Jeff L. Taylor-Pine Flat Power Plant

FERC Project No. 2741

Pre-Application Document
Kings River Conservation District
February 2024

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List of Attachments

1.0 INTRODUCTION

This section consists of seven subsections. Section 1.1 presents the Kings River Conservation District's (KRCD or Licensee) intent to apply to the Federal Energy Regulatory Commission (FERC or Commission) for a new license for the Jeff L. Taylor-Pine Flat Power Plant, FERC Project Number (No.) 2741 (Project), and KRCD's designated agent for the relicensing[1]. Section 1.2 provides a description of KRCD. Section 1.3 provides a brief description of the Project. Section 1.4 describes the purpose of this Pre-Application Document (PAD). Section 1.5 presents the process KRCD implemented to acquire the existing, relevant, and available information provided in this PAD. Section 1.6 presents KRCD's proposed relicensing process plan and schedule. Section 1.7 provides the communication guidelines that KRCD will follow during the relicensing.

1.1 KINGS RIVER CONSERVATION DISTRICT'S INTENT TO APPLY FOR A NEW LICENSE FOR THE JEFF L. TAYLOR-PINE FLAT POWER PLANT FERC PROJECT AND ITS DESIGNATED AGENT

Pursuant to Section (§) 16.6 of Title 18 of the Code of Federal Regulations (C.F.R.), on or about February 1, 2024, KRCD filed with FERC a Notice of Intent to Apply for a New License (NOI) - on or before August 31, 2027, for the Project. KRCD is the existing licensee and current owner of the Project. The Commission issued an original license to KRCD for the Project on September 25, 1979, stating that the new license would be effective from the first day of the month of license issuance for 50 years through August 31, 2029.

The exact name, business address and telephone number of the persons authorized to act as an agent for KRCD for the Jeff L. Taylor-Pine Flat Power Plant relicensing are:

David M. Merritt, General Manager
Kings River Conservation District
4886 E. Jensen Avenue
Fresno, California 93725
(559) 237-5567
dmerritt@krcd.org

and

[1] In this document, "relicensing" means the activities an applicant performs to prepare an application for new FERC license, and the application itself is referred to as the "Application for New License."

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1.2 KINGS RIVER CONSERVATION DISTRICT

Established in 1951 by the Kings River Conservation District Act (Assembly Bill 340, Chapter 931, Stats. of 1951; the KRCD Act) and headquartered in Fresno, California, KRCD is a public agency governed by a seven-member Board of Directors, consisting of one representative from each division within KRCD's service area. The KRCD Act provided for KRCD's organization, operation, maintenance and governance, for the inclusion of lands therein and the exclusion of lands therefrom; for the acquisition, construction, maintenance and operation of works and property for the purposes of KRCD, including the storage, conservation, distribution and sale of water, the development, distribution and sale of electric power, the drainage, reclamation and protection of land, and prescribing and defining KRCD's powers, duties and responsibilities. KRCD's mission is to provide flood protection along the lower Kings River, cooperate with other agencies to achieve a balanced and high-quality water supply, provide on-farm support in efficient water conservation practices, and develop power resources for the public good. KRCD is a municipality as defined in the Federal Power Act.

1.3 BRIEF DESCRIPTION OF THE PROJECT

The Project is located near the community of Piedra, in Fresno County, California, 30 miles east of the City of Fresno, on the north bank of the Kings River at approximately river mile (RM) [2] 111, and 200 feet downstream of the United States Army Corps of Engineers' (USACE) Pine Flat Dam.

On May 3, 2023, the Commission issued an Order Amending License[3] that approved the addition of a new turbine-generator unit (i.e., Unit 4) to the Project. KRCD anticipates the new unit will be constructed, tested, and fully operational by approximately late 2025. For the purpose of this PAD, Unit 4 is treated as a part of the "existing Project."

2 The Kings River diverges into multiple branches in the San Joaquin Valley, with some water flowing south to the old Tulare Lake lakebed and the rest flowing north to the San Joaquin River. River miles in this document are calculated from the portion of the Kings River that confluences with the San Joaquin River, which is designated as RM 0.0, upstream to USACE's Pine Flat Dam.

3 FERC's Order Amending License is available in FERC's eLibrary at accession number 20230503-3104.

The existing Project consists of one development – Pine Flat[4] - that, in total, includes: (1) three penstock extensions from the three 13.5-foot diameter penstocks in Pine Flat Dam to the Jeff L. Taylor Powerhouse; (2) the outdoor Jeff L. Taylor Powerhouse at the toe of the dam, containing three Francis turbines and associated generating units, each with a rated capacity of 55 megawatts (MW); (3) three generator leads and a step-up transformer bank at the Jeff L. Taylor Powerhouse, consisting of three 70 megavolt-amperes (MVA) single-phase units; (4) the outdoor Unit 4 Powerhouse containing one Francis turbine and associated generating unit with a rate capacity of 6.3 MW; (5) one generator lead and a step-up transformer at the Unit 4 Powerhouse consisting of one 6.6 MVA, three-phase unit; (6) appurtenant facilities; and (7) one recreation facility. The Project's total FERC-authorized installed capacity is 171.3 MW. The existing Project does not include any dams, impoundments, transmission lines, or open water conduits. The Project uses USACE-managed water releases from Pine Flat Dam and Lake (non-Project) for operations. Pine Flat Dam and Lake were constructed by the USACE in 1954 to provide local and regional flood protection. Project power is provided from the Project's Pine Flat Switchyard to the grid via the California Department of Water Resources' (DWR) existing Pine Flat Transmission Line, FERC Project No. 2876, which interconnects with Pacific Gas and Electric Company's (PG&E) 230-kilovolt (kV) Balch #2-McCall Transmission Line.

The 11.87-acre FERC Project boundary includes 4.94 acres of federal lands administered by the USACE, 4.55 acres of State of California lands submerged by the Kings River, and 2.38 acres of Fresno County lands. Project facilities are all at an elevation of approximately 670 ft.[5] Figure 1.3-1 illustrates the regional location of the Project. Figure 1.3-2 shows existing Project facilities, features and nearby surrounding non-Project facilities and features.

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4 While the Project includes two powerhouses, the powerhouses are adjoining, use the same source of water for power generation (i.e., USACE's Pine Flat Lake) and discharge at the same location in the Kings River. For these reasons, KRCD treats the two powerhouses as one development in this Application for New License.

5 In this PAD, all elevation data are in U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Geodetic Survey Vertical Datum of 1929 (NGVD 29), unless otherwise stated.

Figure 1.3-1. Location of the Jeff L. Taylor-Pine Flat Power Plant.

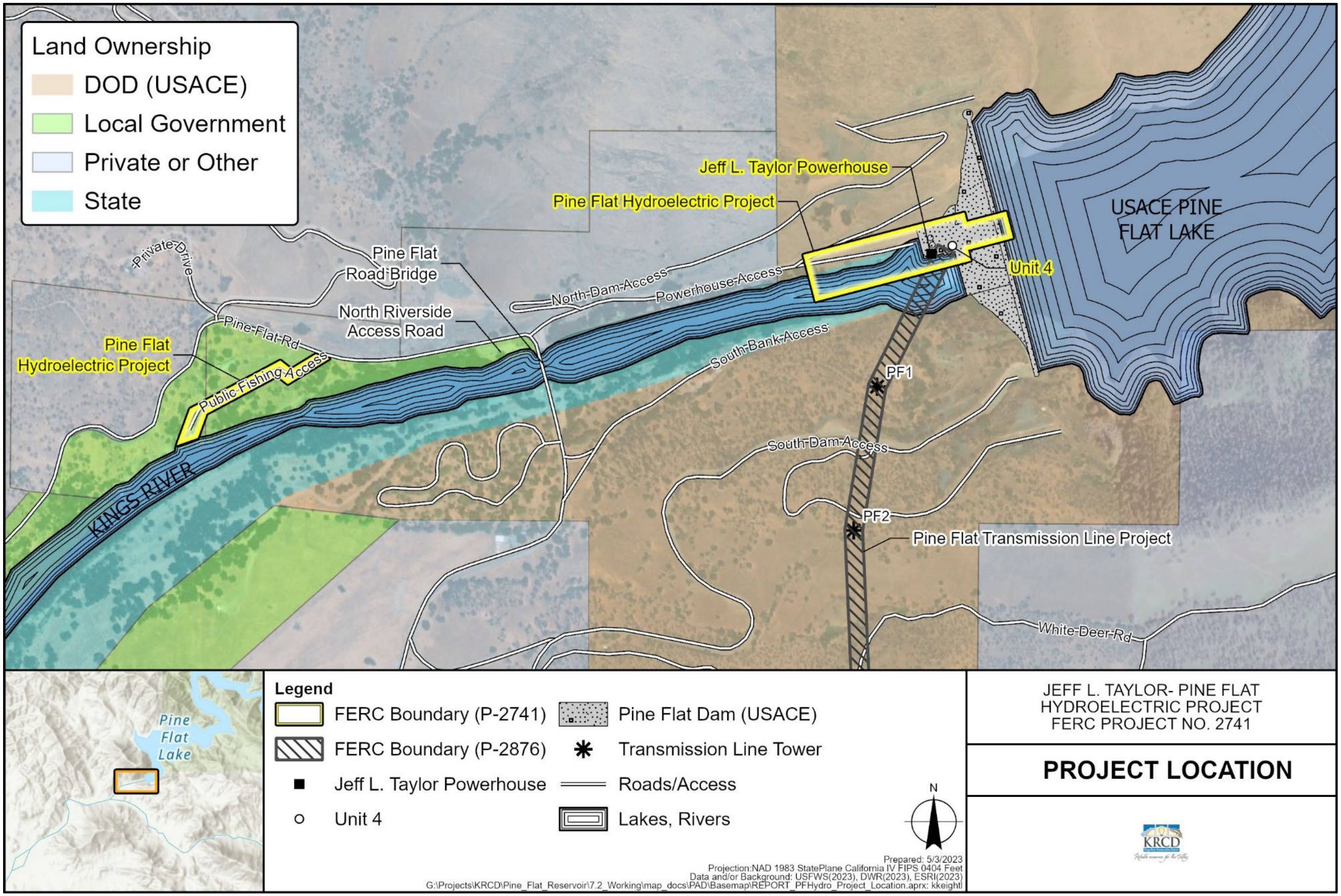

Figure 1.3-2. Jeff L. Taylor-Pine Flat Power Plant facilities and surrounding non-Project features.

The Project is an energy recovery (run-of-river) facility that generates electricity as water is released from Pine Flat Dam. Releases are conducted by USACE during mandatory flood control operations and as requested by the Kings River Water Association through the Kings River Water Master for irrigation demand and other uses including fisheries management – KRCD does not have the authority to schedule or make releases from Pine Flat Lake for the purpose of power generation.

Refer to Section 2 of this PAD for a more detailed description of Project facilities, features, and operations.

At this time, KRCD does not propose any changes to existing Project facilities, features, FERC Project boundary or operations. KRCD reserves its right to propose changes as the relicensing proceeds.

1.4 PURPOSE OF THE PRE-APPLICATION DOCUMENT

This PAD provides to FERC and to federal and State of California agencies, Native American tribes, local governments, non-governmental organizations (NGOs), businesses, members of the public, and others interested in the Project relicensing[6] summaries of existing, relevant, and reasonably available information, that are in KRCD's possession at the time the PAD is filed, related to the Project and resources that may be potentially affected by the Project. In addition, the PAD presents KRCD's proposal for gathering additional information, if needed, to inform the requirements of the new license.

1.5 ACQUISITION OF INFORMATION

KRCD conducted searches of its own files and other existing sources of information to compile existing, relevant, and reasonably available information for this PAD. This included contacting via e-mail the following agencies, Native American tribes, and NGOs on April 14, 2023:

Federal Agencies

- Federal Emergency Management Agency, Region 9
- USACE
- United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS)
- United States Department of the Interior, Bureau of Indian Affairs, Pacific Region
- United States Department of the Interior, National Park Service (NPS)
- United States Department of the Interior, Fish and Wildlife Service (USFWS)
- United States Environmental Protection Agency (USEPA)

[6] In this PAD, these parties are collectively referred to as "stakeholders."

- United States Geological Survey (USGS)

State of California Agencies

- California Coastal Commission
- California Department of Fish and Wildlife (CDFW)
- California Department of Forestry and Fire Protection, Fresno-Kings Unit
- California Department of Parks and Recreation, Office of Historic Preservation (OHP)
- California Native American Heritage Commission (NAHC)
- California State Lands Commission
- California State Parks, Division of Boating and Waterways (DBOW)
- California State Water Resources Control Board (SWRCB)
- Central Valley Regional Water Quality Control Board (RWQCB)
- DWR

Local Agencies

- Alta Irrigation District
- County of Fresno, Board of Supervisors
- Central Kings Groundwater Sustainability Agency
- Clark's Fork Reclamation District #2069
- Consolidated Irrigation District
- Corcoran Irrigation Company
- El Rico Groundwater Sustainability Agency
- Empire West Side Irrigation District
- Fresno County Board of Supervisors
- Fresno County Public Works and Planning
- Fresno Irrigation District
- James Groundwater Sustainability Agency
- James Irrigation District
- Kings River East Groundwater Sustainability Agency
- Kings River Water District
- Laguna Irrigation District

- McMullin Area Groundwater Sustainability Agency
- Mid-Kings River Groundwater Sustainability Agency
- North Fork Kings Groundwater Sustainability Agency
- North Kings Groundwater Sustainability Agency
- Riverdale Irrigation District
- South Fork Kings Groundwater Sustainability Agency
- South Kings Groundwater Sustainability Agency
- Southwest Kings Groundwater Sustainability Agency
- Stratford Irrigation District
- Tri-County Water Authority Groundwater Sustainability Agency
- Tulare Lake Basin Water Storage District
- Tulare Lake Reclamation District #761

Native American Tribes

Federally Recognized Tribes

- Big Sandy Rancheria of Western Mono Indians
- Chicken Ranch Rancheria of Me-Wuk Indians
- Cold Springs Rancheria
- Kings River Choinumni Farm Tribe
- Nashville Enterprise Miwok-Maidu-Nishinam Tribe
- North Fork Rancheria of Mono Indians
- Picayune Rancheria of Chukchansi Indians
- Santa Rosa Rancheria Tachi Yokut Tribe
- Table Mountain Rancheria
- Tejon Indian Tribe
- Tule River Indian Reservation

Other Tribes

- Dumna Wo-Wah Tribal Government
- Dunlap Band of Mono Indians
- Kitanemuk & Yowlumne Tejon Indians
- North Fork Mono Tribe

- Traditional Choinumni Tribe
- Wuksache Indian Tribe/Eshom Valley Band

Non-Governmental Organizations and Businesses

- American Rivers
- American Whitewater
- Burrel Ditch Company
- California Hydropower Reform Coalition
- California Sportfishing Protection Alliance
- California Trout
- Crescent Canal Company
- El Rio Reyes Conservation Trust
- Fresno Fly Fishers
- Friends of the River
- Hanson Environmental
- John Heinlen Mutual Water Company
- Kaweah Fly Fishers
- Kings River Conservancy
- Kings River Water Association
- Last Chance Water Ditch Company
- Lemoore Canal & Irrigation Company
- Liberty Canal Company
- Liberty Mill Race Company
- Natural Heritage Institute
- Northwest Hydroelectric Association
- Pacific Gas and Electric Company (PG&E)
- People’s Ditch Company
- Reed Ditch Company
- Sierra Land Use Committee
- Southeast Lake Water Company
- Stinson Canal & Irrigation Company

- Trout Unlimited
- Tulare Lake Canal Company
- Upper San Jose Water Company

KRCD requested from each of the parties:

1. Any existing, relevant, and reasonably available information in their possession, or a link to where that information may be accessed, that describes the potentially affected environment. Assume that KRCD already has in its possession all relevant information developed by KRCD for the Project.
2. A list of any issues they believe KRCD should address in its PAD and license application, including potential Project effects.
3. A description of any information, including studies, they believe will be needed to assess the Project effects and inform license requirements.
4. The contact information for any other persons outside their agency or affiliation they believe would be interested in the relicensing.

Documentation of this outreach is included in Attachment A to this PAD. KRCD received no responses to its information request.

KRCD held a web-based virtual meeting with interested stakeholders on May 12, 2023, to provide a Project and relicensing overview and to answer any stakeholder questions. Besides KRCD and its consultant, representatives from the following stakeholders attended the meeting: DWR, CDFW, Dunlap Band of Mono Indians, Hanson Environmental, SWRCB, and USACE. Action items from the meeting included distributing the meeting presentation to participants and developing a glossary of commonly used FERC terms, which is included with this PAD as Attachment B and distributed to stakeholders.

1.6 KRCD'S RELICENSING PROCESS PLAN AND SCHEDULE

1.6.1 Regulatory Relicensing Deadlines

On or about February 1, 2024, KRCD filed a request for FERC to authorize KRCD to use the Traditional Licensing Process (TLP) as described in 18 C.F.R. Part 4 and Part 16, rather than the Integrated Licensing Process (ILP) as described in 18 C.F.R. Part 5, to relicense the Project.[7] Some dates are fixed under both the TLP and ILP by the current license expiration date. These fixed dates are:

[7] KRCD anticipates that FERC will reply to KRCD's request to use the TLP within 60 days of the date that KRCD filed its request.

- February 1, 2024 – The earliest date KRCD may file with FERC an NOI and a PAD.
- August 1, 2024 – The latest date KRCD may file with FERC an NOI and PAD.
- August 31, 2027 – The latest date that KRCD may file with FERC a Final Application for New License (FLA).
- August 31, 2029 – The date the original FERC license for the Project expires.

In addition, KRCD anticipates that FERC will consult with federally-recognized Native American tribes within 30 days of the date KRCD files its NOI and PAD, and FERC will issue a notice that the application was filed within 60 days of the date KRCD files its NOI and PAD.

Since, at the time KRCD files this PAD, it is uncertain whether FERC will approve KRCD’s request to utilize the TLP, Table 1.6-1 shows a schedule for relicensing the Project through filing of the FLA using either the TLP or the ILP. KRCD developed the table using the timeframes set forth in 18 C.F.R. Part 4 and Part 16 as applicable, for the TLP and in 18 C.F.R. Part 5, for the ILP, and based the table on an anticipated NOI and PAD filing date of February 1, 2024. Table 1.6-1 shows for both the ILP and TLP: 1) the pertinent regulations for each activity; 2) the party or parties responsible for initiating the activity; 3) a description of the activity including, where appropriate, a previous activity linked to this activity; and 4) the calendar duration of the activity. When an activity is contingent upon completion of a previous activity or an extension may be granted for a designated period, Table 1.6-1 assumes the previous activity will be completed the latest possible date shown for that previous activity, unless otherwise indicated.

KRCD anticipates that FERC will issue its own schedule, which will become the formal relicensing schedule, after KRCD files its NOI and PAD, and that FERC’s schedule will include the post-application filing period (i.e., from filing of the FLA through issuance of a new license).

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Table 1.6-1. Process plan and schedule for KRCD's Jeff L. Taylor-Pine Flat Power Plant relicensing using either FERC's Integrated Licensing Process or Traditional Licensing Process.

Integrated Licensing Process (ILP)					Traditional Licensing Process (TLP)				
Subsection(s)	Lead	Activity[1]	Timeframe (Start and Finish)[3]		Subsection(s)	Lead	Activity[1]	Timeframe (Start and Finish)[3]	
					18 C.F.R. § 5.3.				
					(a)-(d)	KRCD	File request to use TLP (NLT filing of Notice of Intent [NOI])	February 1, 2024 (Thursday)	
18 C.F.R. § 5.5. NOTIFICATION OF INTENT					**18 C.F.R. § 5.5. NOTIFICATION OF INTENT**				
(a)-(g)	KRCD	File Notice of Intent (NOI) on KRCD's intent to file an application for a new license and request for non-federal representative status under § 7 of the Endangered Species Act (ESA) and § 106 of the National Historic Preservation Act (NHPA) *(no earlier than 5.5 years and no later than 5 years prior to expiration of the current license)*	February 1, 2024 (Thursday)		(a)-(g)	KRCD	File an NOI on KRCD's intent to file an application for a new license and request for non-federal representative status under § 7 of the Endangered Species Act (ESA) and § 106 of the National Historic Preservation Act (NHPA) *(no earlier than 5.5 years and no later than 5 years prior to expiration of the current license)*	February 1, 2024 (Thursday)	
18 C.F.R. § 5.6. PRE-APPLICATION DOCUMENT					**18 C.F.R. § 5.6. PRE-APPLICATION DOCUMENT**				
(a)-€	KRCD	File Pre-Application Document (PAD) *(no earlier than 5.5 years and no later than 5 years prior to expiration of the current license)*	February 1, 2024 (Thursday)		(€(e)	KRCD	File Pre-Application Document (PAD) *(no earlier than 5.5 years and no later than 5 years prior to expiration of the current license)*	February 1, 2024 (Thursday)	
18 C.F.R. § 5.7. TRIBAL CONSULTATION					**18 C.F.R. § 5.7. TRIBAL CONSULTATION**				
--	FERC	Hold meeting with potentially affected Native American tribes *(no later than [NLT] 30 days of date NOI and PAD filed)*	February 2, 2024 (Friday)	March 4, 2024[2] (Monday)	--	FERC	Hold meeting with potentially affected Native American tribes *(NLT 30 days of date NOI and PAD filed)*	February 2, 2024 (Friday)	March 4, 2024[2] (Monday)
18 C.F.R. § 5.8. NOTICE OF COMMENCEMENT OF PROCEEDING AND SCOPING DOCUMENT, FERC DECISION ON USE OF TLP, AND INITIATION OF ESA AND NHPA INFORMAL CONSULTATION					**18 C.F.R. § 5.8. NOTICE OF COMMENCEMENT OF PROCEEDING AND SCOPING DOCUMENT, FERC DECISION ON USE OF TLP, AND INITIATION OF ESA AND NHPA INFORMAL CONSULTATION**				
(a)	FERC	Issue Notice of Commencement of Proceeding (NCP) and decision regarding KRCD's request to use TLP *(NLT 60 days of date NOI and PAD filed)*	February 2, 2024 (Friday)	April 1, 2024 (Monday)	(a)	FERC	Issue Notice of Commencement of Proceeding (NCP) and decision regarding KRCD's request to use TLP *(NLT 60 days of date NOI and PAD filed)*	February 2, 2024 (Friday)	April 1, 2024 (Monday)
(b)	FERC	Designate KRCD as FERC's non-federal representative and request initiation of informal consultation under § 7 of the ESA and/or § 106 of the NHPA, if appropriate *(NLT 60 days of date NOI and PAD filed)*	February 2, 2024 (Friday)	April 1, 2024 (Monday)	(b)	FERC	Designate KRCD as FERC's non-federal representative and request initiation of informal consultation under § 7 of the ESA and/or § 106 of the NHPA, if appropriate *(NLT 60 days of date NOI and PAD filed)*	February 2, 2024 (Friday)	April 1, 2024 (Monday)
18 C.F.R. § 5.8. ISSUE SCOPING DOCUMENT 1									
(c)	FERC	Issue Scoping Document 1 (SD1) *(NLT 60 days of date NOI and PAD filed)*	February 2, 2024 (Friday)	April 1, 2024 (Monday)					
18 C.F.R. § 5.8. HOLD NEPA SCOPING MEETING AND SITE VISIT					**18 C.F.R. § 16.8. FIRST STAGE CONSULTATION – HOLD JOINT MEETING AND SITE VISIT**				
					(b)(3)(i)(B)	KRCD	Consult with the resource agencies, Native American tribes, and members of the public on the scheduling of a joint meeting *(NLT 15 days in advance of the joint meeting)*	April 2, 2024 (Tuesday)	May 16, 2024 (Thursday)
(e)	FERC	Post notice of NEPA scoping meeting in Federal Register and local newspapers *(NLT 30 days of date NCP issued)*	April 2, 2024 (Tuesday)	May 1, 2024 (Wednesday)	(b)(3)(i)(B) [and 18 CFR § 16.8(h)(i)]	KRCD	Post notice of joint meeting in local newspapers, including purpose, location, time, and agenda *(NLT 14 days in advance of the joint meeting)*	April 2, 2024 (Tuesday)	May 17, 2024 (Friday)
(e)	FERC	Notify agencies, tribes, and non-governmental organizations electronically or by mail of scoping meeting *(NLT 30 days of date NCP issued)*	April 2, 2024 (Tuesday)	May 1, 2024 (Wednesday)	(b)(3)(i)(B)	KRCD	Provide to resource agencies, Native American tribes, and FERC a written notice of the time and place of the joint meeting and an agenda of the issues to be discussed at the joint meeting *(NLT 15 days in advance of the joint meeting)*	April 2, 2024 (Tuesday)	May 16, 2024 (Thursday)

Table 1.6-1. (continued)

Integrated Licensing Process (ILP)				
Subsection(s)	**Lead**	**Activity[1]**	**Timeframe (Start and Finish)[3]**	
18 C.F.R. § 5.8. HOLD NEPA SCOPING MEETING AND SITE VISIT (Continued)				
(d)	FERC	Hold NEPA scoping meeting and conduct site visit *(NLT 30 days of date NCP issued)*	April 2, 2024 (Tuesday)	May 1, 2024 (Wednesday)
(d)	Relicensing Participants	Resource agencies, Native American tribes and members of the public may attend the NEPA scoping meeting to identify issues for NEPA scoping, preliminary identify study needs, discuss process plan and schedule, and cooperating agency status (*NLT 30 days of date NCP is issued*)	April 2, 2024 (Tuesday)	May 1, 2024 (Wednesday)
--	FERC	Post either an audio recording or written transcripts of the joint meeting on e-Library	--	
18 C.F.R. § 5.9. COMMENTS AND INFORMATION OR STUDY REQUESTS				
(a)	KRCD & Relicensing Participants	File comments on PAD and SD1, and request studies *(NLT 60 days of date NCP issued)*	April 2, 2024 (Tuesday)	May 31, 2024 (Friday)
18 C.F.R. § 5.10. SCOPING DOCUMENT 2				
--	FERC	Issue Scoping Document 2 (SD2) *(NLT 45 days of the end of PAD and SD1 comment period)*	June 1, 2024 (Saturday)	July 15, 2024 (Monday)
18 C.F.R. § 5.11. APPLICANT'S PROPOSED STUDY PLAN AND STUDY PLAN MEETINGS				
(a)	KRCD	File Proposed Study Plan *(NLT 45 days of the end of PAD and SD1 comment period)*	June 1, 2024 (Saturday)	July 15, 2024 (Monday)
(e)	KRCD	Hold Proposed Study Plan meeting *(NLT 30 days after date Proposed Study Plan filed)*	July 16, 2024 (Tuesday)	August 14, 2024 (Wednesday)
18 C.F.R. § 5.12. COMMENTS ON PROPOSED STUDY PLAN				
--	Relicensing Participants	File comments on Proposed Study Plan *(NLT 90 days after date Proposed Study Plan is filed)*	July 16, 2024 (Tuesday)	October 14, 2024[2] (Monday)
18 C.F.R. § 5.13. REVISED STUDY PLAN AND STUDY PLAN DETERMINATION				
(a)	KRCD	File Revised Study Plan (*NLT 30 days of date Proposed Study Plan comment period ends)*	October 15, 2024 (Tuesday)	November 13, 2024 (Wednesday)
(b)	Relicensing Participants	File comments on Revised Study Plan *(NLT 15 days of the date Revised Study Plan is filed)*	November 14, 2024 (Tuesday)	November 29, 2024 (Friday)
(c)	FERC	Issue Study Plan Determination (SPD) *(NLT 30 days of date Revised Study Plan is filed)*	November 14, 2024 (Tuesday)	December 16, 2024[2] (Monday)
(d)	FERC	Revised Study Plan deemed approved *(20th day after FERC issues SPD if no study plan disputes filed)*	January 6, 2025[2] (Monday)	
18 C.F.R. § 5.14. FORMAL STUDY DISPUTE RESOLUTION PROCESS				
(a)	Mandatory Conditioning Agencies and Tribes	File Notice of Dispute (NOD) *(NLT 20 days of date FERC SPD issuance)*	December 16, 2024 (Monday)	January 6, 2025[2] (Monday)

Traditional Licensing Process (TLP)				
Subsection(s)	**Lead**	**Activity[1]**	**Timeframe (Start and Finish)[3]**	
18 C.F.R. § 16.8. FIRST STAGE CONSULTATION – HOLD JOINT MEETING AND SITE VISIT (Continued)				
(b)(3)(ii)(B)	KRCD	Hold the joint meeting and provide an opportunity for a site visit to review the information and discuss the data and studies to be provided by KRCD as part of the consultation process (*No earlier than (NET) 30 days but NLT 60 days of FERC approval to use TLP is issued*)	May 1, 2024 (Wednesday)	May 31, 2024 (Friday)
(b)(4)	Relicensing Participants	Resource agencies, Native American tribes and members of the public may attend the joint meeting to express their views regarding resource issues that should be addressed in the application. Public attendance at the site visit is at the discretion of KRCD (*NET 30 days but NLT 60 days of FERC approval to use TLP is issued*)	May 1, 2024 (Wednesday)	May 31, 2024 (Friday)
(b)(4)	KRCD	Make either an audio recording or written transcripts of the joint meeting, and promptly provide copies of these recordings, upon request (*Promptly provide to FERC, agencies, and Indian tribes, upon request*)	Promptly provide following the joint meeting	
18 C.F.R. § 16.8. FIRST STAGE CONSULTATION - STUDY REQUESTS AND DISPUTE RESOLUTION				
(b)(5)	Relicensing Participants	Provide to KRCD written comments identifying Relicensing Participant's determination of necessary studies to be performed or the information to be provided by KRCD (*NLT 60 days after joint meeting unless deadline is extended to 120 days by FERC*)	June 1, 2024 (Saturday)	July 30, 2024 (Tuesday)

Table 1.6-1. (continued)

Integrated Licensing Process (ILP)					Traditional Licensing Process (TLP)				
Subsection(s)	**Lead**	**Activity[1]**	**Timeframe (Start and Finish)[3]**		**Subsection(s)**	**Lead**	**Activity[1]**	**Timeframe (Start and Finish)[3]**	
18 C.F.R. § 5.14. FORMAL STUDY DISPUTE RESOLUTION PROCESS (Continued)					**18 C.F.R. § 16.8. FIRST STAGE CONSULTATION - STUDY REQUESTS AND DISPUTE RESOLUTION (Continued)**				
(d)	FERC	Convene Dispute Resolution Panel (DRP) (*NLT 20 days of date NOD filed)*	January 7, 2025 (Tuesday)	January 27, 2025[2] (Monday)					
(i)	KRCD & Relicensing Participants	File comments and information on NOD *(NLT 25 days of date NOD filed)*	January 7, 2025 (Tuesday)	January 31, 2025 (Friday)					
(k)	DRP	Deliver to FERC finding on NOD *(NLT 50 days of date NOD filed)*	January 7, 2025 (Tuesday)	February 25, 2025 (Tuesday)					
(l)	FERC	Director of Office of Energy Projects issues written determination regarding NOD *(NLT 70 days of date NOD filed)*	January 7, 2025 (Tuesday)	March 17, 2025 (Monday)					
					(b)(6)(i)	KRCD & Relicensing Participants	During first stage consultation, if KRCD and Relicensing Participant disagree regarding any matter or regarding the need to conduct a study or gather information, KRCD or the Relicensing Participant may refer the dispute in writing to FERC for resolution, providing a copy to other affected parties (*any time during first stage consultation*).	July 30, 2024 (Tuesday)	Until First Stage Consultation ends
					(b)(6)(ii)	Disagreeing Party	If a dispute is filed with FERC, the disagreeing party may file a response (*NLT 15 days from the date the dispute is filed with FERC*)	NLT 15 days from the date the dispute is filed with FERC	
					(b)(6)(iv)	FERC	FERC resolves dispute	--	--
18 C.F.R. § 5.15. CONDUCT STUDIES					**18 C.F.R. § 16.8. SECOND STAGE CONSULTATION – CONDUCT STUDIES**				
(a)	KRCD	Conduct studies	January 7, 2025 (Tuesday)	January 7, 2027 (Thursday)	(c)(1)	KRCD	Conduct studies. Unless otherwise determined by FERC, KRCD must promptly initiate all reasonable and necessary studies and information requested by resource agencies and tribes, as provided for under §16.8(b).	July 30, 2024[5] (Tuesday)	August 31, 2027[5] (Tuesday)
(b)	KRCD	File periodic progress reports	FERC determine frequency						
(c)(1)	KRCD	File Initial Study Report *(NLT 1 year after FERC's approval of Revised Study Plan as approved in the SPD)*	January 7, 2025 (Tuesday)	January 6, 2026 (Tuesday)					
(c)(2)	KRCD	Hold Initial Study Report meeting *(NLT 15 days of date Initial Study Report filed)*	January 7, 2026 (Wednesday)	January 21, 2026 (Wednesday)					
(c)(3)	KRCD	File Initial Study Report meeting summary including proposed plan modifications and new studies *(NLT 15 days after Initial Study Report meeting)*	January 22, 2026 (Thursday)	February 5, 2026 (Thursday)					
(c)(7)	FERC	Approval of meeting summary and study plan modifications if no disagreements filed *(30th day after meeting summary filed)*	March 9, 2026[2] (Monday)						
(c)(4)	Relicensing Participants	File disagreements with meeting summary including KRCD's proposed study plan modifications and new studies *(NLT 30 days after Initial Study Report meeting summary filed)*	February 6, 2026 (Friday)	March 9, 2026[2] (Monday)					
(c)(5)	KRCD & Relicensing Participants	File responses to disagreements *(NLT 30 days after disagreement period ends)*	March 10, 2026 (Tuesday)	April 8, 2026 (Wednesday)					
(c)(6)	FERC	Resolve disagreement and amend study plan *(NLT 30 days after responses to disagreements period ends)*	April 9, 2026 (Thursday)	May 8, 2026 (Friday)					
(f)	KRCD	File Updated Study Report, including election of KRCD to file a Draft License Application (DLA) rather than a Preliminary Licensing Proposal (PLP), if KRCD chose to do so *(Per FERC-approved SPD schedule or NLT 2 years after FERC's approval of Revised Study Plan in the SPD, whichever comes first)*	January 7, 2025 (Tuesday)	January 6, 2027 (Wednesday)					
(c)(2)	KRCD	Hold Updated Study Report meeting *(NLT 15 days of date Updated Study Report filed)*	January 7, 2027 (Thursday)	January 21, 2027 (Thursday)					

Table 1.6-1. (continued)

Integrated Licensing Process (ILP)					Traditional Licensing Process (TLP)				
Subsection(s)	**Lead**	**Activity[1]**	**Timeframe (Start and Finish)[3]**		**Subsection(s)**	**Lead**	**Activity[1]**	**Timeframe (Start and Finish)[3]**	
18 C.F.R. § 5.15. CONDUCT STUDIES (cont.)					**18 C.F.R. § 16.8. SECOND STAGE CONSULTATION – CONDUCT STUDIES (cont.)**				
(c)(3)	KRCD	File Updated Study Plan meeting summary including KRCD's proposed study plan modifications and new studies *(NLT 15 days after Updated Study Report meeting)*	January 22, 2027 (Friday)	February 5, 2027 (Friday)					
(c)(7)	FERC	Approve meeting summary and study plan modifications if no disagreements filed *(30 days after meeting summary filed)*	March 8, 2027[2] (Monday)						
(c)(4)	Relicensing Participants	File disagreements with meeting summary and proposed study modifications and new studies *(NLT 30 days after Updated Study Report meeting summary filed)*	February 6, 2027 (Saturday)	March 8, 2027[2] (Monday)					
(c)(5)	KRCD & Relicensing Participants	File response to disagreements *(NLT 30 days after disagreement period ends)*	March 9, 2027 (Tuesday)	April 7, 2027 (Wednesday)					
(c)(6)	FERC	Resolve disagreement and amend study plan *(NLT 30 days after response to disagreements period ends)*	April 8, 2027 (Thursday)	May 7, 2027 (Friday)					
					(c)(2)	Relicensing Participants	During Second Stage Consultation, a resource agency, Native American tribe, and a member of the public may request KRCD conduct a study or gather information not previously identified. KRCD must promptly initiate all reasonable and necessary studies or gather the information unless FERC makes a determination that the study or information is unreasonable or unnecessary, or that the methodology requested by a Resource Agency or Native American tribe for conducting the study is not a generally accepted practice (*during second stage consultation*).	When Second Stage Consultation begins	Until Second Stage Consultation ends
					(c)(2)	KRCD	KRCD may refer the request to FERC for dispute resolution, copying affected parties.	--	--`
					(b)(6)(ii)	KRCD	If KRCD files the dispute with FERC, other affected parties may file a response (*NLT 15 days from the date the dispute is filed with FERC*)	NLT 15 days from the date KRCD files the dispute with FERC	
					(b)(6)(iv)	FERC	FERC resolves dispute	--	
18 C.F.R. § 5.16. PRELIMINARY LICENSING PROPOSAL OR DRAFT LICENSE APPLICATION					**18 C.F.R. § 16.8. SECOND STAGE CONSULTATION – DRAFT LICENSE APPLICATION**				
(a)–(d)	KRCD	File PLP or DLA *(No less than 150 days prior to deadline for filing license application)*	April 5, 2027[2] (Monday)		c(4)	KRCD	Provide to agencies and Native American tribes a copy of the DLA, including full documentation of consultation. *(No less than 150 days prior to deadline for filing license application)*	April 5, 2027[2] (Monday)	
(e)	Relicensing Participants	File comments on PLP/DLA *(NLT 90 days of date PLP or DLA filed)*	April 6, 2027 (Tuesday)	July 6, 2027[2] (Tuesday)	c(5)	Resource Agencies & Native American Tribes	Provide written comments on DLA to KRCD (*NLT 90 days of date PLP or DLA filed*)	April 6, 2027 (Tuesday)	July 6, 2027 (Tuesday)
					c(6)(ii)	KRCD	Consult with disagreeing party and others about scheduling of joint meeting, and provide FERC, disagreeing party and others with written notice of the time and place of the joint meeting and a written agenda of the issues to be discussed at the joint meeting (*NLT 15 days in advance of the joint meeting*)	NLT 15 days in advance of the joint meeting	c(6)(ii)
					c(6)(i)	KRCD, Resource Agencies & Native American Tribes	If comments indicate that a resource agency or Native American tribe has a substantive disagreement with KRCD's conclusions regarding resource impacts or proposed PM&E measures, KRCD holds at least one joint meeting with the disagreeing resource agency or Native American tribe and other agencies with similar or related areas of interest, expertise, or responsibility to discuss and to attempt to reach agreement. (*NLT 60 days from the date of the written comments of the disagreeing agency or Indian tribe*)	July 7, 2027 (Wednesday)	September 6, 2027[2] (Monday)
					c(7)	KRCD & Disagreeing Party	KRCD and the disagreeing resource agency or Native American tribe may conclude the joint meeting with a document embodying any agreement and any issues that are unresolved.	--	--

Table 1.6-1. (continued)

Integrated Licensing Process (ILP)				Traditional Licensing Process (TLP)			
Subsection(s)	**Lead**	**Activity[1]**	**Timeframe (Start and Finish)[3]**	**Subsection(s)**	**Lead**	**Activity[1]**	**Timeframe (Start and Finish)[3]**
				c(8)	KRCD	KRCD describes all disagreements with a resource agency or Native American tribe on technical or PM&E measures in its application, including an explanation of the basis for KRCD's disagreement with the resource agency or Native American tribe.	--
18 C.F.R. § 5.17. FILING OF APPLICATION				**18 C.F.R. § 16.8. THIRD STAGE CONSULTATION – FINAL LICENSE APPLICATION**			
(a)	KRCD	File a Final License Application (FLA) *(NLT 24 months prior to expiration of the current license)*	August 31, 2027 (Tuesday)	(d)(1)-d(2)	KRCD	File a Final License Application (FLA) and provide a copy of the FLA to agencies, Native American tribes, governmental offices and consulted members of the public *(NLT 2 years prior to expiration of the current license)*	August 31, 2027 (Tuesday)
				(f)	KRCD	Include in Exhibit E documentation of all consultation regarding comments, recommendation and proposed terms and conditions and studies. If the comments, recommendation and proposed terms and conditions and studies were not accepted by KRCD, describe why. (*unspecified*)	Include in FLA

1 The activity description is a good faith effort to summarize the pertinent regulation. The reader is encouraged to read the specific regulation.
2 18 C.F.R. § 385.2007(a)(2) provides that if a filing date falls on a Saturday, Sunday or federal legal public holiday, the deadline for filing becomes the next business day. The schedule includes this consideration.
3 When an activity is contingent upon completion of a previous activity, the schedule assumes the previous activity is completed the latest date possible for that previous activity, unless otherwise indicated.
4 The ILP schedule assumes that studies, if needed, begin when FERC's Study Plan Determination is deemed final, and may continue for 2 years or more, as determined by FERC.
5 The TLP schedule assumes that studies begin after the deadline for providing to KRCD written comments identifying necessary studies or information, and may continue until KRCD files the FLA with FERC

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1.6.2 KRCD's Proposed Location and Dates of the TLP Joint Meeting and Site Visit or the ILP NEPA Scoping Meeting and Site Visit

1.6.2.1 TLP Joint Meeting and Site Visit

If FERC authorizes KRCD to use the TLP, then based on the TLP process schedule in Table 1.6-1, KRCD's proposed date and location of the TLP site visit are as follows:

- Proposed Site Visit – from 9 AM to 12 PM on May 1, 2024, at the Project.

KRCD proposes holding the TLP joint meeting on the same day as the site visit. Specifically, KRCD proposes:

- Proposed Joint Meeting – from 1 PM to 4 PM on May 1, 2024, at KRCD's office located at 4886 E Jensen Avenue, Fresno, California 93725 and virtually via Teams.

The above site visit and joint meeting will only occur if FERC authorizes KRCD's use of the TLP.

1.6.2.2 ILP NEPA Scoping Meeting and Site Visit

If FERC does not approve KRCD's request to use the TLP, Section 5.6(d)(1) of 18 C.F.R. requires an applicant using the ILP to include in its PAD a proposal to FERC for dates and locations for FERC's ILP scoping meeting and site visit. Based on the ILP process schedule in Table 1.6-1, KRCD proposes FERC hold the ILP site visit as follows:

- Proposed Site Visit – from 9 AM to 12 PM on May 1, 2024, at the Project.

KRCD proposes FERC hold the ILP joint meeting on the day of the site visit. Specifically, KRCD proposes:

- Proposed Joint Meeting – from 1 PM to 4 PM on May 1, 2024, at KRCD's office located at 4886 E Jensen Ave, Fresno, California 93725.

However, FERC will set the schedule and location for a FERC ILP site visit and joint meeting, if the ILP is used.

1.6.3 Discretionary Activities

Table 1.6-1 provides a general schedule of regulatory deadlines, many of which must be adhered to by stakeholders, including KRCD and FERC. However, within the confines of those regulations, KRCD may choose to undertake discretionary activities to facilitate the relicensing, such as holding additional meetings and/or workshops. Of note, KRCD may choose to issue the DLA earlier than the dates shown in Table 1.6-1.

1.7 COMMUNICATION GUIDELINES

1.7.1 Objectives

The communication guidelines describe how KRCD plans to communicate and interact with stakeholders during the relicensing, regardless of whether the ILP or TLP is used. Of note:

- These guidelines do not supersede or in any way modify FERC's regulations or any other federal regulation related to the relicensing, including those related to Section 106 of the National Historic Properties Act (NHPA), Section 7 of the Endangered Species Act (ESA), or Section 401 of the Clean Water Act (CWA).
- These guidelines do not apply to FERC or any documents, meetings, correspondence, or other actions for which FERC is responsible for during the relicensing process.
- These guidelines do not apply to stakeholders. Each stakeholder may choose how it wishes to communicate during the relicensing.
- These are guidelines, not hard rules.
- KRCD may revise these communication guidelines as necessary at any time during the relicensing process.

1.7.2 Participation

1.7.2.1 Participants

Participation in the relicensing is open to any federal agency; State of California agency; local agency; NGO; Native American tribe, including tribes that are formally recognized by the federal government, tribes that are not formally recognized by the federal government, and individual tribal representatives; businesses; and unaffiliated members of the public. KRCD assumes that each stakeholder is authorized to speak on behalf of the agency, organization, or affiliation that they represent in the relicensing.

1.7.2.2 Late Participants in the Relicensing

KRCD anticipates each stakeholder that begins participating in the relicensing after the initiation of the relicensing processes (i.e., filing of the NOI and PAD) will take actions, including consulting with KRCD and other stakeholders regarding available information, as necessary to become informed and "up-to-speed." KRCD intends that late or delayed participation will not be allowed to disrupt the relicensing.

1.7.3 Stakeholders Contact List

KRCD will maintain a list of parties that are likely to be interested in the relicensing or that have specifically expressed to KRCD an interest in the relicensing.

KRCD will request that each of these potentially interested parties provide appropriate information (i.e., name, title, affiliation, mailing address, and telephone number, and e-mail address) for its designated contact for the relicensing. KRCD assumes that designated contacts will keep the appropriate members of their agency, tribe, or NGO advised of relicensing activities. Also, KRCD anticipates that each agency, tribe, and NGO will notify KRCD if contact information for its designated contact changes.

Relicensing can be a long process. To keep the Stakeholders' Contact List current, KRCD will periodically issue an e-mail to all those on the Contact List asking for each contact to confirm whether or not they wish to remain on the Contact List. KRCD will assume that those who do not respond in a timely fashion are no longer interested in the relicensing and delete those individuals from the Contact List.

Because KRCD understands that some people would be uncomfortable if their contact information was made readily available, KRCD will not provide the Contact List to parties or otherwise make it publicly available.

1.7.4 Relicensing Website

KRCD has established and will maintain a publicly accessible internet website as a means of making information regarding the relicensing readily available to stakeholders. Examples of information that will be provided on the website include the NOI and PAD as well as other documents as they are developed. Many of the folders on the website will be empty until the documents for each folder are developed. KRCD's Relicensing Website can be accessed at https://www.krcd.org/relicensing/.

1.7.5 Meetings

As noted above, these communication guidelines apply only to KRCD-sponsored meetings. KRCD anticipates that meetings sponsored by another party (e.g., FERC or a stakeholder) will be organized, announced, hosted, and followed-up on by that other party. The guidelines KRCD intends to follow for KRCD-sponsored meetings are provided below.

1.7.5.1 In-Person Meeting Locations and Start Time

KRCD intends that any in-person meeting locations and start times will be selected by KRCD in consultation with interested stakeholders to ensure the greatest participation by those who wish to attend the meeting and the least amount of inconvenient travel for meeting participants overall. KRCD assumes that each stakeholder will be aware of any meeting start time and location posted on the Relicensing Website Event Calendar.

1.7.5.2 Virtual Meetings

To accommodate constrained schedules, minimize travel time, encourage participation, and make meetings as accessible as possible to meeting participants, KRCD will arrange meetings such that they offer a virtual option for stakeholders, even for meetings otherwise planned to be in-person. KRCD will give virtual meeting information to interested stakeholders, as appropriate when scheduling a meeting no later than three days prior to the date of a meeting. As discussed under Section 1.7.5.7 below, stakeholder participation in certain virtual meetings may be limited to those on a need-to-know basis if these meetings involve discussions of sensitive and confidential information such as cultural and biological resources information.

1.7.5.3 Event Calendar

An Event Calendar that includes scheduled KRCD-sponsored meetings, as well as key relicensing milestone dates, will be maintained on the Relicensing Website. Stakeholders may view the Event Calendar to see when a meeting is planned. The calendar will provide details, such as location and an agenda for the meeting, and any information that may be required to participate in video or teleconferences.

1.7.5.4 Meeting Agenda

KRCD will develop an agenda for an upcoming KRCD meeting based on regulatory requirements and input from the stakeholders at previous meetings or as otherwise reasonable. Standard items on each meeting agenda will include:

- Introductions
- Purpose of Meeting
- Review of Agenda
- Review Overall Relicensing Schedule
- Administrative Items, if any
- Status Reports If Appropriate or Requested, if any
- Specific Meeting Agenda Items
- Review of Decisions and Action Items

Those who plan to attend a KRCD-sponsored meeting, in-person, virtual or teleconference should understand that those at the meeting may re-organize the agenda or proceed through an agenda at a faster or slower pace than anticipated when the agenda was developed.

1.7.5.5 Meeting Moderation/Facilitation

KRCD is committed to an open and transparent process with a free exchange of information and interests among KRCD and all stakeholders during meetings. KRCD anticipates leading KRCD-sponsored meetings. KRCD will make a good-faith effort to ensure that all meeting participants are provided opportunities to participate and speak during the meeting.

If KRCD and stakeholders jointly agree that a facilitator is pivotal to the success of any KRCD-sponsored meeting or group of meetings, KRCD will provide a neutral third-party facilitator for that relicensing meeting or group of meetings.

1.7.5.6 Meeting Action Items and Decisions

KRCD does not intend to prepare a summary of meetings unless: 1) KRCD and stakeholders jointly agree that a summary would be important in tracking a particular issue and agree on specific wording that will be included in the summary; or 2) FERC regulations require a summary of the meeting be prepared and filed with FERC. If KRCD prepares a summary, KRCD will post the summary on the Relicensing Website Event Calendar for that meeting, unless the summary is otherwise filed with FERC and available on FERC's eLibrary.

1.7.5.7 Privileged Meetings and Material

Some meetings and information prepared for or shared during a meeting may be privileged. For example, information on Native American resources and locations of sensitive environmental and cultural resources are considered confidential. Privileged material and material considered by KRCD to be Critical Energy/Electric Infrastructure Information (CEII) will have restrictions on their distribution. KRCD will share Privileged information with only those stakeholders who have a need-to-know basis. Further, KRCD anticipates that any stakeholder providing Privileged information to KRCD will identify and so mark each page of the information as Privileged or confidential in advance of providing it to KRCD.

1.7.5.8 Attendance at Meetings

KRCD encourages each stakeholder to make a good faith effort to be represented at every KRCD-sponsored relicensing meeting that is of interest to the stakeholder.

1.7.5.9 Preparation for Meetings

KRCD encourages stakeholders to make good faith efforts to arrive at or enter meetings on time, read background information provided before each meeting, and be prepared to effectively discuss topics on the meeting agenda. KRCD encourages stakeholders to discuss material on the agenda with other stakeholders whom they think might be interested in the material.

1.7.5.10 Caucus

KRCD encourages stakeholders to call for a caucus, if needed, at any time during a KRCD-sponsored meeting.

1.7.5.11 Stakeholders Unable to Attend a Meeting

If a stakeholder finds that they are unable to attend or is unable to have a representative attend a KRCD-sponsored meeting, the stakeholder may provide to KRCD any input the stakeholder wishes to be considered at the meeting. If this occurs, KRCD will make a good faith effort to convey the information accurately, disclosing who provided the information and when they provided it, to stakeholders at the meeting.

1.7.6 Documents

FERC's regulations identify documents that are required during relicensing. The ILP and TLP regulations stipulate that either FERC, the applicant, or in some instances another party, is responsible for producing these necessary documents. KRCD anticipates that there will also be other informal documents generated during the relicensing.

1.7.6.1 FERC's Documents

For documents issued by FERC, KRCD anticipates that FERC will distribute the documents in accordance with FERC's protocols. KRCD anticipates that all documents issued or received by FERC will be posted and publicly available in the e-Library on FERC's website at www.ferc.gov. To view these, a stakeholder should click on "Documents and Filing," "eLibrary," then "General Search." FERC's website provides further instructions for obtaining documents. Each stakeholder can register to receive a notice each time FERC posts a document to its website regarding the relicensing of the Project. To register, a stakeholder should go to FERC's website, click on "Documents and Filing," and then "eSubscription." FERC's website provides further instructions.

1.7.6.2 Non-KRCD or Non-FERC Generated Documents

KRCD expects that any stakeholder that creates, files with FERC, or distributes a document, including correspondence, will be responsible for the distribution of the document. A stakeholder should not assume that by using the "Reply All" function in a KRCD-generated e-mail, all stakeholders on the Contact List received their e-mail.

KRCD reminds stakeholders that FERC encourages parties when filing material with FERC to submit an electronic filing pursuant to 18 C.F.R. § 385.2003(a) or file a complete hardcopy original and required number of copies of the filing to the Office of the Secretary, Federal Energy Regulatory Commission, 888 First Street, N.E., Washington, DC 20426. The filing should reference the Project (Jeff L. Taylor-Pine Flat Power Plant) and FERC Project No. 2741.

1.7.6.3 KRCD's Documents

KRCD anticipates using FERC's e-Filing whenever possible for publicly available documents KRCD files with FERC, and anticipates distributing such documents by e-mail, compact disc (CD or DVD), or paper copy to stakeholders, as appropriate. The distribution will also go to FERC's formal Service List as required . KRCD plans to use e-mail for distribution of informal documents it initiates. KRCD will have the date, the name of the document, and the page number on each page of each document KRCD produces. Other miscellaneous information, such as "draft," will be shown in the footer of each page of the document, if appropriate. KRCD will follow the processes at 18 C.F.R. §§ 388.112 and 388.113 when filing Privileged and CEII material with FERC.

1.7.6.4 Collaboratively Developed Documents

KRCD anticipates that at times KRCD, and stakeholders, may desire to develop a document collaboratively. In those cases, and unless otherwise agreed to by KRCD and stakeholders interested in the document, KRCD plans to use a single-text approach.

Specifically, once an initial draft of the document is developed, KRCD plans to post the document on its Relicensing Website in Microsoft Word or some other appropriate format (i.e., not *.pdf or a password-protected document) that can be downloaded from the Relicensing Website and used by stakeholders. This is referred to as a "Posted File."

As a Posted File is revised, KRCD anticipates that KRCD or the stakeholder that revises the Posted File will include in the file name the date of the version of the file and the author/reviser. For instance, a file may be named "Proposal 1 SWRCB050524.doc" to indicate the Posted File is a version of a proposal, the revisions were made by the SWRCB, and the date of the file is May 5, 2024.

KRCD anticipates that the author or reviewer will ensure that the appropriate headers and footers are on the file and that the date of the file in the footer matches the date in the file name – this is not KRCD's responsibility. KRCD plans to post the revised file on the Relicensing Website if KRCD made the revision, or post the file once provided to KRCD if a stakeholder made the revision.

Periodically, KRCD may remove files from the Relicensing Website that have been revised or are otherwise out-of-date.

KRCD intends that all changes to a Posted File will be made in Microsoft™ Word Track Changes or other appropriate manner so that changes and/or comments can easily be understood, shared, and integrated into a revised text.

KRCD plans that Track Changes on a Posted File may be accepted if KRCD and stakeholders developing the document agree.

1.7.6.5 Availability of Information in PAD

In accordance with 18 C.F.R. §§5.6(c)(2) and 5.2, KRCD plans to provide sources of information on the existing environment and known or potential resource impacts included in the PAD to anyone who requests the information with the exception of Privileged and CEII material. KRCD will make a good faith effort to provide the document within 30 days of receipt of request. The document may be provided electronically (e.g., by e-mail or on CD/DVD) unless the party requesting asks for the information in hardcopy. Except for FERC and resource agencies, KRCD may charge a reasonable cost for copying and postage for the material.

1.7.7 Personal Conduct

1.7.7.1 Respect for Participants

KRCD will respect at all times the personal integrity, values, and legitimacy of the interests of each stakeholder and expects that each stakeholder will do the same.

1.7.7.2 Commitments

KRCD will not make commitments lightly and expects that stakeholders will do the same.

1.7.7.3 Communicating Interests

At KRCD-sponsored meetings, KRCD will make a good faith effort to ensure that adequate time is provided for the interests of all stakeholders to be discussed and acted upon. However, KRCD does not intend to routinely defer decisions or allow the relicensing process to be disrupted by delays.

KRCD will communicate its interests in topics under consideration and expects stakeholders will do the same. KRCD firmly believes that it is incumbent upon KRCD and each stakeholder to state their interests, and that timely voicing of these interests is essential to enable meaningful dialogue and full consideration of different points of view. KRCD will share resource information where appropriate, and will identify its understanding of relevant agency laws, regulations, and policies with regards to assessment of potential impacts and development of potential resource management measures and encourages stakeholders to do the same.

1.7.8 Communications

KRCD understands that all stakeholders, including KRCD, are free to communicate informally with each other; however, all parties are encouraged to share relevant communications with KRCD and among all stakeholders, as appropriate.

Other than verbal communications at meetings, KRCD will use e-mail as the primary means of KRCD's formal communication among stakeholders.

KRCD will treat telephone calls with stakeholders informally, with no specific documentation except in instances where the information discussed during the telephone call is material to the relicensing proceeding and should be documented.

2.0 EXISTING AND PROPOSED PROJECT

This section includes two major sub-sections. Section 2.1 describes the existing Project, including facilities and features; safety; operations; maps, drawings, and plans; environmental measures; Project maps and design drawings; compliance history; and KRCD's current net investment in the Project. Section 2.2 describes any changes KRCD proposes at this time to the existing Project.

2.1 EXISTING PROJECT

2.1.1 Facilities, Features, and Safety

Refer to Attachment C, Draft Exhibit A, Project Description, of this PAD for a detailed description of existing Project facilities and features.

KRCD is unaware of any safety issue related to the Project. The Project has been operating for more than 44 years under the existing license and during this time FERC staff has conducted operational inspections focusing on the continued safety of the structure, inspection of modifications, efficiency and safety of operations, compliance with the terms of the license, and proper maintenance.

Refer to Attachment D, Draft Exhibit B, Project Operations and Resource Utilization, of this PAD for a detailed description of existing Project operations, including hydrology and water availability, monthly flow duration curves, regulatory and contractual operating constraints, license requirements, generation, and dependable capacity.

2.1.2 Maps, Design Drawings and Plans

2.1.2.1 Project Maps

Refer to Attachment E, Draft Exhibit G, Project Maps, of this PAD for a map of the FERC Project boundary, including land ownership.

2.1.2.2 Project Design Drawings

Refer to Attachment F, Draft Exhibit F, Design Drawings, of this PAD for a list of detailed drawings of Project facilities. These drawings provide plan, elevation, profiles and sections, and depict the as-built principal Project works, and due to their content, are treated by the Commission as CEII under 18 C.F.R. Section 388.113 and are not released to the public.

2.1.2.3 Plans and Agreements

The existing license required the development and implementation of two plans. In conformance with Article 33 of the existing license, KRCD amended Exhibit R by preparing a plan for the development of a fishing access site on the Kings River in consultation with the CDFW and the Heritage Conservation and Recreation Service of the U.S. Department of the Interior. KRCD constructed a parking lot and trails and provided a platform that created wheelchair accessibility to a fishing access area located on USACE lands on the south bank of the Kings River immediately below the Pine Flat Dam. This area was closed permanently in 2001 due to security concerns.[1] After consulting with USACE and Fresno County and entering into an agreement with the County (described below), KRCD filed with FERC a Revised Exhibit R that showed an alternative fishing access area downstream of the USACE Pine Flat Dam Bridge. The Revised Exhibit R was approved by FERC on August 21, 2007.[2]

Article 36 of the existing license required the development of a Public Safety Plan as a follow-up item resulting from a 2014 FERC inspection of the Project. The document was developed on November 25, 2014, and filed on January 14, 2015.[3]

In addition to the License required plans and agreements, KRCD has made the following agreements that pertain to the Project:

- An Agreement for the Use of the Waters of the Kings River for Power Generation at the Pine Flat Dam with KRWA, dated October 18. 1977. The Agreement allows KRCD to use water released from the dam[4] to generate power. The Agreement does not allow KRCD to order any water releases or to alter the releases, or to claim any consumptive water rights. KRCD pays 50 percent of all monies received under their Power Sale Contract to KRWA. The Agreement is good for the term of the existing FERC license and any renewal or extension of the license.

- Memorandum of Understanding with the California Department of Fish and Game (CDFG), dated October 2, 1978, that includes eight measures that were implemented during the initial construction and operation of the Project. Included in these measures are: 1) prevention of sedimentation to the extent possible; 2) measurement of dissolved oxygen levels in the Kings River as measured at the bridge downstream from the dam; 3) rainbow trout (*Oncorhynchus mykiss*) and white catfish (*Ameiurus catus*) tagging and release; 4) surveys of rainbow trout in Kings River to estimate population; 5) creel census survey for white catfish; 6) study for construction-related impacts to raptors; 7) angler access to a point downstream of Pine Flat Dam; and 8) the ability for the CDFG to stipulate additional studies. Of these, KRCD considers measures 3, 5, and 6 “expired” or “out-of-date” because the measures pertain to an activity that has been

[1] This area (Kings River from Pine Flat Dam downstream to USACE Bridge on Pine Flat Road) is also closed to fishing year-round per 2020 State regulations.
[2] Order Modifying and Approving Change in Fishing Access Site, issued August 21, 2007 (120 FERC ¶ 62,135).
[3] KRCD submission of the Public Safety Plan for the Pine Flat Pine Plant Project under P-2741 (Accession Number 201501210197).
[4] Water releases may be for flood control purposes, irrigation or other beneficial uses requested by KRWA members, natural flow, in compliance with CDFW agreements, and/or other normal O&M releases.

completed or is no longer pertinent. This Memorandum has an expiration date of August 31, 2029.

- KRCD entered into a contract with DWR that FERC approved on December 13, 1979, to sell power generated at the Jeff L. Taylor-Pine Flat Power Plant to DWR for a period of 50 years after the last of the Project generating units became commercially operable, which FERC anticipated would be two years beyond the license term (or August 31, 2031).

- Cooperative Agreement with the USACE, as the local cost share provider (KRCD contributed 25% of the overall cost), to construct a Bypass System to improve water temperature downstream of Pine Flat Dam. The Bypass System commenced operations in 2003. The non-Project Bypass System facilities consist of a 48-inch-diameter bypass line with a maximum capacity of 900 cubic feet per second (cfs) from each of the three Project penstock extensions. The 48-inch-diameter pipes from Units No.1 and No. 2 penstock extensions combine into a single 66-inch-diameter line that discharges up to 600 cfs through a 66-inch Monovar valve into the air above the Kings River. The bypass line from the Unit No.3 penstock extension discharges up to 300 cfs through a 48-inch Monovar valve into the air above the Kings River. Responsibility for the Bypass System operations, repair, and maintenance is delegated to KRCD under the Cooperative Agreement with the USACE. The Cooperative Agreement runs in perpetuity.

- Project Operation and Maintenance Agreement with the USACE, signed March 25, 1993. KRCD has title to the Jeff L. Taylor-Pine Flat Power Plant and is responsible for all operation and maintenance at the powerplant, but USACE must approve most proposed changes to the facilities, has the right to inspect and access the facilities at any time, and must have all important information communicated to them. The USACE mans and operates the dam 24 hours a day while the powerplant is in operation. This agreement is effective for the term of any license to KRCD for its Pine Flat Power Project, or any renewal or extension thereof.

- Kings River Fisheries Management Program (KRFMP) Framework Agreement (Framework Agreement) (Kings River Water Association, 1999) was signed in June 1999.[5] The agreement is a voluntary program with the goals of balancing the fishery needs with other beneficial uses of the Kings River while maintaining established water and storage rights and is not part of the Project's FERC license. The agreement pertains to a variety of resource issues, including fish monitoring in the Kings River, angler access, minimum flows, annual fish stocking in the Kings River, adaptive management, temperature control of the pool in Pine Flat Lake, stream temperature from Pine Flat Dam to the Fresno Weir to maintain water temperatures suitable for trout, funding projects, ramping

[5] The Framework Agreement superseded a September 11, 1964, entered by KRWA and CDFG.

rates for releases from Pine Flat Lake when releases are 300 cfs or less, flow monitoring program, and an education and awareness program for fishing regulations on the Kings River below Pine Flat Dam. The Framework Agreement runs in perpetuity, and the funding commitment has a 10-year-long term that is renewable. Currently, KRWA, CDFW and KRCD are in the third 10-year-long term, which expires in June 2029, for funding.

- Agreement (dated November 30, 2006) with Fresno County Department of Parks and Recreation (DPR) to build and maintain the Public Fishing Access. Per the agreement, the recreation site was improved and maintained by KRCD and jointly operated by KRCD and Fresno County DPR. The agreement continues in perpetuity unless either KRCD or Fresno County DPR provides a 30-day notice to the other party of its termination.

Section B.3.2.3 of Exhibit B, in Attachment D, describes the various agreements, contracts and MOUs described above in greater detail.

2.1.2.4 Environmental Measures

Exhibit S of the existing License, referenced in Ordering Paragraph B, included six measures for aquatic, fish, and terrestrial resources. The three fish studies are: 1) Turbine Mortality Study; 2) Rainbow Trout Population Study; and 3) White Catfish Population Study. The three wildlife studies are: 1) Noise; 2) Habitat Loss; and 3) Raptor Electrocution were completed within the first 5 years of Project operations. No additional measures were required.

Other environmental measures are described above in Section 2.1.3.3 Plans and Agreements.

2.1.3 <u>Compliance History</u>

KRCD is in compliance with terms and conditions of the existing license. Due to the annual FERC Project inspections and the 5-year public safety, environmental, and recreation inspections, various remedial actions were recommended. KRCD initiates actions and proposes plans and schedules to correct any issues of safety, compliance, or other issues as recommended from the inspections and provides written confirmation of the actions taken.

KRCD has had no recurring situations of non-compliance with the existing license terms and conditions. In the event of a deviation from a term or condition in the existing license, KRCD notifies FERC, initiates an investigation, and provides a written report, including proposed corrective actions, if appropriate, to FERC regarding the deviation. FERC conducts its own analysis and determines if the deviation is considered a formal non-compliance event.

2.1.4 Current Net Investment

KRCD estimates the existing Project's net book value (assets minus liabilities) is approximately $7.5 million in 2023 U.S. dollars.

2.2 KRCD PROPOSED CHANGES TO PROJECT FACILITIES AND OPERATIONS

At this time, KRCD proposes no changes to existing Project facilities and features, Project Boundary, or operations. KRCD reserves its right to propose changes as the relicensing proceeds.

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3.0 INTRODUCTION TO THE RIVER BASIN

In addition to this introductory information, this section is divided into two subsections. Section 3.0.1 provides a general description of the river basin in which the Project occurs. Section 3.0.2 provides existing, relevant, and reasonably available information regarding the resources.

3.0.1 General Description of the River Basin

The Kings River originates along the crest of the Sierra Nevada in and around Kings Canyon National Park, flows in a westward direction for approximately 133 miles where it enters the San Joaquin River during periods of high flows near the Mendota Pool in the City of Mendota, California at an elevation of 154 feet. The Kings River has been designated as fully appropriated year-round (RWQCB, 2018), meaning there is insufficient water for any new water right applications. Figure 3.0-1 shows the Kings River.

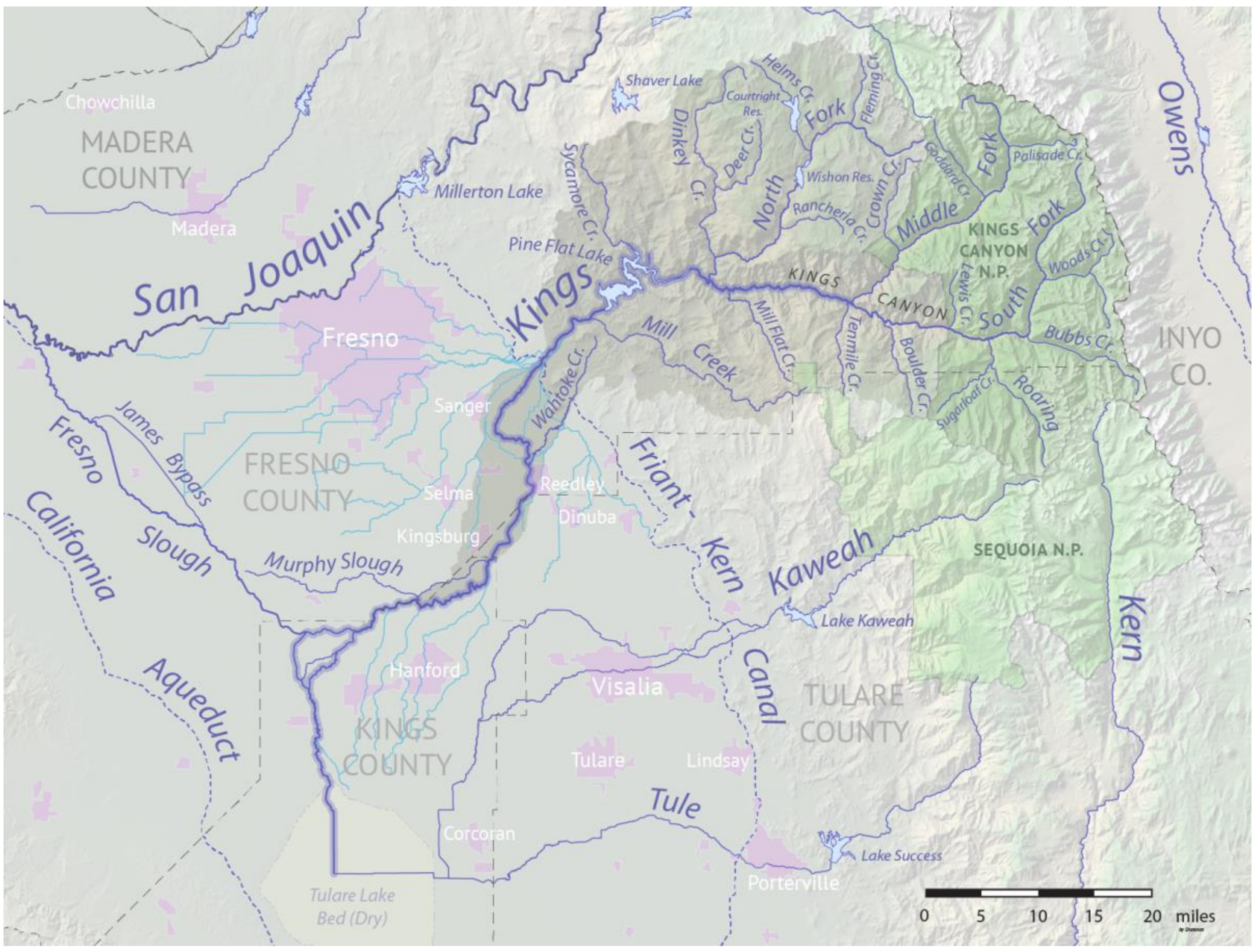

Figure 3.0-1. Kings River upstream and downstream of Pine Flat Lake.

Three main forks form the Kings River. The South and Middle Forks are unimpaired, and both are designated as Wild and Scenic under the Wild and Scenic Rivers Act (16 U.S.C § 1271-1287). The 44-mile South Fork originates on the Sierra Crest at the far eastern edge of Kings Canyon National Park. The South Fork flows south, and then west through the Cedar Grove section of Kings Canyon. The 37-mile-long Middle Fork, originates at Helen Lake in the high Sierra. None of the designated Wild and Scenic segments is located within the Project boundary or below Pine Flat Lake. The South and Middle Forks converge in the Monarch Wilderness at an elevation of 2,257 feet just outside the Kings River National Park to form the Kings River that flows westward for about 30 miles to where it converges with the North Fork Kings River at an elevation of 973 feet near Balch Camp.

The 40-mile-long North Fork Kings River originates at an elevation of approximately 12,000 feet at the White Divide within the John Muir Wilderness. Three FERC licensed hydroelectric projects, all owned and operated by PG&E, occur on the North Fork Kings River: 1) the 193.2 MW Haas-Kings River Hydroelectric Project (P-1988); 2) the 1,080 MW Helms Pumped Storage Project (P-2735); and 3) the 139 MW Balch Hydroelectric Project (P-175). P-1988 consists primarily of the 123,184 acre foot Courtright Lake on Helms Creek, the 128,606 acre foot Lake Wishon on the North Fork Kings River, a tunnel and penstock from Lake Wishon to Haas Powerhouse, a tailrace tunnel from Haas Powerhouse to P-175's 1,260 acre foot Black Rock Reservoir on the North Fork Kings River, a tunnel and penstock from P-175's 319 acre foot Balch Afterbay on the North Fork Kings River to the Kings River Powerhouse at USACE's Pine Flat Lake on the mainstem Kings River and a tailrace from the Kings River Powerhouse to Pine Flat Lake. P-2735 is an open-loop pumped storage hydroelectric project with its lower intake-outlet structure in P-1988's Lake Wishon and its upper intake-outlet structure in P-1988's Courtright Lake. All P-2735 facilities and structures used to exchange water between the two reservoirs are underground, including Helms Powerhouse. P-175 is comprised of Black Rock Reservoir, Balch Afterbay, and Balch Powerhouse. The three FERC licenses for P-175, P-1988, and P2735 expire on April 30, 2026.

From the confluence with the North Fork Kings River, the Kings River flows approximately 20 miles downstream to Pine Flat Lake. Pine Flat Dam was constructed by the USACE in 1954 to provide local and regional flood protection. The dam is a 455-feet-high concrete gravity dam that impounds Pine Flat Lake that, at its normal operations elevation of 955 feet, has a maximum storage capacity of 1,000,000 acre-feet. Pine Flat Lake provides recreation areas and water for irrigation and groundwater replenishment. The lake is about 20 miles long and has a shoreline length and surface area of about 67 miles and 5,760 acres, respectively, at its normal maximum water surface elevation of 955 feet (i.e., spillway crest elevation). The drainage area upstream of Pine Flat Dam is 1,545 square miles. Average annual flow immediately downstream of Pine Flat Dam from 1954 through 2022 was 2,243 cfs.[1] The dam and its associated

[1] The United States Geological Survey (USGS) maintained USGS Gage 11221500, Kings River Below Pine Flat Dam, CA, from January 1, 1954, through October 4, 1990. In October 1990, the USACE assumed the maintenance, operation, and reporting responsibility for the gage, which USACE refers to

facilities do not include USACE hydropower facilities and are not under FERC jurisdiction.

The Jeff L. Taylor-Pine Flat Power Plant is located at the base of Pine Flat Dam and is described in Section 2.0.

The Kings River emerges from the foothills of the Sierra Nevada near Piedra, about 10 miles downstream of Pine Flat Dam. From there, the river diverges into multiple branches that flow across the gently sloping alluvial plain of the San Joaquin Valley. Some water flows south to the old Tulare Lakebed and the rest flows north to the San Joaquin River. This makes estimates of the total drainage area upstream of Kingsburg at the State Highway 99 Bridge difficult because the river downstream of Kingsburg becomes difficult to define due to the diffuse nature of the drainage system across the valley and north to the San Joaquin River.

Downstream of Pine Flat Dam, the Kings River is characterized by a system of canals, ditches, and several diversion structures, as well as a division into North and South Forks some 6 miles north of the City of Lemoore. Sixteen major weirs, numerous diversions, and numerous pumps occur along the Kings River before it reaches the San Joaquin River (from the lower North Fork via Fresno Slough) or the Tulare Lake basin. The Crescent Bypass Weir is a flood control structure that moves Kings River water from the North Fork through the Crescent Bypass and joins the South Fork. Downstream from the Project, these include: Cobbles Weir, Gould Weir, Fresno Weir, Peoples Weir, Dutch John Weir, Cole Slough Weir, Reynolds Weir, Last Chance Weir, Lemoore Weir, Army Weir, Island Weir, Empire Weir 1, Empire Weir 2, Crescent Weir, Crescent Bypass Weir, Stinson Weir, and James Weir. None of these is under FERC jurisdiction.

The first diversion point on the river is at Cobbles Weir, which diverts water into a side channel of the river known as the “76” channel. Upwards of 900 cfs may be diverted from the “76” channel at the Alta Canal Headgate. Additional flow in the “76” channel may return to the main channel at a confluence below the Fresno Weir. The main river channel continues to receive flow minus diversions. Below Cobbles Weir, flow may be diverted from the river at Dennis Cut and Gould Weir. Minimum flow in Dennis Cut is 5 cfs. Diversions at Gould Weir, into the Gould Canal Headgate may be up to about 400 cfs. The Project’s existing FERC license does not include flow requirements in this reach.

The minimum flow at Fresno Weir is 95 cfs. Two diversions at Fresno Weir are Fresno Canal and Consolidated Canal, with a combined diversion capacity that is upwards of 3,200 cfs. The river channel below Fresno Weir receives flow minus these diversions. Minimum flows in the river below Fresno Weir range from 35 to 45 cfs, depending on the time of year. Additional flow below Fresno Weir may occur to meet irrigation

as “PNFQ”. Gage data are publicly available at https://www.spk-wc.usace.army.mil/reports/monthly.html and at https://cdec.water.ca.gov/index.html under Station ID “PNF.”

demand or flood flow requirements. The Project's existing FERC license does not include flow requirements in this reach.

Figure 3.0-2 is a gradient profile of the Kings River from downstream of the Project to the Friant-Kern Canal.

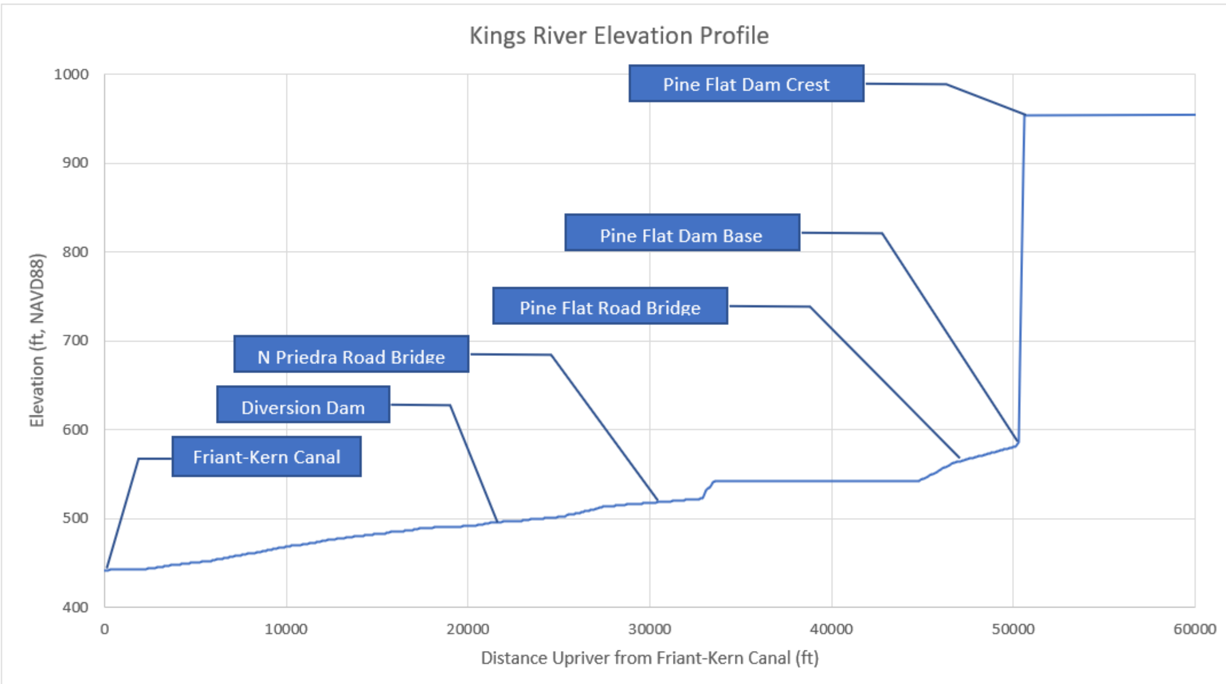

Figure 3.0-2. Streambed gradient of the Kings River from Pine Flat Dam to the Friant-Kern Canal.

3.0.2 Climate

Overall, the climate near the Project is typical of a mixed-elevation Mediterranean climate. The National Weather Service monitoring station at Pine Flat Dam (Number 046896) provides a climate history representative of the Project area. The area occupies the eastern Central Valley and rolling, western Sierra foothills, and experiences high summer temperatures while winters trend toward moderate temperatures. July air temperatures at Pine Flat Dam average a high of 99.9 degrees Fahrenheit (°F) and a low of 64.9°F. Average January high and low temperatures are 58.9°F and 33.9°F, respectively. Annual average precipitation totals 19.8 inches and falls exclusively as rain, with 89 percent falling from November through April. May through September precipitation averages only 1.2 inches generally resulting from rare summer thunderstorms (Western Regional Climate Center, 2023).

3.0.3 Potentially-Affected Stream Reaches

The Project has no effect on the quantity and timing of releases of water from Pine Flat Dam. The Project uses water released by USACE for flood control or as requested by the KRWA through the Kings River Watermaster to meet irrigation demands and other downstream requirements. Consistent with the agreement with KRWA, KRCD can only divert an amount of the releases that are within the operating range of the Project, and cannot in any way “alter the release pattern or regulate such releases…”.[2] In addition, under the agreement between KRCD and USACE, KRCD is “responsible for meeting KRWA’s irrigation demand when the required releases are within the operating range of the powerplant, whereas the USACE is responsible for releases above and below the operating range of the powerplant”.[2] KRCD cannot request or control flow through Pine Flat Dam but uses it advantageously as it becomes available. Also, KRCD is a non-consumptive user of the water and required to pass all the releases for power generation back into the Kings River.

The Project, in combination with USACE’s operations of Pine Flat Dam, has a low potential to cumulatively affect water quality, especially water temperature. Any impacts on water quality would be extremely difficult to measure below the Cobbles Weir (at the end of the 5.6-mile-long section of the Kings River from the Project to Alta Irrigation District Diversion Weir) due to the water diversions at the Cobbles Weir.

3.0.4 Major Land Use

In California, counties are the primary agencies for establishing land use polices for private land within their jurisdiction. The Project is within Fresno County, California. Major land uses include agriculture and cattle grazing on private lands and federal lands surrounding Pine Flat Lake.

3.0.5 Major Water Uses

The Central Valley Regional Water Quality Control Board (RWQCB), in its Water Quality Control Plan for the Tulare Lake Basin (Basin Plan) (RWQCB, 2018) identifies streams and watersheds with unique Hydro Unit (HU) numbers[3]. The Project is a non-consumptive use of Kings River basin water: all water that passes through the Project is returned to the Kings River. Beneficial uses of surface water designated by the Basin Plan (RWQCB, 2018) in the Kings River from Pine Flat Dam to Friant-Kern (Hydrologic Units 552, 551). The Project and the area downstream fall in two Basin Plan units, HU 551 and HU 552 that includes the Kings River from Pine Flat Dam to Friant-Kern. Designated beneficial uses of surface water in this unit are shown in Table 3.0-1.

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[2] Two agreements are acknowledged in the Order Amending License issued on November 19, 1993 (65 FERC ¶ 61,243) that restricts the manner in which KRCD utilizes releases through Pine Flat Dam for power generation including the Agreement for the Use of Waters for Kings River for Power Generation at Pine Flat Dam, dated October 18, 1977 between KRCD and KRWA, and the Agreement for the Operation and Maintenance of Pine Flat Power Plant, dated March 25, 1993 between KRCD and USACE.

[3] Basin Plan Hydro Unit (HU) codes do not correspond to Hydrologic Unit Code (HUC) numbers as defined by the Water Resources Council; the RWQCBs use the HU codes primarily for state-level water quality planning and regulatory purposes.

Table 3.0-1. Beneficial Uses of Surface Water in the Kings River at the Project.

Beneficial Use	Beneficial Use Description
Municipal and Domestic Supply (MUN)	Uses of water for community, military, or individual water supply systems, including, but not limited to, drinking water supply.
Agricultural Supply (AGR)	Uses of water for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.
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.
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.
Ground Water Recharge (GWR)	Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.
Freshwater Replenishment (FRSH)	Uses of water for natural or artificial maintenance of surface water quantity or quality.

Source: (RWQCB, 2018)

3.1 EXISTING ENVIRONMENT

Section 3 is divided into 13 parts by major resource area, starting with this description:

- Geology and Soils (Section 3.2)
- Water Resources (Section 3.3)
- Aquatic Resources (Section 3.4)
- Terrestrial Resources (Section 3.5)
- Federal Endangered Species Act-Listed Species (Section 3.6)
- Recreation Resources (Section 3.7)
- Land Use (Section 3.8)
- Aesthetic Resources (Section 3.9)
- Socioeconomic Resources (Section 3.10)
- Environmental Justice (Section 3.11)
- Cultural Resources (Section 3.12)
- Tribal Interests (Section 3.13)

Where appropriate, existing information is noted as either a source document (i.e., contains original data collected by the author) or anecdotal information. The amount of detail included in the description of each existing resource and known Project effect is commensurate with the importance of the resource and effect in the relicensing.

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3.2 GEOLOGY AND SOILS

This section discusses geology and soil resources potentially affected by the Project. Geology is discussed in Section 3.2.1 and soils are discussed in Section 3.2.2.

3.2.1 Geologic Setting

3.2.1.1 Topography and Geomorphology

The Project is located within the southern portion of the Central Valley of California, also known as the San Joaquin Valley, along the Kings River at the base of the foothills of the Sierra Nevada. The physiographical region that the Project falls within is the Cascade-Sierra Mountains province. Just below Pine Flat Dam, the Kings River flows through a steep canyon at an elevation of approximately 560 feet around the North Riverside Access Park and at an elevation of approximately 972 feet at the top of Pine Flat Dam (United States Geologic Survey, 2023).

3.2.1.2 Bedrock Lithology and Stratigraphy

Within and adjacent to the FERC Project boundary, there are four main rock types: 1) pre-Cenozoic metavolcanic rocks; 2) Mesozoic intrusive rocks; 3) Mesozoic to pre-Cambrian metamorphic and intrusive rocks; and 4) Quaternary alluvium. The metavolcanic rocks are made up of latite, dacite, tuff, and greenstone; commonly schistose. The Mesozoic intrusive rocks are made up of granite, quartz monzonite, granodiorite, quartz diorite, ultramafic serpentine rocks, peridotite, gabbro, and diabase. The Mesozoic to pre-Cambrian metamorphic and intrusive rocks are mostly gneiss and other metamorphic rocks injected by granitic rocks. Downstream of Pine Flat Dam along the FERC Project boundary and the margins of the Central Valley, Quaternary stream alluvium and sedimentary rocks made up of unconsolidated and semi-consolidated lake, playa, and terrace deposits are present (California Department of Conservation, 2015).

3.2.1.3 Tectonics

There are no known faults in the FERC Project boundary or within a 5-mile radius (United States Geologic Survey, 2021).

3.2.1.4 Mineral Resources

Fresno County has historically been a leading producer of mineral resources and primarily mines aggregate resources and chromium (Fresno County 2021). San Joaquin River Resource Area Land parcels that border the FERC Project boundary are mapped as Mineral Resource Zone 1 (MRZ-1), indicating no significant mineral deposits are present. MRZ-2 is mapped within three miles downstream of the FERC Project boundary, indicating there are known significant mineral deposits in the area (Fresno County, 2021). There are currently multiple active mines or extraction sites within 5 miles of the FERC Project boundary; however, none of these locations are impacted by Project operations.

3.2.2 Soils

3.2.2.1 Soil Types

The FERC Project boundary is primarily made up of rocky outcrops and sandy loam soils (Natural Resources Conservation Service, 2019). Soil types within the FERC Project boundary are shown in Table 3.2-1.

Table 3.2-1. Soil Types Within the FERC Project Boundary.

Soil Unit Name	Acreage within FERC Project Boundary	Drainage Class
Blasingame loam, 30 to 45 percent slopes	2.92 (25%)[1]	Well Drained
Riverwash	2.38 (20%)[1]	Excessively drained

Source: (Natural Resources Conservation Service, 2019)
[1] The majority of the FERC Project boundary (6.57 ac, 55%) is classified as water.

The Blasingame soil series occurs in the foothills along the east side of the San Joaquin Valley and in the western part of the southern California foothills. Their elevation range is about 400 to 4,500 feet. This soil series is formed from material weathered from gabbrodiorite and other basic igneous rocks (Natural Resources Conservation Service, 2019). Blasingame loam makes up 25 percent of the FERC Project boundary.

Due to the lack of clay soils in the FERC Project boundary, expansive soils are unlikely to be encountered. Unconsolidated sandy soils in the FERC Project boundary have the potential for liquefaction in saturated conditions when triggered by seismic ground shaking; however, due to the low potential for seismicity in the area, liquefaction would be unlikely.

Figure 3.2-1 shows the soils within the FERC Project boundary and surrounding areas.

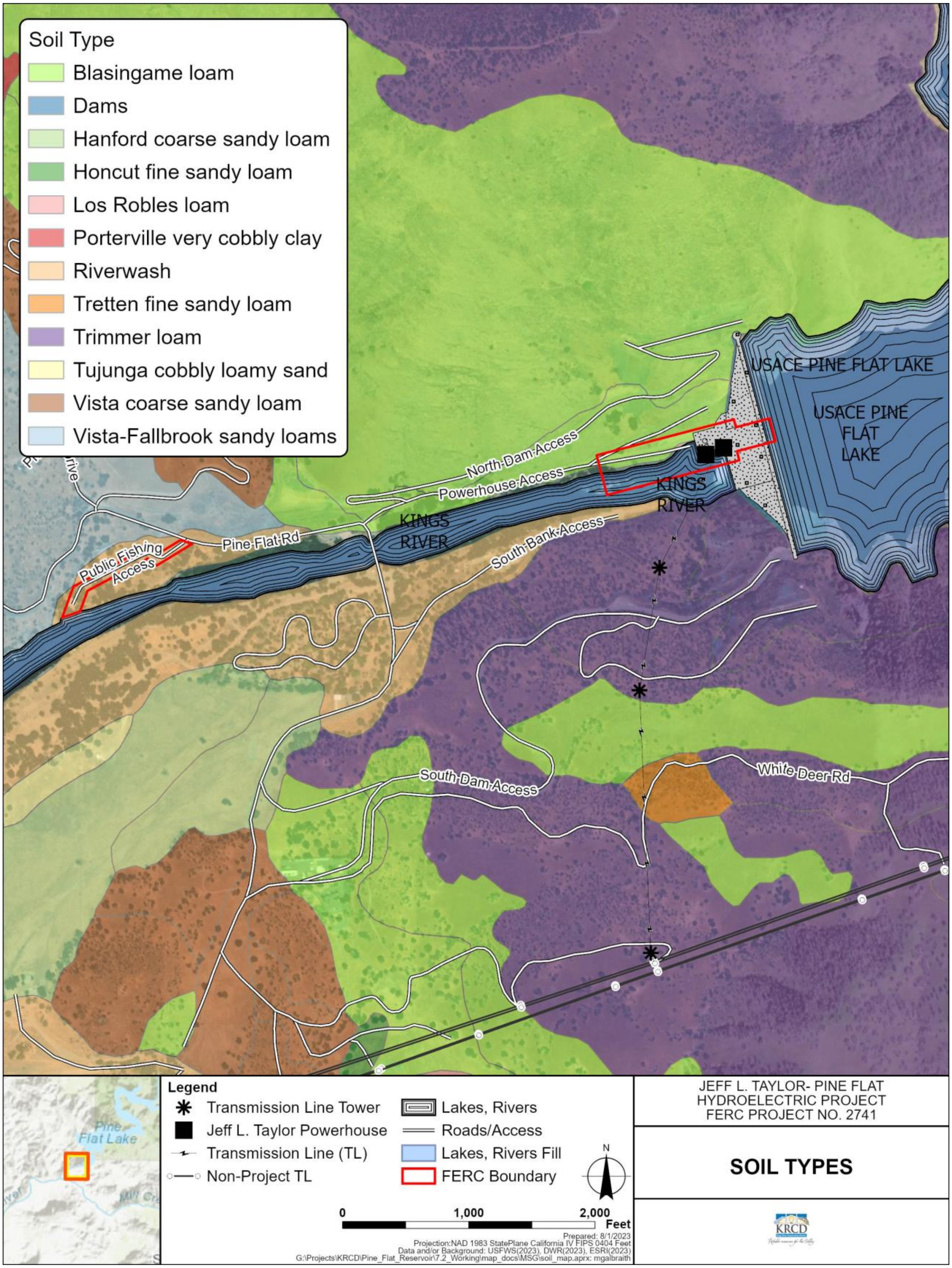

Figure 3.2-1. Soil map within the FERC Project boundary and direct vicinity.

3.2.2.2 Erodibility and Landslide Potential

Reservoir basins and water channels downstream of dam faces are subject to erosion and landslides. The reservoir shoreline below the high-water line is susceptible to erosion due to wave action. Sparse vegetative cover above the ordinary-high water level, including sparse shrubs and trees, reduces the potential for landslides. Some soils present below the dam face might have a potential for runoff due to their steep slopes, despite being well drained. The FERC Project boundary is located in an area not evaluated or mapped for landslide potential (California Department of Conservation, 2022).

3.3 WATER RESOURCES

This section discusses water resources potentially affected by the Project. Section 3.3.1 discusses water quantity and uses, and Section 3.3.2 discusses water quality, including water temperature.

3.3.1 Water Quantity and Use

Section 3.0 of this PAD provides a description of the Kings River basin including hydroelectric and water projects in the basin, existing dams in the basin, tributaries downstream of the Project, drainage areas at key locations, relevant river miles, a streambed gradient from the Pine Flat Dam to the Friant-Kern Canal, and a description of reaches potentially affected by the Project. Information regarding existing hydrology and water availability for use by the Project, as well as monthly flow duration curves and maximum and minimum flow releases from Pine Flat Dam, was calculated by subtracting measured average daily flows for Mill Creek that enter the Kings River between Pine Flat Dam and USACE's Pine Flat Road Bridge from average daily flows reported by USACE at its flow gage located at the Pine Flat Road Bridge. The monthly flow duration curves and maximum and minimum flow releases are provided in Section B.4 of the draft Exhibit B, which is included in Attachment D to this PAD. In addition, Section B.4.3.8, also in Attachment D, describes the critical period used to calculate the Project's dependable capacity. Licensed Project facilities do not include a reservoir or dam. Existing and potential designated Beneficial Uses of surface waters in and around the Project are also described in Section 3.0 of this PAD.

3.3.2 Water Quality

3.3.2.1 Applicable Water Quality Standards and Impairment Status

The Project is a non-consumptive use of Kings River basin water: all water that passes through the Project is returned to the Kings River.

The SWRCB and nine RWQCBs are responsible for preserving, enhancing and restoring the quality of California's water resources and drinking water. In California, the SWRCB in coordination with the RWQCBs establishes water quality standards under CWA Section 303 that are implemented through administrative policies and procedures identified in water quality control plans or basin plans. Basin Plan water quality objectives are established with consideration of past, present, and probable future beneficial uses, environmental characteristics of the hydrographic unit, water quality conditions that can reasonably be achieved, economic considerations, the need for housing development, and the need to develop and use recycled water. The Project is located within the jurisdictional boundary of the CVRWQCB, which adopted the Basin Plan for the Tulare Lake Basin. Water quality objectives identified in the Basin Plan for the Tulare Lake Basin that are relevant to the Kings River in the Project boundary are shown in Table 3.3-1.

Table 3.3-1. CVRWQCB Tulare Lake Basin Plan Water Quality Objectives for the Kings River from Pine Flat Dam to Friant-Kern Canal.

Parameter	Water Quality Objective
Ammonia	No concentrations of un-ionized ammonia exceeding 0.025 mg/L (as N) in receiving waters, or which adversely affects beneficial uses.
Bacteria	In REC-1 designated waters, no fecal coliform concentrations above a geometric mean of 200 cfu/100 ml in a minimum of not less than five samples over 30 days, or more than ten percent of any samples taken during 30 days be over 400 cfu/100 ml.
Biostimulatory substances	No biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth cause nuisance or adversely affect beneficial uses.
Chemical constituents	No chemical constituents in concentrations that adversely affect beneficial uses.
Color	No discoloration that causes nuisance or adversely affects beneficial uses.
Dissolved oxygen (DO)	Waste discharges shall not cause the monthly median DO concentration in the main water mass (at centroid of flow) of streams and above the thermocline in lakes to fall below 85 percent of saturation concentration, and the 95th percentile concentration to fall below 75 percent of saturation concentration. No DO concentrations below 5.0 mg/L for waters designated as WARM and 7.0 mg/L for waters designate as COLD or SPWN. Specific DO water quality objectives for Reach III (Pine Flat Dam to Friant-Kern) of the Kings River shall not be less than 9.0 mg/L. If ambient DO is below the objective, discharges cannot cause a further decrease. There is a note in the plan stating: *Dissolved Oxygen Objectives: The dissolved oxygen objective for Reach III of the Kings River (Pine Flat Dam to Friant-Kern) may not be achievable due to natural conditions. A study should be conducted to investigate this and establish more appropriate objectives, if necessary*.
Floating material	No floating material in amounts that cause nuisance or adversely affect beneficial uses.
Oil and grease	No oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visual film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.
pH	No pH depressed below 6.5 or raised above 8.3 or altered at any time by more than 0.3 from normal ambient.
Pesticides	No pesticides in concentrations that adversely affect beneficial uses.
Radioactivity	Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life nor which result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.
Salinity	Waters shall be maintained as close to natural concentrations of dissolved matter as is reasonable considering careful use of the water resources. The maximum electrical conductivity objective is 100 µmhos/cm for Reach III (Pine Flat Dam to Friant-Kern) of the Kings River.
Sediment	No suspended sediment loads or suspended sediment discharge rates altered in a manner that causes nuisance or adversely affects beneficial uses.
Settleable material	No substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.
Suspended material	No suspended material in concentrations that cause nuisance or adversely affect beneficial uses.
Tastes and odors	Waters shall not contain taste- or odor-producing substances in concentrations that cause nuisance, adversely affect beneficial uses, or impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin or to domestic or municipal water supplies.
Temperature	Natural temperatures of waters shall not be altered unless it can be demonstrated to the satisfaction of CVRWQCB that the alteration does not adversely affect beneficial uses. Elevated temperature wastes in waters designated as COLD or WARM shall not cause the temperature to rise more than 5 degrees Fahrenheit above the natural receiving water temperature.
Toxicity	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. Compliance with this objective will be determined by analyses of indicator organisms, species diversity, population density, growth anomalies, biotoxicity tests of appropriate duration, or other methods as specified by the CVRWQB. The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors shall not be less than that for the same water body in areas unaffected by the waste discharge, or, when necessary, for other control water that is consistent with the requirements for “dilution water” as described in Standard Methods for the Examination of Water and Wastewater, 18th Edition. As a minimum, compliance shall be evaluated with a 96-hour bioassay. In addition, effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate; additional numerical receiving water quality objectives for specific toxicants will be established as sufficient data become available; and source control of toxic substances will be encouraged.

Table 3.3-1. (continued).

Parameter	Water Quality Objective
Turbidity	No changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits: where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTU), increases shall not exceed 1 NTU; where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent; where natural turbidity is equal to or between 50 and 100 NTUs, increases shall not exceed 10 NTUs; and where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent.

Source: (CVRWQCB, 2018), (SWRCB, 2018)

The Kings River from Pine Flat Dam to Island Weir, which is approximately 44 miles downstream of the State Highway 180 Bridge, is on the California's Clean Water Act Section 303(d) list of impaired waters for alkalinity, copper, lead, Paraquat, and toxicity. The SWRCB had expected to issue a Total Maximum Daily Load (TMDL) for toxicity in 2021, and is expecting to issue TMDLs for alkalinity in 2027, and copper, lead and Paraquat in 2035 (SWRCB, 2022). As of April 4, 2023, the SWRCB has not issued any TMDLs for those water quality pollutants. The Project does not add any of the above pollutants to discharge waters from the Jeff L. Taylor Powerhouse or Unit 4 Powerhouse.

3.3.2.2 Water Quality Samples Collected by KRCD

Water quality monitoring downstream of Pine Flat Dam consists of measuring water temperature and DO concentration, which are collected once every 10 minutes at the Pine Flat Road Bridge.

Figure 3.3-1 shows average daily water temperatures at the bridge from Calendar Years (CY) 2016 through 2022. Water temperatures have a seasonal pattern, with lowest temperatures occurring during the winter and early spring and increasing during the spring and summer months, with the greatest increase in seasonal temperatures occurring during the late summer and early fall. Average daily water temperatures were always less than 20 degrees Celsius (°C) except for five days in August 2020, four days in September 2020, two days in August 2022, and 32 days from September 24, 2022 to October 25, 2022; the average daily water temperature peaked on September 28, 2022, at 21.1°C (Figure 3.3-1). Over the seven-year period of record, the instantaneous minimum and maximum water temperatures were 6.5°C and 22.3°C, respectively, both of which occurred when the Jeff L. Taylor Powerhouse was not operating. When the Jeff L. Taylor Powerhouse was in operation, the instantaneous minimum and maximum water temperatures were 6.7°C and 21.1°C, respectively, over the seven-year period of record (Table 3.3-2).

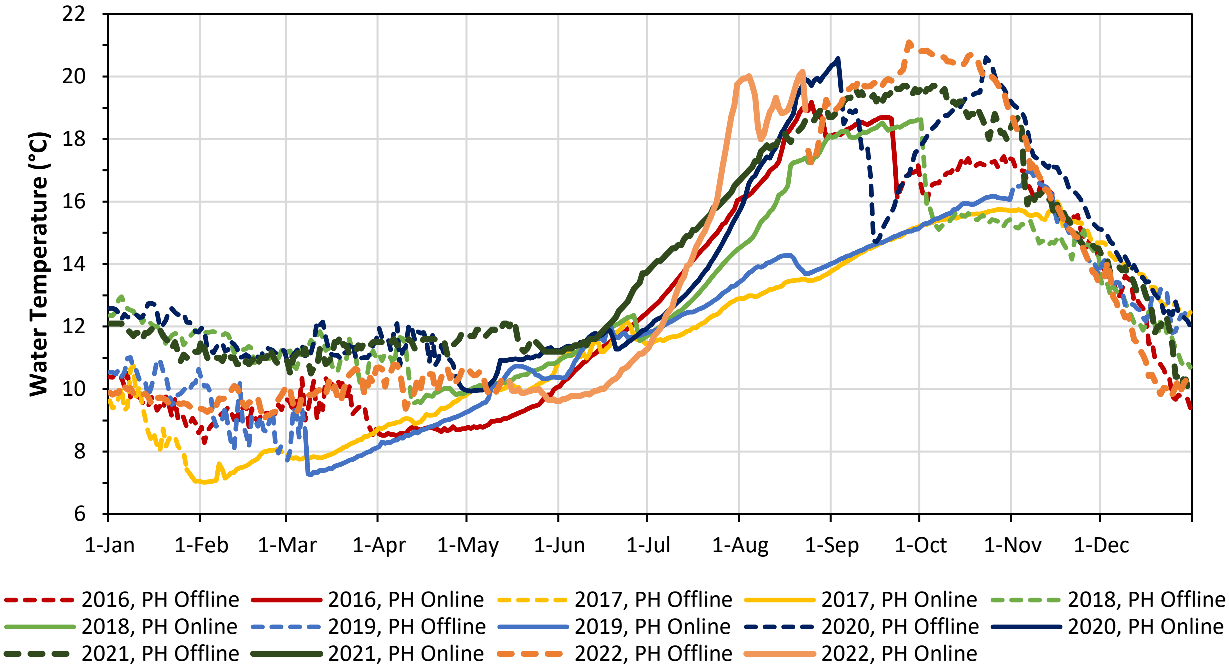

Figure 3.3-1. Average daily water temperature with and without the Jeff L. Taylor Powerhouse in operation at the Pine Flat Road Bridge downstream of Pine Flat Dam for CY 2016 through 2022.
Source: Water temperature data in Attachment G.

Table 3.3-2. Annual minimum, maximum, and average water temperatures with and without the Jeff L. Taylor Powerhouse in operation at the Pine Flat Road Bridge downstream of Pine Flat Dam for CY 2016 through 2022.

Calendar Year	Water Temperature When Jeff L. Taylor Powerhouse Not Operating (°C)			Water Temperature When Jeff L. Taylor Powerhouse Operating (°C)		
	Instantaneous Minimum	Instantaneous Maximum	Period Average	Instantaneous Minimum	Instantaneous Maximum	Period Average
2016	7.1	20.5	12.4	8.2	20.0	13.0
2017	6.5	16.4	12.4	6.7	15.9	11.4
2018	8.9	19.6	12.7	9.2	19.3	13.5
2019	6.5	17.3	11.8	7.1	16.7	12.0
2020	9.2	21.5	14.1	9.8	21.1	13.6
2021	9.6	21.8	14.2	10.9	18.4	13.8
2022	7.8	22.3	13.4	9.4	21	13.6

Source: Water temperature data in Attachment G.

Figure 3.3-2 illustrates average daily DO concentrations at the Pine Flat Road Bridge from CY 2016 through CY 2022. Table 3.3-3 shows the annual minimum, maximum, and average DO concentrations (CY 2016-2022) and total dissolved gases (TDG) percent saturation (CY 2016-2022) when the Jeff L. Taylor Powerhouse was and was not operating. When the powerhouse was not in operation, DO concentration ranged from an instantaneous minimum of 6.3 mg/L to an instantaneous maximum of 14.1 mg/L, and TDG percent saturation ranged from an instantaneous minimum of 62.9 percent to an instantaneous maximum of 130.4 percent. When the powerhouse was in operation, DO concentration ranged from an instantaneous minimum of 5.1 mg/L to an instantaneous maximum of 13.8 mg/L, and TDG percent saturation ranged from an instantaneous minimum of 54.7 percent to an instantaneous maximum of 115.0 percent. The instantaneous DO concentration was always greater than 7 mg/L, when the powerhouse was in operation, except for the events listed below. In each case, KRCD made every effort to immediately increase DO concentrations. Actions most often utilized included adjusting flows through the Bypass System and decreasing turbine flow and power generation.

- In 2016 for eight days (i.e., seven days in August and one in September) when the powerhouse went off-line. During these events, daily DO concentrations briefly dipped below 7.0 mg/L. The lowest DO concentration during these instances was 5.1 mg/L.
- In 2017 for five days (i.e., one day in June, three days in October, and one day in November). During these events, daily DO concentrations briefly dipped below 7.0 mg/L, with the lowest DO concentration during these instances of 6.5 mg/L.
- In 2018 for eight days in August when DO concentrations dipped below 7.0 mg/L for brief periods lasting between 20 and 190 minutes. The lowest DO concentration during these events was 5.4 mg/L.
- In 2019 for one day in October when DO concentrations dipped below 7.0 mg/L for approximately 90 minutes. The lowest DO concentration during this event was 6.9 mg/L.
- In 2020, on two days in August when DO concentrations were less than less than 7.0 mg/L for about an hour in each day. The lowest DO concentration during these events was 6.8 mg/L.
- In 2022, DO concentrations were below 7.0 mg/L for one day in June, two days in July, and one day in August. However, due to proactive remedial actions, the average DO concentrations for these days were well above 7.0 mg/L. On July 13 and September 21, computer glitches required the DO data logger to be restarted and the minimum recorded DO for these days was 0 mg/L.

The events were reported to FERC in KRCD's annual Dissolved Oxygen Monitoring final reports. For the events in 2016 through 2022, FERC determined that the event did not constitute a violation of Article 34[1] because the event was brief and resulted in minor DO concentration deviations, and KRCD took immediate action to increase DO concentrations, which minimized the duration of the event and, in most cases, maintained daily average DO concentrations above 7.0 mg/L. FERC has not commented on KRCD's 2022 annual report, or the events where DO concentrations were below 7.0 mg/L.

[1] Available on the FERC eLibrary at Accession numbers 20170329-3064 (2016), 20180524-3017 (2017), 20190718-3004 (2018), 20200129-3000 (2019), and 20210406-3022 (2020).

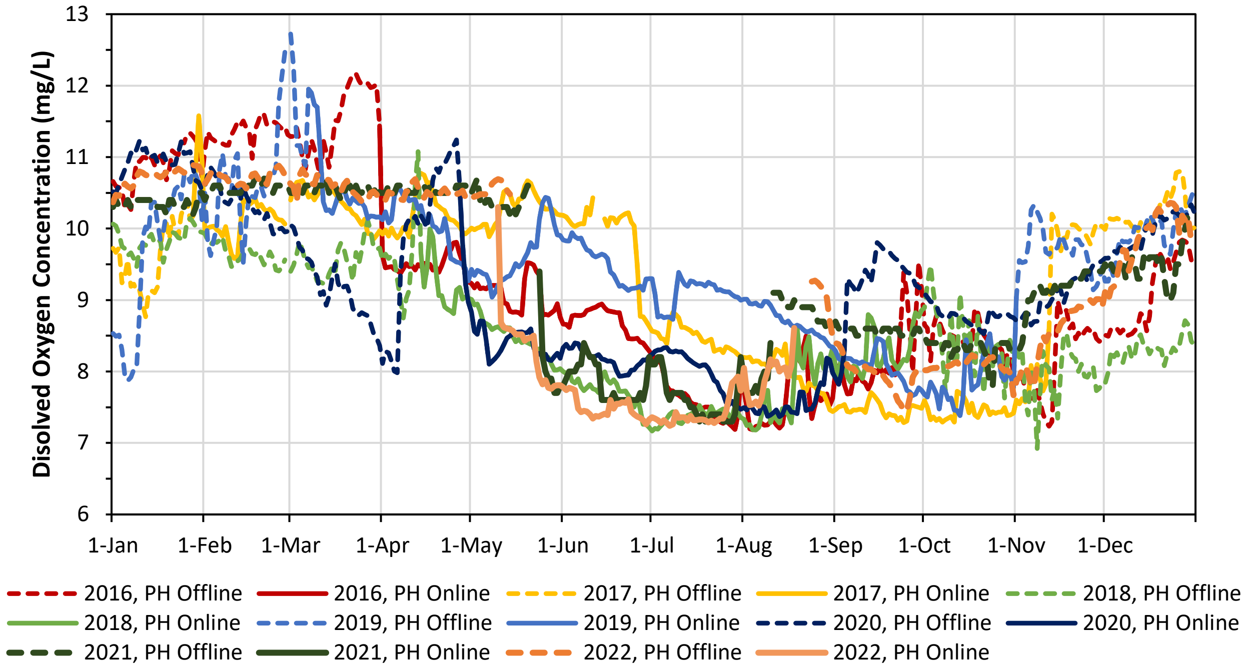

Figure 3.3-2. Average daily dissolved oxygen concentration with and without the Jeff L. Taylor Powerhouse in operation at the Pine Flat Road Bridge downstream of Pine Flat Dam for CY 2015 through 2022.
Source: DO concentration and TDG concentrations in Attachment H.

Table 3.3-3. Annual minimum, maximum, and average dissolved oxygen concentrations with and without the Jeff L. Taylor Powerhouse in operation at the Pine Flat Road Bridge downstream of Pine Flat Dam for CY 2016 through 2022.

Calendar Year	Dissolved Oxygen Concentrations When Jeff L. Taylor Powerhouse Not Operating			Dissolved Oxygen Concentrations When Jeff L. Taylor Powerhouse Operating		
	Instantaneous Minimum	Instantaneous Maximum	Period Average	Instantaneous Minimum	Instantaneous Maximum	Period Average
DISSOLVED OXYGEN (MILLIGRAMS PER LITER)						
2016	6.7	14.1	9.9	5.1	12.0	8.4
2017	8.3	13.1	9.9	6.5	13.8	9.1
2018	6.3	11.4	9.0	5.4	10.9	8.0
2019	7.2	13.1	10.1	6.9	13.4	9.2
2020	7.5	11.8	9.7	6.8	11.5	8.1
2021	7.4	11.5	9.7	7.1	10.8	7.8
2022	7.1	11.7	9.6	6.1	13.4	7.7
TOTAL DISSOLVED GAS (PERCENT SATURATION)						
2016	68.1	130.4	92.6	54.7	106.6	80.4
2017	72.7	111.1	93.8	63.6	115.0	83.4
2018	62.9	105.3	85.6	56.7	104.5	78.1
2019	66.0	115.6	93.8	70.6	118.7	85.4
2020	68.1	115.0	95.3	70.7	104.5	78.7
2021	97.4	106.8	103.0	94.6	115.4	98.5
2022	54.0	113.4	103.4	98.6	113.5	104.5

Source: DO concentration and TDG concentration data in Attachment H.

3.3.2.3 Other Water Resources-Related Available Information

Other information regarding water resources downstream of Pine Flat Dam has been prepared by or for the Framework Agreement's Technical Steering Committee comprised of KRWA, CDFW, and KRCD. The information is available at the Kings River Fisheries Management Program's (KRFMP) website https://krfmp.org/resources/reports-documents-test and includes the Annual Technical Reports for 2005-2021. These reports include additional water temperature data taken at the Fresno Weir stilling well. While this location is not ideal for measurement of temperature in the main channel, it does provide data collection throughout the year and can allow for comparison between years.

The Framework Agreement's Technical Steering Committee completed a Water Quality Monitoring Report for 2004-2005 (Technical Steering Committee, 2006). Water samples were collected along Kings River between Pine Flat Dam and Highway 180 and tested for a variety of constituents including basic water quality parameters, metals, pesticides, and herbicides (Table 3.3-4). Mercury and organophosphates were not detected during testing. The report concluded on page 23 that *"Results of the 2004-2005 pilot-scale water quality monitoring program provided no evidence to suggest that water quality conditions are a significant factor affecting habitat quality or the health and survival of rainbow trout, macroinvertebrates, or other aquatic organisms inhabiting the Kings River between Pine Flat Dam and Highway 180."*

Table 3.3-4. General minerals and metals results from the Framework Agreement's Technical Steering Committee Water Quality Monitoring Report for 2004-2005.

Constituent	Aug 6, 2004 Fresno Weir	Nov 30, 2004 Fresno Weir	Dec 29, 2004 Fresno Weir	Jan 3, 2005 Mill Creek	Feb 2, 2005 Fresno Weir	Feb 2, 2005 Mill Creek
pH	7.1	7.4	7.4	7.7	7.6	8.8
Total Dissolved Solids (parts per million [ppm])	23	25	21	189	88	173
Chloride (ppm)	ND	3.1	3.57	21.9	6.3	13
Nitrate (ppm)	ND	0.5	0.56	1.3	0.66	0.73
Sulfate (ppm)	3.5	4.1	4.4	16.5	6.5	10.8
Bicarbonate (ppm)	10	18.1	16.5	83.4	55.1	75.5
Carbonate (ppm)	ND	ND	ND	ND	ND	10.2
Hydroxide	ND	ND	ND	ND	ND	ND
Alkalinity (ppm)	10	18.1	16.5	83.4	55.1	85.7
Specific Conductance (microsiemens per centimeter at 25°C)	ND	46.5	46.5	290	129	234
Antimony (ppb)	ND	ND	ND	ND	ND	ND
Arsenic (ppb)	ND	ND	ND	ND	ND	ND
Barium (ppb)	8.7	9.7	11.5	71.3	30.2	60.9
Beryllium	ND	ND	ND	ND	ND	-
Cadmium (ppb)	ND	ND	ND	ND	ND	ND
Calcium (ppm)	2.83	4.26	4.61	26	10.8	21
Chromium (ppb)	ND	ND	ND	ND	ND	ND
Cobalt (ppb)	ND	ND	ND	ND	ND	ND
Copper (ppb)	ND	ND	ND	ND	ND	ND

Table 3.3-4. (continued)

Constituent	Aug 6, 2004 Fresno Weir	Nov 30, 2004 Fresno Weir	Dec 29, 2004 Fresno Weir	Jan 3, 2005 Mill Creek	Feb 2, 2005 Fresno Weir	Feb 2, 2005 Mill Creek
Lead (ppb)	ND	ND	ND	ND	ND	ND
Magnesium (ppm)	0.467	1.34	1.42	8.28	6.1	6.59
Molybdenum (ppb)	ND	5.7	ND	5.4	ND	ND
Nickel (ppb)	ND	ND	ND	ND	ND	ND
Potassium (ppm)	ND	ND	ND	3,080	1,460	2,230
Selenium (ppb)	ND	ND	ND	ND	ND	ND
Silver (ppb)	ND	ND	ND	ND	ND	ND
Titanium (ppb)	ND	ND	ND	ND	ND	ND
Vanadium (ppb)	ND	ND	ND	10.9	ND	8.9
Zinc (ppb)	ND	ND	ND	ND	ND	ND
Mercury (ppb)	ND	ND	ND	ND	ND	ND
Hardness (mg/L)	13.58	14.25	16.34	99.02	52.09	79.58

ND = non-detection based on laboratory reporting limits

Source: (Technical Steering Committee, 2006)

The SWRCB's Surface Water Ambient Monitoring Program (SWAMP) provides water quality data for Kings River, collected at the Fresno Weir and Winton Park monitoring stations, on its Data Dashboard. These data include sporadic sampling events, from 2002 to 2022, of various water quality parameters and toxins, such as arsenic, sulfate, total nitrogen, and turbidity (Tables 3.3-5 and 3.3-6).

Table 3.3-5. Summary of water quality data collected at the SWAMP Kings River Fresno Weir monitoring station from 2002 to 2020.

Analyte	# Samples	Years Sampled	Reporting Unit	Min	Mean	Max
Alkalinity as CaCO3, Total (mg/L)	4	2002-2005	mg/L	5	14.5	36
Ammonia as N, Total (mg/L)	2	2004-2005		0.5	0.5	0.5
Escherichia coli (MPN/100)	7	2002-2005		2	17.29	50
Manganese, Total * (ug/L)	3	2003-2005		7.8	20.93	45
Nitrogen, Total Kjeldahl, Total (mg/L)	2	2003-2005		0.5	0.5	0.5
Oxygen, Dissolved, Total (mg/L)	11	2002-2005, 2020	mg/L	4.29	9.97	12.96
pH (standard unit)	11	2002-2005, 2020	standard unit	7.03	7.66	8.5
Phosphorus as P, Total (mg/L)	7	2002-2005	mg/L	0.006	0.017	0.037
Selenium, Total (ug/L)	1	2002	ug/L	1	1	1
Specific Conductivity, Total (uS/cm)	11	2002-2005, 2020	uS/cm	23.4	45.15	107
Temperature (Deg C)	11	2002-2005, 2020	Deg C	7.1	13.25	27.24

Source: (SWAMP, 2023)

Table 3.3-6. Summary of water quality data collected at the SWAMP Kings River Winton Park monitoring station from 2011 to 2020.

Analyte	# Samples	Years Sampled	Min	Mean	Max
Alkalinity as CaCO3, Total (mg/L)	8	2012 - 2013	11	15.7	25
Ammonia as N, Total (mg/L)	21	2012 - 2013	0.05	0.48	0.5
Arsenic, Total (ug/L)	5	2012	0.5	3.2	5
Boron, Dissolved (mg/L)	8	2012 - 2013	0.03	0.03	0.06
Chloride, Dissolved (mg/L)	8	2012 - 2013	1	1.26	3.1
Dissolved Organic Carbon (mg/L)	1	2012	1.2	1.2	1.2
E. coli (MPN/100 mL)	42	2011 - 2014	0.5	27.42	387.7
Nitrogen, Total Kjeldahl, Total (mg/L)	21	2012 - 2013	0.25	0.44	1.1
Oxygen, Dissolved, Total (mg/L)	41	2011 – 2014	5.63	9.29	12.61
pH (standard unit)	42	2011 - 2014	5.58	7.08	8.61
Phosphorus as P, Total (mg/L)	21	2012 - 2013	0.03	0.63	6.7
Selenium, Total	5	2012	0.5	6.2	10
Specific Conductivity, Total	42	2011 - 2014	15.8	38.02	156.5
Sulfate, Dissolved (mg/L)	8	2012 - 2013	1	1.44	3.2
Temperature (Deg C)	42	2011 - 2014	2.27	13.98	22
Turbidity, Total (NTU)	37	2011 – 2014, 2020		1.16	4.72

Source: (SWAMP, 2023)

In addition, SWAMP has data on bacteria concentrations for seven locations in and downstream of Pine Flat Lake, collected weekly during 2020 and 2021 (SWAMP, 2021). Results from *E. coli* monitoring at all seven sites were under the water quality objective value of 400 cfu/100mL, except for the week of May 27, 2021, at Avocado Lake Swim Beach and Reedley Beach, which were recorded at 686.7 cfu/100mL and 344.8 cfu/100mL, respectively (Table 3.3-7).

Table 3.3-7. Preliminary *E. coli* results from weekly monitoring at seven stations in Pine Flat Lake and along Lower Kings River during 2020 and 2021.

2020															
Station	**5/20**	**5/27**	**6/3**	**6/10**	**6/17**	**6/22**	**7/1**	**7/8**	**7/15**	**7/22**	**7/29**	**8/5**	**8/12**	**8/19**	**8/26**
Pine Flat Lake at Island Park	-	-	39	4.1	3.1	39.3	1	-	-	1	1	1	1	2	1
North Riverside Access Park	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Choinumni Park	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Winton Park	-	-	75	22.8	16.8	5.2	21	-	-	93.3	9.7	8.6	29.2	52.9	3
Avocado Lake Swim Beach	-	-	27	2	1	4.1	3.1	-	-	29.2	150	1	1	126	1
Thorburn River Access Park	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reedley Beach	-	-	87	52.9	54.8	54.6	27	-	-	31.7	47.3	62	101	88.4	54.6
2021															
Station	**5/20**	**5/27**	**6/3**	**6/10**	**6/17**	**6/24**	**7/1**	**7/8**	**7/15**	**7/22**	**7/29**	**8/5**	**8/12**	**8/19**	**8/26**
Pine Flat Lake at Island Park	18.3	23.1	23	1	1	-	1	1	1	1	1	1	1	-	-
North Riverside Access Park	10.9	3.1	9.8	ND	2	1	1	1	1	1	1	3.1	1	-	-
Choinumni Park	16.1	5.2	8.5	2	3.1	5.2	2	7.3	4.1	8.5	6.2	12	3.1	-	-
Winton Park	65.1	47.4	56	4.1	308	21.6	5.2	9.8	6.3	98.8	6.3	138	4.1	-	-
Avocado Lake Swim Beach	1	687	75	37.7	18.9	42	7.5	20	8.6	19.3	13.2	6.3	40.8	-	-
Thorburn River Access Park	105	198	53	59.1	63.1	22.3	20	21	21.6	19.5	24.9	21.6	18.7	-	-
Reedley Beach	93.4	345	33	90.5	111	55.6	44	86	35.9	69.7	45	64.4	-	-	-

Source: (SWAMP, 2021)

3.4 AQUATIC RESOURCES

This section discusses aquatic resources that could be affected by the Project. This section is divided into three subsections. Section 3.4.1 addresses special-status aquatic species[1] known or with the potential to occur in the Project boundary, while Section 3.4.2 discusses general fish and other aquatic resources. Finally, Section 3.4.3 identifies aquatic invasive species (AIS)[2] that have the potential to be affected by the Project.

3.4.1 Special-Status Aquatic Species

On March 20, 2023, KRCD queried and reviewed the following sources to generate a list of special-status aquatic species with the potential to occur within the 12.4-mile-long section of the Kings River from Pine Flat Dam to the State Highway 180 Bridge.

- USFWS's Information for Planning and Consultation (IPaC) website (USFWS, 2023) (Attachment I)
- CDFW's California Natural Diversity Database (CNDDB) (CDFW, 2023)
- USACE's 2001 Final Environmental Impact Statement/Environmental Impact Report for Pine Flat Dam Fish and Wildlife Habitat Restoration (USACE, 2001)

As a result of this query and these reviews, KRCD determined one special-status aquatic species is known to occur in the downstream Kings River reach and three other special-status aquatic species have the potential to occur in the reach. Table 3.4-1 provides for each of the special-status aquatic species: 1) status; 2) habitat requirements; 3) potential to occur in the Kings River reach; and 4) rationale for why the species does or does not have potential to occur.

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1 For the purpose of this PAD, a special-status aquatic species is a species that has a reasonable possibility of being affected by Project O&M and meets one or more of the following criteria: 1) listed under CESA as a candidate for listing as endangered (SCE) or threatened (SCT), a candidate for delisting (SCD), or listed as threatened (ST) or endangered (SE); 2) Fully Protected (FP) under California law; and/or 3) designated by CDFW as a Species of Special Concern (SSC). If an aquatic species that meets one of the above criteria and is also listed as threatened or endangered under the federal ESA or proposed for or a candidate for listing under the federal ESA, it is not considered "special status" in this document but treated as an "ESA-listed species" in Section 3.2.5 of this document.

2 For the purpose of this PAD, "aquatic invasive species" are defined as aquatic "*species that are non-native to the ecosystem under consideration, and whose introduction causes, or is likely to cause, economic or environmental harm, or harm to human health*" (USDA National Invasive Species Information Center, 2006). Terrestrial non-native invasive plant species are discussed in Section 3.2.4.

Table 3.4-1. Special-status Aquatic Species with the Potential to Occur within the 12.4-mile-long Section of the Kings River from Pine Flat Dam to the State Highway 180 Bridge.

Common Name *Scientific Name*[1]	Status	Habitat Requirements	Potential to Occur	Rationale
FISH				
hardhead *Mylopharodon conocephalus*	Species of Special Concern (SSC)	Hardhead is typically found within larger mid- and low-elevation streams where summer mean daily water temperatures exceed 20°C (Moyle & Daniels, 1982) (Moyle & Nichols, 1973)	Yes	Observed in the lower end of the reach near Wildwood.
Kern Brook lamprey *Lampetra hubbsi*	SSC	The principal habitats of Kern brook lamprey are silty backwaters of large rivers in foothill regions. Kern Brook lamprey has a relatively small range, which includes the reach, though the nearest known occurrence of the species is approximately 70 miles northwest (CDFW, 2023).	Yes	Observed in the Kings River near Thorburn Channel (Rekedal, Hassan, & Amemiya, 2022).
riffle sculpin *Cottus gulosus*	SSC	Riffle sculpins are found in headwater streams with cold water and rocky or gravelly substrate. The riffle sculpin's range also includes the reach, though the nearest known occurrence is approximately 76 miles northwest of the reach (CDFW, 2023).	Yes	Observed in the Kings River in 2011 (Baumsteiger & Aguilar, 2014)

3.4.1.1 Hardhead[3]

Hardhead are large cyprinids native to the Sacramento and San Joaquin river basins (Moyle P. B., Inland Fishes of California, 2002). Hardhead have very restrictive microhabitat preferences and prefer large, warm streams containing deep, rock-bottomed pools and runs with sand-gravel-boulder substrates, low turbidity, and low water velocities (20–40 centimeters per second) (Moyle P. B., Inland Fishes of California, 2002). They prefer warmer temperatures (>20°C for growth and 24–28°C for optimal physiological performance) and most often occur in streams with temperatures over 20° C. They belong to the pikeminnow-hardhead-sucker assemblage and are typically found with Sacramento pikeminnow (*Ptychocheilus grandis*) and Sacramento sucker (*Catostomus occidentalis*)(Moyle P. B., Inland Fishes of California, 2002). In the intermittent pools of the upper San Joaquin River, they feed on filamentous algae (Wang, 1986).

Hardhead sexually mature in their third year and primarily spawn in April and May. Adults living in larger rivers sometimes migrate upstream to spawn, while others move short distances from their home pool (Moyle P. B., Inland Fishes of California, 2002) (Grant, 1997). Females produce 7,000 to 24,000 eggs per year. Hardhead spawn over gravel and rocky substrate in riffles, runs, or at the heads of pools. Larval and post-larval fish utilize dense cover along stream margins and move into deeper habitats as they grow (University of California Agriculture and Natural Resources, 2020).

[3] California Fish Website (ucdavis.edu)

3.4.1.2 Kern Brook Lamprey[4]

The Kern Brook lamprey is a non-parasitic lamprey endemic to the San Joaquin drainage (Brown & Moyle, 1992). Its morphology is like that of other lampreys: eel-like body, no paired fins, and a sucking disc instead of jaws. Larvae, known as ammocoetes, are similar to adults in shape but lack eyes and a well-developed oral disc. The Kern Brook lamprey is much smaller than the parasitic anadromous lampreys; adults range from 81 to 139 millimeters (mm) total length (TL) and ammocoetes from 117 to 142 mm TL. Ammocoetes are typically larger than adults because non-parasitic lampreys shrink following metamorphosis (Vladykov and Kott 1976). The number of trunk myomeres (i.e., the "blocks" of muscle mass along the body) ranges from 51 to 57 mm in ammocoetes. In adults, the supra-oral lamina (tooth) typically has two cusps, with four inner lateral teeth on each side of the disc. The sides and dorsum are a grey-brown and the ventral area is white. Dorsal fins are unpigmented, but there is some black pigmentation restricted to the area around the notochord in the caudal fin (Vladykov & Kott, 1976).

Kern Brook lamprey was first discovered in the Friant-Kern Canal, but it has since been found in the lower reaches of the Merced River, Kaweah River, Kings River, and San Joaquin River (Brown & Moyle, 1993). It has been reported in the Merced River between Crocker-Huffman Diversion Dam and the Merced Falls Dam by Stillwater Sciences (Stillwater Sciences, 2008) and PG&E (Pacific Gas and Electric Company, 2011) in ammocoete life stages. Adults were not collected in either effort. Notably, taxonomic identification between Pacific lamprey (*Entosphenus tridentata*) and Kern Brook lamprey is challenging and requires counting over 50 myomeres to confirm species.

3.4.1.3 Riffle Sculpin[5]

Riffle sculpin are a species endemic to California; in streams tributary to the San Joaquin River, they are distinct from other riffle sculpin populations (Moyle, Quinones, Katz, & Weaver, 2015). Riffle sculpin are found exclusively in permanent cold-water streams and exhibit narrow habitat requirements and poor dispersal abilities of both adults and juveniles (Moyle, Quinones, Katz, & Weaver, 2015). Riffle sculpins live in permanent, cool, headwater streams where riffles and rocky substrates predominate (Moyle P. B., Inland Fishes of California, 2002) (Leidy, 2007). Such streams are clear and shaded, with moderate gradients.

[4] iNaturalist United Kingdom
[5] California Fish Website (ucdavis.edu)

Riffle sculpins diet consists primarily of benthic invertebrates, including insect larvae such as those of caddisflies, stoneflies, and mayflies (Moyle P. B., Inland Fishes of California, 2002). They are also opportunistic feeder and will consume other prey that is readily available, such as amphipods and small fish, including other sculpins. They appear to feed mainly at night, although their stomachs can contain food at any time of the day (Moyle, Quinones, Katz, & Weaver, 2015).

Riffle sculpin adults are generally 60–80 mm long (standard length) and are assumed to be 2-3 years old (Moyle, Quinones, Katz, & Weaver, 2015). Older fish, probably 3–4-year-old males, measure 75–100 mm (Moyle, Quinones, Katz, & Weaver, 2015). Larger fish are rare but, when food is abundant, they can reach 100–160 mm TL and 4+ years old. Age and growth of riffle sculpin has not been well studied and is based mainly on length-frequency distributions (Moyle P. B., Inland Fishes of California, 2002). The maximum age for the species is not known (Moyle, Quinones, Katz, & Weaver, 2015).

Riffle sculpins are thought to mature at the end of their second year, spawning in February, March, and April (Moyle P. B., Inland Fishes of California, 2002). Spawning takes place under rocks in swift riffles or inside cavities in submerged logs. Males choose nesting sites and will spawn with multiple females (Moyle, Quinones, Katz, & Weaver, 2015).

3.4.2 Fishes and Aquatic Resources

3.4.2.1 Fishery Management and Stocking Below Pine Flat Dam

Since 2007, CDFW has stocked rainbow trout and brook trout (*Salvelinus fontinalis*) in the Kings River downstream of Pine Flat Dam. In addition, as required by paragraph 1(j) in the Framework Agreement, CDFW in cooperation with KRWA, KRCD, and appropriate fishing organizations, implements a focused supplemental rainbow trout stocking program. The program is designed to provide an attractive trout fishery and emphasizes stocking in the main channel and channels that flow into or out of the main channel, and stocking "put-and-grow" sub-catchable fish and eggs that can mature into a sustaining population of adult fish whenever appropriate. The supplemental stocking program is in addition to CDFW's existing stocking program. In addition to the supplemental stocking under the Framework Agreement, KRCD of its own volition also stocks fish, with CDFW's approval, in the same locations. Table 3.4-2 provides a summary of fish stocking in the reach from 2007 through 2021. CDFW stocks fish on a weekly basis downstream to Reedley Beach. Under the Kings River Fisheries Management Program (KRFMP), fish are stocked between October and April through the Framework Agreement. In addition, KRCD has a supplemental stocking program between October and April.

Table 3.4-2. Fish stocking in the Kings River downstream of Pine Flat Dam from 2007 through 2022.

Calendar Year	Trout Species	CDFW Regular Stocking (by size class)				KRCD Supplemental Stocking (by size class)		Kings River Fisheries Management Program Supplemental Stocking under Framework Agreement (by size class)		
		Sub-Catchable (pounds)	Catchable (pounds)	Super-Catchable (pounds)	Trophy (pounds)	Catchable (pounds)	Super-Catchable (pounds)	Catchable (pounds)	Super-Catchable (pounds)	Trout Egg Incubator Program[1], Eggs Incubated
2007	Rainbow	2,000	19,364	3,234	6,240	No Stocking Occurred		No Stocking Occurred		366,000
2008	Rainbow	3,430	17,030	3,100	8,000					--
2009	Rainbow	2,560	18,200	5,300	6,550					300,000
2010	Rainbow	2,200	17,700	3,320	1,000					300,000
	Brook	--	600	2,900	--					--
2011	Rainbow	2,000	14,300	7,000	--					300,000
	Brook	--	5,000	--	--					--
2012	Rainbow	--	18,800	7,000	2,600					225,000
	Brook	--	1,400	100	--					--
2013	Rainbow	4,370	9,800	6,075	5,325					312,000
	Brook	--	6,300	500	--					--
2014	Rainbow	3,000	13,300	6,200	--					438,000
	Brook	--	800	2,800	--					--
2015	Rainbow	2,605	6,800	2,300	--					300,000
	Brook	--	--	1,100	--					--
2016	Rainbow	--	13,170	9,250	--					404,000
2017	Rainbow	--	6,000	2,400	2,000					374,000
	Brook	--	1,600	4,920	--					--
2018	Rainbow	--	24,834	1,350	3,325			8,800	--	220,000
2019	Rainbow	4,821	13,470	3,600	2,300			17,200	--	337,000
	Brook	--	--	1,000	--			--	--	--
2020	Rainbow	3,460	16,750	1,500	--			13,700	2,000	226,000
	Brook	--	7,450	--	--			--	--	--
2021	Rainbow	1,700	5,250	4,000	350	3,804	8,900	13,500	--	205,000
	Brook	--	8,600	--	3,650	--	--	--	--	--
2022	Rainbow	--	13,420	3,600	--	9,005	--	14,900	--	220,000
	Brook	--	--	1,600	--	--	--	--	--	--

[1] Trout eggs are imported, hatched, and the resultant fry are released at 5-6 weeks of age.

Source: (CDFW, 2020) (KRCD, 2023)

3.4.2.2 Fish Community

KRCD monitors the fish community in the Kings River from Pine Flat Dam to Wildwood. Long-term annual baseline fisheries monitoring within the lower Kings River is currently being conducted as part of the KRFMP to determine (1) the assemblage, abundance, and condition of the fish community inhabiting the lower Kings River downstream of Pine Flat Dam; (2) overall fish biomass; (3) hatchery and "wild" rainbow trout abundance, distribution, and condition factor; and (4) the annual survival of rainbow trout populations. This monitoring initially began as part of compliance with Item 4 of the Memorandum of Agreement between the CDFW and KRCD.

A three-pass mark-and-recapture electrofishing survey was employed from 1983 until 1989 by KRCD. Starting in 1990, the survey method was modified to a single pass count of captured trout using only a single block seine net at the upstream end of the sample reach. In 2007, the survey method was modified by KRCD to include a full biomass three-pass removal with upstream and downstream block seines; and identifying, measuring, and weighing every fish sampled.

Six sites were selected and routinely sampled for fish from 2007 through 2021 (Figure 3.4-1). The sites correspond to three reaches where substantial flow changes may occur: Reach 1 - the Upper Reach between Pine Flat Dam and the Cobbles (Alta) Diversion Weir; Reach 2 - the Middle Reach between the Cobbles (Alta) Diversion Weir and the Fresno Weir; and Reach 3 - the Lower Reach downstream of the Fresno Weir. The sites also correspond to the first three reaches in the KRFMP. Reach 1 is managed as a put-and-take trout fishery with a five-fish bag limit. Reach 2 is managed as a catch-and-release trout fishery with a 0 trout bag limit and a requirement that only barbless hooks and artificial lures may be used under California freshwater inland sport fishing regulations. Reach 3 is managed as an opportunistic trout fishery, with the same fishing regulation as Reach 2 to the Highway 180 crossing; downstream of Highway 180 fishing regulations within the reach are managed with the same regulation as Reach 1. Neither the Cobbles (Alta) Diversion Weir nor the Fresno Weir are part of the Project or under FERC's jurisdiction. Figure 3.4-1 shows the location of the three reaches and the electrofishing sites. (Wang, 1986)

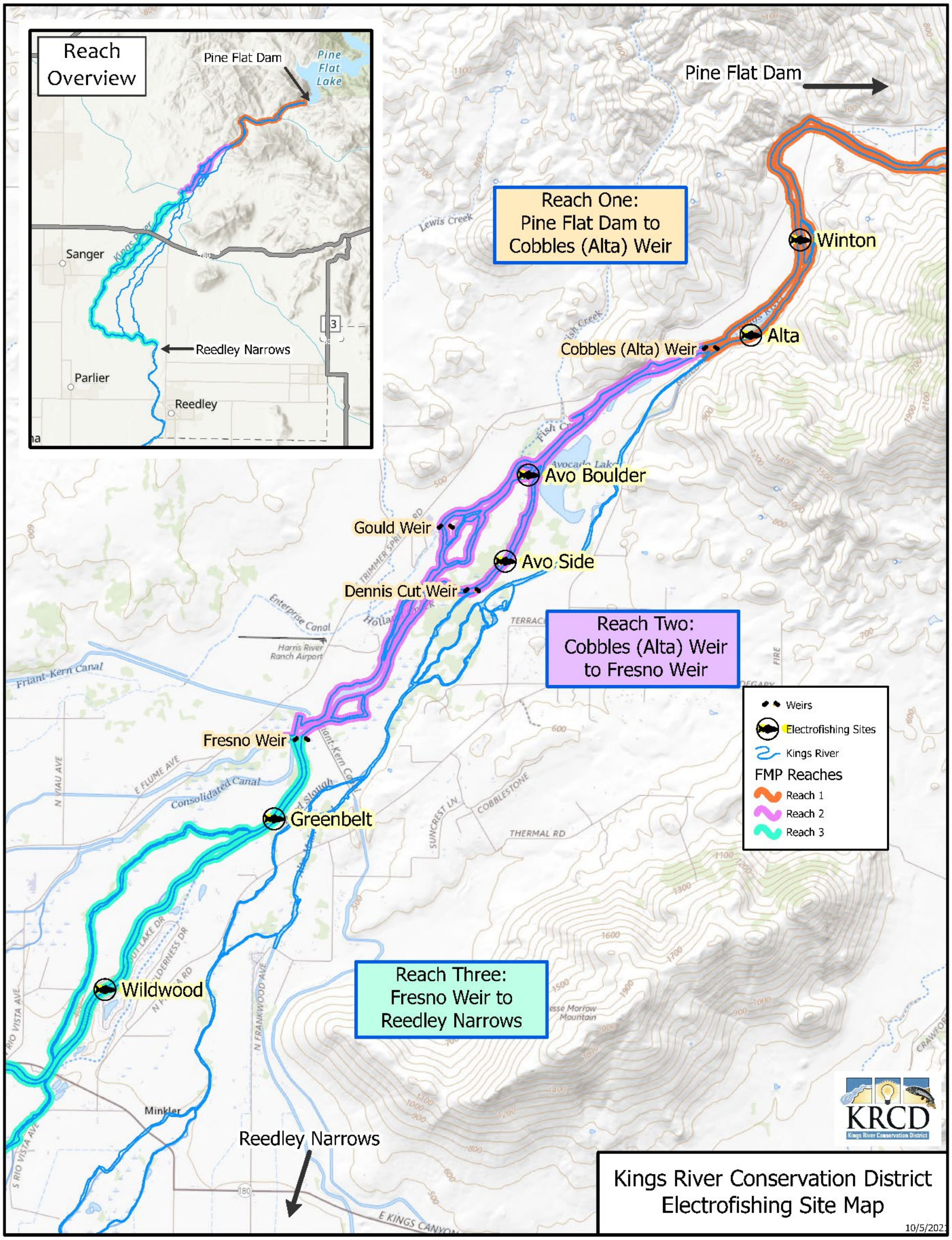

Figure 3.4-1. Location of KRCD's Winton, Cobbles (Alta), Avo Boulder, Avo Side, Greenbelt, and Wildwood fish monitoring sites sampled from 2007 through 2021.

There is additional information on the fish community in the reach from snorkeling surveys that were contracted by KRCD under the KRFMP. KRCD performed snorkel surveys upstream and downstream of the Cobbles (Alta) Diversion Weir in 2019, in cooperation with CDFW.

Monitoring performed by the snorkel survey contractor identified 13 fish to species and four fish to genera only. There were eight native species and 10 introduced species/genera. A summary is provided in Table 3.4-3.

Table 3.4-3. Fish Species Identified During Monitoring Surveys from Pine Flat Dam Downstream to Wildwood in the Kings River from 2007 to 2021.

Common Name ***Scientific Name***	**Native/Introduced**	**Location Within the Reach the Species was Detected (1,2,3)**[1]
Black basses *Micropterus* spp.	Introduced	1,2,3
Bluegill *Lepomis macrochirus*	Introduced	3
Brook trout *Salvelinus fontinalis*	Introduced	1,3
Bullhead/Catfish *Ameiurus* spp.	Introduced	1,3
California roach *Hesperoleucus symmetricus*	Native	1,2,3
Green sunfish *Lepomis cyanellus*	Introduced	1,3
Hardhead *Mylopharodon conocephalus*	Native, species of special concern	3
Lamprey *Lampetra* spp.	Native	1,2,3
Largemouth bass *Micropterus salmoides*	Introduced	3
Mosquitofish *Gambusia affinis*	Introduced	1,3
Rainbow trout *Oncorhynchus mykiss*	Native and introduced (hatchery reared)	1,2,3
Sacramento pikeminnow *Ptychocheilus grandis*	Native	1,2,3
Sacramento sucker *Catostomus occidentalis*	Native	1,2,3
Sculpin *Cottus* spp.	Native	1,2,3
Smallmouth bass *Micropterus dolomieu*	Introduced	3
Three-spined stickleback *Gasterosteus aculeatus*	Native	1,2,3
White catfish *Ameiurus catus*	Introduced	1,2,3

[1] (1) Reach 1: Pine Flat Dam to Cobbles (Alta) Diversion Weir
(2) Reach 2: Cobbles (Alta) Diversion Weir to Fresno Weir
(3) Reach 3: Fresno Weir to Reedley Narrows

Summaries of KRCD’s electrofishing data from 2007, when the sampling method was standardized, through 2021, and KRCD’s snorkeling data from 2019, are provided by reach below. Since each electrofishing site is approximately 300 feet in length, comparison between sites is appropriate.

Reach 1 (Winton Park and Alta Fish Monitoring Sites)

Tables 3.4-4 and 3.4-5 present fish population estimates by sampling site for the Winton Park and Alta monitoring sites, respectively. Collectively, a total of 14 fish taxa were collected over the 14 years of monitoring, including seven native taxa and seven introduced fish taxa.[6] In most years, the catch at each site was numerically dominated by a combination of five native taxa- 1) sculpin (*Cottus* spp.); 2) Sacramento pikeminnow; 3) Sacramento sucker; 4) lamprey (*Lampetra* spp.); and 5) California roach (*Hesperoleucus symmetricus*), with the latter two taxa more abundant at the downstream Alta monitoring site. Both wild and hatchery reared rainbow trout accounted for small portions of the catch in each year. The 2019 snorkeling survey confirmed the species composition and relative abundance of fishes observed in electrofishing monitoring. Based on the snorkel surveys, KRCD estimated the population of rainbow trout in this reach was 109 fish per mile in November 2019, with most rainbow trout in runs and riffles (FISHBIO, 2020).

[6] Although more than one species of sculpin, lamprey, and catfish may have been observed during any monitoring event, due to the difficulty in identifying small individuals of these species, they were classified within their respective genus unless a definitive identification occurred.

Table 3.4-4. Fish Population Estimates at the Winton Park Electrofishing Site from 2007 through 2021.

Common Name ***Scientific Name***	**Calendar Year**													
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017[1]**	**2018**	**2019**	**2021**
NATIVE TO KINGS RIVER (Population Estimate)														
California roach *Hesperoleucus symmetricus*	3	--	--	6	18	--	--	26	34	11	No Data	--	--	3
Lamprey *Lampetra* spp.	1	2	4	--	--	--	3	3	2	3		2	6	4
Rainbow trout *Oncorhynchus mykiss*	24	7	5	8	--	18	3	--	1	--		1	1	3
Sacramento pikeminnow *Ptychocheilus grandis*	113	91	14	14	50	1	239	214	141	78		6	59	368
Sacramento sucker *Catostomus occidentalis*	838	107	35	42	93	128	450	121	538	844		595	66	444
Sculpin *Cottus* spp.	437	176	330	528	326	372	540	395	164	230		877	455	239
Three-spined stickleback *Gasterosteus aculeatus*	12	--	1	20	40	--	15	46	75	158		20	9	6
INTRODUCED TO KINGS RIVER (Population Estimate)														
Brook trout *Salvelinus fontinalis*	--	--	--	1	--	--	--	--	--	--	No Data	--	--	3
Catfish *Ameiurus* spp.	--	--	--	--	--	--	--	**2**	--	--		--	3	--

Table 3.4-4 (continued).

Common Name *Scientific Name*	Calendar Year													
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017[1]**	**2018**	**2019**	**2021**
Green sunfish *Lepomis cyanellus*	--	--	--	--	1	--	--	--	--	--	--	--	--	--
Hatchery-reared rainbow trout *O. mykiss*	9	--	3	1	--	1	2	--	--	2		4	--	2
Mosquitofish *Gambusia affinis*	--	--	--	--	--	--	--	--	2	--		--	--	--
Site Total	**1,437**	**383**	**392**	**620**	**528**	**520**	**1,252**	**807**	**957**	**1,326**		**1,505**	**599**	**1,072**
Taxa per Year	**8**	**5**	**7**	**8**	**6**	**5**	**7**	**7**	**8**	**7**		**7**	**7**	**9**
Total Taxa	**12**													

Source: (KRCD, 2023) (Van Deventer, 2014)

[1] The site was not sampled in 2017 for safety reasons due to higher-than-normal instream flow resulting from unusually wet hydrologic conditions.

Table 3.4-5. Fish Population Estimates at the Alta Electrofishing Site from 2007 through 2021.

Common Name *Scientific Name*	**Calendar Year**													
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017[1]**	**2018**	**2019[1]**	**2021**
NATIVE TO KINGS RIVER (Population Estimate)														
California roach *Hesperoleucus symmetricus*	3	6	150	22	7	39	54	152	189	376	No Data	6	No Data	34
Lamprey *Lampetra* spp.	407	70	86	141	49	154	35	164	160	165		81		249
Rainbow trout *Oncorhynchus mykiss*	4	4	1	--	3	3	--	--	--	--		2		1
Sacramento pikeminnow *Ptychocheilus grandis*	27	15	65	13	23	21	164	55	247	78		14		464
Sacramento sucker *Catostomus occidentalis*	535	231	141	207	112	466	268	100	536	556		510		549
Sculpin *Cottus* spp.	617	175	384	332	229	469	191	61	10	30		799		95
Three-spined stickleback *Gasterosteus aculeatus*	46	36	58	122	50	54	64	258	31	117		10		102
INTRODUCED TO KINGS RIVER (Population Estimate)														
Black bass *Micropterus* spp.	--	--	--	--	--	--	--	--	1	1	No Data	--	No Data	--
Brook trout *Salvelinus fontinalis*	--	--	--	7	--	--	--	--	--	--		--		--

Table 3.4-5 (continued).

Common Name *Scientific Name*	**Calendar Year**													
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017[1]**	**2018**	**2019[1]**	**2021**
Hatchery-reared rainbow trout *O. mykiss*	40	--	1	1	--	--	1	--	--	--	No Data	4	No Data	10
Mosquitofish *Gambusia affinis*	--	2	--	--	--	--	1	1	23	17	No Data	--	No Data	--
Site Total	**1,679**	**539**	**886**	**845**	**473**	**1,206**	**778**	**800**	**1,197**	**1,339**	**--**	**1,426**	**--**	**1,504**
Taxa per Year	**8**	**8**	**8**	**8**	**8**	**7**	**8**	**7**	**8**	**7**	**--**	**8**	**--**	**7**
Total Taxa	**11**													

Source: (KRCD, 2023) (Van Deventer, 2014)

[1] The site was not sampled in 2017 and 2019 for safety reasons due to higher-than-normal instream flow resulting from unusually wet hydrologic conditions.

Reach 2 (Avocado Boulder Channel and Avocado Side Channel Monitoring Sites)

The first diversion point on the river is at Cobbles Weir, which diverts water into a side channel of the river known as the “76” channel. Upwards of 900 cfs may be diverted from the “76” channel at the Alta Canal Headgate. Additional flow in the “76” channel may return to the main channel at a confluence below the Fresno Weir. The main river channel continues to receive flow minus diversions. Below Cobbles Weir, flow may be diverted from the river at Dennis Cut and Gould Weir. Minimum flow in Dennis Cut is 5 cfs. Diversions at Gould Weir, into the Gould Canal Headgate may be up to about 400 cfs. The Project’s existing FERC license does not include flow requirements in this reach.

Tables 3.4-6 and 3.4-7 present fish population estimates by sampling site for the Avocado Boulder Channel and Avocado Side Channel monitoring sites, respectively. A total of 14 fish taxa was collected over the 14 years of monitoring at both sites, including seven native fish taxa and seven introduced fish taxa. In most years, the catch at each site was numerically dominated by a combination of six native taxa: 1) sculpin spp.; 2) Sacramento pikeminnow; 3) Sacramento sucker; 4) lamprey spp.; 5) California roach; and 6) three-spined stickleback (*Gasterosteus aculeatus*). Both wild and hatchery reared rainbow trout accounted for small portions of the catch in each year. As with the Upper Reach, KRWA’s 2019 snorkeling survey confirmed the species composition and relative abundance of fishes observed in electrofishing monitoring. Based on snorkeling surveys, KRWA estimated the population of rainbow trout in the Middle Reach was 174 fish per mile in November 2019, with the majority of rainbow trout in runs and riffles (FISHBIO, 2020).

Table 3.4-6. Fish Population Estimates at the Avocado Boulder Channel Electrofishing Site from 2007 through 2021.

Common Name / *Scientific Name*	Calendar Year													
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017[1]**	**2018**	**2019**	**2021**
NATIVE TO KINGS RIVER (Population Estimate)														
California roach *Hesperoleucus symmetricus*	20	126	45	79	24	116	198	255	350	491	No Data	70	12	50
Lamprey *Lampetra* spp.	5	6	5	7	27	24	7	43	38	35		10	8	48
Rainbow trout *Oncorhynchus mykiss*	8	7	11	--	5	12	4	--	1	2		7	3	8
Sacramento pikeminnow *Ptychocheilus grandis*	112	389	154	40	10	46	370	324	501	232		27	8	198
Sacramento sucker *Catostomus occidentalis*	573	261	257	162	88	415	296	174	366	1,034		517	210	367
Sculpin sp. *Cottus* sp.	201	147	268	239	87	302	307	141	27	26		156	68	29
Three-spined stickleback *Gasterosteus aculeatus*	7	27	33	4	9	6	6	55	21	142		24	13	12

Table 3.4-6. (continued)

Common Name *Scientific Name*	Calendar Year													
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017[1]**	**2018**	**2019**	**2021**
INTRODUCED TO KINGS RIVER (Population Estimate)														
Bass sp. *Micropterus* sp.	--	--	--	--	--	--	--	1	--	--	No Data	--	--	--
Hatchery-reared rainbow trout *O. mykiss*	2	1	--	2	6	3	1	1	1	7		4	41	11
Catfish *Ameiurus* spp.	--	1	--	--	--	--	--	2	--	--		--	--	--
Site Total	**928**	**965**	**773**	**533**	**256**	**924**	**1,189**	**996**	**1,305**	**1,969**	**--**	**815**	**363**	**723**
Taxa per Year	**8**	**9**	**7**	**6**	**8**	**8**	**8**	**9**	**8**	**8**	**--**	**8**	**8**	**8**
Total Taxa	**10**													

Source: (KRCD, 2023) (Van Deventer, 2014)

[1] The site was not sampled in 2017 for safety reasons due to higher-than-normal instream flow resulting from unusually wet hydrologic conditions

Table 3.4-7. Fish population estimates at the Avocado Side Channel Alta electrofishing site from 2007 through 2021.

Common Name *Scientific Name*	Calendar Year													
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017[1]**	**2018**	**2019**	**2021**
NATIVE TO KINGS RIVER (Population Estimate)														
California roach *Hesperoleucus symmetricus*	82	46	6	5	39	45	263	104	253	283	118	11	105	58
Lamprey *Lampetra* spp.	204	112	118	42	135	114	104	210	54	386	362	181	228	164
Rainbow trout *Oncorhynchus mykiss*	--	8	2	3	2	9	4	--	--	4	3	8	10	1
Sacramento pikeminnow *Ptychocheilus grandis*	170	53	31	7	2	254	183	86	185	10	25	5	8	114
Sacramento sucker *Catostomus occidentalis*	372	112	64	45	54	319	88	71	268	291	361	552	201	171
Sculpin *Cottus* spp.	350	73	137	101	159	214	215	107	8	4	172	209	214	40
Three-spined stickleback *Gasterosteus aculeatus*	21	25	21	--	4	36	10	60	20	559	57	107	14	5

Table 3.4-7. (continued)

Common Name *Scientific Name*	Calendar Year													
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017[1]**	**2018**	**2019**	**2021**
INTRODUCED TO KINGS RIVER (Population Estimate)														
Black bass *Micropterus* spp.	--	--	1	--	--	--	--	--	1	--	No Data	1	--	--
Brook trout *Salvelinus fontinalis*	--	--	--	1	--	--	--	--	--	--		--	--	--
Catfish *Ameiurus* spp.	--	--	--	--	--	--	--	2	--	--		--	2	--
Hatchery-reared rainbow trout *O. mykiss*	8	--	0	--	3	--	1	--	--	2	4	3	13	27
Mosquitofish *Gambusia affinis*	--	--	--	--	--	9	--	2	--	--	--	--	--	--
Site Total	**1,207**	**429**	**380**	**204**	**398**	**1,00**	**868**	**642**	**789**	**1.539**	**1,102**	**1,077**	**795**	**580**
Taxa per Year	**6**	**8**	**8**	**7**	**8**	**8**	**8**	**8**	**7**	**8**	**7**	**9**	**9**	**8**
Total Taxa	**14**													

Source: (KRCD, 2023) (Van Deventer, 2014)

[1] Unlike in other years, KRCD reported a range of maximum probability for population estimates in 2017. The number provided here is the midpoint in the reported range.

Reach 3 (Greenbelt Parkway and Wildwood Monitoring Sites)

The minimum flow at Fresno Weir is 95 cfs. Two diversions at Fresno Weir are Fresno Canal and Consolidated Canal, with a combined diversion capacity that is upwards of 3,200 cfs. The river channel below Fresno Weir receives flow minus these diversions. Minimum flows in the river below Fresno Weir range from 35 to 45 cfs, depending on the time of year. Additional flow below Fresno Weir may occur to meet irrigation demand or flood flow requirements. The Project's existing FERC license does not include flow requirements in this reach.

Tables 3.4-8 and 3.4-9 present fish population estimates by sampling site for the Greenbelt Parkway and Wildwood monitoring sites, respectively. At both sites, a total of 18 fish taxa was collected over the 14 years of monitoring, including eight native fish taxa that were collected at both sites and hardhead that was collected at the Greenbelt Parkway site, and 10 introduced fish taxa. In most years, the catch at each site was numerically dominated by a combination of five native fish taxa: 1) sculpin spp.; 2) Sacramento pikeminnow; 3) Sacramento sucker; 4) lamprey spp.; and 5) California roach. Both wild and hatchery reared rainbow trout accounted for small portions of the catch in each year. KRCD's 2019 snorkeling survey did not include the Lower Reach (FISHBIO, 2020).

Table 3.4-8. Fish Population Estimates at the Greenbelt Parkway Electrofishing Site from 2007 through 2021.

Common Name *Scientific Name*	Calendar Year													
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017[1]**	**2018**	**2019**	**2021**
NATIVE TO KINGS RIVER (Population Estimate)														
California roach *Hesperoleucus symmetricus*	177	253	58	75	41	146	297	240	113	114	197	96	10	144
Rainbow trout *Oncorhynchus mykiss*	3	1	--	--	--	1	--	--	--	--	--	--	--	
Hardhead *Mylopharodon conocephalus*	--	--	--	--	--	--	--	--	--	--	--	1	--	--
Lamprey *Lampetra* spp.	3	2	1	1	--	4	5	5	--	2	10	6	2	11
Sacramento pikeminnow *Ptychocheilus grandis*	381	160	114	59	18	69	1,255	150	175	56	29	156	22	334
Sacramento sucker *Catostomus occidentalis*	344	119	64	14	14	109	69	34	24	574	197	215	102	39
Sculpin *Cottus* spp.	219	29	90	85	259	130	195	36	7	37	163	261	71	93
Three-spined stickleback *Gasterosteus aculeatus*	--	--	5	--	1	4	28	6	--	6	116	28	5	87

Table 3.4-8 (continued).

Common Name *Scientific Name*	**Calendar Year**													
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017[1]**	**2018**	**2019**	**2021**
INTRODUCED TO KINGS RIVER (Population Estimate)														
Common Name *Scientific Name*	**Calendar Year**													
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017[1]**	**2018**	**2019**	**2021**
Black bass *Micropterus* spp.	--	--	3	--	--	--	5	27	56	15	3	1		12
Bluegill *Lepomis macrochirus*	--	--	1	--	--	--	--	--	--	1	--	--	--	--
Catfish *Ameiurus* spp.	--	1	2	--	--	1	3	15	2	--	--	1	1	2
Green sunfish *Lepomis cyanellus*	--	--	--	--	--	--	--	--	--	2	5	--	--	--
Hatchery-reared rainbow trout *O. mykiss*	--	--	--	--	--	--	--	--	--	--	1	--	--	4
Mosquitofish *Gambusia affinis*	--	--	--	--	--	--	--	3	20	1	--	--	--	--
Site Total	**1,127**	**565**	**338**	**234**	**333**	**464**	**1,857**	**516**	**397**	**808**	**721**	**765**	**213**	**726**
Taxa per Year	**6**	**7**	**11**	**5**	**5**	**8**	**8**	**9**	**7**	**9**	**9**	**8**	**7**	**9**
Total Taxa	**18**													

Source: (KRCD, 2023) (Van Deventer, 2014)

[1]Unlike in other years, KRCD reported a range of maximum probability for population estimates in 2017. The number provided here is the midpoint in the reported range.

Table 3.4-9. Fish Population Estimates at the Wildwood Electrofishing Site from 2007 through 2021.

Common Name *Scientific Name*	**Calendar Year**													
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017[1]**	**2018**	**2019**	**2021**
NATIVE TO KINGS RIVER (Population Estimate)														
California roach *Hesperoleucus symmetricus*	57	504	440	564	390	514	479	522	1,060	922	No Data	513	154	307
Rainbow trout *Oncorhynchus mykiss*	--	--	--	--	--	--	--	--	--	1		--	--	
Lamprey *Lampetra* spp.	8	--	1	13	--	--	--	1	1	--		9	12	4
Sacramento pikeminnow *Ptychocheilus grandis*	1,441	141	181	108	8	531	908	329	161	66		59	9	421
Sacramento sucker *Catostomus occidentalis*	368	25	28	133	156	765	202	93	25	827		506	401	63
Sculpin *Cottus* spp.	353	58	95	93	150	125	152	63	6	1		165	144	92
Three-spined stickleback *Gasterosteus aculeatus*	22	101	25	69	3	30	150	151	40	175		12	6	221

Table 3.4-9 (continued).

Common Name *Scientific Name*	**Calendar Year**													
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**[1]	**2018**	**2019**	**2021**
INTRODUCED TO KINGS RIVER (Population Estimate)														
Black bass *Micropterus* spp.	--	--	--	--	--	**1**	--	1	4	1	No Data	--	--	4
Hatchery-reared rainbow trout *O. mykiss*	--	--	--	--	--	--	--	--	--	--		--	--	1
Catfish *Ameiurus* spp.	--	--	--	--	--	1	--	--	--	--		--		--
Mosquitofish *Gambusia affinis*	--	--	--	--	--	--	--	14	19	21		--	--	2
Site Total	**2,249**	**829**	**770**	**980**	**707**	**1,967**	**1,891**	**1,174**	**1,316**	**2,014**	**--**	**1,264**	**727**	**1,115**
Taxa per Year	**6**	**5**	**6**	**6**	**5**	**5**	**5**	**8**	**8**	**8**	**--**	**6**	**7**	**9**
Total Taxa	**10**													

Source: (KRCD, 2023) (Van Deventer, 2014)

[1] The site was not sampled in 2017 for safety reasons due to higher-than-normal instream flow resulting from unusually wet hydrologic conditions.

3.4.2.3 Fish Entrainment

KRCD conducted entrainment studies for the Project in late 1970s and early 1980s, releasing groups of 500-1,000 tagged trout into Pine Flat Lake and determining where they were recovered. Between 0-20 percent of the tags were recovered in the Kings River. Overall, none were recovered via releases through the powerhouse. Additionally, KRCD and CDFG surveys in the 1990s via creel census, electroshocking, snorkeling, and entrainment studies also indicated that entrainment from the lake under existing conditions is probably very low (USACE, 2001).

2023 Assessment Methodology

KRCD performed a desktop assessment of the susceptibility of fish to becoming entrained at the Pine Flat Lake water intake structure. The entrainment susceptibility assessment included a characterization of the intake (e.g., depth and dimensions), configuration of the turbines at the Jeff L. Taylor Powerhouse, and a summary of relevant Project flows. These data were used to calculate the approach velocities near the intake structure, which was later used to evaluate the potential for fish to avoid the intake.

Fisheries data from Pine Flat Lake were reviewed and used to develop a list of target species to be included in the entrainment assessment. Information was compiled characterizing the life history, habitat characteristics, size range, and documented swim speeds of the identified target species. Where sufficient data were not available for specific target species, a different species was identified whose data could be used as a “representative” of the target species. Representative species are selected first from closely related species, then if no matches are available, they are selected based on similarity in life history information, habitat preferences, or other factors supported by the literature.

The compiled species biological information in combination with the intake specifications, approach velocities, project-specific operations, and reservoir characteristics aided in assessing entrainment susceptibility and potential for adverse fish community impacts for the target fish species at the FERC-regulated intake structure. The desktop approach and associated methodology used to develop this fish entrainment assessment follow well-established protocols that have been accepted by FERC on multiple hydropower relicensing projects throughout the United States.

Facility and Water Quality and Flow Characterization

Depth and Location of Project Intake Structure
The location and depth of water withdrawal of an intake structure have been shown to be important determining factors of entrainment risk (FERC, 1995). Intake structures of dams can be located along shorelines or at the center of a dam; they can be located at the surface or may be placed at depth. Fish must be present near the intakes to be at risk of entrainment. The position and depth are important in relation to the type(s) of fish habitat available, which in turn influences the species and life stages of fish likely to

occur near the intake. Thus, the risk of entrainment at an intake structure is dependent on the intake location and the ability of the fish to encounter the intake structure, which can vary by species and life stage.

The elevation at the centerline of the Project intake that supplies the Jeff L. Taylor Powerhouse is 654.5 feet (Figure 3.4-2) approximately 15 feet from the reservoir/dam bottom and approximately 315.5 feet below dam crest elevation of 970 feet. At reservoir maximum pool (955 feet elevation) the centerline of the Project intake and three penstock openings is approximately 300 feet below the surface of the lake. However, total lake depth can vary seasonally based on planned seasonal drawdowns, facility operations, and freshwater inflows to Pine Flat Lake. The lowest lake elevation documented between 2017 and 2021 was 758 feet (USACE, 2022) with a total lake depth of approximately 103 feet.

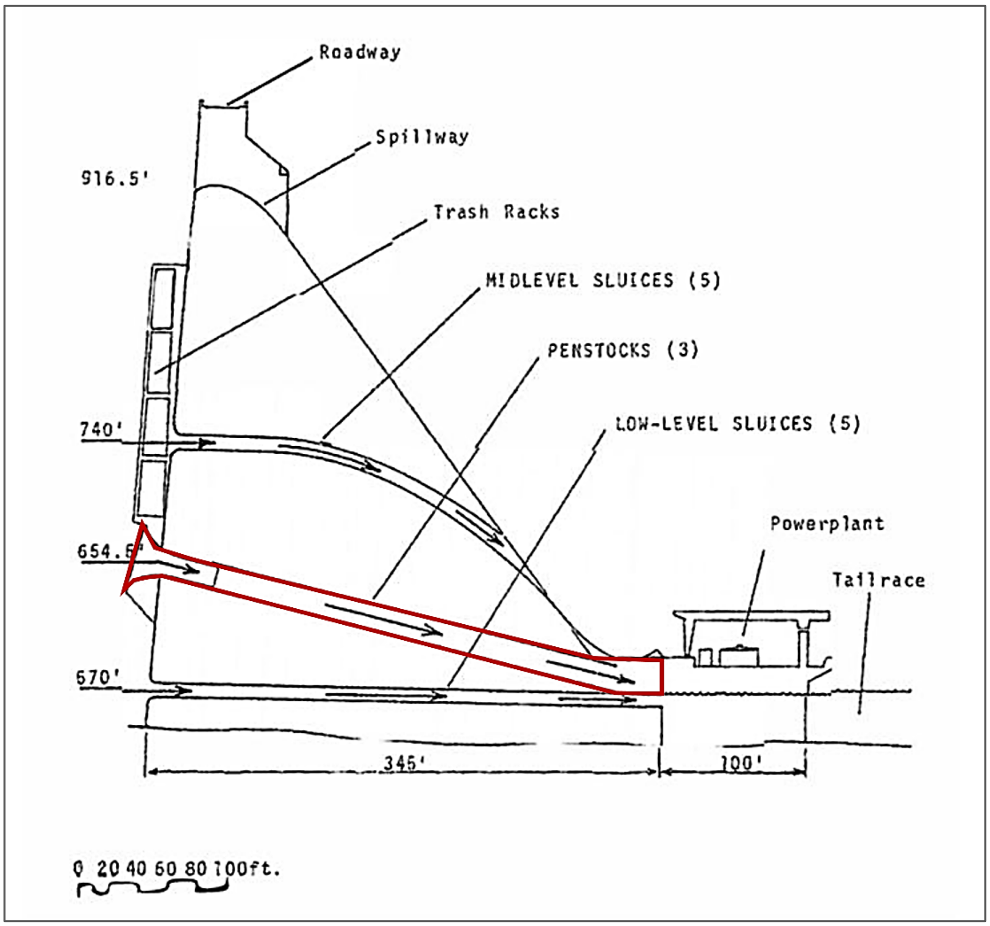

Figure 3.4-2. USACE's Pine Flat water intake, gates, and release points. The water intake at elevation 654.5 feet passes flows to the powerplant and non-Project bypasses.

Intake Structure Location and Available Fish Habitat
The Project intake structure is located at an elevation of 654.5 feet, near the center of the dam and away from the coves or backwater areas where the dam meets the

shoreline (Figure 3.4-2). This open channel location is characteristic of faster moving water and not near vegetative or in-water cover where fish typically seek refuge. As described previously, the Project intakes are approximately 15 feet from the reservoir bottom at an approximate depth of 80 to 300 ft depending on the water level in the reservoir. The water depth at the intake during the period of highest generation is generally greater than 200 ft.

Fish tend to occupy water where prey, aquatic invertebrates, and smaller fish are present. Aquatic invertebrates and smaller fish feed on algae that need sunlight to grow, as such, these organisms are most commonly found in the top three to seven feet of the water column. Therefore, it is unlikely that most fish, regardless of life stage or species, will be at the depths where the intake is located. This reduces the likelihood of fish being in the area of the Project's intake structure.

Intake Flows and Intake Velocities
From 2003 through 2020, flows averaged 1,890 cfs with a range of 0 to 7,834 cfs. During this same time period the bypass flows averaged 88 cfs with a range from zero to 549 cfs. The average flow through the intake during that period was 1,978 cfs consisting of 1,890 cfs (through Project penstocks) plus 88 cfs (through non-Project bypass). The FERC-authorized maximum hydraulic capacity of the Project is 8,000 cfs.

Intake velocities for the Project were calculated based on the dimensions of the three 13.5-ft diameter penstocks, each with a hydraulic capacity of 3,000 cfs. Assuming all three penstocks are at full capacity, the approach velocity at each of the penstocks is 21 feet per second (fps). However, using the 2003 through 2020 combined average actual flows (1,978 cfs) documented through the powerhouse and bypasses, and assuming the flow passed through each of the penstocks equally, the average approach velocity, would be 4.6 fps. The minimum intake flow needed to generate is 500 cfs. Assuming the flow would pass through each of the penstocks equally, the minimum approach velocity at each of the penstocks would be 1.2 fps. The range of approach velocities at each of the penstocks during periods of generation would be from 1.2 to 21 fps, depending on the river flows and generation.

Water Quality Characteristics at Pine Flat Lake
While not part of the Project, KRCD provides a summary of reservoir profile information for Pine Flat Lake as it relates to fish entrainment potential. Temperature and DO profile data were collected once per month within Pine Flat Lake, approximately half a mile upstream of the dam from June through December in 2017 and 2018. Water temperature from the depth at the intake (647.7 ft) ranged from 11 to 17.5°C and DO concentrations ranged from 4 to 7.7 mg/L (Table 3.4-10). From June through September, temperature at the depth of the intake was more than 10°C cooler than at the surface and in October and December temperatures were similar throughout the water column, which shows that the reservoir does not stratify in the fall and winter. DO concentrations were typically lower at the intake depth than at the surface, except in August and December when intake depth concentrations were slightly higher than at the surface.

Table 3.4-10. Temperature and Dissolved Oxygen Readings from Elevations at Surface, Intake, and Bottom, Once Per Month from June through December in either 2017 or 2018.

Month-Year	Surface Elevation (ft)	Intake Water Depth (ft)	Temp (°C)			DO (mg/L)		
			S[1]	I[1]	B[1]	S	I	B
Jun-18	928.8	274.3	24	11	10	9.8	7	6.5
Jul-18	890.4	235.9	27	13	11	10	6.5	2.5
Aug-17	924.7	270.2	28	13	12	7.5	7.7	4.5
Sep-17	886.3	231.8	26	14	12	8	6.5	0
Oct-18	773.8	119.3	19	17.5	14	7.5	4	0
Dec-18	787.7	133.2	15	14	13	7.2	7.7	7.7

[1]S=Surface, I=Intake, B=Bottom

Fish Composition in Pine Flat Lake

The fish community in Pine Flat Lake consists of multiple resident and stocked species including channel catfish (*Ictalurus punctatus*), threadfin shad (*Dorosoma petenense*), crappie (*Pomoxis* sp.), bluegill (*Lepomis macrochirus*), and spotted (*Micropterus punctulatus*), smallmouth bass (*M. dolomieu*), and largemouth bass (*M. salmoides*). Chinook (*Oncorhynchus tshawytscha*), kokanee salmon (*O. nerka*) and rainbow trout (*O. mykiss*) are also observed occasionally during colder wetter years when conditions are favorable (KRDC 2022).

Since 2007, CDFW has stocked rainbow trout and brook trout (*Salvelinus fontinalis*) in the Kings River downstream of Pine Flat Dam and within Pine Flat Lake. As such, these two species were included in the target species evaluated in this entrainment assessment.

Entrainment Susceptibility Assessment

Identification of Target Species
A final list of target species was created from the information above and further refined based on those species that are most likely to occur regularly in Pine Flat Lake. The target species identified through this process are listed in Table 3.4-11 below. Species with life histories that indicate that they would not typically occur in Pine Flat Lake near the location of the intake or at the depths of the intake structure were eliminated from the list, as the risk for entrainment for those species is extremely low.

Intake Avoidance
Available data on the Pine Flat Lake fish community and documented fish passage of Pine Flat Dam indicate that fish do not pass through the Project intake or powerhouse (KRCD, 1993).

To evaluate fish susceptibility to intake flows at the Project, burst swim speeds for target or representative species were compared to the estimated intake velocity. Burst swim speed is the swim speed used to escape predation, maneuver through high flows, or in this case, escape intake velocities and avoid entrainment. Burst swim speed data were not directly available but were calculated as two times (2x) the critical swim speed for a specific species or group based on the literature (Katopodis, 2016) (Myrick A.M. and J.J. Cech, 2000) (Srean, 2016). Table 3.4-11 summarizes the results for fish known to occur within Pine Flat Lake or their representative species.

Table 3.4-11. Burst Swim Speeds for Target Fish Species or Designated Representative Species.

Common Name ***Scientific Name***	**Life Stage**	**Total Length (in)**	**Burst/ Startle Swim speed (fps)**	**Reference**
Black bass[1] *Micropterus* spp.	Adult	6.18	3.01	Katopodis and Gervais, 2016
Bluegill *Lepomis macrochirus*	Adult	3.94-5.91	2.44	Gardner et al., 2006
Brook trout *Salvelinus fontinalis*	Adult	6	4.9	Katopodis and Gervais, 2016
California roach[2] *Hesperoleucus symmetricus*	Adult	5.1	6.67	Katopodis and Gervais, 2016
Catfishe[3] *Ictaluridae*	Adult	8.9	5.19	Katopodis and Gervais, 2016
Green sunfish *Lepomis* spp.	Adult	3.19	4.35	Katopodis and Gervais, 2016
Hardhead *Mylopharodon conocephalus*	Adult	8.85	3.34	Myrick and Cech, 2000
Lamprey[4] *Lampetra* spp.	Adult	15.4	8.3	Katopodis and Gervais, 2016
Mosquitofish *Gambusia affinisi*	Adult	0.59-1.73	0.92	Srean et al., 2016
Rainbow trout *Oncorhynchus mykiss*	Juvenile/ Adult	11	2.7	Katopodis and Gervais, 2016
Sacramento pikeminnow[6] *Ptychocheilus grandis*	Adult	9.7	3.74	Myrick and Cech, 2000
Sacramento sucker[6] *Catostomus occidentalis*	Adult	7.87	3.14	Myrick and Cech, 2000
Sculpin *Cottus* spp.	Adult	2.4	3.4	Katopodis and Gervais, 2016
Three-spined stickleback *Gasterosteus aculeatus*	Adult	2	2.93	Katopodis and Gervais, 2016

[1] Data for the black basses (Micropterus spp.) was based on spotted, small, and largemouth bass.
[2] Common roach data were used to represent this species.
[3] Ictaluridae values were used to represent bullheads and white catfish.
[4] *Lampetra spp.* swim speeds were used as surrogate data for the *Lampetra* spp. collected from Kings River
[5] *Gambusia holbrooki* data used to represent *Gambusia affinis* due to absence of data on *G. affinis*.
[6.] Swim speeds at 15°C as it is closest to temperature at intake depths based on 2017 and 2018 profile data

The range of approach velocities at each of the penstocks would be from 1.2 to 21 fps, depending on the river flows and generation. At the minimum intake flow, all fish species would have burst swim speeds that would be able to outswim approach velocities and would therefore be able to avoid entrainment. At maximum generation, none of the fish species would have burst swim speeds greater than the approach velocity of 21 fps and would, therefore, be unable to avoid entrainment. Under average flow conditions through the powerhouse and bypass combined (1,978 cfs), assuming the flow passed through each of the penstocks equally, and an approach velocity of 4.6 fps, approximately 30 percent of the fish species would be able to avoid the intake.

Early Life Stage Entrainment Susceptibility
Spawning of most of the target species occurs in tributary streams, backwater areas or reservoir margins with slower moving and shallow water. Eggs that are in the reservoir will tend to be in the upper reaches or in or near tributaries and not in the vicinity of the intake or in the deeper open water areas. Eggs are either demersal, sinking to the bottom and remaining in gravel near the spawning area, or are buoyant, drifting downstream into shallows and attaching to submerged vegetation or gravel. If demersal eggs are transported downstream to the dam, they would not likely be entrained, as most eggs would settle out of the water column before reaching the dam and depth of the intake (at 15 feet above the bottom of the reservoir). Similarly, buoyant eggs would not be susceptible to entrainment as the intake is deep in the water column, not near the surface where these eggs would be floating.

Larval fish tend to inhabit shallows with vegetative or in-stream cover, and thus, would not be susceptible to entrainment at the lower end of the reservoir near the dam or at depths where the Project intake opening is located.

Qualitative Risk Assessment
A qualitative risk matrix was developed for this Project, based on all life stages of the species collected in the Project area fish surveys that are known to occur in Pine Flat Lake, and species of special concern (Table 3.4-12). An overall risk of low, moderate, or high was applied based on the findings of each risk factor.

The overall risk categories were defined as:

- Low: species-life stage is generally not present in the reservoir; not found occupying habitat near the intake structures; and/or not susceptible to approach intake velocities.

- Moderate: species-life stage present in the reservoir; routinely or seasonally found occupying the habitat near the intake structures; and is susceptible to intake velocities.

- High: species-life stage is likely to be found occupying the habitat near the intake structures on a regular basis and is susceptible to intake velocities.

Table 3.4-12. Entrainment Risk Assessment for the List of Target Fish.

Common Name ***Scientific Name***	**Life Stage**	**Present in Lake Habitat**	**Water Column Depth Preference**	**Occur Near Intake**	**Susceptible to Approach Velocity**	**Overall risk of Entrainment**
Black basses[1] *Micropterus* spp.	Adult	Yes	Shallow	No	--	Low
Bluegill *Lepomis macrochirus*	Adult	Yes	Shallow	No	--	Low
Brook trout *Salvelinus fontinalis*	Adult	Possible	Shallow and mid-depth	No	--	Low
Bullhead/Catfish *Ameiurus* spp.	All life stages	Yes	Shallow	No	--	Low
California roach *Hesperoleucus symmetricus*	All life stages	No	--	--	--	Low
Green sunfish *Lepomis* spp.	All life stages	Yes	Shallow	No	--	Low
Hardhead *Mylopharodon conocephalus*	Adult	Possible	Shallow or lotic	No	--	Low
Lampreys *Lampetra spp.*	All life stages	No	--	--	--	Low
Mosquitofish *Gambusia affinis*	Adult	Possible	Shallow	No	--	Low
Rainbow trout *Oncorhynchus mykiss*	Adult	Yes	Shallow and mid-depth	No	--	Low
	Juvenile	Possible	Shallow	No	--	Low
	Eggs, alevins, fry	No	--	--	--	Low
Sacramento pikeminnow *Ptychocheilus grandis*	Adult	Possible	Shallow or lotic	No	--	Low
Sacramento sucker *Catostomus occidentalis*	Adult	Possible	Shallow	No	--	Low
Sculpins *Cottus* spp.	All life stages	No	Shallow or lotic	No	--	Low
Three-spined stickleback *Gasterosteus aculeatus*	All life stages	Possible	Shallow or lotic	No	--	Low
White catfish *Ameiurus catus*	Adult	Yes	Deeper water (10-33' summer, 55-98' winter)	Possibly	Yes	Moderate

[1] Represents spotted, small, and largemouth bass.

Based on the qualitative analysis summarized in Table 3.4-12, the susceptibility to entrainment is low for all target species, with the exception of white catfish (*Ameiurus catus*).

When the Project is generating, water depth at the intake is generally greater than 100 feet, with depths typically greater than 200 feet during peak generation, from May through July. With the exception of white catfish, none of the target species are deep water species; their life histories describe them at shallower depths than that of the intake, and therefore the risk of entrainment is low for all remaining adult fish on the target species list. For example, in a literature review summarizing entrainment risk for rainbow and brown trout (*Salmo trutta*) at seven facilities with deep-water intakes located in California, Devine Tarbell & Associates (2004) found that adult trout were more common in the upper water column where food availability was greatest and juvenile trout were more abundant in near-shore habitat (Devine Tarbell & Associates, Inc., 2004). As such, the depth preference of rainbow and brown trout species minimizes their risk of entrainment at the Project intake.

Additionally, early life stages will likely not be entrained, as they are typically spawned in tributaries or in the upper reaches of the reservoir. Eggs and larvae either remain in the tributaries, drift downstream to backwater and vegetated shallows, sink to the bottom of the reservoir, or remain in the top of the water column where food resources are abundant. Therefore, with the exception of white catfish adults, adults and early life stages will not be susceptible to the deep-water intake of the KRCD Jeff L. Taylor Powerhouse intake on Pine Flat Lake.

White catfish occur in Pine Flat Lake and have the highest potential for entrainment due to their preference for deeper water. However, at typical generating and recreational pool depths, white catfish would not be expected to occur at the depth of the intake. White catfish only inhabit deeper water, up to 100 feet, during winter months. Since the Project does not generate often during winter months, the entrainment risk for white catfish during this time is moderate.

3.4.2.4 Other Fish Related Information

Other information regarding fishes downstream of Pine Flat Dam has been prepared by or for the Framework Agreement's Technical Steering Committee comprised of KRWA, CDFW, and KRCD. The information is available at KRFMP's https://krfmp.org/resources/reports-documents-test website and includes:

- Analysis of the Condition of Rainbow Trout Collected from the Kings River Downstream of Pine Flat Dam 1983-2005 (Hanson Environmental, Inc., 2005). Page 5 of the report states: *"Analysis of the length-weight relationship (Figure 2) and condition factors for rainbow trout (Table 1) collected from the Kings River over the 23-year period from 1983 through 2005 consistently were within the range of values reflecting healthy trout, in good condition."*

- Movement of Resident Rainbow Trout: Movement in Response to Temperature, Flow, Management Zone and Weirs in the Kings River Below Pine Flat Dam 2012 (Technical Steering Committee (TSC) and Kings River Fisheries Management Program, 2012a). Page 1 of the report states *"Results showed that the study population contained both sedentary and mobile trout. Trout were observed having traveled total distances ranging from a minimum of 0 m to a maximum of 30,195 m; upstream, downstream or a combination of both. No correlation was found amid dependent variables; direction, rate, or distance moved with independent variables; size class, water temperatures or flow, indicating that trout were not displaced from the fishery by changes in seasonal discharge. In addition, three of the five diversion weirs evaluated did not present an upstream obstacle to study trout of either size class. In all, no determinate cause for trout movement or relocation was identified among the tested variables."*

- Harvest of Rainbow Trout: The Effects of Time, Flow, Size Class, Planting Location and Management Zone on Trout Harvest in the Kings River Below Pine Flat Dam 2012 (Technical Steering Committee (TSC) and Kings River Fisheries Management Program, 2012b). Page 1 of the reports states *"Results of our three-year telemetry investigation found that on average [stocked] trout reside in the fishery for approximately 54 days prior to harvest. Of those caught 59% were classified as large or trophy sized and 41% were classified as small or catchable sized. Not surprisingly, the majority of trout harvested from the fishery were in easy to access Put and Take management zones during river flows which measured 500 cfs or below."*

- Habitat Selection Report: The effects of flow and size-class on habitat use by rainbow trout within the Kings River downstream of the Pine Flat Dam 2012 (Technical Steering Committee (TSC) and Kings River Fisheries Management Program, 2011). Page 1 of the report states "*We quantified the amount of availability for seven habitat types (pools, runs, riffles, boulder projects, glides, weirs, and side channels) across three different flows (100-249 cfs, 250-999 cfs, and ≥ 1,000 cfs) for a 9.4 mile reach of the Kings River below Pine Flat Dam. Use of habitat types by rainbow trout Oncorhynchus mykiss was quantified using relocation data collected from trout implanted with radio transmitters. The effects of flow and trout size-class were tested on the use of available habitat across the three flow stages. Use varied from strong avoidance to strong preference depending on habitat type, size-class, and flow. In general, trout avoided boulder projects and side channels at low flow. Weirs and side channels were avoided at intermediate flows and runs, and side channels were avoided at high flows. We also found that roughly half of the trout in our study chose a single habitat type and location for the duration of their residency while the other half chose multiple habitat types and locations."*

- Habitat Selection, Behavioral Movement, and Fate of Adult Rainbow Trout within the Kings River Downstream of Pine Flat Dam 2012, Summary Report (Technical

Steering Committee (TSC) and Kings River Fisheries Management Program, 2012c). This report summarizes the three above reports.

- Kings River Genetics Study Program Year, Program Year 2011-15 (Technical Steering Committee (TSC) and Kings River Fisheries Management Program, Undated). Page 4 of the report states *"Samples taken below Pine Flat Dam showed an elevated level of genetic variation indicating that there is little to no inbreeding occurring in the fishery. The levels of genetic variation were slightly higher in the samples taken below the [Pine Flat] reservoir than from those taken above. Pairwise population genetic differentiation, as estimated by FST was 0.037 (95% confidence interval: 0.022-0.053) (Aguilar, 2014), indicating that genetic differences between the above dam population and below dam population are minimal."*

- Lower Kings River Fishery Habitat Characteristic and Identification of Habitat Enhancement Opportunities 2019 (Cramer Fish Sciences, 2019). Page viii of the report states *"At flows of 100 cfs, the model predicts ~40-70 acres of river channel meet spawning depth and velocity preferences of Rainbow Trout. At 250 cfs, this increases to ~70-100 acres. However, the substrate analysis implies that less than 25% of bed surface particles within areas that meet spawning depth and velocities could be mobilized by spawning Rainbow Trout (substrate is too large). Although some variability in grainsize was observed along the stream corridor, oversized material appears to be a chronic issue throughout the study reach. Shear stress predictions, coupled with reduced sediment recruitment from upstream (reservoir storage), suggest that at 8,800 cfs the current channel configuration does not facilitate persistence of Rainbow Trout spawning gravels within the study reach. For a minimum viable population of 833 spawners (Population 1), our model predicts ~ 0.5 acres (SD 0.3) of spawning habitat is needed. For a harvestable population (Population 2) that supports past angling pressure (1,600-2,300 spawners; 35,000 harvestable fish annually), the model predicts ~2.6 acres (SD 1.9) of suitable spawning habitat is required."*

3.4.2.5 Benthic Macroinvertebrates

As part of the Framework Agreement, the Technical Steering Committee conducted a benthic macroinvertebrate (BMI) study downstream of Pine Flat Dam in 2006 and 2007 (Technical Steering Committee (TSC), Kings River Fisheries Management Program, 2009). A total of 54 BMI samples were collected and processed to identify and enumerate the BMI collected. Page 10 of the report provides the following summary:

> Overall, results of the 2006-2007 lower Kings River macroinvertebrate surveys show that the river supports a diverse assemblage of macroinvertebrates. Important components of the community in terms of both habitat indicators, and as a prey base for resident trout and other fish, are the Ephemeroptera (mayfly), Plecoptera (stonefly), and Trichoptera (caddisfly) insects that together comprise the EPT taxa. On the lower Kings River, the percent composition of the macroinvertebrate

community comprised of the EPT taxa ranged from 36% to 66% of the macroinvertebrates in the February 2006 survey (Table 6), 48% to 76% in the November 2006 survey (Table 7), and 51% to 70% in the January 2007 survey (Table 8). The values of the ETP taxa (% index) were higher in all surveys on the lower Kings River during 2006 and 2007 than 75% of the studies from other Central Valley rivers and streams (Appendix A; Tables 25-27). These results are consistent with results of the length-weight (condition factor) analysis that showed rainbow trout inhabiting the lower Kings River were in good condition. In addition, growth rates for resident rainbow trout have been found to be relatively high, which supports the finding that the macroinvertebrate community inhabiting the river is relatively diverse (the diversity index for the river was consistently higher than the majority of other Central Valley rivers and streams; Tables 25-27) and provides a prey resource for trout and other fish species. These findings are further reinforced by the Central Valley IBI analysis which rates the Kings River BMI sampling sites as Fair or Good.

KRCD did not identify any additional sources of BMI data in the Project area.

3.4.3 Aquatic Invasive Species

KRCD reviewed USGS's list of aquatic invasive species (AIS), including reported geographical locations (USGS 2020), and found no reported occurrences of AIS in Pine Flat Lake or within the FERC Project boundary. Three AIS, one amphibian and two plants, are reported to occur in the Kings River within 5 miles downstream of the Project. This is in addition to the eight species and 5 genera of introduced fish located during KRCD's monitoring and detailed in Section 3.4.2. Table 3.4-13 includes information on the three species, including listing, habitat requirements and potential to occur in the FERC Project boundary.

Table 3.4-13. Aquatic Invasive Species Known to Occur or with the Potential to Occur in the Project Vicinity.

Common Name *Scientific Name*	**Status or Listing: (1) CCR, (2) Cal-IPC, (3) CDFA**	**Habitat Requirements**	**Potential for Occurrence within the FERC Project Boundary**
American bullfrog *Lithobates catesbianus*	--	Inhabit a wide range of habitats, including rivers, reservoirs/lakes, ponds and other waterbodies.	Pine Flat Lake and the Kings River in and downstream of the FERC Project boundary are suitable habitat.
hyssop loosestrife *Lythrum hyssopifolia*	(2) Moderate	Seasonal wetlands, ditches, and cultivated fields, especially rice fields	No known suitable habitat within the FERC Project boundary.
West Indian spongeplant *Limnobium laevigatum*	(1) CCR 4500 (2) High (3) A-rated	Streams, ponds and lagoons	Pine Flat Lake and the Kings River in and downstream of the FERC Project boundary are suitable habitat.

Source: (CDFA, 2021) (CDFW, 2023) (USGS, 2023)

3.5 TERRESTRIAL RESOURCES

This section discusses terrestrial resources that could be affected by the Project. This section is divided into five subsections. Section 3.5.1 discusses botanical resources, including vegetation types, plant species known to occur within the FERC Project boundary, special-status plants[1], and non-native invasive plants (NNIP).[2] Section 3.5.2 identifies special-status wildlife[3, 4] that could be affected by the Project. Section 3.5.3 discusses general wildlife resources, including wildlife habitat. Section 3.5.4 discusses commercially-valuable wildlife species.[5] Finally, Section 3.5.5 discusses wetland, littoral and riparian habitats in the FERC Project boundary.

3.5.1 Botanical Resources

This section describes the botanical resources that have been documented as present or having the potential to be present within the FERC Project boundary. Botanical resources discussed include vegetation communities/habitat types, NNIP, and special-status plant species.

3.5.1.1 Vegetation Communities

Qualified biologists conducted a botanical survey of the FERC Project boundary on May 6 and 29, 2020, following Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Sensitive Natural Communities (CDFW, 2018). A

[1] For the purpose of this document, a special-status botanical species is a species that has a reasonable possibility of occurring on the Project and meets one or more of the following criteria: 1) listed by the CDFW as a Species of Special Concern (SSC); 2) listed on CDFW's list of California Rare (SR) species under the Native Species Plant Protection Act; 3) listed as threatened or endangered under CESA; or 4) listed on the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants as a California Rare Plant Rank (CRPR). Botanical species listed as threatened or endangered, or a candidate or proposed for listing, under the federal ESA are discussed in Section 3.6.

[2] For the purpose of this document, an NNIP is a plant species that has a reasonable possibility of occurring on the Project and meets one or more of the following criteria: 1) listed as a noxious weed by the California Department of Food and Agriculture (CDFA) with a rating of A or B; or 2) listed by the California Invasive Plant Council (Cal-IPC) as Cal-IPC status of High, Moderate, Limited, or Watch List. CDFA A-list species are mandated for eradication or control, and B-list species are widespread plants that agricultural commissioners may designate for local control efforts. Cal-IPC defines High as species that have severe ecological impacts on the surrounding habitat; Moderate as species that have substantial and apparent, but generally not severe, ecological impacts on the surrounding habitat; and Limited as species that are invasive, but their ecological impacts are minor on a statewide level. These species may be locally persistent and problematic. Cal-IPC Watch List species are species predicted to become invasive if no further actions are taken. Distribution may range from limited to widespread in specific regions (CDFA, 2021)

[3] For the purpose of this document, a special-status wildlife species is a species that has a reasonable possibility of occurring on the Project and meets one or more of the following criteria: 1) protected under the Bald and Golden Eagle Protect Act; 2) designated by CDFW as a Species of Special Concern (SSC); 3) listed as threatened or endangered, or a candidate for listing under CESA; or 4) listed as Fully Protected under California law. Wildlife species listed as threatened, endangered, or a candidate or proposed for listing, under the ESA are discussed in Section 3.6.

[4] Aquatic reptiles, mollusks and snails are discussed in Section 3.4.

[5] For the purpose of this document, a commercially-valuable wildlife species is a species that has a reasonable possibility of occurring on the Project and is listed as a 'Harvest species' by CDFW, that is, Game Birds (Fish and Game Code § 3500); Game Mammals (Fish and Game Code § 3950) and Fur-bearing Mammals and Non-game animals as designated in the California Code of Regulations.

follow-up survey was conducted on March 20, 2023. There were 63 plant species identified during the surveys, which are listed in Attachment J.

KRCD also mapped vegetation alliances within and adjacent to the FERC Project boundary following A Manual of California Vegetation (Sawyer, Keeler-Wolf, & Evans, 2009). A vegetation alliance is a category of plant community classification that describes patterns of plants at the landscape scale. Each alliance is defined by the percentage of dominant plants on the landscape (Sawyer, Keeler-Wolf, & Evans, 2009). A total of eight habitats were identified, each of which is described below and shown in Figure 3.5-1. Communities were then assessed against the definition of a special-status vegetation community, which CDFW ranks as S1,[6] S2,[7] or S3[8] per the NatureServe Heritage Program Status Ranking system (Faber-Langendoen, 2012).

California Sycamore Woodland/Grassland Association Alliance

This alliance is dominated by western sycamore (*Platanus racemosa*) in the tree layer with some valley oak (*Quercus lobata*) around habitat margins. The understory is comprised of the species found in the wild oat (*Avena* spp.) and annual brome (*Bromus* spp.) grassland (Sawyer, Keeler-Wolf, & Evans, 2009). This habitat occurs near the Kings River bank in the western portion of the FERC Project boundary and occupies 0.32 acre (2.70 percent). California Sycamore Woodland/Grassland Association Alliance is designated by CDFW as a sensitive natural community with a State rarity rank of S3 (Sawyer, Keeler-Wolf, & Evans, 2009).

Interior Live Oak Forest Alliance

This alliance is dominated by interior live oak (*Quercus wislizeni*) in the tree layer with occasional occurrences of edible fig (*Ficus carica*), western poison oak (*Toxicodendron diversilobum*), camphor tree (*Cinnamomum camphora*), and ornamental pines (*Pinus* spp.). The understory of this habitat is comprised of the species found in the wild oat and annual brome grassland along with miniature lupine (*Lupinus bicolor*) and club-fruited cylindrical clarkia (*Clarkia cylindrica*) (Sawyer, Keeler-Wolf, & Evans, 2009). This habitat occurs on the slopes away from the Kings River and is the dominant habitat type in the immediate vicinity of the FERC Project boundary occupying 0.29 acre (2.44 percent).

This habitat has a riparian variant that is defined by the absence of camphor trees and ornamental pines, and cover of Hind’s willow (*Salix exigua var. hindsiana*) and Goodding’s black willow (*Salix gooddingii*), but at levels generally below that of interior live oak (Sawyer, Keeler-Wolf, & Evans, 2009). This habitat occurs along the banks of the Kings River in the eastern portion of the FERC Project boundary and occupies 0.18

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[6] CDFW defines a S1 special-status vegetation community as “*Critically imperiled and at a very high risk of extinction or elimination due to extreme rarity, very steep declines, or other factors.*”

[7] CDFW defines a S2 special-status vegetation community as “*Imperiled and at high risk of extinction or elimination due to a very restricted range, very few populations or occurrences, steep declines, or other factors.*”

[8] CDFW defines a S3 special-status vegetation community as “*Vulnerable and at moderate risk of extinction or elimination due to a restricted range, relatively few populations or occurrences, recent and widespread declines, or other factors.*”

acre (1.52 percent). Interior Live Oak Forest Alliance and its riparian variant are both designated by CDFW as sensitive natural communities with a State rarity rank of S4 (Sawyer, Keeler-Wolf, & Evans, 2009).

Goodding's Black Willow- Red Willow Riparian Woodland Alliance

This alliance is dominated by red willow (*Salix laevigata*) with lesser cover of Goodding's black willow, Himalayan blackberry (*Rubus armeniacus*), and California button willow (*Cephalanthus occidentalis*) of which Goodding's black willow is marginally more prevalent (Sawyer, Keeler-Wolf, & Evans, 2009). Occasional patches of edible fig also occur in this habitat, and the herb layer is generally poorly developed. This habitat occurs on the in-stream island in the eastern portion of the FERC Project boundary and occupies 0.89 acre (7.50 percent). Goodding's willow – red willow riparian woodland and forest is designated by CDFW as a sensitive natural community with a State rarity rank of S3 (Sawyer, Keeler-Wolf, & Evans, 2009).

Sandbar Willow Thicket Alliance

This alliance is dominated by Hinds' willow with very high cover. Some herbaceous cover is present around the margins of this habitat that is comprised of the species found in the wild oat and annual brome grassland habitat (Sawyer, Keeler-Wolf, & Evans, 2009). This habitat occurs at a small depression in the western portion of the FERC Project boundary and occupies 0.06 acre (0.5 percent). Sandbar Willow Thicket Alliance is designated by CDFW as a sensitive natural community with a State rarity rank of S4 (Sawyer, Keeler-Wolf, & Evans, 2009).

Valley Oak Forest/Grassland Association Alliance

This alliance is comprised of valley oak in the tree layer and white-leaf bush lupine (*Lupinus albifrons*) in the shrub layer. The canopy of these species is fairly open, and the herb layer is comprised of species found in the wild oat and annual brome grassland habitat (Sawyer, Keeler-Wolf, & Evans, 2009). This habitat occurs in the western portion of the FERC Project boundary and occupies 0.52 acre (4.38 percent). Valley Oak/Grassland Association Alliance is designated by CDFW as a sensitive natural community with a State rarity rank of S3 (Sawyer, Keeler-Wolf, & Evans, 2009).

Wild Oat and Annual Brome Grassland Alliance

This alliance is comprised of a mixture of species in the herb layer with no one species being dominant in any particular area. Overall soft chess brome, rip-gut brome (*Bromus diandrus*), and rose clover (*Trifolium hirtum*) are most prevalent with additional cover of American deervetch, smooth cat's-ear (*Hypochaeris glabra),* silver hair grass (*Aira caryophyllea*), wild oat, diverse hairy vetch (*Vicia villosa*), Carolina geranium (*Geranium carolinianum*), and Heerman's tarplant (*Holocarpha heermannii*) (Sawyer, Keeler-Wolf, & Evans, 2009). This habitat occurs throughout the FERC Project boundary and occupies 3.11 acres (26.20 percent). Wild Oak and Annual Brome Grassland is not State ranked.

Developed Alliance

This alliance is comprised of all built structures and hardscapes and does not have vegetation cover. There are 3.82 acres in the FERC Project boundary (32.18 percent). Developed Alliance is not State ranked.

Open Water Alliance

This alliance is composed of water with no vascular vegetation cover and minimal observations of algae growth. This is defined as the portion of the Kings' River that was covered by water at the time of the survey which occurs in the eastern portion of the FERC Project boundary and occupies 2.68 acres (22.58 percent). Open Water Alliance is not State ranked.

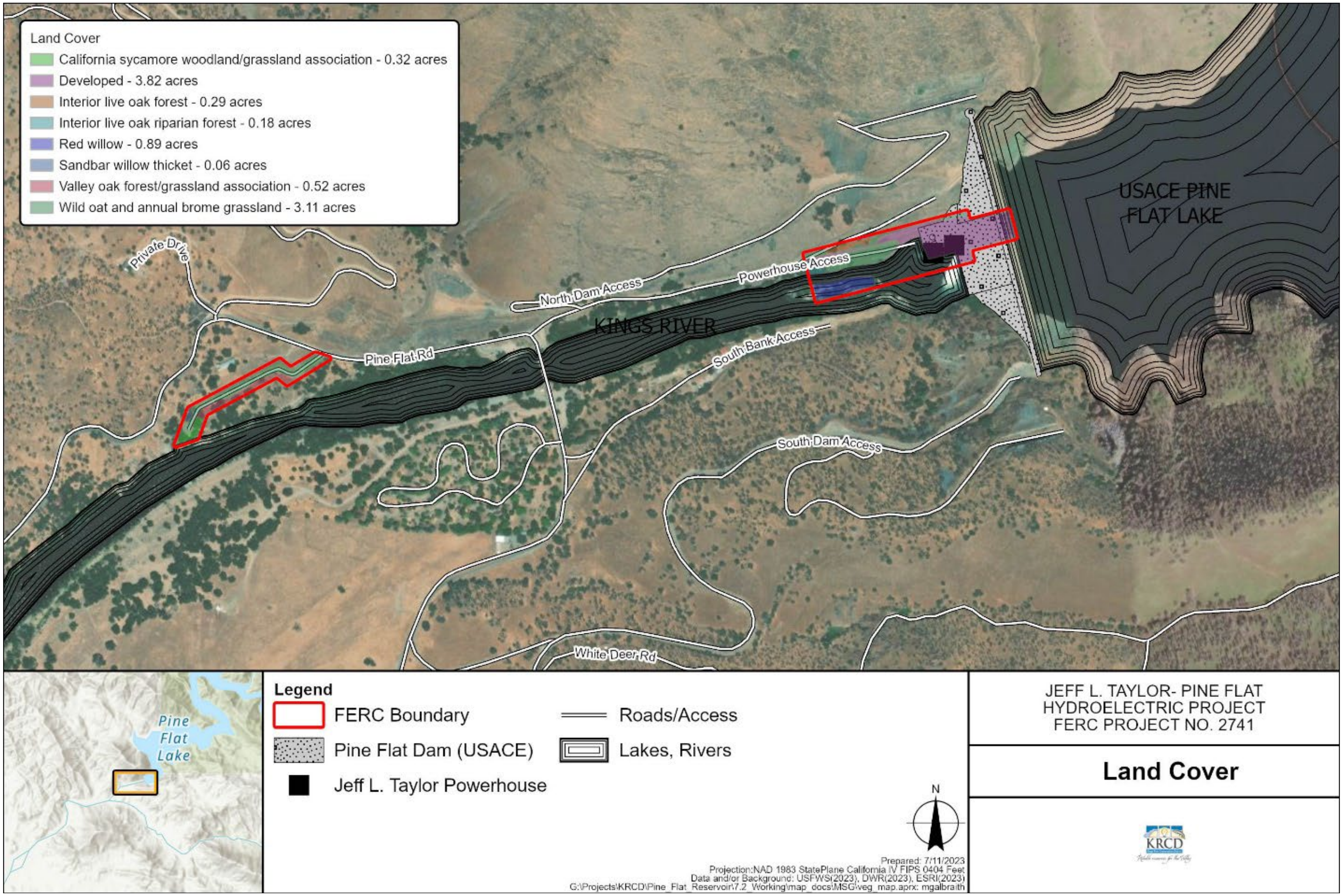

Figure 3.5-1. Land Cover Types within the FERC Project boundary.

3.5.1.2 Special-status Plants

Prior to conducting the botanical surveys on May 6 and 29, 2020 and again on March 20, 2023, KRCD queried the following databases to generate a list of special-status plants with the potential to occur within the FERC Project boundary.

- USFWS's Information for Planning and Consultation (iPaC) (USFWS, 2023) shown in Attachment I
- CDFW's California Natural Diversity Database (CNDDB) (CDFW, 2023)
- CNPS' Inventory of Rare and Endangered Plants of California (CNPS, 2023)

Based on the database reviews, KRCD initially identified 28 special-status plants with the potential to occur within the FERC Project boundary; however, upon further evaluation of the habitat needs for each of the 28 special-status plants, KRCD determined that 14 out of the 28 species-status plants have the potential to occur within the FERC Project boundary.

Table 3.5-1 provides for each of the 28 special-status plant species: 1) status; 2) flowering period; 3) elevation range; 4) habitat requirements; 5) potential to occur; and 6) rationale for why the species does or does not have potential to occur within the FERC Project boundary.

Table 3.5-1. Special-status Plant Species with the Potential to Occur Within the FERC Project boundary.

Common Name *Scientific Name*	Status[1]	Habitat Characteristics	Potential to Occur	Rationale
thread-leaved beakseed *Bulbostylis capillaris*	CRPR 4.2	Meadows, seeps, and montane coniferous forests. Elevation: 1,295–6,810 feet. Blooming period: June–August.	No	Suitable meadows, seeps, and montane coniferous forest are not present in the FERC Project boundary. The FERC Project boundary is over 300 feet below the species elevation range.
Grassland suncup *Camissonia lacustris*	CRPR 1B.2	Granitic, gravelly, and serpentine soils in chaparral, cismontane woodland, lower montane coniferous forest and valley/foothill grassland. Elevation: 590-4,005 feet. Blooming period: March-June.	Yes	Suitable habitat for this species is present within the FERC Project boundary.
tree anemone *Carpenteria californica*	ST, CRPR 1B.2	Usually granitic soils in chaparral and cismontane woodland. Elevation: 1,115–4,395 feet. Blooming period: April–July.	No	The FERC Project boundary is approximately 500 feet below the species elevation range. Nearest occurrences are more than 10 miles away and above 1,500 feet (Consortium of California Herbaria , 2023).
Fresno ceanothus *Ceanothus fresnensis*	CRPR 4.3	Openings of cismontane woodland and lower montane coniferous forest. Elevation: 2,950–6,900 feet. Blooming period: May–July.	No	The FERC Project boundary is approximately 2,000 feet below the species elevation range.
Slender clarkia *Clarkia exilis*	CRPR 4.3	Cismontane woodland. Elevation: 393–3,280 feet. Blooming period: April–May.	Yes	Suitable cismontane woodland habitat for this species is present.

Table 3.5-1. (continued).

Common Name Scientific Name	Status	Habitat Characteristics	Potential to Occur	Rationale
Streambank spring beauty *Claytonia parviflora* ssp. *grandiflora*	CRPR 4.2	Rocky soils in Cismontane woodland. Elevation: 820–3,937 feet. Blooming period: February–May.	Yes	Suitable cismontane woodland and rocky soils habitat for this species is present.
Small-flowered morning-glory *Convolvulus simulans*	CRPR 4.2	Friable clay soils or serpentine seeps in chaparral openings, coastal scrub, and grassland. Elevation: 98–2,297 feet. Blooming period: March–July.	Yes	Suitable habitat for this species is present within the FERC Project boundary.
Ewan's larkspur *Delphinium hansenii* ssp. *ewanianum*	CRPR 4.2	Rocky soils in Cismontane woodland and grassland. Elevation: 196–1,968 feet. Blooming period: March–May	Yes	Suitable habitat for this species is present within the FERC Project boundary.
Kings River buckwheat *Eriogonum nudum* var. *regirivum*	CRPR 1B.2	Carbonate, rocky substrates in cismontane woodland. Elevation: 492–984 feet. Blooming period: August–November.	Yes	Suitable habitat for this species is present within the FERC Project boundary..
Spiny-sepaled button-celery *Eryngium spinosepalum*	CRPR 1B.2	Vernal pools and grassland. Elevation: 262–2,034 feet. Blooming period: April–June.	No	Suitable vernal pool habitat is not present in the FERC Project boundary.
Kings River monkeyflower *Erythranthe acutidens*	CRPR 3	Cismontane woodland and lower montane coniferous forest. Elevation: 1,000–4,005 feet. Blooming period: April–July.	No	Suitable habitat for this species is not present within the FERC Project boundary. The FERC Project boundary is located over 350 feet below the known species elevation range.
slender-stalked monkeyflower *Erythranthe gracilipes*	CRPR 1B.2	Decomposed granitic soils that are often disturbed or in burned areas of chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 1,640–4,265 feet. Blooming period: April–June.	No	The FERC Project boundary is over 600 feet below the species elevation range. Nearest occurrences are more than 15 miles away and above 2,000 feet (Consortium of California Herbaria , 2023).
Sierra Nevada monkeyflower Erythranthe sierrae	CRPR 4.2	Granitic sandy to gravelly soils in vernally wet depressions, swales, or streambanks in openings of cismontane woodland, lower montane coniferous forest, meadows, and seeps. Elevation: 606–7,496 feet. Blooming period: March–July.	Yes	Suitable habitat for this species is present within the FERC Project boundary.
Stinkbells *Fritillaria agrestis*	CRPR 4.2	Clay, sometimes serpentine soils in chaparral, cismontane, pinyon and juniper woodland, and grassland. Elevation: 32–5,101 feet. Blooming period: March–June.	Yes	Suitable habitat for this species is present within the FERC Project boundary.
American manna grass *Glyceria grandis*	CRPR 2B.3	Bogs, fens, meadows, seeps, and the stream banks and lake margins of swamps and marshes. Elevation: 45–6,495 feet. Blooming period: June–August.	No	Suitable habitat for this species is not present within the FERC Project boundary. Nearest occurrence is 15 miles away and at 5,000 feet in elevation (Consortium of California Herbaria , 2023).
Winter's sunflower *Helianthus winteri*	CRPR 1B.2	Granitic or rocky soils along roadsides or on relatively steep south facing slopes in openings of cismontane woodland and grassland. Elevation: 410–1,510 feet. Blooming period: year round.	Yes	Suitable habitat for this species is present within the FERC Project boundary.
Hogwallow starfish *Hesperevax caulescens*	CRPR 4.2	Mesic grassland in clay soils and shallow vernal pools. Elevation: 0–1,656 feet. Blooming period: March–June.	Yes	Suitable habitat for this species is present within the FERC Project boundary.

Table 3.5-1. (continued).

Common Name Scientific Name	Status	Habitat Characteristics	Potential to Occur	Rationale
California satintail *Imperata brevifolia*	CRPR 2B.1	Mesic soils in chaparral, coastal scrub, Mojavean desert scrub, riparian scrub, meadows and seeps (often alkali). Elevation: 0–3,985 feet. Blooming period: September–May.	Yes	Suitable habitat for this species is present within the FERC Project boundary.
Forked hare-leaf *Lagophylla dichotoma*	CRPR 1B.1	Sometimes in clay soils in cismontane woodland and grassland. Elevation: 145–1,100 feet. Blooming period: April–May.	Yes	Suitable habitat for this species is present within the FERC Project boundary.
Madera leptosiphon *Leptosiphon serrulatus*	CRPR 1B.2	Cismontane woodland and lower montane coniferous forest. Elevation: 984–4,265 feet. Blooming period: April–May.	Yes	Suitable habitat for this species is present within the FERC Project boundary.
orange lupine *Lupinus citrinus* var. *citrinus*	CRPR 1B.2	Granitic soils in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 1,245–5,575 feet. Blooming period: April–July.	No	Suitable habitat for this species is not present within the FERC Project boundary. The FERC Project boundary is located over 500 feet below the species elevation range.
Elongate copper moss *Mielichhoferia elongata*	CRPR 4.3	Metamorphic rock and carbonate soils, often along roadsides, that are usually vernally mesic and acidic in chaparral, meadows, seeps, coastal scrub, cismontane woodland, and broadleaf upland and lower montane and subalpine coniferous forests. Elevation: 0–6,430 feet.	Yes	Suitable habitat for this species is present within the FERC Project boundary.
Shevock's copper moss *Mielichhoferia shevockii*	CRPR 1B.2	Mesic and metamorphic rocky soils in cismontane woodland. Elevation: 2,460–4,595 feet.	No	The FERC Project boundary is over 1,500 feet below the species elevation range.
adobe navarretia *Navarretia nigelliformis* ssp. *nigelliformis*	CRPR 4.2	Clay, sometimes serpentine soils in vernally mesic grassland and vernal pools. Elevation: 328–3,280 feet. Blooming period: April–June.	No	Suitable habitat for this species is not present within the FERC Project boundary.
Arizona pholistoma *Pholistoma auritum* var. *arizonicum*	CRPR 2B.3	Mojavean desert scrub. Elevation: 902–2,739 feet. Blooming period: March.	No	Suitable desert scrub habitat is not present in the FERC Project boundary.
aromatic canyon gooseberry *Ribes menziesii* var. *ixoderme*	CRPR 1B.2	Chaparral and cismontane woodland. Elevation: 2,001–3,805 feet. Blooming period: April.	No	The FERC Project boundary is over 1,000 feet below the species elevation range.
Sanford's arrowhead *Sagittaria sanfordii*	CRPR 1B.2	Fresh water marshes and swamps that are typically shallow. Elevation: 0–2,132 feet. Blooming period: May–October.	No	Suitable freshwater marsh and swamp habitat for this species is not present within the FERC Project boundary.
Farnsworth's jewel-flower *Streptanthus farnsworthianus*	CRPR 4.3	Cismontane woodland. Elevation: 1,312–4,593 feet. Blooming period: May–June.	No	The FERC Project boundary is over 600 feet below the species elevation range.
Total	**28 Special-Status Plant Species**		**14 = No Habitat Present 14 = Habitat Present**	

Source: (California Department of Fish and Wildlife, 2023), (CNPS, 2023) (Jepson Flora Project, 2022)

[1]Status:
ST = CESA listed as threatened
CRPR 1B = California Rare Plant Rank, endangered in California and elsewhere
CRPR 2 = California Rare Plant Rank, rare/threatened/endangered in California only
CRPR 3 = California Rare Plant Rank, plants requiring further information
CRPR 4 = California Rare Plant Rank, plants of limited distribution, a watch list
(.1 after CNPS rating indicates a species that is seriously endangered in California, .2 after CNPS rating indicates a species that is fairly endangered in California, .3 after CNPS rating indicates a species that is not very endangered in California)

As shown in Table 3.5-1, 14 special-status plants have suitable habitat present within the FERC Project boundary. KRCD's surveys conducted on May 6 and 29, 2020, and again on March 20, 2023, which followed CDFW's protocol (CDFW, 2018) for focused plant surveys, found no special-status plants within or adjacent to the FERC Project boundary.

3.5.1.3 Non-native Invasive Plants

During KRCD's 2020 vegetation survey, 15 NNIP species with a Cal-IPC rating were identified within the FERC Project boundary. Nine species are rated Moderate, including wild oat, ripgut brome, Italian thistle (*Carduus pycnocephalus* ssp. *pycnocephalus*), Maltese starthistle (*Centaurea melitensis*), Bermuda grass (*Cynodon dactylon*), rattail sixweeks grass (*Festuca myuros*), edible fig, shortpod mustard (*Hirschfeldia incana*), and tall sock-destroyer (*Torilis arvensis*). The five plants rated Limited are soft chess (*Bromus hordeaceus*), smooth-cat's ear, annual beard grass (*Polypogon monspeliensis*), curly dock (*Rumex crispus*), and rose clover. Sugar gum (*Eucalyptus cladocalyx*) is a Watch list species. Italian thistle also has a B rating under the CDFA noxious weed list and is identified as a noxious weed in CDFA regulations at 3 California Code of Regulations Section 4500.

3.5.2 <u>Special-Status Wildlife Species</u>

On March 20, 2023, KRCD queried USFWS's iPaC and CDFW's CNDDB (CDFW, 2023) databases to generate a list of special-status wildlife with the potential to occur within the FERC Project boundary. Based on database reviews, KRCD identified 13 special-status wildlife species with the potential to occur within the FERC Project boundary. One additional species, American peregrine falcon (*Falco peregrinus anatum*), was also reviewed based on its observation near the Project in June 2023.

Table 3.5-2 provides for each of the 13 special-status wildlife species: 1) status; 2) habitat requirements; 3) potential to occur in the Project vicinity; and 4) rationale for why the species does or does not have potential to occur.

Table 3.5-2. Special-status wildlife species with the potential to occur within the FERC Project boundary.

Common Name *Scientific Name*	Status[1]	Habitat Requirements	Potential to Occur	Rationale
INVERTEBRATES				
Crotch bumble bee *Bombus crotchii*	SCE	Occurs primarily in California, ranging across southern California, from the coast and coastal ranges, through the Central Valley, and to the adjacent foothills. Known to inhabit open grassland and shrublands. Requires floral resources and undisturbed nesting and overwintering sites. Food plants include open flowers with short corollas particularly in families Fabaceae, Apocynaceae, Asteraceae, Lamiaceae, Hydrophyllacae, Asclepiadaceae and Boraginaceae. Mated queens overwinter in soft debris, leaf litter, or disturbed soils and emerge in early spring to feed and search for a new colony site; typically in former burrows. May rely on sufficient availability of rodent and other animal burrows to provide underground nesting sites (California Department of Fish and Wildlife, 2019).	Yes	Suitable habitat for this species may be present within the FERC Project boundary.
BIRDS				
golden eagle *Aquila chrysaetos*	BGEPA, FP	Uncommon resident in hills and mountains throughout California, and an uncommon migrant and winter resident in the Central Valley and Mojave Desert. Prefers rolling foothills and mountain terrain, wide arid plateaus deeply cut by streams and canyons, open mountain slopes, cliffs, and rock outcrops (Polite, 1990).	Yes	Suitable habitat is present in the FERC Project boundary. Nearest observation occurred at DWR's Pine Flat Transmission Line on April 12, 2023.
burrowing owl *Athene cunicularia*	SSC	Resident in much of the state in open, dry grasslands and various desert habitats. Requires open areas with mammal burrows; especially those of California ground squirrel (*Otospermophilus beecheyi*). Inhabits rolling hills, grasslands, fallow fields, sparsely vegetated desert scrub, vacant lots and other open human disturbed lands such as airports and golf courses. Absent from the northwest coast and at elevations above 5,500 feet (California Wildlife Habitat Relationships Program Staff, 1999).	Yes	Suitable habitat present in the FERC Project boundary.
Swainson's hawk *Buteo swainsoni*	ST	Nests in oak savanna and cottonwood riparian areas adjacent to foraging habitat of grasslands, agricultural fields, and pastures where they often follow farm equipment to gather killed and maimed rodents. Increasingly also nests in sparse stands of gum trees (*Eucalyptus* spp.) and Australian pines (*Casuarina equisetifolia*) and often forage along roadsides and grassy highway medians. Breeding resident in the Central Valley, Klamath Basin, Northeastern Plateau, and in juniper-sagebrush flats of Lassen County. Most birds are absent from California October through February, though a few overwinter in the Sacramento-San Joaquin River Delta. (California Wildlife Habitat Relationships Program Staff, 2006).	Yes	Suitable habitat present in the FERC Project boundary.
American peregrine falcon *Falco peregrinus anatum*	FP	Breeds near wetlands, lakes, rivers, or other waters on cliffs, banks, dunes or mounds, mostly in woodland, forest, and coastal habitats. Nest is a scrape on a depression or ledge in an open site. May use man-made structures (such as bridges, skyscrapers, or electrical towers), large snags, or trees for nesting (Staff, 1990).	Yes	Suitable habitat present in the FERC Project boundary. Nearest observation occurred at DWR's Pine Flat Transmission Line on June 1, 2023.

Table 3.5-2. (continued).

Common Name Scientific Name	Status	Habitat Requirements	Potential to Occur	Rationale
BIRDS				
white-tailed kite *Elanus leucurus*	FP	Fairly common resident of the Central Valley, coast, and Coast Range Mountains. Nests in oak savanna, oak and willow riparian, and other open areas with scattered trees near foraging habitat. Forages in open grasslands, meadows, farmlands, and emergent wetlands. Often seen hover foraging over roadsides or grassy highway medians (California Wildlife Habitat Relationships Program Staff, 2005).	Yes	Suitable habitat present in the FERC Project boundary.
bald eagle *Haliaeetus leucocephalus*	SE, BGEPA & FP	Permanent resident in the highest Coast Range mountains, across the Cascade Range, and down the Sierra Nevada to the eastern Transverse Ranges of San Bernardino and Riverside counties. Uncommon migrant and winter visitor to lowland rivers, lakes, and reservoirs. Nests in large, old-growth, or dominant live trees with open branchwork, especially ponderosa pine (*Pinus ponderosa*). Requires large bodies of water or rivers with abundant fish, and adjacent snags (California Wildlife Habitat Relationships Program Staff, 1999).	Yes	An individual observed in 2023 along DWR's Pine Flat Transmission Line on April 12, 2023. Suitable habitat present in the FERC Project boundary. There is a reported occurrence of bald eagle nest less than 1 mile away from the FERC Project boundary along the Kings River (iNaturalist, 2023).
great gray owl *Strix nebulosa*	SE	Breeds in red fir (*Abies magnifica*), lodgepole pine (*Pinus contorta* ssp. *murrayana*), and mixed coniferous habitats, always near wet meadows. Nests in large, broken-topped snags usually 25 to 72 feet above the ground. A rarely seen resident at 4,500 to 7,500 feet in elevation in the Sierra Nevada Range, from the vicinity of Quincy south to the Yosemite region. (Gaines, 1990).	No	Suitable coniferous forest habitat is not present in the FERC Project boundary.
MAMMALS				
pallid bat *Antrozous pallidus*	SSC	Ranges across all of California. Generally found in a wide variety of habitats but with preference for arid and semi-arid, and rocky, mountainous areas (Miller 2002; WBWG 2005). Day and night roosts include rocky crevices, caves, mines, trees (snags, exfoliating bark, hollows of larger trees) and anthropogenic structures (bridges, vacant buildings, bat boxes, attics). Common tree species used are coast redwoods; oaks (valley, live, blue); pine (Ponderosa, lodgepole). Pallid bats are not documented to have very low roost fidelity and will often switch roosts seasonally or even daily. Overwintering roosts will typically be found in protected structures out of direct sunlight with stable temperatures (Western Bat Working Group, 2005). When hibernating, pallid bats can be found roosting in buildings, caves, or rock crevices (Miller, 2002), (Western Bat Working Group, 2005).	Yes	Suitable roosting habitat present on trees and structures within the FERC Project boundary.
Townsend's big-eared bat *Corynorhinus townsendii*	SSC	Ranges throughout California except for high elevation portions of the Sierra Nevada Mountains. Generally, prefers mesic habitats but known to occur in all non-alpine habitats of California. Roosting occurs in caves, tunnels, mines, buildings, or other structures and this species may use different roosting sites for day and night (California Wildlife Habitat Relationships Program Staff, 2000)	Yes	Suitable roosting habitat present on structures within the FERC Project boundary.

Table 3.5-2. (continued).

Common Name Scientific Name	Status	Habitat Requirements	Potential to Occur	Rationale
MAMMALS				
spotted bat *Euderma maculatum*	SSC	Ranges across the eastern half of California from the low foothills and over the Cascade and Sierra Nevada crests to Nevada, as well as all of Southern California except for the lowlands of Orange and Los Angeles counties. Generally, occurs in desert, mixed coniferous forests, and grassland habitats. Prefers to roost in rock crevices on cliffs, but will sometimes use caves and buildings (California Wildlife Habitat Relationships Program Staff, 2000)	Yes	Suitable roosting habitat present in Project structures within the FERC Project boundary.
western mastiff bat *Eumops perotis californicus*	SSC	Ranges throughout all of Southern California, the central coast, and the Sierra Nevada Mountains. Generally, occurs in open, arid, or semi-arid habitats. Roosts in rock crevices and buildings. (Ahlborm, 1990)	Yes	Suitable roosting habitat present in Project structures within the FERC Project boundary.
American badger *Taxidea taxus*	SSC	Ranges across nearly all of California except northernmost Humboldt and Del Norte counties. Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils (Ahlborn, 1990)	Yes	Suitable habitat present in the FERC Project boundary.
Total	**13 Special-Status Wildlife Species**			**1 = No Suitable Habitat Present 12 = Suitable Habitat Present**

Source: (CDFW, Special Animals List, 2023)
[1] Special status:
BGEPA = protected under the Bald and Golden Protection Act
SCE = State Candidate endangered for listing under the CESA
SE = CESA listed as endangered
ST = CESA listed as threatened
FP = fully protected under California Fish and Game Code Section 3511

3.5.2.1 American Peregrine Falcon[9]

The American peregrine falcon is a State of California Fully Protected Species (CDFW, Special Animals List, 2023).

The American peregrine falcon may be found throughout the United States, using cliffs and man-made structures, such as buildings and bridges, for nesting. They do not build nests like most birds but lay eggs in a scraping of cliff sides or other shallow indentations. Breeding usually begins in late February and can last until June. A second clutch may be laid if eggs are destroyed or removed early in the breeding season. Primary prey includes birds that range in size from medium-sized passerines up to small waterfowl as well as small reptiles and mammals (CDFW, 2023).

[9] wikimedia.org

This species was observed less than one mile south of the FERC Project boundary along DWR's Pine Flat Transmission Line on June 1, 2023.

3.5.2.2 Bald Eagle[10]

The bald eagle is currently protected under the Bald and Golden Eagle Protection Act and is a State of California Endangered Species as well as a California Fully Protected Species (CDFW, 2023).

The bald eagle breeds or winters throughout California, except for the desert areas and the statewide populations are increasing (Game, 2000). Most breeding in the state occurs in the northern Sierra Nevada, Cascades, and north coast range. California's breeding population is resident year-round in most areas, where the climate is relatively mild (Jurek, 1988). Between mid-October and December, migratory birds from areas north and northeast of California arrive in the state. Wintering populations remain through March or early April. Data from statewide breeding surveys conducted since 1973 indicate that the number of breeding pairs in the state continue to increase on an annual basis (Game, 2000). Breeding generally occurs from February to July, but can be initiated as early as January via courtship, pair bonding, and territory establishment. The breeding season normally ends around August 31, as the fledglings are no longer attached to their nest area.

The bald eagle typically nests in large, old growth or dominant live trees with open branching, and within two miles of a lake, reservoir, or river containing fish. Most nesting territories in California are located in elevations ranging 1,000 to 6,000 feet, but nesting can occur from near sea level to over 7,000 feet (Jurek 1988). The bald eagle often constructs up to five nests within a territory and alternate between them from year to year. Wintering habitat is associated with open bodies of water, primarily large lakes and reservoirs. Two characteristics that play a significant role in habitat selection during the winter are diurnal feeding perches and communal night roost areas. Most communal roosts are usually located near an abundant food source and have greater protection from the weather than diurnal habitat (Game, 2000).

This species was observed immediately west of the FERC Project boundary on April 12, 2023.

[10] wikimedia.org

3.5.2.3 Golden Eagle[11]

The golden eagle is currently protected under the Bald and Golden Eagle Protection Act and is a State of California Fully Protected Species (CDFW, Special Animals List, 2023)

Most golden eagles in California are yearlong residents with some migration into California in the winter. The golden eagle generally breeds from late January through August (CDFW, 2023).

Golden eagles use a range of terrestrial habitats, including forests, chapparal, grasslands, and oak woodlands, feeding on mammals, birds, and terrestrial reptiles, including as carrion. Open water is not considered foraging habitat for the species (CDFW, 2013). Golden eagle nest on cliffs of all heights and in large trees in open areas. Alternative nest sites are maintained, and old nests are reused. They build large platform nests, often 10 feet across and 3 feet high, of sticks, twigs, and greenery. Rugged, open habitats with canyons and escarpments are used most frequently for nesting (J.E. Pagel, 2010).

This species was observed less than one mile south of the FERC Project boundary along DWR's Pine Flat Transmission Line on April 12, 2023.

3.5.3 <u>Wildlife Resources</u>

A variety of wildlife utilize the available habitat within the FERC Project boundary. Reptiles recorded in the area include the western fence lizard (*Sceloporus occidentalis*), sagebrush lizard (*Sceloporus graciosus*), Gilbert's skink (*Plestiodon gilberti*), rubber boa (*Charina bottae*), California kingsnake (*Lampropeltis californiae*), Sierra gartersnake (*Thamnophis couchii*) and western rattlesnake (*Crotalus oreganus*). California newt (*Taricha torosa*), Gregarious slender salamander (*Batrachoseps gregarious*), American bullfrog (*Lithobates catesbeianus*), western toad (*Anaxyrus boreas*), and Sierran treefrog (*Pseudacris sierra*) are all common amphibian species that have been observed in the area (California Watchable Wildlife, 2023); (eBird, 2023); (iNaturalist, 2023); (USACE, 2001).

Over 60 bird species have been recorded in or around the FERC Project boundary, including a variety of waterfowl such as common merganser (*Mergus merganser*), American coot (*Fulica americana*), killdeer (*Charadrius vociferus*), California gull (*Larus californicus),* eared grebe (*Podiceps nigricollis*), great blue heron (*Ardea herodias*), western grebe (*Aechmophorus occidentalis*), and ruddy duck (*Oxyura jamaicensis*). Other bird species in the area include bald eagle, red-tailed hawk (*Buteo jamaicensis*), tree swallow (*Tachycineta bicolor*), white-crowned sparrow (*Zonotrichia leucophrys*),

[11] wikimedia.org

California quail (*Callipepla californica*), Bullock's oriole (*Icterus bullockii*), acorn woodpecker (*Melanerpes formicivorus*), Anna's hummingbird (*Calypte anna*) and mourning dove (*Zenaida macroura*) (California Watchable Wildlife, 2023); (eBird, 2023); (iNaturalist, 2023); (USACE, 2001).

The most common large mammal in the vicinity of the Project is mule deer (*Odocoileus hemionus*), members of the North Kings herd. Smaller mammals include coyote (*Canis latrans*), California ground squirrel (*Otospermophilus beecheyi*), striped skunk (*Mephitis mephitis*), bobcat (*Lynx rufus*), raccoon (*Procyon lotor*), and gray fox (*Urocyon cinereoargenteus*) (California Watchable Wildlife, 2023); (eBird, 2023); (iNaturalist, 2023); (USACE, 2001).

Surveys conducted on May 6 and 29, 2020, encountered 14 species of common wildlife. Additional surveys in the immediate vicinity conducted on April 12 and June 1, 2023, encountered additional species of common wildlife. These include western fence lizard, mallard (*Anas platyrhynchos*), red-tailed hawk, phainopepla (*Phainopepla nitens*), California quail, turkey vulture (*Cathartes aura*), common raven (*Corvus corax*), house finch (*Haemorhous mexicanus*), acorn woodpecker (*Melanerpes formicivorus*), cliff swallow (*Petrochelidon pyrrhonota*), Nuttall's woodpecker (*Picoides nuttallii*), great blue heron (*Ardea herodias*), bushtit (*Psaltriparus minimus*), black phoebe (*Sayornis nigricans*), tree swallow, Northern rough-winged swallow (*Stelgidopteryx serripennis*), mule deer (*Odocoileus hemionus*), and California ground squirrel.

3.5.4 <u>Commercially-Valuable Wildlife Species</u>

Game bird and mammal species are those regulated by California Fish and Game Code Sections 3500 and 3950, which provide recreational hunting opportunities. Geographic location, elevation, and available habitat[12] were used to evaluate the potential for game animals to occur within the FERC Project boundary. Table 3.5-3 lists game species, their habitat requirements, and their potential seasonal distribution within the FERC Project boundary. Of the 64 game species identified (35 birds, 3 reptiles, 3 amphibians, and 23 mammals), American badger (*Taxidea taxus*) is the only special-status species (SSC) that is also listed as a commercially-valuable species (California Department of Fish and Wildlife, 2023). No hunting occurs within the FERC Project boundary, but fishing is allowed at the Project recreation area.

[12] KRCD crosswalked the vegetation alliances and other land covers within the FERC Project boundary against California Wildlife Habitat Relationship (CWHR) habitat classifications following the Manual of California Vegetation (Sawyer, Keeler-Wolf, & Evans, 2009).

Table 3.5-3. Commercially-Valuable Wildlife Species Potentially Occurring within the FERC Project boundary.

Common Name/ Scientific Name	Temporal and Spatial Distribution and General Habitat Requirement [1, 2]
Reptiles and Amphibians	
Western toad (*Anaxyrus boreas*)	Yearlong – AGS, OAK, RIV, VFR
Arboreal salamander (*Aneides lugubris*)	Yearlong – OAK, VFR
Glossy snake (*Arizona elegans*)	Yearlong – AGS, OAK
North American racer (*Coluber constrictor*)	Yearlong – AGS, OAK, VFR
Western rattlesnake (*Crotalus oreganus*)	Yearlong – AGS, DEV, OAK, VFR
American bullfrog (*Lithobates catesbeianus*)	Yearlong – AGS, OAK, RIV, VFR
Birds	
Wood duck (*Aix sponsa*)	Yearlong – DEV, OAK, RIV, VFR
Chukar (*Alectoris chukar*)	Yearlong – AGS, VFR
Northern pintail (*Anas acuta*)	Yearlong – AGS, DEV, RIV
American wigeon (*Anas americana*)	Yearlong – AGS, DEV, RIV
Northern shoveler (*Anas clypeata*)	Yearlong – AGS
Green-winged teal (*Anas crecca*)	Winter – AGS, DEV, RIV
Cinnamon teal (*Anas cyanoptera*)	Yearlong – AGS, RIV, VFR
Eurasian wigeon (*Anas penelope*)	Winter – AGS, DEV, RIV
Mallard (*Anas platyrhynchos*)	Yearlong – AGS, DEV, RIV, VFR
Gadwall (*Anas strepera*)	Yearlong – AGS, RIV
Greater white-fronted goose (*Anser albifrons*)	Winter – AGS, RIV
Lesser scaup (*Aythya affinis*)	Winter – RIV
Canvasback (*Aythya valisineria*)	Winter – RIV
Canada goose (*Branta canadensis*)	Winter – AGS, DEV, RIV
Bufflehead (*Bucephala albeola*)	Yearlong – VFR
Common goldeneye (*Bucephala clangula*)	Winter – RIV, VFR
California quail (*Callipepla californica*)	Yearlong – AGS, DEV, OAK, VFR
Snow goose (*Chen caerulescens*)	Winter – AGS, RIV
Ross's goose (*Chen rossii*)	Winter – AGS, RIV
Rock pigeon (*Columba livia*)	Yearlong – AGS, DEV
American crow (*Corvus brachyrhynchos*)	Yearlong – AGS, DEV, OAK, RIV, VFR
American coot (*Fulica americana*)	Yearlong – AGS, DEV, RIV
Wilson's snipe (*Gallinago delicata*)	Winter – RIV, VFR
Common gallinule (*Gallinula galeata*)	Yearlong – RIV, DEV
Hooded merganser (*Lophodytes cucullatus*)	Winter – DEV, RIV, VFR
Wild turkey (*Meleagris gallopavo*)	Yearlong – AGS, OAK, VFR
Common merganser (*Mergus merganser*)	Winter – DEV, RIV, VFR
Mountain quail (*Oreotyx pictus*)	Yearlong – AGS, OAK, VFR
Ruddy duck (*Oxyura jamaicensis*)	Yearlong – VFR
House sparrow (*Passer domesticus*)	Yearlong – OAK, VFR
Band-tailed pigeon (*Patagioenas fasciata*)	Yearlong – DEV, OAK, VFR
Ring-necked pheasant (*Phasianus colchicus*)	Yearlong – AGS, DEV, VFR
Spotted dove (*Streptopella chinensis*)	Yearlong – DEV
European starling (*Sturnus vulgaris*)	Yearlong – AGS, DEV, OAK, VFR
Mourning dove (*Zenaida macroura*)	Yearlong – AGS, DEV, OAK, VFR
Mammals	
Coyote (*Canis latrans*)	Yearlong – AGS, DEV, OAK, VFR
American beaver (*Castor canadensis*)	Yearlong – AGS, OAK, RIV, VFR
Elk (*Cervus elaphus*)	Yearlong – AGS, OAK, VFR
Virginia opossum (*Didelphus virginiana*)	Yearlong – AGS, DEV, OAK, VFR
Black-tailed jackrabbit (*Lepus californicus*)	Yearlong – AGS, DEV, OAK, VFR
Bobcat (*Lynx rufus*)	Yearlong – AGS, OAK, VFR
Striped skunk (*Mephitis mephitis*)	Yearlong – AGS, DEV, OAK, VFR
House mouse (*Mus musculus*)	Yearlong – AGS, DEV, OAK, VFR
Long-tailed weasel (*Mustela frenata*)	Yearlong – AGS, DEV, OAK, VFR
American mink (*Mustela vison*)	Yearlong – RIV, VFR
Mule deer (*Odocoileus heminonus*)	Yearlong – AGS, DEV, OAK, VFR
Common muskrat (*Ondatra zibethicus*)	Yearlong – RIV, VFR
Raccoon (*Procyon lotor*)	Yearlong – AGS, DEV, OAK, RIV, VFR
Norway rat (*Rattus norvegicus*)	Yearlong – DEV, OAK, VFR
Black rat (*Rattus rattus*)	Yearlong – DEV, OAK, VFR
Western gray squirrel (*Sciurus griseus*)	Yearlong – OAK, VFR
Eastern fox squirrel (*Sciurus niger*)	Yearlong – DEV, OAK

Table 3.5-3. (continued).

Common Name/ Scientific Name	Temporal and Spatial Distribution and General Habitat Requirement [1, 2]
Mammals	
Wild pig (*Sus scrofa*)	Yearlong – AGS, OAK, VFR
Audubon's cottontail (*Sylvilagus audubonii*)	Yearlong – AGS, DEV, OAK, VFR
Brush rabbit (*Sylvilagus bachmani*)	Yearlong – AGS, DEV, OAK, VFR
American badger (*Taxidea taxus*)	Yearlong – AGS, OAK, VFR
Gray fox (*Urocyon cinereoargenteus*)	Yearlong – AGS, DEV, OAK, VFR
Black bear (*Ursus americanus*)	Yearlong – AGS, RIV, VFR

Source: (California Department of Fish and Wildlife, 2023)
[1] Habitat Types
AGS = Annual grassland
BAR = Barren
DEV = developed
OAK = Interior live oak riparian
RIV = Riverine (Kings River)
VFR = Valley foothill riparian
[2] Temporal and Spatial Distribution - CWHR habitat types. KRCD crosswalked the vegetation communities and three other land covers within the FERC Project boundary into six CWHR habitat classifications, following the Manual (Sawyer, Keeler-Wolf, & Evans, 2009).

3.5.5 Wetlands, Riparian, and Littoral Habitats

The majority of the FERC Project boundary consists of developed areas and non-native grassland. However, riparian habitat is found along the Kings River on the in-stream island that overlaps with a small portion of the western edge and southwestern corner of the FERC Project boundary near Pine Flat Dam. Additionally, the southeastern portion of the FERC Project boundary overlaps with the Kings River just downstream of Pine Flat Dam.

Per Section 3.5.1.1, there are four riparian alliances in the FERC Project boundary, occupying 1.33 acres (11.20%).

The FERC Project boundary occurs to the west of Pine Flat Lake which provides littoral habitat, but there is no littoral habitat within the FERC Project boundary. The FERC Project boundary also does not contain any known wetlands.

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3.6 ENDANGERED SPECIES ACT-LISTED SPECIES

This section discusses species listed under the federal Endangered Species Act (ESA) as threatened (FT), endangered (FE), proposed or candidates for listing and their designated critical habitats that could be affected by the Project. Section 3.6 is divided into two subsections. Section 3.6.1 identifies ESA-listed and ESA-candidate species and their designated critical habitats that could be affected by the Project. Section 3.6.2 provides a general life history for each ESA-listed species and available information regarding the distribution, abundance, and condition of the ESA-listed species and their designated critical habitat in the FERC Project boundary and in the Upper Kings River.

3.6.1 Federal Endangered Species Act Listed Species

On January 22, 2024, KRCD generated a list of ESA-listed and ESA-candidate species for the Project, plus a one-mile buffer, using the USFWS's Information for Planning and Consultation (IPaC) System (USFWS, 2023) (Attachment I). The list includes nine species, of which one is threatened (one amphibian), five are endangered (one plant, one amphibian, one bird and two mammals), three are ESA proposed (one reptile, one amphibian and one bird) and one is an ESA candidate (one invertebrate). The nine ESA-listed species are:

- Threatened
  - California tiger salamander – Central California Distinct Population Segment (*Ambystoma californiense* pop. 1)
- Endangered
  - Keck's checkerbloom (*Sidalcea keckii*) and its critical habitat
  - Foothill yellow-legged frog – Southern Sierra Distinct Population Segment (DPS) (*Rana boylii* pop. 5)
  - California condor (*Gymnogyps californianus*) and its critical habitat
  - Fisher – Southern Sierra Nevada Evolutionarily Significant Unit (ESU) (*Pekania pennanti* pop. 2)
  - San Joaquin kit fox (*Vulpes macrotis mutica*)
- Proposed
  - Northwestern pond turtle (*Actinemys marmorata*)
  - Western Spadefoot (*Spea hammondii*)

Candidates[1]

- Monarch butterfly - California overwintering population (*Danaus plexippus* pop. 1)

A focused plant survey and habitat assessment was conducted on May 6 and May 29, 2020 for the FERC Project boundary.[2] No ESA-listed species were observed during either visit.

California tiger salamander was eliminated from further consideration because there are no suitable breeding ponds within 3 miles of the Project boundary. California tiger salamander upland habitat encompasses an approximately 1.5-mile buffer around suitable breeding habitat. However, due to the absence of suitable breeding ponds within the California tiger salamander's approximately 1.5-mile dispersal buffer, the FERC Project boundary does not provide suitable upland habitat. Additionally, there are no known occurrences of the species within 7 miles of the Project (CDFW, 2023).

The Southern Sierra Nevada ESU of Fisher was also eliminated from further consideration as the FERC Project boundary does not contain a mature dense forested area this species typically requires, nor is there any such habitat in near proximity to the Project. The Project is also below the known elevation range of the species.

Foothill yellow-legged frog have no documented extant occurrences within the Project vicinity, and there are no documented occurrences within a mile of the Project. The ten plus recorded occurrences within 15 miles of the Project have been extirpated (CDFW, 2023). Therefore, this species was also removed from further consideration.

On October 11, 2023, KRCD also queried the following databases to generate a list of other ESA-listed species with the potential to occur within the FERC Project boundary:

- CDFW's California Natural Diversity Database (CNDDB) (CDFW, 2023)
- CNPS' Inventory of Rare and Endangered Plants of California (California Native Plant Society, 2023)

No additional ESA-listed species were determined to have the potential to occur.

As a result, KRCD concluded that five species (Keck's checkerbloom, monarch butterfly, northwestern pond turtle, California condor, and San Joaquin kit fox) have the potential to occur within the FERC Project boundary. Information regarding ESA listing, suitable habitat, known occurrences, proximal reports of the species to the Project, and relevant status reports and recovery plans are shown in Table 3.6-1.

[1] A candidate species is species being considered for listing but not yet the subject of a proposed rule.
[2] Habitat descriptions are included in Section 3.5 of this PAD.

Table 3.6-1. ESA listed species and their designated critical habitat with the potential to occur in the FERC Project boundary.

Species		Suitable Habitat Type	Known Occurrence in Project Vicinity	Status[1]	Status Reports and Recovery Plans Relevant to Project Vicinity
Common Name	**Scientific Name**				
PLANTS					
Keck's Checkerbloom	*Sidalcea keckii*	Serpentine or clay soils in cismontane woodland and grassland habitats at elevations ranging from 245 to 2,135 feet (CNPS, 2023).	Nearby CNDDB records within Piedra quad, 2 miles SW of Project (CDFW, 2023)	FE	5-Year Reviews (USFWS, 2008); (USFWS, 2012); (USFWS, 2020) Critical Habitat – Near Project (68 FR 12863, 2003)
INVERTEBRATES					
Monarch butterfly	*Danaus plexippus*	In the larva stage monarch butterflies require milkweed host plants, primarily of the genus Asclepias. Adult monarch butterflies require a diverse set of nectaring resources, which would include milkweed for ovipositioning in addition to larval feeding. Monarchs will often also use a variety of roosting trees along their fall migration routes. The overwintering habitats in California include tree groves of blue gum eucalyptus (*Eucalyptus globulus*), Monterey pine (*Pinus radiata*), and Monterey cypress (*Hesperocyparis macrocarpa*) all of which act as roost trees.	No known occurrences in the Project vicinity.	FCT	Status Reports (USFWS, 2020)
AMPHIBIANS					
Western spadefoot	*Spea hammondii*	Endemic to California and northern Baja California. Ranges from Redding throughout the Central Valley and associated foothills, through the South Coast Ranges into southern California west of the Peninsular mountains. Breeding sites include vernal pools, temporary rain pools, cattle tanks, and occasionally pools of intermittent streams. They typically use turbid water with little to no cover that remain wet for at least 30 days to allow for transformation of larvae (Nafis 2023). Prefers open areas with sandy or gravely soils, in a variety of habitats including grasslands, oak woodlands, coastal sage scrub, chaparral, sandy washes, floodplains, alluvial fans, playas, and alkali flats. Pools with invasive species, such as crayfish *(Pacifasticus* spp.), or bullfrogs, often, but not always, exclude this species (Thomson et al. 2016).	Nearby CNDDB records within Piedra, Tucker Mountain, Orange Cove North and Humphrey's Station quads (CDFW, 2023)	FPT	Status Reports (USFWS, 2023)
REPTILES					
Northwestern pond turtle	*Actinemys marmorata*	Variety of natural habitats including small mountain creeks, large rivers and oxbow lakes, and modified habitats, such as wastewater treatment oxidation ponds, irrigation ditches, urban parks, and artificially created lakes from sea level to nearly 6,700 feet (CDFW, 2023).	The species has been sighted in tributary streams and Kings River (Bureau of Reclamation and CDFW, 2003).	FPT	Recovery Plan (USFWS, 2020) Status Reports (USFWS, 2023)

Table 3.6-1. (continued).

Species		Suitable Habitat Type	Known Occurrence in Project Vicinity	Status[1]	Status Reports and Recovery Plans Relevant to Project Vicinity
Common Name	Scientific Name				
BIRDS					
California condor	*Gymnogyps californianus*	Formerly ranged across much of North America, but over the course of the 20th Century, disappeared from nearly its entire range. Dwindled to such small numbers that by the 1980's, all remaining birds were removed from the wild to a captive rearing program. In the 1990's, began being re-released, and now the species has reestablished in the foothills of the southern Sierra Nevada Range, across the Tehachapi Range and through the Transverse Ranges from Los Angeles County to Santa Barbara County, and up the Coast Range Mountains to Big Sur and Pinnacles National Park. Nests in cavities located on steep rock formations or in the burned-out hollows of old-growth coast redwoods (*Sequoia semervirens*) or giant sequoias (*Sequoiadendron giganteum*). Less commonly uses cliff ledges or large old nests of other bird species. Forages in open terrain of foothill grassland and oak savanna habitats, and at coastal sites in central California (USFWS, 2013).	No known occurrences in the Project vicinity.	FE	Recovery Plan (USFWS, 1996); (USFWS, 2019) 5-Year Reviews (USFWS, 2013) Critical Habitat – Near Project (42 FR 47840, 1977)
MAMMALS					
San Joaquin kit fox	*Vulpes macrotis mutica*	The subspecies historically ranged in alkali scrub/shrub and arid grasslands throughout the level terrain of the San Joaquin Valley floor from southern Kern County north to Tracy in San Joaquin County, and up into more gradual slopes of the surrounding foothills and adjoining valleys of the interior Coast Range. Occurs in desert-like habitats characterized by sparse or absent shrub cover, sparse ground cover, and short vegetative structure. Prefers areas with open, level, sandy ground (USFWS, 2010).	Nearby CNDDB record within Piedra quad, about 4.5 miles SW of Project (CDFW, 2023)	FE	Status Reports (USFWS, 2020) Recovery Plan (USFWS, 1998) 5-Year Reviews (USFWS, 2010)

[1]Special Status:
FE = listed under the Endangered Species Act as endangered
FCT = candidate for listing under Endangered Species Act as threatened
FPT = proposed to be listed under the Endangered Species Act as threatened

3.6.2 Life Histories of ESA-Listed Species

A brief description of listing status and life history of each ESA-listed species potentially affected by the Project is provided below.

3.6.2.1 Keck's Checkerbloom[3]

On February 16, 2000, the USFWS listed the Keck's checkerbloom as an endangered species (65 FR 7757).The checkerbloom is endangered due to urban development, grazing, and agricultural land development, their small population sizes, and they are also susceptible to random weather events (CNPS, 2023).

Critical habitat has been designated for Keck's checkerbloom [68 FR 12863]. Lands that have been designated as critical habitat are under both private and federal jurisdiction totaling about 438 ha across 3 units: Piedra, Mine Hill, and White River. The closest unit to the FERC Project boundary is the Piedra unit, approximately 2.5 miles west-southwest along Elwood Road and the Kings River, just west of Tivy Mountain. This area has been established for the conservation of Keck's checkerbloom, and populations have been documented in 2000 and 2001 growing on both Fancher and Cibo soils [68 FR 12863]. This unit is essential, as it is the most northerly location known for Keck's checkerbloom and is the only location with above-ground plants with maroon-centered flowers documented [68 FR 12863].

Appearance

The checkerbloom is a California endemic annual herb; the species is slender and hairy and grows anywhere from 6 to 13 inches tall (CNPS, 2023). During the flowering period (April-June), deep pink flowers with petals reaching 10-20 mm wide appear (Hill, 2012). Keck's checkerbloom resemble four other *Sidalcea* species: *S. calycosa, S. diploscyha, S. hartwegii,* and *S. hirsuta*. Only two of these have ranges that overlap Keck's checkerbloom, *S. calycosa* and *S. diploscyha* (CNPS, 2023). Keck's checkerbloom can be separated from these two species by: number and size of flowers, arrangement of stamens, size and shape of the stem leaves, density of hairs on the stems, and the presence of a purple spot on the flower, 1-2 mm wide (Hickman, 1993) (Hill, 2012).

Habitat

Habitat requirements are not well understood due to the low number of known extant occurrences. These populations occur in clay or serpentine soils in sparsely vegetated grasslands and on the margins of cismontane woodlands [65 Federal Register 7757] (CNPS, 2023).

[3] FWS.gov

No Keck's checkerbloom were observed during 2020 surveys of the Project, nor are there any other reports of the species within the FERC Project boundary. The nearest known occurrence is approximately 2 miles southwest of the Project. Additionally, there are several occurrences in the Piedra quadrangle, last reported in 2019 (CDFW, 2023).

3.6.2.2 Monarch Butterfly[4]

The monarch butterfly is currently a candidate for ESA listing as of May 3, 2022 (87 FR 26152, 2022). The proposed listing is to help in combating declining populations across their range, due largely to habitat loss and climatic changes. There is no designated critical habitat for this species within the Project area.

Life Cycle

Adult female monarchs will lay eggs on milkweed (*Asclepias* spp.) plants, of which the leaves will serve as the exclusive food source for caterpillars as they grow prior to pupating (Brower, Taylor, Williams, Slayback, & Zubieta, 2012). The pupa stage will last for about 2 weeks, while the caterpillar undergoes metamorphosis transforming into a butterfly (Brower, Taylor, Williams, Slayback, & Zubieta, 2012).

Migration and Overwintering

In the fall, monarch butterflies in western North America will migrate south to California, where they will overwinter in clusters in coastal regions. The Project is outside of the overwintering area. In the spring, the overwintering populations in California will migrate north, with female adults laying eggs on milkweed plants along the way (Brower, Taylor, Williams, Slayback, & Zubieta, 2012).

Habitat

Conducive habitat supporting monarch life histories will include milkweed plants for reproduction and early life cycles, as well as a variety of other flowering plant species that produce nectar in the butterfly phase of their life cycle (Flockhard, Pichancourt, Norris, & G., 2017).

The California Consortium of Herbaria shows the closest instance of milkweed as California milkweed (*Asclepias californica*) was collected in 1996, 2.1 miles west of the Project, between Elwood Road and N Piedra Road where Hughes Creek meets Kings

[4] FWS.gov

River (Consortium of California Herbaria, 2023). Additionally, the Consortium shows a collection of Woollypod milkweed (*Asclepias eriocarpa*) from 2008 approximately 6.5 miles north of the Project near Watts Valley Cemetery (Consortium of California Herbaria, 2023). No milkweed was identified within the Project boundary during botanical surveys in 2020. There is no overwintering habitat associated with the Project.

3.6.2.3 Western Spadefoot[5]

The northern DPS western spadefoot is currently proposed to be listed as threatened with rules issued under section 4(d) of the ESA as of December 5, 2023 [88 FR 84252]. The proposed listing notes that the southern DPS will also be listed. The designation of critical habitat for this species has not been determined due to insufficient data. This proposed listing is due to habitat loss, nonnative predators, chemical contaminants, noise disruptions, wildfire, and climate change [88 FR 84261].

Appearance and Behavior

The western spadefoot ranges in size from 3.8 to 6.3 centimeters from snout to vent length. They vary in color from dusky green to gray on their backs with four irregular light-colored stripes. The iris of the eye is usually pale gold. The abdomen is white in color without any markings. The western spadefoot has a wedge-shaped spade on each hind foot used for digging burrows.

Western spadefoots are primarily terrestrial inhabiting underground burrows. They spend most of their life cycle in a torpor state in underground burrows upland of their aquatic breeding habitat. Spadefoots emerge to forage and breed in seasonally wet pools after winter and spring rains. Surface activity is mostly nocturnal. Breeding and oviposition occur from October to May in ephemeral pools and non-flowing drainage areas natural or manmade. Females deposit many egg clusters with an average of 24 eggs per cluster and 300 to 500 eggs per season. Eggs hatch in 1 to 6 days and tadpole development can be completed between 3 to 11 weeks provided the pool hasn't dried out. Individuals may take at least 2 years to mature.

Habitat and Range

The historical range of the western spadefoot is from Shasta County, California south to Baja California, Mexico. They have been observed from sea level up to 4,550 feet in the Sierra Nevada foothills. In California, the western spadefoot inhabits the Central Valley, the Coast Ranges and coastal lowlands. Genetic analysis determined that the species is divided into the northern and southern DPS by the Transverse Ranges in southern California.

[5] Wikimedia Commons

Western spadefoot habitat is primarily open treeless grassland, scrub, or mixed woodland and grassland where aquatic breeding habitat is nearby. They are primarily terrestrial and require upland habitat to forage and construct burrows for dry season dormancy. Aquatic breeding habitat in vernal pools, sand and gravel washes, and ephemeral streams is favored but egg and larvae have also been observed in artificial ponds, livestock ponds, irrigation ditches and tire ruts.

3.6.2.4 Northwestern Pond Turtle[6]

The northwestern pond turtle is currently proposed to be listed as threatened with rules issued under section 4(d) of the ESA as of October 3, 2023 [88 FR 68370]. The proposed listing notes that the western pond turtle was previously believed to be a single species; however, it is now recognized as two distinct species, the northwestern pond turtle, discussed here, and the southwestern pond turtle [88 FR 68370]. This proposed listing is due largely to drought, predation by bullfrogs, and anthropogenic factors such as habitat loss and fragmentation, altered hydrology, and climate change (USFWS, 2023).

Due to the recently recognized split in species, any instance where western pond turtle is referenced can be understood to be in reference to both distinct species.

<u>Appearance and Behavior</u>

The western pond turtle is a small to medium-sized turtle that ranges in coloration from dark brown, olive brown, to blackish. It usually has a pattern of striping or spotting that radiates from the center of the scutes (Nafis, 2023). Turtles that are south of the Transverse Ranges tend to be lighter in color, from yellowish brown to light brown (Nafis, 2023), understood now to be likely in reference to morphological distinctions of the southwestern pond turtle.

Western pond turtles are typically active from February through November, but may be active during warm periods in winter in warmer climates (Nafis, 2023); those that are not may hibernate underwater for several months over the winter, clustering in shallow areas of ponds or moving themselves into woodlands to bury themselves in loose soil or in existing California ground squirrel burrows (Nafis, 2023). In the heat of summer, especially during droughts, pond turtles will estivate by burying themselves in the bottoms of ponds to cool off (Nafis, 2023).

Mating occurs between April and May, where females will dig nests along stream or pond margins where full sunlight is available to lay a clutch of eggs (Nafis, 2023). Hatchlings may emerge in the late summer or the fall of the same year, but some turtles

[6] Wikimedia Commons

have been documented to overwinter in the nest and emerge the following spring (Nafis, 2023).

Habitat and Range

Largely, the western pond turtle is common in suitable aquatic habitat throughout California west of the Sierra-Cascade crest and absent from all desert regions but the Mojave, where it is found along the Mojave River and its tributaries (CDFW, 2000). In California, the northwestern pond turtle's range expands to includes areas from the Oregon-California border down to northern Monterey County, the lower elevation and foothills of the southern Cascades and Sierra Nevada Mountains, and areas within the Sacramento and San Joaquin Valleys [88 FR 68370]. Elevation ranges extend from very near sea level up to 4,692 ft (1,430 m), and they are associated with permanent or nearly permanent water bodies in various habitat types (CDFW, 2000).

Western pond turtles require basking sites within their immediate habitats – these areas could be partially submerged logs, rocks, mats of floating vegetation, or open mud banks (CDFW, 2000). Terrestrial habitat is important in their life history in search for food, finding shelter, and laying eggs in the spring (Nafis, 2023).

No northwestern pond turtles have been observed in or near the FERC Project Boundary. The nearest documented occurrence of western pond turtle is approximately 6 miles northeast of the FERC Project Boundary along Sycamore Creek. Three western pond turtles were captured and retained in 1988. This report was last updated in February 1996. An additional occurrence in the Sacate Ridge USGS Quadrangle is approximately 7 miles northeast of the FERC Project Boundary along Big Creek. 24 western pond turtles were captures with three retained in 1988, last updated March 1996 (CDFW, 2023).

3.6.2.5 California Condor[7]

On March 11, 1967, the USFWS listed the California condor as an endangered species under the Endangered Species Preservation Act of 1966 (supplanted by the current Endangered Species Act of 1973) due to historic hunting practices, poisoning from lead ammunition, and habitat loss (32 FR 4001, 1967). One of the major threats to the condor continues to be poisoning from lead ammunition as they ingest fragments in carrion (Church, et al., 2006).

Critical habitat has been designated for the California condor [42 FR 47840]. Lands that have been designated as critical habitat are described as: Sespe-Piru Condor Area, Matilija Condor Area, Sisquoc-San Rafael Condor Area, Hi Mountain-Beartrap Condor Areas, Mt. Pinos Condor Area, Blue Ridge Condor Area, Tejon Ranch, Kern County rangelands, and Tulare County rangelands. Of these areas, the closest to the FERC

[7] Wikimedia Commons

Project boundary include the Blue Ridge Condor Area and Tulare County rangelands; these areas include the land, water, and airspace in Tulare County (42 FR 47840). These areas are approximately 45 miles south of the Project vicinity.

Appearance and Behavior

California condors have wingspans of about 9.5 feet, have black feathers except for white underwings and bald heads and necks, where their skin coloration can vary from pink and red to light blue (USFWS, 1996). Condors spend a great deal of time perched or sunning, often in groups (Synder & Snyder, 1989). They have been known to nest on cliffsides, deep within cave systems, and inside burned-out cavities of coastal redwoods and giant sequoias (Synder, Ramey, & Sibley, 1986).

Condors are obligate scavengers and feed exclusively on carrion, or cadavers, of cattle, deer, and large marine mammals (Church, et al., 2006).

Habitat and Range

Currently, the condor is found in the western U.S. in California, Arizona, and Utah (Synder & Snyder, 1989), as well as Baja California, Mexico (USFWS, 2023). Remaining California condor are composed of two main populations: one in the coastal mountains of central and southern California, and another in the Grand Canyon region of Arizona and Utah (Finkelstein, et al., 2012). Historically, the condor could be found from British Columbia down to Baja California, but there was a sharp decline in the 1800s (CDFW, 2017). In the 1980s, individuals were captured to begin a captive breeding program; the first Californian condors were released back into the wild in 1992 in Ventura County (CDFW, 2017). As of 2022, there were 347 known California condors in the wild(USFWS, 2023).

There are no verified occurrences of California condors within the FERC Project boundary; however, the area is considered within the species' range (USFWS, 2021). There is an unconfirmed sighting less than 15 miles southeast of the Project from 2017 along Highway 180 (The Cornell Lab of Ornithology, 2022). The California condor was also observed in 2009 approximately 90 miles west of the FERC Project boundary, near Rock Spring Peaks (CDFW, 2023).

3.6.2.6 San Joaquin Kit Fox[8]

On March 11, 1967, the USFWS listed the San Joaquin kit fox as an "endangered" species under the Endangered Species Preservation Act of 1966 (supplanted by the current Endangered Species Act of 1973) (32 FR 4001, 1967). The fox is endangered by multiple problems throughout its range, including disease and competition with other canid species

[8] Wikimedia Commons

(Sovada, Coates, & Carver, 2017); however, the most prominent threats to the fox are habitat degradation, loss, and fragmentation (Cypher, Phillips, & Kelly, 2013). There is no designated critical habitat for this species within the Project area.

Appearance and Behavior

The San Joaquin kit fox, a subspecies of the kit fox (*Vulpes macrotis*), is a small fox species that is characteristically slender with large, pointed ears (Brown, Johnson, Kelly, & Williams). Their coloration can range from a light buff to grayish along the back to the tail while they can show gray, rust, or yellow along their sides with white bellies; there are two distinct coats depending on the season, a tan summer and silver-gray winter coat (Williams, et al., 1998).

The fox is a predominantly nocturnal mammal, and feeds on other small nocturnal mammals such as kangaroo rats, pocket mice, and other rodents (Williams, et al., 1998). However, they will also feed on many other organisms including birds, lagomorphs, and insects (Williams, et al., 1998) (Cypher, Rudd, & Westall, 2014) (Kelly, McLean, & Ernest, 2003).

Reproduction can begin when the fox reaches one year of age, and breeding typically occurs from December through February with litters of 3 to 5 pups born sometime between February and late March (Williams, et al., 1998) (Ralls, White, & Garcelon, 2004) (Cypher, Rudd, & Westall, 2014).

Habitat and Denning

The fox is endemic to the San Joaquin Valley and adjacent arid areas of central California, with the majority of remaining natural lands occurring at the valley edges and the base of the Diablo and Sierra Nevada ranges (Ralls, White, & Garcelon, 2004) (Cypher, Phillips, & Kelly, 2013). The most important attributes to conducive fox habitat include sparse vegetation coverage that is dominated by allscale saltbush (*Atriplex polycarpa*) and red brome (*Bromus rubens*) and are generally flat or gently rolling (Cypher, Phillips, & Kelly, 2013).

Den use by the fox is for temperature regulation, shelter from environmental conditions and predation, and reproduction; they will dig new dens in the terrain, or repurpose dens dug by other animals, such as badgers and coyotes (Williams, et al., 1998).

No San Joaquin kit fox have been observed in or near the FERC Project boundary. The nearest reported occurrence of San Joaquin kit fox is approximately 5 miles away, southeast of the Kings River, between Sanger and Pine Flat reservoirs in the Piedra quadrangle. Kit fox pups were observed there in the early 1990s. The occurrence was last reported in August 2007 (CDFW, 2023).

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3.7 RECREATION

This section describes existing conditions pertaining to recreation facilities, opportunities, and use within the FERC Project boundary and vicinity. The Project is located near the Community of Piedra, Fresno County, California, 30 miles east of the City of Fresno, on the north bank of the Kings River approximately 200 feet downstream of the USACE's Pine Flat Dam. Regionally, the NPS and the USFS provide recreational opportunities. Under the current FERC Project license, KRCD supports public recreational, educational, and interpretive facilities on surrounding USACE lands.

Section 3.7.1 describes existing recreation facilities on the Project, as well as non-Project recreation facilities. Section 3.7.2 describes current recreational use of Project lands and waters, while Section 3.7.3 discusses shoreline buffer zones. Recreation-related goals and identified needs are described in Section 3.7.4, while shoreline management plan/policy is in Section 3.7.5. Section 3.7.6 includes information about designated scenic and protected river segments. National trails system and wilderness area lands are discussed in Section 3.7.7, while regional recreation areas are included in Section 3.7.8.

3.7.1 Existing Recreation Facilities

3.7.1.1 Project Recreation Facilities

Public Fishing Access

As a requirement of the FERC Project license, KRCD operates and maintains a public fishing access (Public Fishing Access) located on Pine Flat Road on Fresno County land, approximately one mile downstream of Pine Flat Dam on the Kings River (Figure 3.7-1). The Public Fishing Access consists of a picnic area, parking area, access road, trash facilities, and signage (Figure 3.7-2).

In 2022, KRCD conducted a visitor use and facility assessment at the Public Fishing Access, including an inventory of the facility and visitor questionnaire. The results of this assessment are summarized below.

Recreation Facilities
In 2022, KRCD conducted an inventory of the facilities including the number and type of facility, condition, compliance with current accessibility standards, and presence of recreational use impacts at the public fishing access site. The condition assessment categories included poor, fair, good, and excellent condition, as defined below.

- Poor – All/most facilities in disrepair or need of replacement soon.
- Fair – Need for improved maintenance/repair in some areas; no major safety concerns; repairs needed but not immediately.
- Good – All facilities in good condition and well maintained; no significant signs of disrepair or aging.

- Excellent – All facilities are new/near new/recently reconditioned and well maintained.

KRCD also assessed the facilities and site amenities for consistency with current accessibility guidelines. As the Public Fishing Access site is located on Fresno County land, the requisite standards for accessibility are the 2010 Americans with Disabilities Act (ADA) Standards for Accessible Design for public accommodations (Title II) (USDOJ, 2010). These standards require parking area and informational/directional signage accessibility elements. Notably, the 2010 ADA Standards for Accessible Design do not have standards for the picnic area facilities. As such, the Public Fishing Access is required to have the following accessible elements (USDOJ, 2010).

- Parking Spaces (§208) – One van-accessible parking space with applicable space sizing, surfacing, vertical clearance, identification, and connecting accessible routes. Note that the site does not have other required accessible elements that would require a connecting accessible route.

- Informational and Directional Signage (§703.5) – Signs that meet visual requirements, including non-glare finish, color contrast, and character specifications. Note that tactile requirements do not apply to directional/informational signage.

Figure 3.7-1. Map of the KRCD Public Fishing Access location and surrounding non-Project sites.

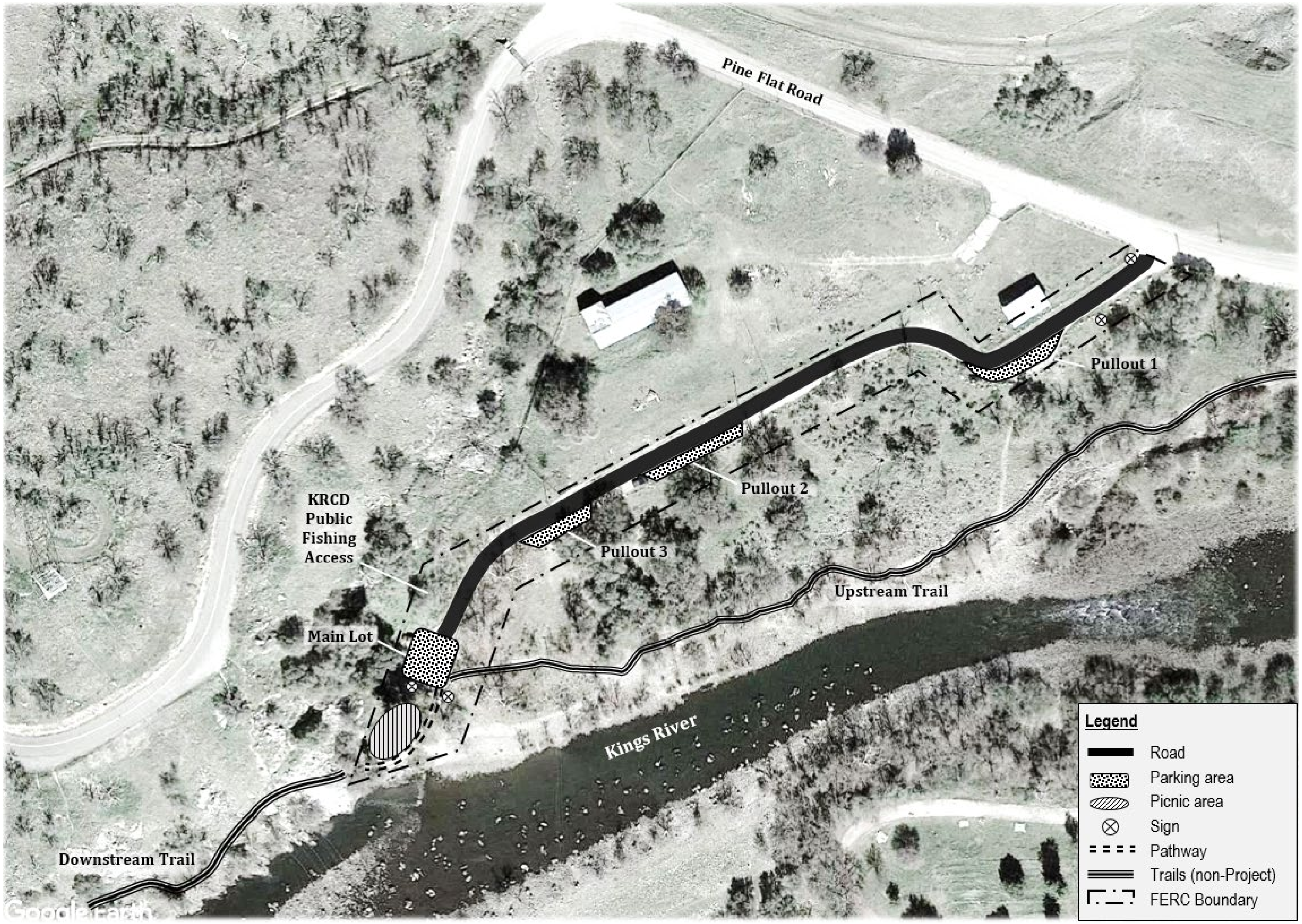


Figure 3.7-2. Schematic of KRCD Public Fishing Access facilities and adjoining non-Project trails.

Finally, KRCD assessed the recreation use impacts at the Public Fishing Access site and categorized the impacts as either low (few if any evidence of use impact observed), moderate (several signs/evidence of use impact but not extensive or widespread impacts), or high (extensive evidence of use impact; widespread use with many impacts evident). Evidence of use impacts typically may include the presence of litter, dumping, tree cutting, graffiti, inadequate vegetation clearances around grills, presence of grill ash, visible off-highway vehicle use/tracks, trampled vegetation, erosion, human waste, and toilet paper.

The following section details the inventory and Table 3.7-1 summarizes the overall results by amenity. Representative photographs of the amenities are provided.

Table 3.7-1. Summary of inventory and evaluations at the KRCD Public Fishing Access.

Amenity		Material	Dimensions	Description	Condition	Accessibility
Access Road	n/a	Gravel	1,000 ft. long x 16-18 ft. wide	2-way, in-out entrance road with vehicle barriers (boulders) along river side of road	Fair	Not applicable
Parking Areas	Main Lot	Gravel	90 ft. long x 72 ft. wide	Large, rectangular lot with metal vehicle barriers; no striping or space markers/wheel stops	Fair	Inaccessible
	Pullout 1	Gravel	100 ft. long x 22 ft. wide	Roadside pullout (river side of road); no signage	Fair	
	Pullout 2	Gravel	130 ft. long x 16 ft. wide	Roadside pullout (river side of road); no signage	Fair	
	Pullout 3	Gravel	90 ft. long x 30 ft. wide	Roadside pullout (river side of road); no signage	Fair	
Picnic Area	Tables	Metal	8 ft. long x 3 ft. wide	5 metal picnic tables; each a concrete pad (6 ft. by 10 ft.)	Poor	Inaccessible
	Pedestal Grills	Metal	n/a	3 pedestal grills dispersed throughout picnic area	Poor	
	Pathway	Concrete	130 ft. long x 6 ft. wide	Pathway from the parking area providing access to the picnic area and river's edge	Fair	
Trash	Dumpster	Metal	6 ft. long, 3 ft. wide, 4 ft. high (4 yards)	Small dumpster on wheels; no lid	Poor	Not applicable
Signage	Entrance	Metal	2 ft. by 5 ft.	Site identification/entrance sign at junction with Pine Flat Road	Good	Accessible
	Information	Metal	3 ft. x 4 ft.	Federal Energy Regulatory Commission (FERC) Part 8 signs; at entrance to site at junction with Pine Flat Road	Good	Accessible
	Regulations	Metal	12 in. x 18 in.	California Department of Fish and Wildlife fishing regulations sign; at pullout 1	Fair	Inaccessible
	Information	Metal	3 ft. x 4 ft.	FERC Part 8 signs; located between main lot and picnic area	Good	Accessible
	Warning	Metal	18 in. x 12 in.	2 small warning signs related to change in river flow/evacuation and strong currents	Good	Accessible

Access Road

The site has a single access route branching off Pine Flat Road. The route is a gravel-surfaced, two-way road that dead ends at the parking area (Figure 3.7-3). The approximately 130-foot-long road varies in width from 16 to 18 feet throughout its length. The condition of the road is fair, primarily due to rutting and two large depressions in the surfacing that lead to pooling of water. The depressions are adjacent to each other and may restrict or make vehicle passage difficult depending upon the depth and extent of the pooled water. The roadway has large boulder vehicle barriers situated approximately 4 to 6 ft. off the road edge, though only along the river side of the road. The 2010 ADA Standards for Accessible Design do not apply to roadways.

At junction with Pine Flat Road

Depressions in road where water pools

Initial road segment

Final road segment before main parking lot

Figure 3.7-3. Photographs of access road.

Parking Areas

The site has a total of four parking areas, including a main lot (approximately 12 vehicles) and three roadside pullouts (up to approximately 12 vehicles) along the river side of the road. The large, rectangular main lot (90 feet long by 72 feet wide) is located at the end of the access/entrance road with metal vehicle barriers around the two-thirds of the parking lot perimeter. The lot has a gravel surface that is generally level with several small depressions where water pools during rain events, as well as debris (e.g., branches, rocks) that was observed throughout the parking area which impacts the evenness of the surface. In addition, the gravel surfacing is thin and irregular and lacks striping or designated space markers (i.e., wheel stops). Overall, the main lot is in fair condition, but does not meet accessibility standards (i.e., lacks the requisite one designated van accessible space with appropriate sizing, striping, identification, and surfacing). Use impacts were low with some litter and graffiti on the dumpster located in the main lot. Table 3.7-1 provides a summary of the inventory, condition, and accessibility evaluations.

In addition to the main lot, three roadside pullouts exist along the access road on the river side of the road (Figure 3.7-4). The pullouts have a gravel surface, though it is thin and irregular overall (similar to the main lot). None of the pullouts has parking signage or marked spaces. The pullouts were in fair condition, but do not meet current accessibility standards (i.e., lack requisite slopes, surfacing, and designated accessible spaces with markings/signage). Use impacts were low with signs of litter in the pullouts. Notably, several informal/user-created access trails branch off from two of the roadside pullouts, providing pedestrian access towards the Kings River, though these trails are not signed/designated.

Picnic Area

The picnic area is located between the main parking lot and the Kings River and consists of five picnic sites and three pedestal grills (Figure 3.7-5). The picnic area is accessed via a concrete pathway (6 feet wide), which ends at a large rock outcrop. Each picnic site has a metal table on a concrete pad (6 feet by 10 feet), though there is no defined access route connecting the concrete pathway to the concrete picnic site pad. Instead, the surfacing between these elements is an uneven, grassy surface. The metal picnic tables are in poor condition, showing signs of damage, and rusting. The 2010 ADA Standards for Accessible Design do not have standards for picnic sites.

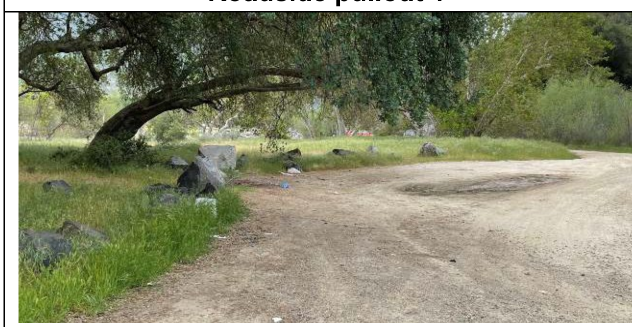
The picnic area has three pedestal grills dispersed throughout. These pedestal grills also lack a defined access route from the concrete pathway and picnic sites (i.e., uneven grassy surface). The pedestal grills were found to be in poor condition with bent grill grates, operable parts, and overall rusting materials/surfaces.

The picnic area is accessed via a 6-foot-wide concrete pathway from the parking area, including a curb along the river’s edge. The pathway is in fair condition due to cracking, some uneven/sloped concrete segments, and several tread obstacles (2 to 3 inches high) at the seams between concrete slabs.

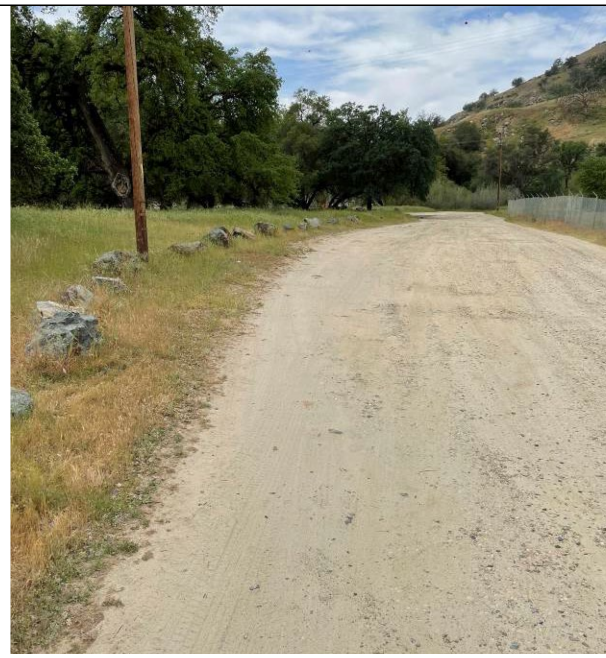
Use impacts were moderate with trash/litter, graffiti on amenity surfaces, and signs of ash from pedestal grills dispersed on the grassy areas around the grills.

Main parking lot

Roadside pullout 1



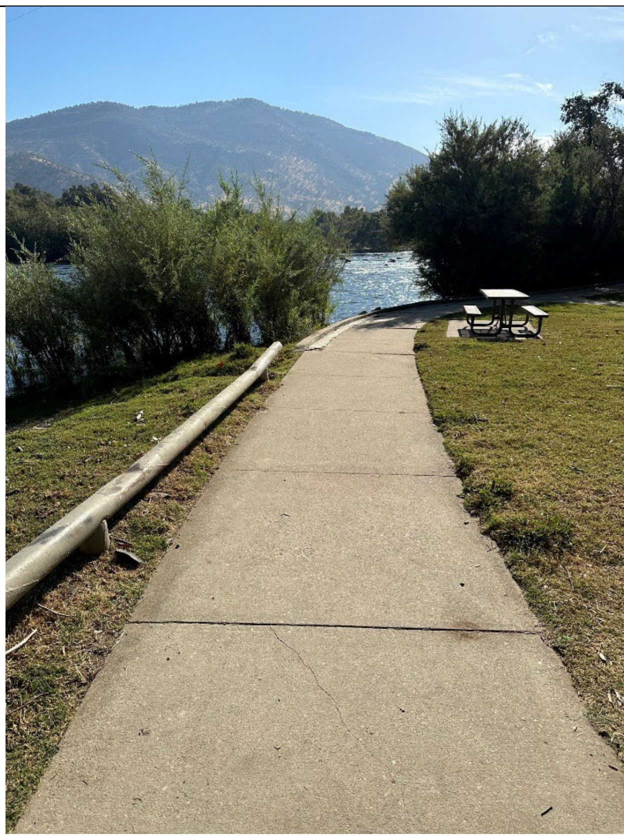
Roadside pullout 3



Roadside pullout 2

Figure 3.7-4. Photographs of main parking area and roadside pullouts.

Picnic area overview



Pathway from main parking lot to the picnic area

Typical picnic site/table

Typical pedestal grill

Figure 3.7-5. Photographs of the picnic area.

Signage

The site has a total of five signs dispersed throughout, all of metal construction and on posts (Figure 3.7-6). At the entrance to the site along Pine Flat Road, there are two signs including an entrance/site identification sign and FERC FPA Part 8[1] sign (both in good condition). Along the access road, there is a single, small metal CDFW sign providing information on fishing regulations for the Kings River. The sign is in fair condition showing signs of damage and does not meet accessibility standards (i.e., lacks access route, clear approach/clearances, and proper sign height). The final signs are located along the perimeter of the main parking lot, including a second FERC FPA Part 8 sign and two warning signs identifying hazards/danger related to changing water levels and strong currents. All of the signs meet the requisite ADA visual requirements, except the CDFW fishing regulations sign (i.e., does not meet the character height and stroke thickness requirements).

[1] FPA Part 8 relates to making reasonable efforts in keeping the public informed of recreational opportunities and development at FERC licensed projects.

Entrance sign / FERC FPA Part 8 sign

CDFW fishing regulations sign

FERC Part 8 sign at main parking lot

Warning signs at main parking lot

Figure 3.7-6. Photographs of site informational and directional signage.

Trash Facilities

The site has a single trash dumpster located on the edge of the parking area. The dumpster is in poor condition due to a missing lid/operable parts, extensive graffiti, and lack of animal-resistant elements (i.e., locking lid). The dumpster does not meet accessibility standards for the clear approach/clearances primarily due to the uneven surfacing and debris on the gravel surfaced main lot. The 2010 ADA Standards for Accessible Design do not require accessible dumpsters/trash facilities.

River Access

The site does not have defined river access pathways or trails beyond the concrete pathway from the parking area to the picnic area (described in the *Picnic Area* section above), which also parallels the shoreline for approximately half its length. Access from the concrete pathway to the river's edge occurs in 4- to 6-foot-wide gaps in the curbing or metal barriers, though access beyond the pathway is not defined and is steep and rocky in several places.

Overall Facility Ratings

Overall, the facility is in fair condition with many of the elements showing signs of wear/damage. The fishing access site does not meet current accessibility standards required for parking spaces and signage. Use impacts are moderate overall, due to the presence of trash/litter along the roadside pullouts, in the main parking lot, and in the picnic area, along with graffiti on the dumpster and picnic tables, and presence of pedestal grill ash on the ground.

Visitor Survey Results

KRCD implemented a visitor questionnaire (Attachment K) at the KRCD Public Fishing Access site from July through October 2022. KRCD employed an online version of the questionnaire with signs posted at the site with a QR code to complete the questionnaire. In addition, survey staff periodically visited the site and asked visitors to complete the survey. In total, KRCD received 78 completed questionnaires.

The following section provides a summary of the questionnaire response results, including visitor demographics, typical trip characteristics, acceptability of existing facilities/amenities, crowding, user conflict, safety, and preferences for new or improved facilities/amenities.

Visitor Demographics

Overall, the respondents' average age was 43 years old, ranging from 20 to 72 years old. Most of the respondents were male (56 percent), of white (44 percent) or Hispanic/Latino (28 percent) ethnicity, spoke English as their primary language (73 percent), and resided in Fresno County, California (77 percent) (i.e., Project location) (Table 3.7-2).

Table 3.7-2. Summary of visitors' demographic information.

Demographic	Response	N (Count)	Percent
Gender	Male	44	56%
	Female	31	40%
	Declined to state	3	4%
	Total	**78**	**100%**

Table 3.7-2 (continued).

Demographic	Response	N (Count)	Percent
Ethnicity	White	34	44%
	Hispanic/Latino	22	28%
	Black/African American	9	12%
	Spanish Hispanic/Latino	1	1%
	Asian	7	9%
	American Indian	2	3%
	Declined to state	3	4%
	Total	**78**	**100%**
Primary Language	English	57	73%
	Spanish	12	15%
	Chinese	2	<3%
	Russian	2	<3%
	Hmong	2	<3%
	Declined to state	3	4%
	Total	**78**	**100%**
County	Fresno	60	77%
	Madera	4	5%
	Merced	1	<1%
	Sacramento	1	<1%
	San Joaquin	1	<1%
	Tulare	11	14%
	Declined to state	3	4%
	Total	**81**	**100%**

Trip and Group Characteristics

The respondents were asked several questions about their typical visit characteristics to the KRCD Public Fishing Access (Table 3.7-3). Overall, respondents averaged 7.1 visits per year (ranged from 1 to 52 visits), stayed for 1 hour and 22 minutes (ranged from 15 minutes to 4 hours), and first visited in 2014 (ranged from 2000 to 2022). The typical recreation group for the respondents were friends (33 percent), alone (32 percent), and family (28 percent).

Activity Participation

Top overall activities for respondents were picnicking (58 percent), hiking (54 percent), fishing (36 percent), and swimming (33 percent). The top primary activity was picnicking (42 percent), followed by fishing (28 percent) and swimming (21 percent).

Areas Visited and Primary Destination

The majority of respondents (63 percent) also visited other sites/areas during their trips to the KRCD Public Fishing Access (Table 3.7-3 and Figure 3.7-1). The most popular other sites/areas were the upstream trail (38 percent) connecting to North Riverside Access Park, downstream trail (32 percent) leading to another fishing access site, and North Riverside Access Park (24 percent). All of the other sites noted by respondents are in the vicinity (i.e., within 2 miles) of the KRCD Public Fishing Access site, though access to the nearest recreation area at Pine Flat Lake is 6 miles away.

Table 3.7-3. Summary of visitors' characteristics on typical trips to the Public Fishing Access.

VISITOR CHARACTERISTICS				
Characteristic	**N (Count)**	**Average**	**Minimum**	**Maximum**
Yearly Visits	78	7.1	1	52
Year First Visited	78	2014	2000	2022
Stay Length (hh:mm)	78	1:22	0:15	4:00
People	78	2.2	1	8
Vehicles	78	1.1	1	3
RECREATION GROUP TYPE				
Type	**N (Count)**	**%**		
Friends	26	33%	--	--
Alone	25	32%	--	--
Family	22	28%	--	--
Family and Friends	5	7%	--	--
Total	**78**	**100%**	--	--
ACTIVITY PARTICIPATION				
Activity	**Activity Participation**		**Primary Activity**	
	N (Count)	**%**	**N (Count)**	**%**
Picnicking	45	58%	33	42%
Hiking	42	54%	6	8%
Fishing	28	36%	22	28%
Swimming	26	33%	16	21%
Wading	8	10%	0	0%
River Boating	8	10%	1	1%
Wildlife Viewing	3	4%	0	0%
Other	0	0%	0	0%
Total	**160**	**n/a**	**78**	**100%**
LOCATIONS VISITED				
Location	**Other Areas Visited**		**Primary Destination**	
	N (Count)	**%**	**N (Count)**	**%**
Visited Other Area(s)	49	63%	n/a	n/a
Other Areas (Specific Responses)				
KRCD Public Fishing Access (Project)	n/a	n/a	52	67%
Upstream Trail (non-Project)	30	38%	0	0%
Downstream Trail (non-Project)	25	32%	0	0%
North Riverside Access Park (non-Project)	19	24%	13	17%
Pine Flat Lake (non-Project)	6	8%	4	5%
Choinumni Park (non-Project)	6	6%	3	4%
Kings River Wildlife Area (non-Project)	4	5%	3	4%

Table 3.7-3. (continued).

OTHER AREAS/SITES VISITED				
Kings River Conservancy Raptor Walk (non-Project)	3	4%	0	0%
Other Area(s)	5	14%	3	4%
Source	**N (Count)**	**%**	--	
Word of mouth	44	56%		
Past visit(s)	24	31%		
Internet	9	12%		
Other	1	1%		
Total	**78**	**100%**		

Facility Acceptability and Preferences

Existing Facility Acceptability Ratings

Visitors were asked to rate the acceptability of the existing KRCD Public Fishing Access facilities and amenities using a 5-point scale as follows.

1	*2*	*3*	*4*	*5*
Unacceptable	***Slightly Unacceptable***	***Neither***	***Slightly Acceptable***	***Acceptable***

Overall, most of the respondents rated three of the existing site amenities (access road, parking areas, and shoreline access) as slightly acceptable and four of the existing site amenities as slightly unacceptable or unacceptable (picnic sites, picnic site shading, accessible accommodations, and visitor information) (Table 3.7-4). Notably, a substantial percentage of respondents did not use or had no opinion of the picnic sites, shading, and accessible accommodations. The remaining existing site amenities (trails to picnic sites, trash facilities, shoreline access, and safety information) were rated by most respondents as neither acceptable nor unacceptable (or had no opinion/did not use).

Table 3.7-4. Summary of visitors' acceptability with existing facilities at the Public Fishing Access.

Amenity	Average Rating	Acceptability Scale (% of Responses [N=78])						Total
		Un-acceptable	Slightly Un-acceptable	Neither	Slightly Acceptable	Acceptable	No Opinion/ Did Not Use	
		1	2	3	4	5		
Picnic site	2.8	1%	18%	32%	6%	0%	42%	100%
Picnic site shading	1.9	15%	31%	12%	0%	0%	42%	100%
Trails to picnic sites	3.2	0%	4%	37%	17%	0%	42%	100%
Trash facilities	3.2	0%	13%	59%	28%	0%	0%	100%
Parking areas	4.0	0%	3%	15%	63%	19%	0%	100%
Access road	4.1	0%	0%	9%	68%	23%	0%	100%
Accessible accommodations	2.8	1%	4%	28%	0%	0%	67%	100%
Shoreline access	3.6	1%	3%	35%	42%	6%	13%	100%
Visitor information	2.6	8%	32%	44%	10%	0%	6%	100%
Safety information	3.3	0%	5%	51%	29%	1%	13%	100%

New or Improved Facilities Preference

Visitors were asked to rate their preference for new or improved amenities at the KRCD Public Fishing Access using a 5-point scale as follows.

1	2	3	4	5
Not at all preferred	*Slightly not preferred*	*Neither*	*Slightly preferred*	*Highly preferred*

Overall, respondents preferred new or improved amenities for picnic sites, picnic site shading, trails to picnic sites, restrooms, interpretive displays, visitor information and safety information (Table 3.7-5). Most respondents did not prefer new or improved trash facilities and were neutral (neither preferred nor not preferred) for the remaining amenities (accessible accommodations and shoreline access). Notably, five respondents indicated they highly preferred other types of new facilities or amenities, including group picnic/event facilities (3 respondents), a fishing platform (1 respondent), and a beach area (1 respondent).

Table 3.7-5. Summary of visitors' preference for new/improved facilities at the Public Fishing Access.

Amenity	Average Rating	Preference Scale (% of Responses [N (count)=78])					Total
		Not At All Preferred	Slightly Not Preferred	Neither	Slightly Preferred	Highly Preferred	
		1	2	3	4	5	
Picnic site	4.0	0%	3%	21%	54%	23%	100%
Picnic site shading	3.7	0%	5%	41%	37%	17%	100%
Trails to picnic sites	4.1	0%	3%	17%	54%	27%	100%
Restrooms	3.4	0%	10%	44%	42%	4%	100%
Trash facilities	2.2	9%	73%	12%	6%	0%	100%
Parking areas	3.1	0%	5%	78%	15%	1%	100%
Road	3.2	0%	10%	68%	18%	4%	100%
Interpretation	3.6	0%	6%	38%	49%	6%	100%
Accessible accommodations	3.1	0%	0%	91%	5%	4%	100%
Shoreline access	3.1	0%	0%	86%	14%	0%	100%
Visitor information	3.6	0%	0%	49%	42%	9%	100%
Safety information	3.5	0%	0%	54%	40%	6%	100%

Crowding, Conflict and Safety

Respondents were asked how crowded they felt during their typical visits to the KRCD Public Fishing Access site using a standardized 9-point scale as follows.

1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
Not at all crowded		***Slightly crowded***		***Moderately crowded***			***Extremely crowded***	

The respondents' crowding response is summarized below in Table 3.7-6 using the two most common reporting methods (Shelby, 1989) – (1) percent of respondents reporting any crowding (i.e., 3-9 on the scale) and (2) the scale average. The vast majority of visitors (91 percent) did not experience crowding and the highest response on the crowding scale was 4 (slightly crowded). Using the percent reporting any crowding (i.e., 3-9 on the scale), the crowding at the Public Fishing Access site during respondents' typical visits is categorized as "suppressed crowding" (Shelby, 1989).[2]

Table 3.7-6. Summary of crowding responses for visitors' typical visits to the Public Fishing Access.

Parameter	N (Count)	Scale Average	No Crowding (1-2 on scale)	Any Crowding (3-9 on scale)
Crowding Scale Response	78	1.4	91%	9%

Regarding user conflict, only five respondents (6 percent of all respondents) indicated any conflict with other users during typical/previous visits to the Public Fishing Access site (Table 3.7-7). Respondents indicated picnickers (loud music, profane language), shoreline users (unleashed dogs, intimidating dog behavior), and anglers (fishing in the vicinity of other shoreline users/swimmers). Visitors were also asked if there were any constraints or barriers that prevented any member of their typical recreation group from participating in desired recreation activities at the site, and none of the respondents indicated any constraints or barriers.

Table 3.7-7. Summary of visitors' user conflict at the Public Fishing Access.

User Conflict Responses			
User	**N (Count)**	**%**	**Reasons**
Picnickers	2	3%	Loud music; profane language
Shoreline users	2	3%	Unleashed dogs; intimidating dog behavior
Anglers	1	1%	Fishing in vicinity of other shoreline users/swimmers
Total	**5**	**7%**	**--**

[2] The five categories of crowding or carrying capacity judgments (based on the percentage of visitors reporting any level of crowding [i.e., scale points 3 through 9]) are: suppressed crowding (0–35%), low normal (36–50%), high normal (51–65%), over-capacity (66–80%), and greatly over-capacity (81–100%) (Shelby, 1989).

Six respondents (8 percent of total respondents) indicated they felt unsafe during visits to the Public Fishing Access site (Table 3.7-8). The reasons and locations of the responses are detailed in Table 3.7-8.

Table 3.7-8. Summary of visitors' responses to feeling unsafe at the Public Fishing Access.

Did You Feel Unsafe?		
Response	**N (Count)**	**%**
No	72	92%
Yes	6	8%
Total	**78**	**100%**
Reason	**Location(s)**	**N (Count)**
Aggressive/profane behavior of other users	Picnic area	1
Large groups of cars over-running the parking area; loud music and yelling	Parking area	1
Target shooting activities	Shoreline, parking area	2
Suspicious vehicles in parking lot	Parking area	1
Vehicles blocking the road	Road	1
Total		**6**

3.7.1.2 Non-Project Recreation Facilities

In addition to the Public Fishing Access, there are several non-Project public recreation sites in the vicinity of the Project including at Pine Flat Lake, North Riverside Access Park, Kings River Conservancy Raptor Walk, Choinumni Park, Winton Park, and Avocado Lake Park. The parks are owned and operated by local and State agencies, while the Pine Flat Lake recreation facilities (non-Project) are operated jointly by USACE and the USFS.

Pine Flat Lake

Pine Flat Lake is formed by Pine Flat Dam. Pine Flat Lake is 20 miles long, has 67 miles of shoreline, and approximately 9 square miles of surface area. Recreation opportunities at various sites around Pine Flat Lake include picnicking, camping, boating, fishing, and hunting (USACE, 2023).

These sites include Island Park Campground which features 49 campsites and group camping areas, and 45 overflow campsites. Trimmer Campground features 10 campsites. Both campgrounds have flush restrooms and showers. Deer Creek and Trimmer recreation areas feature commercial marinas; boat launching ramps are available at Deer Creek, Island Park, Lakeview, and Trimmer recreation areas. There are also six overnight mooring areas around the lake (USFS, 2023) (USACE, 2023). The Pine Flat Lake recreational development also includes the Kings River Wildlife Area, a day-use site with hiking and wildlife viewing recreation opportunities located immediately downstream of Pine Flat Dam along the Kings River.

North Riverside Access Park

North Riverside Access Park is on the northern bank of the Kings River just downstream of Pine Flat Dam. The day-use park features a 1.5-mile multi-purpose trail directly accessing the Kings River, of which one-half mile is designed to ADA standards, a parking lot for 11 vehicles, an ADA-compliant restroom, two interpretive kiosks, and visitor feedback stations (North Riverside Access Park, 2019).

Kings River Conservancy Raptor Walk

The Kings River Conservancy Raptor Walk follows the south shore of the Kings River just below the dam. The walk features interpretive signs describing the large birds of prey you are likely to encounter along the trail. Recreation opportunities include wildlife viewing, hiking, and river access (Kings River Conservancy, Kings River Conservancy Raptor Walk, 2019).

Choinumni Park

Choinumni Park is a 170-acre park on the northern bank of the Kings River approximately 2 miles downstream of Pine Flat Dam. Recreation opportunities include camping, fishing, and hiking. It features picnic tables, two group picnic areas, barbeque grills, a playground, 75 campsites, including one group camping area, a trailer dump station, and restrooms (Fresno County, 2023).

Winton Park

Winton Park is a 26-acre day-use park on the southeastern bank of the Kings River approximately 3.5-miles downstream of Pine Flat Dam. Recreation opportunities include fishing and Kings River access. It features picnic tables, barbeque grills, and two restrooms (Fresno County, 2023).

Avocado Lake Park

Avocado Lake Park is a 210-acre day-use park, with an 83-acre fishing lake, on the southern bank of the Kings River approximately 6.5 miles downstream of Pine Flat Dam. Recreation opportunities include swimming, fishing, and picnicking. It features picnic tables, a group picnic area, barbeque grills, boat launching ramp, and a playground (Fresno County, 2023).

3.7.2 Current Recreational Use of Project Lands and Waters

This section describes visitor use in the broader Project vicinity as well as specific facilities and water inside the FERC Project boundary.

3.7.2.1 Recreation Opportunities Immediately Downstream of the Project

Based on KRCD's last FERC Form 80 Recreation Report filed on February 27, 2015,[3] a total 15,128 recreationists visited the Public Fishing Access in 2014. Notably, this use includes trail users from the adjoining non-Project trail coming from the non-Project North Riverside Access Park.

Angling

Angling is a popular recreation activity along the river where public access is available (refer to Section 2.2.3.2 for the California Fish and Game Commission's fishing regulations for this area). Since 2007, CDFW has stocked rainbow and brook trout in the Kings River downstream of Pine Flat Dam to, in part, provide an attractive trout fishery (refer to Section 3.4.2.1 for more details on fish stocking). The Kings River from the Pine Flat Lake Road bridge is open year-round with a five trout bag limit (CDFW, 2023).

Whitewater Boating

According to American Whitewater (AW), the section of Kings River from Pine Flat Dam to the State Highway 180 Bridge is a Class I-II paddling run for beginner and intermediate use and largely for canoes and floats with some kayakers. AW states the run has some rapids, some weirs that require portaging, and a boatable flow range of 500 cfs to 10,000 cfs (Table 3.7-9) (AW, 2023).

Table 3.7-9. Known whitewater boating reaches on the Kings River below Pine Flat Dam.

Whitewater Run	Length (mi)	Elevation Range	Gradient (ft per mi)	Flow Range (cfs)	Whitewater Classification
Pine Flat Dam to the State Hwy 180 Bridge	12.2	560-385	14	500-10,000	Class I-II

Source: (AW, 2023)

3.7.3 Shoreline Buffer Zones

The Project does not include a reservoir or impoundment with shoreline areas. Rather, the Project, including a single recreational facility, is located in a riverine environment. As such, there are no shoreline buffer zones within the FERC Project boundary.

3.7.4 Recreation-Related Goals and Needs Identified in Agency Management Plans

Management plans that cover recreation resources that overlap with the Project boundary include the California Department of Parks and Recreation's (CDPR) California Outdoor Recreation Plan (SCORP) and the Fresno County General Plan.

[3] To view KRCD's February 27, 2015, Form 80 filing, refer to FERC's ELibrary at Accession Number 20150306-0032.

3.7.4.1 Statewide Comprehensive Outdoor Recreation Plan

California's 2021-2025 SCORP (CDPR, Statewide Comprehensive Outdoor Recreation Plan, 2020) identifies and prioritizes outdoor recreation opportunities and constraints most critical in California. The SCORP establishes the following actions to address California's park and recreation needs: 1) increase park access, 2) community-based planning, and 3) health partnerships through grants.

An element of the SCORP, the 2012 Survey on Public Opinions and Attitudes on Outdoor Recreation (SPOA) in California, identifies the top 15 recreational activities in California with the highest latent demand, as follows in order of rank (CDPR, 2014):

1. Picnicking in picnic areas (with tables, fire pits, or grills)
2. Walking for fitness or pleasure on paved surfaces
3. Camping in developed sites with facilities such as toilets and tables (not including backpacking)
4. Beach activities (swimming, sunbathing, surf play, wading, playing on beach)
5. Swimming in a pool
6. Day hiking on un-paved trails
7. Attending outdoor cultural events
8. Visiting outdoor nature museums, zoos, gardens, or arboretums
9. Shopping at a farmer's market
10. Visiting historic or cultural sites
11. Wildlife viewing, bird watching, viewing natural scenery
12. Driving on paved surfaces for pleasure, sightseeing, driving through natural scenery
13. Swimming in freshwater lakes, rivers and/or streams
14. Jogging and running for exercise (on trails, streets, sidewalks, paths)
15. Bicycling on paved surfaces

These are activities that Californians would participate in, from a statewide perspective, if more facilities and opportunities were provided. Of these top 15 recreation activities, picnicking, wildlife viewing, swimming, and day hiking are available within or immediately adjacent to the FERC Project boundary. Additionally, freshwater fishing ranks 17 on the list of top recreational activities in California with the highest latent demand.

Other relevant findings from the 2012 SPOA survey include (CDPR, 2014):

- More than two-thirds (68 percent) of Californians report spending the same or more time in outdoor recreation activities compared to 5 years ago.

- Most Californians participated in walking for fitness or pleasure (74 percent). Other activities with high percentages of participants include picnicking in picnic areas; driving for pleasure; sightseeing; driving through natural scenery; beach activities; and visiting outdoor nature museums, zoos, gardens, or arboretums.
- The park facilities and services that Californians rank most important are play areas for young children; wilderness type areas where no vehicles or development are allowed; environmental and outdoor education programs; multi-use turf areas for field sports; picnic sites for large groups; trails for multiple, non-motorized activities; and hard-surface trails.
- The majority of Californians visit highly developed parks and recreation areas; developed nature-oriented parks and recreation areas; historical or cultural buildings, sites, or areas; and natural and undeveloped areas during the past 12 months.

3.7.4.2 Fresno County General Plan

The Fresno County General Plan goals and policies includes specific parks and recreation goals. These include promoting the continued and expanded use of national forests, national parks, and other recreational areas to meet the recreational needs of County residents, maintaining a standard of 5 to 8 acres of County-owned improved parkland per 1,000 residents in the unincorporated areas, and encourage the development of parks near public facilities, public and private campgrounds and recreational vehicle parks where environmentally appropriate, and private recreation facilities to reduce demands on public agencies (Fresno County, 2021).

3.7.5 Shoreline Management Plan/Policy

The Project does not include a reservoir or impoundment with shoreline areas. Rather, the Project, as well as the single recreational facility, are located in a riverine environment. As such, a shoreline management plan is not relevant/needed.

3.7.6 Designated Scenic and Protected River Segments

The nearest designated river segment is the Kings River Wild and Scenic River located 19 river miles upstream of the Project. On November 3, 1987, Congress designated 81 miles of the Kings River system, including the entire Middle and South Forks of the Kings River and six miles of the main stem of the Kings River, which flow through Kings Canyon National Park and the Sequoia and Sierra National Forests (NWSRS, 2023). The designated sections of the Kings River include 65.5 miles classified as wild and 15.5 miles classified as recreational.

3.7.7 National Trails System and Wilderness Area Lands

The National Trails System Act of 1968 called “for establishing trails in both urban and rural settings for people of all ages, interests, skills, and physical abilities. The act promotes the enjoyment and appreciation of trails while encouraging greater public access. It establishes four classes of trails: national scenic trails, national historic trails, national recreation trails, and side and connecting trails" (National Trails System Act, 1968).

There are no federally designated trails located within the FERC Project boundary; however, the Pacific Crest National Scenic Trail (PCT), a national scenic trail, is the nearest national trail approximately 40 miles east of the Project. The PCT is one of the original National Scenic Trails established by Congress in the 1968 National Trails System Act. It begins at the Mexico-California border and is a total distance of 2,650 miles through California, Oregon, and Washington, ending at the U.S.-Canada border (USFS, Pacific Crest Trail, 2023). In addition to being split into regions (Southern, Central, Northern California, Oregon, and Washington), the trail is divided into "Sections," with Section CA H being in the Project vicinity (Magellan, 2018). Section CA H starts at the Crabtree Meadows Trailhead and continues north for 175.5 miles and includes 39,061 feet of cumulative elevation gain to Highway 120 at Tuolumne Meadows (AllTrails, 2023).

The Wilderness Act of 1964 established the National Wilderness Preservation System, which provides federal-level protection for preservation of wilderness areas in their natural condition. There are no federally designated wilderness areas located within the FERC Project boundary; however, the federally designated John Muir Wilderness and Monarch Wilderness are located within the vicinity of the Project to the east.

3.7.8 Regional Recreation Areas

Regionally, the Project is located in the Central California Valley, just west of the Sierra Nevada foothills. Recreation facilities and opportunities are identified within the Project vicinity include camping, day-use, swimming, and fishing. Regional areas are described below by locality. There are also innumerable State and locally managed parks, campgrounds, and access areas.

Sierra National Forest, established in 1893, covers 1,300,000 acres on the western slope of central Sierra Nevada and is bounded on the northwest by Yosemite National Park and to the south by Kings Canyon National Park. Ansel Adams, John Muir, Dinkey Lakes, Kaiser, and Monarch Wilderness areas and the Merced and the Tuolumne Wild and Scenic Rivers are within the forest (USFS, Sierra National Forest, 2023).

Sierra Heritage Scenic Byway is approximately 70 miles north of the Project. It includes recreation opportunities, such as horseback riding, skiing/snowboarding, camping, boating, fishing, and mountain biking as well as impressive views. Highway 168 goes to the border of the Sierra National Forest (USFS, Sierra National Forest, 2023).

Sequoia National Forest, established in 1908, covers 1,193,315 acres in the southern Sierra Nevada and is bounded on the north by Sequoia National Park and on the south by Highway 58. Domeland, Golden Trout, Jennie, Kiavah, Monarch, and South Sierra Wilderness areas, the Giant Sequoia National Monument, and the Kings and Kern Wild and Scenic Rivers are within the forest (USFS, Sequoia National Forest, 2023).

Kings Canyon Scenic Byway (Highway 180) is approximately 50 miles south of the Project. It is internationally significant for its unique scenic and geologic displays. Highway 180 is a showcase of nature's wonderland. The largest species of trees on earth, the giant sequoia (*Sequoiadendron giganteum*), and one of the deepest canyons in America, the Kings Canyon, are two outstanding tributes to the natural beauty found here. There are dramatic changes in vegetation, wildlife, and geology throughout the 4,000 feet through the eastern foothills of the Sierra Nevada (USFS, Sequoia National Forest, 2023).

Millerton Lake State Recreation Area is around Millerton Lake, formed in 1944 by the Friant Dam. It provides 47 miles of shoreline and recreation opportunities such as camping, swimming, boating, boat camping, hiking, bicycling, and interpretive programs (California State Parks, 2014).

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3.8 LAND USE

This section discusses land use resources potentially affected by the Project. This section is divided into two subsections. Land use in Fresno County is discussed in Section 3.8.1 and lands within the FERC Project Boundary are described in 3.8.2.

3.8.1 Fresno County

The FERC Project boundary is entirely within Fresno County and encompasses 11.87 acres, with 4.94 acres of federal lands administered by the USACE, 4.55 acres of State of California lands submerged by the Kings River, and 2.38 acres of Fresno County lands. The area within the boundary is zoned as agricultural (AE160) and resource conservation (RC40), and no special designated lands occur within or adjacent to the boundary. In addition, the lands near the powerhouse are closed to public access. No designated federal or State of California Wildernesses, Wild and Scenic Rivers, wetlands, or environmentally sensitive areas occur within or adjacent to the FERC Project boundary. The only affected federal lands occur near the powerhouse that are managed by the USACE and are closed to the public.

Fresno County is 3.84 million acres in size, including 1.88 million acres of farmland (Fresno County 2021). Fresno County has been transitioning from a resource-based rural county to a more diverse and urban economic base. Agriculture continues to be the main land use in the county, in which field crops make up the dominant form. Unincorporated lands make up over 65% of the acreage in Fresno County, and over 60% of unincorporated lands are dedicated agricultural lands (Fresno County 2021).

The 15 cities in Fresno County are increasing in population density, even as population is decreasing in the unincorporated communities. The largest three cities in Fresno County are Fresno (542,107 people), Clovis (120,124 people), and Reedley (25,227 people) (U.S. Census Bureau, 2022).

3.8.2 Lands within the FERC Project Boundary

The 4.94 acres of federal lands within the FERC Project boundary are managed by the USACE as part of Pine Flat Lake. Pine Flat Lake was constructed by the USACE in 1947 under the Flood Control Act of 1944 as part of the Pine Flat Lake and Kings River Project (USACE, 1976). The primary purpose of the lake is flood control along the Kings River and in the Tulare Lake Basin (USACE, 1976). USACE manages Pine Flat Lake in accordance with its federal land and dam protocols and is guided by USACE's Operational Management Plan for the operation of the recreation development (i.e., USACE does not have a management plan for the operation of the dam specifically). Pine Flat Lake and Dam, and their associated facilities, are not under FERC jurisdiction.

Table 3.8-1 identifies the area within the existing FERC Project boundary that encompasses federal lands including township, range, and section.

Table 3.8-1. Federal lands within the existing FERC Project boundary and managing federal agency.

Administered by	Township	Range	Section	Acres
USACE	13S	24E	2	4.94
Total				4.94

Source: (USGS, 2023)

The Project includes the Public Fishing Access site, a recreation facility designated for angler access and other recreational day uses. This area contains an approximately 1,050-foot-long access road from North Piedra Road, a 0.1-acre parking area, three roadside parking areas (i.e., pullouts), five day-use sites, each with a picnic table, and three barbecue grills. KRCD entered into an agreement with the Fresno County DPR to build and maintain this public fishing access on November 30, 2006. Per the agreement, the recreation site was improved and is maintained by KRCD and jointly operated by KRCD and Fresno County DPR. The agreement continues in perpetuity unless either entity provides a 30-day notice to the other party of its termination.

3.9 AESTHETIC RESOURCES

This section is divided into two subsections. Regulatory context is discussed in Section 3.9.1 and visual character is discussed in 3.9.2.

3.9.1 Regulatory Context

The Project is located on federal lands administered by USACE, State of California lands (submerged by the Kings River), and private lands. Applicable aesthetic resource guidance is provided solely by the Fresno County General Plan. The Project recreation facility (Public Fishing Access) is located on Fresno County land and is primarily visible only to those using the Public Fishing Access facility or visitors recreating in/around the Kings River.

The 2000 Fresno County General Plan goals and policies applicable to the protection of scenic resources on county and private lands include (Fresno County 2000):

- Goal OS-K. To conserve, protect, and maintain the scenic quality of Fresno County and discourage development that degrades areas of scenic quality.
    - Policy OS-K.1. The County shall encourage the preservation of outstanding scenic views, panoramas, and vistas wherever possible. Methods to achieve this may include encouraging private property owners to enter into open space easements for designated scenic areas.
    - Policy OS-K.2. The County shall identify and map significant scenic resources within the County and shall develop a program to manage these resources.
    - Policy OS-K.3. The County should preserve areas of natural scenic beauty and provide for public access to scenic vistas by purchasing sites for park use.
    - Policy OS-K.4. The County should require development adjacent to scenic areas, vistas, and roadways to incorporate natural features of the site and be developed to minimize impacts to the scenic qualities of the site.

None of the Project facilities that may be viewed by the public are designated by Fresno County as significant scenic resources.

3.9.2 Existing Aesthetic Resources

The Project is situated in the community of Piedra, approximately 30 miles east of the City of Fresno in Fresno County, California. It is located along the Kings River in the Kings River Watershed, within the Sierra Nevada foothills. The Project is on the north bank of the Kings River at approximately RM 111, two hundred feet downstream of the USACE's Pine Flat Dam (a non-Project facility).

The major access road to the Project from the west is North Piedra Road to East Trimmer Springs Road to Pine Flat Road.

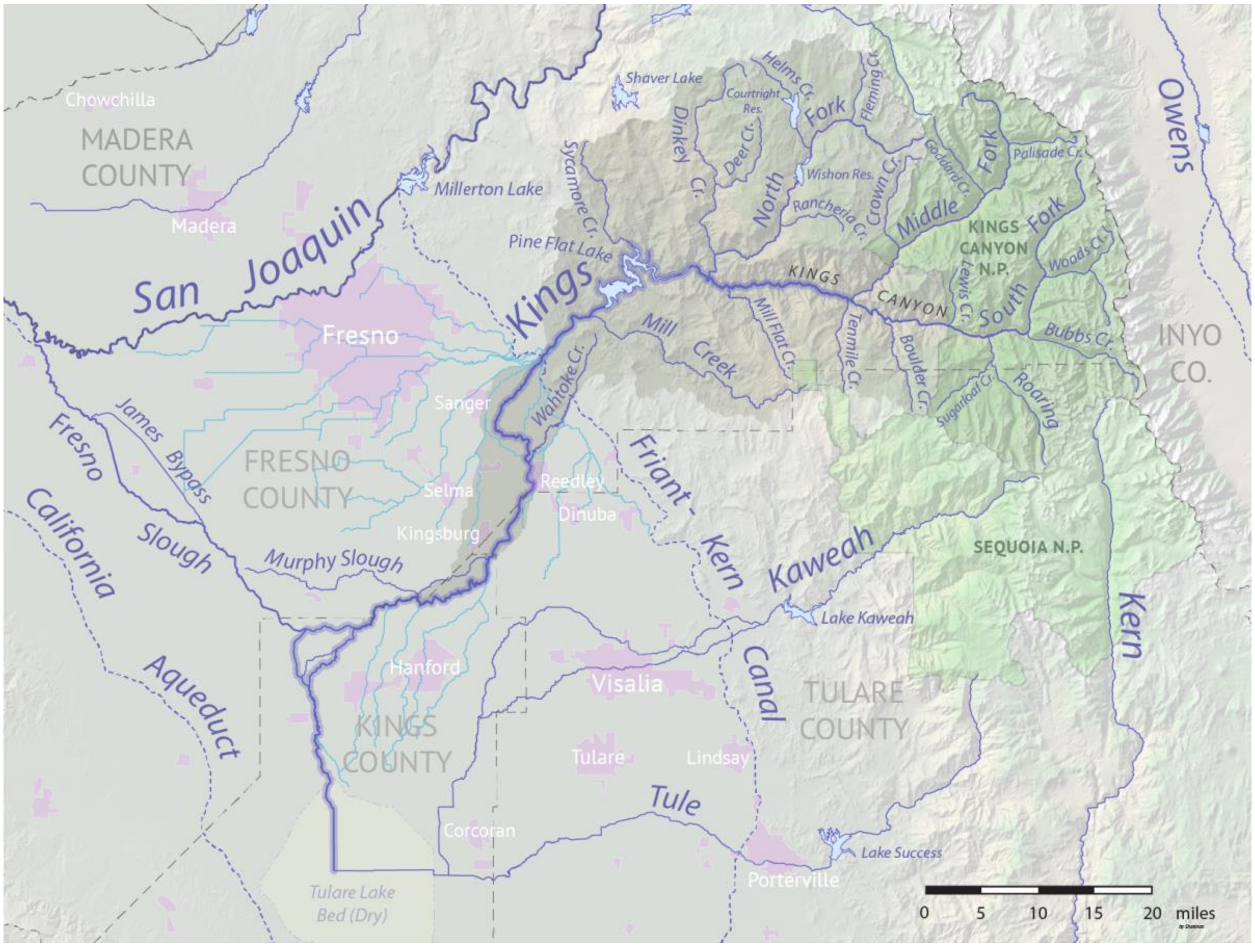

Figure 3.9-1. Pine Flat Hydroelectric Project within the region.

3.9.2.1 Existing Aesthetic Character

Kings River

The Kings River originates in the high mountains of the Sierra Nevada range and traverses through deep canyons and scenic valleys before reaching Pine Flat Lake. Six miles of the Kings River are designated as Wild and Scenic. The clear, unpolluted water is seen in rapids and large pools. In the upper reaches, the river flows through deep canyons with steep granite walls and cascading waterfalls. As it moves downstream, the river transitions into a wider valley, meandering through the flat and fertile Central Valley. The diversity of vegetation and many boulders enhance the beauty of the river corridor.

Pine Flat Lake

Pine Flat Lake is nestled within a narrow canyon carved by the Kings River, creating steep slopes and cliffs in some areas. Surrounding the canyon, the land gradually transitions into undulating hills and broad valleys. In spring and early summer, snowmelt from the higher elevations of the Sierra Nevada Mountains contributes as a major water source of the Kings River and subsequently Pine Flat Lake.

3.9.2.2 Vegetation

Nearby valleys are fertile agricultural land, with orchards, vineyards, and crop fields. The surrounding foothills and mountains of the Sierra Nevada are covered in chaparral, oak woodlands, and coniferous forests, providing a diverse range of colors and textures throughout the year. In the spring, wildflower blooms cover the hillsides in vibrant hues of yellow, purple, and orange. In the fall, the trees display a spectacular array of red, orange, and gold foliage, making the area a popular destination for sightseeing.

3.9.2.3 Topography

The non-Project Pine Flat Dam is a 429-foot-high concrete gravity dam. It stores 1,000,000 acre-feet of water at maximum capacity, which is the origin of Pine Flat Lake (a non-Project facility). The lake is 20 miles long, provides 67 miles of shoreline, and 9 square miles of surface area. The shoreline of the lake is rocky, with large boulders and cliffs jutting out of the water, creating dramatic and picturesque landscapes.

Project facilities are all at an elevation of approximately 670 feet. The topography is characterized by its rugged hills and steep cliffs. The surrounding hills provide breathtaking views of the valley below, with numerous hiking trails and lookout points available for visitors to explore. Recreation resources are detailed in Section 3.7 of this document.

3.9.3 Project Facilities

Project facilities consist of: (a) three penstock extensions from the three 13.5-foot diameter penstocks in Pine Flat Dam to the Jeff L. Taylor Powerhouse; (b) the outdoor Jeff L. Taylor Powerhouse at the toe of the dam, containing three Francis turbines and associated generating units, each with a rated capacity of 55 MW; (c) three generator leads and a step-up transformer bank at the Jeff L. Taylor Powerhouse, consisting of three 70 MVA single-phase units; (d) the outdoor Unit 4 Powerhouse containing one Francis turbine and associated generating unit with a capacity of 6.3 MW; (e) one generator lead and a step-up transformer at the Unit 4 Powerhouse consisting of one 6.6 MVA, three-phase unit; (f) appurtenant facilities; and (g) the Public Fishing Access. Figure 3.9-2 shows the Project location in context to the region.

The 11.87-acre FERC Project boundary includes 4.94 acres of federal lands administered by the USACE, 4.55 acres of State of California lands submerged by the Kings River, and 2.38 acres of Fresno County lands.

Figure 3.9-2 shows the Pine Flat Dam as viewable by the public from the Pine Flat Road Bridge.

Figure 3.9-2. View of Pine Flat Dam from the Pine Flat Road Bridge.

3.10 SOCIOECONOMIC RESOURCES

This section is divided into two parts. Section 3.10.1 describes existing socioeconomic conditions in Fresno County, California, the county in which the Project is located. Section 3.10.2 describes socioeconomic considerations for the Project.

3.10.1 Fresno County Socioeconomic Conditions

The population of Fresno County, in which the Project is located, was estimated at 1,011,273 people in January 2022 (California Department of Finance, 2022). Between 2010 and 2022, Fresno County's population increased by 8.7% from 930,450 to 1,011,273, which is more than the State's approximate growth of 5.2% over the same decade (U.S. Census Bureau, 2022). Fresno County's population has increased every year for the last three years (California Department of Finance, 2022).

With a population of 1,011,273 residents, 343,513 housing units, Fresno County has an estimated 2.94 persons per household and a vacancy rate of 5.6% (California Department of Finance, 2022). The 2020 population density of Fresno County is an estimated 169.3 persons per square mile (U.S. Census Bureau, 2022). From 1990 to 2000, 2000 to 2010, and 2010 to 2020, the population of Fresno County increased by 19.28%, 16.86%, and 8.4%, respectively. During those same periods, the number of housing units increased at a rate of 14.69%, 16.80%, and 7.26%, respectively. For comparison, the population of the State of California increased by 13.32%, 10.48%, and 6.13% and the number of housing units increased by 8.97%, 12.18%, and 5.28%, respectively (Table 3.10-1).

Table 3.10-1. Population and housing units in Fresno County and the State of California

Area		2022 (number)	2021 (number)	2020 (number)	2010 (number)	2000 (number)	1990 (number)
Fresno County	Population	1,011,273	1,009,231	1,008,654	930,450	796,187	667,490
	Housing Units	343,513	341,686	338,441	315,531	270,157	235,563
State of California	Population	39,185,605	39,303,157	39,538,223	37,253,956	33,721,583	29,758,213
	Housing Units	14,583,998	14,512,281	14,392,140	13,670,304	12,186,125	11,182,513

Source: (California Department of Finance, 2007); (California Department of Finance, 2012); (California Department of Finance, 2022)

Table 3.10-2 shows that the majority (598,673 or 59.2%) of the Fresno County population falls between the ages of 18 and 65 years old. The State of California has a higher percent of the population between the ages of 18 and 65 years old (62.4%) (U.S. Census Bureau, 2022).

Table 3.10-2. Population age in Fresno County and the State of California

Population: Age	Fresno County (number)	California (number)
Population under 5 years old	71,800	2,224,672
Persons under 5 years old, percent [1]	7.1%	5.7%
Persons under 18 years old	285,178	8,742,572
Persons under 18 years old, percent [1]	28.2%	22.4%
Persons 65 years old and over	127,420	5,932,459
Persons 65 years old and over, percent [1]	12.6%	15.2%

Source: (U.S. Census Bureau, 2022)

[1] Estimates provided with data from the U.S. Census Bureau are not comparable to other geographic levels due to methodology and differences that exist between different data sources.

Fresno County has 15 incorporated areas including: Clovis, Coalinga, Firebaugh, Fowler, Fresno, Huron, Kerman, Kingsburg, Mendota, Orange Cove, Parlier, Reedley, Sanger, San Joaquin, and Selma. In 2021, the estimated population of Fresno, the largest city in Fresno County, was 542,720. In 2022, it grew to 543,660, increasing by 0.17% (California Department of Finance, 2022). The second largest city in Fresno County is Clovis, which had an estimated population of 123,665 in 2022, a 1.64% population growth from the year before (California Department of Finance, 2022). Major population centers around Fresno County are the City of Sacramento, 169 miles north of Fresno, and the City of Bakersfield, 109 miles to the south of Fresno.

Table 3.10-3 summarizes household units (i.e., number of units, net change for a given period, and percent change for a given period), homeownership rate, median home value, income, and poverty level for Fresno County. Median value of owner-occupied housing and median household income in Fresno County are significantly lower than that of the State of California. Also, the percent of people in poverty in Fresno County (19.4%) is almost double that of the State of California (12.3%).

Table 3.10-3. Household units, homeownership, home value, and income in Fresno County and the State of California.

Household Information	Fresno County (number)	California (number)
Housing units, 2021	341,686	14,512,281
Homeownership rate, 2017-2021, percent	54.1%	55.5%
Median value of owner-occupied housing units, 2017- 2021	$288,100	$573,200
Households, 2021	992,406	38,513,178
Persons per household, 2021	3.09	2.85
Median household income, 2017-2021	$61,276	$84,097
Per capita income in the past 12 months, 2017-2021	$27,295	$41,276
Persons in poverty, 2021[1]	19.4%	12.3%

Source: (U.S. Census Bureau, 2022); (California Department of Finance, 2022)

[1] Estimates provided with data from the U.S. Census Bureau are not comparable to other geographic levels due to methodology and differences that exist between different data sources.

Fresno County is like the State of California in respect to ethnic diversity. Table 3.10-4 provides a summary of population estimates by race for Fresno County and the State of California for the year 2022.

Table 3.10-4. Population estimates by gender and race in Fresno County and the State of California in 2022.

Population: Gender/Race	Fresno County	California
POPULATION (number)		
White persons[1]	765,534	27,860,965
White alone, not Hispanic or Latino	275,066	13,793,333
Black or African American persons[1]	59,665	2,547,064
American Indian and Alaska Native persons[1]	32,361	666,155
Asian persons[1]	117,308	6,230,511
Native Hawaiian and Other Pacific Islander persons[1]	3,034	195,928
Persons reporting two or more races	33,372	1,645,795
Persons of Hispanic or Latino origin[2]	553,166	15,752,613
PERCENT OF POPULATION (%)		
Female persons, percent	49.8%	50.0%
White persons, percent[1]	75.7%	71.1%
White alone, not Hispanic or Latino	27.2%	35.2%
Black or African American persons, percent[1]	5.9%	6.5%
American Indian and Alaska Native persons, percent[1]	3.2%	1.7%
Asian persons, percent[1]	11.6%	15.9%
Native Hawaiian and Other Pacific Islander, percent[1]	0.3%	0.5%
Persons reporting two or more races, percent	3.3%	4.2%

Source: (U.S. Census Bureau, 2022); (California Department of Finance, 2022)

[1] Includes persons reporting only one race.

The Census Bureau estimates that 77.9% of Fresno County's population is educated through high school with 22.6% of the population having obtained a Bachelor's degree or higher. An estimated 84.2% of California's population is estimated to have a high school education or higher. In California the percentage of the population who has obtained a Bachelor's degree or higher is 35.3%. When compared to the State of California, Fresno County has a lower percentage of both high school graduates and individuals with a Bachelor's degree or higher (U.S. Census Bureau, 2022).

According to the California Employment Development Department (EDD), in 2022 the annual average unemployment rate was 6.3% for Fresno County (State of California Employment Development Department, 2023). Comparatively, the average unemployment rates for 2010 and 2015 were, respectively, 17.1% and 10.3 % (State of California Employment Development Department, 2023). These rates are higher compared to those for the State of California, which had an unemployment rate of approximately 4.1% in 2022 and approximately 12.2% and 6.2% in 2010 and 2015 (State of California Employment Development Department, 2023).

Based on data from December 2022, health care and social assistance (18.37%), local government (12.86%), and retail trade (9.82%) are the three largest industry types in Fresno County. Leisure and hospitality accounts for 8.77% of employment in Fresno County. Transportation, warehousing, and utilities, which includes PG&E, makes up 5.05% of the employees in the county (Table 3.10-5). These percentages are similar to the State of California, except for leisure and hospitality, which account for 14.27% of total employment in the State (State of California Employment Development Department, 2023).

Table 3.10-5. Industry statistics for Fresno County and State of California for December 2022.

Industry Type	Fresno County		State of California	
	Employees (number)	Percent Total (%)	Employees (number)	Percent Total (%)
Farming	36,300	8.69%	416,200	2.29%
Mining and Logging	300	0.07%	19,300	0.11%
Construction	20,500	4.91%	925,600	5.09%
Durable Goods	9,000	2.16%	847,000	4.66%
Nondurable Goods	17,100	4.1%	470,600	2.59%
Wholesale Trade	16,000	3.83%	661,600	3.64%
Retail Trade	41,000	9.82%	1,618,600	8.9%
Transportation, Warehousing & Utilities	21,100	5.05%	848,200	4.67%
Information	3,300	0.79%	604,500	3.33%
Finance & Insurance	8,100	1.94%	542,900	2.99%
Real Estate & Rental & Leasing	5,000	1.2%	297,400	1.64%
Professional, Scientific, and Technical Services	11,400	2.73%	1,444,000	7.94%
Management of Companies & Enterprises	3,000	0.72%	246,700	1.36%
Administrative & Support & Waste Services	19,200	4.6%	1,183,900	6.51%
Educational Services	4,500	1.08%	401,700	2.21%
Health Care & Social Assistance	76,700	18.37%	2,594,000	4.9%
Leisure & Hospitality	36,600	8.77%	1,952,500	14.27%
Other Services	12,600	3.02%	556,500	3.06%
Federal Government	9,600	2.3%	245,300	1.35%
State Government	12,500	2.99%	549,600	3.02%
Local Government	53,700	12.86%	1,752,000	9.64%
Total	**417,500**	**100%**	**18,178,100**	**100%**

Source: (State of California Employment Development Department, 2023)

3.10.2 KRCD Socioeconomic Conditions

KRCD was formed under the Kings River Conservation District Act in 1951 (Assembly Bill No. 340 Chapter 931) with the goal to establish one public agency which could act for the entire Kings River service area. KRCD was to include all territory generally considered to be the Kings River service area, except for all cities not a part of existing irrigation districts. Later changes to the KRCD Act excluded all incorporated cities. Currently, KRCD's primary functions are to furnish water and power, acquire and dispose of property, construct water works, appropriate and conserve water, maintain actions involving water rights, incur indebtedness, enter contracts, issue bonds, cooperate with the United States, and control floodwater (Kings River Conservation District, 2023). KRCD is a part of the "Local Government" employment sector shown in Table 3.10-5.

KRCD is headquartered in Fresno, California, and has about 45 full-time employees, serving a 1.2-million-acre service area. KRCD's work includes power generation, flood control, and water resources. Approximately fifteen employees work directly on the Project on a daily basis.

KRCD pays an historical average of approximately $926,700 each year to FERC in fees, including $270,000 in administrative, $2,700 in government land, and $654,000 for use of the dam (variable based on generation). In addition, KRCD pays sales tax on all equipment and supplies.

3.11 ENVIRONMENTAL JUSTICE

This section presents information on environmental justice communities, including race and ethnicity, poverty status, and English-speaking proficiency of the individuals within the Project vicinity. Given the relatively limited information that exists on environmental justice in the Project vicinity, this section relies on available U.S. Census Bureau data for the respective state, county, census tracts, and block groups.

The term ‘environmental justice’ means “fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no population bears a disproportionate share of negative environmental consequences resulting from industrial, municipal, and commercial operations or from the execution of federal, state, and local laws; regulations; and policies. Meaningful involvement requires effective access to decision makers for all, and the ability in all communities to make informed decisions and take positive actions to produce environmental justice for themselves” (Department of Energy, n.d.).

Pursuant to Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*, and Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, as amended, FERC will complete an analysis of potential impacts from Project operations on the local community in the vicinity of the Project to understand the impacts to human health and the environment as they relate to environmental justice communities. An environmental justice community is defined as a community that stands to be disproportionately impacted by construction of a new facility or the continued operation of an existing facility, including socioeconomic and/or sociocultural impacts.

Additionally, FERC plays an integral role in regulating large parts of the United States energy industry, having far-reaching impacts to the nation, especially regarding the move toward cleaner energy (FERC, 2022). Although FERC is an independent agency that is not required to comply with Executive Order 13985, *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government*, FERC has voluntarily elected to participate in the process, in an effort to ensure everyone can benefit from the clean energy transition (FERC, 2022). Pursuant to Executive Order 13985, FERC has developed an Equity Action Plan and recognizes that many licensed hydropower projects were constructed prior to implementation of the National Environmental Policy Act (NEPA), or the issuance of executive orders related to equity or environmental justice (FERC, 2022). The information compiled in this section is meant to support FERC’s consideration of environmental justice communities as they relate to the relicensing process.

The Project is located on the Kings River in the Community of Piedra, Fresno County, California. Within a one-mile buffer of the Project boundary, each state, county, census tract, and block group were analyzed for racial and ethnic statistics (United States Census Bureau, 2021a), poverty statistics (United States Census Bureau, 2021b), and

English speaking proficiency statistics (United States Census Bureau, 2021c) using the U.S. Census Bureau 2021 American Community Survey 5-year Estimate.

3.11.1 Environmental Justice Communities

The presence of environmental justice communities within the geographic scope of the Project was evaluated through the methods included in the EPA *Promising Practices for Environmental Justice Methodologies in NEPA Reviews* (United States Environmental Protection Agency, 2016).

The methods begin with a selection of the appropriate geographic unit of analysis within the affected environment (e.g., census block, block group, census tract). For example, within the one-mile buffer of the Project, there are two census tracts and two block groups partially within the Project's area of analysis that could potentially be impacted by the relicensing and continued operation of the Project. Block groups were selected for minority and low-income analysis. Census tracts were selected for non-English speakers' analysis as the U.S. Census Bureau does not provide this data at the block group level.

It is important to note, census data is self-reported and can only be disaggregated to certain prescribed levels (e.g., census blocks, census tracts). This suggests that pockets of minority or low-income communities, including those that may be experiencing disproportionately high and adverse effects, may be missed in a traditional census tract-based analysis. For this reason, census data also has the potential of distorting population breakdowns. However, census data is the most comprehensive and standardized database of the population composition and its distribution, as well as the recommended statistical source of data for environmental justice analysis (United States Environmental Protection Agency, 2016).

The assessment identified no minority populations using the fifty percent analysis and the meaningfully greater analysis.

3.11.2 Minority and Low-income Populations

After selecting the appropriate unit of analysis, several analyses are performed to identify minority populations or low-income populations. The term 'minority' means "individual(s) who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic" (Council on Environmental Quality, 1997). A population is identified as minority in a potentially affected area by either a fifty percent analysis or meaningfully greater analysis. The fifty percent analysis highlights populations with a cumulative minority population that exceeds fifty percent in the affected area (United States Environmental Protection Agency, 2016). The meaningfully greater analysis highlights populations with a cumulative minority population percentage that is meaningfully greater than the minority population percentage in the general population (United States Environmental Protection Agency, 2016). The low-income threshold criteria analysis is used to identify low-income populations. The low-income threshold analysis highlights populations within the affected area with an income below poverty level percentage, which is equal to or greater than the respective county (United States Environmental Protection Agency, 2016).

The assessment identified two block groups as low-income populations using the low-income threshold analysis.

3.11.3 Non-English-Speaking Communities

The percentage of non-English-speaking communities identified in the area of analysis is minimal (0.8 and 2.2 percent). Non-English-speaking communities are identified regardless of whether the census tract has been identified as an environmental justice community.

As noted above, the percentage of non-English-speaking communities in the area of analysis is minimal.

The results of these analyses are detailed in Table 3.11-1 and Table 3.11-2. The block groups that were identified as environmental justice communities and their location in relation to the FERC Project boundary are shown on Figure 3.11-1.

3.11.4 Sensitive Receptors

Sensitive receptor locations are areas where the occupants are more susceptible to the adverse effects of exposure to toxic chemicals, pesticides, and other pollutants. Due to the remote nature of the site and limited size of the FERC Project boundary, no sensitive receptor locations (e.g., daycare facilities, schools, elderly housing, hospitals, etc.) are located within the geographic scope of analysis.

3.11.5 Outreach

The Project is an existing hydroelectric facility that has been operating for more than 44 years under the existing FERC license. At this time, KRCD proposes no changes to the existing Project’s facilities and features, FERC Project boundary, or operations. As part of the relicensing, KRCD will conduct outreach and collaboration with various entities including local, State, and federal agencies, Native American Tribes and tribal representatives, and non-governmental organizations and businesses. Documentation of outreach for the PAD and responses are included in Attachment A. KRCD also held a web-based meeting with interested stakeholders on May 12, 2023, to provide a Project and relicensing overview and answer any questions. Besides KRCD and its consultant staff from HDR, Inc., representatives from the following stakeholders attended the meeting: CDFW, Dunlap Band of Mono Indians, DWR, Hanson Environmental, SWRCB and USACE. Action items resulted from the meeting included the distribution of the presentation PowerPoint to meeting participants and preparing a commonly used FERC acronyms list to accompany the PAD (Attachment B). As part of this relicensing, there will be additional opportunities for public involvement, such as the Joint Meeting and Site Visit scheduled for Spring of 2024.

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Table 3.11-1. Race and Ethnicity and Low-Income Data for Block Groups Within One Mile of the FERC Project Boundary.

	RACE AND ETHNICITY DATA										LOW-INCOME DATA
Geography	Total Population (count)	White Alone Not Hispanic (count)	African American (count)	Native American/ Alaska Native (count)	Asian (count)	Native Hawaiian & Other Pacific Islander (count)	Some Other Race (count)	Two or More Races (count)	Hispanic or Latino (count)	Total Minority (%)	Below Poverty Level (%)
California	39,455,353	14,109,297	2,128,184	124,341	5,802,086	134,692	149,096	1,413,870	15,593,787	64.2%	11.8%
Fresno County	1,003,150	279,940	42,525	4,340	104,266	1,561	2,945	26,229	541,344	72.1%	18.4%
Census Tract 64.07 Block Group 2	909	565	0	44	0	0	8	77	215	37.8%	19.6%*
Census Tract 64.11 Block Group 2	1,512	982	0	0	92	0	0	16	422	35.1%	23.1%*

*Shaded grey cells with an asterisk denote a qualifying value for an environmental justice community.
Source: (United States Census Bureau, 2017-2021 American Community Survey 5-Year Estimates - Table B03002: Hispanic or Latino Origin by Race, 2021a), (United States Census Bureau, 2017-2021 American Community Survey 5-Year Estimates - Table B17017: Poverty Status in the Past 12 Months by Household Type by Age of Householder, 2021b)

Table 3.11-2. Non-English Speaking Data for Census Tracts Within One Mile of the Project Boundary.

	PRIMARY LANGUAGE – SPEAK ENGLISH LESS THAN "VERY WELL"					
Geography	Total Population (count)	Total non-English Speaking (percent)	Spanish (percent)	Indo-European (percent)	Asian/ Pacific Island (percent)	Other (percent)
California	37,105,018	17.2%	10.9%	1.3%	4.6%	0.4%
Fresno County	928,069	17.8%	13.7%	1.2%	2.5%	0.4%
Census Tract 64.07	2,240	0.8%	0.8%	0%	0%	0%
Census Tract 64.11	3,169	2.2%	1.0%	0%	1.2%	0%

Source: (United States Census Bureau, 2017-2021 American Community Survey 5-Year Estimates - Table S1601: Language Spoken at Home, 2021c)

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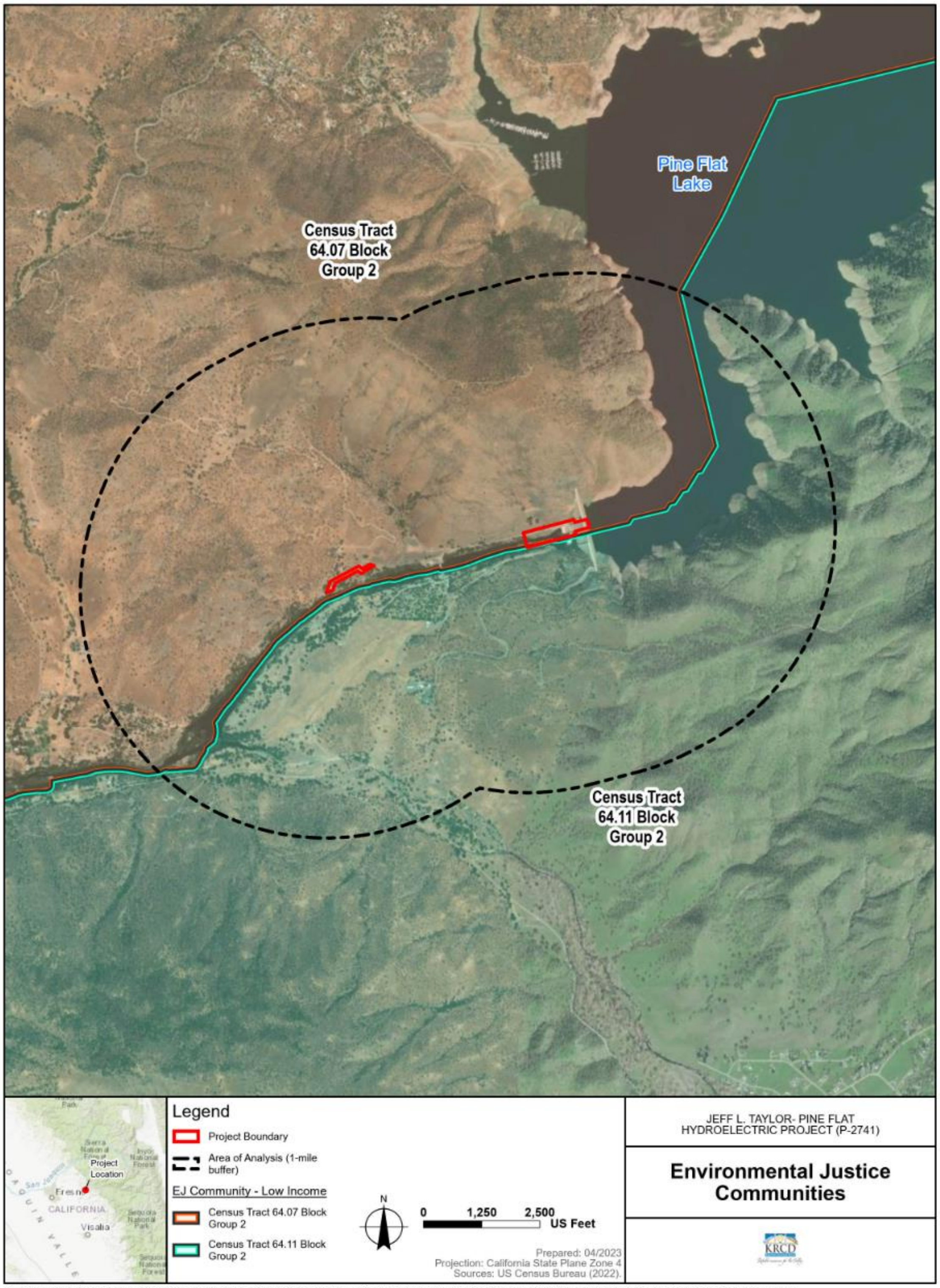

Figure 3.11-1. Environmental Justice Communities Map.

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3.12 CULTURAL RESOURCES

Section 3.12 provides information regarding previously documented cultural and tribal resources within the FERC Project boundary and a 0.5-mile search radius surrounding the FERC Project boundary. Examining known resources within the buffer provides information regarding cultural and tribal resources in the general vicinity of the FERC Project boundary. For the purpose of this document, a cultural resource is any precontact or historic district, site, building, structure, or object, regardless of its National Register of Historic Places (NRHP) eligibility.

3.12.1 Affected Environment

3.12.1.1 Records Search Summary

To obtain background information pertinent to understanding the archaeology, history, and ethnohistory of the FERC Project boundary, in 2019 KRCD procured a records search through the Southern San Joaquin Valley Information Center (SSJVIC) of the California Historical Resources Information System (CHRIS), located at California State University, Bakersfield. Data from a subsequent records search request at SSJVIC for an unrelated but overlapping project was reviewed in 2021. The records searches included examining resource location maps and records for archaeological sites, historic built environment resources, and tribal resources; historic property files, the NRHP, the California Register of Historical Resources (CRHR), the Historic Property Data File for Fresno County, the Built Environment Resource Directory, and California Historic Landmarks. The background research also included a review of historical General Land Office plats (GLOs) and United States Geological Survey (USGS) topographic maps to identify the potential to encounter historic sites and features potentially still present within the existing FERC Project boundary.

Archival research within the FERC Project boundary and the0.5-mile search radius of the FERC Project boundary, revealed that previous researchers conducted four cultural resource surveys, spanning from 1948 to 2020, which included portions of the existing FERC Project boundary (Table 3.12-1). One cultural resource analysis completed in 2020 (Lloyd et al. 2020) was specifically focused on the Jeff L. Taylor Powerhouse and existing FERC Project boundary and is discussed in more detail below. Researchers conducted an additional four surveys within the 0.5-mile search radius of the FERC Project boundary, only one of which occurred during the last 10 years (Table 3.12-1).

Table 3.12-1. Previous Cultural Resource Studies within the FERC Project boundary and 0.5-mile radius.

Year	Author(s)	Report Name and Description	SSJVIC Report No.
PREVIOUS CULTURAL RESOURCE STUDIES WITHIN THE FERC PROJECT BOUNDARY			
1948	Draucker, Philip	*Appraisal of the Archaeological Resources of Pine Flat Reservoir, Fresno County, California.*	FR-00706
1976	Varner, Dudley M.	*Cultural Resources Investigation in the Pine Flat Power Plant Project Area.*	FR-00798
1988	Meighan, C. W., B. D. Dillon, D. Armstrong, and D. Whitley	*Pine Flat Lake Intensive Cultural Resources Survey.*	FR-00547

Table 3.12-1. (continued).

Year	Author(s)	Report Name and Description	SSJVIC Report No.
2020	Lloyd, Jay, Leesa Gratreak, and Kamil Rochon	*Cultural Resources Inventory and National Register of Historic Places Evaluation for the Jeff L. Taylor – Pine Flat Hydropower Project, Fresno County, California, FERC Project No. 2741.*	Not Applicable (N/A)
PREVIOUS CULTURAL RESOURCE STUDIES WITHIN THE 0.5-MILE SEARCH RADIUS			
1981	Ambro, Richard D., Michael K. Crist, and Billy J. Peck	*An Archaeological Reconnaissance for the Big Creek No. 3 and No. 4 Springville-Magunden 220kV Transmission Lines in Fresno, Tulare, and Kern counties, California.*	FR-00157
1977	English, June Anne and Joanne Kipps	*An Archaeological Reconnaissance for the Kings River Kamper Park.*	FR-00489
1980	Wren, Donald G.	*An Archaeological Reconnaissance of the Matus/Presson Property (TPM No. 5435).*	FR-00887
2009	Monastero, Andrew P. and Jay B. Lloyd	*Cultural Resources Survey for Fishery Habitat Enhancement Projects on the Power Kings River below Pine Flat Dam, Fresno County, California.*	FR-02311

Archival research showed that one archaeological site and two built environment resources have been previously recorded within the existing FERC Project boundary (Table 3.12-2). Archaeological site CA-FRE-665 has been previously evaluated as not eligible for listing in the NRHP, although it is not listed in the Historic Properties Data File for Fresno County and there is no documentation showing that the evaluation was submitted to the State Historic Preservation Officer (SHPO) for concurrence. However, the cultural resource summary in the existing FERC license indicates that the determination was made by SHPO (FERC 1979). The Pine Flat Power Plant (Jeff L. Taylor Powerhouse) Intake Structure and Pine Flat Power Plant (Jeff L. Taylor Powerhouse) were recently recorded and evaluated for significance (Lloyd et al. 2020). Each is discussed further below.

An additional seven cultural resources have been previously recorded within the 0.5-mile search radius of the FERC Project boundary (Table 3.12-2). The seven previously recorded cultural resources within the 0.5 mile search radius includes four precontact archaeological sites, one precontact isolate, and one traditional cemetery as well as the Southern California Edison Company’s Big Creek No. 4 220 kV transmission line. The Big Creek No. 4 transmission line has been previously evaluated as not eligible for listing in the NRHP, while the remaining six sites have not been evaluated.

Table 3.12-2. Previously Recorded Cultural Resources within the FERC Project boundary and 0.5-mile radius.

Primary No.	Trinomial /Other ID	Recorders	Description	CRHR/NRHP Evaluation
PREVIOUSLY RECORDED RESOURCES WITHIN THE FERC PROJECT BOUNDARY				
P-10-000665	CA-FRE-665	J.M.F. and M.B.	Precontact food processing site consisting of two bedrock milling stations with a total of ten milling cups.	Not Eligible
N/A	Pine Flat Power Plant	Gratreak 2019	Pine Flat Power Plant (Jeff L. Taylor Powerhouse)	Not Eligible
N/A	Pine Flat Power Plant Intake Structure	Gratreak 2019	Pine Flat Power Plant (Jeff L. Taylor Powerhouse) Intake Structure	Not Eligible
PREVIOUSLY RECORDED RESOURCES WITHIN THE 0.5-MILE SEARCH RADIUS				
P-10-000036	CA-FRE-036	G.W.H. and W.C.M 1939; C. H. Jennings 1970	Precontact village site, including bedrock mortars	Unevaluated
P-10-001674	CA-FRE-1674H	D.V. Armstrong and C.R. DeCorse 1983	Ruins of house and yard reportedly once occupied by “Pony Bill”, a local Native American. Ruins includes rubble pile of foundation stones; linear and circular patterns of stone possible marking garden areas.	Unevaluated
P-10-001675	CA-FRE-1675	D.V. Armstrong and S. Kenton 1983	Precontact midden and circular pit structure with a bedrock mortar in the center; 3 bedrock features with 59 mortars, metates, and slicks.	Unevaluated
P-10-001676	CA-FRE-1676	P. Hickey and R. Rechtman 1983	Precontact food processing site consisting of six bedrock mortars.	Unevaluated
P-10-005926	N/A	Andrew Monastero 2009	Precontact isolate consisting of unifacial granite handstone fragment	Unevaluated
P-10-007028	N/A	Audry Williams 2017	Southern California Edison Company’s Big Creek No. 4 220 kV Transmission Line	Not Eligible
N/A	FRE-PRO-001	Steven M. Ptomey 1990	Precontact traditional cemetery for the Choinumni tribe.	Unevaluated

Pine Flat Power Plant (Jeff L. Taylor Powerhouse) Survey and Evaluation

In 2019, KRCD conducted an archaeological and historic built environment survey and evaluation within the FERC Project boundary. The study included:

- background and archival research;
- a records search from the SSJVIC of the CHRIS;
- a Sacred Lands File search with the Native American Heritage Commission;
- preliminary outreach via certified mail on July 16, 2019, with the local Native American tribes and representatives listed below:

  - Chairperson Robert Ledger Sr. of the Dumna Wo-Wah Tribal Government
  - Stan Alec of the Kings River Choinumni Tribe
  - Chairperson Rueben Barrios Sr. of the Santa Rosa Rancheria Tachi Yokut Tribe
  - Chairperson Leanne Walker-Grant of the Table Mountain Rancheria
  - Cultural Resources Director Bob Pennell of Table Mountain Rancheria
- NRHP significance recommendations for both the Pine Flat Power Plant (Jeff L. Taylor Powerhouse) Intake Structure and the Pine Flat Power Plant (Jeff L. Taylor Powerhouse).

In addition, the study included a pedestrian archaeological and historic built environment survey of the area. The research and field study did not identify any tribal resources, archaeological sites (precontact or historic), or historic built environment resources within or adjacent to the FERC Project boundary. Archaeological site CA-FRE-665, which had been previously mapped within the FERC Project boundary, was relocated and confirmed to lie outside of the FERC Project boundary. The Pine Flat Power Plant was documented on a California Department of Parks and Recreation (DPR) form 524 dated June 19, 2019, in association with the *Cultural Resources Inventory and National Register of Historic Places Evaluation for the Pine Flat Power Plant* (Lloyd et al. 2020). The analysis recommended the Pine Flat Power Plant as not eligible for listing in the NRHP or CRHR as an individual resource or as a contributor to a potential historic district. The eligibility recommendation has not been submitted to SHPO for concurrence.

3.12.1.2 Historic Map Review

A review of historic USGS quadrangles and Bureau of Land Management (BLM) General Land Office (GLO) plats indicate that prior to 1900 development in the vicinity of the FERC Project boundary is relatively sparse with only a few unnamed roads, fence lines, and a house identified. One notable feature, however, near the FERC Project boundary is the “Indian Rancheria” located northeast of the confluence of the Kings River and Mill Creek (approximately one mile downstream from present-day Pine Flat Dam). The rancheria was recorded on the 1879 GLO plat but is not present on the subsequent 1916 plat covering the same location. This rancheria is likely on the same location as the “Choinumni Cemetery,” a dedicated and currently used Native American cemetery across the river from Fresno County’s Choinumni Park and about one mile downstream of Pine Flat Lake.

Between 1900 and 1940, development of the areas encompassing the FERC Project boundary, particularly the lower elevations, greatly increased. Notable linear features in the general vicinity of the FERC Project boundary developed during that time include the “Hume-Bennett Lumber Flume to Sanger” (also referred to as the Hume-Sanger Flume or simply the Sanger Flume) and the Atchison Topeka and Santa Fe (AT&SF),

Reedley and Piedra Branch Railroad. The flume extended more than 60 miles along the Kings River connecting mill ponds in the Sierra Nevada with the finishing mill in Sanger and was reportedly the longest flume ever constructed. Additional notable features from the early-twentieth century include the towns of Piedra and Avocado, the Road to Trimmer, Rogers Crossing, Pine Flat School, and Kellers Ranch. By 1930, features associated with the Balch Hydroelectric Project are mapped onto both the GLO plats and the USGS quadrangles. The 1930 GLO plat notes a penstock, telephone lines, several roads, and power lines in addition to the Balch Powerhouse and Balch Camp itself. By the mid-twentieth century, the USGS quadrangles show many of the landscape features still observable today including Elwood and Trimmer Springs roads, Kirch Flat, the Kings River Hatchery (1928-1954), Pine Flat Dam, and Pine Flat Lake.

3.12.2 Historical Context

The following sections describe the archaeological and historical context of the environment of the FERC Project boundary and its vicinity.

3.12.2.1 Archaeological Context

The San Joaquin Valley and adjacent Sierra foothills and Coast Range have a long and complex cultural history with distinct regional patterns that extend back more than 11,000 years (McGuire 1995). The first generally agreed-upon evidence for the presence of prehistoric peoples in the region is represented by the distinctive basally thinned and fluted projectile points found on the margins of extinct lakes in the San Joaquin Valley. These projectiles, often compared to Clovis points, have been found at three localities in the San Joaquin Valley including along the Pleistocene shorelines of Tulare Lake. Based on evidence from these sites and other well-dated contexts elsewhere, these Paleo-Indian hunters who used these spear points existed during a narrow time range of 11,550 Before Present (BP) to 8,550 BP (Rosenthal et al. 2007).

As a result of climate change at the end of the Pleistocene, a period of extensive deposition occurred throughout the lowlands of central California, burying many older landforms and providing a distinct break between Pleistocene and subsequent occupations during the Holocene. Another period of deposition had similar results around 7,550 BP, burying some of the oldest archaeological deposits discovered in California (Rosenthal and Meyer 2004).

The Lower Archaic (8,550-5,550 BP) is characterized by an apparent contrast in economies, although it is possible that they may be seasonal expressions of the same economy. Archaeological deposits which date to this period on the valley floor frequently include only large-stemmed spear points, suggesting an emphasis on large game such as artiodactyls (Wallace 1991). Recent discoveries in the adjacent Sierra Nevada have yielded distinct milling assemblages which clearly indicate a reliance on plant foods. Investigations at Copperopolis (Lajeunesse and Pryor 1996) argue that nut crops were the primary target of seasonal plant exploitation. Assemblages at these foothill sites include dense accumulations of handstones, millingslabs, and various cobble-core tools, representing “frequently visited camps in a seasonally structured settlement system" (Rosenthal et al. 2007). As previously stated, these may represent different elements of the seasonal round. What is known is that during the Lower Archaic, regional interaction spheres had been well established. Marine shell from the central California coast has been found in early Holocene contexts in the great basin east of the Sierra Nevada, and eastern Sierra obsidian comprises a large percentage of flaked stone debitage and tools recovered from sites on both sides of the Sierra.

On the valley floor, early Middle Archaic sites are relatively rare. This changes significantly toward the end of the Middle Archaic. Late Middle Archaic settlement in central California focused on river courses on the valley floor. "Extended residential settlement at these sites is indicated by refined and specialized tool assemblages and features, a wide range of non-utilitarian artifacts, abundant trade objects, and plant and animal remains indicative of year-round occupation" (Rosenthal et al. 2007). The change in climate may influence this shift, with warmer, drier conditions prevailing throughout California. The shorelines of many lakes, including Tulare Lake, contracted substantially, while at the same time rising sea levels favored the expansion of the San Joaquin/Sacramento Delta region, with newly formed wetlands extending eastward from the San Francisco Bay.

In contrast, early Middle Archaic sites are relatively common in the Sierra foothills, and the mainly utilitarian assemblages recovered show relatively little change from the preceding period with a continued emphasis on acorns and pine nuts. Few bone or shell artifacts, beads, or ornaments have been recovered from these localities. Projectile points from this period reflect a high degree of regional morphological variability, with an emphasis on local toolstone material supplemented with a small amount of obsidian from eastern sources. In contrast with the more elaborate mortuary assemblages and extended burial mode documented at Valley sites, burial sites documented at some foothill sites such as CA-FRE-61 on Wahtoke Creek are reminiscent of "reburial" features reported from Milling Stone Horizon sites in southern California. These reburials are characterized by reinterment of incomplete skeletons often capped with inverted millingstones (McGuire 1995).

A return to colder and wetter conditions marked the Upper Archaic in Central California (2,500-1,000 BP). Previously desiccated lakes returned to spill levels and increased freshwater flow in the San Joaquin River and Sacramento River watersheds. Cultural patterns as reflected in the archeological record, particularly specialized subsistence practices, emerged during this period. The archeological record becomes more complex, as specialized adaptations to locally available resources were developed, and Central Valley populations expanded into the lower Sierra foothills. New and specialized bead-manufacturing techniques resulted in expanded distribution of distinct shell bead types across the region. The range of subsistence resources utilized in exchange systems that expanded significantly from the previous period. In the Central Valley, archaeological evidence of social stratification and craft specialization is indicated by well-made artifacts such as charmstones and beads, often found as funerary items.

The period between approximately 1,000 BP and Euro-American contact is referred to as the Emergent Period. The Emergent Period is marked by the introduction of bow and arrow technology which replaced the dart and atlatl at about 1,100 to 800 BP. In the San Joaquin region, villages and small residential sites developed along the many stream courses in the lower foothills and along the river channels and sloughs of the valley floor. A local form of pottery was developed in the southern Sierra foothills along the Kaweah River. While many sites with rich archaeological assemblages have been documented in the northern Central Valley, relatively few sites have been documented from this period in the southern Sierra foothills and adjacent valley floor, despite the fact that the ethnographic record suggests dense populations for this region.

Further ethnographic contextual information is provided in Section 3.13 Tribal Resources of this PAD.

3.12.2.2 Historic Context

Regional History

Transportation

Native Americans have traveled the mountain passes of the Sierra Nevada Mountains (Sierras) on foot for thousands of years. At one time, nearly every gulch and ridgeline was traveled by different groups to engage in trade, hunting, and exploration. During the early-nineteenth century, European explorers navigated Native American trails while also creating their own routes through the region. After the California Gold Rush started in 1848, settlers began utilizing some of the same native trails and trade routes using horses and mule trains. One of the region’s earliest trails, the El Camino Viejo, traversed the entire length of the San Joaquin Valley (Hoover et al. 2002:88-89).

Another early road, the Stockton-Los Angeles Road, followed the base of the Sierras through the present-day towns of Reedley, Sanger, and Friant, with numerous roads and trails branching off to the east (Hoover et al. 2002:90). During the late-nineteenth and early-twentieth centuries, additional mountain roads were developed to access mining, lumber milling, ranching, and hydroelectric production areas. One example, Dinkie’s (Dinkey’s) Trail, followed the North Fork Kings River to what became known as Coolidge Meadow (now submerged under Wishon Reservoir [BLM 2020; Greenwood and Foster 1982:126]). The two Kings River crossings along the road were managed by privately-owned ferry operations. One crossing was established in 1851 by John Pool at Pool’s Ferry, and the other was established in 1855 by James Smith at present-day Reedley. Smith’s Ferry was more popular as it provided the only access across the King’s River at high water. From 1858 to 1861, the Butterfield Stage traveled the Stockton-Los Angeles Road and used either Smith’s Ferry during high water or diverted northwest to Firebaugh’s Ferry. The road and ferry crossings were the primary means of travel through the region until the railroad arrived in the early 1870s. Smith’s Ferry was the last remaining ferry that ceased operation in 1874 (Hoover et al. 2002:90).

The transcontinental railroad connecting California with the rest of the U.S. was completed in 1869 (Hayes 2007). In 1872, the Southern Pacific Railroad (having recently merged with the Central Pacific Railroad) began laying tracks through California's Central Valley, which led to the development of towns such as Fresno, Modesto, and Merced by the railroad's completion in 1874 (Coate 2005). Nearly 20 years later, the San Francisco and San Joaquin Valley (SF&SJV) Railroad was constructed. The line connected Stockton to Bakersfield, where it linked to the second transcontinental rail line (Blaszak 1995; Hayes 2007). Spur tracks connected both railroads to lumber and milling operations in the Sierras to the east. The SF&SJV Railroad, a competitor of the Southern Pacific Railroad, ran parallel to that line throughout the Central Valley. The SF&SJV's construction aimed to break the Southern Pacific Railroad's monopoly over the Central Valley's agriculture industry. With the SF&SJV Railroad's completion, central California's economic base was untethered from the "tyranny" of the Southern Pacific Railroad, and the SF&SJV Railroad became known informally as "The People's Railroad" or the "Valley Road" (Hooper 2014). In 1899, the AT&SF Railroad acquired the SF&SJV Railroad. The AT&SF operated the rail line until 1996 when it was merged with the Burlington Northern Railroad, incorporated, and renamed the Burlington Northern Santa Fe Railway (Trains 2006).

Ranching

Ranching in California dates to the Spanish Period (circa [ca.] 1776-1822) and expanded during the Mexican Period (1822-1848) with the creation of large private ranchos granted to California's elites. Animal husbandry, a relatively undeveloped industry at the time, consisted primarily of branding and marking stock. Every rancho was required to hold a yearly roundup for accountability. During this period, the hide and tallow trade drove the cattle industry, especially after the 1820s when owners of American sailing vessels purchased large amounts of these commodities on a regular basis. An estimated five million hides were exported from California during the early nineteenth century, making the industry one of the economy's chief components (Burcham 1981; Guinn and Beck 1915).

During the Gold Rush, increased demand for beef combined with the proceeds from hides and tallow led California's ranching industry to become more lucrative. New stock imported to California from the east also improved cattle breeds. The demand for beef was so high that California's stock alone was insufficient to supply the miners. Approximately 150,000 head of cattle had to be transported from Mexico and the midwest during the early 1850s to meet demand. Within 10 years, nearly the entire Spanish native stock had been replaced with crossbred cattle from all over the world (Burcham 1981; Guinn and Beck 1915). In this environment, small stock raising operations, such as Miller and Lux's San Luis Ranch in the San Joaquin Valley, developed into cattle empires (Hoover et al. 2002:89).

By the early 1860s, California herds had grown to over three million head but the demand for beef had begun to decline. Intense floods from 1862 to 1863 followed by several years of drought led to the loss of nearly one million head of cattle. The cattle crisis ended ranching speculation and generated a system of range management to prevent overgrazing. The situation was complicated by significant growth in the agricultural industry which continued to encroach on rangelands (Burcham 1981; Guinn and Beck 1915). In the wake of the cattle crisis, sheep ranching was introduced to California when the eastern U.S. cotton trade was interrupted by the Civil War. By the 1870s, sheep ranching began to overtake the cattle industry as the more profitable stock trade, with Bakersfield as the center of production (Greenwood and Foster 1982:123-124).

By the late nineteenth century, Fresno County had become California's leading producer of wool, and stockmen were increasingly drawn to the meadows of the Sierra foothills for grazing land. The Sierras provided water and dense grasslands with ample food for flocks, especially in the summer when the San Joaquin Valley was dry. The North Fork Kings River area was first settled by ranchers William Helm and Frank Dusy. Helm settled at Dry Creek in 1865 and Dusy, after spending several years in Fresno, settled at Dinkey Flat in 1872. Between 1870 and 1874, they partnered in the stock business, and the meadows where Helm and Dusy pastured their sheep were named after them. Dusy also entered partnerships with Henry Carpenter and William Coolidge who then organized stock business in the meadows along the North Fork Kings River (Greenwood and Foster 1982:123-125).

After the Tollhouse Road to the Pine Ridge lumber mills was constructed in 1867, the North Fork Kings River became more accessible to stockmen who entered the meadows from Pine Ridge using the Dinkey Trail. Early stockmen in the area included Thomas Nelson at Laurel and Bear Creek Meadows, William Markwood at Cutt's Meadow, John Hall at Hall's Meadow, John and Elisha Patterson at Patterson Mountain, Albert Statham at McKinley Grove and Rancheria Creek, the Collins brothers at Big Crown Meadow (Collins Meadow), David Sample at lower Crown Valley, and Henry Ross at Dinkey Creek. These early stockmen-built cabins and corrals in the meadows and along the creeks where they raised their sheep. They constructed numerous fences after 1874 when the "No Fence Act" required stockmen to keep their sheep away from a farmer's crops (Greenwood and Foster 1982:125-128).

As the number of stockmen in the Sierras increased so did the landscape's degradation. Large flocks were capable of denuding meadows and slopes of all vegetation within a matter of weeks. To promote new growth, stockmen would set fire to the forests at the end of the season. During the late-nineteenth century, the disappearance of grazing lands, a decline in wool prices, and an increase in the price of beef led many stockmen to trade their sheep for cattle. By 1895, Frank Dusy was operating a cattle ranch at Dinkey Flat. However, not all stockmen switched to cattle and there were disputes over the use of grazing lands. After the turn of the twentieth century, the Forest Reserves (now called National Forests) sought to regulate stock raising to prevent destruction and disputes within the Sierras. Eventually, sheep were prohibited from grazing in the Sierra National Forest (Greenwood and Foster 1982:129-131).

Mining

No major mining camps were present along the Kings River during the Gold Rush Era (1848-ca. 1859) and no early claims were recorded (Britannica 2022). However, many prospectors passed through the region on their way to the Mother Lode Mine and may have engaged in some placer mining. Established mining along the Kings River did not occur until the late 1870s when the price of silver increased. One of the first claims was discovered by Tom Bacon in 1879 north of Dinkey Flat. Bacon and his associates decided to build a town near the claim at “Miningtown” Meadow, but the plan never materialized. Gold mining began at Dinkey and Laurel Creeks during the 1880s, and a small discovery led to the development of a road connecting the site with the Pine Ridge mill area. Claims associated with the discovery included Richard Burton’s and Joe Kesterman’s Laurel Creek Placer, H. Richter’s Cabin Meadow Placer, and a hydraulic mining operation at Russell’s Camp known as Howell’s Mine. By 1910, the mines had been depleted and little mining activity took place over the next few decades. During the 1930s, a rise in the price of gold and the onset of the Great Depression revived mining activity at Laurel Creek with a small claim operated by J. Kesson (Greenwood and Foster 1982:131-132).

Gold mining did not occur again in the area at any notable scale; however, two tungsten deposits were discovered in the 1940s. Following the onset of World War II, tungsten became a valuable resource for use in the construction of aircraft and machinery. The two mines associated with the tungsten deposits were both called Garnet Dike; one was in Fox Canyon and the other was at Mud Lakes. The Fox Canyon mine was discovered in 1943, possibly by Clarence Quigley, and was developed by the Garnet Dike Mining Company under Orrin Farrand (Greenwood and Foster 1982:131). Development of the mine was the impetus for the construction of a road along the Kings River to the east of Rogers Crossing. The Mud Lake mine was discovered during World War II by Joe Sadler, who sold it to H. A. Savage. Savage leased the claim to the Garnet Dike Mining Company, which began extracting ore in 1953. In 1954, the operation was acquired by the Cal-Tex Tungsten Company, which processed between 175 and 200 tons of ore per day until the mine closed in 1956 (Greenwood and Foster 1982:161).

Other mining claims documented in the area include: the “Gold Wonder” lode claims discovered by John Cogdell in 1984 along the Kings River just west of the North Fork Kings River; the “Mein Lieben” lode claims staked by Ray Long in the early 1980s to the north of Balch Camp; the “6K” lode claims discovered by Robert Konvalin during the 1960s and 1970s to the southeast of Black Rock Reservoir; and the “Jimmie Jeanne” lode claim discovered in 1956 by Walter Frank to the west of Sawmill Flat. All of these mines have either been formally closed through the U.S. Department of the Interior, Bureau of Land Management or were abandoned (The Diggings 2020).

Timber Harvesting

Timber harvesting in the Sierras began shortly after California achieved statehood in 1850, and the first mills opened in 1852 within the northern part of Fresno County at Pine Ridge (Shaver Lake). Early logging targeted the Giant Sequoia trees found throughout the region before the trees had achieved protected status. Early loggers encountered major obstacles, namely transporting the harvested lumber to developing valley towns to place on the market. Transport methods included logging roads and log flumes; however, the need for constant repair and maintenance rendered these methods costly and inefficient. As a result, loggers also used toll roads such as Tollhouse Road, which had been constructed in 1867 to connect the mills at Pine Ridge with Fresno (Greenwood and Foster 1982: 140; Hoover et al. 2002:96-97).

Similar to the livestock and agricultural industries, the lumber industry was bolstered by railroad development in the 1870s. As a result, lumber milling promoted the establishment of regional towns throughout the late-nineteenth and early-twentieth centuries such as Madera, which was founded by the California Lumber Company in 1876 (Coate 2005). Near the FERC Project boundary, lumber milling began around the turn of the twentieth century when the Sanger Lumber Company constructed a flume to the south of the Kings River for timber harvesting. In 1925, the San Joaquin Light and Power Company (SJLPC) harvested 80 acres of land along the North Fork Kings River to prepare for Balch Camp construction. The wood was processed at the Patterson Mountain Lumber Mill, which only operated for a single season. Generally, logging within the region was not as frequent as in areas to the northwest of Dinkey Creek where operations had cleared large sections of the Sierras by the early twentieth century (Greenwood and Foster 1982:140-141).

The lumber industry's decline threatened the livelihood of many towns in the San Joaquin Valley and Sierra foothills and, after the Great Depression, many lumber companies failed (Coate 2005). However, some large-scale regional operations resumed in the early 1940s when Byles and Jamison harvested Bear Meadow, and the Pine Logging Company harvested near Dinkey Flat. Later, during the 1950s, smaller operations occurred at Tule Meadow, Fence Meadow, Black Rock Reservoir, and Lake Wishon. Most of these harvesting operations were associated with the construction of dams for hydroelectric projects (Greenwood and Foster 1982:140-141).

The Sierra and Sequoia National Forests

The Kings River watershed covers three million acres that includes portions of the John Muir Wilderness, Kings Canyon National Park, Sequoia National Forest, and Sierra National Forest. Reservoirs within the watershed include Pine Flat, Black Rock, Balch Afterbay, Courtright, and Wishon (Finney 2002). During the late-nineteenth century, concern mounted over the protection of watersheds in California as fires burned out of control, lands were overhunted, and livestock overgrazing went unchecked. The Homestead Act of 1862 and the Timber and Stones Acts of 1870 led to the private ownership and exploitation of millions of acres which had to be managed to prevent destruction of the natural landscape and resources (Newland 2008). Naturalist and wilderness preservationist John Muir referred to sheep as hoofed locusts that turned meadows to dust and fouled local streams. Abbott Kinney, a rancher, botanist, and developer, spearheaded a movement for forest management, and in 1886 he was appointed as the first chairman of California's Board of Forestry. Through the efforts of Muir, Kinney, and others, Congress was pressed to act. Then, in 1891, the Forest

Reserve Act was passed which gave the President authority to set aside lands as forest reserves (Robinson 1991).

In 1893, President Benjamin Harrison created 15 new forest reserves and, in 1897, President Grover Cleveland created 13 more under the Forest Reserve Act (Robinson 1989 and 1991). The Sierra Forest Reserve, one of the first and largest, was established by President Harrison on February 14, 1893, with more than six million acres in the Sierras (USDA 2020a). Despite creation of the reserves, Congress had not appropriated funding for administration or management of the forest reserves. From 1892 to 1897, the forest reserves were only a reality on paper with no administration, officers, or rangers to enforce the law. During these years, timber cutting and livestock grazing continued unchecked. In 1896, public outcry resulted in a Forest Reserve Commission consisting of Charles Sargent, John Muir, and Gifford Pinchot visiting the Forest Reserves. The Commission declared that the protection of reserves was of the utmost importance due to their symbiotic relationship with water supply (Robinson 1989 and 1991).

In 1905, President Theodore Roosevelt transferred responsibility of the Forest Reserves from the U.S. Department of the Interior to the U.S. Department of Agriculture and appointed Pinchot as the head of the newly created Forest Service. Pinchot devised a civil service exam for prospective rangers and created a set standard of qualifications for supervisors and rangers to create a professional staff of qualified foresters. The term “reserve” was eliminated because Pinchot believed it implied the forests were off limits, and in 1907 the forest reserves became national forests (Robinson 1989 and 1991; USDA 2020a).

In 1908, the Sequoia National Forest was created from the Sierra National Forest to the south of the Kings River and what was once the Tulare Forest Reserve. The reserve establishment resulted primarily from the lobbying efforts of Tipton Lindsey, Frank. J. Walker, John Tuohy, and George Stewart; four prominent San Joaquin Valley residents who recognized the necessity of protecting the Sierra watersheds. In 1909, President Roosevelt designated new forest lands that increased total acreage to over 3 million acres (Tweed 2012). The new Sequoia National Forest protected 38 groves of giant sequoias (*Sequoiadendron giganteum*), more than any other national forest or reserve. Only two other national forests contain giant sequoia groves; the Sierra National Forest has two groves and the Tahoe National Forest has one grove. Much of the Sequoia National Forest was annexed in 1910 as part of the Kern National Forest but was reabsorbed five years later (Stewart et al. 1994:151; USDA 2020b).

During the early-twentieth century, the newly created Forest Service hired rangers to administer the new districts and programs within the national forests. A hierarchal structure of rangers, assistant rangers, and foresters was established to maintain newly created districts within the forests. Rangers were assigned specialized duties such as scaling and marking timber sold to lumber companies and working with cattlemen to control grazing within the forests. The rangers also worked to control wildfires, and several lookouts were established at high points. In 1916, President Woodrow Wilson created the National Park Service under the leadership of Stephen Mather who sought to increase awareness of National Forests and Parks (USDA 2020a).

Beginning in 1929, the Great Depression brought devastation to the U.S. economy. As a result, the California Division of Forestry, in partnership with the U.S. Forest Service, initiated the California Relief Program and created work camps for economic relief and the betterment of the National Forests. Between 1931 and 1932, numerous camps filled with unemployed men sprang up in California forests. The men worked six days a week building roads, trails, and firebreaks in exchange for meals and lodging. These camps became the largest construction and fire control program in Forest Service history (Robinson 1989 and 1991).

In 1933, President Franklin Roosevelt launched his New Deal Program which included the Emergency Conservation Act. The act created the Civilian Conservation Corps (CCC), a large-scale version of the California Relief Program. Within a few months, the CCC enrolled approximately 275,000 men in 1,300 camps across the nation, with over one million enrolled by 1940. New enrollees between the ages of 17 and 29 committed to a six-month term. They worked eight hours a day, five days a week on Forest Service projects in exchange for room, board, and a monthly salary of 35 dollars. The Works Progress Administration, the National Industrial Relief Administration, and the State Emergency Relief Administration also worked in the Sierra and Sequoia National Forests during the 1930s. These groups improved infrastructure by developing trails, building roads, clearing areas for camp sites, removing old structures, and building new structures (Newland 2008; Robinson 1989; USDA 2020a and 2020b).

Within the Sierra National Forest, the CCC constructed 16 bridges, 240 miles of roads, 20 miles of trails, 90 miles of firebreaks, 62 buildings and lookout towers, and 145 miles of telephone lines, as well as improving 70 different campgrounds (USDA 2020a). The CCC conducted similar operations within the Sequoia National Forest and constructed or rebuilt most of the fire lookout towers and ranger guard stations (USDA 2020b). The U.S. entered World War II in December 1941, which effectively ended the Great Depression along with most of the federal relief programs. The CCC was disbanded in 1942 as former workers joined the military. The Forest Service also lost 40 percent of its rangers who signed up for military service. After the war ended in 1945, the ranger service was renewed with returning veterans. Within a short time, fire suppression methods were upgraded with new technologies such as the use of aircraft (Robinson 1989 and 1991).

During the mid- to late-twentieth century, early hydroelectric operations along the San Joaquin and Kings River watersheds were expanded by construction of multiple reservoirs including Courtright Lake and Lake Wishon. In 1964, the Wilderness Act led to the establishment of the Ansel Adams and John Muir Wilderness Areas within the Sierra National Forest (USDA 2020a). At the turn of the twenty-first century, the Sequoia National Monument was created by President Clinton, encompassing all the giant sequoia groves and approximately one third of the Sequoia National Forest lands (USDA 2020b).

Recreation

Beginning in the 1880s, San Joaquin Valley residents sought refuge in the Sierras and established recreational camp sites to escape the extreme summer heat. Creation of the Sierra Forest Reserve and Sequoia National Forest increased the popularity of recreational activities such as camping, hiking, fishing, and hunting. The explorations and actions of naturalists like John Muir and groups like the Sierra Club led to increased interest in the Sierras. By 1911, traffic into the Sierra foothills was beginning to interfere with the activities of stockmen. The following year, special use areas were set aside for tourists, horses, and pack animals. Pine Ridge, the recreational headquarters for campers, was surrounded by satellite locations like the pasture at Dinkey Creek. Within a few years, the number of tourists at the Dinkey Creek camp increased and a trail was built to Mount Nelson for hiking. In 1916, Jay Robinson established a resort and packing business at the Dinkey Creek camp and, five years later, Fresno County provided funds to enlarge the camp. The development of resorts like Robinson's was made possible by the Organic Administration Act of 1897, which allocated use permits in exchange for an annual fee. During the 1930s, the CCC improved the camp at Dinkey Creek and built better access roads (Greenwood and Foster 1982:142-143; USDA 2020a).

During the mid-twentieth century, hydroelectric projects throughout the Sierras led to the creation of numerous manmade lakes by the construction of dams along waterways. PG&E created reservoirs along the Kings River and its tributaries, including Courtright Lake and Lake Wishon, that were completed by in 1958 for the Haas-Kings River Project (FERC Project No. 1988) which later became high Sierra recreation areas. Black Rock Reservoir was impounded in the 1920s for the Balch Hydroelectric Project (FERC Project No. 175). PG&E operates and maintains the lake campgrounds. The lakes also provide public boat launching facilities and are stocked with several varieties of trout. The lakes have hiking and equestrian trails with access to Dinkey Lake, John Muir Wilderness, and Kings Canyon National Park. Downstream, the Pine Flat Lake, which was constructed in 1954 by the USACE, provides similar recreational opportunities. Apart from the lakes, the river reaches are also used for rafting and kayaking (Greenwood and Foster 1982:147; USDA 2020c).

The City and County of Fresno

Six years after California achieved statehood in 1850, Fresno County was carved out of portions of Mariposa, Merced, and Tulare counties (Hoover et al. 2002:88-91). The Spanish word "Fresno" translates as "ash tree," after the shade trees planted by Spanish explorers (SJLPC 1925a:1). The county's original seat was in Millerton, founded as the mining town of Rootville in 1851. During the 1860s, Millerton suffered several catastrophic floods and fires, leaving it a ghost town by the 1870s. Before being finalized in 1903, Fresno County's boundaries were redrawn eight times to create other counties, such as Madera County to the north (Hoover et al. 2002:88-91).

During the mid-nineteenth century, Fresno was a sparsely populated county consisting primarily of barren sand plains with rugged mountains to the east. The population spiked during the 1870s after the railroad was constructed through the valley. The railroad facilitated rapid growth, and numerous towns were built by the Central Pacific

Railroad Company (CPRC) along the route. The CPRC was a predecessor to the Southern Pacific Railroad Company. The railroad was completed to what was then known as Fresno Station in 1872, and the settlement became the new county seat in 1874 (Hattersley-Drayton 2013; SJLPC 1925a:1). That year, the city had 55 buildings and a population of approximately 150. Fresno's new status as a railroad town prompted the community of Millerton to move many of its buildings, including a hotel, to Fresno (SJLPC 1925a:1). Edward H. Mix had surveyed the original town site, which was organized on a grid. The townsite straddled the rail corridor and extended to the CPRC tracks' east side along Front Street (present day H Street) (PRA 2008:11).

In 1875, one year after Fresno became the county seat, the Central California Colony was established to the south of Fresno with a system of irrigated canals dividing 20-– to 40-acre parcels. The successful new agricultural colony became the model for nearly 50 similar colonies throughout the county during the next few decades (Hattersley-Drayton 2013). By October 1885, Fresno's population had increased to 3,459 (SJLPC 1925a:1).

The City of Fresno was incorporated in 1885 and, by the turn of the twentieth century, had a population of more than 10,000. Initially, cattle ranching was the primary economic activity in the San Joaquin Valley; however, this was overtaken by agriculture after Henry Miller and Charles Lux tapped the San Joaquin and Kings Rivers to irrigate approximately 610,000 acres of land. Crops included wheat, figs, and grapes. In 1875, grape crops were scorched by the summer heat, inadvertently creating what would become one of the nation's most lucrative raisin industries - the Sun-Made Raisin Cooperative. Between 1872 and 1903, the county's raisin yield grew from 50,000 pounds to 100 million pounds. Fresno County also produced alfalfa, dairy products, livestock, wine, oranges, lemons, olives, grain, wool, flax, silk, petroleum, oil, lumber, gold, silver, iron, and coal. Later, cotton would become Fresno County's primary crop after shortages during World War I encouraged the industry's growth (Fresno City and County Historical Society 1980:16; Hattersley-Drayton 2013; Hoover et al. 2002:94-95).

In summer 1887, George McCullough and Lyman Andrews began constructing a public water works project to centralize the town's water supply and establish a water distribution system. The Fresno Water Company later purchased the system and increased its capacity with new wells and tanks. By 1902, financial problems forced the company into receivership until it was purchased in 1904 by A. C. Balch, W. G. Kerckhoff, and A. G. Wishon, who reorganized as the Fresno City Water Company (SJLPC 1925b:3).

The area's early power transmission included a 68-mile, 19.6-kV transmission line from Fresno to Selma and Fowler to Hanford, which was the longest in the world at the time of completion in 1899 (Fresno City and County Historical Society 1980:22). That year, the Santa Fe Railroad Depot was completed on Tulare Street to serve the San Francisco and San Joaquin Valley Railroad, which ended the Southern Pacific Railroad's monopoly on Fresno rail activities. By 1900, the City of Fresno population had increased from 10,818 to 12,470 (PRA 2008:12-13). The city's population nearly doubled between 1900 and 1910, and the first municipal planning commission – one of the oldest in the state – was established in 1916. Seven years later, in 1923, the city adopted a planning report which proposed a civic center, downtown revitalization, park and recreation plan, and street system to accommodate the growing automobile traffic (PRA 2008:13).

Following World War I, Fresno's population spiked to approximately 75,000 and its area reached over eight square miles by 1925. While the region remained primarily agricultural, the City of Fresno's downtown skyline was touted as "comparable to any inland city on the Pacific Coast, and tied to this picture of modern achievement is a large and expanding manufacturing and wholesale section" (SJLPC 1925a:2). At that time, the City of Fresno and environs functioned as a supply and trading center with 140 manufacturing plants and 100 wholesale houses, supported by the region's network of railroads and highways. The thriving industrial sector included plants for fruit processing, ice, cotton, and printing as well as production of broom, macaroni, and automotive parts. The manufacturing and wholesale sector was served by two transcontinental railroads and was a terminus for almost 40 stage lines transporting passengers and freight throughout California (SJLPC 1925a:2). During this period of dynamic industrial growth, PG&E's Balch hydroelectric project was under construction to meet the substantial increase in the area's power demand.

The migration of farmers from the Dust Bowl region to the San Joaquin Valley during the Great Depression increased competition for farm and agricultural industry work and led many new arrivals to seek employment in town, where resources were also limited. New Deal projects brought employment to Fresno in the form of building construction. As the U.S. prepared for and ultimately entered World War II, inland bases were established in and around Fresno, bringing nearly 60,000 military personnel to Fresno and nearby bases. In order to address labor shortages resulting from the draft, workers coming mostly from Mexico were contracted to work in the agricultural industry. In the meantime, Executive Order 9066 authorized the removal of U.S. citizens and residents of Japanese ancestry in West Coast states. This included 1,000 persons forced from their homes in Fresno and Madera counties by the U.S. Army and placed in assembly centers, such as the Fresno County Fairgrounds, before being transported to wartime internment camps (PRA 2008:20-23, 27).

By the end of World War II, Fresno's fruit production remained abundant; the county was the State's top producer of figs and raisins, and ranked third in production of peaches, table grapes, and wine grapes. In addition to 209,541 acres of fruit cultivation, the county boasted 86,000 acres of cotton, 60,000 acres of flax, and 1,000 acres of sugar beets. At that time, two companies dominated power development and transmission in the San Joaquin Valley: Southern California Edison (SCE) primarily served mostly the state's southern region, and PG&E served the northern region (Walker 1946:191-92).

In addition to agriculture, ranching, mining, and timber harvesting were other important aspects of Fresno County's economy during the twentieth century. However, the development of agriculture increased while the latter industries declined or remained stagnant. By the late-twentieth century, Fresno County was ranked first in the nation for agricultural output with annual sales in excess of three billion dollars (City of Fresno n.d.).

Following the end of World War II, Fresno suffered a housing shortage and inadequate infrastructure to support a growing population. By the early 1950s, the Fresno-Clovis metropolitan area's growth exceeded that of the City of Fresno. Between 1945 and 1955, the City of Fresno population increased by 13 percent while the outlying areas increased by 35 percent. In order to meet the area's growing demand for power, PG&E began construction to expand the existing Balch hydroelectric facility by raising the Balch Diversion Dam and building a second penstock and second powerhouse. After the Balch expansion was completed, PG&E commissioned the design and construction of three model homes known as Electra Living Houses in Fresno to demonstrate the advantages of houses powered completely by electricity. The houses were completed circa 1960 along East Gettysburg Avenue (PRA 2008:35).

By the mid-1980s, PG&E still powered the Kings River basin and most of the San Joaquin Valley basin including Fresno, except for SCE's Hanford service area in Kings County. The PG&E and SCE power systems were interconnected near Bakersfield, California, at PG&E's Kern Substation and SCE's Magunden Substation. Both companies directly or indirectly interconnected with California's other electric generating and transmission systems, and with most systems in other western states, through power pool agreements and power exchange contracts (FERC 1984:24).

<u>Hydroelectric Power in the West</u>

The first hydroelectric plant in the West – High Grove Station – was established in 1887 in San Bernadino, California. Other significant early hydroelectric facilities were at Willamette Falls in Oregon City, Oregon, where the first alternating current plant was completed in 1889, and at Mill Creek, California, where the first three-phase hydroelectric plant was constructed in 1883. The three-phase generator enabled long-distance power transmission, expanding the role of electricity from industrial use to commercial production. Alternating currents also allowed power to travel greater distances, because electricity could be generated at one voltage, stepped up by a transformer to a higher voltage for transmission, and then stepped down for distribution to customers. Also in 1893, the Folsom powerhouse, a three-phase hydroelectric facility was constructed in Folsom, California on the American River. Power was initially transmitted 22 miles over uninsulated copper wires to Sacramento for commercial use. Due to the growing demand for power in the area and an opportunity to harness additional power, a smaller powerhouse was built in 1897 just below the main Folsom Powerhouse at the mouth of the tailrace. By 1902-1903, PG&E acquired the Folsom Powerhouse and other powerplants in the foothills. In 1898, SCE's early predecessor, Edison Electric Company of Los Angeles, constructed, at the time, the world's largest transmission line and the Santa Ana River No. 1 hydroelectric plant on the Santa Ana River. Power generated from the powerplant was transmitted through the 83-mile, 33 kV double-circuit transmission line to Los Angeles, California (Hay 1991: xix-xxi).

Advancements in power generation led to evolving uses of electricity, including lamps, electrified machines, and indoor wiring. Relatively low-cost electricity had become available on a large scale, greatly impacting how people lived and worked. Another innovation associated with early hydroelectric developments was the use of concrete in dam construction, which became a ubiquitous building method in dams throughout the American West (Hay 1991: xix-xxi, 10; Edison Tech Center 2013). The development of hydroelectric power in the western Sierras began during the mid-1890s amid widespread conflict over water rights in the San Joaquin Valley. Water for irrigation was in high demand at the time and fledgling power companies were placing new demands on the water supply (Turrentine and Pisani 1983:208).

The Kings River was one of California's last major rivers to be developed for electrical power generation (Geiger 1928:124). The river originates in the Sierras and extends through eastern and southern Fresno County, northwest Tulare County, and northern and central Kings County (KRCD and KRWA 2009:45). Formed by mountain snowmelt, the river descends into the San Joaquin Valley at a point approximately 25 miles east of Fresno. The snow melts early in the summer, which causes runoff to peak in June. Before reservoir development in the area, the early summer runoff resulted in substantial loss of water before the river dropped to minimum flow by early August (Geiger 1928:122). J. B. Lippincott, a renowned California engineer, led a United States Geological Survey party to the Kings River Canyon in 1901. At that time, the area had no roads, and the party traveled by horseback to survey all three Kings River forks. The surveyors observed potential power development sites along the river's north fork; however, hydroelectric engineering had yet to develop the means for handling small water volumes under such a high head ("fall of water") (Palmer 1955:36-37).

San Joaquin Light and Power Corporation

The origins and evolutions of the SJLPC are inextricably tied to the ingenuity and work of Albert Graves Wishon. Wishon was born in Missouri in 1858 at Coppedges Mill near the town of Rolfe. He studied civil engineering at the State School of Mines in Rolla, Missouri, but left for lack of funds. During the 1880s, he worked as a railroad station agent and merchant before moving to Oregon, and then to Tulare, California, in 1889. Wishon worked at a lumber yard, and then as a bank's assistant cashier. In 1893, he established a real estate and insurance business. While living in Tulare, Wishon observed how irrigation substantially increased crop production and learned about the potential for hydropower production in the Sierras. His observations inspired him to develop a motorized pump system for irrigation, pioneering electric pump irrigation and expanding farm electrification in California. In 1894, Wishon partnered with brothers John H. Hammond and William H. Hammond to establish the Kaweah Power and Water Company. The company built a small hydroelectric plant at Lime Kiln Point on the Kaweah River in Tulare County, to distribute power in Tulare, Visalia, Exeter, Porterville, and Lindsay. In 1899, the Mt. Whitney Power Company (later acquired by SCE) was incorporated to assume control of the Kaweah River properties, enabling Wishon and William H. Hammond to cash out company stock they received as payment for their time and labor (Coleman 1952:181-84).

Around 1902, Wishon resigned from the Mt. Whitney Power Company and accepted a position managing the San Joaquin Power Company. The San Joaquin Power Company had been organized by famed engineer John Eastwood to construct a hydroelectric plant for powering the growing City of Fresno. At that time, Fresno’s only power supplier was the Fresno Gas and Electric Company, which operated a small electric system. The San Joaquin Electric Company, a successor of the San Joaquin Power Company, was incorporated in 1895 with initial capital of $800,000. John J. Seymour, who held the majority of stock, served as company president and Eastwood as vice-president and chief engineer. Seymour also owned the Fresno Water Company. The region’s first power plant – San Joaquin No. 1 – was constructed on the North Fork San Joaquin River (Willow Creek) and placed into operation in May 1896. The powerhouse encountered catastrophic mechanical and environmental issues, as well as low utility rates and interference from the Fresno Gas and Electric Company. By 1899, the San Joaquin Electric Company was in bankruptcy, and Seymour retained control by serving as receiver. Seymour operated the company for over two years while searching for a buyer (Coleman 1952:185-87).

In 1902, A. C. Balch and William G. Kerckhoff purchased the company, which they incorporated as the San Joaquin Power Corporation on August 11th. That year, Balch and Kerckhoff also incorporated the Pacific Light and Power Company (later merged into SCE). Kerckhoff served as the San Joaquin Power Corporation’s president and Balch as vice-president (Coleman 1952:188-89). The company’s holdings included the Fresno City Railway, which controlled the streetcar system, and Fresno City Water Company (*Fresno Morning Republican* 1929). In order to remove local competition, the company purchased the Fresno Gas and Electric Light Company’s electric system for $25,000 (Coleman 1952:190).

Under Wishon’s management, the San Joaquin Powerhouse No. 1 was placed into good working order and an addition was built to increase plant capacity (Coleman 1952:191). On May 13, 1905, the SJLPC filed articles of incorporation with the Los Angeles County Clerk. The capitalization was $3 million, and the new company replaced the predecessor San Joaquin Power Corporation (*Bakersfield Morning Echo* 1905). In the next few years, the company constructed additional power facilities on the San Joaquin River and tributaries. During this period, Wishon continued to secure water rights on the San Joaquin, Tule, and Kings rivers for future power development (Coleman 1952:193).

In order to generate additional capital for projects, the SJLPC was organized on July 19, 1910, with a capitalization of $25 million to pursue the work begun by the predecessor companies (Coleman 1952:195). The reincorporation also enabled the company to use a portion of its capitalization to acquire the Merced and Bakersfield Light and Power Companies (*Fresno Tribune* 1910). A. G. Wishon managed the newly acquired Bakersfield system, in addition to the Fresno system (*Fresno Morning Republican* 1910). The reincorporation and ongoing acquisition of additional utilities, including the Merced Gas and Electric Company in summer 1910, gave the SJLPC a virtual monopoly on the San Joaquin Valley’s power system (*Fresno Morning Republican* 1910; *Bakersfield Morning Echo* 1910).

Also, in 1910, a new San Joaquin Powerhouse No. 1 (later renamed A. G. Wishon Powerhouse) was constructed adjacent to the original plant. Development continued during that decade, and by 1920, SJLPC was operating 11 powerhouses and an increasing number of transmission lines throughout the San Joaquin Valley. The mounting power needs of the San Joaquin Valley over the subsequent decade prompted the company to increase its capitalization to $150 million on March 10, 1921 (Coleman 1952:195-99).

In 1924, the Western Power Corporation, holding company of the Great Western Power Company, purchased controlling shares of the SJLPC system. The deal paved the way to merge the two power systems but did not formally merge the companies or change management or operational personnel (*Fresno Morning Republican* 1924). As part of the merger, A. G. Wishon became SJLPC president and his son A. Emory Wishon became vice president while remaining general manager (Coleman 1952:292-93). At that time, the SJLPC had a service area of approximately 6 million acres in 7 San Joaquin Valley counties, providing power with 11 hydroelectric plants, 3 steam plants, and 5,500 miles of transmission line (*Fresno Morning Republican* 1924). In September 1925, the North American Investment Company obtained control of the Western Power Corporation and, therefore, control of the SJLPC. The SJLPC retained its corporate identity, but its system operations were coordinated with Great Western Power Company, both now managed by A. Emory Wishon (Coleman 1952:294).

In April 1930, PG&E acquired all the public utility interests of the North American Investment Company, including the Great Western Power Company, SJLPC, and Midland Counties Public Service Corporation (an SJLPC affiliate). The $650 million transaction was the largest ever recorded in California (*Gustine Standard* 1930). By acquiring the SJLPC and Great Western Power Company, PG&E attained the capacity to provide gas and electric services throughout Northern California. Also, in 1930, A. Emory Wishon became president of the SJLPC and his father A. G. Wishon retired as president to become vice-chairman of the board of directors. PG&E and the SJLPC did not fully merge until 1938 when PG&E's San Joaquin Power Division was established (Coleman 1952:297; *Visalia Times-Delta* 1936). By then, A. G. Wishon had passed away. His June 1936 obituary acknowledged the efforts he made to power the region, particularly his critical role in developing the San Joaquin Valley's rural electrification: "Farms, cities and towns, industries and oil fields are now served by the vast electrification built up by Mr. Wishon (*San Francisco Examiner* 1936). As reported by the *Fresno Morning Republican*, "For more than two decades [A. G.] Wishon worked building up this organization until the entire [San Joaquin] Valley was unified under the San Joaquin Corporation" (*Fresno Morning Republican* 1929).

<u>Regional Hydropower Development During the Twentieth Century</u>

Early Hydroelectric Development on the North Fork Kings River

The Balch Plant, built as the first unit of the larger Kings River Project, was completed in February 1927, and is now licensed under the Balch Project, FERC Project No. 175. Upon completion, Balch boasted the "highest headwater in the United States," and its original powerhouse (Balch No. 1 Powerhouse) reportedly contained the largest capacity generator of its type (Geiger 1928:122). In addition, the installation of the original penstock (Balch No. 1 Penstock) was regarded as a feat of engineering due to the steepness of the canyon walls, the implementation of a specially constructed tramway, and the novel process of embedding a penstock section in the riverbed. California newspapers and national engineering journals regularly reported on Balch's construction progress. *Scientific American* featured the Balch powerhouse in a February 1928 article entitled, "America's Greatest Water-Wheel," while the local *Fresno Bee* touted Balch "as spectacular a piece of engineering as can be found anywhere" (Geiger 1928:122-24; Elliot 1926).

As described by SJLPC,

> The Kings River project of the San Joaquin Light and Power Corporation is spectacular because of the extremely high altitude of its storage and the unusually high heads under which its plants will operate. It will be remarkably efficient because of its possibilities of huge water storage, and its comparatively cheap construction, and particularly because it will deliver its power over a main transmission line only thirty-nine miles long (SJLPC 1925c:1).

Developing the Kings River for hydropower was anticipated to meet the San Joaquin Valley's expected population growth and associated power demand for the coming decades. In 1926, the *Fresno Bee* described the development as having "primary significance," because the completed project would eventually supply power for a population four times greater than that of the San Joaquin Valley at that time (Warren 1926). In addition to the growing population, new factories and expansion of existing industries was driving the area's increasing demand for electricity. SJLPC anticipated that by 1936, about a decade after the Balch unit's expected completion date, the valley would require the entire Kings River project output to meet demand. SJLPC engineers had planned to place the final Kings River plant in operation by 1936 (Warren 1926).

The Kings River project originally contemplated construction of 4 reservoirs, 9 powerhouses, 14 dams, and 40 miles of conduit, with an estimated cost of $45 million (Jourdan 1926:13; *Fresno Bee* 1926). The six powerhouses planned for the North Fork Kings River would be Wishon (formerly San Joaquin Powerhouse No. 1), Balch, Haas, Kings River, Helms, and Junction. Of those planned for the North Fork Kings River, Junction was never constructed. The three powerhouses planned for the West Fork Kings River (Dinkey Creek) would be Peart, Meyer, and Farnham; however, none of those facilities were constructed (SJLPC 1927:11).

While SJLPC conducted preliminary work on the Balch Project, other San Joaquin Valley power projects were underway, as well as irrigation-related legislation and the ongoing Kings River project licensing process. By 1920, five powerhouses had been completed, as well as the Kerckhoff Reservoir and Dam (Westman n.d.). Part of what facilitated the construction of these reservoirs and powerhouses was the need for inexpensive power to help promote irrigation in the San Joaquin Valley. However, it was determined that the development of hydroelectric power had to be regulated to prevent power companies from claiming all the water rights. Therefore, the California State legislature enacted several laws in 1911 to that end. One law declared all water public property and limited appropriations for hydroelectric power at the discretion of a committee with only publicly owned utilities being exempt. Another law required the filing of extensive applications for obtaining permits with review by a five-member board, as well as the annual filing of financial statements (Turrentine and Pisani 1983:237-238).

A few years later, the Pine Flat-Kings River Conservation District Act was passed, which led to a movement to develop Pine Flat Dam and form irrigation districts throughout the San Joaquin Valley (McFarland 2015). Wishon and his associates recognized that the area's hydropower development was bound to local irrigation-related issues. In order to address the concerns of irrigation interests, upstream reservoir construction with the intent of providing water storage for irrigation and other uses on the upper Kings River would require a downstream reservoir to re-regulate water releases through the powerplants. Wishon proposed to the irrigation districts and canal companies that the SJLPC pay to construct Pine Flat Dam. In exchange, Wishon would construct an associated powerhouse for power generation without further charge. This plan required that Wishon negotiate with each district and canal company on the river, and the irrigation entities initially rejected the plan. Later negotiations resulted in an agreement that led to eventual construction of the Balch project, the first unit of the Kings River project (Palmer 1955:39-41).

During the 1920s, the San Joaquin Power Company purchased or merged with numerous entities throughout the region and reorganized as the SJLPC. A formal application for the Kings River project was submitted to the newly established Federal Power Commission (FPC) in December 1920; however, the FPC license limited initial construction to one-quarter of the Balch powerhouse's proposed capacity. Construction of the rest of the project was contingent on erection of the Pine Flat Dam to establish a regulatory reservoir. Another condition of the license was that the Kings River irrigation interests enter into an agreement for the operation of the Balch Powerhouse and that the powerhouse be operated under the direction of a State water master. Plant plans were altered to enhance stream-flow operations permitted by the FPC license (Palmer 1955:41-42).

In 1922, the company was granted a 50-year license for hydroelectric power development on the North and West Forks of the Kings River. On April 11, 1924, SJLPC applied for an amendment to the Project No. 175 license to include the Project No. 102 facilities within the Project No.175 license. The amendment was authorized by the FPC on January 28, 1926, about a year before Balch was placed in commission (PG&E 1970: Exhibit Q). Development of the Kings River project was facilitated by settling decades old legal disputes by dividing the waters of the Kings River in an equitable manner for both power and irrigation purposes. Additionally, the operation of hydroelectric powerhouses was only allowed if they did not interfere with the normal flow of the river to the satisfaction of the Kings River watermaster who represented the irrigation districts (*Madera Daily Tribune* 1968). That was a critical condition as, by the time Balch was under construction, the San Joaquin Valley had hundreds of miles of canals that supplied Kings River water to irrigate over 400,000 acres of land (Geiger 1928:122). Thus, when the Balch plant was placed in service in 1927, it operated under direction of the Kings River watermaster (Palmer 1955:42).

Mid-Century Development Along the North Fork Kings River

By 1930, Kerckhoff had retired and was replaced by A. G. Wishon's son, A. E. Wishon, who served as director and executive Vice President of PG&E after the merger with the SJLPC (Westman n.d.). PG&E subsequently began working on a complex agreement with the irrigation districts and the U.S. Department of the Interior, Bureau of Reclamation (Reclamation) to transfer water from the San Joaquin River to the Kings River. This would allow water to be stored in planned reservoirs for the Kings River project rather than being continually released for irrigation (*Madera Daily Tribune* 1968).

On March 28, 1934, SJLPC applied to the FPC for abandonment of parts of the Kings River project, retaining only the Balch, Wishon and Haas developments. The FPC approved the request on July 19, 1935. The Wishon and Haas developments were then eliminated from the project on June 8, 1937, leaving only the Balch development as a licensed project. On December 31, 1938, SJLPC merged with PG&E and the existing license for the project was transferred to PG&E on November 22, 1939 (PG&E 1970: Exhibit Q).

Pine Flat Dam was key to hydropower development for the Kings River project. In 1944, Congress authorized the USACE to build Pine Flat Dam, and two years later, construction began following appropriation of initial funds. During construction, the dam and reservoir were incorporated into the federal Central Valley Project. At the same time, the California Legislature passed the Kings River Conservation District Act, creating an agency to act on behalf of all regional irrigation districts. The dam was completed and dedicated in 1954, enabling the first water storage to occur (*Madera Daily Tribune* 1968; Provost 2013:7-8; McFarland 2015; KRCD 2020).

Meanwhile, in 1948, PG&E filed an application with the FPC to expand the facilities along the North Fork Kings River to create more capacity and proposed amending the FPC license to incorporate several changes. The new expansion program involved construction of the underground Haas Powerhouse, upstream of Black Rock Reservoir, and construction of the Kings River Powerhouse at the head of Pine Flat Lake, as well as water conveyance structures and other associated facilities. PG&E's design required storing water in the two new reservoirs impounded by the Courtright and Wishon dams (completed 1962). PG&E's application with the FPC was resubmitted on September 20, 1955, with a design that would increase power generation (FPC 1958:958; PG&E 1970: Exhibit Q). The revised application was approved on June 1, 1956, and construction began immediately (PG&E 1970: Exhibit Q). The general contractor was a joint venture of Morrison-Walsh-Perini (Ellingson 1956). Until the expansion, Balch had been the only power development on the Kings River for nearly 30 years.

The Courtright and Wishon dams were completed in 1958, after three years of construction, as primary components of the Haas-Kings River Project (FERC No. 1988) (*Madera Daily Tribune* 1968; PG&E 2021:3.9-24). After completion, Courtright Lake

(8,170-foot elevation) served as a storage reservoir and released water to Lake Wishon (6,545-foot elevation) three miles downstream, without power generation. From Lake Wishon, the water was conveyed through a 6.2-mile tunnel to a 5,510-foot-long penstock. The penstock extended down the mountain before initiating a 500-foot vertical drop to the underground Haas Powerhouse (1959), the nation's first large-scale underground powerhouse. From Haas Powerhouse, the water flowed to Black Rock Reservoir. As part of the Hass-Kings River Project, the Balch Diversion Dam, which impounds Black Rock Reservoir, was raised approximately 40 feet to expand capacity for the increased water flow. Water would continue through a tunnel until transitioning into the existing Balch No. 1 Penstock (1927) and the new Balch No. 2 Penstock. Balch No. 1 Penstock would continue to supply the Balch No. 1 Powerhouse (1927) and the Balch No. 2 Penstock would supply the Balch No. 2 Powerhouse. From the Balch powerhouses, the water would flow into the raised Balch Afterbay Dam (the afterbay dam bridge was removed), through tunnels and into a penstock to the Kings River Powerhouse at the upper end of Pine Flat Lake (*Selma Enterprise* 1956). In June 1959, the Haas-Kings River Project's new $80 million facilities were dedicated at a ceremony attended by 500 guests that was held at the Balch powerhouse site (*Fresno Bee* 1959).

The Haas-Kings River Project, including construction of the Kings River Powerhouse, was completed in 1962 (*Madera Daily Tribune* 1968; McFarland 2015). On July 27, 1972, the original 50-year license for hydroelectric development along the Kings River expired. From 1972 to 1980, PG&E operated under annual licenses to continue ongoing development such as the Helms Pumped Storage Project (PSP) (PG&E 1980:1-2). On April 18, 1980, the project was formally relicensed (FERC 1980; PG&E 1970: Exhibit R). The Haas-Kings River Project No. 1988, Helms PSP No. 2735, and the Balch Project No. 175 are separately licensed, but are operated in close coordination and are collectively considered a "complete unit of development" (FERC 1980; PG&E 1984). In 1984, the KRCD constructed a power plant at the base of Pine Flat Dam.

Late Twentieth Century Development Along the North Fork Kings River

Helms Pumped Storage Project

By the late 1960s, PG&E recognized a need for "quick load on reserve to backup existing and planned large generating units and to satisfy additional peaking capacity requirements expected in the late 1990s" (Paul 1989:9). PG&E co-developed a design for what would become the Helms PSP and the Diablo Canyon Nuclear Power Plant (DCNPP). DCNPP was designed to operate at a steady rate around the clock, while Helms PSP would generate power during peak demand periods. During off-peak periods, Helms PSP generating units would reverse to pump water from Lake Wishon, the lower reservoir, to Courtright Lake, the upper reservoir. This pumping function required four units of electricity for every three units that Helms PSP generates; however, DCNPP would provide inexpensive energy for the pumping function to make the system efficient.

PG&E selected the existing Courtright Lake and Lake Wishon as the upper and lower reservoirs for Helms PSP based on the reservoirs' "high elevation differential and relatively short horizontal separation" (Paul 1989:9). At that time, water from Lake

Wishon was conveyed through a tunnel and penstock to PG&E's underground Haas powerplant, then farther downstream through PG&E's Balch and Kings River powerhouses (*Lemoore Advance* 1973). Like the Haas Powerhouse, the Helms Powerhouse was constructed underground. However, the two powerhouses had notable distinctions. As PG&E's first pumped storage hydroelectric plant, Helms PSP was designed for a 1,125,000-kW capacity, compared to Haas, a conventional hydroelectric facility with 144,000 kW capacity. In addition, PG&E constructed the Helms Powerhouse at twice the underground depth of the Haas Powerhouse. Furthermore, the Haas plant transformers were aboveground, as opposed to the Helms plant where the transformers were located in an underground chamber on the main powerhouse floor (Kuhn 1976).

On September 24, 1973, PG&E filed an application for a major license under Section 4€ of the Federal Power Act (16 U.S.C § 797[e]) to authorize the construction, operation, and maintenance of the Helms PSP. PG&E sought to amend the existing license for the Hass-Kings Project to reflect the construction of the Helms PSP due to the use of the existing Courtright Lake and Lake Wishon, which are components of the Hass-Kings River Project (PG&E 2021:3.9-24). FERC granted the license in May 1976 and the California Public Utilities Commission (CPUC) certificate was received in June 1976 (Zayakov et al. 1985:47).

The project was named after Helms Creek, a tributary of the North Fork Kings River and a major water source for Courtright Lake. The project would link Courtright Lake and Lake Wishon through a tunnel, with the underground powerhouse near the tunnel's lower end. During off-peak hours, water from Lake Wishon would be pumped to Courtright Lake using available power from PG&E's integrated electric system. During peak periods, water would be released by gravity flow from Courtright Lake to Lake Wishon to "generate quick response peaking power" (*Lemoore Advance* 1973; *Reedley Exponent* 1976). Helms PSP was regarded as the "sister project" of PG&E's DCNPP in San Luis Obispo County, which would provide less expensive nuclear energy to Helms PSP for off-peak pumping of water from Lake Wishon to Courtright Lake (Hardcastle 1980; Bigham 1980).

<u>Pine Flat Power Plant</u>

History

Kings River Conservation District (KRCD)

The Kings River historically flowed to Tulare Lake. During periods of high-runoff, water traveled through the lower Kings River to the San Joaquin River, then to the Sacramento River Delta, and flowed into the San Francisco Bay. Until recently, Tulare Lake was largely drained to divert water for commercial and residential use. The first recorded irrigation diversions from the Kings River date to the 1850s. Between 1860 and 1880, substantial diversion structures and irrigation canals were constructed, and by the early 1900s, all of the Kings River's normal flows had been vested in private ownership by local water users (Barnes 1977:9).

The Kings River Water Association (KRWA), formed in 1927, was comprised of locally owned and operated public water districts and mutual water companies that generally administered the waters flowing into the Kings River (Barnes 1977:9).

In 1937, the USACE proposed construction of Pine Flat Dam and Lake as a flood control project even though Reclamation regarded the proposed dam and reservoir as an extension of the developing Central Valley Project. In December 1944, Congress approved the Flood Control Act, which specifically authorized the USACE to build Pine Flat Dam and for KRWA member units to pay for the irrigation storage benefit (KRCD and KRWA 2009:9-10). With regard to the Kings River, the act stated, in part, that:

> The division of costs between flood control, and irrigation and other water uses shall be determined by the Secretary of War on the basis of continuing studies by the Bureau of Reclamation, the War Department, and the local organizations (Flood Control Act of 1944 – Sec. 10:810).

In 1946, Reclamation was tasked with negotiating contracts related to dam construction and payment for irrigation storage benefits. The USACE, which began construction of Pine Flat Dam in 1949, decided to retain complete authority over flood control and to allow the Kings River watermaster to control conservation storage and releases (KRCD and KRWA 2009:9-10).

The KRCD was formed by California's Kings River Conservation District Act of 1951 (Act). Upon formation of the KRCD, KRWA's authority and functions were transferred to KRCD. The impetus for establishing the KRCD was to create a single public agency for managing the entire Kings River irrigational service area, including Pine Flat Lake water storage contract negotiations previously managed by Reclamation. KRCD's jurisdiction included the Kings River service area, except for cities outside of existing irrigation districts. Later changes to the KRCD Act excluded all incorporated cities (KRCD 2019; Provost 2014: 41). In 1954, the year in which Pine Flat Dam was completed, the KRCD and Reclamation entered into a one-year storage agreement. The agreement, which enabled the KRCD to repay the Pine Flat Dam's construction costs, required water consumers to pay $1.50 per acre-foot of water released from storage, not including flood releases (Provost 2014:52). Between 1954 and 1963, KRCD played a critical role in Pine Flat Lake contract negotiations, representing water users in contracting with Reclamation for water storage agreements (KRCD and KRWA 2009:9-10).

The Act provided KRCD flexibility in meeting the region's dynamic water requirements. The Act also enabled KRCD to furnish water and power; acquire and dispose of property; construct water works facilities; appropriate and conserve water; maintain actions involving water rights; incur debt; enter into contracts; issue bonds; cooperate with the U.S. government; and control flood water (KRCD 2019).

Following the Act, the KRCD continued negotiations with Reclamation regarding whether Reclamation would exercise Reclamation Law over the Kings River and whether any exercise of powers should continue after KRCD had paid in full for the Pine Flat Dam's construction. In October 1982, the Reclamation Reform Act exempted Pine

Flat Dam (and all other USACE-constructed dams) from Reclamation Law (Provost 2014:44). By 1987, 18 small dams blocked the Kings River beginning at Pine Flat Dam and continuing to the San Joaquin River, with 61 canals and ditches intersecting with the river for irrigation purposes (Palmer 1987:20).

Today, KRCD activities are diverse, with responsibilities in flood control, hydroelectric power generation, improved water management and efficiency, environmental and regulatory oversight, and groundwater management. Additionally, the KRWA continues to function as a non-profit organization overseeing irrigation water distribution of its 28 member agencies as well as assisting its members to meet the Sustainable Groundwater Management Act goals.

Pine Flat Power Plant

The Pine Flat Power Plant, completed in 1984, was rededicated in 2004 as the Jeff L. Taylor Pine Flat Power Plant after long-time KRCD general manager Jeff L. Taylor. The plant was engineered by International Engineering Company, Inc. (IECO). IECO was established in the early 1950s by the Morrison Knudsen Company, Inc. (MK) as an

In 1973, KRCD contracted with IECO for a comprehensive study of water issues within the KRCD service area (IECO 1974; KRCD 1974:B-1). The 1973-1974 study concluded that modernizing the service area would result in more water available for irrigation, improved flood control activities, and the potential for power generation (IECO 1974:S-1). The study proposed five power developments, consisting of powerhouses at Pine Flat Dam, Piedra Afterbay Dam, Dinkey Creek, Rodgers Crossing, and Mill Creek. The five developments would collectively constitute the “Kings River Hydroelectric Project”; however, only the Pine Flat Power Plant was actually constructed (IECO 1974:S-2, S-3; IECO 1975:I-1).

IECO determined that hydroelectric power generation would benefit growing statewide energy needs and potentially facilitate electric water pumping at groundwater wells throughout the KRCD service area, thereby justifying the cost of powerplant construction (IECO 1975:III-1).

In 1974, the KRCD applied to the FPC for a preliminary permit to construct a powerhouse at the Pine Flat Dam site (KRCD 1974:1). IECO engineered the plant using specifications influenced by the 1973-74 study. The Pine Flat Power Plant already had the necessary penstock connection points embedded within the existing dam, which facilitated construction (IECO 1974:V-2). The powerplant design called for the use of local alluvial deposits, which contained material suitable for concrete aggregate. The deposits were found along the Kings River and the lower valley of nearby Mill Creek. The design also required an extension of the three existing 13-foot-6-inch penstocks embedded within the dam, and a new penstock measuring 12 feet in diameter (IECO 1974:V-5, V-6).

DWR agreed to purchase the power generated at the dam for the State Water Project (SWP). The SWP utilizes power generated at powerplants throughout the state to offset costs of conveying water for commercial and residential use. By 1978, the SWP required additional power sources for long-term reliability and growth. DWR obtains power through the CAISO market and power purchase agreements to meet the power demand. To support the SWP operations, nine powerplants were constructed and connections to multiple additional power facilities were incorporated. However, the power purchases required to meet the SWP pumping load demand exceeds the power generated and sold by all power generating facilities operated by DWR. In order to transmit the power generated at the Pine Flat Power Plant, DWR constructed a 0.8-mile transmission line (FERC Project No. 2876) from the powerplant to an existing PG&E transmission tower and power grid connection point for the Balch No. 2-to-McCall 230-kV transmission line (DWR 2019; KRCD 1978:x-xii, I-4, A-5). The transmission facilities are not owned, maintained, or licensed by KRCD.

In 1991, fishery groups filed a “public trust” complaint with the State that required a 300,000 acre-foot minimum pool and a 250 cfs minimum release from Pine Flat Dam. Negotiations with fishery interests concluded in 1996 and in 1997, in coordination with the management of their three upstream reservoirs, PG&E agreed to allow a minimum pool of 100,000 acre-feet within Pine Flat Lake (Provost 2013). Structural modifications to the powerplant were necessary to manage water temperatures. Between 2001 and 2003, a turbine bypass was constructed for the penstocks to comply with the agreement (USACE 2001:2). The turbine bypass, completed in 2003, can divert water from the penstocks into the Kings River to maintain suitable water temperatures for fish (Provost 2014:140).

Descriptions

The Pine Flat Power Plant, also known as the Jeff L. Taylor Powerhouse, was constructed between 1982 and 1984 and consists of the powerhouse structure, approximately 50 feet of penstock piping, and the switchyard located on the powerhouse’s upper deck.

Jeff L. Taylor-Pine Flat Power Plant (Jeff L. Taylor Powerhouse)

The powerhouse has five levels: (1) switchyard and 27-ton gantry crane; (2) generator tops and control room; (3) generators; (4) turbines; and (5) the penstock gallery. The following paragraph describes the primary features at each of the five levels.

At the powerhouse’s upper deck is the switchyard, a 27-ton gantry crane, and a concrete-clad entrance for the powerhouse interior. The switchyard features three primary 138-kV, single-phase step-up transformers. Below the switchyard is the control room, break room, machine shop, and an open-air space where the generator tops are visible from outside the powerhouse. Below the control room are three Hitachi generating units, which were manufactured in Japan in 1982. Each generating unit has a 61.10 MVA/70.28 MVA capacity, 257.14 RPM speed, 13.8 kV rated voltage, and a frequency of 60 HZ. Each of the three units consists of a vertical shaft with thrust, one guide bearing above the rotor, one guide bearing below the rotor (suspended type). The turbine level contains the three 55 MW, 76,000 HP Hitachi brand Francis-style turbines. Units 1 and 2 were manufactured in 1981, and Unit 3 was manufactured in 1982. Each turbine is composed primarily of steel with hydraulic components, copper and steel piping, and a solid steel shaft connecting to the generating unit above. The penstock gallery interior contains the penstocks' lower cones, where water exits the turbines and flows to the tailrace. The penstock gallery exterior, at the powerplant's west elevation, is the tailrace output, which consists of the three turbine exit portals where water is discharged into the Kings River. The tailrace extends approximately 250 feet to meet the river's downstream flow.

The three short, riveted steel penstock pipes (Penstocks 1, 2, and 3) measure 12 feet in diameter, connect to the dam's west face, and submerge belowground to power the three Francis-style turbines. Between 2001 and 2003, a turbine bypass was constructed to divert water from the penstocks to the Kings River in order to maintain suitable water temperature for the fishery.

Pine Flat Dam

Pine Flat Dam was constructed between 1947 and 1954 by the Corps. The original midcentury dam design contemplated future hydropower functions, which ultimately began in 1984 after completion of the Pine Flat Power Plant. When completed in 1954, the dam incorporated several components that anticipated the construction of a powerhouse:

- Three hollowed, steel-lined dam openings with a bulkhead on the east face of the dam.
- Three ventilation holes embedded in the dam's west face, near the crest, for use as air vacs once the penstocks were installed.
- Three recessed niches (hoist rooms) on the dam's east face to house future inlet equipment.
- A concrete breast wall located 40 feet below the reservoir water line that attached to the dam's east face and would support the intake gates.

Pine Flat Power Plant Intake Structure

The powerhouse intake, constructed between 1982 and 1984, is located on the dam's east side within Pine Flat Lake. The intake incorporates a steel trolley structure attached to the dam's east face for the vertical hoisting of trash racks, stop log gates, and emergency gates. The intake also consists of associated hydraulic equipment, as well as the steel railing, stairs, and catwalk attached to the dam's east face for accessing the intake structure and equipment niches. Each of the three penstock openings within the dam is controlled by two (17 stem) wicket gates and shielded by stop logs. Equipment associated with the intake controls was manufactured by Mitsubishi of Japan (gate position gages); Nippon Electric Industry of Japan (opening indicator); and Barksdale of Los Angeles (gate hoist hydraulic piston unit).

Pine Flat Power Plant Unit 4

In 2021, KRCD filed a Non-Capacity License Amendment Application with FERC to add a fourth turbine-generating unit to the Project. The unit ("Unit 4") will primarily utilize flows of 375 cfs that cannot be used to generate power in the existing powerhouse and are currently discharged through the Bypass System. Unit 4 may also operate concurrently with the existing powerhouse to provide additional generation and capacity during times when the Bypass System would not normally be in operation. The new unit will increase the generating capacity of the Project by approximately 6.3 MW from 165 MW to 171.3 MW, an increase in name-plate generation capacity of 3.8 percent. The new unit will not increase the existing 8,000 cfs maximum hydraulic capacity of the Project. Unit 4 includes: 1) a 66-inch-diameter extension from the existing Bypass System's Units 1 and 2, 66-inch-diameter pipe; 2) an outdoor Unit 4 Powerhouse that contains a 6.3 MW Francis turbine and associated generator; 3) a generator lead and a step-up transformer consisting of one 6.6 mva, three-phase unit at the new powerhouse; and 4) appurtenant equipment.

On May 3, 2023, the Commission issued an Order Amending License[1] that approved the addition of a new turbine-generator unit (i.e., Unit 4) to the Project. KRCD anticipates the new unit will be constructed, tested, and fully operational by approximately late 2025. For the purpose of this PAD, Unit 4 is treated as a part of the "existing Project."

3.12.3 Archaeological and Historic Built Environment Resources in the FERC Project Boundary

Lands within the FERC Project Boundary have been surveyed for archaeological resources as recently as 2019. No sites were located within the FERC Project boundary. One site, CA-FRE-665, is located adjacent to, but outside of the FERC Project boundary. The site was previously determined not eligible for listing in the NRHP and there is no indication that a subsurface component was identified at the site.

[1] FERC's Order Amending License is available in FERC's eLibrary at accession number 20230503-3104.

3.13 TRIBAL RESOURCES

The existing FERC Project boundary and surrounding area are traditional and ancestral lands and waters of Foothill Yokuts peoples. The following section provides cultural-environmental context pertinent to the current state of the existing environment as it relates to Tribal resources. This section also discusses potentially affected Native American Tribes, Lands, and Interests.

3.13.1 Cultural-Environmental Context

For Native peoples of North America, *where* traditional events, practices, and lifeway processes have occurred are often much more important than *when* they have occurred. As this suggests, geography—and the stories, songs, prayers, and other traditions that tie intimately and indelibly to place—simultaneously speaks to history and time.

Yokuts history tells of creation, a time when the world was flooded. Eagle and Crow were flying, looking for a place to land. Eagle and Crow asked Duck to bring up mud from the water, which became land. The place of creation is the Sierra Nevada Mountains and the Coast Mountain Range (Kroeber 1907:204-205; Kroeber 1925:510). Geographical formations of these events continue to serve as landmarks and educational lessons on cosmology and transformation integral to everyday functions and capacities for Yokuts peoples.

From time immemorial, unique ancestral and traditional cultural land/waterscapes have provided capacities, functions, meanings, power, and life to Yokuts peoples for navigating processes of change through cultural compasses and traditional knowledge systems of continuity. The Yokuts ancestral and traditional use area includes the entire San Joaquin valley floor, inclusive of the western barren range before the Coast Range; the sloughs, King and San Joaquin Rivers, and Tulare, Buena Vista, and Kern Lakes; the oak-covered eastern edge of the *tular;* and the foothill lands meeting with the Sierra Nevada (Kroeber 1925, Gayton 1948). With reference to the geographic zones of the larger ancestral and traditional use area, Yokuts peoples are often identified as Valley Yokuts and Foothill Yokuts. As stated above, the Project is situated within the traditional and ancestral lands and waters of Foothill Yokuts peoples, specifically the Choinumni tribe. The Choinumni[1] Yokuts traditional cultural land/waterscape is situated “along Mill Creek from the junction of its north and south forks to its union with Kings River” and envelopes the Project area (Gayton 1948:143; see also Kroeber 1925:474, Spier 1978:437, and Figure 3.13- 1 and Figure 3.13-2).

[1] Alternatively spelled “Choinimni” by some sources, including Gayton (t1948) and Kroeber (1925). Spelling in this section is in following local Tribal governance conventions as “Choinumni.”

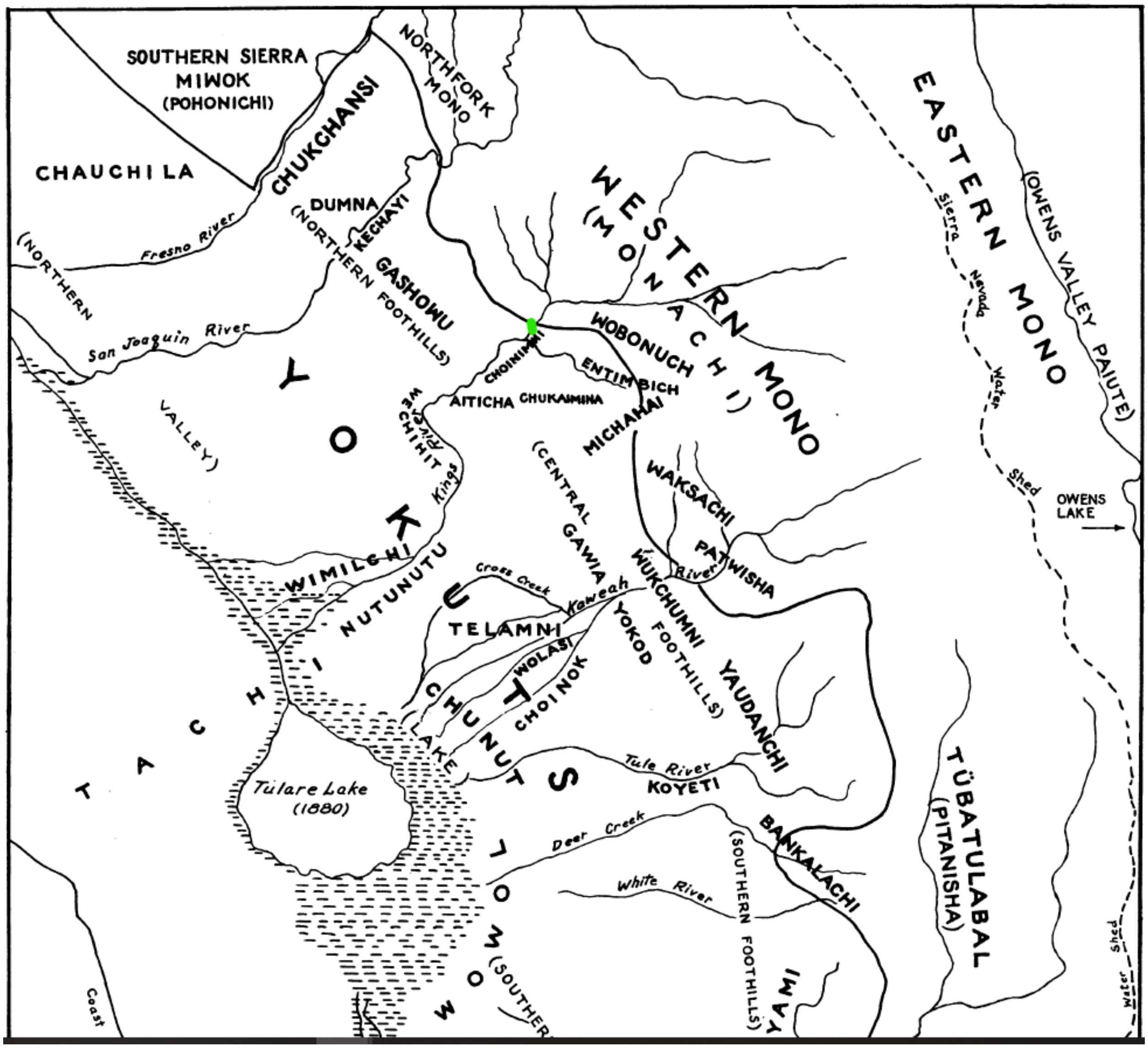

Figure 3.13-1. Excerpt of “Map 1. Yokuts and Western Mono tribes” (Gayton 1948). The green dot represents the general Project area.

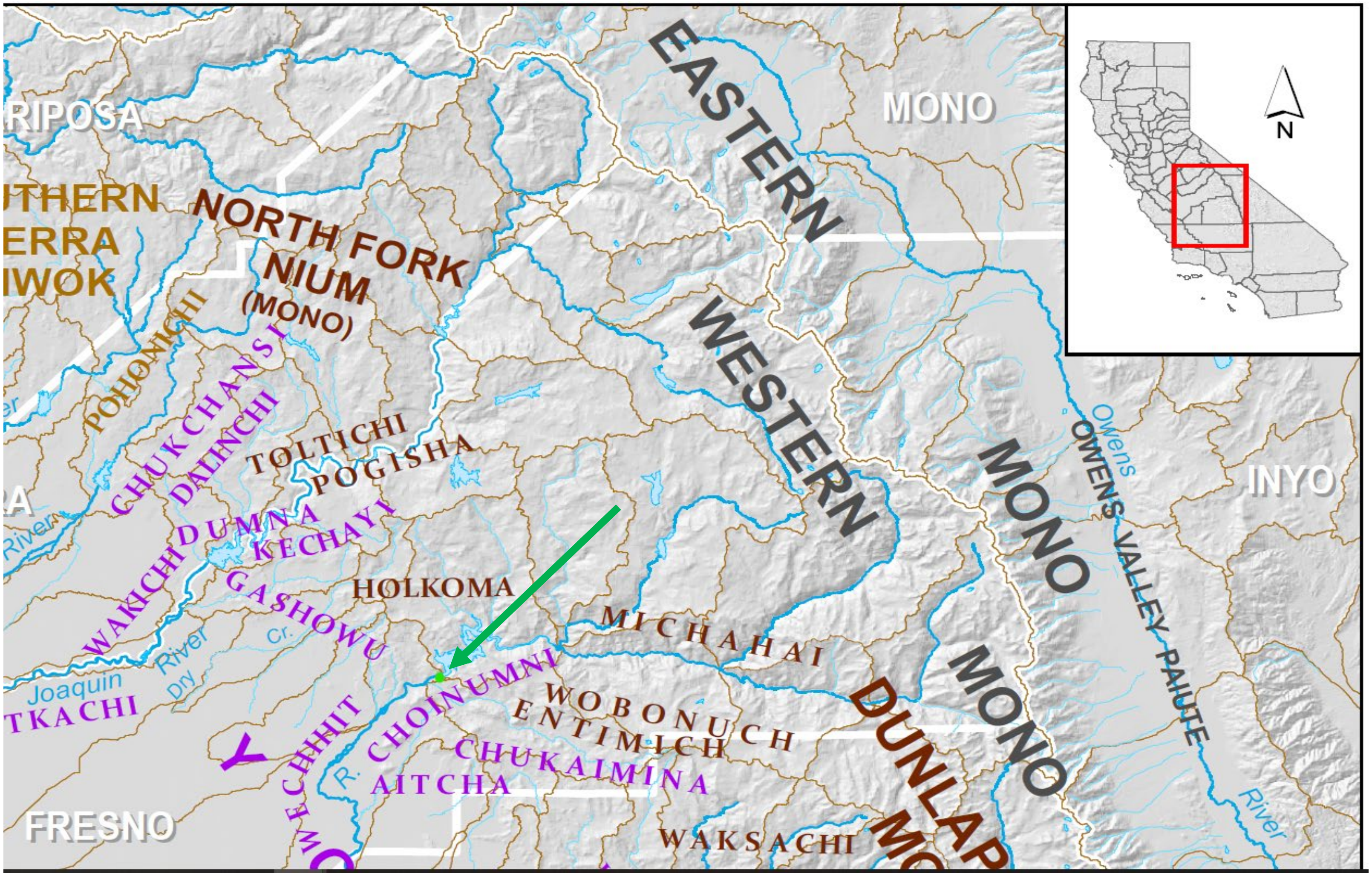

Figure 3.13-2. Excerpt of "Historic Tribal Groups of the South Central Homeland" prepared by the California Department of Water Resources, South Central Region Office; note the specific identifier for Choinumni.[2] The green dot represents the general Project area.

[2] Available online at https://www.lessonsofourland.org/wp-content/uploads/2017/08/HistoricalTribalGroupsSouthCentralHomeland20110719.pdf.

Native identity and relationships to the environment are partially defined by linguistics (Silverstein 1996; Kroskrity 2009, 2018).The Yokuts language is included in the broader Penutian family, a diverse group of languages including Miwok, Costanoan, Maiduan, and Wintuan (Silverstein 1978). The traditional and ancestral lands and waters of the linguistically related Northern Valley Yokuts are situated to the north, and Miwok traditional and ancestral lands and waters lie to the north-northeast. Southern Valley Yokuts traditional cultural subsistence focuses on Tulare, Buena Vista, and Kern lakes that are fed by the lower Kings, Kaweah, Tule, and Kern rivers from the western slope of the Sierra Nevada. The lower elevations in the San Joaquin Valley have been home to Southern Valley Yokuts tribes. Traditional territories of a few localized Foothill Yokuts tribes are indelibly connected to the foothills. Higher elevations (typically above 3,000 feet) marked the transition to typical Western Mono territory. Yokuts, Mono, and Southern Sierra Miwok groups have shared an otherwise regionally unique moiety system of social organization and are traditionally multilingual, bringing forward the importance of recognizing "the practical significance of Indigenous patterns of multilingualism and the prescriptive force they exercise on contemporary and future linguistic adaptations of these communities" (Kroskrity 2018:11; see also Kroskrity 2009).

The Kings River and its tributaries have provided food (i.e., fish and waterfowl), riparian plants for gathering and basket making, and avenues of travel for small watercraft. Ancestral Yokuts villages are situated near major waterways and originally built on low mounds to prevent spring flooding. Villages were occupied for the majority of the year and abandoned for short periods as the residents left to engage in seasonal resource gathering (McCarthy 1995). Northern Foothill Yokuts, including the Dumna and Gashowu, located immediately to the north, may have entered the vicinity by way of the rough country forming a loose boundary with the central Foothill Yokuts. Yokuts traditionally have patrilineal lineages with two moieties. Yokuts patrilineal lineages are each associated with a totem such as Eagle, Falcon, Dove, Crow, Rattlesnake, Coyote, Bluejay or Cougar. The lineages belong to one of two moieties, translated as "upriver" and "downriver." A person's lineage influenced their social roles, with each moiety including a chiefly lineage (Spier 1978:471).

Hunters used both plain and sinew-backed bows. Most Yokuts bows were made by Mono people, from whom Yokuts procured them in trade (Spier 1978:474-75). Arrows were tipped with either locally available quartz or obsidian imported from Owens Valley or the Coast Ranges. The area remains important for hunting and for gathering plant foods and basketry materials.

Although California was relatively distant from the early-sixteenth century actions of explorers and conquistadors in Mexico, the smallpox epidemic introduced by Cortés and his army in 1519 reached mainland North America, and likely spread to California populations. The extent of this epidemic is not quantified, but later disease events decimated California Native populations, through waves of "Old World" diseases like smallpox, measles, influenza, and diphtheria. These epidemics killed thousands of enslaved and converted Native people at the California missions beginning in 1769, and effects proliferated to Yokuts populations as those escaping and fleeing from the missions brought diseases with them to remote hiding areas, and mission agents sought and captured some Foothill Yokuts as replacements for the dying and escaping (Preston 1996).

Spanish expeditions reached the hinterlands with frequent confrontations with Yokuts communities (Cook 1960, 1962). Relations between Native and non-Native people worsened with Mexico's acquisition of California once it won independence from Spain in 1821. Settlers arrived in Alta California to receive land grants. Some Native groups resisted, including the Yokuts and Miwok, who conducted guerilla raids on ranchos, often to steal horses (Castillo 1978:106). The 1830–1833 malaria epidemic was also devastating. According to Cook (1955), the population of interior tribes may have been reduced by 75 percent. Tribal communities were undoubtedly profoundly affected in every way and their social patterns were changed in ways that are not fully understood. Stories of the annihilation and decimation of Yokuts have been recounted by Gayton (1946, 1948) and Davis-King (2009).

After defeating Mexico in the 1840s, the U.S. acquired California through the signing of the Treaty of Guadalupe Hidalgo in 1848, giving the U.S. full ownership of California. As Americans flooded into California the same year the treaty was signed in response to the discovery of gold, indigenous populations were further displaced as prospectors and settlers sought to acquire land and mining claims. In response to resultant conflicts within the state, the U.S. Senate appointed a commission to negotiate with Native communities, resulting in the Camp Belt Treaty of 1851, signed by representatives of the "Holcumas and Tuhucmaches." These treaties promised the retention of some ancestral land and various farming aids in exchange for a majority of traditional territories (Theodoratus et al. 1985:40). These treaties were never ratified.

The Tule River War of 1856 consisted of a clash of nearby Yokuts groups with settlers encroaching on lands promised in the treaty. In a six-week period, the conflict escalated to include the California State Militia and a detachment of the army from Fort Miller. The heightened tensions extended to all groups in the area, regardless of their participation in raids. The Tule River Farm near Porterville was established in 1858, and became a federal reservation in 1864, housing local Tule River groups as well as Owens Valley Paiute who had been removed from their lands after the Owens Valley War of 1863. Nearby settlers soon objected to the reservation, resulting in the relocation of the Tule River Reservation in 1873. The reservation was established by a Presidential Executive Order of Ulysses S. Grant as a homeland for Tule River, Kings River, Owens River, Monache, Cajon and other scattered tribal groups.

In 1858, 200 Native people from the Kings River were relocated by the Fresno Indian Agency to the "Fresno Farm," located on the Fresno River (Theodoratus et al. 1985:46). The Fresno Farm was the nearest reservation to the Kings River people that had been created by the treaties; it lasted only until 1859. It never succeeded in any sense due to underfunding and corrupt agents. People left the reservation and returned to their previous homes (McCarthy 2011:20).

As a result of the Gold Rush, the lumber business became a thriving industry and "working in the woods" for these enterprises in the cash economy became a common career for many Native American men (McCarthy 2011). Men worked in many capacities such as limbers, fallers, and choker-setters. Some women worked in the kitchens at the lumber camps (Theodoratus et al. 1985:88–89). This work allowed people to return to their former territories.

Congress also passed the Indian Homestead Act of 1884 and the Indian Allotment Act of 1887 (aka the Dawes Act) which permitted Indians to obtain land legally for the first time. It was hoped that by allowing people to take individual allotments, larger groups could be separated into nuclear family farming units, which were seen as more appropriate for capitalism (Casey 2020; Garza 2015; Noguchi 2009). In many cases, however, people chose allotments near old villages or other culturally valued places and maintained their communities. Unfortunately, many allotments were lost, either through the sale of the property due to great financial need, or because they were ceded when taxes became due. Rancherias allowed people to continue to live on their traditional territories pursuing a mixed economy, with wages, gardens, and traditional foods supporting their livelihoods. This strategy was particularly successful when consistent jobs, such as logging, were locally available. When they were not, , the conditions were marginal for those who wished to remain in their homeland, and many communities were not afforded the opportunity to return.

Tribes continued to face pressures to abandon traditional religious and cultural practices through the twentieth century. Congressional and State mandates for reservation and rancheria termination as well as federal recognition status hurdles prevented equitable consideration, treatment, and support of Indigenous people. However, Tribes continue to steward their language, culture, traditions, and viable futures through various programs within their communities and Tribal governments. Several Tribes have been successful at gaining federal recognition of their sovereign nations, while others are not yet recognized. Networks of resilient Indigenous people and their communities continue their stewardship commitments to the natural-cultural environment that overlaps and envelopes the Project.

3.13.2 Native American Tribes and Lands

The traditional and ancestral lands and waters of Yokuts peoples include what are known by settler populations today as the Southern San Joaquin Valley and the adjacent Sierra Nevada. Southern Valley Yokuts traditional religious and cultural practice is indelibly connected to interrelated and interfunctional geographical areas of the Tulare, Buena Vista, and Kern lakes that are fed by the lower Kings, Kaweah, Tule, and Kern rivers from the western slope of the Sierra Nevada (Callaghan 1958; Gayton 1948; Spier 1978; Wallace 1978:448). The Kings River and its tributaries integrally sustain an environment of plants, animals, and minerals that in turn support places of intensive dwelling and homecoming and avenues of travel and trade since time immemorial.

Southern Valley and Foothill Yokuts-affiliated Tribes include (alphabetically listed)[3]:

- Dumna Wo-Wah Tribal Government
- Kings River Choinumni Farm Tribe
- Kitanemuk & Yowlumne Tejon Indians
- Picayune Rancheria of Chukchansi Indians
- Santa Rosa Rancheria Tachi Yokut Tribe
- Table Mountain Rancheria
- Tejon Indian Tribe
- Traditional Choinumni Tribe
- Tule River Indian Tribe
- Wuksache Indian Tribe/Eshom Valley Band

As discussed above in Section 3.12, preliminary outreach for the relicensing was sent via certified mail on July 16, 2019 to the following representatives and Tribes:

- Chairperson Robert Ledger Sr. of the Dumna Wo-Wah Tribal Government
- Stan Alec of the Kings River Choinumni Tribe
- Chairperson Rueben Barrios Sr. of the Santa Rosa Rancheria Tachi Yokut Tribe
- Chairperson Leanne Walker-Grant of the Table Mountain Rancheria
- Cultural Resources Director Robert Pennell of Table Mountain Rancheria

Robert Pennell, Tribal Cultural Resources Director for Table Mountain Rancheria, responded in a letter dated August 1, 2019, that the Rancheria is very interested in the Project as it lies within its cultural area of interest. HDR responded via email and telephone on August 14, 2019, acknowledging the Rancheria's interest in the Project and that further consultation would occur once the NHPA Section 106 compliance process was initiated during relicensing (Lloyd et al. 2020).

Additional outreach was conducted in April 2023 to contact Tribes listed above, as well as neighboring Tribes with potential interest and concerns for the Project, in accordance

[3] Cultural affiliations are self-reported by Tribes as listed with the State of California Native American Heritage Commission.

with “reasonable and good faith efforts” to identify Tribes to be consulted in the NHPA Section 106 process (36 CFR 800.2(c)(2)(ii)(A)). Phone calls and emails were made to provide initial information on the Project and an invitation to a meeting held on May 12, 2023. In addition to Tribes listed above, the following Tribes were contacted:

- Big Sandy Rancheria of Western Mono Indians
- Chicken Ranch Rancheria of Me-Wuk Indians
- Cold Springs Rancheria
- Dunlap Band of Mono Indians
- Nashville Enterprise Miwok-Maidu-Nishinam Tribe
- North Fork Mono Tribe
- North Fork Rancheria of Mono Indians

Of those Tribes contacted, the Dunlap Band of Mono Indians was the only Tribe to have a representative at the meeting on May 12, 2023.

No tribal lands[4] are located within the FERC Project Boundary. According to the United States Census Bureau and the California Native American Heritage Commission (NAHC) digital atlas (NAHC 2020), the closest tribal lands are Public Domain Allotment (PDA) lands held in trust by the government for Indian individuals or families. The PDA is approximately 4.0 miles east of the FERC Project boundary, and south/southeast of Pine Flat Reservoir adjacent to Zebe Creek.

3.13.3 Native American Interests

Indigenous communities do not draw dichotomies between “natural” and “cultural” resources. Natural resources used by tribal communities within the Central Valley/Sierra Nevada region that overlap with the Project include all waters, as well as the following plants (Lightfoot and Parris 2009):

Bear grass	Coffeeberry	Mountain mahogany	Sugar Pine
Big-leaf maple	Currants	Mugwort	Sunflowers
Black oak	Dandelions	Mushrooms, unidentified	Tarweeds
Blackberry	Deer grass	Native barley	Thimbleberry
Blue oak	Dogbane	Nightshades	Tobaccos
Bracken fern	Elderberry	Onions	Toloache
Brodiaeas	Foothill/gray pine	Oregon oak	Toyon
Buckbrush	Gooseberries	Pinyon pine	Tules

[4] The term "tribal land" means any land or interests in land owned by any Indian tribe, title to which is held in trust by the United States or is subject to a restriction against alienation under laws of the United States.

California bay	Goosefoots	Ponderosa pine	Turkey mullein
California blackberry	Incense-cedar	Raspberries	Valley/white oak
California buckeye	Interior live oak	Red alder	Western redbud
California hazel	Ithuriel's spear	Red maids	White fir
California maiden-hair fern	Juniper	Redberry	Wild oats
California wild grape	Laurel	Redbud	Wild rose
Canary grasses	Manzanita	Sedge	Willow
Canyon live oak	Mariposa lilies	Skunkbush	Wormwoods
Cattails	Milkweed	Snow bush	Yerba Aanta
Ceanothus	"Miner's lettuce"	Soaproot	-
Clarkias	Monkeyflower	Sour berry	-
Clovers	Mountain dogwood	Strawberries	-

Natural/cultural resources represented by animals include:

American coot	Ducks	Honeybee	Sacramento Sucker
Angleworms	Dusky grouse	Horseflies	Salmon flies
anta	Falcons	Jays	Squirrels
Band-tailed pigeon	Foxes	Loons	Steelhead Thicktail chub
Bears	Freshwater clams	Mourning dove	Sturgeons
Blackbirds	Freshwater pearl mussel	Owls	Tule Elk
Black-tailed deer	Geese	Pacific lamprey	Turtles
California gall wasp	Golden eagle	Polyphemus moth	Western rattlesnake
California quail	Gophers	Pronghorn	Western ridged mussel
Caterpillars	Grasshoppers	Rabbits	Woodpeckers
Ceanothus silk moth	Greater roadrunner	Rails	Woodrats
Chinook	Grebes	Rainbow trout	Yellow-billed magpie
Chipmunks	Hardhead	Ravens	Yellowjacket larvae
Crayfish	Hares	Sacramento perch	-
Crows	Hawks	Sacramento splittail	-

Minerals of natural/cultural importance include: basalt, chert, clay, hematite, magnesite, obsidian, salt, and steatite/soapstone (Lightfoot and Parris 2009).

A review of historic General Land Office (GLO) plats of the general FERC Project boundary noted an "Indian Rancheria" located northeast of the confluence of the Kings River and Mill Creek (approximately one mile downstream from present-day Pine Flat Dam). The rancheria was recorded on the 1879 GLO plat but is not present on the subsequent 1916 plat covering the same location. This rancheria is likely on the same location as the "Choinumni Cemetery," a dedicated and currently used Native American cemetery across the river from Fresno County's Choinumni Park and about one mile downstream of Pine Flat Lake.

Named places and features often reflect focal points in a culture: traditional religious and cultural importance is often reflected by some of the most durable and remembered place names. Anthropologist Keith Basso (1996) has detailed at length how named places impart the wisdom and lessons of Indigenous traditional knowledge and value systems. Anthropologist Peter Nabakov (2006:x-xi) has similarly identified how Native peoples often “named places to commemorate where the earliest mythic figures had played out their great adventures” and how “[t]hrough place-names … [they] staked user claims to … foraging areas, hunting grounds, fishing stations and historical and sacred locations.” Anthropologist Brian Thom (2005:197) expands on this, explaining that how Native place names function as “important linguistic devices for evoking and negotiating … attachments to place…. [and] are called on to engage social discourses outside the culturally in situ talk of landscape, myth and spirit and ex situ talk of identity and property.” Thom further (2005:197) observes that Native place names both “reflect ideas of territory” and convey “culturally implicit knowledge of land use, personal history, charter myth, and deep history.” Such expressions make “these names … powerful linguistic devices in social contexts” and they, along with associated cultural stories, function as “sophisticated linguistic tools that bind people to place” (Thom 2005:214). As this suggests, for Native people in general and Yokuts people specifically, place names and traditional history are often interrelated and symbiotic to the integrity and perseverance of the traditional religious and cultural importance of places and land/waterscapes that function and convey traditional cultural property/traditional cultural landscape significance.

Community historians, documentarians, cultural practitioners, and knowledge bearers have informed ethnographic investigations of the Choinumni Yokuts traditional cultural land/waterscape that overlaps the FERC Project boundary. Components of the traditional cultural land/waterscape within the vicinity of the Project include, but are not limited to: the Kings River, several Yokuts villages, a fishing camp, and cemetery (Gayton 1948; Hoover 1966). Components of the traditional cultural landscape that are near the Project have been partially identified through archaeological investigation as well, reporting at a minimum of four ancestral places that likely form a “larger complex of permanently occupied villages” (CA-FRE-1674H, CA-FRE-1675, CA-FRE-1676, and P-10-005296) outside of the FERC Project boundary (Meighan et al. 1988:137; Armstrong and DeCorse 1983; Armstrong and Kenton 1983; Draucker 1948; Fenenga 1948: 6-7; Hickey and Rechtman 1983; Monastero 2009; Powers 1877; Hodge 1912; Kroeber 1925; Gayton 1948). Within the Project area is an ancestral site archaeologically designated CA-FRE-665.[5] Although a site visit to CA-FRE-665 was conducted in 2019, and subsequent assessment incorporated previous documentation that stated the site was not considered eligible for the NRHP (FERC 1979; Lloyd et al. 2020; Varner 1976), Tribal expertise (36 CFR §800.4(c)(1)) on the significance of the resource was not considered or included in the resource assessment and thus remains a data gap.

[5] The 2019 field survey confirmed that the site’s identified archaeological components (three bedrock milling features) are outside of the FERC Project boundary. However, previous disturbance, limited access, and dense surface vegetation precluded a more thorough identification of associated archaeological constituents (if any).

Under the NHPA Section 106 process as outlined at 36 CFR § 800.16(l)(1), "historic properties" are defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the [NRHP] [… and] includes properties of traditional religious and cultural importance to an Indian tribe."[6] Historic properties are evaluated for their eligibility to the NRHP using specific criteria found at 36 CFR § 60.4. *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation* (Bulletin 15; NPS 1997) states that information and guidance on traditional cultural values and their associations to historic properties should be sought from National Register Bulletin 38, *National Register Guidelines for Evaluating and Documenting Traditional Cultural Properties* (Bulletin 38; Parker and King 1998). Designations of Traditional Cultural Properties (TCPs) and Traditional Cultural Landscapes (TCLs) serve as expressions of significance rather than NRHP property types, and which should be identified, evaluated, and assessed through the same considerations, professional standards, methods, and sensibilities as TCPs (Advisory Council on Historic Preservation [ACHP] 2012:2).

If a property that has TCP/TCL significance is evaluated as eligible or potentially eligible for listing on the NRHP, it becomes the responsibility of the lead federal agency, per 36 CFR §800.4(d) *et seq.*, to assess, in coordination or consultation with the community or communities for whom it is important, whether the proposed project actions and activities would have an adverse effect on it. In this context, it is important to note the importance of inclusion of Indigenous Knowledge (IK) of affiliated Tribes and that the ACHP stresses in their historic preservation guidance that:

> There are very different views [between Federal agencies and Native American Tribes] on *the treatment of effects* to traditional cultural landscapes. Non-native people tend to think in a linear fashion while native peoples tend to think cyclically. This difference in world view affects not only whether or not the significance of sacred places is understood but also how such places should be treated. These places are part of living communities and are their actual history (ACHP 2011:2).

As stipulated at 36 CFR §800.4(c)(1):

> The passage of time, changing perceptions of significance, or incomplete prior evaluations may require the agency official to reevaluate properties previously determined eligible or ineligible. The agency official shall

[6] As indicated in National Register Bulletin 36: *Guidelines for Evaluating and Registering Archaeological Properties* (Bulletin 36; Little et al. 2000), "[a]n archeological property may be 'prehistoric' (precontact), 'historic' (post-contact), or contain components from both periods. What is often termed prehistoric archeology studies the archeological remains of indigenous American societies as they existed before substantial contact with Europeans and resulting written records. The [NHPA] treats prehistory as a part of history for purposes of national policy; therefore the terms 'historic,' and, 'historical,' as used in [Bulletin 36], refer to both pre- and post-contact periods." As is done in Bulletin 36, the term "precontact" is used throughout this report instead of" prehistoric" unless directly quoting materials that use "prehistoric," quoting legislation or regulations.

> acknowledge that Indian tribes and Native Hawaiian organizations possess special expertise in assessing the eligibility of historic properties that may possess religious and cultural significance to them.

The Native American interests identified in this section as overlapping and enveloping the FERC Project boundary (e.g., natural/cultural resources including plants, animals, minerals, and tribal ancestral places, etc.) have not been identified as properties of traditional religious and cultural importance to an Indian tribe (i.e., historic properties), nor have they each been evaluated for their eligibility to the NRHP in accordance with guidance from Bulletin 15, Bulletin 38, nor the ACHP (2012) for TCP/TCL significance for those that may experience Project-related effects. In consideration of the framework and context provided above, the Licensees will coordinate with Tribes to better understand and consider the effects of the Project.

4.0 ISSUES AND PROPOSED STUDIES

In addition to this introductory information, this section is divided into three subsections. Section 4.1 provides KRCD's "data gap analysis", which includes a preliminary list of potential environmental issues that may need to be evaluated during the relicensing process. In addition, Section 4.1 identifies known Project effects[1] and existing, relevant, and reasonably available information regarding potentially affected resources that would inform an analysis of each identified potential environmental issue and requirements in a new license regarding the issue and, if there is a data gap, any relicensing studies[2] KRCD proposes to undertake to close the data gap. Section 4.2 describes Project O&M activities KRCD proposes to undertake as a condition (i.e., Protection, Mitigation, and Enhancement (PM&E) measure) of the new license for the purpose of: 1) protecting or mitigating impacts from continued Project O&M; or 2) enhancing resources affected by continued Project O&M (proposed PM&E measures). Section 4.3 provides a list of relevant qualifying federal and State of California comprehensive waterway plans and resource management plans.

4.1 DATA GAP ANALYSIS

4.1.1 Known Project Effects

KRCD is unaware of any existing, ongoing, unmitigated Project effects.

4.1.2 Identification of Study Needs

Identification of potential environmental issues is a key step in the relicensing process because the issues represent specific concerns or questions that may need to be addressed. Once environmental issues are identified, they can be evaluated, existing information relevant to the issues can be assessed for adequacy, and additional information and potential studies needed to augment existing information can be identified. Identified potential environmental issues may or may not ultimately warrant specific PM&E measures.

KRCD contacted agencies, Native American tribes, and NGOs on April 14, 2023, and requested a description of any issues they believed should be addressed in the relicensing and information, including studies they believed necessary to assess the

[1] In this PAD, consistent with the April 20, 2022, Council on Environmental Quality (CEQ) rule amending its regulations implementing the National Environmental Policy Act of 1969, an effect is a change to the human environment from the proposed Project (or alternatives) that is reasonably foreseeable and include direct, indirect and cumulative effects. Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Cumulative effects are effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. The CEQ is currently reviewing the July 16, 2020 amended rule.

[2] For the purpose of this PAD, a "*study*" is any data gathering effort to be undertaken by KRCD as part of the relicensing needed for KRCD, FERC and others to assess Project effects and inform proposed requirements in the new license. Studies may or may not include fieldwork, and do not include analysis of Project effects.

issues and inform requirements in the new license. No replies were received. KRCD’s April 14, 2023, outreach is provided in Attachment A to this PAD.

Table 4.1-1 includes a list of preliminary potential environmental issues KRCD believes are relevant to the Project relicensing. For each potential environmental issue, Table 4.1-1 identifies KRCD’s assessment of existing information to address the issue; KRCD’s identification of data gaps, if any; and, if a data gap is identified, KRCD’s proposed study to address the data gaps.

Table 4.1-1. Summary of preliminary potential environmental issues, existing information to address the issues, data gaps, and KRCD's proposed relicensing studies, if any, to close the data gaps.

Preliminary Potential Environmental Effect within the Project Boundary	Existing, Relevant, and Reasonably Available Information	Identified Data Gap(s), If Any	Proposed Study to Close Data Gap(s), If Any
Soil erosion	As described in Section 3.2.2.2 of this PAD, the Project includes no spoil/borrow areas or a spillway. A census of the area within the FERC Project boundary does not reveal any active erosion areas associated with the Project and the facilities are not located on steep slopes. Ground-disturbing Project O&M activities are minimal and concentrated in already disturbed areas. The non-Project Bypass System discharges are made through energy dissipation valves and pipe that penetrate an existing spray wall above the Kings River (i.e. discharges are sprayed into the air for aeration and above the plunge pool), which further dissipates energy of the releases prior to entering the river.	Additional data gathering is not needed because Project O&M activities have very limited potential to cause erosion. Existing information is adequate to assess potential Project effects on soil erosion and to inform requirements in the new license.	None
Effects of the proposed Project on water quantity	As described in Section 3.3.2.1 of this PAD, the Project is a non-consumptive use of Kings River basin water; all water that passes through the Project is returned to the Kings River. The Project opportunistically uses water provided for downstream users made by USACE at the request of KRWA through the Kings River watermaster to produce power. The Project has no effect on the magnitude and timing of flows and does not have the necessary rights to require flow releases – only to generate power with releases required by others.	Additional data gathering is not needed because the Project has no effect on water quantity. The Project is non-consumptive use of water required for release by other parties. Existing information is adequate to assess potential Project effects on water quantity and to inform requirements in the new license.	None
Effects of the proposed Project on water quality, including temperature	As described in Section 3.3.2 of this PAD, the Project does not introduce any pollutants into surface waters. However, the Project has potential to affect water temperature and dissolved oxygen concentrations in the Kings River immediately downstream of the Project. KRCD has monitored water temperature and dissolved oxygen concentrations at the Pine Flat Road Bridge once every 10 minutes from 2016 to the present. KRCD has monitored for dissolved oxygen in the Kings River since 1988.	Additional data gathering is not needed because existing water quality information for parameters potentially affected by the Project is readily available and included in this PAD, including continuous 10-minute water temperature and dissolved oxygen concentrations since 2016. Existing data are adequate to assess potential Project effects and to inform requirements in the new license	None

Table 4.1-1. (continued)

Preliminary Potential Environmental Effect within the Project Boundary	Existing, Relevant, and Reasonably Available Information	Identified Data Gap(s), If Any	Proposed Study to Close Data Gap(s), If Any
Effects of the proposed Project on fishes in Pine Flat Lake	As described in Section 3.4.2.3 of this PAD, FERC, KRCD and CDFW concluded in the 1980's and 1990's that the Project has no effect on fishes in Pine Flat Lake. In addition, based on a recent desktop study provided in Section 3.4.2.3 of this PAD, KRCD concluded the potential for fish entrainment related to the Project is very low and would have no effect on fishes in Pine Flat Lake.	Additional data gathering is not needed because FERC and CDFW have already previously concluded the Project has no adverse effect on fishes in Pine Flat Lake (non-Project), which is supported by a recent desktop study conducted by KRCD. Existing data are adequate to assess potential Project effects on fishes in Pine Flat Lake.	None
Effects of the proposed Project on downstream non-anadromous fishes	As described in Section 3.4.2.2 of this PAD, KRCD has monitored the fish community in the Kings River from Pine Flat Dam to Wildwood since 1983 and continues to conduct annual monitoring under the KRFMP.	Additional data gathering is not needed because almost 40 years of annual fish monitoring data provide adequate data to assess potential Project effects and to inform requirements in the new license.	None
Effects of the proposed Project on other aquatic resources	As described in Section 3.4.1 of this PAD, data from a variety of sources, including the CNDDB, IPaC, and recent surveys at the Project, provide a list of aquatic resources that have a potential to be affected by the Project. No special-status aquatic species were identified as having the potential to occur in the Kings River near the Project. Additionally, two AIS were identified as potentially occurring in the reach below the Project as discussed in Section 3.4.3. Information on benthic macroinvertebrates was also identified for the Kings River downstream of the Project and is discussed in Section 3.4.2.5.	Additional data gathering is not needed because there are no special-status aquatic species with the potential to be impacted by the Project. Additionally, Project O&M and recreation is understood sufficiently to determine potential avenues for the introduction of AIS, including American bullfrog and West Indian spongeplant. Finally, sufficient information on benthic macroinvertebrates is available to assess potential Project effects and to inform requirements in the new license.	None
Effects of the proposed Project on riparian habitat	As described in Section 3.5.1.1 of this PAD, vegetation mapping of the Project was conducted in 2020 and again in 2023. Four riparian alliances occur in the FERC Project boundary, occupying 1.33 acres (11.20 percent).	Additional data gathering is not needed because the extent of riparian habitat in the FERC Project boundary is known from the vegetation mapping. Little to no Project O&M is performed in these areas, and the habitat exists under the baseline Project conditions. Existing information is sufficient to assess potential Project effects on riparian habitat and to inform requirements in the new license.	None

Table 4.1-1. (continued)

Preliminary Potential Environmental Effect within the Project Boundary	Existing, Relevant, and Reasonably Available Information	Identified Data Gap(s), If Any	Proposed Study to Close Data Gap(s), If Any
Effects of the proposed Project on wetlands	As described in Section 3.5.5 of this PAD, the Project does not include a reservoir or any impoundments. No wetlands were found in the FERC Project boundary during surveys in 2020.	Additional data gathering is not needed because recent surveys found no wetlands within or adjacent to the FERC Project boundary. Existing information is adequate to assess potential Project effects on wetlands and to inform requirements in the new license.	None
Effects of the proposed Project on special-status plants	As described in Section 3.5.1.2 of this PAD, plant surveys were conducted within and adjacent to the FERC Project boundary on May 6 and 29, 2020 as well as a follow-up survey in March 2023. No special-status plants were located. Vegetation mapping was also conducted, and sensitive vegetation communities were mapped.	Surveys for botanical resources and sensitive vegetation communities were performed in 2020 and are provided in the PAD. Existing information is adequate to assess potential Project effects on special-status plants and inform requirements in the new license.	None
Effects of the proposed Project on the spread of invasive plant species	As described in Section 3.5.1.2 of this PAD, plant surveys were conducted in the FERC Project boundary on May 6 and 29, 2020. One CDFA-listed NNIP- Italian thistle (*Carduus pycnocephalus* ssp. *pycnocephalus*)- was located. Fifteen species with Cal-IPC ratings were also recorded.	Recent plant surveys were conducted within and adjacent to the FERC Project boundary and information on invasive plant species was collected at that time. This information is adequate to assess potential Project effects and inform requirements in the new license.	None
Effects of the proposed Project on avian species	As described in Section 3.5.2 of this PAD, data from a variety of sources, including the CNDDB, IPaC, and recent surveys at the Project and neighboring Pine Flat Transmission Line (FERC Project No. 2876) resulted in a list of potential nesting and foraging bird species that may be affected by the Project. Incidental observations of nesting and foraging bird species were also taken during May 2020 surveys within the FERC Project boundary and during spring and summer 2023 surveys of the neighboring Pine Flat Transmission Line (FERC Project No. 2876).	Data on avian species known or with the potential to be located on the Project was collected in 2023 through database searches and combined with surveys and habitat assessment from 2020. These data provide sufficient recent information on bird species that do or may use habitat in the Project area for nesting and foraging This existing information is adequate to assess potential Project effects on birds and inform requirements in the new license.	None

Table 4.1-1. (continued)

Preliminary Potential Environmental Effect within the Project Boundary	Existing, Relevant, and Reasonably Available Information	Identified Data Gap(s), If Any	Proposed Study to Close Data Gap(s), If Any
Effects of the proposed Project on special-status bats	As described in Section 3.5.2 of this PAD, data from a variety of sources, including the CNDDB, IPaC, and recent surveys at the Project and neighboring Pine Flat Transmission Line (FERC Project No. 2876) resulted in a list of potential special-status bats that may be affected by the Project. The powerhouse is the only Project facility with potential to provide bat habitat.	The Project powerhouse is the only Project facility that may provide potential bat roosting habitat. There is a possibility that bats could roost in trees and other locations at or near the Public Fishing Access site, but limited Project O&M occurs at this location. The information on special-status bat species that may have the potential to occur within the FERC Project boundary, combined with knowledge of where the bats could occur, is adequate to assess potential Project effects on special-status bats and inform requirements in the new license.	None
Effects of the proposed Project on other special-status wildlife species	As described in Section 3.5.2 of this PAD, data from a variety of sources, including the CNDDB, IPaC, and recent surveys at the Project and neighboring Pine Flat Transmission Line (FERC Project No. 2876), along with habitat assessment, resulted in a list of potential special-status wildlife species that may occur within the FERC Project boundary.	Data on special-status wildlife known or with the potential to be located on the Project was collected in 2023 through database searches and combined with surveys and habitat assessment from 2020.A list of possible special-status wildlife that might occur in the FERC Project boundary was generated. These data are adequate to assess potential Project effects on special-status wildlife species and inform requirements in the new license.	None
Effects of the proposed Project on ESA-listed plants	As described by 3.5.2.1, plant surveys were conducted in the FERC Project boundary on May 6 and 29, 2020. No ESA-listed plants were located. There was suitable habitat for one ESA-listed plant species, but no designated critical habitat. A 2023 database search of the CNDDB, IPaC and CNPS did not reveal any additional potential ESA-listed plant species.	Recent plant surveys, reinforced by 2023 database searches provide adequate information to assess potential Project effects on ESA-listed plants and inform requirements in the new license. Further, this existing information is adequate for Section 7 consultation with USFWS under the ESA.	None

Table 4.1-1. (continued)

Preliminary Potential Environmental Effect within the Project Boundary	Existing, Relevant, and Reasonably Available Information	Identified Data Gap(s), If Any	Proposed Study to Close Data Gap(s), If Any
Effects of the proposed Project on ESA-listed wildlife species and their critical habitats	Per Section 3.6.1, data from a variety of sources, including the CNDDB, IPaC, and recent surveys at the Project and neighboring Pine Flat Transmission Line (FERC Project No. 2876) resulted in a list of potential ESA-listed wildlife species that may be affected by the Project. A habitat assessment of the FERC Project boundary was performed during surveys on May 6 and 29, 2020. Per IPaC, there are no critical habitats for terrestrial ESA-listed wildlife species within the boundary, and no ESA-listed wildlife species have been documented to occur in the boundary.	The data from the 2020 surveys and habitat assessment, reinforced by the 2023 database searches, are adequate to assess potential Project effects on ESA-listed wildlife species and their critical habitats and inform requirements in the new license. Further, this existing information is adequate for Section 7 consultation with USFWS under the ESA.	None
Effects of the proposed Project on recreation	Existing recreation facilities and uses in the FERC Project boundary are described and evaluated in Section 3.7.1 of this PAD. Visitor use and facility assessments were conducted in 2022, and visitor count data collection is ongoing.	Data on recreation in and around the Project has been and continues to be collected for the Public Fishing Access site. Existing information is adequate to assess potential effects on recreation in and immediately downstream of the Project and inform requirements in the new license.	None
Effects of the proposed Project on land use	Per Section 3.8.2, the lands within the FERC Project boundary are minimal (11.87 acres) with most Project facilities, including a single short access road, in the footprint of the USACE Pine Flat Dam. Surrounding lands are predominantly undeveloped.	The Project is on a very small footprint, with existing hardscapes and structures. KRCD proposes no changes to the existing Project facilities and features, FERC Project boundary, or operations. Existing information is adequate to assess potential Project effects on land uses and to inform requirements in the new license.	None
Effects of Project facilities on visual resources	The only part of the Project that is viewable by the public is the Public Fishing Access, per Section 3.9.2, which is maintained for visitor access and viewing.	The public does not have access to the Project except for the Public Fishing Access. Existing information is adequate to assess potential Project effects on visual resources and to inform requirements in the new license.	None
Effects of Project on environmental justice	Per Section 3.11, the Project is an existing hydroelectric facility that has been operating for more than 44 years under the existing FERC license. At this time, KRCD proposes no changes to the existing Project's facilities and features, FERC Project boundary, or operations.	The Project has been in existence for more than 44 years and does not propose any changes to operations. As part of the relicensing, KRCD will conduct outreach and collaborate with various entities including local, state, and federal agencies, Native American Tribes and tribal representatives, and non-governmental organizations, businesses, and interested members of the public whose input is anticipated to further inform this topic.	None

Table 4.1-1. (continued)

Preliminary Potential Environmental Effect within the Project Boundary	Existing, Relevant, and Reasonably Available Information	Identified Data Gap(s), If Any	Proposed Study to Close Data Gap(s), If Any
Effects of the proposed Project on cultural resources	Archaeological and historical built environment resources studies were conducted in 2019 and are summarized in Section 3.12 of this PAD. The studies included a review of existing, relevant, and readily available information, in addition to information solicited from Native American tribes and agencies and gathered from KRCD's archives. There are no archaeological resources in the FERC Project boundary. The historical built environment resources consist only of the Project operating facilities which are not eligible for listing on the NRHP as they do not meet any of the NRHP criteria of significance either individually or as a historic district.	Existing data from the 2019 background research and studies are adequate to demonstrate that no archaeological resources are present in the FERC Project boundary which is likely the limit of Project effects (i.e. horizontal and vertical limit making up the area of potential effects) and, pending SHPO concurrence, that the built resources are ineligible for listing on the NRHP, indicating that there are no historic properties in the FERC Project boundary. These data are adequate to assess Project effects and inform requirements in the new license related to cultural resources. Existing information is adequate at this time to initiate NHPA Section 106 consultation with relevant stakeholders. KRCD anticipates this NHPA Section 106 consultation will result in the development of an HPMP that will be included in the new license.	None
Effects of the proposed Project on tribal resources	The results of the background and archival research identified no TCPs, ITAs, Indian Reservations, lands designated under tribal ownership, or specific ethnographic locales within the FERC Project boundary, as described in Section 3.13. Potentially interested Native American tribes and organizations have been identified with the assistance of the NAHC. Initial correspondence began in 2019 with potentially interested Native American tribes and organizations to provide Project information, to request information about tribal resources within the FERC Project boundary and general vicinity, and to solicit any concerns about the Project. No tribal resources within or adjacent to the FERC Project boundary have been identified to date and no concerns regarding the Project were identified by the individuals that were contacted.	Existing information is adequate at this time to initiate NHPA Section 106 consultation with interested tribes and Native Americans. KRCD anticipates this NHPA Section 106 consultation will result in the development of an HPMP that will be included in the new license.	None

4.1.3 KRCD Proposed Studies

As shown in Table 4.1-1, existing information is adequate to assess Project effects and inform requirements in the new license. KRCD will also conduct, as FERC's designated Federal Representative, informal consultations under Section 7 of the ESA and Section 106 of the NHPA and will incorporate any relevant information from those consultations into the License Application.

KRCD contacted agencies, Native American tribes, and NGOs on April 14, 2023, and requested a description of any issues they believed should be addressed in the relicensing and information, including studies, they believed necessary to assess the issues and inform requirements in the new license. This request was reiterated during the May 12, 2023 meeting described in Section 1.5. No replies were received.

At this time, KRCD believes no relicensing studies are needed.

4.2 KRCD PROPOSED MEASURES

KRCD will propose measures at the appropriate time in the relicensing (i.e. in the License Application).

4.3 RELEVANT QUALIFYING PLANS

Section 10(a)(2)(A) of the FPA (16 U.S.C. § 803[a][2][A]) requires the Commission to consider the extent to which a project is consistent with federal and State comprehensive plans for improving, developing, or conserving waterways affected by the Project. On April 27, 1988, FERC issued Order No. 481 A, which revised Order No. 481, issued on October 26, 1987. This order provides that FERC give FPA Section 10(a)(2)(A) comprehensive plan status to any federal and State plan that meet each of the following three criteria: 1) it is a comprehensive study of one or more of the beneficial uses of a waterway or waterways; 2) it specifies the standards, the data, and the methodology used to develop the plan; and 3) it is filed with FERC. FERC's Revised List of Comprehensive Plans, dated August 2022, can be found at FERC's eLibrary (https://cms.ferc.gov/media/list-comprehensive-plans). A review of this list shows that the Commission has listed, under FPA Section 10(a), 94 comprehensive plans for the State of California. Provided below is a list of Qualifying Plans currently on file with the Commission that may be relevant to the Project relicensing.

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None

5.2 SECTION 2.0 EXISTING AND PROPOSED PROJECT

None

5.3 SECTION 3.0 INTRODUCTION TO THE RIVER BASIN

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5.17 SECTION 4.0 ISSUES, PROPOSED STUDIES AND QUALIFIED PLANS

None

Attachment A

Consultation

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From:	Kent, Robin
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Cc:	Jeremiah.McNeil@water.ca.gov; Joseph Muradyan (Ovsep.Muradyan@water.ca.gov); David Merritt (dmerritt@krcd.org); Charlotte Gallock
Subject:	KRCD/DWR: Pine Flat Relicensings Initial Relicensing Meeting and Request for Information
Date:	Friday, April 14, 2023 4:11:28 PM
Importance:	High

KINGS RIVER CONSERVATION DISTRICT
JEFF L. TAYLOR – PINE FLAT HYDROELECTRIC PROJECT, FERC PROJECT NO. 2741

DEPARTMENT OF WATER RESOURCES
PINE FLAT TRANSMISSION LINE PROJECT, FERC PROJECT NO. 2867

INVITATION TO MAY 12, 2023, INITIAL RELICENSING MEETING
AND
REQUEST FOR INFORMATION BY JUNE 15, 2023

The Kings River Conservation District (KRCD) is preparing to relicense its Jeff L. Taylor - Pine Flat Hydroelectric Project, FERC Project No. 2741 (KRCD Project) and the California Department of Water Resources (DWR) is preparing to relicense its Pine Flat Transmission Line Project, FERC Project No. 2876 (DWR Project), each of which is described below. The projects are located in the Kings River basin in Fresno County near the United States Army Corps of Engineers' (USACE) Pine Flat Dam. The two separate and distinct projects have current licenses from the Federal Energy Regulatory Commission (FERC) that expire on August 1, 2029. KRCD and DWR each plan to use FERC's Traditional Licensing Process (TLP) to relicense their respective project; and KRCD and DWR are each using HDR, Inc. to assist them in their relicensing. For these reasons, KRCD and DWR have decided, to the extent practical, to cooperate and coordinate on their relicensing efforts. Through this cooperative effort, KRCD and DWR hope to: (1) streamline the relicensing process for agencies, Native American tribes, and the public by coordinating the release and format of information; (2) reduce the relicensing costs for all interested parties by sharing information related to these projects; (3) maintain and enhance the overall comprehensive value of the projects; and (4) develop with agencies, Native American tribes, and the public a comprehensive plan for the management of resources affected by the projects.

One of the first steps under the TLP regulations is for KRCD and DWR to each prepare a Pre-

Application Document (PAD). The PAD will provide FERC and other potentially interested parties with existing, relevant, and reasonably available information pertaining to each project. The PAD also helps to identify issues and information needs.

This e-mail advises you of KRCD's and DWR's coordinated relicensings: (1) invites you to an initial meeting for the relicensings on May 12, 2023, and (2) respectively request your help in identifying existing, relevant, and reasonably available information that describes the existing environment near these projects or known potential impacts of one or more of the projects.

-

RSVP FOR INVITATION TO MAY 12, 2023, INITIAL MEETING

KRCD and DWR plan to hold a 1-hour virtual meeting[1] on May 12, 2023, to answer any questions you may have regarding the information in this e-mail and concerning the relicensings. **If you are interested in participating in this virtual meeting, please let us know by return e-mail no later than by May 8, 2023**. By May 10, 2023, we will send an invite to those who advise us they wish to participate in the virtual meeting.

PROJECT DESCRIPTIONS

KRCD Project

The KRCD Project is located on the north bank of the Kings River approximately 200 feet downstream of USACE's Pine Flat Dam. The KRCD Project is an energy-recovery project that operates in run-of-river mode to generate power from water released by the USACE from Pine Flat Dam. Releases are requested by the Kings River Water Association (KRWA) through its Water Master for irrigation use or to meet other KRWA flow requirements, except during mandatory flood control operations when all releases are determined by the USACE. KRCD has no authority to schedule releases from Pine Flat Dam for power generation. The main project components include: (1) six fixed-wheel emergency gates (two per intake), each approximately 9 feet wide by 15 feet high located on USACE's intake and associated gate hoists controlled by equipment in USACE's hoist room located near the top of Pine Flat Dam; (2) three penstock extensions, one from the three USACE 13.5-foot-diameter underground penstocks; (3) the outdoor Jeff L. Taylor Powerhouse, which contains three Francis turbines and associated generating units each with an installed name-plate capacity of 55 megawatts (MW) and each with air injection systems; (4) three generator leads and a step-up transformer bank at the powerhouse, consisting of three 70 megavolt-amperes single-phase units; and (5) the public fishing access containing an approximately 1,050-foot-long access road from North Piedra Road, a 0.1 acre parking area, three roadside parking areas/pullouts, five day-use sites each with a picnic table, and three barbecue grills. On December 21, 2021, KRCD filed with FERC an application to amend its current license to include a fourth unit, which would increase the project's overall installed capacity to 161.3 MW. KRCD assumes the fourth unit will be approved by FERC, constructed and operating by the time KRCD files its application for new license (i.e., will be part of the existing project). The 11.87-acre FERC Project Boundary includes 4.94 acres of federal lands administered by the USACE, 4.55 acres of State of California lands submerged by the Kings River, and 2.38 acres of Fresno County lands. The KRCD Project does not include dams (i.e., Pine Flat Dam and Lake are federal facilities operated by USACE and are not under FERC's jurisdiction), impoundments, transmission lines, or open water conduits.

DWR Project

The DWR Project is 0.8-miles-long extending from KRCD Project switchyard across the Kings River and south in a draw to the crest of a nearby ridge, and then southeast, terminating at a point on Pacific Gas and Electric Company's Balch #2-McCall Transmission Line. The main project components include a single-circuit 230-kilovolt conductor hung on three self-supporting, square-based steel lattice towers. The FERC Project Boundary includes a 120-foot-wide right-of-way, which encompasses 12.33 acres of land. Approximately 6.45 acres are United States lands under the management of the USACE. The remaining 5.88 acres are in private ownership. The DWR Project does not include any dams or reservoirs, open water conveyance facilities, streamflow gages, recreation facilities, or borrow or spoil areas.

REQUESTED EXISTING, RELEVANT, AND REASONABLY AVAILABLE INFORMATION

At this time, **KRCD and DWR request you provide to Robin Kent of HDR, Inc. by return e-mail no later than June 1, 2023** the following:

1. Any existing, relevant, and reasonably available information in your possession, or a link to where that information may be accessed, that describes the potentially affected environment. Assume that KRCD and DWR already have in their possession all materials and plans regarding their respective projects.
2. A list of any issues you believe each Licensee should address in its PAD and subsequent application, including potential Project effects.
3. Given existing information, a description of any information you believe will be needed to assess the projects' effects and inform licenses' requirements.
4. If you are not the primary contact for your agency or affiliation, please provide the information for the person we should contact regarding the relicensings.
5. The contact information for any other persons outside your agency or affiliation you believe would be interested in the relicensings.

Contact Robin Kent (robin.kent@hdrinc.com) if you have any questions regarding this e-mail.

Robin Kent, MESM
She/her
Project Manager, FERC
HDR
2379 Gateway Oaks Drive, Suite 200
Sacramento, CA 95833
D 916.679.8733 **M** 530.220.4283
robin.kent@hdrinc.com

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[1] The virtual platform will be included in the invitation to the meeting.

Kent, Robin

Subject: KRCD and DWR Pine Flat Relicensings: Initial Relicensing Meeting
Location: https://ca-water-gov.zoom.us/j/83948644046?pwd=TmpXaFdFQ0MxZ0FqcXA1b0NZUWhJdz09

Start: Fri 5/12/2023 1:00 PM
End: Fri 5/12/2023 2:00 PM

Recurrence: (none)

Meeting Status: Meeting organizer

Organizer: Kent, Robin
Required Attendees Kent, Robin; abimael.leon@wildlife.ca.gov; leeadrian019@gmail.com; csrwellnessmanager1@gmail.com; ben.charley@yahoo.com; dcharley2016@gmail.com; chanson@hansonenv.com; alecmarcia@rocketmail.com; 2deedominguez@gmail.com; smccarty@tachi-yokut-nsn.gov; escalon@tachi-yokut-nsn.gov; Hoffmann, Glenn@Waterboards; Nathan.Fisch@Waterboards.ca.gov; dave@davealvarez.com; lemek@att.net; lkipp@bsrnation.com; Simpson, David M CIV USARMY CESPK (USA); Foster, Calvin CIV USARMY CESPK (USA); Jacob.K.Severns@usace.army.mil; rsewell@bsrnation.com; rpennell@tmr.org; Adams, LaVerne F (Verne) CIV USARMY CESPK (USA); David Merritt; Charlotte Gallock; Joseph Muradyan, P.E.; Parsons, Jeffrey@DWR; Gleim, James@DWR; Lee, Lisa D.@DWR; Stoddard, Tera@DWR; Miller, Aaron S.@DWR; Jeremiah.McNeil@water.ca.gov; Lynch, Jim; oescobedo@tejonindiantribe-nsn.gov
Optional Attendees: Prasad, Rodney@DWR; Rebecca Riley; Agustinez, Anecita S.@DWR; Lau, Richard@DWR

INVITATION TO MAY 12, 2023, INITIAL MEETING

Thank you for requesting to attend the May 12 initial relicensing meeting for the KRCD Jeff L Taylor- Pine Flat Hydroelectric Project and DWR Pine Flat Transmission Line Project, which will be held from 1-2 on Friday, May 12. We will be opening the Zoom meeting room a little early and starting promptly at 1pm.

The link: Topic: Initial Relicensing Meeting - Kings River Conservation District and California Department of Water Resources

Time: May 12, 2023 12:30 PM Pacific Time (US and Canada)

Join from PC, Mac, Linux, iOS or Android: https://ca-water-gov.zoom.us/j/83948644046?pwd=TmpXaFdFQ0MxZ0FqcXA1b0NZUWhJdz09

Password: 856760

Or Telephone:
USA 215 446 0155
USA 8886848852 (US Toll Free)
Conference code: 839066

Find local AT&T
Numbers: https://www.teleconference.att.com/servlet/glbAccess?process=1&accessNumber=2154460155&accessCode=839066

Please let me know if you have any questions.

Thank you!

Robin Kent, MESM
She/her
Project Manager, FERC
D 916.679.8733 **M** 530.220.4283

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From:	Kent, Robin
To:	"abimael.leon@wildlife.ca.gov"; "leeadrian019@gmail.com"; "csrwellnessmanager1@gmail.com"; "ben.charley@yahoo.com"; "dcharley2016@gmail.com"; chanson@hansonenv.com; "alecmarcia@rocketmail.com"; "2deedominguez@gmail.com"; "smccarty@tachi-yokut-nsn.gov"; "escalon@tachi-yokut-nsn.gov"; Hoffmann, Glenn@Waterboards; "Nathan.Fisch@Waterboards.ca.gov"; "dave@davealvarez.com"; "lemek@att.net"; "lkipp@bsrnation.com"; Simpson, David M CIV USARMY CESPK (USA); Foster, Calvin CIV USARMY CESPK (USA); Jacob.K.Severns@usace.army.mil; "rsewell@bsrnation.com"; "rpennell@tmr.org"; Adams, LaVerne F (Verne) CIV USARMY CESPK (USA); David Merritt (dmerritt@krcd.org); Charlotte Gallock; Joseph Muradyan (Ovsep.Muradyan@water.ca.gov); Parsons, Jeffrey@DWR; Gleim, James@DWR; Lee, Lisa D.@DWR; Stoddard, Tera@DWR; Miller, Aaron S.@DWR; Jeremiah.McNeil@water.ca.gov; Lynch, Jim; "oescobedo@tejonindiantribe-nsn.gov"
Cc:	Prasad, Rodney@DWR; Rebecca Riley; Agustinez, Anecita S.@DWR; Lau, Richard@DWR
Subject:	KRCD and DWR Pine Flat Relicensings: Initial Relicensing Meeting Presentation
Date:	Thursday, May 18, 2023 9:21:59 AM
Attachments:	KRCD DWR Relicen Intro Presentation final.pdf

MAY 12, 2023, INITIAL MEETING PRESENTATION

Thank you all for your interest in the May 12 initial relicensing meeting for the KRCD Jeff L Taylor-Pine Flat Hydroelectric Project and DWR Pine Flat Transmission Line Project, which was held from 1-2 on Friday, May 12. A pdf of the meeting presentation is enclosed.

We look forward to working with everyone during the relicensing.

Thank you again!

Robin Kent, MESM
She/her
Project Manager, FERC
HDR
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Welcome to the Relicensing Meeting!
The meeting will begin shortly.

Before We Begin…

- Ensure your microphone is muted; unmute yourself to speak and be sure to mute again when finished.
- Wear headphones, if you have them, to reduce ambient noise.
- All questions will be taken at the end. Please wait until the end and either unmute to speak or type your question in the chat.
- Use only ONE audio source - computer or phone.
- For computer audio, to select your microphone and speaker, access the 'Device settings' menu.
- When speaking, state your name, focus on the topic, and be respectful of other people's time.

We will acknowledge everyone at the beginning of the meeting.

Technical Problems?

- Use the **"Chat"**; or
- **e-mail Robin.Kent@hdrinc.com**; or
- **text** (530) 220-4283

Jeff L. Taylor - Pine Flat Hydroelectric Project (P-2741)

Pine Flat Transmission Line Project (P-2876)

Initial Relicensing Meeting

May 12, 2023

Introductions

- KRCD Participants:
  - David Merritt, General Manager
  - Charlotte Gallock, Director of Water Resources/Chief Engineer, Project Manager
- DWR Primary Participants:
  - Jeremiah McNeil, Relicensing Program Manager
  - Joseph Muradyan, Project Manager
  - Anecita Agustinez, DWR Tribal Policy Advisor
- Relicensing Consultant Team Participants:
  - Jim Lynch, HDR
  - Robin Kent, HDR
- Stakeholders: Roundtable Introductions

Agenda

- Safety Moment
- Purpose of Meeting
- Coordinated Relicensings
- Brief Description of Projects
- Relicensing Milestones
- Requested Information
- Questions
- Action Items
- Adjourn

Safety Moment

Sharing the Road with Bicycles

As the weather improves more people will be out and about on bikes. Each year in California, more than 100 bicyclists are killed and over 10,000 are injured in collisions.

- Bicycles are considered vehicles and should follow the same rules as cars.
- Double check for a bicyclist before opening your car doors parked on the street. Doors are dangerous to bike riders!
- In a lot of cities, bikes share the streets with cars without a bike lane.
- Drivers, be extra vigilant for bicyclists. Check mirrors and continue with caution.
- Learn the hand signals bicyclists may use to signal turns.
- Be patient. Only pass a bicyclist when it is safe to do so. Give all bikes at least 3 feet when passing them from behind.

Purpose of the Meeting

- Familiarize agencies, Native American tribes and members of the public with the two projects being relicensed
- Provide agencies, Native American tribes and members of the public with an opportunity to submit available information to Licensees

Coordinated Relicensings

- Kings River Conservation District (KRCD) and the California Department of Water Resources (DWR) will cooperate and coordinate on their relicensing efforts to:
  - Streamline the relicensing process by coordinating the release and format of information
  - Reduce relicensing costs for all interested parties by sharing information related to these projects
  - Maintain and enhance the overall comprehensive value of the projects
  - Develop a comprehensive plan for the management of resources affected by the projects
- Public relicensing documents will be shared on KRCD's website (once NOIs and PADs filed with FERC) and can be accessed on the Project dockets (FERC.gov)

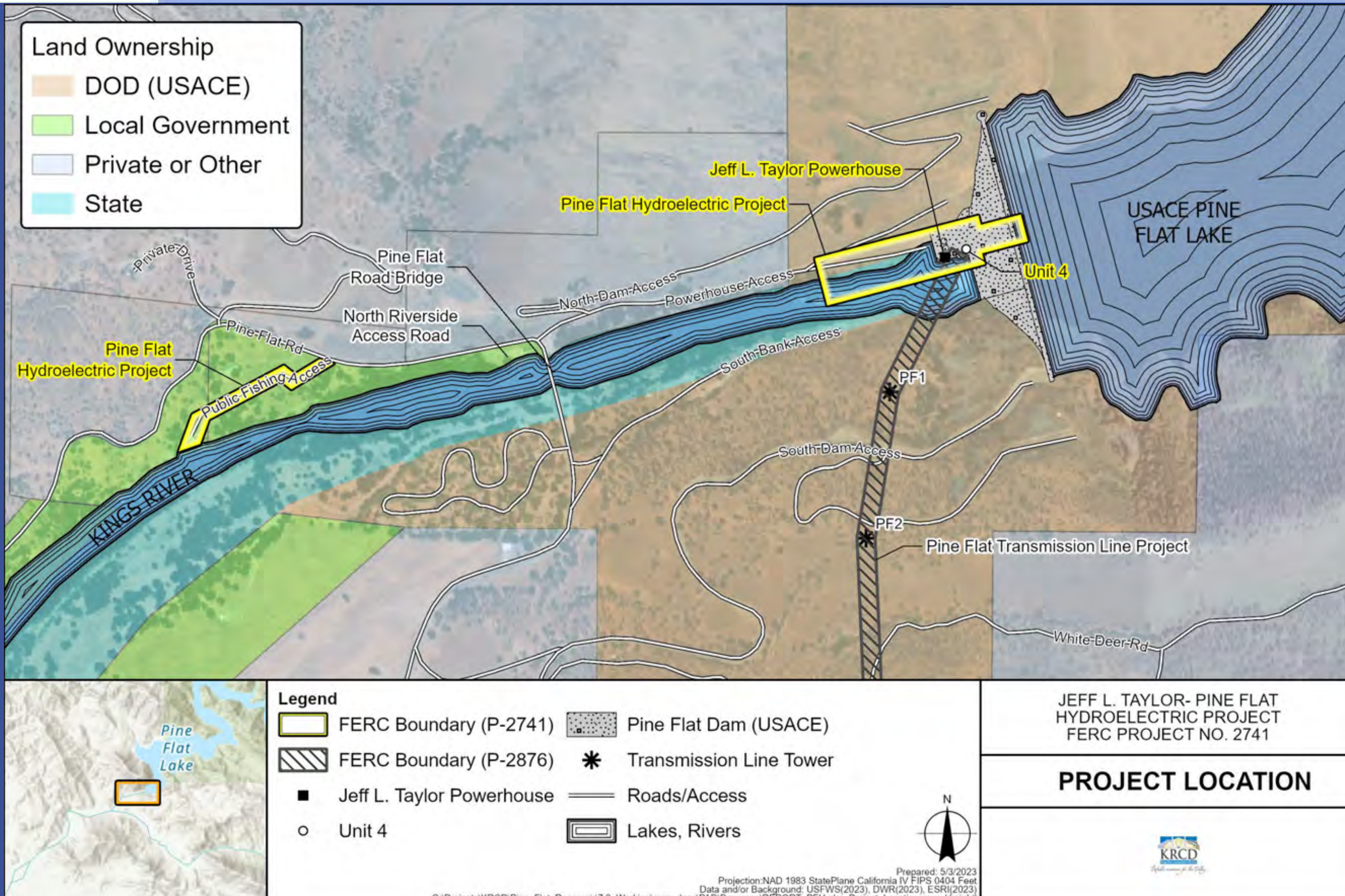
Jeff L. Taylor - Pine Flat Hydroelectric Project (P-2741)

Existing Facilities

- Initial license issued on September 25, 1979
- The 11.87-acre FERC Project boundary consists of: 4.94 acres DOD (USACE) lands, 4.55 acres of State of California lands, and 2.38 acres of Fresno County lands
- No dams, reservoirs or open water conduits
- Project power is provided from the Pine Flat Switchyard to the grid via DWR's Pine Flat Transmission Line (P-2876)
- Project facilities include:
  - Six fixed-wheel emergency gates (two per intake)
  - Three penstock extensions
  - Jeff L. Taylor Powerhouse: three Francis turbines and associated generating units each with an installed name-plate capacity of 55 MW
  - Unit 4 Powerhouse: outdoors, one unit with a 6.3 MW Francis turbine and associated generator (FERC approved on May 3, 2023)
  - Public Fishing Access: approximately 1,050-foot-long access road from North Piedra Road, a 0.1-acre parking area, three roadside parking areas/pullouts, five-day use sites

Jeff L. Taylor - Pine Flat Hydroelectric Project (P-2741)

Existing Facilities



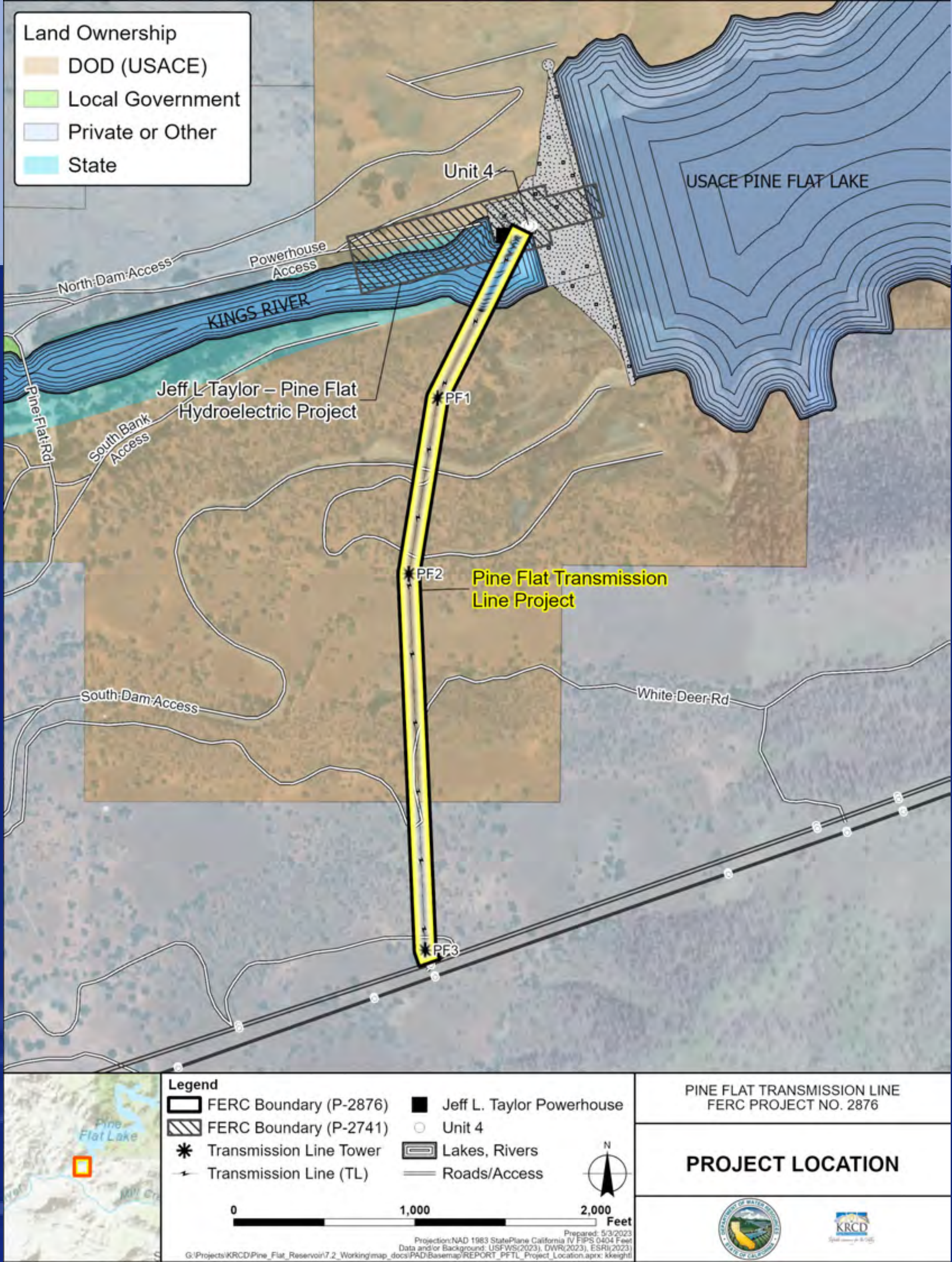
Pine Flat Transmission Line Project (P-2876)

Existing Facilities

- Initial license issued on March 24, 1980.
- The 11.52-acre FERC Project boundary consists of: 7.94 acres DOD (USACE) lands, 1.11 acres of State of California lands, and 2.46 acres of private lands.
- Consists of a 0.8-mile long, single-circuit 230 kV transmission line constructed on three self-supporting, square-based steel lattice towers. Three towers vary in height from 79 to 112 feet.
- No dams, powerhouses, reservoirs or open water conduits.
- Crosses Kings River from the Jeff L. Taylor Pine Flat Powerhouse switchyard (P-2741) and proceeds until it connects with PG&E's 230-kV Balch #2-McCall transmission line.

Existing Facilities

Pine Flat Transmission Line Project (P-2876)



Proposed Changes

- At this time, Licensees propose no changes to either Projects' facilities or operations.
- The Unit 4 addition to the Jeff L Taylor – Pine Flat Hydroelectric Project is under the current license. FERC amended the existing license on May 3, 2023, to include Unit 4. KRCD's relicensing assumes Unit 4 will be in place and operating before new license is issued.

Relicensing Milestones

- 2/1/24 to 8/1/24 - Window to file with FERC Notices of Intent (NOIs) and Pre-Application Documents (PADs)
- 2/1/24 to 8/1/24 - Window to file with FERC a request to use the Traditional Licensing Process for both projects
- 8/31/27 - Deadline to file with FERC the final applications for new licenses (FLA)
- 8/31/29 - Existing licenses expire

Requested Information by 6/15/23

- Existing, relevant, and reasonably available information in your possession, or a link to where that information may be accessed, that describes the potentially-affected environment.

- List of any issues you believe should be addressed in the relicensing.

- Description of any additional information you believe is needed for KRCD/DWR, FERC, and stakeholders to assess Project effects and inform license requirements.

- Please send the information by close of business on June 15 to: Robin Kent (robin.kent@hdrinc.com).

Questions

Action Items From Today's Meeting

- Update presentation, pdf and provide to attendees

- Develop and provide a glossary of commonly used FERC terms as part of the PAD

Adjourn

Attachment B

Glossary

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COMMON FERC TERMS

Term	Definition
Other	
°C	Celsius
A	
ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
AGR	Agricultural Supply
AGS	annual grassland
AIS	aquatic invasive species
APLIC	Avian Power Line Interaction Committee
AT&SF	Atchison Topeka and Santa Fe
AW	American Whitewater
B	
BAR	Barren
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BP	Before Present
C	
C.F.R.	Code of Federal Regulations
CAISO	California Independent System Operator
Cal-IPC	California Invasive Plant Council
CCC	Civilian Conservation Corps
CDFA	California Department of Food and Agriculture
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CDPR	California Department of Pesticide Regulation
CDRP	California Department of Parks and Recreation
CEII	Critical Energy/Electric Infrastructure Information
CEQ	Council on Environmental Quality
cfs	cubic feet per second
CHRIS	California Historical Resources Information System
CNDDB	CDFW's California Natural Diversity Database
CNPS	California Native Plant Society
COLD	Cold Freshwater Habitat
CPRC	California Public Resources Code
CPRC	Central Pacific Railroad Company
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CTS	California tiger salamander
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationship
CWHR	California Wildlife Habitat Relationship
CY	Calendar Years
D	
DBOW	California State Parks, Division of Boating and Waterways
DCNPP	Diablo Canyon Nuclear Power Plant
DCPP	Diablo Canyon Power Plant

Term	Definition
DEV	developed
DLA	Draft License Application
DO	dissolved oxygen
DPR	Fresno County Department of Parks and Recreation
DPR	Fresno County Department of Pesticide Regulation
DPS	distinct populations segment
DRP	Dispute Resolution Panel
DWR	Department of Water Resources
E	
EDD	California Employment Development Department
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
F	
FE	Federally endangered under the ESA
FEMA	Federal Emergency Management Agency
FERC FPA	FPA Part 8 relates to making reasonable efforts in keeping the public informed of recreational opportunities and development at FERC licensed projects
FERC	Federal Energy Regulatory Commission
FLA	Final License Application
FP	fully protected under California Fish and Game Code § 3511
FPC	Federal Power Commission
FR	Federal Register
FRSH	Freshwater Replenishment
FT	Federally threatened under the ESA
G	
GLO	General Land Office
GWR	Ground Water Recharge
H	
Helms PSP	Helms Pumped Storage Project
HPMP	Historic Properties Management Plan
HU	Hydro Unit
HUC	Hydrologic Unit Code
I	
IECO	International Engineering Company, Inc.
IK	Indigenous Knowledge
ILP	Integrated Licensing Process
IPaC	USFWS's Information for Planning and Consultation
K	
KRCD Act	Assembly Bill 340, Chapter 931, Stats. Of 1951
KRCD	Kings River Conservation District
KRFMP	Kings River Fisheries Management Program
KRWA	Kings River Water Association
M	
MK	Morrison Knudsen Company, Inc.
Mm	milimeters
MRZ-1	Mineral Resource Zone 1
MRZ-2	Mineral Resource Zone 2
MUN	Municipal and Domestic Supply
MVA	megavolt amperes

Term	Definition
MW	megawatts
N	
NAHC	California Native American Heritage Commission
NCP	Notice of Commencement of Proceeding
ND	Non-detection based on laboratory reporting limits
NEPA	National Environmental Policy Act
NET	no earlier than
NGOs	non-governmental organizations
NGVD 29	National Geodetic Survey
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NNIP	Non-native invasive plants
No.	FERC Project Number
NOD	Notice of Dispute
NOI	Notice of Intent
NPS	National Park Service
NRHP	National Register of Historic Places
NTL	no later than
NTU	Nephelometric Turbidity Units
O	
O&M	operations and maintenance
OAK	Interior live oak riparian
OHP	Office of Historic Preservation
P	
PAD	Pre-Application Document
PCT	Pacific Crest National Scenic Trail
PDA	Public Domain Allotment
PG&E	Pacific Gas and Electric Company
PLP	Preliminary Licensing Proposal
PM&E	Protection, Mitigation, and Enhancement
PNFQ	USGS Gage 11221500
POW	Hydropower Generation
ppb	parts per billion
ppm	parts per million
PSP	Pumped Storage Project
R	
REC-1	Water Contact Recreation
REC-2	Non-Contact Water Recreation
RIV	Riverine (Kings River)
RM	River Mile
RWQCB	Regional Water Quality Control Board
S	
SCD	State Candidate for delisting under the CESA
SCE	Southern California Edison
SCE	State Candidate endangered for listing under the CESA
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SCT	State Candidate threatened under the CESA
SD1	Scoping Document 1
SD2	Scoping Document 2
SE	CESA listed as endangered
SHPO	State Historic Preservation Officer

Term	Definition
SJLPC	San Joaquin Light and Power Company
SPD	Study Plan Determination
SPOA	Survey on Public Opinions and Attitude on Outdoor Recreation
SPWN	Spawning, Reproduction, and/or Early Development
SQF	Sequoia National Forest
SR	California State Rare
SSC	considered a Species of Special Concern by CDFW
SSJVIC	Southern San Joaquin Valley Information Center
ST	CESA listed as threatened
SWAMP	Surface Water Ambient Monitoring Program
SWP	State Water Project
SWRCB	California State Water Resources Control Board
T	
TCLs	Traditional Cultural Landscapes
TCPs	Traditional Cultural Properties
TDG	total dissolved gasses
TL	total length
TLP	Traditional Licensing Process
TMDL	Total Maximum Daily Load
U	
USACE	U.S. Army Corps of Engineers
USBR	U.S. Department of the Interior, Bureau of Reclamation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
V	
VFR	Valley foothill riparian
W	
WARM	Warm Freshwater Habitat
WILD	Wildlife Habitat

Attachment C

Exhibit A Project Description

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A.0 PROJECT DESCRIPTION

A.1 INTRODUCTION

The Kings River Conservation District (KRCD or Licensee) has prepared this Exhibit A, Project Description, as part of its Application for a New License Major Project – Existing Dam – from the Federal Energy Regulatory Commission (FERC or Commission) for the Jeff L. Taylor-Pine Flat Power Plant (Project), FERC Project Number 2741. This exhibit is prepared in conformance with Title 18 of the Code of Federal Regulations (C.F.R.), Subchapter B (Regulations under the Federal Power Act), Part 4 (Licenses, Permits, Exemptions and Determination of Project Costs), Subpart F and, as applicable, Part 16 (traditional process). In particular, this exhibit conforms to the regulations in 18 C.F.R. Section 4.51(b), which describes the contents of Exhibit A, Project Description. This exhibit satisfies the requirements of 18 C.F.R. Section 5.6(d)(2)(iii). This Exhibit A describes, in detail, all existing and KRCD-proposed Project facilities. As a reference, 18 C.F.R. Section 4.51(b) states:

> Exhibit A is a description of the Project. This exhibit need not include information on project works maintained and operated by the U.S. Army Corps of Engineers, the Bureau of Reclamation, or any other department or agency of the United States, except for any project works that are proposed to be altered or modified. If the project includes more than one dam with associated facilities, each dam and the associated component parts must be described together as a discrete development. The description for each development must contain:
>
> (1) The physical composition, dimensions, and general configuration of any dams, spillways, penstocks, powerhouses, tailraces, or other structures, whether existing or proposed, to be included as part of the project;[1]
>
> (2) The normal maximum surface area and normal maximum surface elevation (mean sea level), gross storage capacity, and usable storage capacity of any impoundments to be included as part of the project;[2]
>
> (3) The number, type, and rated capacity of any turbines or generators, whether existing or proposed, to be included as part of the project;[3]
>
> (4) The number, length, voltage, and interconnections of any primary transmission lines, whether existing or proposed, to be included as part of the project (see 16 U.S.C. 796(11));[4]
>
> (5) The specifications of any additional mechanical, electrical, and transmission equipment appurtenant to the project; and[5]
>
> (6) All lands of the United States that are enclosed within the project boundary described under paragraph (h) of this section (Exhibit G), identified and tabulated by legal subdivisions of a public land survey of the affected area or, in the absence of a public land survey, by the best available legal

[1] [See Section A.3]
[2] [N/A]
[3] [See Section A.3]
[4] [N/A]
[5] [See Section A.3]

description. The tabulation must show the total acreage of the lands of the United States within the project boundary.[6]

Besides introductory material, this exhibit includes four sections. Section 2.0 describes the Project location. Section 3.0 provides details of the existing Project facilities, features, and Project Boundary. Section 4.0 describes KRCD's proposed changes to existing Project facilities and features. Section 5.0 provides a bibliography of any references in this exhibit.

All elevation data in this exhibit are in United States Department of Commerce, National Oceanic and Atmospheric Administration, National Geodetic Survey Vertical Datum of 1929 (NGVD 29), unless otherwise stated.

On May 3, 2023, the Commission issued an Order Amending License[7] that approved the addition of a new turbine-generator unit (i.e., Unit 4) to the Project. KRCD anticipates the new unit will be constructed, tested, and fully operational by approximately 2025. For the purpose of this PAD, Unit 4 is treated as a part of the "existing Project."

A.2 PROJECT LOCATION

The Project is in the Community of Piedra, Fresno County, California, 30 miles east of the City of Fresno, on the north bank of the Kings River at approximately river mile 111,[8] two hundred feet downstream of the United States Army Corps of Engineers' (USACE) Pine Flat Dam. The Project is accessed from the City of Fresno by following California State Highway 180 east for approximately 18 miles to North Piedra Road, and then following North Piedra Road for approximately 12 miles to the gated entrance to the Jeff L. Taylor Powerhouse.

Figure A.1-1 shows the Project location in context to the region. Figure A.1-2 shows existing Project facilities, features and nearby surrounding non-Project facilities and features.

[6] [See Section A.3]
[7] FERC's Order Amending License is available in FERC's eLibrary at accession number 20230503-3104.
[8] The Kings River diverges into multiple branches in the San Joaquin Valley, with some water flowing south to the old Tulare Lake lakebed and the rest flowing north to the San Joaquin River. The river mile is calculated from the portion of the Kings River that confluences with the San Joaquin River to USACE's Pine Flat Dam.

Figure A.1-1. Location of the Jeff L. Taylor-Pine Flat Power Plant.

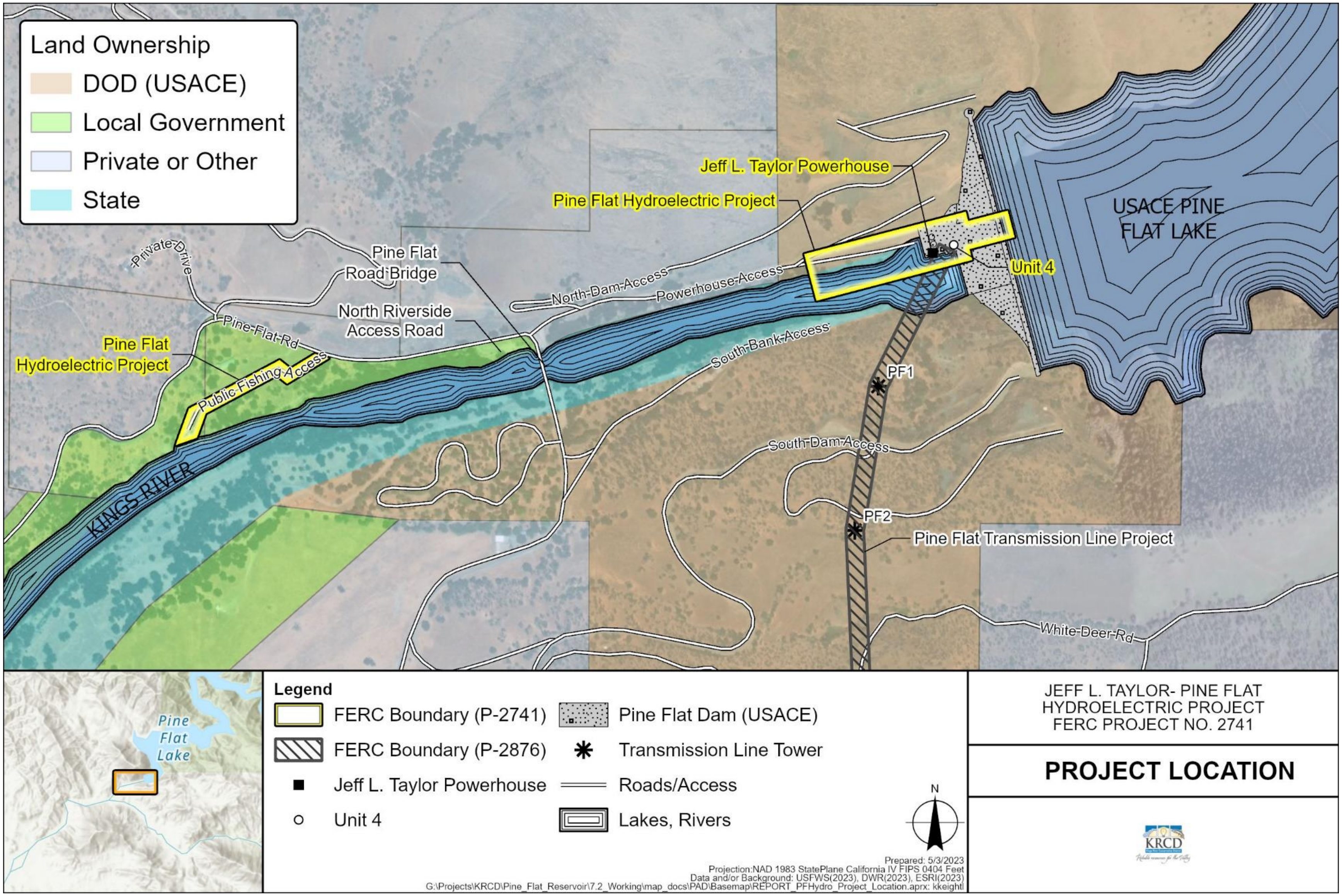

Figure A.1-2. Jeff L. Taylor-Pine Flat Power Plant facilities and nearby surrounding non-Project features.

A.3 EXISTING PROJECT FACILITIES, FEATURES AND BOUNDARY

The existing Project consists of one development, Pine Flat[9], that in total includes: three penstock extensions, one 165 MW powerhouse, one 6.3 MW powerhouse, and one recreation facility. The existing Project does not include any dams, impoundments, transmission lines, or open water conduits.

Existing Project facilities include:

- Jeff L. Taylor Powerhouse: outdoors at the toe of the dam, which contains three Francis turbines and associated generating units each with an installed name-plate capacity of 55 MW and each with air injection systems. The maximum hydraulic capacity of the existing Project is 8,000 cfs.

- Unit 4 Powerhouse: outdoors adjacent to the Jeff L. Taylor Powerhouse and contains one unit with a 6.3 MW Francis turbine and associated generator. Also includes a generator lead and a step-up transformer consisting of one 6.6 megavolt ampere (MVA), three-phase unit. The non-Project Bypass System discharges are made through energy dissipation valves and pipe that penetrate an existing spray wall above the Kings River (i.e. discharges are sprayed into the air for aeration and above the plunge pool), which further dissipates energy of the releases prior to entering the river

- Public Fishing Access: containing an approximately 1,050-foot-long access road from North Piedra Road, a 0.1-acre parking area, three roadside parking areas/pullouts, five day-use sites each with a picnic table, and three barbecue grills. A non-Project 1.5-mile-long multipurpose trail, of which 0.5 mile is ADA compliant, connects to the Public Fishing Access parking area and provides access to the Kings River.

- Penstock extensions: three 13.5-foot diameter penstocks in Pine Flat Dam to the Jeff L. Taylor Powerhouse.

- Three generator leads and a step-up transformer bank: at the Jeff L. Taylor Powerhouse, consisting of three 70 MVA single-phase units.

- One generator lead and a step-up transformer: at the Unit 4 Powerhouse consisting of one 6.6 MVA, three-phase unit.

- And appurtenant facilities.

[9] While the Project includes two powerhouses, the powerhouses are adjoining, use the same source of water for power generation (i.e., USACE's Pine Flat Lake) and discharge at the same location in the Kings River. For these reasons, KRCD treats the two powerhouses as one development in this Application for New License.

Project power is provided from the Pine Flat Switchyard to the grid via California DWR's existing Pine Flat Transmission Line, FERC Project No. 2876, which interconnects with Pacific Gas and Electric Company's 230-kV Balch #2-McCall Transmission Line (Figure A.1-2). The only Project water conduits are the three penstock extensions described above.

The 11.87-acre FERC Project Boundary includes 4.94 acres of federal lands administered by the USACE, 4.55 acres of State of California lands submerged by the Kings River, and 2.38 acres of Fresno County lands. The lands within the FERC Project Boundary are zoned by Fresno County as AE160 (exclusive agricultural) and RC40 (resource conservation) (Fresno County, 2023).

Table A.2-1 identifies by Public Land Survey System federal and non-federal land sections within the FERC Project boundary.

Table A.2-1. Township, Range and Section for federal and non-federal lands enclosed within the FERC Project Boundary.

Lands	Township	Range	Section	Acres
Federal Lands (USACE)	13S	24E	2	4.94
Non-Federal Lands	13S	24E	3	6.83
			Total	**11.87**

SOURCE: (USGS, 2023)

A.4 KRCD'S PROPOSED CHANGES TO EXISTING PROJECT FACILITIES, FEATURES AND BOUNDARY

At this time, KRCD does not propose any changes to existing Project facilities and features or the FERC Project boundary. KRCD reserves its right to propose changes as the relicensing proceeds.

A.5 REFERENCES CITED

Fresno County. 2023. *GIS Shapefiles*. Retrieved from Fresno County: https://www.co.fresno.ca.us/departments/public-works-planning/divisions-of-public-works-and-planning/cds/gis-shapefiles

United States Geographic Society. 2023. *The National Map*. Retrieved from https://www.usgs.gov/programs/national-geospatial-program/national-map

Attachment D

Exhibit B Project Operations and Resource Utilization

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B.0 PROJECT OPERATIONS AND RESOURCE UTILIZATION

B.1 INTRODUCTION

The Kings River Conservation District (KRCD) has prepared this Exhibit B, Project Operations and Resource Utilization, as part of its Application for a New License Major Project – Existing Dam – from the Federal Energy Regulatory Commission (FERC) for the Jeff L. Taylor-Pine Flat Power Plant (Project), FERC Project Number 2741. This exhibit is prepared in conformance with Title 18 of the Code of Federal Regulations (C.F.R.), Subchapter B (Regulations under the Federal Power Act), Part 4 (Licenses, Permits, Exemptions and Determination of Project Costs), Subpart F and, as applicable, Part 16 (Traditional Licensing Process). In particular, this exhibit conforms to the regulations in 18 C.F.R. Section (§) 4.51(c), which describes the contents of Exhibit B, Project Operations and Resource Utilization, and also satisfies the requirements of 18 C.F.R. § 5.6(d)(iv). This Exhibit B describes, in detail, the way KRCD operates the existing Project and any changes to existing operations that KRCD proposes under the new license. As a reference, 18 C.F.R. § 4.51(c) states:

> Exhibit B is a statement of project operation and resource utilization. If the project includes more than one dam with associated facilities, the information must be provided separately for each such discrete development. The exhibit must contain:
>
> (1) A statement whether operation of the powerplant will be manual or automatic[1], an estimate of the annual plant factor[2], and a statement of how the project will be operated during adverse, mean, and high water years,[3]
>
> (2) An estimate of the dependable capacity and average annual energy production in kilowatt-hours (or a mechanical equivalent),[4] supported by the following data:
>
> (i) The minimum, mean, and maximum recorded flows in cubic feet per second of the stream or other body of water at the powerplant intake or point of diversion, with a specification of any adjustment made for evaporation, leakage, minimum flow releases (including duration of releases), or other reductions in available flow, monthly flow duration curves indicating the period of record and the gauging stations used in deriving the curves, and a specification of the period of critical stream flow used to determine the dependable capacity;[5]
>
> (ii) An area-capacity curve showing the gross storage capacity and usable storage capacity of the impoundment, with a rule curve showing the proposed operation of the impoundment and how the usable storage capacity is to be utilized;[6]
>
> (iii) The estimated minimum and maximum hydraulic capacity of the powerplant (maximum flow through the powerplant) in cubic feet per second;[7]
>
> (iv) A tailwater rating curve;[8] and
>
> (v) A curve showing powerplant capability versus head and specifying maximum, normal, and minimum

[1] See Section B.4.1.
[2] See Section B.4.3.7.
[3] See Section B.4.2.
[4] See Section B.4.3.7.
[5] See Section B.4.3.1.
[6] See Section B.4.3.3.
[7] See Section B.4.3.2.
[8] See Section B.4.3.5.

heads.[9]

(3) A statement, with load curves and tabular data, if necessary, of the manner in which the power generated at the project is to be utilized, including the amount of power to be used on-site, if any, the amount of power to be sold, and the identity of any proposed purchasers;[10] and

(4) A statement of the applicant's plans, if any, for future development of the project or of any other existing or proposed water power project on the stream or other body of water, indicating the approximate location and estimated installed capacity of the proposed developments.[11]

Besides this introductory section, this Exhibit B includes eight sections. Section B.2 provides a general description of the existing Project and its location. Section B.3 describes operating constraints. In addition, Section B.3 includes monthly flow duration curves. Section B.4 summarizes regulatory and contractual operating constraints of the Project. Section B.5 describes existing Project operations. Section B.6 describes uses of Project power. Section B.7 describes any plans KRCD may have for additional development at the Project or other future water projects in the Kings River watershed. Section B.8 states any changes to Project operations proposed by KRCD at this time, and Section 9.0 includes a list of references cited in this exhibit.

All elevation data in this exhibit are in U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Geodetic Survey Vertical Datum of 1929 (NGVD 29), unless otherwise stated.

On May 3, 2023, the Commission issued an Order Amending License[12] that approved the addition of a new turbine-generator unit (i.e., Unit 4) to the Project. KRCD anticipates the new unit will be constructed, tested, and fully operational by approximately late 2025. For the purpose of this PAD, Unit 4 is treated as a part of the "existing Project."

B.2 BRIEF DESCRIPTION OF THE EXISTING PROJECT AND ITS LOCATION

The Project is near the Community of Piedra, Fresno County, California, 30 miles east of the City of Fresno. The Project is on the north bank of the Kings River 200 feet (ft) downstream of United States Army Corps of Engineers' (USACE) Pine Flat Dam, and 111 river miles upstream of the Kings River confluence with the San Joaquin River.[13] The existing Project consists of one development - Pine Flat[14] - and one recreation

[9] See Section B.4.3.4.
[10] See Sections B.4.3.6 and B.5
[11] See Sections B.6 and B.7.
[12] FERC's Order Amending License is available in FERC's eLibrary at accession number 20230503-3104.
[13] The Kings River diverges into multiple branches in the San Joaquin Valley, with some water flowing south to the Tulare Lake basin and the rest flowing north to the San Joaquin River. For the purpose of this Application for New License, river miles (RM) are calculated from Pine Flat Dam, designated as RM 0.0, downstream in the Kings River to the confluence with the San Joaquin River, designated as RM 111.0.
[14] While the Project includes two powerhouses, the powerhouses are adjoining, use the same source of water for power generation (i.e., USACE's Pine Flat Lake) and discharge at the same location in the Kings River. For these reasons, KRCD treats the two powerhouses as one development in this Application for New License.

facility. The 11.87-acre FERC Project Boundary includes 4.94 acres of federal lands administered by the USACE, 4.55 acres of State of California lands submerged by the Kings River, and 2.38 acres of Fresno County lands. The existing Project does not include any dams, impoundments, transmission lines, open water conduits, or borrow and spoil areas.

Figure B.2-1 shows the Project location in context to the region. Figure B.2-2 shows existing Project facilities, features and FERC Project boundary and nearby surrounding non-Project facilities and features.

Figure B.2-1. Location of the Jeff L. Taylor-Pine Flat Power Plant Project.

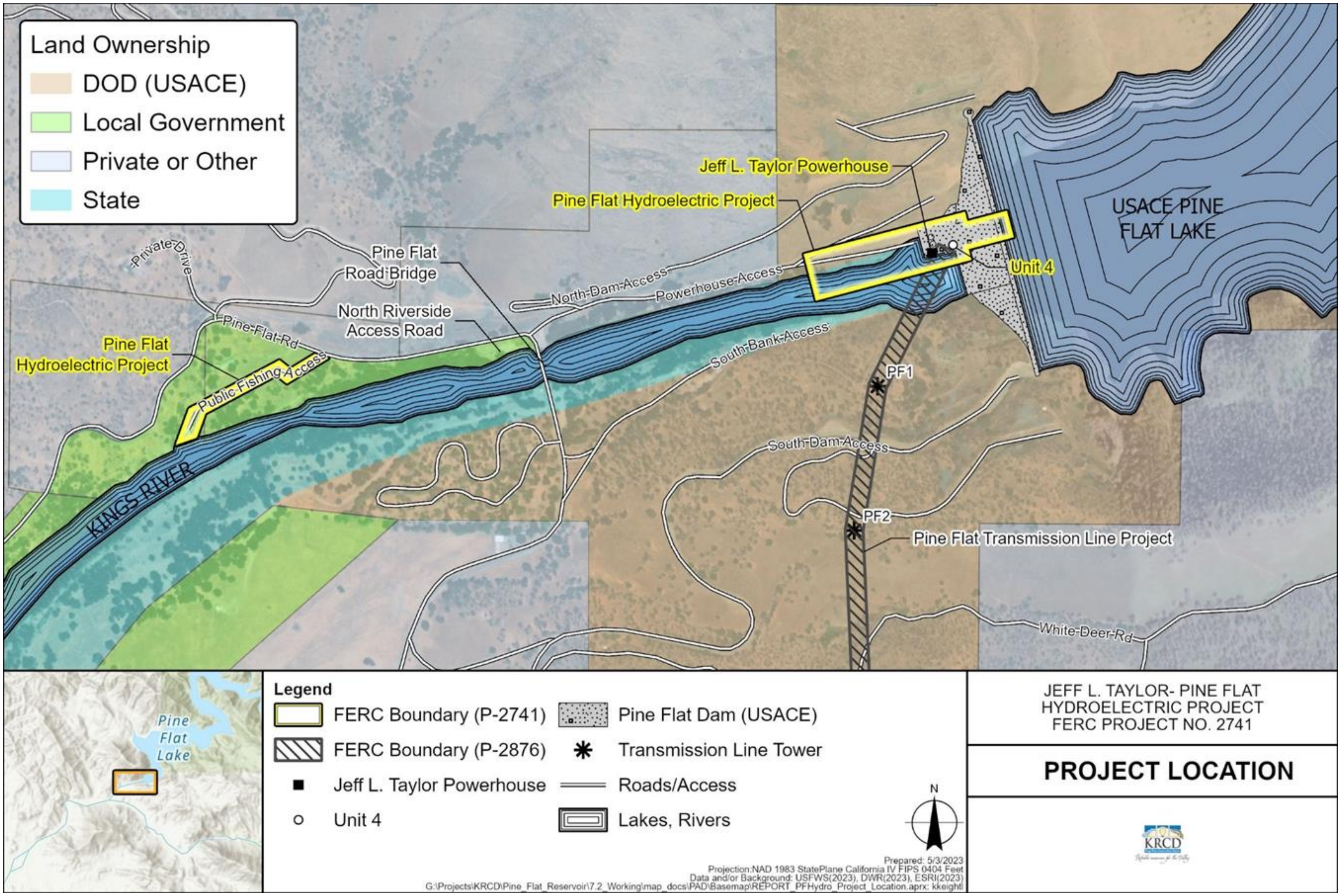


Figure B.2-2. Map of Jeff L. Taylor-Pine Flat Power Plant facilities and surrounding non-Project features.

The Project is an energy-recovery project operating in run-of-river mode to generate power from water released by the USACE's Pine Flat Lake that is formed by USACE's Pine Flat Dam. The lake and dam are not part of the Project or under FERC's jurisdiction but are federal facilities. Pine Flat Dam is a 455-ft-high concrete gravity dam and Pine Flat Lake at its normal operations elevation of 955 ft has a maximum storage capacity of 1,000,000 acre-feet (ac-ft). The dam's spillway consists of six bays each controlled by 36- by 42-ft-wide Tainter gates[15] and the spillway has a capacity of 391,000 cubic feet per second (cfs). The dam also includes a multiport intake that is shown in Figure B.2-3, and three 13.5-ft-diameter penstocks, each of which has a maximum capacity of 3,000 cfs. The drainage area upstream of the dam is 1,545 square miles.

All releases from Pine Flat Dam are made by the USACE as requested by the Kings River Water Association (KRWA)[16] through the Kings River Watermaster for irrigation demand or to meet other KRWA flow requirements, except during mandatory flood control operations when all releases are determined by the USACE consistent with the Flood Control Act of 1944 (Pub. L. No. 78-534, 58 Stat. 887) and the water control plan for Pine Flat Dam and Lake (33 C.F.R. § 208.11). KRCD has no authority to schedule or control (i.e., ramping) releases from Pine Flat Dam for power generation.

[15] A Tainter gate is a type of radial arm floodgate used in dams to control water flow.

[16] The KRWA was formed in 1927 and currently includes the following 28 members, which hold all consumptive water rights through riparian and pre-1914 appropriative rights of Kings River flows and storage rights within Pine Flat Lake: Alta Irrigation District, Burrel Ditch Company, Clark's Fork Reclamation District #2069, Consolidated Irrigation District, Corcoran Irrigation Company, Crescent Canal Company, Empire West Side Irrigation District, Fresno Irrigation District, James Irrigation District, John Heinlen Mutual Water Company, KRCD, Laguna Irrigation District, Last Chance Water Ditch Company, Lemoore Canal & Irrigation Company, Liberty Canal Company, Liberty Mill Race Company, Lovelace Water Corporation, Peoples Ditch Company, Reed Ditch Company, Riverdale Irrigation District, Southeast Lake Water Company, Stinson Canal & Irrigation Company, Stratford Irrigation District, Tranquility Irrigation District, Tulare Lake Basin Water Storage District, Tulare Lake Canal Company, Tulare Lake Reclamation District #761, and Upper San Jose Water Company.

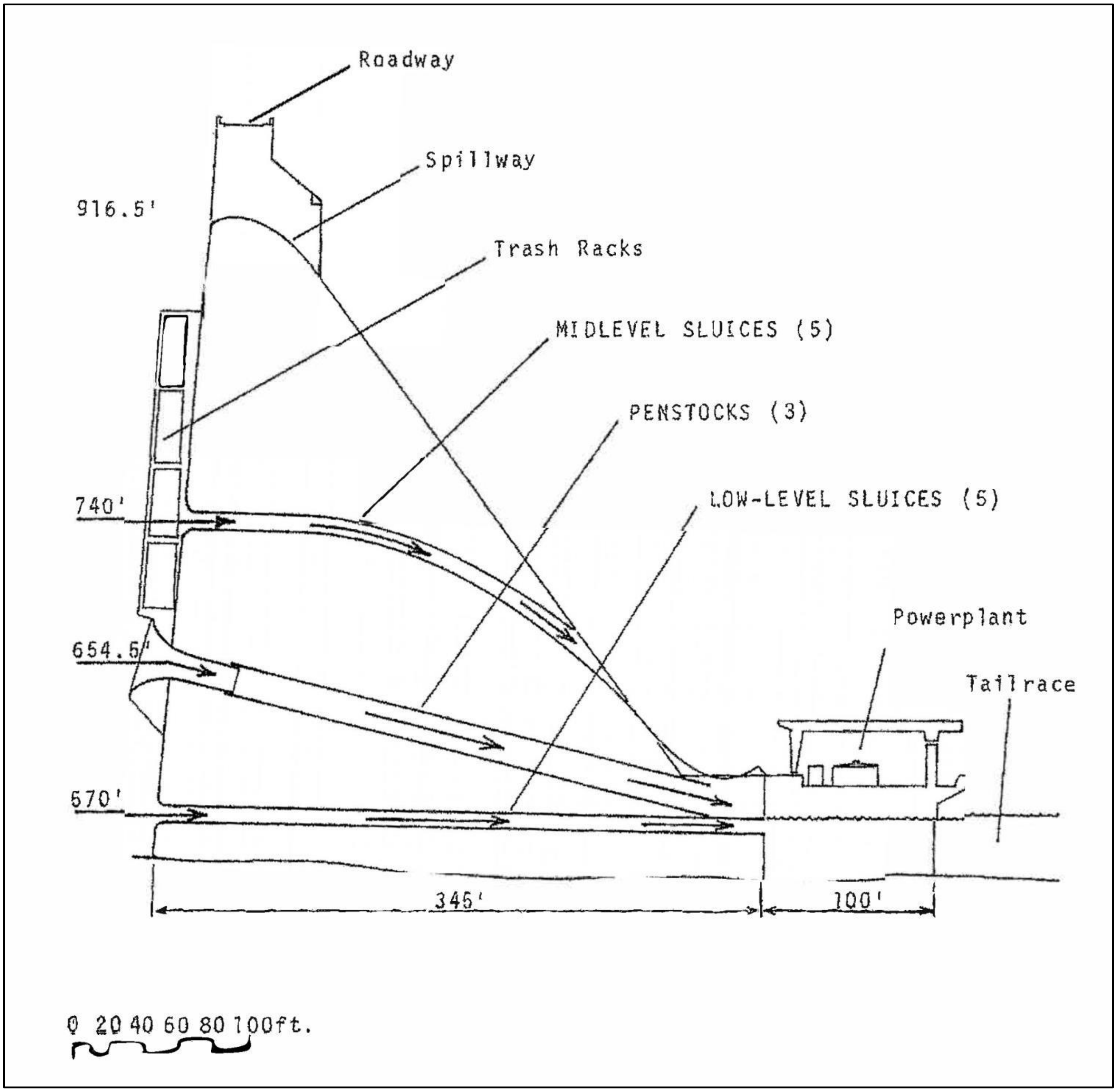


Figure B.2-3. USACE's Pine Flat Dam intake, gates, and release points.

<u>SOURCE</u>: Adapted from Figure II-1 in Exhibit S of the current Project FERC license.

B.3 EXISTING PROJECT OPERATING CONSTRAINTS

Besides the physical constraints of the Project described in Exhibit A of this Application for New License, Project operations are constrained by the current FERC license, water rights, and agreements, each of which is summarized below.

B.3.1 <u>Existing FERC License</u>

The Project's existing FERC license includes 45 articles. Of these, KRCD considers five articles (i.e., 14, 28, 39, 44 and 45) "expired" or "out-of-date" because the article pertains to an activity that has been completed or is no longer pertinent. As a result, the existing license contains 40 articles that KRCD considers "active." In addition, the Project's existing FERC license includes Exhibits J (Location Map), K, (Site Plan), L (Design Drawings), M (General Specifications of Equipment), R (Recreation), and S (Fish and Wildlife Measures). The general subject that each of the 40 active articles address is listed in Table B.3-1.

Table B.3-1. Articles in the current FERC license for the Jeff L. Taylor-Pine Flat Power Plant that KRCD considers "active."

Article	Subject	Article	Subject
1	Compliance with license	22	Fire control and suppression
2	No substantial changes without approval	23	Use of water for fire suppression
3	Conformity of construction with exhibits	24	Liability for destruction of U.S. property
4	FERC inspections and supervision	25	Construction of facilities by U.S.
5	Acquire title in fee or land use for project	26	Approvals for construction of facilities
6	Takeover by U.S.	27	Interference with U.S. communication lines / facilities
7	FERC determines cost of project	29	Disposal of mineral and vegetative material
8	Install and monitor stream gages	30	Operate project in good faith
9	Install additional capacity or other changes	31	Use or occupancy cease at end of license period
10	Coordination with other projects	32	License will not impair Federal Power Act
11	Headwater or other project benefits	33	Recreation Plan (Exhibit R)
12	Release of waters	34	Maintain dissolved oxygen concentrations at 7.0 mg/L or more when operating
13	Reasonable use of reservoir or lands	35	Maintain minimum flow of 25 cfs or more when operating
15	Protective devices for fish and wildlife	36	Install and maintain public safety devices
16	Free use to U.S. for fish and wildlife	37	Obtain USACE's approval prior to construction
17	Recreation facilities	38	No claim against U.S. related to Pine Flat Lake pool level
18	Public access to project waters	40	Payment to U.S.
19	Prevent soil erosion	41	Reimburse U.S related to Pine Flat Dam
20	Keep clear project lands	42	File final design with FERC prior to construction
21	Payment for timber cleared from U.S. lands	43	Consult with SHPO prior to construction
Total = 40 Active Articles			

As part of the initial licensing process for the Project, the State Water Resources Control Board (State Water Board) issued Clean Water Act (CWA) Section 401 Water Quality Certification (WQC) No. 78-11 on February 22, 1979. The WQC did not include any conditions stating, "*This activity as proposed will not violate Sections 301, 302, 303, and 307 of the Clean Water Act.*"

As part of the license amendment adding Unit 4 to the Project, the State Water Board issued a WQC on December 19, 2020, which includes 25 conditions pertaining to the construction, operation, and maintenance of Unit 4.[17] KRCD considers three of the Unit 4 WQC conditions (i.e., 2, 4 and 5) "expired" or "out-of-date" because the conditions pertain to construction of Unit 4. As a result, the Unit 4 WQC contains 22 active conditions.

Active articles in the existing FERC license are shown in their entirety below followed by active conditions in the State Water Board's Unit 4 WQC.

[17] The State Water Board's Unit 4 WQC is available in FERC's eLibrary at accession number 20221220-5242.

B.3.1.1 Existing FERC License Articles

Article 1. The entire project, as described in this order of the Commission, shall be subject to all of the provisions, terms, and conditions of the license.

Article 2. No substantial change shall be made in the maps, plans, specifications, and statements described and designated as exhibits and approved by the Commission in its order as a part of the license until such change shall have been approved by the Commission: Provided, however, That if the Licensee or the Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval a revised, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become a part of the license and shall supersede, in whole or in part, such exhibit or exhibits theretofore made a part of the license as may be specified by the Commission.

Article 3. The project works shall be constructed in substantial conformity with the approved exhibits referred to in Article 2 herein or as changed in accordance with the provisions of said article. Except when emergency shall require for the protection of navigation, life, health, or property, there shall not be made without prior approval of the Commission any substantial alteration or addition not in conformity with the approved plans to any dam or other project works under the license or any substantial use of project lands and waters not authorized herein; and any emergency alteration, addition, or use so made shall thereafter be subject to such modification and change as the Commission may direct. Minor changes in project works, or in uses of project lands and waters, or divergence from such approved exhibits may be made if such changes will not result in a decrease in efficiency, in a material increase in cost, in an adverse environmental impact, or in impairment of the general scheme of development; but any of such minor changes made without the prior approval of the Commission, which in its judgment have produced or will produce any of such results, shall be subject to such alteration as the Commission may direct.

Article 4. The construction, operation, and maintenance of the project and any work incidental to additions or alterations shall be subject to the inspection and supervision of the Regional Engineer, of the Commission, in the region wherein the project is located, or of such other officer or agent as the Commission may designate, who shall be the authorized representative of the Commission for such purposes. The Licensee shall cooperate fully with said representative and shall furnish him a detailed program of inspection by the Licensee that will provide for an adequate and qualified inspection force for construction of the project and for any subsequent alterations to the project. Construction of the project works, or any feature or alteration thereof shall not be initiated until the program of inspection for the project works or any such feature thereof has been approved by said representative. The Licensee shall also furnish to said representative such further information as he may require concerning the construction, operation, and maintenance of the project, and of any alteration thereof, and shall notify him of the date upon which work will begin, as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The Licensee shall allow said representative and other officers or employees of the United States, showing proper credentials, free and unrestricted access to, through, and across the project lands and project works in the performance of their official duties. The Licensee shall comply with such rules and regulations of general or special applicability as the Commission may prescribe from time to time for the protection of life, health, or property.

Article 5. The Licensee, within five years from the date of issuance of the license, shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the United States, necessary or appropriate for the construction, maintenance, and operation of the project. The Licensee or its successors and assigns shall, during the period of the license, retain the possession of all project property covered by the license as issued or as later amended, including the project area, the project works, and all franchises, easements, water rights, and rights of occupancy and use; and none of such properties shall be voluntarily sold, leased, transferred, abandoned, or otherwise disposed of without the prior written approval of the Commission, except that the Licensee may lease or otherwise dispose of interests in project lands or property without specific written approval of the Commission pursuant to the then current regulations of the Commission. The provisions of this article are not intended to prevent the abandonment or the retirement from service of structures, equipment, or other project works in connection with replacements thereof when they become obsolete, inadequate, or inefficient for further service due to wear and tear; and mortgage or trust deeds or judicial sales made thereunder, or tax sales, shall not be deemed voluntary transfers within the meaning of this article.

Article 6. In the event the project is taken over by the United States upon the termination of the license as provided in Section 14 of the Federal Power Act, or is transferred to a new licensee or to a non-power licensee under the provisions of Section 15 of said Act, the Licensee, its successors and assigns shall be responsible for, and shall make good any defect of title to, or of right of occupancy and use in, any of such project property that is necessary or appropriate or valuable and serviceable in the maintenance and operation of the project, and shall pay and discharge, or shall assume responsibility for payment and discharge of, all liens or encumbrances upon the project or project property created by the Licensee or created or incurred after the issuance of the license: Provided, that the provisions of this article are not intended to require the Licensee, for the purpose of transferring the project to the United States or to a new licensee, to acquire any different title to, or right of occupancy and use in, any of such project property than was necessary to acquire for its own purposes as the Licensee.

Article 7. The actual legitimate original cost of the project, and of any addition thereto or betterment thereof, shall be determined by the Commission in accordance with the Federal Power Act and the Commission's Rules and Regulations thereunder.

Article 8. The Licensee shall install and thereafter maintain gages and stream-gaging stations for the purpose of determining the stage and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage, and the effective head on the turbines; shall provide for the required reading of such gages and for the adequate rating of such stations; and shall install and maintain standard meters adequate for the determination of the amount of electric energy generated by the project works. The number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, shall at all times be satisfactory to the Commission or its authorized representative. The Commission reserves the right, after notice and opportunity for hearing, to require such alterations in the number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, as are necessary to secure adequate determinations. The installation of gages, the rating of said stream or streams, and the determination of the flow thereof, shall be under the supervision of, or in cooperation with, the District Engineer of the United States Geological Survey having charge of stream-gaging operations in the region of the project, and the Licensee shall advance to the United States Geological Survey the amount of funds estimated to be necessary for such supervision, or cooperation for such periods as may be mutually agreed upon. The Licensee shall keep accurate and sufficient records of the foregoing determinations to the satisfaction of the Commission and shall make return of such records annually at such time and in such form as the Commission may prescribe.

<u>Article 9</u>. The Licensee shall, after notice and opportunity for hearing, install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so.

<u>Article 10</u>. The Licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission may direct in the interest of power and other beneficial public uses of water resources, and on such conditions concerning the equitable sharing of benefits by the Licensee as the Commission may order.

<u>Article 11</u>. Whenever the Licensee is directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement, the Licensee shall reimburse the owner of the headwater improvement for such part of the annual charges for interest, maintenance, and depreciation thereof as the Commission shall determine to be equitable, and shall pay to the United States the cost of making such determination as fixed by the Commission. For benefits provided by a storage reservoir or other headwater improvement of the United States, the Licensee shall pay to the Commission the amounts for which it is billed from time to time for such headwater benefits and for the cost of making the determinations pursuant to the then current regulations of the Commission under the Federal Power Act.

<u>Article 12</u>. The operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled by such reasonable rules and regulations as the Commission may prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes, and the Licensee shall release water from the project reservoir at such rate in cubic feet per second, or such volume in acre-feet

per specified period of time, as the Commission may prescribe for the purposes hereinbefore mentioned.

Article 13. On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, . irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the Licensee to incur. Any such compensation shall be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefiting or after notice and opportunity for hearing. Applications shall contain information in sufficient detail to afford a full understanding of the proposed use, including satisfactory evidence that the applicant possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot concurrently be submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders which may have been adopted with respect to the use of such waters.

Article 15. The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.

Article 16. Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the Licensee shall permit the United States or its designated agency to use, free of cost, such of the Licensee's lands and interests in lands, reservoirs, waterways and project works as may be reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the Licensee shall modify the project operation as may be reasonably prescribed by the Commission in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wild- life facilities or to relieve the Licensee of any obligation under this license.

Article 17.[18] The Licensee shall construct, maintain, and operate, or shall arrange for the construction, maintenance, and operation of such reasonable recreational facilities, including modifications thereto, such as access roads, wharves, launching ramps, beaches, picnic and camping areas, sanitary facilities, and utilities, giving consideration to the needs of the physically handicapped, and shall comply with such reasonable modifications of the project, as may be prescribed here-after by the Commission during the term of this license upon its own motion or upon the recommendation of the Secretary of the Interior or other interested Federal or State agencies, after notice and opportunity for hearing.

Article 18. So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the Licensee for the purpose of full public utilization of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting: Provided, That the Licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.

Article 19. In the construction, maintenance, or operation of the project, the Licensee shall be responsible for, and shall take reasonable measures to prevent, soil erosion on lands adjacent to streams or other waters, stream sedimentation, and any form of water or air pollution. The Commission, upon request or upon its own motion, may order the Licensee to take such measures as the Commission finds to be necessary for these purposes, after notice and opportunity for hearing.

Article 20. The Licensee shall consult with the appropriate State and Federal agencies and, within one year of the date of issuance of this license, shall submit for Commission approval a plan for clearing the reservoir area. Further, the Licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. Upon approval of the clearing plan all clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

[18] Articles 17, 18, 22, 23, 24, 25 and 33 all pertain to recreation. The original fishing access area located on USACE lands on the south bank of the Kings River immediately below the Pine Flat Dam had to be replaced after the Department of Homeland Security excluded public access to the 0.6-mile-long section of the Kings River from Pine Flat Dam to the Pine Flat Road Bridge. After consulting with the USACE and Fresno County and entering into an agreement with the County, KRCD filed with FERC a Revised Exhibit R that showed an alternative fishing access area downstream of the USACE Pine Flat Dam Bridge. This is the Public Fishing Access area described in this Application for New License and currently available for use by the public.

Article 21. Timber on lands of the United States cut, used, or destroyed in the construction and maintenance of the project works, or in the clearing of said lands, shall be paid for, and the resulting slash and debris disposed of, in accordance with the requirements of the agency of the United States having jurisdiction over said lands. Payment for merchantable timber shall be at current stump- age rates, and payment for young growth timber below merchantable size shall be at current damage appraisal values. However, the agency of the United States having jurisdiction may sell or dispose of the merchantable timber to others than the Licensee: Provided, that timber so sold or disposed of shall be cut and removed from the area prior to, or without undue interference with, clearing operations of the Licensee and in coordination with the Licensee's project construction schedules. Such sale or disposal to others shall not relieve the Licensee of responsibility for the clearing and disposal of all slash and debris from project lands.

Article 22. The Licensee shall do everything reasonably within its power, and shall require its employees, contractors, and employees of contractors to do every- thing reasonably within their power, both independently and upon the request of officers of the agency concerned, to prevent, to make advance preparations for suppression of, and to suppress fires on the lands to be occupied or used under the license. The Licensee shall be liable for and shall pay the costs incurred by the United States in suppressing fires caused from the construction, operation, or maintenance of the project works or of the works appurtenant or accessory thereto under the license.

Article 23. The Licensee shall interpose no objection to, and shall in no way prevent, the use by the agency of the United States having jurisdiction over the lands of the United States affected, or by persons or corporations occupying lands of the United States under permit, of water for fire suppression from any stream, conduit, or body of water, natural or artificial, used by the Licensee in the operation of the project works covered by the license, or the use by said parties of water for sanitary and domestic purposes from any stream, conduit, or body of water, natural or artificial, used by the Licensee in the operation of the project works covered by the license.

Article 24. The Licensee shall be liable for injury to, or destruction of, any buildings, bridges, roads, trails, lands, or other property of the United States, occasioned by the construction, maintenance, or operation of the project works or of the works appurtenant or accessory thereto under the license. Arrangements to meet such liability, either by compensation for such injury or destruction, or by reconstruction or repair of damaged property, or otherwise, shall be made with the appropriate department or agency of the United States.

Article 25. The Licensee shall allow any agency of the United States, without charge, to construct or permit to be constructed on, through, and across those project lands which are lands of the United States such conduits, chutes, ditches, railroads roads, trails, telephone and power lines, and other routes or means of transportation and communication as are not inconsistent with the enjoyment of said lands by the Licensee for the purposes of the license. This license shall not be construed as conferring upon the Licensee any right of use, occupancy, or enjoyment of the lands of the United States other than for the construction, operation, and maintenance of the project as stated in the license.

Article 26. In the construction and maintenance of the project, the location and standards of roads and trails on lands of the United States and other uses of lands of the United States, including the location and condition of quarries, borrow pits, and spoil disposal areas, shall be subject to the approval of the department or agency of the United States having supervision over the lands involved.

Article 27. The Licensee shall make provision, or shall bear the reasonable cost, as determined by the agency of the United States affected, of making provision for avoiding inductive interference between any project transmission line or other project facility constructed, operated, or maintained under the license, and any radio installation, telephone line, or other communication facility installed or constructed before or after construction of such project transmission line or other project facility and owned, operated, or used by such agency of the United States in administering the lands under its jurisdiction.

Article 29. The Licensee shall cooperate with the United States in the disposal by the United States, under the Act of July 31, 1947, 61 Stat. 681, as amended (30 U.S.C. sec. 601, et seq.), of mineral and vegetative materials from lands of the United States occupied by the project or any part thereof: Provided, That such disposal has been authorized by the Commission and that it does not unreasonably interfere with the occupancy of such lands by the Licensee for the purposes of the license: Provided further, That in the event of disagreement, any question of unreasonable interference shall be determined by the Commission after notice and opportunity for hearing.

Article 30. If the Licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the Licensee or its agent, the Commission will deem it to be the intent of the Licensee to surrender the license. The Commission, after notice and opportunity for hearing, may require the Licensee to remove any or all structures, equipment and power lines within the project boundary and to take any such other action necessary to restore the project waters, lands, and facilities remaining within the project boundary to a condition satisfactory to the United States agency having jurisdiction over its lands or the Commission's authorized representative, as appropriate, or to provide for the continued operation and maintenance of nonpower facilities and fulfill such other obligations under the license as the Commission may prescribe. In addition, the Commission in its discretion, after notice and opportunity for hearing, may also agree to the surrender of the license when the Commission, for the reasons recited herein, deems it to be the intent of the Licensee to surrender the license.

Article 31. The right of the Licensee and of its successors and assigns to use or occupy waters over which the United States has jurisdiction, or lands of the United States under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless the Licensee has obtained a new license pursuant to the then existing laws and regulations, or an annual license under the terms and conditions of this license.

Article 32. The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.

Project-specific Articles

Article 33. The Licensee shall consult with the California Department of Fish and Game and the Heritage Conservation and Recreation Service of the U.S. Department of the Interior and, within one year from the date of issuance of this license, shall file for approval an amendment to the Exhibit R which shall include, but need not be limited to, a plan for development of a fishing access site on the Kings River, downstream from Pine Flat Dam, to be included within the project boundary.

Article 34. Upon commencement of commercial operation of the project, the Licensee shall install and operate continuously dissolved oxygen monitoring equipment in the Kings River at the Pine Flat Road bridge. The Licensee shall maintain records of the monitoring data and shall file with the California Department of Fish and Game and the Commission an annual summary at the end of each year after the commencement of commercial operation, and summaries for other intervals when requested, which shall include observed daily minimum, maximum, and average dissolved oxygen concentrations. If the results of the monitoring indicate that any change in project works or operation is necessary to maintain a minimum dissolved oxygen concentration of 7.0 mg/1, the Licensee shall promptly file for approval its proposal for the change.

Article 35. Pending further order by the Commission, on its own motion or at the request of others, the Licensee shall discharge from the Pine Flat Dam a continuous minimum flow of 25 cfs or a flow equal to the natural inflow to the Pine Flat Reservoir, whichever is less, for the purpose of protecting fish and wildlife resources. These flows may be modified temporarily: (1) during and to the extent required by operating emergencies beyond the control of the Licensee; and (2) for fishery management purposes, upon mutual agreement between the Licensee and the California Department of Fish and Game.

Article 36. The Licensee shall, to the satisfaction of the Commission's authorized representative, install and operate any signs, lights, sirens, or other safety devices that may reasonably be needed to warn the public of fluctuations in flow from the project and to protect the public in its recreational use of project lands and waters.

Article 37. The Licensee shall, prior to initiation of construction, obtain approval from the U.S. Army Corps of Engineers, Sacramento District, Sacramento, California, of the final design, construction plans, specifications, and operating plans for the Pine Flat Project.

Article 38. The Licensee shall have no claim under this license against the United States arising from the effect of any changes made in the pool levels of the Pine Flat Reservoir.

Article 40. The licensee shall pay the United States the following annual charges, effective the date this order is issued:

(1) For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable annual charge as determined by the Commission in accordance with its regulations in effect from time to time. The total authorized installed capacity for that purpose is 165,000 kilowatts, until the date of commencement of operation of Unit 4, after which time the authorized installed capacity 171,300 kilowatts.

(2) For the purpose of recompensing the United States for the use, occupancy, and enjoyment of 4.94 acres of its lands, an amount as may be determined from time to time pursuant to the Commission's regulations.

(3) For the purpose of recompensing the United States for the use of the Pine Flat Dam, an amount that shall be determined later and that shall not exceed $1,430,000, subject to possible adjustment at the intervals specified in Section 10(e) of the Act.

Article 41. The Licensee shall reimburse the United States for all construction costs incurred by the United States for the specific and sole purpose of accommodating the installation of power facilities at the Pine Flat Dam. This reimbursement is in addition to the annual charge specified in paragraph (3) of Article 40. Arrangements for payment shall be made with the Chief of Engineers, Department of the Army, at the time of commencement of construction of the project.

Article 42. The Licensee shall file with the Commission's Regional Engineer in San Francisco, California, with a copy to the Director, Office of Electric Power Regulation, one copy each of the final design and construction plans and specifications prior to the start of construction. The Director, Office of Electric Power Regulation, may require any changes in those plans and specifications necessary to ensure a safe and adequate project.

Article 43. The Licensee shall continue to consult and cooperate with the California State Historic Preservation Officer (SHPO) prior to any construction or development of any project works or other facilities at the project. If any previously unrecorded archeological sites are discovered during the course of any construction or development of any project works or other facilities at the project, construction activity in the vicinity shall be halted, a qualified archeologist shall be consulted to determine the significance of the sites, and the Licensee shall consult with the SHPO to develop a mitigation plan for the protection of significant archeological resources. The Licensee shall provide funds in a reasonable amount for any mitigative measures that may be necessary. If the Licensee and the SHPO cannot agree on the amount of money to be expended on archeological work related to the project, the Commission reserves the right to require the Licensee to conduct, at its own expense, any archeological work found necessary.

B.3.1.2 Unit 4 Water Quality Certification

FERC's May 3, 2023, Order Amending License incorporated the 25 conditions of the WQC (December 19, 2020) into the license by ordering paragraph (B). KRCD considers conditions 2, 4 and 5 to be expired or out-of-date. The remaining 22 active conditions under the WQC are as follows:

Unit 4 WQC Condition 1. Unless otherwise modified by conditions of this water quality certification (certification) or approved by the Deputy Director of the Division of Water Rights (Deputy Director), the Licensee shall implement the Project as described in the Kings River Conservation District's December 20, 2021, certification application (KRCD 2021a).

Unit 4 WQC Condition 3. The Licensee shall comply with the State Water Resources Control Board's (State Water Board's) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit)6 (State Water Board 2009), and amendments thereto. For construction and maintenance activities with the potential to impact water quality or beneficial uses that are not subject to the Construction General Permit and that are not covered by another condition of this certification, the Licensee shall prepare and implement site-specific Water Quality Monitoring and Protection Plans (WQMP Plans) for Deputy Director review and consideration for approval.

At a minimum, the WQMP Plans must demonstrate compliance with sediment and turbidity water quality objectives in the Water Quality Control Plan for the Tulare Lake Basin (Tulare Lake Basin Plan) as adopted and may be amended by the Central Valley Regional Water Quality Control Board (Central Valley Regional Water Board 2018).

The Licensee shall submit WQMP Plans to the Deputy Director for review and consideration for approval at least 120 days prior to the desired start date of the applicable construction or maintenance activity. The objective of the WQMP Plans shall be to identify and implement control measures for construction, maintenance, or other activities with the potential to cause erosion, stream sedimentation, fugitive dust, soil mass movement, release of hazardous materials, or other water quality impairment.

WQMP Plans shall be based on actual site geologic, soil, and groundwater conditions, and at a minimum shall include:

- A description of site conditions and the proposed activity;
- Detailed descriptions, design drawings, and specific topographic locations of all control measures in relation to the proposed activity, which may include:
    - Measures to divert runoff away from disturbed land surfaces;

- Measures to collect and filter runoff from disturbed land surfaces, including sediment ponds;
- Measures to dissipate energy and prevent erosion;

- Revegetation measures for disturbed areas, which shall include use of native plants and locally-sourced plants and seeds; and
- A monitoring, maintenance, and reporting schedule.

The Deputy Director may require modifications as part of any approval. The Licensee shall file with FERC the Deputy Director-approved WQMP Plans, and any approved amendments thereto. The Licensee shall implement the WQMP Plans upon receipt of Deputy Director and any other required approvals, in accordance with the schedule and requirements specified therein.

Unit 4 WQC Condition 6. Unless otherwise specified in this certification or at the request of the Deputy Director, data and/or reports shall be submitted electronically in a format accepted by the State Water Board to facilitate the incorporation of this information into public reports and the State Water Board's water quality database systems in compliance with California Water Code section 13167.

Unit 4 WQC Condition 7. This certification does not authorize any act which results in the take of a threatened, endangered, or candidate species or any act which is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (ESA) (Fish & G. Code, §§ 2050 – 2097) or the federal ESA (16 U.S.C. §§ 1531 – 1544). If a “take” will result from any act authorized under this certification or water rights held by the Licensee, the Licensee must obtain authorization for the take prior to any construction or operation of the portion of the Project that may result in a take. The Licensee is responsible for meeting all requirements of the applicable ESAs for the Project authorized under this certification.

Unit 4 WQC Condition 8. This certification shall not be construed as replacement or substitution for any necessary federal, state, and local approvals. The Licensee is responsible for compliance with all applicable federal, state, or local laws or ordinances and shall obtain authorization from applicable regulatory agencies prior to the commencement of Project activities.

Unit 4 WQC Condition 9. Any requirement in this certification that refers to an agency whose authorities and responsibilities are transferred to or subsumed by another state or federal agency, will apply equally to the successor agency.

Unit 4 WQC Condition 10. Nothing in this certification shall be construed as State Water Board approval of the validity of any water rights, including pre-1914 or riparian claims. The State Water Board has separate authority under the Water Code to investigate and take enforcement action, if necessary, to prevent any unauthorized or threatened unauthorized diversions of water.

Unit 4 WQC Condition 11. This certification is subject to modification or revocation upon administrative or judicial review, including but not limited to review and amendment pursuant to Water Code section 13330 and California Code of Regulations, title 23, division 3, chapter 28, article 6 (commencing with section 3867).

Unit 4 WQC Condition 12. This certification is not intended and shall not be construed to apply to any activity involving a hydroelectric facility and requiring a FERC license or an amendment to a FERC license unless the pertinent application for certification was filed pursuant to California Code of Regulations, title 23, section 3855, subdivision (b) and that application for certification specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.

Unit 4 WQC Condition 13. This certification is conditioned upon total payment of any fee required under California Code of Regulations, title 23, division 3, chapter 28.

Unit 4 WQC Condition 14. Notwithstanding any more specific provision of this certification, any plan or report developed as a condition of this certification requires review and approval by the Deputy Director. The State Water Board's approval authority, including authority delegated to the Deputy Director or others, includes the authority to withhold approval or to require modification of a plan, proposal, or report prior to approval. The State Water Board may take enforcement action if the Licensee fails to provide or implement a required item in a timely manner. If a time extension is needed to submit an item for Deputy Director approval, the Licensee shall submit a written request for the extension, with justification, to the Deputy Director no later than 15 days prior to the deadline. The Licensee shall not implement any plan, proposal, or report until after the applicable State Water Board approval and any other necessary regulatory approvals.

Unit 4 WQC Condition 15. In the event of any violation or threatened violation of the conditions of this certification, the violation or threatened violation is subject to any remedies, penalties, process, or sanctions as provided for under applicable state or federal law. For the purposes of section 401(d) of the Clean Water Act, the applicability of any state law authorizing remedies, penalties, process, or sanctions for the violation or threatened violation constitutes a limitation necessary to ensure compliance with the water quality standards and other pertinent requirements incorporated into this certification. In response to any violation of the conditions of this certification, the State Water Board may add to or modify the conditions of this certification as appropriate to ensure compliance.

Unit 4 WQC Condition 16. The Licensee shall submit any change to the Project, including, operations, facilities, technology changes or upgrades, or methodology, which could have a significant or material effect on the findings, conclusions, or conditions of this certification, to the State Water Board for prior review and written approval. The State Water Board shall determine significance and may require consultation with other state and/or federal agencies. If the State Water Board is not notified of a change to the Project, it will be considered a violation of this certification.

Unit 4 WQC Condition 17. This certification is contingent on compliance with all applicable requirements of the Tulare Lake Basin Plan.

Unit 4 WQC Condition 18. Unless otherwise specified by conditions in this certification, Project activities shall be conducted in a manner consistent with all water quality standards and implementation plans adopted or approved pursuant to the Porter-Cologne Water Quality Control Act or section 303 of the Clean Water Act. The Licensee shall take all reasonable measures to protect the beneficial uses of waters of the state, including the Kings River and Pine Flat Reservoir.

Unit 4 WQC Condition 19. In response to a suspected violation of any condition of this certification, the State Water Board or Central Valley Regional Water Board may require the holder of any federal permit or license subject to this certification to furnish, under penalty of perjury, any technical or monitoring reports the State Water Board deems appropriate, provided that the burden, including costs, of the reports shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. (Wat. Code, §§ 1051, 13165, 13267, and 13383.)

Unit 4 WQC Condition 20. Upon request, a construction schedule shall be provided to State Water Board and Central Valley Regional Water Board staff. The Licensee shall provide State Water Board and Central Valley Regional Water Board staff access to Project sites to document compliance with this certification.

Unit 4 WQC Condition 21. A copy of this certification shall be provided to any contractor and all subcontractors conducting Project-related work, and copies shall remain in their possession at the Project site. The Licensee shall be responsible for work conducted by its contractors, subcontractors, or other persons conducting Project-related work.

Unit 4 WQC Condition 22. The State Water Board reserves the authority to add to or modify the conditions of this certification: (1) to incorporate changes in technology, sampling, or methodologies; (2) if monitoring results indicate that Project activities could violate water quality objectives or impair beneficial uses; (3) to implement any new or revised water quality standards and implementation plans adopted or approved pursuant to the Porter-Cologne Water Quality Control Act or section 303 of the Clean Water Act; and (4) to require additional monitoring and/or other measures, as needed, to ensure that Project activities meet water quality objectives and protect beneficial uses.

Unit 4 WQC Condition 23. The Licensee shall use analytical methods approved by California's Environmental Laboratory Accreditation Program, where such methods are available. Samples that require laboratory analysis shall be analyzed by Environmental Lab Accreditation Program-certified laboratories.

Unit 4 WQC Condition 24. The State Water Board shall provide notice and an opportunity to be heard in exercising its authority to add to or modify the conditions of this certification.

Unit 4 WQC Condition 25. The provisions of this certification are severable. If any provision of this certification is found invalid, affects the validity of the certification, or would result in a determination that the State Water Board has waived its section 401 certification authority for the Project, the State Water Board reserves authority to consider whether an alternative term would address the water quality issue without being found invalid or resulting in a waiver determination. If any provision of this certification is found invalid, affects the validity of the certification, or would result in a determination that the State Water Board has waived its section 401 certification authority for the Project, the remainder of this certification shall not be affected.

B.3.2 Measures in Other Licenses, Agreements, and Contracts that Affect Operations

B.3.2.1 Project Water Rights for Power [No Expiration Date]

As described above, the Project is an energy recovery (i.e., run-of-river) facility that generates power as water is released from USACE's Pine Flat Lake during mandatory flood control operations and as requested by the KRWA through its Water Master for irrigation demand or to meet KRWA's other downstream flow requirements. KRCD holds one water right (Application No. A025169, License No. 012885) with a priority date of October 8, 1976, related to the Project. The water right does not include any rights to store a volume of water in Pine Flat Lake, divert a volume of natural flow in the Kings River, or redivert a volume of water stored in Pine Flat Lake, but provides KRCD with the right to pass water released by others from the dam though its powerhouses for the purpose of power generation at the Project.

B.3.2.2 1992 USACE and KRCD Agreement for the Operation and Maintenance of Pine Flat Power Plant [Expiration upon FERC License termination]

USACE and KRCD entered into an agreement, after the approval of the proposed construction of the Jeff L. Taylor Power Plant by USACE and FERC, for the ongoing operation and maintenance of the powerplant. USACE kept title to all lands, Pine Flat Dam, and existing appurtenances and equipment already in the United States ownership, while KRCD was given title to the powerplant. A Project Operations Plan was developed and included in the Agreement, and KRCD was made responsible for operating the turbines in cooperation with the USACE. All major modifications to the powerplant necessitate written consent of the USACE, who also retains access rights to the area. All costs necessary for the maintenance, repair, replacement, and proper operation of the powerplant facilities are solely the responsibility of KRCD, but USACE and KRCD coordinate O&M activities. The agreement also includes terms for inspections, emergency situations, liability and training, among other things. KRCD expects that FERC will include in the new FERC license a license article requiring KRCD to enter into a new agreement with the USACE for ongoing Project operations.

B.3.2.3 2000 USACE and KRCD Cooperative Agreement for Non-Project Bypass System [No Expiration]

USACE, through a Cooperative Agreement with KRCD as the local cost share provider, constructed a non-Project Bypass System to improve water temperature downstream of

Pine Flat Dam. Prior to the Bypass System, water released by the USACE that did not pass through the powerhouse was withdrawn from Pine Flat Lake via the Pine Flat Intake at an invert elevation of 740 ft and released through one or more of five mid-level sluices in the dam (Figure B.2-3). Water released by the Jeff L. Taylor Powerhouse was withdrawn from Pine Flat Lake at an invert elevation of 654.5 ft and released into the powerhouse via one or more penstocks (Figure B.2-3). The Bypass System withdraws water from Pine Flat Lake through the intake gate at an invert elevation of 654.5 ft and discharges the water into the air above the Kings River through Monovar[19] energy dissipation valves. As a result, releases from the Bypass System are colder since they withdraw water from deeper depths in Pine Flat Lake.

USACE was authorized to make improvements by Section 1135 of the Water Resource Development Act of 1986, Public Law 99-662, and the Bypass System commenced operations in 2003. The non-Project Bypass System facilities consist of a 48-inch-diameter bypass line with a maximum capacity of 900 cfs from each of the three Project penstock extensions. The 48-inch-diameter pipes from Units No. 1 and No. 2 penstock extensions combine into a single 66-inch-diameter line that discharges up to 600 cfs through a 66-inch Monovar valve into the Kings River. The bypass line from the Unit No.3 penstock extension discharges up to 300 cfs through a 48-inch Monovar valve into the Kings River (Figure B.2-2.). Responsibility for the Bypass System operations, repair, and maintenance is delegated to KRCD under the Cooperative Agreement. Benefits of the Bypass System include enhanced fish flows and water quality, as well as the ability to use this port from the dam versus the mid-sluice or low-level sluice way.

B.3.2.4 1978 CDFW and KRCD Memorandum of Understanding [Expires August 31, 2029]

In anticipation of Project licensing, in 1978 the California Department of Fish and Game (CDFG), now California Department of Fish and Wildlife (CDFW), and KRCD entered into a Memorandum of Understanding (MOU), which has an expiration date of August 31, 2029. The MOU includes the seven following conditions:

- Condition 1 requires KRCD to prevent sedimentation related to the Project. The Project does not capture or release sediment.
- Condition 2 requires KRCD to monitor dissolved oxygen concentration at the Pine Flat Dam Bridge and maintain dissolved oxygen concentrations at a minimum of 7.0 milligrams per liter (mg/L) when the Jeff L. Taylor Powerhouse is in operation, as does Article 34 in the current FERC license. KRCD established and maintains the dissolved oxygen concentration monitoring station and continuously monitors dissolved oxygen concentration.

[19] A Monovar valve consists of a fixed and sliding plate with a pattern of orifices in each plate. As the sliding plate is adjusted the orifices line up controlling flow through the valve. When the valve is fully open, the orifices in the fixed and siding plate are fully aligned to allow full flow through the valve.

- Condition 3 required KRCD to stock rainbow trout (*Oncorhynchus mykiss*) and white catfish (*Ictalurus catus*) in USACE's Pine Flat Lake from 1978 through the first year of Project operations and assess whether Project operations resulted in a decline of fish populations. KRCD stocked the fish and assessed Project affects concluding in a 1993 report that states: "*Survival estimates for the reservoir trout during the post-project period is greater than the pre-project period*."
- Condition 4 required KRCD to monitor rainbow trout between the Jeff L. Taylor Powerhouse and first downstream diversion dam on the Kings River in the year prior to completion of Project construction and during the third and fifth year of Project operation and, if the results show significant adverse impact to the rainbow trout population, implement appropriate mitigation measures. KRCD completed the monitoring and found no adverse effects.
- Condition 5 required KRCD to conduct a creel census to determine effects of Project construction and operations on white catfish in the second year prior to completion of Project construction and during the third and fifth year of Project operation and, if the results show significant adverse impact to the white catfish population, implement appropriate mitigation measures. In a letter dated October 1, 1981, CDFW removed this requirement from the MOU.
- Condition 6 required KRCD to determine if Project construction had an adverse impact on raptors. KRCD completed the study and found no impacts.
- Condition 7 requires KRCD to provide angler access at a point downstream from Pine Flat Dam on the Kings River to replace any angler access which was lost due to Project operation and safety concerns, as does Article 33 in the FERC current license. KRCD identified and constructed an angler access site on the left bank between the powerhouse and Pine Flat Road Bridge. However, subsequently, USACE and the California Fish and Game Commission closed public access from the dam to the bridge in 2005 due to security concerns rendering KRCD's angler access site useless. To meet the requirements in Condition 7 and Article 33, KRCD negotiated an agreement with Fresno County Department of Parks and Recreation (DPR) to provide a replacement angler access site. KRCD currently maintains the downstream angler access site in cooperation with Fresno County DPR. The replacement angler access site and facilities were approved by FERC on August 21, 2007 and are included in the license.[20]

B.3.2.5 1999 CDFW, KRCD, and KRWA Framework Agreement [No Expiration Date]

On May 28, 1999, KRCD, KRWA, and CDFW signed the Kings River Fisheries Management Program Framework Agreement (Framework Agreement). The

[20] FERC's approval of KRCD's change in the fishing access site is available at FERC's eLibrary as ascension number 20070821-4012.

Framework Agreement is a voluntary program with the goals of balancing the fishery needs with other beneficial uses of the Kings River, while maintaining KRWA members' established water and storage rights. The Framework Agreement is not incorporated into the current license and is outside FERC's jurisdiction since it involves contractual commitments of third parties. The Framework Agreement established an adaptive management program that includes: 1) establishing a 100,000 acre-foot (ac-ft) coldwater pool within the USACE's Pine Flat Lake; 2) balancing the beneficial uses of the lower Kings River; 3) providing annual funding; 4) stocking coldwater fish; 5) fishery habitat improvements; 6) public education and involvement; 7) public access improvements; 8) program monitoring; and 9) regulating fishing along the lower Kings River. In addition, the Framework Agreement requires that the KRWA provide flows at Piedra (RM 3.7), Dennis Cut (RM 8.0), and upstream and downstream of the Fresno Weir (RM 9.6), with 50 percent of the release for Piedra made at Pine Flat Dam (Figure B.3-1). The Framework Agreement runs in perpetuity and the funding commitment has a 10-year-long term that is renewable. Currently, KRCD, KRWA, and CDFW are in the third 10-year-long term, which has funding that expires in June 2029.

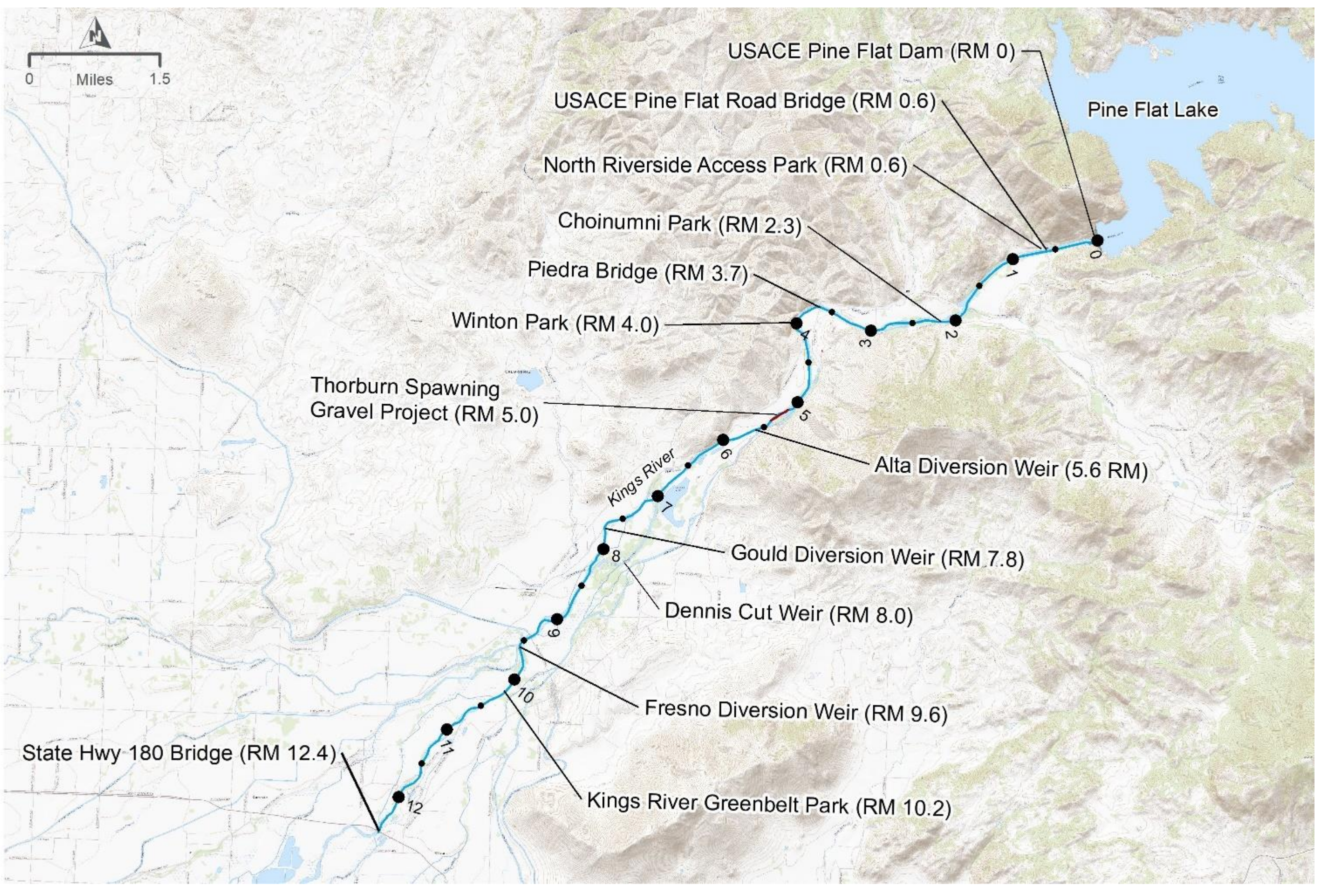


Figure B.3-1. 12.4-mile-long section of Kings River from USACE's Pine Flat Dam to State Highway 180 in Fresno, California.

B.4 EXISTING OPERATIONS

B.4.1 Manual or Automatic Operations

Typically, KRCD manually operates the Project at the two powerhouses.

B.4.2 Operations in Adverse, Mean and High Water Years

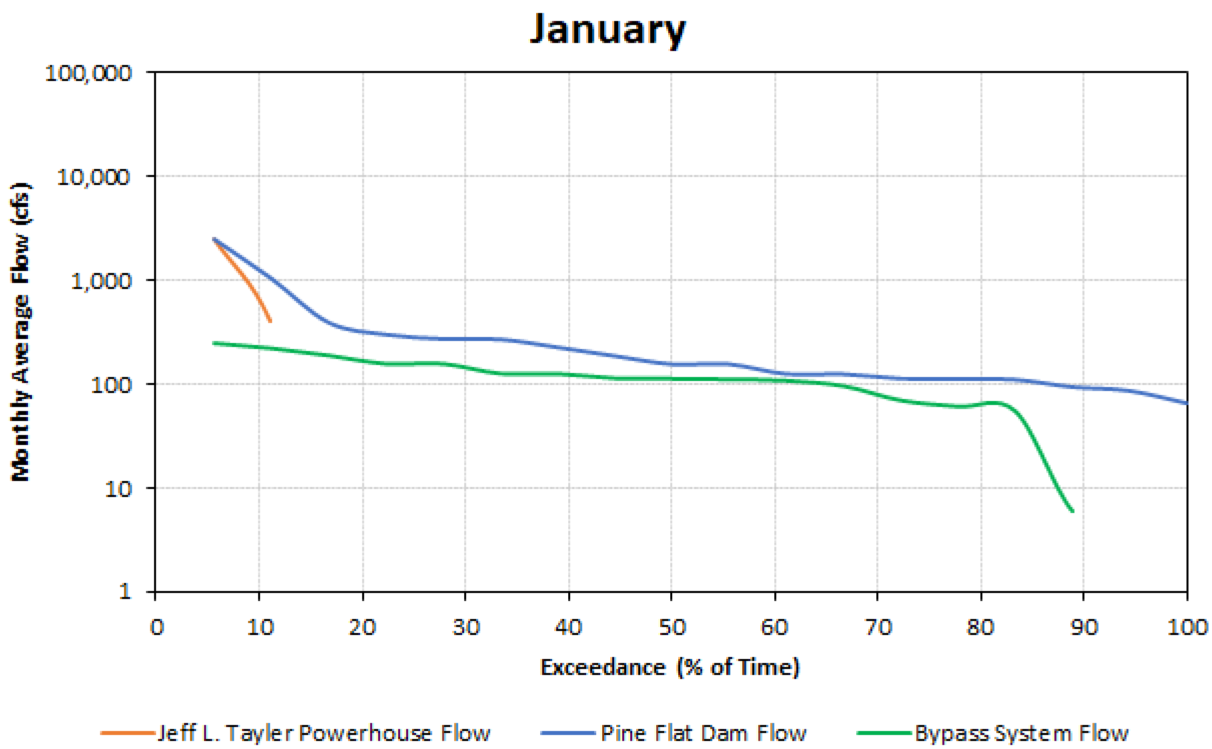
As described above, the Project is an energy recovery (run-of-river) facility that generates power from water releases from USACE's Pine Flat Lake by USACE during mandatory flood control operations and as requested by the KRWA through the Kings River Watermaster for irrigation demand and to meet other flow requirements. For that reason, Project operations do not vary based on changes in local hydrological conditions (i.e., adverse, mean and high water years).

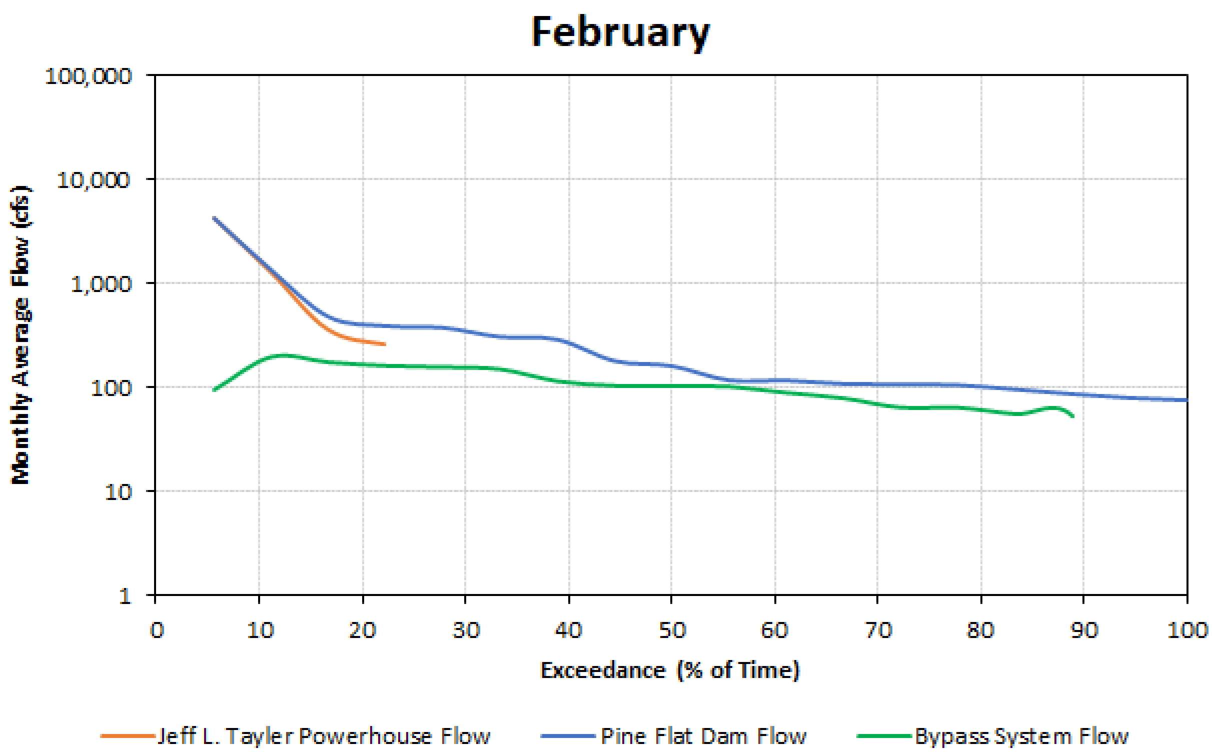
Under typical operations, if USACE releases less than approximately 100 cfs, the release does not pass through the Project's powerhouses because Unit 1 requires approximately 100 cfs to begin generating power and Units 2 and 3 each require approximately 500 cfs to begin generating power. If USACE releases between approximately 100 and 375 cfs (i.e., the approximate maximum flow at which Unit 4 can generate power) of water from Pine Flat Lake, Unit 4 becomes available (i.e., able to generate) and if KRCD decides to do so, the water is passed through Unit 4 for power generation. Releases between approximately 376 and 499 cfs are not passed through the powerhouses because those flows would be too high to generate power at Unit 4 and too low to generate power at Units 1, 2 and 3. If USACE releases between approximately 500 and 7,500 cfs (i.e., the approximate flow at which Units 1, 2 and 3 combined can generate power), all the units become available, and if KRCD decides to do so, the water is passed through Units 1, 2, 3, and 4 to generate power. To reiterate, KRCD has no authority to schedule or control (i.e., ramping) releases from Pine Flat Dam for power generation. The Project only utilizes releases from Pine Flat Dam made by the USACE for flood control and as requested by the KRWA through the Kings River Watermaster to meet downstream irrigation demand and other flow requirements.

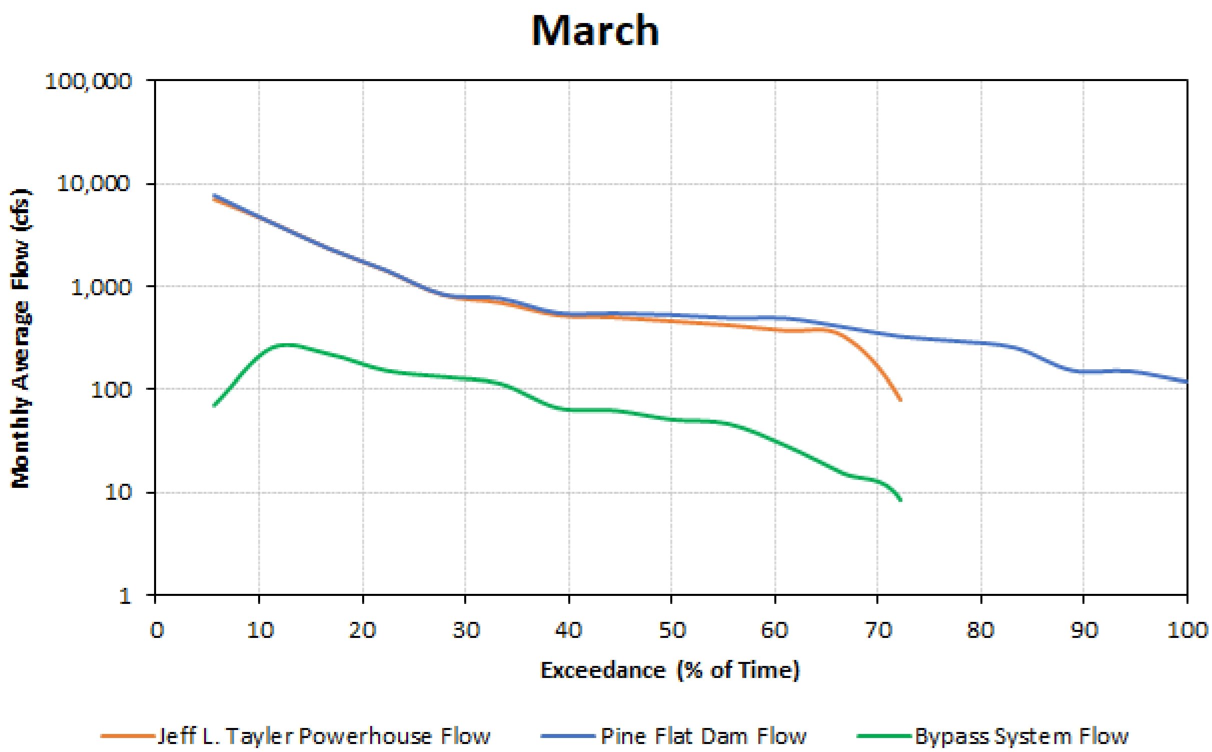
B.4.3 Jeff L. Taylor Powerhouse and Unit 4 Powerhouse Operations

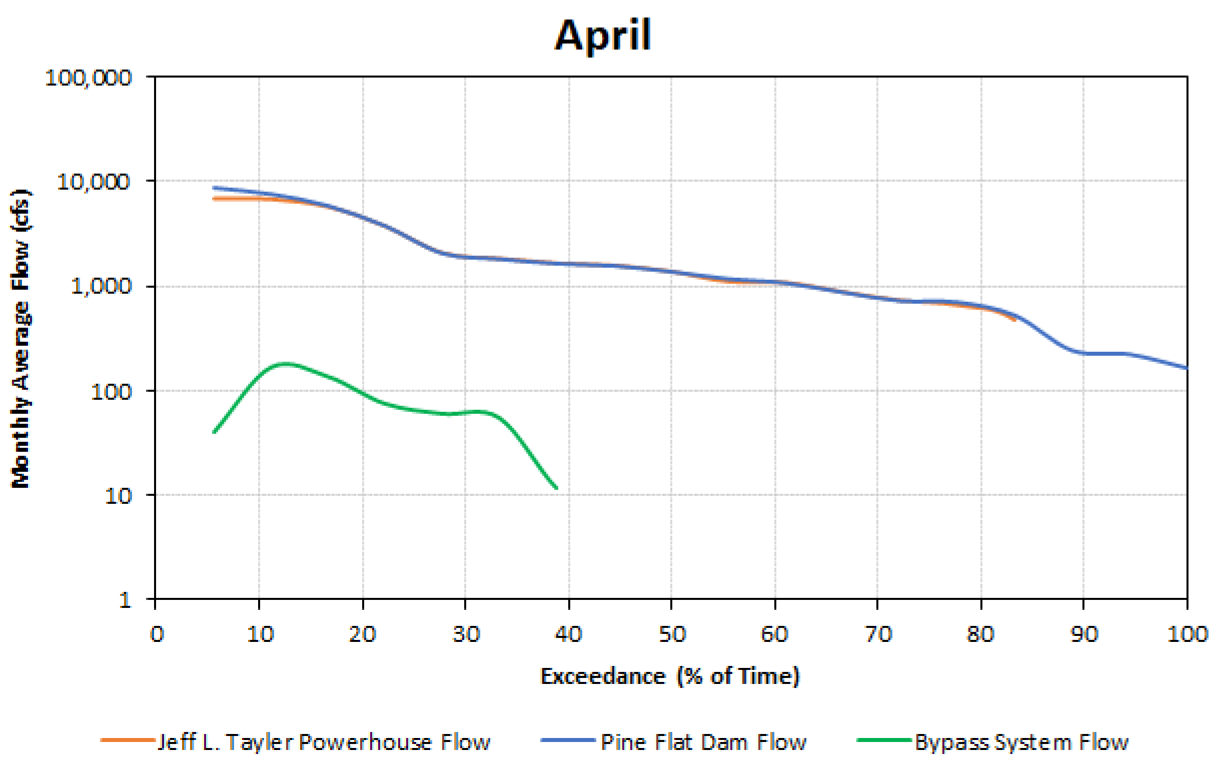
B.4.3.1 Minimum, Maximum, and Mean Flows and Monthly Exceedance Curves

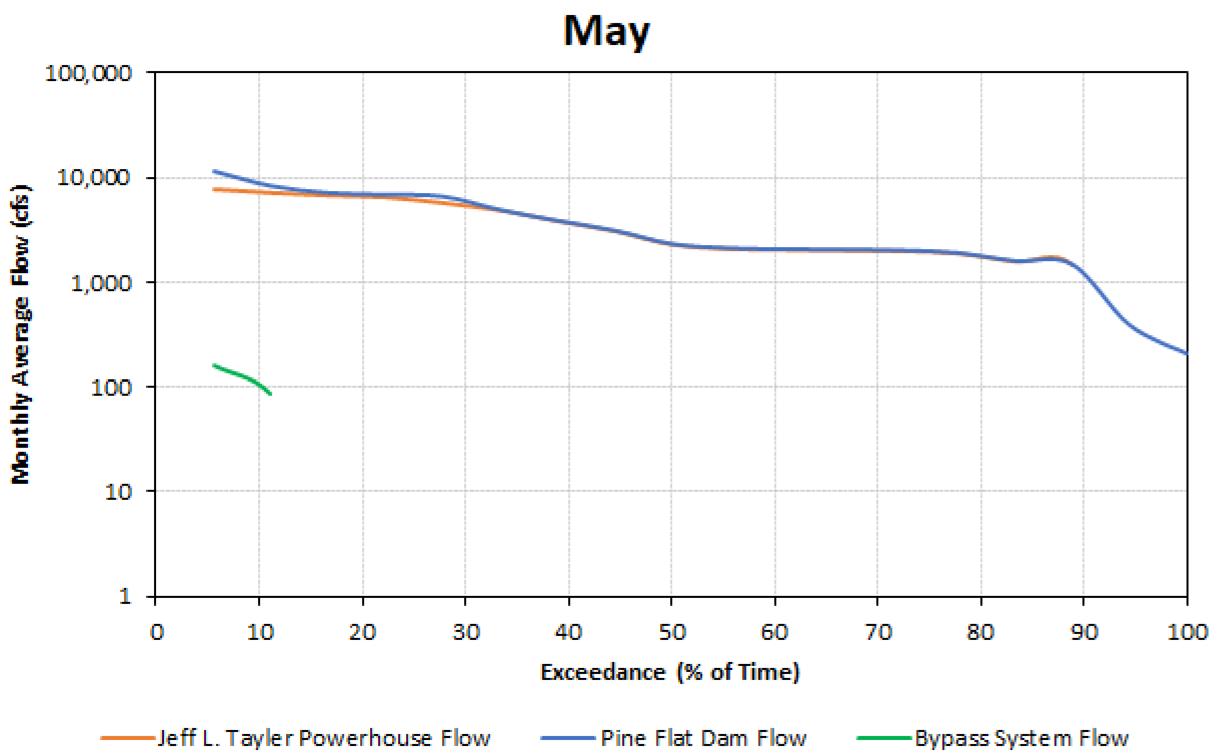
As required by 18 C.F.R. § 4.51(2)(i), Figure B.4-1 provides monthly flow duration curves for total releases from Pine Flat Dam for the period from Water Year (WY) 2003 through WY 2020 (i.e., hydrology period of record). The flows include combined releases from Pine Flat Dam and Spillway, the Jeff L. Taylor Powerhouse and the Bypass System. Flows were calculated by subtracting from average daily flows reported by USACE at its flow gage located at the Pine Flat Road Bridge and measured average daily flows for Mill Creek that enter the Kings River between Pine Flat Dam and USACE's Pine Flat Road Bridge. During the hydrology period of record, the minimum, maximum, and mean flows at the gage were 65 cfs, 11,542 cfs, and 2,388 cfs, respectively. The exceedance plots in Figure B.4-1 are on a logarithmic scale to best show the full range of flows for each month.

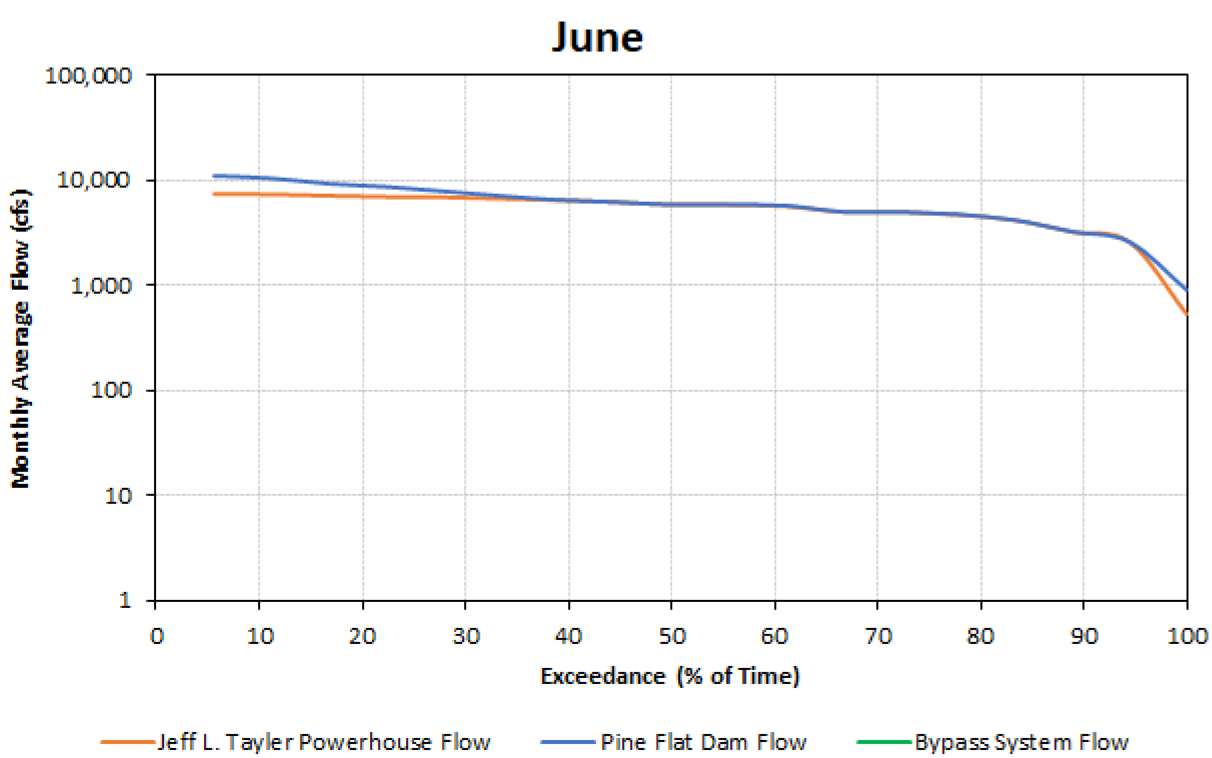


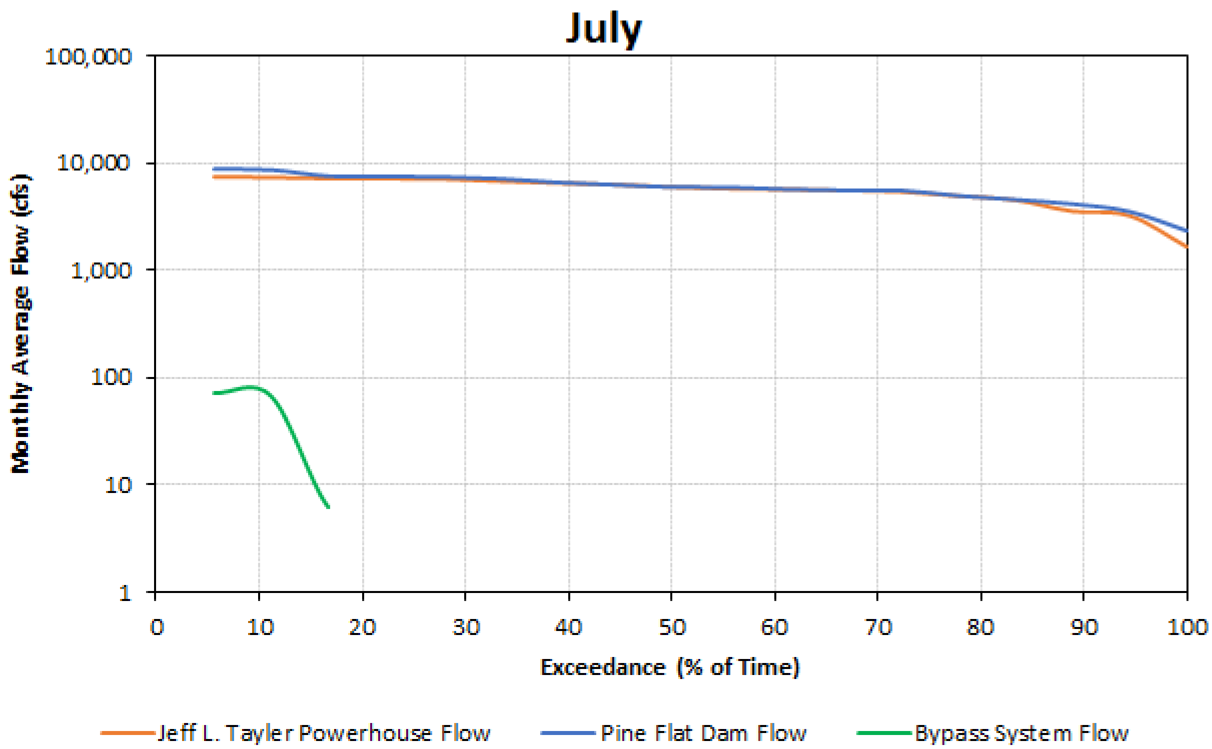


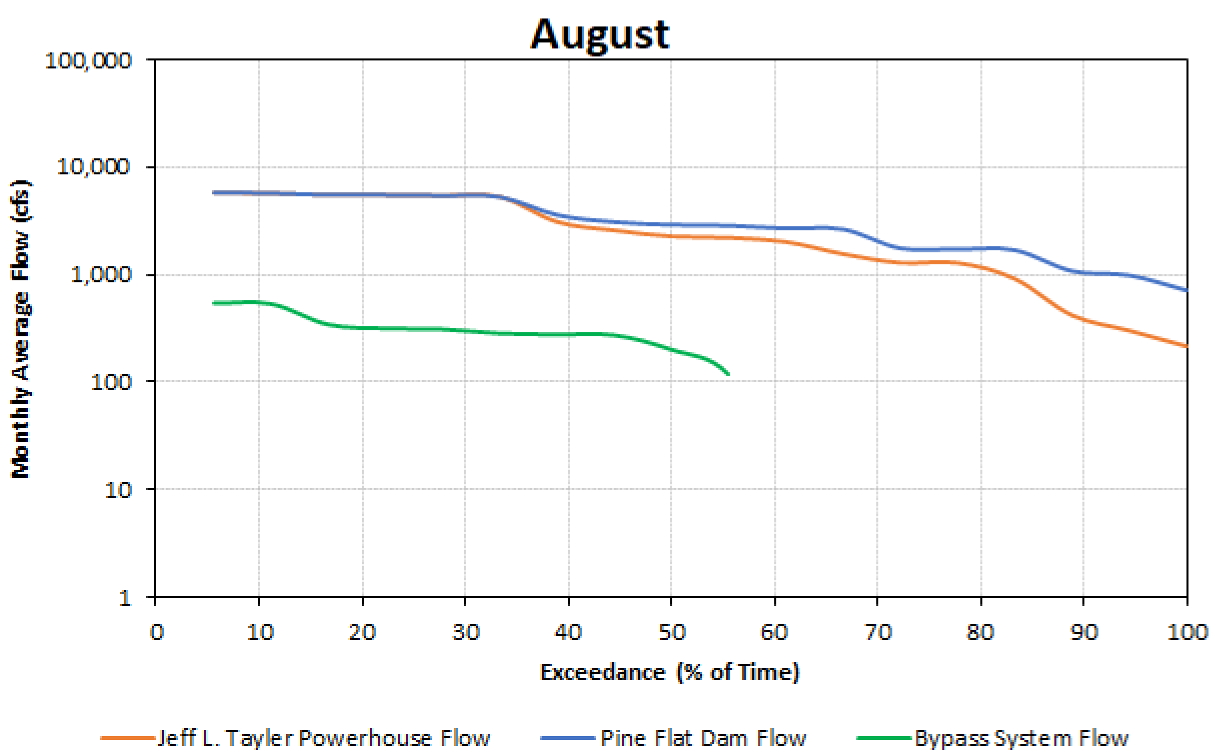

March
100,000
10,000
1,000
100
10
1
Monthly Average Flow (cfs)
0
10
20
30
40
50
60
70
80
90
100
Exceedance (% of Time)
Jeff L. Tayler Powerhouse Flow
Pine Flat Dam Flow
Bypass System Flow

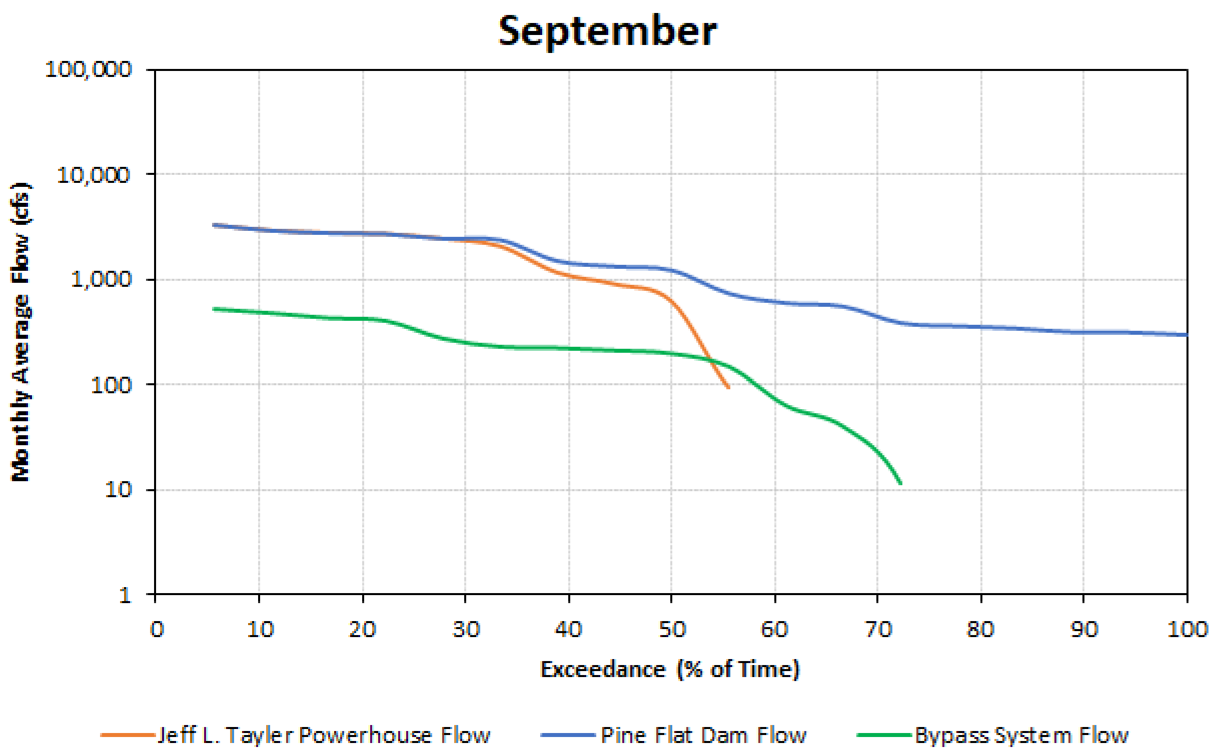

April
100,000
10,000
1,000
100
10
1
Monthly Average Flow (cfs)
0
10
20
30
40
50
60
70
80
90
100
Exceedance (% of Time)
Jeff L. Tayler Powerhouse Flow
Pine Flat Dam Flow
Bypass System Flow

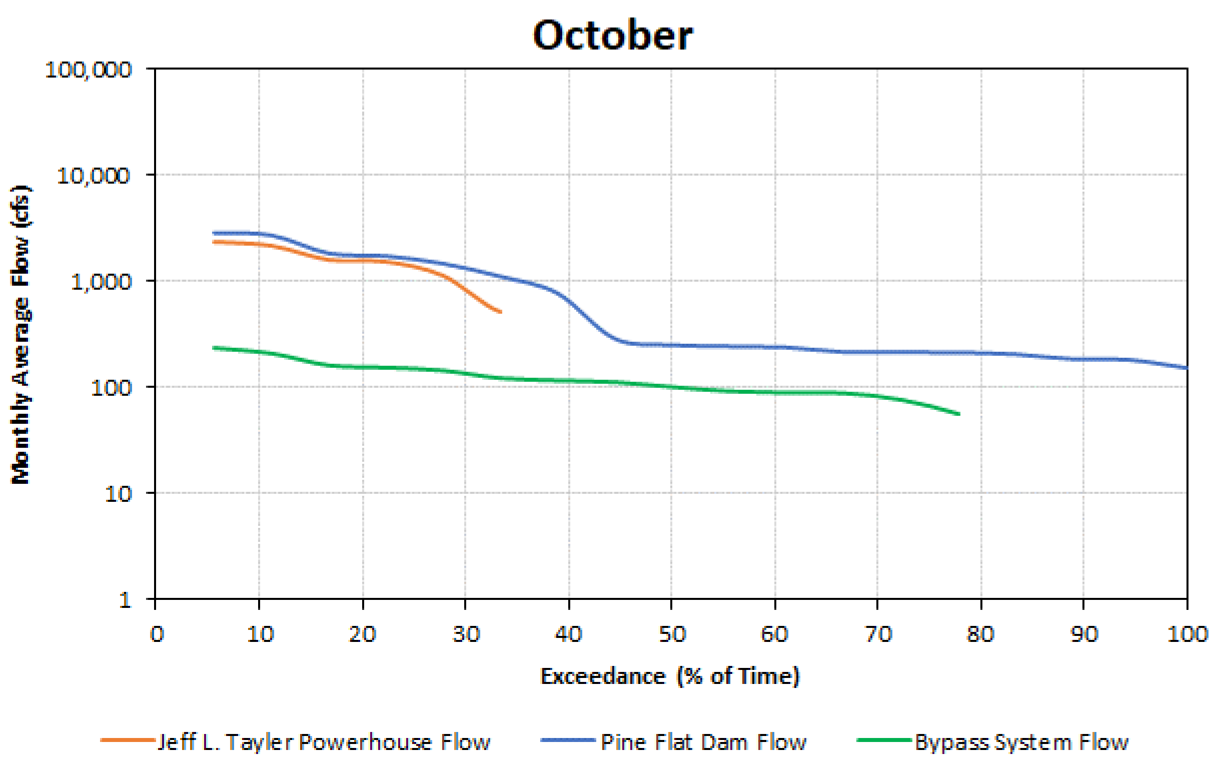

May
100,000
10,000
1,000
100
10
1
Monthly Average Flow (cfs)
0
10
20
30
40
50
60
70
80
90
100
Exceedance (% of Time)
Jeff L. Tayler Powerhouse Flow
Pine Flat Dam Flow
Bypass System Flow

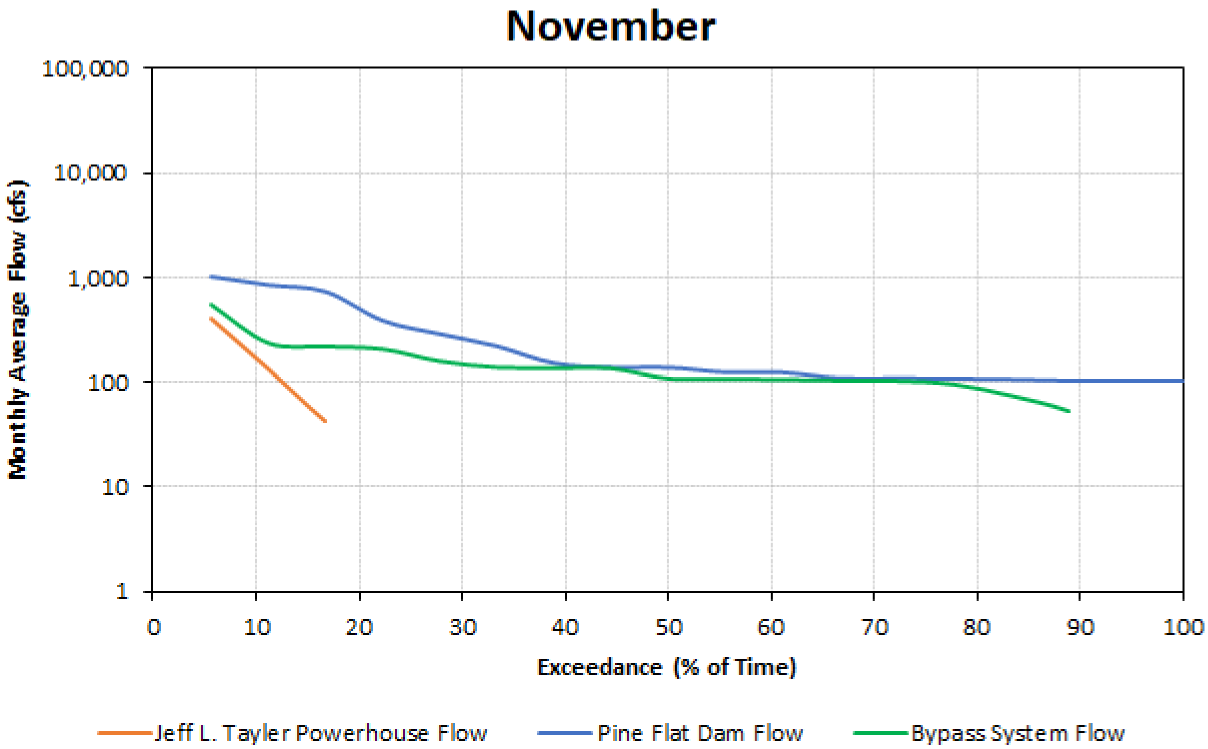

June
100,000
10,000
1,000
100
10
1
Monthly Average Flow (cfs)
0
10
20
30
40
50
60
70
80
90
100
Exceedance (% of Time)
Jeff L. Tayler Powerhouse Flow
Pine Flat Dam Flow
Bypass System Flow


July
100,000
10,000
1,000
100
10
1
Monthly Average Flow (cfs)
0
10
20
30
40
50
60
70
80
90
100
Exceedance (% of Time)
Jeff L. Tayler Powerhouse Flow
Pine Flat Dam Flow
Bypass System Flow


August
100,000
10,000
1,000
100
10
1
Monthly Average Flow (cfs)
0
10
20
30
40
50
60
70
80
90
100
Exceedance (% of Time)
Jeff L. Tayler Powerhouse Flow
Pine Flat Dam Flow
Bypass System Flow


September
Monthly Average Flow (cfs)
100,000
10,000
1,000
100
10
1
0
10
20
30
40
50
60
70
80
90
100
Exceedance (% of Time)
Jeff L. Tayler Powerhouse Flow
Pine Flat Dam Flow
Bypass System Flow


October
Monthly Average Flow (cfs)
100,000
10,000
1,000
100
10
1
0
10
20
30
40
50
60
70
80
90
100
Exceedance (% of Time)
Jeff L. Tayler Powerhouse Flow
Pine Flat Dam Flow
Bypass System Flow



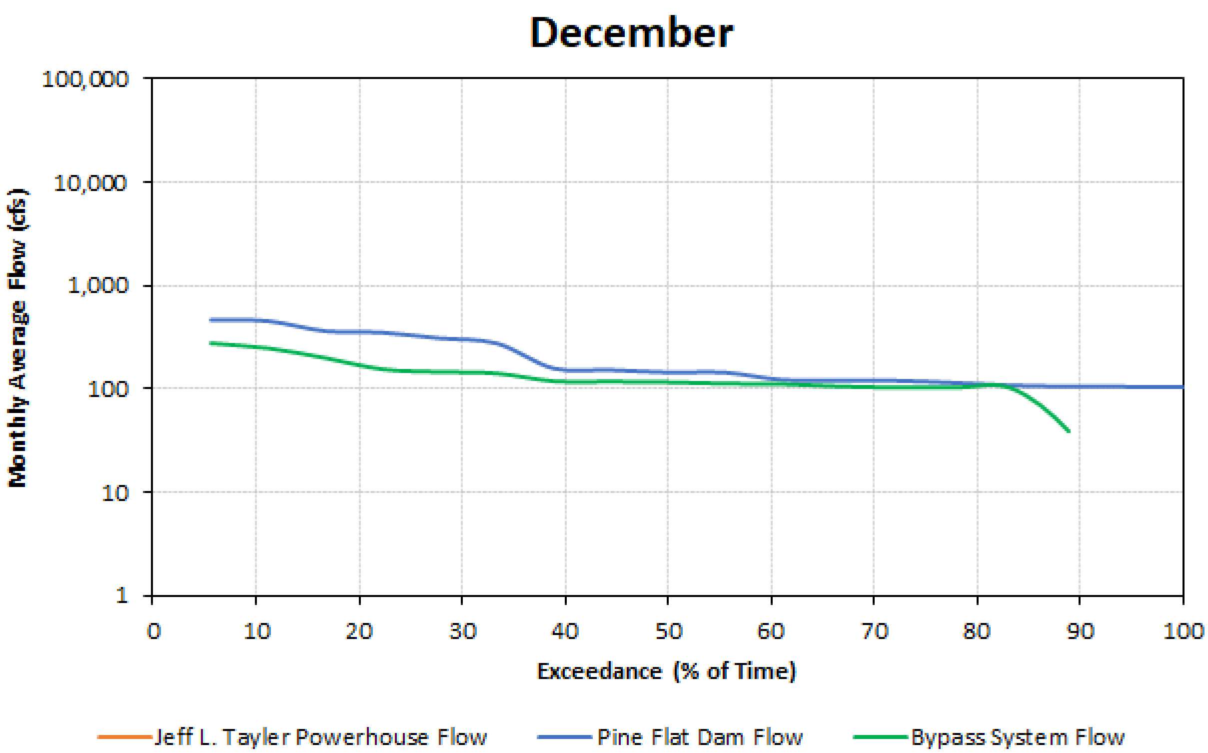


Figure B.4-1. Monthly flow duration curves for Water Year 2003 through Water Year 2020.
SOURCE: Appendix 1 to this Exhibit B.

B.4.3.2 Project Maximum Hydraulic Capacity

The maximum hydraulic capacity at net head for each of the three units in the Jeff L. Taylor Powerhouse is 2,500 cfs, and the maximum hydraulic capacity at net head for Unit 4 is 375 cfs, for a combined total Project maximum hydraulic capacity of 8,000 cfs. For reference, the maximum hydraulic capacity of the non-Project Bypass System is 900 cfs.

B.4.3.3 Area Versus Capacity Curve

The Project does not include an impoundment and, therefore, an area-capacity curve is not required in Exhibit B.

B.4.3.4 Capability Versus Head

Figure B.4-2 shows the relationship between capability and head for each of the three units (Units 1, 2 and 3) in the Jeff L. Taylor Powerhouse. The rated head for each of the three units is 345 ft and the maximum and minimum operating heads are 125 to 384 ft, respectively.

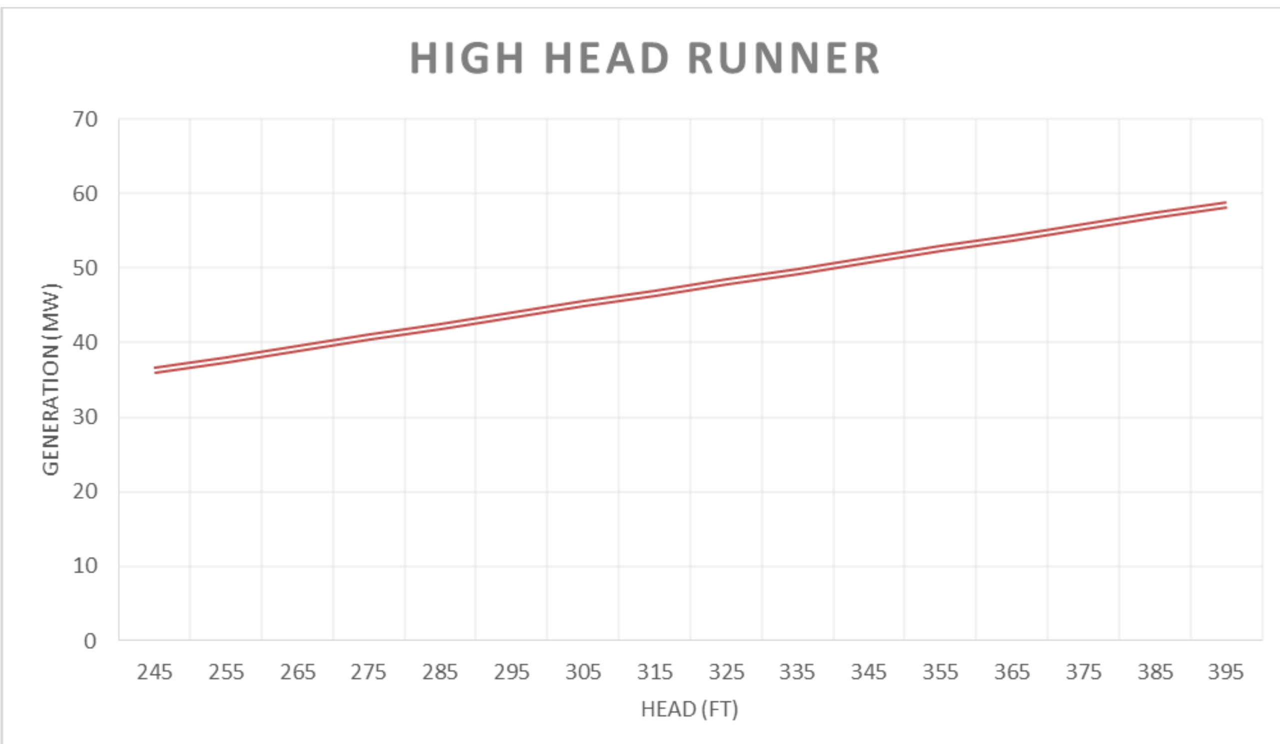


Figure B.4-2. Capability verses head for each of the three units in the Jeff L Taylor Powerhouses.

Figure B.4-3 shows the approximated relationship between capability and head for Unit 4. The rated head is 208 ft and the maximum and minimum operating heads are 124 to 281 ft, respectively.

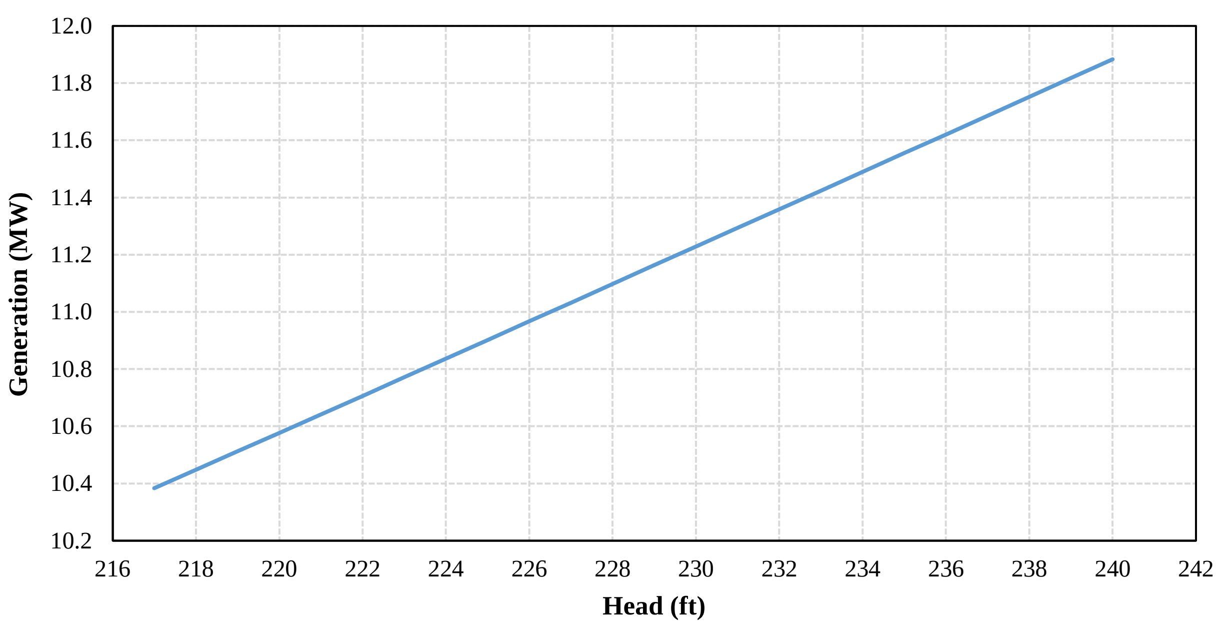
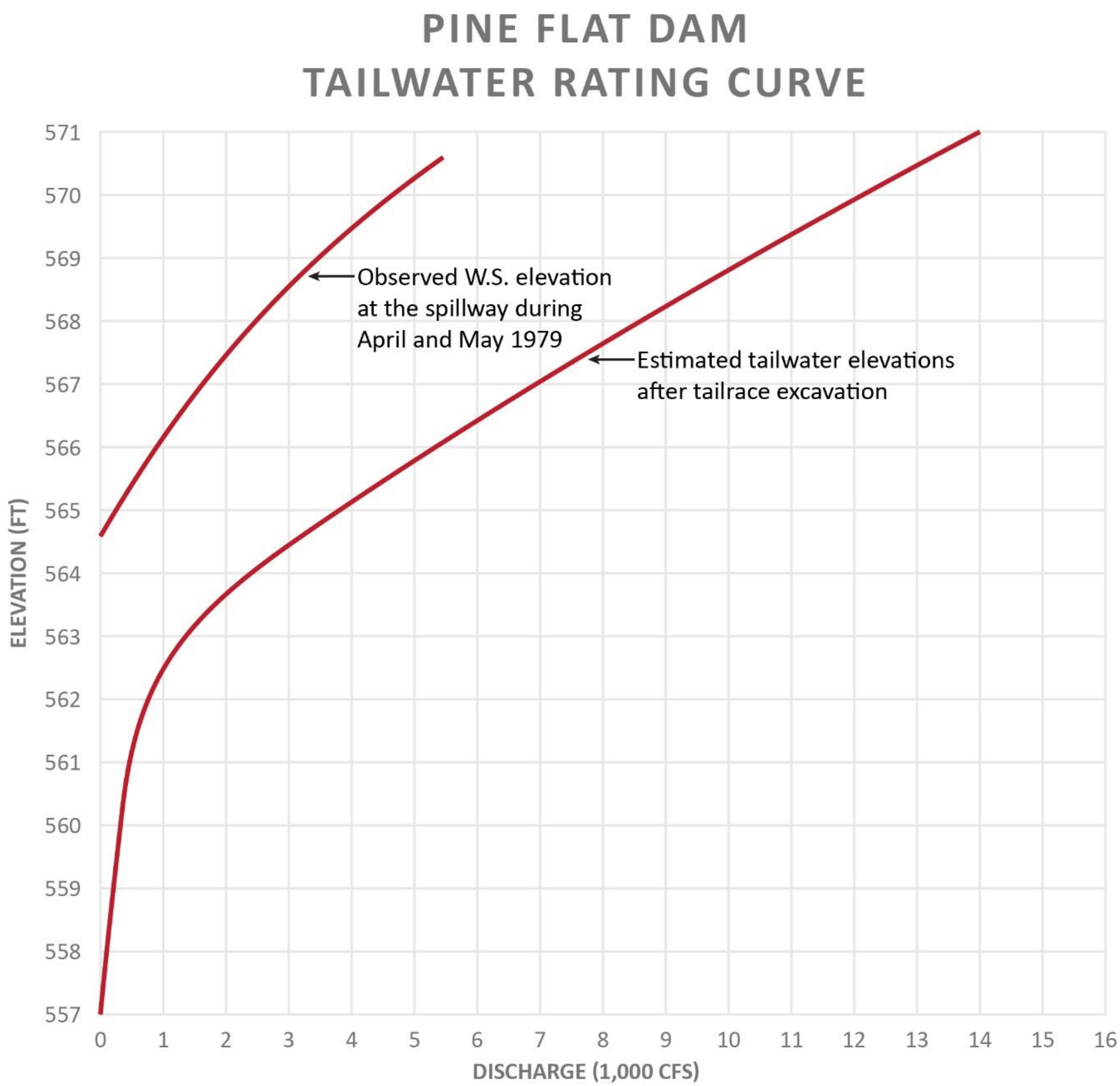


Figure B.4-3. Capability verses head for the unit in the Unit 4 Powerhouse.

B.4.3.5 Tailwater Rating Curve

Figure B.4-4 shows the tailwater rating curves for the Jeff L. Taylor and Unit 4 powerhouses.



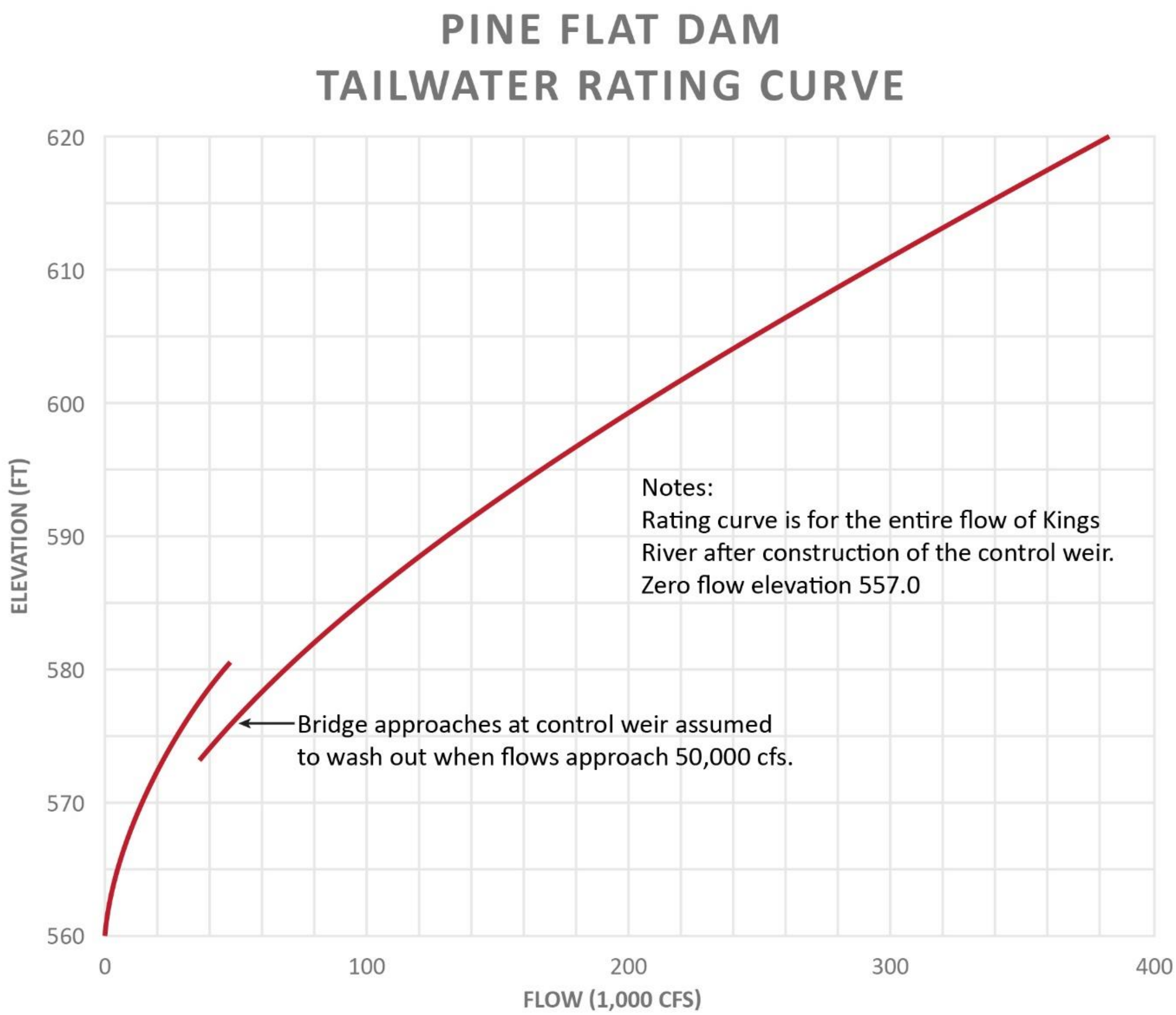


Figure B.4-4. Pine Flat Dam Tail Water Rating Curves.

B.4.3.6 Load Curves

The Jeff L. Taylor and Unit 4 powerhouses do not have load curves because they generate power opportunistically with flows released from Pine Flat Lake by the USACE during mandatory flood control operations and as requested by the KRWA through the Kings River Watermaster for irrigation demand and other flow requirements.

B.4.3.7 Average Annual Energy Production, Plant Factor, and Station Power

The Jeff L. Taylor Powerhouse generated a Calendar Year (CY) annual average of 293,364,658 kilowatt-hours (kW-hrs) from CY 2018 through CY 2022, as shown in Table B.4-1. The average plant factor during this period was 0.20 based on the annual generation divided by the plant nameplate generating capability (165,000 kW) times the number of hours per year. Average annual energy production and plant factor for Unit 4 are not available at this time.

Table B.4-1. Monthly and annual gross generation in kilowatt-hours (kW-hrs) for the Project from Calendar Year (CY) 2018 through CY 2022.

Month	Monthly Generation (Gross kW-hrs)					Average Monthly Generation (kW-hrs)
	CY 2018	CY 2019	CY 2020	CY 2021	CY 2022	
January	0	0	0	0	0	0
February	0	0	0	0	0	0
March	0	72,020,000	0	0	0	14,404,000
April	20,966,400	60,300,000	1,721,770	0	0	16,597,634
May	78,703,100	119,800,000	39,071,150	2,451,810	4,790,670	48,963,346
June	110,497,300	135,930,000	86,902,680	33,650,710*	56,170,610	84,630,260
July	92,281,000	144,610,000	90,318,720	14,855,400	42,597,040	76,932,432
August	29,472,400	106,320,000	23,981,540	2,225,130	7,307,770	33,861,368
September	8,162,300	44,820,000	735,790	0	0	10,743,618
October	0	35,920,000	0	0	0	7,184,000
November	0	240,000	0	0	0	48,000
December	0	0	0	0	0	0
Total Annual	**340,082,500**	**719,960,000**	**242,731,650**	**53,183,050**	110,866,090	**--**
Total Days in Operation	**170 days**	**238 days**	**131 days**	**78 days**	**100 days**	**--**

SOURCE: KRCD's annual generation report, which are available on FERC's eLibrary, filed with the Commission each year. * Error in 2021 FERC report and corrected value indicated.

KRCD estimates that, on average, less than 1 kW of Project power is used on site as station power.

B.4.3.8 Dependable Capacity

The dependable capacity of a generating facility is defined as "*the generating capacity that the plant can deliver under the most adverse water supply conditions to meet the needs of an electric power system with a given maximum demand*." (Elliott *et al.* 1997). One of the critical parameters for defining dependable capacity is the period over which the capacity must be provided. Since Project generation is entirely dependent on USACE and KRWA releases of water from Pine Flat Lake (i.e., KRCD has no authority to require flow releases), the Project has no dependable capacity.

B.4.4 Facility Maintenance

KRCD conducts annual mechanical and electrical inspections and maintenance at the Jeff L. Taylor and Unit 4 powerhouses to verify the structural and/or functional integrity of the facilities and to identify conditions that might disrupt operations. This activity typically occurs in October and extends for approximately 90 days but can be longer or shorter depending on the planned maintenance activities. Depending on maintenance work needed on the penstocks, they can be dewatered by closing the emergency intake gates or placement of stoplogs. Air is expelled through the penstock standpipe when refilling or draining the penstock. The emergency intake gates at each powerhouse are operated at least annually to verify integrity and functionality. Maintenance on each penstock is implemented on an as-needed basis and inspected on a tri-annual basis.

KRCD implements routine maintenance activities, which are described below, within the FERC Project boundary to:

- Ensure safe and reliable operation of Project facilities
- Protect worker and public health and safety and environmental resources
- Maintain the facilities

KRCD implements rodent control as needed in facility interiors using non-restricted rodenticides (e.g., D-Con®), which are applied in accordance with the label instructions. Rodent control occurs within the powerhouses as needed.

Vegetation management, primarily trimming by hand and using herbicides is implemented by KRCD as needed. Vegetation management is implemented within the area necessary to reduce fire hazard, to provide for adequate Project facility access and inspection, to protect Project works, and to provide for worker health and safety. This usually occurs within 15 feet outside the perimeter of the powerhouses, switchyard and recreation access road, and within the switchyard and recreation area.

KRCD uses string trimmers to trim grasses and vegetation, and chainsaws or other handheld saws or clippers to remove or trim overhanging shrubs and tree limbs. These management activities are conducted as needed in conjunction with facility inspections.

KRCD uses herbicides and surfactants in addition to manual vegetation management activities on an as needed basis at Project works. All herbicide applications occur under the direction of a licensed Pest Control Advisor (PCA). Prior to applying herbicides, KRCD uses established protocols that require individuals applying herbicides to complete training on general application procedures and precautions. In addition, the PCA prepares Pest Control Recommendations (PCR) for each site prescribing specific application direction and associated precautions that must be strictly followed. Herbicides used near the water's edge are only those certified for use in or near water. In general, herbicides are applied using backpack sprayers or small hand-held sprayers, and all herbicides are applied in accordance with label instructions and PCR. Herbicide application typically consists of two application cycles annually: 1) Cycle 1 - pre-emergent application between October 15 and March 15, as determined by the PCA; and 2) Cycle 2 - post-emergent application between April 1 and June 30. This cycle includes follow-up visits to determine if additional pre- and post-emergent application(s) and/or additional treatments are needed. A third cycle, if required, is applied between July 1 and October 14.

Few hazard trees, generally defined as dead or dying trees or trees with defects that may result in failure and have the potential to cause property damage, personal injury, or death, are near Project works or in the Public Fishing Access site. However, if a hazard tree is identified, removal is conducted with a chainsaw, handheld saw, or other equipment. Smaller diameter debris from felled hazard trees is either chipped or lopped and scattered. Downed logs are typically left onsite and only moved if needed for safety. If moving logs is necessary, it may be completed by hand or machine depending on the situation.

KRCD repaints the exterior of the powerhouses and other Project works as needed.

Public Fishing Access maintenance includes: landscape maintenance, access road grading as needed, damage and use repair of picnic tables and barbeque grills, and routine general cleanup.

B.5 USE OF POWER

The Project license states that KRCD will continue to sell power from the Project to the California Department of Water Resources (DWR). Further, DWR holds the FERC license for the Pine Flat Transmission Line (FERC Project No. 2876) that transmits Project power from the Pine Flat Switchyard to a point on Pacific Gas and Electric Company's existing 230-kV Balch #2-McCall transmission line.

KRCD entered into a contract with DWR, which was approved by FERC on December 13, 1979, to sell power from the Project for a period of 50 years after the last of the Project generating units became commercially operable, in which FERC anticipated would be two years beyond the license term (August 31, 2031).

KRCD will consider its power sales options as the contract with DWR approaches its expiration. The current Power Purchase Agreement expires on March 31, 2037, but further extends based on the Energy Balance Account per Section 13 of the contract.

B.6 PLANS FOR FUTURE DEVELOPMENT OF THE PROJECT AND IN THE WATERSHED

At this time, KRCD has no plans to expand the Project or to develop other water projects in the Kings River watershed.

B.7 KRCD'S PROPOSED CHANGES TO PROJECT OPERATIONS

At this time, KRCD does not propose any changes to current Project operations other than including in the new license any protection, mitigation, and enhancement (PM&E) measures that KRCD may develop during relicensing.

B.8 REFERENCES CITED

Elliott, T. C., Chen, K., and Swanekamp, R. C. 1997. Standard Handbook of Powerplant Engineering, Second Edition. McGraw-Hill October 1, 1997.

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Attachment E

Exhibit G Project Maps

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G.0 PROJECT MAPS

G.1 INTRODUCTION

The Kings River Conservation District (KRCD or Licensee) has prepared this Exhibit G, Project Maps, as part of its Application for a New License Major Project – Existing Dam – from the Federal Energy Regulatory Commission (FERC or Commission) for the Jeff L. Taylor-Pine Flat Power Plant, FERC Project Number (No.) 2741 (Project). This exhibit is prepared in conformance with Title 18 of the Code of Federal Regulations (C.F.R.), Subchapter B (Regulations under the Federal Power Act), Part 4 (Licenses, Permits, Exemptions and Determination of Project Costs), Subpart F and, as applicable, Part 16 (Traditional Licensing Process). In particular, this exhibit conforms to the regulations in 18 C.F.R. Section 4.51(h), which directs an applicant to 18 C.F.R. Section 4.41(h). The regulations at 18 C.F.R. Section 4.41(h) describes the contents of Exhibit G, and references 18 C.F.R. Section 4.39, Specifications for maps and drawings. As a reference, 18 C.F.R. Sections 4.41(h) and 4.39 state:

<u>18 C.F.R. § 4.41(h):</u> Exhibit G is a map of the project that must conform to the specifications of § 4.39. In addition, to the other components of Exhibit G, the applicant must provide the project boundary data in a geo-referenced electronic format - such as ArcView shape files, GeoMedia files, MapInfo files, or any similar format. The electronic boundary data must be positionally accurate to ± 40 feet, in order to comply with the National Map Accuracy Standards for maps at a 1:24,000 scale (the scale of USGS quadrangle maps). The electronic Exhibit G data must include a text file describing the map projection used (*i.e.*, UTM, State Plane, Decimal Degrees, etc.), the map datum (*i.e.*, feet, meters, miles, etc.). Three sets of the maps must be submitted on compact disk or other appropriate electronic media. If more than one sheet is used for the paper maps, the sheets must be numbered consecutively, and each sheet must bear a small insert sketch showing the entire project and indicate that portion of the project depicted on that sheet. Each sheet must contain a minimum of three known reference points. The latitude and longitude coordinates, or state plane coordinates, of each reference point must be shown. If at any time after the application is filed there is any change in the project boundary, the applicant must submit, within 90 days following the completion of project construction, a final exhibit G showing the extent of such changes. The map must show:

(1) *Location of the project and principal features.* The map must show the location of the project as a whole with reference to the affected stream or other body of water and, if possible, to a nearby town or any other permanent monuments or objects, such as roads, transmission lines or other structures, that can be noted on the map and recognized in the field. The map must also show the relative locations and physical interrelationships of the principal project works and other features described under paragraph (b) of this section (Exhibit A).

(2) *Project boundary.* The map must show a project boundary enclosing all project works and other features described under paragraph (b) of this section (Exhibit A) that are to be licensed. If accurate survey information is not available at the time the application is filed, the applicant must so state, and a tentative boundary may be submitted. The boundary must enclose only those lands necessary for operation and maintenance of the project and for other project purposes, such as recreation, shoreline control, or protection of environmental resources (*see* paragraph (f) of this section [Exhibit E]). Existing residential, commercial, or other structures may be included within the boundary only to the extent that underlying lands are needed for project purposes (e.g., for flowage, public recreation, shoreline control, or protection of environmental resources). If the boundary is on land covered by a public survey, ties must be shown on the map at sufficient points to permit accurate platting of the position of the boundary relative to the lines of the public land survey. If the lands are not covered by a public land survey, the best available legal description of the position of the boundary must be

provided, including distances and directions from fixed monuments or physical features. The boundary must be described as follows:

(i) *Impoundments.*

(A) The boundary around a project impoundment must be described by one of the following:

(1) Contour lines, including the contour elevation (preferred method);

(2) Specified courses and distances (metes and bounds);

(3) If the project lands are covered by a public land survey, lines upon or parallel to the lines of the survey; or

(4) Any combination of the above methods.

(B) The boundary must be located no more than 200 feet (horizontal measurement) from the exterior margin of the reservoir, defined by the normal maximum surface elevation, except where deviations may be necessary in describing the boundary according to the above methods or where additional lands are necessary for project purposes, such as public recreation, shoreline control, or protection of environmental resources.

(ii) *Continuous features.* The boundary around linear ("continuous") project features such as access roads, transmission lines, and conduits may be described by specified distances from center lines or offset lines of survey. The width of such corridors must not exceed 200 feet unless good cause is shown for a greater width. Several sections of a continuous feature may be shown on a single sheet with information showing the sequence of contiguous sections.

(iii) *Noncontinuous features.*

(A) The boundary around noncontinuous project works such as dams, spillways, and powerhouses must be described by one of the following:

(1) Contour lines;

(2) Specified courses and distances;

(3) If the project lands are covered by a public land survey, lines upon or parallel to the lines of the survey; or

(4) Any combination of the above methods.

(B) The boundary must enclose only those lands that are necessary for safe and efficient operation and maintenance of the project or for other specified project purposes, such as public recreation or protection of environmental resources.

(3) *Federal lands.* Any public lands and reservations of the United States ("Federal lands") [*see* 16 U.S.C. 795(1) and (2)] that are within the project boundary, such as lands administered by the U.S. Forest Service, Bureau of Land Management, or National Park Service, or Indian tribal lands, and the boundaries of those Federal lands, must be identified as such on the map by:

(i) Legal subdivisions of a public land survey of the affected area (a protraction of identified township and section lines is sufficient for this purpose); and

(ii) The Federal agency, identified by symbol or legend, that maintains or manages each identified subdivision of the public land survey within the project boundary; or

(iii) In the absence of a public land survey, the location of the Federal lands according to the distances and directions from fixed monuments or physical features. When a Federal survey monument or a Federal bench mark will be destroyed or rendered unusable by the construction of project works, at least two permanent, marked witness monuments or bench marks must be established at accessible points. The maps show the location (and elevation, for bench marks) of the survey monument or bench mark which will be destroyed or rendered unusable, as well as of the witness monuments or bench marks. Connecting courses and distances from the witness monuments or benchmarks to the original must also be shown.

(iv) The project location must include the most current information pertaining to affected Federal lands as described under §4.81(b)(5).

(4) *Non-Federal lands.* For those lands within the project boundary not identified under paragraph (h)(3) of this section, the map must identify by legal subdivision:

(i) Lands owned in fee by the applicant and lands that the applicant plans to acquire in fee; and

(ii) Lands over which the applicant has acquired or plans to acquire rights to occupancy and use other than fee title, including rights acquired or to be acquired by easement or lease.

18 C.F.R. § 4.39: Specifications for maps and drawings. All required maps and drawings must conform to the following specifications, except as otherwise prescribed in this chapter:

(a) Each original map or drawing must consist of a print on silver or gelatin 35mm microfilm mounted on Type D (3 1/4" by 7 3/8") aperture cards. Full-sized prints of maps and drawings must be on sheets no smaller than 24 by 36 inches and no larger than 28 by 40 inches. A space five inches high by seven inches wide must be provided in the lower right hand corner of each sheet. The upper half of this space must bear the title, numerical and graphical scale, and other pertinent information concerning the map or drawing. The lower half of the space must be left clear. Exhibit G drawings must be stamped by a Registered Land Surveyor. If the drawing size specified in this paragraph limits the scale of structural drawings (exhibit F drawings) described in paragraph (c) of this Section, a smaller scale may be used for those drawings. Potential applicants or licensees may be required to file maps or drawings in electronic format as directed by the Commission.

(b) Each map must have a scale in full-sized prints no smaller than one inch equals 0.5 miles for transmission lines, roads, and similar linear features and no smaller than one inch equals 1,000 feet for other project features, including the project boundary. Where maps at this scale do not show sufficient detail, large scale maps may be required. Each map must show:

(1) True and magnetic meridians;

(2) State, county, and town lines; and

(3) Boundaries of public lands and reservations of the United States [see 16 U.S.C. 796 (1) and (2)], if any. If a public land survey is available, the maps must show all lines of that survey crossing the project area and all official subdivisions of sections for the public lands and reservations, including lots and irregular tracts, as designated on the official plats of survey that may be obtained from the Bureau of Land Management, Washington, D.C., or examined in the local land survey office; to the extent that a public land survey is not available for public lands and reservations of the United States, the maps must show the protractions of townships and section lines, which, if possible, must be those recognized by the Federal agency administering those lands.

(c) Drawings depicting details of project structures must have a scale in full-sized prints no smaller than:

(1) One inch equals 50 feet for plans, elevations, and profiles; and

(2) One inch equals 10 feet for sections.

(d) Each map or drawing must be drawn and lettered to be legible when it is reduced to a print that is 11 inches on its shorter side. Following notification to the applicant that the application has been accepted for filing [see §4.31(c)], prints reduced to that size must be bound in each copy of the application which is required to be submitted to the Commission or provided to any person, agency, or other entity.

(e) The maps and drawings showing project location information and details of project structures must be filed in accordance with the Commission's instructions on submission of Critical Energy Infrastructure Information in §§388.112 and 388.113 of subchapter X of this chapter.

Besides this introductory material, this Exhibit G includes three sections. Section G.2 describes Project maps in the existing license, Section G.3 states any changes to the

FERC Project boundary proposed by KRCD at this time, and Section G.4 includes a list of references cited in this exhibit.

See Exhibit A for a description of existing Project facilities and features, Exhibit B for a description of existing Project operations, Exhibit C for a construction history and a construction schedule, Exhibit D for costs and financing information, and Exhibit E for a discussion of existing environmental resources in the Project area, potential environmental effects from Project O&M and KRCD's proposed resource management measures. Design drawings are included in Exhibit F. Exhibit H contains a detailed description of the need for the electricity provided by the Project, the availability of electrical energy alternatives, and other miscellaneous information.

All elevation data in this exhibit is in United States Department of Commerce, National Oceanic and Atmospheric Association, National Geodetic Survey Vertical Datum of 1929 (NGVD 29), unless otherwise stated.

G.2 EXISTING PROJECT MAPS AND FEDERAL LANDS

The existing FERC license includes one Project Map: Exhibit K-1, Pine Flat Power Project Plan Project No. 2741 Project Boundary Map. FERC approved the map in an order dated May 3, 2023 and assigned the map drawing number P-2741-17.[1] The map shows land ownership and acreage for the FERC Project boundary.

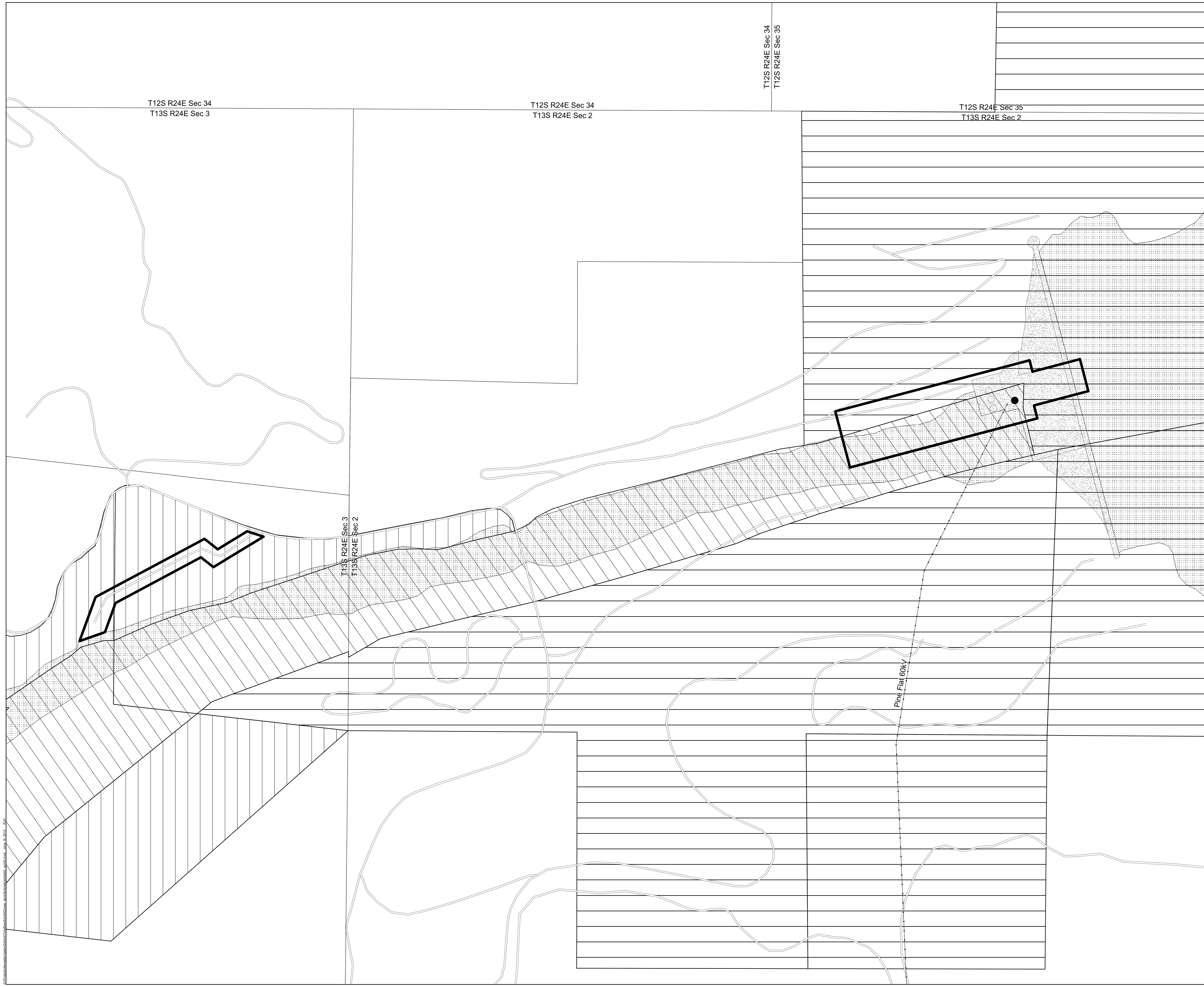
G.3 KRCD'S PROPOSED CHANGES TO EXISTING PROJECT BOUNDARY

At this time, KRCD does not propose any changes to the existing FERC Project boundary as shown in Exhibit K-1 of the existing license. KRCD reserves its right to propose changes as the relicensing proceeds.

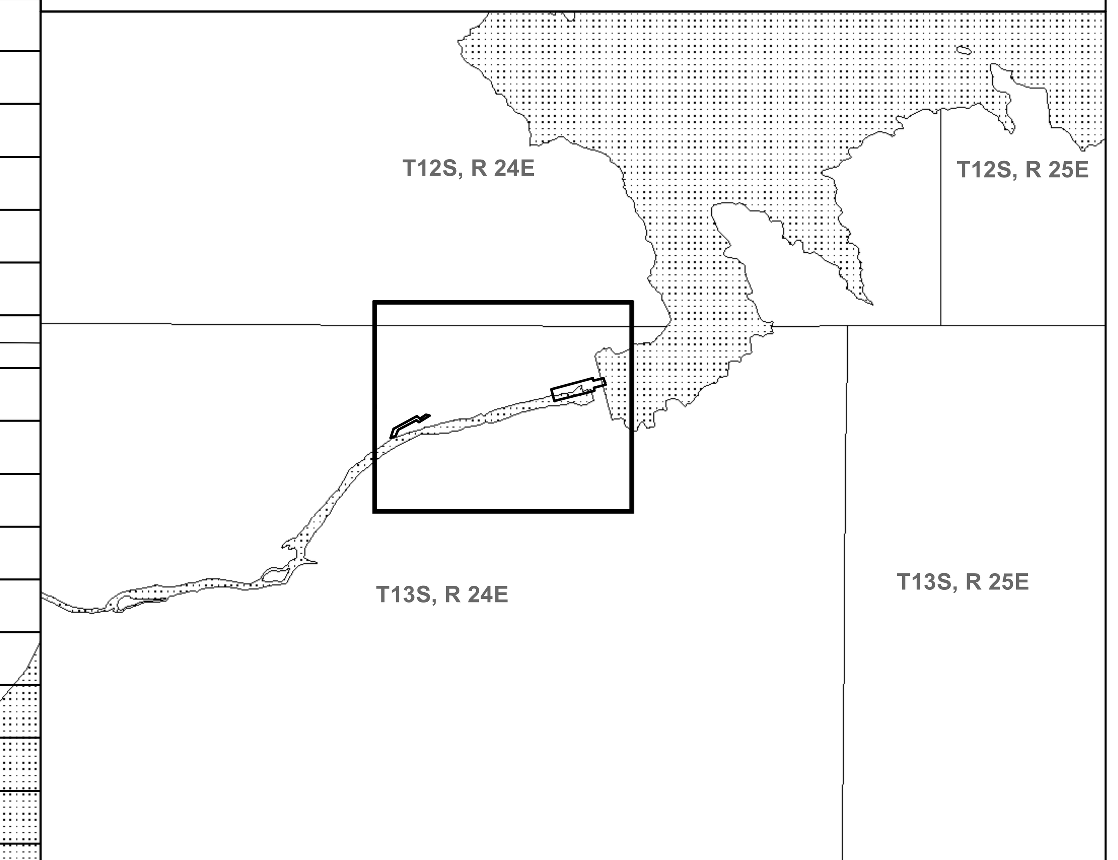
G.4 REFERENCES CITED

None.

[1] The Exhibit K-1 Pine Flat Power Project Plan Map is available on FERC's eLibrary at accession number 20230615-5108.



KEY MAP



SURVEYORS STATEMENT

I HEREBY CERTIFY TO THE FEDERAL ENERGY REGULATORY COMMISSION (FERC) THAT THIS PLAN MEETS THE CONDITIONS SET FOURTH BY FERC FOR ITS EXPRESSED PURPOSE. THE PURPOSE OF THIS MAP IS TO PROVIDE A GEOREFERENCED VISUAL DEPICTION OF THE LOCATION OF PROJECT FEATURES AND BOUNDARIES BASED ON THE BEST AVAILABLE HISTORICAL DRAWINGS AND DIGITAL REFERENCE SOURCES INCORPORATED INTO THE GEOGRAPHIC INFORMATION SYSTEM (GIS). LOCATIONS HAVE NOT BEEN VERIFIED BY PHYSICAL FIELD SURVEYS AND THIS DRAWING SHOULD NOT BE USED FOR PURPOSES OF DEVELOPING PROPERTY BOUNDARY DESCRIPTIONS.

Survey Stamp

DRAWING COORDINATE SYSTEM

PROJECTION - STATE PLANE
DATUM - NAD83
ZONE - CA IV
UNITS - FEET

BASE MAP DATA SOURCES

ROADS: ESRI 9.3 (TELE ATLAS),
HYDROGRAPHY: DIGITIZED FROM USDA
NAIP AERIAL IMAGERY

LEGEND

- FERC Project No. 2741
- Transmission Line
- Reference Point
- Pine Flat Reservoir
- Paved Road
- Township & Range Section

Ownership

- DOD (USACE)
- County
- Private or Other
- State

0 125 250 500 750 Feet
0 35 70 140 210 Meters

EXHIBIT G-1

PINE FLAT HYDROELECTRIC PROJECT BOUNDARY MAP

PINE FLAT TRANSMISSION LINE PROJECT (FERC NO. 2741)
CALIFORNIA DEPARTMENT OF WATER RESOURCES

DATE:	SCALE:	DRAWING NUMBER:
5/5/2023	1 inch = 250 feet	P-2741-

Attachment F

Exhibit F General Design Drawings

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F.0 GENERAL DESIGN DRAWINGS

F.1 INTRODUCTION

The Kings River Conservation District (KRCD or Licensee) has prepared this Exhibit F, General Design Drawings, as part of its Application for a New License Major Project – Existing Dam – from the Federal Energy Regulatory Commission (FERC or Commission) for the Jeff L. Taylor-Pine Flat Power Plant, FERC Project Number (No.) 2741 (Project). This exhibit is prepared in conformance with Title 18 of the Code of Federal Regulations (C.F.R.), Subchapter B (Regulations under the Federal Power Act), Part 4 (Licenses, Permits, Exemptions and Determination of Project Costs), Subpart F and, as applicable, Part 16 (Traditional Licensing Process). In particular, this exhibit conforms to the regulations in 18 C.F.R. Section 4.51(g), which directs an applicant to 18 C.F.R. Section 4.41(g). The regulations at 18 C.F.R. Section 4.41(g) describes the contents of Exhibit F and references 18 C.F.R. Section 4.39, Specifications for maps and drawings. As a reference, 18 C.F.R. Sections 4.41(g) and 4.39 state:

18 C.F.R. § 4.41(g): Exhibit F consists of general design drawings of the principal project works described under paragraph (b) of this section (Exhibit A) and supporting information used as the basis of design. If the Exhibit F submitted with the application is preliminary in nature, applicant must so state in the application. The drawings must conform to the specifications of § 4.39.

(1) The drawings must show all major project structures in sufficient detail to provide a full understanding of the project, including:
(i) Plans (overhead view);
(ii) Elevations (front view);
(iii) Profiles (side view); and
(iv) Sections.
(2) The applicant may submit preliminary design drawings with the application. The final Exhibit F may be submitted during or after the license process and must show the precise plans and specifications for proposed structures. If the project is licensed on the basis of preliminary designs, the applicant must submit the final Exhibit F for Commission approval prior to the commencement of any construction of the project.
(3) Supporting design report. The applicant must furnish, at a minimum, the following supporting information to demonstrate that existing and proposed structures are safe and adequate to fulfill their stated functions, and must submit such information in a separate report at the time the application is filed. The report must include:
(i) An assessment of the suitability of the site and the reservoir rim stability based on geological and subsurface investigations, including investigations of soils and rock borings and tests for the evaluation of all foundations and construction materials sufficient to determine the location and type of dam structures suitable for the dam site;
(ii) Copies of all boring logs, geology reports and laboratory test reports;
(iii) An identification of all borrow areas and quarry sites and an estimate of required quantities and suitable construction material;
(iv) Stability and stress analyses for all major structures and critical abutment slopes under all probable loading conditions, including seismic and hydrostatic forces induced by water loads up to the Probable Maximum Flood as appropriate; and
(v) The basis for determination of seismic loading and the Spillway Design Flood in sufficient detail to permit independent staff evaluation.
(4) The applicant must submit two copies of the supporting design report described in paragraph (g)(3) of this section at the time preliminary and final design drawings are submitted to the Commission for review. If the report contains preliminary drawings, it must be designated a "Preliminary Supporting Exhibit Report."

18 C.F.R. § 4.39: Specifications for maps and drawings. All required maps and drawings must conform to the following specifications, except as otherwise prescribed in this chapter:

(a) Each original map or drawing must consist of a print on silver or gelatin 35mm microfilm mounted on Type D (3 1/4" by 7 3/8") aperture cards. Full-sized prints of maps and drawings must be on sheets no smaller than 24 by 36 inches and no larger than 28 by 40 inches. A space five inches high by seven inches wide must be provided in the lower right hand corner of each sheet. The upper half of this space must bear the title, numerical and graphical scale, and other pertinent information concerning the map or drawing. The lower half of the space must be left clear. Exhibit G drawings must be stamped by a Registered Land Surveyor. If the drawing size specified in this paragraph limits the scale of structural drawings (exhibit F drawings) described in paragraph (c) of this Section, a smaller scale may be used for those drawings. Potential applicants or licensees may be required to file maps or drawings in electronic format as directed by the Commission.

(b) Each map must have a scale in full-sized prints no smaller than one inch equals 0.5 miles for transmission lines, roads, and similar linear features and no smaller than one inch equals 1,000 feet for other project features, including the project boundary. Where maps at this scale do not show sufficient detail, large scale maps may be required. Each map must show:

(1) True and magnetic meridians;

(2) State, county, and town lines; and

(3) Boundaries of public lands and reservations of the United States [see 16 U.S.C. 796 (1) and (2)], if any. If a public land survey is available, the maps must show all lines of that survey crossing the project area and all official subdivisions of sections for the public lands and reservations, including lots and irregular tracts, as designated on the official plats of survey that may be obtained from the Bureau of Land Management, Washington, D.C., or examined in the local land survey office; to the extent that a public land survey is not available for public lands and reservations of the United States, the maps must show the protractions of townships and section lines, which, if possible, must be those recognized by the Federal agency administering those lands.

(c) Drawings depicting details of project structures must have a scale in full-sized prints no smaller than:

(1) One inch equals 50 feet for plans, elevations, and profiles; and

(2) One inch equals 10 feet for sections.

(d) Each map or drawing must be drawn and lettered to be legible when it is reduced to a print that is 11 inches on its shorter side. Following notification to the applicant that the application has been accepted for filing [see §4.31(c)], prints reduced to that size must be bound in each copy of the application which is required to be submitted to the Commission or provided to any person, agency, or other entity.

(e) The maps and drawings showing project location information and details of project structures must be filed in accordance with the Commission's instructions on submission of Critical Energy Infrastructure Information in §§388.112 and 388.113 of subchapter X of this chapter.

Besides this introductory material, this Exhibit F includes four sections. Section F.2 provides a list of all existing design drawings needed to show all major Project structures in sufficient detail to provide a full understanding of the Project. These include plan, elevation, and section profiles. Section F.3 addresses the requirement for a supporting design report. Section F.4 states any changes to Project facilities proposed by KRCD at this time, and Section F.5 includes a list of references cited in this exhibit.

See Exhibit A for a description of existing Project facilities and features, Exhibit B for a description of existing Project operations, Exhibit C for construction history and construction schedule, Exhibit D for costs and financing information, and Exhibit E for a discussion of environmental resources within the Project area, potential environmental effects from Project O&M, and KRCD's proposed resource management measures. Project maps are included in Exhibit G. Exhibit H contains a detailed description of the need for the power provided by the Project, the availability of power alternatives, and other miscellaneous information. All elevation data in this exhibit is in United States Department of Commerce, National Oceanic and Atmospheric Administration, National Geodetic Survey Vertical Datum of 1929, unless otherwise stated.

F.2 EXISTING GENERAL DESIGN DRAWINGS

The existing FERC license includes two Exhibit L general design drawings that were approved by the Commission in an Order dated May 3, 2023.[1] These drawings will be updated to Exhibit F and will be filed with the License Application. The drawings are listed in Table F.2-1.

Table F.2-1. Existing Exhibit L Drawings

Exhibits L Drawing Number in Existing License	Exhibit L Drawing Name	FERC-Assigned Drawing Number
L-1, Sheet 1 of 2	Cross Section and Elevation	P-2741-18
L-2, Sheet 2 of 2	Plans and Longitudinal Section	P-2741-19

In accordance with 18 C.F.R. Sections 5.30 and 4.32(k) of FERC's regulations and in light of heightened national security concerns, FERC and KRCD treat Exhibit F drawings as Critical Energy Infrastructure Information (CEII) under Section 388.113 of FERC's regulations. This is considered CEII because the plans contain detailed design information about existing critical infrastructure and details about power generation which could be useful to a person planning an attack on critical infrastructure. Therefore, KRCD is not filing the drawings as Public information. Procedures for the public to obtain access to CEII may be found at 18 C.F.R. Section 388.113. Requests for access should be made to FERC's CEII Coordinator.

F.3 SUPPORTING DESIGN REPORT FOR EXISTING FACILITIES

The Project does not include any dams or reservoirs. FERC's San Francisco Regional Office inspects the Project periodically, and no safety issues have been identified. KRCD believes a supporting design report is not required for this Project relicensing.

F.4 KRCD'S PROPOSED CHANGES TO EXISTING PROJECT FACILITIES, FEATURES AND BOUNDARY

At this time, KRCD does not propose any changes to existing Project facilities and does not propose any new Project facilities.

F.5 REFERENCES CITED

None.

[1] The Exhibit L Design Drawings are on FERC's eLibrary at accession number 20230615-5109.

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Attachment G

Annual Temp, DO and TDG Data

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This Attachment G was uploaded the Federal Energy Regulatory Commission's (FERC) eLibrary as a Microsoft Excel file.

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Attachment H

IPaC Resource List

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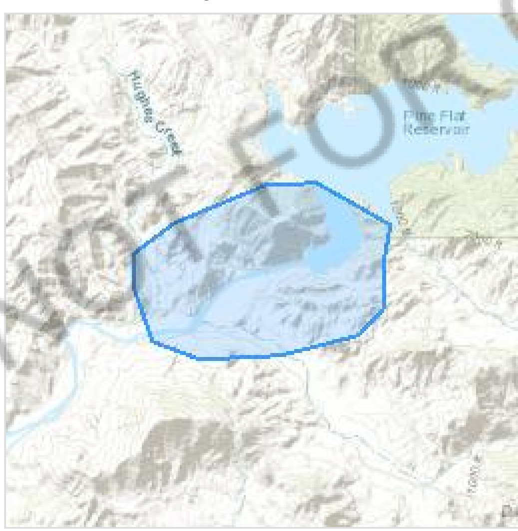
IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Fresno County, California



Local office

Sacramento Fish And Wildlife Office

(916) 414-6600
(916) 414-6713

Federal Building

2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

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1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Fisher Pekania pennanti There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/3651	Endangered
San Joaquin Kit Fox Vulpes macrotis mutica Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2873	Endangered

Birds

NAME	STATUS
California Condor Gymnogyps californianus There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/8193	Endangered

Reptiles

NAME	STATUS
Northwestern Pond Turtle Actinemys marmorata Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1111	Proposed Threatened

Amphibians

NAME	STATUS
California Tiger Salamander Ambystoma californiense There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/2076	Threatened

Foothill Yellow-legged Frog Rana boylii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5133	Endangered
Western Spadefoot Spea hammondii Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/5425	Proposed Threatened

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Keck's Checker-mallow Sidalcea keckii Wherever found There is **final** critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/5704	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are bald and/or golden eagles in your project area.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 1 to Aug 31
Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

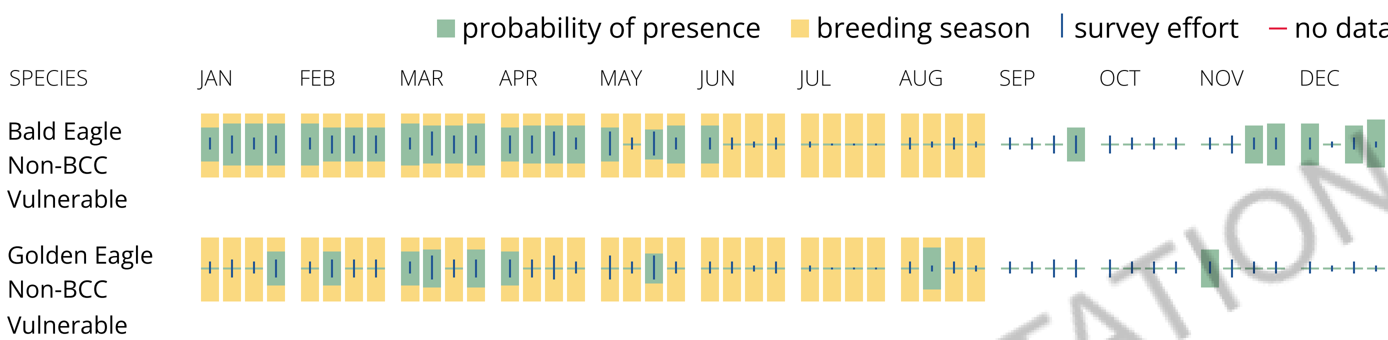
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 1 to Aug 31
Belding's Savannah Sparrow Passerculus sandwichensis beldingi This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8	Breeds Apr 1 to Aug 15
Bullock's Oriole Icterus bullockii This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 21 to Jul 25
California Gull Larus californicus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 1 to Jul 31
California Thrasher Toxostoma redivivum This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Jul 31
Cassin's Finch Carpodacus cassinii This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9462	Breeds May 15 to Jul 15
Clark's Grebe Aechmophorus clarkii This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jun 1 to Aug 31
Common Yellowthroat Geothlypis trichas sinuosa This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/2084	Breeds May 20 to Jul 31

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Lawrence's Goldfinch Carduelis lawrencei — Breeds Mar 20 to Sep 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9464

Nuttall's Woodpecker Picoides nuttallii — Breeds Apr 1 to Jul 20

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9410

Oak Titmouse Baeolophus inornatus — Breeds Mar 15 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

Olive-sided Flycatcher Contopus cooperi — Breeds May 20 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3914

Tricolored Blackbird Agelaius tricolor — Breeds Mar 15 to Aug 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3910

Western Grebe aechmophorus occidentalis — Breeds Jun 1 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/6743

Wrentit Chamaea fasciata — Breeds Mar 15 to Aug 10

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

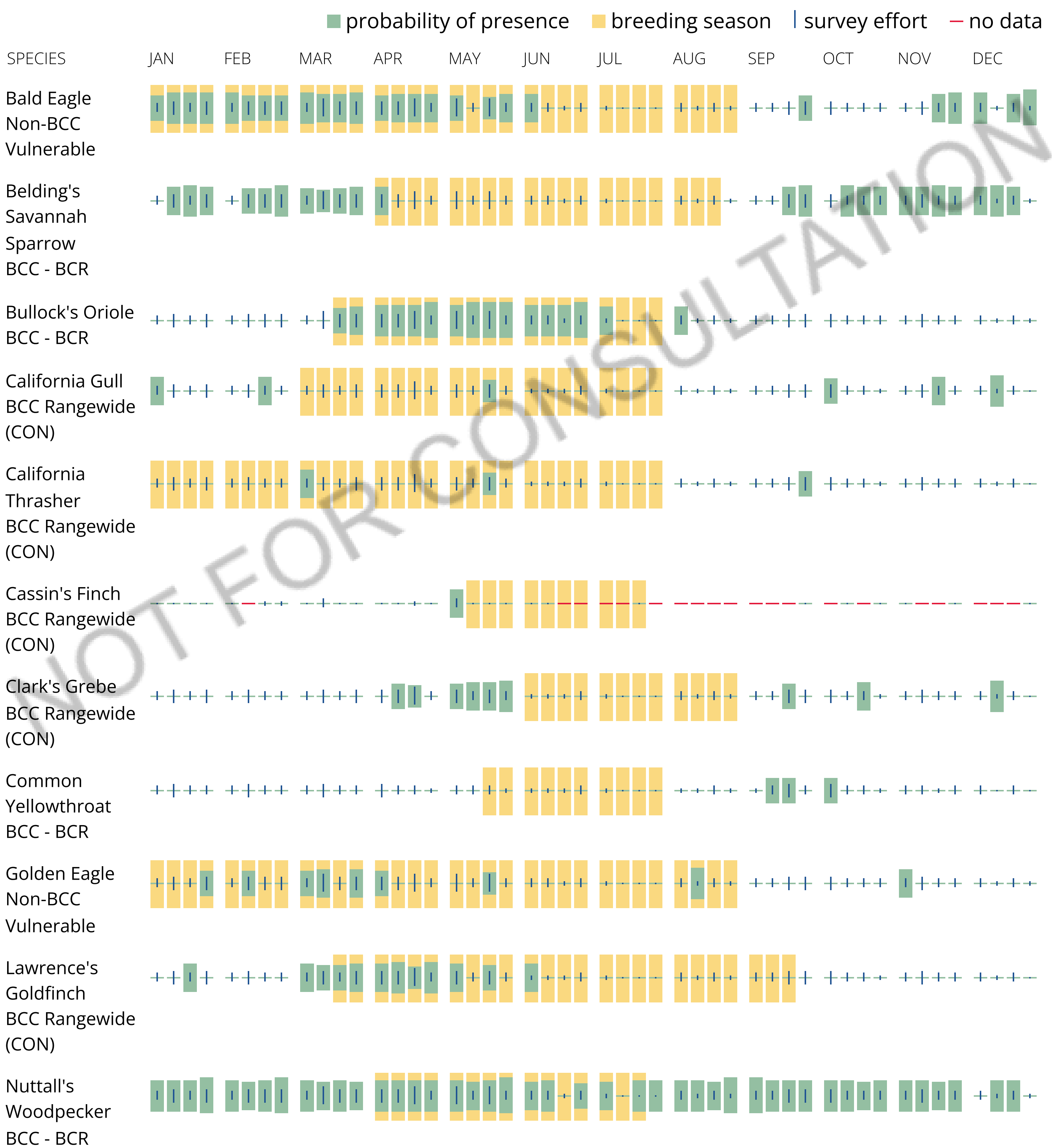
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

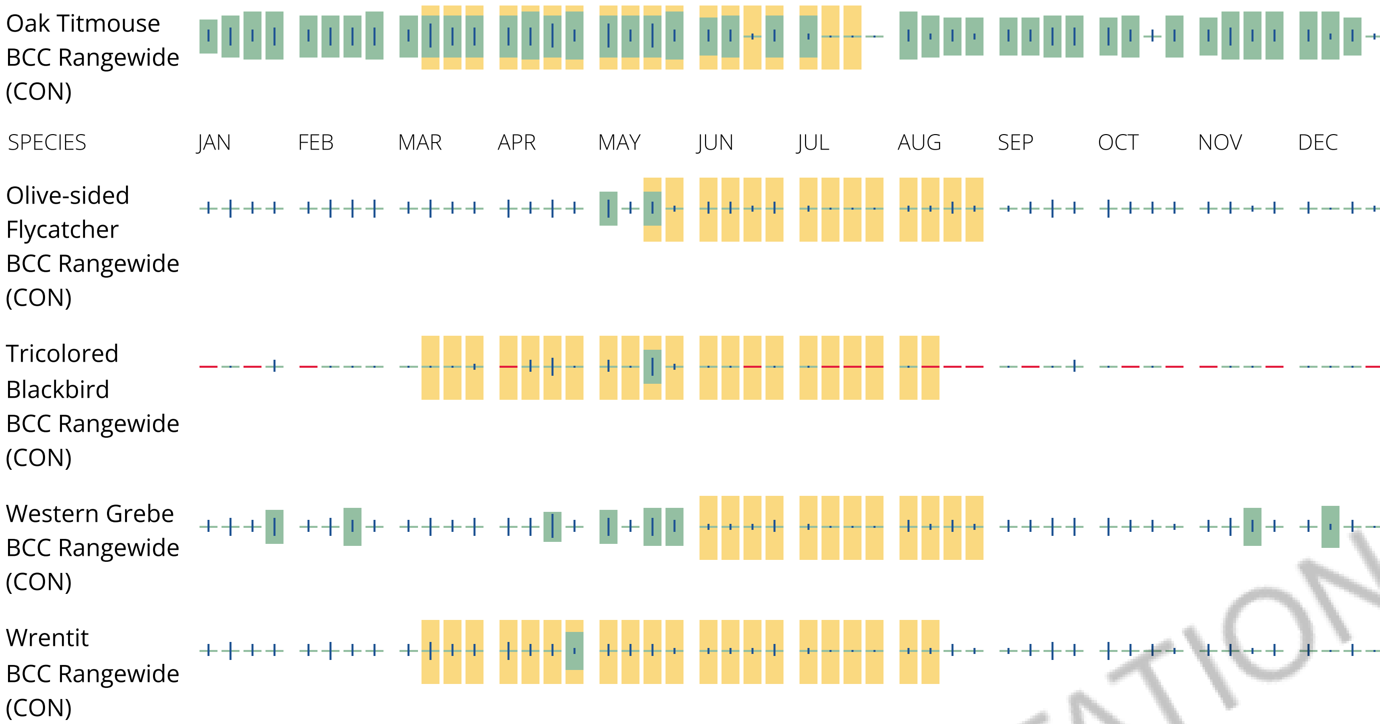
No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

- PEM1B
- PEM1A

FRESHWATER FORESTED/SHRUB WETLAND

- PFOA
- PFOC
- PSSC

FRESHWATER POND

- PABFh
- PABF

LAKE

- L1UBHh

RIVERINE

- R3UBH
- R4SBC
- R3USC
- R5UBF

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Attachment I

Pine Flat Botanical Compendium

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Species	Common Name	Special-Status	Wetland Rank	Weed Rank
FERNS				
PTERIDACEAE – BRAKE FAMILY				
Pentagramma triangularis	goldback fern			
MAGNOLIIDS				
LAURACEAE – LAUREL FAMILY				
*Cinnamomum camphora**	camphor tree			
EUDICOTS				
ANACARDIACEAE – SUMAC FAMILY				
Toxicodendron diversilobum	western poison oak		FACU	
APIACEAE – CARROT FAMILY				
*Torilis arvensis**	tall sock-destroyer			
ASTERACEAE – SUNFLOWER FAMILY				
*Carduus pycnocephalus ssp. pycnocephalus**	Italian thistle			B
*Centaurea melitensis**	Maltese star-thistle			C
Erigeron canadensis	horseweed		FACU	
Helianthus annuus	annual sunflower		FACU	
Heterotheca grandiflora	telegraph weed			
*Hypochaeris glabra**	smooth cat's-ear			
Layia pentachaeta ssp. pentachaeta	five-bristled layia			
*Logfia gallica**	daggerleaf cottonrose			
Madia elegans	common madia			
*Matricaria discoidea**	pineapple weed		FACU	
*Sonchus asper ssp. asper**	prickly sow thistle		FAC	
Stephanomeria sp.	wire-lettuce			
BORAGINACEAE – BORAGE FAMILY				
Pholistoma auritum var. auritum	fiesta flower			
BRASSICACEAE – MUSTARD FAMILY				
*Hirschfeldia incana**	shortpod mustard			
Thysanocarpus sp.	lacepod			
CARYOPHYLLACEAE – PINK FAMILY				
*Silene gallica**	small-flower catchfly			
*Spergularia bocconi**	boccone's sand-spurrey		FACW	
*Stellaria media**	common chickweed		FACU	
FABACEAE – LEGUME FAMILY				
Acmispon americanus var. americanus	American deervetch			
Acmispon glaber var. glaber	deerweed			
Lupinus albifrons var. albifrons	white leaf lupine			

Species	Common Name	Special-Status	Wetland Rank	Weed Rank
Lupinus bicolor	miniature lupine			
Lupinus microcarpus var. densiflorus	dense-flowered chick lupine			
*Melilotus indicus**	Indian sweetclover		FACU	
*Trifolium dubium**	little hop clover			
*Trifolium hirtum**	rose clover			
*Vicia villosa ssp. varia**	diverse hairy vetch			
FAGACEAE – OAK FAMILY				
Quercus lobata	valley oak		FACU	
Quercus wislizeni var. wislizeni	interior live oak			
GERANIACEAE – GERANIUM FAMILY				
*Erodium botrys**	long-beaked filaree		FACU	
Geranium carolinianum	Carolina geranium			
JUGLANDACEAE – WALNUT FAMILY				
Juglans cf. hindsii	northern California black walnut		FAC	
MONTIACEAE – MINER'S–LETTUCE FAMILY				
Claytonia parviflora cf. ssp. parviflora	small-flowered spring beauty		FACU	
MORACEAE – MULBERRY FAMILY				
*Ficus carica**	edible fig		FACU	
MYRTACEAE – MYRTLE FAMILY				
*Eucalyptus cladocalyx**	sugar gum			
ONAGRACEAE – EVENING PRIMROSE FAMILY				
Camissonia contorta	twisted sun cup			
Clarkia cylindrica ssp. clavicarpa	club-fruited cylindrical clarkia			
Clarkia purpurea ssp. quadrivulnera	four-spot purple clarkia			
PLATANACEAE – SYCAMORE FAMILY				
Platanus racemosa	western sycamore		FAC	
POLYGONACEAE – BUCKWHEAT FAMILY				
Chorizanthe membranacea	pink spineflower			
Persicaria lapathifolia	willow weed		FACW	
*Rumex crispus**	curly dock		FAC	
ROSACEAE – ROSE FAMILY				
Rubus ursinus	California blackberry		FAC	
RUBIACEAE – COFFEE FAMILY				
Galium aparine	goose grass		FACU	
SALICACEAE – WILLOW FAMILY				
Salix exigua var. hindsiana	Hinds' willow		FACW	
Salix gooddingii	Goodding's black willow		FACW	
Salix laevigata	red willow		FACW	

Species	Common Name	Special-Status	Wetland Rank	Weed Rank
SAPINDACEAE – SOAPBERRY FAMILY				
Aesculus californica	California buckeye			
SCROPHULARIACEAE – FIGWORT FAMILY				
*Verbascum virgatum**	wand mullein			
SOLANACEAE – NIGHTSHADE FAMILY				
Datura wrightii	Wright's jimsonweed			
URTICACEAE – NETTLE FAMILY				
Urtica dioica ssp. holosericea	hoary nettle		FAC	
MONOCOTS				
POACEAE – GRASS FAMILY				
*Aira caryophyllea**	silver hair grass		FACU	
*Avena fatua**	wild oat			
*Bromus diandrus**	ripgut grass			
*Bromus hordeaceus**	soft chess		FACU	
*Cynodon dactylon**	bermuda grass		FACU	D
*Festuca myuros**	rattail sixweeks grass		FACU	
*Polypogon monspeliensis**	annual beard grass		FACW	

Legend

Symbols:

* Non-native species
^ Seed mix species
+ Volunteer species
cf. confer: This designation is used when a species or infraspecific taxon cannot be confirmed, but is believed to be the selected species of infraspecific taxon based on available anatomy

Federal Designations:

U.S. Fish and Wildlife Service:

FE Endangered
FT Threatened
FC Candidate Species

U.S. Forest Service:

FSS Forest Service Sensitive
WL Watch List

U.S. Army Corps of Engineers Wetland Rank:

OBL Wetland-dependent plants that require standing water or seasonally saturated soils near the surface.
FACW Plants dependent on and predominantly occur with hydric soils, standing water, or seasonally high water tables in wet habitats.
FAC These plants can occur in wetlands or non-wetlands. They can grow in hydric, mesic, or xeric habitats.
FACU Plants that are not wetland dependent. They are non-wetland plants by habitat preference.
None Plants are upland plants and do not occur in wetlands.

Other Designations:

California Invasive Plant Council Rank:

High These species have severe ecological impacts on the surrounding habitat. They have moderate to high rates of dispersal and establishment, and most are widely distributed.
Moderate These species have substantial and apparent—but generally not severe—ecological impacts on the surrounding habitat. They have moderate to high rates of dispersal. Distribution may range from limited to widespread.
Limited These species are invasive, but their ecological impacts are minor on a statewide level. They have low to moderate rates of colonization. Although their distribution is generally limited, these species may be locally persistent and problematic.
Watch List These species are predicted to become invasive if no further actions are taken. Distribution may range from limited to widespread in specific regions.

State of California Designations:

California Department of Fish and Wildlife:

SE Endangered
ST Threatened
SR Rare

California Rare Plant Rank:

1A Plants presumed extirpated in California and either rare or extinct elsewhere
1B Plants Rare, Threatened, or Endangered in California and elsewhere
2A Plants presumed extirpated in California, but more common elsewhere
2B Plants Rare, Threatened, or Endangered in California, but more common elsewhere
3 Plants about which we need more information - review list
4 Plants of limited distribution - watch list

Threat Code Extensions:

None Plants lacking any threat information
.1 Seriously threatened in California (over 80% of occurrences threatened; high degree and immediacy of threat)
.2 Moderately threatened in California (20–80% of occurrences threatened; moderate degree and immediacy of threat)
.3 Not very threatened in California (<20% of occurrences threatened; low degree and immediacy of threat or no current threats known)

California Department of Food and Agriculture Weed Rank:

A eradication, containment, rejection, or other holding action at the state-County level is mandated
B eradication, containment, control, or other holding action is at the discretion of the commissioner
C no state action is required except to retard the speed of spreading
D no state action is required
W this plant is included in CCR Section 4500 list of state noxious weeds

Attachment J

KRCD Fishing Access Visitor Questionnaire

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RECREATION VISITOR QUESTIONNAIRE
for the Kings River Conservation District Fishing Access

This questionnaire is related to your typical visits to the Kings River Conservation District (KRCD) Fishing Access and should take approximately 5-10 minutes to complete. The information will help KRCD better manage the Fishing Access area by understanding visitors' uses and preferences. This survey is not intended for users who only use the upstream trail and North Riverside Access Park. Please review the map included with this survey to familiarize yourself with the KRCD Fishing Access and the other area recreation sites. Thank you for taking the time to complete this questionnaire.

1. For your **typical** visit to the KRCD Fishing Access, how long do you **typically** stay (hours)? ________

2. What **year** did you first visit the KRCD Fishing Access? _________

3. How many times, on average, do you **visit** the KRCD Fishing Access each year? _________

4. Which of the following best describes your **recreation group** during your typical visits to the KRCD Fishing Access? *(check one)*

❑ *Alone* ❑ *Family* ❑ *Multiple Families* ❑ *Family & Friends* ❑ *Friends* ❑ *Organized Group Outing* ❑ *Other*

5. How many **people** (including yourself) travel in your group on your typical visits to the KRCD Fishing Access? _________

6. How many **vehicles** do you typically travel with to the KRCD Fishing Access? _________

7. Check each of the **activities** that you typically participate in during your typical visits to the KRCD Fishing Access.

❑ *Fishing* ❑ *Swimming* ❑ *Hiking or walking* ❑ *River/stream boating*
❑ *Picnicking* ❑ *Wading* ❑ *Wildlife viewing or birding* ❑ *Other (specify)*

8. Of the above activities, please identify your **primary** recreation activity for your typical visit to KRCD Fishing Access. _______________

9. What **other areas did you visit** or plan to visit during your typical visits to the KRCD Fishing Access (refer to map)?

❑ *North Riverside Access Park* ❑ *Downstream trail* ❑ *Kings River Conservancy Raptor Walk* ❑ *Other (specify)*
❑ *Upstream trail* ❑ *Kings River Wildlife Area* ❑ *Pine Flat Lake recreation areas*

10. Which area is the **primary destination** of your typical visits to this area (refer to map)? (check one)

❑ *KRCD Fishing Access* ❑ *Upstream trail* ❑ *Kings River Wildlife Area* ❑ *Pine Flat Lake recreation sites*
❑ *North Riverside Access Park* ❑ *Downstream trail* ❑ *Kings River Conservancy Raptor Walk* ❑ *Other (specify)*

Your Thoughts on Existing Conditions…

11. Please rate the **acceptability** of the following **Existing Conditions** at the KRCD Fishing Access.

Amenities	*Acceptable*	*Slightly Acceptable*	*Neither*	*Slightly Unacceptable*	*Unacceptable*	*Did Not Use, No Opinion, N/A*	*If you rated a condition **"slightly unacceptable"** or **"unacceptable"**, describe the **nature** of the unacceptable condition:*
Picnic tables/sites	5	4	3	2	1	❑	
Shading of picnic sites	5	4	3	2	1	❑	
Trash receptacles	5	4	3	2	1	❑	
Vehicle parking areas	5	4	3	2	1	❑	
Access road	5	4	3	2	1	❑	
Interpretive displays	5	4	3	2	1	❑	
Foot trails to picnic sites	5	4	3	2	1	❑	
Accessible accommodations	5	4	3	2	1	❑	
Access to the shoreline	5	4	3	2	1	❑	
Visitor information	5	4	3	2	1	❑	
Safety/warning information	5	4	3	2	1	❑	
Other (specify)	5	4	3	2	1	❑	

12. Using the scale below, please rate how **crowded** you feel at the KRCD Fishing Access during your typical visits? *(check one)*

Not at all Crowded		*Slightly Crowded*		*Moderately Crowded*			*Extremely Crowded*		*Not Applicable*
1	2	3	4	5	6	7	8	9	❑

13. Did you experience any **conflict** with other recreation users during your previous visits to the KRCD Fishing Access (*i.e.*, anyone who negatively impacted your experience)? ❑ Yes ❑ No

a) If **yes**, what was the activity of the other recreation user? ______________________________

b) If **yes**, please explain the conflict: ______________________________

14. Are there any **constraints** or **barriers** that prevent you or a member of your group from participating in desired recreation activities at the KRCD Fishing Access? ❑ Yes ❑ No

a) If **yes**, please describe what prevented you from participating: ______________________________

b) If **yes**, please describe the location where you would have liked to participate in desired recreation activities: _______________

15. Are there any places at the KRCD Fishing Access where you feel **unsafe**? ❑ Yes ❑ No

a) If **yes**, please describe why you feel unsafe: ______________________________

b) If **yes**, please identify the location where you feel unsafe: ______________________________

16. How did you learn about the KRCD Fishing Access? ❑ *Word of mouth* ❑ *Newspaper* ❑ *Internet* ❑ *Other (specify)*

Your Thoughts on Potential New Recreation Facilities…

17. Please rate your preference for the **potentially new** or **upgraded** amenities at the KRCD Fishing Access.

Amenities *(make one selection per row)*	***Highly Preferred***	***Slightly Preferred***	***Neither***	***Slightly Not Preferred***	***Not Preferred At All***	***Did Not Use, No Opinion, N/A***
Picnic tables/sites	5	4	3	2	1	❑
Shading of picnic sites	5	4	3	2	1	❑
Restroom	5	4	3	2	1	❑
Trash receptacles	5	4	3	2	1	❑
Vehicle parking areas	5	4	3	2	1	❑
Access road	5	4	3	2	1	❑
Interpretive displays	5	4	3	2	1	❑
Foot trails to picnic sites	5	4	3	2	1	❑
Accessible accommodations	5	4	3	2	1	❑
Access to the shoreline	5	4	3	2	1	❑
Visitor information	5	4	3	2	1	❑
Safety/warning information	5	4	3	2	1	❑
Other:_________________	5	4	3	2	1	❑

About You

18. What is the **zip code** for your primary residence? ____________ ❑ *Decline to state*

19. Your **Age**: _______ ❑ *Decline to state*

20. Your **Gender**: ❑ *Male* ❑ *Female* ❑ *Decline to state*

21. Please tell us which of the following categories best represents your **ethnicity**:

❑ *American Indian/Alaskan Native*
❑ *Black/African-American*
❑ *Native Hawaiian/other Pacific Islander*
❑ *Spanish Hispanic or Latino*
❑ *Hispanic or Latino*
❑ *Asian*
❑ *White*
❑ *Other (specify)*
❑ *Decline to state*

22. What is your primary spoken **language**? _________ ❑ *Decline to state*

23. Please use this space if you have any **additional comments** regarding your recreation experience at the KRCD Fishing Access.