below.

- SCE requested to be designated as the non-federal representative for the purpose of conducting informal Section 7 consultation with the USFWS for the Project on December 14, 2016. FERC granted SCE’s request on February 10, 2017.
- On March 26, 2018, SCE e-mailed resource agencies, including USFWS, to provide an updated special-status species list and notification of survey timing.
- On May 2, 2018, SCE e-mailed resource agencies, including USFWS, to provide notification of the timing of special-status bat surveys.
- On April 18, 2018, SCE e-mailed resource agencies, including USFWS, to provide the results of special-status plant reference population monitoring.
- SCE provided Draft TSPs and TSRs to USFWS for review and comment.
- On September 4, 2019, SCE conducted a meeting with the USFWS to discuss study results, potential impacts to federally listed species, and any proposed protection, mitigation, and enhancement measures.

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<sup>1</sup> The AQ 9 – Entrainment study is ongoing. A TSR for this study with results to date is included in Supporting Document A.



## 14.7 NATIONAL HISTORIC PRESERVATION ACT – SECTION 106 INFORMAL CONSULTATION

The Kaweah Project relicensing is an “undertaking” as defined in 36 CFR 800.16(y). Therefore, the relicensing of the Project is subject to Section 106 of the National Historic Preservation Act (NHPA). Section 106 of the NHPA requires FERC to take into account the effect of continued operation and maintenance of the Project on properties that are listed or recommended as eligible for listing on the National Register of Historic Places (NRHP). SCE’s Section 106 consultation efforts are summarized below.

- SCE requested to be designated as the non-federal representative for the purpose of conducting informal Section 106 consultation with the State Historic Preservation Officer (SHPO) for the Project on December 14, 2016. FERC granted SCE’s request on February 10, 2017.
- SCE initiated consultation with the SHPO and other stakeholders including the Bureau of Land Management (BLM) and interested Native American Tribes during a Cultural Resources TWG meeting held on March 20, 2018. The meeting focused on providing an overview of the Project and the relicensing process; defining the undertaking and proposing an Area of Potential Effects (APE) for the undertaking; and soliciting public involvement and comments on the undertaking and cultural studies to be conducted.
- On April 4, 2018, in accordance with Section 36 §800.4(a)(1), SCE requested concurrence on the appropriateness of the proposed APE for the Project. SCE received concurrence on the APE from SHPO in a letter dated on May 3, 2018.
- On April 18, 2018, SCE coordinated with the BLM to obtain records regarding cultural resources within the FERC Project boundary on BLM lands.
- SCE provided Draft Cultural TSPs and TSRs to all stakeholders, including SHPO, BLM, Native American Tribes, and members of the Cultural Resources TWG, for review and comment.
- SCE convened a Cultural Resources TWG meeting on May 7, 2019, to discuss built environment, archaeological, and ethnographic study results, and the development of a Historic Properties Management Plan (HPMP) and Draft NRHP Evaluation Plan for Archaeological Resources.
- SCE provided Final Cultural TSRs to all stakeholders, including SHPO, BLM, Native American Tribes, and members of the Cultural Resources TWG, that were updated based on comments on the Draft TSRs.
- On November 5, 2019, SHPO provided concurrence on all built environment NRHP eligibility determinations documented in the CUL 1 – Built Environment TSR (Ref. FERC 2018 0309 001).

- On December 23, 2019, SCE circulated a Draft HPMP and NRHP Evaluation Plan for Archaeological Resources to members of the Cultural Resources TWG for a 60-day review and comment period.
- After accepting the License Application for filing, FERC will continue consultation with the Advisory Council on Historic Preservation (ACHP) and SHPO regarding the Project. FERC typically completes Section 106 by entering into a Programmatic Agreement (PA) or Memorandum of Agreement (MOA) with the Licensee, ACHP, and SHPO. This agreement is then incorporated by reference into the project license when it is issued. Upon issuance of a new license, SCE will be responsible for implementing the HPMP and the FERC will be responsible for enforcing compliance with the plan.

#### **14.7.1 Section 106 Informal Consultation with Native American Tribes**

SCE conducted informal Section 106 consultation with Native American Tribes in association with the Kaweah Project relicensing. SCE coordinated with appropriate tribal representatives to identify properties, plants, and other resources of traditional cultural or religious importance to Native Americans (including “traditional cultural properties” as discussed in National Register Bulletin No. 38) that may be present in the Project vicinity. This informal consultation included a combination of written, telephone, and e-mail correspondence; meetings; and site visits. Native Americans were included in the consultation summarized above. Additional consultation and efforts to include Native American Tribes in the relicensing process are summarized below.

- At the outset of the relicensing effort, representatives of seven federally-recognized tribes were invited to participate in the relicensing process by FERC on January 10, 2017, as part of its initial tribal government-to-government formal Section 106 consultation for the Project. Follow-up e-mails and telephone contacts were made by FERC after sending letters by registered mail.
- SCE contacted the Native American Heritage Commission (NAHC) on February 12, 2018, to request a search of its Sacred Lands File and a contact list of Native Americans knowledgeable about the tribal resources of the Project vicinity. All Native Americans identified by the NAHC were added to the Project distribution list and Cultural Resources TWG.
- On June 5, 2018, SCE coordinated with the BLM to obtain their list of potentially interested Native American Tribes in the Project vicinity. All potentially interested Native Americans identified by the BLM were added to the Project distribution list and Cultural Resources TWG.
- On June 29, 2018, Native American Tribes were invited to participate in the development of the CUL 1 – Ethnography TSR in a letter sent by SCE on behalf of a Secretary of the Interior Qualified Consulting Ethnographer.

- On October 1, 2018, a follow-up e-mail was sent by the Consulting Ethnographer to all Native American Tribes in the Cultural Resources TWG inviting them to participate in the development of the Ethnography TSR.
- Copies of all formal correspondence from FERC and SCE are contained in the CUL 1 – Ethnography TSR, Appendix A (Supporting Document A), along with a detailed contact log with dates of follow-up e-mails and telephone correspondence.

#### **14.8 DRAFT LICENSE APPLICATION DEVELOPMENT AND DISTRIBUTION**

Pursuant to the FERC's regulations at 18 CFR §5.16, SCE is required to file a preliminary licensing proposal no later than 150 days prior to the deadline for filing a license application. As allowed under §5.16(c), SCE elected to file a Draft License Application which includes the contents of a license application required by §5.18 instead of the preliminary licensing proposal. The regulation at §5.16(c) states that if an applicant elects to file a Draft License Application, a notice of its intent should be included in the updated study report.

The deadline to file a Draft License Application for the Kaweah Project was August 3, 2019. The updated study report was not due to be filed until October 24, 2019. Due to this disparity in the relicensing process schedule, and to satisfy the notification requirement under §5.16(c), SCE filed a notice of its intent to prepare a draft license application with the FERC on February 5, 2019. In addition, the notice went to the Project's distribution list.

On July 26, 2019, SCE filed a Draft License Application with FERC. Concurrent with the filing, SCE notified stakeholders of the documents availability for a 90-day review and comment period. The comment period ended on November 1, 2019. On September 10, 2019, SCE conducted a stakeholder meeting to discuss the contents and analysis in the application and proposed environmental measures; management and monitoring plans; and programs to be included in the new license.

A total of seven comment letters on the Draft License Application were received from resource agencies, NGOs, and interested stakeholders. Each comment letter, organized chronologically, is identified in Table 14-5 and is provided in Appendix 14-A. In addition, Appendix 14-A includes SCE's response to comments received on the Draft License Application.

#### **14.9 FINAL LICENSE APPLICATION DEVELOPMENT AND DISTRIBUTION**

The Final License Application filed with the Commission in December 2019 meets the content requirements specified in 18 CFR §5.18. Further, as specified in the Commission's regulations in 18 CFR §5.18(b), Exhibit E addresses the resources listed in the PAD provided for in 18 CFR §5.6; follows Commission's guidelines in "Preparing Environmental Assessments: Guidelines for Applicants, Contractors, and Staff"; and meets the format and content requirements specified by the Commission.

In accordance with 18 CFR §5.18(e), the Final License Application responds to requests for additional information-gathering and studies filed with comments on the Draft License Application. In Appendix 14-A, SCE provides the basis for declining additional information-gathering and studies proposed by stakeholders.

Exhibit E of the Final License Application provides the necessary technical information and analyses to identify and evaluate potential impacts of continued operation and maintenance of the Project under the Proposed Action. In addition, the Exhibit E specifies new environmental measures; management and monitoring plans; and programs under the Proposed Action to protect, maintain, and enhance environmental and cultural resources.

The License Application is comprised of six volumes, including public, critical energy infrastructure information (CEII), confidential, and privileged information. In accordance with 18 CFR §5.18(a)(3) and 18 CFR §385.2010, SCE has made a good faith effort to give notification by certified mail and electronically of the filing of the License Application. In addition, public portions of this filing (Volumes 1 and 3) will be available at the following locations: (1) FERC's eLibrary at [www.ferc.gov/docs-filing/elibrary.asp](http://www.ferc.gov/docs-filing/elibrary.asp); (2) SCE's Kaweah Relicensing Website at [www.sce.com/kaweah](http://www.sce.com/kaweah); (3) by appointment at SCE's Kaweah Hydro Headquarters Office – Carpenter's Shop, 44511 Sierra Drive, Three Rivers, CA 93271 (to schedule an appointment contact David Moore at [david.moore@sce.com](mailto:david.moore@sce.com) or 626-302-9494); and (4) Three Rivers Branch Library, 42052 Eggers Drive, Three Rivers, CA 93271. Volumes 2, 4, 5, and 6 will not be made available to the public because they contain CEII or confidential information. Volumes 2, 4, 5, and 6 will be separately provided to those entities with jurisdiction over those resources.

In accordance with 18 CFR §5.17(d)(2), SCE will publish notice twice of the filing of its License Application, no later than 14 days after the filing date, in the Visalia Times-Delta newspaper and online at [www.3Riversnews.com](http://www.3Riversnews.com). A copy of proof of publication of this public notice will be filed with FERC upon receipt.

## **TABLES**

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**Table 14-1. Parties Consulted in Preparation of the Application for New License**

<b>Organization</b>	<b>Name</b>	<b>Street Address</b>	<b>City, State, Zip</b>	<b>E-mail</b>
<b>Federal Government/Representatives</b>				
Federal Energy Regulatory Commission	Kimberly D. Bose, Secretary	888 First Street, N.E.	Washington, DC 20426	
Federal Energy Regulatory Commission	Frank Winchell	888 First Street, N.E.	Washington, DC 20426	frank.winchell@ferc.gov
Federal Energy Regulatory Commission	Jim Hastreiter	805 SW Broadway #550	Portland, OR 97205	james.hastreiter@ferc.gov
National Marine Fisheries Service, California Central Valley Office	Maria Rea, Assistant Regional Administrator	650 Capitol Mall, Suite 5-100	Sacramento, CA 95814	maria.rea@noaa.gov
National Marine Fisheries Service, California Central Valley Office	Tancy Mill, Central Valley Office Division Manager	650 Capitol Mall, Suite 5-100	Sacramento, CA 95814	tancy.mill@noaa.gov
Sequoia and Kings Canyon National Parks	Woody Smeck, Superintendent	47050 Generals Highway	Three Rivers, CA 93271-9700	woody_smeck@nps.gov
Sequoia and Kings Canyon National Parks	Ginger Bradshaw	47050 Generals Highway	Three Rivers, CA 93271-9700	ginger_bradshaw@nps.gov
Sequoia and Kings Canyon National Parks	Jane Allen	47050 Generals Highway	Three Rivers, CA 93271-9700	jane_allen@nps.gov
National Park Service, Hydropower Assistance Program	Stephen M. Bowes	333 Bush Street, Suite 500	San Francisco, CA 94104	stephen_bowes@nps.gov
National Park Service, Hydropower Assistance Program	Susan Rosebrough	333 Bush Street, Suite 500	San Francisco, CA 94104	susan_rosebrough@nps.gov
National Park Service, Hydropower Assistance Program	Barbara Rice, Program Manager	333 Bush Street, Suite 500	San Francisco, CA 94104	barbara_rice@nps.gov

<b>Organization</b>	<b>Name</b>	<b>Street Address</b>	<b>City, State, Zip</b>	<b>E-mail</b>
U.S. Army Corps of Engineers, Planning Division	Sacramento District	1325 J Street, Room 1513	Sacramento, CA 95814	spk-pao@usace.army.mil
U.S. Bureau of Indian Affairs, Pacific Region	Amy Dutschke, Regional Director	2800 Cottage Way	Sacramento, CA 95825	amy.dutschke@bia.gov
U.S. Bureau of Land Management, Bakersfield Field Office	Christina Castellon, Realty Specialist	3801 Pegasus Drive	Bakersfield, CA 93308	ccastellon@blm.gov
U.S. Bureau of Land Management, Bakersfield Field Office	Amy Girado, Archaeologist	3801 Pegasus Drive	Bakersfield, CA 93308	agirado@blm.gov
U.S. Bureau of Land Management, Bakersfield Field Office	Maria Soto, Realty Specialist	3801 Pegasus Drive	Bakersfield, CA 93308	msoto@blm.gov
U.S. Bureau of Land Management, Bakersfield Field Office	Carly Summers, Natural Resource Specialist Supervisor/Planning	3801 Pegasus Drive	Bakersfield, CA 93308	csummers@blm.gov
U.S. Bureau of Land Management, Bakersfield Field Office	Tamara Whitley, Archaeologist	3801 Pegasus Drive	Bakersfield, CA 93308	twhitley@blm.gov
U.S. Bureau of Land Management, Bakersfield Field Office	Brien Chartier, Recreation	3801 Pegasus Drive	Bakersfield, CA 93308	bchartie@blm.gov
U.S. Bureau of Land Management, Bakersfield Field Office	Romina Copado, GIS	3801 Pegasus Drive	Bakersfield, CA 93308	rcopado@blm.gov
U.S. Bureau of Land Management, Bakersfield Field Office	Alison Lipscomb, Realty Specialist	3801 Pegasus Drive	Bakersfield, CA 93308	alipscomb@blm.gov
U.S. Bureau of Land Management, Bakersfield Field Office	Karen Doran, Range Specialist	3801 Pegasus Drive	Bakersfield, CA 93308	kdoran@blm.gov



<b>Organization</b>	<b>Name</b>	<b>Street Address</b>	<b>City, State, Zip</b>	<b>E-mail</b>
U.S. Bureau of Land Management, Bakersfield Field Office	Sarah Bullock, Wildlife Biologist	3801 Pegasus Drive	Bakersfield, CA 93308	sbullock@blm.gov
U.S. Bureau of Land Management, Bakersfield Field Office	CJ Clara Hurley, Wildlife Biologist	3801 Pegasus Drive	Bakersfield, CA 93308	cchase@blm.gov
U.S. Bureau of Reclamation, South-Central California Area Office	Michael Jackson, Area Manager	1243 N Street	Fresno, CA 93721-1813	mjackson@usbr.gov
U.S. Fish and Wildlife Service, Pacific Southwest Region	Daniel Welsh	2800 Cottage Way, W-2605	Sacramento, CA 95825	Daniel_Welsh@fws.gov
U.S. Fish and Wildlife Service, Pacific Southwest Region	Alison Willy	2800 Cottage Way, W-2605	Sacramento, CA 95825	alison_willy@fws.gov
U.S. Fish and Wildlife Service, Pacific Southwest Region	Richard Kuyper	2800 Cottage Way, W-2605	Sacramento, CA 95825	richard_kuyper@fws.gov
U.S. Geological Survey, Placer Hall, Room 200	Denis O'Halloran, FERC Coordinator	6000 J Street	Sacramento, CA 95819	dohall@usgs.gov
U.S. House of Representatives, 21st Congressional District of California	TJ Cox, Congressman	2700 M. Street, Suite 250B	Bakersfield, CA 93301	
U.S. House of Representatives, 22nd Congressional District of California	Devin Nunes, Congressman	113 North Church Street, Suite 208	Visalia, CA 93291	
U.S. House of Representatives, 23rd Congressional District of California	Kevin McCarthy, Congressman	4100 Empire Drive, Suite 150	Bakersfield, CA 93309	

<b>Organization</b>	<b>Name</b>	<b>Street Address</b>	<b>City, State, Zip</b>	<b>E-mail</b>
U.S. Senate	Kamala Harris	501 I Street, Suite 7-800	Sacramento, CA 95814	
U.S. Senate	Dianne Feinstein	One Post Street, Suite 2450	San Francisco, CA 94104	
<b>State Government/Representatives</b>				
California Department of Fish and Wildlife, Central Region	Julie Vance	1234 E. Shaw Avenue	Fresno, CA 93710	julie.vance@wildlife.ca.gov
California Department of Fish and Wildlife, Central Region	Abimael León	1130 E. Shaw Avenue	Fresno, CA 93710	abimael.leon@wildlife.ca.gov
Office of Historic Preservation, SHPO	Julianne Polanco	1725 23rd Street, Suite 100	Sacramento, CA 95816	julianne.polanco@parks.ca.gov
Office of Historic Preservation, SHPO	Anmarie Medin	1725 23rd Street, Suite 100	Sacramento, CA 95816	anmarie.medin@parks.ca.gov
Office of Historic Preservation, SHPO	Brendon Greenaway	1725 23rd Street, Suite 100	Sacramento, CA 95816	brendon.greenaway@parks.ca.gov
California Public Utilities Commission		505 Van Ness Avenue	San Francisco, CA 94102-3214	
California State Senate, 16th Senate District	Shannon Grove, Senator	State Capitol, Room 3048	Sacramento, CA 95814-4900	
California State Senate, 16th Senate District	Wes Anderson	5701 Truxtun Avenue	Bakersfield, CA 93309	wes.anderson@sen.ca.gov
California State Senate, 14th Senate District	Melissa Hurtado, Senator	State Capitol, Room 2054	Sacramento, CA 95814-4900	
Central Valley Regional Water Quality Control Board, Fresno Branch	Manager	1685 E Street	Fresno, CA 93706-2007	
Native American Heritage Commission		1550 Harbor Boulevard, Suite 100	West Sacramento, CA 95691	nahc@nahc.ca.gov

<b>Organization</b>	<b>Name</b>	<b>Street Address</b>	<b>City, State, Zip</b>	<b>E-mail</b>
State Water Resources Control Board, Division of Water Rights	Jeff Wetzel	1001 I Street, 14th Floor	Sacramento, CA 95814	jeff.wetzel@waterboards.ca.gov
State Water Resources Control Board, Division of Water Rights	Karmina Padgett	1001 I Street, 14th Floor	Sacramento, CA 95814	karmina.padgett@waterboards.ca.gov
State Water Resources Control Board, Division of Water Rights	Chase Hildeburn	1001 I Street, 14th Floor	Sacramento, CA 95814	chase.hildeburn@waterboards.ca.gov
State Water Resources Control Board, Water Quality Certification Program	Ann Marie Ore, Environmental Program Manager	1001 I Street, 14th Floor	Sacramento, CA 95814	annmarie.ore@waterboards.ca.gov
State Water Resources Control Board, Division of Water Rights	Erin Ragazzi	1001 I Street, 14th Floor	Sacramento, CA 95814	erin.ragazzi@waterboards.ca.gov
<b>Local Government</b>				
Tulare County, Planning Branch	Michael Washam, Assistant Director	5961 South Mooney Blvd.	Visalia, CA 93277	mwasham@co.tulare.ca.us
Tulare County	Clerk-Recorder	221 South Mooney Blvd., Room 103	Visalia, CA 93291	
Tulare County Library, Main Branch	County Librarian	200 W. Oak Avenue	Visalia, CA 93291	
Tulare County Water Commission, County of Tulare	Denise England, Water Policy Manager	2800 W. Burrell Avenue	Visalia, CA 93291	dengland@co.tulare.ca.us
Tulare County, Environmental Planning Division	Jessica Willis, Environmental Planner	5961 South Mooney Blvd.	Visalia, CA 93277	jwillis@co.tulare.ca.us
Tulare County, Environmental Planning Division	Hector Guerra,	5961 South Mooney Blvd.	Visalia, CA 93277	hguerra@co.tulare.ca.us

<b>Organization</b>	<b>Name</b>	<b>Street Address</b>	<b>City, State, Zip</b>	<b>E-mail</b>
City of Tulare, Planning Department	Josh McDonnell, Community & Economic Development Director	411 East Kern Avenue	Tulare, CA 93274	jmcdonnell@tulare.ca.gov
City of Visalia, Planning Department	Paul Bernal, City Planner	315 E. Acequia Avenue	Visalia, CA 93291	paul.bernal@visalia.city
<b>Public Agency</b>				
Exeter Irrigation District	District Manager	150 S. E Street	Exeter, CA 93221	
Ivanhoe Irrigation District	District Manager	33777 Road 164	Visalia, CA 93292	
Kaweah Delta Water Conservation District	Mark Larsen, General Manager	2975 N. Farmersville Blvd.	Farmersville, CA 93223	mlarsen@kdwcd.com
Lindmore Irrigation District	Michael Hagman, District Manager	PO Box 908	Lindsay, CA 93247	mhagman@lindmoreid.com
Tulare Irrigation District	J. Paul Hendrix, General Manager	6826 Avenue 240	Tulare, CA 93274	jph@tulareid.org
Kaweah River Power Authority	Terry Stafford	2975 N. Farmersville Blvd.	Farmersville, CA 93223	tstafford@kdwcd.com
<b>Non-Governmental Organization</b>				
American Whitewater	Dave Steindorf, California Stewardship Director	4 Baroni Drive	Chico, CA 95928-4314	dave@americanwhitewater.org
American Whitewater	Theresa Simsiman			theresa@americanwhitewater.org
California Sportfishing Protection Alliance	Christopher Shutes, FERC Projects Director			cshutes@calsport.org
CalTrout – Sierra Headwaters Region	Eric Huber, Director	PO Box 3442	Mammoth Lakes, CA 93546	ehuber@caltrout.org
CalTrout – Central California Region	Jacob Katz, Director	930 Shiloh Rd., Bldg. 40-#6	Windsor, CA 95492	jkatz@caltrout.org
Friends of the River	Eric Wesselman, Executive Director	1418 20th Street, Suite 100	Sacramento, CA 95811	eric@friendsoftheriver.org

<b>Organization</b>	<b>Name</b>	<b>Street Address</b>	<b>City, State, Zip</b>	<b>E-mail</b>
Trout Unlimited	James Polfer, President, Central Sierra Chapter			jpolver@hotmail.com
Trout Unlimited	John Sikora, Council Chairman	4005 Manzanita Ave., Suite 6, Box 302	Carmichael, CA 95608	JESIKORA@SBCGLOBAL.NET
Trout Unlimited	Walt Bentley			bentley46@earthlink.net
Advisory Council on Historic Preservation	John Eddins	401 F Street, NW, Suite 308	Washington, DC 20001-2637	jeddins@achp.gov
Tulare County Historical Society	Mike Chrisman, President	PO Box 295	Visalia, CA 93279	
Three Rivers Historical Museum	Thomas Marshall, President	PO Box 162	Three Rivers, CA 93271	history@3rmuseum.org
<b>Native American Tribes</b>				
Tule River Indian Tribe	Neil Peyron, Chairperson	PO Box 589	Porterville, CA 93258	Neil.Peyron@tulerivertribe-nsn.gov
Santa Rosa Indian Community of the Santa Rosa Rancheria	Bianca Arias	PO Box 8	Lemoore, CA 93245	barias@tachi-yokut-nsn.gov
Tule River Indian Tribe	Kerri Vera, Environmental Coordinator	PO Box 589	Porterville, CA 93258	tuleriverenv@yahoo.com
Tule River Indian Tribe	Joseph Garfield, Environmental Technician	PO Box 589	Porterville, CA 93258	joseph.garfield@yahoo.com
Tule River Indian Tribe	Zack Jaroko	PO Box 589	Porterville, CA 93258	
Wukchumni Tribal Council	Hector Lalo Franco, Director Cultural Resources Program	4737 West Concord Avenue	Visalia, CA 93277	hlfranco54@gmail.com
Tachi-Yokut Tribe	Greg Cuara, Cultural Specialist I	PO Box 8	Lemoore, CA 93245	gcuara@tachi-yokut-nsn.gov
Tachi-Yokut Tribe	Shana Powers	PO Box 8	Lemoore, CA 93245	spowers@tachi-yokut-nsn.gov

<b>Organization</b>	<b>Name</b>	<b>Street Address</b>	<b>City, State, Zip</b>	<b>E-mail</b>
Dunlap Band of Mono Indians - Historical Preservation Society	Mandy Marine, President	PO Box 18	Dunlap, CA 93621	mandy_marine@hotmail.com
Northern Band of Mono Yokuts	Delaine Bill, Chairperson	PO Box 234	Dunlap, CA 93621	
Cold Springs Tribe	Carol Bill, Chair	PO Box 209	Tollhouse, CA 93667	csrchair@netptc.net
Cold Springs Tribe	Blossom Hunter, Tribal Administrator	PO Box 209	Tollhouse, CA 93667	csradmin1@netptc.net
Cold Springs Tribe	Eric Smith, Environmental Director	PO Box 209	Tollhouse, CA 93667	csrepa@netptc.net
California Indian Basketweavers Association	Linda Navarro, Executive Director	428 Main Street	Woodland, CA 95695	ciba@ciba.org
Mono Elder	Keith Turner	PO Box 306	Auberry, CA 93602	keithturner1950@yahoo.com
North Fork Mono Tribe	Ron Goode, Chairman	13396 Tollhouse Road	Clovis, CA 93619	rwgoode911@hotmail.com
Kern Valley Indian Community	Julie Turner, Secretary	PO Box 1010	Lake Isabella, CA 93240	administrator@kawaiisu.org
Kern Valley Indian Community	Robert Robinson, Chairperson	PO Box 1010	Lake Isabella, CA 93240	bbutterbredt@gmail.com
Tubatulabas of Kern Valley	Robert L. Gomez Jr., Tribal Chairperson	PO Box 226	Lake Isabella, CA 93240	rgomez@tubatulabal.org
Wuksache Indian Tribe / Eshom Valley Band	Kenneth Woodrow, Chairperson	1179 Rock Haven Ct.	Salinas, CA 93906	kwood8934@aol.com
Picayune Rancheria of Chukchansi Indians	Jennifer Ruiz, Chairwoman	PO Box 2226	Oakhurst, CA 93644	jruiz@chukchansitribe.net
Wukchumni Tribal Council	Darlene Franco, Chairwoman	4737 West Concord Avenue	Visalia, CA 93277	

<b>Organization</b>	<b>Name</b>	<b>Street Address</b>	<b>City, State, Zip</b>	<b>E-mail</b>
Dunlap Band of Mono Indians	Dirk Charley, Tribal Secretary	5509 East McKenzie Avenue	Fresno, CA 93727	dcharley2016@gmail.com
Dunlap Band of Mono Indians	Benjamin Charley, Jr., Tribal Chairman	470 Winuba Lane	Bishop, CA 93621	charley07@verizon.net
<b>Public</b>				
	Rene Roederer	46468 Mineral King Road	Three Rivers, CA 93271	reneeroederer@gmail.com
Bear Ranch	Daniel Armstrong	616 South Irena Avenue	Redondo Beach, CA 90277	davidarmstrong43@gmail.com
Bear Ranch	Philip Armstrong	1723 Beaver Dam Road	Vilas, NC 28692	
	Autumn Davidson	46262 Mineral King Road	Three Rivers, CA 93271	clarion@value.net
	William Haxton	PO Box 811	Three Rivers, CA 93271	mountainviewrealty@sbcglobal.net
	Anne Haxton	PO Box 811	Three Rivers, CA 93271	mountainviewrealty@sbcglobal.net
	David Dunham	44024 Sierra Drive	Three Rivers, CA 93271	2shiners@sbcglobal.net
	Mike Hauber	PO Box 1116	Three Rivers, CA 93271	m.d.hauber@gmail.com
	Francis Kunz	44229 Kaweah River Drive	Three Rivers, CA 93271	
	Joy Kunz	222 E. Constance Avenue	Santa Barbara, CA 93105	
	D. Eleanor Newman	PO Box 66	Three Rivers, CA 93271	redbudacres28@aol.com
	Dana Sun	PO Box 276, 44229-C Kaweah River Drive	Three Rivers, CA 93271	redbudacres28@aol.com

<b>Organization</b>	<b>Name</b>	<b>Street Address</b>	<b>City, State, Zip</b>	<b>E-mail</b>
St. Anthony's Retreat	Mike Hand	43816 Sierra Drive	Three Rivers, CA 93271	mike@stanthonyretreat.org
	Betty Wood	PO Box 83	Three Rivers, CA 93271	brwood6@sbcglobal.net
	Ben Peña	43815 Dinley Drive	Three Rivers, CA 93271	penarb@sbcglobal.net
	Ginger Curtis	44044 Dinely Drive	Three Rivers, CA 93271	ginger.curtis@att.net
	Robert Ruehling	44044 Dinely Drive	Three Rivers, CA 93271	ruehling@att.net
	Doug Hammer	44751 Dinely Drive	Three Rivers, CA 93271	hhp682@gmail.com
	John Gibler	43459 Sierra Drive	Three Rivers, CA 93271	john.gibler@yahoo.com
	Rudy Nesmith	43429-A Sierra Drive	Three Rivers, CA 93271	rudy@viewpt.com
	Dan Dellinges	43429 Sierra Drive	Three Rivers, CA 93271	
	Coleen Bath	43429 Sierra Drive	Three Rivers, CA 93271	monosail@earthlink.net
Lake Elowin Resort	Milton Melkonian	43840 Dinely Drive	Three Rivers, CA 93271	catchall@lake-elowin.com
	Jonathan Peltzer	PO Box 454, 44422 Sierra Drive	Three Rivers, CA 93271	peltzerj@asme.org
	Holly Peltzer	PO Box 454, 44422 Sierra Drive	Three Rivers, CA 93271	drholly@hughes.net
	Michael Kunz	3244 East Kerckhoff	Fresno, CA 93702	mkunz@fresno.edu
	Uwe Reimer	PO Box 1179	Three Rivers, CA 93271	bedbug1@sbcglobal.net



<b>Organization</b>	<b>Name</b>	<b>Street Address</b>	<b>City, State, Zip</b>	<b>E-mail</b>
	Nancy Reimer	PO Box 1179	Three Rivers, CA 93271	bedbug1@sbcglobal.net
	George Tomi	PO Box 572, 43875 Dinely Drive	Three Rivers, CA 93271	ctomi3r@gmail.com
	Christy Tomi	PO Box 572, 43875 Dinely Drive	Three Rivers, CA 93271	ctomi3r@gmail.com
Three Rivers Hideaway	Dave Hammond	43365 Sierra Drive	Three Rivers, CA 93271	info@threerivershideaway.com
	Paul Doose	625 Pier Avenue	Santa Monica, CA 90405	pauldoose@earthlink.net
	Tom Baker	46262 Mineral King Road	Three Rivers, CA 93271	clarion@value.net
	Eddie and Jerry Belanger	PO Box 177, 43715 Dinely Drive	Three Rivers, CA 93271	jbelanger@icc-stravinski.com
	Sue Shanley	44609 Dinely Drive	Three Rivers, CA 93271	
	WW Boating TWG			info@sequoiaadventures.com
	WW Boating TWG			raft3rivers@gmail.com
	WW Boating TWG			raftgoodtimes@gmail.com
	WW Boating TWG			rivers@aorrafting.com
	WW Boating TWG			evanmoore32@yahoo.com
	WW Boating TWG			chasewhitewater@gmail.com
	WW Boating TWG			christulley@gmail.com
	WW Boating TWG			bill.pooley@gmail.com
	WW Boating TWG			eric@kernriverbrewing.com
	WW Boating TWG			d_mcquoid@hotmail.com
	WW Boating TWG			paul_martzen@yahoo.com

<b>Organization</b>	<b>Name</b>	<b>Street Address</b>	<b>City, State, Zip</b>	<b>E-mail</b>
	WW Boating TWG			trkayaker@ymail.com
	WW Boating TWG			paddle@sierrasouth.com
	WW Boating TWG			chris.tulley@gmail.com
<b>Private</b>				
Sequoia Riverlands Trust	Soapy Mulholland, President and CEO	427 S. Garden Street	Visalia, CA 93277	soapy@sequoiariverlands.org
California Water Service, Visalia District	District Manager	216 North Valley Oaks Drive	Visalia, CA 93292	
Consolidated Peoples Ditch Company	James P Silva, Jr	PO Box 366	Farmersville, CA 93223-0366	
Hurley and Laird	Russell Hurley	403 N Floral Street	Visalia, CA 93291	
Minasian, Spruance, Baber, Meith, Soares & Sexton, LLP	Jeffrey Meith, Partner	1681 Bird Street	Oroville, CA 95965	
Three Rivers Village Foundation	Tom Sparks	45001 Sierra Drive	Three Rivers, CA 93271	tom.sparks@live.com
The Kaweah Commonwealth	John Elliott	PO Box 806	Three Rivers, CA 93271	tkcplanner@gmail.com
Williams, Brodersen, Pritchett, Burke, LLP	Steven Williams	2222 West Main Street	Visalia, CA 93291	srw@visaliaattorneys.com
<b>SCE Staff</b>				
Southern California Edison	Dan Keverline	15171 Sierra Way	Kernville, CA 93240	keverlds@sce.com
Southern California Edison, Kaweah Hydro Headquarters Office, Kaweah 1 Powerhouse	Robert Biedermann	44511 Sierra Drive	Three Rivers, CA 93271	robert.biedermann@sce.com
Southern California Edison	Wayne Allen	1515 Walnut Grove	Rosemead, CA 91770	wayne.allen@sce.com

<b>Organization</b>	<b>Name</b>	<b>Street Address</b>	<b>City, State, Zip</b>	<b>E-mail</b>
Southern California Edison	David Moore	1515 Walnut Grove	Rosemead, CA 91770	david.moore@sce.com
Southern California Edison	Audry Williams	1515 Walnut Grove	Rosemead, CA 91770	audry.williams@sce.com
<b>FERC SERVICE LIST</b>				
Southern California Edison	Kelly Henderson, Attorney	PO Box 800	Rosemead, CA 91770-0800	kelly.henderson@sce.com
Southern California Edison	Martin Ostendorf, Compliance Manager	PO Box 100	Big Creek, CA 93605	martin.ostendorf@sce.com
Southern California Edison	FERC Case Administrator	2244 Walnut Grove Ave.	Rosemead, CA 91770	ferccaseadmin@sce.com
Southern California Edison	Nicolas von Gersdorff, Dam Safety Engineer	1515 Walnut Grove	Rosemead, CA 91770	nicolas.von@sce.com
Southern California Edison	Sher Beard	54170 Mountain Spruce	Big Creek, CA 93605	sher.beard@sce.com
Southern California Edison	Derrick Tito			derrick.tito@sce.com

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**Table 14-2. Resource Agency and Stakeholder Meeting Dates and Topics**

Date	Type / Purpose	General Attendance	Location	Relicensing Process Overview	Project Description Overview	Existing Information Data Request	Stakeholder Interest Statements	Project Schedule	Project Facilities and Operations	Relicensing Process Plan / Communication Protocols	Existing Resource Information	Technical Study Plan Development	Technical Study Implementation Progress	Draft License Application	Environmental Measures	Impacts / Analysis
Mar 31, 2015	Project Introduction	BLM	Bakersfield, CA	•	•	•		•								
Apr 08, 2015	Project Introduction	NPS	Three Rivers, CA	•	•	•		•								
Apr 09, 2015	Project Introduction	CDFW	Fresno, CA	•	•	•		•								
Jun 08, 2015	Informational	Water Users	Three Rivers, CA	•	•		•	•	•							
Jun 09, 2015	Project Kick-off	Interested Stakeholders	Visalia, CA	•	•		•	•	•	•						
Aug 11, 2015	Informational / Plenary	Interested Stakeholders	Visalia, CA		•		•		•	•	•					
Feb 24, 2016	Informational / Plenary	Interested Stakeholders	Visalia, CA	•	•							•				
May 24, 2016	Study Coordination	BLM	Teleconference									•				
Aug 18, 2016	Study Coordination	BLM	Bakersfield, CA									•				
Mar 14, 2017	FERC Scoping	Interested Stakeholders	Visalia, CA	•	•			•	•							
Mar 15, 2017	FERC Site Visit	Interested Stakeholders	Three Rivers, CA						•							
Jun 21, 2017	Proposed Study Plan	Interested Stakeholders	Visalia, CA	•				•				•				
Mar 01, 2018	Study Plan Kick-off	Interested Stakeholders	Teleconference	•	•							•				
Apr 04, 2018	Annual Agency Coordination	NPS	Three Rivers, CA									•				
Nov 01, 2018	Initial Study Report	Interested Stakeholders	Visalia, CA										•			
Sep 04, 2019	ESA Consultation	USFWS	Sacramento, CA												•	•
Sep 10, 2019	Informational / Plenary	Interested Stakeholders	Visalia, CA											•		
Oct 28, 2019	Focused Agency Consultation	SWB	Sacramento, CA												•	
Nov 06, 2019	Updated Study Report	Interested Stakeholders	Visalia, CA										•			

BLM: Bureau of Land Management  
 CDFW: California Department of Fish and Wildlife  
 FERC: Federal Energy Regulatory Commission  
 NPS: National Park Service  
 SWB: State Water Board  
 USFWS: U.S. Fish and Wildlife Service

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**Table 14-3. Technical Working Group and Focus Group Meeting Dates and Topics**

Date	General Topics of Discussion / Objectives
<b>Aquatic Resources TWG</b>	
Mar 26, 2018	<ul style="list-style-type: none"> <li>• Select instream flow modeling sites and transects</li> <li>• Select fish population sampling sites</li> <li>• Select macroinvertebrate sampling sites</li> <li>• Select foothill yellow-legged frog modeling sites</li> </ul>
Jun 8, 2018	<ul style="list-style-type: none"> <li>• Study sites and specific habitat units and transects to model</li> <li>• Obtain concurrence on cross-section placement within mesohabitat units</li> <li>• Select location and lengths of reach study sites</li> <li>• Select geomorphic and riparian quantitative transects</li> <li>• Entrainment study approach</li> </ul>
Jun 25, 2018	<ul style="list-style-type: none"> <li>• Site visit with interested agencies and Aquatic Resources TWG participants</li> </ul>
Nov 15, 2018	<ul style="list-style-type: none"> <li>• Revised entrainment study</li> </ul>
Dec 4, 2018	<ul style="list-style-type: none"> <li>• Revised entrainment study</li> </ul>
Dec 3, 2019	<ul style="list-style-type: none"> <li>• Options for completing entrainment study</li> </ul>
Dec 10, 2019	<ul style="list-style-type: none"> <li>• Options for completing entrainment study</li> </ul>
<b>Cultural Resources TWG</b>	
Mar 20, 2018	<ul style="list-style-type: none"> <li>• Built environment, archaeological, and ethnographic study implementation</li> <li>• Initiate consultation regarding the proposed APE for the studies</li> <li>• Proposed field study plans and timelines</li> </ul>
May 7, 2019	<ul style="list-style-type: none"> <li>• Built environment, archaeological, and ethnographic study results</li> <li>• NRHP Evaluation Plan and HPMP Planning</li> </ul>
<b>Whitewater Boater Focus Group</b>	
Apr 3, 2018	<ul style="list-style-type: none"> <li>• Project hydrology</li> <li>• Collect whitewater boating resource information</li> </ul>

**Table 14-4. Technical Study Report Distribution Dates**

Technical Study Report <sup>1</sup>	Draft TSR Distribution Date	Final TSR Distribution Date
<b>Aquatic Resources</b>		
AQ 1 – Instream Flow	Aug 3, 2019 (DLA)	Dec 23, 2019 (FLA)
AQ 2 – Fish Population	Apr 2, 2019	Dec 23, 2019 (FLA)
AQ 3 – Macroinvertebrates	Aug 3, 2019 (DLA)	Dec 23, 2019 (FLA)
AQ 4 – Water Temperature	Aug 3, 2019 (DLA)	Dec 23, 2019 (FLA)
AQ 5 – Geomorphology	Aug 3, 2019 (DLA)	Dec 23, 2019 (FLA)
AQ 6 – Water Quality	Apr 2, 2019	Dec 23, 2019 (FLA)
AQ 7 – SS Amphibians and Aquatic Reptiles	Aug 3, 2019 (DLA)	Dec 23, 2019 (FLA)
AQ 8 – Fish Passage	Apr 2, 2019	Dec 23, 2019 (FLA)
AQ 9 – Entrainment <sup>1</sup>	Dec 23, 2019 <sup>1</sup>	TBD
<b>Cultural Resources<sup>2</sup></b>		
CUL 1 – Cultural, Built Environment	Jan 22, 2019	Dec 23, 2019 (FLA)
CUL 1 – Cultural, Archaeology	Jan 22, 2019	Dec 23, 2019 (FLA)
CUL 1 – Cultural, Ethnography	Feb 15, 2019	Dec 23, 2019 (FLA)
<b>Land Resources</b>		
LAND 1 – Transportation	Jan 22, 2019	Dec 23, 2019 (FLA)
LAND 2 – Aesthetic Resources	Jan 22, 2019	Dec 23, 2019 (FLA)
LAND 3 – Land Use	Feb 15, 2019	Dec 23, 2019 (FLA)
<b>Recreation Resources</b>		
REC 1 – Recreation Resources	Aug 3, 2019 (DLA)	Dec 23, 2019 (FLA)
REC 2 – Whitewater Boating	Jan 22, 2019	Dec 23, 2019 (FLA)
<b>Terrestrial Resources</b>		
TERR 1 – Botanical Resources	Jan 22, 2019	Dec 23, 2019 (FLA)
TERR 2 – Wildlife Resources	Jan 30, 2019	Dec 23, 2019 (FLA)

<sup>1</sup> The AQ 9 – Entrainment Study is ongoing and will not be completed until after the License Application is filed with FERC. A Draft TSR with study results to date is being distributed to stakeholders in the License Application (Supporting Document A). A Final TSR will be distributed to stakeholders for review and comment upon completion of the study.

<sup>2</sup> To aid in clarity and ease of stakeholder review, the CUL 1 – TSR was distributed as three separate reports – Built Environment, Archaeology, and Ethnography.

DLA = Draft License Application

FLA = Final License Application



**Table 14-5. Stakeholder Comments on the Draft License Application Filed with FERC**

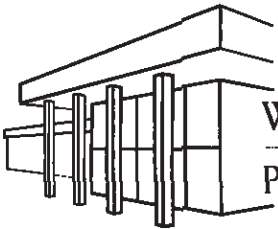
<b>Comment Letter Number</b>	<b>Filing Entity</b>	<b>Date</b>	<b>FERC Accession Number</b>
1	Williams, Brodersen & Pritchett LLP	Aug 23, 2019	20190830-0032
2	American Whitewater	Oct 24, 2019	20191024-5017
3	National Park Service	Oct 25, 2019	20191030-5121
4	Bureau of Land Management	Oct 31, 2019	20191031-5285
5	California Department of Fish and Wildlife	Nov 1, 2019	20191104-5051
6	Federal Energy Regulatory Commission	Nov 1, 2019	20191101-3033
7	State Water Board	Nov 1, 2019	20191101-5277

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## **APPENDIX 14-A**

### **Stakeholder Comments on Draft License Application and Associated SCE Responses**

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WILLIAMS / BRODERSEN  
PRITCHETT / BURKE LLP

ORIGINAL

STEVEN R. WILLIAMS  
srw@visalialawyers.com

THOMAS C. BRODERSEN  
brodersen@visalialawyers.com

NICK PRITCHETT  
nick@visalialawyers.com

RUSSELL P. BURKE  
russ@visalialawyers.com

CHARLOTTE A. WITTIG  
charlotte@visalialawyers.com

NICHOLAS R. RUIZ  
nicholas@visalialawyers.com

REGULATORY COMMISSION

2009 AUG 30 P 2:42

FILED  
SECRETARY OF THE  
COMMISSION

August 23, 2019

Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E.  
Washington, DC 20426

Re: FERC Project No. 298:  
Kaweah Hydroelectric Project  
Our File No. 24951

Dear Ms. Bose:

We represent Renee Roederer who owns real property through with the Southern California Edison Company flume runs to power, in part, the hydroelectric plant which is the subject of the above-referenced project. In addition to providing electricity in a safe, efficient and clean fashion, the project also provides for the distribution of water to those along the flume which water is literally the lifeblood of the community.

Historically, in exchange for the easement rights for the building, operation and maintenance of the flume the property owners reserved water rights to the water coming through the flume to provide water to their residences and property. Without such water the properties are virtually useless. These rights have passed to each subsequent owner of the properties and have been relied upon by each subsequent owner.

On behalf of our client we ask that the project be approved with eh additional proviso that Southern California Edison Company adequately maintain the flume to preserve its operation and the rights of the adjoining property owners. Should you need any further information please feel free to contact the undersigned.

1a

Sincerely,

WILLIAMS, BRODERSEN & PRITCHETT LLP

By

Steven R. Williams

SRW/cad  
cc: Client



**UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION**

**Southern California Edison Company  
Kaweah Hydroelectric Project**

**FERC Project #298**

AMERICAN WHITEWATER'S COMMENTS REGARDING  
SOUTHERN CALIFORNIA EDISON DRAFT LICENSE APPLICATION  
(FERC PROJECT NUMBER 298)

(Submitted October 24, 2019)

American Whitewater is a national non-profit 501 (c)(3) river conservation organization founded in 1954 with over 6,000 members and 100 locally based affiliate clubs, representing whitewater enthusiasts across the nation. American Whitewater's mission is to conserve and restore America's whitewater resources and to enhance opportunities to enjoy them safely. A significant percentage of our members reside in and travel to California for its whitewater resources. The Kaweah and the East Fork Kaweah are world class whitewater rivers attracting visitors from around the world, state and region. American Whitewater has engaged throughout the current relicensing process to ensure the interests of whitewater paddlers are identified and addressed on these watersheds. We provide the following comments on the Draft License Application. Specifically, regarding the Recreation Enhancement Measures and overall river access.

**Recreation Enhancement Measures**

*Kaweah No. 2 Powerhouse River Access Parking Area Enhancements*

REC 2 Whitewater Boating Focus Group members singled out put-in and take-out access as key improvement opportunities. Thus, we are pleased to see Southern California Edison propose a measure to address river access parking area enhancements including a portable restroom at the Kaweah No. 2 Powerhouse. This location can serve as both a take-out for the Gateway Bridge whitewater run and a put-in for the downstream Dinely Bridge whitewater run. We note that the interest of whitewater boaters at this site is not additional facilities or capital improvements as presumed by the licensee, rather it is the ability to use the existing parking and access as it is.

Southern California Edison has a current policy that closes the parking area and beach at Kaweah No. 2 Powerhouse Friday, Saturday & Sunday between Memorial Day and Labor Day. Spring run-off on the Kaweah can provide boating flow opportunity into July. If this policy remains, Friday and weekend boaters on the Gateway Bridge run must paddle an extra 7 miles to get to

2a

the nearest public parking and access at Kaweah Lake. Additionally, there is no public option for put-in on the Class III-IV Dinely Bridge run unless paddlers are skilled enough to take on the upstream Class IV-V Gateway Bridge run. Furthermore, outside of this policy the licensee has been known to simply close access and parking at Kaweah Powerhouse No. 2 when boating flows are available. (See Figure 7-9 of American Whitewater comments filed with FERC August 25, 2017.<sup>1</sup>) In order for this enhancement to work for whitewater boating interests we ask that it be available as a parking and access point 7 days a week when boatable flows are available. We would not be opposed to a time of day limit i.e. dawn to dusk.

2a

### *Dissemination of Real-time Flow Information*

American Whitewater and paddling stakeholders commend Southern California Edison's proposal to disseminate real time flow information. This information will eliminate the instances of boaters guesstimating flows, traveling hundreds of miles and getting "skunked" of flows at the put in. Both proposed gages at East Fork Kaweah River near Three Rivers CA (USFS Gage No. 11208730) (SCE Gage No. 201) and Kaweah River below Conduit No. 2 near Hammond CA (USGS Gage No. 11208600) (SCE Gage No. 203) will provide high value flow information to paddlers on the watershed.

2b

We would like to suggest, however, that the diversion flow amounts at both the Kaweah No. 1 Diversion Dam and Kaweah No. 2 Diversion Dam be provided as well. Having these diversion amounts will maximize whitewater flow information on the Kaweah and East Fork Kaweah by allowing boaters to subtract the amounts from the real time gage information to ascertain flows upstream of the diversions. Effectively, paddlers would have information for the Ash Mountain run upstream of Kaweah No. 2 Diversion Dam; the downstream Park Boundary run, Gateway Bridge run, Dinely Bridge Run and the Three Rivers run. On the East Fork Kaweah, diversion amounts would provide flow information on the upper portion of the East Fork Kaweah within the project boundary.

Also, though outside the project boundary but part of the SUP with Sequoia National Park that having the same gage and diversion information below the Middle Fork Kaweah Diversion Dam (USGS 11206500) (SCE Gage No. 210) would be of high value to paddling stakeholders as well.

2c

Finally, as an alternate to creating and maintaining a website for this information, we recommend that the licensee simply provide the information to the California Data Exchange Center (CDEC) which is currently used on many other hydroelectric projects in California to provide streamflow information. At such time in the future that CDEC is no longer viable the licensee could consider then other alternatives including its own website.

2d

### **Kaweah and East Fork Kaweah River Access**

As voiced throughout our engagement on the relicensing process, river access to the Kaweah and East Fork Kaweah remains a top concern. Understanding, there are constraints to providing

2e

<sup>1</sup> AMERICAN WHITewater's COMMENTS REGARDING SOUTHERN CALIFORNIA EDISON PROPOSED STUDY PLAN (FERC PROJECT NUMBER 298) available on the Commission's website from the eLibrary feature at <http://www.ferc.gov/docs-filing/elibrary.asp>. Accession number 20170825-5048



access through private property, we would like the Licensee to take a closer look at reasonable access and parking provided at Kaweah Powerhouse No. 1 and Kaweah Powerhouse No. 3.

Having access at Kaweah Powerhouse No. 1 would provide paddlers on the Park Boundary and the East Fork Kaweah run a safer egress than walking with boating equipment in hand along the two-lane road at Gateway Bridge. (See Figure 2-3 of American Whitewater comments filed with FERC August 25, 2017.<sup>2</sup>) Understanding the Licensee's concern of interference with administrative building staff, we note that there are ways to mitigate for this including fencing, hours of access, signage and a dedicated foot path to the river. It is also observed that public access near administrative buildings occur on other projects like the Skagit P-553 and the Nantahala P-2692.

In terms of access at Kaweah Powerhouse No. 3 we note that this was a requirement of the current license and was removed 27 years ago without input from paddling stakeholders. Current conditions are not the same and we emphasize that our interests are not large scale capital improvements. We simply require access to the river via a foot path, parking spaces and a portable restroom. This site would provide take-out for the Ash Mountain run and put in for the Park Boundary Run. Access at this site would also alleviate park entrance congestion and would allow for long term parking which is not currently available at the Indian Head River Trailhead.

### Conclusion

Overall, American Whitewater commends Southern California Edison for meeting stakeholders real time flow information interests within the DLA. We ask that they consider enhancing gage information with flow diversion information and provide all information on CDEC. Additionally, we ask the licensee to continue to explore opportunities for reasonable parking and access to the Kaweah and East Fork Kaweah watershed. We thank you for the opportunity to comment.

Sincerely,



Theresa L. Simsiman  
California Stewardship Director  
American Whitewater  
916-835-1460

---

<sup>2</sup> Ibid

**UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION**

**Southern California Edison Company  
Kaweah Hydroelectric Project**

**FERC Project #298**

**CERTIFICATE OF SERVICE**

Pursuant to Rule 2010 of the Commission's Rules of Practice and Procedure, I hereby certify that I have this day caused the foregoing **American Whitewater's Comments Regarding Southern California Edison Draft License Application for the Kaweah Hydroelectric Project (P-298)** to be served upon each person designated on the official service list compiled by the Secretary in this proceeding. Dated this 24<sup>th</sup> day of October 2019.



Theresa L. Simsiman  
California Stewardship Director  
American Whitewater  
916-835-1460



## United States Department of the Interior

NATIONAL PARK SERVICE  
Interior Regions 8, 9, 10, and 12  
333 Bush Street, Suite 500  
San Francisco, CA 94104-2828



IN REPLY REFER TO:

October 25, 2019

Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, NE  
Washington DC. 20426

Electronic Filing

RE: National Park Service's (NPS) comments on the Draft License Application (DLA) Kaweah Hydropower Project (P-298).

Dear Ms. Bose:

The NPS has authority to consult with FERC and applicants concerning a project's effects on outdoor recreation resources under the Federal Power Act (18 CFR 4.38(a), 5.41(f)(4)-(6), and 16.8(a)); the Outdoor Recreation Act (Public Law [PL] 88-29), the NPS Organic Act (39 Stat. 535), and the Wild and Scenic Rivers Act (PL 90-542). It is the policy of the NPS to represent the national interest regarding recreation and to assure that hydroelectric projects subject to relicensing recognize the full potential for meeting present and future public outdoor recreation demands while maintaining and enhancing a quality environmental setting for those projects. Investigating opportunities to improve the recreation experience is consistent with the NPS policy and FERC guidelines to identify future potential recreation needs.

NPS has reviewed the Kaweah DLA regarding recreation and whitewater boating. Over the past five years, the NPS has engaged with Southern California Edison Company (SCE) and their consultants in this re-licensing.

On April 13, 2017, the NPS submitted a study request for a comprehensive whitewater boating study to provide reliable data that can be used in making recommendations on enhancing whitewater boating opportunities and experiences. In Table 1 of the Proposed Study Plan (PSP), SCE agreed to adopt the NPS's study request and developed a new study plan focusing specifically on whitewater boating in the Project area (REC-2 Whitewater Boating Technical Study Plan, located in Appendix B of the PSP). The REC-2 Whitewater Boating Study Plan incorporates the study approach suggested by the NPS and other stakeholders.

INTERIOR REGION 8 • LOWER COLORADO BASIN\*  
INTERIOR REGION 9 • COLUMBIA—PACIFIC NORTHWEST\*  
INTERIOR REGION 10 • CALIFORNIA—GREAT BASIN  
INTERIOR REGION 12 • PACIFIC ISLANDS

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AMERICAN SAMOA, ARIZONA\*, CALIFORNIA, GUAM, HAWAII, IDAHO, MONTANA\*,  
NEVADA, NORTHERN MARIANA ISLANDS, OREGON, WASHINGTON

\*PARTIAL

The NPS offers these comments to inform SCE and its consultants of outstanding concerns that we have.

The NPS appreciates and is supportive of the improved facilities at Powerhouse No. 2 and the real-time flow information measures described in the DLA. Providing the real-time information on the East Fork Kaweah (Gauge # 11208730) will be useful to the boaters to understand the flows in the Lower East Fork run. In addition, the NPS recommends that SCE provide the realtime information on the amount of water diverted at Kaweah No 1 Diversion Dam. This will allow boaters to understand the river flow in the river segment upstream of the diversion dam, which is another boating run. The NPS also appreciates SCE's proposal to provide real-time flow information at Gauge #11208600. The NPS also recommends that SCE provide the real-time information regarding flows diverted at Kaweah No 2 Diversion Dam. In addition, the NPS recommends that SCE provide real-time information at Gauge # 11206500 and the amount of flow diverted at the Middle Fork Diversion Dam.

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3c

The results of the whitewater boating study show that access is the main barrier preventing recreation use of the river. The NPS is not recommending recreation flow releases for boating based on the results of this study and does recommend additional access improvements to ensure the public can use the river during the next license term.

During the focus group, boaters identified access as a barrier to their use of the river. Access to SCE lands would alleviate that barrier and allow the public to use the river. FERC guidelines for recreation under 18 CFR 2.7 states:

*“Recreational development at licensed projects.*

*The Commission will evaluate the recreational resources of all projects under Federal license or applications therefore and seek, within its authority, the ultimate development of these resources, consistent with the needs of the area to the extent that such development is not inconsistent with the primary purpose of the project. ...The Commission expects the licensee to assume the following responsibilities:*

*(b) To develop suitable public recreational facilities upon project lands and waters and to make provisions for adequate public access to such project facilities and waters and to include therein consideration of the needs of persons with disabilities in the design and construction of such project facilities and access.”*

SCE is asking for a 50 year instead of the default 40-year license term. The NPS recommends additional recreation mitigation measures be conducted to allow adequate public access to the Kaweah River.

The NPS recommends the following:

1. SCE currently allows access to the Powerhouse 2 and proposes to add a trash receptacle and Porta-Potty. The Powerhouse #2 is open to public use Monday –Thursday during Memorial Day to Labor Day and seven days a week during the rest of the year. The hours of operation are 8 am to 7 pm. The majority of visitors work during the week, and most visitor use is expected during the evenings and weekends. In their response to comments on the whitewater

3d

boating study, SCE described concerns from near-by private landowners as a reason to limit the visitor use days and hours. The NPS recommends that SCE extend the days of operation to seven days year around. SCE should address the concerns by private landowners while allowing the public access to the river. These concerns could be mitigated in a number of ways, such as limiting the hours of operation to dawn to dusk, installing a gate or fencing to separate private and public use, educating users about expected behaviors and regulations, and conducting maintenance to address any litter or vandalism issues. SCE's proposed installation of a trash receptacle and Porta-Potty should also help alleviate problems with sanitation and litter.

3d

2. Powerhouse #1. SCE explained in their response to comments that the Powerhouse #1 is adjacent to administrative buildings for staff. Due to this, SCE did not think public access would be a compatible use at this location. The NPS understands these concerns and recommends that the feasibility of providing access to the river here be explored further. Other FERC licensed projects co-locate administrative buildings with public access. The Skagit p-553 and Nantahala p-2692 are two examples where the public access is provided near administrative buildings. Many other projects have access near dams and powerhouses. The NPS recommends that SCE in consultation with stakeholders explore design solutions to address these concerns while still allowing public access to the river. Design and operational solutions could include separating the uses through fencing, gates, or vegetation; educating users about the rules and regulations; and limiting the hours of operation be dawn to dusk.

3e

3. Powerhouse #3. In the previous license, FERC required the development of formal river access at Powerhouse #3, including parking, sanitation, and improved trail facilities. SCE shared that they never constructed the project due to concerns from private landowners and NPS law enforcement. The requirement was formally removed from the license on June 30, 1993. SCE states in their response to comments that the same conditions and concerns exist today. As indicated by the whitewater study report and focus group, boaters still need river access at this site. The restrictions are limiting the public's ability to access the river. Given that the previous concerns occurred 27 years ago, the NPS recommends that SCE in consultation with stakeholders explore access opportunities at this site through documenting current conditions and ways to address any existing concerns through design and education solutions.

3f

Thank you for the opportunity to comment on the DLA for the Kaweah Hydropower Project (P-298). If you have any further questions, please contact Steve Bowes at 415-623-2321 or Barbara Rice at 415-623-2320.

Sincerely,



Barbara Rice  
Program Manager  
Rivers, Trails and Conservation and Hydropower Assistance Programs  
National Park Service  
333 Bush Street  
San Francisco, CA 94104





## United States Department of the Interior



BUREAU OF LAND MANAGEMENT  
 Bakersfield Field Office  
 3801 Pegasus Drive  
 Bakersfield, CA 93308  
[www.blm.gov/office/bakersfield-field-office](http://www.blm.gov/office/bakersfield-field-office)

OCT 3 1 2019

***In Reply, Refer To:***  
 Kaweah Project No. 298  
 LLCAC06000.45

### Electronic Filing

RE: Bureau of Land Management's (BLM) comments on Draft License Application (DLA) for Kaweah Hydropower Project (P-298).

Dear Ms. Bose:

The BLM has the authority to consult with the Federal Energy Regulatory Commission (FERC) and the proponent concerning the application under the Federal Power Act of 1940 (41 Stat. 1063; 16 U.S.C. 791-825r) and Title V of the Federal Land Policy and Management Act of October 21, 1976 (90 Stat. 2776; 43 U.S.C. 1761), as amended. It is the mission of BLM to sustain the health, diversity, and productivity of public lands for the use and enjoyment of present and future generations. The review of the Kaweah DLA was conducted in a manner that aligns with the mission of BLM.

The BLM offers the following attached comments on the DLA of the Kaweah Project No. 298 to inform Southern California Edison (SCE) and its consultants of outstanding concerns that BLM has.

The BLM appreciates the opportunity to comment on the DLA and participating in relicensing process. Should you have any questions, please do not hesitate to call Alison Lipscomb, Realty Specialist at (661)391-6177 or at [alipscomb@blm.gov](mailto:alipscomb@blm.gov).

Sincerely,

Gabriel R. Garcia  
 Field Manager

Enclosures:  
 Certificate of Service  
 DLA Comments

**CERTIFICATE OF SERVICE**

Pursuant to Rule 2010 of the Commission's Rules of Practice and Procedure, I hereby certify that I have this day cause the foregoing document to be served upon each person designated on the official service list compiled by the Secretary in this proceeding. Dated this 31<sup>st</sup> day of October 2019.

  
Gabriel R. Garcia  
Bakersfield Field Office Manager  
661-391-6139



Comments on Draft License Application for Kaweah Project No. 298

**A. SD A, Technical Study Reports**

**LAND 3-Land Use TSR: Section 5.2, Maintenance Practices and Responsibilities**

The results of this Study and SCE’s characterization of exclusionary fencing supports the argument that all such fencing should be included throughout the license application as Project protection and safety features. For example, SCE states, “Generally, exclusionary fencing is located around the primary Project features and is used to block or inhibit access by wildlife, domestic animals and the general public.” The Project flowlines and forebays are evidently key Project features.

SCE states that, “All exclusionary fencing associated with the Project is inspected on a regular basis and repaired on an “as-needed” basis.” The Study revealed that most of this fencing is in poor to fair condition where it still exists at all. SCE has a duty to take all reasonable measures to maintain and operate the Project in a manner that is safe for domestic animals according to 18 Code of Federal Regulations (CFR) Part 12 and applicable license requirements. This exclusionary fencing should be included throughout the license application as a Project feature. Furthermore, this fencing should also be inspected, repaired and maintained as required for all protection and safety features.

4a

**B. Exhibit A - Description of the Project**

The BLM requests that the description of the Project be updated to reflect BLM Comment A; the inclusion of the exclusionary fencing.

4b

**C. Exhibit H – General Information, Appendix H-1**

The BLM requests that Appendix H-1 be updated to reflect BLM Comment A; the inclusion of the exclusionary fencing along flowlines nor SCE installed or maintained fence on exclusionary fence on the map associated with the K3 Forebay.

4c

**D. Exhibit E – Environmental Exhibit**

The BLM requests that Exhibit E be updated to reflect BLM Comment A; the inclusion of the exclusionary fencing. In addition, Exhibit E has the following inaccuracies and requests the following be updated to address the inaccuracies:

4d

**Section 3.0 No Action Alternative**

**3.2.9 Ancillary and Support Facilities**

No reference to the exclusionary fence along flowlines or the K3 Forebay.

4e

**3.2.9.3 Wildlife Bridges and Escape Ramps**

No reference of reducing livestock mortality, nor any mention of exclusionary fencing along flowlines.

4f

**3.4.3 Flowline Inspections and Maintenance**

No reference of repairs to the exclusionary fencing along the flowlines and at K3 Forebay.

4g

**3.4.6 Road Maintenance**

Access control structures should include fences associated with the gates and posts mentioned.

4h

**3.9.2 Project Safety Features**

**Physical Restraining Devices**

No mention of the exclusionary fencing along K2 cement ditch to restrict livestock access.

4i

**Flowline Safety Features**

Exclusionary fencing should be maintained along the flowlines to reduce animal mortality including livestock and to focus wildlife crossings at bridges along K2 Flowlines. BLM requests SCE update to reflect this comment.

**Table 3-2. No-Action Alternative – Existing Project Facilities, Ancillary and Support**

4j

**Facilities**

No mention of the K2 Flowline exclusionary fence and K3 Forebay exclusionary fence.

↑ 4j

**Section 4.0 Proposed Action Alternative**

**Table 4-1. Proposed Action – Project Facilities**

No reference to the K2 Flowline exclusionary fence and K3 Forebay exclusionary fence. BLM requests this information be included.

↑ 4k

**APPENDIX 4-A. New Environmental Measures, Management and Monitoring Plans, and Programs. 4.5.5 Wildlife Mortality Monitoring Plan**

Needs to be modified to read, “Animal Mortality” and specifically include livestock.

↑ 4l

**Section 7.0 Affected Environment**

**7.9.5 Land Use Within the FERC Project Boundary**

Livestock grazing land use is not listed as occurring within the FERC boundary; although, it is an active use within the FERC Project boundary. BLM requests that SCE modify the first sentence to read, “Land use within the FERC Project boundary primarily includes hydropower generation and a limited amount of dispersed recreation” *and livestock grazing.*

↑ 4m

**7.9.5.2 Safety Programs and Features**

SCE states, “SCE has installed a variety of features to help protect animals, including wildlife and livestock.” Yet, in Section 3.0 – No-Action Alternative, where the reader is referenced to see these features described, it does not include any features directed at protecting livestock, namely the exclusionary fencing.

↑

SCE states, “SCE inventoried and assessed the condition of the safety features that are present along the Kaweah No. 2 Flowline, the Kaweah No. 3 Flowline, the Kaweah No. 3 Forebay, and the Kaweah No. 1 Forebay Road. The results of this effort are provided in Appendix A of the LAND 3 – TSR, which is included in SD A. SCE inspects and maintains all of these features on a regular basis. Accordingly, as documented in Appendix A of the LAND 3 – TSR, almost all of these features are in good condition, meaning the feature is in new or like-new condition and functions as intended without signs of wear and/or deterioration.” However, the exclusionary fencing displayed on maps in the TSR show many gaps in the inventoried data. Although SCE states in Exhibit E that it inspects and maintains all of these features on a regular basis, the data provided in the LAND 3 TSR shows most exclusionary fencing to be non-existent or in fair to poor condition.

↑ 4n

**7.9.6 Land Use Outside the FERC Project Boundary, 7.9.6.1 Livestock Grazing**

SCE states, “An allotment is a designated area of land available for livestock grazing.” Although this statement is true, it does not clearly address the requirements of grazing management within this region of California; that is required to consist of public *and* private lands to make one manageable unit with which to properly graze livestock. BLM requests this statement modified to read, “An allotment is a designated area of land available for livestock grazing, *which could include federal and private lands making up the livestock management unit.*”

↑ 4o

SCE states, “SCE is not responsible for installing or maintaining fencing associated with BLM grazing allotments, referred to herein as cattle exclusion fencing.” This statement is opinion held by SCE and should not be present in the affected environment without describing it as such. BLM argues that SCE has a duty to take all reasonable measures to maintain and operate the Project in a manner that is safe for domestic animals according to 18 Code of Federal Regulations (CFR) Part 12 and applicable license requirements, and have stated that they have installed a variety of features designed to protect animals,

↓

including wildlife and livestock. One feature that would protect livestock from mortality caused by Project operations is the exclusionary fencing. BLM requests the inclusion of the exclusionary fencing as a Project feature.

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**Section 8.0 Environmental Effects of the Proposed Action**

**Table 8.1-1. Resource Areas Potentially Affected by Project Operation and Maintenance under the Proposed Action**

The Land Use Resource is affected by the Flowline Maintenance actions of the Proposed Action and should be indicated as such in the table.

4p

**8.9.1.3 Potential Conflicts with Land Management Plans and Policies**

Operation of the Project, without addressing maintenance of exclusionary fencing along canal of K2 conflicts with the Bakersfield Field Office Resource Management Plan (RMP) goals and objectives (page 63, *Provide for livestock grazing opportunities on lands within the grazing decision area in a manner that limits impacts on other resources and meets RMP goals.*), and is inconsistent with SCE’s requirements to protect animals. Without this protection from the Project, this grazing unit (BLM and private) is rendered un-usable for livestock grazing opportunities due to high probability of direct livestock mortality.

4q

**8.9.2 Other Land Use Issues**

Modify this sentence as follows; “An allotment is a designated area of land available for livestock grazing *and it includes the BLM allotment and private lands that make up the livestock management area.*”

4r

SCE states, “The BLM and/or private parties have erected fencing in various locations to contain livestock to designated allotments.” BLM has no record of this fencing being installed by BLM or its grazing Lessees. Based on the results of the LAND 3 TSR, the remaining remnant fences indicate that SCE or a previous Project operator had installed the fencing along the entire Project boundary at K2.

4s

SCE also states, “The only exclusionary fencing that SCE maintains is at the Kaweah No. 3 Forebay, where SCE recently erected fencing to prevent cattle from causing erosion along the banks of the forebay (i.e. to protect SCE infrastructure).” SCE installed and maintains this exclusionary fencing yet, this fence is not listed among the Project facilities. Cattle were drawn to the K3 Forebay in search of water in open rangeland, just as they are along the K2 Flowlines. As required by 18 CFR Part 12, BLM requests that SCE maintain all exclusionary fencing as it relates to their Project infrastructure and the protection of animals.

4t

The BLM finds the following statement an opinion, “SCE does not believe that the Project flowlines effect cattle grazing opportunities or other uses on BLM land.” To the contrary, the operation of the Project without adequate exclusionary fencing renders the surrounding livestock management units (combined public and private lands) un-useable. The purpose of the exclusionary fencing is to protect livestock from impacts associated with operation the Project. By protecting livestock, the Proposed Action would also then provide for livestock grazing opportunities on BLM land in conformance with the Bakersfield BLM RMP goals and objectives. By not protecting livestock, this action is in conflict with the Bakersfield BLM RMP.

4u





State of California – Natural Resources Agency  
DEPARTMENT OF FISH AND WILDLIFE  
Central Region  
1234 East Shaw Avenue  
Fresno, California 93710  
(559) 243-4005  
[www.wildlife.ca.gov](http://www.wildlife.ca.gov)

*GAVIN NEWSOM, Governor*  
*CHARLTON H. BONHAM, Director*



## COMMENT LETTER 5

November 1, 2019

Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, NE  
Washington, D.C. 20426

Via Electronic Submission

**Subject: California Department of Fish and Wildlife Comments on the Draft License Application (DLA) for Kaweah Hydroelectric Project (P-298)**

Dear Secretary Bose:

On December 14, 2016, Southern California Edison (SCE or Licensee) filed a Notice of Intent to seek a new license from the Federal Energy Regulatory Commission (Commission) for the Kaweah Hydroelectric Project (Project). The Licensee owns and operates the Project consisting of three developments: Kaweah No. 1, Kaweah No. 2 and Kaweah No. 3. On July 26, 2019, SCE submitted a DLA to the Commission for a new license to continue to operate these developments.

CDFW staff reviewed the DLA and we hereby submit the following specific comments (Table 1) and general comments (Table 2) on the DLA for the Project. At the time of DLA submission, some of the supporting studies are forthcoming and stakeholders have not had an opportunity to evaluate all the information that would support this application and that will eventually provide evidence to guide license conditions for the protection of environmental resources from potential project effects. Therefore, CDFW comments do not constitute final concurrence with the proposed Protection, Mitigation, and Enhancement measures.

CDFW appreciates this opportunity to comment on the DLA. Please address any questions or concerns regarding these comments to Abimael León, the Regional FERC Coordinator, at (559) 243-4014, extension 251, or at [Abimael.Leon@wildlife.ca.gov](mailto:Abimael.Leon@wildlife.ca.gov)

Sincerely,

A handwritten signature in black ink, appearing to read "Julie A. Vance".

Julie A. Vance  
Regional Manager

Kimberly D. Bose, Secretary  
 Federal Energy Regulatory Commission  
 November 1, 2019  
 Page 2

## COMMENT LETTER 5

**Table 1. Specific Comments from the California Department of Fish and Wildlife on the Draft License Application for Kaweah Hydroelectric Project (FERC P-298)**

Chapter // Section	Page (Line(s))	Comment	
Initial Statement	IS-3 // 13-14	Did Southern California Edison (SCE) submit a §1602 notification to CDFW?	5a
Exhibit A - Description of Project	11	The Kaweah DLA does not include information on the Lands of the US within project boundaries. This information is forthcoming.	5b
Exhibit B - Statement of Operation and Resource Utilization	Table B-1 (Note #2)	The text should be revised to refer to California Department of Fish and <b>Wildlife</b> , instead of California Department of Fish and Game. Similar revisions should be conducted throughout the manuscript, as appropriate.	5c
Exhibit E - Environmental Exhibit	1-1 (26-27); 3-10 (1-10)	Acreage information for the FERC Project boundary is forthcoming and the Licensee indicates it will be provided in the Final License Application.	5d
3.0 No Action Alternative // Section 3.10 Literature Cited	3-28 (7-25)	Please include the citations in the manuscript.	5e
Appendix 4-A // Ramping Rates	6-7	Why is there no Up-Ramping requirement for the operation of Kaweah No. 1 Diversion?	5f
Appendix 4-A// 4.1.4 (Fish Population Monitoring Plan)	11 (18-20)	Original text: "Fish population monitoring will be implemented in Year 2 following license issuance and every 10 years thereafter."  Comment: Why will fish population monitoring be implemented only after license issuance? Please describe the baseline data the monitoring data will be compared to. In addition, CDFW thinks that a shorter timestep (e.g., every 5 years) would be more appropriate in this case.	5g
Appendix 4-A// 4.1.5 Entrainment Study Measure	15 (14-16)	Original text: "Water temperature monitoring will be implemented in Year 2 following license issuance and every 10 years thereafter."  Comment: Why will temperature monitoring be implemented every 10 years? CDFW advises a shorter timestep; for instance, every five years thereafter.	5h
7.3.3 Historical Water Quality Information	7.3-2 (last paragraph) to 7.3.3	Is there a contingency plan to avoid water quality violations regarding pH, alkalinity, ammonia and fecal coliforms in the Kaweah River Bypass Reach?	5i

Kimberly D. Bose, Secretary  
 Federal Energy Regulatory Commission  
 November 1, 2019  
 Page 3

## COMMENT LETTER 5

Chapter // Section	Page (Line(s))	Comment
7.4.8.1 Kaweah River	7.4-16	<p>Original Text: "In the Kaweah River there were two Project-related barriers identified. These include the Kaweah No. 2 Diversion Dam (RM 8.9) and Kaweah No. 2 Diversion Dam Gage Pool Weir (RM 8.8). The Kaweah No. 2 Diversion Dam was identified as an impassable barrier and the Kaweah No. 2 Diversion Dam Gage Pool Weir was identified as a partial barrier to fish passage (Map 7.4-6; Table 7.4-12; AQ 8 – TSR Appendix C (SCE 2019h; SD A). Additionally, one natural partial barrier was documented on the Kaweah River below Kaweah No. 2 Powerhouse at RM 3.8, downstream of the bypass reaches, and an impassable natural barrier was identified upstream of the bypass reaches within the SNP at RM 9.5 approximately 0.6 mile upstream of the Kaweah No. 2 Diversion Dam. The Kaweah No. 2 Diversion Dam at RM 8.9 precludes upstream fish passage into the river reach from RM 8.9 upstream to the impassable natural barrier at RM 9.5 (numerous partial and impassable barriers exist upstream of RM 9.5, both natural and manmade)."</p> <p>Comment: What are the plans to improve passage through manmade barriers?</p>

5j

Kimberly D. Bose, Secretary  
 Federal Energy Regulatory Commission  
 November 1, 2019  
 Page 4

## COMMENT LETTER 5

Chapter // Section	Page (Line(s))	Comment
7.4.9.4 Abundance (Standing Crop)	7.4-19	<p>Original text: "For comparison purposes, the rainbow trout fish density and biomass results from the sampling effort in the bypass reaches associated with the Kaweah Project were compared to density and biomass data from other Sierra Nevada stream systems in the same elevation range (Figure 7.4-25). Rainbow trout density and biomass in the bypass reaches and reference reaches upstream of the Project are lower than most of the Sierra Nevada fish density data in Figure 7.4-25. The Sierra Nevada fish density data were summarized from the Yuba and American Rivers (PCWA 2010) as well as the Middle Fork San Joaquin River, Clark Fork Stanislaus River, Clavey River, Merced River, Kings River, Kaweah River (1984 and 1985 surveys), and Tule River (CDFW 2017). The dataset was limited to elevations between 500 and 3,000 ft msl. Water temperature may be a confounding factor in the Sierra Nevada data sets as many of the data sets are derived from streams with colder water temperature downstream of reservoirs, whereas the bypass reach data sets are not influenced by cold/cool reservoir flow releases."</p> <p>Comment: The role of water temperatures in the lower numbers, density and biomass of rainbow trout in the bypass reaches associated with the Kaweah Project compared to data from other Sierra Nevada stream systems in the same elevation range suggests that temperature monitoring should be prioritized. Water temperature monitoring only every 10 years after license issuance seems to be a low frequency and could lead to missing out on temperature effects on fish population variability throughout the duration of this project.</p>
7.4.9.6 Bypass Reach Habitat Modeling (Habitat versus Flow Modeling)	7.4-20	<p>Original text: "The amount of rainbow trout spawning habitat in the bypass reaches was very low due to the very limited amount of spawning gravel."</p> <p>Comment: The Licensee should consider spawning habitat enhancement and gravel augmentation in the bypass reaches.</p>

5k

5l



Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
November 1, 2019  
Page 5

**COMMENT LETTER 5**

**Table 2. General Comments from the California Department of Fish and Wildlife on the Draft License Application for Kaweah Hydroelectric Project (FERC P-298)**

1	The Licensee should consider focused surveys and/or eDNA sampling to evaluate the presence of native mussels and Pacific Lamprey in the Project reaches and the potential impact of project operations on their populations	5m
2	The forthcoming Entrainment study (AQ 9) results (in progress) should include evaluations over the four sampling periods that were discussed in the Study Plan meetings.	5n
3	The CDFW recommends a baseline analysis of existing data to determine the frequency of periods when instream flows, water temperatures and other conditions could have provided suitable Foothill Yellow-Legged Frog habitat in the Project area.	5o



FEDERAL ENERGY REGULATORY COMMISSION  
WASHINGTON, DC 20426  
November 1, 2019

OFFICE OF ENERGY PROJECTS

Project No. 298-080—California  
Kaweah Hydroelectric Project  
Southern California Edison Company

VIA FERC Service

Wayne P. Allen, Principle Manager  
Southern California Edison Company  
1515 Walnut Grove Avenue  
Rosemead, CA 91770

**Reference: Comments on Draft License Application**

Dear Mr. Allen:

This letter contains comments by Commission staff on the draft license application filed on July 26, 2019, by Southern California Edison Company (SEC) for relicensing the Kaweah Hydroelectric Project No. 298. In order for Commission staff to have adequate information to assess potential project impacts, please review and address our comments outlined in Appendix A in the final license application.

If you have any questions, please contact Jim Hastreiter at (503) 552-2760, or at [james.hastreiter@ferc.gov](mailto:james.hastreiter@ferc.gov).

Sincerely,



Timothy Konnert, Chief  
West Branch  
Division of Hydropower Licensing

Enclosure: Appendix A--Comments on the Draft License Application for the Kaweah Hydroelectric Project, FERC No. 298-080

Project No. 298-080

**APPENDIX A**  
**COMMENTS ON THE DRAFT LICENSE APPLICATION**  
**FOR THE KAWEAH HYDROELECTRIC PROJECT NO. 298**

Commission staff has identified that your draft license application (DLA) did not contain some of the information that will be required by our regulations for a final license application (FLA). In our comments, we note the areas of the DLA where more specific information will be needed for a complete license application.

**Exhibit E – Environmental Report and Attached Technical Study Reports**

1. In Section 3 *No-Action Alternative*, Maps 3-3g & 3-3h are missing. In the FLA, please provide Maps 3-3g and 3-3h. 6a
2. In Section 3.2.2 *Forebays*, you state that: overflow from the Kaweah No. 1 Forebay Tank is directed through a spillway flume into a natural drainage channel located adjacent to the penstock; overflow from the Kaweah No. 2 Forebay can flow into three concrete-lined spillways – the primary spillway is located adjacent to the forebay, and the other two spillways are located along the flowline, approximately 300 feet and 500 feet upstream of the forebay; and, at the Kaweah No. 3 Forebay, overflows can enter into an approximately 75-foot long concrete-lined spillway chute that begins at the upstream end of the forebay. Additionally, on the Project Facilities maps in Section 3, you indicate in the map legend that the spillway channels and pipes are project facilities; however, you do not show the entirety of the spillway channels and pipes encompassed by the project boundary. Please clarify if the spillway channels and pipes are project facilities. 6b
3. In Section 7.9.6 *Land Use Outside of the FERC Project Boundary*, you cite the Three Rivers Management Plan 2018 Update when discussing allowable land uses adjacent to the project boundary; however, in Section 7.9.9 *Literature Cited*, you list the Three Rivers Community Plan 2018 Update. Please correct the typographical error in the FLA for this section, and any additional sections where this error may occur. 6c
4. In REC 1, *Recreation Resources Technical Study Report (TSR)*, Tables REC 1-4 and REC 1-5 indicate that an in-person vehicle and visitor count survey was conducted on Thursday, July 5, 2018, and that the Powerhouse No. 2 River Access Parking Area and Edison Beach were closed that day; however, as stated in the footnote on Table REC 1-4, the parking area and Edison Beach were closed on July 4, 2018 for the 6d

Project No. 298-080

July 4 holiday. Please clarify whether the entry date of July 5, 2018 is a typographical error. If the entry date is not a typographical error, and an in-person vehicle and visitor count survey was conducted on July 5, 2018, please clarify the reason for the parking area and Edison Beach closure.

6d

5. In REC 1, *Recreation TSR*, Table REC 1-4 indicates that an in-person vehicle and visitor count survey was conducted on Tuesday, August 28, 2018 and on Monday, September 3, 2018. As stated in the Table REC 1-4 notes, the parking area and beach were closed on both dates; August 30 - September 2, 2018 due to graffiti issues, and September 3, 2018 for the holiday (Labor Day). Please clarify why an in-person vehicle and visitor count survey was conducted on each known day of closure for the parking area and beach, and why the two survey dates were not rescheduled.

6e

6. In REC 1, *Recreation TSR*, Section 4.4.1 *In-Person Vehicle Counts at the Kaweah No. 2 Powerhouse River Access Parking Area* you state that in-person vehicle and visitor count surveys were conducted by field technicians who were instructed to visit the Kaweah No. 2 Powerhouse River Access Parking Area and Edison Beach in accordance with the pre-established count calendar, remaining at the site for approximately 30 minutes during each visit; however, multiple surveys listed in Table REC 1-4 indicate that the elapsed time between the survey's Start Time and End Time was significantly less than 30 minutes, including many surveys with a duration of approximately 15 minutes, or less. In addition, the approximate 30-minute period of time used during the REC 1 study appears to be an arbitrary amount of time that was not proposed in your May 24, 2017 Proposed Study Plan, and was chosen after the Commission's Study Plan Determination issued on October 24, 2017; it was also not indicated as a study plan variance in your Initial Study Report submitted on October 17, 2018. Your Proposed Study Plan stated that during the peak recreation season, surveys would be conducted during one of three randomly selected time blocks (Block 1 – 8:00 a.m. to 12:00 p.m.; Block 2 – 12:00 p.m. to 4:00 p.m.; Block 3 – 4:00 p.m. to close), and during the non-peak seasons, surveys would be conducted during one of two randomly selected time blocks (Block 1 – 8:00 a.m. to 12:00 p.m.; Block 2 – 12:00 p.m. to close); however, your Proposed Study Plan gave no indication that only a 30-minute period of time during those blocks would be chosen as the duration for each survey. Rather, as no definitive length of time for each survey was identified in the Proposed Study Plan, the Plan appeared to imply that each in-person vehicle and visitor count survey would last the entirety

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of the randomly chosen time block. Please clarify: 1) how the 30-minute period of time for the in-person vehicle and visitor count survey period was developed, and why it was chosen; and, 2) why, in over half of the surveys, the elapsed time between the Start Time and End Time was significantly less than 30 minutes, including many with a duration of approximately 15 minutes, or less.

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7. In all of the subsections related to aquatic resources in Section 8, *Environmental Effects of the Proposed Action*, the analyses and conclusions of effects on individual aquatic resources should be technically supported by existing detailed quantitative information. For the most part, analyses of effects of the project and benefits of proposed measures are not well supported because they are either described qualitatively even though quantitative information is available from the aquatic technical studies already completed or a general quantitative analysis was used even though data are available for a detailed quantitative analysis. For example:

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(1) In section 8.3.1.1 *Instream Flows* you suggest that the proposed minimum flows would slightly improve summer/fall low flow season water temperatures and water quality but you do not present or describe data which supports that conclusion;

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(2) In section 8.3.2.3, *Sediment Management* you say that sediment removal from the forebays has the potential to increase turbidity and then suggest that the sediment release and resulting turbidity would be small without quantifying the amount;

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(3) In section 8.4.1.2 *Effects Analysis of Aquatic Riverine Habitat*, you state that the proposed minimum flows would result in higher flows in the bypassed reaches during select dry months and water year types, without stating which months and water year types;

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(4) In section 8.4.1.2 *Temperature and Water Quality* you state that existing conditions result in a small amount of warming in November and December in the bypassed reaches, and a very small amount of warming in East Fork Kaweah River in August through December but with the proposed minimum flows water temperatures would cool a small amount. You do not describe and support these conclusion with modeling results or water temperature data;

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(5) In section 8.4.2.2 *Effects Analysis of Riverine Aquatic Community, Algae, and Benthic Macroinvertebrates*, without presenting data to

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Project No. 298-080

support your conclusions you state that the average summer/fall drift density of benthic macroinvertebrates was similar between comparison and bypass reaches as were benthic macroinvertebrate sampling metric results and IBI scores;

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(6) In section 8.4.2.2 *Bypass Reach Wetted Perimeter*, you state that the proposed minimum instream flows would increase the wetted perimeter of various effected stream reaches in certain months without presenting or describing the absolute values or percentages of the wetted perimeter data that was collected;

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(7) In section 8.4.4.2 *Bypass Reach Physical Habitat*, you conclude that the proposed minimum instream flows would have a beneficial effect on adult hardhead and Sacramento pike minnow habitat in the bypassed reaches. To support this conclusion, you state that for the combined project bypass reaches the proposed minimum flows would provide approximately 80 percent of the unimpaired flow habitat in the warm water temperature months (June, July, August, September, October) and generally 70% or greater in the cool water temperature months (November through May), and that the amount of habitat with the proposed minimum flow is greater than under existing conditions. In order to effectively support the technical basis for the proposed minimum flows in the three bypassed reaches on the subject fish species, you should incorporate and describe the specific data and analyses produced in the habitat versus flow relationships and in the habitat time series analyses from study AQ-1 (Instream Flow) for each individual bypassed reach for each fish species and life stage.

6n







## COMMENT LETTER 7



GAVIN NEWSOM  
GOVERNOR



JARED BLUMENFELD  
SECRETARY FOR  
ENVIRONMENTAL PROTECTION

### State Water Resources Control Board

NOV 01 2019

Ms. Kimberly D. Bose, Secretary  
Federal Energy Regulatory Commission  
888 First Street, N.E., Room 1A  
Washington, DC 20426

Dear Ms. Bose:

#### COMMENTS ON DRAFT LICENSE APPLICATION FOR KAWEAH HYDROELECTRIC PROJECT (FEDERAL ENERGY REGULATORY COMMISSION PROJECT NO. 298)

State Water Resources Control Board (State Water Board) staff appreciates the opportunity to comment on the Draft License Application (DLA) for a new Federal Energy Regulatory Commission (Commission or FERC) license for the Kaweah Hydroelectric Project (Project). The DLA was submitted by Southern California Edison (SCE or Licensee) to the Commission on July 26, 2019. State Water Board staff has participated in the Integrated Licensing Process relicensing proceeding since the applicants filed their Notice of Intent to seek a new Commission license for the Project on December 14, 2016.

The DLA describes environmental effects on a range of resource areas influenced by current Project operations. During the upcoming November 6, 2019, Updated Study Report meeting, the Licensee is expected to present results from all completed studies and a tentative schedule for completion of the remaining technical memos. Current studies still in progress or under analysis include:

- AQ 4 – Water Temperature
- AQ 9 – Entrainment

Pending the release and review of these technical memos, State Water Board staff will not be able to fully evaluate the Project's environmental effects or Licensees' proposed Protection, Mitigation, and Enhancement measures. Additionally, priority of the Project's diversions, minimum instream flows, and water right delivery obligations associated with the Project are still being evaluated internally.

#### Specific Comments

1. The DLA states, on page 3-16 and separately on page 3-17 of Exhibit E, that SCE filed water rights "*applications with the State Water Board identifying a pre-1914 right*" to divert their allocated water diversions. However, diverters claiming pre-1914 water rights are not required to file an *application*, but rather a Statement of Diversion and Use. Consequently, this sentence should be changed to say that SCE filed a Statement of Diversion and Use claiming their pre-1914 water rights.

7a

E. JOAQUIN ESQUIVEL, CHAIR | EILEEN SOBECK, EXECUTIVE DIRECTOR

2. The DLA states, on page 3-20 of Exhibit E, the following, *“The origin of these deliveries dates back to reservations made in a deed between W.F. Dean and the Mt. Whitney Power Company dated March 31, 1903, and recorded March 23, 1903 (Vol. 111 of Deeds, Page 255).”* As described, the deed was recorded before it was signed. Please clarify whether these dates are typographical errors. If the dates are not typographical errors, and the deed between W.F. Dean and the Mt. Whitney Power Company was, in fact, recorded before it was signed, please clarify. 7b
  
3. Figure AQ 1-3, in the AQ 1 – Instream Flow Draft Technical Study Report (July 2019), displays the habitat suitability criteria (velocity and depth) for various life stages of rainbow trout. The x-axis in the Rainbow Trout Depth is labeled “Velocity (ft/s).” The figure displays a relationship between habitat suitability and depth. SCE should change the x-axis label of this figure to “Depth (ft)”. 7c

State Water Board staff appreciates SCE’s effort in this relicensing process. SCE has fostered a collaborative and productive environment in which State Water Board staff will continue to participate. If you have questions regarding this letter, please contact me at (916) 323-0358 or by email: [Chase.Hildeburn@waterboards.ca.gov](mailto:Chase.Hildeburn@waterboards.ca.gov). *Written correspondences or inquiries should be addressed to:*

*State Water Resources Control Board  
Division of Water Rights - Water Quality Certification Program  
Attention: Chase Hildeburn  
P.O. Box 2000  
Sacramento, CA 95812-2000*

Sincerely,

ORIGINAL SIGNED BY:

Chase Hildeburn, Water Resource Control Engineer  
Water Quality Certification Program  
Division of Water Rights

**Table 14-A. Stakeholder Comments on Draft License Application and Associated SCE Responses**

No.	Stakeholder Comment	SCE Response
<b>COMMENT LETTER 1: WILLIAMS, BRODERSEN &amp; PRITCHETT LLP, Steven R. Williams – August 23, 2019</b>		
1a	<p>We represent Renee Roederer who owns real property through with the Southern California Edison Company flume runs to power, in part, the hydroelectric plant which is the subject of the above-referenced project. In addition to providing electricity in a safe, efficient, and clean fashion, the project also provides for the distribution of water to those along the flume which water is literally the lifeblood of the community.</p> <p>Historically, in exchange for the easement rights for the building, operation, and maintenance of the flume the property owners reserved water rights to the water coming through the flume to provide water to their residences and property. Without such water the properties are virtually useless. These rights have passed to each subsequent owner of the properties and have been relied upon by each subsequent owner.</p> <p>On behalf of our client we ask that the project be approved with eh additional proviso that Southern California Edison Company adequately maintain the flume to preserve its operation and the rights of the adjoining property owners. Should you need any further information please feel free to contact the undersigned.</p>	<p>Southern California Edison Company (SCE) is seeking to renew its Federal Energy Regulatory Commission (FERC) license to continue operation and maintenance of the Kaweah Project. SCE will continue to provide water to water users along the Kaweah No. 1 and No. 2 flowlines in accordance with existing agreements and license conditions.</p>
<b>COMMENT LETTER 2: AMERICAN WHITEWATER, Theresa Simsiman, California Stewardship Director – October 24, 2019</b>		
2a	<p>Kaweah No. 2 Powerhouse River Access Parking Area Enhancements. Southern California Edison has a current policy that closes the parking area and each at Kaweah No. 2 Powerhouse Friday, Saturday &amp; Sunday between Memorial Day and Labor Day. Spring run-off on the Kaweah can provide boating flow opportunity into July. If this policy remains, Friday and weekend boaters on the Gateway Bridge run must paddle an extra 7 miles to get to the nearest public parking and access at Kaweah Lake. Additionally, there is no public option for put-in on the Class III-IV Dinely Bridge run unless paddlers are skilled enough to take on the upstream Class IV-V Gateway Bridge run. Furthermore, outside of this policy the licensee has been known to simply close access and parking at Kaweah Powerhouse No. 2 when boating flows are available. (See Figure 7-9 of American Whitewater comments filed with FERC August 25, 2017.) In order for this enhancement to work for whitewater boating interests we ask that it be available as a parking and access point 7 days a week when boatable flows are available. We would not be opposed to a time of day limit i.e. dawn to dusk.</p>	<p>The Kaweah No. 2 River Access Parking Area and Edison Beach are located on land owned by SCE but are accessed via Kaweah River Road. This road also provides access to numerous private residences located along the Kaweah River. These private residences have repeatedly expressed concerns about the general public using Kaweah River Road, the parking area, and river. The private residents are concerned about factors such as noise, litter, sanitation, and trespassing.</p> <p>Accordingly, SCE limits use of the parking area and beach to between the hours of 8:00 a.m. and 7:00 p.m. In addition, between Memorial Day and Labor Day, use is limited to Monday through Thursday. During all other times of the year, SCE typically allows use of the parking area seven days a week. However, SCE sometimes closes the parking area and beach due to complaints by local residents or to address safety or vandalism issues (graffiti), as was the case in late August/early September 2018. Out of respect for the local residents, SCE does not plan to modify the days or hours that the parking area is open.</p> <p>Based on experience, SCE has determined that opening the Kaweah No. 2 Powerhouse River Access Parking Area on Friday, Saturday, and Sunday between Memorial Day and Labor Day will increase visitor/landowner conflicts. In addition, recreation-use observations indicate that, even when boating flows are available in this reach, this area is not used for boating activities.</p> <p>SCE conducted camera counts during daylight hours at the Kaweah No. 2 Powerhouse River Access Parking Area from March 30, 2018 through March 28, 2019. The photos captured from the video camera were used to identify total visitor use at the site and to validate the in-person vehicle and visitor count data. Based on the camera data, a total of 2,719 visitors and 1,268 vehicles and were counted during the 314 days the camera was operational and recording data. No boaters were observed using the parking area as a put-in or take-out site.</p> <p>Further, SCE conducted in-person vehicle and visitor counts at the Kaweah No. 2 Powerhouse River Access Parking Area on a total of 34 days over a one-year period extending from March 13, 2018 to March 19, 2019. SCE personnel also observed and recorded visitor activities at the same time that the vehicle counts were conducted. Swimming/beach use accounted for 95% of all observed activity. All other activity consisted of people walking and/or recreating with dogs. One fisherman was observed. No boaters were observed using the river access parking area.</p> <p>The following summarizes information when spring boating flows and access to the parking area were available:</p> <ul style="list-style-type: none"> <li>From March 21, 2018 through June 14, 2018 (85 days), flows in the river reach were 300 cfs or more; the kayaking minimum acceptable flow. During this time, the Kaweah No. 2 Powerhouse River Access Parking Area was open for 76 days, including 10 Fridays, 9 Saturdays, and 9 Sundays (total of 28 “weekend” days). No boater used the parking area.</li> </ul>

No.	Stakeholder Comment	SCE Response
		<ul style="list-style-type: none"> <li>From April 1, 2018 through June 5, 2018 (65 days), flows in the river reach were 500 cfs or more; the rafting minimum acceptable flow. During this time, the Kaweah No. 2 Powerhouse River Access Parking Area was open for 59 days, including 8 Fridays, 7 Saturdays, and 8 Sundays (total of 23 “weekend” days). No boater used the parking area.</li> </ul> <p>It should be noted that access to the river is available at the Three Rivers Hideaway, a privately-owned recreational facility, located directly across the river from Kaweah No. 2 Powerhouse River Access Parking Area. This recreational facility is used by commercial whitewater boating outfitters for put-in and take-out. Private boater access at Three Rivers Hideaway is typically granted by arrangement with the owner.</p>
2b	<p><i>Dissemination of Real-time Flow Information.</i> American Whitewater and paddling stakeholders commend Southern California Edison’s proposal to disseminate real-time flow information...We would like to suggest, however, that the diversion flow amounts at both the Kaweah No. 1 Diversion Dam and Kaweah No. 2 Diversion Dam be provided as well.</p>	<p>Real-time Flow Information regarding flows diverted for power generation are considered proprietary information by SCE and will not be released to the public. Moreover, this information is not needed for paddlers to plan their recreational activities.</p>
2c	<p><i>Dissemination of Real-time Flow Information.</i> Also, though outside the project boundary but part of the SUP with Sequoia National Park that having the same gage and diversion information below the Middle Fork Kaweah Diversion Dam (USGS 11206500) (SCE Gage No. 210) would be of high value to paddling stakeholders as well.</p>	<p>As correctly noted, the Middle Fork Diversion Dam and associated features (i.e., gages) are not part of the FERC Project and are operated under a Special Use Permit (SUP) with Sequoia National Park (SNP). The relicensing process is not the appropriate venue to request boating enhancements within SNP.</p> <p>In Appendix 4-A of Section 4.0 – Proposed Action, SCE proposed dissemination of Real-time Flow Information to enhance recreational opportunities in bypass reaches in the East Fork Kaweah River and Kaweah River associated with the FERC Project.</p>
2d	<p><i>Dissemination of Real-time Flow Information.</i> Finally, as an alternate to creating and maintaining a website for this information, we recommend that the licensee simply provide the information to the California Data Exchange Center (CDEC) which is currently used on many other hydroelectric projects in California to provide streamflow information. At such time in the future that CDEC is no longer viable the licensee could consider then other alternatives including its own website.</p>	<p>As stated in the Application, real-time streamflow information will be provided to the public on a website developed and maintained by the Licensee. SCE believes this approach will ensure the public is provided information in a timely manner, consistent with the proposed license conditions, and allows SCE to be solely in control of compliance. Any party in the future may simply provide a link to the SCE website to facilitate communication of the information.</p>
2e	<p><i>Kaweah and East Fork Kaweah River Access.</i> As voiced throughout our engagement on the relicensing process, river access to the Kaweah and East Fork Kaweah remains a top concern. Understanding, there are constraints to providing access through private property, we would like the Licensee to take a closer look at reasonable access and parking provided at Kaweah Powerhouse No. 1 and Kaweah Powerhouse No. 3.</p> <p>Having access at Kaweah Powerhouse No. 1 would provide paddlers on the Park Boundary and the East Fork Kaweah run a safer egress than walking with boating equipment in hand along the two-lane road at Gateway Bridge. (See Figure 2-3 of American Whitewater comments filed with FERC August 25, 2017.2 ) Understanding the Licensee’s concern of interference with administrative building staff, we note that there are ways to mitigate for this including fencing, hours of access, signage, and a dedicated foot path to the river.</p>	<p>As stated previously, SCE considered the possibility of providing public access in the vicinity of the Kaweah No. 1 Powerhouse. However, SCE concluded that providing public access in this location is not a viable option because the powerhouse is located immediately below the Kaweah No. 1 Powerhouse Campus, which serves as SCE’s administration center for the Kaweah Project. The campus includes numerous buildings including an operator’s cottage, materials storage buildings, and a machine shop and SCE personnel repeatedly come and go from this facility throughout the day. Allowing the general public to cross through or adjacent to the campus would seriously affect SCE’s ability to complete the day to day activities that are required to operate and maintain the Project and would jeopardize the health and safety of both SCE workers and the public. Accordingly, the possibility of providing public access at this location was eliminated from further consideration.</p> <p>SCE also considered the possibility of providing public access in the vicinity of the Kaweah No. 3 Powerhouse during the previous relicensing effort. When the current FERC license was issued, the FERC required SCE to construct a formal river access point at the Kaweah No. 3 Powerhouse with parking, sanitation, and improved trail facilities to enhance recreational use of the Project. However, this site was not constructed due primarily to opposition by adjacent landowners and concerns expressed by the NPS law enforcement officials. The FERC formally deleted this requirement from the Kaweah License by order issued June 30, 1993. The same issues that existed during the previous relicensing effort still exist today, and to some extent have increased. Therefore, SCE does not believe that developing a formal river access point in the vicinity of the Kaweah No. 3 Powerhouse is a viable option.</p>

No.	Stakeholder Comment	SCE Response
2f	<p><i>Kaweah and East Fork Kaweah River Access.</i> In terms of access at Kaweah Powerhouse No. 3 we note that this was a requirement of the current license and was removed 27 years ago without input from paddling stakeholders. Current conditions are not the same and we emphasize that our interests are not large scale capital improvements. We simply require access to the river via a foot path, parking spaces, and a portable restroom. This site would provide take-out for the Ash Mountain run and put-in for the Park Boundary Run. Access at this site would also alleviate park entrance congestion and would allow for long term parking which is not currently available at the Indian Head River Trailhead.</p>	See response to American Whitewater comment 2e.
<b>COMMENT LETTER 3: NATIONAL PARK SERVICE, Barbara Rice, Program Manager – October 25, 2019</b>		
3a	NPS recommends that SCE provide the real-time information on the amount of water diverted at Kaweah No 1 Diversion Dam.	See response to American Whitewater comment 2b.
3b	NPS also recommends that SCE provide the real-time information regarding flows diverted at Kaweah No 2 Diversion Dam.	See response to American Whitewater comment 2b.
3c	NPS recommends that SCE provide real-time information at Gauge # 11206500 and the amount of flow diverted at the Middle Fork Diversion Dam.	See response to American Whitewater comment 2c.
3d	<p><i>Powerhouse #2.</i> SCE currently allows access to the Powerhouse 2 and proposes to add a trash receptacle and Porta-Potty. The Powerhouse #2 is open to public use Monday –Thursday during Memorial Day to Labor Day and seven days a week during the rest of the year. The hours of operation are 8 am to 7 pm. The majority of visitors work during the week, and most visitor use is expected during the evenings and weekends. In their response to comments on the whitewater boating study, SCE described concerns from nearby private landowners as a reason to limit the visitor use days and hours. NPS recommends that SCE extend the days of operation to seven days year around. SCE should address the concerns by private landowners while allowing the public access to the river. These concerns could be mitigated in a number of ways, such as limiting the hours of operation to dawn to dusk, installing a gate or fencing to separate private and public use, educating users about expected behaviors and regulations, and conducting maintenance to address any litter or vandalism issues. SCE’s proposed installation of a trash receptacle and Porta-Potty should also help alleviate problems with sanitation and litter.</p>	See response to American Whitewater comment 2a.
3e	<p><i>Powerhouse #1.</i> SCE explained in their response to comments that the Powerhouse #1 is adjacent to administrative buildings for staff. Due to this, SCE did not think public access would be a compatible use at this location. The NPS understands these concerns and recommends that the feasibility of providing access to the river here be explored further. Other FERC licensed projects co-locate administrative buildings with public access. The Skagit p-553 and Nantahala p-2692 are two examples where the public access is provided near administrative buildings. Many other projects have access near dams and powerhouses. The NPS recommends that SCE in consultation with stakeholders explore design solutions to address these concerns while still allowing public access to the river. Design and operational solutions could include separating the uses through fencing, gates, or vegetation; educating users about the rules and regulations; and limiting the hours of operation be dawn to dusk.</p>	See response to American Whitewater comment 2e.
3f	<p><i>Powerhouse #3.</i> In the previous license, FERC required the development of formal river access at Powerhouse #3, including parking, sanitation, and improved trail facilities. SCE shared that they never constructed the project due to concerns from private landowners and NPS law enforcement. The requirement was formally removed from the license on June 30, 1993. SCE states in their response to comments that the same conditions and concerns exist today. As indicated by the whitewater study report and focus group, boaters still need river access at this site. The restrictions are limiting the public’s ability to access the river. Given that the previous concerns occurred 27 years ago, the NPS recommends that SCE in consultation with stakeholders explore access opportunities at this site through documenting current conditions and ways to address any existing concerns through design and education solutions.</p>	See response to American Whitewater comment 2e.

No.	Stakeholder Comment	SCE Response
<b>COMMENT LETTER 4: BUREAU OF LAND MANAGEMENT, Gabriel R. Garcia, Field Manager – October 31, 2019</b>		
4a	<p><b>SD A, Technical Study Reports</b></p> <p><b>LAND 3-Land Use TSR: Section 5.2, Maintenance Practices and Responsibilities</b></p> <p>The results of this Study and SCE's characterization of exclusionary fencing supports the argument that all such fencing should be included throughout the license application as Project protection and safety features. For example, SCE states, "Generally, exclusionary fencing is located around the primary Project features and is used to block or inhibit access by wildlife, domestic animals and the general public." The Project flowlines and forebays are evidently key Project features.</p> <p>SCE states that, "All exclusionary fencing associated with the Project is inspected on a regular basis and repaired on an "as-needed" basis." The Study revealed that most of this fencing is in poor to fair condition where it still exists at all. SCE has a duty to take all reasonable measures to maintain and operate the Project in a manner that is safe for domestic animals according to 18 Code of Federal Regulations (CFR) Part 12 and applicable license requirements. This exclusionary fencing should be included throughout the license application as a Project feature. Furthermore, this fencing should also be inspected, repaired, and maintained as required for all protection and safety features.</p>	<p>Based on comments contained in the Bureau of Land Management's (BLM) letter, we have revised Section 3.0 – No-Action Alternative of the License Application and the LAND 3 – Land Use Technical Study Report (TSR) to clarify that there are two types of fences in the vicinity of the Project, as follows:</p> <ul style="list-style-type: none"> <li>• <b>Project Fences.</b> These are fences that were erected by SCE specifically to protect public safety and Project facilities. Section 3.0 – No-Action Alternative has been updated to include a description of the Project fences and Table 3-2, No-Action Alternative – Existing Project Facilities has been updated to include a list of Project fences. In addition, Maps 3-2a-h and Maps 3-3a-h have been updated to show the location of the Project fences. As indicated, Project fences are located around select Project facilities such as powerhouses, switchyards, tailraces, and forebays. SCE regularly inspects and maintains the Project fences. Accordingly, all of the Project fences are in good condition.</li> <li>• <b>Non-Project Fences.</b> These fences were not constructed by SCE and are not necessary for operation of the Project. Non-Project fences in the vicinity of the flowlines were erected by either the BLM or private landowners. SCE is not responsible for inspecting or maintaining non-Project fences. Many of the non-Project fences that occur in the Project vicinity are in fair to poor condition due to lack of maintenance by the applicable landowner.</li> </ul> <p>Note that all references to the phrase "exclusionary fencing" have been removed from the License Application and from the LAND 3 – TSR because the terminology is confusing and ambiguous. For clarity, all fencing is now discussed in terms of Project fencing and non-Project fencing.</p> <p>All safety features associated with the Kaweah Project comply with the provisions of CFR 18 Part 12, which requires SCE to provide and maintain safety features to protect life, health, and property. CFR 18 Part 12 also requires SCE to alleviate conditions that could compromise the safety, stability, or integrity of a Project facility or feature. Cattle grazing in the vicinity of the Kaweah No. 3 Forebay is contributing to erosion below the forebay. Accordingly, and consistent with CFR 18 Part 12, SCE installed a fence to keep cattle away from the forebay to protect the structural integrity of this facility. This fence is considered a Project fence and is referred to as the Kaweah No. 3 Forebay Fence. Otherwise, SCE does not maintain any fencing that is specifically intended to keep cattle away from the Project facilities.</p>
4b	<p><b>Exhibit A - Description of the Project</b></p> <p>The BLM requests that the description of the Project be updated to reflect BLM Comment A; the inclusion of the exclusionary fencing.</p>	<p>Exhibit A – Description of the Project has been revised to include discussion of Project fences (see Response to Comment 4a). Note that all references to the phrase "exclusionary fencing" have been removed from the License Application and from the LAND 3 – TSR because the terminology is confusing and ambiguous.</p>
4c	<p><b>Exhibit H - General Information, Appendix H-1</b></p> <p>The BLM requests that Appendix H-1 be updated to reflect BLM Comment A; the inclusion of the exclusionary fencing along flowlines nor SCE installed or maintained fence on exclusionary fence on the map associated with the K3 Forebay.</p>	<p>Exhibit H has been revised to include discussion of Project fences (see Response to Comment 4a). Note that all references to the phrase "exclusionary fencing" have been removed from the License Application and from the LAND 3 – TSR because the terminology is confusing and ambiguous as discussed in Response to Comment 4a.</p> <p>There are no Project fences along any of the flowlines. Any fences located along the flowlines are non-Project fences.</p>
4d	<p><b>Exhibit E - Environmental Exhibit</b></p> <p>The BLM requests that Exhibit E be updated to reflect BLM Comment A; the inclusion of the exclusionary fencing.</p>	<p>See Response to Comment 4a. The following sections of Exhibit E have been revised to include information about the Project fences:</p> <ul style="list-style-type: none"> <li>• Section 3.3.9 – Ancillary and Support Facilities was revised to include a new subsection entitled 3.3.9.8 – Project Fences.</li> <li>• Table 3-2 was revised to include a list of the Project fences.</li> <li>• Table 3-6 was revised to include information about the inspection and maintenance of Project fences.</li> <li>• Map 3-2a-h was revised to include Project fences.</li> <li>• Map 3-2a-h was revised to include Project fences.</li> <li>• Table 4-1 was revised to include a list of the Project fences.</li> </ul>

No.	Stakeholder Comment	SCE Response
	<i>In addition, Exhibit E has the following inaccuracies and requests the following be updated to address the inaccuracies:</i>	
4e	<b>3.2.9 Ancillary and Support Facilities</b> No reference to the exclusionary fence along flowlines or the K3 Forebay.	Section 3.2.9 Ancillary and Support Facilities has been revised to include a new subsection: Section 3.2.9.8 – Project Fences.
4f	<b>3.2.9.3 Wildlife Bridges and Escape Ramps</b> No reference of reducing livestock mortality, nor any mention of exclusionary fencing along flowlines.	Section 3.2.9.3 provides specific information about wildlife bridges and escape ramps. This section does not pertain to fences. Therefore, the referenced section was not revised.
4g	<b>3.4.3 Flowline Inspections and Maintenance</b> No reference of repairs to the exclusionary fencing along the flowlines and at K3 Forebay.	Section 3.4.3 provides specific information about flowline inspections and maintenance. The information in this section was updated to include inspection and repair of Project fences and features that surround select flowline features.
4h	<b>3.4.6 Road Maintenance</b> Access control structures should include fences associated with the gates and posts mentioned.	Section 3.4.6 identifies various types of access control structures that SCE maintains along the Project roads. These include gates and posts that have been installed by SCE specifically to prohibit public vehicular use of the Project roads. SCE does not maintain any fences along the Project roads or in association with the gates that are present along the Project roads. Therefore, Section 3.4.6 was not revised to include fences.
4i	<b>3.9.2 Project Safety Features</b> <b>Physical Restraining Devices</b> No mention of the exclusionary fencing along K2 cement ditch to restrict livestock access. <b>Flowline Safety Features</b> Exclusionary fencing should be maintained along the flowlines to reduce animal mortality including livestock and to focus wildlife crossings at bridges along K2 Flowlines. BLM requests SCE update to reflect this comment.	Refer to Response to Comment 4a.
4j	<b>Table 3-2. No-Action Alternative - Existing Project Facilities, Ancillary and Support Facilities</b> No mention of the K2 Flowline exclusionary fence and K3 Forebay exclusionary fence.	Table 3-2 was updated to include a list of the Project fences.
4k	<b>Table 4-1. Proposed Action - Project Facilities</b> No reference to the K2 Flowline exclusionary fence and K3 Forebay exclusionary fence. BLM requests this information be included.	Table 4-1 has been updated to include a list of Project fences, which includes the Kaweah No. 3 Forebay Fence. See Response to Comment 4a.
4l	<b>APPENDIX 4-A. New Environmental Measures, Management and Monitoring Plans, and Programs. 4.5.5 Wildlife Mortality Monitoring Plan</b> Needs to be modified to read, "Animal Mortality" and specifically include livestock.	This monitoring plan is specifically focused on monitoring wildlife mortality in the Kaweah No. 2 and Kaweah No. 3 flowlines and documenting SCE maintenance of the wildlife protection features consistent with the existing license condition. Therefore, SCE did not modify the name of the plan.
4m	<b>7.9.5 Land Use Within the FERC Project Boundary</b> Livestock grazing land use is not listed as occurring within the FERC boundary; although, it is an active use within the FERC Project boundary. BLM requests that SCE modify the first sentence to read, "Land use within the FERC Project boundary primarily includes hydropower generation and a limited amount of dispersed recreation" <i>and livestock grazing.</i>	Section 7.9.5 has been revised as requested.

No.	Stakeholder Comment	SCE Response
4n	<p><b>7.9.5.2 Safety Programs and Features</b></p> <p>SCE states, "SCE has installed a variety of features to help protect animals, including wildlife and livestock." Yet, in Section 3.0 – No-Action Alternative, where the reader is referenced to see these features described, it does not include any features directed at protecting livestock, namely the exclusionary fencing.</p> <p>SCE states, "SCE inventoried and assessed the condition of the safety features that are present along the Kaweah No. 2 Flowline, the Kaweah No. 3 Flowline, the Kaweah No. 3 Forebay, and the Kaweah No. 1 Forebay Road. The results of this effort are provided in Appendix A of the LAND 3 - TSR, which is included in SD A. SCE inspects and maintains all of these features on a regular basis. Accordingly, as documented in Appendix A of the LAND 3 - TSR, almost all of these features are in good condition, meaning the feature is in new or like-new condition and functions as intended without signs of wear and/or deterioration." However, the exclusionary fencing displayed on maps in the TSR show many gaps in the inventoried data. Although SCE states in Exhibit E that it inspects and maintains <u>all</u> of these features on a regular basis, the data provided in the LAND 3 TSR shows most exclusionary fencing to be non-existent or in fair to poor condition.</p>	<p>Section 7.9.5.2 Safety Programs and Features in the Draft License Application was incorrect. SCE has not installed, nor does SCE maintain, any safety features for the protection of cattle. Therefore, the section was revised to exclude any reference to the protection of livestock.</p> <p>See Section 3.7.3.1 Wildlife Protection and Monitoring for a description of Project safety features associated with the protection of wildlife.</p> <p>See Response to Comment 4a regarding Project fences maintained by SCE and their current condition.</p>
4o	<p><b>7.9.6 Land Use Outside the FERC Project Boundary, 7.9.6.1 Livestock Grazing</b></p> <p>SCE states, "An allotment is a designated area of land available for livestock grazing." Although this statement is true, it does not clearly address the requirements of grazing management within this region of California; that is required to consist of public and private lands to make one manageable unit with which to properly graze livestock. BLM requests this statement modified to read, "An allotment is a designated area of land available for livestock grazing, which could include federal and private lands making up the livestock management unit."</p> <p>SCE states, "SCE is not responsible for installing or maintaining fencing associated with BLM grazing allotments, referred to herein as cattle exclusion fencing." This statement is opinion held by SCE and should not be present in the affected environment without describing it as such. BLM argues that SCE has a duty to take all reasonable measures to maintain and operate the Project in a manner that is safe for domestic animals according to 18 Code of Federal Regulations (CFR) Part 12 and applicable license requirements, and have stated that they have installed a variety of features designed to protect animals including wildlife and livestock. One feature that would protect livestock from mortality caused by Project operations is the exclusionary fencing. BLM requests the inclusion of the exclusionary fencing as a Project feature.</p>	<p>SCE understands that a grazing allotment could potentially encompass both public and private land. However, SCE is not aware of any specific regulations that require a grazing allotment to consist of public <i>and</i> private lands to make one manageable unit. As such, the section was not revised.</p> <p>See Response to Comment 4a regarding the fencing comment in paragraph two.</p>
4p	<p><b>Table 8.1-1. Resource Areas Potentially Affected by Project Operation and Maintenance under the Proposed Action</b></p> <p>The Land Use Resource is affected by the Flowline Maintenance actions of the Proposed Action and should be indicated as such in the table.</p>	<p>As indicated in Table 8.1-1, flowline maintenance activities include: repair of flumes, canals, and support structures; repair of wildlife bridges and escape ramps; and removal of algae and large wood debris. SCE does not believe that these activities effect land use. Therefore, the section has not been edited.</p>
4q	<p><b>8.9.1.3 Potential Conflicts with Land Management Plans and Policies</b></p> <p>Operation of the Project, without addressing maintenance of exclusionary fencing along canal of K2 conflicts with the Bakersfield Field Office Resource Management Plan (RMP) goals and objectives (page 63, <i>Provide/or livestock grazing opportunities on lands within the grazing decision area in a manner that limits impacts on other resources and meets RMP goals.</i>), and is inconsistent with SCE's requirements to protect animals. Without this protection from the Project, this grazing unit (BLM and private) is rendered un-usable for livestock grazing opportunities due to high probability of direct livestock mortality.</p>	<p>With respect, this comment is not consistent with demonstrated, ongoing uses within this grazing unit and BLM policies. First, operation and maintenance of the Project does not limit livestock grazing opportunities. SCE does not restrict grazing on any of the Project lands, except where Project fences encompass key Project facilities for public safety and protection of the facilities. Cattle are free to graze throughout the watershed in accordance with the BLM's Bakersfield RMP. Furthermore, the grazing units in the vicinity of the Project have not been rendered un-useable, as cattle are currently grazing in the Project vicinity.</p>
4r	<p><b>8.9.2 Other Land Use Issues</b></p> <p>Modify this sentence as follows; "An allotment is a designated area of land available for livestock grazing <i>and it includes the BLM allotment and private lands that make up the livestock management area</i>".</p>	<p>See Response to Comment 4o.</p>



No.	Stakeholder Comment	SCE Response
4s	<p><b>8.9.2 Other Land Use Issues</b></p> <p>SCE states, "The BLM and/or private parties have erected fencing in various locations to contain livestock to designated allotments." BLM has no record of this fencing being installed by BLM or its grazing Lessees. Based on the results of the LAND 3 TSR, the remaining remnant fences indicate that SCE or a previous Project operator had installed the fencing along the entire Project boundary at K2.</p>	See Response to Comment 4a.
4t	<p><b>8.9.2 Other Land Use Issues</b></p> <p>SCE also states, "The only exclusionary fencing that SCE maintains is at the Kaweah No. 3 Forebay, where SCE recently erected fencing to prevent cattle from causing erosion along the banks of the forebay (i.e. to protect SCE infrastructure)." SCE installed and maintains this exclusionary fencing yet, this fence is not listed among the Project facilities. Cattle were drawn to the K3 Forebay in search of water in open rangeland, just as they are along the K2 Flowlines. As required by 18 CFR Part 12, BLM requests that SCE maintain all exclusionary fencing as it relates to their Project infrastructure and the protection of animals.</p>	See Response to Comment 4a.
4u	<p><b>8.9.2 Other Land Use Issues</b></p> <p>The BLM finds the following statement an opinion, "SCE does not believe that the Project flowlines effect cattle grazing opportunities or other uses on BLM land." To the contrary, the operation of the Project without adequate exclusionary fencing renders the surrounding livestock management units (combined public and private lands) un-useable. The purpose of the exclusionary fencing is to protect livestock from impacts associated with operation the Project. By protecting livestock, the Proposed Action would also then provide for livestock grazing opportunities on BLM land in conformance with the Bakersfield BLM RMP goals and objectives. By not protecting livestock, this action is in conflict with the Bakersfield BLM RMP.</p>	See Response to Comment 4q.
<b>COMMENT LETTER 5: CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE, Julie A. Vance, Regional Manager – November 1, 2019</b>		
5a	<p><b>Initial Statement, IS-3 // 13-14</b></p> <p>Did Southern California Edison (SCE) submit a §1602 notification to CDFW?</p>	No, Southern California Edison Company did not submit a §1602 notification to the California Department of Fish and Wildlife (CDFW). As indicated in Initial Statement, Item (5)(ii)A, SCE will submit a §1602 notification to CDFW should work in a streambed be required.
5b	<p><b>Exhibit A - Description of Project, 11</b></p> <p>The Kaweah DLA does not include information on the Lands of the US within project boundaries. This information is forthcoming.</p>	Information regarding lands of the United States that are within the Project boundary has been included in Exhibit A of the Final License Application.
5c	<p><b>Exhibit B - Statement of Operation and Resource Utilization, Table B-1 (Note #2)</b></p> <p>The text should be revised to refer to California Department of Fish and Wildlife, instead of California Department of Fish and Game. Similar revisions should be conducted throughout the manuscript, as appropriate.</p>	Exhibit B, Table B-1 has been revised to refer to the California Department of Fish and Wildlife.
5d	<p><b>Exhibit E - Environmental Exhibit, 1-1 (26-27); 3-10 (1-10)</b></p> <p>Acreage information for the FERC Project boundary is forthcoming and the Licensee indicates it will be provided in the Final License Application.</p>	FERC Project boundary and acreage information are provided in Exhibits A, E, and G of the Final License Application.
5e	<p><b>3.0 No-Action Alternative // Section 3.10 Literature Cited, 3-28 (7-25)</b></p> <p>Please include the citations in the manuscript.</p>	In text citations have been added to Section 3.0.

No.	Stakeholder Comment	SCE Response
5f	<p><b>Appendix 4-A // Ramping Rates, 6-7</b> Why is there no Up-Ramping requirement for the operation of Kaweah No. 1 Diversion?</p>	<p>The natural East Fork Kaweah River channel frequently experiences flows in excess of 1,000 cubic feet per second (cfs) and is naturally sized to accommodate these high flows. Conversely, the Kaweah No. 1 Diversion is a relatively small diversion with a maximum capacity of 24 cfs, but frequently diverts much less flow. Up-ramping in the river related to the Project occurs only when the Project stops diverting, which only occurs a few times a year. In the most extreme case when the diversion stops diverting, 24 cfs could be "released" back into the river in a short amount of time (e.g., 1 hour). In the most extreme up-ramping case, this could occur when only minimum flows are present in the river downstream of the diversion. We evaluated the stage change in this most limiting case and found that the maximum stage change was less than 1 foot / hour. Typically, the stage change would be much less than this because the amount of flow being diverted would be less and/or the flows in the river would be greater (with higher flows in the river, stage changes is typically less). Because of the limited potential for stage change and limited frequency of potential occurrence, there were no biological or recreation safety issues related to up-ramping at the Kaweah No. 1 Diversion that were identified. Therefore, an up-ramping rate was not included in the Proposed Action.</p>
5g	<p><b>Appendix 4-A// 4.1.4 (Fish Population Monitoring Plan), 11 (18-20)</b> Original text: "Fish population monitoring will be implemented in Year 2 following license issuance and every 10 years thereafter." Comment: Why will fish population monitoring be implemented only after license issuance? Please describe the baseline data the monitoring data will be compared to. In addition, CDFW thinks that a shorter timestep (e.g., every 5 years) would be more appropriate in this case.</p>	<p>The existing FERC license for the Kaweah Project does not include a fish monitoring component. Fish population monitoring was conducted in 2018 as part of the relicensing studies approved by FERC. Currently, there are no other FERC requirements for fish monitoring related to the Kaweah Project. However, SCE has proposed a periodic fish monitoring program that will be implemented under the new license.</p> <p>The fish data that were collected in 2018 provide the baseline data for current conditions in the Kaweah and East Fork Kaweah rivers. Future fish monitoring will use the 2018 data and any other data collected as part of the new FERC license as reference data.</p> <p>The Kaweah Project is a run-of-the-river project with limited potential to affect riverine fishes or their habitat if minimum instream flows are maintained. The Proposed Action includes instream flows that are the same as, or greater than, the existing minimum instream flows (depending on the month and water year type) (Appendix 4-A, Section 4.1.1 – Instream Flow Measures). The Proposed Project also includes continuous monitoring of instream flows and ramping rates (Appendix 4-A, Section 4.1.2 – Stream Gaging Plan) and reporting to FERC, including reporting any deviations (e.g., cause, severity, duration, environmental impacts) to FERC (Appendix 4-A, Section 4.1.1 – Instream Flow Measures). This will ensure that habitat is continuously maintained. No issues regarding fish populations were identified during the course of the relicensing. Because the habitat will be maintained/improved and continuously available, it was determined that periodic monitoring in Year 2 and every 10 years thereafter would be sufficient to evaluate fish populations over the term of the new license.</p>
5h	<p><b>Appendix 4-A // 4.1.5 Entrainment Study Measure, 15 (14-16)</b> Original text: "Water temperature monitoring will be implemented in Year 2 following license issuance and every 10 years thereafter." Comment: Why will temperature monitoring be implemented every 10 years? CDFW advises a shorter timestep; for instance, every five years thereafter.</p>	<p>The Kaweah Project is a run-of-the-river project with short bypass reaches and limited potential to affect riverine water temperature if minimum instream flows are maintained. The Proposed Action includes instream flows that are the same as, or greater than, the existing minimum instream flows (depending on the month and water year type) (Appendix 4-A, Section 4.1.1 – Instream Flow Measures). The Proposed Project also includes continuous monitoring of instream flows (Appendix 4-A, Section 4.1.2 – Stream Gaging Plan) and reporting to FERC, including reporting any deviations (e.g., cause, severity, duration, environmental impacts) to FERC (Appendix 4-A, Section 4.1.1 – Instream Flow Measures). This will ensure that water temperature is continuously maintained. No issues regarding water temperature were identified during the course of the relicensing. Because the instream flows will be maintained/improved and continuously available, it was determined that periodic monitoring in Year 2 and every 10 years thereafter would be sufficient to evaluate water temperature over the term of the new license.</p>

No.	Stakeholder Comment	SCE Response
5i	<p><b>7.3.3 Historical Water Quality Information, 7.3-2 (last paragraph) to 7.3.3</b></p> <p>Is there a contingency plan to avoid water quality violations regarding pH, alkalinity, ammonia, and fecal coliforms in the Kaweah River Bypass Reach?</p>	<p>The Proposed Action includes a Water Quality Monitoring Plan (Appendix 4-A, Section 4.1.7) to periodically characterize physical, chemical, and bacterial water quality conditions in the bypass reaches and comparison reaches, and compare the results to the current Water Quality Control Plan for the Tulare Lake Basin (Basin Plan) objectives and water quality standards and other applicable Environmental Protection Agency (EPA) national or California Toxics Rule (CTR) standards.</p> <p>In general, there is no indication that the Project affects the water quality parameters identified by the commenter. The Kaweah Project is a run-of-the-river project with short bypass reaches and limited potential to affect water quality including pH, alkalinity, ammonia, and fecal coliform in the Kaweah River bypass reach. Historical water quality data and data collected in 2018 as part of the relicensing studies (Section 7.3 – Water Quality Affected Environment) indicate that the physical and water chemistry conditions in the streams and rivers associated with the Project are of high quality and generally conform to regulatory water quality objectives and standards.</p> <p>Regarding the water quality parameters identified by the commenter:</p> <ul style="list-style-type: none"> <li>• pH and Alkalinity – The Kaweah River watershed has relatively low pH and alkalinity, but this is the natural background condition due to the characteristics of the granitic watershed, unrelated to the Kaweah Project.</li> <li>• Fecal Coliform – Sampling for coliform bacteria during the FERC study in 2018 (Section 7.3 – Water Quality Affected Environment) found suitable bacteria conditions in the bypass reaches.</li> <li>• Ammonia – Four of 29 ammonia samples in the study area were greater than the Basin Plan ammonia “waste discharge” objective; however, Project operations do not produce any waste discharge. Project operations only divert water from the river into the flowlines, then into powerhouses, and back into the river. There are no known Project-related activities, facilities, or operations that have the potential to affect ammonia concentrations. Ammonia can be produced from septic systems (decomposing organic matter) and there are many homes that are adjacent to the Kaweah River and could potentially be a source for ammonia.</li> </ul>
5j	<p><b>7.4.8.1 Kaweah River, 7.4-16</b></p> <p>Original Text: "In the Kaweah River there were two Project-related barriers identified. These include the Kaweah No. 2 Diversion Dam (RM 8.9) and Kaweah No. 2 Diversion Dam Gage Pool Weir (RM 8.8). The Kaweah No. 2 Diversion Dam was identified as an impassable barrier and the Kaweah No. 2 Diversion Dam Gage Pool Weir was identified as a partial barrier to fish passage (Map 7.4-6; Table 7.4-12; AQ 8 - TSR Appendix C (SCE 2019h; SD A). Additionally, one natural partial barrier was documented on the Kaweah River below Kaweah No. 2 Powerhouse at RM 3.8, downstream of the bypass reaches, and an impassable natural barrier was identified upstream of the bypass reaches within the SNP at RM 9.5 approximately 0.6 mile upstream of the Kaweah No. 2 Diversion Dam. The Kaweah No. 2 Diversion Dam at RM 8.9 precludes upstream fish passage into the river reach from RM 8.9 upstream to the impassable natural barrier at RM 9.5 (numerous partial and impassable barriers exist upstream of RM 9.5, both natural and manmade)."</p> <p>Comment: What are the plans to improve passage through manmade barriers?</p>	<p>The fish species present in the Kaweah River are resident species capable of fulfilling their life history requirements (spawning, incubation, juvenile rearing, adult rearing) within a relatively limited home range. Providing upstream passage at the barriers (e.g., Kaweah No. 2 Diversion Dam) would provide very limited increased mobility for resident fish species (0.6 mile of stream between the diversion and the next upstream natural passage barrier). Therefore, there is limited potential benefit identified related to providing upstream passage. Therefore, improving upstream fish passage was not included in the Proposed Action. Further, approximately 10 miles downstream of the Kaweah Project, the Kaweah River is impounded by USACE's Terminus Dam that forms Lake Kaweah. Terminus Dam does not provide fish passage and is a complete barrier to upstream migration.</p>

No.	Stakeholder Comment	SCE Response
5k	<p><b>7.4.9.4 Abundance (Standing Crop), 7.4-19</b></p> <p>Original text: "For comparison purposes, the rainbow trout fish density and biomass results from the sampling effort in the bypass reaches associated with the Kaweah Project were compared to density and biomass data from other Sierra Nevada stream systems in the same elevation range (Figure 7.4-25). Rainbow trout density and biomass in the bypass reaches and reference reaches upstream of the Project are lower than most of the Sierra Nevada fish density data in Figure 7.4-25. The Sierra Nevada fish density data were summarized from the Yuba and American Rivers (PCWA 2010) as well as the Middle Fork San Joaquin River, Clark Fork Stanislaus River, Clavey River, Merced River, Kings River, Kaweah River (1984 and 1985 surveys), and Tule River (CDFW 2017). The dataset was limited to elevations between 500 and 3,000 ft msl. Water temperature may be a confounding factor in the Sierra Nevada data sets as many of the data sets are derived from streams with colder water temperature downstream of reservoirs, whereas the bypass reach data sets are not influenced by cold /cool reservoir flow releases."</p> <p>Comment: The role of water temperatures in the lower numbers, density and biomass of rainbow trout in the bypass reaches associated with the Kaweah Project compared to data from other Sierra Nevada stream systems in the same elevation range suggests that temperature monitoring should be prioritized. Water temperature monitoring only every 10 years after license issuance seems to be a low frequency and could lead to missing out on temperature effects on fish population variability throughout the duration of this project.</p>	<p>Because the Kaweah Project is a run-of-the-river project with short bypass reaches and limited potential to affect riverine water temperature if minimum instream flows are maintained. The Proposed Action includes instream flows that are the same as, or greater than, the existing minimum instream flows (depending on the month and water year type) (Appendix 4-A, Section 4.1.1 – Instream Flow Measures). The Proposed Project also includes continuous monitoring of instream flows (Appendix 4-A, Section 4.1.2 – Stream Gaging Plan) and reporting to FERC, including reporting any deviations (e.g., cause, severity, duration, environmental impacts) to FERC (Appendix 4-A, Section 4.1.1 – Instream Flow Measures). This will ensure that water temperature is continuously maintained. Because the instream flows will be maintained/improved and continuously available, it was determined that periodic monitoring in Year 2 and every 10 years thereafter would be sufficient to evaluate water temperature conditions over the term of the new license.</p>
5l	<p><b>7.4.9.6 Bypass Reach Habitat Modeling (Habitat versus Flow Modeling), 7.4-20</b></p> <p>Original text: "The amount of rainbow trout spawning habitat in the bypass reaches was very low due to the very limited amount of spawning gravel."</p> <p>Comment: The Licensee should consider spawning habitat enhancement and gravel augmentation in the bypass reaches.</p>	<p>The low amount of spawning gravel is a natural feature of the Kaweah and East Fork Kaweah rivers. The Project does not modify the gravel availability in the vicinity of the Project. The diversions are small and bedload sediments (gravels), pass downstream of the diversions. In addition, the small diversion capacity relative to the size of geomorphic high flows that structure the channel, does not affect the geomorphic character of the channel. Therefore, there is not a nexus between the Proposed Action and limited spawning habitat.</p>
5m	<p>The Licensee should consider focused surveys and/or eDNA sampling to evaluate the presence of native mussels and Pacific Lamprey in the Project reaches and the potential impact of project operations on their populations.</p>	<p>The Licensee does not believe that focused surveys and/or eDNA sampling to evaluate the presence of native mussels and Pacific lamprey is warranted with respect to ecology or FERC relicensing process:</p> <p><b>Ecology</b></p> <ul style="list-style-type: none"> <li>• Pacific Lamprey – The Kaweah River does not connect to the ocean; therefore, Pacific Lamprey would not be present in the river.</li> <li>• Native Mussels – Based on previous experience for rivers where native mussels are present, it is highly unlikely that the Project, with the existing or proposed minimum instream flows (see minimum instream flows in the License Application) would have an impact on native mussels. Mussels are typically in habitats that both remain wetted and un-scoured over a wide range of flows. These potential habitats would remain intact with implementation of the Proposed Project.</li> </ul> <p><b>FERC Relicensing Process</b></p> <ul style="list-style-type: none"> <li>• eDNA or field surveys for mussels or Pacific lamprey were not requested or proposed by the commenter as part of the FERC study plan determination process or the Initial Study Report / Updated Study Report process.</li> <li>• The study request does not include the proper content. Study requests must include (1) a description of the goals/objectives, (2) relevant resource management goals, (3) relevant public interest, (4) a description of existing information, (5) an explanation of the Project nexus, (6) methodology consistency with accepted practice, and (7) cost and level of effort (see 18 CFR § 5.9(b)).</li> <li>• The study request does not include the requisite demonstration of timing or circumstance expediency. Study requests at this point in the FERC relicensing process must include information regarding why the study request was not made earlier and must demonstrate extraordinary circumstances warranting approval (see 18 CFR § 5.15(d and f)).</li> </ul>

No.	Stakeholder Comment	SCE Response
5n	The forthcoming Entrainment study (AQ 9) results (in progress) should include evaluations over the four sampling periods that were discussed in the Study Plan meetings.	Comment noted.
5o	The CDFW recommends a baseline analysis of existing data to determine the frequency of periods when instream flows, water temperatures, and other conditions could have provided suitable Foothill Yellow-Legged Frog habitat in the Project area.	The Licensee does not believe the requested analysis would provide additional information. Foothill yellow-legged frogs were not found in the Project vicinity. It is likely they were extirpated from the watershed due to invasive species such as bull frogs and crayfish and possibly other factors such as airborne insecticides from agricultural areas. Suitable hydrologic and water temperature conditions are currently and have been historically present within the Project vicinity for foothill yellow-legged frogs. The only exception is in the river locations such as much of the East Fork Kaweah River and the main stem Kaweah River upstream of the East Fork Kaweah River confluence where the natural channel is too steep gradient and confined to provide successful breeding habitat in the spring (see AQ 7 – Special-Status Amphibian and Aquatic Reptile TSR). The project does not limit habitat conditions for foothill yellow-legged frogs and hydrologic and water temperature habitat is continuously available.
<b>COMMENT LETTER 6: FEDERAL ENERGY REGULATORY COMMISSION, Timothy Konnert, Chief, West Branch Division of Hydropower Licensing – November 1, 2019</b>		
6a	In Section 3 No-Action Alternative, Maps 3-3g & 3-3h are missing. In the FLA, please provide Maps 3-3g and 3-3h.	Maps 3-3g and 3-3h are provided in the Final License Application.
6b	Section 3.2.2 <i>Forebays</i> , Please clarify if the spillway channels and pipes are project facilities.	For clarification, spillways and piping are considered Project facilities. Water from the spillways enters natural channels which are not considered Project facilities. The text of Section 3.2.3 has been revised to reflect this.
6c	In Section 7.9.6 Land Use Outside of the FERC Project Boundary, you cite the Three Rivers Management Plan 2018 Update when discussing allowable land uses adjacent to the project boundary; however, in Section 7.9.9 Literature Cited, you list the Three Rivers Community Plan 2018 Update. Please correct the typographical error in the FLA for this section, and any additional sections where this error may occur.	The reference in Section 7.9.6 to the Three Rivers Management Plan 2018 Update included a typographical error. The error has been corrected to read “Three Rivers <i>Community</i> Plan 2018 Update”. This error was not found in other sections of License Application.
6d	In REC 1, <i>Recreation Resources Technical Study Report (TSR)</i> , Tables REC 1-4 and REC 1-5 indicate that an in-person vehicle and visitor count survey was conducted on Thursday, July 5, 2018, and that the Powerhouse No. 2 River Access Parking Area and Edison Beach were closed that day; however, as stated in the footnote on Table REC 1-4, the parking area and Edison Beach were closed on July 4, 2018 for the July 4 holiday. Please clarify whether the entry date of July 5, 2018 is a typographical error. If the entry date is not a typographical error, and an in-person vehicle and visitor count survey was conducted on July 5, 2018, please clarify the reason for the parking area and Edison Beach closure.	The Kaweah No. 2 Powerhouse River Access Parking Area is not typically closed on Thursdays. As such, the survey technician visited the site in accordance with the pre-established randomized sampling schedule (see Figure REC 1-1). When the survey technician arrived on site, he found that the parking area was closed. Regardless, since he was already on site, the technician conducted a survey of the Edison Beach area. As indicated, a total of 8 people were observed on the beach despite the parking area closure.
6e	In REC 1, <i>Recreation TSR</i> , Table REC 1-4 indicates that an in-person vehicle and visitor count survey was conducted on Tuesday, August 28, 2018 and on Monday, September 3, 2018. As stated in the Table REC 1-4 notes, the parking area and beach were closed on both dates; August 30 – September 2, 2018, due to graffiti issues, and September 3, 2018 for the holiday (Labor Day). Please clarify why an in-person vehicle and visitor count survey was conducted on each known day of closure for the parking area and beach, and why the two survey dates were not rescheduled.	All in-person surveys were conducted in accordance with the pre-established randomized sampling schedule (see Figure REC 1-1). As shown on Figure REC 1-1, in-person surveys were scheduled to occur on Tuesday, August 28. However, when the survey technician arrived on site that day, he found that SCE had closed the parking area to address graffiti issues. Regardless, he visited the beach to observe and record use but found no recreation users (see Table REC 1-4). As documented in Section 4.4.1, an in-person survey was mistakenly scheduled to occur on Monday, September 3, which was a holiday. Regardless, the technician visited the site on that date, following the schedule and survey protocols as instructed.  As discussed in the REC 1 – TSR, SCE installed a motion activated camera and continuously collected use data at the parking area over a 314-day period. The camera data was systematically reviewed and used to tabulate all use recorded at the parking area. Accordingly, the camera data was used in lieu of adding another in-person survey day.

No.	Stakeholder Comment	SCE Response
6f	<p>In REC 1, <i>Recreation TSR</i>, Section 4.4.1 <i>In-Person Vehicle Counts at the Kaweah No. 2 Powerhouse River Access Parking Area</i> Please clarify: 1) how the 30-minute period of time for the in-person vehicle and visitor count survey period was developed, and why it was chosen; and, 2) why, in over half of the surveys, the elapsed time between the Start Time and End Time was significantly less than 30 minutes, including many with a duration of approximately 15 minutes, or less.</p>	<p>After the REC 1 – TSP was finalized, SCE voluntarily decided to develop a robust recreation-use data set by continuously recording use at the parking area with a motion activated camera over a 314-day period. This data set is more comprehensive than intermittent in-person counts, which must be extrapolated to estimate use. With the availability of the camera data, the technician was instructed to conduct “instantaneous” surveys, meaning, the technician visited the site during the specified randomly selected time period, but only stayed onsite long enough to record the number of vehicles in the parking area and to observe and record recreation use at the nearby Edison Beach. The in-person data was used primarily to record and document recreation activities at Edison Beach while the camera data was used to tabulate use at the parking area. Section 4.4.1 of the REC 1 – TSR was revised to clarify these points.</p>
6g	<p>In all of the subsections related to aquatic resources in Section 8, <i>Environmental Effects of the Proposed Action</i>, the analyses and conclusions of effects on individual aquatic resources should be technically supported by existing detailed quantitative information. For the most part, analyses of effects of the project and benefits of proposed measures are not well supported because they are either described qualitatively even though quantitative information is available from the aquatic technical studies already completed or a general quantitative analysis was used even though data are available for a detailed quantitative analysis. For example:</p>	<p>We have included more quantitative data in the text of Section 8 – Environmental Effects of the Proposed Action. In all cases, where quantitative data is available (for example water temperature and instream flow physical habitat), the data supporting the analysis are in Section 8 in the form of graphics showing unimpaired, existing conditions, and Proposed Action conditions. The quantitative data are extensive, particularly with respect to instream flows and best viewed comprehensively in a graphical form as presented in the document. We recognize, however, that some summary data would be useful and we have created summary tables that aid the reader and included them in each section along with numbers incorporated into the text to help the reader.</p> <p>There are some effect analyses that are in fact qualitative. For example, we have quantitative data on the existing water quality within the Project Area, however, assessing the effects of increased minimum instream flows (or other Project operations) on water quality requires a qualitative assessment that water quality will remain similar to existing conditions. Where qualitative analyses are used, we have clarified the basis of the qualitative analysis within the text.</p> <p>With respect to the specific instances identified by the commenter regarding quantitative data, please refer to response to comments 6h through 6n below. Also for clarity, in the Technical Study Reports referenced by the commenter, there are no analyses of Proposed Action conditions (i.e., environmental effects analysis of the Proposed Action) in the technical reports, by design. The Technical Study Reports are specific to existing conditions and, in some cases, include unimpaired conditions. All Proposed Action effects analyses, quantitative or qualitative, are presented in Section 8 – Environmental Effects of the Proposed Action. This includes instream flow and water temperature modeling of the Proposed Action.</p>
6h	<p>In section 8.3.1.1 <i>Instream Flows</i> you suggest that the proposed minimum flows would slightly improve summer/fall low flow season water temperatures and water quality but you do not present or describe data which supports that conclusion;</p>	<p>With respect to water temperature:</p> <ul style="list-style-type: none"> <li>• In Section 8.3.1.1, the text stated, “modified minimum instream flows would slightly improve summer/fall low flow season water temperatures in the Kaweah River and East Fork Kaweah River compared to existing conditions (No-Action Alternative). These effects are discussed in Section 8.4 (Fish and Aquatic Resources).”</li> <li>• In Section 8.4.1.2 Effects Analysis for Riverine Aquatic Habitat, a series of figures (Figures 8.4-6a-c) illustrated that in a dry year (2018) (Figure 8.4-6a), the Project has essentially no effect on water temperature in any of the bypass reaches compared to unimpaired conditions. By implication, the Proposed Action would also have essentially no effect on water temperature compared to unimpaired (or existing conditions). In a wetter year (2003), the existing project slightly increases water temperature (<math>\leq 0.5^{\circ}\text{C}</math>) above those that would occur under unimpaired conditions (Figure 8.4-6b). The Proposed Action (Figure 8.4-6c), due to increased minimum instream flow in the proposed Instream Flow Measure, slightly improves water temperature compared to the No-Action Alternative (Figure 8.4-6c).</li> <li>• To make these quantitative results more explicit in the Final License Application, we have modified the text in Section 8.4.1.2.</li> <li>• To make the reference in Section 8.3.1.1 to the 8.4 Fish and Aquatic Resources section more explicit we have changed it to read “These effects are discussed in Section 8.4.1.2 Effects Analysis for Riverine Aquatic Habitat.”</li> </ul>

No.	Stakeholder Comment	SCE Response
		<p>With respect to water quality:</p> <ul style="list-style-type: none"> <li>We have modified the text in Section 8.3.1.1 to say that the Proposed Action, which includes the Instream Flow Measure (IFM) (i.e., increased minimum instream flows), Water Temperature Monitoring Plan, Water Quality Monitoring Plan, and Sediment Management and Erosion Control Plan (SMECP) would have a beneficial effect relative to maintaining and monitoring existing water quality.</li> </ul>
6i	<p>In section 8.3.2.3, <i>Sediment Management</i> you say that sediment removal from the forebays has the potential to increase turbidity and then suggest that the sediment release and resulting turbidity would be small without quantifying the amount;</p>	<p>The SMECP in Appendix 4-A, Section 4.1.3, previously stated, “Methods for sediment removal and disposition are designed to be protective of water quality and downstream aquatic resources.” We have added the following language to make the text more explicit, “Sediment management will comply with turbidity and sediment (suspended sediment load and suspended sediment discharge) criteria in the Water Quality Control Plan for the Tulare Lake Basin.”</p> <p>In Section 8.3.2.3 Sediment Management we have modified the text, where applicable, to explicitly state that sediment management activities would be implemented according to the SMECP, which includes compliance with turbidity and sediment (suspended sediment load and suspended sediment discharge) criteria in the Water Quality Control Plan for the Tulare Lake Basin and, therefore, the effects of sediment management on water quality would be negligible.</p>
6j	<p>In section 8.4.1.2 <i>Effects Analysis of Aquatic Riverine Habitat</i>, you state that the proposed minimum flows would result in higher flows in the bypassed reaches during select dry months and water year types, without stating which months and water year types;</p>	<p>In Section 8.4.1.2 in the Hydrology subsection states, “The Proposed Action IFM provides higher minimum instream flows (Table 8.4-2; Figure 8.4-1) that would result in increased flows in the bypass reaches (Table 8.4-3) during some select dry months and water year types. In the East Fork Kaweah, minimum instream flows are increased in all months in normal water year types, but remain unchanged in dry water year types. In the Kaweah River, minimum instream flows are modified in select months in both dry and normal water year types.”</p> <p>Figure 8.4-1, referred to in the text, shows explicitly the original and modified minimum flows in both Normal and Dry water year types and the months that were changed.</p> <p>For clarification, we have modified the text in the last sentence related to the Kaweah River to identify the specific months and water year types in which minimum instream flows are increased.</p>
6k	<p>In section 8.4.1.2 Temperature and Water Quality you state that existing conditions result in a small amount of warming in November and December in the bypassed reaches, and a very small amount of warming in East Fork Kaweah River in August through December but with the proposed minimum flows water temperatures would cool a small amount. You do not describe and support these conclusion with modeling results or water temperature data;</p>	<p>The referenced sentences state, “Water temperature modeling ... indicates that almost no change occurred in the Kaweah River bypass reaches, except a small amount of warming in November/December, compared to unimpaired conditions. In the East Fork Kaweah River a very small amount of warming occurred August through December (<math>\leq 0.5^{\circ}\text{C}</math>) under existing conditions compared to unimpaired conditions (Figure 8.4-6b). With implementation of the IFM in the Proposed Action, however, the water temperatures in the East Fork Kaweah River cool a small amount compared to existing (No-Action) (Figure 8.4-6c)...”</p> <p>Figures 8.4-6b and 8.4-6c referred to in the sentences provide hourly water temperature for the entire year (2003) for unimpaired, existing, and Proposed Action modeling scenarios. They show the small amount (e.g., <math>\leq 0.5^{\circ}\text{C}</math>) of warming and cooling quantitatively.</p> <p>We have modified the text to be more specific with the warming in the Kaweah River (average <math>0.45^{\circ}\text{C}</math>) and East Fork Kaweah River (average <math>0.17^{\circ}\text{C}</math>) and cooling in the East Fork Kaweah (average <math>0.14^{\circ}\text{C}</math>).</p>
6l	<p>In section 8.4.2.2 Effects Analysis of Riverine Aquatic Community, Algae, and Benthic Macroinvertebrates, without presenting data to support your conclusions you state that the average summer/fall drift density of benthic macroinvertebrates was similar between comparison and bypass reaches as were benthic macroinvertebrate sampling metric results and IBI scores;</p>	<p>Section 8.4.2.2 Effects Analysis of Riverine Aquatic Community, we have included the direct reference to figures and tables in Section 7.4.7 that illustrate drift density for benthic macroinvertebrates was similar between comparison and bypass reaches (Figure 7.4-12) and that metric results and Index of Biological Integrity (IBI) scores were similar between comparison and bypass reaches (Table 7.4-10).</p>

No.	Stakeholder Comment	SCE Response
6m	In section 8.4.2.2 Bypass Reach Wetted Perimeter, you state that the proposed minimum instream flows would increase the wetted perimeter of various effected stream reaches in certain months without presenting or describing the absolute values or percentages of the wetted perimeter data that was collected;	In Section 8.4.2.2, Bypass Reach Wetted Perimeter, the text states, "Appendix A shows the monthly exceedance plots for wetted perimeter for each month in the bypass reaches for existing (No-Action Alternative), unimpaired, and modified (Proposed Action) hydrology. Figures 8.4-7, 8.4-8, 8.4-9, and 8.4-10 show percent of unimpaired flow exceedance plots for wetted perimeter for each month in the bypass reaches for the modified (Proposed Action) hydrology. The percent of unimpaired wetted perimeter for the Proposed Action hydrology is approximately 80% (or greater)." In addition, the text identifies the months that wetted perimeter increases in each reach and the plots in Appendix A show the increases in wetted perimeter for each reach and for each month.  To assist the reader, we have included a summary table (Table 8.4-4) to the Final License Application and added some additional text.
6n	In section 8.4.4.2 <i>Bypass Reach Physical Habitat</i> , you conclude that the proposed minimum instream flows would have a beneficial effect on adult hardhead and Sacramento pike minnow habitat in the bypassed reaches. To support this conclusion, you state that for the combined project bypass reaches the proposed minimum flows would provide approximately 80 percent of the unimpaired flow habitat in the warm water temperature months (June, July, August, September, October) and generally 70% or greater in the cool water temperature months (November through May), and that the amount of habitat with the proposed minimum flow is greater than under existing conditions. In order to effectively support the technical basis for the proposed minimum flows in the three bypassed reaches on the subject fish species, you should incorporate and describe the specific data and analyses produced in the habitat versus flow relationships and in the habitat time series analyses from study AQ-1 (Instream Flow) for each individual bypassed reach for each fish species and life stage.	Section 8.4.4.2 is a section specific to Effects Analysis for Special-Status Species. The only special-status fish species is hardhead. That is why only hardhead are discussed in the section.  Section 8.4.3.2 Effects Analysis for Riverine Fish (Bypass Reach Physical Habitat subsection) includes hardhead / Sacramento pikeminnow adult habitat as the primary species of importance in the bypass reaches and as one of the most limiting lifestages (requires the most flow). The section also includes all species / life stages. Table 8.4-4 shows all species and life stages and reaches and whether habitat increases with the Proposed Action compared to existing conditions. Appendix B shows the effect of the Proposed Action on physical habitat for all species and life stages compared to unimpaired conditions.  To aid the reader, we have included summary tables of habitat changes in the Proposed Action compared to existing condition (percent and ft <sup>2</sup> / 1000 ft) in the text.
<b>COMMENT LETTER 7: STATE WATER RESOURCES CONTROL BOARD, Chase Hildeburn, Water Resource Control Engineer – November 1, 2019</b>		
7a	The DLA states, on page 3-16 and separately on page 3-17 of Exhibit E, that SCE filed water rights "applications with the State Water Board identifying a pre-1914 right" to divert their allocated water diversions. However, diverters claiming pre-1914 water rights are not required to file an application, but rather a Statement of Diversion and Use. Consequently, this sentence should be changed to say that SCE filed a Statement of Diversion and Use claiming their pre-1914 water rights.	The text cited in the comment and similar text located elsewhere in Section 3.5.1.2 has been revised as suggested.
7b	The DLA states, on page 3-20 of Exhibit E, the following, "The origin of these deliveries dates back to reservations made in a deed between W.F. Dean and the Mt. Whitney Power Company dated March 31, 1903, and recorded March 23, 1903 (Vol. 111 of Deeds, Page 255)." As described, the deed was recorded before it was signed. Please clarify whether these dates are typographical errors. If the dates are not typographical errors, and the deed between W.F. Dean and the Mt. Whitney Power Company was, in fact, recorded before it was signed, please clarify.	The sentence included a typographical error. The referenced deed is dated March <u>21</u> , 1903 and was signed before it was recorded on March 23, 1903. The text cited in the comment has been corrected accordingly.
7c	Figure AQ 1-3, in the AQ 1 – Instream Flow Draft Technical Study Report (July 2019), displays the habitat suitability criteria (velocity and depth) for various life stages of rainbow trout. The x-axis in the Rainbow Trout Depth is labeled "Velocity (ft/s)". The figure displays a relationship between habitat suitability and depth. SCE should change the x-axis label of this figure to "Depth (ft)".	Figure AQ 1-3 in the AQ 1 – Instream Flow TSR has been revised so that the x-axis label of this figure reads "Depth (ft)".

BLM	Bureau of Land Management	NPS	National Park Service
CDEC	California Data Exchange Center	RMP	Resource Management Plan
CDFW	California Department of Fish and Wildlife	SCE	Southern California Edison Company
CFR	Code of Federal Regulations	SMECP	Sediment Management and Erosion Control Plan
CTR	California Toxics Rule	SNP	Sequoia National Park
DLA	Draft License Application	SUP	Special Use Permit
EPA	Environmental Protection Agency	TSR	Technical Study Report
FERC	Federal Energy Regulatory Commission		
FLA	Final License Application		
IBI	Index of Biological Integrity		
IFM	Instream Flow Measure		



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**LIST OF ACRONYMS**

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Project	Kaweah Project
SCE	Southern California Edison Company

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## **15.0 LIST OF PREPARERS**

This section provides the names and titles of Southern California Edison Company (SCE) personnel that provided senior management and technical review of the Kaweah Project (Project) Application for New License, including Exhibit E (Table 15-1). In addition, a complete list of preparers is provided in Table 15-2 that includes the firm, personnel name, current position, highest degree received, the field in which the degree was received, and section(s) prepared.

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## **TABLES**

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**Table 15-1. Southern California Edison Company Personnel Providing Review of the License Application – Exhibit E**

<b>Southern California Edison Company (SCE)</b>	
<b>Senior Management/Review</b>	
Wayne Allen	Principal Manager, Regulatory Support Services
Martin Ostendorf	Senior Manager, Regulatory Support Services
David Moore	Relicensing Project Manager
Kelly Henderson	Senior Attorney
<b>Technical Review</b>	
Robert Biedermann	Senior Supervisor
Derrick Tito	Hydrographer Foreman
Tim Condit	Senior Advisor
Audry Williams	Senior Archaeologist
Martin Blagaich	Senior Advisor
Cindy Calemno	SCE Lands Department

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