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LIST OF ACRONYMS

CALVEG	Classification and Assessment with LANDSAT (land satellite) of Visible Ecological Groupings
CFR	Code of Federal Regulations
FERC or Commission	Federal Energy Regulatory Commission
Forest Service	United States Forest Service
GIS	Geographic Information Systems
LANDSAT	land satellite
NWI	National Wetlands Inventory
Project	Kern River No. 1 Hydroelectric Project
SCE	Southern California Edison Company
USFWS	United States Fish and Wildlife Service

3.9 FLOODPLAINS, LITTORAL ZONES, AND ASSOCIATED WETLAND AND RIPARIAN RESOURCES

This section describes the floodplains, littoral zones, and associated wetland and riparian resources along the bypass reach[1]; Democrat Dam Impoundment; and flumes, conduits, and adits located along the water conveyance system associated with the Kern River No. 1 Hydroelectric Project (Project). The content requirements for this section are specified in Title 18 of the Code of Federal Regulations (CFR) Chapter I § 5.6(d)(3)(vi). The Federal Energy Regulatory Commission (FERC) regulations require a description of the floodplain, littoral, wetland and riparian habitats in the vicinity of the Project, that must include: (1) a list of plant and animal species that use these habitats; (2) a map showing these habitats; and (3) estimates of the amounts of these habitats. This section also describes vegetation cover along the streambanks and reservoir shorelines, specified in § 5.6(d)(3)(ii)(C).

A floodplain is a relatively flat lowland adjacent to a river, underlain by unconsolidated alluvial deposits, and subject to periodic inundation by the river. The littoral zone occurs in the near-shore areas of lakes, reservoirs, and impoundments where sunlight penetrates to the bottom of the waterbodies such that aquatic plants are able to grow.

Wetlands and riparian habitats may occur within the floodplain alongside a stream or within the littoral zone of a lake, reservoir, or impoundment. Hydrologic conditions (including water table elevations, the annual hydrograph, and overbanking flows/reservoir fluctuations) and soil types present define the location of wetland and riparian habitats within the floodplains and littoral zones.

Wetlands are areas that are inundated or saturated by surface or groundwater at a sufficient frequency and duration to support vegetation that is adapted to these hydrologic and saturated soil conditions.

Riparian habitat is located in transitional areas between the aquatic and terrestrial landscapes regularly influenced by fresh water, and normally extend from the edges of waterbodies, including lakes and streams, to the edges of the upland community. The term ‘riparian’ or ‘riparian zone’, as referred to in this section, includes the stream bars and banks and the areas adjacent to the channel (floodplain) that are inundated or saturated by the historic dominant discharge every 1–3 years. The riparian plant community generally transitions into an upland community when the riparian community patterns are no longer controlled by the stream hydrologic conditions, including water table elevations, the annual hydrograph, and overbanking flows.

The study area in this section is defined to include the full extent of wetland and riparian habitats associated with the floodplains and littoral zones along the bypass reach of the Kern River and the Democrat Dam Impoundment. Also included are wetland and riparian habitats that are associated with the flumes, conduits, and adits located along the water

[1] A bypass reach is a segment of a river downstream of a diversion facility where Project operations result in the diversion of a portion of the water from that reach. The bypass reach associated with the Project includes the Kern River from Democrat Dam to the Kern River No. 1 Powerhouse.

conveyance system and which may be influenced by flume leakage as identified in Article 405 of the current FERC license order (FERC 1998).

3.9.1 Information Sources

Existing information on floodplains, littoral zones, and associated wetland and riparian habitats include published reports associated with previous relicensing studies, geographic information system (GIS) data, aerial imagery, and management plans and policies that describe desired conditions for riparian systems. Documents and studies that were reviewed in the development of this section include:

- Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979)
- Application for New License, Kern River No. 1 Hydroelectric Project – FERC Project No. 1930, Kern County, California (License Application) (Southern California Edison Company [SCE] 1994)
- Final Environmental Assessment for Kern River No. 1 Hydroelectric Project – FERC No. 1930-014, California (Environmental Assessment) (FERC and Forest Service 1998)
- Order Issuing New License for the Kern River No. 1 Hydroelectric Project No. 1930-014 (FERC 1998)
- Google Earth© imagery
- The United States Forest Service (Forest Service) Classification and Assessment with LANDSAT (land satellite) of Visible Ecological Groupings (CALVEG) data (Forest Service 2016)
- The United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) (USFWS 2022)

The following sections provide an overview of existing information on floodplains and littoral zones and their associated wetland and riparian resources. Three primary resources were reviewed to characterize and quantify wetland and riparian resources in floodplains and littoral zones:

- CALVEG vegetation alliances are classified based on LANDSAT color infrared satellite imagery and are verified using soil-vegetation maps and professional guidance from various statewide sources (Forest Service 2016). Because the classification system relies on aerial imagery sources, CALVEG does not often capture the small-scale wetland/riparian habitats or habitats that are obscured by overhead vegetation. Refer to Section 3.6 for an overview of the CALVEG system, and to Table 3.6-1 and Map 3.6-1 for the extent of CALVEG vegetation alliances within 1 mile of the FERC Project boundary. The information in Section 3.6 was

reviewed to determine wetland and riparian alliances that may be present in the vicinity of the Project, as determined by the hydrophytic status of the dominant species present in the community. Only one riparian habitat, Baccharis (Riparian) Alliance, was identified in the vicinity of the Project. Refer to Table 3.9-1 for a description of this community type.

- USFWS NWI data layers are developed and classified through the Cowardin classification system (Cowardin et al. 1979) using remotely sensed imagery as the primary data source. The USFWS uses basic image elements to make decisions about wetland boundaries, including tone, size, shape, texture, pattern, shadow, geographic location, and association with other objects (USFWS 2017). Wetlands and deepwater habitats are defined separately. The targeted mapping unit for wetland habitats is one acre (typically visible at 1:12,000 maximum scale imagery, with a maximum zoom on 1:5,000). Because the classification system relies on aerial imagery sources, NWI does not often capture the small-scale wetland/riparian habitats or habitats that are obscured by overhead vegetation. One community type, the freshwater forested/shrub wetland, was identified in the vicinity of the Project, with three sub-classifications. Refer to Table 3.9-1 for a description of these sub-classifications.

- Riparian information was collected in the vicinity of the Project in support of the previous License Application (SCE 1994) and the Environmental Assessment (FERC and Forest Service 1998). Based on a review of information in the License Application, vegetation mapping was conducted in the vicinity of the Project according to rough equivalents of the vegetation descriptions in Holland (1986) (SCE 1994). The Holland (1986) classification system is no longer supported by the State of California and has been replaced by *The Manual of California Vegetation, Second Edition* (Sawyer, Keeler-Wolf and Evens 2009). Reach-by-reach descriptions are provided in the License Application as well as hand-drawn maps, but these areas only cover the bypass reach and do not describe vegetation in the Democrat Dam Impoundment or associated with Project flumes, conduits, or adits. The exact methods used to produce these maps (i.e., field mapping versus aerial imagery delineation) were not specified in the License Application. Digitized/GIS layers for these reaches and riparian communities are not available.

The following sections describe the wetland and riparian resources found in floodplains and littoral zones in the vicinity of the Project.

3.9.2 Floodplains and Associated Wetland and Riparian Resources

Floodplains supporting wetland and riparian resources are found in three main locations in the vicinity of the Project: (1) the bypass reach, (2) the Democrat Dam Impoundment, and (3) along flumes, conduits, and adits associated with the water conveyance system. Each location is described further below.

3.9.2.1 Bypass Reach

The bypass reach is defined as the stretch of the Kern River from Democrat Dam to the tailrace of the Kern River No. 1 Powerhouse influenced by operation of the Project. Like many western Sierra streams, riparian development in the bypass reach is limited by the narrow-incised floodplain, steep canyon slopes, low rainfall, rapid runoff, high stream gradient, and large boulder and bedrock dominated substrates. Riparian development is slightly greater in some reach segments with more braided channels and slightly wider floodplains.

The review of CALVEG and NWI yielded approximately 29 acres of CALVEG Baccharis Riparian Alliance and 28 acres of NWI freshwater forested/shrub wetland vegetation in the bypass reach. Refer to Table 3.9-2 for the amount of CALVEG and NWI communities present in the bypass reach and to Maps 3.9-1A through 3.9-1G for the location of these communities along the bypass reach.

The riparian community information provided in the License Application (SCE 1994) and Environmental Assessment (FERC and Forest Service 1998) provide detailed descriptions of the floodplain and riparian community, including metrics such as floodplain area, floodplain width, amount of riparian vegetation, average riparian patch size, tree height, and tree/understory species observed. SCE estimated approximately 58 acres of riparian vegetation are present in the bypass reach. Refer to Table 3.9-3 for a summary of the characteristics of riparian resources along the bypass reach as reported in SCE 1994.

As characterized in the License Application (SCE 1994) and the Environmental Assessment (FERC and Forest Service 1998), riparian communities identified in the bypass reach include southern interior riparian woodland, southern willow scrub, live oak riparian woodland, and small amounts of valley freshwater marsh. Riparian species composition exhibits an elevational gradient, with the upper portion of the river near the Democrat Dam supporting narrow, broken strips of vegetation dominated by Fremont cottonwood (*Populus fremontii*), interior live oak (*Quercus wislizenii*), sycamore (*Platanus racemosa*), willows (*Salix* spp.), and occasionally gray pine (*Pinus sabiniana*). A few alders (*Alnus* spp.) are present just below the Democrat Dam. Scattered pockets of mugwort (*Artemisia douglasiana*), mulefat (*Baccharis salicifolia*), horsetails (*Equisetum* spp.), nettle (*Urtica* spp.), Mexican rush (*Juncus mexicanus*), poison oak (*Toxicodendron diversilobum*), blackberry (*Rubus* spp.), elderberry (*Sambucus* spp.) and other herbs are also present. The riparian community becomes less diverse and considerably less luxuriant farther downstream, consisting predominantly of an open and broken sycamore woodland, with associated Fremont cottonwood, willows, and occasionally buttonbrush (*Cephalanthus occidentalis*).

3.9.2.2 Democrat Dam Impoundment

The Democrat Dam Impoundment is approximately 1.1 miles long and is more riverine in form rather than lacustrine. The floodplain is wider than sections of the Kern River immediately above and below the impoundment. The Democrat Dam Impoundment

contains an island that is extensively bordered by riparian vegetation, and thin bands of riparian vegetation are also present along the banks.

The Democrat Dam Impoundment is bordered by approximately 23 acres of CALVEG Baccharis Riparian Alliance and 9 acres of NWI freshwater forested/shrub wetland. Refer to Table 3.9-2 for the amount of riparian vegetation and Map 3.9-1A for the location of the riparian habitat in the impoundment.

The riparian descriptions in the License Application (SCE 1994) and Environmental Assessment (FERC and Forest Service 1998) do not provide information about riparian communities at the Democrat Dam Impoundment.

3.9.2.3 Project Flumes, Conduits, and Adits

The Project contains 19 tunnels with six open flumes, nine conduits, and nine adits. Generally, flumes, conduits, and adits are located in areas where the tunnels intersect with tributaries/drainages to the Kern River. Riparian and wetland vegetation in these drainages is tightly associated with the stream channels within a narrow floodplain.

There are approximately 10 acres of CALVEG Baccharis Riparian Alliance and 1 acre of NWI freshwater forested/shrub wetland associated with drainages that intersect with the Project flumes, conduits, and adits. This vegetation is mostly associated with the open flumes, conduits, and adits above major drainages such as Cow Flat Creek, and Lucas Creek. Refer to Maps 3.9-1A through 3.9-1G for the location of this riparian habitat along flumes, conduits, and adits.

There was no description in the License Application (SCE 1994) regarding the composition of riparian vegetation along flumes, conduits, and adits associated with the water conveyance system. The Environmental Assessment (FERC and Forest Service 1998) stated that leaking flumes and water that splashes over the flume edges often form small pools beneath the flumes, which enhance the vegetative diversity in these localized areas (FERC and Forest Service 1998).

3.9.3 Littoral Zones and Associated Wetlands and Riparian Resources

Based on a review of aerial imagery and the description of vegetation communities provided in the License Application (SCE 1994) and the Environmental Assessment (FERC and Forest Service 1998), there are no littoral zones in the vicinity of the Project. The narrow, incised channel of the Kern River causes fast flows on a relatively steep gradient that prevents the development of a littoral zone. Based on a review of CALVEG and recent Google Earth imagery, the Democrat Dam Impoundment is characterized as riverine habitat (Forest Service 2016).

3.9.4 Plant and Wildlife Species that Use Riparian and Wetland Habitats

Riparian and wetland habitats in the vicinity of the Project provide habitat for a variety of plants, amphibians, wildlife, and avian species (FERC and Forest Service 1998). Riparian corridors provide valuable habitat for many species, including riparian nesting birds, and

provide value as cover near water sources and travel corridors for a multitude of wildlife species. Plants and wildlife that have the potential to occur in the vicinity of the Project and the habitats in which they occur are described in Section 3.6, Botanical and Wildlife Resources. Aquatic species that also use or are influenced by riparian and wetland habitats are described in Section 3.5, Fish and Aquatic Resources.

3.9.5 References

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. Reprinted in 1992. FWS/OBS-79/31. Performed for the US Department of Interior, Fish and Wildlife Service Office of Biological Service. 142 pp.

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Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Unpublished paper prepared for the Department of Fish and Game, Nongame Heritage Program, The Resources Agency, Sacramento, California.

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USFWS (United States Fish and Wildlife Service). 2017. Technical Procedures for Conducting Status and Trends of the Nation's Wetlands (Version 2). U.S. Fish and Wildlife Service, Division of Budget and Technical Support, Washington, D.C. 76 p.

———. 2022. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Accessed October 2022. Available at: https://www.fws.gov/program/national-wetlands-inventory.

TABLES

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Table 3.9-1. Riparian and Wetland Community Types Mapped along the Bypass Reach, Democrat Dam Impoundment, and Project Flumes, Conduits, and Adits

Forest Service CALVEG Community Types	
BACCHARIS (RIPARIAN) ALLIANCE (ML) This dry wash alliance is dominated by *Baccharis* species occupying wet habitats, including mulefat (*B. salicifolia*) and/or desert Baccharis (*B. sergiloides*) in the southern Sierras. Fremont cottonwood and wet meadows are often found adjacent to or within these riparian sites, while gray pine and blue oak (*Quercus douglasii*) are commonly found in uplands in the vicinity. This alliance is typically found from 2,000 to 2,800 feet in elevation.	
USFWS NWI Cowardin Riparian Type	
FRESHWATER FORESTED/SHRUB WETLAND	
PFOA	**P System PALUSTRINE:** The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, emergent, mosses, or lichens. **FO Class FORESTED**: Characterized by woody vegetation that is 6 m tall or taller. **Modifier:** **A Water Regime Temporary Flooded:** Surface water is present for brief periods during growing season, but the water table usually lies well below the soil surface for most of the growing season. Plants that grow both in uplands and wetlands may be characteristic of this water regime.
PSSA	**P System PALUSTRINE:** The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, emergent, mosses, or lichens. **SS Class SCRUB-SHRUB:** Includes areas dominated by woody vegetation less than 6 meters (20 feet) tall. The species include true shrubs, young trees (saplings), and trees or shrubs that are small or stunted because of environmental conditions. **Modifier:** **A Water Regime Temporary Flooded:** Surface water is present for brief periods during growing season, but the water table usually lies well below the soil surface for most of the growing season. Plants that grow both in uplands and wetlands may be characteristic of this water regime.
PSSC	**P System PALUSTRINE:** The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, emergent, mosses, or lichens. **SS Class SCRUB-SHRUB:** Includes areas dominated by woody vegetation less than 6 meters (20 feet) tall. The species include true shrubs, young trees (saplings), and trees or shrubs that are small or stunted because of environmental conditions. **Modifier:** **C Water Regime Seasonally Flooded:** Surface water is present for extended periods (generally for more than a month) during the growing season, but is absent by the end of the season in most years. When surface water is absent, the depth to substrate saturation may vary considerably among sites and among years.

Table 3.9-2. Acres of CALVEG and NWI Riparian Communities along the Bypass Reach, Democrat Dam Impoundment, and Project Flumes, Conduits, and Adits

Location	Community Type	Acreage[1]
Forest Service CALVEG Mapping		
Bypass Reach[2]	Baccharis (Riparian) Alliance	29
Democrat Dam Impoundment	Baccharis (Riparian) Alliance	23
Flumes, Conduits, and Adits	Baccharis (Riparian) Alliance	10
USFWS NWI Mapping		
Bypass Reach[2]	Freshwater Forested/Shrub Wetland - PFOA	9
	Freshwater Forested/Shrub Wetland - PSSA	18
	Freshwater Forested/Shrub Wetland - PSSC	1
Democrat Dam Impoundment	Freshwater Forested/Shrub Wetland - PFOA	1
	Freshwater Forested/Shrub Wetland - PSSA	8
Flumes, Conduits, and Adits	Freshwater Forested/Shrub Wetland - PFOA	0
	Freshwater Forested/Shrub Wetland - PSSA	1

[1] Acreage was rounded to the nearest whole acre for simplicity.

[2] Defined as the acreage of any CALVEG or NWI polygon that touches the Kern River.

Table 3.9-3. Description of Riparian Vegetation along Bypass Reach as Specified in the License Application (1994) for the Kern River No. 1 Hydroelectric Project[1]

Reach Number	Distance from Democrat Diversion Dam (river miles)	Area of Floodplain (acres)	Average Width of Floodplain (feet)	Amount of Riparian Vegetation (acres)	Cover of Riparian Vegetation	Average Riparian Patch Size (acres)	Tree Height Range (feet)	Tree Species Observed	Understory Species Observed
1	8.5–9.5	30	250	5.3	18	0.08	30–60	sycamore	willows
2	8–8.5	13	250	1.5	12	0.05	NA	sycamore	willows
3	7.75–8	13	325	3.3	32	0.08	10–30	sycamore	willows, mulefat, buttonbrush
4	7–7.75	15	200	2.1	14	0.04	40–60	sycamore	willows, mulefat
5	4.5–7	72.5	250	23	32	NA; (2.5 maximum size)	NA	sycamore	willow, buttonbrush, other shrubs
6	1.5–4.5	63	175	10	16	0.07	35–70	sycamore, cottonwood, live oak, willow, gray pine	buttonbrush
7	0–1.5	32	200	12.4	40	NA	35–70	sycamore, willow, cottonwood, alder	willow, buttonbrush, poison oak, blackberry, elderberry

NOTES:
NA = not applicable, metric was not reported in the License Application

[1] SCE. 1994. Application for New License, Kern River No. 1 Hydroelectric Project, FERC Project No. 1930, Kern County, California. April 28, 1994.

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MAPS

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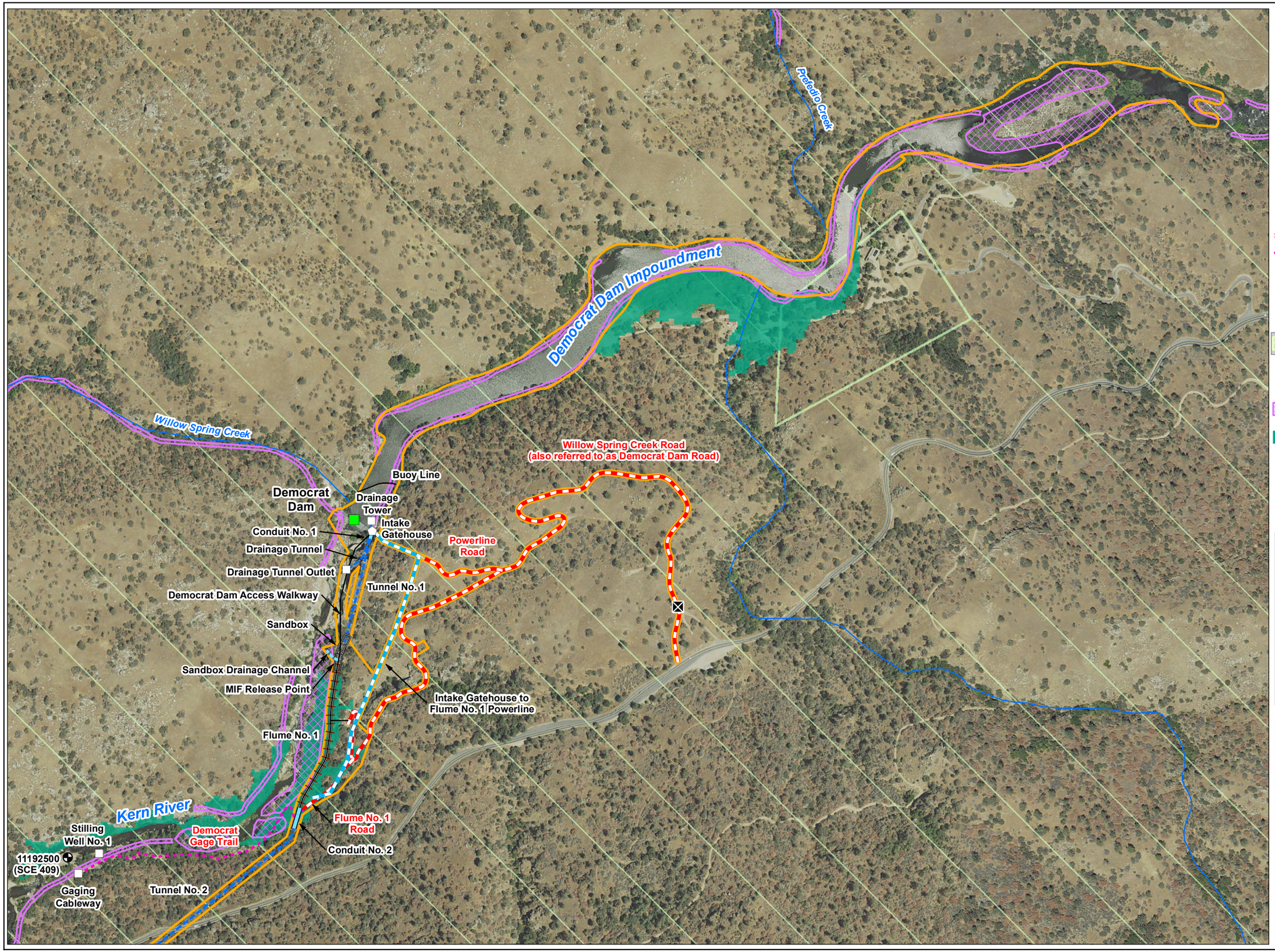


Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

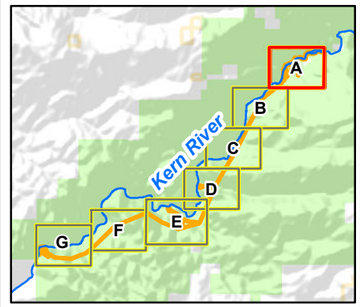
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Habitats

- Freshwater Forested/Shrub Wetland (NWI)
- Baccharis (Riparian) Alliance (CALVEG)

Note: Digitized/GIS layers for riparian habitats described in the License Application (SCE 1994) and the Environmental Assessment (FERC and Forest Service1998) are not included/available.



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

Map 3.9-1a

Riparian and Wetland Vegetation in the Vicinity of the Kern River No.1 Hydroelectric Project

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 12/12/2022

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Tunnel No. 2
Adit 2 & 3
Kern River
Saturday Spring Creek
Tunnel No. 3
Democrat Spring
Conduit No. 3 Trail
Conduit No. 3
Tunnel No. 4

Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

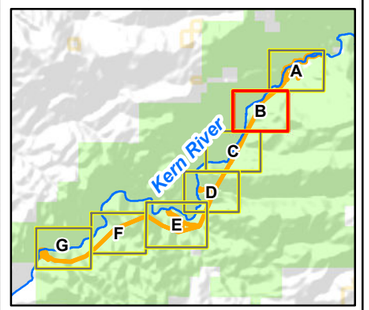
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Habitats

- Freshwater Forested/Shrub Wetland (NWI)
- Baccharis (Riparian) Alliance (CALVEG)

Note: Digitized/GIS layers for riparian habitats described in the License Application (SCE 1994) and the Environmental Assessment (FERC and Forest Service1998) are not included/available.



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

Map 3.9-1b

Riparian and Wetland Vegetation in the Vicinity of the Kern River No.1 Hydroelectric Project

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 12/12/2022

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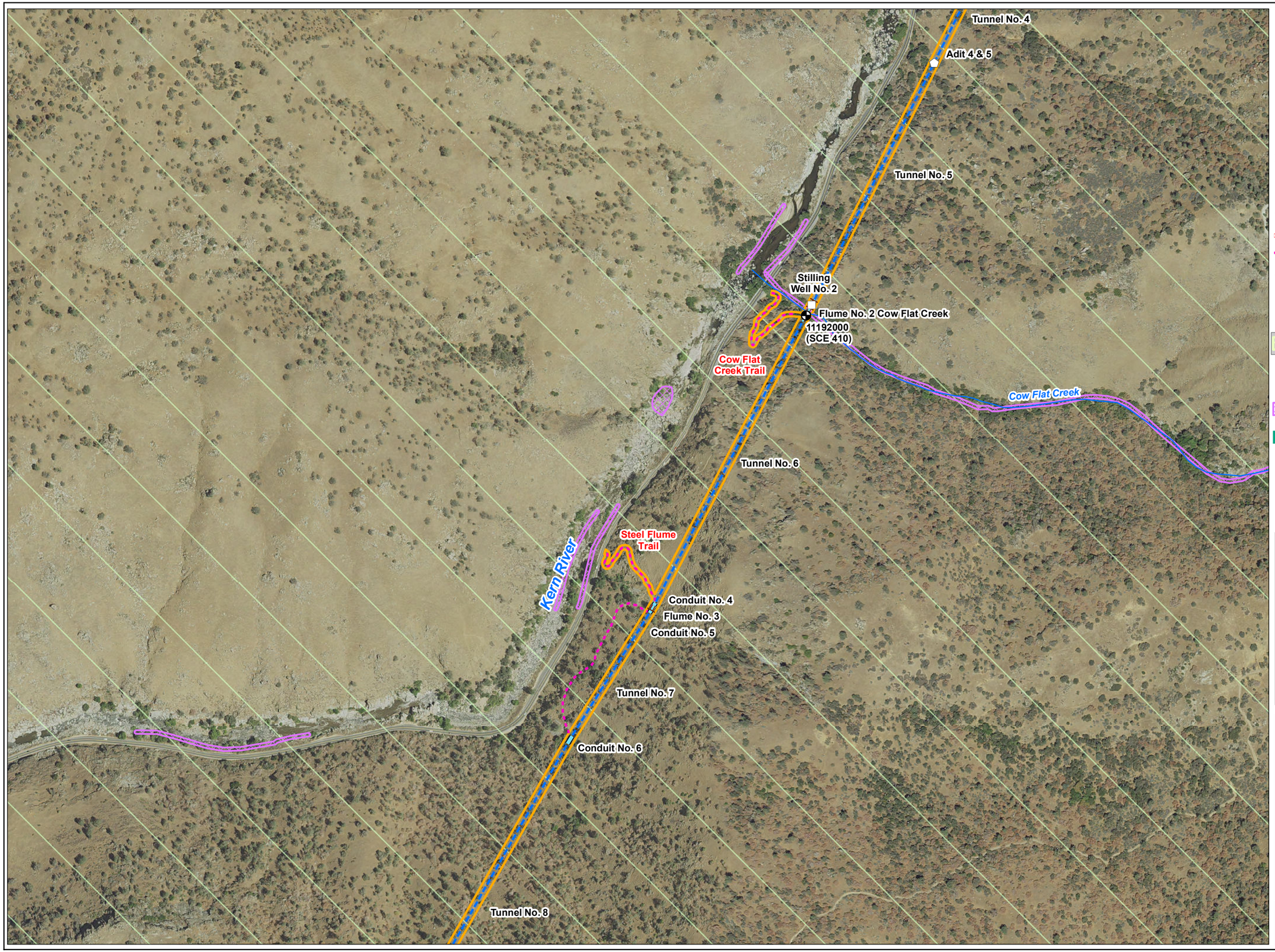


Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

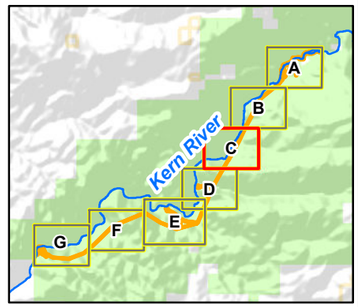
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Habitats

- Freshwater Forested/Shrub Wetland (NWI)
- Baccharis (Riparian) Alliance (CALVEG)

Note: Digitized/GIS layers for riparian habitats described in the License Application (SCE 1994) and the Environmental Assessment (FERC and Forest Service1998) are not included/available.



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

Map 3.9-1c

Riparian and Wetland Vegetation in the Vicinity of the Kern River No.1 Hydroelectric Project

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 12/12/2022

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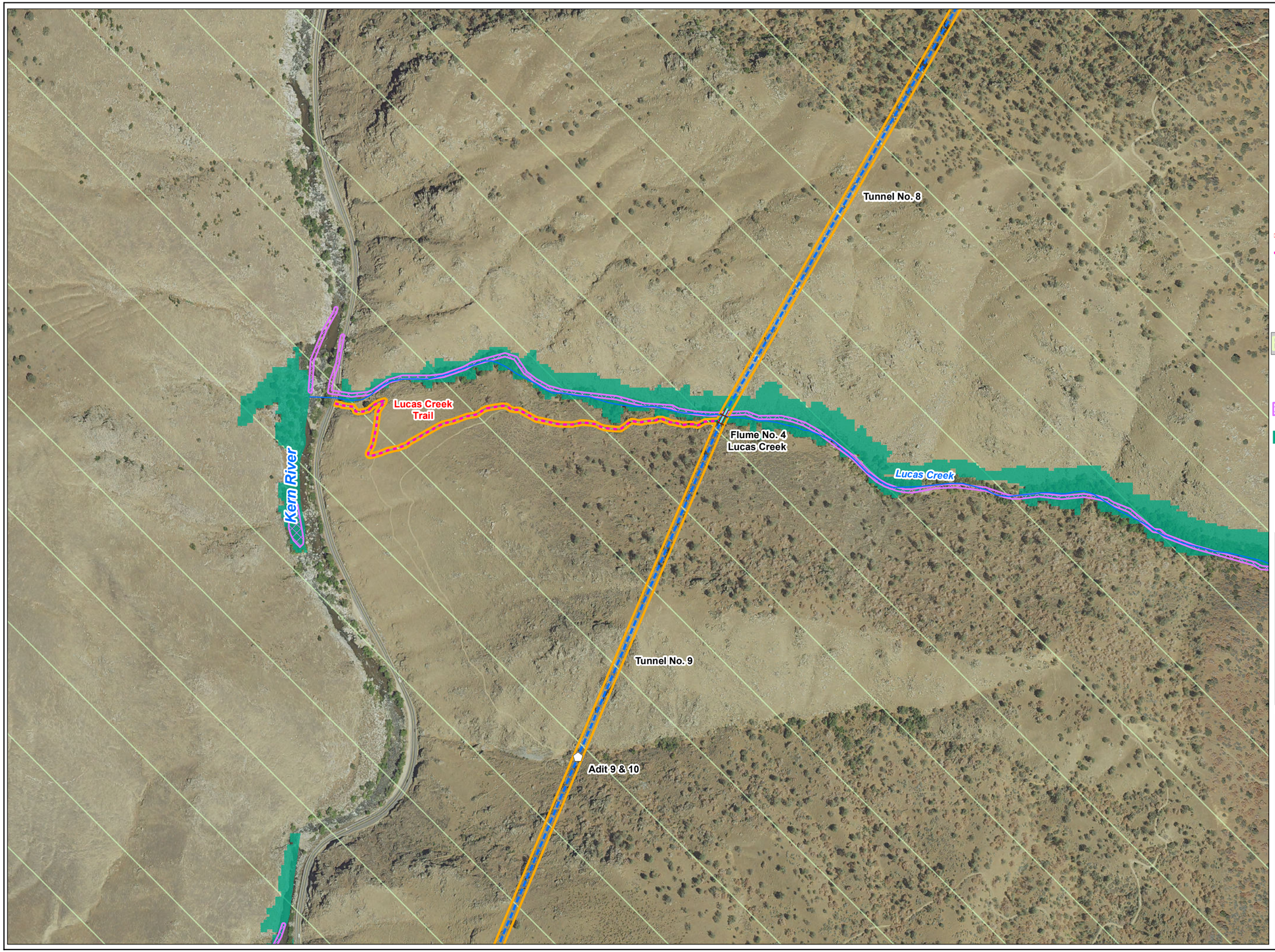


Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

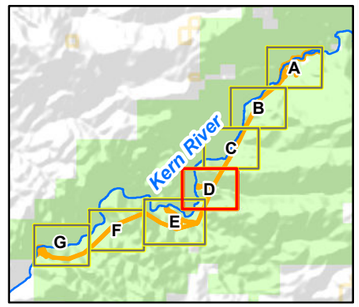
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Habitats

- Freshwater Forested/Shrub Wetland (NWI)
- Baccharis (Riparian) Alliance (CALVEG)

Note: Digitized/GIS layers for riparian habitats described in the License Application (SCE 1994) and the Environmental Assessment (FERC and Forest Service1998) are not included/available.



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

Map 3.9-1d

Riparian and Wetland Vegetation in the Vicinity of the Kern River No.1 Hydroelectric Project

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 12/12/2022

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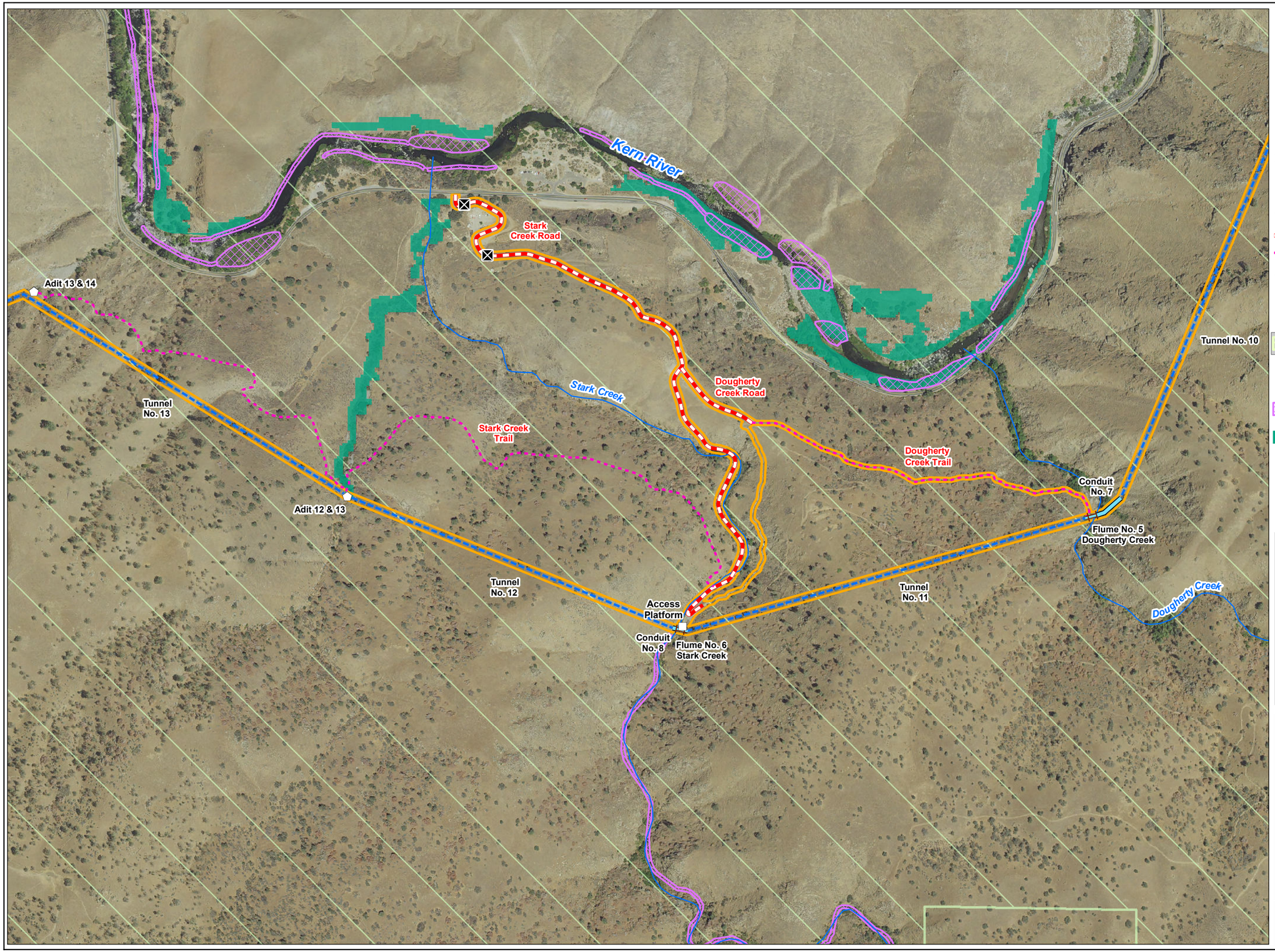


Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

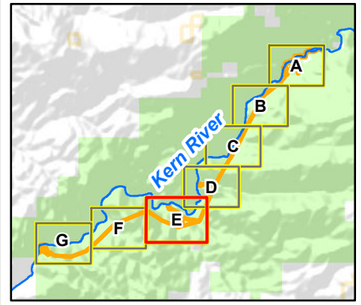
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Habitats

- Freshwater Forested/Shrub Wetland (NWI)
- Baccharis (Riparian) Alliance (CALVEG)

Note: Digitized/GIS layers for riparian habitats described in the License Application (SCE 1994) and the Environmental Assessment (FERC and Forest Service1998) are not included/available.



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

Map 3.9-1e

Riparian and Wetland Vegetation in the Vicinity of the Kern River No.1 Hydroelectric Project

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 12/12/2022

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Kern River

Pechacho Creek

Tunnel No. 14

Adit 14 & 15

Tunnel No. 15

Adit 15 & 16

Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

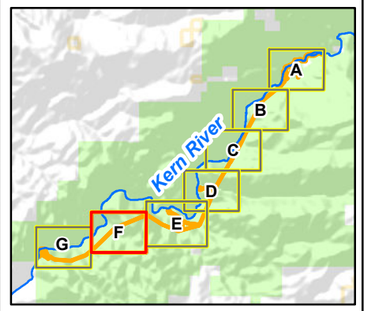
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Habitats

- Freshwater Forested/Shrub Wetland (NWI)
- Baccharis (Riparian) Alliance (CALVEG)

Note: Digitized/GIS layers for riparian habitats described in the License Application (SCE 1994) and the Environmental Assessment (FERC and Forest Service1998) are not included/available.



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

Map 3.9-1f

Riparian and Wetland Vegetation in the Vicinity of the Kern River No.1 Hydroelectric Project

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 12/12/2022

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Kern River

Kern River No. 1 Powerhouse

Tailrace

Kern River No. 1 Switchyard

Forebay Overflow Spillway

Water Tank

Aerial Cable

Penstock

Hoist Cable

Overflow Spillway Trail

Lower Powerhouse Road

Upper Powerhouse Road

Skip Hoist/ Forebay Trail

Forebay

Forebay Operations Area Road

Skip Hoist Upper Landing

Communication Site

Tunnel No. 19

Adit 18 & 19

Tunnel No. 18

Adit 17 &18 Trail

Conduit No. 9

Tunnel No. 17

Adit 16 & 17

Tunnel No. 16

Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

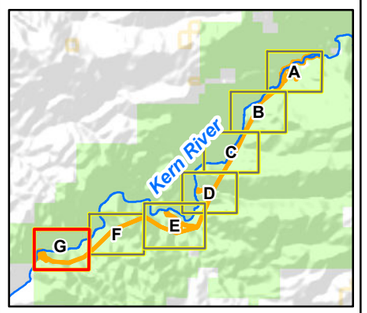
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Habitats

- Freshwater Forested/Shrub Wetland (NWI)
- Baccharis (Riparian) Alliance (CALVEG)

Note: Digitized/GIS layers for riparian habitats described in the License Application (SCE 1994) and the Environmental Assessment (FERC and Forest Service1998) are not included/available.



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

Map 3.9-1g

Riparian and Wetland Vegetation in the Vicinity of the Kern River No.1 Hydroelectric Project

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 12/12/2022

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LIST OF ACRONYMS

BLM	United States Bureau of Land Management
CALFIRE	California Department of Forestry and Fire Protection
CFR	Code of Federal Regulations
FERC or Commission	Federal Energy Regulatory Commission
Forest Plan	Sequoia National Forest Land Management Plan
Forest Service	United States Forest Service
Project	Kern River No. 1 Hydroelectric Project
ROS	Recreation Opportunity Spectrum
SCE	Southern California Edison Company
SQF	Sequoia National Forest

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3.10 LAND USE

This section describes land use in the vicinity of Southern California Edison Company's (SCE) Kern River No. 1 Hydroelectric Project (Project). The Federal Energy Regulatory Commission's (FERC) content requirements for this section are specified in Title 18 of the Code of Federal Regulations (CFR) Chapter I § 5.6(d)(3)(viii).

The FERC regulations require the applicant to provide information regarding both land use and recreation. This section focuses on describing land uses and pertinent land management plans and policies that govern land uses within and adjacent to the FERC Project boundary. Recreation resources are described in Section 3.11, Recreation Resources.

3.10.1 Information Sources

This section was developed using existing information available in the following primary sources. Additional references are cited in the text, as appropriate.

- Sequoia National Forest Land Management Plan, Forest Plan (United States Forest Service [Forest Service] 1988)
- Land Management Plan for the Sequoia National Forest, Pre-Objection Version (Forest Service 2022a)
- Final Environmental Impact Statement for Revision of the Sequoia and Sierra National Forests Land Management Plans, Pre-objection Version (Forest Service 2022b)
- Kern County General Plan (Kern County Planning Department 2009)
- California Department of Forestry and Fire Protection (CALFIRE) information (CALFIRE 2007) and mapping (CALFIRE 2013)

3.10.2 Setting

The Project is located along a section of the lower Kern River on the western slope of the Sierra Nevada, approximately 15 miles east of the City of Bakersfield in Kern County, California. The FERC Project boundary is narrowly defined by the features of the Project encompassing a total of approximately 121.27 acres of land, consisting almost entirely of federal land (116.79 acres) within the Kern River Ranger District of the Sequoia National Forest (SQF). A single parcel of private land (owned by a third party) intersects the FERC Project boundary along a small portion of the shoreline of the Democrat Dam Impoundment. The area of private land within the FERC Project boundary is 4.48 acres. Refer to Map 2-1 in Section 2.0, Project Location, Facilities and Operations for geographic depictions of the Project vicinity and land jurisdictions.

State Route 178 (SR-178) is the main transportation route between the metropolitan Bakersfield area and the communities and recreation areas around Lake Isabella and is the primary road providing access the lower Kern River and Project facilities. SR-178 parallels the lower Kern River along the river's southern bank from the Kern River No. 1 Powerhouse east to the terminus of the FERC Project boundary above the Democrat Dam Impoundment. SR-178 passes through the FERC Project boundary around the Kern River No. 1 Powerhouse, and also intersects with the Project water conveyance flowline upstream of the Powerhouse. Several Project roads and Project trails are accessible from SR-178. Recreation facilities and other improvements are relatively limited along the lower Kern River owning to the steep and rugged topography and the proximity of the highway.

3.10.3 Land Use and Management within the FERC Project Boundary

Land use within the FERC Project boundary includes hydropower generation, recreation, and grazing. The majority of land within the FERC Project boundary is federal land within and administered by the SQF in accordance with the 1988 SQF Land Management Plan (1988 Forest Plan).[1]

3.10.3.1 Sequoia National Forest Land Management Plan (SQF Forest Plan)

The SQF is at the southernmost end of the Sierra Nevada range in California and is in portions of Tulare, Kern, and Fresno counties. Within the national forest boundary, there are approximately 1.1 million acres of National Forest System land and 54,155 acres of land under state, private, and other ownerships. Elevations range from 790 feet in the lower Kern River Valley to 11,873 feet in the Golden Trout Wilderness (Forest Service 2022b).

Every national forest managed by the Forest Service is required to have a Land Management Plan that is consistent with the National Forest Management Act of 1976[2] and other laws. The Forest Plan includes goals, objectives, direction, and prescriptions used to guide land management activities with respect to desired existing and future conditions.

The Forest Service is in the final stages of revising the 1988 Forest Plan for SQF and released the final environmental impact statement, final Forest Plan, and draft record of decision for the Forest Plan revision in the summer of 2022. The administrative period during which objections may be filed on the final plan closed in August 2022. As such it is reasonable to expect that a new Forest Plan for the SQF (revised Forest Plan) will be approved soon. Therefore, this section references both the 1988 Forest Plan and draft revised Forest Plan (Forest Service 2022a) to describe land uses and pertinent land management plans and policies.

[1] In accordance with the 1982 Planning Rule, plans were called "land and resource management plans," while the 2012 Planning Rule uses the term land management plans. Throughout this document both the existing 1988 Land and Resource Management Plan and revised Land Management Plan (2022) are referred to as land management plans, or more simply as the 1988 Forest Plan and the revised Forest Plan.

[2] 16 U.S.C. 1604 – National Forest System Land and Resource Management Plans

1988 Sequoia National Forest Land Management Plan

The 1988 Forest Plan provides comprehensive management direction that instructs the Forest Service on how to manage the resources of the entire forest. The Forest Plan describes management of the forest for a variety of land uses, including recreation, wilderness use, maintenance and improvement of habitat, rangeland, timber production, and the exploration and development of mineral resources, particularly energy resources (Forest Service 1988).

The 1988 Forest Plan identifies management areas made up of management emphases and vegetative types: Management emphases include grazing, dispersed recreation, water-oriented recreation, developed recreation, water yield, wildlife, timber, Research Natural Areas, special interest areas and wilderness. Vegetative types include blue oak savanna, oak woodland, mixed chaparral, pinyon-sage, and conifer forest. Management prescriptions are practices and activities selected and scheduled for application within management areas to attain desired goals and objectives. The management prescription for each management area can be identified by combining the vegetative type with the emphasis area.

The management areas for the lower Kern River corridor, including the land within the FERC Project boundary, fall within the Forest Plan ecological zone “foothill” and vegetative type “mixed chaparral”. The management prescriptions for this vegetative type are guided by the management emphases for mixed chaparral which are: “general dispersed recreation” (management area prescription code MC1), “water-oriented recreation” (MC2), “wildlife and dispersed recreation” (MC5), and “grazing” (MC6).[3]

Consistent with these management prescriptions, the 1988 Forest Plan includes the following land use designations within and around the Project boundary.

- The Recreation Opportunity Spectrum (ROS) designations are Semi-Primitive Motorized and Roaded Natural. Off-highway vehicle use is allowed on designated roads and trails only. For additional information on the ROS designations, refer to Section 3.11, Recreation Resources.

- The Visual Quality Objectives (VQOs) are Retention (within and immediately adjacent to the Kern River) and Partial Retention (further away from the river corridor). For additional information on Forest Service visual and scenic designations refer to Section 3.12, Aesthetics.

The area around the lower Kern River corridor is not considered suitable for timber production and is not within a designated special wildlife habitat area, roadless area, wilderness area, or special interest area (areas classified because of their unusual or outstanding scenic, cultural, scientific, natural, or other unique characteristics which merit

[3] MC1, MC2, MC5 and MC6 are the management area prescription codes in the 1988 Forest Plan for the vegetative type “mixed chaparral.”

special attention and management). Use of lands for hydroelectric power is consistent with the 1988 Forest Plan.

Revised Land Management Plan for the Sequoia National Forest (2022)

Like the 1988 plan, the draft revised Forest Plan (Forest Service 2022a) describes management of the forest for a variety of land uses, including recreation, wilderness use, maintenance and improvement of habitat, rangeland, timber production, and the exploration and development of mineral resources. However, the draft revised Forest Plan does not rely on the same methodology of management emphases and vegetative types to identify management areas and designated areas. Instead, the draft revised Forest Plan identifies and maps lands of specific character and defines boundaries of management areas or designated areas where the characteristics that define those lands exist. The Forest Service lands of specific character, management areas, and designated areas within and surrounding the FERC Project boundary include Riparian Conservation Areas, various strategic fire management zones, Conservation Watersheds, Sustainable Recreation Management Areas, and Inventoried Roadless Areas. Descriptions of each of these areas follows.

- **Riparian Conservation Areas:** Lands adjacent to water resources and unstable and potentially unstable areas where special standards and guidelines direct land use. Management activities in riparian conservation areas are designed to protect, restore, or enhance water quality and the ecological health and function of aquatic and riparian ecosystems and associated resources. Riparian areas and aquatic habitat standards were developed to protect hydrologic processes, water temperatures, fens, connectivity, aquatic species, shorelines, and occupied native cutthroat trout stream reaches.

- **Strategic Fire Management Zones:** The purpose of strategic fire management zones is to support decision-making before a fire ignition occurs, by pre-assessing the risk and benefits from wildland fire (both wildfire and prescribed fire) to areas on the landscape. The Strategic Fire Management Zones around the Project boundary are either Wildfire Restoration, General Wildfire Protection, or Community Wildfire Protection.

- **Conservation Watershed:** These large-scale conservation watersheds allow for habitat connectivity, where appropriate, for species to shift their distributions in response to climate change. Conservation watersheds are intended to help protect and maintain the most intact aquatic systems as well as restore degraded watersheds of high importance for stewardship of fish, aquatic resources, and water quality over the long term.

- **Sustainable Recreation Management Areas (RMAs):** RMAs provide management direction for specific opportunities and activities. The Forest Plan designates three RMAs: Destination Recreation Areas (High Use), General Recreation Areas (moderate use), Challenging Backroad Areas (Low Use). Within

the Project boundary the RMAs are Challenging Background Area, and Destination Recreation Area.

- **Wild and Scenic Rivers:** The Forest Service identifies the lower Kern River from Lake Isabella 31 miles downstream to the canyon mouth above Bakersfield as an eligible (but not Congressionally designated) Wild and Scenic River. Refer to Section 3.10.4, below, for more details on this designation.

In addition, the revised Forest Plan (2022) establishes the following land use designations within and around the Project boundary.

- The ROS designations are Semi Primitive Motorized, and Roaded Natural (the same ROS designations as in the 1988 Forest Plan).

- The Scenery Management System Scenic Integrity Objectives (SIOs) are High or Moderate (equivalent to the Visual Quality Objective ratings of the 1988 Forest Plan).

The Forest Service range allotments for livestock grazing around the lower Kern River, including within the FERC Project boundary, are active.

3.10.3.2 Kern County General Plan

The Kern County General Plan (Kern County Planning Department 2009) includes goals, policies, and implementation measures to guide development in the county on a long-term basis. The county land use regulations do not apply to property administered by the state or federal government, defined by the County as Non-Jurisdictional Lands, in the absence of Memorandums of Understanding indicating otherwise. Private inholdings within the SQF are primarily resource lands (i.e., lands managed for limited, if any development). In the vicinity of the Project, identified land uses on County inholdings include resource use such as agricultural and mining. Several of the resource lands along the Kern River include environmental overlay designations, locations within which the development provisions of the underlying use (e.g., extensive agricultural) are augmented to address specific environmental constraints such as flood hazard or steep slopes (Kern County Planning Department 2009). The land use designations for Kern County in the vicinity of the FERC Project boundary are included in the General Plan *Central Section Map* of the Kern County General Plan (Kern County 1982). The single parcel of private land that intersects with the FERC Project boundary is a placer mining claim identified in the *Central Section Map* as an agricultural parcel (Extensive Agriculture) with a steep slope environmental constraints overlay (Kern County 1982).

3.10.4 Wild and Scenic River Eligibility

A Wild and Scenic River is a river designated by Congress as part of the National Wild and Scenic Rivers System that was established in the Wild and Scenic Rivers Act of 1968 with the following characteristics:

- **Wild**—Those rivers or sections of rivers free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

- **Scenic**—Those rivers or sections of rivers free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

- **Recreational**—Those rivers or sections of rivers readily accessible by road or railroad that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

The Forest Service has identified the lower Kern River from Lake Isabella 31 miles downstream to the canyon mouth above Bakersfield (inclusive of the Project area) as a river that meets Wild and Scenic eligibility requirements. The lower Kern River meets these requirements under the classification of “recreational” river with identified outstanding remarkable values for scenery, recreation, wildlife, population and habitat, prehistory, and history (Forest Service 2022b). The criteria for a Wild and Scenic Recreation River classification includes existing impoundments and diversions, as long as the waterway remains generally natural and riverine in appearance. The SQF manage eligible, suitable, or recommended Wild and Scenic rivers to protect free-flow and outstandingly remarkable values and maintain preliminary classifications (Forest Service 2022a).

3.10.5 Shoreline Buffer Zones and Management Plans

The Project is operated in a run-of-river mode and does not include any reservoirs. The Democrat Dam Impoundment (also referred to as the “pond”) is located upstream of Democrat Dam and covers approximately 27 acres however there is no usable storage capacity. Because Democrat Dam is a run-of-river dam and its whole crest is a spillway, the dam regularly spills and the impoundment and tailwater levels are governed by natural flows in the Kern River.

The FERC Project boundary represents a buffer zone around the impoundment. Aside from Democrat Hot Springs, which is privately owned by a third party and not open to the public, public access to the impoundment is not restricted by the Forest Service.

There are no permitted public piers, boat docks, landings, bulkheads, or other shoreline facilities associated with the impoundment. Therefore, SCE does not maintain a shoreline management plan.

3.10.6 Land Use and Management Adjacent to the FERC Project Boundary

The lower Kern River is surrounded by National Forest System lands within the SQF and some scattered private inholdings with the SQF boundary. As discussed previously, the SQF is managed by the Forest Service in accordance with the SQF Forest Plan while private inholdings in Kern County are subject to the land management goals and policies of the Kern County General Plan. There are no other federal, state or local jurisdictions that own or manage land adjacent to the FERC Project boundary. The closest additional entities with land jurisdiction are the City of Bakersfield and Bureau of Land Management (BLM). Upstream from the Project boundary, closer to Lake Isabella, there are federal parcels under the jurisdiction of the BLM.

3.10.6.1 Specially Designated Areas

Aside from the SQF, there are no specially designated management areas in the vicinity of the Project, including lands under study for inclusion in the National Trails System or as a Wilderness Area, or any roads designated at the federal or state level as a scenic highway or byway. The lower Kern River does not include any state-protected river segments.

3.10.7 Fire History and Fuels Management

The Project is situated within the Kern River Valley, an area primarily characterized by grasslands and herbaceous cover in mountainous territory. Wildfires are common events throughout this region. The largest recorded fires within or adjacent to the FERC Project boundary were the 2011 Breckenridge Complex and 2017 Garden Fire (Forest Service 2022c). The Breckenridge Complex was started by lightning and burned approximately 25,000 acres; its perimeter encompassed of the Kern River No. 1 Powerhouse and associated facilities. The Garden Fire was started by equipment and burned around 1,300 acres, including acreage immediately south and east of the Democrat Dam Impoundment.

Because the vast majority of land in and around the FERC Project boundary is National Forest Land, fire prevention and fuels management in the area of the Project is primarily provided by the Forest Service. Kern County is a CALFIRE Contract County – where CALFIRE provides funding for fire prevention and response staffing, infrastructure, and equipment, and where CALFIRE units provide responses to fires that cannot be addressed by the County's existing fire services. Therefore, on private lands in the vicinity, CALFIRE is the primary entity responsible for fire prevention and fuels management.

According to the revised Forest Plan for the SQF (Forest Service 2022a), fire management within and surrounding the FERC Project boundary fall within three strategic wildfire management zones based on wildfire risk within the forest: Community Wildfire Protection Zone; General Wildfire Protection Zone; or Wildfire Restoration Zone. The single parcel of private property that intersects with the Project boundary is identified as a High Fire Hazard Severity Zone by CALFIRE (CALFIRE 2007). CALFIRE classes of fire severity are "very high," "high" and "moderate."

To reduce fire hazards associated with Project facilities, SCE implements regular maintenance activities, including vegetation management and hazard tree removal. Vegetation management includes trimming by hand and with equipment, and herbicide use to provide adequate buffer around facilities. In addition, SCE removes trees posing a threat to facilities and which could become a fire hazard. Refer to Section 2.0, Project Location, Facilities and Operations for a detailed description of Project facility maintenance activities and the locations and timing of their implementation.

3.10.8 References

CALFIRE (California Department of Forestry and Fire Protection). 2007. Fire Hazard Severity Zones in State Responsibility Areas. Accessed: October 2022. Available online: https://osfm.fire.ca.gov/divisions/community-wildfire-preparedness-and-mitigation/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/.

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Forest Service (U.S. Forest Service). 1988. Sequoia National Forest Land and Resource Management Plan. U.S. Department of Agriculture, Forest Service, Sequoia National Forest. March 1988. Accessed: October 2022. Available online: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5400303.pdf.

———. 2022a. Land Management Plan for the Sequoia National Forest, Pre-Objection Version. Fresno, Kern, and Tulare Counties, California. R5-MB-325-A. U.S. Department of Agriculture, Forest Service, Pacific Southwest Region. Accessed: October 2022. Available online: https://www.fs.usda.gov/project/?project=3375.

———. 2022b. Final Environmental Impact Statement for Revision of the Sequoia and Sierra National Forests Land Management Plans, Pre-objection Version. R5-MB-327-A. U.S. Department of Agriculture, Forest Service, Pacific Southwest Region. Accessed: October 2022. Available online: https://www.fs.usda.gov/project/?project=3375.

———. 2022c. Sequoia and Sierra National Forests Plan Revision Final Environmental Impact Statement. Alternatives and Data Viewer. Available online: https://www.fs.usda.gov/project/?project=3375.

Kern County Planning Department. 1982. Kern County General Plan maps; Land Use, Open Space & Conservation Element, Central Section Map. April 15, 1982. Accessed: October 2022. Available online: https://kernplanning.com/planning/planning-documents/general-plans-elements/.

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LIST OF ACRONYMS

AWW	American Whitewater
BLM	Bureau of Land Management
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
cfs	cubic feet per second
FERC or Commission	Federal Energy Regulatory Commission
Forest Service LWCF	United States Forest Service
NPS	Land and Water Conservation Fund
Parks	National Park Service
Project	California Department of Parks and Recreation
ROS	Kern River No. 1 Hydroelectric Project
SCE	Recreation Opportunity Spectrum
SCORP	Southern California Edison Company
SQF	Statewide Comprehensive Outdoor Recreation Plan Sequoia
SPOA	National Forest
	Survey on Public Opinions and Attitudes on Outdoor
SR	Recreation
USACE	State Route
	U.S. Army Corps of Engineers

3.11 RECREATION RESOURCES

This section describes the recreation resources in the vicinity of Southern California Edison Company's (SCE) Kern River No. 1 Hydroelectric Project (Project). The Federal Energy Regulatory Commission's (FERC) regulations require the applicant to provide information regarding both recreation and land use. This section provides an overview of the recreation setting, including existing recreational facilities and opportunities; recreation use of Project lands; United States Forest Service's (Forest Service) management objectives and other pertinent federal and state recreation designations; and summarizes current and future recreation needs identified in existing management plans. Non-recreation land use within and adjacent to the FERC Project boundary is discussed separately in Section 3.10, Land Use. The FERC requirements for this section are specified in Title 18 of the Code of Federal Regulations (CFR) Chapter I § 5.6(d)(3)(viii).

3.11.1 Information Sources

This section was developed using existing information available in the following primary documents. Additional references are cited in the text, as appropriate.

- Sequoia National Forest Land and Resource Management Plan, Forest Plan (Forest Service 1988)
- Application for New License, Kern River No. 1 Hydroelectric Project, FERC Project No. 1930 (SCE 1994)
- Final Environmental Assessment for Hydropower License, Kern River No. 1 Hydroelectric Project, FERC Project No. 1930-014 (FERC 1998a)
- FERC Order Issuing New License (Major Project), FERC Project No. 1930-014 (FERC 1998b)
- Five-Year Recreation Use Report, Kern River No. 1 Hydroelectric Project – FERC No. 1930 (TCW 2005)
- Land Management Plan for the Sequoia National Forest, Pre-Objection Version (Forest Service 2022a)
- The Best Whitewater in California (Holbeck, L. and Stanley, C. 1998);
- California Whitewater, A Guide to the Rivers (Cassady J. and Calhoun F. 1995);
- Various state and federal agency websites; and
- Various whitewater boating websites.

3.11.2 Setting

The Project is located along a section of the lower Kern River[1] on the western slope of the Sierra Nevada, approximately 15 miles east of the City of Bakersfield in Kern County, California. The Project is almost entirely on lands within the Sequoia National Forest (SQF).

SCE operates the Project in a run-of-river mode for hydroelectric generation. Water is diverted from the Kern River at Democrat Dam and directed through the Project's water conveyance system, comprised of approximately 8.5 miles of tunnels, flumes, and conduits. Water within the conveyance system is directed to a small concrete forebay, through a buried penstock, and into the Project powerhouse. Water exiting the powerhouse is returned to the Kern River via the Kern River No. 1 Tailrace.

3.11.2.1 Bypass Reach

The bypass reach[2] is an approximately 10.2-mile reach of the lower Kern River from Democrat Dam downstream to the Kern River No. 1 Tailrace. The bypass reach is characterized by swift flowing water and difficult rapids.

3.11.2.2 Flows within the Bypass Reach

As noted in Section 3.3, Water Use and Hydrology, the hydrology of the lower Kern River is dominated by reservoir operations at Lake Isabella (the large reservoir in the Kern River Basin). As a result of reservoir operations by the U.S. Army Corps of Engineers (USACE) at Lake Isabella, flows are high in summer when agricultural releases are made, and low in the winter when the dam retains water to refill the reservoir.

The period of record used to characterize recent historical flows associated with the Project extends from Water Year 1999 through Water Year 2021 (October 1, 1998, through September 30, 2021). This time period represents Project operations since issuance of the current FERC License in 1998. Total annual inflow into the Project in Water Years 1999–2021 ranged from approximately 135,000 acre-feet to over 1,735,000 acre--feet. The median total annual inflow was approximately 455,000 acre-feet during this period (Figure 3.3-1).

The Project has diversion rights of 412 cubic feet per second (cfs) from the Kern River, which is the maximum capacity of the diversion. Minimum instream flow release requirements in Article 401 of the current FERC License (FERC 1998a) requires 50 cfs to be released to the bypass reach from June 1 to September 30 and 15 cfs to be released between October 1 and May 31, or inflow if lower than the seasonal flow requirement.

[1] The lower Kern River begins at Lake Isabella and travels down Kern Canyon to the City of Bakersfield.

[2] A bypass reach is a segment of a river downstream of a diversion facility where Project operations result in the diversion of a portion of the water from the river.

3.11.2.3 Democrat Dam Impoundment

Democrat Dam Impoundment is located upstream of Democrat Dam and covers approximately 27 acres, with a gross storage capacity of 247 acre-feet when full. Because Democrat Dam is a run-of-river dam and its whole crest is a spillway, the dam regularly spills, and the impoundment water elevation is governed by inflow from the Kern River and downstream FERC minimum flow requirements.

3.11.2.4 Kern River Access

State Route 178 (SR-178) is the main transportation route between the metropolitan Bakersfield area and the communities and recreation areas around Lake Isabella and is the primary road providing access to the lower Kern River and Project facilities. SR-178 parallels the lower Kern River along the river's southern bank from the Kern River No. 1 Powerhouse to the terminus of the FERC Project boundary above the Democrat Dam Impoundment, continuing easterly (Map 3.11-1a, b).

3.11.3 Recreational Facilities

SCE does not own or operate developed recreation facilities in the vicinity of the Project. Other recreation facilities and improvements are relatively limited along the lower Kern River owing to the steep and rugged topography and the proximity of the highway. Developed recreation facilities along the bypass reach include four day use areas and one privately owned recreation site at Democrat Hot Springs (Map 3.11-1a, b). The day use areas are on SQF land and administered by the Forest Service or a concessionaire to the Forest Service. These recreational facilities are described below.

3.11.3.1 Day Use Facilities

The four Forest Service day use areas in the vicinity of the Project include:

- Democrat Raft Take-Out Boating Site at the Project's impoundment;
- Upper Richbar Day Use Area (bypass reach);
- Lower Richbar Day Use Area (bypass reach); and
- Live Oak Day Use Area (bypass reach).

The day use sites along the bypass reach are located on narrow flats of land between SR-178 and the river and are all accessed from SR-178. The sites are operated under a concessionaire permit with Rocky Mountain Recreation (as are all developed campground areas on the SQF). None of the day use facilities are included in SCE's license.

Democrat Raft Take-Out Boating Site

The Democrat Raft Take-Out Boating Site (Democrat Take-out) is located on the left bank of the impoundment approximately 0.8 mile upstream from the dam, just upstream of Prefedio Creek confluence. Democrat Take-out features two boat ramps. One is about 100 yards upstream from the slightly larger take-out. The boat ramps serve as a take-out for the boaters rafting upstream of the Project, and as a put-in for boaters fishing the impoundment. Parking is available in the dirt lot, located uphill from the bus turn around area. There is a pit-toilet available in the parking lot (The River Travel Company 2022). The Democrat Raft Take-Out Boating Site is not included in SCE's license.

Upper Richbar Day Use Area

The Upper Richbar Day Use Area is located approximately 20 miles northeast of Bakersfield along SR-178, just upstream of where Dougherty Creek flows into the Kern River. It has a paved road, picnic tables, toilets, and dumpsters. There is no potable water available. The elevation is 1,400 feet. It is open all year. Day use hours are between 6am until 10am daily. Use fees are $12 per day (Forest Service 2022c). The Upper Richbar Day Use Area is not included in SCE's license.

Lower Richbar Day Use Area

The Lower Richbar Day Use Area is located approximately 20 miles northeast of Bakersfield along SR-178, just upstream of where Dougherty Creek empties into the Kern River. It has a paved road, picnic tables, toilets, and dumpsters. There is no potable water available. The elevation is 1,400 feet. It is open from March to October. Day use hours are between 6am until 10am daily. Use fees are $12 per day (Forest Service 2022c). The Lower Richbar Day Use Area is not included in SCE's license.

Live Oak Day Use Area

The Live Oak Day Use Area, also known as Live Oak Picnic Area, is located approximately 19 miles northeast of Bakersfield along SR-178, about one-half mile downstream from the Lower Richbar site. It has a paved road, picnic tables, toilets, and dumpsters. There is no potable water available. The elevation is 1,400 feet. It is open March to October. Day use hours are between 6am until 10am daily. Use fees are $12 per day (Forest Service 2022c). The Live Oak Day Use Area is not included in SCE's license.

3.11.3.2 Private Recreation Facility

Democrat Hot Springs

Democrat Hot Springs was constructed in 1904 providing a hotel and cottages to accommodate hot springs guests that came in stagecoaches from Bakersfield to dine and relax during the early 1900's. It is located at 30401 Hwy 178, near the Democrat Raft Take-Out. Five springs on the property flow at 115 degrees into large soaking tubs and a swimming pool (Kernvalley.com 2023). It is privately owned and not open to the public (Facebook, Democrat Hot Springs 2023).

3.11.4 Recreation Opportunities

The lower Kern River is the key recreational attraction in the vicinity of the Project with streamside activities including picnicking, swimming and wading, and fishing. Upstream of the Project, the lower Kern River is an important regional whitewater boating attraction, and summer irrigation flow releases from Lake Isabella provide relatively high flows for boating when other comparable resources in southern California have limited water (TCW 2005). In the bypass reach, limited whitewater boating activities (primarily kayaking) also occur (SCE 1994; TCW 2005; AWW 2009).

3.11.4.1 Fishing and Swimming

Fishing along the lower Kern is open all year; however, fishing does not typically begin until October when water temperatures cool. Fishing continues to be good until April, prior to increased flows from runoff (Flyfishingthesierra.com 2021). There are three sections designated by the California Department of Fish and Wildlife (CDFW) for fish planting: Section #1 is from Democrat Beach to Lower Richbar; Section 2 is from Sandy Flat to Democrat Beach; and Section 3 is from Sandy Flat to the Isabella Dam. Most of the lower Kern consists of stocked rainbow trout with wild populations of bass and brown trout (Flyfishingthesierra.com 2021).

Swimming and wading are also a frequent recreation activity. However, the Forest Service discourages swimming due to powerful currents, cold water temperatures, and underwater hazards, (Forest Service 2022c). Optimum conditions for swimming are in the 600 to 800 cfs range based on surveys of recreators seeking swimming as a recreation activity (TCW 2005).

3.11.4.2 Whitewater Boating

Lower Kern Upstream of Project

Flow in the lower Kern upstream of the Project is regulated by Lake Isabella Dam, providing whitewater boating from below the dam to Democrat Beach for 18 miles. During a normal water year, the boating season usually runs from May to September. Normal flows range from 800 to 3000 cfs. After Labor Day, flows may drop below 800 cfs (Forest Service 2019). Recommended flow levels are between 1,000-3,000 cfs (Cassady J. and Calhoun F. 1995).

The level of difficulty for this reach ranges from II – VI (Cassady J. and Calhoun F. 1995). As shown on Table 3.11-1, the International Scale of River Difficulty (AWW 2023b) defines difficulty of rapids as follows.

Upstream of the Project, the lower Kern has four designated launch sites: Bureau of Land Management (BLM) South near Lake Isabella Main Dam; BLM North at Keyesville Bridge; Sandy Flat; and Miracle Hot Springs. Democrat Raft Take-Out is the only designated take-out site in the vicinity of the Project (Forest Service 2019).

Lower Kern Within the Bypass Reach

The bypass reach, below Democrat Dam to the Kern No. 1 Powerhouse, is an 8.9-mile Class IV-V+ section. This section of the Kern River is characterized by swift flowing water and difficult rapids. The bypass reach is divided into three distinct runs: Cadillacs (Class V); Richbar (Class III-IV); and Cataracts (Class V+)(AWW 2009). This stretch of the lower Kern has been described as:

> Just upstream, between the mouth of the canyon and Democrat Hot Springs, the Kern is violent and unrunnable, dropping at more than 100 feet per mile over one deadly waterfall after another (Cassady J. and Calhoun F. 1995).

There are no designated launch sites below Democrat Dam (Forest Service 2019). The highway runs close to the river along this section so there are potential locations for put-in and take-out, but it is difficult to get from the river back up to the road. The lowest take-out is at the mouth of the canyon (AWW 2009).

Based on existing information (FERC 1998a), optimal flows for boating in the bypass reach are between 950 cfs and 1,750 cfs, with the minimum flow requirement of at least 500 cfs. As shown on Table 3.3-C-1 (monthly average flows by year from 1999–2021), flows within the bypass reach between May and September each year from 2000–2005 were, except for 2022, were generally in a range that would make running the reach possible.

Private boaters who boat the Kern River below Democrat Dam (the bypass reach) are not currently required to obtain a permit. There is no commercial whitewater boating in the bypass reach. Private boaters who use the lower Kern River above Democrat Dam are required to obtain annual permits from the Forest Service.

Lower Kern Downstream of Project—Mouth of Canyon to Lake Ming

As the river flows out of the valley, its gradient slackens and its difficulty eases first to Class IV, then to III, then to II. Downstream from the take-out for the Rio Bravo run (which is not a Project recreation facility) are ten more miles of easier Class I and Class II water. From September through May, flows are usually 600–1,200 cfs, but can rise to 1,200–3,000 cfs June through August due to irrigation releases. Recommended flow levels are between 1,000–3,000 cfs. (Cassady J. and Calhoun F. 1995).

3.11.5 Recreation Use of Project Lands—Five-Year Recreation Use Monitoring Study

As required by Article 409 in the 1998 FERC License for the Project, SCE conducted a five-year monitoring study on recreation use in vicinity of the Project and published the compiled results in the Report on Five-Year Recreation Use Monitoring Study for the Project (TCW 2005). The monitoring period covered the years 2001 through 2005. The study found that on average the study area (the approximate area of the bypass reach)

averaged about 17,200 visitor days[3] annually, including 13,500 visitor days in the 5-month high-use season (spring and summer), and about 3,700 visitor days during the 7-month low-use season. Daily, this equates to about 90 visits per day during the high-use season and about 18 visits per day during the low-use season. Of the visitors surveyed, 98% indicated that they were satisfied with their overall experience in the study area.

Sequoia National Forest National Visitor Use Monitoring data and reports are available for 2006, 2011, and 2016. Those numbers indicate that the total number of forest visits increased over the decade (2006–2016) by approximately 21% (Forest Service 2022b). The Report on Five-Year Recreation Use Monitoring Report also described expectations in increased visitation to the bypass reach based on expected increases to the population of Kern County, and to Bakersfield in particular. Approximately half of all visitors to the bypass reach during the study period identified as having originated from Bakersfield (TCW 2005).

3.11.5.1 Day Use Areas

Forest Service capacity estimates for the day use areas indicate that in general each site is used to capacity on weekends, each is over-capacity on holiday weekends, and each receives low-use on weekdays (Forest Service 1998 and Forest Service 2022c). Each of these sites is described above in Section 3.11.3.1 and shown on Map 3.11-1a and Map 3.11-1b.

3.11.5.2 Fishing and Swimming

The Report on the Five-Year Recreation Use Monitoring Study for the Project (TCW 2005) found that fishing is by far the primary recreation activity for visitors. Of visitors surveyed about the activity they were participating in during their visit, on average, more than 50% of respondents identified their recreation activity as fishing. This finding is consistent with information from the 1994 license application, which found that fishing is popular and occurs year-round. Angling access is scattered throughout the bypass reach where highway turnouts are available (SCE 1994).

For fishing and swimming, a wide range of flows (200 to 1,200 cfs) appear to be acceptable for most people participating in these activities, although flows between 600 and 800 cfs appear optimum for swimming. During the peak summer season (Memorial Day through Labor Day), flow conditions occur in the acceptable range for fishing and swimming (200 to 1,200 cfs) more than 95 percent of the time, with the only notable exception being in late August in some years (TCW 2005).

3.11.5.3 Whitewater Boating

The Report on Five-Year Recreation Use Monitoring Study for the Project (TCW 2005) referenced data collected by Forest Service manifest forms to determine the number of boaters that run the bypass reach. The manifest forms are voluntary forms obtained at

[3] The Report on Five-Year Recreation Use Monitoring Study (TCW 2005) defined a 'visitor day' as a visit lasting an average of 5 hours.

Forest Service offices or at designated popular put-ins and take-outs that boaters are encouraged to fill out prior to running the river. The manifest forms ask boaters to identify what part of the Kern River they will boat, the date of their run, and the number of people in their party. The current manifest form separates the lower Kern River into four distinct runs, the Jungle Run, the Miracle Run, the Big 5 Run, and the Cataracts Run.

Based on the data collected by the manifest forms and documented in the Report on Five-Year Recreation Use Monitoring Study, between three and seven boaters ran the Cataract Run each year between 2001 and 2005. Boating use in the other runs during the same span of years ranged from several hundred boaters per year to more than 2,000 boaters per year. The recreation use study suggested that the low boating use in the bypass reach compared to the other runs along the lower Kern River is due to the extreme difficulty of the rapids in the reach.

3.11.6 Forest Service Management Objectives

3.11.6.1 Forest Service Management Emphasis and Recreation Opportunity Spectrum

Except for some scattered private inholdings, most of the land in the vicinity of the Project is within the SQF administered by Forest Service. Forest Service manages land within the SQF in accordance with the goals, objectives, and prescriptions outlined in the Land Management Plan (Forest Plan) for the SQF. The 1988 Forest Plan identifies "Management Emphasis" for lands within the SQF. The Management Emphasis in the vicinity of the Project includes "Water Oriented Recreation" and "Grazing." "Water Oriented Recreation" lands occur adjacent to the Kern River for the entire length of the bypass reach (excluding private inholdings). Water Oriented Recreation emphasizes management that provides recreation opportunities compatible with surrounding resources and consistent with the character of the area as identified in the Recreation Opportunity Spectrum (ROS).

Forest Service uses the ROS to classify lands on the SQF. ROS is a system by which existing and desired recreation settings are defined, classified, inventoried, and monitored. The ROS is a combination of physical, biological, social, and managerial conditions that give value to a place. The 1988 Forest Plan Final Environmental Impact Statement describes the ROS as a tool to ensure that a diversity of opportunities and experiences are provided across the forest (Forest Service 2022b). The ROS includes six distinct recreation settings/ROS classes along a continuum primitive, semi-primitive nonmotorized, semi-primitive motorized, roaded natural, rural, and urban, as defined below.

Both the 1988 Sequoia National Forest Land and Resource Management Plan (1988 Forest Plan) and the 2022 Sequoia National Forest Land Management Plan – pre-objection version (revised Forest Plan[4]) classify the land in the vicinity of the Project using the same ROS classes. Forest Service classifies most of the land immediately adjacent

[4] The revised Forest Plan is expected to be finalized by the end of February 2023.

to the Kern River between Democrat Dam and the powerhouse tailrace as "rural," indicating a physically altered landscape with naturally appearing backdrops.

Land further away from the immediate river corridor is classified as either "roaded natural" or "semi-primitive motorized." "Roaded natural" is defined in the revised Forest Plan (Forest Service 2022a) as a naturally appearing landscape with nodes and corridors of development such as campground, trailheads, boat launches and rustic, small-scale resorts. "Semi-primitive motorized" is a predominantly natural-appearing landscape where motorized use is visible and audible. Map 3.11-2 displays the ROS classifications Forest Service assigns to lands in the vicinity of the Project.

3.11.7 Other Pertinent Federal and State Designations

3.11.7.1 National Wild and Scenic River System

A Wild and Scenic River is a river designated by Congress as part of the National Wild and Scenic Rivers System that was established in the Wild and Scenic Rivers Act of 1968 with the following characteristics:

- **Wild**—Those rivers or sections of rivers free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

- **Scenic**—Those rivers or sections of rivers free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

- **Recreational**—Those rivers or sections of rivers readily accessible by road or railroad that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

The criteria for a Wild and Scenic Recreation River classification includes existing impoundments and diversions if the waterway remains generally natural and riverine in appearance. The Forest Service manages eligible, suitable, or recommended Wild and Scenic Rivers to protect free-flow and outstandingly remarkable values and maintain preliminary classifications (Forest Service 2022a).

The Forest Service has identified the lower Kern River from Lake Isabella 31 miles downstream to the canyon mouth above Bakersfield (inclusive of the bypass reach) as a river that meets Wild and Scenic eligibility requirements. The lower Kern River meets these requirements under the classification of "recreational" river with identified outstanding remarkable values for scenery, recreation, wildlife, population and habitat, prehistory, and history (Forest Service 2022b; AWW 2009).

3.11.7.2 California Wild and Scenic Rivers

It is the policy of the State of California that certain rivers which possess extraordinary scenic, recreational, fishery, or wildlife values be preserved in their free-flowing state, together with their immediate environments, for the benefit and enjoyment of the people of the state (California Public Resource Code [PRC], Chapter 1.4. California Wild and Scenic Rivers Act, Section 5093.50). The Legislature declares that such use of these rivers is the highest and most beneficial use and is a reasonable and beneficial use of water. The lower Kern River is not a state-designated Wild and Scenic Rivers (CNRA 2020).

3.11.7.3 National Trail System

The National Trails System is the network of scenic, historic, and recreation trails created by the National Trails System Act of 1968. There are no national trails within the vicinity of the Project.

3.11.7.4 Wilderness Areas

There are no Congressionally designated Wilderness Areas in the vicinity of the Project.

3.11.7.5 Shoreline Buffer Zones and Management Plans

There are no permitted public piers, boat docks, landings, bulkheads, or other shoreline facilities associated with the Democrat Dam Impoundment. Therefore, SCE does not maintain a shoreline management plan.

3.11.8 Current and Future Recreation Needs Identified in Management Plans

The FERC regulations require a discussion of current and future recreation needs identified in State comprehensive plans and regional conservation and recreation plans. The following adopted plans pertain to recreation and may include management direction and/or recreation use and demographic information (e.g., trends in use intensity and recreation preferences) with applicability to the Project:

- California Department of Parks and Recreation. Statewide Comprehensive Outdoor Recreation Plan (SCORP). Sacramento, California. 2021-2025; and

- California Department of Parks and Recreation. 1998. Public opinions and attitudes on outdoor recreation in California. Sacramento, California.

In addition, the FERC's List of Comprehensive Plans includes the following plans that pertain to recreational fisheries:

- California Department of Fish and Game. 2003. Strategic Plan for Trout Management: A Plan for 2004 and beyond. Sacramento, California;

- California Department of Fish and Wildlife. 2021. Strategic Plan for Trout Management, Draft 2021 Update; and

- U.S. Fish and Wildlife Service. n.d. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, D.C.

3.11.8.1 California's 2021–2025 Statewide Comprehensive Outdoor Recreation Plan

California State Parks' Planning Division developed the SCORP, the statewide master plan for parks, outdoor recreation, and open space for California, with an emphasis on increasing access to parks and recreation services for community health and wellness and creating park access in underserved communities. The SCORP provides policy guidance to all outdoor recreation providers, including federal, state, local, and special district agencies that provide outdoor recreational lands, facilities, and services throughout California. The SCORP is also the primary tool for prioritizing Land and Water Conservation Fund grant allocations to local governments.

California's SCORP is updated every five years. By creating the five-year SCORP action plan for grant-making priorities, California maintains eligibility for federal Land and Water Conservation Fund (LWCF) grants. The LWCF provides matching grants for both recreation and natural resource conservation. The LWCF program is divided into the "State Side" which provides grants to State and local governments, and the "Federal Side" which is used to acquire lands, waters, and interests therein necessary to achieve the natural, cultural, wildlife, and recreation management objectives of federal land management agencies.

The SCORP sets a plan for California's state agencies that are eligible to receive LWCF funding per California's Public Resource Code § 5099.12. These plans address actions for California State Parks, Department of Fish and Wildlife, Wildlife Conservation Board, Department of Water Resources, and State Coastal Conservancy. The 2021-2025 SCORP includes an Action Plan for Wetlands, which aims to increase the inventory of California wetlands as a priority for the National Park Service (NPS) (Parks 2021).

3.11.8.2 Survey on Public Opinions and Attitudes on Outdoor Recreation in California

The Survey on Public Opinions and Attitudes on Outdoor Recreation (SPOA) in California examines residents' attitudes, opinions, values, and participation trends relating to outdoor recreation. The SPOA is an element of the SCORP.

The most current 2012 SPOA identified the top 15 recreational activities in California with the highest latent demand (Table 3.11-2) (Parks 2012). These are activities that Californians would participate in, from a statewide perspective, if more facilities and opportunities were provided. Many of these top 15 recreation activities are available along the lower Kern River, including along the bypass reach and along the reaches upstream

of the Project. These include picnicking in picnic areas, walking for fitness or pleasure, camping, day hiking, wildlife viewing, and swimming in rivers.

Other relevant findings from the 2012 SPOA survey include:

- More than two-thirds (68 percent) of Californians reported 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 included 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 ranked most important were 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, nonmotorized activities; and hard-surface trails.
- Most Californians visited 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.

3.11.8.3 Trout Management

The 2003 Strategic Plan for Trout Management is currently being updated, as discussed below. The goals and strategies presented in the 2003 plan were developed around two themes that reflect the general mission of 1) habitat and native species protection and management, and 2) public use, in this case, recreational angling (CDFG 2003).

CDFW is currently in the process of drafting guidelines for trout management. Three associated projects make up this effort:

- Strategic Plan for Trout Management;
- Strategic Plan for Trout Hatcheries (unpublished); and
- Inland Trout Angling Regulations Simplification (unpublished).

Strategic Plan for Trout Management

Among California anglers, trout are the most popular target, pursued by about 60 percent of those who fish in freshwater (CDFW 2021). California supports a rich heritage of native trout, excellent wild trout fisheries, and a hatchery system that produces and stocks abundant trout. The Strategic Plan for Trout Management is intended to guide CDFW programs and staff in effectively managing the trout resources of California. This document acts as an update to the original plan which was finalized in 2003.

The 2021 Draft update has six goals for trout management for the next 5 years:

- Goal 1: Investigate and Improve Wild Trout Populations. Wild trout fisheries are the most common trout fisheries in California and are best supported by high-quality ecosystems.

- Goal 2: Investigate and Improve Stocked Trout Management. California's robust trout hatchery system provides biologists with tools to improve trout fisheries and, increasingly, opportunities to support native trout recovery.

- Goal 3: Integrate Stakeholders. We can achieve more through a better understanding of public interest in trout management and collaboration with our partners.

- Goal 4: Evaluate Water and Land Use Practices. Existing land use planning and regulatory tools can help mitigate ecosystem impacts and allow biologists and resource users to find common solutions.

- Goal 5: Continue Applied Research Activities. Department biologists can conduct research that has direct impacts on trout management decisions.

- Goal 6: Increase the Resiliency of Trout Populations. Trout populations are more resilient to long-term ecosystem impacts when other stressors are removed, or habitats are improved.

3.11.9 References

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TABLES

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Table 3.11-1. International Scale of River Difficulty

Class	Rapids Description
I	Fast moving water with riffles and small waves. Few obstructions and easily missed with little training. Risk to swimmers is slight; self-rescue is easy.
II	**Novice**: Straightforward rapids with wide, clear channels which are evident without scouting. Occasional maneuvering may be required, but rocks and medium-sized waves are easily missed by trained paddlers. Swimmers are seldom injured and group assistance, while helpful, is seldom needed. Rapids that are at the upper end of this difficulty range are designated “Class II+”.
III	**Intermediate**: Rapids with moderate, irregular waves which may be difficult to avoid and which can swamp an open canoe. Complex maneuvers in fast current and good boat control in tight passages or around ledges are often required; large waves or strainers may be present but are easily avoided. Strong eddies and powerful current effects can be found, particularly on large-volume rivers. scouting is advisable for inexperienced parties. Injuries while swimming are rare; self-rescue is usually easy, but group assistance may be required to avoid long swims. Rapids that are at the lower or upper end of this difficulty range are designated “Class III-” or “Class III+” respectively.
IV	**Advanced**: Intense, powerful but predictable rapids requiring precise boat handling in turbulent water. Depending on the character of the river, it may feature large, unavoidable waves and holes or constricted passages demanding fast maneuvers under pressure. A fast, reliable eddy turn may be needed to initiate maneuvers, scout rapids, or rest. Rapids may require “must” moves above dangerous hazards. Scouting may be necessary the first time down. Risk of injury to swimmers is moderate to high, and water conditions may make self-rescue difficult. Group assistance for rescue is often essential but requires practiced skills. A strong Eskimo roll is highly recommended. Rapids that are at the lower or upper end of this difficulty range are designated “Class IV-” or “Class IV+” respectively.
V	**Expert**: Extremely long, obstructed, or very violent rapids which expose a paddler to added risk. Drops may contain** large, unavoidable waves and holes or steep, congested chutes with complex, demanding routes. Rapids may continue for long distances between pools, demanding a high level of fitness. What eddies exist may be small, turbulent, or difficult to reach. At the high end of the scale, several of these factors may be combined. Scouting is recommended but may be difficult. Swims are dangerous, and rescue is often difficult even for experts. A very reliable Eskimo roll, proper equipment, extensive experience, and practiced rescue skills are essential. Because of the large range of difficulty that exists beyond Class IV, Class 5 is an open-ended, multiple-level scale designated by Class 5.0, 5.1, 5.2, etc.... each of these levels is an order of magnitude more difficult than the last. Example: increasing difficulty from Class 5.0 to Class 5.1 is a similar order of magnitude as increasing from Class IV to Class 5.0.

Source: AWW 2023

Table 3.11-2. Top 15 Recreation Activities with High Latent Demand in California

Rank	Activity
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 pleasures, 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

MAPS

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Willow Spring Creek
Prefedio Creek
Democrat Raft Take-out Boating Site
Democrat Hotsprings (private)
Powerline Road
Willow Spring Creek Road
Flume No. 1 Road
178
Kern River
Saturday Spring Creek
Democrat Spring
Cow Flat Creek

Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- FERC Boundary

Transportation

- Project Road
- Other Road

Other Features

- Watercourse

Land Jurisdiction*

- U.S. Forest Service

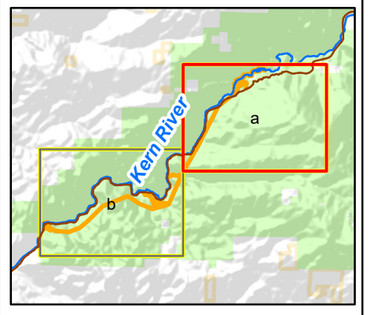
*SOURCE: BLM 2021

Forest Service Recreation Sites

- Raft Takeout
- Day Use Area

Private Recreation Sites

- Democrat Hotsprings



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

Map 3.11-1a

Recreation Facilities in the Vicinity of the Project

0 1,000 2,000
Feet

Date: 3/21/2023

Projection: UTM Zone 11
Datum: NAD 83

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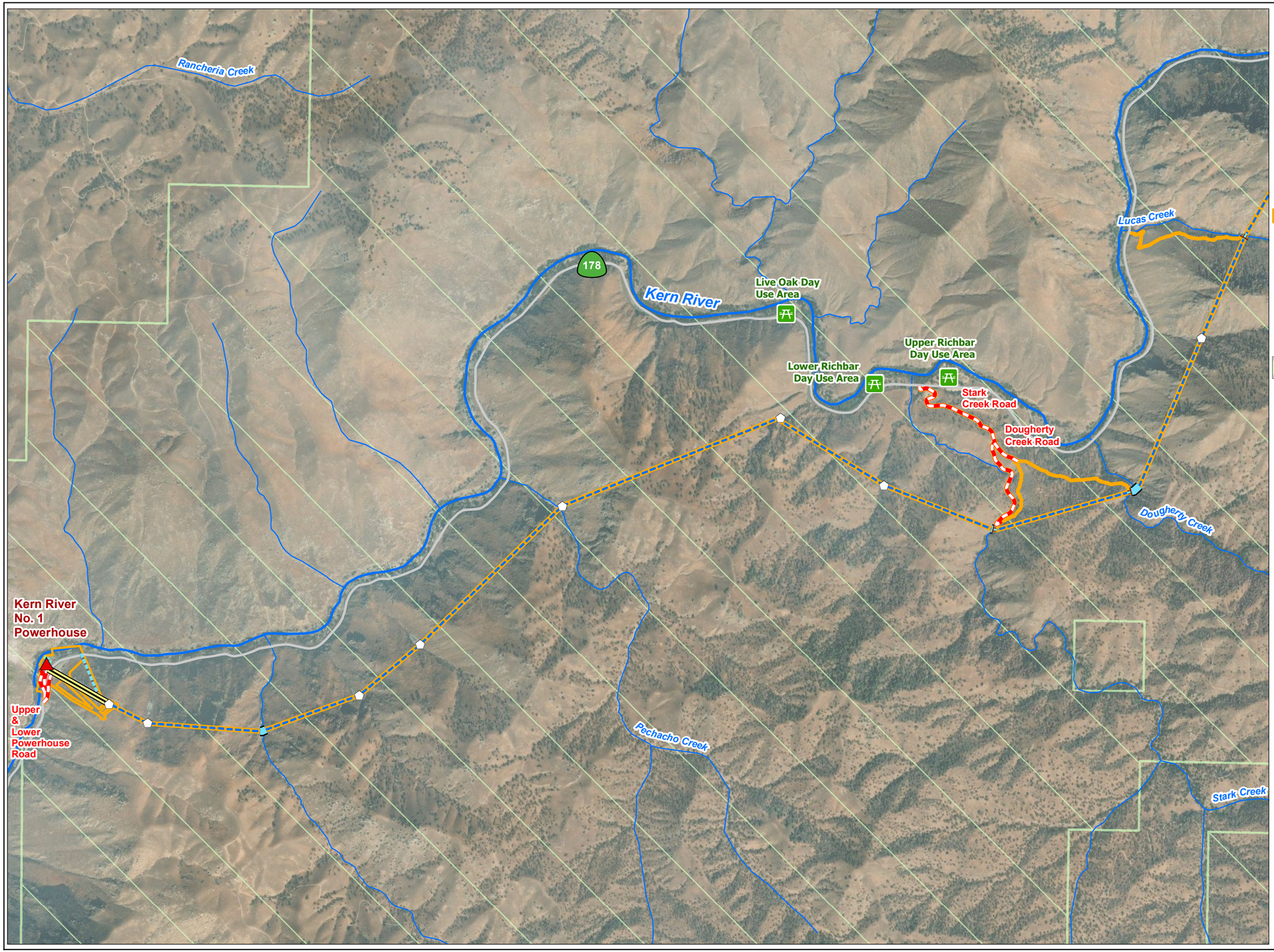


Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- FERC Boundary

Transportation

- Project Road
- Other Road

Other Features

- Watercourse

Land Jurisdiction*

- U.S. Forest Service

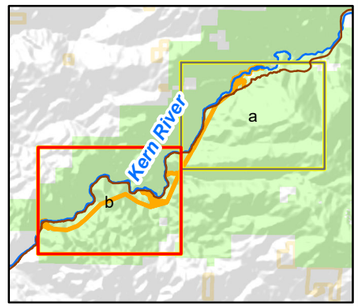
*SOURCE: BLM 2021

Forest Service Recreation Sites

- Raft Takeout
- Day Use Area

Private Recreation Sites

- Democrat Hotsprings



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

Map 3.11-1b

Recreation Facilities in the Vicinity of the Project

0 1,000 2,000
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/21/2023

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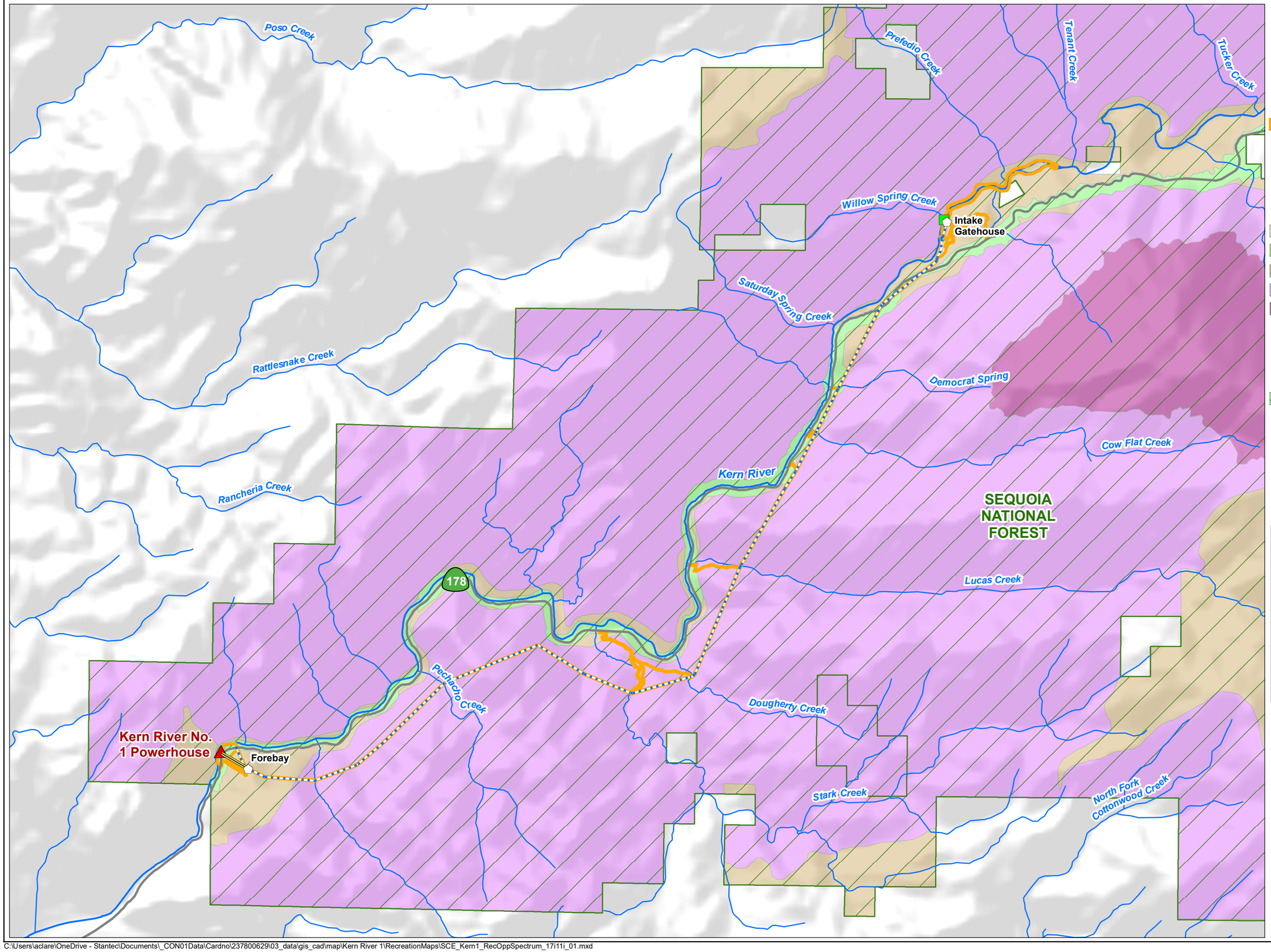


Facilities

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

Other Features

- Watercourse
- Highway

Recreation Opportunity Spectrum*

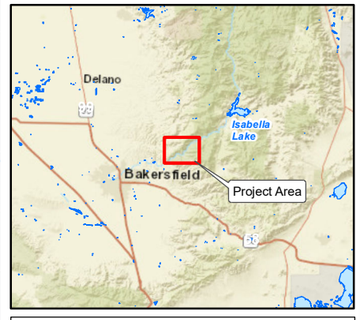
- Non-Applicable
- Rural
- Roaded Natural
- Semi-Primative Motorized
- Semi-Primitive Non-Motorized

**SOURCE: USDA-FS, FEIS Recreation Opportunity Spectrum Alternatives B, B Modified and D, June 2022

Land Jurisdiction**

- U.S. Forest Service

**SOURCE: BLM 2021



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

Map 3.11-2

Recreation Opportunity Spectrum in the Vicinity of the Project

0 0.5 1 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 2/23/2023

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LIST OF ACRONYMS

EA	Environmental Assessment
FERC or Commission	Federal Energy Regulatory Commission
Forest Plan	Sequoia National Forest Land Management Plan
Forest Service	United States Forest Service
Project	Kern River No. 1 Hydroelectric Project
SCE	Southern California Edison Company
SIO	Scenic Integrity Objectives
SMS	Scenery Management System
SQF	Sequoia National Forest
VMS	Visual Management System
VQO	Visual Quality Objectives

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3.12 AESTHETICS

This section describes the aesthetic resources surrounding Southern California Edison Company's (SCE) Kern River No. 1 Hydroelectric Project (Project). Components include a description of the visual characteristics of the lands and waters within and surrounding the Project, visible Project facilities, and other scenic features of the Project and surrounding area. The discussion is based on reasonably available public information. The Federal Energy Regulatory Commission (FERC) content requirements for this section are specified in Title 18 of the Code of Federal Regulations Chapter I § 5.6(d)(3)(ix).

3.12.1 Information Sources

This section was developed using existing information available in the following primary sources. Additional references are cited in the text, as appropriate.

- Sequoia National Forest Land Management Plan, Forest Plan (United States Forest Service [Forest Service] 1988)
- Application for New License, Kern River No. 1 Hydroelectric Project, FERC Project No. 1930 (SCE 1994)
- Final Environmental Assessment for Hydropower License, Kern River No. 1 Hydroelectric Project, FERC Project No. 1930-014 (FERC 1998)
- Kern River No. 1 Hydroelectric Project (FERC No. 1930) Resource Plans: Plan for the Design and Construction of Project Facilities in Order to Preserve or Enhance Visual Quality (SCE 2004)
- Kern County General Plan (Kern County Planning Department 2009)
- Land Management Plan for the Sequoia National Forest, Pre-Objection Version (Forest Service 2022a)
- Final Environmental Impact Statement for Revision of the Sequoia and Sierra National Forests Land Management Plans, Pre-objection Version (Forest Service 2022b)

3.12.2 Description of Existing Condition

The Project is located on the Kern River in the foothills along the western slope of the Sierra Nevada within Kern County, California. The section of the Kern River from Lake Isabella Dam downstream to the mouth of the Kern River Canyon is known as the lower Kern River. The canyon of the lower Kern River is narrow, steep, and dry with occasional foothill pines, buckeye, oaks, and grasses. The river's edge supports large sycamores and willows. The lower Kern River is close in proximity to the City of Bakersfield and is a popular recreation area for city residents (Forest Service 2022d). The Forest Service has

classified the lower Kern River and the surrounding landscape as distinctive[1] because of the scenic interest created by perennial flowing water and riparian vegetation, as well as vertical canyon walls and prominent rock boulders and outcroppings (FERC 1998).

As shown on Map 2-1 in Section 2.0, Existing Project Location, Facilities, and Operations, the FERC Project boundary encompasses Democrat Dam Impoundment, facilities around Democrat Dam, the water conveyance system that runs along the eastern hillslope above the Kern River, and the powerhouse and forebay operations areas. Project facilities range in elevation from 1,913 feet at Democrat Dam to 975 feet at the powerhouse. Project facilities, in relation to the FERC Project boundary, are shown on Maps 2-3a–g.

State Route 178 (SR-178) is the main transportation route between the metropolitan Bakersfield area and the communities and recreation areas around Lake Isabella and is the primary road from which to access the lower Kern River and Project facilities. SR-178 closely parallels the lower Kern River along the river's southern bank from the powerhouse east to the terminus of the FERC Project boundary above the Democrat Dam Impoundment.

The landscape within and surrounding the Project (from the Democrat Dam Impoundment downstream to the powerhouse) consists of a narrow canyon with dense vegetation along the riverbank, granitic outcroppings, and steeply angled grass-covered slopes rising as much as 1,500 feet above the riverbed. The grey/tan rock outcroppings vary in size from small boulders to dramatic vertical cliffs. At the upper end of the Project, the grassy slopes above the river are also dotted with mixed evergreens and oaks. At the lower end of the Project, the canyon opens and the landscape changes to open rolling foothills vegetated with sparse grasses.

3.12.2.1 Visual Description of Project Facilities

The existing Project facilities are described in detail in Section 2.0, Existing Project Location, Facilities, and Operations, and include (from upstream to downstream) Democrat Dam and its 27-acre impoundment (the impoundment is also referred to as the "pond"); an intake structure upstream of the diversion dam which includes two steel trash racks; an 8.5-mile water conveyance system consisting of sandbox, flowline, forebay, and penstock that connects the intake structure at Democrat Dam with the powerhouse; the powerhouse and associated equipment; access roads and trails; two powerlines/communication lines; three gaging stations; and ancillary and support facilities.

The Kern River No.1 Hydroelectric Project facilities visible from SR-178 are Democrat Dam and impoundment; the powerhouse area, including the two-story powerhouse, adjacent switchyard, and ancillary support buildings; the forebay operations area, including ancillary support buildings, and the skip hoist; and the forebay overflow spillway pipe. Various access Project roads and trails are also visible from SR-178. Project

[1] Landscape variety classes are a relative classification of the landscape into areas of importance from a scenic quality perspective. The classification is based on the premise that all landscapes have some value, but those with the most variety or diversity have the greatest potential for high scenic value. The Forest Service Visual Management System (Forest Service 1974) has established three variety classes: Class A – Distinctive, Class B – Common, Class C – Minimal.

facilities are painted in earth tones to blend into the surrounding landscape as much as possible and road cuts have either naturally revegetated or have been revegetated to obscure the effects of road construction (SCE 2004). Facilities not readily visible by the public, but that may be seen from hiking trails, include the gated intake structure, sandbox, forebay, and portions of the water conveyance system (aboveground flumes and conduits). Most of the water conveyance system (approximately 8.1 miles) is comprised of underground tunnels. The penstock is also buried and not visible. Appendix 3.12-A includes representative photographs of the landscape surrounding the Project facilities.

The following briefly describes the most predominant Project features: Democrat Dam and impoundment, and associated features (including intake structure and powerline); the powerhouse, switchyard, and associated equipment; the forebay operations area; and the access roads and trails. A summary of visual Project features based on the prior visual assessment of the Project is provided in the 1994 license application (SCE 1994) and FERC Final Environmental Assessment (EA) for the 1994 license application (FERC 1998).

Democrat Dam and Impoundment

Democrat Dam and intake structures are located on the Kern River approximately 10.2 miles upstream of the powerhouse. The dam, one-story control house, concrete flume, and ancillary facilities are all visible from SR-178 and from nearby riverbanks used for recreation (SCE 1994). The dam is a 58-foot high cyclopean-concrete overflow gravity dam. The crest of the dam is at an elevation of 1,913 feet and approximately 29 feet is exposed above the stream bed. The length along the crest is 204 feet with a radiused top of approximately 7-foot width. The crest of the dam also serves as a spillway and is designed to spill all river flows that are not diverted for power production.

The Democrat Dam Impoundment covers approximately 27 acres and has a gross storage capacity of 247 acre-feet (ac-ft) at an elevation of 1,913 feet. Because Democrat Dam is a run-of-river dam and its whole crest is a spillway, the dam regularly spills and the impoundment and tailwater levels are governed by natural flows in the Kern River. A 329-foot-long drainage tunnel with a 72-inch electric motor operated sluice gate is provided for draining the impoundment.

The Gatehouse to Covered Conduit Powerline is a 1,844-foot-long (0.35 mile) powerline that extends from the Democrat Dam Intake Gatehouse to an outlet box near the southern end of Flume No. 1 and provides power for appurtenances during tunnel outages.

The visual character, and contrasts, of Democrat Dam vary with the amount of water in the Kern River. When water cascades over the concrete dam, the facility creates a waterfall. Water cascades over the dam during much of the spring and summer – when releases from Lake Isabella are high to support downstream water demands during the irrigation season. During months of lower flows (winter and late fall), when water is not spilling over the dam the light tan industrial concrete structure contrasts with the surrounding natural environment.

Powerhouse, Switchyard, and Associated Equipment

The powerhouse, switchyard, and the adjacent powerline on steel lattice towers are the most visually predominant Project features. All of these facilities are located immediately adjacent and west of SR-178. The features are viewed by highway travelers for a short distance because they are located on a curve. The powerhouse is an approximately 80-foot by 170-foot concrete structure located on the left (south) bank of Kern River. The switchyard is located directly adjacent to and south of the powerhouse. The Powerhouse to Forebay Communication/Powerline is a 1,665-foot-long (0.32 mile) communication line that extends from the powerhouse to the forebay at the upper end of the penstock. The same poles which carry the communication line also carry a powerline which is used for the remote control of the gate at the upper end of the penstock. Other ancillary facilities located near the powerhouse include a machine shop, office, and restroom facilities.

Forebay Operations Area

Several buildings located on the east side of SR-178 support forebay operations activities, including the old administrative building, two garages, and the old Ice House. There is also a large parking lot, the aerial cable tower, and skip hoist house and lower landing. A hoist cable extends from the skip hoist house lower landing to the upper landing near the forebay. All of these facilities are visible from SR-178. Similar to the powerhouse features, the facilities located at the forebay operations area are viewed by highway travelers for a short distance because they are located on a curve.

Access Roads and Trails

Project facilities are accessed via Project roads and trails that extend from SR-178. All Project access roads and trails are located on National Forest Land, however, are maintained by SCE. There are eight Project access roads, and ten Project access trails. Five of the Project roads are paved or aggregate and the remaining are native soil (unimproved dirt). All of the Project trails are native soil. Table 2-3 in Section 2.0 provides descriptive information about each access road and trail and Map 2-3a–g illustrates their location.

3.12.3 Visual Resources Management Plans

The majority of land within the FERC Project boundary is federal land within the Sequoia National Forest (SQF) and administered by the Forest Service in accordance with the SQF Land Management Plan (Forest Plan). The single parcel of private land within the FERC Project boundary is subject to the land management goals and policies of the Kern County General Plan (Kern County Planning Department 2009). Land use and management activities on private land within unincorporated portions of the county must be consistent with land management objectives and policies outlined in the Kern County General Plan (Kern County Planning Department 2009), and related county ordinances. An overview of the relevant sections of the SQF Forest Plan and Kern County General Plan is provided in the following subsections.

3.12.3.1 Sequoia National Forest Land Management Plan (Forest Plan)

The 1988 Forest Plan established the management direction and long-range goals and objectives for the SQF. The Forest Service is in the final stages of updating the 1988 Forest Plan and released the final environmental impact statement, final Forest Plan, and draft record of decision for the Forest Plan revision in the summer of 2022. The administrative period during which objections may be filed on the final plan closed in August 2022. As such it is reasonable to expect that a new Forest Plan for the SQF (revised Forest Plan) will be approved in early 2023. Therefore, this section references both the 1988 Forest Plan and revised Forest Plan (Forest Service 2022a) to describe the visual management direction and desired level of scenic quality and diversity of the landscape where the Project boundary is located.

1988 Sequoia National Forest Land Management Plan (1988 Forest Plan)

The 1988 Forest Plan describes the visual resources (Section 3.C.23), future visual resource conditions of the forest (Section 4.C.3.o), and forest-wide standards and guidelines (in relation to recreation for visual resources, Section 4.F.2.k). The 1988 Forest Plan relied on the Forest Service's Visual Management System (VMS) (Forest Service 1974), a standardized method to inventory and evaluate the visual attributes of a National Forest, and to establish the visual management goals and policies for Forest Service administered lands.

During the planning process for the 1988 Forest Plan, the VMS was used to inventory the visual landscape based on the character of the landscape, and to assess the sensitivity of views by considering the types of viewers, length of viewing time, and the distance from which the landscape was most commonly viewed. The Forest Service then assigned Visual Quality Objectives (VQOs) to definitive land areas within the SQF (Forest Service1988). The VQOs reflect the visual management objectives (management direction) for implementation through the Forest Plan. There are four VQO designations: preservation, retention, partial retention, and modification.

- **Preservation (P)**—The Preservation (P) VQO designation allows for ecological changes only. Management activities, except for very low visual impact recreation facilities are prohibited. The objective applies to Wilderness Areas, primitive areas, other special classified areas, areas awaiting classification and some unique management units that do not justify special classification (Forest Service1974).

- **Retention (R)**—The Retention (R) VQO provides for management activities that are not visually evident. Under Retention, activities may only repeat form, line, color and texture which are frequently found in the characteristic landscape. Changes in their qualities of size, amount, intensity, direction, pattern, etc., should not be evident (Forest Service1974).

- **Partial Retention (PR)**—Under the Partial Retention (PR) VQO, management activities are to remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color, or texture common to the characteristic

landscape but changes in their qualities of size, amount, intensity, direction, pattern, etc., remain visually subordinate to the characteristic landscape. Activities may also introduce form, line, color, or texture, which are found infrequently or not at all in the characteristic landscape, but they should remain visually subordinate to the visual strength of the characteristic landscape (Forest Service1974).

- **Modification (M)**—Under the modification (M) VQO, management activities may visually dominate the original characteristic landscape. However, activities of vegetative and land form alterations must borrow from naturally established form, line, color, or texture so completely and at such a scale that its visual characteristics are those of natural occurrences within the surrounding area or character type. Additional parts of these activities such as structures, roads, slash, root wads, etc., must remain visually subordinate to the proposed composition. Activities which are predominantly introduction of facilities such as buildings, signs, roads, etc., should borrow naturally established form, line, color, and texture so completely and at such a scale that its visual characteristics are compatible with the natural surroundings (Forest Service1974).

As illustrated in the VQO map in the 1988 Forest Plan, the VQO for the area along the Kern River, inclusive of the FERC Project boundary, is Retention. The area immediately adjacent to the boundary is identified as Partial Retention.

Revised Land Management Plan for the Sequoia National Forest (2022)

In 1995, the Forest Service published Landscape Aesthetics: A Handbook for Scenery Management which is the guidance document for the Scenery Management System (SMS). The SMS is an updated version of the Forest Service's VMS. The SMS uses Scenic Integrity Objectives (SIOs) in place of the VMS VQOs. SIOs were assigned to the management areas that comprise the SQF as a part of the most recent update to the revised Forest Plan (Forest Service 2022a). As described in the revised Forest Plan, management areas consist of land areas within the planning area that have the same set of applicable plan components. A map identifying the SIO for each management area of the SQF is included in Appendix A of the revised Forest Plan (Forest Service 2022a).

A SIO is the desired level of scenic quality and diversity of a landscape based on physical and sociological characteristics of an area. The Forest Service identifies scenic integrity as a continuum ranging over five levels: Very High, High, Moderate, Low, and Very Low. A landscape with very minimal visual disruption is considered to have very high scenic integrity. Those landscapes having increasingly discordant relationships among scenic attributes are viewed as having diminished scenic integrity. Descriptions of each scenic integrity level, as defined in the Handbook for Scenery Management, include the following:

- **Very High (VH) scenic integrity** refers to landscapes where the valued landscape character “is” intact with only minute if any deviations. The existing landscape character and sense of place is expressed at the highest possible level.

- **High (H) scenic integrity** refers to landscapes where the valued landscape character "appears" intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident.

- **Moderate (M) scenic integrity** refers to landscapes where the valued landscape character "appears slightly altered". Noticeable deviations must remain visually subordinate to the landscape character being viewed.

- **Low (L) scenic integrity** refers to landscapes where the valued landscape character "appears moderately altered". Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed but compatible or complimentary to the character within.

- **Very Low (VL) scenic integrity** refers to landscapes where the valued landscape character "appears heavily altered". Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles within or outside the landscape being viewed. However, deviations must be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition.

The SIO for most of the land within the FERC Project boundary is "High" with some scattered sections of "Moderate." Map 3.12-1 shows the designated Forest Service SIO with respect to the Project facilities within the SQF. The SIO data was obtained from the 2022 SIO dataset available from the Sequoia and Sierra Forest Plan Revisions website on its "Geospatial Data" webpage (Forest Service 2022c).

3.12.3.2 Kern County General Plan

The Kern County General Plan (Kern County Planning Department 2009) includes goals, policies, and implementation measures to guide development and protect visual quality in the county on a long-term basis. The Land Use, Open Space, and Conservation Element contains general provisions regarding open space, natural resources, recreation, and enjoyment of scenic beauty. The Kern River Plan Element, adopted as an integral part of the Kern County General Plan in 1985, contains goals, policies and implementation measures related to preservation of open space and limits on development along the river. A key goal that is applicable to the protection of aesthetic resources in the vicinity of the Project is the Kern River Plan Open Space Goal (Goal 3.2.2). That goal (which is supported by various policies) is to guide and assist existing and proposed development to protect open space and enhance environmental quality of developed lands adjacent to the river to ensure that the open spaces of the Kern River are maintained and enhanced as a unique and valuable resource for the Bakersfield metropolitan area.

3.12.4 Previous Visual Resources Assessment

The aesthetic resource assessment completed in 1994 as part of SCE's previous relicensing effort used the Forest Service's VMS to assess the visual compatibility of the Project facilities with the surrounding landscapes (SCE 1994). The Forest Service reviewed the assessment and concluded that the Project facilities are compatible with the VMS (FERC 1998).

3.12.5 References

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MAPS

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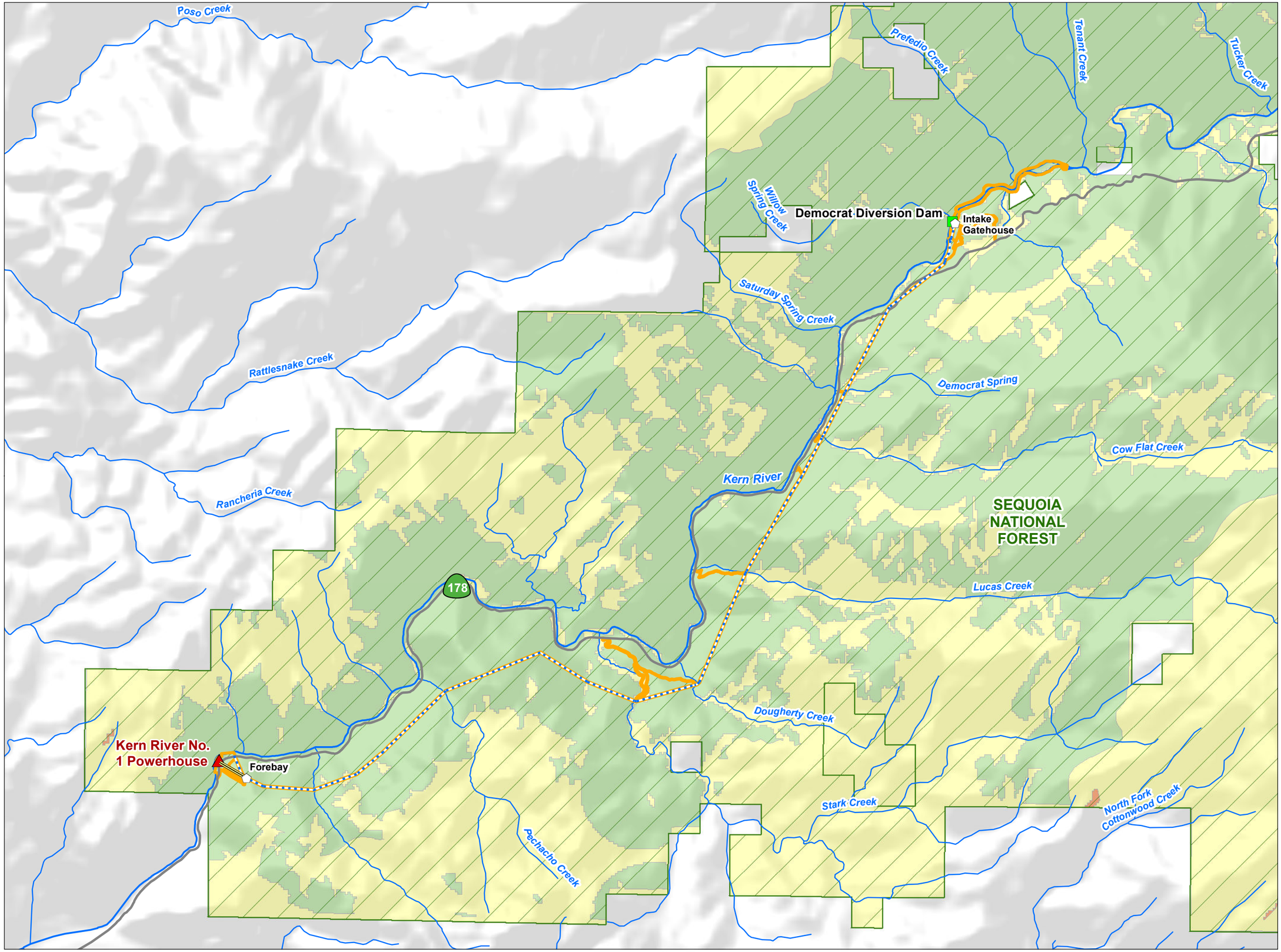


Facilities

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

Other Features

- Watercourse
- Highway

Scenic Integrity Objectives*

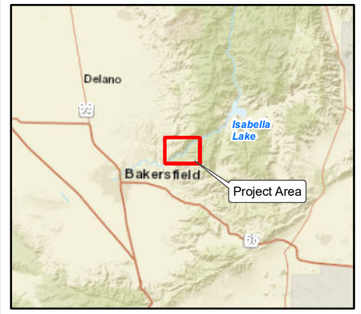
- Non-Applicable
- Low
- Medium
- High

**SOURCE: USDA-FS, FEIS Scenic Integrity Objectives Alternatives B, B Modified, and D, June 2022

Land Jurisdiction**

- U.S. Forest Service

**SOURCE: BLM 2021



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

Map 3.12-1

Scenic Integrity Objectives in the Vicinity of the Project

0 0.5 1 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 11/16/2022

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APPENDIX 3.12-A

Representative Photographs

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Photo A-1. Democrat Dam and elevated steel walkway on top of Flume No. 1 as seen from SR-178.

Photo A-2. Democrat Dam when spilling.

Photo A-3. Democrat Dam when dry.

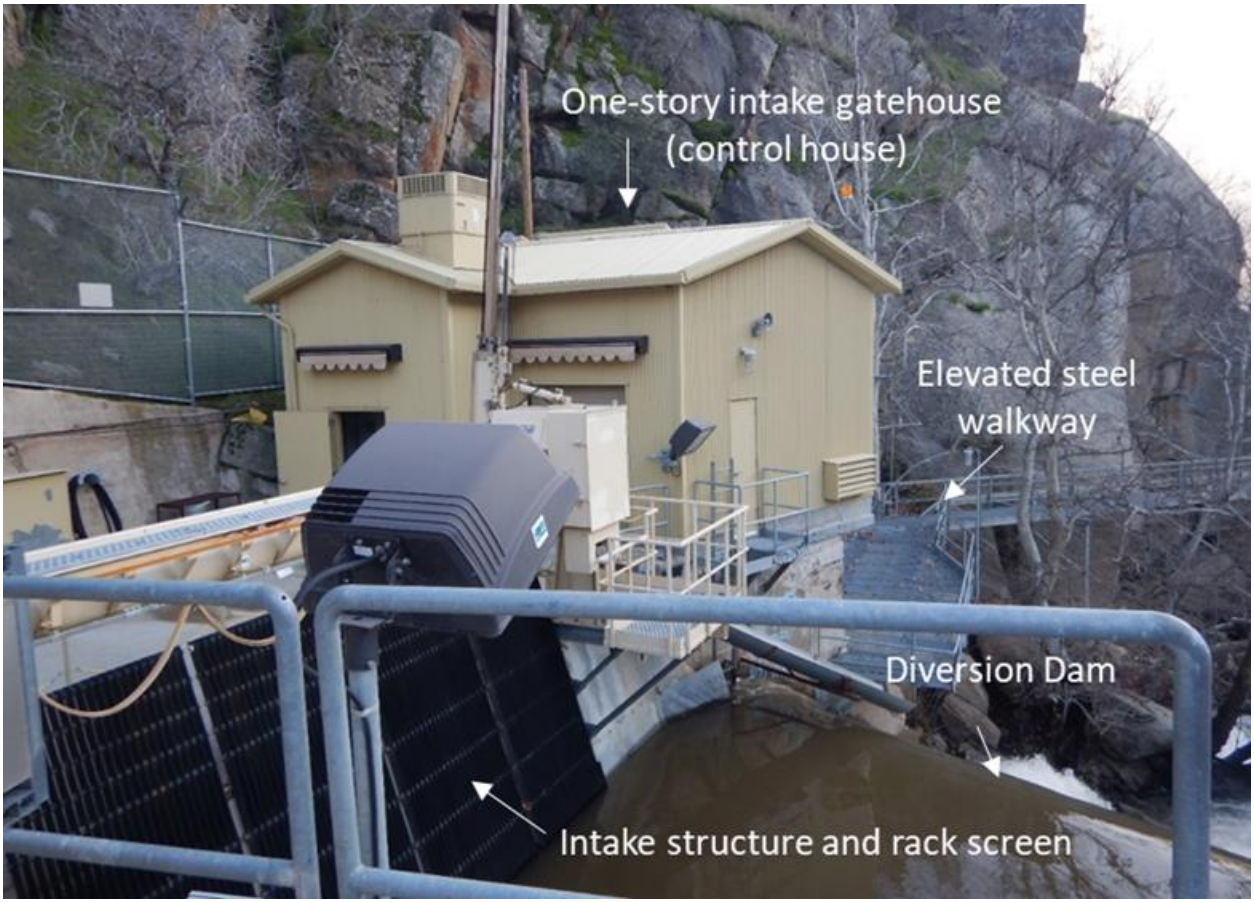

Photo A-4. Democrat Dam intake structure and trash rack.

Photo A-5. Slide gate valve house at the downstream end of the sandbox (approximately 700 feet downstream of the Diversion Dam at the head of the flowline).

Photo A-6. Looking upstream at the Diversion Dam (spilling) from the slide gate valve house.

Photo A-7. Democrat Dam Impoundment and buoy line, looking upstream from the dam.

Photo A-8. Kern River No. 1 Powerhouse and Tailrace.

Photo A-9. Kern River No. 1 Powerhouse and Switchyard.

Photo A-10. Lucas Creek Trail looking north (upstream).

Photo A-11. View of the Kern River No. 1 Powerhouse and Switchyard and Forebay Operations Area as seen from the Skip Hoist Upper Landing. The skip hoist cable is visible in the foreground.

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LIST OF ACRONYMS

°F	Degrees Fahrenheit
AGOL	ArcGIS Online
amsl	Above mean sea level
APE	Area of Potential Effects
ArcGIS	geographical information system software
BP	before present
Caltrans	California Department of Transportation
CFR	Code of Federal Regulations
CHRIS	California Historical Resources Information System
CRHR	California Register of Historical Resources
CRMP	Cultural Resources Management Plan
DPR	Department of Parks and Recreation
FERC	Federal Energy Regulatory Commission
Forest Service	United States Forest Service
GIS	geographic information system
HAER	Historic American Engineering Record
HRMP	Heritage Resources Management Plan
KR&LAEP	Kern River and Los Angeles Electric Power
KR1HD	Kern River No. 1 Hydroelectric Project Historic District

MOA	Memorandum of Agreement
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places
NRM	Natural Resource Manager
PAD	Pre-Application Document
PCT	Pacific Crest Trail
PL&P	Pacific Light and Power
Project	Kern River No. 1 Hydroelectric Project
SCE	Southern California Edison Company
SHPO	State Historic Preservation Officer
SQF	Sequoia National Forest
TCP	Traditional Cultural Property
USACE	United States Army Corps of Engineers
USFS	United States Forest Service

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3.13 CULTURAL RESOURCES

3.13.1 Introduction

This section describes cultural resources in the vicinity of Southern California Edison's (SCE) Kern River No. 1 Hydroelectric Project (Project). The Federal Energy Regulatory Commission's (FERC or Commission) content requirements for this section are specified in Title 18 of the Code of Federal Regulations (CFR) Chapter I § 5.6(d)(3)(x).

This cultural resource section provides (1) a definition of the proposed Area of Potential Effects (APE) and Study Area; (2) a broad overview of the pre-contact, Native American ethnographic, and historic settings for contextual purposes; (3) a description of the known cultural resources (archaeological and built environment) within the proposed APE and Study Area, including identification of properties that are listed or eligible for listing in the National Register of Historic Places (NRHP); and (4) a discussion of ethnic or social groups that may attach significance to cultural resources within the proposed APE and vicinity. The resource information presented in this section is based primarily on information contained in SCE's ArcGIS Online (AGOL) cultural resources database, which includes information from the United States Forest Service (Forest Service) Region 5 heritage data and from the California Historical Resources Information System (CHRIS) cultural resources data within SCE service territory, and the current Cultural Resources Management Plan (CRMP) for the Project. Tribal cultural resources are discussed separately in Section 3.14, Tribal Resources.

3.13.2 Area of Potential Effects and Study Area

The APE is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR § 800.16[d]).

The proposed cultural resources APE for the purposes of study implementation is defined as the area within the FERC Project boundary, a 25-foot buffer from centerline of the access trails located outside of the FERC boundary, and a 50-foot radius around FERC ancillary facilities such as gauges located outside of the FERC boundary (Map 3.13-1).

The proposed cultural resource Study Area (Study Area) is a 0.5-mile radius around the proposed APE that was used to capture cultural resource information (Map 13.3-1). This area was used to capture cultural resource information and facilitate knowledge about past settlement subsistence practices, and past land use.

3.13.3 Information Sources

This section was developed using existing information available from the following sources. Additional references are cited in the text, as appropriate.

- SCE's AGOL cultural database.

- CRMP for SCE's Kern River No. 1 Hydroelectric Project (FERC Project No. 1930), Kern County, California (SCE 1993).

- Native American Heritage Commission (NAHC) Sacred Lands File for the Project, received on November 10, 2022 (NAHC 2022).

- Cultural Resources Inventory Report of Access Roads and Flume Sections Associated with the Kern River No. 1 Hydroelectric Project (Kovak and Jackson 2012).

- Kern River No. 1 Hydroelectric Project Historic District (KR1HD) NRHP Evaluation (Mikesell 1988).

- SCE's Kern River No. 3 Hydroelectric Project Pre-Application Document (FERC Project No. 2290), Section 5.10 Cultural Resources (SCE 2021).

As stated above a records search of the Study Area was conducted using SCE's AGOL database, which includes heritage/cultural data from the Forest Service[1] and the CHRIS.[2]

The records search revealed that there have been 82 previous cultural resources studies in the Study Area, 47 of which intersect the APE (Maps 13.3-2a–g; Table 13.3-1). Combined, these investigations resulted in approximately 29.6 percent of the 7,517-acre Study Area and 37.1 percent of the 140-acre APE being previously surveyed or studied.

One of the earliest surveys in the Study Area occurred in 1984 as an inventory and evaluation of cultural resources along Kern River near Democrat Hot Springs (White and Taylor 1984). A total of 19 archaeological sites were identified: 6 historical-period sites and 13 pre-contact sites (White and Taylor 1984). In 1988 the California Department of Transportation (Caltrans) conducted a survey to widen Route 178. The survey evaluated the Kern River No. 1 Hydroelectric Project and determined it to be eligible for the NRHP (Mikesell 1988). The area was surveyed again in 1989 and 1990 for the same Caltrans project with negative results (Riley and Martin 1989; Riley and Kennedy 1990). SCE conducted a survey in 1992 to identify accessible portions of the transmission line associated with the Project (Taylor 1992). No cultural resources were encountered in this survey.

Over the past decade there have been a total of 16 surveys within the Project Study Area (see Table 13.3-1). Beginning in 2012, SCE conducted an inventory of access roads and flume sections associated with the Project to support future operations and maintenance

[1] Forest Service Region 5 has developed and maintains databases that include information about heritage resources and heritage resource investigations (Natural Resource Manager [NRM] Heritage Database) and geographic information system (GIS) data, in accordance with Section 112(2) of the National Historic Preservation Act and Forest Service Manual 2360. Region 5 Forests will share with SCE all NRM GIS data that intersect utility facilities (e.g., transmission and distribution facilities and roads) on all Forest Service lands.

[2] SCE maintains a subscription with CHRIS. Under the terms of SCE's CHRIS Access and Use Agreement and the California Office of Historic Preservation's Electronic Data Subscription Standard, SCE is permitted to maintain these data within an AGOL database and perform internal records searches using data sets and share said data with authorized and allowable users.

activities, including road and trail maintenance and culvert rehabilitation. The survey resulted in the identification of five new historical-period resources; a trash scatter, a water basin, an earthen pad, and three culverts (Kovak and Jackson 2012). In 2017, two surveys were conducted for the replacement of deteriorated utility poles, with one (Millington et al. 2017) resulting in the recording of two new milling sites, both of which were avoided. The survey for the other two poles (Hall and Brodie 2016) concluded negative results.

SCE conducted a Historic-era Built Environment Survey to assess the historic significance of SCE distribution circuits under the NRHP and California Register of Historic Resources (CRHR) that intersect lands managed by the Sequoia National Forest (SQF). No distribution circuits were found eligible for listing in the NRHP or CRHR (Williams 2020). The remaining 10 survey results are described in quarterly compliance reports[3]. None of these surveys identified resources located in the current Study Area or APE.

3.13.4 Physical Environment and Climate

The natural setting of the Study Area is discussed in prior PAD sections, primarily in Section 3.2 General Description of the River Basin, Section 3.5 Fish and Aquatic Resources, and Section 3.6 Botanical and Wildlife Resources. This section provides an overview of the environment as needed to contextualize cultural resources. The Study Area/APE is located in the lower Kern River Canyon, a deep canyon cut by the Kern River, on the southern edge of the Greenhorn Mountains in Kern County, California. The Greenhorn Mountains are located at the southernmost end of the Sierra Nevada range and merge with the mountains east of Bakersfield, the largest city near the Study Area/APE, 15 miles to the southwest. The terrain within and surrounding the Study Area/APE is comprised of rugged, steep, rocky hillsides that descend into narrow drainages; the hillsides are vegetated in annual grasses, some chaparral, and few trees. The surrounding lands are managed by the SQF. State Route 178 follows the corridor of the canyon.

The Kern River begins in the Sierra Nevada on the eastern side of Tulare County and ends on the west side of Kern County where it is diverted into canals to irrigate the farms of the southern San Joaquin Valley and for Bakersfield's municipal water supplies. Prior to the division of water, the Kern River spread out into vast wetlands and seasonal lakes (Kroeber 1925). The main branch of the river is often referred to as the North Fork Kern River. The North and South Forks of the Kern River converge at Lake Isabella, a previous natural lake that is now a reservoir formed by Isabella Dam. South of the dam, the river runs southwest into the lower Kern River Canyon and Study Area/APE.

Elevations surrounding the Study Area/APE range from approximately 924 feet above mean sea level (amsl) at the Kern River No. 1 Powerhouse to 1,913 feet amsl at Democrat Dam. The upstream drainage area at the powerhouse and dam are 2,300 and 2,258 feet,

[3] HRMP Quarterly Compliance Report, USFS Pacific Southwest Region, Master Permits and Easements for the Operation & Maintenance of Southern California Edison's Electric Facilities on the Sequoia National Forest, Fresno and Tulare Counties, California.

respectively. The climate is Mediterranean characterized by cool, wet winters and hot, dry summers. Average precipitation averages between 25-40 inches generally falling as rain below 4,500 ft elevation (Section 3.2).

3.13.5 Biological Resources

The southern Sierra Nevada supports a diverse and extensive set flora and fauna communities, though not all would have been of interest to pre-contact peoples. The more important pre-contact resources are detailed below.

3.13.5.1 Flora

The Study Area/APE is within the Blue Oak Woodland (Ritter 1988; Barbour et al. 2007) or Foothill Woodland (Schoenherr 1992), which is dominated by Blue oak (*Quercus douglasii*), Foothill pine (*Pinus sabiniana*), California buckeye (*Aesculus californica*), valley oak (*Quercus lobata*), interior live oak (*Quercus wislizenii*), canyon live oak (*Quercus chrysolepis*), and California black oak (*Quercus kelloggii*) are commonly associated with the Blue oaks (Barbour et al. 2007). The understory is dominated by annual grasses with common species including *Bromus hordeaceus*, *Lolium multiflorum*, *Bromus diandrus*, and *Hordeum leporinum*. An array of seed, nut, and bulb- or corm-producing plants were exploited by Native American populations during their annual round. Some Shrub species include poison-oak (*Toxicodendron diversilobum*), California coffeeberry (*Rhamnus californica*) and species of *Ceanothus* and *Arctostaphylos* (e.g., manzanita) (Barbour et al. 2007). For a comprehensive discussion of vegetation communities within the Project vicinity, see Section 3.6 Botanical and Wildlife Resources.

3.13.5.2 Fauna

Mammals

Among mammalian fauna, artiodactyls were among the more important animal species to pre-contact peoples. Black-tailed deer (*Odocoileus hemionus*) are the most common large herbivore in the Sierra Nevada, with year-round resident populations at lower elevations and seasonal herds in higher-elevation areas. They were also one of the taxa more frequently exploited by Indigenous peoples (Voegelin 1938). Three distinct mule deer herds; the Greenhorn Deer Herd, the South Sierra Foothill Deer Herd, and the Piute Deer Herd, are present in the vicinity of the Project (CDFW 2022).

Large-bodied omnivores and carnivores were once found throughout the mountains and foothills. Larger predators such as grizzly (*Ursus arctos*) and black bear (*Ursus americanus),* puma (*Felis concolor*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), and gray fox (*Urocyon cinereoargenteus*) would have competed with humans for resources, including artiodactyls, small mammals, and larger rodents. Other common predators include mustelids (weasels and relatives), skunks, and badgers. None of these carnivores were regularly exploited for food.

Small mammals, in contrast, were eaten regularly and, along with artiodactyls, were ranked among the more commonly consumed resources ethnographically (Voegelin 1938). Rabbits (*Sylvilagus* spp.) and hares (*Lepus* sp.) are common throughout the high Sierra and foothills. Frequently encountered taxa include white-tailed jackrabbit, black-tailed jackrabbit, brush rabbit, and mountain cottontail, depending on elevation and habitat.

Rodents are the largest, most diverse group of mammals by far and are known to have been consumed by Native Americans, particularly the larger taxa. The Western gray squirrel (*Sciurus griseus*) and other squirrel species (*Otospermophilus* sp., *Tamasciuris* spp.) are residents of the area, as are porcupine (*Erethizon dorsatum),* woodrat (*Neotoma* sp.)*,* several types of chipmunk (*Tamias* sp.), and various species of pocket gopher (*Thomomys* sp.), rats, and mice.

Birds

Hundreds of bird species can be found in the southern Sierra Nevada although many are more common or exclusively found in lower elevation areas. Taxa commonly found in montane settings include California quail (*Callipepla californica*), woodpeckers (*Picidae*), red-tailed hawks (*Buteo jamaicensis*), turkey vultures (*Cathartes aura*) and an array of smaller songbirds. Several species of geese and ducks (*Anatidae*) were also reportedly taken by Tübutulabal hunters (Voegelin 1938).

Fish

Only three native fish were found in the upper reaches of the Kern River—the endemic golden trout (*Oncorhynchus mykiss aguabonita*), the Kern River rainbow trout (*O. m. gilberti*), and the Sacramento sucker (*Catostomus occidentalis*) (Moyle 2002). Golden trout appear to have evolved in the upper Kern River drainage while rainbow trout are native to streams throughout the elevational range in the Sierran streams below 6,000 feet amsl. Kern River rainbow trout were once widespread in the upper Kern Basin and grew to large sizes, but over-exploitation, habitat degradation and, most importantly, hybridization with other trout since the 19th century has reduced populations to a small fraction of historical numbers. Sacramento sucker are part of a broader San Joaquin Valley assemblage and Kern River Watershed. Prior to extensive fish planting in the 19th and 20th centuries, many areas above 6,000 feet amsl lacked fish (Moyle 2002). Local Native American peoples report harvesting all these species from the Kern River and adjacent tributary streams and creeks.

3.13.6 Cultural Setting

3.13.6.1 Pre-contact Setting

People have inhabited the southern Sierra Nevada for at least 10,000–12,000 years. The archaeological record for the region is poorly understood, and only a minimal outline of cultural chronology and process is known. It is known that at least two different ethnic groups, the Tübatulabal and the Foothill Yokuts, inhabited this region at the time of Euroamerican contact, but few data are available on these people. Limited archaeological work has been reported for the southern Sierra Nevada and, consequently, few data on

the regional prehistory are available. General summaries of southern Sierra Nevada prehistory are available in Schiffman and Garfinkel (1981), Moratto (1984), and Garfinkel (2007). The following is a generalized account of the prehistory of the area.

The pre-contact chronology for the southern Sierra Nevada can be divided into five phases: Kennedy, Lamont, Canebrake, Sawtooth, and Chimney (Moratto 1984; Garfinkel 2007: Table 4.2). This general sequence was initially developed based on work along the Pacific Crest Trail (PCT; located along the eastern edge of the Sierra Nevada) in the late 1970s and early 1980s (Garfinkel et al. 1980, 1984; McGuire 1981, 1983; McGuire and Garfinkel 1980) and later expanded by Garfinkel (2007). It is briefly outlined below.

The initial appearance of people in the southern Sierra Nevada was during the Kennedy Phase (ca. 13000–6000 BP [before present]). However, the only reported evidence of such a presence has been a few isolated Clovis projectile points (Zimmerman et al. 1989; Glennan 1971). To date, no evidence has been found of any permanent occupation of the region during Paleoindian times. The later part of the Kennedy Phase is identified by the appearance of stemmed (e.g., Lake Mojave) points. There is very little evidence of a Kennedy Phase occupation of the region (Garfinkel 2007:45), and it seems likely that Kennedy Phase groups only used the area on an occasional basis.

The Lamont Phase (ca. 6000–3200 BP) is marked by the appearance of Pinto series projectile points, and several examples have been recovered (McGuire and Garfinkel 1980). McGuire and Garfinkel (1980) suggested that the Lamont Phase settlement and subsistence systems in the southern Sierra Nevada were focused on small groups from valley to the east (e.g., Indian Wells and Owens) or west (the San Joaquin) using the area for occasional resource procurement (e.g., to hunt or gather pine nuts).

The subsequent Canebrake Phase (ca. 3200–1500 BP) is marked by Elko series points and may reflect an occupation focused on the exploitation of pinyon (McGuire and Garfinkel 1980). McGuire and Garfinkel (1980) suggested that Canebrake Phase groups made use of resources such as pine nuts, seeds, bulbs, and animals (large and small).

The Sawtooth Phase (ca. 1500–650 BP) is marked by the presence of Rose Spring points (reflecting the introduction of the bow and arrow), manos and metates, bedrock mortars, stone beads, and *Olivella* spire-ground beads (Class A; Bennyhoff and Hughes 1987). Sawtooth Phase sites increase in number relative to the previous phase, and both pinyon gathering and hunting camps have been found. This suggests that the use of upland habitats increased and became more regular during the Sawtooth Phase.

The Chimney Phase (ca. 650–150 BP) is characterized by Desert Side-notched and Cottonwood Triangular points, brownware pottery, glass beads, and *Olivella* rough disk beads (Class H; Bennyhoff and Hughes 1987). Moratto (2011) suspected that brownware pottery diffused into the southern Sierra Nevada from the north after about 500 years ago. It appears that Chimney Phase site intensity further increased from the Sawtooth Phase, reflecting a generalized hunting and gathering economic system, similar to that known during ethnographic times.

Previous Archaeological Research in the Kern River Drainage

Among the early archaeological work in the region was that of Steward (1929), who documented some of the rock art, and of Voegelin (1938), who documented a number of Tübatulabal hamlet sites and locations. Brief summaries of the archaeology of the southern Sierra Nevada were presented by Guthrie (1957) and Griffin (1963a, 1963b).

The majority of the archaeological work along the Kern River has been conducted in and around Lake Isabella. Prior to the construction of the dam, a survey (Fenenga 1947; Drucker 1948; Moratto and Riddell 2014) assessed the cultural resources of the lake basin, recording 14 sites (and test-excavated one site; see Meighan et al. 1984:27). Other inventory work in the Lake Isabella area (much of it on United States Army Corps of Engineers [USACE] land) included surveys by Wallace (1970), Hanks (1973), Schiffman (1976), Glassow and Moore (1978), and Meighan et al. (1984). In addition, numerous smaller surveys conducted as part of environmental review processes have been performed in the area and a number of small special purpose sites have been recorded.

Few sites have been tested and/or excavated in the region. Fenenga (1947) proposed major excavations at several sites prior to the construction of Isabella Dam, but they were not carried out (with the exception of a single test unit at CA-KER-1) (Meighan et al. 1984).

The CA-KER-260 and CA-KER-574 sites (likely the same site), located on the lower Kern River south of Isabella Dam and adjacent to a transmission line, was apparently excavated by Fresno State College in 1970–1971. No report on that work has been completed, and the disposition of the collection and notes is unknown. The CA-KER-17 rock art site (Harper-Slaboszewicz and Cooper 1988) is located directly across the Kern River from the CA-KER-260/CA-KER-574 site(s).

3.13.6.2 Ethnographic Setting

The following provides a brief ethnographic overview of Native American groups who occupied the Study Area. The Study Area falls within the ethnographic territories of both the Valley Yokuts and the Tübatulabal (Smith 1978; Spier 1978). Comprehensive ethnographic data can be found in Gayton (1948), Kroeber (1925), Latta (1977), Voegelin (1938), Smith (1978), Silverstein (1978), Wallace (1978a, 1978b), and Spier (1978:471–484). See also PAD Section 3.14, *Tribal Resources* for additional information.

Yokuts

Kroeber (1925) characterized the Valley Yokuts as unique among California Native people as they were divided into as many as 50 tribes (or tribelets), each with their own distinct dialect and territory with no overarching political unity (Kroeber 1925; Spier 1978). The Valley Yokuts occupied nearly the entire San Joaquin Valley, “from near where the San Joaquin makes a big bend northward to the line midway between the Calaveras and Mokelumne rivers” (Wallace 1978b:462) to the Tehachapi Mountains (Wallace 1978a). Some Yokuts groups occupied the “western slopes of the Sierra Nevada from the Fresno River southward to the Kern River” (Spier 1978:471).

Spier (1978) indicates that the Palewyami Yokuts occupied a territory north of the Kern River along Little Poso Creek that extended southward to the Kern River (near the junction of Lucas Creek). The Palewyami villages were Altau (also known as Altinin), Bekiu, Shikidapau, Holmiu (Kroeber 1925) and were mostly along Poso Creek. The territory of the Yaulemaniwas extensive and included the lower reaches of the Kern River (Kroeber 1925). According to Kroeber (1925:482), the Yaulemani at times resided at K'ono-ilkin ("waterfall") and Shoko ("wind place" in a gorge), "above which began the territory of the Tübatulabal, whom they knew as Pitanisha." These places were also frequented by the Palewyami and it is not certain whose territory it was (Kroeber 1925).

The sociopolitical organization of the Yokuts was that of a true tribe (Kroeber 1925). Groups were divided and each had a name, a dialect, and a territory. Each tribe was led by a chief whose main responsibilities were group advisor, organize gathering or trade expeditions, settled quarrels, provided for needy community members, directed the annual mourning ceremony, and sanctioned the killing of persons posing a threat to the community.

Powers (1877) states that each Yokuts village consisted of a single row of tule houses, either conical or wedge-shaped. Yokuts settlement patterns reflect seasonal subsistence practices. In late fall, winter, and spring, Yokuts groups in the foothills of the Sierra Nevada occupied villages located along the lower waterways while in the summer and early fall, groups of two to three families moved to higher hunting camps (Kroeber 1925; Spier 1978). Summer houses were small, conical structures covered with brush or bark (Kroeber 1925). The winter houses were conical and built of tule or larger, ridged houses with two fireplaces and a door at each end (Kroeber 1925).

Hunting and gathering were the main subsistence activities supplemented by fishing. Deer, quail, and acorns were the principal foods with pine nuts, ground squirrels, rabbits, wild oats, manzanita berries, wasp grubs, Buckeye nuts, ducks, trout, salmon, mussels, grasshoppers, caterpillars, maggots, snails, wild onions, salt grass, and Mariposa lily bulbs (Gayton 1945; 1948; Kroeber 1925; Spier 1978).

Yokuts had a variety of ceremonies. Ceremonial material culture that could be archaeologically identifiable includes charm stones, pictographs, and sweathouses. Pictographs are found in rock shelters and caves in the southern Sierra Nevada and have a religious significance (Gehr 1979; Latta 1977).

Tübatulabal

Tübatulabal territory extended along the Kern River and South Fork Kern River drainage from the source near Mt. Whitney to approximately 20 miles below the junction of the two forks of the river (Smith 1978; Kroeber 1925). Their traditional territory includes the Kern River drainage in which they inhabited three contiguous valleys: the Kern, Hot Springs, and South Fork Kern Valleys.

Their neighbors to the west were the Yokuts, to the south, the Kawaiisu, to the north and east the Koso and Owens Valley Paiute, and to the northeast, the Monache or Western Mono. According to Kroeber (1925), the Tübatulabal and the Kawaiisu had friendly interactions and intermarried with the Yokuts.

The Tübatulabal were organized, like the Yokuts, in tribelets which Voegelin (1938) called bands, each with its own “chief.” Although interband unity did not exist, the bands frequently visited each other and intermarried; they would group together in times of warfare (Smith 1978; Voegelin 1938).

Smith (1978) divided the Tübatulabal into three subgroups or bands: the Bankalachi (Toloim), the Palagewan, and the Pahkanapïl. The Bankalachi lived along the western foothills of the southern Sierra Nevada. The Palagewan inhabited the North Fork of the Kern River. The Pahkanapïl lived along the South Fork of the Kern River and were also called Pahkanapül (Kroeber 1925), Pa-kan'-e-pul (Merriam 1904), or Pitanisha (Gayton 1930; Latta 1977). The Palagewan and Pahkanapïl collectively called themselves “Te-bot-e-lob'-e-lay” (Tübatulabal), pine-nut eaters (Merriam 1904; Kroeber 1907; Smith 1978). Neither the Palagewan nor Bankalachi survived contact with Euroamericans while the Pahkanapïl did. As a result, the Pahkanapïl are now collectively called Tübatulabal (Smith 1978).

The Tübatulabal speak a northern Uto-Aztecan language. Tübatulabal is Shoshonean for “pine-nut eaters,” however they call themselves and their language Pahkanapül (Kroeber 1925) or Pahkanapïl (Voegelin 1938).

The major habitation sites were located at the forks of the Kern River and along the South Fork of the Kern River (Kroeber 1925). The Bankalachi dialect was mostly like that of the other Tübatulabal groups, while they mainly associated and intermarried extensively with nearby Foothill Yokuts (Kroeber 1925).

Hamlets, the permanent winter, early spring residences, consisted of two to six households. The majority of the Tübatulabal hamlets sites were located along the South Fork Kern River (Kroeber 1925; Smith 1978). Ethnographically known hamlets that are in the vicinity of the Study Area include the Palagewan hamlet pašgeštap and the Pahkanapïl hamlet pa-da-zap.

Tübatulabal followed a seasonal pattern of mobility that was based on hunting, gathering, and fishing. The Tübatulabal exploited both acorns, in the Greenhorn Mountains to the west, and pinyon nuts on the eastern slopes of the Sierra Nevada. In addition to acorn and pinyon nuts, seeds (chia and wild oats), roots (tule and cattail), shoots, leaves, bulbs (varieties of lilies), tubers, and berries (juniper, manzanita, gooseberries, boxthorn berries) were gathered by women. Fishing was an important component to the diet. Fish were caught by individual men or communally with corral-like traps. Large game including deer, bear, mountain sheep, antelope, and mountain lion were hunted. Small mammals such as mice and squirrels were caught in traps and snares that were checked. Rabbits were communally hunted (Smith 1978).

Measles and influenza epidemics negatively affected Tübatulabal population. Kroeber (1925) estimated the ancient Tübatulabal population to be 1,000 people. By the 1910 United States Census, Tübatulabal population had decreased to 105. Many of the Tübatulabal were displaced by Anglo settlers and they moved to the Tule River Indian Reservation (Smith 1978).

Important to the local history of the area is the 1863 Tübatulabal massacre. White ranchers in the area had complained that the Tübatulabal stole their cows. Soldiers of the United States Army responded to the settlers' complaints. Tübatulabal men (approximately 35–40) were killed near Kernville (Smith 1978; Voegelin 1938). The 1863 Tübatulabal massacre site located on the shores of Lake Isabella has been documented as Traditional Cultural Property (TCP) and includes CA-KER-410 and CA-KER-411. Annual ceremonies are conducted to remember this devastating event and honor ancestors of the Tübatulabal. The TCP is outside of the Study Area/APE.

3.13.7 Historic-Era Setting

A basic overview of the historical development of the APE and Study Area provides a framework to understand the existing conditions for historical archaeological and built environment resources. The following contexts explore major themes of area history and include early exploration and settlement, mining, agriculture and ranching, logging and milling, recreation, transportation and hydroelectric power generation.

3.13.7.1 Early Exploration and Settlement

The traditional lifeways of Native peoples who first made the lower Kern River valley their home is discussed in previous sections; however they also participated in historic-era activities such as mining, agriculture, ranching, logging, and development of transportation and hydroelectric power. These roles are typically undocumented in historic records. At the time of European contact, the Tübatulabal primarily occupied territory along the Kern River to the north of Democrat Hot Springs, whereas the Penutian-speaking Foothill Yokuts were principally located at the southern end of Kern Canyon. Most of the territory within the Study Area/ APE for this report has been described as a middle ground between these two groups (Kroeber 1925; Smith 1978).

The Spanish, who were the first Europeans to explore and settle in what was initially known as Alta California, established their dominance during the period of 1769–1821. They built a series of missions and presidios that were located primarily along the coast between present-day San Diego and Sonoma. They also relied on military force to subjugate Native American populations and establish both religious and political control over the region. Father Francisco Garcés headed an exploration of the lower Kern River valley in 1776 and was likely the first of the Spanish missionaries to interact with the Tübatulabal in that vicinity. The Tübatulabal soon began to establish economic relations with the Spanish, sending several trading expeditions to the San Buenaventura Mission. This early contact resulted in exposure to diseases, including measles and influenza, with often deadly consequences (Castillo 1978; Smith 1978).

As a result of the Mexican Revolution in 1821, changes to the Spanish mission system in California began, although the secularization process proceeded slowly. It was not until the 1830s that much of land previously held by the missions in California was distributed to Hispanic soldiers and settlers in large land grants called ranchos. While none of these ranchos were located in the Study Area, the size of these land holdings influenced the growth and patterns of settlement throughout the region (Theodoratus 1984).

During this same period, the search for furs brought European and American traders to the Sierra Nevada area. Competition between the Americans, who were often referred to as mountain men, and the British Hudson's Bay Company prompted further exploration of the region as traders tried to find more-easily passable routes to the coast through the mountains. Jedediah Smith, one of the early American traders, was the first to cross the Sierra Nevada from the east in 1826, and he was followed by Peter Skene Ogden of the Hudson's Bay Company, who led an exploratory party in the eastern Sierra Nevada from 1829 to 1830. The American Fur Trading Company, founded by Benjamin Bonneville, planned to develop both a maritime and land-based fur trading network in the region, and in 1834, two members of the company's overland party, Captain Joseph Walker and Garland Guthary, tried to find an easier route through the Sierra Nevada to the south. They left the San Francisco Bay area and eventually followed a Native American trail through the mountains that became established as Walker Pass. This essentially snow-free route extended from the Kern River valley to the Mojave Desert, and while Walker's first party did not explore further southwest into the Study Area at this time, Walker Pass became the major wagon road for settlers heading from the east into the lower Kern River valley and beyond. Walker himself later led a group of settlers through the pass in 1843, although their route then took them to the Salinas Valley (Farquhar 1925; O'Meara 1915; Smith 1978).

American expansionism during this period prompted many in the United States to call for the annexation of Mexican-held territory in California. Among the proponents of these efforts was Missouri Senator Thomas Hart Benton, whose son-in-law, John C. Fremont, was a member of the Topographic Corps, which undertook scientific exploration with government backing. Fremont led three expeditions to California and accompanying the third of these ventures was Edward M. Kern, a noted artist who served as an illustrator and topographer. The party camped for several weeks during the winter of 1845–1846 at the confluence of the north and south forks of a river that Father Garcés had earlier called Rio de San Felipe. Fremont decided to rename the river as Kern River for Edward Kern, who apparently almost drowned in its waters. Later, when under American control, Kern's name also was attached to a county and to the town of Kernville. The town, originally located at the confluence of the North and South Forks of the Kern River, was the site of an early gold rush into the region and had several previous names, including Whiskey Flats. It was moved in 1953 about a mile and a half to the north when a dam was built on the Kern River and a reservoir, the current Lake Isabella, was created. While northeast of the Study Area, Kernville was an originally an important launching point for other mining exploration throughout the lower Kern River watershed (Farquhar 1925; Hine 1984; Office of Historic Preservation 2022).

President James K. Polk, who was elected in 1845 as an avowed expansionist, believed that the Mexican government was too unstable to retain control of all its lands and that its northern portion should become part of the United States for strategic, economic, and political reasons. Polk signed a declaration of war in the following year. The Mexican-American War lasted longer than anticipated, but after fighting in Texas and intermittently in California, Mexico agreed to make a large land cession to the United States. By the terms of the Treaty of Guadalupe Hidalgo, signed on February 2, 1848, the northern border of Mexico was established and California and other Mexican landholdings in the southwest came under the control of the United States. California was initially regarded as an unorganized territory, but it attained statehood on September 9, 1850, after a compromise agreement was reached that, among other provisions, prohibited the spread of slavery into the newly created state (Hine 1984).

Mining

The California Gold Rush coincided with the end of the Mexican-American War, as prospectors discovered gold near Sutter's Mill in northern California. Word quickly spread, and thousands of would-be miners headed to the area and then spread out to locate potential placer claims in the region. Some of these prospectors moved south along the Sierra Nevada, and the first discovery along the Kern River was made about 1851. By 1853 and 1854, a real rush had started that extended into the lower reaches of the Kern Valley. This surge of interest began with the discovery by Richard Keys of a quartz vein and the development of the nearby town of Keysville. Prospectors then began to inspect gulches all along the Kern River where the sands might have washed down and carried some placer gold. At the same time, quartz mining also continued, and the first quartz mill was established on the Kern River in 1856 to process some of this ore (Bradley 1915; Morgan 1914).

Another major find occurred in 1861 when a large piece of gold-bearing ore was dug out of the Big Blue ledge and a camp developed at Whiskey Flat on the later site of Kernville, northeast of the Study Area. A rival town of Quartzburg also catered to miners exploiting the ore veins in the vicinity. At the same time entrepreneurs established a number of small processing plants to separate the gold from the ore, and at least one source indicates that by 1867 there were as many as 22 stamp mills operating along the North Fork of the Kern River. Many were small, one-person operations, often referred to as "Chilean" stamps mills, which differed from the traditional stamp mills because of their use of large upright wheels that ran on tracks to crush the ore. Other profitable mining areas in Kern County included the Greenhorn Mountain area and the Clear Creek mining district, which was located along a tributary of the Kern River. The first find in the Clear Creek district was a placer claim, the Havilah Mine, in 1864, and among the most productive of the operations in this area was the Delphi Mine. Because of the extensive mining activities in that area, the town of Havilah originally became the Kern County seat (Bradley 1915; Morgan 1914).

Within the Study Area, a number of other small mining operations evolved as individual prospectors or larger mining groups searched for valuable claims. Placer mining likely occurred along much of the lower Kern River beginning as early as 1851, but only a limited amount of gold was found in the riverbed deposits. Hydraulic mining was the more common technique used along many of the river terraces, including Upper Richbar, the Democrat Springs area and other sites in the valley. Parts of the river were diverted, and high-powered water jets or hoses were used to wash down or undercut the hillsides to release possible gold-bearing soils. The tailings from these mining efforts, if allowed to flow downstream, polluted the waters, and legal action in the 1880s led to the construction of coffer dams in some areas in an attempt to prevent some of this damage (Wilkerson 2017).

Lode mining, where the gold deposits are extracted from quartz veins, also took place in the Study Area. One of the most productive was the Gem Mine, which began operations during the first decade of the 20th century and continued into the 1950s. Uranium mining also became important by the 1950s and the Miracle Mine, the Kergon and Little Sparkler mines were in or near the Study Area (Wilkerson 2017).

From the beginning of this mining development, this influx of newcomers encouraged the development of commercial opportunities but also led to the need for increased governmental organization. Tulare County was first formed in 1855, and later in 1866 Kern County was carved out of portions of both Tulare and Los Angeles counties. Although there was limited diversity in these new communities, some Chinese miners were eventually allowed to rework some of the placer operations, although initially they could not live in the area without being under contract to American mine owners operating locally. Many of these Chinese prospectors settled in the Hogeye Gulch area near Keysville (Morgan 1914).

Much of the mining interest began to decline by the 1870s, but Quartzburg and Kernville continued to be prominent towns into the early 1880s. A fire destroyed parts of Quartzburg and the Big Blue Mine in 1883 and attempts to revive its mining successes over the next few decades failed. Although gold mining also began to play a limited role by 1879, later attempts were made to locate uranium, tungsten, copper and silver in parts of lower Kern River valley. The transition to greater reliance on agriculture, logging and other types of development provided additional incentives for continued settlement in the area (Morgan 1914; Theodoratus 1984).

Agriculture and Ranching

There are some indications that settlement in the lower Kern River valley may have begun before the early mining efforts, but the very rough and often steep terrain in the Study Area did not lend itself to successful farming activity. During the early years of the gold rush, a limited amount of agricultural development occurred to supply food for the rapid influx of prospectors to the region. Small farmers grew hay and vegetables or grazed cattle in areas near the mining camps. As prospecting became less productive, some of the former miners turned to agriculture and ranching, whereas newcomers also began to form small farming communities and play a much greater role in the land use of the region. The South Fork of the Kern River was the site of much of this early agricultural settlement,

although in more-marginal areas, small landowners were often forced to supplement their incomes with other activities (Morgan 1914).

Land along the Kern River became available in a variety of ways. The Treaty of Guadalupe Hidalgo after the Mexican-American War had provided that existing landowners, the rancheros, could retain title to their property. The Land Law of 1851 was supposed to reinforce these terms by establishing a commission to review property titles, but this legislation proved to be more of a detriment to their ownership. The burden of proof rested with the Spanish and Mexican landowners, and they faced many hurdles, including the hostility of many incoming Americans, a rise in the number of squatters on their lands, and difficulties in defending their rights because of limited English language skills and predatory attorneys. As a result, many lost their lands or were forced to sell (Caltrans 2007).

State grants, new federal land laws and the sale of railroad holdings also provided additional means for land acquisition. For more than a decade after California achieved statehood, local officials rather than the federal land office often disbursed land or adjudicated conflicting claims. State land grants were made in return for public improvements, to reclaim swamp or overflow land, or to establish public education and were given to railroad companies to encourage them to provide new transportation access. Influential land brokers and attorneys also were able to negotiate huge land sales to wealthy corporations and businessmen, increasing the monopolization of California property. Among the most successful was the firm of Miller and Lux, which over a few decades had become the one of the largest land and cattle companies in the state, controlling more than 800,000 acres in California, and ultimately also acquiring water rights and developing irrigation networks. The Southern Pacific Railroad also obtained large land grants in the Kern River valley, and much of the land in the Study Area was originally owned by the Southern Pacific (Caltrans 2007; Rolle 1996; Waldschmidt-Nelson 2018).

In addition to purchasing land from the railroad, settlers could take advantage of several government land laws that transferred much of the remaining land in the public domain to individual ownership. Claimants could not attain full ownership until the land was officially surveyed, and although government surveyors established township boundaries in 1859, they did not complete the section boundaries in this part of Kern County until late 1874. In the meantime, settlers could file for land under the Preemption Act of 1841, which allowed for cash sales of property until these surveys were made. The Homestead Act of 1862 initially provided up to 160 acres for individuals who made improvements and resided on the land for 5 years, whereas the Desert Land Act, the Timber and Stone Act, as well as the Timber Culture Act contained provisions for the acquisition of lands that had marginal agricultural potential or were better suited for mining or timber resource development. Larger companies also took advantage of some of these laws by using what were known as “dummy entrymen” to file for these types of claims and then quickly turn over the land to corporate backers (Caltrans 2007; General Land Office 1874).

As the focus on agricultural development and ranching increased, the need for irrigation also became increasingly important. In parts of the Kern River valley east of the Study Area, the land was fertile but only could be productive if it received additional water. As

early as 1861, landowners began to dig irrigation ditches to bring Kern River water to their property, with the labor often supplied by Chinese immigrants. Although most low-lying areas of the county were irrigated by the 1880s, the competition for water rights became extremely contentious and resulted in frequent litigation. In addition, the large corporations like Miller and Lux, which had continued to purchase riparian rights as they consolidated their holdings, also brought suits over irrigation rights. Their goal was apparently to augment their own allocations of water rather than prevent other landholders from receiving water. The decision to develop the hydroelectric potential of the Kern River also added to the bitter conflicts over water rights and irrigation (Caltrans 2007; Kovak and Jackson 2012; Morgan 1914; Rolle 1996).

Ranching was primarily focused on grazing livestock in the upper elevations of Kern County as well as in portions of the valleys, particularly on unirrigated lands. Initially, there were no real limitations on grazing, so livestock owners utilized lands along the river and in the foothills and mountains, including parts of the Study Area, for their large herds of cattle and sheep. The livestock industry peaked in the 1890s, as the establishment of federal control over a significant portion of the available grazing lands had significant effects on ranching after that time. Preservationists had long noted that the rapid exploitation of public lands for ranching as well as mining and logging with little governmental oversight had led to substantial environmental damage. In California, for example, overgrazing in the upper Kern River valley was a point of contention as was watershed damage and the rapid decline in forest resources. Recognition of the need to protect some of this land for public use led Congress to pass the Forest Reserve Act of 1891 and subsequent legislation that set aside lands in various parts of the country to remain under federal control. The Sierra Forest Reserve was created in 1893, adding nearly 4 million acres into the reserve system and setting some new restrictions, including the prohibition of sheep grazing, on these federal lands. In 1905, the forest reserves were placed under the control of the Department of Agriculture and became part of the newly created Forest Service. The agency's policy of multiple use and sustained yield allowed both mining and logging to continue in addition to increased focus on its recreational potential. Permits also were granted for cattle grazing in the higher elevations and, by the 1920s, became a significant enterprise (Dilsaver and Strong 1990; Steen 2004; Theodoratus 1984).

Sequoia National Forest

As discussed in the previous section, the development of the Forest Reserve system was considered a means to protect resources for the public good. Conservation advocates had become more vocal by the late 19th century and pointed to the nation's forests as a dwindling and endangered resource. Threats to some of the giant Sequoia trees had led to a public outcry and resulted in the designation of the Sequoia National Park in 1890 as only the second of America's national parks. Many expected portions of the Kings and Kern River drainages to be added eventually to the park, but these lands were initially incorporated into the Sierra Forest Reserve. The reserve included over 4 million acres, and in 1908, only a few years after it came under the jurisdiction of the Forest Service, it was divided into five separate units that included the SQF. It was not until 1915 that land in the lower Kern River became part of the SQF (Dilsaver and Strong 1990; Steen 2004; Theodoratus 1984).

Recreation

The Forest Service also had a mandate to manage its lands for recreational use, although even before its formation, parts of the Kern River valley were frequented by some hunting, fishing and hiking enthusiasts. The founding of the Sierra Club in 1892 encouraged these types of recreational activities, and its members were among the first to map the area and organize outings. For some trips they established base camps and then used burros to pack into the mountains, with women as well as men encouraged to participate (Theodoratus 1984).

By the early 1900s, several hot springs resorts were established in the foothills of the Kern River Canyon and included Democrat, Miracle, Delonegha, and Scovern. The success of these resorts relied on improved stagecoach lines and logging roads to provide relatively easy access to the canyon. Packers also were available to guide visitors to hunting and fishing sites, and the establishment of the Sierra Forest Reserve in 1893 also helped to encourage this type of recreational activity (Theodoratus 1984; Wilkerson 2017).

Road construction related to the development of the Borel, Kern River No. 1 and Kern River No. 3 Hydroelectric Projects also provided new recreational opportunities. As individual ownership of automobiles became more common, the backcountry could be reached much more quickly than in the past. Tourists seeking these new recreation experiences frequently were able to use the roads that SCE constructed for its hydroelectric projects in the Kern River valley. Lake Isabella, the reservoir created by a dam built for flood control by the USACE on the Kern River in 1953, also created new water-based recreational potential, including boating, water skiing and wind surfing. Most of these recreational areas are currently managed by the USACE and SQF (Powers 2003).

Transportation

Transportation access was an essential component of every aspect of Kern River development and resource use, from mining to agriculture, ranching and logging. Trails first used by Native Americans brought the earliest explorers into the region and were then followed and expanded by the miners to search for and ultimately locate their claims. Beginning in the 1850s, some of these trails were improved to become roads that connected settlements with the mining areas and allowed freight wagons to be used to haul in supplies to the mines (Theodoratus 1984).

Local residents also built segments of roads and defrayed the construction and maintenance costs by charging tolls. As the mining rush was slowly ebbing, agriculture, ranching, and logging were becoming established industries in the lowlands. Some of the first trails were developed to drive cattle and sheep for grazing to the higher elevations, and later roads were constructed to allow livestock to be transported by motorized vehicles.

In the mid-1890s, the Edison Electric Company (renamed Southern California Edison in 1909) built a road to the Kern River No. 1 Powerhouse that was the precursor to State Route 178. Originally used for oxen- and mule-drawn vehicles, the dirt road started at the mouth of the Kern River Canyon and continued to the powerhouse site. By the time the powerhouse was completed in 1907, the road was designated as Legislative Route 57 or the Walker Pass Route and by 1913 it could be accessed by automobiles. In 1919, the road was added to the state highway system as Highway 178 and was soon extended for an additional 8.4 miles to Democrat, with costs paid for by a bond issue. The steep rocky terrain made construction through the canyon extremely difficult, and convicts from Folsom Prison Camp 9 provided much of the labor. Ultimately, State Route 178 extended through Walker Pass and by the 1930s ended near Ridgecrest. The road was subject to frequent rockslides and occasional flooding and despite numerous improvements, continued to be a dangerous stretch for automobile traffic (Connelly 2007; Hovey 1999).

The advent of rail access was also eagerly awaited in Kern County and the federal government provided some supplemental funding to the Southern Pacific Railroad to build spurs into portions of the Kern River valley. These rail connections offered an important means to receive goods and market resources, not only in San Francisco and Los Angeles, but also nationwide via links to transcontinental lines. The closest railhead to the powerhouse was in Bakersfield; however, an improved road continued to be essential for transporting building materials, equipment and goods to the powerhouse site (Theodoratus 1984).

Hydroelectric Development

Following the early mining era, the population of the southern Kern River Valley and its surrounding area stabilized and then began to expand with improved transportation access and the development of new agricultural, ranching and logging opportunities. The demand for electricity also grew, and new hydroelectric power systems on the Kern River and other waterways in the Central Valley were planned. The initial focus was on local needs, but technological advances, including the development of alternating current generators in the early 1890s, enabled long-distance transmission that had not been possible with earlier direct current systems. As a result, the size and capabilities of some of the new hydroelectric plants were much greater than originally anticipated and eventually allowed the sale of power in much larger markets (Collum 2009; Mikesell 1988).

The steam and hydroelectric plants that were constructed before 1900 to furnish power to Southern California were owned by many different individual companies and generally were inefficient with a relatively small output. The first of the hydroelectric plants in the Kern River valley was begun in December of 1894 at the mouth of Kern Canyon, approximately 15 miles east of Bakersfield. The Electric Power Development Company, which was a subsidiary of the Kern Land Company, built a steam-powered incline railway to carry construction materials to the site where the penstock and powerhouse were located. Water from upstream was transported through a redwood flume, 8,500 feet in length, to the canyon’s mouth. The plant was completed in 1897 and purchased in 1910

by the San Joaquin Light and Power Corporation, which closed it in 1920 to install a new facility (Mikesell 1988; Morgan 1914).

In 1895, the Kern River and Los Angeles Electric Power Company (KR&LAEP), organized by William G. Kerckhoff, obtained water rights on the Kern River and planned construction of a power plant designed by engineer Henry Hawgood (Myers 1984; Mikesell 1996). KR&LAEP was unable to finance the project. But beginning in 1897, the KR&LAEP began to undertake just enough work on a canal to retain its water rights (Mikesell 1996). In 1902, Henry E. Huntington, with partners that included Kerckhoff, formed the Pacific Light and Power Company (PL&P) and in desperate need of electrical energy to power Huntington's growing streetcar system in Los Angeles, purchased the KR&LAEP stock. PL&P reconstituted KR&LAEP as a subsidiary named the Kern River Company and pushed construction as rapidly as possible. The plant, which Huntington named “Borel” for associate and San Francisco financier Antoine Borel, was completed in 1904. Kern River Company was absorbed into PL&P in 1908 and ceased to exist as a separate entity. PL&P merged with SCE in 1917.

The California Power Company was formed by the promoters of Redlands Electric Light & Power Company to complete certain preliminary work on Kern River No. 1. It was organized in 1901 and acquired water rights filed during the year 1900. The company began some preliminary work. In 1902, Edison Electric Company formally took over the California Power Company and the construction of the project (Fowler 1923). Survey of the Kern River for hydroelectric project locations, and design of the Kern River No. 1 system was undertaken by F.C. Finckle, chief engineer for California Power Company, and Edison Electric when the latter acquired California Power. Finckle identified five potential hydroelectric power sites along the Kern River. The site on the main flow of the Kern River lowest in elevation and nearest the mouth of the Kern River Canyon was to be Kern River No. 1. Kern River No. 2 was to be located on the main flow of the river upstream from PL&P’s Borel Power Plant. Kern River No. 3 was located on the North Fork Kern River above Kernville. Kern River Nos. 4 and 5 were to be located on the North fork upstream from Plant No. 3. Only Kern River No. 1 and No. 3 were built. See below for additional details on Kern River No. 3 (Mikesell 1989).

The Kern River No.1 Powerhouse began service in 1907 and served as the generating facility for the Edison Electric Company’s Kern River to Los Angeles Transmission Line. At the start of operation, the Kern River No. 1 Hydroelectric Project was identified as the “most permanent and costly hydraulic waterway in the country” (Tinsley Becker et al. 2015).

The Edison Electric Company began planning for the Kern River No. 3 Hydroelectric Project on the North Fork of the Kern River. In March 1901, Edison Electric Company applied for a permit with the Forest Service and this was acquired in the following year. F.C Finkle began the design of Kern River No. 3 Hydroelectric Project, but he left the company in 1909 after his design for the penstock at Kern River No. 1 Hydroelectric Project failed. Another engineer, William Brackenridge, took over the project, but plans for the plant were not approved until 1914. Construction of Kern River No. 3 Hydroelectric Project did not begin until the end of World War I.

In 1909, the Edison Electric Company was reincorporated as the SCE to reflect its increasing presence through five counties in southern California. SCE merged with PL&P in 1916, gaining operation of the Borel system in addition to the Kern River No. 1 and No. 3 Hydroelectric Systems (Meyers 1984).

The complex historical background of SCE was the result of the consolidation of several smaller power companies. The philosophy of the company's president, John Miller, was to purchase and combine numerous smaller power companies into one larger and more efficient operation and then replace older facilities with new, more technologically advanced plants. This strategy succeeded in making the company a major force in power development in the region (Collum 2009; Meyers 1984, Mikesell 1988).

3.13.8 Known Cultural Resources

A total of 41 cultural resources have been previously recorded in the Study Area. This includes 33 archaeological resources and eight built environment resources. These are discussed in more detail below.

3.13.8.1 Archaeological Resources

The records search identified a total of 33 previously recorded archaeological resources within the Study Area (see Table 13.3-2 and confidential Maps 3.13-3 and 3.13-3a–g). The 33 resources include 30 archaeological sites, two isolated historical-period artifacts, and one resource that was in the SCE AGOL dataset but no information was available for the resource. The 30 archaeological sites include 16 pre-contact sites, 13 historical-period sites, and one multicomponent site.

Six of the archaeological sites are within or intersect the APE, including three pre-contact sites and three historical sites. The three pre-contact sites, P-15-001928, P-15-001930, and P-15-001944 all contain bedrock milling features. These sites areas are part of a larger area that includes at least 13 such sites in or near the Study Area that were recommended as a Historic District because of their ability to address research topics related to the pre-contact use of the area (White and Taylor 1984). However, they did not formally define a district in their report and no formal determinations of eligibility are available. The three historical sites are P-15-001936, P-15-015663, and P-15-020124. Site P-15-001936 is a historic gold mine where Tenant Creek was diverted into two series of ditches, holding tanks and sluices (White and Taylor 1984). Only a small portion of the southeastern part of the site extends into the APE. The site has been recommended eligible for listing in the NRHP, but no formal eligibility determination was located. Site P-15-015663 is a small refuse scatter located just east of the Kern River No. 1 Hydroelectric Project flowline. The site includes 30 metal cans, five barrel hoops, and two metal pipes. The site has not been evaluated for the NRHP (Kovak and Jackson 2012). Site P-15-020124 is the remains of a prison work camp associated with the construction of a segment of what is now State Route 178, between Bakersfield and the Democrat Hot Springs (Valentin 2019). The site has not been formally evaluated for the NRHP.

Based on site records and locational data, the remaining 24 archaeological sites are outside of the APE (see Table 13.3-2 and confidential Maps 3.13-3 and 3.13-3a–g). These consist of 13 pre-contact sites, 10 historical sites, and one multicomponent site. Additionally, the two historical isolated artifacts are outside of the APE. The 13 pre-contact sites include 12 sites with bedrock milling features as well as pestles, mortars, slicks, cracking basins and associated lithic scatters, and one hunting blind. The 10 historical sites include three mines, the Gem Mine (P-15-001676), Red Cloud Mine (P-15-003907), and an unnamed mine, a site with dredge mining equipment, a collapsed cabin site, two sites within unnamed foundations, a site with a foundation from a Guard Station (P-15-013709), and the remains of the historic Democrat Hot Springs Hotel (P-15-001941) and pre-contact component. One site was identified in SCE AGOL data, but no site record or other site information was found.

Of the 24 archaeological sites outside of the APE but within the Study Area, 15 have been evaluated for listing in the NRHP and nine sites either have not been evaluated or their evaluation status in uncertain. The 15 sites that have been evaluated include nine pre-contact sites, five historical-period sites, and one multicomponent site. The nine pre-contact sites were all recommended eligible for listing in the NRHP by White and Taylor (1984). Four of the five historical sites were recommended as potentially eligible by White and Taylor (1984), but no formal determinations of eligibility are available. These include a collapsed cabin site (P-15-001938), a foundation, well, and cistern (P-15-001940), an unnamed gold mine (P-15-001942), and the Democrat Hot Springs Hotel (P-15-001941). The fifth site, the Gem Mine (P-15-001676) was recommended as not eligible for listing in the NRHP (Storm 2004), however, concurrence from the SHPO was not found. An isolated aqua glass bottle base and car frame were also identified with the Study Area; however, isolates are generally not eligible for listing in the NRHP.

The Democrat Hot Springs Hotel site is located north of the Democrat Dam, on the south side of Kern River. It contains a multicomponent assemblage of historic habitation including a concrete foundation, construction refuse, and planted fruit trees, in addition to a bifacial quartzite mano. The site is associated with the remains of the bath house that was fed by the hot spring. The hotel was built by the owners of the O.K. Placer mining claim as a tourist attraction, after roads were constructed running from the lower Kern River Canyon west to Democrat Dam (Powers 2007). When the hotel opened in 1908, it could accommodate 100 guests. The hotel is still in existence but is now private property and outside of the Project APE.

3.13.8.2 Built Environment Resources

A total of eight built environment resources have been identified in the Study Area. Of these resources, seven are within or adjacent to the APE, with the eighth resource in the Study Area but outside of the APE (Table 13.3-3 and Table 13.3-4 and Maps 3.13-3a–g). KR1HD (FS No. 05-13-54-838H) and Democrat Dam Complex (P-15-001927) were recorded as separate resources with unique resource numbers; however, portions of the Democrat Dam Complex contribute to the KR1HD.

The KR1HD (FS No. 05-13-54-838H) was identified and evaluated in 1988 to access potential effects from a Caltrans Project (Mikesell 1988). The study recommended the KR1HD eligible for listing as a historic district in the NRHP under Criteria A and C. The significance of the facility is based on the role it played in relation to the development of SCE and its technological innovations that were representative of new hydroelectric plants of the period. The Kern River No. 1 Powerhouse is not unique, but it is an important example of an innovative power plant of the period. The SHPO concurred with this recommendation in a letter dated January 9, 1989 (FHWA881212). The KR1HD evaluation identified and evaluated 11 major components as potential contributors to the historic district including (see Table 3.13-4): intake dam (Democrat Dam [contributing]); intake gate house (contributing); flume (non-contributing); sandbox (contributing); tunnel (contributing); forebay (contributing); penstock (contributing); bypass conduit (non-contributing); powerhouse (contributing), including the turbines (contributing), generators (contributing), exciters (non-contributing), tailrace (contributing), switchboard (contributing), and transformers (outdoor substation racks [non-contributing]); three ancillary buildings including boarding house (office [contributing]), three garages near office (non-contributing) and garage east of office (non-contributing); and a tram (contributing [Mikesell 1988]).

The remote location of Kern River No. 1 was a major factor in the length of time it took to complete the Project. A series of steep and difficult roads were constructed to provide access through the Kern River Canyon Gorge to the powerhouse site as well as one of the camps that housed construction workers. Three additional camps were reached by a 12-mile trail that was built along one side of the gorge. Bakersfield was the nearest railhead and source of many of the supplies needed for the Project, so additional road improvements were also made for the mule and horse teams that were used to haul these goods to the site. A stable was built near the location of the powerhouse to shelter the animals throughout the construction process (Collum 2009).

Construction of the project also required the excavation of 20 tunnels, which had to be driven through solid rock. A temporary power plant was built about a 1.5-miles from the permanent powerhouse site and allowed the use of pneumatic drills to complete the remaining excavation work. Five air compressor plants were set up along the length of the tunnels, two utilizing 50-horsepower compressors and four utilizing 75-horsepower compressors. In order to expedite the completion of the tunnels, adits were cut into the tunnel line to provide a large number of tunnel faces to be worked on at one time. Progress was delayed for nearly one year as the company turned its focus to finish three other projects including Santa Ana and Lytle Creek Hydroelectric Projects in San Bernardino County and a steam turbo-generator plant in East Los Angeles. Work resumed in December of 1904 with a crew of nearly 200 men, and that number was doubled in the following January to speed up the construction. By September of 1905, the tunneling was complete and concrete work began to clad the tunnels. Construction of the powerhouse was completed in May of 1907. Power was transmitted over the Kern River-Los Angeles 60V Transmission Line for 117 miles on steel towers to the Los Angeles Steam and Transformer Plant No. 3 (Collum 2009; Meyers 1984).

One of the features of the powerhouse, the exciters, were documented in Historic American Engineering Record (HAER) No. CA-165-A in 1994 as mitigation for their replacement (Taylor 1994). Since these were replaced, they are no longer considered character-defining features of the powerhouse.

In 2023, the KR1HD was documented on a Department of Parks and Recreation (DPR) 523 Form (FS No. 05-13-54-838H), as well as the "Powerhouse Complex" (P-15-003544), which was documented on a DPR. The powerhouse complex DPR identifies the following structures within the complex: the powerhouse and six ancillary buildings (office building, three garages, and two sheds) located on the hillside just above the powerhouse and State Route 178.

As stated above, Democrat Dam Complex was recorded as P-15-001927. The recording includes the dam, intake house, sandbox, Tunnel No. 1, Flume No. 1, Tunnel No. 2 and various other structures associated with the northern end of the flowline, as well as the archaeological remains of the Dam Tender's Cottage and remnant features from the construction of the system.

The original evaluation of the KR1HD did not identify the stable located adjacent to the substation as a potential contributor to the historic district. SCE determined that the stable needed to be removed to ensure larger truck access to the powerhouse. In support of this project, the stable was evaluated and determined a contributing element to the KR1HD. The SHPO concurred with this finding in a letter dated May 25, 2010 (FERC080206D). The removal of the stable constituted an adverse effect. SHPO and FERC entered into a Memorandum of Agreement (MOA) to resolve effects, which resulted in the documentation of the stable on a HAER (Collum 2009; FERC080206D). However, the MOA did not require the HAER be submitted to the National Park Service. The documentation was submitted to the SHPO and is on file at SCE.

As stated above, the Kern River No. 1 Hydroelectric Project transmitted electricity to Los Angeles on the Kern River-Los Angeles 60V Transmission Line. The line was evaluated and recorded on a DPR form in 2011 (Tinsley Becker 2011). The DPR was updated by Urbana Preservation and Planning in 2022 (P-15-010562, P-15-015251). The transmission line was the longest in existence at the time of construction and was the first to be constructed exclusively on steel towers. Of the original 1,140 towers only 500 remained when the line was evaluated in 2011—the longest intact segment was 28 miles in length. As a result, the Kern River-Los Angeles 60V Transmission Line was found ineligible for listing in the NRHP under Criteria A and C due to loss of integrity of materials, design, workmanship, or feeling, and, in some portions where the line had been completely removed, loss of integrity of location. The SHPO concurred with this finding in a letter dated January 16, 2013 (FERC_2012_1003_001).

Highway CA-178/Kern Canyon Road (P-15-020317) is located within the APE. The route was used to access and develop potential agricultural lands when early Mexican land grants were combined to create the Tejon Ranch in 1868. The route was also likely used by early miners in the region and then was improved as a wagon road for the construction of the Kern River No. 1 Hydroelectric Project between 1902 and 1907. By that time the

road became known as Legislative Route 57 or the Walker Pass Route. As automobile use increased, the road was periodically widened and realigned but major improvements took place beginning in 1924 with funds from a bond issue to extend the road for 8.6 miles from Cottonwood Creek to the first crossing of the Kern River. The use of convict laborers, who lived in a camp on Rich Bar, was considered innovative at the time, and the difficult project, which involved extensive rock work, was completed by the end of 1925. The road has been recommended eligible for listing in the NRHP under Criterion A for its association with early Transportation, Roadways, and Travel pathways during the period 1827 to 1974 (Valentin 2019; Urbana Preservation and Planning 2022).

Ancillary structures (P-15-015664) potentially associated with P-15-020317 within the APE but that have not been evaluated for eligibility include a culvert stamped 1925 and a water basin with an iron pipe that feeds into it on the east side of State Route 178. Two additional culverts that are also marked 1925 are located at Lucas Creek (P-15-015665) and at an unnamed drainage (P-15-015666). Within the Study Area but outside the APE, an abandoned penstock tower and water conveyance system (P-15-013720) that likely redirected water from the roadway during floods is partially within the right-of-way on the north side of State Route 178 and has not been evaluated for eligibility.

3.13.9 Tribal Interests and Traditional Cultural Properties

See Section 3.14 Tribal Resources for information on Tribal interests and Traditional Cultural Properties

3.13.10 Current Cultural Resource Management

SCE prepared a CRMP for the Kern River No. 1 Hydroelectric System in 1993, *Cultural Resources Management Plan for Southern California Edison Company's Kern River No. 1 Hydroelectric Project, Kern County, California, FERC Project No. 1930* (SCE 1993). The CRMP identifies specific measures that SCE undertakes to avoid adverse effects to NRHP-eligible cultural resources in the FERC Project boundary and specifically addresses potential effects to the KR1HD during operation and maintenance of the Project. The CRMP requires that if effects to NRHP-eligible properties cannot be avoided with implementation of protective and avoidance measures, SCE, in consultation with SHPO and FERC, shall address any effects in accordance with 36 CFR Part 800.

3.13.11 References

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TABLES

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Table 13.3-1. Previous Cultural Resource Studies within the Kern River No. 1 Hydroelectric Project Study Area

SCE Document No.	Information Center Report No.	Forest Service Report No.	Study	Author	Year	In APE?
1166036	–	–	2022 Q2 Heritage Resource Management Plan (HRMP) Quarterly Compliance Report, United States Forest Service (USFS) Pacific Southwest Region, Master Permits and Easements for the Operation & Maintenance of Southern California Edison's Electric Facilities on the Sequoia National Forest, Kern County, California	Ogaz et al.	2022	Yes
1165978	–	–	2022 Q1 Heritage Resource Management Plan (HRMP) Quarterly Compliance Report, USFS Pacific Southwest Region, Master Permits and Easements for the Operation & Maintenance of Southern California Edison's Electric Facilities on the Sequoia National Forest, Fresno and Tulare Counties, California	Ogaz and Talcott	2022	No
1165657	–	–	2021 Q2 Heritage Resource Management Plan (HRMP) Quarterly Compliance Report, USFS Pacific Southwest Region, Master Permits and Easements for the Operation & Maintenance of Southern California Edison's Electric Facilities on the Sequoia National Forest, Fresno and Tulare Counties, California	Peabody	2021	Yes
1165682	–	–	2021 Q2 Heritage Resource Management Plan (HRMP) Quarterly Compliance Report, USFS Pacific Southwest Region, Master Permits and Easements for the Operation & Maintenance of Southern California Edison's Electric Facilities on the Sequoia National Forest, Fresno and Tulare Counties, California	Ortiz et al.	2021	Yes

SCE Document No.	Information Center Report No.	Forest Service Report No.	Study	Author	Year	In APE?
1165730	–	–	2021 Q1 Heritage Resource Management Plan (HRMP) Quarterly Compliance Report, USFS Pacific Southwest Region, Master Permits and Easements for the Operation & Maintenance of Southern California Edison's Electric Facilities on the Sequoia National Forest, Fresno and Tulare Counties, California	Ortiz and Marks	2021	Yes
1165893	–	–	2021 Q2 Heritage Resource Management Plan (HRMP) Quarterly Compliance Report, USFS Pacific Southwest Region, Master Permits and Easements for the Operation & Maintenance of Southern California Edison's Electric Facilities on the Sequoia National Forest, Fresno, Tulare, and Kern Counties, California	Gilbert et al.	2021	No
1165344	–	–	Historic-era Built Environment Survey Report for Southern California Edison Company's Distribution Circuits on the Sequoia National Forest, Kern and Tulare Counties, California	Williams	2020	Yes
1165235	–	–	2019-2020 Q1 Heritage Resource Management Plan (HRMP) Quarterly Compliance Report, USFS Pacific Southwest Region, Master Permits and Easements for the Operation & Maintenance of Southern California Edison's Electric Facilities on the Sequoia National Forest, Fresno and Tulare Counties, California	Newcomb	2020a	Yes
1165320	–	–	2019-2020 Q2 Heritage Resource Management Plan (HRMP) Quarterly Compliance Report, USFS Pacific Southwest Region, Master Permits and Easements for the Operation & Maintenance of Southern California Edison's Electric Facilities on the Sequoia National Forest, Fresno and Tulare Counties, California	Newcomb	2020b	No

SCE Document No.	Information Center Report No.	Forest Service Report No.	Study	Author	Year	In APE?
1165335	–	–	2019-2020 Q3 Heritage Resource Management Plan (HRMP) Quarterly Compliance Report, USFS Pacific Southwest Region, Master Permits and Easements for the Operation & Maintenance of Southern California Edison's Electric Facilities on the Sequoia National Forest, Fresno and Tulare Counties, California	Newcomb	2020c	No
1165583	–	–	2020 Q4 Heritage Resource Management Plan (HRMP) Quarterly Compliance Report, USFS Pacific Southwest Region, Master Permits and Easements for the Operation & Maintenance of Southern California Edison's Electric Facilities on the Sequoia National Forest, Fresno, Tulare, and Kern Counties, California	Gilbert	2020	Yes
1164892	–	–	RE: Letter Report for Cultural Resources Study for Southern California Edison's Infrastructure Replacement Project (TD1111202) along the Mebane 12kV Circuit, on Lands Administered by USFS Sequoia National Forest, Kern Count	Belcourt, T	2018	No
–	KE-05068	–	Cultural Resources Survey and Monitoring Report for Southern California Edison's Replacement of Deteriorated Poles in Support of the Region 5 Special Use Permit R50003, Sequoia National Forest, Tulare and Kern Counties, California	Millington et al.	2017	Yes
1164273	–	–	Archaeological Survey Report for the Southern California Edison Company Replacement of Sixty-One Deteriorated Power Poles on the Bonanza 12 kV, Erskine 12 kV, Intake 16 kV, Isabella 12 kV, Johnsondale 4 kV, Mebane 2.4 kV, Mustang 12 kV, Pascoe 2.4 kV, Tee Vee 12 kV, and Tungsten 12 kV Circuits, Sequoia National Forest, Kern and Tulare Counties, California	Hall and Brodie	2016	Yes

SCE Document No.	Information Center Report No.	Forest Service Report No.	Study	Author	Year	In APE?
–	KE-04167	–	Archaeological survey report—improvements to Highline Road from Banducci Road to Tehachapi/Willow Springs Road (approximately 7 miles), Tehachapi, Kern County, California	Romani	2012	No
–	–	R2011051354047	Cultural Resources Inventory Report of Access Roads and Flume Sections Associated with the Kern River No. 1 Hydroelectric Project	Kovak and Jackson	2012	Yes
–	–	R2011051354020	3 power poles	USFS	2011	No
–	KE-04112	–	Cultural Resource Assessment for a Grid Reliable Maintenance Program Project (Replacement of Damaged Pole #280236E) on the Southern California Edison Company Erskine 12 kV Circuit, Sequoia National Forest, Kern Ranger District, Kern County, California	Parr	2011	No
–	–	R2010051354014	Piute Reforestation	USFS	2010	Yes
–	KE-03609	–	Cultural Resource Assessment for the Replacement of Twenty Deteriorated Power Poles on the Southern California Edison Company Erskine 12 kV Circuit, Sequoia National Forest, Kern River Canyon, Kern County, California	Parr	2010	Yes
–	KE-03777	–	Cultural Resource Inventory of Caltrans District 6 Rural Conventional Highways in Fresno, Western Kern, Kings, Madera, and Tulare Counties	Leach-Palm et al.	2010	Yes
–	–	R2010051354059*****	Breckenridge Mountain Grazing Project	-	2010	Yes
–	–	R2010051354045*****	Cultural Resource Inventory of Caltrans District 6	-	2010	Yes
–	–	R2009051354021	Piute BAER Road Work	USFS	2009	Yes
–	–	R2009051354115	Piute Restoration	USFS	2009	No

SCE Document No.	Information Center Report No.	Forest Service Report No.	Study	Author	Year	In APE?
–	KE-03895	–	Cultural Resource Assessment for a Fiber Optic Installation at Southern California Edison Company Kern River No.1 Powerhouse Sequoia National Forest, Kern County, California	Parr, R.E	2009	No
–	KE-03728	–	Cultural Resource Assessment for the Installation of a Power Pole on the Southern California Edison Company Kern River No. 1 Hydroelectric Project Erksine 12 kV Circuit Sequoia National Forest, Kern River Canyon, Kern County, California	Parr	2009a	Yes
–	KE-03899	R2009051354110	Cultural Resource Assessment for a Fiber Optic Cable Installation at Southern California Edison Company Kern River No. 1 Powerhouse Sequoia National Forest, Kern County, California	Parr	2009b	Yes
–	KE-03679	–	Cultural Resource Assessment for the Replacement of Twenty-one Deteriorated Power Poles on the Southern California Edison Company Erskine 12 kV Circuit, on the Sequoia National Forest, in Kern River Canyon, Kern County, California	Parr	2009c	Yes
–	KE-03852	–	Cultural Resource Assessment for the Replacement of Three Deteriorated Power Poles on the Southern California Edison Company Erskine 12 kV Circuit, Sequoia National Forest, Kern River Canyon, Kern County, California	Parr	2009d	No
–	KE-03965	–	Cultural Resource Assessment for the Replacement of Fourteen Deteriorated Power Poles on the Southern California Edison Company Bonanza, Erskine, Faye, Mustang, and Tungsten 12 kV Circuits and Pascoe 2.4 kV Circuit in the Vicinity of Lake Isabella, Kern County, California	Parr	2009f	No
–	–	R2009051354073*	KR-1 Pole Replacement	N/A	2009	Yes
–	–	R2009051354062	Democrat Pole Replacement	Kelly	2009a	Yes
–	–	R2009051354096	KR-1 Pole Replacement	Kelly	2009b	Yes

SCE Document No.	Information Center Report No.	Forest Service Report No.	Study	Author	Year	In APE?
–	–	R2008051354060	Piute Roadside Hazard	USFS	2008	Yes
–	KE-04022	R2008051354010	Archaeological Assessment Report for the Borel Hydroelectric Project Democrat Dam 4E Conditions, Sequoia National Forest, Kern County, California	Pollock	2008a	Yes
–	–	R2008051354012	Archaeological Assessment Report for the Borel Hydroelectric Project Democrat Dam Cableway Improvements, Sequoia National Forest, Kern County, California	Pollock	2008b	Yes
–	–	R2008051354026	Cow Flat Road Maintenance	Kelly	2008a	No
–	KE-03910	–	Archaeological Assessment Report for the Kern River 1 Hydroelectric Project Upper Tram Platform Replacement Sequoia National Forest, Kern County, California	Pollock	2007a	Yes
–	KE-03993	–	Archaeological Assessment Report for the Kern River 1 Hydroelectric Project Distribution Line Pole Interset, Sequoia National Forest, Kern County, California	Pollock	2007b	Yes
-	-	R2007051354007*****	Re-Issuance of FLPMA Road SUP Permits	N/A	2007	No
–	KE-03527	–	Archaeological Survey Report for the Southern California Edison Company Replacement of One Deteriorated Pole (#1710724E) Erskine 12KV Circuit on Public Land in Sequoia National Forest Kern County, California (WO#6053-4800, JI#6-4813)	Jordan	2007	No
–	–	R2005051354003	Clear Creek Forest Health Improvement	USFS	2005	Yes
–	KE-03350	–	Cultural Resources Inventory of Pacific Gas and Electric Company's Kern Canyon Project and National Register of Historic Places Evaluation of Pacific Gas and Electric Company's Kern Canyon Powerplant, Pacific Gas and Electric Company's Kern Canyon Project, FERC No. 178, Kern County, California	Pacific Legacy, Inc.	2002	No

SCE Document No.	Information Center Report No.	Forest Service Report No.	Study	Author	Year	In APE?
–	KE-02314	–	Archaeological Survey Report for a Pavement Rehabilitation Project (Route 178, Kern County, California), Caltrans District 6, Fresno	Hovey	1999	Yes
–	KE-00640	–	Negative Archaeological Survey Report for 06-KER-178, P.M. 18.9/19.4	McGowan and Weigel	1998	No
–	KE-00219	–	Negative Archaeological Survey Report for 06-KER-178, P.M. 16.5/17.0	Chamberlin and Marine	1997	No
–	KE-00218	–	Negative Archaeological Survey Report for 06-KER-178, K.P. 24.62	Wickstrom	1996	Yes
–	–	R1996051354011	Badger Gap Trail	USFS	1996	No
–	–	R1996051354012	Clear Creek Trail Re-Route	USFS	1996	No
–	KE-00602	–	Abandoned Mine Reclamation-1996 (ARR No. 54-96-8)	Lomax	1996	Yes
–	–	R1995051354007	Democrat Parking Lot Stabilization Project R1995051354007 2004 Unknown Southern California Edison, Kern River No. 1 Powerhouse, Tunnel 19 Maintenance	Manuel	1995	No
–	KE-01526	–	Gem Mine Plan of Operations	Silvis et al.	1994	No
–	KE-02081	–	Kern Canyon Salamander Rehab. Project (ARR No. 05-13-54-94-11)	Ptomey	1994a	No
–	KE-02082	–	Gashouse Salamander Rehab. (ARR No. 05-13-54-94-10)	Ptomey	1994b	Yes
–	KE-00089	–	Proposed PG&E Cableway	Caruso	1994	Yes
–	KE-01983	–	Red Cloud Mine Project (ARR No. 05-13-54-93-16)	Ptomey	1993a	No
–	KE-01985	–	Mine Rehab Project FY 93 #2 (ARR No. 05-13-54-93-17)	Ptomey	1993b	Yes
–	–	R1993051354010	Democrat Raft Take Out Project	Ptomey	1993d	Yes

SCE Document No.	Information Center Report No.	Forest Service Report No.	Study	Author	Year	In APE?
–	KE-02000	–	Archaeological Survey Report Kern River No. 1 Transmission Line from the Powerhouse to Tower 1-4, Kern County, California	Taylor	1992	No
–	–	R1993051354002	Archaeological Survey Report for a Proposed Passing Lane Project on Route 178 Near Democrat Hot Springs in Kern Canyon, Kern County, California	Parr	1992	No
–	–	R1990051354005	Brown Meadow Underground Water Tank Survey	USFS	1990	No
–	KE-00984	–	Negative Archaeological Survey Report for 06-KER-178, P.M. 23.2/23.5	Riley and Kennedy	1990	Yes
-	-	R1990051354001*	Clear Creek Horizontal Well	N/A	1990	No
–	KE-00983	–	Negative Archaeological Survey Report for the Realignment of Bridge Approaches and Replacement of Bridge #50-47, Cottonwood Creek, California	Riley and Martin	1989	Yes
-	KE-03544	-	Historic Resource Evaluation Report Kern River No. 1 Power House 6-KER-178, 15.3 06-275701	Mikesell	1988	Yes
–	KE-01929	–	Negative Archaeological Survey Report for 06-KER-178, P.M. 26.9/27.3	Dondero	1988a	No
–	KE-00236	–	Historic Property Survey Report for a Proposed Overlay, Widening and Curve Realignment Project at the Southern California Edison Powerhouse No. 1, Kern County	California Department of Transportation	1988	Yes
–	KE-01960	–	Kern River Pipeline: Cultural Resource Overview	Dames and Moore	1986	Yes
–	KE-01783	–	An Inventory and Evaluation of Archaeological and Historic Resources along the Kern River in the Vicinity of Democrat Hot Springs, Kern County, California, for the Proposed SCE Democrat Hydroelectric Project	White and Taylor	1984	Yes
–	–	R1984051354008	Brown Timber Sale	USFS	1984	No

SCE Document No.	Information Center Report No.	Forest Service Report No.	Study	Author	Year	In APE?
–	–	R1984051354008	Lookout Timber Sale	USFS	1984	No
–	–	R1981051354014	Brown Meadow Encroachment Project	USFS	1981	No
–	–	R1981051354009	Democrat Hot Springs Road	Silvis	1981	No
–	KE-00583	–	Archaeological Evaluation of Pipeline in Kern Canyon for Leedshill	Schiffman and Lewis	1981	No
–	KE-01183	–	Prehistory of Kern County: An Overview	Schiffman and Garfinkel	1981	Yes
–	–	R1980051354005	Bearout Timber Sale	USFS	1980	Yes
–	–	R1980051354006	Bearout Timber Sale	USFS	1980	Yes
–	–	R1979051354010	Saddle Helicopter Timber Sale	USFS	1979	Yes
–	KE-02232	–	Notes on Pictographs and Petroglyphs, Mostly in Kern County	Cawley	1963	Yes
–	–	R1993051354016	Red Cloud Mine Project (ARR No. 05-13-54-93-16)	Ptomey	1933[a]	No
–	KE-03963	–	Cultural Resource Assessment for the Upgrade of Two Power Poles on the Southern California Edison Company Kern River 1 Hydroelectric Project, Erskine 12 kV Circuit, Sequoia National Forest, Kern River Canyon, Kern County, California	Parr	2009e	Yes

* Could not locate report on SCE Archaeological Database

Notes:
ARR = Archaeological Resources Report;
BAER = Burned Area Emergency Response;
FLPMA = Federal Land Policy and Management Act;
PG&E = Pacific Gas and Electric Company;
SUP = Special Use Permit

Table 13.3-2. Previously Recorded Archaeological Resources within the Study Area

Primary No. (P-15-)	Trinomial (CA-KER-)	Forest Service No.	Period	Resource Type	Description	NRHP Status
Within or Adjacent to the APE						
001928	1928	05-13-54-243	pre-contact	Site	midden with 13 bedrock milling features	Recommended eligible as a district with other sites (White and Taylor 1984)
001930	1930	05-13-54-246	pre-contact	Site	11 bedrock milling features	Recommended eligible as a district with other sites (White and Taylor 1984)
001936	1936H	05-13-54-240	historical	Site	gold mine	Recommended probably eligible (White and Taylor 1984)
001944	1944	05-13-54-254	pre-contact	Site	4 bedrock milling features	Recommended eligible as a district with other sites (White and Taylor 1984)
015663	8645H	05-13-54-839	historical	Site	Refuse scatter	Unevaluated
020124	10997H	05-13-54-812	historical	Site	Folsom Prison Construction Camp/Rich Bar Prison Camp	Unevaluated
Within the Study Area but Outside the APE						
019928	--	--	historical	Isolate	aqua glass bottle base	N/A
	Other: HTMP_SQNF_ISO_007_JS		historical	Isolate	Car Frame	N/A

Primary No. (P-15-)	Trinomial (CA-KER-)	Forest Service No.	Period	Resource Type	Description	NRHP Status
001676	1676H	05-13-54-234	historical	Site	Gem Mine	Recommended Not Eligible (Storm 2004)
001926	1926	05-13-54-235	pre-contact	Site	3 bedrock milling features	Recommended eligible as a district with other sites (White and Taylor 1984)
001929	1929	05-13-54-244	pre-contact	Site	12 bedrock milling features	Recommended eligible as a district with other sites (White and Taylor 1984)
001931	1931	05-13-54-249	pre-contact	Site	1 bedrock milling feature	Recommended eligible as a district with other sites (White and Taylor 1984)
001932	1932	05-13-54-250	pre-contact	Site	1 bedrock milling feature	Recommended eligible as a district with other sites (White and Taylor 1984)
001933	1933	05-13-54-236	pre-contact	Site	2 bedrock milling features	Recommended eligible as a district with other sites (White and Taylor 1984)
001934	1934	05-13-54-238	pre-contact	Site	2 bedrock milling features	Recommended eligible as a district with other sites (White and Taylor 1984)

Primary No. (P-15-)	Trinomial (CA-KER-)	Forest Service No.	Period	Resource Type	Description	NRHP Status
001935	1935	05-13-54-239	pre-contact	Site	10 bedrock milling features	Recommended eligible as a district with other sites (White and Taylor 1984)
001937	1937	05-13-54-241	pre-contact	Site	23 bedrock milling features	Recommended eligible as a district with other sites (White and Taylor 1984)
001938	1938H	05-13-54-242	historical	Site	Collapsed cabin/shed and 2 trash dumps	Potentially Eligible (White and Taylor 1984)
001939	1939	05-13-54-245	pre-contact	Site	1 bedrock milling feature	Recommended eligible as a district with other sites (White and Taylor 1984)
001940	1940H	05-13-54-247	historical	Site	foundation, well, cistern	Potentially Eligible (White and Taylor 1984)
001941	1941H	05-13-54-237	historical	Site	Democrat Hot Springs Hotel (foundations)	Recommended potentially eligible (White and Taylor 1984)
001942	1942H	05-13-54-251	historical	Site	gold mine	Potentially Eligible (White and Taylor 1984)
001943	1943	05-13-54-253	pre-contact	Site	2 bedrock milling features	Unevaluated

Primary No. (P-15-)	Trinomial (CA-KER-)	Forest Service No.	Period	Resource Type	Description	NRHP Status
003360	3360/H	--	multicomponent	Site	bifacial mano, concrete foundation, construction refuse, trees	Recommended not Eligible (Valdez et al. 1992)
003907	3907H	05-13-54-316	historical	Site	Red Cloud Mine	Unevaluated
013709	--	--	historical	Site	Democrat Guard Station	Unevaluated
015667	8649H	05-13-54-840	historical	Site	earthen pad and refuse scatter	Unevaluated
020316	11124	--	pre-contact	Site	hunting blind	Unevaluated
--	--	05-13-54-005	historical	Site	dredge mining equipment	Unknown
--	--	05-13-54-020	pre-contact	Site	10 bedrock mortars	Unevaluated
--	--	05-13-54-603	pre-contact	Site	bedrock mortar	Unknown
--	--	05-13-54-819	Unknown	Unknown	Unknown	Unknown
--	--	05-13-54-826	historical	Site	Unknown	Unknown

Table 13.3-3. Previously Recorded Built Environment Resources within the Study Area

Resource Name	Construction Date	NRHP Evaluation Status
Within and Adjacent to APE		
Kern River No. 1 Powerhouse and associated features FS 05-13-54-838	1902-1907	Contributing, KR1HD;Determined Eligible for the NRHP/CRHR (SHPO Ref. No. FHWA881212A)
Democrat Dam P-15-001927H CA-KER-1927H FS 05-13-54-237	1902-1907	Contributing, KR1HD
Kern River No. 1-Los Angles 66KV Transmission Line P-15-010562/P-15-015251	1907	Not Eligible for the NRHP/CRHR (SHPO Ref. No. FERC_2012_1003_001)
Concrete culvert and water basin P-15-015664 CA-KER-8646H FS 05-13-54-862	1925	Unevaluated for the NRHP/CRHR
Concrete culvert P-15-015665 CA-KER-8647H FS 05-13-54-863	1925	Unevaluated for the NRHP/CRHR
Concrete culvert P-15-015666 CA-KER-8648H FS 05-13-54-864	1925	Unevaluated for the NRHP/CRHR
CA-178/Kern Canyon Road P-15-020317	1902-1907; 1922-1931	Recommended Eligible for the NRHP/CRHR
Within the Study Area but Outside the APE		
Water conveyance features and penstock tower P-15-013720	ca 1902-1907	Unevaluated for the NRHP/CRHR

Table 13.3-4. Components of Kern River No. 1 Hydroelectric Project Historic District (FS No. 05-13-54-838H)

Component	Sub-Components	Contributing / Non-Contributing Element	Comments
Intake Dam (Democrat Dam)		Contributing	P-15-001927
Intake Gate		Contributing	
Flume		Non-contributing	P-15-001927; Multiple replacements of original redwood flume; currently metal
Sandbox		Contributing	P-15-001927
Tunnels		Contributing	P-15-001927
Forebay		Contributing	
Penstock		Contributing	
Bypass conduit		Non-contributing	Original redwood conduit replaced with metal pipe
Powerhouse		Contributing	P-15-003544
	Turbines	Contributing	
	Generators	Contributing	
	Exciters	Non-contributing	Replaced by digital exciters in 1994; HAER No. CA-165-A
	Tailrace	Contributing	
	Switchboard	Contributing	
	Transformers	Non-contributing	Original transformers replaced
Boarding House/Office		Contributing	
	Garages	Non-contributing	Substantially modified
	Parking Lot/rock walls	Non-contributing	Leveled/substantially modified
Forebay Tram		Contributing	
Stable		Contributing	SHPO concurrence FERC080206D; HAER documentation for mitigation of removal of stable

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MAPS

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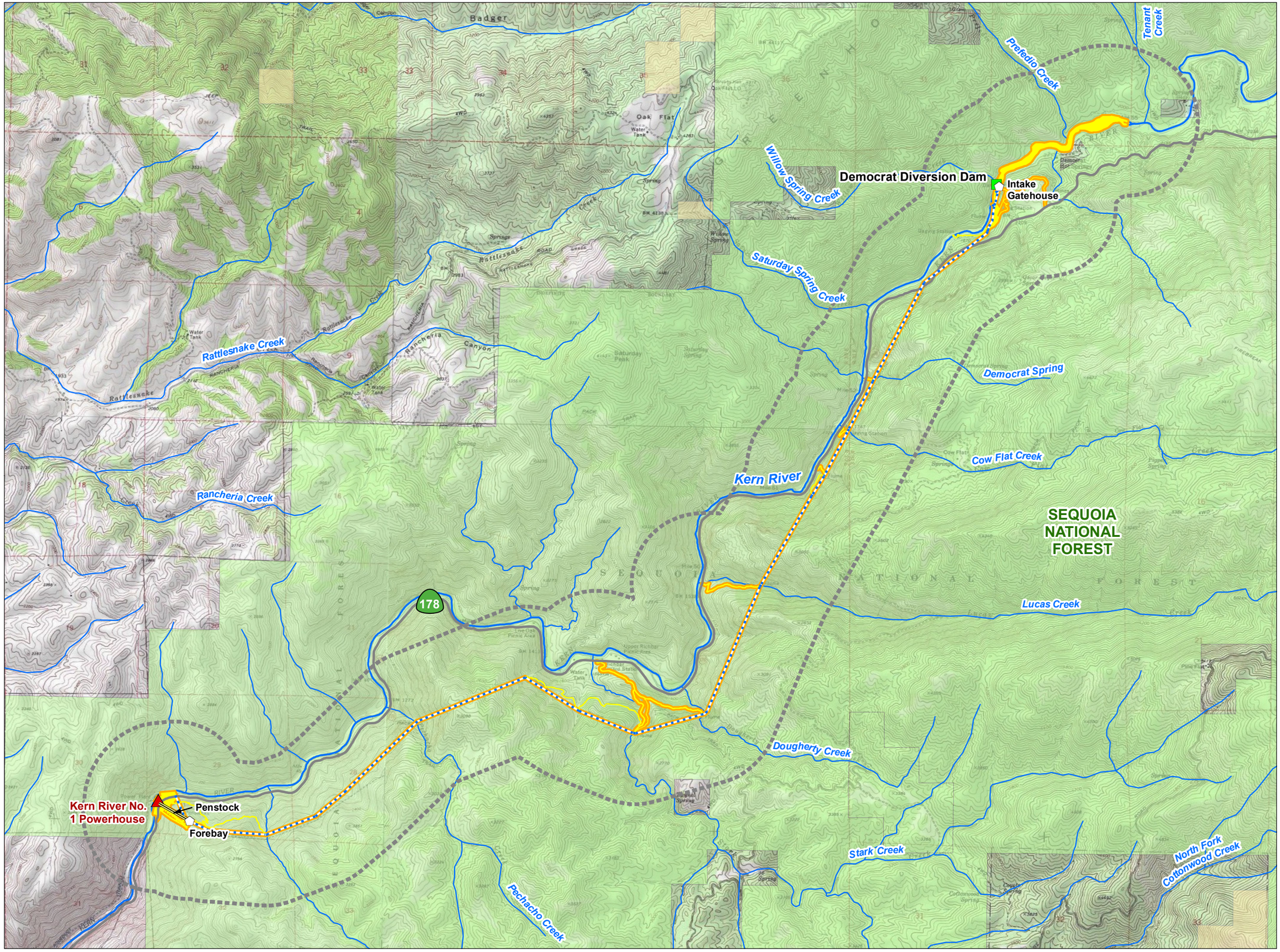


Facilities

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

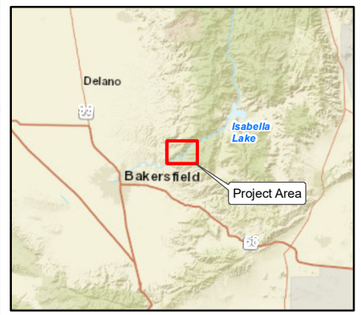
Other Features

- Watercourse
- Highway
- Project APE
- 0.5 Mile Study Area

Land Jurisdiction*

- U.S. Forest Service
- U.S. Bureau of Land Management
- Private (Blank)

*SOURCE: BLM 2021



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

Map 3.13-1

APE and Study Area Map

Date: 3/30/2023

0 0.25 0.5 Miles

Projection: UTM Zone 11
Datum: NAD 83

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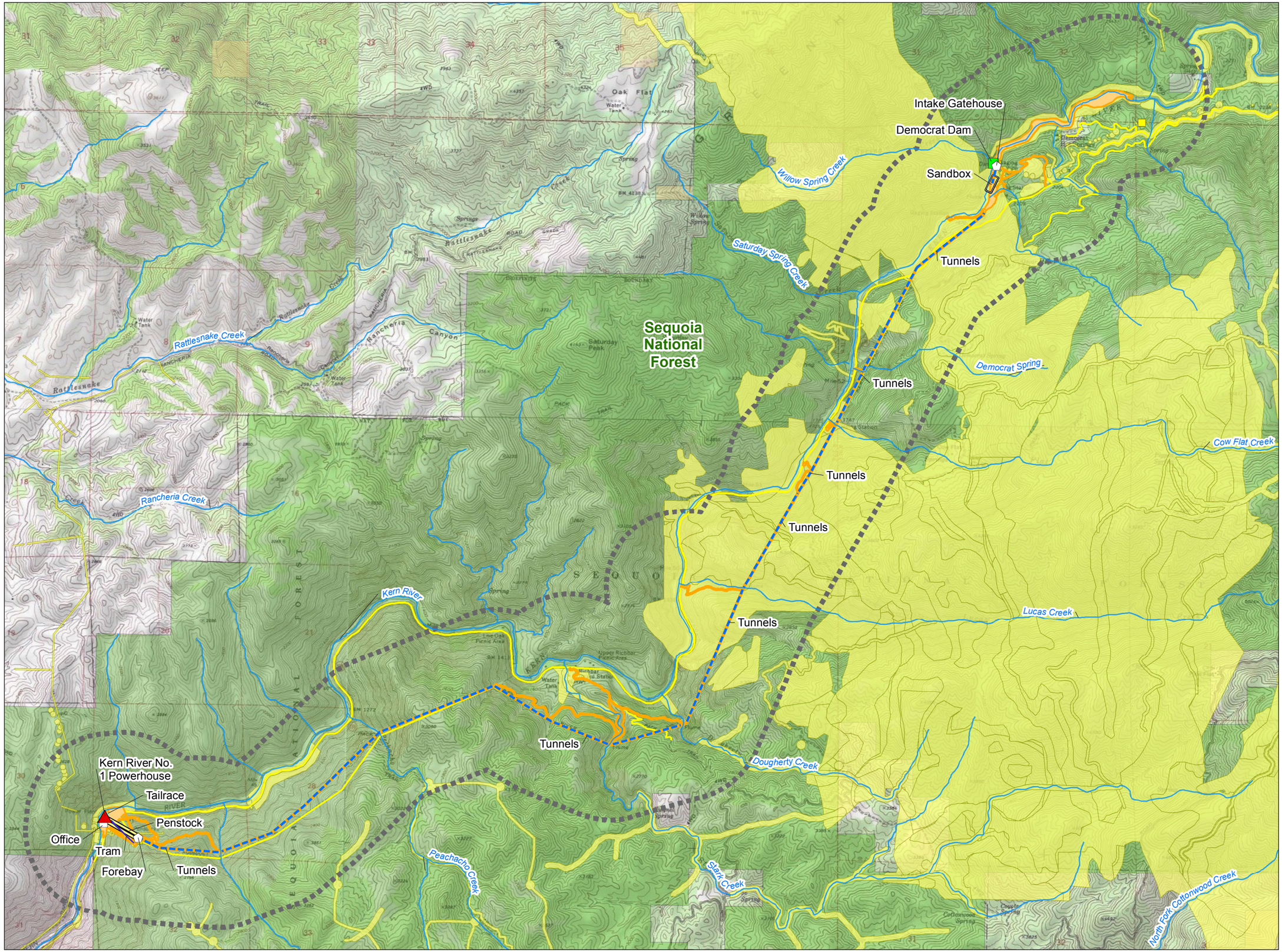

Facilities

- Water Conveyence Feature
- Office
- Dam
- Powerhouse
- Tram
- Tailrace
- Sandbox
- Tunnels
- Penstock
- Streams_Rivers

Report

- Survey report (point)
- Survey report (line)
- Survey report (polygon)

Project

- APE (Area of Potential Effects)
- Study Area

Land Jurisdiction

- Bureau of Land Management
- US Forest Service
- Unclassified

SOUTHERN CALIFORNIA EDISON®
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Kern River No. 1 Project (FERC 1930)

Map 3.13-2
Overview Previous Cultural Resource Studies within the Study Area

0 0.25 0.5 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 4/14/2023

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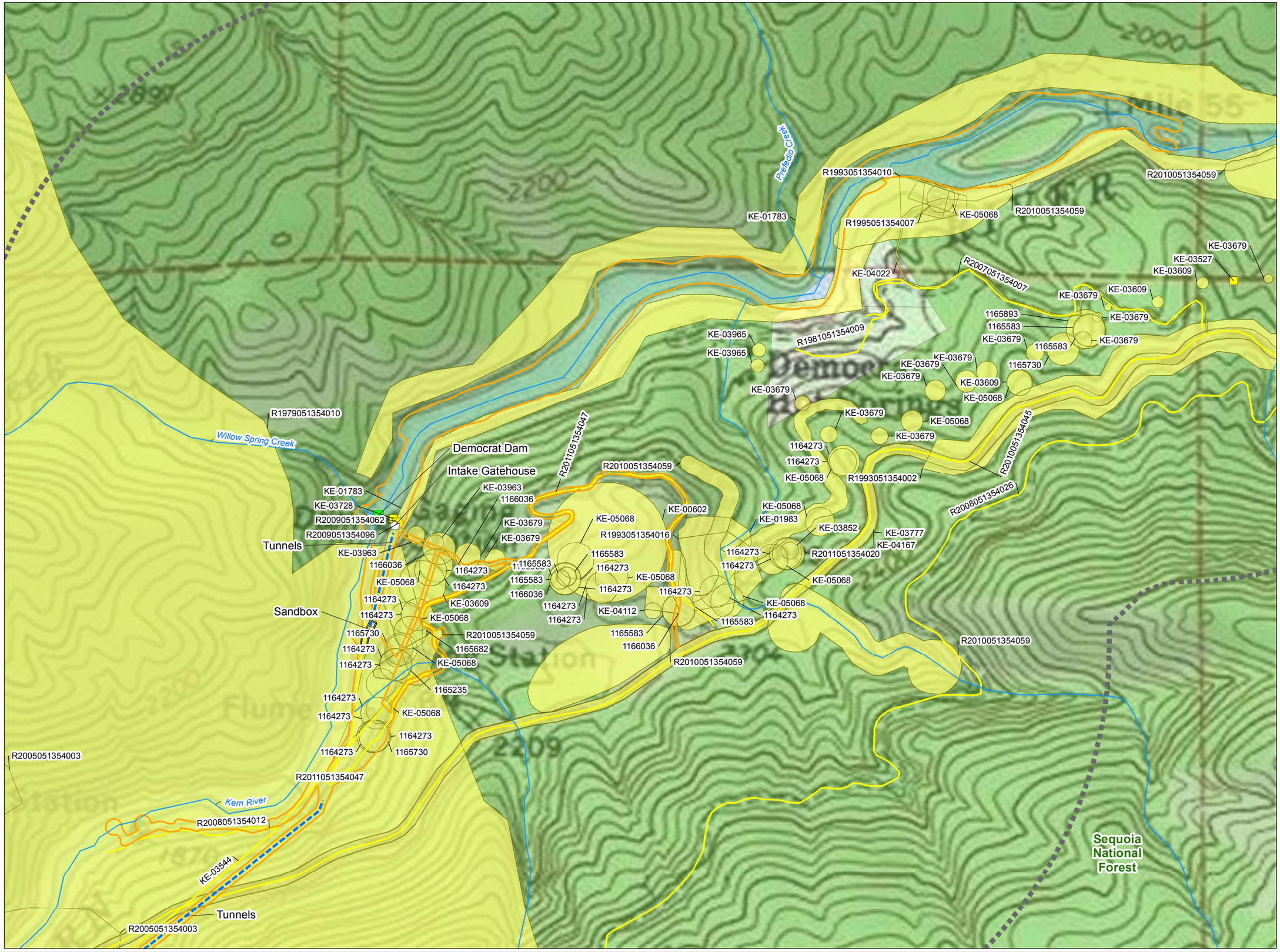

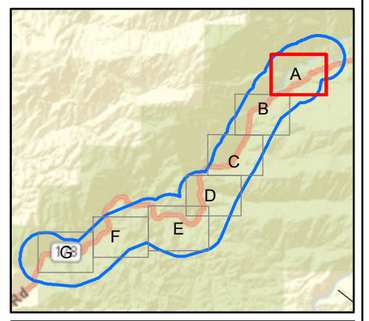

Facilities

- Water Conveyence Feature
- Office
- Dam
- Powerhouse
- Tram
- Tailrace
- Sandbox
- Tunnels
- Penstock
- Streams_Rivers
- <all other values>

Report

- Survey report (point)
- Survey report (line)
- Survey report (polygon)

Project

- APE (Area of Potential Effects)
- Study Area

Land Jurisdiction

- Bureau of Land Management
- US Forest Service
- Unclassified

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Kern River No. 1 Project (FERC 1930)

Map 3.13-2a
Previous Cultural Resource Studies within the Study Area

0 250 500 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 4/14/2023

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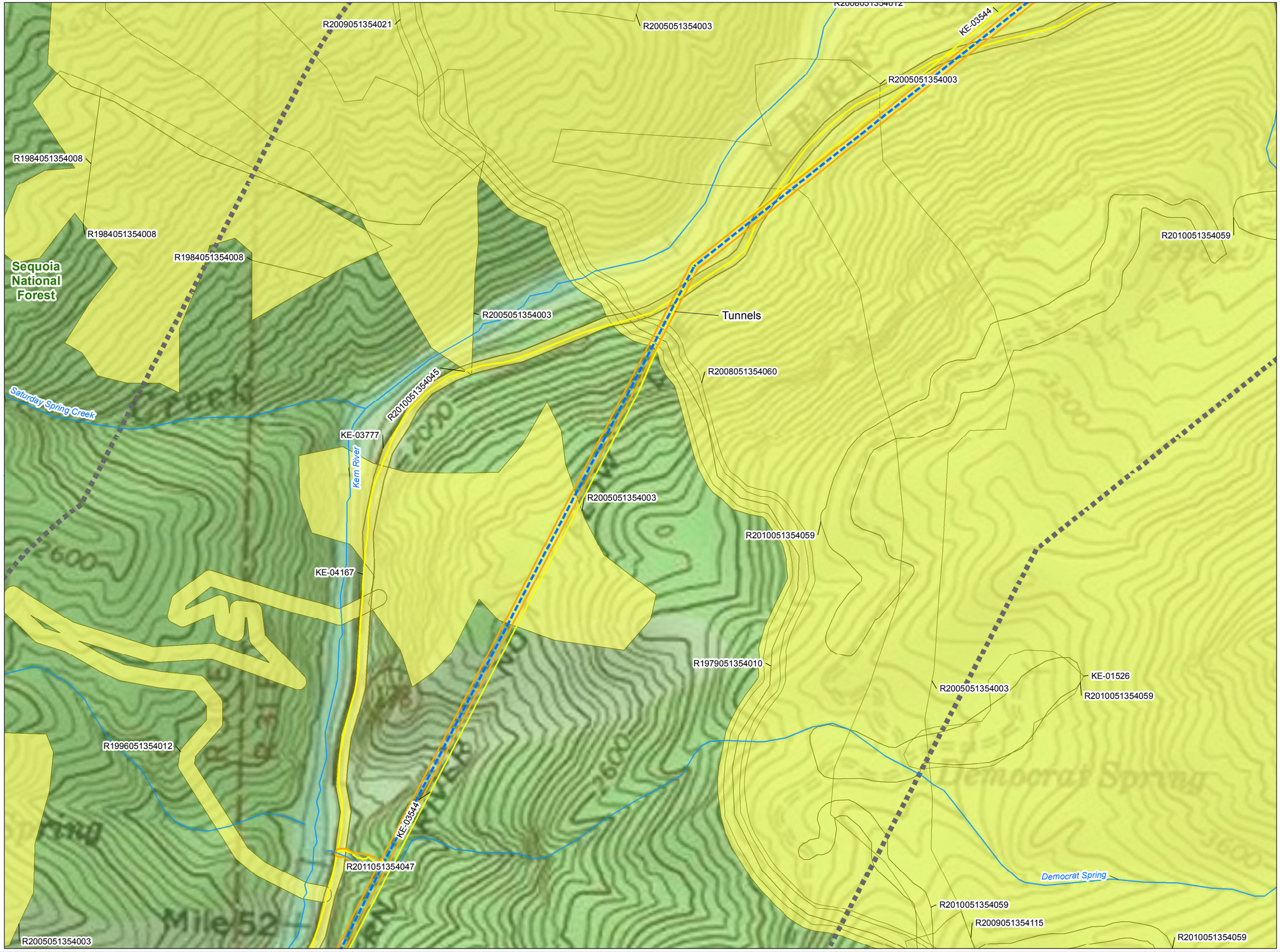

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Kern River No. 1 Project (FERC 1930)

Map 3.13-2b
Previous Cultural Resource Studies within the Study Area

Date: 4/14/2023

0 250 500 Feet

Projection: UTM Zone 11
Datum: NAD 83

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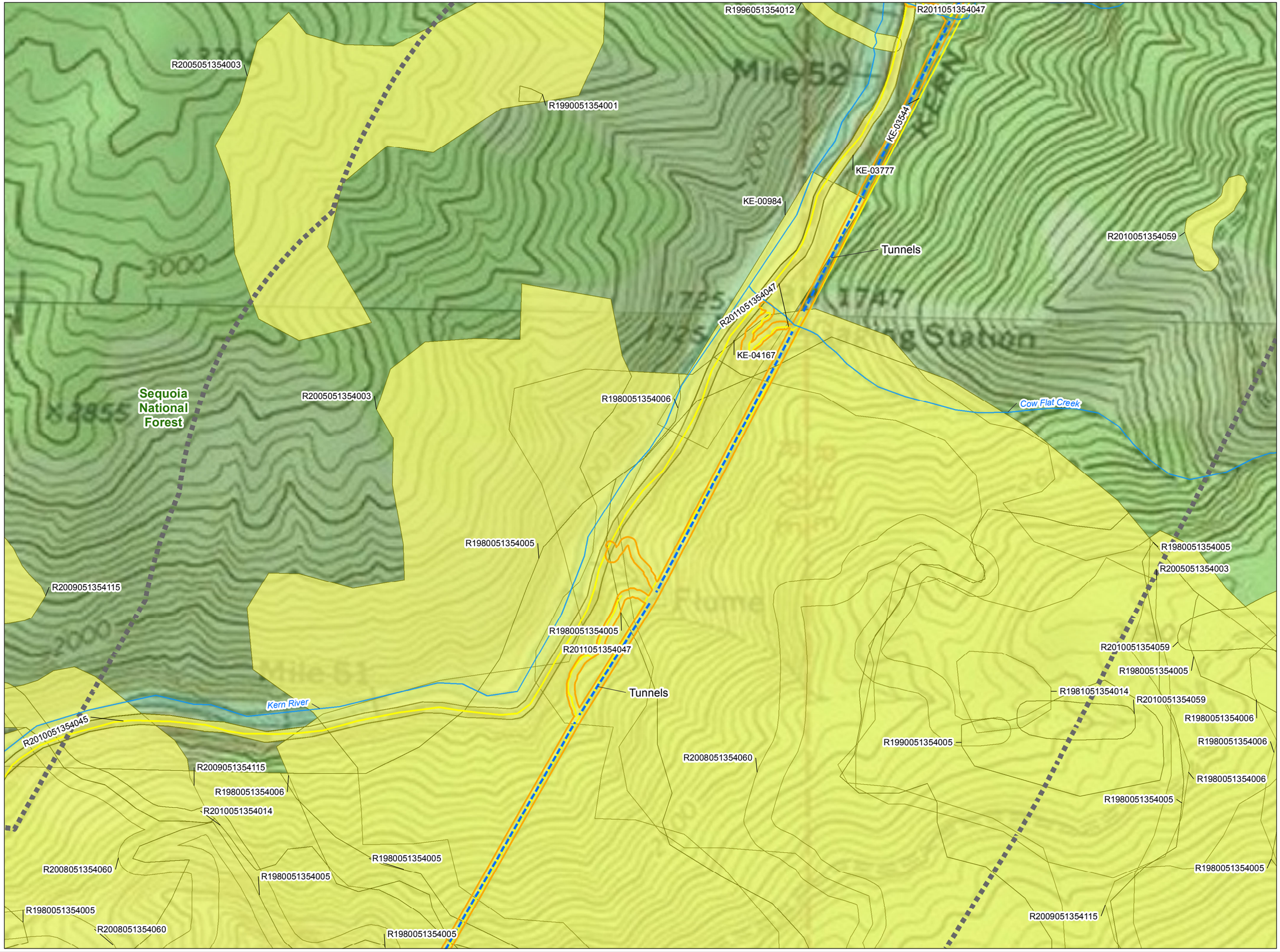


Facilities

- Water Conveyence Feature
- Office
- Dam
- Powerhouse
- Tram
- Tailrace
- Sandbox
- Tunnels
- Penstock
- Streams_Rivers
- <all other values>

Report

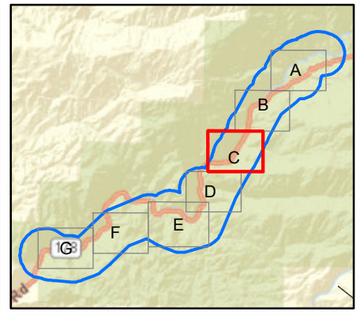
- Survey report (point)
- Survey report (line)
- Survey report (polygon)

Project

- APE (Area of Potential Effects)
- Study Area

Land Jurisdiction

- Bureau of Land Management
- US Forest Service
- Unclassified



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Kern River No. 1 Project (FERC 1930)

Map 3.13-2c
Previous Cultural Resource Studies within the Study Area

0 250 500 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 4/14/2023

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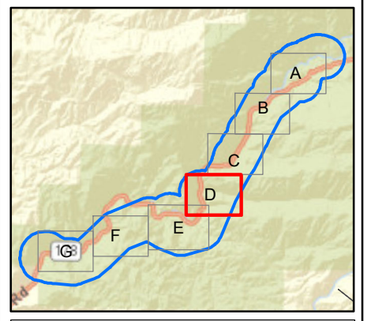
R2008051354060
R2010051354014
R1980051354005
R1980051354005
Kern River
R2009051354021
R2011051354047
R2011051354047
Tunnels
R2005051354003
R2008051354060
R1980051354005
R1980051354006
R1980051354005
R2009051354115
R2010051354014
R2009051354115
KE-03777
KE-04167
R2010051354045
KE-03544
Kern River
Lucas Creek
R1980051354006
R1984051354008
R1980051354005
Sequoia National Forest
R1984051354008
R2010051354059
R1984051354008

Facilities
- Water Conveyence Feature
- Office
- Dam
- Powerhouse
- Tram
- Tailrace
- Sandbox
- Tunnels
- Penstock
- Streams_Rivers
- <all other values>

Report
- Survey report (point)
- Survey report (line)
- Survey report (polygon)

Project
- APE (Area of Potential Effects)
- Study Area

Land Jurisdiction
- Bureau of Land Management
- US Forest Service
- Unclassified



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Kern River No. 1 Project (FERC 1930)

Map 3.13-2d
Previous Cultural Resource Studies within the Study Area

0 250 500 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 4/14/2023

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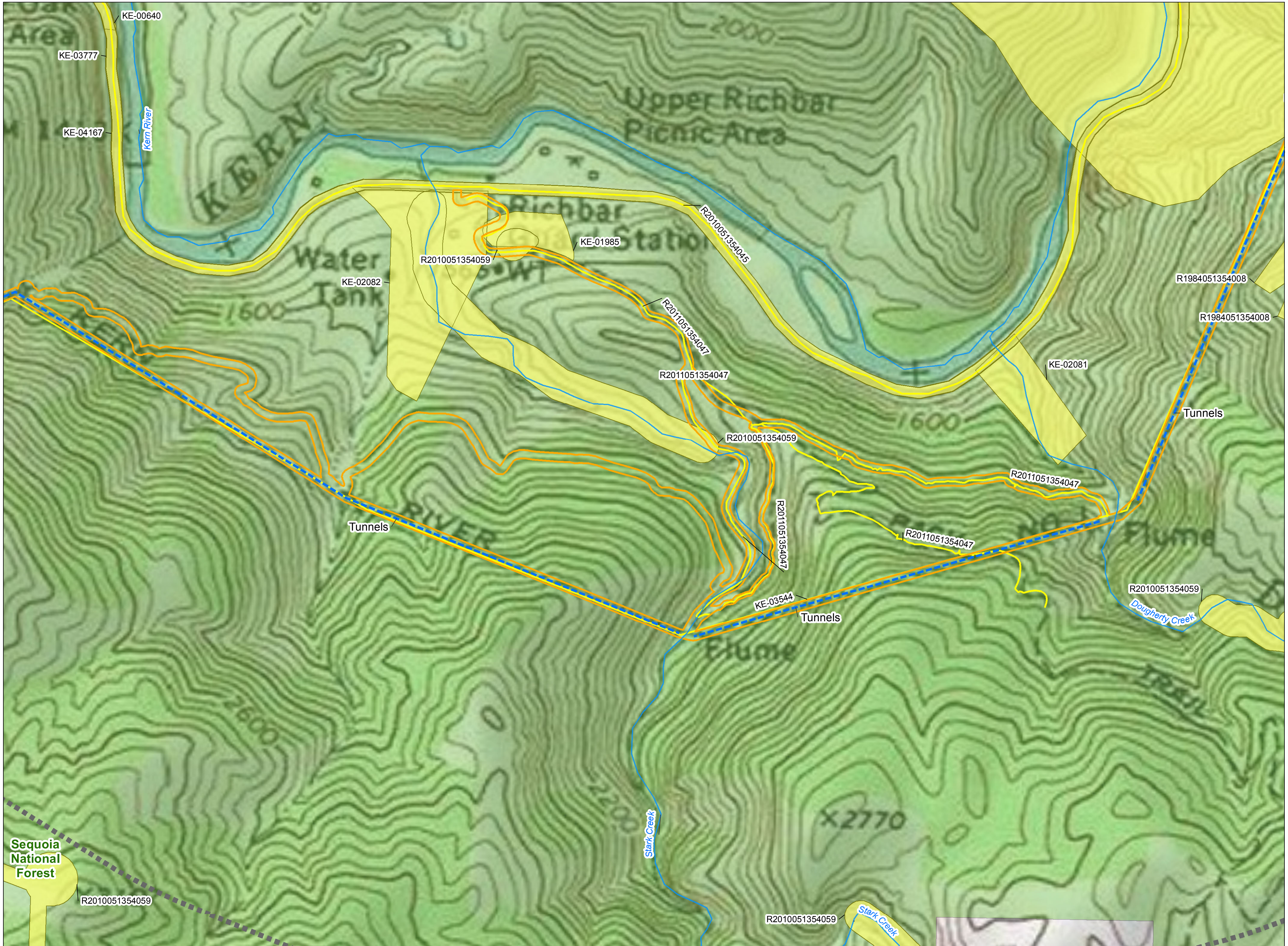

Facilities
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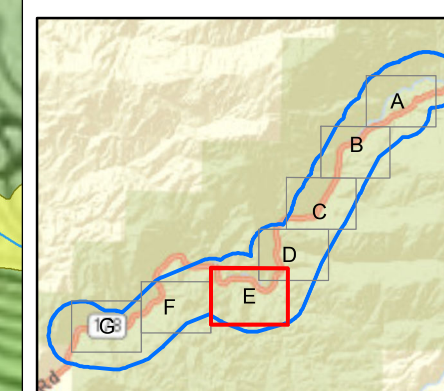
- Office
- Dam
- Powerhouse
- Tram
- Tailrace
- Sandbox
- Tunnels
- Penstock
- Streams_Rivers
- <all other values>

Report
- Survey report (point)
- Survey report (line)
- Survey report (polygon)

Project
- APE (Area of Potential Effects)
- Study Area

Land Jurisdiction
- Bureau of Land Management
- US Forest Service
- Unclassified



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Kern River No. 1 Project (FERC 1930)

Map 3.13-2e
Previous Cultural Resource Studies
within the Study Area

Date: 4/14/2023

0 250 500 Feet

Projection: UTM Zone 11
Datum: NAD 83

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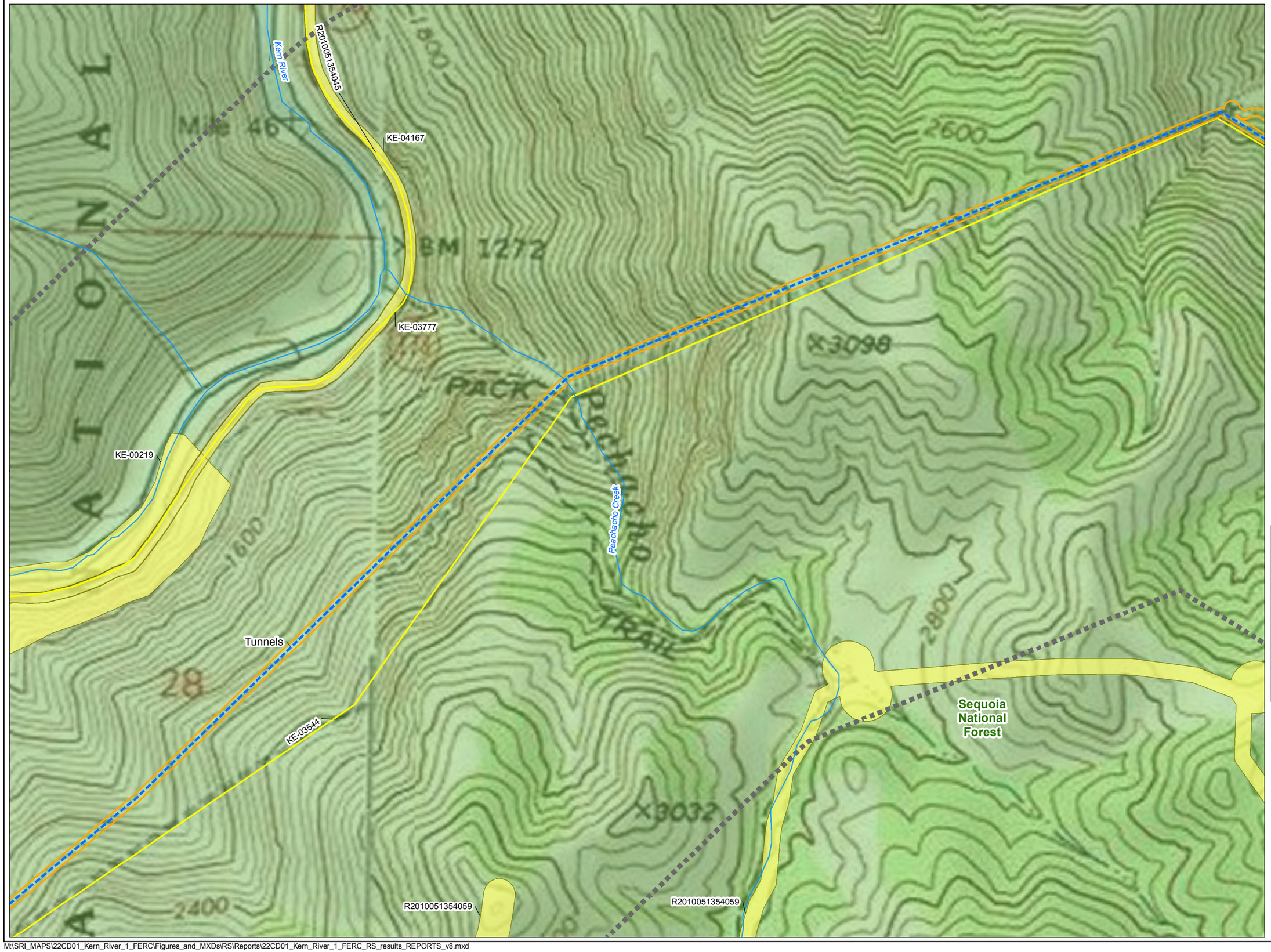

Facilities

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- Office
- Dam
- Powerhouse
- Tram
- Tailrace
- Sandbox
- Tunnels
- Penstock
- Streams_Rivers
- <all other values>

Report

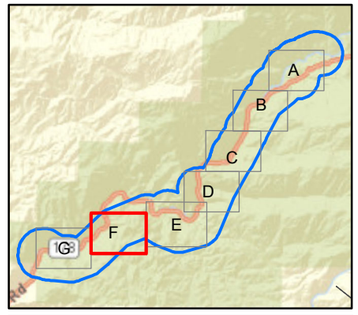
- Survey report (point)
- Survey report (line)
- Survey report (polygon)

Project

- APE (Area of Potential Effects)
- Study Area

Land Jurisdiction

- Bureau of Land Management
- US Forest Service
- Unclassified



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Kern River No. 1 Project (FERC 1930)

Map 3.13-2f
Previous Cultural Resource Studies within the Study Area

0 250 500 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 4/14/2023

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Sequoia National Forest

Kern River

KE-00219

KE-04167

KE-03777

KE-00219

Tailrace

Kern River No. 1 Powerhouse

KE-00218

KE-03777
KE-00089
KE-00236
KE-03544
KE-03895
KE-03895
KE-05068
1164273
1165335
1165335
1165335
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KE-02000
KE-03350
KE-02314
KE-03777

KE-00236
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Penstock
Office
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KE-03993
1165344
1165344
KE-03910
1165978
1165344
Forebay
1165344
1165344
KE-03899
KE-00218
KE-03777
Tram
1165657
KE-05068
KE-03993
KE-03910

Tunnels

Tunnels

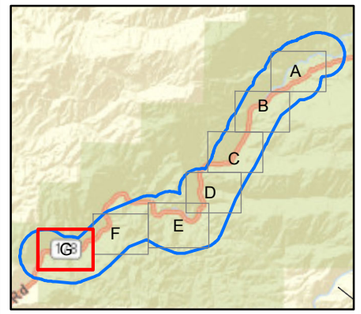
1165344

Facilities
- Water Conveyence Feature
- Office
- Dam
- Powerhouse
- Tram
- Tailrace
- Sandbox
- Tunnels
- Penstock
- Streams_Rivers
- <all other values>

Report
- Survey report (point)
- Survey report (line)
- Survey report (polygon)

Project
- APE (Area of Potential Effects)
- Study Area

Land Jurisdiction
- Bureau of Land Management
- US Forest Service
- Unclassified



SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Kern River No. 1 Project (FERC 1930)

Map 3.13-2g
Previous Cultural Resource Studies within the Study Area

0 250 500 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 4/14/2023

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CONFIDENTIAL

The following map is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of sensitive cultural resources, and qualifies as Confidential Information (36 CFR § 800.11(c)(1)). Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings visit: https://www.ferc.gov/enforcement-legal/foia.

Map 3.13-3. Overview of Previously Recorded Cultural Resources within the Study Area (Confidential)

Map 3.13-3 (overview of resources within APE and Study Area) will not be distributed to the general public. Documents containing Confidential Information may be requested by entities and organizations with jurisdiction over these resources. To request copies, please contact David Moore, SCE Relicensing Project Manager at (626) 999-6101 or david.moore@sce.com.

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CONFIDENTIAL

The following map is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of sensitive cultural resources, and qualifies as Confidential Information (36 CFR § 800.11(c)(1)). Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings visit: https://www.ferc.gov/enforcement-legal/foia.

Maps 3.13-3a–g. Previously Recorded Cultural Resources within the Study Area (Confidential)

Maps 3.13-3a–g (detail map series of cultural resources within APE and Study Area) will not be distributed to the general public. Documents containing Confidential Information may be requested by entities and organizations with jurisdiction over these resources. To request copies, please contact David Moore, SCE Relicensing Project Manager at (626) 999-6101 or david.moore@sce.com.

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LIST OF ACRONYMS

APE	Area of Potential Effect
CFR	Code of Federal Regulations
FERC or Commission	Federal Energy Regulatory Commission
GLO	General Land Office
NAHC	Native American Heritage Commission
NFKR	North Fork Kern River
NRHP	National Register of Historic Places
Project	Kern River No. 1 Hydroelectric Project
SCE	Southern California Edison Company
SFKR	South Fork Kern River
TCP	Traditional Cultural Property

3.14 TRIBAL RESOURCES

This section describes Tribal Resources and Native American Tribes known to have cultural interest in the vicinity of Southern California Edison Company's (SCE) Kern River No. 1 Hydroelectric Project (Project). The Federal Energy Regulatory Commission's (FERC) content requirements for this section are specified in Title 18 of the Code of Federal Regulations (CFR) Chapter I § 5.6(d)(3)(xii).

This section identifies Indian Tribes that are known to have cultural ties or other Tribal interests in the vicinity of the Project, identifies Tribal lands in the vicinity of the FERC Project boundary, and identifies Tribal cultural or economic interests, including Traditional Cultural Properties (TCP) that may be affected by existing Project operation or maintenance activities.

3.14.1 Area of Potential Effects and Study Area

The proposed Tribal resources Area of Potential Effect (APE) for the purposes of study implementation is defined as the area within the FERC Project boundary, a 25-foot buffer from centerline of the access trails located outside of the FERC boundary, and a 50-foot radius around FERC ancillary facilities such as gauges located outside of the FERC boundary (Map 3.14-1). The proposed Tribal resources Study Area is a 5-mile radius around the APE. This Study Area is a guide for archival research, development of the historic context and background statements, and general Tribal informant interviews (Map 3.14-1).

3.14.2 Information Sources

Information presented in this section was collected from readily available, existing ethnographic, ethnohistoric, and other data and represents the type of resources that may be important to local Tribes. Tribal consultation, archival research, and ethnographic interviews have not yet occurred, but will be conducted and/or used to provide information and ensure Tribal interests and concerns are identified and addressed. This section was developed using existing information available in the following primary documents. Additional references are cited in the text, as appropriate.

Archival information sources are anticipated to include, in part:

- California State Library History Room
- California State University Library
- JSTOR Digital Library
- Native American Heritage Commission (NAHC) Sacred Lands File for the Project, received on November 10, 2022 (NAHC 2022)
- Previous/ongoing Tribal studies (SCE Borel License Surrender and Kern River No. 3 Hydroelectric Relicensing Projects)

- Sequoia National Forest
- Tiley Research library
- University of California, Berkeley publications (online access)

3.14.3 Identification of Indian Tribes

3.14.3.1 Background

The Project is located in the Kern River Watershed (Watershed) within the southern Sierra Nevada mountains. Elevations of ridges in the headwaters of the Watershed reach 14,491 feet above sea level at Mount Whitney in Sequoia National Park. The North Fork Kern River (NFKR) is the primary drainage within the Watershed and flows in a southerly direction for approximately 70 miles from its headwaters in Sequoia National Park to Lake Isabella. The South Fork Kern River (SFKR) joins NFKR at Lake Isabella. The lower Kern River flows in a southwesterly direction from Lake Isabella through the narrow, steep-walled Kern Canyon (e.g., 2,500 feet of vertical relief from the river to nearby ridge tops) until it reaches the mouth of the canyon.

Much of the Watershed was inhabited by the Tübatulabal, the Kawaiisu to the south, and the Yokuts to the west. The ethnogeography of the area is somewhat contradictory. Smith (1978) suggests that Tübatulabal range extends from near Mt. Whitney to 41 miles below the junction of the forks of the Kern. This would indicate Tübatulabal territory extended to the canyon mouth. Voegelin, in her 1935 monograph, specifies that the territory ends at a set of rapids about one half mile from the mouth of the gorge (Voegelin 1938).

The Yokuts groups' boundaries indicate that the Paleuyami lived on the north side of the Kern River and in Poso Creek (Figures 3.14.1 and 3.14.2), with their territory extending into the northern foothills. Although their lands were near the north bank of the Kern River, this was far from their core area along Little Poso Creek (Spier 1978). Kroeber asserts that they as well as the Yowlumne visited the Kern Canyon as far up as Kern Falls "and adjacent sites on the Kern River" (1925).

Yowlumne territory extended from at or near the mouth of the Kern River gorge to encompass a large territory on the valley floor centered on Bakersfield (Gayton 1948). Figure 3.14.1 and 3.14.2 are not detailed enough to provide a clear boundary with the Tübatulabal. Wallace's map (1978) of the Southern Valley Yokuts shows five villages east of Bakersfield on the Kern, one of which (Shoko) is apparently within the canyon based upon Latta's more detailed information (Latta 2014). Latta describes the upstream limits of the Yowlumne as "about where the second powerhouse" is located, presumably the Kern River No. 1 Powerhouse.

3.14.3.2 Ethnographers

Tübatulabal

Beginning in 1902 and continuing until the mid-1930s, C. Hart Merriam, an ethnographer, made periodic visits to the area that have not been published, although his journals are available. A.L. Kroeber worked with the Tübatulabal as early as 1907. T.T. Waterman worked with the group from 1910 to 1912, and J.P. Harrington obtained information on the Tribe in 1916. The principal ethnographers of the Tübatulabal were Ermine and Charles Voegelin, beginning in the late 1920s. Ermine Voegelin's 1938 monograph remains the most complete documentation of Tübatulabal culture and Charles Voegelin's work on the Tübatulabal language is similarly important. No ethnographic fieldwork was done for several decades after the Voegelins until Charles Smith's work beginning in 1968. Smith (1978) provided a cultural summary for the Smithsonian handbook. Works by Bob Powers (1979, 1981, 1989, 1991) on regional history provide important information on past and present Native lifeways. More recently, several ethnographic overviews have been conducted that include the Tübatulabal. Blount and McCarthy (1990) conducted an ethnographic overview specifically for SCE's Kern River No. 3 Hydroelectric Project, whereas Davis-King et al. (2010) conducted a much broader overview for the California Department of Transportation (Caltrans) that also included the Tübatulabal.

Yowlumne and Paleuyami Yokuts

The Southern Valley Yokuts are described by Powers (1976); Curtis (1907–1930); Kroeber (1925); Gayton (1948); and Harrington (notes, n.d.). The Culture Element Distribution List was completed by Driver (1937). The work by avocational ethnographer Frank Latta provides an in-depth discussion of Yowlumne unavailable in the other works. Historical documents of interest include an account of Father Garces trip through the area (Coues 1900) and Sherbourne Cook's account of the effect of disease on local populations (Cook 1955). Wallace's 1978 summary includes Yowlumne as a Southern Valley Yokuts group, while Robert Spier's 1978 summary includes Paleuyami in the Foothill Yokuts section.

3.14.3.3 Ethnographic Summary

Tübatulabal

The following section primarily draws upon information from Voegelin (1938) and Smith (1978). Modern ethnographic accounts subsume three Uto-Aztecan groups as Tübatulabal: the Palagewan of the Kern River; Tübatulabal "proper" (or Pahkanapil) of the South Fork of the Kern River, and Toloim (often referred to as Bankalachi) of the Greenhorn Mountains and Poso Creek (Smith 1978; Voegelin 1938). The latter is likely a transitional Yokuts–Tübatulabal group, consisting of an intermarried and bilingual community.

Territory, Travel, and Trade

Tübatulabal territory consisted of almost the entire Kern River Watershed in the southern Sierra Nevada, nearly down to the San Joaquin Valley plus a portion of the western foothills of the southern Sierra Nevada (Smith 1978). Neighboring Tribes consist of the Western Mono and Yokuts (especially Yowlumne) to the west and south, the Kawaiisu and Coso Shoshone to the south and east, and the Owens Valley Paiute to north. The cordial relationships between Tribes facilitated a long-distance trade route eventually connecting the Pacific Ocean to the Great Basin; subsistence strategies were also affected by the potential for resource sharing.

A complex system of trails is assumed to exist within the Tübatulabal territory. However, relatively few of those trails have been documented. Trails within the Tübatulabal core area would have interconnected all the hamlets, ritual locations, fishing spots, springs, river crossings, and resource-procurement localities (e.g., acorn and pinyon areas, deer habitat, places for basketry material, and tobacco fields). In addition, trails would have connected the Tübatulabal core area to other regions to the west and east.

Tübatulabal families visited Tulare Lake in the San Joaquin Valley to fish and hunt ducks (Voegelin 1938), a distance of about 55 miles. This would have entailed a multi-day or perhaps multi-week trip and likely involved interacting with the Yokuts and perhaps other visiting groups.

Travel to the pinyon grounds in the mountains to the east and northeast would have involved a fairly large number of people carrying equipment to the locations(s) and carrying quantities of pinyon nuts back, likely an arduous task. People returning from pinyon collection also traveled to Indian Wells Valley in the Mojave Desert to collect grapes (Voegelin 1938).

The Tübatulabal participated in a multicultural (with the Yokuts, Kitanemuk, Kawaiisu, and others) communal pronghorn hunt in the Southern San Joaquin Valley in July (Voegelin 1938). It has been reported that the location of these hunts was at the Sinks of the Tejon at the foot of Comanche Point just south of Arvin (Barras 1984; Kroeber 1925; Voegelin 1938). To get to that location, Tübatulabal people would have probably traveled down the Kern River Canyon and then south to the Arvin area.

Voegelin (1938) reported that the Tübatulabal went on expeditions to trade with the Yokuts and Chumash as far as the Pacific coast. Such travel would have entailed the use of a number of trails, camps, and interactions well outside the Tübatulabal region.

Important to understanding the use of the lower Kern River is its function as an inter-regional trade route. Tübatulabal people sometimes traveled westward to the coast to trade with Ventureno Chumash, bringing back asphaltum, steatite and clam shells. Obsidian was gained in trade from their eastern neighbors in Owens Valley. Salt and clay were obtained in Koso territory.

Seasonal Resources

The Tübatulabal occupancy was based upon the availability of riverine and terrestrial resources, as well as the potential to access resources from the San Joaquin Valley to the west and upland resources in the Sierras. While the Tübatulabal heartland in the Kern River Valley had an elevation of ca. 2,500 feet above mean sea level, the territory extended eastward to the crest of the Sierras at ca. 14,500 feet above mean sea level. According to Merriam (1898), they are unique among California Indians in having all the California Life Zones in their territory. The variety resulting from this elevational range provided many different resources for the people. Though surrounded by desert or near-desert areas, the area was well watered by the river and springs.

Though their name means 'pine nut gatherers' after their main storable winter food, their diet was wide, including greens, seeds, and mushrooms in the earliest spring in the valley, and fishing in the cold waters of the Kern. In summers, they went to successively higher altitudes following ripening plants, collecting nuts and berries and hunting and fishing along the way. On occasion, these trips continued into Owens Valley for visiting and trading with Paiute people there. In July, some men undertook communal antelope hunting on the plains below the river's mouth, and autumn was a time devoted to collecting acorns in the oak woodlands.

There is no detailed Tübatulabal ethnobotany, but considerable information is present in Voegelin (1938). Voegelin (1938) reported that the Tübatulabal utilized over 220 plant species, 130 of which were of economic or medicinal use. Of those, 56 were obtained in the "foothill floral area," 40 in the "desert floral area," and 10 in the "Great Basin floral area."

Both the Bankalachi and Yokuts came into Tübatulabal Territory to gather pine nuts (Driver 1937). In May, while the cones of the Digger pine were still green and unopened, the cones would be knocked down, gathered, and roasted to open so the nuts could be collected (Voegelin 1938). This "green cone" procurement system prevented the animals getting the nuts before the people did. The same procedure was done for the pinyon in August.

Pronghorn also were hunted in July in the southern San Joaquin Valley in communal hunts with the Yokuts, Kawaiisu, Kitanemuk, and others (Voegelin 1938; see also Kroeber 1925; Latta 1977; Smith 1978).

There is no published ethnographic information regarding the specific species of fish taken, but the only ones known to be present in prehistoric and ethnographic times were the golden trout and the Kern River rainbow trout (Moyle 2002).

In April and October/November, some family groups traveled into the San Joaquin Valley and to Tulare Lake to hunt ducks and fish. The fish available in the lake would have included Sacramento blackfish, hitch, thick-tail chub, Sacramento sucker, Sacramento perch, and tule perch.

Winter was spent in warmer valley locations near the lower Kern River in substantial winter houses consisting of mud-covered thatch, sometimes with a sudatory (sweathouse) in the hamlet. Warm summers required simpler brush shelters for temporary quarters. The

material culture was unsurprising for California, with bedrock milling stations, milling slabs and stone or wood mortars for seed, nut, and other processing. Baskets were multi-functional, serving as containers, cooking pots, and cradle boards; Tübatulabal basket markers were experts at this art. Pottery was made from red clay, and was unpainted. Stone tools were made from both local and imported materials.

Yokuts

Much of the following information is from Latta (2014), who specifically discusses Yowlumne lifeways; more general information is from Wallace (1978) on Southern Valley Yokuts and Spier (1978) on Foothill Yokuts. The Yowlumne are treated as Valley Yokuts by Wallace. The Yokuts are part of the vast Penutian language family whose members inhabited inland California from the Kern Lake area of the Southern San Joaquin Valley to nearly the Oregon border at the north. The Yowlumne Tribe, with lands within the Study Area, held the largest amount of land of any Yokuts group. Their land stretched along the eastern boundary of the San Joaquin Valley, encompassing both the lower foothills and the valley floor.

Their dense population and social complexity have been in part attributed to an "inexhaustible supply" of plant and animal foods from the wetlands, lowland sloughs, lakes, and lower stream courses of rivers and creeks, notably the Kern River for the Yowlumne (Wallace 1978). Abundant ducks and geese, fish, turtle, and mussels came from these environments, while the drier plains supported large herds of pronghorn antelope and tule elk. Roots and seeds were also gathered. While fishing was a year-round activity, seeds and nuts were gathered as they ripened. Tule roots and seeds, grass seeds, and greens, particularly clover, were relished and formed a substantial portion of the diet. Rabbits and elk were hunted in communal drives, and small mammals were shot or caught in snares.

Although tule mat-covered houses were used in summer, the mild lowland environment allowed permanent houses to be built, sometimes arranged in a single row and sometimes joined together as a single, communal residence. As among the Tübatulabal, material goods were dominated by multi-functional baskets, rabbit skin robes, and stone and bone tools. Tule canoes served as the preferred mode of transportation.

3.14.3.4 Ethnohistoric Period

The early ethnohistoric period was experienced differently for Yowlumne Yokuts and Tübatulabal people. In the lower River Kern area, the expedition of Francisco Garces in 1776 may have been the first European contact (Coues 1900). Arriving from the south along Cottonwood Creek, the group was assisted by Indians to safely ford the Kern River, a place name commemorated as Garces Crossing on maps. This was just upstream of the village of Wawcoyo and near the headquarters of the Rio Bravo Ranch. After crossing, the expedition attended a feast at a village on the north shore, probably Hawsu, and gifted people with glass beads and tobacco. In that same year, guides for Pedro Font encountered a group of people near the junction of the North and South Forks of the Kern River (Bolton 1931), possibly Palagewan (Smith 1978).

Later visits had a less friendly intent as the area was scouted for mission locations, encouraged by the area's dense populations. Though no mission was ever established, runaways from the existing mission came frequently, introducing some mission lifeways along with those of their own cultures. The horse was accepted first as a food item, and later as transportation. As punitive expeditions were mounted to recover escaped neophytes, an adversarial relationship resulted. So common was the raiding of horses that the Yokuts began to be called the "Horsethief Indians."

The 1833 malaria outbreak was catastrophic for valley dwellers; Cook (1955) estimates as many as 75% of the population died; some survivors evacuated to the more mosquito-free foothills. Though spared some of the negative effects of early colonization by the Spanish, the Tübatulabal suffered disease outbreaks beginning in the 1830s, though less than the Indian groups from lower elevations. The Bankalachi, a related group from Poso Flat and White River, had moved into the area around historic Kernville decades before to escape the malaria-infested lowlands (Powers 1976).

A combination of increased displacement by miners following 1849, the resulting environmental degradation, and two opposing natural disasters greatly increased conflict to the Tübatulabal in the Kern River Valley. First, a 32-year-long drought caused the Koso Shoshone to relocate in Tübatulabal territory. The local environment was damaged by the Great Flood in the winter of 1861/1862. East of the Sierras, this exceptionally hard winter drove game away just as cattle were beginning to damage their fields of wild hyacinth and nutgrass; and the Owens Valley Paiute were starving. A cowboy found a Paiute man butchering a steer and he shot and killed him. This led to a series of reprisals and counter-reprisals that grew into the Owens Valley War (Chalfant 1922).

Some settlers and miners became fearful and suspicious of the influx of non-local Indians, some of whom were actively at war. Settlers of Keyesville had appealed for assistance to the Major Army Command of the western states. In early April, Lieutenant Colonel William Jones received a petition from citizens of Keyesville and vicinity asking military protection from "Indian depredations." Accordingly, 'Tehachapi' (Kawaiisu) and Owens River Native people involved in raiding the settlers were in the Kern River Valley in local villages The resulting encounter became known as the Keyesville or Whiskey Flat massacre; where some 35 to 40 local Palagewan, and some Yokuts and Kawaiisu, were killed without provocation (Smith 1978; Voegelin 1938).

In the 1870s, some Tübatulabal obtained allotments and land grants and began to farm. Tübatulabal people also worked in ranching, in households, and as field labor, and supplemented their income by selling pine nuts and crafts, such as rope, beadwork, and baskets. After 1900, many Tübatulabal moved to the Tule River Indian Reservation (Smith 1978). Remnants of the Southern Valley Yokuts were sent to the Sebastian Reservation at Tejon, then moved to Tule River Reservation near Porterville. The survivors seem to have been primarily Yowlumne individuals, and the Yowlumne dialect became the lingua franca there. Some Tübatulabal went to Tule River as well, although many were able to stay in the area around the South Fork of the Kern River, and eventually received allotments.

3.14.4 Tribal Lands

No Tribal lands are located within the Project APE.

The Tule River Reservation is located in Tulare County, California and is home to the Tule River Indian Tribe, a federally recognized Tribe of Native Americans. Most members are Yokuts but also include Yowlumne, Wukchumnis, Western Mono, and Tübatulabal. The Tule River Indian Reservation operates the Eagle Mountain Casino.

The Tejon Indian Tribe is a federally recognized Tribe of Native Americans in Kern County, California and is currently without Tribal Lands. The Tejon Indian people are of the Kitanemuk nation and share bloodlines with tribes of the region, including bands of the Chumash, Tataviam, Tubatulabal, Paiute, and Yokuts.

The Tübatulabal are currently a non-federally recognized Tribe of Native Americans but hold allotments (federal [BIA] trust land) in Kern County, none are within the Study Area or APE.

3.14.5 Tribal Resources and Interests

No specific Tribal resources or interests have been identified through development of the PAD using readily available, existing ethnographic, ethnohistoric, and other data that may be important to local Tribes. However much of the ethnographic work with the Yowlumne Yokuts is too dated to meaningfully identify their interests. Tribal consultation, archival research, and ethnographic interviews have not yet occurred, but will be conducted and/or used to provide information and ensure Tribal interests and concerns are identified and addressed.

3.14.6 Traditional Cultural Properties

TCPs, defined as locations associated with cultural practices or beliefs of a living community that are: (1) rooted in that community's history; and (2) important in maintaining the continuing cultural identity of a community. A TCP must meet at least one of the four National Register of Historic Places (NRHP) eligibility criteria (36 CFR 63). No TCPs have been identified in the proposed APE.

3.14.7 Tribal Cultural Places and Values

There is a paucity of identified places within the APE and Study Area, likely due to the narrowness of the canyon in this area. However, land at the canyon mouth itself and just above and below includes documented resources of interest to both the Yowlumne and Tübatulabal.

Five villages, all west of the Project vicinity, have been documented as Yowlumne places. They include Shokau, in the lower canyon; Kaw-na Il-kau at the mouth of the canyon where the waters make a slight fall; Wawcoya, on the south bank just west of the confluence with Cottonwood Creek, including the Rio Bravo Ranch area; and Hawsu and T’sinleu on the north bank across from Wawcoya (Latta 2014: Figure 2). The latter three

villages are likely those observed during the Original Survey in 1855 for Township 29S Range 29E as ‘dilapidated rancheries’ of the Indians who had left for the Tule River Reservation. Voegelin specifically mentions the people of Shokau as neighbors with whom the Tübatulabal interacted.

Kaw-na Il-kau ‘place of falling water’ is located upriver from the canyon mouth. Latta (2014) calls it a Tripne, or supernatural, fishing place.

Gayton (1948) records a story about a healing at this place. A man named Kawu, a Yowlumne, was ill, and was diagnosed by a shaman as having a water snake within his stomach. Kawa traveled to Kaw-na Il-kau and called on fish (his *posa*) to help him and dove into the deep pool beneath the waterfall. A rainbow trout went into his stomach while he was underwater. He went home and asked his wife to gather the people. His wife called to the fish and it jumped out of his mouth. He asked a friend to cut the fish open, and inside was a water snake. “Kawu got well right away.”’

Voegelin included a likely description of Palagewan (Tübatulabal) spring fishing at Kaw-na Il-kau “at the rapids at the west end of the gorge.” Her consultant said “there were lots of fish; the Tolowim (Bankalachi) used to camp there too, also the Tejon Indians [Yokuts] and Pahkanapil. Sometimes the Monilabal and Palabatal [other Yokuts groups] came up there to fish” (Voegelin 1935). Number 28 of Voegelin’s place name list gives the Tübatulabal name for the site as paluntanakamapan, ‘water where it falls,’ a literal translation of the Yokuts name (or vice versa). She notes that Kroeber mistakenly provides this as the name for Bakersfield (Voegelin 1935).

This site seems to have been connected to a flat just east of the canyon mouth where “many Tribal ceremonial meetings were held.” Kroeber (1925) states that each July Tübatulabal, Kawaiisu, Tejon, Venture Indians, and Yokuts et on a plain in Yokuts territory took part in a communal antelope drive. He states that as many as 500 men took part.

While specific places have rarely been identified in the river gorge itself, the multi-group use of Kaw-na Il-kau and adjacent plains and descriptions of the long-distance trade between Kern River groups and eastern Owens Valley Paiute groups and Chumash groups on the Pacific coast to the west demonstrate that the Kern River was an important corridor linking desert, mountain, valley, and coastal groups. The absence of habitation or camp sites is predictable, given the canyon’s steepness, but should not be taken to indicate a lack of use. The General Land Office (GLO) map for Township 29S, Range 28 East just east of the Study Area shows an ’Indian trail’ following the river’s north bank and apparently continuing east. Unfortunately, the adjacent map set does not continue to note the trail.

3.14.8 Tribal Landscapes

No Tribal landscapes have been identified to date.

3.14.9 References

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FIGURES

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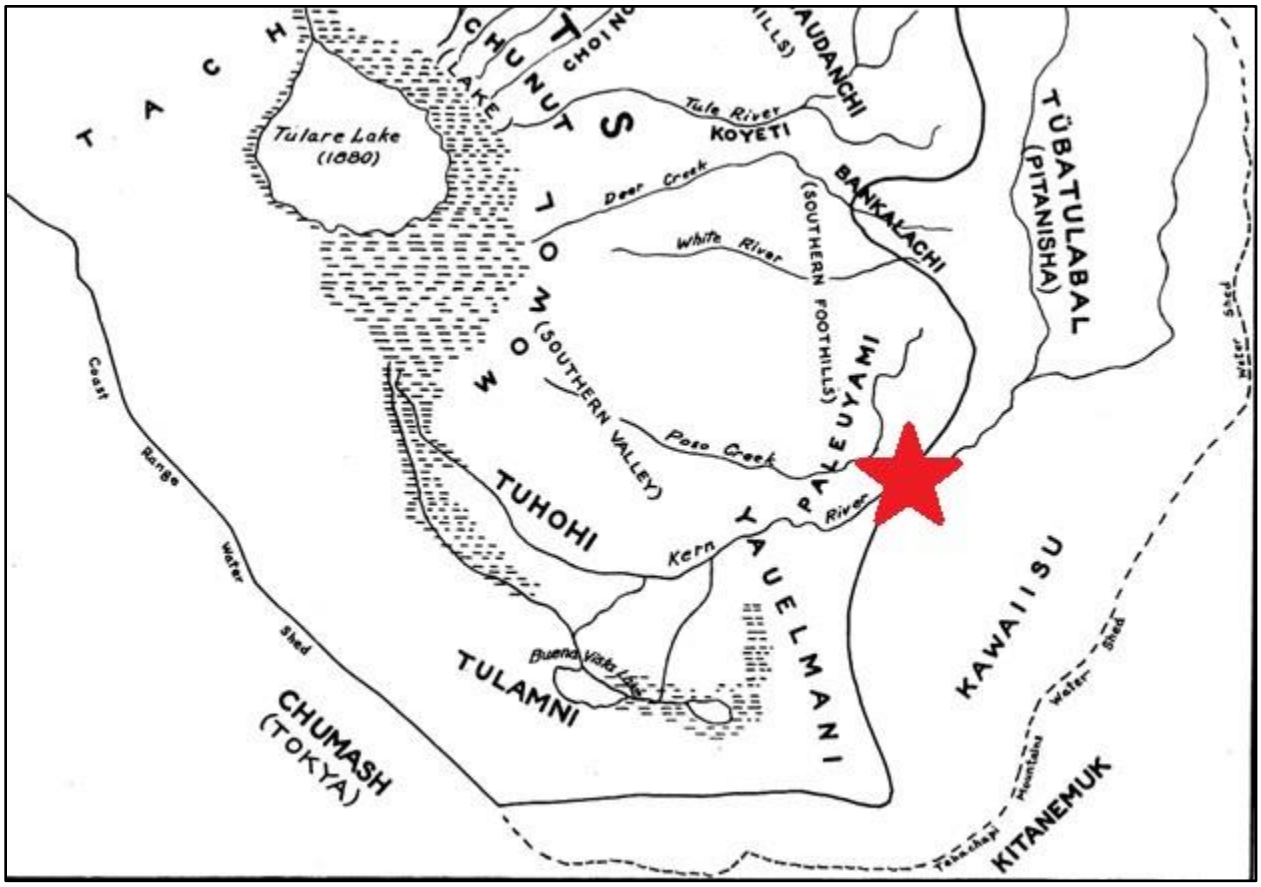

Figure 3.14-1. Yokuts and Western Mono Tribes (after Kroeber). Red star donates general Project location in the lower Kern River (Gayton 1948)

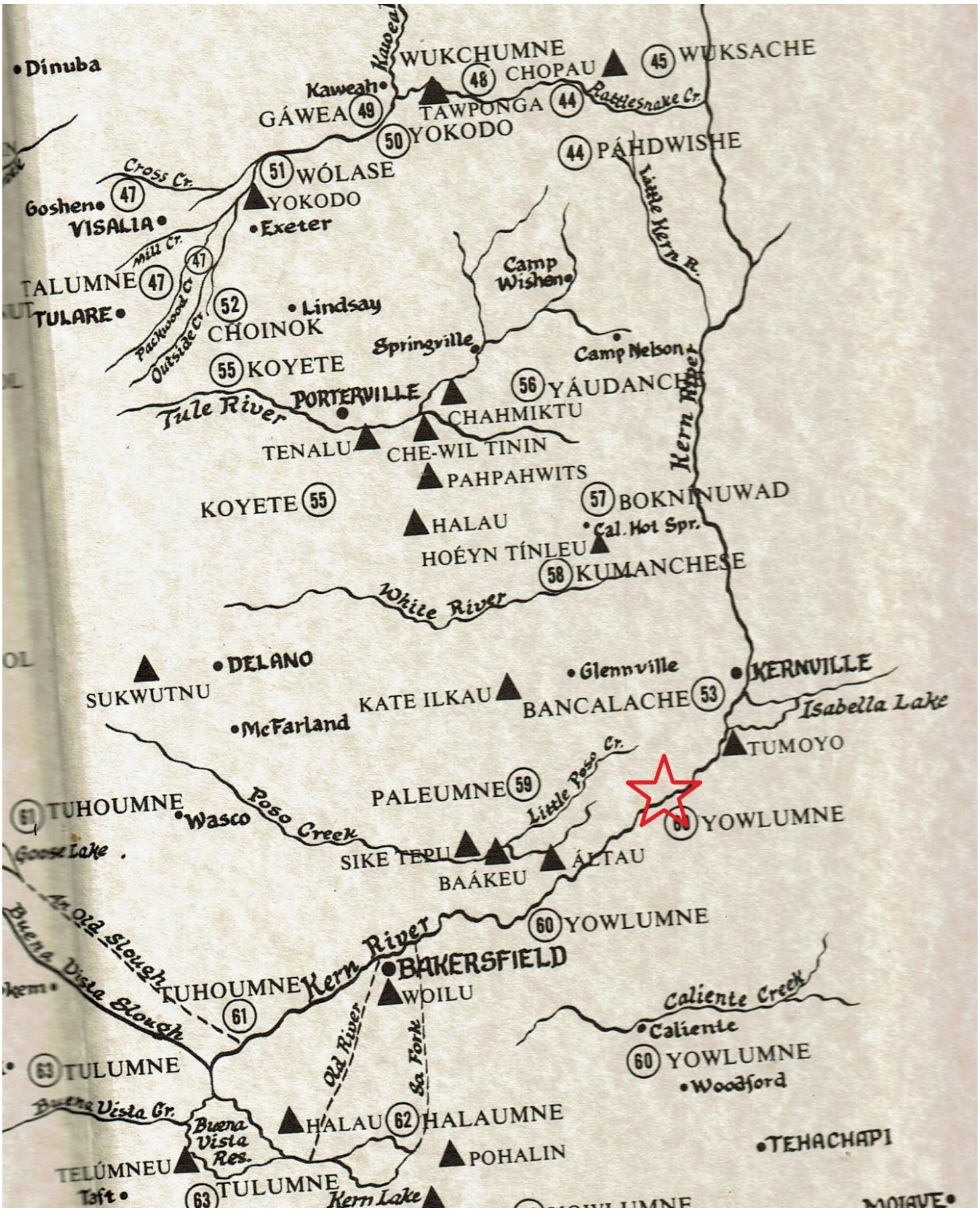

Figure 3.14-2. Hamlets and villages within the Kern River Watershed, red star denotes general Project location (Latta 2014)

MAPS

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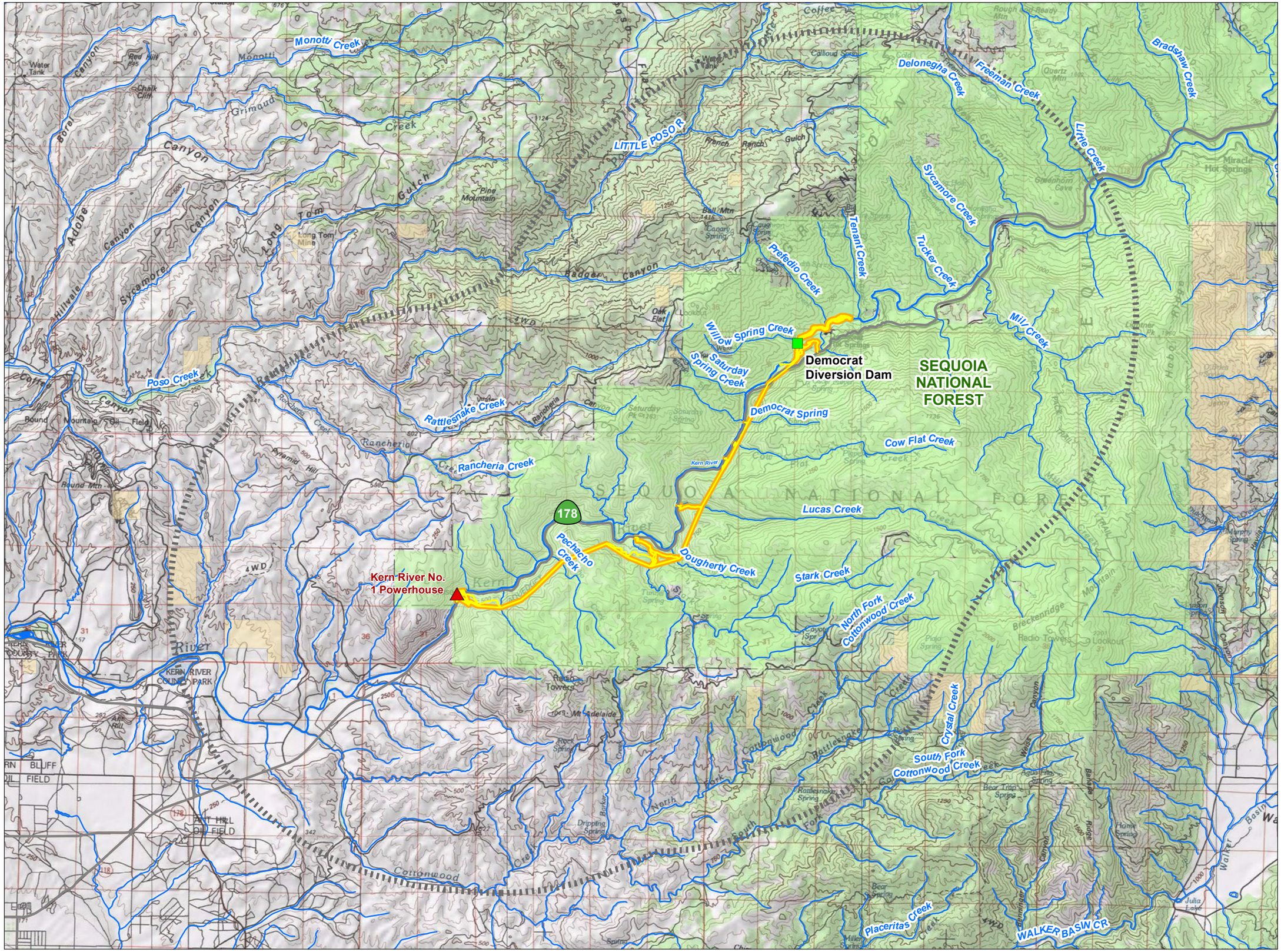

Facilities

- Dam
- Powerhouse
- FERC Boundary

Other Features

- Watercourse
- Highway
- Project APE
- 5 Mile Study Area

Land Jurisdiction*

- U.S. Forest Service
- U.S. Bureau of Land Management
- Private (Blank)

*SOURCE: BLM 2021

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

Map 3.14-1

APE and Study Area Map

0 1 2 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/30/2023

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LIST OF ACRONYMS

FERC or Commission	Federal Energy Regulatory Commission
Forest Service	United States Forest Service
Project	Kern River No. 1 Hydroelectric Project
SCE	Southern California Edison Company
SQF	Sequoia National Forest
SR	State Route

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3.15 SOCIOECONOMICS

This section provides a general description of the socioeconomic conditions in the vicinity of Southern California Edison Company's (SCE) Kern River No. 1 Hydroelectric Project (Project). The Federal Energy Regulatory Commission's (FERC) content requirements for this section are specified in Title 18 of the Code of Federal Regulations (CFR) Chapter I § 5.6(d)(3)(xi). The following sections summarize socioeconomic conditions, including general land use patterns, population patterns, and sources of employment in the vicinity of the Project. Refer to Section 3.10, Land Use for more information regarding the land use in the Project vicinity.

3.15.1 Information Sources

This section was developed using existing data and information available in the following information sources:

- Kern County Recirculated Draft Program Environmental Impact Report, Volume I (Kern County 2004)
- Kern County Recommended Budget, Fiscal Year 2022-2023 (Kern County 2022)
- Kern Economic Development Corporation, 2019–2020 Kern County Market Overview and Member Directory (Kern County 2019)
- United States Census Bureau, 2010 Decennial Census (U.S. Census Bureau 2020)

3.15.2 Area Overview

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

The nearest largest populated area to the Project (as measured from the Project powerhouse) is the City of Bakersfield, which is approximately 9 miles southwest. Several small towns and communities within the Kern River Valley include the town of Lake Isabella, which is approximately 20 miles northeast, Bodfish, which is immediately south of the town of Lake Isabella, Mountain Mesa located along the southern edge of Lake Isabella and the location of the region's hospital, and the City of Kernville, which is approximately 28 miles northeast.

State Route 178 (SR-178) is the main transportation route between the metropolitan Bakersfield area and Lake Isabella and provides access to the Project. Within the vicinity of the Project, SR-178 follows along the eastern edge of the Kern River and the canyon.

3.15.3 General Land Use Patterns in the Vicinity of the Project

The Project facilities are located on public lands within the SQF. Land use in the immediate vicinity of Project facilities primarily consists of outdoor recreation, such as water-oriented activities along the Kern River and hiking in the adjacent canyon. Refer to Section 3.10, Land Use and Section 3.11, Recreation Resources for additional information and maps.

3.15.3.1 Land Use Patterns in Kern County

Kern County is California's third largest county by area, encompassing approximately 8,100 square miles at the southern end of the Central Valley. The geography of the county is diverse, containing mountainous areas, agricultural lands, and desert areas. Approximately 27% of the lands within the county are state or federal lands, including military facilities, lands managed by the Forest Service and the Bureau of Land Management, and other state lands (Kern County 2004). Kern County has 11 incorporated cities; Bakersfield is the largest and serves as the county seat. Incorporated cities occupy approximately 5% of the county's land area. As of 2004, agriculture (including cultivated crops, pasture, forestry, and supporting activities) accounted for approximately 85% of unincorporated land in Kern County (i.e., non-federal land outside of incorporated cities) (Kern County 2004).

3.15.4 Population Characteristics

The population of Kern County increased between 2010 and 2020; Kern County grew by 5.9%, compared to 5.3% statewide growth. By comparison, populations of the City of Bakersfield and Lake Isabella increased between 2010 and 2020 by 8.5% and 4.3%, respectively. Over the same time period, Kernville had a sharp decrease in population (-76.4%) (U.S. Census Bureau 2010, 2020a).

The City of Bakersfield accounted for approximately 43% of the population of Kern County. The population density in Kern County (109.7 people per square mile) is substantially lower than the California average (252.6 people per square mile) (U.S. Census Bureau 2020a).

Table 3.15-1 summarizes population trends in the State of California, Kern County, the City of Bakersfield, and key communities located in the vicinity of the Project.

3.15.5 Housing

Housing ownership, occupancy, and rental vacancy data are used to assess housing needs and to provide an indicator of the economic "climate" within an area. In Kern County, the share of owner-occupied units (as compared to renter-occupied units) was slightly higher (58.8%) than statewide (55.3%). In the vicinity of the Project, owner occupancy was higher than both the county and state reference levels in Kernville (64.9%) but fell in between the county and state reference levels in Lake Isabella (56.9%) (U.S. Census Bureau 2020b).

The overall residential vacancy rate was 8.6% in Kern County compared to the statewide average of 7.8%. Vacancy rates outside of Bakersfield were substantially higher than within the city, which indicates higher overall rural vacancy rates. In communities in the vicinity of the Project, vacancy rates were above 30% (U.S. Census Bureau 2020b).

Kern County accounts for approximately 2% of the state's overall housing stock. Table 3.15-2 summarizes housing information in Kern County.

3.15.6 Economic Indicators

Economic data including per capita personal income, median household income, unemployment rates, and poverty rates are widely used as indicators of economic and social wellbeing. In 2021, the per capita income in Kern County was $25,500, substantially lower than the statewide average of $42,396. Median household income was also substantially lower in Kern County ($58,217) as compared to the state ($84,907) (U.S. Census Bureau 2021).

In 2021, the average unemployment rate in Kern County was 10.0% as compared to the California average of 8.3%. Similarly, in 2021 the shares of individuals below the federal poverty level were higher in Kern County (18.6%) than for the state (12.3%) (U.S. Census Bureau 2021).

Table 3.15-3 presents economic indicators for Kern County and the State of California, including per capita and median household income, unemployment rates, and poverty rates.

3.15.7 Employment

Kern County's economy is strongly tied to resource-based industries, particularly agriculture (including farming, forestry, fishing, and hunting) and extractive activities (including mining, quarrying, and oil and gas extraction). Kern County is the number one agricultural producer in the United States. In 2017, the gross value of the agricultural commodities produced in Kern County was over $7.2 billion (Kern EDC 2019). Other industries, such as manufacturing, are tied to these primary activities. Kern County's economic output has fluctuated since 2014 due to changes in oil and gas prices, water supply (droughts) and other factors affecting agriculture.

Table 3.15-4 summarizes the estimated number of full-time employees 16 years of age and over by industry in Kern County (seasonal workers, such as agricultural workers, are not included in these data) and the State of California. The health care, agriculture, and retail industries account for the largest number full-time employees (U.S. Census 2021). Table 3.15-5 provides the major employers and number of employees in Kern County as of 2020.

3.15.8 References

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TABLES

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Table 3.15-1. Population Trends (2010 -2020)

Geography	Population (2010)	Population (2020)	Population Percent Change (2010–2020)	Land Area (square miles)	Population Density (2020) (population per square mile)
California	37,253,956	39,346,023	5.3%	155,779.2	252.6
Kern County	839,631	892,458	5.9%	8,131.9	109.7
• Bakersfield	347,483	379,879	8.5%	142.2	2,671.4
• Kernville	1,395	791	-76.4%	12.6	62.8
• Lake Isabella	3,466	3,621	4.3%	21.7	166.9
• Remainder of Kern County	487,287	508,167	4.1%	7,955.5	63.9

Source: U.S. Census Bureau 2010, 2020a

Table 3.15-2. Housing Occupancy Information (2020)

Geography	Housing Units					Total Housing Units
	Occupied			Vacant	Vacancy Rate	
	Owner-Occupied	Renter-Occupied	Total Occupied			
California	7,241,318	5,861,796	13,103,114	1,107,831	7.8%	14,210,945
Kern County	161,113	112,443	273,556	25,623	8.6%	299,179
• Bakersfield	70,470	48,098	118,568	6,575	5.3%	125,143
• Kernville	276	149	425	283	39.9%	708
• Lake Isabella	851	645	1,496	709	32.2%	2,205
• Remainder of Kern County	89,516	63,551	153,067	18,056	10.6%	171,123

Source: U.S. Census Bureau 2020b

Table 3.15-3. Economic Indicators (2021)

Geography	Per Capita Income	Median Household Income	Share of Individuals Below Poverty Level	Unemployment Rate
California	42,396	84,907	12.3%	8.3%
Kern County	25,500	58,217	18.6%	10.0%

Source: U.S. Census Bureau 2021

Table 3.15-4. Kern County and California Employment by Industry (2021)

Industry	Estimated Employed Population, 16 Years of Age and Over	
	Kern County	**California**
Agriculture, forestry, fishing and hunting, and mining	48,303	380,249
Construction	20,225	1,237,615
Manufacturing	21,140	1,640,451
Wholesale trade	8,130	468,531
Retail trade	36,955	1,853,463
Transportation, warehousing, and utilities	27,928	1,117,219
Information	3,377	531,079
Finance, insurance, real estate, and rental and leasing	13,187	1,054,129
Professional, scientific, management, administrative and waste management services	26,864	2,600,262
Educational services, health care, and social assistance	82,560	3,992,891
Arts, entertainment, recreation, accommodation, and food services	29,371	1,581,602
Other services (except public administration)	15,847	834,295
Public administration	21,129	864,265
Total	**355,016**	**18,156,051**

Source: U.S. Census Bureau 2021

Table 3.15-5. Major Employers in Kern County (2020)

Employer	Number of Employees
Edwards Air Force Base	9,400
County of Kern	9,300
China Lake Naval Weapons Center	7,000
Grimmway Farms	3,700
Dignity Health	3,300
Adventist Health Bakersfield	2,300
Bolthouse Farms	2,250
Kern Medical	1,600
City of Bakersfield	1,600
Chevron	1,000

Source: Kern EDC 2019

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