Kaweah Project, FERC Project No. 298

TERR 1 – Botanical Resources Technical Study Report

July 2019

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List of Acronyms

BA	barren
BLM	Bureau of Land Management
BLMS	Bureau of Land Management Sensitive Species Lists
CA	Chamise Alliance
Cal-IPC	California Invasive Plant Council
CALVEG	Classification and Assessment with Landsat of Visible Ecological Groupings
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CQ	Chaparral Alliance
CRPR	California Rare Plant Ranking
CSC	California Species of Special Concern
CWHR	California Wildlife Habitat Relationships
ESA	Endangered Species Act
FC	Federal Candidate
FE	Federally Endangered
FERC	Federal Energy Regulatory Commission
FPD	Federally Proposed for Delisting
FPE	Federally Proposed Endangered
FPT	Federally Proposed Threatened
FT	Federally Threatened
GIS	Geographic Information System
GPS	Global Positioning System
HG	annual grasses and forbes
IPaC	Information for Planning and Conservation
NNIP	Non-Native Invasive Plants
NPS	National Park Service
NR	riparian mixed hardwood alliance
NRCS	Natural Resources Conservation Service
NX	interior mixed hardwood alliance
PAD	Pre-Application Document
Project	Kaweah Project
QD	blue oak woodland
QI	California buckeye alliance
QW	interior live oak
SCE	Southern California Edison Company

SE	State Endangered
SR	State Rare
SSP	Special-Status Species
ST	State Threatened
SY	chaparral yucca alliance
TSP	Technical Study Plan
TSR	Technical Study Report
USDA-FS	U.S. Department of Agriculture – Forest Service
USFWS	U.S. Fish and Wildlife Service

1 INTRODUCTION

This Technical Study Report (TSR) provides methods and results of surveys completed by Southern California Edison Company (SCE) in association with implementation of the TERR 1 – Botanical Resources Technical Study Plan (TERR 1 – TSP) for the Kaweah Project (Project). The TERR 1 – TSP was included in SCE's Revised Study Plan (RSP)[1] (SCE 2017a) and was approved by the Federal Energy Regulatory Commission (FERC) on October 24, 2017, as part of its Study Plan Determination for the Project (FERC 2017). Specifically, this report provides a detailed description of the methods and results of vegetation alliance and wildlife habitat studies, special-status plant (SSP) studies, and non-native invasive plant (NNIP) studies completed in 2018.

For the purposes of this report, a SSP is defined as any plant or moss species that is granted protection by a federal or state agency. Federally listed plant species granted status by the United States Fish and Wildlife Service (USFWS) under the Federal Endangered Species Act (ESA) include threatened (FT), endangered (FE), proposed threatened or endangered (FPT, FPE), candidate (FC), or listed species proposed for delisting (FPD).

The Bureau of Land Management (BLM) also maintains lists of sensitive plant species (BLMS) that are designated by the BLM State Director for special management consideration in California. This includes all plants on BLM lands that are listed as FC, California State threatened (ST), endangered (SE), and rare (SR); as well as all plants that have a California Rare Plant Rank (CRPR) of 1B; and any other plants that the State Director has determined to warrant status (BLM 2013 as cited in SCE 2017a, BLM 2018).

State of California listed plant species, which are granted status by the California Department of Fish and Wildlife (CDFW) under the California Endangered Species Act (CESA) include ST, SE, SR, and California Species of Special Concern (CSC).

Under the California Environmental Quality Act (CEQA), SSPs are also defined to include those species identified by the California Native Plant Society (CNPS) CRPR rating system as rare, threatened, or endangered plants in California. This includes the following CRPR:

- 1A (presumed extirpated in California and either rare or extinct elsewhere);
- 1B (rare, threatened, or endangered in California and elsewhere);
- 2A (presumed extirpated in California, but common elsewhere); and
- 2B (rare, threatened, or endangered in California, but common elsewhere).

The California Invasive Council (Cal-IPC) defines NNIPs as plants that 1) are not native to, yet can spread into, wildland ecosystems, and that also 2) displace native species, hybridize with native species, alter biological communities, or alter ecosystem processes (Cal-IPC 2006, Cal-IPC 2018). For the purposes of this Technical Study Report, NNIPs were identified through consultation with the BLM, the primary federal agency maintaining a target list of non-native species recommended for management in the vicinity of the Kaweah Project.

[1] SCE filed a Proposed Study Plan (PSP) on May 24, 2017 (SCE 2017b). Three comments were filed on the PSP; however, they did not result in revisions to any of the study plans. Therefore, SCE filed a Revised Study Plan (RSP) on September 19, 2017, which stated that the PSP, without revision, constituted its RSP. The FERC subsequently issued a Study Plan Determination on October 24, 2017, approving all study plans for the Kaweah Project.

2 STUDY OBJECTIVES

The objectives of the study, as outlined in the TERR 1 – TSP (SCE 2017a) are:

- Document vegetation alliances and wildlife habitats adjacent to Project facilities.
- Document riparian vegetation alliances along bypass reaches and Project diversion pools and forebays.
- Document SSP and moss populations at Project facilities.
- Document NNIPs at Project facilities.

Information on the relationship between flow and riparian vegetation in the bypass reaches is provided in AQ 1 – Instream Flow TSP.

3 EXTENT OF STUDY AREA

3.1 Vegetation Alliances and Wildlife Habitats

- For vegetation alliances and wildlife habitats, the study area is 1 mile around Project facilities (see Table TERR 1-1);
- For ground-truthing of vegetation alliances and wildlife habitats, the study area is within 0.25 mile around Project facilities; and
- For riparian vegetation alliances, the study area includes streambanks of the bypass reaches and the shoreline of Project diversion pools and forebays.

3.2 Special-Status Plants and Non-Native Invasive Plants

For the purposes of the SSP and NNIP surveys, the study area includes:

- All public lands within the FERC Project boundary where operations and/or maintenance activities are conducted, plus a protective buffer. Refer to Table TERR 1-1 for a list of Project facilities and Table TERR 1-2 for the survey buffer by facility type.
- For surveys at or around Project facilities that are located outside of the FERC Project Boundary and on private property, SCE took the following steps to obtain approval prior to implementation of studies:
  - Provide notification to landowner of Project relicensing and request authorization to enter property to conduct surveys.
  - If authorization is obtained, SCE will complete surveys as described in this TSP.
  - If authorization is not obtained, SCE will not complete surveys at these locations.

4 STUDY APPROACH AND METHODS

This section provides details on the study approach for documentation of vegetation alliances and wildlife habitats, SSPs, and NNIPs in the study area.

4.1 Vegetation Alliances and Wildlife Habitats

The study approach for documenting vegetation alliances and wildlife habitats included development of preliminary vegetation alliance maps from available data; verification of preliminary maps based on a review of aerial photography; conducting ground-truth surveys; and development of final vegetation maps. These study approaches are described below. Higher-resolution information on riparian habitats along bypass reaches, diversion pools, forebays, and flowlines will be documented as part of the AQ 1 – Instream Flow TSR.

4.1.1 Document Vegetation Alliances and Wildlife Habitats in the Study Area

Develop Vegetation Alliance Maps from Available CALVEG Data

The best available information on vegetation alliances in the study area was used to develop preliminary maps of vegetation alliances within 1 mile of Project facilities. This included the Classification and Assessment with Landsat of Visible Ecological Groupings (CALVEG) data for the study area (USDA-Forest Service [USDA-FS] 2017a, 2017b). The CALVEG system is used to classify existing vegetation present on federally managed forestlands based on Landsat color infrared satellite imagery. Data are verified using soil-vegetation maps and professional guidance from various sources statewide.

The term "alliance" is used in the CALVEG system and is defined as a uniform group of plant associations sharing one or more dominant or diagnostic overstory species. This term corresponds closely to what plant ecologists call a "community type" and foresters call a "forest type" or "stand." The term "community" is considered synonymous to the term "alliance" as defined by CALVEG.

Verify CALVEG Data Using Aerial Photographs

Pre-field verification of the preliminary vegetation alliance maps included a review of aerial photographs of the study area (Google Earth 2018). CALVEG data, as shown on the preliminary maps, were compared to Google Earth aerial photography. Areas where CALVEG data did not appear to correspond to the aerial photographs were marked on hard-copy maps as areas requiring follow-up examination during ground-truth surveys.

In addition, as described in Section 3.9.3 of the Pre-Application Document (PAD) (SCE 2016), a landscape-level visual assessment of riparian resources was conducted along bypass reaches, diversion pools, and flowlines in July 2015. Riparian characteristics were mapped during a low-altitude helicopter flight, supplemented with aerial photography review.

Conduct Ground-Truthing of Vegetation Alliances

Ground-truth surveys of vegetation alliances within 0.25 mile of Project facilities were conducted in May 2018 in areas identified for follow-up examination during pre-field verification of the preliminary maps, as described above.

Ground-truth surveys were conducted by a team of two biologists on foot and by vehicle. The following data were collected throughout the study area: date and surveyor names; GPS coordinates and location or facility name; CALVEG-designated vegetation alliance and field-assessed vegetation alliance (if different); approximate size of area surveyed; and wildlife species observed on the site. Ground-truth surveys were not conducted in inaccessible areas or on private property where access was not approved.

Vegetation alliance type was verified by comparing dominant overstory species observed at each site with the dominant overstory species that characterize the vegetation alliance as described in the *Field Key to CALVEG–South Sierran Zone 4* (USDA-FS 2010) and *Vegetation Descriptions South Sierran Ecological Province–CALVEG Zone 4* (USDA-FS 2009b). For sites in which the CALVEG-designated vegetation alliance on the preliminary maps did not appear to be correct, the new field-assessed vegetation alliance was noted, and hard-copy vegetation alliance maps of the study area were marked to indicate the extent of the field-corrected vegetation alliance.

Riparian vegetation alliance ground-truth surveys were conducted at seven AQ 1 – Instream Flow sites along the Project bypass reaches and at comparison sites over a six-day period beginning on September 5, 2018. Within each site, homogenous stands of vegetation based on species composition and structure with the riparian zone were mapped. Within each stand, the total percent canopy cover; dominant species present, canopy cover, and age class; and substrate type and percent cover were recorded. The entire riparian zone, extending from the river banks to the valley walls or uplands, was surveyed.

4.1.2 Develop Crosswalk from CALVEG Vegetation Alliances to CWHR Wildlife Habitats

USDA-FS and CDFW developed a CALVEG-CWHR Crosswalk for California (USDA-FS 2004a) as a way to determine what wildlife habitats are likely to be present based on existing CALVEG vegetation alliances. A list of CALVEG vegetation alliances was compiled for the study area based on final vegetation alliances maps. Each CALVEG alliance was then translated into a CWHR wildlife habitat using the CALVEG-CWHR Crosswalk for California.

4.1.3 Develop Final Vegetation Alliance Maps

Final maps of vegetation alliances were developed based on the results of pre-field review of the existing CALVEG data, pre-field verification using Google Earth aerial photography of the study area, and ground-truth surveys.

Hard-copy corrections to vegetation alliance maps completed during review of aerial photographs and ground-truth surveys were digitized and incorporated into Geographic Information System (GIS) layers.

4.2 Special-Status Plants

The study approach for documenting SSPs in the study area included development of preliminary information and conducting protocol SSP and moss surveys. Each of these is described below.

4.2.1 Develop Preliminary Information on Special-Status Plants in the Study Area

Development of preliminary information on SSPs included compilation and review of relevant literature, databases and online resources, as well as consultation with resource agencies (i.e., BLM, USFWS, CDFW, and State Water Resources Control Board). The following sources were used to compile existing information on SSPs within the Kaweah River watershed:

- Kaweah Project FERC Project No. 298 Pre-Application Document, Volumes 1 and 2 (SCE 2016);
- Special Status Plants list provided by the BLM*, All BLM California Special Status Plants*. Only species with potential to occur in the vicinity of the Kaweah River watershed were included (BLM 2015; T. Arbogast, pers. comm., February 2018);
- CDFW California Natural Diversity Database (CNDDB) (CDFW 2018);
- USFWS Information for Planning and Conservation (IPaC) online database (USFWS 2018); and
- CNPS *Inventory of Rare and Endangered Plants of California* online database (CNPS 2018).

Additional resources included:

- Calflora online database, including the Consortium of California Herbaria (Calflora 2018);
- USDA Natural Resources Conservation Service Plants Database (USDA NRCS 2018);
- Jepson eFlora online resource (Jepson Flora Project 2018); and
- Flora of North America (eFloras) (Flora of North America 2004).

Existing species lists included in the PAD (SCE 2016) provided a basis for identification of known and potentially occurring SSPs. Occurrence maps and species lists included in the PAD were updated with current information obtained from the above-listed online databases.

The CNDDB was queried for a 5-mile radius surrounding the Project area (CDFW 2018). The CNPS Inventory database search included a query of the Kaweah and Case Mountain 7.5-minute quadrangles, as well as the surrounding ten quadrangles, which included: Chickencoop Canyon, Dennison Peak, Moses Mountain, Silver City, Lodgepole, Giant Forest, Shadequarter Mountain, Aukland, Woodlake, and Rocky Hill (CNPS 2018). Online resources provided by the Sacramento office of the USFWS (USFWS 2018) were queried for the Project area plus a 0.5-mile buffer, and the official species list that was generated was used to cross-reference and/or supplement the target special-status species list. Bloom period for each species was obtained from the CNPS Inventory (CNPS 2018) and supplemented with the Calflora (Calflora 2018) and Jepson eFlora (Jepson Flora Project) online databases.

The final target list of SSPs and accompanying bloom period table was transmitted to resource agencies on March 26, 2018, for review and approval. No comments were received.

4.2.2 Conduct Special-Status Plant and Moss Surveys

The following describes the timing and methods for field surveys conducted to document the presence of SSPs.

4.2.2.1 Survey Timing

Field surveys were conducted at the proper time of year when rare, threatened, or endangered species are both evident and identifiable. Generally, this is when the plants are flowering. Based on the blooming periods for plants known or potentially occurring within the Project vicinity, two surveys were conducted, one in April and one in June 2018. Timing of surveys was verified based on reference population monitoring, which occurred immediately preceding each survey period.

Agencies were contacted in February 2018 for input regarding potential reference populations to be monitored. In addition, on March 26, 2018 resource agencies were notified of the proposed timing for reference population monitoring and SSP surveys. No responses were received.

4.2.2.2 Survey Methods

Per the TERR 1 – TSP, survey methods for SSPs followed procedures outlined in *Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2009). The updated publication *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018) was referenced for 2018 field surveys.

Surveys were completed in accessible areas by two biologists implementing systematic field techniques (e.g., zigzag patterns, random meandering, and linear transects) in the study area. Surveys were floristic in nature, that is, all species were identified to the level (i.e., genus, species, variety or subspecies) required to determine if that species is special-status. Nomenclature followed *The Jepson Manual, Vascular Plants of California* (Baldwin et al. 2012), and a comprehensive list of species observed during field surveys was compiled.

Populations of SSPs identified within the survey area were assigned a unique ID composed of the first two letters of the genius, the first two letters of the species, and a 3-digit numerical code (e.g., ABCD001); populations were numbered roughly from east to west. Data collected for each population included: an estimate of the number of individuals' present, digital photographs, Global Positioning System (GPS) location, area (square feet), and a description of associated vegetation. If a SSP population was identified on the perimeter of the study area, the study area was expanded to document the full extent of the population. For rhizomatous species, the following criteria were used to distinguish individual plants and populations:

- An individual is defined as a clump of plants occupying an area no larger than approximately 2 feet by 2 feet and separated from other plants by at least 5 feet.
- A populations is defined to include groups of individuals separated from other individuals by at least 100 feet.

Moss specimens were collected throughout the survey area, and labeled with the date and collection location. Moss specimens were sent to a qualified bryologist for identification.

4.3 Non-Native Invasive Plants

The approach for documenting NNIPs in the study area included development of preliminary information and conducting protocol NNIP surveys. Each of these is described below.

4.3.1 Develop Preliminary Information on Non-Native Invasive Plants in the Study Area

A target list of NNIPs was developed through consultation with the BLM (T. Arbogast, pers. comm., February 2018). Additional resources consulted to compile the final list of target NNIPs included:

- Calflora online database (Calflora 2018); and
- Cal-IPC California Invasive Plant Inventory (Cal-IPC 2018).

The final target list of NNIPs was transmitted to resource agencies March 26, 2018 for review and approval. No comments were received.

4.3.2 Conduct Non-Native Invasive Plant Surveys

Focused NNIP surveys were conducted in conjunction with SSP surveys. The following data were collected for each NNIP population: species, location, area infested, and level of infestation. Levels of infestation were reported as: low (<5% cover); moderate (6–25% cover), and high (>25% cover). Areas that were surveyed and found to be weed-free were also identified. Each population was assigned a unique population ID (according to the criteria outlined above for SSPs), and areas of infestation were mapped with a hand-held GPS unit. Where possible, if an NNIP population was identified on the perimeter of the study area, the study area was expanded to document the full extent of the population.

5 STUDY RESULTS

5.1 Vegetation Alliances and Wildlife Habitats

The following sections present the results of the vegetation alliance and wildlife habitat studies completed in 2018.

5.1.1 Document Vegetation Alliances and Wildlife Habitats in the Study Area

Preliminary vegetation alliance maps based on the existing CALVEG data for the study area were completed in 2015 and were included in the PAD (SCE 2016). Preliminary vegetation alliance maps were ground-truthed during field surveys conducted in September and May 2018. Areas that were reclassified after ground-truth surveys included areas in the immediate vicinity of the Kaweah River, which were reclassified from blue oak woodland (QD), interior live oak (QW), and annual grasses and forbes (HG) to riparian mixed hardwood (NR) or barren (BA) where gravel bars were present. In addition to the areas along the Kaweah River, five large polygons were reclassified. The reclassifications are described below:

- A large polygon southwest of the Three Rivers Substation was designated by CALVEG as HG but consisted of QD around the western edge. The portion dominated by QD was reclassified as a new polygon (Appendix B, Photo B-2).
- A large polygon designated by CALVEG as QW south of Kaweah No. 1 Forebay Road consisted of California buckeye alliance (QI) and was subsequently reclassified (Appendix B, Photo B-3).
- A large polygon overlapping the Kaweah No. 1 Flowline approximately 0.4 mile northeast of the northern end of the Kaweah No. 1 Forebay Road was designated by CALVEG as interior mixed hardwood alliance (NX) and was reclassified as lower montane mixed chaparral alliance (CQ) (Appendix B, Photo B-4).
- A large polygon that crosses Kaweah No. 1 Flowline and borders Mineral King Road approximately 0.2 mile north of the southern end of the Kaweah No. 1 Flowline Access Road - Grapevine was designated by CALVEG as barren (BA) and was reclassified as CQ west of the flowline and as HG east of the flowline (Appendix B, Photo B-5).
- A large polygon approximately 0.2 mile north of the intersection of Mineral King Road and Kaweah No. 1 Flowline Access Road-Upper Pine was designated as chaparral yucca alliance (SY). It was reclassified as BA (Appendix B, Photo B-6).

Table TERR 1-3 provides a list of vegetation alliances (including riparian alliances) present in the study area based on the results of ground-truth surveys. A description of each alliance is provided in Appendix A, photographs of representative vegetation alliances are provided in Appendix B, and datasheets from the ground-truth surveys are provided in Appendix C.

5.1.2 Develop Crosswalk from CALVEG Vegetation Alliances to CWHR Wildlife Habitats

Table TERR 1-3 provides the Project CALVEG–CWHR Crosswalk, which identifies wildlife habitats occurring in the study area based on the final vegetation alliance maps described above. CALVEG Vegetation Alliances and the corresponding wildlife habitats are listed alphabetically by CALVEG Code.

5.1.3 Develop Final Vegetation Alliance Maps

Maps TERR 1-1, 1-1a, 1-1b, and 1-1c is a series of maps showing vegetation alliances within 1 mile of the Kaweah Project.

5.2 Special-Status Plants

5.2.1 Develop Preliminary Information on Special-Status Plants and Mosses

Based on the database and literature search, 31 SSP and moss species were determined to have the potential to occur within the vicinity of the Project. This includes three species documented as historically occurring within the FERC Project boundary, Kaweah brodiaea (*Brodiaea insignis*, BLMS, SE, CRPR 1B.2), mouse buckwheat (*Eriogonum nudum* var. *murinum*, BLMS, CRPR 1B.2), and Munz's iris (*Iris munzii*, BLMS, CRPR List 1B.3). These 31 species, listed in Appendix D, comprise the target species for the TERR-1 surveys.

5.2.2 Conduct Special-Status Plant and Moss Surveys

One special-status plant, Munz's iris, was identified during protocol surveys within the study area. Kaweah brodiaea and mouse buckwheat, previously known from the study area, were not observed during the surveys. No other SSPs (including mosses) were observed. Refer to Appendix E for a list of all plants and mosses observed in the study area.

Twenty-nine populations of Munz's iris were mapped within the study area, all located in the vicinity of the Kaweah No. 1 Flowline. As specified in the TSP survey approach, populations that extended outside the study area were mapped to their full extent. Table TERR 1-4 provides the unique population ID, total number of individuals, and size in square feet for each population. Refer to Map TERR 1-2 (a-t) for the location of each population. Appendix F provides photographs of Munz's iris and typical habitat in the study area. Appendix G provides the California Native Species Field Survey Forms to be submitted to CNDDB. Note that, based on guidance provided by CNDDB, populations located within 0.25 mile of each other should be reported on the same California Native Species Field Survey Form (M. Nelson., pers. comm., June 2018). Therefore, a total of six forms were completed.

5.3 Non-Native Invasive Plants

5.3.1 Develop Preliminary Information on Non-Native Invasive Plants in the Study Area

Appendix H provides the list of 26 target NNIPs for the Project. As described previously, this list was developed through consultation with the BLM, the primary federal agency maintaining a target list of non-native species recommended for management in the vicinity of the Kaweah Project.

5.3.2 Conduct Non-Native Invasive Plant Surveys

One hundred and two populations of the following five NNIP species were identified within the study area, including:

- Two populations of tree-of-heaven (*Ailanthus altissima*),
- Seventy-three populations of tocalote (Malta starthistle) (*Centaurea melitensis*),
- One population of bull thistle (*Cirsium vulgare*),
- One population of French broom (*Genista monspessulana*), and
- Twenty-five populations of puncture vine (*Tribulus terrestris*).

The full extent of each population was mapped, with the exception of tocalote. This species was widespread in grasslands, woodlands and other openings throughout the Project vicinity, and, therefore with the exception of five populations (CEME001, CEME029, CEME042, CEME059, and CEME070) mapping for this species was not extended beyond the study area.

Table TERR 1-5 provides a summary of the 102 NNIP populations mapped within the survey area including: scientific name, common name, unique population ID, facility, level of infestation, population size (in square feet), and survey date. The location and extent of each NNIP population is depicted on Map TERR 1-2 (a-t). Photographs of representative NNIP populations are also provided in Appendix I.

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TABLES

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Table TERR 1-1. Project Facilities and Relationship to FERC Project Boundary

Project Facility	Within FERC Project Boundary	Portion of Facility Outside FERC Project Boundary		
		Entirely on Private Property	Partially on Private Property	Partially on NPS Property
Diversion Dams and Pools				
Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)	X			
Kaweah No. 2 Diversion Dam and Pool (Kaweah River)	X			
Flowlines				
Kaweah No. 1 Flowline	X			
Kaweah No. 2 Flowline	X			
Kaweah No. 3 Flowline	X			
Forebays				
Kaweah No. 1 Forebay Tank and Spillway Channel	X			
Kaweah No. 2 Forebay and Spillway Channels	X			
Kaweah No. 3 Forebay and Spillway Channel	X			
Penstocks				
Kaweah No. 1 Penstock	X			
Kaweah No. 2 Penstock	X			
Kaweah No. 3 Penstock	X			
Powerhouses and Switchyards				
Kaweah No. 1 Powerhouse and Switchyard	X			
Kaweah No. 2 Powerhouse and Switchyard	X		X (Tailrace Only)	
Kaweah No. 3 Powerhouse and Switchyard	X			

Project Facility	Within FERC Project Boundary	Portion of Facility Outside FERC Project Boundary		
		Entirely on Private Property	Partially on Private Property	Partially on NPS Property
Transmission Lines and Transmission Tap Lines				
Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	X			
Kaweah No. 1 Powerhouse Transmission Tap Line	X			
Kaweah No. 2 Powerhouse Transmission Tap Line	X			
Power Lines				
Kaweah No. 1 Diversion Intake House Solar Panel to Kaweah No. 1 Diversion Dam Power Line (solar)	X		X	
Kaweah No. 1 Switchyard to Kaweah No. 1 Maintenance Building Power Line	X			
Kaweah No. 1 Switchyard to Kaweah No. 1 Office Building Power Line	X			
Kaweah No. 1 Switchyard to Kaweah No. 1 Operator's Office ~~Old Machine Shop~~ Power Line	X			
Kaweah No. 1 Switchyard to K1 Workshop Power Line	X			
Kaweah No. 1 Office Building to K1 Forebay Tank Power Line	X			
Kaweah No. 1 Powerhouse Campus Alternate Power Line	X			
Kaweah No. 2 Diversion/Flowline Gage and Kaweah No. 3 Powerhouse Alternate Power Line	X			X
Kaweah No. 2 Powerhouse Alternate Power Line	X			
Kaweah No. 2 Powerhouse to Kaweah No. 2 Forebay Power Line	X			
Kaweah No. 3 Powerhouse to Kaweah No. 2 Diversion Power Line	X			
Kaweah No. 3 Powerhouse to Kaweah No. 2 Flowline Gage Power Line	X			X
Kaweah No. 3 Powerhouse to Kaweah No. 3 Forebay Power Line	X			
Communication Lines				
Kaweah No. 1 Powerhouse to Kaweah No. 1 Office Building Fiber Communication Line	X			
Kaweah No. 1 Office Building to Kaweah No. 1 Forebay Tank Fiber Communication Line	X			
Kaweah No. 2 Diversion Dam to Kaweah No. 3 Powerhouse Fiber Communication Line	X			
Kaweah No. 2 Powerhouse to Kaweah No. 2 Forebay Fiber Communication Line	X			

Project Facility	Within FERC Project Boundary	Portion of Facility Outside FERC Project Boundary		
		Entirely on Private Property	Partially on Private Property	Partially on NPS Property
Kaweah No. 3 Powerhouse to Kaweah No. 3 Forebay Fiber Communication Line	X			
Kaweah No. 3 Forebay to Kaweah No. 3 Forebay Inlet Fiber Communication Line	X			
Stream Gages				
East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a)	X			
East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)	X			
Kaweah No. 1 Minimum Instream Flow Release (SCE Gage No. 201a)	X			
East Fork Kaweah River Conduit 1 near Three Rivers CA (SCE Gage No. 202)	X			
Kaweah River below Conduit No. 2 near Hammond CA (USGS Gage No. 11208600) (SCE Gage No. 203)	X			
Kaweah River Conduit No. 2 near Hammond CA (SCE Gage No. 204a)	X			
Kaweah River Conduit No. 2 at Power Plant near Hammond CA (USGS Gage No. 11208818) (SCE Gage No. 205a)	X			
Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)	X			
Project Access Roads				
Kaweah No. 1 Development				
Kaweah No. 1 Flowline Access Road – Bear Canyon	X		X	
Kaweah No. 1 Flowline Access Road – Grapevine	X			
Kaweah No. 1 Flowline Access Road – Lumberyard	X			
Kaweah No. 1 Flowline Access Road – Lumberyard (spur)	X			
Kaweah No. 1 Flowline Access Road – Slick Rock	X		X	
Kaweah No. 1 Forebay Road	X			
Kaweah No. 1 Intake Road	X		X	

Project Facility	Within FERC Project Boundary	Portion of Facility Outside FERC Project Boundary		
		Entirely on Private Property	Partially on Private Property	Partially on NPS Property
Kaweah No. 1 Flowline Access Road – Lower Pine	X			
Kaweah No. 1 Flowline Access Road – Lower Pine (spur)	X			
Kaweah No. 1 Flowline Access Road – Summit	X			
Kaweah No. 1 Flowline Access Road – Unnamed	X		X	
Kaweah No. 1 Flowline Access Road – Upper Pine	X			
Kaweah No. 2 Development				
Kaweah No. 2 Flowline East Access Road	X			
Kaweah No. 2 Flowline Access Road – Open Siphon Grids	X			
Kaweah No. 2 Flowline Access Road – Red Barn	X		X	
Kaweah No. 2 Intake Road	X			X
Kaweah No. 2 Powerhouse Road	X			
Kaweah No. 2 Flowline Center Access Road	X		X	
Kaweah No. 2 Flowline Access Road – Canal 2 Brushout Grid	X		X	
Kaweah No. 2 Flowline Access Road – Canal 4 East	X		X	
Kaweah No. 2 Flowline Access Road – Canal 4 West	X		X	
Kaweah No. 2 Flowline Access Road – Canal 5	X		X	
Kaweah No. 2 Flowline Access Road – Canal 6 East	X		X	
Kaweah No. 2 Flowline Access Road – Canal 6 West	X		X	
Kaweah No. 2 Flowline Access Road – Flume 11	X		X	
Kaweah No. 2 Flowline Access Road – Flume 8	X			
Kaweah No. 2 Flowline West Access Road	X		X	
Kaweah No. 2 Forebay Road	X			
Kaweah No. 2 Penstock Road	X			

Project Facility	Within FERC Project Boundary	Portion of Facility Outside FERC Project Boundary		
		Entirely on Private Property	Partially on Private Property	Partially on NPS Property
Kaweah No. 3 Development				
Kaweah No. 3 Forebay Road	X		X	
Kaweah No. 3 Powerhouse Road	X			
Project Trails				
Kaweah No. 1 Development				
Kaweah No. 1 Flowline Access Trail – Unnamed	X			
~~Kaweah No. 1 Flowline Access Trail – Grand Canyon~~				
~~Kaweah No. 1 Solar Panel Access Trail~~				
Kaweah No. 2 Development				
Kaweah No. 2 Flowline Access Trail – Canal 11	X		X	
Kaweah No. 2 Flowline Access Trail – Canal 13	X			
Kaweah No. 2 Flowline Access Trail – Canal 15	X			
Kaweah No. 2 Flowline Access Trail – Canal 2	X			
Kaweah No. 2 Flowline Access Trail – Canal 4 East	X			
Kaweah No. 2 Flowline Access Trail – Canal 4 West	X			
Kaweah No. 2 Flowline Access Trail – Canal 5	X			
Kaweah No. 2 Flowline Access Trail – Canal 6	X			
Kaweah No. 2 Flowline Access Trail – Open Siphon	X			
Kaweah No. 2 Flowline Access Trail – Water User 14	X			
Kaweah No. 2 Flowline Access Trail – Water User 9	X		X	
Kaweah No. 2 Flowline Access Trail – Wildlife Crossing 2	X			
Kaweah No. 2 Powerhouse River Access Trail	X			

Project Facility	Within FERC Project Boundary	Portion of Facility Outside FERC Project Boundary		
		Entirely on Private Property	Partially on Private Property	Partially on NPS Property
Kaweah No. 3 Development				
Kaweah No. 3 Flowline Access Trail	X			
Ancillary and Support Facilities				
Kaweah No. 1 Forebay Tank Repeater	X			
Kaweah No. 1 Powerhouse Campus	X			
Kaweah No. 1 Diversion Intake House Solar Panel		X		
Kaweah No. 1 Solar Yard Satellite Repeater		X		
Kaweah No. 1 Intake Cableway	X			
Kaweah No. 1 Grapevine Satellite Repeater	X			
Kaweah No. 2 Powerhouse River Access Parking	X			
Kaweah No. 2 Intake Cableway	X			
Kaweah No. 2 Wildlife Bridges	X			
Kaweah No. 2 Wildlife Escape Ramps	X			
Kaweah No. 2 Footbridges	X			
Kaweah No. 3 Wildlife Bridges	X			
Kaweah No. 3 Wildlife Escape Ramps	X			
Kaweah No. 3 Footbridges	X			

Sources:

1. FERC boundary Exhibit G sheets obtained from SCE (Dec. 2014). Sheets filed with FERC in 2009; Sheets 4-6 updated and filed with FERC 2012.

2. Digital FERC boundary obtained from SCE but heavily modified to account for known errors (Dec. 2014)

3. Digital parcel boundary for Tulare County purchased from OGInfo.com LLC (June 2017)

Parcel Vintage: 02/01/2017

Attribute Vintage: 02/01/2017

Notes: NPS = National Park Service

Red = Changes from the TERR 1 – Technical Study Plan

Property jurisdiction based on multiple sources. Some data has been modified to account for known errors.

Table TERR 1-2. Survey Area for Special-Status Plant and Non-Native Invasive Plants

Project Facility	Survey Area[1]
Diversion Dams and Pools	15 feet around the perimeter
Flowlines[2]	20 feet on either side
Forebays/Forebay Tank	20 feet around the perimeter
Penstocks	15 feet on either side
Powerhouses and Switchyards	Within and up to 15 feet around the perimeter fence
Transmission, Power, and Communication Lines	25 feet on either side
Gages	10 feet around gages
Project Access Roads	20 feet on either side
Project Trails	15 feet on either side
Ancillary and Support Facilities	
Kaweah No. 1 Powerhouse Campus	Within the developed campus
Repeaters and Solar Panels	15 feet around the perimeter
River Access Parking	10 feet around parking area and beach

Notes:

[1] Survey areas represent locations where potential operation and maintenance activities occur.

[2] Footbridges, wildlife bridges, and wildlife escape ramps are located on Project flowlines and will be surveyed concurrently with the flowlines.

Table TERR 1-3. CALVEG Vegetation Alliances and CWHR Wildlife Habitats in the Study Area

CALVEG Vegetation Alliance (CALVEG Code)	**CWHR Habitat Type Description (CWHR Type Code)**
Barren (BA)	Barren (BAR)
Chamise Alliance (CA)	Chamise-Redshank Chaparral (CRC)
Ceanothus Chaparral Alliance (CC)	Mixed Chaparral (MCH)
Wedgeleaf Ceanothus Alliance (CL)	Mixed Chaparral (MCH)
Lower Montane Mixed Chaparral Alliance (CQ)	Mixed Chaparral (MCH)
Whiteleaf Manzanita Alliance (CW)	Mixed Chaparral (MCH)
Upper Montane Mixed Chaparral (CX)	Mixed Chaparral (MCH)
Annual Grasses and Forbes Alliance (HG)	Annual Grassland (AGS)
Perennial Grasses and Forbes Alliance (HM)	Perennial Grassland (PGS)
Incense Cedar Alliance (MD)	Montane Hardwood-Conifer (MHC)
Mixed Conifer-Pine Alliance (MP)	Montane Hardwood-Conifer (MHC)
Riparian Mixed Hardwood Alliance (NR)	Aspen (ASP) Montane Riparian (MRI) Valley Foothill Riparian (VRI)
Interior Mixed Hardwood Alliance (NX)	Montane Hardwood (MHW)
Canyon Live Oak Alliance (QC)	Montane Hardwood (MHW)
Blue Oak Alliance (QD)	Blue Oak Woodland (BOW)
White Alder Alliance (QE)	Montane Riparian (MRI)
Black Oak Alliance (QK)	Montane Hardwood (MHW)
California Buckeye Alliance (QI)	Montane Hardwood (MHW)
California Sycamore Alliance (QP)	Valley Foothill Riparian (VRI)
Interior Live Oak Alliance (QW)	Coastal Oak Woodland (COW) Montane Hardwood (MHW) Valley Oak Woodland (VOW)
Chaparral Yucca Alliance (SY)	Mixed Chaparral (MCH)
Urban or Developed (UB)	Urban (URB)
Water (WA)	Lacustrine (LAC)
Shrub Willow Alliance (WL)	Montane Riparian (MRI)
Birchleaf Mountain Mahogany Alliance (WM)	Mixed Chaparral (MCH)

Table TERR 1-4. Special-Status Plant Populations Identified During Botanical Surveys in the Study Area

Scientific Name	Common Name	Unique Population/Map ID[1]	Facility	Total # of Individuals	Population Size (Square Feet)	Survey Date
Iris munzii	Munz's iris	IRMU001	Kaweah No. 1 Flowline	3	135	6/17/2018
Iris munzii	Munz's iris	IRMU002	Kaweah No. 1 Flowline	7	2,177	6/17/2018
Iris munzii	Munz's iris	IRMU003	Kaweah No. 1 Flowline	7	7,925	6/17/2018
Iris munzii	Munz's iris	IRMU004	Kaweah No. 1 Flowline	45	16,413	6/17/2018
Iris munzii	Munz's iris	IRMU005	Kaweah No. 1 Flowline	1	3	6/17/2018
Iris munzii	Munz's iris	IRMU006	Kaweah No. 1 Flowline	2	10	6/17/2018
Iris munzii	Munz's iris	IRMU007	Kaweah No. 1 Flowline	2	150	6/18/2018
Iris munzii	Munz's iris	IRMU008	Kaweah No. 1 Flowline	58	8,258	6/18/2018
Iris munzii	Munz's iris	IRMU009	Kaweah No. 1 Flowline	21	17,829	6/18/2018
Iris munzii	Munz's iris	IRMU010	Kaweah No. 1 Flowline	1	4	6/18/2018
Iris munzii	Munz's iris	IRMU011	Kaweah No. 1 Flowline	1	4	6/18/2018
Iris munzii	Munz's iris	IRMU012	Kaweah No. 1 Flowline	14	3,285	6/18/2018
Iris munzii	Munz's iris	IRMU013	Kaweah No. 1 Flowline	29	9,479	6/18/2018
Iris munzii	Munz's iris	IRMU014	Kaweah No. 1 Flowline	94	21,828	6/18/2018
Iris munzii	Munz's iris	IRMU015	Kaweah No. 1 Flowline	10	1,873	6/18/2018
Iris munzii	Munz's iris	IRMU016	Kaweah No. 1 Flowline	2	471	6/18/2018
Iris munzii	Munz's iris	IRMU017	Kaweah No. 1 Flowline	2	503	6/18/2018
Iris munzii	Munz's iris	IRMU018	Kaweah No. 1 Flowline	4	1,396	6/18/2018
Iris munzii	Munz's iris	IRMU019	Kaweah No. 1 Flowline	1	36	6/18/2018
Iris munzii	Munz's iris	IRMU020	Kaweah No. 1 Flowline	3	412	6/18/2018
Iris munzii	Munz's iris	IRMU021	Kaweah No. 1 Flowline	5	932	6/18/2018
Iris munzii	Munz's iris	IRMU022	Kaweah No. 1 Flowline	4	2,474	6/19/2018
Iris munzii	Munz's iris	IRMU023	Kaweah No. 1 Flowline	1	9	6/19/2018
Iris munzii	Munz's iris	IRMU024	Kaweah No. 1 Flowline	4	5,889	6/19/2018

Scientific Name	Common Name	Unique Population/Map ID[1]	Facility	Total # of Individuals	Population Size (Square Feet)	Survey Date
Iris munzii	Munz's iris	IRMU025	Kaweah No. 1 Flowline	11	12,512	6/19/2018
Iris munzii	Munz's iris	IRMU026	Kaweah No. 1 Flowline	5	7,761	6/19/2018
Iris munzii	Munz's iris	IRMU027	Kaweah No. 1 Flowline	1	8	6/19/2018
Iris munzii	Munz's iris	IRMU028	Kaweah No. 1 Flowline	6	4,159	6/19/2018
Iris munzii	Munz's iris	IRMU029	Kaweah No. 1 Flowline	2	4,264	6/19/2018

Notes:

[1] Refer to Map TERR 1-2 (a-t) for the location of each individual/population in the Study Area.

Table TERR 1-5. Non-Native Invasive Plant Populations Identified During Botanical Surveys in the Study Area

Scientific Name	Common Name	Unique Population/Map ID[1]	Facility	Level of Infestation[2]	Population Size (Square Feet)	Survey Date
Ailanthus altissima	Tree of Heaven	AIAL001	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	MOD	8,752	6/23/2018
Ailanthus altissima	Tree of Heaven	AIAL002	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	HIGH	16,718	4/26/2018
Centaurea melitensis	Tocalote	CEME001[3]	Kaweah No. 3 Forebay Road	LOW	6,836	6/14/2018
Centaurea melitensis	Tocalote	CEME002	Kaweah No. 3 Forebay Road	LOW	129,704	6/14/2018
Centaurea melitensis	Tocalote	CEME003	Kaweah No. 3 Forebay Road, Kaweah No. 3 Penstock	LOW	200,760	6/14/2018, 6/23/2018
Centaurea melitensis	Tocalote	CEME004	Kaweah No. 3 Powerhouse and Switchyard	MOD	4	6/15/2018
Centaurea melitensis	Tocalote	CEME005	Kaweah No. 3 Powerhouse Road	LOW	320	6/15/2018
Centaurea melitensis	Tocalote	CEME006	Kaweah No. 3 Powerhouse Road	LOW	1,730	6/15/2018
Centaurea melitensis	Tocalote	CEME007	Kaweah No. 2 Intake Road	LOW	25	6/15/2018
Centaurea melitensis	Tocalote	CEME008	Kaweah No. 2 Intake Road	MOD	100	6/15/2018
Centaurea melitensis	Tocalote	CEME009	Kaweah No. 2 Intake Road	LOW	100	6/15/2018
Centaurea melitensis	Tocalote	CEME010	Kaweah No. 2 Flowline Access Road - Open Siphon Grids, Kaweah No. 2 Flowline	LOW	18,756	6/15/2018
Centaurea melitensis	Tocalote	CEME011	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	30,994	4/27/2018
Centaurea melitensis	Tocalote	CEME012	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	13,540	4/27/2018
Centaurea melitensis	Tocalote	CEME013	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	4,799	4/27/2018

Scientific Name	Common Name	Unique Population/Map ID[1]	Facility	Level of Infestation[2]	Population Size (Square Feet)	Survey Date
Centaurea melitensis	Tocalote	CEME014	Kaweah No. 2 Flowline (Canal 2 to Forebay)	LOW	980,963	6/15/2018
Centaurea melitensis	Tocalote	CEME015	Kaweah No. 2 Flowline East Access Road	LOW	212,577	6/15/2018
Centaurea melitensis	Tocalote	CEME016	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	67,108	6/16/2018
Centaurea melitensis	Tocalote	CEME017	Kaweah No. 2 Flowline Access Trail - Canal 4 West, Kaweah No. 2 Flowline Access Road - Canal 4 East	LOW	19,558	6/15/2018
Centaurea melitensis	Tocalote	CEME018	Kaweah No. 2 Flowline Access Road - Canal 4 West	LOW	31,371	6/16/2018
Centaurea melitensis	Tocalote	CEME019	Kaweah No. 2 Flowline Access Road - Canal 5	LOW	38,427	6/16/2018
Centaurea melitensis	Tocalote	CEME020	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	12,245	6/16/2018
Centaurea melitensis	Tocalote	CEME021	Kaweah No. 2 Flowline Access Road - Canal 6 East	LOW	12,981	6/16/2018
Centaurea melitensis	Tocalote	CEME022	Kaweah No. 2 Flowline Access Road - Canal 6 West	LOW	5,968	6/16/2018
Centaurea melitensis	Tocalote	CEME023	Kaweah No. 2 Flowline East Access Road	LOW	29,603	6/16/2018
Centaurea melitensis	Tocalote	CEME024	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	400	4/27/2018
Centaurea melitensis	Tocalote	CEME025	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	12,163	4/27/2018
Centaurea melitensis	Tocalote	CEME026	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	900	4/27/2018

Scientific Name	Common Name	Unique Population/Map ID[1]	Facility	Level of Infestation[2]	Population Size (Square Feet)	Survey Date
Centaurea melitensis	Tocalote	CEME027	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	HIGH	15,273	6/16/2018
Centaurea melitensis	Tocalote	CEME028	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	MOD	900	4/27/2018
Centaurea melitensis	Tocalote	CEME029[3]	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	MOD	3,001	4/27/2018
Centaurea melitensis	Tocalote	CEME030	Kaweah No. 2 Flowline Access Road - Flume 8	LOW	43,422	6/21/2018
Centaurea melitensis	Tocalote	CEME031	Kaweah No. 2 Flowline Center Access Road	LOW	212,844	6/21/2018
Centaurea melitensis	Tocalote	CEME032	Kaweah No. 2 Flowline West Access Road	LOW	226,414	6/21/2018
Centaurea melitensis	Tocalote	CEME033	Kaweah No. 2 Spillways	LOW	14,505	6/21/2018
Centaurea melitensis	Tocalote	CEME034	Kaweah No. 2 Forebay Road	LOW	87,801	6/21/2018
Centaurea melitensis	Tocalote	CEME035	Kaweah No. 2 Penstock	LOW	88,032	6/22/2018
Centaurea melitensis	Tocalote	CEME036	Kaweah No. 2 Penstock Road	LOW	96,300	6/22/2018
Centaurea melitensis	Tocalote	CEME037	Kaweah No. 2 Powerhouse Transmission Tap Line	LOW	29,897	6/22/2018
Centaurea melitensis	Tocalote	CEME038	Kaweah No. 2 Powerhouse Transmission Tap Line	LOW	300	6/22/2018
Centaurea melitensis	Tocalote	CEME039	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	35,389	6/24/2018
Centaurea melitensis	Tocalote	CEME040	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	13,197	6/23/2018
Centaurea melitensis	Tocalote	CEME041	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	9,146	6/24/2018

Scientific Name	Common Name	Unique Population/Map ID[1]	Facility	Level of Infestation[2]	Population Size (Square Feet)	Survey Date
Centaurea melitensis	Tocalote	CEME042[3]	Kaweah No. 1 Penstock	LOW	10,170	6/18/2018
Centaurea melitensis	Tocalote	CEME043	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	72,630	6/23/2018
Centaurea melitensis	Tocalote	CEME044	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	6,791	6/23/2018
Centaurea melitensis	Tocalote	CEME045	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	25	6/23/2018
Centaurea melitensis	Tocalote	CEME046	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	5,524	6/23/2018
Centaurea melitensis	Tocalote	CEME047	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	3,929	4/26/2018
Centaurea melitensis	Tocalote	CEME048	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	5,069	4/26/2018
Centaurea melitensis	Tocalote	CEME049	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	LOW	400	6/23/2018
Centaurea melitensis	Tocalote	CEME050	Kaweah No. 1 Solar Yard Satellite Repeater	HIGH	2,807	6/17/2018
Centaurea melitensis	Tocalote	CEME051	Kaweah No. 1 Solar Yard Satellite Repeater	LOW	8,479	6/17/2018
Centaurea melitensis	Tocalote	CEME052	Kaweah No. 1 Intake Road	LOW	40,782	6/17/2018
Centaurea melitensis	Tocalote	CEME053	Kaweah No. 1 Flowline	LOW	36,632	6/17/2018
Centaurea melitensis	Tocalote	CEME054	Kaweah No. 1 Flowline	LOW	3,998	6/17/2018
Centaurea melitensis	Tocalote	CEME055	Kaweah No. 1 Flowline	LOW	44,893	6/17/2018
Centaurea melitensis	Tocalote	CEME056	Kaweah No. 1 Access Road - Lumberyard	MOD	3,293	6/18/2018

Scientific Name	Common Name	Unique Population/Map ID[1]	Facility	Level of Infestation[2]	Population Size (Square Feet)	Survey Date
Centaurea melitensis	Tocalote	CEME057	Kaweah No. 1 Flowline	LOW	28,067	6/18/2018
Centaurea melitensis	Tocalote	CEME058	Kaweah No. 1 Flowline	LOW	21,880	6/18/2018
Centaurea melitensis	Tocalote	CEME059[3]	Kaweah No. 1 Access Road - Upper Pine	LOW	40,693	6/22/2018
Centaurea melitensis	Tocalote	CEME060	Kaweah No. 1 Flowline	LOW	2,370	6/18/2018
Centaurea melitensis	Tocalote	CEME061	Kaweah No. 1 Flowline	LOW	33,653	6/18/2018
Centaurea melitensis	Tocalote	CEME062	Kaweah No. 1 Flowline Access Road - Lower Pine	LOW	32,447	6/22/2018
Centaurea melitensis	Tocalote	CEME063	Kaweah No. 1 Flowline	LOW	8,126	6/18/2018
Centaurea melitensis	Tocalote	CEME064	Kaweah No. 1 Flowline	LOW	15,948	6/19/2018
Centaurea melitensis	Tocalote	CEME065	Kaweah No. 1 Flowline Access Road - Grapevine	LOW	39,555	6/19/2018
Centaurea melitensis	Tocalote	CEME066	Kaweah No. 1 Flowline	LOW	13,736	6/19/2018
Centaurea melitensis	Tocalote	CEME067	Kaweah No. 1 Flowline	LOW	2,691	6/19/2018
Centaurea melitensis	Tocalote	CEME068	Kaweah No. 1 Flowline	LOW	19,794	6/19/2018
Centaurea melitensis	Tocalote	CEME069	Kaweah No. 1 Flowline Access Road - Summit	MOD	2,430	6/22/2018
Centaurea melitensis	Tocalote	CEME070[3]	Kaweah No. 1 Forebay Tank and Spillway Channel	LOW	1,048	6/19/2018
Centaurea melitensis	Tocalote	CEME071	Kaweah No. 1 Forebay Road	LOW	91,443	6/19/2018
Centaurea melitensis	Tocalote	CEME072	Kaweah No. 1 Forebay Road	LOW	66,683	6/19/2018
Centaurea melitensis	Tocalote	CEME073	Kaweah No. 1 Forebay Road	LOW/MOD/HIGH	23,390	6/19/2018
Cirsium vulgare	Bull thistle	CIVU001	Kaweah No. 2 Flowline at Flume 4	LOW	150	6/16/2018
Genista monspessulana	French broom	GEMO001	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	HIGH	2,042	4/26/2018
Tribulus terrestris	Puncture vine	TRTE001	Kaweah No. 3 Forebay and Spillway Channel	LOW	14,766	6/14/2018

Scientific Name	Common Name	Unique Population/Map ID[1]	Facility	Level of Infestation[2]	Population Size (Square Feet)	Survey Date
Tribulus terrestris	Puncture vine	TRTE002	Kaweah No. 3 Powerhouse and Switchyard	LOW	954	6/15/2018
Tribulus terrestris	Puncture vine	TRTE003	Kaweah No. 3 Powerhouse and Switchyard	LOW	20	6/15/2018
Tribulus terrestris	Puncture vine	TRTE004	Kaweah No. 3 Powerhouse and Switchyard	LOW	3,319	6/15/2018
Tribulus terrestris	Puncture vine	TRTE005[4]	Kaweah No. 3 Powerhouse and Switchyard	LOW	100	6/15/2018
Tribulus terrestris	Puncture vine	TRTE006	Kaweah No. 3 Powerhouse Road	LOW	2,815	6/15/2018
Tribulus terrestris	Puncture vine	TRTE007	Kaweah No. 3 Powerhouse Road	LOW	1,227	6/15/2018
Tribulus terrestris	Puncture vine	TRTE008	Kaweah No. 3 Powerhouse Road	LOW	9,193	6/15/2018
Tribulus terrestris	Puncture vine	TRTE009	Kaweah No. 2 Intake Road	LOW	19,590	6/15/2018
Tribulus terrestris	Puncture vine	TRTE010	Kaweah No. 2 Intake Road, Kaweah No. 2 Flowline Access Road - Open Siphon Grids	LOW	28,862	6/15/2018
Tribulus terrestris	Puncture vine	TRTE011	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	MOD	225	6/16/2018
Tribulus terrestris	Puncture vine	TRTE012	Kaweah No. 2 Access Road - Red Barn	LOW	30,828	6/21/2018
Tribulus terrestris	Puncture vine	TRTE013	Kaweah No. 2 Flowline West Access Road	MOD	16	6/21/2018
Tribulus terrestris	Puncture vine	TRTE014	Kaweah No. 2 Flowline Access Trail - Canal 15	LOW	1,062	6/21/2018
Tribulus terrestris	Puncture vine	TRTE015	Kaweah No. 2 Flowline Access Trail - Canal 15	LOW	587	6/21/2018
Tribulus terrestris	Puncture vine	TRTE016	Kaweah No. 2 Forebay Road	LOW	73,683	6/22/2018

Scientific Name	Common Name	Unique Population/Map ID[1]	Facility	Level of Infestation[2]	Population Size (Square Feet)	Survey Date
Tribulus terrestris	Puncture vine	TRTE017	Kaweah No. 2 Powerhouse Road, Kaweah River Drive, Kaweah No. 2 Powerhouse	MOD	3,352	6/22/2018
Tribulus terrestris	Puncture vine	TRTE018	Kaweah No. 2 Powerhouse Road, Kaweah River Drive, Kaweah No. 2 Switchyard	LOW	10,207	6/22/2018
Tribulus terrestris	Puncture vine	TRTE019	Kaweah No. 2 Powerhouse Road, Kaweah River Drive, Kaweah No. 2 Powerhouse	LOW	10,102	6/22/2018
Tribulus terrestris	Puncture vine	TRTE020	Kaweah No. 2 Powerhouse Transmission Tap Line	LOW	4	6/22/2018
Tribulus terrestris	Puncture vine	TRTE021	Kaweah No. 2 Powerhouse Transmission Tap Line	LOW	300	6/22/2018
Tribulus terrestris	Puncture vine	TRTE022	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line, Kaweah No. 1 Powerhouse	LOW/MOD	32,905	6/18/2018
Tribulus terrestris	Puncture vine	TRTE023	Kaweah No. 1 Powerhouse	LOW	2,198	6/18/2018
Tribulus terrestris	Puncture vine	TRTE024	Kaweah No. 2 Penstock	LOW	23,005	6/18/2018
Tribulus terrestris	Puncture vine	TRTE025	Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	MOD	400	6/23/2018

Notes: LOW = <5% cover
MOD = 6–25% cover
HIGH = >25% cover

[1] Refer to Map TERR 1-2 (a–t) for the location of each individual/population in the Study Area.

[2] Level of Infestation

[3] Tocalote is widespread in the Project vicinity. Therefore, with the exception of populations CEME001, CEME029, CEME042, CEME059, and CEME070, the full extent of tocalote populations were not fully mapped and extend beyond the study area boundaries.

[4] After review, TRTE005 was removed from the map because it falls outside of the Project boundary. It is included in this table for reference.

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MAPS

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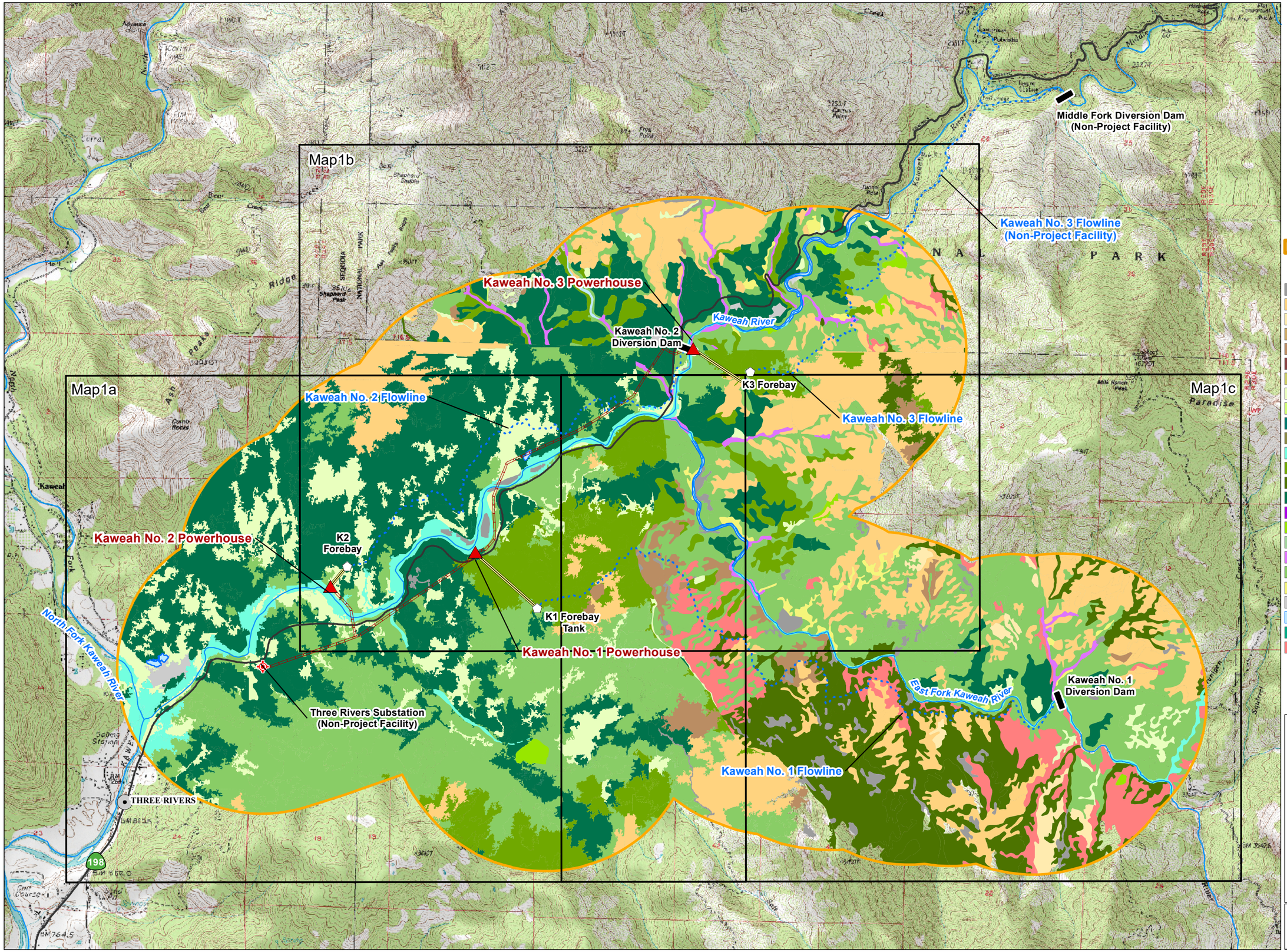

Facilities

- Powerhouse
- Diversion
- Dam
- Utility
- Forebay
- Flowline
- Penstock
- Transmission Line

Other Features

- Highway/Road
- Watercourse
- 1 Mile Buffer of FERC Boundary

CALVEG Vegetation Alliances*

- Barren (BA)
- Chamise Alliance (CA)
- Ceanothus Chaparral Alliance (CC)
- Wedgeleaf Ceanothus Alliance (CL)
- Lower Montane Mixed Chaparral Alliance (CQ)
- Whiteleaf Manzanita Alliance (CW)
- Upper Montane Mixed Chaparral Alliance (CX)
- Annual Grasses and Forbs Alliance (HG)
- Perennial Grasses and Forbs Alliance (HM)
- Incense Cedar Alliance (MD)
- Mixed Conifer-Pine Alliance (MP)
- Riparian Mixed Hardwood Alliance (NR)
- Interior Mixed Hardwood Alliance (NX)
- Canyon Live Oak Alliance (QC)
- Blue Oak Alliance (QD)
- White Alder Alliance (QE)
- California Buckeye Alliance (QI)
- Black Oak Alliance (QK)
- California Sycamore Alliance (QP)
- Interior Live Oak Alliance (QW)
- Chaparral Yucca Alliance (SY)
- Urban (UB)
- Water (WA)
- Willow (Shrub) Alliance (WL)
- Birchleaf Mountain Mahogany Alliance (WM)

***Source: Hexagon Imagery 2016, USDA-FS 2017a, USDA-FS 2017b, (with 2018 desktop and field updates)**

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FERC Project No. 298

Map TERR 1-1

CALVEG Vegetation Alliances Occurring within 1 Mile of the Kaweah Project

0 0.25 0.5 Miles

Date: 11/8/2018

Projection: UTM Zone 11
Datum: NAD 83

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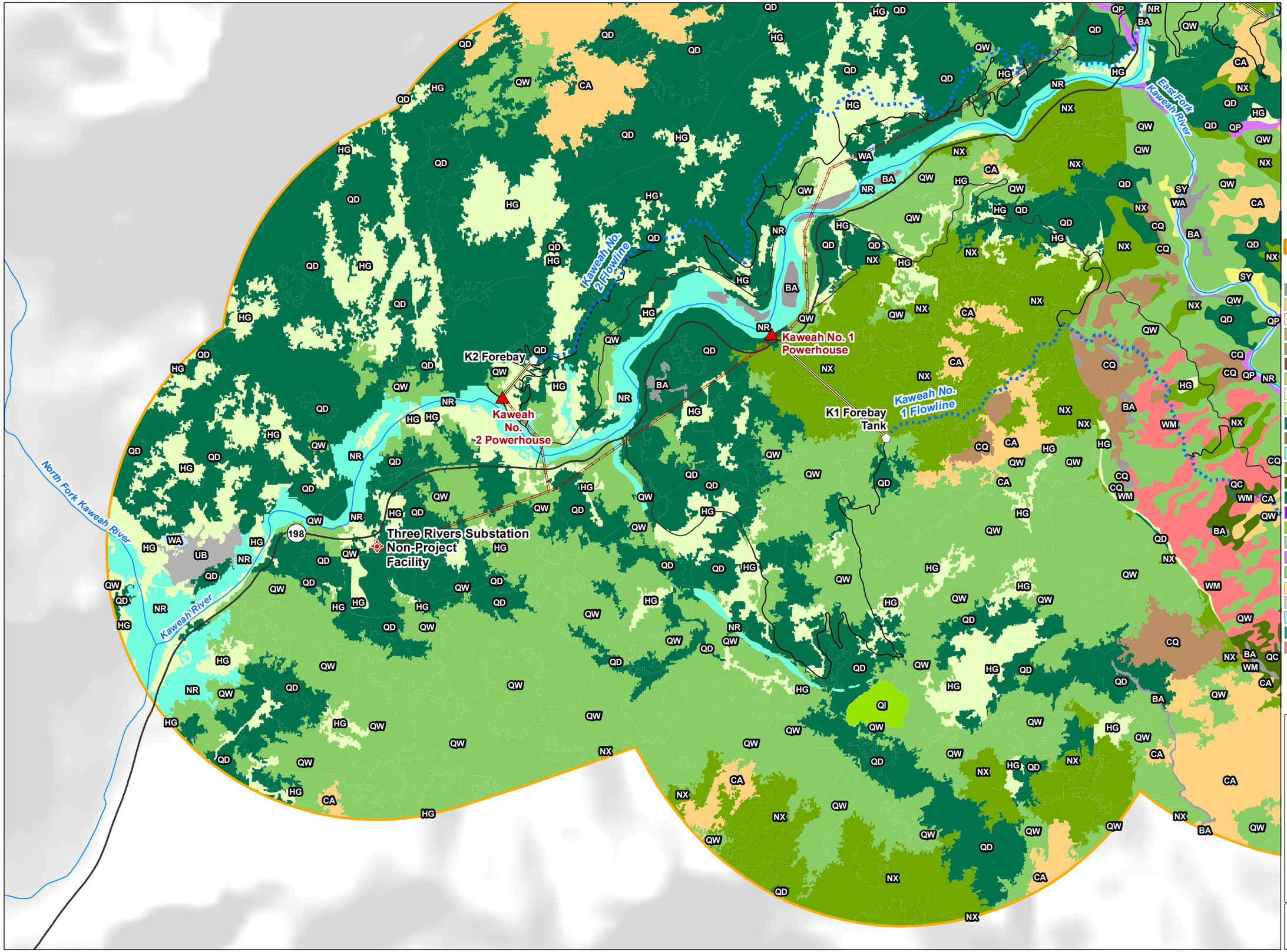

Facilities

- Powerhouse
- Diversion
- Dam
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- Forebay
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- Penstock
- Transmission Line

Other Features

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***Source: Hexagon Imagery 2016, USDA-FS 2017a, USDA-FS 2017b, (with 2018 desktop and field updates)**

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Map TERR 1-1a

CALVEG Vegetation Alliances Occurring within 1 Mile of the Kaweah Project

0 500 1,000 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 11/8/2018

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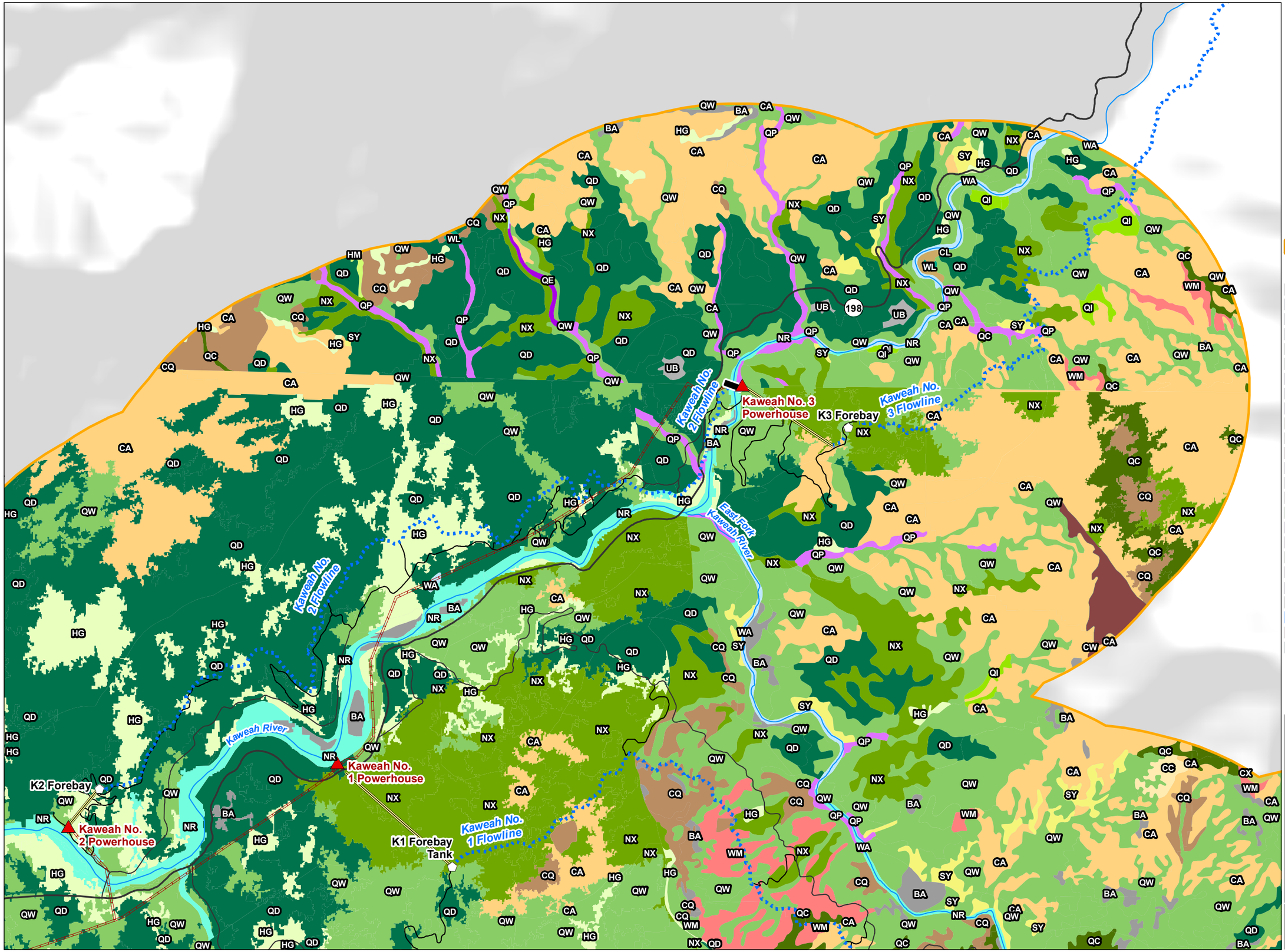

Facilities

- Powerhouse
- Diversion
- Dam
- Utility
- Forebay
- Flowline
- Penstock
- Transmission Line

Other Features

- Highway/Road
- Watercourse
- 1 Mile Buffer of FERC Boundary

CALVEG Vegetation Alliances*

- Barren (BA)
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- Ceanothus Chaparral Alliance (CC)
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- Water (WA)
- Willow (Shrub) Alliance (WL)
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*Source: Hexagon Imagery 2016, USDA-FS 2017a, USDA-FS 2017b, (with 2018 desktop and field updates)

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Map TERR 1-1b

CALVEG Vegetation Alliances Occurring within 1 Mile of the Kaweah Project

0 500 1,000 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 11/8/2018

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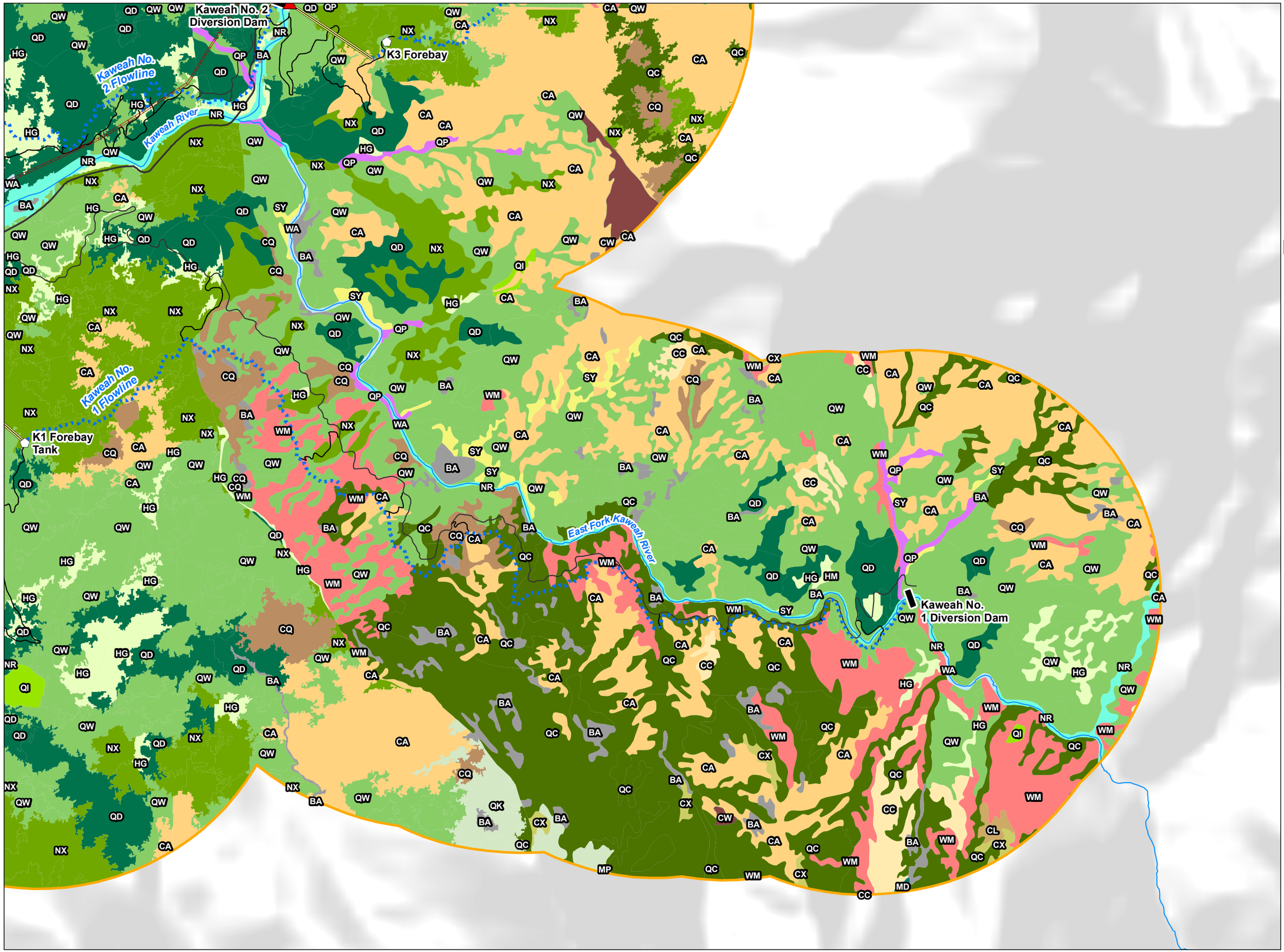

Facilities

- Powerhouse
- Diversion
- Dam
- Utility
- Forebay
- Flowline
- Penstock
- Transmission Line

Other Features

- Highway/Road
- Watercourse
- 1 Mile Buffer of FERC Boundary

CALVEG Vegetation Alliances*

- Barren (BA)
- Chamise Alliance (CA)
- Ceanothus Chaparral Alliance (CC)
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- Willow (Shrub) Alliance (WL)
- Birchleaf Mountain Mahogany Alliance (WM)

***Source: Hexagon Imagery 2016, USDA-FS 2017a, USDA-FS 2017b, (with 2018 desktop and field updates)**

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

FERC Project No. 298

Map TERR 1-1c

CALVEG Vegetation Alliances Occurring within 1 Mile of the Kaweah Project

0 500 1,000 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 11/8/2018

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CONFIDENTIAL

The following map series is being withheld from public disclosure in accordance with applicable regulations. This map series contains details on the locations of special-status biological resources and qualifies as Confidential Information [18 CFR §385.1112]. Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings visit http://www.ferc.gov/legal/ceii-foia/foia.asp.

Maps TERR 1-2a-t. CONFIDENTIAL Location of Special-Status Plant and Non-Native Invasive Plant Populations in the Study Area

This map series will not be distributed to the general public. Maps 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) 302-9494, or david.moore@sce.com.

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APPENDIX A

Descriptions of CALVEG Vegetation Alliances Occurring in the Study Area

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Barren (BA)

Landscapes generally devoid of vegetation as seen from a high-altitude image source such as aerial photography, are labeled as Barren. This category includes mappable landscape units in which surface lithology is dominant, such as exposed bedrock, cliffs, interior sandy or gypsum areas, and the like. It does not include areas considered as modified or developed, as in urban areas, but may include quarries and mine sites.

Chamise Alliance (CA)

Chamise (*Adenostoma fasciculatum*) is a dominant shrub of lower elevation, xeric slopes and ridges of the western Sierra Nevada Mountains between about 1200 – 4800 ft (366 – 1464 m). This alliance has been mapped most frequently in the westside Upper Foothills Metamorphic Belt Subsection, and more sparsely in the Lower Batholith Subsection. Associated minor species of this Alliance include shrubs of the Lower Mixed Chaparral Alliance such as Birchleaf Mountain Mahogany (*Cercocarpus betuloides*) and Whiteleaf Manzanita (*Arctostaphylos viscida*). California Buckwheat (*Eriogonum fasciculatum* var. *polifolium*) and, especially towards the eastside, the grass Squirreltail (*Elymus elymoides*) may also be present in this type. Interior Live Oak (*Quercus wislizenii*), Canyon Live Oak (*Q. chrysolepis*), Gray Pine (*Pinus sabiniana*) and Ponderosa Pine (*P. ponderosa*) may occur in close proximity to the Chamise Alliance.

Ceanothus Chaparral Alliance (CC)

An Alliance of Ceanothus species has been mapped sparsely and well scattered in the Tehachapi – Piute Mountains, Kern Plateau, Lower Batholith and the Upper Batholith and Volcanic Flows Subsections at elevations in the general range of about 3000 – 8000 ft (915 – 2440 m). Within the higher ranges of the Tehachapi Mountains, the mixture is more likely to contain prominent Mountain Whitethorn (*C. cordulatus*), Mojave Ceanothus (*C. greggii* var. *vestitus*) and/or Deerbrush (*C. integerrimus*), where its main associates are White Fir (*Abies concolor*), Black Oak (*Quercus kelloggii*) and other shrubs in the Great Basin – Mixed Chaparral Transition Alliance. Areas lower and further west, such as in the Lower Batholith Subsection, are more likely to include conspicuous Wedgeleaf Ceanothus (*C. cuneatus*), Chaparral Whitethorn (*C. leucodermis*) and/or Woolyleaf Ceanothus (*C. tomentosus*) in the mixture. Snowbrush (*C. velutinus*) may appear more prominently in northern areas, such as in the Upper Batholith and Volcanic Flows Subsection.

Wedgeleaf Ceanothus Alliance (CL)

This Alliance is dominated by Wedgeleaf Ceanothus (*Ceanothus cuneatus*) and occurs prominently in the Tehachapi – Piute Mountains, Lower Batholith and Eastern Slopes Subsections and less commonly in several other subsections. Elevations are generally in the 3000 – 6000 ft (914 – 1830 m) range. These stands are in close proximity to other shrubs of the Lower Montane Chaparral Alliance such as Birchleaf Mountain Mahogany (*Cercocarpus betuloides*) as well as lower elevation trees such as Canyon and Interior Live Oaks (*Quercus chrysolepis*, *Q. wislizenii*) and Gray and Ponderosa Pines (*Pinus sabiniana*, *P. ponderosa*). California Buckwheat (*Eriogonum fasciculatum*) may also be associated with it on drier or more disturbed sites.

Lower Montane Mixed Chaparral Alliance (CQ)

The Lower Montane Mixed Chaparral Alliance is very common in the southern Sierra Nevada Mountains at elevations below about 5800 ft (1372 m) on the westside and higher in the Tehachapi – Piute Mountains Subsection. The Alliance has been mapped in nine subsections and may contain mixtures of Ceanothus species, Whiteleaf and Common Manzanitas (Arctostaphylos viscida, A. manzanita), Chamise (*Adenostoma fasciculatum*), Fremont or Wavyleaf Silk-tassel (*Garrya fremontii*, *G. elliptica*), Flannelbush (*Fremontodendron californicum*), Birchleaf Mountain Mahogany (*Cercocarpus betuloides*), Poison Oak (*Toxicodendron diversilobum*), Shrub Oaks (*Quercus* spp.) and other lower elevation shrub species. Foothill Ash (*Fraxinus dipetala*) and Bush Poppy (*Dendromecon rigida*) may occasionally be part of this mixture as well. Individual sites may support pure stands of these shrubs such as in the Wedgeleaf Ceanothus (*C. cuneatus*) Alliance. Associated trees often include Canyon and Interior Live Oaks (*Quercus chrysolepis*, *Q. wislizenii*) adjacent to these sites and often Ponderosa Pine (*Pinus ponderosa*) as well.

Whiteleaf Manzanita Alliance (CW)

Two forms of Whiteleaf Manzanita (*Arctostaphylos viscida* var. *viscida*) and Mariposa Manzanita (*Arctostaphylos viscida* var. *mariposa*) assume dominance on dry slopes in the same elevation range as Ponderosa Pine and the Mixed Conifer - Pine Alliances in the southern Sierra Nevada. These varieties are merged in the Whiteleaf Manzanita Alliance, which occurs more prominently toward the west (Central Valley Calveg Zone) and less commonly in this zone. The Alliance has been mapped in scattered locations of five subsections, chiefly between about 2600 – 5400 ft (792 – 1646 m). The species is usually found on south and west aspects or on rocky or infertile soils in association with Chamise (*Adenostoma fasciculatum*) and other lower elevation shrubs and Canyon Live Oak (*Quercus chrysolepis*).

Upper Montane Mixed Chaparral Alliance (CX)

The Upper Montane Mixed Chaparral Alliance is a mid- to upper-elevation shrub type in which no single species is dominant. It has been mapped abundantly in this zone. Species that are commonly found in the mixture include Greenleaf Manzanita (*Arctostaphylos patula*), Mountain Whitethorn (*Ceanothus cordulatus*), Mountain Misery (*Chamaebatia foliolosa*), Deerbrush (*Ceanothus integerrimus*), Huckleberry Oak (*Quercus vaccinifolia*), Bush Chinquapin (*Chrysolepis sempervirens*) and Bitter Cherry (*Prunus emarginata*). Site differences, autoecological factors, and especially fire history account for variability in the mixtures. For example, Deerbrush, a prolific deciduous-leaved seeder, is found on mesic, well-drained soils on westside slopes while Greenleaf Manzanita, a prolific evergreen root-sprouter and seeder, most often is found on xeric sites or on coarse soils on both eastside and westside slopes. Mountain Whitethorn, an evergreen stump-sprouter and prolific seeder, found mainly on the westside, is preferred browse for deer and is often heavily cropped after fires. In the eastside condition, Big Sagebrush (*Artemisia tridentata*), Snowbrush (*Ceanothus velutinus*), an evergreen prolific seeder and vigorous rootcrown-sprouter, Fern Bush (*Chamaebatiaria millefolium*), Snowberry (*Symphoricarpos* spp.) and Squirreltail (*Elymus elymoides*) may occur as species associated with this Alliance.

Annual Grasses And Forbs Alliance (HG)

Throughout the low elevations of the western slopes of the southern Sierra Nevada, annual grasses such as Bromes (*Bromus* spp.), Needlegrass (*Achnatherum* spp.) and Wild Oats (*Avena* spp.) may dominate rolling hills. Dominant forbs in this Alliance include Owl's Clover (*Orthocarpus* spp.), Fiddleneck (*Amsinckia intermedia*) and Stork's Bill (*Erodium* spp.). They may occur in pure stands or contain an overstory of scattered oaks (*Quercus* spp.) or California Buckeye (*Aesculus californica*). Associated westside species include hardwoods growing in sheltered areas and conifers such as Gray Pine (*Pinus sabiniana*) or Ponderosa Pine (*P. ponderosa*) in the Upper Foothills Metamorphic Belt and Lower Batholith Subsections. In some areas, this Alliance may dominate a vast array of slopes and aspects due to wildfires, xeric conditions and other factors; on eastside slopes in the Eastern Slopes and Kern Plateau Subsections,

recent wildfires have created large grass patches at elevations up to 8000 ft (2440 m) or more. Great Basin species such as Big Sagebrush (*Artemisia tridentata*), Rabbitbrush (*Chrysothamnus* spp.), Singleleaf Pinyon Pine (*P. monophylla*) and Jeffrey Pine (*P. jeffreyi*) are often found adjacent to these patches.

Perennial Grasses and Forbs Alliance (HM)

Perennial grasses and forbs in moist sites have been mapped in widespread areas of the southern Sierra Nevada Mountains within ten subsections. The elevations of these sites generally are within about 6400 – 12,000 ft (1952 – 3660 m), spanning the mid-montane to alpine regions. Upper elevations are often associated with subalpine conifers such as Whitebark Pine (*Pinus albicaulis*), Lodgepole Pine (*P. contorta* ssp. *murrayana*) and Red Fir (*Abies magnifica*). The Perennial Grasses and Forbs Alliance is a form of dry to moist grassland or meadows in which it is difficult to determine species composition and to separate it from the Wet Meadows and Alpine Grasses and Forbs types. At lower altitudes, some of these areas are currently being used for livestock pasture and are a mix of perennial and annual grasses and legumes that vary according to management practices. Perennial bunchgrasses introduced from Eurasia such as Desert Crested, Tall and Intermediate Wheatgrasses (*Agropyron desertortum*, *Elytrigia pontica* and *Elytrigia intermedia*), in addition to Tall Fescue (*Festuca arundinacea*), Clover (*Trifolium* spp.), Needlegrass (*Achnatherum* spp.), Squirreltail (*Elymus elymoides*), Rockcress (*Arabis* spp.), Monardella (*Monardella* spp.), Buckwheat (*Eriogonum* spp.), Cheatgrass (*Bromus tectorum*) and others may be included in the mixture. Mules-ears (*Wyethia* spp.) are a common component on some eastside locations. Sites may have other grass or grasslike indicators such as Sedges of various species (*Carex* spp.), Barley (*Hordeum brachyantherum*) and forbs such as Groundsel (*Senecio* spp.), Aster (*Aster alpigenus*), Beardtongue (*Penstemon heterodoxus*), and others in the alpine herbaceous type.

Incense Cedar Alliance (MD)

Incense Cedar (*Calocedrus decurrens*) is a wide-ranging species that competes well on a variety of sites. It has been mapped sparsely as a dominant conifer in five subsections in the southern Sierras. The Incense Cedar Alliance is typically found in the elevation range 3000 - 4000 ft (915 – 1952 m), but this conifer is typically a component of the Mixed Conifer – Pine Alliance and associates with trees such as White Fir (*Abies concolor*), Ponderosa Pine (*Pinus ponderosa*) and Canyon Live and Black Oaks (*Quercus chrysolepis*, *Q. kelloggii*).

Mixed Conifer - Pine Alliance (MP)

Ponderosa Pine (*Pinus ponderosa*) and Sugar Pine (*P. lambertiana*) are important components of the Mixed Conifer - Pine Alliance, the most commonly mapped conifer alliance in the southern Sierras. It has been mapped abundantly in the Batholith and Volcanic Flows (westside), Upper Foothills Metamorphic Belt and Upper Batholith Subsections and less commonly in five others in this zone. White Fir (*Abies concolor*), Incense Cedar (*Calocedrus decurrens*), Knobcone Pine (*P. attenuata*) and several hardwoods such as Black Oak (*Quercus kelloggii*) may be present in varying amounts in the mixture. The Mixed Conifer – Pine Alliance is generally found at elevations between about 3200 – 6400 ft (976 – 1952 m), although scattered sites have been mapped at higher and lower altitudes. This Alliance is usually found on mesic soils between the higher Mixed Conifer - Fir and the lower Ponderosa Pine Alliances. Understory shrubs include Mountain Misery (*Chamaebatia foliosa*), Mountain Whitethorn (*Ceanothus cordulatus*), Mariposa (*Whiteleaf*) Manzanita (*Arctostaphylos viscida* ssp. *mariposa*), and at higher elevations, Greenleaf Manzanita (*A. patula*).

Riparian Mixed Hardwood Alliance (NR)

A mixture of two or more non-dominant hardwoods found in shaded drainages, riparian and seep sites has been mapped in scattered pockets of seven subsections in the southern Sierras zone such as in the Upper Foothills Metamorphic Belt, Tehachapi – Piute Mountains, and Lower Batholith Subsections. Elevations range from below 1000 ft (305 m) up to about 9600 ft (2928 m), reflecting a variety of hardwoods such as Bigleaf Maple (*Acer macrophyllum*), California Bay (*Umbellularia californica*), Mountain Dogwood (*Cornus nuttallii*), Fremont or Black Cottonwoods (*Populus fremontii*, *P. balsamifera* ssp. *trichocarpa*) and Oregon Ash (*Fraxinus latifolia*). Tree Willows (*Salix* spp.), White Alder (*Alnus rhombifolia*) also commonly occur, with California Sycamore (*Platanus racemosa*) occasionally towards the west part of this zone. Upland trees such as Interior Live Oak (*Quercus wislizenii*) and Canyon Live Oak (*Q. chrysolepis*) occasionally occur on these sites. Quaking Aspen (*Populus tremuloides*) and Water Birch (*Betula occidentalis*) are more prevalent in this type in the Eastern Slopes Subsection and an occasional Valley Oak (*Q. lobata*) is more likely to occur in the Kern Plateau Subsection.

Interior Mixed Hardwood Alliance (NX)

A mixture of upland hardwoods with no clearly dominant species occurs very commonly in the Lower Batholith and Tehachapi - Piute Mountains Subsections and more rarely in five other subsections. This type has been mapped most often in the elevation range of about 1000 – 6000 ft (305 – 1830 m). The mixture includes any combination of Interior Live Oak (*Quercus wislizenii*), Canyon Live Oak (*Q. chrysolepis*), Blue Oak (*Q. douglasii*), and/or California Buckeye (*Aesculus californica*), with Valley Oak (*Q. lobata*) or Black Oak (*Q. kelloggii*) occurring less frequently. The occasional overstory conifers may include Gray Pine (*Pinus sabiniana*) or Ponderosa Pine (*P. ponderosa*). Lower-elevation shrubs in canopy openings such as Wedgeleaf Ceanothus (*Ceanothus cuneatus*) and Birchleaf Mountain Mahogany (*Cercocarpus betuloides*) may also be present onsite or in the vicinity.

Canyon Live Oak Alliance (QC)

Canyon Live Oak (*Quercus chrysolepis*) in pure stands generally occurs above the Lower Montane Mixed Chaparral Alliance and below the Black Oak (*Q. kelloggii*) and Ponderosa Pine (*Pinus ponderosa*) Alliances on droughty sites. The Canyon Live Oak Alliance is the most frequently mapped hardwood type in the southern Sierras, being present in eight subsections, most abundantly in the Lower Batholith Subsection. These sites are often found on shallow colluvial soils in steep canyons generally between about 1600 ft (488 m) and 8400 ft (2562 m) in the Southern Sierras, the higher elevations in the east. The Alliance is occasionally also associated with the Mixed Conifer – Pine and Interior Live Oak (*Q. wislizenii*) Alliances, usually on rock outcrops and ridge tops. Shrubs such as Deerbrush (*Ceanothus integerrimus*) and Whiteleaf Manzanita (*Arctostaphylos viscida*) may occur in the understory, as well as annual grasses and forbs. In the Tehachapi – Piute Mountains Subsection, this type is frequently found adjacent to the Singleleaf Pinyon Pine, California Buckwheat, Scrub Oak and Great Basin – Mixed Chaparral Transition Alliances.

Blue Oak Alliance (QD)

The Blue Oak (*Quercus douglasii*) Alliance occurs on shallow upland soils in foothill savannas adjacent to the western slopes of the Sierra Nevada. It has been mapped in five ecological units, most commonly in the Tehachapi – Piute Mountains, Lower Batholith and Upper Foothills Metamorphic Belt Subsections. Elevations where mapped are often in the 1000 – 5800 ft (305 – 1768 m) range, highest towards the south. Blue Oak naturally occurs in an oak-grass association on well drained, gentle slopes. Gray Pine (*Pinus sabiniana*) is the most common tree associate in this hillside type; Interior Live Oak (*Q. wislizenii*) may also be a major hardwood occurring in close proximity to this type. Non-stump sprouting chaparral shrubs such as Wedgeleaf Ceanothus (*Ceanothus cuneatus*), Manzanitas (*Arctostaphylos* spp.), Coffeeberry (*Rhamnus* spp.), California Buckwheat (*Eriogonum fasciculatum*) and Poison Oak

(*Toxicodendron diversilobum*) are scattered throughout this Alliance and Chamise (*Adenostoma fasciculatum*) often occurs adjacent to these sites.

Black Oak Alliance (QK)

Black Oak (*Quercus kelloggii*) occurs in pure stands or associates with Ponderosa Pine (*Pinus ponderosa*), generally below about 8200 ft (2501 m) on westside slopes of the southern Sierra Nevada. This occasionally sprouting hardwood out-competes the pine on poorly drained or somewhat shallow soils. In other mixed stands, Black Oak is more commonly associated with the Mixed Conifer – Pine and Mixed Conifer – Fir Alliances. It has been mapped in nine subsections, most often in the Upper Foothills Metamorphic Belt, Lower Batholith, Tehachapi – Piute Mountains, Upper Batholith, and Batholith and Volcanic Flows Subsections. Shrubs of the Lower and Upper Montane Mixed Chaparral Alliances may be found adjacent to this type.

White Alder Alliance (QE)

White Alder (*Alnus rhombifolia*) is the major dominant hardwood in this Alliance, although Oregon Ash (*Fraxinus latifolia*), Water Birch (*Betula occidentalis*) and Black Cottonwood (*Populus balsamifera* ssp. *trichocarpa*) are often present. The White Alder Alliance occurs in riparian areas at mid-montane elevations throughout the southern Sierra Nevada on both eastside and westside slopes, and has been mapped to a limited extent in seven subsections. Elevations are in the range of about 2600 – 6400 ft (792 – 1952 m). Upland associated types include the Lower Montane Mixed Chaparral, Ponderosa Pine and Mixed Conifer – Pine Alliances.

California Buckeye Alliance (QI)

California Buckeye (*Aesculus californica*) has been mapped on occasion in pure stands in three subsections of the southern Sierras, occurring most often in the western sectors of the Lower Batholith Subsection at elevations between 1600 – 4800 ft (488 – 1464 m). These areas are adjacent to hardwoods such as Interior and Canyon Live Oaks (Quercus wislizenii, Q. chrysolepis) and Blue Oak (*Q. douglasii*). Sites on which California Buckeye occur tend to be xeric in this zone, but often moister in areas of other zones further north and west.

California Sycamore Alliance (QP)

Riparian areas dominated by California Sycamore (*Platanus racemosa*) have been mapped in one area of the Lower Batholith Subsection at elevations between about 1800 – 4400 ft (548 – 1342 m). Other riparian or mesic site hardwoods may be present in this alliance in minor amounts, such as Fremont Cottonwood (*Populus fremontii*), Bigleaf Maple (*Acer macrophyllum*) and Willows (Salix spp.).

Interior Live Oak Alliance (QW)

Interior Live Oak (*Quercus wislizenii*) occurs as a hardwood dominant in semi-open or closed stands in this Alliance, and was mapped broadly and widespread along the western borders and some interior locations of six subsections of the southern Sierra Nevadas. It is most abundant in the Lower Batholith, Upper Foothills Metamorphic Belt and Tehachapi – Piute Mountains, and Batholith and Volcanic Flows Subsections, generally at elevations between about 1200 – 6400 ft (366 – 1952 m). Canyon Live Oak (*Q. chrysolepis*) or Black Oak (*Q. kelloggii*) may become associated with the Interior Live Oak Alliance at higher elevations, grading into the Interior Mixed Hardwoods Alliance, especially in the Tehachapi – Piute Mountains Subsection. Ponderosa Pine (*Pinus ponderosa*) commonly occurs with Interior Live Oak in mixed stands. On drier sites or lower elevations, Gray Pine (*P. sabiniana*), Blue Oak (*Q. douglasii*) and Buckeye (*Aesculus californica*) are associated trees. In most areas, shrub associates are chiefly those in the Lower Montane Mixed Chaparral type, such as Chamise (*Adenostoma fasciculatum*) and Wedgeleaf

Ceanothus (*Ceanothus cuneatus*). However, shrubs such as California Buckwheat (*Eriogonum fasciculatum*), Scrub Oak (*Q. berberidifolia*) and Big Sagebrush (*Artemisia tridentata*) are more likely to be within and adjacent to this Alliance in the Tehachapi – Piute Mountains Subsection.

Chaparral Yucca Alliance (SY)

Chaparral Yucca (*Yucca whipplei*) occurs as individual shrubs and in several subspecies in a variety of habitats, but will occasionally dominate harsher sites such as those having shallow, rocky, or porous soils in the southern Sierras. It also may sprout vigorously from basal leaves after light fires, increasing its dominance over small areas. The Chaparral Yucca Alliance has been mapped sparsely in western areas of the Tehachapi - Piute Mountains Subsection, mainly at elevations between about 2200 – 6000 ft (670 – 1830 m). On these dry sites, it occurs in the vicinity of Chamise (*Adenostoma fasciculatum*), Canyon and Interior Live Oaks (*Quercus chrysolepis*, *Q. wislizenii*) and in proximity to the Annual Grasses and Forbs Alliance.

Urban Or Developed (UB)

This category applies to landscapes that are dominated by urban structures, residential units, or other developed land use elements such as highways, city parks, cemeteries, and the like. In those cases in which the managed landscapes may have a considerable vegetation component, other land use categories may be more appropriate, such as Ornamental Conifer and Hardwood mixtures within city parks.

Water (WA)

Water is labeled in CALVEG mapping in those cases in which permanent sources of surface water are identified within a landscape unit of sufficient size to be mapped. The category includes lakes, streams, and canals of various size, bays and estuaries and similar water bodies. These areas are considered to have a minimum of vegetation components, except along the edges, which may be mapped as types such as Wet Meadows, Tule-Cattail freshwater marshes, or Pickleweed-Cordgrass saline or mixed marshes. Islands of sufficient size within water bodies will be mapped according to their terrestrial dominant vegetation types.

Shrub Willow Alliance (WL)

Shrub Willows (*Salix* spp.) may dominate stretches of low to high elevation streams, springs and seeps in the southern Sierras. Depending on location and elevation, species may include Geyer's (*S. geyeriana*), Gray-leaved Sierra (*S. orestera*), Lemmon's (*S. lemmonii*), Narrow-leaved (*S. exigua*), Shining (*S. lucida*), Yellow (*S. lutea*), or other Willows. This type has been mapped extensively over ten subsections, most frequently in the Glaciated Batholith, Eastern Slopes, Glaciated Batholith and Volcanic Flows, and Upper Batholith Subsections. On the eastside, it is often found adjacent to upland Great Basin types such as Low, Mountain and Big Sagebrushes (*Artemisia arbuscula*, *A. tridentata* var. *vaseyana*, *A. tridentata*), subalpine and upper montane trees such as Lodgepole Pine (*Pinus contorta* ssp. *murrayana*), Western White Pine (*P. monticola*), Red Fir (*Abies magnifica*), Whitebark Pine (*P. albicaulis*), Mountain Hemlock (*Tsuga mertensiana*) and Quaking Aspen (*Populus tremuloides*). Mesic shrubs of these elevations, such as Huckleberry Oak (*Quercus vaccinifolia*) also are often found near the Shrub Willow Alliance. As this type may occupy the wettest upland sites, the Wet Meadows Alliance is very frequently associated with it, as are riparian shrubs such as Blue Elderberry (*Sambucus mexicana*), White-stemmed Gooseberry (*Ribes inerme*) and California

Birchleaf Mountain Mahogany Alliance (WM)

Birchleaf Mountain Mahogany (*Cercocarpus betuloides*, also called *C. montanus*) may occasionally occur in pure stands on xeric, semi-desert, cliff or even moist sites to the exclusion of other species. The Birchleaf Mountain Mahogany Alliance, where it is the dominant shrub, has been mapped infrequently on slopes in the southern Sierras within the Lower Batholith, Tehachapi – Piute Mountains, Eastern Slopes and Upper Foothills Metamorphic Belt Subsections. Elevations of these sites are within the range from about 2000 – 6200 ft (610 – 1890 m). Canyon and Interior Live Oaks (*Quercus chrysolepis*, *Q. wislizenii*), and other Lower Montane Chaparral shrubs such as Chamise (*Adenostoma fasciculatum*) are associated with this type in this region.

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APPENDIX B

Representative Photographs of Vegetation Alliances and Wildlife Habitats within 0.25 Mile of Project Facilities

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Photo B-1 **Riparian mixed hardwood alliance (NR) surrounding barren gravel bars (BA) on the Kaweah River.**

Photo B-2 **A large polygon southwest of the Three Rivers Substation was designated by CALVEG as annual grasses and forbs (HG) but supported blue oak alliance (QD) around the western edge. The portion dominated by QD was reclassified as a new polygon.**

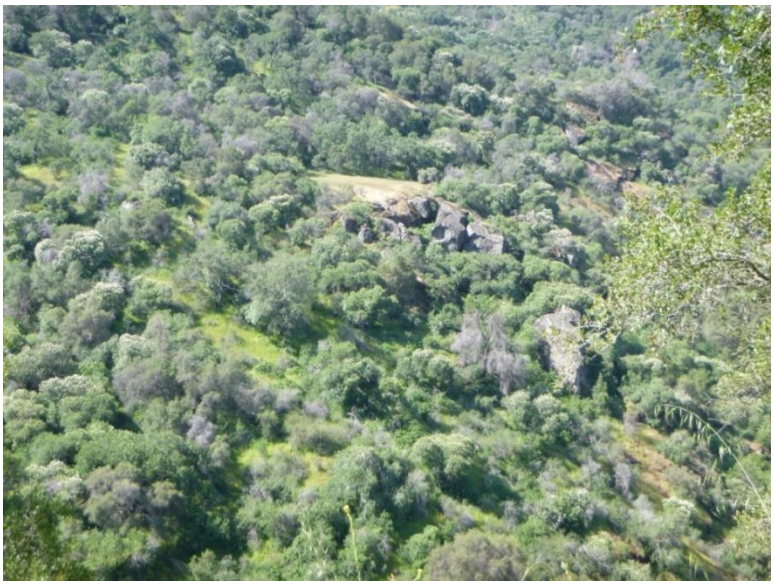

Photo B-3 **A large polygon designated by CALVEG as interior live oak (QW) south of Kaweah No. 1 Forebay Road consisted of California buckeye alliance (QI) and was subsequently reclassified.**

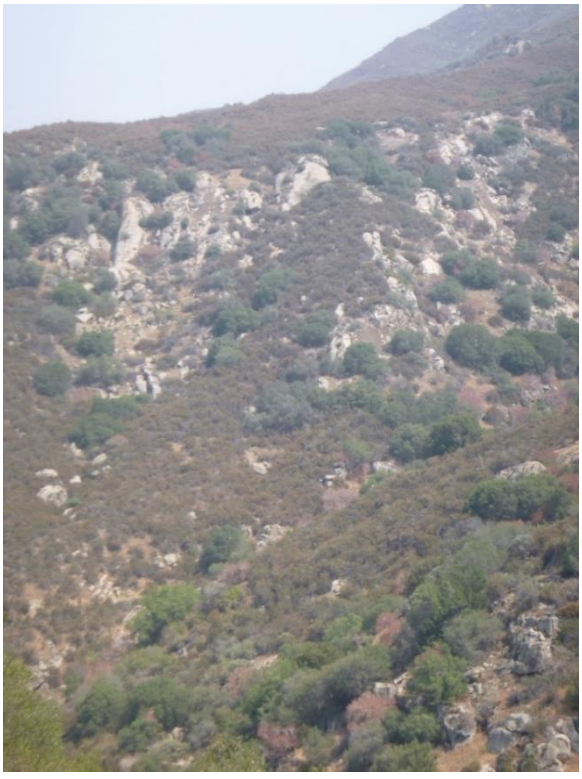

Photo B-4 **A large polygon overlapping the Kaweah No. 1 Flowline approximately 0.4 mile northeast of the northern end of the Kaweah No. 1 Forebay Road was designated by CALVEG as interior mixed hardwood alliance (NX) and was reclassified as lower montane mixed chaparral alliance (CQ).**

Photo B- 5 **A large polygon that crosses Kaweah No. 1 Flowline and borders Mineral King Road approximately 0.2 mile north of the southern end of the Kaweah No. 1 Flowline Access Road - Grapevine was designated by CALVEG as barren (BA) and was reclassified as ceanothus chaparral (CQ) west of the flowline and as annual grasses and forbs (HG) east of the flowline. The photo above shows the HG east of the flowline.**

Photo B-6 **A large polygon approximately 0.2 mile north of the intersection of Mineral King Road and Kaweah No. 1 Flowline Access Road - Upper Pine was designated as chaparral yucca alliance (SY). It was reclassified as barren (BA).**

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APPENDIX C

Vegetation Alliance Ground-Truthing Survey Forms

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SCE Kaweah Hydroelectric Project (FERC No. 298)
TERR 1: Vegetation Alliance Ground-Truthing Survey Form

Date: 5/7/2018	
Surveyors: Robyn Smith and Elliot Maldonado	
Location Name: K3 Powerhouse to Three Rivers Substation Transmission Line	
GPS Coordinates: 330669 E, 4035685 N	Trimble ID #[1]: QD-001
CalVeg Designation: HG	
Field-Assessed CalVeg Designation: HG & QD	

General Site Summary

General site description/notes:
Pasture dominated by grasses bordered in barbed wire with interspersed blue oak. Blue oaks become dominant around the edges of the core
pasture.
Substrate Notes: The field team was unable to access the parcel due to the barbed wire fence.

SCE Kaweah Hydroelectric Project (FERC No. 298)
TERR 1: Vegetation Alliance Ground-Truthing Survey Form

Community Composition and Structure

Dominant Species	% Cover (Approx)
Grasses	80%
Blue Oak	20%

Characterize subdominant/understory species:
Variety of brome and wild oat grasses.
Wildlife species observed on site:
RTHA

[1] Create a unique Trimble ID using vegetation community name and sequential number (ex. VEGCOM-001).

SCE Kaweah Hydroelectric Project (FERC No. 298)
TERR 1: Vegetation Alliance Ground-Truthing Survey Form

Date: 5/7/2018	
Surveyors: Robyn Smith and Elliot Maldonado	
Location Name: Kaweah Powerhouse to Three Rivers Substation	
GPS Coordinates: 4036481.79 N, 332214.52 E	Trimble ID #[1]: NR-001
CalVeg Designation: QW	
Field-Assessed CalVeg Designation: NR-Riparian mixed hardwood	

General Site Summary

General site description/notes:
Good-sized creek running though the middle of the corridor.
Cottonwoods
Alder
Live oak
Substrate Notes: Granite Boulders

SCE Kaweah Hydroelectric Project (FERC No. 298)
TERR 1: Vegetation Alliance Ground-Truthing Survey Form

Community Composition and Structure

Dominant Species	% Cover (Approx)
Cottonwood	30%
Alder	30%
Oak	30%

Characterize subdominant/understory species:
Willow, alder, ash, buckeye, oaks
Wildlife species observed on site:
Cooper's hawk , black phoebe

[1] Create a unique Trimble ID using vegetation community name and sequential number (ex. VEGCOM-001).

SCE Kaweah Hydroelectric Project (FERC No. 298)
TERR 1: Vegetation Alliance Ground-Truthing Survey Form

Date: 5/7/2018	
Surveyors: Robyn Smith and Elliot Maldonado	
Location Name: Kaweah 1 Forebay Road	
GPS Coordinates: 4035240.07 N, 333894.59 E	Trimble ID #[1]: QI-001
CalVeg Designation: QW	
Field-Assessed CalVeg Designation: QI	

General Site Summary

General site description/notes:
Dominant species is California buckeye with valley oak and blue oak intermixed. Across the ravine from the forebay road on the other side of
the stream.
Photo #s 0003 and 0004
The center of the community is approximately 300 meters SW of the coordinate point.
Substrate Notes: Large granite boulders intermixed.

SCE Kaweah Hydroelectric Project (FERC No. 298)
TERR 1: Vegetation Alliance Ground-Truthing Survey Form

Community Composition and Structure

Dominant Species	% Cover (Approx)
California buckeye	70%
valley oak	10%
blue oak	10%

Characterize subdominant/understory species:
Grassland interspersed in small patches and boulders make up final 10% cover.
Wildlife species observed on site:
common raven

[1] Create a unique Trimble ID using vegetation community name and sequential number (ex. VEGCOM-001).

SCE Kaweah Hydroelectric Project (FERC No. 298)
TERR 1: Vegetation Alliance Ground-Truthing Survey Form

Date: 5/8/2018	
Surveyors: Robyn Smith and Elliot Maldonado	
Location Name: Kaweah 1 Flowline	
GPS Coordinates: 334565 E, 4036705 N	Trimble ID #[1]: CQ-001
CalVeg Designation: NX	
Field-Assessed CalVeg Designation: CQ-lower montane mixed chaparral	

General Site Summary

General site description/notes:
Rocky, open, sunny. Could not see over the rock face that runs halfway through the ground-truthing area.
Substrate Notes: Granite rocks

SCE Kaweah Hydroelectric Project (FERC No. 298)
TERR 1: Vegetation Alliance Ground-Truthing Survey Form

Community Composition and Structure

Dominant Species	% Cover (Approx)
ceanothus	30%
chamise	30%
scrub oak	30%
boulders	10%

Characterize subdominant/understory species:
Monkeyflower
Wildlife species observed on site:
canyon wren, wrentit, bewick's wren, western fence lizard, skink species

[1] Create a unique Trimble ID using vegetation community name and sequential number (ex. VEGCOM-001).

SCE Kaweah Hydroelectric Project (FERC No. 298)
TERR 1: Vegetation Alliance Ground-Truthing Survey Form

Date: 5/8/2018	
Surveyors: Robyn Smith and Elliot Maldonado	
Location Name: Kaweah 1 Flowline	
GPS Coordinates: 335637 E, 4036857 N	Trimble ID #[1]: AGS-002
CalVeg Designation: BA	
Field-Assessed CalVeg Designation: AGS	

General Site Summary

General site description/notes:
Rocky with a few shrubs and trees interspersed
Substrate Notes: Granite rock

SCE Kaweah Hydroelectric Project (FERC No. 298)
TERR 1: Vegetation Alliance Ground-Truthing Survey Form

Community Composition and Structure

Dominant Species	% Cover (Approx)
grasses	50%
rocks	40%
ceanothus	10%
scrub oak	10%

Characterize subdominant/understory species:
NA
Wildlife species observed on site:
NA

[1] Create a unique Trimble ID using vegetation community name and sequential number (ex. VEGCOM-001).

SCE Kaweah Hydroelectric Project (FERC No. 298)
TERR 1: Vegetation Alliance Ground-Truthing Survey Form

Date: 5/8/2018	
Surveyors: Robyn Smith and Elliot Maldonado	
Location Name: Kaweah 1 Flowline	
GPS Coordinates: 336654 E, 4036425 N	Trimble ID #[1]: BA-001
CalVeg Designation: SY	
Field-Assessed CalVeg Designation: BA	

General Site Summary

General site description/notes:
Mostly exposed rock and cliff with a scattering of yucca, ceanothus, individual oaks, and other chaparral species.
Substrate Notes: Granite bedrock

SCE Kaweah Hydroelectric Project (FERC No. 298)
TERR 1: Vegetation Alliance Ground-Truthing Survey Form

Community Composition and Structure

Dominant Species	% Cover (Approx)
rocks	>80%
ceanothus	10%
yucca	5%
undetermined	5%

Characterize subdominant/understory species:
Undetermined due to distance to the location. Area was off trail and inaccessible. Was viewed through binoculars.
Wildlife species observed on site:
NA

[1] Create a unique Trimble ID using vegetation community name and sequential number (ex. VEGCOM-001).

APPENDIX D

Target Special-Status Plants List

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Target Special-Status Plants List

Scientific/Common Name	Federal Status	State Status and CRPR Rank	Blooming Period	Habitat Conditions
Astragalus hornii var. *hornii* Horn's milk-vetch	BLMS	CRPR 1B.1	May – Oct	Lake margins, with alkaline substrate including meadows and seeps, and playas. 196 to 2,888 feet elevation.
Atriplex cordulata var. *cordulata* heart-leaved saltbush	BLMS	CRPR 1B.2	Apr – Oct	Chenopod scrub, meadows and seeps, and valley and foothill grassland with sandy, aline, or alkaline substrate. Up to 1,837 feet.
Atriplex coronata var. *vallicola* Lost Hills crownscale	BLMS	CRPR 1B.2	Apr – Aug	Chenopod scrub, valley and foothill grassland, and vernal pools with alkaline substrate. 164 to 2,083 feet elevation.
Brasenia schreberi watershield	–	CRPR 2B.3	Jun – Sep	Ponds and slow streams below 7,200 feet.
Brodiaea insignis Kaweah brodiaea	BLMS	SE, CRPR 1B.2	Apr – Jun	Known only from blue oak woodlands in the Kaweah and Tule River drainages in Tulare County (approx. 400 to 5,000 feet). Associated with reddish-brown clay loam soils underlain by granitic rock substrates.
California macrophylla round-leaved filaree	BLMS	CRPR 1B.1.2	Mar – May	Open sites, grassland, scrub, vertic clay, occasionally serpentine. 50 to 3,935 feet.
Calochortus striatus alkali mariposa lily	BLMS	CRPR 1B.2	Apr – Jun	Chaparral, chenopod scrub, Mojavean desert scrub, and meadows and seeps with alkaline and mesic substrate. 229 to 5,232 feet.
Carex praticola northern meadow sedge	–	CRPR 2B.2	May – Jul	Perennial herb. Meadows and seeps. To 10,500 feet.
Caulanthus californicus California jewelflower	FE	SE, CRPR 1B.1	Feb – May	Grasslands in the southern San Joaquin valley. 250 to 3,300 feet. USFWS has not designated critical habitat for this species.
Clarkia springvillensis Springville clarkia	FT, BLMS	SE, CRPR 1B.2	May – Jul	Chaparral, grasslands, and woodlands from 800 to 4,000 feet. USFWS has not designated critical habitat for this species. Known only from the Tulare River Drainage.
Deinandra mohavensis Mojave tarplant	BLMS	SE, CRPR 1B.3	(May) Jun – Oct (Jan)	Chaparral, Coastal and Riparian scrub with mesic substrate. 2,100 to 5,250 feet elevation.
Delphinium purpusii rose-flowered larkspur/ Kern county larkspur	BLMS	CRPR 1B.3	Mar – May	Talus areas and cliffs among chaparral, foothill woodland, and pinyon-juniper woodland 900 to 4,400 feet.

Scientific/Common Name	Federal Status	State Status and CRPR Rank	Blooming Period	Habitat Conditions
Delphinium recurvatum recurved larkspur	BLMS	CRPR 1B.2	Mar – Jun	Poorly drained, fine, alkaline soils in grassland scrub, and foothill woodland below 2,600 feet.
Eremalche (=Malvastrum) kernensis Kern mallow	FE, BLMS	CRPR 1B.1	Mar – May	Found on dry, open sandy to clay soils, often at the edge of balds. In valley and foothill grasslands. USFWS has not designated critical habitat for this species.
Eriogonum nudum var. *murinum* mouse buckwheat	BLMS	CRPR 1B.2	Jun – Nov	Sandy soils in chaparral, grassland, or foothill woodland 1,100 to 3,800 feet. Known only from the Kaweah River drainage. Restricted to marble outcrops, although it may colonize disturbed sites.
Eryngium spinosepalum spiny-sepaled button-celery	–	CRPR 1B.2	Apr – Jun	Vernal pools, swales, and roadside ditches in lower foothills and grasslands of Fresno, Stanislaus, and Tulare counties from 200 to 2,100 feet.
Fritillaria striata striped adobe-lily	BLMS	ST, CRPR 1B.1	Feb – Apr	Clay soil in valley grassland and foothill woodland below 3,300 feet. Known to occur at one remaining site in Tulare County (Lewis Hill east of Porterville).
Glyceria grandis American manna grass	–	CRPR 2B.3	Jun – Aug	Freshwater emergent wetlands, streambanks, and lake margins below 6,500 feet.
Helianthus winteri Winter's sunflower	BLMS	CRPR 1B.2	Jan – Dec	Cismontane woodland and valley and foothill grassland. Grows in openings on relatively steep south-facing slopes, with granitic and often rocky substrate, often roadsides. 410 to 1,510 feet elevation.
Hesperocyparis nevadensis Piute cypress	BLMS	CRPR 1B.2	–	Closed-cone coniferous forest, chaparral, and cismontane, pinyon, and juniper woodland. 2,360 to 6,005 feet elevation.
Iris munzii Munz's iris	BLMS	CRPR 1B.3	Apr	Wet, grassy sites, open to part shade in foothill woodland habitat from 1,000 to 2,700 feet.
Leptosiphon serrulatus Madera leptosiphon	–	CRPR 1B.2	Apr – May	Dry slopes in cismontane oak woodland and lower montane coniferous forest. Usually in decomposed granite, one instance on serpentine. 900 to 4,300 feet.
Mimulus norrisii/Erythranthe norrisii Kaweah monkeyflower	BLMS	CRPR 1B.3	Mar – May	Marble crevices in chaparral and cismontane woodlands. Known only from the Kaweah and Kings River drainages. 1,100 to 4,300 feet.
Mimulus pictus/Diplacus pictus calico monkeyflower	BLMS	CRPR 1B.2	Mar – May	Bare, sunny, shrubby areas, around granite outcrops. 443 to 4,101 feet.

Scientific/Common Name	Federal Status	State Status and CRPR Rank	Blooming Period	Habitat Conditions
Monolopia congdonii San Joaquin woollythreads	FE	CRPR 1B.2	Feb – May	Chenopod scrub and valley and foothill grassland. 190 to 2,625 feet elevation.
Navarretia setiloba Piute Mountains navarretia	BLMS	CRPR 1B.1	Apr – Jul	Cismontane, pinyon, and juniper woodland and valley and foothill grassland with clay or gravelly loam substrate. 935 to 6,890 feet elevation.
Orthotrichum holzingeri Holzinger's orthotrichum moss	–	CRPR 1B.3	N/A	Periodically inundated rock surfaces near streams in dry, montane forests from 2,300 to 5,900 feet.
Phacelia nashiana Charlotte's phacelia	BLMS	CRPR 1B.2	Mar – Jun	Joshua tree woodland, Mojavean desert scrub, and pinyon and juniper woodland with usually granitic and sandy substrate. 1,960 to 7,220 feet elevation.
Pseudobahia peirsonii San Joaquin adobe sunburst/ Tulare pseudobahia	FT	SE, CRPR 1B.1	Feb – Apr	Clay (Cibo, Porterville, or Centerville) soils in grassland and foothill woodland from 200 to 2,700 feet.
Ribes menziesii var. *ixoderme* aromatic canyon gooseberry	–	CRPR 1B.2	Apr	Chaparral and montane woodlands to 3,900 feet.
Sidalcea keckii Keck's checker-mallow/ Keck's checkerbloom	FE	CRPR 1B.1	Apr – May	Cismontane woodland and valley and foothill grassland with serpentinite and clay substrates from 300 to 2,200 feet. USFWS has designated critical habitat for this species.

LEGEND:

Federal Status

FT = Federal Threatened

FE = Federal Endangered

FC = Federal Candidate

BLMS = Bureau of Land Management Sensitive

State Status

SR = Listed by California as Rare

ST = California Threatened

SE = California Endangered

CNPS Status (California Native Plant Society)

1B = rare, threatened or endangered in California and elsewhere

2 = rare in California but more common elsewhere

3 = need more information

4 = plants of limited distribution; a watch list

_.1 = Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)

_.2 = Fairly endangered in California (20-80% occurrences threatened)

_.3 = Not very endangered in California (<20% of occurrences threatened or no current threats known)

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APPENDIX E

Plant and Moss Species Documented During Botanical Surveys in the Study Area

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Plant and Moss Species Documented During Botanical Surveys in the Study Area

Scientific Name	Common Name	Family	Native/ Exotic	Rarity	Comments
Vascular Plants					
Adenostoma fasciculatum	chamise	Rosaceae	native	not rare	
Acmispon americanus var. *americanus*	Spanish lotus	Fabaceae	native	not rare	= *Lotus purshianus*
Acmispon argophyllus var. *argophyllus*	silver lotus	Fabaceae	native	not rare	= *Lotus*
Acmispon glaber var. *glaber*	deerweed	Fabaceae	native	not rare	= *Lotus scoparius*
Acmispon parviflorus	hill lotus	Fabaceae	native	not rare	= *Lotus micranthus*
Acmispon strigosus	strigose lotus, bishop lotus	Fabaceae	native	not rare	=*Lotus*
Acmispon wrangelianus	Chilean trefoil	Fabaceae	native	not rare	=*Lotus*
Adenostoma fasciculatum	chamise	Rosaceae	native	not rare	
Aesculus californica	California buckeye	Sapindaceae	native	not rare	= *Hippocastanaceae*
Agoseris grandiflora var. *grandiflora*	California dandelion	Asteraceae	native	not rare	
Agoseris heterophylla	annual mountain dandelion	Asteraceae	native	not rare	
Agoseris retrorsa	spearleaf mountain dandelion	Asteraceae	native	not rare	
Agrostis sp.	bent grass	Poaceae	native	not rare	
Ailanthus altissima	tree of heaven	Simaroubaceae	exotic	not rare	Cal-IPC “Moderate”, BLM NOX
Aira caryophyllea	shiver grass, silver hairgrass	Poaceae	exotic	not rare	
Allium hyalinum	glassy onion	Alliaceae	native	not rare	= *Liliaceae*
Alnus rhombifolia	white alder	Betulaceae	native	not rare	
Amaranthus albus	tumbleweed, pigweed	Amaranthaceae	exotic	not rare	
Ambrosia artemisiifolia	common ragweed	Asteraceae	native	not rare	
Ambrosia psilostachya	Western ragweed	Asteraceae	native	not rare	
Amsinckia eastwoodiae	Eastwood’s fiddleneck	Boraginaceae	native	not rare	
Anagallis arvensis	scarlet pimpernel	Myrsinaceae	exotic	not rare	= *Primulaceae*
Anthriscus caucalis	bur chevril	Apiaceae	exotic	not rare	

Scientific Name	Common Name	Family	Native/ Exotic	Rarity	Comments
Aphyllon californicum ssp. *feudgei*	California broomrape	Orobanchaceae	native	not rare	= *Orobanche californica* ssp. *feudgei*
Arctostaphylos viscida	whiteleaf manzanita	Ericaceae	native	not rare	
Arenaria serpyllifolia var. *serpyllifolia*	thyme leaf sandwort	Caryophyllaceae	exotic	no rare	
Aristida ternipes	spiderplant	Poaceae	native	not rare	check sample
Artemisia douglasiana	Douglas' sagewort	Asteraceae	native	not rare	
Artemisia dracunculus	Dragon-foot wormwood	Asteraceae	native	not rare	
Asarum hartwegii	wild ginger	Aristolochiaceae	native	not rare	
Asclepias californica	California milkweed	Apocynaceae	native	not rare	=*Asclepiadaceae*
Asclepias cordifolia	heart leaf milkweed	Apocynaceae	native	not rare	=*Asclepiadaceae*
Asclepias eriocarpa	Indian milkweed	Apocynaceae	native	not rare	=*Asclepiadaceae*
Asclepias fascicularis	narrow leaf milkweed	Apocynaceae	native	not rare	= *Asclepiadaceae*
Asclepias fascicularis	narrow leaf milkweed	Apocynaceae	native	not rare	=*Asclepiadaceae*
Athyrium filix-femina	lady fern	Woodsiaceae	native	not rare	= *Dryopteridaceae*
Athysanus pusillus	dwarf Athysanus, common sandweed	Brassicaceae	native	not rare	
Avena sp.	Wild oat	Poaceae	exotic	not rare	
Baccharis salicifolia	mule fat	Asteraceae	native	not rare	
Balsamorhiza deltoidea	deltoid balsam root	Asteraceae	native	not rare	
Barbarea orthoceras	winter cress	Brassicaceae	native	not rare	
Boechera californica	California rock cress	Brassicaceae	native	not rare	
Bowlesia incana	Hoary bowlesia	Apiaceae	native	not rare	
Brassica nigra	black mustard	Brassicaceae	exotic	not rare	Cal-IPC Moderate
Brickellia californica	California brickellia	Asteraceae	native	not rare	
Briza minor	little rattlesnake grass	Poaceae	exotic	not rare	
Brodiaea elegans	harvest brodiaea	Themidaceae	native	not rare	= *Liliaceae*
Brodiaea elegans ssp. *elegans*	harvest brodiaea	Themidaceae	native	not rare	= *Liliaceae*

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Bromus arenarius	Australian chess	Poaceae	exotic	not rare	
Bromus diandrus	ripgut brome	Poaceae	exotic	not rare	Cal-IPC Moderate
Bromus hordeaceus	soft chess	Poaceae	exotic	not rare	Cal-IPC Limited
Bromus madritensis ssp. *rubens*	red brome	Poaceae	exotic	not rare	Cal-IPC High
Bromus sp.	Brome	Poaceae	exotic	not rare	
Bromus sterilis	poverty brome	Poaceae	exotic	not rare	
Bromus tectorum	cheatgrass	Poaceae	exotic	not rare	Cal-IPC High
Calandrinia menziesii	red maids	Montiaceae		not rare	= *C. ciliata* var. *menziesii* = *Portulacaceae*
Calocedrus decurrens	incense cedar	Cupressaceae	native	not rare	horticultural planting
Calochortus albus	white globe lily	Liliaceae	native	not rare	
Calochortus venustus	butterfly mariposa lily	Liliaceae	native	not rare	
Calycanthus occidentalis	spicebush	Calycanthaceae	native	not rare	
Calystegia longipes	Piute morning glory	Convolvulaceae	native	not rare	
Calystegia malacophylla ssp. *malacophylla*	Sierra morning glory	Convolvulaceae	native	not rare	
Capsella bursa-pastoris	shepherd's purse	Brassicaceae	exotic	not rare	
Cardamine hirsuta	hairy buttercress	Brassicaceae	exotic	not rare	
Carduus pycnocephalus	Italian thistle	Asteraceae	exotic	not rare	Cal-IPC Moderate
Carex sp.	Sedge	Cyperaceae	native	not rare	
Castilleja attenuata	narrow leaved owl's clover, valley tassels	Orobanchaceae	native	not rare	= *Scrophulariaceae*
Castilleja exserta ssp. *exserta*	purple owl's clover	Orobanchaceae	native	not rare	= *Scrophulariaceae*
Catalpa sp.	Southern catalpa	Bignoniaceae	exotic	not rare	
Caulanthus coulteri	Coulter"s jewel flower	Brassicaceae	native	not rare	
Ceanothus cuneatus var. *cuneatus*	buckbrush	Rhamnaceae	native	not rare	
Ceanothus leucodermis	chaparral whitethorn	Rhamnaceae	native	not rare	

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Centaurea melitensis	tocalote	Asteraceae	exotic	not rare	Cal-IPC Moderate, BLM NOX
Cephalanthus occidentalis	buttonwillow	Rubiaceae	native	not rare	
Cerastium glomeratum	large mouse ears	Caryophyllaceae	exotic	not rare	
Cercis occidentalis	western red bud	Fabaceae	native	not rare	
Cercocarpus betuloides	birchleaf mountain mahogany	Rosaceae	native	not rare	
Chaenomeles xsuperba	quince	Rosaceae	exotic	not rare	horticultural planting
Chamaebatia foliolosa	mountain misery	Rosaceae	native	not rare	
Chamaesyce ocellata ssp. *ocellata*	valley spurge	Euphorbiaceae	native	not rare	
Chenopodium album	lambs quarters	Chenopodiaceae			
Chenopodium desiccatum	aridland goosefoot	Chenopodiaceae	native	not rare	
Chlorogalum pomeridianum var. *pomeridianum*	wavyleaf soap plant	Agavaceae	native	not rare	
Chorizanthe membranacea	pink spineflower	Polygonaceae	native	not rare	
Cirsium occidentale	cobweb thistle	Asteraceae	native	not rare	
Cirsium occidentale var. *californicum*	California thistle	Asteraceae	native	not rare	
Cirsium vulgare	bull thistle	Asteraceae	exotic	not rare	Cal-IPC Moderate, BLM NOX
Clarkia cylindrica	speckled clarkia	Onagraceae	native	not rare	
Clarkia purpurea ssp. *quadrivulnera*	purple clarkia, winecup clarkia	Onagraceae	native	not rare	
Clarkia sp.	Clarkia	Onagraceae	native	not rare	not *C. springvillensis*
Clarkia unguiculata	elegant clarkia	Onagraceae	native	not rare	
Claytonia perfoliata	miner’s lettuce	Montiaceae	native	not rare	= *Portulacaceae*
Clematis lasiantha	chaparral clematis	Ranunculaceae	native	not rare	
Collinsia heterophylla var. *heterophylla*	Chinese houses	Plantaginaceae	native	not rare	
Conium maculatum	poison hemlock	Apiaceae	native	not rare	Cal-IPC Moderate
Corethrogyne filaginifolia var. *filaginifolia*	common sandaster	Asteraceae	native	not rare	

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Cornus sericea	American dogwood	Cornaceae	native	not rare	
Cotula australis	southern brass buttons	Asteraceae	exotic	not rare	
Croton setiger	turkey mullein	Euphorbiaceae	native	not rare	= *Eremocarpus setigerus*
Cryptantha flaccida	beaked cryptantha	Boraginaceae	native	not rare	
Cryptantha sp.	Cryptantha	Boraginaceae	native	not rare	
Cynodon dactylon	Bermuda grass	Poaceae	exotic	not rare	Cal-IPC Moderate
Cynoglossum grande	grand hound's tongue	Boraginaceae	native	not rare	
Cynosurus echinatus	bristly dogtail grass	Poaceae	exotic	not rare	Cal-IPC Moderate
Cyperus eragrostis	tall cyperus	Cyperaceae	native	not rare	
Datura wrightii	toluaca	Solanaceae	native	not rare	
Daucus pusillus	American wild carrot	Apiaceae	native	not rare	
Delphinium sp.	Larkspur	Ranunculaceae	native	not rare	no flower
Dendromecon rigida	bush poppy	Papaveraceae	native	not rare	
Dichelostemma capitatum	blue dicks	Themidaceae	native	not rare	= *Liliaceae*
Dichelostemma volubile	twining brodiaea	Themidaceae	native	not rare	= *Liliaceae*
Digitaria ischaemum	smooth crabgrass	Poaceae	exotic	not rare	
Draba verna	spring draba	Brassicaceae	native	not rare	
Drymocallis glandulosa	sticky cinquefoil	Rosaceae	native	not rare	= *Potentilla*
Drymocallis glandulosa var. *glandulosa*	sticky cinquefoil	Rosaceae	native	not rare	= *Potentilla*
Dryopteris arguta	wood fern	Dryopteridaceae	native	not rare	
Dudleya cymosa ssp. *cymosa*	canyon dudleya	Crassulaceae	native	not rare	
Dysphania botrys	Jerusalem oak goosefoot	Chenopodaceae	exotic	not rare	= *Chenopodium*
Eleocharis sp.	Spikerush	Cyperaceae	native	not rare	
Elymus elymoides	squirrel tail grass	Poaceae	native	not rare	
Elymus glaucus	blue wild rye	Poaceae	native	not rare	
Elymus triticoides	beardless wild rye	Poaceae	native	not rare	= *Leymus*

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Emmenanthe penduliflora	yellow whispering bells	Boraginaceae	native	not rare	= *Hydrophyllaceae*
Epilibium canum ssp. *latifolium*	California fushia	Onagraceae	native	not rare	=*Zauschneria californica* ssp. *latifolia*
Epilobium brachycarpum	annual fireweed	Onagraceae	native	not rare	
Epilobium canum	California fuchsia	Onagraceae	native	not rare	= *Scrophulariaceae*
Epilobium ciliatum ssp. *ciliatum*	willow herb	Onagraceae	native	not rare	
Epilobium glaberrimum ssp. *glaberrimum*	glaucus willow herb	Onagraceae	native	not rare	
Ericameria 6uneate var. *cuneata*	cliff goldenbush	Asteraceae	native	not rare	
Erigeron canadensis	Canada horseweed	Asteraceae	native	not rare	=*Conyza*
Erigeron foliosus var. *foliosus*	thread stemmed fleabane	Asteraceae	native	not rare	
Eriodictyon californicum	California yerba santa	Boraginaceae	native	not rare	= *Hydrophyllaceae*
Eriogonum fasciculatum	California buckwheat	Polygonaceae	native	not rare	
Eriogonum nudum var. *nudum*	nude buckwheat	Polygonaceae	native	not rare	
Eriophyllum confertiflorum var. *confertiflorum*	golden yarrow	Asteraceae	native	not rare	
Erodium botrys	longbeak stork's bill	Geraniaceae	exotic	not rare	
Erodium cicutarium	redstem stork's bill	Geraniaceae	exotic	not rare	Cal-IPC Limited
Erysimum capitatum	western wallflower	Brassicaceae	native	not rare	
Erysimum capitatum ssp. *capitatum*	sanddune wallflower	Brassicaceae	native	not rare	
Erythranthe floribunda	many flowered monkey flower	Phrymaceae	native	not rare	= *Scrophulariaceae* = *Mimulus floribundus*
Eschscholzia caespitosa	tufted poppy	Papaveraceae	native	not rare	
Eucalyptus sp.	Eucalyptus	Myrtaceae	exotic	not rare	
Euphorbia maculata	spotted spurge	Euphorbiaceae	exotic	not rare	=*Chamaesyce maculata*
Festuca microstachys	small fescue	Poaceae	native	not rare	= *Vulpia microstachys*

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Festuca myuros	rattail fescue	Poaceae	exotic	not rare	Cal-IPC Moderate = *Vulpia myuros*
Ficus carica	common fig	Moraceae	exotic	not rare	Cal-IPC Moderate
Frangula californica ssp. *tomentella*	hoary coffeeberry	Rhamnaceae	native	not rare	= *Rhamnus*
Fraxinus latifolia	Oregon ash	Oleaceae	native	not rare	
Fraxinus dipetala	two petaled ash	Oleaceae	native	not rare	
Fremontodendron californicum	California flannelbush	Malvaceae	native	not rare	= *Sterculiaceae*
Galium aparine	common bedstraw	Rubiaceae	native	not rare	
Galium bolanderi	Bolander's bedstraw	Rubiaceae	native	not rare	
Galium parisiense	wall bedstraw	Rubiaceae	exotic	not rare	
Galium porrigens var. *tenue*	graceful bedstraw	Rubiaceae	native	not rare	
Gastridium phleoides	nit grass	Poaceae	exotic	not rare	
Genista monspessulana	French broom	Fabaceae	exotic	not rare	Cal-IPC High, BLM NOX
Geranium pusillum	small flowered geranium	Geraniaceae	exotic	not rare	
Gilia capitata	bluehead gilia	Polemoniaceae	native	not rare	
Gilia tricolor	bird's eyes	Polemoniaceae	native	not rare	
Heteromeles arbutifolia	toyon	Rosaceae	native	not rare	
Hesperoyucca whipplei	chaparral yucca	Agavacea	native	not rare	
Heterotheca grandiflora	telegraph weed	Asteraceae	native	not rare	
Heuchera micrantha	alum root	Saxifragaceae	native	not rare	
Hirschfeldia incana	shortpod mustard	Brassicaceae	exotic	not rare	Cal-IPC Moderate
Holocarpha heermannii	Heermann's tarweed	Asteraceae	native	not rare	
Hordeum murinum	foxtail barley	Poaceae	exotic	not rare	
Hosackia crassifolia var. *crassifolia*	broad leaved lotus	Fabaceae	native	not rare	= *Lotus crassifolius* var. *crassifolius*
Hypochaeris glabra	smooth cat's ear	Asteraceae	exotic	not rare	Cal-IPC Limited

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Iris munzii	Munz's iris	Iridaceae	native	rare	CRPR 1B.3, BLMS
Juncus effusus	common bog rush	Juncaceae	native	not rare	.
Juncus acutus	spiny rush	Juncaceae	native	not rare	horticultural planting
Juncus sp.	Rush	Juncaceae	native	not rare	
Keckiella breviflora var. *breviflora*	gaping penstemon	Plantaginaceae	native	not rare	= *Scrophulariaceae*
Kelloggia galioides	kelloggia	Rubiaceae	native	not rare	
Lactuca serriola	prickly lettuce	Asteraceae	exotic	not rare	
Lagerstroemia indica	crapemyrtle	Lythraceae	exotic	not rare	horticultural planting
Lamium amplexicaule	henbit	Lamiaceae	exotic	not rare	
Lasthenia californica ssp. *californica*	California goldfields	Asteraceae	native	not rare	
Layia pentachaeta ssp. *pentachaeta*	Sierra tidy tips	Asteraceae	native	not rare	
Leontodon saxatilis	hawkbit	Asteraceae	exotic	not rare	
Lepidium nitidum	shining pepper grass	Brassicaceae	native	not rare	
Lepidium strictum	pepper grass	Brassicaceae	native	not rare	
Lepidium virginicum ssp. *virginicum*	wild pepper grass	Brassicaceae	native	not rare	
Leptosiphon ciliatus	whisker bush	Polemoniaceae	native	not rare	= *Linanthus*
Leptosiphon montanus	mustang clover	Polemoniaceae	native	not rare	
Leptosiphon parviflorus	variable linanthus	Polemoniaceae	native	not rare	
Lessingia leptoclada	Sierra lessingia	Asteraceae	native	not rare	
Lithophragma bolanderi	hillstar	Saxifragaceae	native	not rare	
Lithophragma sp.	Woodland star	Saxifragaceae	native	not rare	
Logfia filaginoides	California cottonrose	Asteraceae	native	not rare	= *Filago californica*
Logfia gallica	narrow-leaved cottonrose	Asteraceae	exotic	not rare	= *Filago gallica*
Lonicera interrupta	chaparral honeysuckle	Caprifoliaceae	native	not rare	
Lupinus albifrons var. *albifrons*	silver lupine	Fabaceae	native	not rare	shrub
Lupinus benthamii	spider lupine	Fabaceae	native	not rare	

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Lupinus bicolor	bicolor lupine	Fabaceae	native	not rare	
Lupinus microcarpus	chick lupine	Fabaceae	native	not rare	
Lysimachia arvensis	scarlet pimpernel	Myrsinaceae	exotic	not rare	
Lythrum californicum	California loosestrife	Lythraceae	native	not rare	
Madia elegans	common madia	Asteraceae	native	not rare	
Malva parviflora	cheeseweed mallow	Malvaceae	exotic	not rare	
Malus sp.	Apple	Rosaceae	exotic	not rare	horticultural planting/volunteer
Marah horrida	wild cucumber	Cucurbitaceae	native	not rare	
Marrubium vulgare	white horehound	Lamiaceae	exotic	not rare	Cal-IPC Limited
Matricaria chamomilla	German chamomile	Asteraceae	exotic	not rare	
Matricaria discoidea	pineapple weed	Asteraceae	exotic	not rare	= *Chamomilla suaveolens*
Medicago orbicularis	round leafed medick	Fabaceae	exotic	not rare	
Medicago polymorpha	bur clover	Fabaceae	exotic	not rare	Cal-IPC Limited
Melica californica	California melic	Poaceae	native	not rare	
Melica imperfecta	small flowered melic	Poaceae	native	not rare	
Melilotus albus	white sweetclover	Fabaceae	exotic	not rare	
Melilotus indicus	annual yellow sweetclover	Fabaceae	exotic	not rare	
Mentha pulegium	pennyroyal	Lamiaceae	exotic	not rare	
Micranthes californica	Greene's saxifrage	Saxifragaceae	native	not rare	
Micropus californicus var. *californicus*	cotton top	Asteraceae	native	not rare	
Microseris douglasii	Douglas' microseris	Asteraceae	native	not rare	
Mimulus aurantiacus	bush monkeyflower	Phrymaceae	native	not rare	= *Scrophulariaceae*
Mimulus cardinalis	cardinal monkey flower	Phrymaceae	native	not rare	= *Scrophulariaceae*
Mimulus guttatus	yellow monkey flower	Phrymaceae	native	not rare	= *Scrophulariaceae*
Mimulus moschatus	musk monkeyflower	Phrymaceae	native	not rare	= *Scrophulariaceae*

Scientific Name	Common Name	Family	Native/ Exotic	Rarity	Comments
Mimulus nanus var. *mephiticus*	skunky monkeyflower	Phrymaceae	native	not rare	= *M. mephiticus* (*Scrophulariaceae*)
Minuartia douglasii	Douglas' sandwort	Caryophyllaceae	native	not rare	
Mollugo verticillata	green carpetweed	Molluginaceae	exotic	not rare	
Muhlenbergia rigens	deergrass	Poaceae	native	not rare	
Myriopteris covillei	Coville's lipfern	Pteridaceae	native	not rare	= *Cheilanthes* covillei
Nemophila menziesii	baby blue eyes	Boraginaceae	native	not rare	= *Hydrophyllaceae*
Nemophila pulchella	Eastwood's nemophila	Boraginaceae	native	not rare	= *Hydrophyllaceae*
Nerium oleander	oleander	Apocynaceae	exotic	not rare	horticultural planting
Olea europaea	olive	Oleaceae	exotic	not rare	Cal-IPC Limited, horticultural planting
Oxalis pes-caprae	Bermuda buttercup	Oxalidaceae	exotic	not rare	Cal-IPC Moderate
Osmorhiza berteroi	sweetcicely	Apiaceae	native	not rare	= Osmorhiza chilensis
Panicum acuminatum var. *fasciculatum*	Pacific panic grass	Poaceae	native	not rare	
Papaver heterophyllum	wind poppy	Papaveraceae	native		
Parthenocissus inserta	woodbine	Vitaceae	exotic	not rare	= *P. vitacea*
Paspalum dilatatum	dallis grass	Poaceae	exotic	not rare	
Pedicularis densiflora	indian warrior	Orobanchaceae	native	not rare	= *Scrophulariaceae*
Pellaea andromedifolia	coffee fern	Pteridaceae	native	not rare	
Pellaea mucronata var. *californica*	California cliffbrake	Pteridaceae	native	not rare	
Pellaea mucronata var. *mucronata*	bird's foot fern	Pteridaceae	native	not rare	
Penstemon laetus var. *laetus*	mountain blue penstemon	Plantaginaceae	native	not rare	= *Scrophulariaceae*
Pentagramma triangularis ssp. *triangularis*	goldback fern	Pteridaceae	native	not rare	
Persicaria punctata	dotted smartweed	Polygonaceae	native	not rare	= *Polygonum*
Petrorhagia dubia	windmill pink	Caryophyllaceae	exotic	not rare	
Phacelia cicutaria	caterpillar phacelia	Boraginaceae	native	not rare	= *Hydrophyllaceae*

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Phacelia hastata	mountain phacelia	Boraginaceae	native	not rare	
Philadelphus lewisii	wild mock orange	Hydrangeaceae	native	not rare	
Phoenix canariensis	Canary Island date palm	Arecaceae	exotic	not rare	Cal-IPC Limited
Pholistoma auritum	blue fiestaflower	Boraginaceae	native	not rare	= *Hydrophyllaceae*
Phoradendron sp.	mistletoe	Viscaceae	native	not rare	
Pinus ponderosa	ponderosa pine	Pinaceae	native	not rare	
Pinus sp.	Pine	Pinaceae	exotic	not rare	horticultural planting
Pistacia chinensis	Chinese pistachio	Anacardiaceae	exotic	not rare	horticultural planting
Plagiobothrys nothofulvus	rusty popcorn flower	Boraginaceae	native	not rare	
Plantago erecta	foothill plantain	Plantaginaceae	native	not rare	
Plantago lanceolata	English plantain	Plantaginaceae	exotic	not rare	Cal-IPC Limited
Platanus racemosa	California sycamore	Platanaceae	native	not rare	
Plectritis ciliosa	long spurred plectritis	Valerianaceae	native	not rare	
Poa annua	annual blue grass	Poaceae	exotic	not rare	
Poa bulbosa	bulbous bluegrass	Poaceae	exotic	not rare	
Poa secunda	pine bluegrass	Poaceae	native	not rare	
Polycarpon tetraphyllum var. *tetraphyllum*	four-leaved allseed	Caryophyllaceae	exotic	not rare	
Polygala cornuta	Sierra milkwort	Polygalaceae	native	not rare	
Polygonum aviculare	prostrate knotweed	Polygonaceae	exotic	not rare	
Polypodium calirhiza	licorice fern	Polypodiaceae	native	not rare	
Populus fremontii ssp. *fremontii*	Fremont's cottonwood	Salicaceae	native	not rare	
Portulaca oleracea	purslane	Portulacaceae	exotic	not rare	
Pseudognaphalium californicum	ladies' tobacco	Asteraceae	native	not rare	= *Gnaphalium*
Pseudognaphalium luteoalbum	Jersey cudweed	Asteraceae	exotic	not rare	= *Gnaphalium*
Pseudognaphalium thermale	small headed cudweed	Asteraceae	native	not rare	= *Gnaphalium*

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Pteridium aquilinum	Western bracken fern	Dennstaedtiaceae	native	not rare	
Pterostegia drymarioides	woodland pterostegia	Polygonaceae	native	not rare	
Pyracantha angustifolia	pyracnatha, narrow leaf firethorn	Rosaceae	exotic	not rare	Cal-IPC Limited
Quercus chrysolepis	canyon live oak	Fagaceae	native	not rare	
Quercus douglasii	blue oak	Fagaceae	native	not rare	
Quercus lobata	valley oak	Fagaceae	native	not rare	horticultural planting
Quercus wislizeni	interior live oak	Fagaceae	native	not rare	
Radermachera sinica	china doll	Bignoniaceae	exotic	not rare	horticultural planting
Rafinesquia californica	California chicory	Asteraceae	native	not rare	
Rhamnus ilicifolia	evergreen buckthorn	Rhamnaceae	native	not rare	
Rhus aromatica	fragrant sumac	Anacardiaceae	native	not rare	= *R. trilobata*
Ribes roezlii	Sierra gooseberry	Grossulariaceae	native	not rare	
Ribes roezlii var. *roezlii*	Sierran gooseberry	Grossularaceae	native	not rare	
Ribes sp.	gooseberry	Grossulariaceae	native	not rare	not flowering, rare ssp. excluded
Rorippa nasturtium-aquaticum	watercress	Brassicaceae	native	not rare	
Rosa sp.	rose	Rosaceae	exotic	not rare	horticultural planting
Rosmarinus officinalis	rosemary	Lamiaceae	exotic	not rare	
Rubus armeniacus	Himalayan blackberry	Rosaceae	exotic	not rare	Cal-IPC High
Rubus parviflorus	thimbleberry	Rosaceae	native	not rare	
Rubus ursinus	California blackberry	Rosaceae	native	not rare	
Rumex salicifolius	willow leaved dock	Polygonaceae	native	not rare	
Rumex sp.	Bitter dock	Polygonaceae	native	not rare	
Rumex transitorius	willow dock	Polygonaceae	native	not rare	= *Rumex salicifolius* var. *transitorius*
Sagina apetala	annual pearlwort	Caryophyllaceae	native	not rare	

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Salix exigua	narrow leaved willow, sandbar willow	Salicaceae	native	not rare	
Salix gooddingii	Goodding's willow	Salicaceae	native	not rare	
Salix laevigata	red willow	Salicaceae	native	not rare	
Salix lasiandra var. *lasiandra*	Pacific willow	Salicaceae	native	not rare	= *Salix lucida* ssp. *lasiandra*
Salix lasiolepis	arroyo willow	Salicaceae	native	not rare	
Salix melanopsis	dusky willow	Salicaceae	native	not rare	
Salvia columbariae	chia sage	Lamiaceae	native	not rare	
Salvia leucophylla	purple sage	Lamiaceae	native	not rare	horticultural planting
Sambucus nigra ssp. *caerulea*	blue elder	Adoxaceae	native	not rare	= *Sambucus mexicana* = *Caprifoliaceae*
Sanicula bipinnata	poison sanicle	Apiaceae	native	not rare	
Sanicula crassicaulis	Pacific sanicle	Apiaceae	native	not rare	
Scleranthus annuus ssp. *annuus*	kwawel	Caryophyllaceae	exotic	not rare	
Scrophularia californica	California bee plant, California figwort	Scrophulariaceae	native	not rare	
Scutellaria tuberosa	Danny's skullcap	Lamiaceae	native	not rare	
Selaginella hansenii	Hansen's spike moss	Selaginellaceae	native	not rare	MOSS002/009 spike moss, not a true moss
Senecio flaccidus	threadleaf ragwort	Asteraceae	native	not rare	
Senecio vulgaris	common groundsel	Asteraceae	exotic	not rare	
Setaria viridis	foxtail	Poaceae	exotic	not rare	
Silene gallica	common catchfly	Caryophyllaceae	exotic	not rare	
Silene laciniata ssp. *californica*	California indian pink	Caryophyllaceae	native	not rare	= *Silene californica*
Silybum marianum	milk thistle	Asteraceae	exotic	not rare	Cal-IPC Limited
Sisymbrium irio	London rocket	Brassicaceae	exotic	not rare	Cal-IPC Moderate

Scientific Name	Common Name	Family	Native/ Exotic	Rarity	Comments
Sisymbrium officinale	hedge mustard	Brassicaceae	exotic	not rare	
Sisymbrium orientale	indian hedge mustard	Brassicaceae	exotic	not rare	
Solanum xanti	nightshade	Solanaceae	native	not rare	
Solidago velutina ssp. *californica*	California goldenrod	Asteraceae	native	not rare	
Soliva sessilis	common soliva	Asteraceae	exotic	not rare	
Sonchus asper	spiny sow thistle	Asteraceae	exotic	not rare	
Sonchus oleraceus	sow thistle	Asteraceae	exotic	not rare	
Spartium junceum	Spanish broom	Fabaceae	exotic	not rare	Cal-IPC High
Spergularia rubra	purple sand spurry	Caryophyllaceae	exotic	not rare	
Stachys albens	cobwebby hedge nettle	Lamiaceae	native	not rare	
Stellaria media	chickweed	Caryophyllaceae	exotic	not rare	
Stellaria nitens	shining chickweed	Caryophyllaceae	native	not rare	
Stephanomeria virgata	rod wirelettuce	Asteraceae	native	not rare	
Stipa sp.	needle grass	Poaceae	native	not rare	
Symphoricarpos mollis	creeping snowberry	Caprifoliaceae	native	not rare	likely, no flower
Tauschia hartwegii	tauschia	Apiaceae	native	not rare	
Thalictrum fendleri	Fendler's meadow rue	Ranunculaceae	native	not rare	= *Apiaceae*
Thysanocarpus curvipes	common fringe pod	Brassicaceae			
Torilis arvensis	hedge parsley	Apiaceae	exotic	nor tare	Cal-IPC Moderate
Toxicodendron diversilobum	pacific poison oak	Anacardiaceae	native	not rare	
Tribulus terrestris	puncture vine	Zygophyllaceae	exotic	not rare	Cal-IPC Limited, BLM NOX
Trichostema lanceolatum	vinegar weed	Lamiaceae	native	not rare	
Trifolium albopurpureum	indian clover	Fabaceae	native	not rare	
Trifolium campestre	hop clover	Fabaceae	exotic	not rare	
Trifolium ciliolatum	tree clover	Fabaceae	native	not rare	
Trifolium dubium	shamrock	Fabaceae	exotic	not rare	

Scientific Name	Common Name	Family	Native/ Exotic	Rarity	Comments
Trifolium glomeratum	clustered clover	Fabaceae	exotic	not rare	
Trifolium hirtum	rose clover	Fabaceae	exotic	not rare	
Trifolium microcephalum	small head clover	Fabaceae	native	not rare	
Trifolium repens	white clover	Fabaceae	exotic	not rare	
Trifolium tomentosum	woolly clover	Fabaceae	exotic	not rare	
Trifolium variegatum var. *variegatum*	variegated clover	Fabaceae	native	not rare	
Trifolium willdenovii	tomcat clover	Fabaceae	native	not rare	
Triteleia laxa	Ithuriel's spear	Themidaceae	native	not rare	= *Liliaceae*
Triteleia oxioides ssp. *scabra*	golden brodiaea	Themidaceae	native	not rare	= *Liliaceae*
Turritis glabra	tower mustard	Brassicaceae	native	not rare	= *Arabis*
Typha angustifolia	narrow leaf cattail	Typhaceae	native	not rare	
Umbellularia californica	California bay	Lauraceae	native	not rare	
Uropappus lindleyi	silver puffs	Asteraceae	native	not rare	
Urtica dioica ssp. *holosericea*	stinging nettle	Urticaceae	native	not rare	
Verbascum thapsus	woolly mullien	Scrophulariaceae	exotic	not rare	Cal-IPC Limited
Verbascum virgatum	wand mullein	Scrophulariaceae	exotic	not rare	
Verbena lasiostachys var. *scabrida*	robust vervain	Verbenaceae	native	not rare	
Veronica sp.	water speedwell	Plantaginaceae	native	not rare	= *Scrophulariaceae*
Vicia villosa ssp. *villosa*	winter vetch	Fabaceae	exotic	not rare	
Vinca major	periwinkle	Apocynaceae	exotic	not rare	Cal-IPC Moderate
Vitis californica	California wild grape	Vitaceae	native	not rare	
Wyethia invenusta	Coville's mule ears	Asteraceae	native	not rare	= *Agnorhiza*
Xanthium strumarium	cocklebur	Asteraceae	native	not rare	

Scientific Name	Common Name	Family	Native/ Exotic	Rarity	Comments
Mosses and Spike Mosses					
Hedwigia detonsa	hedwigia moss	Hedwigiaceae	native	not rare	MOSS001
Selaginella hansenii	Hansen's spike moss	Selaginellaceae	native	not rare	MOSS002/009 spike moss, not a true moss
Bryum argenteum	silvergreen bryum moss	Bryaceae	native	not rare	MOSS003
Orthotrichum rupestre	orthotrichum moss	Orthotrichaceae	native	not rare	MOSS004
Didymodon sp.	didymondon moss	Pottiaceae	native	not rare	MOSS005
Grimmia lisae	grimmia moss	Grimmiaceae	native	not rare	MOSS006
Polytrichum juniperinum	juniper polytrichum moss	Polytrichaceae	native	not rare	MOSS007
Ceratodon stenocarpus	ceratodon moss	Ditrichaceae	native	not rare	MOSS008

Sources: Baldwin et al 2014, Jepson Flora Project 2018, Calflora 2018, Cal-IPC 2018, Pers. Comm. BLM 2018, USDA NRCS 2018, Flora of North America 2004.

Codes:

BLMS = Bureau of Land Management Sensitive

BLM NOX = Target noxious listed by the BLM (Pers. Comm. BLM 2018)

CRPR = California Native Plant Society Rare Plant Rank

CRPR 1B = rare, threatened or endangered in California and elsewhere

_.3 = Not very threatened in California (<20% of occurrences threatened or no current threats known)

Cal-IPC Ratings

High = These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate = These species have substantial and apparent-but generally not severe-ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited = These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

APPENDIX F

Photographs of Special-Status Plants and Representative Habitat

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Photo F-1 Munz's iris (*Iris munzii*) in bloom along the Kaweah No. 1 Flowline.

Photo F-2 Munz's iris (*Iris munzii*) in bloom along the Kaweah No. 1 Flowline.

Photo F-3 Representative habitat for Munz's iris (*Iris munzii*) along the Kaweah No. 1 Flowline.

Photo F-4 Representative habitat for Munz's iris (*Iris munzii*) along the Kaweah No. 1 Flowline.

Photo F-5 Individual "clumps" of Munz's iris (*Iris munzii*) along the Kaweah No. 1 Flowline.

Photo F-6 Representative habitat for Munz's iris (*Iris munzii*) along the Kaweah No. 1 Flowline.

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APPENDIX G

California Native Species Field Forms (CONFIDENTIAL)

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CONFIDENTIAL

The following appendix is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of special-status biological resources and qualifies as Confidential Information [18 CFR §385.1112]. Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings visit http://www.ferc.gov/legal/ceii-foia/foia.asp.

Appendix G. California Native Species Field Forms (CONFIDENTIAL)

Appendix G will not be distributed to the general public. Documents containing Confidential Information may be requested by entities and organizations with jurisdiction over these resources. To request copies, please contact David Moore, SCE Relicensing Project Manager at (626) 302-9494, or david.moore@sce.com.

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APPENDIX H

Target Non-Native Invasive Plant List

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Target Non-Native Invasive Plant List

Scientific Name	Common Name(s)
Ailanthus altissima	tree-of-heaven, Chinese sumac
Alhagi maurorum	Camelthorn
Arundo donax	giant reed
Carduus tenuiflorus	Italian thistle
Centaurea melitensis	Malta starthistle, tocalote
Centaurea solstitialis	yellow starthistle
Cirsium vulgare	bull thistle
Convolvulus arvensis	field bindweed
Cortaderia jubata	jubatagrass, pampasgrass
Cynara cardunculus	artichoke thistle
Cyperus esculentus	yellow nutsedge
Cyperus rotundus	purple nutsedge
Cytisus scoparius	Scotch broom, English broom
Egeria najas	anacharis
Genista monspessulana	French broom
Lepidium draba (=Cardaria draba)	heart-podded hoary cress
Lepidium latifolium	perennial pepperweed, tall whitetop
Salsola tragus	common Russianthistle
Salsola damascene (=S. vermiculata)	wormleaf salsola
Solanum elaeagnifolium	white horsenettle
Sorghum halepense	Johnsongrass
Tamarix chinensis	salt cedar (=Chinese tamarisk)
Tamarix gallica	salt cedar (=French tamarisk)
Tamarix parviflora	salt cedar (=smallflower tamarisk)
Tamarix ramosissima	salt cedar (=Saltcedar)
Tribulus terrestris	puncture vine

Sources: Bureau of Land Management (BLM). 2018. E-mail from Tierra Arbogast, BLM on February 5, 2018, to Tera Stoddard (Janelle Nolan & Associates Environmental Consulting) providing list of noxious weeds for the Bakersfield Region. Kaweah Project, Pre-Application Document (PAD). December 2016.

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APPENDIX I

Photographs of Non-Native Invasive Plants and Representative Habitat

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Photo I-1 **Tocalote (*Centaurea melitensis*) along the Kaweah No. 2 Flowline.**

Photo I-2 **Tocalote (*Centaurea melitensis*) along the Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line.**

Photo I-3 Puncture vine (*Tribulus terrestris*) at the Kaweah No. 3 Forebay.

Photo I-4 Puncture vine (*Tribulus terrestris*) along Kaweah No. 3 Powerhouse Road.

Photo I-5 Puncture vine (*Tribulus terrestris*) along Kaweah No. 2 Intake Road.

Photo I-6 Bull thistle (*Cirsium vulgare*) along the Kaweah No. 2 Flowline.

Photo I-7 **French broom (*Genista monspessulana*) along the Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line.**

Photo I-8 **Tree of heaven (*Ailanthus altissima*) along the Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line.**

Kaweah Project, FERC Project No. 298

TERR 2 – Wildlife Resources
Technical Study Report

July 2019

Southern California Edison Company
Regulatory Support Services
1515 Walnut Grove Avenue, Rosemead, CA 91770

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List of Acronyms

APLIC	Avian Power Line Interaction Committee
BCC	Birds of Conservation Concern
BLM	Bureau of Land Management
BLMS	Bureau of Land Management Sensitive Species
CALVEG	Classification and Assessment with Landsat of Visible Ecological Groupings
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CFP	California Fully Protected
CNDDB	California Natural Diversity Database
CWHR	California Wildlife Habitat Relationships
DNA	deoxyribonucleic acid
ESA	Endangered Species Act
FC	Federal Candidate for Listing
FD	Federal Delisted
FE	Federal Endangered
FERC	Federal Energy Regulatory Commission
FPD	Federal Proposed Delisted
FPE	Federal Proposed Endangered
FPT	Federal Proposed Threatened
FT	Federal Threatened
GB	gigabyte
GC	game camera
GIS	Geographic Information System
GPS	Global Positioning System
IPaC	Information for Planning and Conservation (USFWS)
kHz	kilohertz
NCBI	National Center for Biotechnology Information
PAD	Pre-Application Document
PL	Power Line

Project	Kaweah Project
PSP	Proposed Study Plan
RSP	Revised Study Plan
SCE	Southern California Edison Company
SD	Secure Digital
SE	State Endangered
SSC	Species of Special Concern
ST	State Threatened
TL	Transmission Line
TSP	Technical Study Plan
TSR	Technical Study Report
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WL	Watch List

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1 INTRODUCTION

This Technical Study Report (TSR) describes the methods and results developed by Southern California Edison Company (SCE) in association with implementation of the TERR 2 – Wildlife Resources Technical Study Plan (TERR 2 – TSP) for the Kaweah Project (Project). The TERR 2 – TSP was included in SCE's Revised Study Plan (RSP)[1] (SCE 2017a) and was approved by the Federal Energy Regulatory Commission (FERC) on October 24, 2017, as part of its Study Plan Determination for the Project (FERC 2017). Specifically, this report provides a detailed description of the methods and results of wildlife resource studies completed in 2018.

For the purpose of this document, a special-status wildlife species is defined as any animal species that is granted status by a federal or state agency. Federally listed species granted status by U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act (ESA) include Federal Threatened (FT), Federal Endangered (FE), Federal Proposed Threatened or Endangered (FPT or FPE), candidates for listing (FC), Federal Delisted (FD), or proposed for delisting (FPD). Also included are those species listed by USFWS as Birds of Conservation Concern (BCC) which include "species, subspecies, and populations of all migratory nongame birds that, without additional conservation action, are likely to become candidates for listing under the ESA of 1973" (USFWS 2008). The Project falls in Bird Conservation Region 15 (USFWS 2008).

The Bureau of Land Management (BLM) also maintains lists of BLM sensitive species (BLMS) that are not federally listed but that are designated by the BLM State Director for special management consideration.

State of California listed terrestrial wildlife species, which are granted status by the California Department of Fish and Wildlife (CDFW) under the California Endangered Species Act (CESA), include threatened (ST), endangered (SE), Fully Protected species (CFP), and California Species of Special Concern (SSC). In addition, one species, osprey that is on the CDFW Watch List (WL) is also considered as special-status for the purposes of this report.

2 STUDY OBJECTIVES

The objectives of the wildlife resource studies described in the TERR 2 – TSP are to:

- Identify special-status wildlife species potentially occurring in California Wildlife Habitat Relationships (CWHR) habitats documented as part of the TERR 1 – Botanical Resources Technical Study Report (TERR 1 – TSR) (SCE 2018).
- Determine whether Project transmission line, transmission tap line, and power line configurations are consistent with guidelines for the avoidance of avian mortalities.
- Document use of Project facilities by special-status bats during reproduction or other seasonal use.
- Evaluate the use of wildlife bridges and escape ramps by mule deer and other animals, including livestock.
- Document mortality of wildlife/livestock in Project flowlines.

[1] SCE filed a Proposed Study Plan (PSP) on May 24, 2017 (SCE 2017b). Three comments were filed on the PSP; however, they did not result in revisions to any of the study plans. Therefore, SCE filed a Revised Study Plan (RSP) on September 19, 2017, which stated that the PSP, without revision, constituted its RSP. The FERC subsequently issued a Study Plan Determination on October 24, 2017, approving all study plans for the Kaweah Project.

3 EXTENT OF STUDY AREA

The study areas for each study objective listed in Section 2 are described below.

Documentation of Special-status Wildlife Occurrences and Habitats

- For identification of special-status species potentially occurring in CWHR habitats, the study area is 1 mile around Project facilities (Table TERR 2-1).
- For wildlife reconnaissance surveys, the study area is the area where operations and/or maintenance occurs around Project facilities, plus a protective buffer. Refer to Table TERR 2-2 for the survey area by facility type.

Evaluation of Transmission Line, Transmission Tap Line, and Power Line Configurations

- For the evaluation of consistency with Avian Power Line Interaction Committee (APLIC) guidelines for the avoidance of avian mortalities, the study area is Project transmission lines, transmission tap lines, and power lines. Refer to Table TERR 2-1 for a list of evaluated lines.

Special-Status Bat Reproductive and Seasonal Use Surveys

- For special-status bat reproductive and seasonal use surveys, the study area is the Project facilities listed in Table TERR 2-3 and shown in Map TERR 2-1 of the TERR 2 – TSP.

Evaluation of Wildlife Use of Wildlife Bridges and Escape Ramps

- For the evaluation of wildlife use of wildlife bridges and escape ramps, the study area is the wildlife monitoring sites at the wildlife bridges and wildlife escape ramps shown in Map TERR 2-1.

Evaluation of Wildlife/Livestock Mortality in Project Flowlines

- For the evaluation of mortality of wildlife and livestock, the study area includes all portions of the Project flowlines under FERC jurisdiction (see Table TERR 2-1).

4 STUDY APPROACH

This section provides details on the study approach for documentation of special-status wildlife occurrences and associated habitats; evaluation of the consistency of transmission line, tap line, and power line configurations with APLIC guidelines; documentation of special-status bat use of Project facilities; evaluation of wildlife use of wildlife bridges and escape ramps; and evaluation of wildlife/livestock mortality in Project flowlines.

4.1 Document Special-Status Wildlife Occurrences and Habitats

The study approach for identifying special-status wildlife occurrences and habitats in the study area included developing preliminary tables and maps of special-status wildlife species known to occur or potentially occurring in the study area, documenting the distribution of CWHR habitats, conducting field surveys, compiling other incidental wildlife data, and developing final tables and maps of special-status wildlife species known to occur or potentially occurring in the study area. The approach for each of these study elements is described below.

4.1.1 Develop Preliminary Special-Status Wildlife Table and Maps

Existing information on special-status species known to occur or having the potential to occur in the study area was reviewed, and preliminary special-status wildlife occurrence tables and maps were developed in 2015 based on data obtained from the following sources:

- *BLM Special Status Animals in California, Including BLM Designated Sensitive Species* (BLM 2014). Only those wildlife species on the list whose geographic range overlaps the study area were included.
- CDFW's *State and Federally Listed Endangered and Threatened Animals of California* (CDFW 2018). Only those wildlife species on the list whose geographic range overlaps the study area were included.
- List of species considered CFP under the California Fish and Game Code Sections 3511, 4700, 5050 and 5515) (CDFW 2018). Only those wildlife species on the list whose geographic range overlaps the study area were included.
- The USFWS Information for Planning and Conservation (IPaC) (USFWS 2018) website was queried to generate a list of federally endangered and threatened species that occur or may potentially occur within the nine USGS 7-Minute quadrants surrounding the Project.
- List of BCC birds from USFWS's *Birds of Conservation Concern* (USFWS 2008). The Project is within Bird Conservation Region 15 (Sierra Nevada). Therefore, the BCC within this region were included.
- A 5-mile query of the California Natural Diversity Database (CNDDB) (CNDDB 2018a) to obtain information on known occurrences in the Project vicinity.
- Supplemental information (e.g., habitat descriptions and occurrences) obtained from a review of the following Project-specific sources:
  - Environmental Assessment, Kaweah Project (FERC Project No. 298) (FERC 1991); and
  - Sensitive Wildlife Species Investigation for the Kaweah Hydroelectric Project (SCE 1989).

Preliminary special-status wildlife tables and occurrence maps were provided in Section 3.6 of the Kaweah Project Pre-Application Document (PAD) (SCE 2015).

4.1.2 Document CWHR Wildlife Habitats and Associated Special-Status Wildlife

The study approach for documenting CWHR wildlife habitats and associated special-status wildlife in the study area included developing CWHR habitat maps for the study area and a table showing special-status wildlife associated with each wildlife habitat. Each approach is described below.

4.1.2.1 CWHR Habitat Maps

CWHR habitat maps for the study area were developed based on vegetation alliance maps published in the TERR 1 – TSR. Each Classification and Assessment with Landsat of Visible Ecological Groupings (CALVEG) alliance present in the study area was referenced to a CWHR wildlife habitat using the *CALVEG CWHR Crosswalk for California* (USDA-FS 2009). This information was then used to develop a Project-specific CALVEG-CWHR crosswalk table (refer to Table TERR 1-4 of the TERR 1 – TSR) and new maps showing the location of CWHR habitats in the study area.

4.1.2.2 Associated Special-Status Wildlife Species

CDFW's CWHR database was reviewed to develop a list of special-status wildlife species potentially occurring in each CWHR habitat (CDFW 2014). The CWHR database uses a predictive model to determine the likelihood of the occurrence of animal species in any given geographical location based on ecological data included in the model, such as the life history and known distribution of an animal, existing

vegetation, percent canopy cover, presence of water, and a number of other elements including landscape features.

A table was then developed listing each CWHR habitat in the study area, and special-status species known or potentially occurring in the study area that may occur in each habitat.

4.1.2.3 Conduct Field Surveys

Surveys were conducted on foot between approximately 0800 and 1800 hours. Inaccessible areas were surveyed with binoculars, to the degree possible. Species were recorded as present if they were observed, species-specific vocalizations were heard, or if diagnostic field signs were found (e.g., scat, tracks, pellets). Depending on the survey area and terrain, survey methods included zigzag and linear transects. Zigzag transects were utilized in larger habitat areas (e.g., mixed conifer forest) while linear transects were utilized in narrow habitats (e.g., riparian).

Wildlife sign recorded included direct species observations, scat, pellets, whitewash, tracks, nests, fur or feathers, burrows, dens, prey remains, vegetation browse, food caches, and markings on the ground or on tree bark. The following data were recorded on datasheets developed for these studies:

- Date
- Time
- General location
- Weather conditions
- CWHR wildlife habitat
- Wildlife sign observed
- Specific location or GPS coordinates
- Photograph numbers

Following completion of surveys, survey results were incorporated into an electronic database (i.e., Excel spreadsheet).

For each special-status species observed, a CNDDB field survey form was completed and submitted to CDFW. According to CNDDB guidelines for submitting data, ringtails are not tracked in the CNDDB (CNDDB 2018b) and bird observations should not be submitted unless specific reproductive behaviors are observed (CNDDB 2018c). Therefore, CNDDB forms were only submitted for applicable animal species and for special-status birds that displayed reproductive behavior.

4.1.3 Compile Incidental Wildlife Observation Data

Incidental observations of special-status species documented during all technical studies completed for the Kaweah Project were compiled and reviewed. The following data were obtained for each observation: date, location of observation, species observed, and Global Positioning System (GPS) coordinates (when available). These data were entered into the electronic database of special-status wildlife species and were reviewed for accuracy and reliability. Follow-up contact with the original observer was made to obtain additional information or clarification, as necessary.

4.1.4 Develop Final Tables and Maps of Special-Status Wildlife Species and Habitats

Tables and maps showing special-status wildlife species known to occur or potentially occurring in the study area were revised and finalized based on study elements completed for this report including CWHR habitat analysis, agency consultation, field surveys, and incidental wildlife observations, as described above.

Resource agencies were contacted, and resource agency websites and databases (e.g., CNDDB and CWHR) were reviewed to obtain any new data on special-status wildlife known to occur or potentially occurring in the study area that had become available since the development of the preliminary wildlife occurrence maps in 2015 (see Section 5.1.1). USFWS, BLM, and CDFW species lists were reviewed for any changes in the status of listed animals. Any new location data, including data obtained from implementation of other technical studies or from the compilation of incidental wildlife observation data, was recorded, digitized, and incorporated into Geographic Information Systems (GIS) layers.

4.2 Evaluate Transmission Line, Transmission Tap Line, and Power Line Configurations

This section describes the study approach for the evaluation of Project transmission lines, transmission tap lines, and power lines to determine their consistency with guidelines outlined in *Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). The Guidelines were developed by USFWS and APLIC to provide recommendations for power line structure designs and modifications for protecting raptors or other avian species from electrocution. APLIC is a committee that includes representatives from the utility industry, wildlife resource agencies, conservation groups, and manufacturers of avian protection products. Specific methods completed in the evaluation of Project transmission lines, transmission tap lines, and power lines are summarized below.

4.2.1 Map the Location of Project Transmission Lines, Transmission Tap Lines, and Power Lines

Project transmission lines, transmission tap lines, and power lines were identified and mapped in 2015 as part of the PAD (SCE 2015). In addition, information on each transmission line, transmission tap line, and power line including length, voltage, and start and end points, was obtained from SCE personnel.

4.2.2 Consult with Resource Agencies and SCE Regarding Avian Electrocutions and Mortalities on Project Transmission Lines, Transmission Tap Lines, and Power Lines

SCE monitors avian mortalities on Project lines and provides reports to FERC every 5 years in compliance with Article 412 of the Kaweah Hydroelectric Project (P-289) License. Avian mortality reports from 1991 to 2013 were downloaded from FERC eLibrary (https://www.ferc.gov/docs-filing/elibrary.asp), and SCE personnel were consulted regarding any additional mortalities observed from 2014 to 2018 (Moore, pers. comm. 2018). All reports were reviewed, and compiled into an electronic database (Excel spreadsheet) recording the year, date, avian species, mortality location, and any additional notes about the mortality.

4.2.3 Evaluate Consistency of Project Transmission Lines, Transmission Tap Lines, and Power Lines with APLIC Guidelines

Field inspections were conducted in conjunction with special-status wildlife reconnaissance surveys to document pole configurations and determine the extent of avian use of Project transmission lines, transmission tap lines, and power lines. Accessible portions of Project transmission lines, transmission tap lines, and power lines were visited on foot, and photographs were taken of each type of pole configuration. In addition, any avian use of the power lines was documented through visual identification of individuals or their sign (e.g., whitewash, feathers, pellets, etc.).

Each Project transmission line, transmission tap line, and power line pole configuration was assigned a configuration type code and was then evaluated against APLIC raptor-safe configuration guidelines. In general, electrocution can occur when birds perch on, nest on, or collide with structures having: 1) uninsulated phase conductors separated by less than the wrist-to-wrist or head-to-foot measurement of a bird; or 2) distances between grounded hardware (e.g., grounded wires, equipment, or guy wires) and any energized phase conductors (or other energized equipment) less than the wrist-to-wrist or head-to-foot measurement of a bird. APLIC recommends a conductor-to-conductor or conductor-to-grounded hardware distance of about 60 inches to accommodate the body dimensions of large birds such as bald

and golden eagles (APLIC 2006). Therefore, each pole configuration type was evaluated according to the following criteria:

- Whether power lines are underground and/or insulated (and, therefore, pose no risk of electrocution);
- Whether the distance between uncovered phase conductors is less than 60 inches with no perch guard;
- Whether the distance between uncovered energized parts and grounded equipment on equipment poles is less than 60 inches; and
- Whether the pole contains uninsulated or partially insulated metal guy wires, jumper, or transformer cables.

4.3 Evaluate Special-Status Bat Reproductive and Seasonal Use of Project Facilities

This section describes the study approach for the special-status bat reproductive and seasonal use surveys.

4.3.1 Conduct Reproductive Surveys

The primary purpose of reproductive surveys was to document special-status bat use of Project facilities during the reproductive season. Reproductive surveys included roost surveys, acoustic sampling, and mist net sampling. The methods for each survey type are described below.

4.3.1.1 Conduct Roost Surveys

Roost surveys included an initial facility suitability evaluation, followed by more intensive evaluation of those facilities determined to be suitable habitat for roosting bats. First, a visual evaluation of the exterior of Project facilities listed in Table TERR 2-3 was conducted to determine their suitability to support bat roosts. Criteria used to assess suitability include presence of appropriate crevice or cave-like features and appropriate thermodynamic conditions. In addition, the facilities were examined to determine the accessibility of the structure to bats (e.g., presence of small cracks or openings for bats to enter the interior of the structure). Follow-up investigations were then conducted at facilities that were determined to have the potential to support bat roosts. The exterior and interior of these facilities were examined for signs of bats and/or bat sign (e.g., skeletons, guano, urine staining, and culled insect parts). Spotlights and high-powered flashlights were used in combination with binoculars for more detailed examination of potential roost sites. If bat roosts were observed, then the time of day was noted, number of individuals was estimated, and the bats using the roost were identified to species, if possible. If bat sign was present, the type, amount, and approximate age of sign was noted.

Fresh guano samples, if available, were obtained from roost locations where significant guano deposits were present, but bats were not visually observed. The samples were stored in a stabilizing solution to prevent deoxyribonucleic acid (DNA) degradation and were then submitted to the Genidaqs℠ Molecular Biology and Genetics Lab (Cramer Fish Sciences) for DNA sequencing and species identification. DNA sequences were compared to species-specific genetic markers developed by Walker et al. 2016; these samples were further verified by comparison to samples at: 1) the National Center for Biotechnology Information (NCBI) DNA sequence database, and 2) voucher samples collected at the field site during mist net sampling to confirm identification. One special-status species potentially occurring in the study area, western small-footed myotis (*Myotis ciliolabrum*) (BLMS) has no unique genetic markers distinguishing it from the common species, California myotis (*Myotis californicus*). Therefore, these species are paired in the DNA analysis results.

4.3.1.2 Conduct Acoustic Sampling

Acoustic sampling (i.e., sampling of echolocation calls) was conducted at the locations indicated on Map TERR 2-1 of the TERR 2 – TSP, as well as at locations where bat roosts were observed during roost surveys, but were not able to be identified to species. Based on consultation with bat expert David Wyatt, acoustic sampling was conducted in the last two weeks of June, rather than August and September as

required under the TERR 2 – TSP. Specifically, it was recommended that reproductive acoustic sampling be conducted when non-volant young are still dependent upon their mothers. When young are in the early development stages, mothers can be expected to more heavily utilize the aquatic habitats associated with the Kaweah River. Therefore, acoustic sampling during the latter part of June would provide the best opportunity for detection of bats (David Wyatt, pers. comm. May 2018).

Resource agencies were contacted on May 2, 2018, regarding conducting acoustic sampling earlier to increase the opportunity to detect bats. No responses were received. Reproductive acoustic sampling was, therefore, conducted in June 2018. Acoustic units were operated at the selected sites for 5 nights from 1 hour before sunset until 1 hour after sunrise. Additional acoustic sampling was also conducted in August at locations where, upon downloading of the data, it was determined that equipment malfunctions resulted in collection of fewer than 5 nights of data.

Acoustic sampling was conducted using full-spectrum Wildlife Acoustics SM4BAT-FS detectors, which recorded the ultrasonic calls of bats and saved them as .wav files (sonograms) onto external secure digital (SD) cards. After downloading, sonogram files were processed using the Kaleidoscope Pro 4.5.5 (Wildlife Acoustics) software program on a laptop computer, which auto-classifies each sonogram into tentative species determinations (with generally 70 to 80% accuracy). Because of the high volume of sonogram files, biologists used Anabat Insight with customizable sonogram filters to further classify files and reduce the amount of time required to manually inspect sonograms. Finally, experienced biologists vetted the auto-classified sonograms to confirm species.

Note that some species have more distinct echolocation signatures and therefore are more readily identifiable using acoustic data. Three bat species, the silver-haired bat (*Lasionycteris noctivagans*), western small-footed myotis, and long-legged myotis (*Myotis volans*), currently lack readily identifiable acoustic characteristics that can distinguish their calls from other species in the same frequency range. These species are placed into “bat groups” with other bat species from which they cannot be acoustically distinguished for analysis. The bat groups are named based on the frequency range of their calls and are listed below:

- 25 kilohertz (kHz) bat group: big brown bat (*Eptesicus fuscus*), silver-haired bat, and Brazilian free-tailed bat (*Tadarida brasiliensis*)
- 40 kHz bat group: western small-footed myotis, little brown bat (*Myotis lucifugus*), and long-legged myotis.

A table of the confirmed species detected through acoustic sampling at Project facilities during the reproductive season was then developed, including both special-status species and common species of bats occurring at Project facilities. A table of the relative amount of bat activity per species, recorded as the average number of files per night, was also developed to compare bat activity levels between species and seasons.

4.3.1.3 Conduct Mist Net Sampling

Mist net sampling was conducted at the locations indicated on Map TERR 2-1 of the TERR 2 – TSP, as well as at locations where bat roosts were observed during roost surveys but were not able to be identified to species. In addition, due to the high volume of bat activity recorded from acoustic detectors at the Kaweah No. 3 Powerhouse and Switchyard, a second night of sampling was conducted on the opposite side of the Kaweah River to capture bats flying across the river from the Kaweah No. 3 Powerhouse. Mist net sampling was not conducted at the Kaweah No. 1 Diversion Dam; the East Fork Kaweah River near Three Rivers CA (U.S. Geological Survey [USGS] Gage No. 11208730) (SCE Gage No. 201); or the Kaweah No. 1 Flowline because of safety concerns related to monitoring nets on the steep slopes and narrow walkways of the flowline at night.

Fine mesh, low visibility mist nets were set up to maximize potential bat captures along potential foraging habitat or commuting. Mist nets were set up perpendicular to the estimated direction of bat movement. Single nets were approximately 8 feet high and varied between approximately 20 feet wide and 40 feet wide. A triple-stacked net (set approximately 25 feet high) was also employed to attempt to capture species that avoid foraging close to the ground. Mist nets were set up for one night, from sunset to 1:00 a.m., in locations where active roosts were identified. Nets were checked every 15 minutes over the course of the sampling period.

Captured bats were identified to species. Other information collected included sex, age (juvenile, subadult, or adult), reproductive status, and forearm measurements. Reproductive status for females was determined by abdominal palpation and mammary condition, and females were classified as pregnant, lactating, post-lactating, or non-reproductive. Reproductive status for males was determined by visual inspection of the testes, which become hairless and enlarged during the reproductive season. Captured bats were released on-site and echolocation calls were recorded at the time of release to better identify bat species that are difficult to determine solely from morphological characteristics.

Bats were also visually inspected for the presence of white-nose disease, a highly contagious fungal infection that has caused significant bat mortality in other parts of the United States. During handling, single-use latex gloves and sanitary bags were used on each individual bat to prevent the potential spread of the fungus. Between mist net sampling, nets were sanitized in a diluted solution of bleach to kill any white-nose fungal spores present.

Because some bat species prefer to fly at much higher altitudes than the mist nets, spotlighting was also used to identify bat species during mist-netting surveys. Bats flying overhead were initially detected by their calls using a real-time acoustic detector (Wildlife Acoustics Echo Meter Touch Pro 2) combined with an iPad Mini. Spotlights were then aimed at the sky to find the bat making the calls. This technique is effective in visually determining many bat species. A table of the confirmed species detected through mist net sampling and spotlighting at Project facilities during the reproductive season was then developed, including both special-status and common bat species.

4.3.2 Conduct Seasonal Use Surveys

To determine seasonal patterns of bat use of Project facilities, an additional survey was conducted in October at those locations where active roosts were identified during the reproductive surveys and within flight corridors between roost sites and potential foraging habitat. The survey included acoustic and mist net sampling using methods as described above in Section 4.3.1.2 and Section 4.3.1.3, respectively. Tables of confirmed species detected through acoustic and mist net sampling were developed, including both special-status species and common bat species.

4.3.3 Develop Map and Electronic Database Providing the Results of Special-Status Bat Surveys

Following completion of the reproductive and seasonal use surveys, a GIS layer of special-status and common bat roosts was developed and overlaid onto a map of Project facilities. A map was also developed to show special-status bats detected through acoustic and mist net sampling during the reproductive and seasonal use surveys.

In addition, special-status survey data was documented in an electronic database (i.e., Excel spreadsheet) which included survey location, latitude, longitude, survey period, survey dates, survey type, bat species common and scientific name, and species status.

4.4 Evaluate Wildlife Use of Wildlife Bridges and Escape Ramps

This section describes the study approach for the evaluation of wildlife use of wildlife bridges and escape ramps along Project flowlines, which included installation of game cameras, a desktop evaluation of game camera photographs to determine crossing success, and development of an electronic database to document successful and unsuccessful wildlife crossings.

4.4.1 Install Game Cameras to Monitor Wildlife Use of Bridges and Escape Ramps

Game cameras (Browning® Trail Camera, 2018 Dark Ops Pro) were used to capture wildlife images at selected wildlife bridges and escape ramps at nine locations along the Kaweah No. 2 and Kaweah No. 3 flowlines, as specified in the TERR 2 – TSP. Game cameras were installed at the locations shown on Map TERR 2-1 considering the following criteria:

- Locations where wildlife bridges and escape ramps are co-located; and, therefore, could be evaluated simultaneously;
- Locations in Important Winter Range for the Kaweah mule deer herd. Monitoring sites both within and outside of Important Winter Range were selected; and
- Sites across vegetation alliances.

Camera monitoring was conducted during seasonal movements of the Kaweah mule deer herd for 5 weeks in the spring, and 5 weeks in the fall. At each monitoring site, cameras were mounted to maximize the potential to detect and record wildlife movements in the vicinity of the selected wildlife bridges and escape ramps. Cameras were installed based on site-specific characteristics including, but not limited to, the range and sensitivity of the camera, the length/span of the wildlife bridge, location of trees or other objects potentially obscuring the view of the camera, and the slope of the site. The game cameras are motion-triggered and were programmed to take a series of eight images at each trigger, with 2 seconds in between each shot, to enable a more accurate determination of crossing success.

During each monitoring period, data was downloaded from cameras on a weekly basis. Data downloaded from the cameras included photographs as well as the date and time that the photograph was taken.

4.4.2 Evaluate Wildlife Bridge/Escape Ramp Use

Photographs captured on the game cameras were reviewed and assessed for successful wildlife crossings. A qualified biologist reviewed the photographs for the presence of wildlife, livestock, or humans. Wildlife were identified to the species level wherever possible. If resolution of the photograph was insufficient to identify the animal to the species level, the nearest taxonomic unit was used (e.g., undetermined fox species, undetermined mammal species, etc.).

For the purposes of the analysis, a single observation is defined as a series of sequential photos (eight photos on average) showing the movements of an individual animal at a given time and game camera location. For each observation, the following data were recorded in an electronic database (i.e., Excel spreadsheet):

- Game camera location Map ID (i.e., GC1 to GC9)
- Crossing characteristics
  - Wildlife bridge, escape ramp, or both
  - Vegetation alliance
  - Important deer habitat

- Date
- Start time (i.e., time of the earliest photo in the series)
- Photograph numbers used in analyzing the observation
- Species observed (common name and scientific name)
- Wildlife bridge crossing or escape ramp use evaluation rating (i.e., successful, unsuccessful, or undetermined). Refer below for definitions of each term
- Notes

An observation at a wildlife bridge crossing was rated as successful if the crossing was started and completed by the same animal. The observation was rated as unsuccessful if the crossing was not attempted, or if the crossing was attempted by an animal but was halted and the animal retraced its steps. The observation was defined as undetermined if there was not sufficient information to definitively determine whether the crossing was completed successfully.

An observation at an escape ramp was rated as successful if an escape was attempted and completed by the same animal. The observation was rated as unsuccessful if the escape was attempted but animal did not successfully reach the top of the ramp. The observation was defined as undetermined if there was insufficient information to definitively determine whether the escape was completed successfully.

4.5 Evaluate Wildlife/Livestock Mortality in Project Flowlines

SCE has been monitoring wildlife mortality at the Kaweah No. 2 and No. 3 Flowlines in compliance with Article 410 of the Kaweah Hydroelectric Project (P-289) License since 1991. Annual mortality reports were reviewed and compiled into an electronic database (Excel spreadsheet), and any additional mortalities captured from game camera images or obtain through consultation with SCE staff were also added. The year, date, animal species, mortality location, and any additional notes about the mortality were recorded.

5 STUDY RESULTS

This section summarizes the results of special-status wildlife surveys; the evaluation of the consistency of Project transmission line, transmission tap line, and power line configurations with APLIC guidelines; special-status bat surveys; the evaluation of the effectiveness of wildlife bridges and escape ramps; and the evaluation of wildlife and livestock mortality in Project flowlines.

5.1 Document Special-Status Wildlife Occurrences and Habitat

Thirteen CHWR wildlife habitats were identified in the study area, representing suitable habitat for 36 special-status wildlife species known to occur or potentially occurring in the study area. Two special-status wildlife species—golden eagle and yellow warbler—were detected during reconnaissance surveys, and 11 additional special-status wildlife species—osprey, ringtail, and nine species of bat (refer to Section 5.3 for further information on special-status bats in the study area)—were detected during other technical studies. Provided below are the detailed results of the documentation of wildlife habitats and special-status wildlife species in the study area.

5.1.1 Develop Preliminary Special-Status Wildlife Table and Maps

Preliminary special-status wildlife occurrence tables and maps were developed based on data obtained from the BLM, CDFW, USFWS, and other pertinent sources. These preliminary maps and tables are available in Section 3.6 of the PAD (SCE 2015).

5.1.2 Document CWHR Wildlife Habitats and Associated Special-Status Wildlife

Based on the CALVEG–CWHR crosswalk developed for the study area (refer to Table TERR 1-4 in the TERR 1 – TSR [SCE 2018]), the following CWHR habitats were identified in the study area:

- Annual Grassland
- Barren
- Blue Oak Woodland
- Chamise-Redshank Chaparral
- Mixed Chaparral
- Montane Chaparral
- Montane Hardwood
- Montane Riparian
- Perennial Grassland
- Urban
- Valley Foothill Riparian
- Valley Oak Woodland
- Water

Refer to Map TERR 2-2 for the location and distribution of these habitats within the study area. Table TERR 2-4 provides a list of special-status species known to occur or potentially occurring in the study area and their potential distribution within CWHR habitats.

5.1.3 Conduct Field Surveys

Two special-status wildlife species were observed during wildlife reconnaissance surveys, which were conducted in May 2018:

- Golden eagle (*Aquila chrysaetos*) (Eagle Act, BLMS, BCC, CFP, WL): One individual was observed flying over the Kaweah No. 1 Flowline near the Kaweah No. 1 Flowline Access Road – Summit;
- Yellow warbler (*Dendroica petechia*) (SSC): One singing male was observed approximately 0.2 mile southwest of the Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River).

No other special-status animal species or their sign were observed within the study area.

Common species or their sign observed included terrestrial reptiles such as the western fence lizard (*Sceloporus occidentalis*), California striped racer (*Masticophis lateralis*), and side-blotched lizard (*Uta stansburiana*); raptors such as the red-tailed hawk (*Buteo jamaicensis*); songbirds such as house wren (*Troglodytes aedon*), ash-throated flycatcher (*Myiarchus cinerascens*), and California scrub-jay (*Aphelocoma californica*); and mammals such as California ground squirrel (*Otospermophilus beecheyi*), mule deer (*Odocoileus hemionus*), gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), and raccoon (*Procyon lotor*). Refer to Table TERR 2-5 for a complete list of wildlife species observed during reconnaissance surveys.

5.1.4 Compile Incidental Wildlife Observation Data

Two special-status species were incidentally observed during other field surveys conducted in support of relicensing:

- Osprey (*Pandion haliaetus*) (WL): One osprey was observed on April 25, 2018 as it flew towards the Kaweah River from a small pond adjacent to the Kaweah No. 2 Flowline Access Road – Canal 5;
- Ringtail (*Bassariscus astutus*) (CFP): Ringtail scat was observed along the flume structure at the Kaweah No. 1 Diversion Dam on June 16, 2018 during installation of bat detectors, and ringtail tracks were observed behind the Kaweah No. 3 Powerhouse campus on October 12, 2018 during bat mist net sampling.

In addition, nine species of special-status bat were detected during special-status bat surveys. Refer to Section 5.3 for a detailed description of special-status bat survey results. Refer to Appendix A for CNDDB forms submitted to CDFW.

5.1.5 Develop Final Tables and Maps of Special-Status Wildlife Species

The final list of special-status wildlife known to occur or potentially occurring in the study area is provided in Table TERR 2-6. Final maps of special-status wildlife occurrences in the study area are provided in Map TERR 2-3 (CONFIDENTIAL) of this report.

5.2 Evaluate Transmission Line, Transmission Tap Line, and Power Line Configurations

Overall, 44 different pole configuration types were identified along transmission lines and transmission tap lines (11 pole configuration types are consistent with APLIC guidelines, and 29 are inconsistent); and 15 different pole configuration types were identified along power lines (7 configuration types are consistent with APLIC guidelines, and 8 pole configuration types are inconsistent). There are no recorded avian mortalities associated with Project transmission lines, transmission tap lines, or power lines. Following are detailed results of the evaluation of Project transmission line, transmission tap line, and power line configurations.

5.2.1 Map the Location of Project Transmission Line, Transmission Tap Lines, and Power Lines

There are 16 Project transmission lines, transmission tap lines, and power lines in the study area. Refer to Table TERR 2-7 for a list of each Project transmission line, transmission tap line, and power line as well as the length, voltage, and start and end point of each line. The locations of Project transmission lines, transmission tap lines, and power lines are shown in Maps TERR 2-4a–h.

5.2.2 Consult with Resource Agencies and SCE Regarding Avian Electrocutions and Mortalities on Project Transmission Lines, Transmission Tap Lines, and Power Lines

Based on a review of SCE's avian mortality reports since 1991, as well as consultation with SCE staff, there are no reported avian electrocutions or mortalities resulting from birds perching on, nesting on, or colliding with Project transmission lines, transmission tap lines, and power lines.

5.2.3 Evaluate Consistency of Project Transmission Lines, Transmission Tap Lines, and Power Lines with APLIC Guidelines

Field inspections of Project transmission line, transmission tap line, and power line configurations were conducted in May 2018 in conjunction with the special-status wildlife reconnaissance surveys. Forty-four (44) different transmission pole configuration types (symbolized as TL1–TL44) were identified along the 3 transmission lines and transmission tap lines associated with the Kaweah Project. Of these, 11 pole configuration types are consistent with APLIC guidelines, and 29 are inconsistent.

Fifteen (15) different power pole configuration types (symbolized as PL1–PL15) were identified along the 13 power lines associated with the Kaweah Project. Seven (7) of the 15 pole configuration types are consistent with APLIC guidelines, and 8 pole configuration types are inconsistent.

Transmission and power line configuration types that were determined to be inconsistent with APLIC guidelines pose a potential risk to avian species. These configurations included one or more of the following:

- The distance between uncovered phase conductors is less than 60 inches with no perch guard;
- The distance between uncovered phase conductors and grounded equipment on equipment poles is less than 60 inches; and
- The pole contains uninsulated or partially insulated metal guy-wires, jumper, or transformer cables.

Refer to Table TERR 2-7 for details on the consistency of pole configuration types associated with each Project transmission line, transmission tap line, and power line with APLIC guidelines. Refer to Maps TERR 2-4a–h for a map of each pole configuration type along Project transmission lines, transmission tap lines, and power lines. Refer to Appendix B for an example photograph of each pole configuration type and the associated APLIC consistency analysis.

A low level of avian use of Project transmission lines, transmission tap lines and/or power lines was observed during the field inspections. Because of their larger size and wingspan, raptorial and other large bird species are at greater risk of electrocution along transmission and power lines. One turkey vulture (*Cathartes aura*) was observed during the evaluation perching on a pole on the Kaweah No. 2 Powerhouse to Kaweah No. 2 Forebay Power Line (see configuration PL-9 in Appendix B). No other raptors or large birds were observed perching on poles or lines.

Passerine species, including acorn woodpeckers (*Melanerpes formicivorus*), Eurasian collared-doves (*Streptopelia decaocto*), and California scrub-jays, were also observed perching on transmission and power poles/lines. An acorn woodpecker nest was observed in a power pole on the Kaweah No. 2 Powerhouse to Kaweah No. 2 Forebay Power Line.

In general, Project transmission lines, transmission tap lines and/or power lines are located within habitats that contain structural elements (such as large trees and snags) that provide excellent nesting and perching substrates for a variety of species. While there is some use of lines, avian species in the study area may be preferentially selecting natural nesting and perching structures over artificial structures such as transmission or power line poles.

5.3 Special-Status Bat Reproductive and Seasonal Use Surveys

Provided below are the results of the special-status bat reproductive and seasonal use surveys. A total of nine special-status bat species and six common bat species were observed that were identifiable to species. Seven bat roosts were identified at Project facilities, including two roosts that are used by a special-status bat, Yuma myotis (*Myotis yumanensis*) (SSC). A summary of all bat species observed, the facilities where the species were observed, and survey method that yielded the detections is provided in Table TERR 2-8. Provided below are the detailed results of each special-status bat study component.

5.3.1 Conduct Reproductive Surveys

Reproductive surveys included roost surveys, acoustic sampling, and mist net sampling. The results for each survey type are described below.

5.3.1.1 Conduct Roost Surveys

Roost surveys were conducted in August 2018, with the exception of the Kaweah No. 1 Flowline (flume sections only) and the East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201), which were inspected in conjunction with acoustic surveys in June 2018. During the initial evaluation it was determined that nine of the 22 facilities listed in Table TERR 2-3 provided suitable habitat for bat roosts. The remaining 13 facilities were determined to be unsuitable because they lacked appropriate crevice or cave-like features for roosts; thermodynamic conditions were not appropriate for roosts; or because they lacked small cracks or openings for bats to enter the interior of the structure. Refer to Table TERR 2-9 for the results of the suitability evaluation for each facility.

Seven bat roosts were observed at five facilities identified as providing suitable habitat for bat roosts. This included two roosts that are used by a special-status bat, Yuma myotis. A description of each roost is provided below:

- Kaweah No. 1 Flowline (flume section only): A day roost was identified on the exterior of the flume. Identification to species was not possible because *Myotis* species cannot typically be distinguished by visual observation alone. In addition, no guano was available for DNA analysis, and mist netting was not conducted at this location for safety reasons (refer to Section 4.3.1.3).
- Kaweah No. 2 Powerhouse and Switchyard: A day roost was identified on the interior of the facility. Analysis of DNA from guano indicated that three species are using this roost, Brazilian free-tailed bat, California and/or western small foot myotis (the two species cannot be distinguished via DNA analysis), and Yuma myotis.
- Kaweah No 3. Powerhouse and Switchyard: Two roosts were identified at this facility, including:
  - A day roost on the interior of the powerhouse (species could not be determined because DNA was too degraded); and
  - A night roost on the exterior of the maintenance building southwest of the powerhouse. Analysis of DNA indicates this is a Yuma myotis roost.
- East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201): A night roost was identified on the exterior of the gage by the presence of sparse guano. The species could not be identified due to the lack of sufficient guano for testing.
- Kaweah No. 1 Powerhouse Campus: Two roosts were identified at the campus, including:
  - A day roost located inside the western-most maintenance building near the lumber piles. Analysis of DNA indicated that California and/or western small-footed myotis are using the roost. The two species cannot be distinguished via DNA analysis.
  - A night roost located on the eastern-most maintenance building. Guano was not collected because the guano was not fresh enough for DNA analysis, suggesting that this may be an older roost.

Refer to Table TERR 2-9 for a summary of the results of the roost surveys. Refer to Map TERR 2-5 (CONFIDENTIAL) for the geographic locations of all bat roosts.

5.3.1.2 Conduct Acoustic Sampling

Reproductive acoustic sampling was conducted in June 2018. Acoustic units were deployed at the Project facilities shown in Table TERR 2-10. Note that, in several cases, one unit was placed to obtain data for several facilities that are located in close proximity (e.g., at the Kaweah No. 1 Powerhouse and Switchyard and Powerhouse Campus). Conversely, six units were placed along the Kaweah No. 1 Flowline to obtain data along the entire flume section.

Approximately 306 gigabytes (GB) of sonogram data were obtained, consisting of 74,414 individual files, each representing a unique bat call. Fifteen species of bats were identified, including the following eight special-status species:

- Pallid bat (*Antrozous pallidus*) (BLMS, SSC)
- Townsend's big-eared bat (*Corynorhinus townsendii*) (BLMS, SSC)
- Spotted bat (*Euderma maculatum*) (BLMS, SSC)
- Western red bat (*Lasiurus blossevillii*) (SSC)
- Long-eared myotis (*Myotis evotis*) (BLMS)
- Fringed myotis (*Myotis thysanodes*) (BLMS)
- Yuma myotis
- Western mastiff bat (*Eumops perotis*) (BLMS, SSC)

One additional special-status species, the western small-footed myotis, was suspected to be present. However, because this species currently lacks known discernable species-isolating acoustic characteristics, the species could not be definitively confirmed.

5.3.1.3 Conduct Mist Net Sampling

Reproductive mist net sampling was conducted in August 2018. Five species were captured during mist net sampling, including the following three special-status species:

- Pallid bat
- Western small-footed myotis
- Yuma myotis

One captured individual, a pallid bat, was in reproductive condition at time of capture (a post-lactating female). No other bat species were in reproductive condition when captured. None of the bats showed any signs of white-nose syndrome.

Four species, including the special-status western mastiff bat and pallid bat, were identified by spotlighting.

Refer to Table TERR 2-11 for a list of all bat species captured and spotlighted during mist net sampling conducted during the reproductive season, including the sex, age, and reproductive status of all captured bats. Refer to Map TERR 2-6 (CONFIDENTIAL) for the specific geographic locations of special-status bat species captured and spotlighted during the reproductive season.

5.3.2 Conduct Seasonal Use Surveys

The results of acoustic and mist net sampling surveys to determine seasonal use are presented below.

5.3.2.1 Conduct Acoustic Sampling

Acoustic detectors deployed for seasonal acoustic sampling in October 2018 recorded approximately 216 GB of sonograms, consisting of 87,245 individual files. Fourteen species of bats were confirmed to be present at Project facilities. The seven special-status bat species identified included:

- Pallid bat
- Townsend's big-eared bat
- Spotted bat

- Long-eared myotis
- Fringed myotis
- Yuma myotis
- Western mastiff bat

Generally, special-status bat species activity comprised a relatively small proportion of the total bat species activity (see Appendix C), with the exception of one species, the Yuma myotis, which is likely present in abundance within the vicinity of Project facilities. Compared to the reproductive season, two special-status species, the western mastiff bat and spotted bat, had higher bat activity in the late-season compared to the reproductive season, which suggests that these species could be migrating through this region at this time of year (October).

Refer to Table TERR 2-12 for a detailed description of special-status bat and common species identified during seasonal use acoustic sampling, and to Map TERR 2-7 (CONFIDENTIAL) for the geographic locations of these detections. Appendix C provides an overview of bat acoustic levels during the seasonal acoustic sampling, calculated as the average number of files recorded per species per day.

5.3.2.2 Conduct Mist Net Sampling

Three species of bats were captured in the seasonal use mist net sampling conducted in October 2018. Special-status species captured included:

- Pallid bat
- Yuma myotis

One species, the pallid bat, showed evidence of being in reproductive condition at time of capture (two scrotal males). No other bat species were in reproductive condition when captured. None of the bats showed any signs of white-nose syndrome.

One special-status species, the western mastiff bat, and two common bat species were identified during spotlighting surveys.

Refer to Table TERR 2-13 for a list of all bat species captured and spotlighted during seasonal use mist net sampling, including the sex, age, and reproductive status of all captured bats. Refer to Map TERR 2-7 (CONFIDENTIAL) for the specific geographic locations of special-status bat species captured and spotlighted.

5.4 Evaluate Wildlife Use of Wildlife Bridges and Escape Ramps

Overall, nine species were documented using wildlife bridges during spring game camera monitoring, and ten species were documented using the wildlife bridges during fall game camera monitoring. No use of escape ramps was documented during either monitoring period. Refer below for a detailed description of the results of the evaluation of wildlife use of wildlife bridges and escape ramps.

5.4.1 Install Game Cameras to Capture Wildlife Images at Bridges and Escape Ramps

Game cameras were installed at the locations shown on Map TERR 2-1, which includes information on each installation location including unique map ID, type of crossing (bridge, escape ramp, or both), the vegetation alliance at the crossing location, and whether the location is within important deer habitat.

5.4.2 Evaluate Wildlife Bridge/Escape Ramp Use

A summary of the results of spring and fall game camera monitoring of wildlife bridges and escape ramps is provided below.

5.4.2.1 Spring Monitoring

Spring monitoring of game cameras was conducted for 5 weeks beginning in late March 2018. As shown in Table TERR 2-14, nine species (a total of 268 observations) were identified using the wildlife bridges during the spring monitoring. These are:

- Domestic cow (*Bos taurus*) (3 observances; 0 successful crossings)
- Mule deer (94 observances; 81 successful crossings)
- Bobcat (55 observances; 24 successful crossings)
- Mountain lion (*Puma concolor*) (3 observances; 0 successful crossings)
- Coyote (*Canis latrans*) (17 observances; 15 successful crossings)
- Gray fox (42 observances; 22 successful crossings)
- Black bear (*Ursus americanus*) (1 observance; 1 successful crossing)
- Striped skunk (*Mephitis mephitis*) (5 observances; 3 successful crossings)
- Raccoon (7 observances; 1 successful crossing)

Game cameras GC1 to GC6 located along the Kaweah No. 2 Flowline were more frequently used and had an average of 31 observations per camera (with a range between 10 and 56 observations); while GC7 to GC9 along the Kaweah No. 3 Flowline had an average of 4 observations per camera (with a range between 1 and 8 observations).

No use of escape ramps was observed.

Table TERR 2-15 provides a list of other species (i.e., humans, domestic dogs, small reptiles, birds, and small mammals) observed in game camera photographs.

5.4.2.2 Fall Monitoring

Fall monitoring of game cameras was conducted for 5 weeks beginning in mid-November 2018. As shown in Table TERR 2-16, ten species (a total of 425 observations) were identified using the wildlife bridges during the spring monitoring. These are:

- Virginia opossum (*Didelphis virginiana*) (1 observance, 0 successful crossings)
- Domestic cattle (11 observances, 0 successful crossings)
- Mule deer (205 observances, 173 successful crossings)
- Bobcat (37 observances, 17 successful crossings)
- Coyote (66 observances, 36 successful crossings)
- Gray fox (81 observances, 33 successful crossings)
- Black bear (3 observances, 1 successful crossing)
- Striped skunk (14 observances, 6 successful crossings)
- Western spotted skunk (*Spilogale gracilis*) (3 observances, 1 successful crossing)
- Raccoon (4 observances, 1 successful crossing)

Total number of observations during the fall monitoring increased by approximately 59 percent as compared to spring monitoring; and total number of successful crossings increased by approximately 54 percent. Similar to the spring monitoring results, game cameras GC1 to GC6 located along the Kaweah No. 2 Flowline were more frequently used (with an average of 59 observations per camera) than

GC7 to GC9 along the Kaweah No. 3 Flowline (with an average of 22 observations per camera). However, the number of observations recorded at GC7 increased from 3 to 63 during fall monitoring as compared to spring monitoring.

No use of escape ramps was observed.

Table TERR 2-17 provides a list of other species (i.e., humans, domestic dogs, birds, and small mammals) observed in game camera photographs.

5.5 Evaluate Wildlife/Livestock Mortality in Project Flowlines

A summary of the annual reports for wildlife and domestic livestock is provided below.

Since 1991, there have been a total of 52 wildlife mortalities in the Kaweah No. 2 and No. 3 Flowlines. The majority of these wildlife mortalities have been mule deer (a total of 41 observations), but seven foxes, a coyote, a black bear, a golden eagle, and an unknown owl species were also recorded. A total of 35 wildlife mortalities were recorded on the Kaweah No. 3 Flowline, and 17 wildlife mortalities were recorded on the Kaweah No. 2 Flowline. The highest number of mortalities in a given year (6 mortalities) occurred in 2006. No wildlife mortalities were recorded in 1997, 2010–2014, and 2016–2017. Refer to Table TERR 2-18 for more detailed information on each mortality event.

Since 1991, there have been a total of five domestic livestock mortalities in the Kaweah No. 2 and No. 3 Flowlines. All of these mortalities were of domestic cattle. Four of these mortalities occurred on the Kaweah No. 3 Flowline, and one on the Kaweah No. 2 Flowline. Refer to Table TERR 2-19 for more detailed information on each mortality event.

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TABLES

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Table TERR 2-1. Project Facilities

Diversion Dams and Pools
Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)
Kaweah No. 2 Diversion Dam and Pool (Kaweah River)
Flowlines
Kaweah No. 1 Flowline
Kaweah No. 2 Flowline
Kaweah No. 3 Flowline
Forebays
Kaweah No. 1 Forebay Tank and Spillway Channel
Kaweah No. 2 Forebay and Spillway Channels
Kaweah No. 3 Forebay and Spillway Channel
Penstocks
Kaweah No. 1 Penstock
Kaweah No. 2 Penstock
Kaweah No. 3 Penstock
Powerhouses and Switchyards
Kaweah No. 1 Powerhouse and Switchyard
Kaweah No. 2 Powerhouse and Switchyard
Kaweah No. 3 Powerhouse and Switchyard
Transmission Lines and Transmission Tap Lines
Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line
Kaweah No. 1 Powerhouse Transmission Tap Line
Kaweah No. 2 Powerhouse Transmission Tap Line
Power Lines
Kaweah No. 1 Diversion Intake House Solar Panel to Kaweah No. 1 Diversion Dam Power Line (solar)
Kaweah No. 1 Switchyard to Kaweah No. 1 Maintenance Building Power Line
Kaweah No. 1 Switchyard to Kaweah No. 1 Office Building Power Line
Kaweah No. 1 Switchyard to Kaweah No. 1 Operator's Office ~~Old Machine Shop~~ Power Line
Kaweah No. 1 Switchyard to K1 Workshop Power Line
Kaweah No. 1 Office Building to K1 Forebay Tank Power Line
Kaweah No. 1 Powerhouse Campus Alternate Power Line
Kaweah No. 2 Diversion/Flowline Gage and Kaweah No. 3 Powerhouse Alternate Power Line
Kaweah No. 2 Powerhouse Alternate Power Line
Kaweah No. 2 Powerhouse to Kaweah No. 2 Forebay Power Line
Kaweah No. 3 Powerhouse to Kaweah No. 2 Diversion Power Line
Kaweah No. 3 Powerhouse to Kaweah No. 2 Flowline Gage Power Line
Kaweah No. 3 Powerhouse to Kaweah No. 3 Forebay Power Line

Communication Lines
Kaweah No. 1 Powerhouse to Kaweah No. 1 Office Building Fiber Communication Line
Kaweah No. 1 Office Building to Kaweah No. 1 Forebay Tank Fiber Communication Line
Kaweah No. 2 Diversion Dam to Kaweah No. 3 Powerhouse Fiber Communication Line
Kaweah No. 2 Powerhouse to Kaweah No. 2 Forebay Fiber Communication Line
Kaweah No. 3 Powerhouse to Kaweah No. 3 Forebay Fiber Communication Line
Kaweah No. 3 Forebay to Kaweah No. 3 Forebay Inlet Fiber Communication Line
Stream Gages
East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a)
East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)
Kaweah No. 1 Minimum Instream Flow Release (SCE Gage No. 201a)
East Fork Kaweah River Conduit 1 near Three Rivers CA (SCE Gage No. 202)
Kaweah River below Conduit No. 2 near Hammond CA (USGS Gage No. 11208600) (SCE Gage No. 203)
Kaweah River Conduit No. 2 near Hammond CA (SCE Gage No. 204a)
Kaweah River Conduit No. 2 at Power Plant near Hammond CA (USGS Gage No. 11208818) (SCE Gage No. 205a)
Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)
Project Access Roads
Kaweah No. 1 Development
Kaweah No. 1 Flowline Access Road – Bear Canyon
Kaweah No. 1 Flowline Access Road – Grapevine
Kaweah No. 1 Flowline Access Road – Lumberyard
Kaweah No. 1 Flowline Access Road – Lumberyard (spur)
Kaweah No. 1 Flowline Access Road – Slick Rock
Kaweah No. 1 Forebay Road
Kaweah No. 1 Intake Road
Kaweah No. 1 Flowline Access Road – Lower Pine
Kaweah No. 1 Flowline Access Road – Lower Pine (spur)
Kaweah No. 1 Flowline Access Road – Summit
Kaweah No. 1 Flowline Access Road – Unnamed
Kaweah No. 1 Flowline Access Road – Upper Pine
Kaweah No. 2 Development
Kaweah No. 2 Flowline East Access Road
Kaweah No. 2 Flowline Access Road – Open Siphon Grids
Kaweah No. 2 Flowline Access Road – Red Barn
Kaweah No. 2 Intake Road
Kaweah No. 2 Powerhouse Road
Kaweah No. 2 Flowline Center Access Road

Project Access Roads (*continued*)
Kaweah No. 2 Flowline Access Road – Canal 2 Brushout Grid
Kaweah No. 2 Flowline Access Road – Canal 4 East
Kaweah No. 2 Flowline Access Road – Canal 4 West
Kaweah No. 2 Flowline Access Road – Canal 5
Kaweah No. 2 Flowline Access Road – Canal 6 East
Kaweah No. 2 Flowline Access Road – Canal 6 West
Kaweah No. 2 Flowline Access Road – Flume 11
Kaweah No. 2 Flowline Access Road – Flume 8
Kaweah No. 2 Flowline West Access Road
Kaweah No. 2 Forebay Road
Kaweah No. 2 Penstock Road
Kaweah No. 3 Development
Kaweah No. 3 Forebay Road
Kaweah No. 3 Powerhouse Road
Project Trails
Kaweah No. 1 Development
Kaweah No. 1 Flowline Access Trail – Unnamed
~~Kaweah No. 1 Flowline Access Trail – Grand Canyon~~
~~Kaweah No. 1 Solar Panel Access Trail~~
Kaweah No. 2 Development
Kaweah No. 2 Flowline Access Trail – Canal 11
Kaweah No. 2 Flowline Access Trail – Canal 13
Kaweah No. 2 Flowline Access Trail – Canal 15
Kaweah No. 2 Flowline Access Trail – Canal 2
Kaweah No. 2 Flowline Access Trail – Canal 4 East
Kaweah No. 2 Flowline Access Trail – Canal 4 West
Kaweah No. 2 Flowline Access Trail – Canal 5
Kaweah No. 2 Flowline Access Trail – Canal 6
Kaweah No. 2 Flowline Access Trail – Open Siphon
Kaweah No. 2 Flowline Access Trail – Wildlife Crossing 2
Kaweah No. 2 Flowline Access Trail – Water User 14
Kaweah No. 2 Flowline Access Trail – Water User 9
Kaweah No. 2 Powerhouse River Access Trail
Kaweah No. 3 Development
Kaweah No. 3 Flowline Access Trail

Ancillary and Support Facilities
Kaweah No. 1 Powerhouse Campus
Kaweah No. 1 Diversion Intake House Solar Panel
Kaweah No. 1 Solar Yard Satellite Repeater
Kaweah No. 1 Intake Cableway
Kaweah No. 1 Grapevine Satellite Repeater
Kaweah No. 2 Powerhouse River Access Parking
Kaweah No. 2 Intake Cableway
Kaweah No. 2 Wildlife Bridges
Kaweah No. 2 Wildlife Escape Ramps
Kaweah No. 2 Footbridges
Kaweah No. 3 Wildlife Bridges
Kaweah No. 3 Wildlife Escape Ramps
Kaweah No. 3 Footbridges

Red = Changes from Pre-Application Document

Table TERR 2-2. Survey Area for Special-Status Wildlife Around Project Facilities

Project Facility	Survey Area[1]
Diversion Dams and Pools	15 feet around the perimeter
Flowlines[2]	20 feet on either side
Forebays/Forebay Tank	20 feet around the perimeter
Penstocks	15 feet on either side
Powerhouses and Switchyards	Within and up to 15 feet around the perimeter fence
Transmission, Power, and Communication Lines	25 feet on either side
Gages	10 feet around gages
Project Access Roads	20 feet on either side
Project Trails	15 feet on either side
Ancillary and Support Facilities	
Kaweah No. 1 Powerhouse Campus	Within the developed campus
Repeaters and Solar Panels	15 feet around the perimeter
River Access Parking	10 feet around parking area and beach

[1] Survey areas represent locations where potential operation and maintenance activities occur.

[2] Footbridges, wildlife bridges, and wildlife escape ramps are located on Project flowlines and were surveyed concurrently with the flowlines.

Table TERR 2-3. Special-Status Bat Roost Reproductive Survey Locations

Diversion Dams and Pools
Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)
Kaweah No. 2 Diversion Dam and Pool (Kaweah River)
Flowlines
Kaweah No. 1 Flowline (flume section only)
Kaweah No. 2 Flowline (flume section only)
Powerhouses and Switchyards
Kaweah No. 1 Powerhouse and Switchyard
Kaweah No. 2 Powerhouse and Switchyard
Kaweah No. 3 Powerhouse and Switchyard
Stream Gages
East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a)
East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)
Kaweah No. 1 Minimum Instream Flow Release (SCE Gage No. 201a)
East Fork Kaweah River Conduit 1 near Three Rivers CA (SCE Gage No. 202)
Kaweah River below Conduit No. 2 near Hammond CA (USGS Gage No. 11208600) (SCE Gage No. 203)
Kaweah River Conduit No. 2 near Hammond CA (SCE Gage No. 204a)
Kaweah River Conduit No. 2 at Power Plant near Hammond CA (USGS Gage No. 11208818) (SCE Gage No. 205a)
Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)
Ancillary and Support Facilities
Kaweah No. 1 Powerhouse Campus
Kaweah No. 2 Wildlife Bridges
Kaweah No. 2 Wildlife Escape Ramps
Kaweah No. 2 Footbridges
Kaweah No. 3 Wildlife Bridges
Kaweah No. 3 Wildlife Escape Ramps
Kaweah No. 3 Footbridges

Table TERR 2-4. Special-Status Species Known to Occur or Potentially Occurring in the Study Area and Associated CWHR Wildlife Habitats

Common Name	Scientific Name	Status		CWHR Wildlife Habitats													
		Federal	State	Annual Grassland	Barren	Blue Oak Woodland	Chamise-Redshank Chaparral	Mixed Chaparral	Montane Chaparral	Montane Hardwood	Montane Riparian	Perennial Grassland	Sierran Mixed Conifer	Urban	Valley Foothill Riparian	Valley Oak Woodland	Water (Riverine)
Known to Occur in the Study Area																	
Birds																	
osprey	*Pandion haliaetus*	—	WL	x	x	x		x	x	x	x	x	x		x	x	x
golden eagle	*Aquila chrysaetos*	Eagle Act, BLMS, BCC	CFP (nesting and wintering), WL	x	x	x	x	x	x	x	x	x	x	x	x	x	
yellow warbler	*Dendroica petechia*	BCC	SSC (nesting)			x	x	x	x	x	x		x	x	x	x	
Mammals																	
pallid bat	*Antrozous pallidus*	BLMS	SSC	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Townsend's big-eared bat	*Corynorhinus townsendii*	BLMS	SSC	x	x	x	x	x	x	x	x	x	x	x	x	x	x
spotted bat	*Euderma maculatum*	BLMS	SSC	x		x			x		x	x	x	x	x	x	x
western red bat	*Lasiurus blossevillii*	—	SSC	x		x	x	x	x	x	x	x	x	x	x	x	x
western small-footed myotis	*Myotis ciliolabrum*	BLMS	—	x	x	x	x	x	x	x	x	x	x	x	x	x	x
long-eared myotis	*Myotis evotis*	BLMS	—		x	x	x	x	x	x	x	x	x		x	x	x
fringed myotis	*Myotis thysanodes*	BLMS	—	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Yuma myotis	*Myotis yumanensis*	BLMS	—	x		x	x	x	x	x	x	x	x	x	x	x	x
western mastiff bat	*Eumops perotis californicus*	BLMS	SSC	x	x	x	x	x	x	x	x	x		x	x	x	
ringtail	*Bassariscus astutus*	—	CFP	x	x	x	x	x	x	x	x	x	x		x	x	
fisher – West Coast DPS	*Pekania pennanti*	BLMS	ST, SSC								x		x				
May Potentially Occur in the Study Area																	
Amphibians																	
western spadefoot	*Spea hammondii*	BLMS	SSC	x	x	x	x	x				x				x	x
Reptiles																	
coast horned lizard	*Phrynosoma blainvillii*	BLMS	SSC	x	x	x	x	x				x			x	x	
northern California legless lizard	*Anniella pulchra*	—	SSC			x	x	x				x			x	x	
California mountain kingsnake	*Lampropeltis zonata*	BLMS	WL	x		x		x	x	x	x		x		x	x	
Birds																	
California condor	*Gymnogyps californianus*	FE	SE, CFP	x	x	x	x	x	x	x		x	x			x	x
northern goshawk	*Accipiter gentilis*	BLMS	SSC (nesting)			x	x	x	x	x	x		x		x	x	

Common Name	Scientific Name	Status		CWHR Wildlife Habitats													
		Federal	State	Annual Grassland	Barren	Blue Oak Woodland	Chamise-Redshank Chaparral	Mixed Chaparral	Montane Chaparral	Montane Hardwood	Montane Riparian	Perennial Grassland	Sierran Mixed Conifer	Urban	Valley Foothill Riparian	Valley Oak Woodland	Water (Riverine)
Swainson's hawk	*Buteo swainsoni*	BLMS, BCC	ST (nesting)	x	x	x	x	x	x	x		x		x	x	x	
northern harrier	*Circus cyaneus*	—	SSC (nesting)	x	x	x	x	x	x	x	x	x	x	x	x	x	x
white-tailed kite	*Elanus leucurus*	BLMS	CFP	x	x	x	x	x				x		x	x	x	
bald eagle	*Haliaeetus leucocephalus*	FD, Eagle Act, BCC, BLMS	SE, CFP	x	x	x	x	x	x	x	x	x	x		x	x	x
prairie falcon	*Falco mexicanus*	BCC	WL (nesting)	x	x	x	x	x	x	x	x	x	x	x	x	x	
American peregrine falcon	*Falco peregrinus anatum*	FD, BCC	SD, CFP	x	x	x	x	x	x	x	x	x	x	x	x	x	x
California black rail	*Laterallus jamaicensis coturniculus*	BLMS, BCC	ST, CFP														x
short-eared owl	*Asio flammeus*	—	SSC (nesting)	x		x	x	x	x		x	x	x	x	x	x	
burrowing owl	*Athene cunicularia*	BLMS, BCC	SSC	x	x	x	x	x				x		x	x	x	
California spotted owl	*Strix occidentalis*	BLMS, BCC	SSC							x	x		x		x		
black swift	*Cypseloides niger*	BCC	SSC (nesting)	x	x	x		x	x	x	x	x	x	x	x	x	x
Lewis' woodpecker	*Melanerpes lewis*	BCC	—	x		x		x	x	x	x	x	x		x	x	
willow flycatcher	*Empidonax traillii*	BCC	SE								x				x		
southwestern willow flycatcher	*Empidonax traillii extimus*	FE	SE (nesting)								x				x		
Mammals																	
American badger	*Taxidea taxus*	—	SSC	x	x	x	x	x	x	x	x	x	x		x	x	

LEGEND:

Federal Status
BCC = Birds of Conservation Concern
BLMS = Bureau of Land Management Sensitive (Bakersfield Office)
FC = Federal Candidate
FD = Delisted Species
FE = Federal Endangered
FPD = Federal Proposed for Delisting
FT = Federal Threatened

State Status
CFP = California Fully Protected
SD = State Delisted
SE = California Endangered
SR = California Rare
SSC = California Species of Special Concern
ST = California Threatened
WL = Watch List

Table TERR 2-5. Special-Status and Common Wildlife Species Detected in the Study Area During Wildlife Reconnaissance Surveys

Common Name	Scientific Name	Status		Type of Detection				
		Federal	State	Visual/Auditory	Scat	Den/Bedding Area	Tracks/Feathers	Remains
Insects								
bumble bee species	*Bombus spp.*	—	—	X				
tarantula hawk species	Pompilidae family	—	—	X				
western tiger swallowtail butterfly	*Papilio rutulus*	—	—	X				
cabbage white butterfly	*Pieris rapae*	—	—	X				
Sara orange-tip butterfly	*Anthocharis sara*	—	—	X				
orange sulfur butterfly	*Colias eurytheme*	—	—	X				
great purple hairstreak butterfly	*Atlides halesus*	—	—					X
variable checkerspot butterfly	*Euphydryas chalcedona*	—	—	X				
California tortoiseshell butterfly	*Nymphalis californica*	—	—	X				
Lorquin's admiral butterfly	*Limenitis lorquini*	—	—	X				
California sister butterfly	*Adelpha bredowii californica*	—	—	X				
Fish								
mosquitofish	*Gambusia spp.*	—	—	X				
Amphibians								
bullfrog	*Lithobates catesbiana*	—	—	X				
western toad	*Anaxyrus boreas*	—	—	X				X
Pacific chorus frog	*Pseudacris regilla*	—	—	X				
Reptiles								
western fence lizard	*Sceloperus occidentalis*	—	—	X				
side-blotched lizard	*Uta stansburiana*	—	—	X				
Gilbert's skink	*Plestiodon gilberti*	—	—	X				
western whiptail	*Aspidoscelis tigris*	—	—	X				
yellow-bellied racer	*Coluber constrictor mormon*	—	—	X				
California striped racer	*Masticophis lateralis lateralis*	—	—	X				
Pacific rattlesnake	*Crotalus oreganus*	—	—	X			X	
Birds								
pied-billed grebe	*Podilymbus podiceps*	—	—	X				
mallard	*Anas platyrhynchos*	—	—	X				
common merganser	*Mergus merganser*	—	—	X				
turkey vulture	*Cathartes aura*	—	—	X				
Cooper's hawk	*Accipiter cooperii*	—	WL (nesting)	X				
red-shouldered hawk	*Buteo lineatus*	—	—	X				
red-tailed hawk	*Buteo jamaicensis*	—	—	X				

Common Name	Scientific Name	Status		Type of Detection				
		Federal	State	Visual/Auditory	Scat	Den/Bedding Area	Tracks/Feathers	Remains
golden eagle	*Aquila chrysaetos*	Eagle Act, BLMS, BCC	CFP, WL (nesting and wintering)					
American kestrel	*Falco sparverius*	—	—	X				
California quail	*Callipepla californica*	—	—	X			X	
mountain quail	*Oreotyx pictus*	—	—	X				
wild turkey	*Meleagris gallopavo*	—	—				X	
American coot	*Fulica americana*	—	—	X				
spotted sandpiper	*Actitis macularius*	—	—	X				
mourning dove	*Zenaida macroura*	—	—	X				
Eurasian collared-dove	*Streptopelia decaocto*	—	—	X				
white-throated swift	*Aeronautes saxatalis*	—	—	X				
Anna’s hummingbird	*Calypte anna*	—	—	X				
black-chinned hummingbird	*Archilochus alexandri*	—	—	X				
acorn woodpecker	*Melanerpes formicivorus*	—	—	X				
downy woodpecker	*Picoides pubescens*	—	—	X				
hairy woodpecker	*Picoides villosus*	—	—	X				
Nuttall’s woodpecker	*Picoides nuttallii*	—	—	X				
northern flicker	*Colaptes auratus*	—	—	X				
western wood-pewee	*Contopus sordidulus*	—	—	X				
Pacific-slope flycatcher	*Empidonax difficilis*	—	—	X				
black phoebe	*Sayornis nigricans*	—	—	X				
ash-throated flycatcher	*Myiarchus cinerascens*	—	—	X				
western kingbird	*Tyrannus verticalis*	—	—	X				
warbling vireo	*Vireo gilvus*	—	—	X				
Hutton’s vireo	*Vireo huttoni*	—	—	X				
California scrub-jay	*Aphelocoma californica*	—	—	X				
common raven	*Corvus corax*	—	—	X				
northern rough-winged swallow	*Stelgidopteryx serripennis*	—	—	X				
violet-green swallow	*Tachycineta thalassina*	—	—	X				
tree swallow	*Tachycineta bicolor*	—	—	X				
cliff swallow	*Petrochelidon pyrrhonota*	—	—	X				
oak titmouse	*Baeolophus inornatus*	—	—	X				
bushtit	*Psaltriparus minimus*	—	—	X				
white-breasted nuthatch	*Sitta carolinensis*	—	—	X				
Bewick’s wren	*Thryomanes bewickii*	—	—	X				
house wren	*Troglodytes aedon*	—	—	X				

Common Name	Scientific Name	Status		Type of Detection				
		Federal	State	Visual/Auditory	Scat	Den/Bedding Area	Tracks/Feathers	Remains
canyon wren	*Catherpes mexicanus*	—	—	X				
american dipper	*Cinclus mexicanus*	—	—	X				
wrentit	*Chamaea fasciata*	—	—	X				
blue-gray gnatcatcher	*Polioptila caerulea*	—	—	X				
western bluebird	*Sialia mexicana*	—	—	X				
American robin	*Turdus migratorius*	—	—	X				
Swainson's thrush	*Catharus ustulatus*	—	—	X				
European starling	*Sturnus vulgaris*	—	—	X				
phainopepla	*Phainopepla nitens*	—	—	X				
orange-crowned warbler	*Vermivora celata*	—	—	X				
yellow warbler	*Dendroica petechia*	—	SSC	X				
black-throated gray warbler	*Dendroica nigrescens*	—	—	X				
Wilson's warbler	*Wilsonia pusilla*	—	—	X				
western tanager	*Piranga ludoviciana*	—	—	X				
black-headed grosbeak	*Pheucticus melanocephalus*	—	—	X				
lazuli bunting	*Passerina amoena*	—	—	X				
spotted towhee	*Pipilo maculatus*	—	—	X				
California towhee	*Melozone crissalis*	—	—	X				
rufous-crowned sparrow	*Aimophila ruficeps*	—	—	X				
lark sparrow	*Chondestes grammacus*	—	—	X				
golden-crowned sparrow	*Zonotrichia atricapilla*	—	—	X				
song sparrow	*Melospiza melodia*	—	—	X				
brown-headed cowbird	*Molothrus ater*	—	—	X				
red-winged blackbird	*Agelaius phoeniceus*	—	—	X				
Brewer's blackbird	*Euphagus cyanocephalus*	—	—	X				
great-tailed grackle	*Quiscalus mexicanus*	—	—	X				
Bullock's oriole	*Icterus bullockii*	—	—	X				
purple finch	*Carpodacus purpureus*	—	—	X				
house finch	*Carpodacus mexicanus*	—	—	X				
lesser goldfinch	*Spinus psaltria*	—	—	X				
house sparrow	*Passer domesticus*	—	—	X				

Common Name	Scientific Name	Status		Type of Detection				
		Federal	State	Visual/Auditory	Scat	Den/Bedding Area	Tracks/Feathers	Remains
Mammals								
desert cottontail	*Sylvilagus audubonii*	—	—	X				
Merriam's chipmunk	*Neotamias merriami*	—	—	X				
western gray squirrel	*Sciurus griseus*	—	—	X		X		
California ground squirrel	*Spermophilus beecheyi*	—	—	X	X			
dusky-footed woodrat	*Neotoma fuscipes*	—	—	X		X		
deermouse species	*Peromyscus spp.*	—	—	X				X
mule deer	*Odocoileus hemionus*	—	—	X	X		X	
Myotis species	*Myotis spp.*	—	—	X				
bobcat	*Lynx rufus*	—	—		X		X	
mountain lion	*Puma concolor*	—	—		X		X	
coyote	*Canis latrans*	—	—		X		X	
gray fox	*Urocyon cinereoargenteus*	—	—		X		X	
striped skunk	*Mephitis mephitis*	—	—		X			
long-tailed weasel	*Mustela frenata*	—	—		X			
raccoon	*Procyon lotor*	—	—		X		X	

LEGEND:

Federal Status
BCC = Birds of Conservation Concern
BLMS = Bureau of Land Management Sensitive (Bakersfield Office)
FC = Federal Candidate
FD = Delisted Species
FE = Federal Endangered
FPD = Federal Proposed for Delisting
FT = Federal Threatened

State Status
CFP = California Fully Protected
SSC = California Species of Special Concern
SCE = State Candidate Endangered
SCT = State Candidate Threatened
SD = State Delisted
SE = California Endangered
SR = California Rare
ST = California Threatened
WL = Watch List

Table TERR 2-6. Special-Status Wildlife Species Known to Occur or Potentially Occurring in the Study Area

Scientific/Common Name	Federal Status	State Status	Habitat	Likelihood for Occurrence/Occurrence Notes
Known to Occur in the Study Area				
Birds				
Pandion haliaetus osprey	—	WL	Uncommon migratory raptor that builds large perennial nests in dead trees or other prominent supports near open water. Foraging areas include regulated and unregulated rivers, reservoirs, lakes, estuaries, and coastal marine ecosystems.	Known to occur in the Project Vicinity. An individual was observed April 2018 foraging in a pond adjacent to the Kaweah No. 2 Flowline Access Trail – Canal 5 during technical studies conducted in 2018. However, there is no appropriate breeding habitat within the FERC project boundary.
Aquila chrysaetos golden eagle	Eagle Act, BLMS, BCC	CFP, WL (nesting and wintering)	Forages in grasslands and early successional stages of forest and shrub habitats at elevations up to 11,500 feet. Nests on secluded cliffs with overhanging ledges or large trees in open areas with unobstructed view.	Known to occur in the Project Vicinity. A mortality was recorded by SCE in the Kaweah No. 2 Forebay in 1994. An individual was observed flying over Kaweah No. 1 Flowline during reconnaissance surveys conducted in May 2018.
Dendroica petechia yellow warbler	BCC	SSC (nesting)	Breeds in riparian woodlands from coastal and desert lowlands at elevations up to 8,000 feet in the Sierra Nevada. Also breeds in montane chaparral, open ponderosa pine, and mixed conifer habitats with substantial amounts of brush.	Known to occur in the Project Vicinity. One singing male was observed near the Kaweah No. 1 Flowline just downstream of the Kaweah No. 1 Diversion Dam during reconnaissance surveys conducted in May 2018
Mammals				
Antrozous pallidus pallid bat	BLMS	SSC	Occurs in grasslands, shrublands, woodlands, and forests from sea level to 10,000 feet in elevation. Typically roosts in caves, crevices, or mines. Requires open habitat for foraging.	Known to occur in the Project Vicinity. Observed during bat surveys conducted for relicensing studies in 2018. Refer to Table TERR 2-8 for specific facilities where this species was observed.
Corynorhinus townsendii Townsend's big-eared bat	BLMS	SSC	Found in all but alpine and subalpine habitats; most abundant in mesic habitats up to 6,000 feet in elevation. Requires caves, mines, tunnels, buildings, or other man-made structures for roosting. Extremely sensitive to disturbance and may abandon a roost if disturbed.	Known to occur in the Project Vicinity. Observed during bat surveys conducted for relicensing studies in 2018. Refer to Table TERR 2-8 for specific facilities where this species was observed. The CNDDB query yielded one record for this species 2.5 miles northeast of Sycamore Drive at Generals Highway (HWY 198).
Euderma maculatum spotted bat	BLMS	SSC	Ranges from arid deserts and grasslands through mixed conifer forests up to elevations of 10,600 feet in southern California. Prefers sites with adequate roosting habitat, such as cliffs. Often limited by the availability of cliff habitat. Feeds over water and along marshes.	Known to occur in the Project Vicinity. Observed during bat surveys conducted for relicensing studies in 2018. Refer to Table TERR 2-8 for specific facilities where this species was observed.
Lasiurus blossevillii western red bat	—	SSC	Roosts in forests and woodlands from seal level up through mixed mesic conifer forests in coastal ranges and the Sierra Nevada. Forages in a variety of habitats including croplands, grasslands, shrublands, and open woodlands and forests. Prefers solitary roosts in trees and occasionally shrubs.	Known to occur in the Project Vicinity. Observed during bat surveys conducted for relicensing studies in 2018. Refer to Table TERR 2-8 for specific facilities where this species was observed.
Myotis ciliolabrum western small-footed myotis	BLMS	—	Found in a wide variety of habitats, primarily in relatively arid wooded and brushy uplands near water. Elevation range is from 0 to 8,900 feet.	Known to occur in the Project Vicinity. Observed during bat surveys conducted for relicensing studies in 2018. Refer to Table TERR 2-8 for specific facilities where this species was observed.
Myotis evotis long-eared myotis	BLMS	—	Found predominantly in coniferous forests, typically only at higher elevations in southern areas (between 7,000 and 8,500 feet). They roost in tree cavities and beneath exfoliating bark in both living trees and dead snags.	Known to occur in the Project Vicinity. Observed during bat surveys conducted for relicensing studies in 2018. Refer to Table TERR 2-8 for specific facilities where this species was observed.
Myotis thysanodes fringed myotis	BLMS	—	Optimal habitats are pinyon-juniper, valley foothill hardwood, and hardwood-conifer, generally at 4,000 to 7,000 feet. Roosts in caves, mines, buildings, and crevices. Separate day and night roosts may be used. Uses open habitats, early successional stages, streams, lakes, and ponds as foraging areas. This species is migratory, making relatively short, local movements to suitable hibernacula.	Known to occur in the Project Vicinity. Observed during bat surveys conducted for relicensing studies in 2018. Refer to Table TERR 2-8 for specific facilities where this species was observed.
Myotis yumanensis Yuma myotis	BLMS	—	Occasionally roosting in mines or caves, these bats are most often found in buildings or bridges. Bachelors also sometimes roost in abandoned cliff swallow nests, but tree cavities are probably the original sites for most nursery roosts. These bats typically forage over water in forested areas.	Known to occur in the Project Vicinity. Observed during bat surveys conducted for relicensing studies in 2018. Refer to Table TERR 2-8 for specific facilities where this species was observed.

Scientific/Common Name	Federal Status	State Status	Habitat	Likelihood for Occurrence/Occurrence Notes
Eumops perotis californicus western mastiff bat	BLMS	SSC	Found in variety of habitats including desert scrub, chaparral, oak woodland, ponderosa pine, meadows, and mixed conifer forests up to 4,600 feet in elevation. Distribution is likely limited by availability of significant rock features offering suitable roosting habitat.	Known to occur in the Project Vicinity. The CNDDB query yielded two records for this species adjacent to Project facilities: • A 1994 detection approximately 0.5 mile to the north of the Kaweah No. 3 Powerhouse and Switchyard; • A 1994 detection approximately 0.5 mile to the south of the Kaweah No. 3 Powerhouse and Switchyard.
Bassariscus astutus ringtail	—	CFP	Found in most forest and shrub habitats in close association with rocky and/or riparian areas, usually not more than 0.6 miles from water. Dens in hollow trees, snags, or other cavities.	Known to occur in the Project Vicinity. Sign was observed incidentally during surveys conducted for relicensing studies in October 2018: Scat found at the Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River); Tracks found by the river behind the Kaweah No. 3 Powerhouse and Switchyard.
Pekania pennanti fisher – West Coast DPS	BLMS	ST, SSC	Found in large areas of mature, dense forest red fir, lodgepole pine, ponderosa pine, mixed conifer, and Jeffery pine forests with snags and greater than 50% canopy closure. Historically known from elevations of sea level to 8,000 feet.	Known to occur in the Project Vicinity. The CNDDB query yielded three records for this species in the Project study area: • A 1937 circular (non-specific) record in the mountains between the Kaweah River and East Fork Kaweah River, approximately 3.5 miles east of the Kaweah No. 3 Powerhouse; • A record from 1968 and is a circular (non-specific) record which covers the Kaweah No. 2 facilities including the powerhouse and the diversion; • A 2003 detection at a mesocarnivore photo station, 1 mile south of Oak Grove and the East Fork Kaweah River (approximately 1 mile south of the Kaweah No. 1 diversion). • There are seven other CNDDB records within 5 miles of the Project area.
May Potentially Occur in the Study Area				
Amphibians				
Spea hammondii western spadefoot	BLMS	SSC	Prefers open areas with sandy or gravelly soil in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains (California Herps, 2018b). Requires ephemeral water features for breeding.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing.
Reptiles				
Phrynosoma blainvillii coast horned lizard	BLMS	SSC	Occurs in valley foothill hardwood, conifer and riparian habitats, as well as in pine-cypress, juniper, and annual grassland habitats. The elevational range extends up to 4,000 feet in the Sierra Nevada foothills and up to 6,000 feet in the mountains of southern California.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing.
Anniella pulchra northern California legless lizard	—	SSC	Occurs in moist warm loose soil with plant cover. Moisture is essential. Occurs in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks. Often can be found under surface objects such as rocks, boards, driftwood, leaf litter, and logs. Elevation range is from sea level to 5,900 feet.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing. The CNDDB query yielded one record for this species from 1907 with the general location as Kaweah.
Lampropeltis zonata California mountain kingsnake	BLMS	WL	A habitat generalist, found in diverse habitats including coniferous forest, oak-pine woodlands, riparian woodland, chaparral, manzanita, and coastal sage scrub. Wooded areas near a stream with rock outcrops, talus, or rotting logs that are exposed to the sun are good places to find this snake. Elevation range is from 1,500 to 8,000 feet.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing.
Thamnophis hammondii two-striped garter snake	BLMS	SSC	Associated with permanent or semi-permanent bodies of water in rocky areas, woodland, shrubland, and coniferous forest from sea level to 8,000 feet.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing.

Scientific/Common Name	Federal Status	State Status	Habitat	Likelihood for Occurrence/Occurrence Notes
Birds				
Gymnogyps californianus California condor	FE	SE, CFP	Found mostly below 9,000 feet in open rangelands in the mountain ranges surrounding the southern San Joaquin Valley. Nests in caves, crevices, or sandstone ledges, typically at elevations below 6,500 feet. USFWS has designated critical habitat for this species.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing. The CNDDB query yielded one record outside the Project vicinity, which documents a condor roosting area located at Blue Ridge, approximately 4.5 miles to the southwest of the Kaweah No. 2 Powerhouse. Condors typically roost here between April and September. The closest critical habitat is located along the Kaweah River downstream of the Project area, including a portion of Kaweah Lake.
Accipiter gentilis northern goshawk	BLMS	SSC (nesting)	Forages and nests in middle to high elevation, mature, dense conifer forests. Wintering habitat includes foothills, northern deserts in pinyon-juniper woodland, and low elevation riparian habitats.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing.
Buteo swainsoni Swainson's hawk	BLMS, BCC	ST (nesting)	Uncommon breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen County, and Mojave Desert. Nests in riparian woodlands, juniper-sage flats, and oak woodlands. Forages in grasslands and agricultural areas.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing.
Circus cyaneus northern harrier	—	SSC (nesting)	Occurs in a variety of habitats at elevations up to 10,000 feet. Forages in open areas such as meadows, wetlands, and grasslands. Breeding habitat is up to 5,700 feet in the Sierra Nevada, in areas with shrubby vegetation near foraging habitat.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing.
Elanus leucurus white-tailed kite	BLMS	CFP	Prefers coastal and lowland valleys; often associated with farmlands, meadows with emergent vegetation, and grasslands.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing.
Haliaeetus leucocephalus bald eagle	FD (Former FT, delisted on 7/09/07), Eagle Act, BCC, BLMS	SE, CFP	Year-round resident in ice-free regions of California. Foraging areas include regulated and unregulated rivers, reservoirs, lakes, estuaries, and coastal marine ecosystems. The majority of bald eagles in California breed near reservoirs and nests are usually located within 1 mile of foraging habitat.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing. This species could potentially forage along the Kaweah River. There is no appropriate breeding habitat within the FERC project boundary.
Falco peregrinus anatum American peregrine falcon	FD (Former FE , delisted on 8/25/99) (nesting), BCC	SD (Former SE, delisted on 8/6/09) , CFP	Very uncommon breeding resident and uncommon as a migrant. Breeds in woodlands, forests, coastal habitats, and riparian areas near wetlands, lakes, rivers, or other water on high cliffs, banks, dunes, or mounds. Active nesting sites are known along the coast, in the Sierra Nevada, and in the mountains of northern California. Migrants occur along the coast and the western Sierra Nevada in spring and fall.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing.
Laterallus jamaicensis coturniculus California black rail	BLMS, BCC	ST, CFP	Year-round resident of the western slope foothills of the Sierra Nevada range in California. Nests in high portions of salt marshes, shallow freshwater marshes, wet meadows, and flooded grassy vegetation.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing.
Asio flammeus short-eared owl	—	SSC (nesting)	Open areas with few trees, such as annual and perennial grasslands, prairies, dunes, meadows, irrigated lands, saline and fresh emergent wetlands. Needs elevated sites for perching and dense vegetation for roosting.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing.
Athene cunicularia burrowing owl	BLMS, BCC	SSC	Suitable habitat throughout their breeding range typically includes open, treeless areas within grassland, steppe, and desert biomes. They generally inhabit gently-sloping areas, characterized by low, sparse vegetation.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing.
Strix occidentalis occidentalis California spotted owl	BLMS, BCC	SSC	Nests and forages in dense, old growth, multi-layered mixed conifer, redwood, Douglas fir, and oak woodland habitats, from sea level to elevations of approximately 7,600 feet.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing.
Cypseloides niger black swift	BCC	SSC (nesting)	Nests in moist crevices or caves, or on cliffs near waterfalls in deep canyons at elevations ranging from 6,000 to 11,000 feet. Forages widely over many habitats; seems to avoid arid regions. Known from the high elevations of the Sierra National Forest.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing. The CNDDB query yielded one historic (1935) record for this species outside the Project vicinity along the Marble Fork, approximately 3 miles upstream of the Kaweah No. 3 Powerhouse.
Melanerpes lewis Lewis' woodpecker	BCC	—	Breeds east of the Sierra Nevada crest in cavities excavated in sycamore, cottonwood, oak, or conifer trees. Winter resident in open oak savannas, broken deciduous, and coniferous habitats with a sufficient supply of acorns and insects.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing.

Scientific/Common Name	Federal Status	State Status	Habitat	Likelihood for Occurrence/Occurrence Notes
Empidonax traillii willow flycatcher	BCC	SE	Summer resident in wet meadow and montane riparian habitats at 2,000 to 8,000 feet in the Sierra Nevada. Most often occurs in broad, open river valleys or large mountain meadows with lush growth of shrubby willows.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing. The Kaweah Project is located outside the breeding range for this species. However, individuals may be present during the non-breeding season.
Empidonax traillii extimus southwestern willow flycatcher	FE	SE (nesting)	Wet meadow and montane riparian habitats at elevations ranging from 2,000 to 8,500 feet in elevation. Most often occurs in broad, open river valleys or large mountain meadows with lush growth of shrubby willows. USFWS has designated critical habitat for this species.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing. The Kaweah Project is located outside the breeding range for this species. However, individuals may be present during the non-breeding season. The closest designated critical habitat is in Kern County.
Mammals				
Taxidea taxus American badger	—	SSC	Occurs throughout most of the state in areas with dry, friable soils. It is most abundant in drier open stages of most shrub, forest, and herbaceous habitats up to 12,000 feet in elevation.	May potentially occur in appropriate habitat; however, this species was not observed during surveys conducted in support of relicensing.
Unlikely to Occur in the Project Vicinity				
Invertebrates				
Coelus gracilis San Joaquin dune beetle	BLMS	—	This beetle inhabits inland sand dunes along the western edge of the San Joaquin Valley.	Unlikely to occur. Project is outside the geographic range of this species.
Desmocerus californicus dimorphus valley elderberry longhorn beetle	FT	—	Central valley riparian forests and adjacent upland vegetation along river corridors, in close association with elderberry (*Sambucus* ssp.) plants.	Unlikely to occur. Two CNDDB records exist within the Study Area. However, project is outside the geographic range of this species. In 2014, the USFWS revised their description of the life history, population distribution, range, and occupancy. As part of the revised range, several counties were removed from the species' range. The Kaweah Hydroelectric Project is located within Tulare County, which is no longer within the species' range.
Amphibians				
Ambystoma californiense California tiger salamander	FT	ST, WL	Found in grassland, oak savanna, edges of mixed woodland, and lower elevation coniferous forest. The USFWS has designated critical habitat for this species. Critical habitat consists of vernal pools, permanent or ephemeral standing water bodies, as well as upland habitat with small mammal burrows adjacent to the water bodies.	Unlikely to occur. Project is outside the geographic range of this species. The closest critical habitat in Tulare County is northeast of Visalia in the Central Valley. The Project area does not meet the Primary Constituent Elements (PCEs) of critical habitat.
Batrachoseps stebbinsi Tehachapi slender salamander	BLMS	ST	Inhabits north-facing moist canyons and ravines in oak and mixed woodlands in arid to semi-arid locations. Found under rocks, logs, bark, and other debris in moist areas, especially in areas with a lot of leaf-litter, often near talus slopes. Only recorded from the Tehachapi mountains in Kern County.	Unlikely to occur. Project is outside the geographic range of this species.
Ensatina eschscholtzii croceator yellow-blotched salamander	BLMS	WL	Found in evergreen and deciduous forests, under rocks, logs, and other surface debris, especially bark that has peeled off and fallen beside decaying logs. Shaded north-facing areas seem to be favored, especially near creeks or streams. Subspecies and intergrades only recorded from Kern County.	Unlikely to occur. Project is outside the geographic range of this species.
Rana muscosa southern mountain yellow-legged frog	FE	SE, WL	Found in Sierra Nevada streams, lakes and ponds in montane riparian, lodgepole pine, subalpine conifer, and wet meadow habitats at elevations from 4,500 feet to 12,000 feet. Range extends from Fresno County to Kern County.	Unlikely to occur. Project is outside the elevation range of this species.

Scientific/Common Name	Federal Status	State Status	Habitat	Likelihood for Occurrence/Occurrence Notes
Reptiles				
Gambelia (=Crotaphytus) sila blunt-nosed leopard lizard	FE	SE, CFP	Found in sparsely vegetated alkali scrub and desert habitats below 2,400 feet in the San Joaquin Valley and adjacent foothills. USFWS has not designated critical habitat for this species.	Unlikely to occur. Project is outside the geographic range of this species.
Thamnophis gigas giant garter snake	FT	ST	Uses a wide variety of habitats including forests, mixed woodlands, grasslands, chaparral, and agricultural lands in the Central and San Joaquin Valleys. The species often occurs near aquatic habitat including ponds, marshes, and streams where it freely enters and retreats to when alarmed.	Unlikely to occur. Project is outside the geographic range of this species.
Birds				
Pelecanus occidentalis californicus California brown pelican	FD, BLMS	SD, CFP	Brown Pelicans live year-round in estuaries and coastal marine habitats along both the east and west coasts. On the west coast they breed on dry, rocky offshore islands. When not feeding or nesting, they rest on sandbars, pilings, jetties, breakwaters, mangrove islets, and offshore rocks.	Unlikely to occur. Project is outside the geographic range of this species.
Charadrius montanus mountain plover	BLMS	SSC	Breeds on open plains at moderate elevations in the Intermountain West. Winters in short-grass plains and fields, plowed fields, and sandy deserts in the western United States.	Unlikely to occur. Project is outside the geographic range of this species.
Coccyzus americanus occidentalis western yellow-billed cuckoo	FT, BLMS	SE	Breeds and forages in riparian areas with low woody vegetation in lowland California, especially willow-cottonwood habitat. Critical habitat has been proposed for this species.	Unlikely to occur. Project is outside the geographic range of this species. The closest population is located Southwest of the Project area near the town of Lindsay.
Otus flammeolus flammulated owl	BCC	—	Summer resident in coniferous habitats from ponderosa pine to red fir forests from 6,000 to 10,000 feet in elevation; prefers low to intermediate canopy closure. Breeds in the North Coast and Klamath Ranges, Sierra Nevada, and in suitable habitats in mountains of southern California.	Unlikely to occur. Project is outside the elevation range of this species.
Strix nebulosa great gray owl	—	SE (nesting)	Nests in old-growth coniferous forests and forages in montane meadows. Distribution includes high elevations of the Sierra Nevada and Cascade ranges, from 4,500 to 7,500 feet in elevation.	Unlikely to occur. Project is outside the elevation range of this species.
Stellula calliope calliope hummingbird	BCC	—	Prefers coniferous forests and mountain meadow habitats for breeding. In the Sierra Nevada, it typically nests above 4,000 feet in elevation. Nests almost always in a lodgepole pine or aspen, immediately beneath live branches, and typically in riparian areas. Migrates and spends winter in central and southern Mexico.	Unlikely to occur. Project is outside the elevation range of this species.
Sphyrapicus thyroideus Williamson's sapsucker	BCC	—	Uncommon to fairly common summer resident in coniferous forests from approximately 5,500 to 9,500 feet in elevation throughout California. Preferred nesting habitat is lodgepole pine forests.	Unlikely to occur. Project is outside the elevation range of this species.
Contopus borealis olive-sided flycatcher	BCC	SSC (nesting)	Uncommon to common summer resident in a wide variety of forest and woodland habitats. Nesting habitats include mixed conifer, montane hardwood-conifer, Douglas-fir, redwood, red fir, and lodgepole pine forests from 3,000 to 7,000 feet in elevation.	Unlikely to occur. Project is outside the elevation range of this species.
Vireo bellii pusillus least Bell's vireo	FE	SE	Breeds in riparian habitats (typically in dense willows) in the southwestern U.S. Winters in Baja California. Its distribution includes cismontane southern California (most breeding pairs occur in San Diego county) extending north up to the Owens Valley and east into Death Valley National Park. USFWS has designated critical habitat for this species.	Unlikely to occur. Project is outside the geographic range of the species, and outside of designated critical habitat for this species.
Vireo vicinior gray vireo	BLMS, BCC	SSC	Found in hot, arid mountains and high plains scrubland habitats, including desert scrub, mixed juniper or pinyon pine and oak scrub associations, and chaparral. Found in desert habitats on the eastern slope of the Sierra Nevada and eastern slopes of San Bernardino mountains.	Unlikely to occur. Project is outside of the geographic range for this species.
Riparia riparia bank swallow	BLMS	ST	Nests in riparian, lacustrine, and coastal areas with vertical banks, bluffs and cliffs with sandy soils; found in open country near water during migration.	Unlikely to occur. Project is outside of the geographic range for this species.
Toxostoma lecontei macmillanorum San Joaquin Le Conte's thrasher	BLMS	SSC	Le Conte's thrashers are generally found in open desert scrub, alkali desert scrub, and desert succulent scrub. In the San Joaquin Valley, the species is found primarily in habitats dominated by saltbush, and often frequents desert washes and flats with scattered saltbush. Elevation range is between sea level and 3,800 feet.	Unlikely to occur. Project is outside the geographic range of the species.

Scientific/Common Name	Federal Status	State Status	Habitat	Likelihood for Occurrence/Occurrence Notes
Agelaius tricolor tricolored blackbird	BLMS, BCC	SCE, SSC (Nesting colony)	Nests near fresh water, emergent wetland with cattails or tules, and Himalayan blackberry; forages in grasslands, woodland, and agriculture in the Central Valley and coastal ranges.	Unlikely to occur. Suitable habitat for this species is not abundant within the Project area and the Project is higher in elevation than preferred valley habitats.
Carpodacus cassinii Cassin's finch	BCC	—	A common montane resident from 4,200 to 8,000 feet in elevation. Prefers tall, open coniferous forests, in lodgepole pine, red fir, and subalpine conifer habitats, especially for breeding. Most numerous near wet meadows and grassy openings; also frequents semi-arid forests.	Unlikely to occur. Project is outside the elevation range of this species.
Mammals				
Macrotus californicus California leaf-nosed bat	BLMS	SSC	Occupied habitats include desert riparian, desert wash, desert scrub, desert succulent shrub, and alkali desert scrub. Their preferred roosting habitats are caves, mines, and rock shelters near palm oases. In California they are generally recorded below 2,000 feet.	Unlikely to occur. Project is outside the geographic range of the species, and the Project area does not contain appropriate habitat.
Aplodontia rufa Sierra Nevada mountain beaver	—	SSC	Dense riparian and open brushy stages of most forest types at elevations ranging from 3,900 to 10,100 feet in elevation. Deep, friable soils are required for burrowing along cool, moist microclimates. Burrows are typically located in or near deep soils near streams and springs. Found in Sierra montane riparian habitats.	Unlikely to occur. Project is outside the elevation range of this species.
Ammospermophilus nelson Nelson's antelope squirrel	BLMS	ST	Habitat consists of dry, flat, or rolling terrain with grassy, sparsely shrubby ground; requires soils with sandy or gravelly texture, or fine-grained soils that are nearly brick-hard when dry. They also occur in areas lacking shrubs where giant kangaroo rats are present. The range of this species is restricted to the central and western San Joaquin Valley and neighboring areas to the west in the inner Coast Ranges of California. Elevation range is between 165 to 3,610 feet.	Unlikely to occur, Project is outside of the geographic range for this species.
Dipodomys ingens giant kangaroo rat	FE	SE	Large (6-inch) kangaroo rat that lives in dry, sandy grasslands. It currently is found only in isolated areas west of the San Joaquin Valley, including the Carrizo Plain, Elkhorn Plain, and Kettleman Hills. No critical habitat rules have been published for this species.	Unlikely to occur. Project is outside the known geographic range of the species.
Dipodomys nitratoides brevinasus short-nosed kangaroo rat	BLMS	SSC	Short-nosed kangaroo rats generally occupy grassland with scattered shrubs and desert-shrub associations on friable soils. Historically this species occurred on the western, southern, and extreme southeastern side of the San Joaquin Valley. Museum records for this species range from 148-2,411 feet. The current range is approximately 1.5-3.7% of the historic range. Restricted and disjunct populations are known to occur or potentially occur in the following areas (listed from north to south): Panoche and San Joaquin valleys, Kettleman Hills, Antelope and Carrizo plains, and Cuyama Valley.	Unlikely to occur. Project is outside of the geographic range for this species.
Dipodomys nitraroides exilis Fresno kangaroo rat	FE	SE	The range of this species encompasses arid grasslands (with friable, sandy soils) in the San Joaquin and adjacent valleys, from the valley floor in Merced County, south of the Merced and San Joaquin rivers, to the southern edge of the valley, and the Panoche Valley (eastern San Benito County), the Carrizo Plain (San Luis Obispo County), and the upper Cuyama Valley (San Luis Obispo and Santa Barbara counties), at elevations of 100 to 2,700 feet. USFWS has designated critical habitat for this species.	Unlikely to occur. The Project area is outside the geographic range of the species. The closest critical habitat designated for this species is in western Fresno County.
Dodomys nitriatoides nitratoides Tipton kangaroo rat	FE	SE	Tipton kangaroo rats are limited to arid-land communities occupying the Valley floor of the Tulare Basin in level or nearly level terrain. They are currently found in scattered, isolated areas clustered in low-elevation valleys of Tulare and Kern County. USFWS has not designated critical habitat for this species.	Unlikely to occur. The Project area is (just) outside the geographic range of the species.
Microtus californicus vallicola Owens Valley vole	BLMS	SSC	Occurs in mesic habitats including riparian corridors and montane riparian, meadows, dense annual grassland, and agricultural lands. This species is limited to the Owen's Valley of California.	Unlikely to occur. Project is outside the geographic range for this species.

Scientific/Common Name	Federal Status	State Status	Habitat	Likelihood for Occurrence/Occurrence Notes
Onychomys torridus tularensis Tulare grasshopper mouse	BLMS	SSC	Habitats include compact soils with a sparse growth of perennial grasses; blue oak savannas; desert scrub associations composed of grasses and shrubs; valley sink and saltbush scrub communities on the valley floor; and valley grassland. The historic range of the Tulare grasshopper mouse extended along the foothills and floor of the southern San Joaquin Valley from western Merced and eastern San Benito counties, east to Madera County, and south to the foothills of the Tehachapi and San Emigdio mountains. It also occurs on the Carrizo Plain in eastern San Luis Obispo County, Cuyama Valley, Caliente Creek Wash in southern Kern County, Weldon and Kelso Valley in northeastern Kern County, the Tulare Basin, and the Panoche Valley. Elevation range is between 279 to 2,650 feet.	Unlikely to occur. Project is outside of the geographic range for this species.
Perognathus inornatus San Joaquin pocket mouse	BLMS	—	Occurs in dry, open grasslands with fine-textured soils in the Central and Salinas Valleys from elevation 1,000 to 2,000 feet.	Unlikely to occur. Project is outside of the geographic range for this species.
Perognathus xanthonotus yellow-eared pocket mouse	BLMS	—	The species is found in Joshua tree woodland, desert scrub, pinyon-juniper, mixed and montane chaparral, sagebrush and bunchgrass habitats. Occurs primarily in sandy soils with sparse to moderate shrub cover. Elevations of known localities range between 3,380 and 5,300 feet.	Unlikely to occur. Project is outside the elevation range of this species.
Vulpes macrotis mutica San Joaquin kit fox	FE	ST	Grasslands and shrubland areas in the San Joaquin Valley with friable soils for building underground dens. Denning begins around September, mating occurs from December to March, and pups are born February through April. No critical habitat rules have been published for this species.	Unlikely to occur. Project is outside the geographic range of this species.
Vulpes vulpes necator Sierra Nevada red fox	FC	ST	Occurs throughout the Sierra Nevada in forests interspersed with meadows or alpine forests at elevations above 7,000 feet. Open areas are used for hunting, forested habitats for cover and reproduction.	Unlikely to occur. Project is outside the elevation range of this species.
Gulo gulo luscus California wolverine	FPT	ST, CFP	Mixed conifer, red fir, and lodgepole habitats, and probably sub-alpine conifer, alpine dwarf shrub, wet meadow, and montane riparian habitats. Occurs in Sierra Nevada at elevations ranging from 4,300 to 10,800 feet. Majority of recorded sightings are found above 8,000 feet in elevation.	Unlikely to occur. Project is outside the elevation range of this species.
Ovis canadensis sierrae Sierra Nevada bighorn sheep	FE	SE, CFP	Lives on steep, rugged slopes in the high Sierra Nevada and Great Basin in shrub, grassland, montane chaparral, subalpine conifer, or riparian habitats. The USFWS has designated critical habitat for this species.	Unlikely to occur. Project is outside the geographic range of this species, and outside the designated critical habitat for this species.

LEGEND:

Federal Status
BCC = Birds of Conservation Concern
BLMS = Bureau of Land Management Sensitive (Bakersfield Office)
FC = Federal Candidate
FD = Delisted Species
FE = Federal Endangered
FPD = Federal Proposed for Delisting
FT = Federal Threatened

State Status
CFP = California Fully Protected
SSC = California Species of Special Concern
SCT = State Candidate Threatened
SCE = State Candidate Endangered
SD = State Delisted
SE = California Endangered
SR = California Rare
ST = California Threatened
WL = Watch List

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Table TERR 2-7. Consistency of Project Transmission Lines, Transmission Tap Lines, and Power Lines with APLIC Guidelines

Project Transmission Lines, Transmission Tap Lines, and Power Lines	Map #	Start Point of Line	End Point of Line	Approximate Length (Miles)	Voltage	Configuration Notes	Consistency with APLIC Guidelines
Transmission Line							
Kaweah No. 3 Powerhouse to Three Rivers Substation Transmission Line	Maps TERR 2-4b, c, d, f, g, h, and i	Three Rivers Substation	Kaweah No. 3 Powerhouse	4.00	66kV	Includes poles with transmission line configuration types TL-1 through TL-40.	Inconsistent. • 29 transmission line pole configuration types are inconsistent with APLIC guidelines. • 11 transmission line pole configuration types are consistent with APLIC guidelines. • Refer to Appendix B for photos and consistency evaluation for each configuration type. Refer to Maps TERR 2-4b,c,d,e,f,g, and h for the geographic location of each transmission line pole configuration type.
Transmission Tap Lines							
Kaweah No. 1 Powerhouse Transmission Tap Line	Map TERR 2-4d	Primary Transmission Line Interconnection at the Kaweah No. 1 Switchyard	Kaweah No. 1 Switchyard	0.03	66kV	Contains no poles.	Consistent.
Kaweah No. 2 Powerhouse Transmission Tap Line	Maps TERR 2-4a and c	Primary Transmission Line Interconnection near the Intersection of Hwy 198 and Skyline Drive	Kaweah No. 2 Switchyard	0.4	66kV	Includes poles with transmission line configuration types TL-24, TL-26, TL-27, TL-28, TL-30, TL-36, and TL-41 through TL-44.	Inconsistent. • Eight configuration types are inconsistent with APLIC guidelines. • Two transmission line pole configuration types are consistent with APLIC guidelines. • Refer to Appendix B for photos and a consistency evaluation for each configuration type. Refer to Maps TERR 2-4a and c for the geographic location of each transmission line pole configuration type.
Power Lines							
Kaweah No. 1 Diversion Intake House Solar Panel to K1 Diversion Dam Power Line (solar)	*	Kaweah No. 1 Diversion Intake House Solar Panel	Kaweah No. 1 Diversion Dam	0.10	120 V	Contains three poles.	Consistent. APLIC guidelines indicate that lines with voltages less than 600 V are not an avian electrocution risk.
Kaweah No. 1 Switchyard to K1 Maintenance Building Power Line	Map TERR 2-4d	Kaweah No. 1 Switchyard	Kaweah No. 1 Maintenance Building	0.05	2.4 kV	Contains no poles.	Consistent.
Kaweah No. 1 Switchyard to K1 Office Building Power Line	Map TERR 2-4d	Kaweah No. 1 Switchyard	Kaweah No. 1 Office Building	0.01	2.4 kV	Contains no poles.	Consistent.
Kaweah No. 1 Switchyard to Kaweah No. 1 Operator's Office Power Line	Map TERR 2-4d	Kaweah No. 1 Switchyard	Kaweah No. 1 Operator's Office	0.01	2.4 kV	Contains no poles.	Consistent.
Kaweah No. 1 Switchyard to K1 Workshop Power Line	Map TERR 2-4d	Kaweah No. 1 Switchyard	Kaweah No. 1 Workshop	0.03	2.4 kV	Contains no poles.	Consistent.
Kaweah No. 1 Office Building to K1 Forebay Tank Power Line	Maps TERR 2-4d and e	Kaweah No. 1 Office Building	Kaweah No. 1 Forebay Tank	0.57	2.4 kV	Includes poles with power line configuration types PL-1 and PL-2.	Inconsistent. • Both power line pole configuration types are inconsistent with APLIC guidelines. • Refer to Appendix B for photos and consistency evaluation for each configuration type. Refer to Map TERR 2-4d for the geographic location of each power line pole configuration type.

Project Transmission Lines, Transmission Tap Lines, and Power Lines	Map #	Start Point of Line	End Point of Line	Approximate Length (Miles)	Voltage	Configuration Notes	Consistency with APLIC Guidelines
Kaweah No. 1 Powerhouse Campus Alternate Power Line	Map TERR 2-4d	Non-Project Distribution Line (near Hwy 198)	Kaweah No. 1 Switchyard	0.38	12 kV	Includes poles with power line configuration types PL-3 through PL-6.	Inconsistent. • One power line pole configuration type is inconsistent with APLIC guidelines. • Three power line pole configuration types are consistent with APLIC guidelines. • Refer to Appendix B for photos and consistency evaluation for each configuration type. Refer to Map TERR 2-4d for the geographic location of each configuration type.
Kaweah No. 2 Diversion/Flowline Gage and Kaweah No. 3 Powerhouse Alternate Power Line	Map TERR 2-4i	Non-Project Distribution Line (near Hwy 198)	SCE Project Pole	0.12	12 kV	Contains no poles.	Consistent.
Kaweah No. 2 Powerhouse Alternate Power Line	Map TERR 2-4a	Non-Project Distribution Line	Kaweah No. 2 Switchyard	0.04	12 kV	Includes a pole with power line configuration type PL-1.	Inconsistent. • This power line pole configuration type is inconsistent with APLIC guidelines. • Refer to Appendix B for photos and consistency evaluation for this configuration type. Refer to Map TERR 2-4a for the geographic location of this power line pole configuration type.
Kaweah No. 2 Powerhouse to Kaweah No. 2 Forebay Power Line	Map TERR 2-4a	Kaweah No. 2 Powerhouse	Kaweah No. 2 Forebay	0.22	2.4 kV	Includes poles with power line configuration types PL-7 through PL-12.	Inconsistent. • Three power line pole configuration types are inconsistent with APLIC guidelines. • Three power line pole configuration types are consistent with APLIC guidelines. • Refer to Appendix B for photos and consistency evaluation for each configuration type. Refer to Map TERR 2-4a for the geographic location of each power line pole configuration type.
Kaweah No. 3 Powerhouse to Kaweah No. 2 Diversion Power Line	Map TERR 2-4i	Kaweah No. 3 Powerhouse	Kaweah No. 2 Diversion Dam	0.12	2.4 kV	Includes a pole with power line configuration type PL-13.	Inconsistent. • This power line pole configuration type is inconsistent with APLIC guidelines. • Refer to Appendix B for photos and consistency evaluation for each configuration type. Refer to Map TERR 2-4h for the geographic location of this power line pole configuration type.
Kaweah No. 3 Powerhouse to Kaweah No. 2 Flowline Gage Power Line	Map TERR 2-4i	Kaweah No. 3 Powerhouse	Kaweah No. 2 Flowline Gage	0.10	2.4 kV	Contains no poles.	Consistent.
Kaweah No. 3 Powerhouse to Kaweah No. 3 Forebay Power Line	Maps TERR 2-4i and j	Kaweah No. 3 Powerhouse	Kaweah No. 3 Forebay	0.46	2.4 kV	Includes poles with power line configuration types PL-14 and PL-15.	Inconsistent. • Both power line pole configuration types are inconsistent with APLIC guidelines. • Refer to Appendix B for photos and consistency evaluation for each configuration type. Refer to Map TERR 2-4h for the geographic location of these power line pole configuration types.

*This power line is not considered an avian electrocution risk because it is low voltage and it is therefore not included on the map series.

Table TERR 2-8. Special-Status and Common Bat Species Detected in the Study Area

Common Name	Scientific Name	Status	Facility Where Bat was Detected[1]	Survey Method/Detection Type						
				Roost Type			Reproductive Acoustic Detection(s)	Reproductive Mist Net Capture or Spotlight Detections	Seasonal Acoustic Detections(s)	Seasonal Mist Net Capture or Spotlight Detections
				Maternal	Day	Night				
Special-Status Bat Species										
pallid bat	*Antrozous pallidus*	BLMS, SSC	Kaweah No. 1 Flowline				X		X	
			Kaweah No. 1 Powerhouse and Switchyard				X		X	
			Kaweah No. 1 Powerhouse Campus				X		X	
			East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a)				X		X	
			Kaweah No. 2 Powerhouse and Switchyard				X	X	X	X
			Kaweah No. 3 Powerhouse and Switchyard				X	X	X	
			Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)				X	X	X	
			Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)				X		X	
			East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)				X		X	
Townsend's big-eared bat	*Corynorhinus townsendii*	BLMS, SSC	Kaweah No. 1 Flowline				X		X	
			Kaweah No. 1 Powerhouse and Switchyard				X		X	
			Kaweah No. 1 Powerhouse Campus				X		X	
			East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a)				X		X	
			Kaweah No. 2 Powerhouse and Switchyard				X		X	
			Kaweah No. 3 Powerhouse and Switchyard				X		X	
			Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)				X		X	
			Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)						X	
			East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)						X	
spotted bat	*Euderma maculatum*	BLMS, SSC	Kaweah No. 1 Flowline						X	
			Kaweah No. 1 Powerhouse and Switchyard						X	
			Kaweah No. 1 Powerhouse Campus						X	
			East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a)						X	
			Kaweah No. 2 Powerhouse and Switchyard						X	
			Kaweah No. 3 Powerhouse and Switchyard				X		X	
			Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)				X		X	

Common Name	Scientific Name	Status	Facility Where Bat was Detected[1]	Survey Method/Detection Type						
				Roost Type			Reproductive Acoustic Detection(s)	Reproductive Mist Net Capture or Spotlight Detections	Seasonal Acoustic Detections(s)	Seasonal Mist Net Capture or Spotlight Detections
				Maternal	Day	Night				
western red bat	*Lasiurus blossevillii*	SSC	Kaweah No. 1 Flowline				X			
			Kaweah No. 3 Powerhouse and Switchyard				X			
			Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)				X			
western small-footed myotis	*Myotis ciliolabrum*	BLMS	Kaweah No. 3 Powerhouse and Switchyard					X		
			Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)					X		
long-eared myotis	*Myotis evotis*	BLMS	Kaweah No. 1 Flowline				X			
			Kaweah No. 3 Powerhouse and Switchyard				X			
			Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)				X			
			Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)				X		X	
			East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)				X		X	
fringed myotis	*Myotis thysanodes*	BLMS	Kaweah No. 3 Powerhouse and Switchyard				X			
			Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)				X			
			Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)						X	
			East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)						X	
Yuma Myotis	*Myotis yumanensis*	BLMS	Kaweah No. 1 Flowline				X		X	
			Kaweah No. 1 Powerhouse and Switchyard				X	X	X	
			Kaweah No. 1 Powerhouse Campus				X	X	X	
			East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a)				X	X	X	
			Kaweah No. 2 Powerhouse and Switchyard		X		X		X	
			Kaweah No. 3 Powerhouse and Switchyard			X	X	X	X	X
			Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)				X	X	X	X
			Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)				X		X	
			East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)				X		X	

Common Name	Scientific Name	Status	Facility Where Bat was Detected[1]	Survey Method/Detection Type						
				Roost Type			Reproductive Acoustic Detection(s)	Reproductive Mist Net Capture or Spotlight Detections	Seasonal Acoustic Detections(s)	Seasonal Mist Net Capture or Spotlight Detections
				Maternal	Day	Night				
western mastiff bat	*Eumops perotis*	BLMS, SSC	Kaweah No. 1 Flowline				X		X	
			Kaweah No. 1 Powerhouse and Switchyard				X		X	X
			Kaweah No. 1 Powerhouse Campus				X		X	X
			East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a)				X		X	X
			Kaweah No. 2 Powerhouse and Switchyard				X		X	
			Kaweah No. 3 Powerhouse and Switchyard				X	X	X	X
			Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)				X	X	X	X
			Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)						X	
			East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)						X	
Common Bat Species										
big brown bat	*Eptesicus fuscus*	—	Kaweah No. 1 Flowline				X		X	
			Kaweah No. 1 Powerhouse and Switchyard				X		X	
			Kaweah No. 1 Powerhouse Campus				X		X	
			East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a)				X		X	
			Kaweah No. 2 Powerhouse and Switchyard				X		X	
			Kaweah No. 3 Powerhouse and Switchyard				X			
			Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)				X			
			Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)				X		X	
			East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)				X		X	
hoary bat	*Lasiurus cinereus*	—	Kaweah No. 1 Flowline						X	
			Kaweah No. 1 Powerhouse and Switchyard				X		X	
			Kaweah No. 1 Powerhouse Campus				X		X	
			East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a)				X		X	
			Kaweah No. 2 Powerhouse and Switchyard						X	
			Kaweah No. 3 Powerhouse and Switchyard				X		X	
			Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)				X		X	
			Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)						X	
			East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)						X	

Common Name	Scientific Name	Status	Facility Where Bat was Detected[1]	Survey Method/Detection Type						
				Roost Type			Reproductive Acoustic Detection(s)	Reproductive Mist Net Capture or Spotlight Detections	Seasonal Acoustic Detections(s)	Seasonal Mist Net Capture or Spotlight Detections
				Maternal	Day	Night				
California myotis	*Myotis californicus*	—	Kaweah No. 1 Flowline				X		X	
			Kaweah No. 1 Powerhouse and Switchyard				X		X	
			Kaweah No. 1 Powerhouse Campus				X		X	
			East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a)				X		X	
			Kaweah No. 2 Powerhouse and Switchyard				X	X	X	
			Kaweah No. 3 Powerhouse and Switchyard				X	X	X	X
			Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)				X	X	X	X
			Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)				X		X	
			East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)				X		X	
little brown bat	*Myotis lucifugus*	—	Kaweah No. 1 Flowline				X		X	
			Kaweah No. 1 Powerhouse and Switchyard				X		X	
			Kaweah No. 1 Powerhouse Campus				X		X	
			East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a)				X		X	
			Kaweah No. 2 Powerhouse and Switchyard				X		X	
			Kaweah No. 3 Powerhouse and Switchyard						X	
			Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)						X	
			Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)						X	
			East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)						X	
western pipistrelle	*Pipistrellus hesperus*	—	Kaweah No. 1 Flowline				X		X	
			Kaweah No. 1 Powerhouse and Switchyard				X	X	X	
			Kaweah No. 1 Powerhouse Campus				X	X	X	
			East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a)				X	X	X	
			Kaweah No. 2 Powerhouse and Switchyard				X	X	X	
			Kaweah No. 3 Powerhouse and Switchyard				X	X	X	X
			Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)				X	X	X	X
			Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)				X		X	
			East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)				X		X	

Common Name	Scientific Name	Status	Facility Where Bat was Detected[1]	Survey Method/Detection Type						
				Roost Type			Reproductive Acoustic Detection(s)	Reproductive Mist Net Capture or Spotlight Detections	Seasonal Acoustic Detections(s)	Seasonal Mist Net Capture or Spotlight Detections
				Maternal	Day	Night				
Brazilian free-tailed bat	*Tadarida brasiliensis*	—	Kaweah No. 1 Flowline				X		X	
			Kaweah No. 1 Powerhouse and Switchyard				X	X	X	X
			Kaweah No. 1 Powerhouse Campus				X	X	X	X
			East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a)				X	X	X	X
			Kaweah No. 2 Powerhouse and Switchyard		X		X	X	X	
			Kaweah No. 3 Powerhouse and Switchyard				X	X	X	
			Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)				X	X	X	
			Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)				X		X	
			East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)				X		X	
Bat Groups										
California myotis/western small-footed myotis[2]	*Myotis californicus/ Myotis ciliolabrum*	—/ BLMS	Kaweah No. 1 Powerhouse Campus		X					
			Kaweah No. 2 Powerhouse and Switchyard		X					
Myotis spp.[3]	*Myotis spp.*	—	Kaweah No. 1 Flowline		X					
25 kHz bat group[4] (big brown bat/silver-haired bat/ Brazilian free-tailed bat)	*Eptesicus fuscus/ Lasionycteris noctivagans/ Tadarida brasiliensis*	—/—/—	Kaweah No. 1 Flowline				X		X	
			Kaweah No. 1 Powerhouse and Switchyard				X		X	
			Kaweah No. 1 Powerhouse Campus				X		X	
			East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a)				X		X	
			Kaweah No. 2 Powerhouse and Switchyard				X		X	
			Kaweah No. 3 Powerhouse and Switchyard				X		X	
			Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)				X		X	
			Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)				X		X	
			East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)				X		X	

Common Name	Scientific Name	Status	Facility Where Bat was Detected[1]	Survey Method/Detection Type						
				Roost Type			Reproductive Acoustic Detection(s)	Reproductive Mist Net Capture or Spotlight Detections	Seasonal Acoustic Detections(s)	Seasonal Mist Net Capture or Spotlight Detections
				Maternal	Day	Night				
40 kHz bat group[4] (western small-footed myotis/ little brown bat/ long-legged myotis)	*Myotis ciliolabrum/ Myotis lucifugus/ Myotis volans*	BLMS/—/—	Kaweah No. 1 Flowline				X		X	
			Kaweah No. 1 Powerhouse and Switchyard				X		X	
			Kaweah No. 1 Powerhouse Campus				X		X	
			East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a)				X		X	
			Kaweah No. 2 Powerhouse and Switchyard				X		X	
			Kaweah No. 3 Powerhouse and Switchyard				X		X	
			Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)				X		X	
			Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)				X		X	
			East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)				X		X	

[1] Some facilities are geographically co-located and therefore acoustic and mist net surveys covered both facility types. The following facilities are geographically co-located:
Kaweah No. 1 Powerhouse and Switchyard, Kaweah No. 1 Powerhouse Campus, and East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a);
Kaweah No. 3 Powerhouse and Switchyard and Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a);
Kaweah No. 1 Diversion Dam and Pool and East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201).

[2] Currently, there are no unique genetic markers that can distinguish California myotis/western small-footed myotis species from guano samples. Therefore, these roosts could consist of either or both species.

[3] *Myotis* bat species cannot be confirmed to the species level unless they are captured in hand. A bat was visually observed at this roost, but not captured, and was therefore conservatively identified to the genus *Myotis.* Refer to Table TERR 2-9 for more information on this observation.

[4] Some bat species lack uniquely identifiable acoustic characteristics. Sonograms that could not be confirmed to the species level, but could be narrowed down to a subset of species, are placed into bat groups containing two or more species. These groups are named for the frequency range of calls for these species. Placing unidentifiable sonograms into bat groups is a standard practice in reporting bat acoustic observations.

Table TERR 2-9. Special-Status and Common Bat Roosts Identified in the Study Area

Project Facility	Facility Suitability Evaluation		Roost Surveys				
	Suitability	If Not Suitable, Provide Explanation	Roosts Observed?	Type of Roost (Day/Night/Maternity)	Species Observed: Special-Status Bats	Species Observed: Common Bats	Identification Method(s)
Diversion Dams and Pools							
Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River)	Not suitable	Diversion dam structures too close to the water elevation, no dry crevices suitable for bat roosting present.	—	—	—	—	—
Kaweah No. 2 Diversion Dam and Pool (Kaweah River)	Not suitable	Diversion dam structures too close to the water elevation, no dry crevices suitable for bat roosting present.	—	—	—	—	—
Flowlines							
Kaweah No. 1 Flowline (flume section only)	Suitable	—	Yes	Day roost (possibly maternity)[1], exterior of flume	—	Myotis spp.[2]	Visual
Kaweah No. 2 Flowline (flume section only)	Not suitable	The south-facing slopes and metal construction of the flume makes roosting unsuitable due to high temperatures from sunlight exposure.	—	—	—	—	—
Powerhouses and Switchyards							
Kaweah No. 1 Powerhouse and Switchyard	Suitable	—	No	—	—		—
Kaweah No. 2 Powerhouse and Switchyard	Suitable	—	Yes	Day roost, interior of facility	Yuma myotis, western small-footed myotis[3]	California myotis[3]	Presence of guano/DNA analysis
Kaweah No. 3 Powerhouse and Switchyard	Suitable	—	Yes	Day roost, inside Kaweah No. 3 Powerhouse	Unknown, DNA too degraded to determine species		Presence of guano
				Night roost, exterior of maintenance building southwest of Kaweah No. 3 Powerhouse	Yuma myotis	—	Presence of guano/DNA analysis
Stream Gages							
East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a)	Suitable	—	No	—	—	—	—
East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)	Suitable	—	Yes	Night roost, exterior of gage	Unknown, DNA too degraded to determine species		Visual
Kaweah No. 1 Minimum Instream Flow Release (SCE Gage No. 201a)	Not suitable	This gauge is too close to the water elevation, and no dry crevices suitable for bat roosting were present.	—	—	—	—	—
East Fork Kaweah River Conduit 1 near Three Rivers CA (SCE Gage No. 202)	Not suitable	This gauge is too close to the water elevation, and no dry crevices suitable for bat roosting were present.	—	—	—	—	—
Kaweah River below Conduit No. 2 near Hammond CA (USGS Gage No. 11208600)(SCE Gage No. 203)	Not suitable	The corrugated metal structure does not provide grips for bats to roost and is in direct sunlight, such that temperatures become too hot for roosting.	—	—	—	—	—
Kaweah River Conduit No. 2 near Hammond CA (SCE Gage No. 204a)	Suitable	—	No	—	—	—	—

Project Facility	Facility Suitability Evaluation		Roost Surveys				
	Suitability	If Not Suitable, Provide Explanation	Roosts Observed?	Type of Roost (Day/Night/Maternity)	Species Observed		Identification Method(s)
					Special-Status Bats	Common Bats	
Kaweah River Conduit No. 2 at Power Plant near Hammond CA (USGS Gage No. 11208818)(SCE Gage No. 205a)	Not suitable	The corrugated metal structure does not provide grips for bats to roost and is in direct sunlight, such that temperatures become too hot for roosting.	—	—	—	—	—
Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565)(SCE Gage No. 206a)[4]	Suitable	—	No	—	—	—	—
Ancillary and Support Facilities							
Kaweah No. 1 Powerhouse Campus	Suitable	—	Yes (2)	• Day roost, inside the western-most maintenance building	western small-footed myotis[3]	California myotis[3]	• Presence of guano/DNA analysis
				• Night roost, exterior of the eastern-most maintenance building	Unknown, DNA too degraded to determine species		• Presence of guano
Kaweah No. 2 Wildlife Bridges	Not Suitable	Wildlife bridges are located too close to the water and do not provide enough vertical space for roosting bats to drop into flight.	—	—	—	—	—
Kaweah No. 2 Wildlife Escape Ramps	Not Suitable	Wildlife escape ramps do not provide suitable vertical and roofed components that can serve as bat roost locations.	—	—	—	—	—
Kaweah No. 2 Footbridges	Not Suitable	Footbridges are located too close to the water and do not provide enough vertical space for roosting bats to drop into flight.	—	—	—	—	—
Kaweah No. 3 Wildlife Bridges	Not Suitable	Wildlife bridges are located too close to the water and do not provide enough vertical space for roosting bats to drop into flight.	—	—	—	—	—
Kaweah No. 3 Wildlife Escape Ramps	Not Suitable	Wildlife escape ramps do not provide suitable vertical and roofed components that can serve as bat roost locations.	—	—	—	—	—
Kaweah No. 3 Footbridges	Not Suitable	Footbridges are located too close to the water and do not provide enough vertical space for roosting bats to drop into flight.	—	—	—	—	—

[1] Female bats will often carry their young with them on short foraging trips for a few days before returning back to a maternity colony, which usually consists of several female/juvenile pairs. Only one female bat is observed carrying a juvenile bat at this location, which suggests that this location is more likely a day roost. However, a female bat carrying young indicates that a maternity colony could be present in the near vicinity.

[2] Identification to species is not possible because *Myotis* species cannot typically be distinguished by visual observation alone. In addition, no guano is available for DNA analysis, and mist netting is not conducted at this location for safety reasons.

[3] Currently, there are no unique genetic markers that can distinguish California myotis/western small-footed myotis species from guano samples. Therefore, these roosts could consist of either or both species.

[4] This facility is located inside the Kaweah No. 3 Powerhouse.

Table TERR 2-10. Special-Status and Common Bat Species Identified During Reproductive Acoustic Sampling

Facilities Covered by Units	Acoustic Unit Map ID[1]	Special-Status Species								Common Species						Acoustic Groups Detected[2]	
		Antrozous pallidus pallid bat	*Corynorhinus townsendii* Townsend's big-eared bat	*Euderma maculatum* spotted bat	*Lasiurus blossevillii* western red bat	*Myotis evotis* long-eared myotis	*Myotis thysanodes* fringed myotis	*Myotis yumanensis* Yuma myotis	*Eumops perotis* western mastiff bat	*Eptesicus fuscus* big brown bat	*Lasiurus cinereus* hoary bat	*Myotis californicus* California myotis	*Myotis lucifugus* little brown bat	*Pipistrellus hesperus* western pipistrelle	*Tadarida brasliensis* Brazilian free-tailed bat	25 kHz bat group	40 kHz Myotis group
• Kaweah No. 2 Powerhouse and Switchyard	A1, A2	X	X					X	X	X		X	X	X	X	X	X
• Kaweah No. 1 Powerhouse and Switchyard • East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a) • Kaweah No. 1 Powerhouse Campus	A3, A4	X	X					X	X	X	X	X	X	X	X	X	X
• Kaweah No. 3 Powerhouse and Switchyard • Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)	A5, A6	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
• Kaweah No. 1 Flowline (flume section only)	A7	X	X		X	X		X	X	X		X	X	X	X	X	X
	A8		X			X		X		X		X		X	X	X	X
	A9	X	X					X		X		X		X	X	X	X
	A10	X	X					X		X		X	X	X	X	X	X
	A11	X	X			X		X		X		X		X	X	X	X
	A12	X	X					X		X		X		X	X	X	X
• Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River) • East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)	A13, A14	X				X		X		X		X		X	X	X	X

[1] Refer to Map TERR 2-7 (CONFIDENTIAL) for location of acoustic units by ID.

[2] Some bat species lack uniquely identifiable acoustic characteristics. Sonograms that could not be confirmed to the species level, but could be narrowed down to a subset of species, are placed into bat groups containing two or more species. These groups are named for the frequency range of calls for these species. Placing unidentifiable sonograms into bat groups is a standard practice in reporting bat acoustic observations.

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Table TERR 2-11. Special-Status and Common Bat Species Identified During Reproductive Mist Net Sampling

Facilities Covered[1]	Mist Net Map ID[2]	Common Name	Scientific Name	Status	Gender	Age	Reproductive Condition	Forearm Length (mm)
• Kaweah No. 2 Powerhouse and Switchyard	N1	No captures.						
	N2	pallid bat	*Antrozous pallidus*	BLMS, SSC	Male	Subadult	Not reproductive	55
		pallid bat	*Antrozous pallidus*	BLMS, SSC	Female	Adult	Post-lactating	55.5
	N3	No captures.						
	N4	pallid bat	*Antrozous pallidus*	BLMS, SSC	Female	Subadult	Not reproductive	56.5
		California myotis	*Myotis californicus*	—	Male	Adult	Not reproductive	34
	Spotlight	western pipistrelle	*Pipistrellus hesperus*	—	—	—	—	—
		Brazilian free-tailed bat	*Tadarida brasiliensis*	—	—	—	—	—
• Kaweah No. 1 Powerhouse and Switchyard • East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a) • Kaweah No. 1 Powerhouse Campus	N5	No captures.						
	N6	Yuma myotis	*Yuma myotis*	BLMS	Male	Subadult	Not reproductive	34.5
	N7	No captures.						
	N8	No captures.						
	Spotlight	western pipistrelle	*Pipistrellus hesperus*	—	—	—	—	—
		Brazilian free-tailed bat	*Tadarida brasiliensis*	—	—	—	—	—
• Kaweah No. 3 Powerhouse and Switchyard • Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)	N9	No captures.						
	N10	No captures.						
	N11	No captures.						
	N12	No captures.						
	N13	Brazilian free-tailed bat	*Tadarida brasiliensis*	—	Male	Subadult	Not reproductive	41
	N14	California myotis	*Myotis californicus*	—	Male	Adult	Not reproductive	32
		Brazilian free-tailed bat	*Tadarida brasiliensis*	—	Female	Juvenile	Not reproductive	44
	N15	Yuma myotis	*Myotis yumanensis*	BLMS	Male	Adult	Not reproductive	35
	N16	western small-footed myotis	*Myotis ciliolabrum*	BLMS	Male	Subadult	Not reproductive	33
	Spotlight	pallid bat	*Antrozous pallidus*	BLMS, SSC	—	—	—	—
		western pipistrelle	*Pipistrellus hesperus*	—	—	—	—	—
		western mastiff bat	*Eumops perotis*	BLMS, SSC	—	—	—	—
		Brazilian free-tailed bat	*Tadarida brasiliensis*	—	—	—	—	—

[1]Mist net sampling was not conducted at the Kaweah No. 1 Diversion Dam; the East Fork Kaweah River near Three Rivers CA (US. Geological Survey (USGS) Gage No. 11208730) (SCE Gage No. 201); or the Kaweah No. 1 Flowline because of safety concerns related to monitoring nets on the steep slopes and narrow walkways of the flowline at night.

[2]Refer to Map TERR 2-7 (CONFIDENTIAL) for location of mist nets by ID.

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Table TERR 2-12. Special-Status and Common Bat Species Identified During Seasonal Acoustic Sampling

Facilities Covered by Units	Acoustic Unit Map ID[2]	Special-Status Species							Common Species						Acoustic Groups Detected[2]	
		Antrozous pallidus pallid bat	*Corynorhinus townsendii* Townsend's big-eared bat	*Euderma maculatum* spotted bat	*Myotis evotis* long-eared myotis	*Myotis thysanodes* fringed myotis	*Myotis yumanensis* Yuma myotis	*Eumops perotis* western mastiff bat	*Eptesicus fuscus* big brown bat	*Lasiurus cinereus* hoary bat	*Myotis californicus* California myotis	*Myotis lucifugus* little brown bat	*Pipistrellus Hesperus* western pipistrelle	*Tadarida brasiliensis* Brazilian free-tailed bat	25 kHz bat group	40 kHz *Myotis* group
• Kaweah No. 2 Powerhouse and Switchyard	A1, A2	X	X	X			X	X	X	X	X	X	X	X	X	X
• Kaweah No. 1 Powerhouse and Switchyard • East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a) • Kaweah No. 1 Powerhouse Campus	A3, A4	X	X	X			X	X	X	X	X	X	X	X	X	X
• Kaweah No. 3 Powerhouse and Switchyard • Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)	A5, A6	X	X	X			X	X		X	X	X	X	X	X	X
• Kaweah No. 1 Flowline (flume section only)	A7	X	X				X	X	X	X	X	X	X	X	X	X
	A8	X	X				X	X	X	X	X	X	X	X	X	X
	A9	X					X	X	X	X	X		X	X	X	X
	A10		X	X			X	X		X	X		X	X	X	X
	A11	X	X				X				X		X	X	X	X
	A12	X	X				X	X	X	X	X		X	X	X	X
• Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River) • East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)	A13, A14	X	X		X	X	X	X	X	X	X	X	X	X	X	X

[1] Refer to Map TERR 2-8 for location of acoustic units by ID.

[2] Some bat species lack uniquely identifiable acoustic characteristics. Sonograms that could not be confirmed to the species level, but could be narrowed down to a subset of species, are placed into bat groups containing two or more species. These groups are named for the frequency range of calls for these species. Placing unidentifiable sonograms into bat groups is a standard practice in reporting bat acoustic observations.

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Table TERR 2-13. Special-Status and Common Bat Species Identified During Seasonal Use Mist Net Sampling

Facilities Covered[1]	Mist Net Map ID[2]	Common Name	Scientific Name	Status	Sex	Age	Reproductive Condition	Forearm Length (mm)
• Kaweah No. 2 Powerhouse and Switchyard	N1	No captures.						
	N2	pallid bat	*Antrozous pallidus*	BLMS, SSC	Male	Subadult	Scrotal	57
		pallid bat	*Antrozous pallidus*	BLMS, SSC	Male	Subadult	Scrotal	57
	N3	pallid bat	*Antrozous pallidus*	BLMS, SSC	Female	Subadult	Not reproductive	56.5
	N4	No captures.						
	Spotlight	No bats spotlighted.						
• Kaweah No. 1 Powerhouse and Switchyard • East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a) • Kaweah No. 1 Powerhouse Campus	N5	No captures.						
	N6	No captures.						
	N7	No captures.						
	N8	No captures.						
	Spotlight	western mastiff bat	*Eumops perotis*	BLMS, SSC	—	—	—	—
		Brazilian free-tailed bat	*Tadarida brasiliensis*	—	—	—	—	—
• Kaweah No. 3 Powerhouse and Switchyard • Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a)	N9	No captures.						
	N10	No captures.						
	N11	No captures.						
	N12	No captures.						
	N13	Yuma myotis	*Myotis yumanensis*	BLMS	Male	Adult	Not reproductive	32
	N14	No captures.						
	N15	No captures.						
	N16	California myotis	*Myotis californicus*	—	Male	Adult	Not reproductive	32
	Spotlight	western pipistrelle	*Pipistrellus hesperus*	—	—	—	—	—
		western mastiff bat	*Eumops perotis*	BLMS, SSC	—	—	—	—

[1] Mist net sampling was not conducted at the Kaweah No. 1 Diversion Dam; the East Fork Kaweah River near Three Rivers CA (US. Geological Survey (USGS) Gage No. 11208730) (SCE Gage No. 201); or the Kaweah No. 1 Flowline because of safety concerns related to monitoring nets on the steep slopes and narrow walkways of the flowline at night.

[2] Refer to Map TERR 2-8 for location of mist nets by ID number.

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Table TERR 2-14. Wildlife Crossing and Escape Ramp Use by Game Camera Location (Spring 2018)

Game Camera ID	Type of Crossing*	Project Flowline	Is Location within Important Deer Habitat?	Vegetation Alliance (CWHR)	Species Observed/Success Determination																			
					Mule Deer		Bobcat		Mountain Lion		Coyote		Gray Fox		Black Bear		Striped Skunk		Raccoon		Cow		Totals	
					# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations
GC1	Wildlife Bridge	Kaweah No. 2 Flowline	No	Blue Oak Woodland	2	3	1	13	0	1	0	1	7	16	0	0	1	3	1	6	0	0	**12**	**43**
GC1	Escape Ramp	Kaweah No. 2 Flowline	No	Blue Oak Woodland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
GC2	Wildlife Bridge	Kaweah No. 2 Flowline	No	Blue Oak Woodland	4	5	2	9	0	1	0	0	2	12	0	0	2	2	0	1	0	0	**10**	**30**
GC3	Wildlife Bridge	Kaweah No. 2 Flowline	No	Blue Oak Woodland	7	8	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**8**	**10**
GC4	Wildlife Bridge	Kaweah No. 2 Flowline	Yes	Annual Grassland	13	13	3	5	0	1	11	12	0	0	0	0	0	0	0	0	0	0	**27**	**31**
GC4	Escape Ramp	Kaweah No. 2 Flowline	Yes	Annual Grassland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
GC5	Wildlife Bridge	Kaweah No. 2 Flowline	Yes	Blue Oak Woodland	26	27	6	10	0	0	4	4	4	4	0	0	0	0	0	0	0	0	**40**	**45**
GC6	Wildlife Bridge	Kaweah No. 2 Flowline	Yes	Annual Grassland	29	37	5	9	0	0	0	0	9	10	0	0	0	0	0	0	0	0	**43**	**56**
GC7	Wildlife Bridge	Kaweah No. 3 Flowline	Yes	Montane Hardwood	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	**0**	**3**
GC8	Wildlife Bridge	Kaweah No. 3 Flowline	Yes	Montane Hardwood	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**1**
GC9	Wildlife Bridge	Kaweah No. 3 Flowline	Yes	Mixed Chaparral	0	0	6	7	0	0	0	0	0	0	1	1	0	0	0	0	0	0	**7**	**8**
				Totals	**81**	**94**	**24**	**55**	**0**	**3**	**15**	**17**	**22**	**42**	**1**	**1**	**3**	**5**	**1**	**7**	**0**	**3**	**147**	**227**

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Table TERR 2-15. Other Species Detected During Game Camera Monitoring (Spring 2018)

Species Name	Scientific Name	Game Camera ID	Total Number of Observations
Humans and Domestic Dogs			
Human	*Homo sapiens*	GC1, GC2, GC3, GC4, GC5, GC6, GC7, GC8, GC9	*
Human with domestic dog	*Homo sapiens, Canis familiaris*	GC1, GC2, GC3, GC4, GC5	*
Domestic dog	*Canis familiaris*	GC1	23
		Total	**217**
Wildlife			
Reptiles			
western fence lizard	*Sceloperus occidentalis*	GC1, GC2, GC4, GC6	102
unidentified lizard		GC1, GC2, GC4, GC6	11
		Total	**113**
Birds			
great blue heron	*Ardea herodias*	GC6	1
red-shouldered hawk	*Buteo lineatus*	GC1	1
California quail	*Callipepla californica*	GC1, GC3, GC5, GC6	11
mourning dove	*Zenaida macroura*	GC1, GC5, GC6	8
hummingbird species		GC1	1
acorn woodpecker	*Melanerpes formicivorus*	GC6	7
black phoebe	*Sayornis nigricans*	GC1, GC2, GC3, GC4, GC5, GC6	276
ash-throated flycatcher	*Myiarchus cinerascens*	GC4, GC6	2
western kingbird	*Tyrannus verticalis*	GC1, GC6	3
California scrub-jay	*Aphelocoma californica*	GC1, GC4, GC5, GC6	13
common raven	*Corvus corax*	GC3, GC7, GC9	12
California towhee	*Melozone crissalis*	GC1	1
rufous-crowned sparrow	*Aimophila ruficeps*	GC2	1
lark sparrow	*Chondestes grammacus*	GC2	4
golden-crowned sparrow	*Zonotrichia atricapilla*	GC1	1
song sparrow	*Melospiza melodia*	GC2	1
sparrow species		GC1, GC2, GC4	6
Brewer's blackbird	*Euphagus cyanocephalus*	GC6	1
unidentified bird		GC1, GC2, GC3, GC4, GC6	9
		Total	**359**
Mammals			
California ground squirrel	*Otospermophilus beecheyi*	GC1, GC4, GC5	106
Unidentified rodent		GC1, GC2, GC6	19
		Total	**125**

* Use of the wildlife crossings on the Kaweah No. 1 Flowline by humans (and domestic dogs) as captured by the game cameras is discussed in the REC 1 – Recreation Resources TSR (SCE 2019).

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Table TERR 2-16. Wildlife Crossing and Escape Ramp Use by Game Camera Location (Fall 2018)

Game Camera ID	Type of Crossing*	Project Flowline	Is Location within Important Deer Habitat?	Vegetation Alliance (CWHR)	Species Observed/Success Determination																			
					Virginia Opossum		Mule Deer		Bobcat		Coyote		Gray Fox		Black Bear		Striped Skunk		Western Spotted Skunk		Raccoon		Cow		Totals	
					# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations	# Successful Crossings	# Total Observations
GC1	Wildlife Bridge	Kaweah No. 2 Flowline	No	Blue Oak Woodland	0	0	8	11	3	18	1	18	6	42	0	0	0	0	0	0	0	3	0	0	**18**	**92**
GC1	Escape Ramp	Kaweah No. 2 Flowline	No	Blue Oak Woodland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
GC2	Wildlife Bridge	Kaweah No. 2 Flowline	No	Blue Oak Woodland	0	0	5	5	2	2	7	9	1	1	0	0	0	0	0	0	0	0	0	0	**15**	**17**
GC3	Wildlife Bridge	Kaweah No. 2 Flowline	No	Blue Oak Woodland	0	0	53	59	1	1	4	6	6	11	0	0	2	2	0	0	0	0	0	0	**66**	**79**
GC4	Wildlife Bridge	Kaweah No. 2 Flowline	Yes	Annual Grassland	0	0	42	42	2	5	21	27	1	1	0	0	0	0	0	0	1	1	0	0	**67**	**76**
GC4	Escape Ramp	Kaweah No. 2 Flowline	Yes	Annual Grassland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
GC5	Wildlife Bridge	Kaweah No. 2 Flowline	Yes	Blue Oak Woodland	0	0	14	30	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	**18**	**34**
GC6	Wildlife Bridge	Kaweah No. 2 Flowline	Yes	Annual Grassland	0	0	51	56	1	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0	**53**	**61**
GC7	Wildlife Bridge	Kaweah No. 3 Flowline	Yes	Montane Hardwood	0	1	0	2	6	7	0	1	19	26	0	2	4	12	1	3	0	0	0	9	**30**	**63**
GC8	Wildlife Bridge	Kaweah No. 3 Flowline	Yes	Montane Hardwood	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	**0**
GC9	Wildlife Bridge	Kaweah No. 3 Flowline	Yes	Mixed Chaparral	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2	**1**	**3**
				Totals	**0**	**1**	**173**	**205**	**17**	**37**	**36**	**66**	**33**	**81**	**1**	**3**	**6**	**14**	**1**	**3**	**1**	**4**	**0**	**11**	**268**	**425**

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Table TERR 2-17. Other Species Detected During Game Camera Monitoring (Fall 2018)

Species Name	Scientific Name	Game Camera ID	Total Number of Observations
Humans and Domestic Dogs			
Human	*Homo sapiens*	GC1, GC2, GC4, GC5, GC6, GC9	*
Human with domestic dog	*Homo sapiens, Canis familiaris*	GC1, GC3	*
Domestic dog	*Canis familiaris*	GC1	6
		Total	**32**
Wildlife			
Birds			
great blue heron	*Ardea herodias*	GC6	1
red-tailed hawk	*Buteo jamaicensis*	GC1	2
California quail	*Callipepla californica*	GC1	5
barn owl	*Tyto alba*	GC4	1
owl species		GC3	1
acorn woodpecker	*Melanerpes formicivorus*	GC6	1
black phoebe	*Sayornis nigricans*	GC3, GC4, GC6	9
California scrub-jay	*Aphelocoma californica*	GC1	19
common raven	*Corvus corax*	GC3	1
California towhee	*Melozone crissalis*	GC1	2
spotted towhee	*Pipilo maculatus*	GC1	2
golden-crowned sparrow	*Zonotrichia atricapilla*	GC1, GC4	3
white-crowned sparrow	*Zonotrichia leuchophrys*	GC1, GC4	2
unidentified bird		GC4	2
		Total	**51**
Mammals			
California ground squirrel	*Spermophilus beecheyi*	GC4	9
western gray squirrel	*Sciurus griseus*	GC7	1
Unidentified rodent		GC2	2
Unidentified mammal		GC1, GC7	3
		Total	**15**

* Use of the wildlife crossings on the Kaweah No. 1 Flowline by humans (and domestic dogs) as captured by the game cameras is discussed in the REC 1 – Recreation Resources TSR (SCE 2019).

Table TERR 2-18. Wildlife Mortalities In Project Flowlines Since 1991

Year	Date	Wildlife Species	Project Location	Notes
1991	April 1	mule deer	Kaweah No. 2 Forebay	Female, 120 lbs, appeared to be injured
1992	July 24	mule deer	Kaweah No. 2 Forebay	Fawn
	July 24	mule deer	Kaweah No. 2 Forebay	Fawn
1993	(No report available)			
1994	March 15	mule deer	Kaweah No. 3 Forebay	Female, 70 lbs
	July 21	golden eagle	Kaweah No. 2 Forebay	CDFW removed remains
	November 22	mule deer	Kaweah No. 2 Forebay	Male, 170 lbs, 4 point antlers
1995	May 15	mule deer	Kaweah No. 3 Forebay	Female, 90 lbs
	October 11	mule deer	Kaweah No. 2 Forebay	Female, 110 lbs
1996	February 22	gray fox	Kaweah No. 3 Forebay	
	February 27	mule deer	Kaweah No. 3 Forebay	80 lbs
	February 27	mule deer	Kaweah No. 3 Forebay	80 lbs
	March 24	mule deer	Kaweah No. 3 Marble Fork	100 lbs
	March 29	mule deer	Kaweah No. 3 Forebay	95 lbs
	April 18	mule deer	Kaweah No. 3 Forebay	95 lbs
1997	No mortalities observed			
1998	June 3	mule deer	Kaweah No. 3 Forebay	small
	July 16	mule deer	Kaweah No. 3 Forebay	small
	July 23	mule deer	Kaweah No. 3 Forebay	small
1999	January 2	mule deer	Kaweah No. 3 Forebay	male, 90 lbs
	June 21	mule deer	Kaweah No. 3 Forebay	female fawn, 20 lbs
	July 14	mule deer	Kaweah No. 3 Forebay	female fawn, 20 lbs
	November 22	mule deer	Kaweah No. 3 Forebay	female, 100 lbs
2000	February 11	mule deer	Kaweah No. 3 Forebay	female, 40 lbs
	February 22	mule deer	Kaweah No. 3 Forebay	female, 80 lbs
	February 22	mule deer	Kaweah No. 3 Forebay	fawn, 50 lbs
	February 22	fox (unknown species)	Kaweah No. 3 Forebay	6 lbs
2001	May 12	mule deer	Kaweah No. 3 Forebay	80 lbs
	August 20	mule deer	Kaweah No. 2 Forebay	female, 50 lbs
2002	February 23	mule deer	Kaweah No. 3 Forebay	fawn, 35 lbs
	March 10	fox (unknown species)	Kaweah No. 3 Forebay	10 lbs
	April 14	mule deer	Kaweah No. 3 Forebay	50 lbs
2003	February 24	mule deer	Kaweah No. 3 Forebay	female, 70 lbs
	May 8	mule deer	Kaweah No. 3 Forebay	male, 225 lbs

Year	Date	Wildlife Species	Project Location	Notes
2004	June 16	mule deer	Kaweah No. 2 Flowline	fawn, 35 lbs
	September 9	fox (unknown species)	Kaweah No. 3 Flowline	20 lbs
	November 2	mule deer	Kaweah No. 3 Flowline	female, 70 lbs
	November 2	mule deer	Kaweah No. 3 Flowline	female, 70 lbs
	November 6	fox (unknown species)	Kaweah No. 3 Flowline	15 lbs
	December 20	fox (unknown species)	Kaweah No. 2 Flowline	10 lbs
2005	unspecified date	coyote	Kaweah No. 2 Forebay	
	unspecified date	mule deer	Kaweah No. 3 Forebay	male
	unspecified date	mule deer	Kaweah No. 3 Forebay	female
	unspecified date	mule deer	Kaweah No. 3 Forebay	fawn
	unspecified date	owl (unknown species)	Kaweah No. 3 Forebay	
2006	July 14	mule deer	Kaweah No. 2 Forebay	fawn, 30 lbs
	July 16	mule deer	Kaweah No. 2 Forebay	fawn, 20 lbs
	November 29	mule deer	Kaweah No. 3 Forebay	female, 70 lbs
2007	May 23	black bear	Kaweah No. 3 Forebay	cub, 20 lbs
2008	January 15	mule deer	Kaweah No. 2 Forebay	female, 40 lbs
2009	unspecified date	mule deer	Kaweah No. 2 Forebay	
	unspecified date	mule deer	Kaweah No. 2 Forebay	
	unspecified date	fox (unknown species)	Kaweah No. 2 Forebay	
2010	No mortalities observed			
2011	No mortalities observed			
2012	No mortalities observed			
2013	No mortalities observed			
2014	No mortalities observed			
2015	August 19	mule deer	Kaweah No. 2 Flowline, Canal 15	
2016	No mortalities observed			
2017	No mortalities observed			
2018	No mortalities observed			

Source: Annual mortality reports (years 1991 to 2017) required as part of SCE's compliance with Article 410 of the Kaweah Hydroelectric Project (P-289) License. 2018 data were obtained through consultation with SCE.

Table TERR 2-19. Domestic Animal Mortalities In Project Flowlines Since 1991

Year	Date	Domestic Animal Species	Project Location	Notes
1991	No mortalities observed			
1992	No mortalities observed			
1993	(No report available)			
1994	No mortalities observed			
1995	No mortalities observed			
1996	No mortalities observed			
1997	No mortalities observed			
1998	No mortalities observed			
1999	No mortalities observed			
2000	No mortalities observed			
2001	No mortalities observed			
2002	January 25	cow	Kaweah No. 3 Forebay	calf, 75 lbs
	January 25	cow	Kaweah No. 3 Forebay	cow, 150 lbs
2003	No mortalities observed			
2004	No mortalities observed			
2005	unspecified date	cow	Kaweah No. 2 Forebay	calf
2006	March 19	cow	Kaweah No. 3 Forebay	female calf, 70 lbs
2007	No mortalities observed			
2008	No mortalities observed			
2009	No mortalities observed			
2010	No mortalities observed			
2011	No mortalities observed			
2012	No mortalities observed			
2013	No mortalities observed			
2014	No mortalities observed			
2015	No mortalities observed			
2016	No mortalities observed			
2017	No mortalities observed			
2018	February 25	cow	Kaweah No. 3 Flowline	male calf

Source: Annual mortality reports (years 1991 to 2017) required as part of SCE's compliance with Article 410 of the Kaweah Hydroelectric Project (P-289) License. 2018 data were obtained consultation with SCE.

MAPS

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CALVEG Vegetation Alliances*

- Barren (BA)
- Chamise Alliance (CA)
- Ceanothus Chaparral Alliance (CC)
- Wedgeleaf Ceanothus Alliance (CL)
- Lower Montane Mixed Chaparral Alliance (CQ)
- Whiteleaf Manzanita Alliance (CW)
- Upper Montane Mixed Chaparral Alliance (CX)
- Annual Grasses and Forbs Alliance (HG)
- Perennial Grasses and Forbs Alliance (HM)
- Incense Cedar Alliance (MD)
- Mixed Conifer-Pine Alliance (MP)
- Riparian Mixed Hardwood Alliance (NR)
- Interior Mixed Hardwood Alliance (NX)
- Canyon Live Oak Alliance (QC)
- Blue Oak Alliance (QD)
- White Alder Alliance (QE)
- California Buckeye Alliance (QI)
- Black Oak Alliance (QK)
- California Sycamore Alliance (QP)
- Interior Live Oak Alliance (QW)
- Chaparral Yucca Alliance (SY)
- Urban (UB)
- Water (WA)
- Willow (Shrub) Alliance (WL)
- Birchleaf Mountain Mahogany Alliance (WM)

*Source: Hexagon Imagery 2016, USDA-FS 2017a, USDA-FS 2017b, (with 2018 desktop and field updates)

Kaweah No. 2 Flowline
Kaweah River
GC4
GC5
GC6
GC3
GC1
GC2
198
K2 Forebay
Kaweah No. 2 Powerhouse
Kaweah No. 1 Powerhouse
K1 Forebay Tank
Kaweah No. 1 Flowline
Kaweah No. 2 Diversion Dam
Kaweah No. 3 Powerhouse
Kaweah River
Kaweah No.3 Flowline (Non-Project)
K3 Forebay
GC7
GC8
GC9
Kaweah No.3 Flowline
East Fork Kaweah River

SCE Facilities

- Powerhouse
- Diversion
- Forebay
- Flowline
- Penstock
- Transmission Line
- FERC Boundary

Other Features

- Highway/Road
- Watercourse
- Water Body

Wildlife Features*

- Wildlife Bridge
- Game Camera (GC)
- Wildlife Escape Ramp

*All escape ramps are equipped with hazers and flashers

Deer Range [1]

- Key Winter Range
- Important Winter Range

[1] Source: Southern California Edison Company, November 1989.

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FERC Project No. 298

Map TERR 2-1

Wildlife Bridge and Escape Ramp Monitoring Locations

Date: 1/11/2019

0 0.05 0.1 0.2 Miles

Projection: UTM Zone 11
Datum: NAD 83

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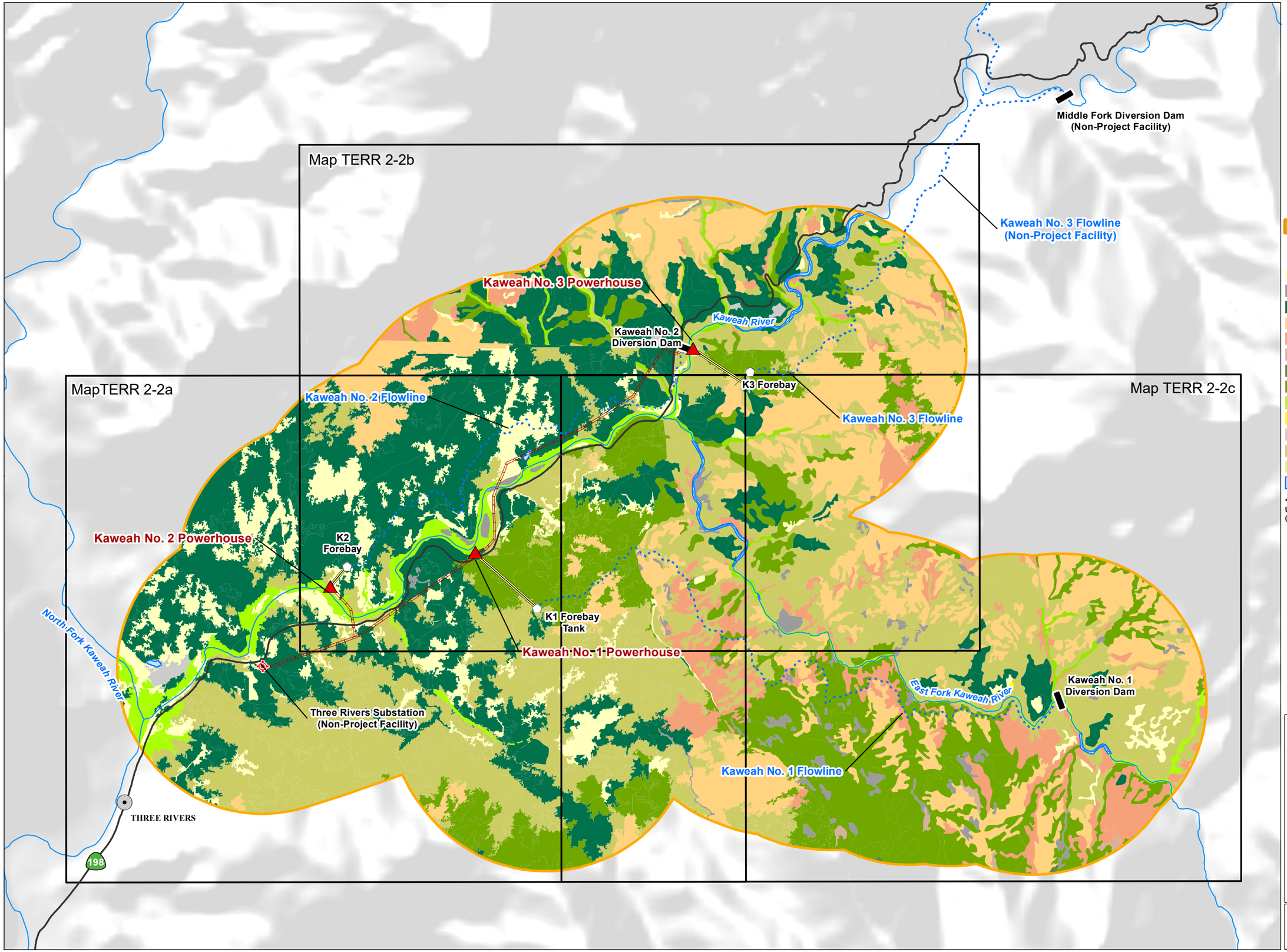

Facilities

- Powerhouse
- Diversion
- Utility
- Forebay
- Flowline
- Penstock
- Transmission Line

Other Features

- Highway/Road
- Watercourse
- 1 Mile Buffer of FERC Boundary

CWHR Habitats*

- Annual Grassland (AGS)
- Barren (BAR)
- Blue Oak Woodland (BOW)
- Chamise-Redshank Chaparral (CRC)
- Mixed Chaparral (MCH)
- Montane Chaparral (MCP)
- Sierran Mixed Conifer (SMC)
- Montane Hardwood (MHW)
- Montane Riparian (MRI)
- Perennial Grassland (PGS)
- Urban (URB)
- Valley Oak Woodland (VOW)
- Valley Foothill Riparian (VRI)
- Water (WAT)

*Source: Hexagon Imagery 2016, USDA-FS 2017a, USDA-FS 2017b,
(with 2018 desktop and field data updates)

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Map TERR 2-2

CWHR Habitats Occurring within 1 Mile of the Kaweah Project

0 0.25 0.5 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 1/11/2019

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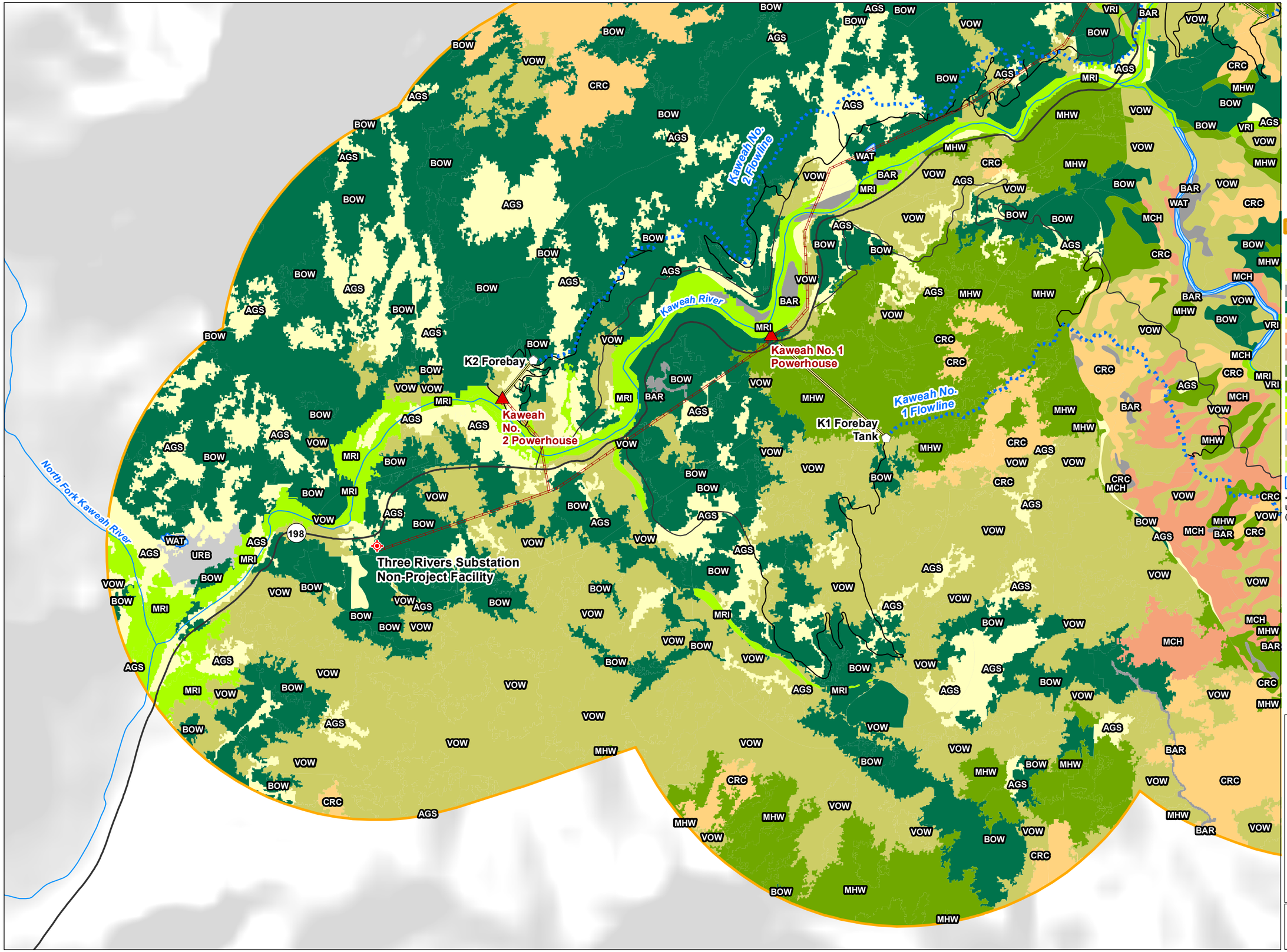

Facilities

- Powerhouse
- Diversion
- Utility
- Forebay
- Flowline
- Penstock
- Transmission Line

Other Features

- Highway/Road
- Watercourse
- 1 Mile Buffer of FERC Boundary

CWHR Habitats*

- Annual Grassland (AGS)
- Barren (BAR)
- Blue Oak Woodland (BOW)
- Chamise-Redshank Chaparral (CRC)
- Mixed Chaparral (MCH)
- Montane Chaparral (MCP)
- Sierran Mixed Conifer (SMC)
- Montane Hardwood (MHW)
- Montane Riparian (MRI)
- Perennial Grassland (PGS)
- Urban (URB)
- Valley Oak Woodland (VOW)
- Valley Foothill Riparian (VRI)
- Water (WAT)

*Source: Hexagon Imagery 2016, USDA-FS 2017a, USDA-FS 2017b, (with 2018 desktop and field data updates)

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Map TERR 2-2a

CWHR Habitats Occurring within 1 Mile of the Kaweah Project

0 500 1,000 2,000 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 1/11/2019

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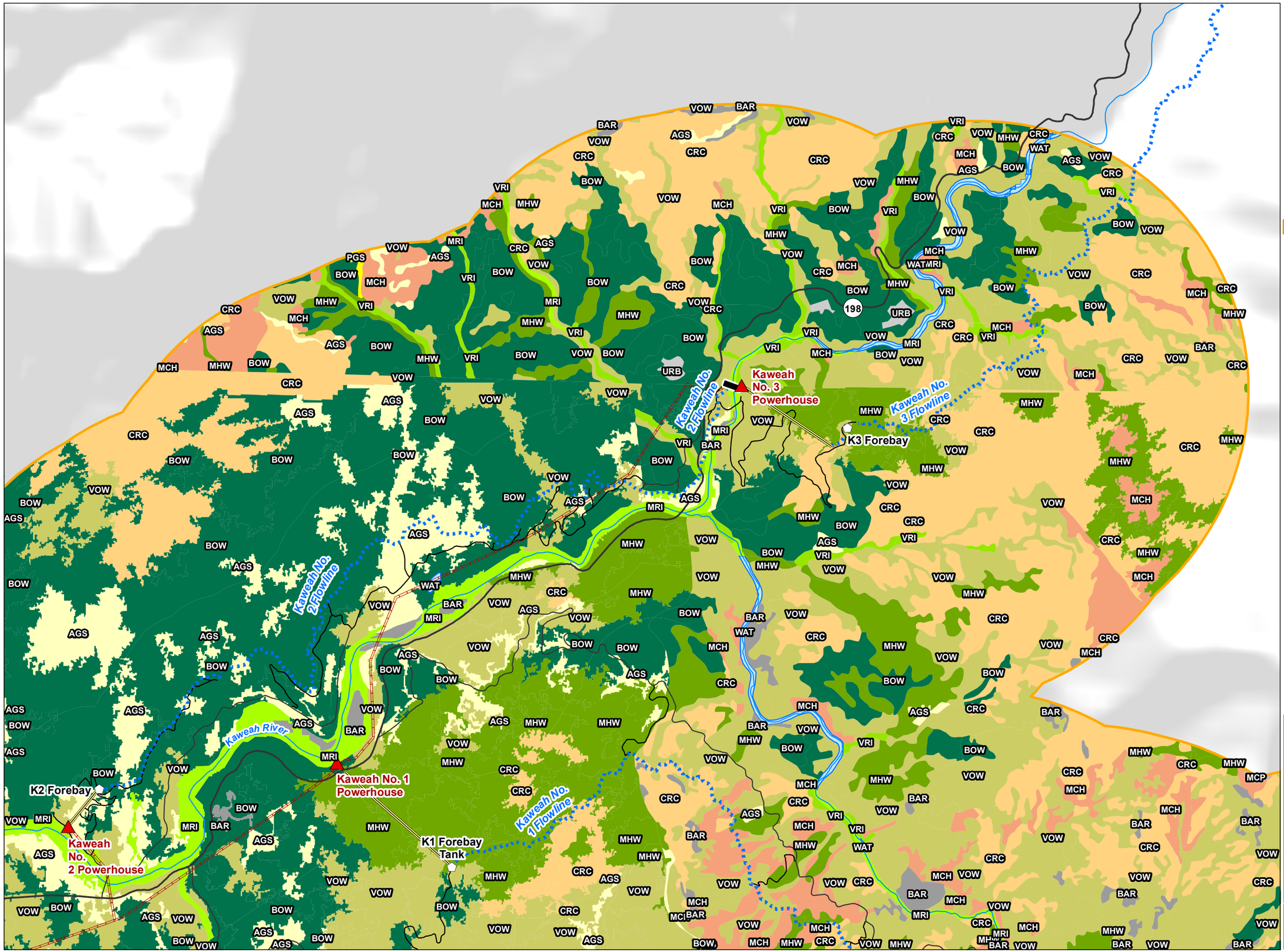

Facilities

- Powerhouse
- Diversion
- Utility
- Forebay
- Flowline
- Penstock
- Transmission Line

Other Features

- Highway/Road
- Watercourse
- 1 Mile Buffer of FERC Boundary

CWHR Habitats*

- Annual Grassland (AGS)
- Barren (BAR)
- Blue Oak Woodland (BOW)
- Chamise-Redshank Chaparral (CRC)
- Mixed Chaparral (MCH)
- Montane Chaparral (MCP)
- Sierran Mixed Conifer (SMC)
- Montane Hardwood (MHW)
- Montane Riparian (MRI)
- Perennial Grassland (PGS)
- Urban (URB)
- Valley Oak Woodland (VOW)
- Valley Foothill Riparian (VRI)
- Water (WAT)

*Source: Hexagon Imagery 2016, USDA-FS 2017a, USDA-FS 2017b,
(with 2018 desktop and field data updates)

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Map TERR 2-2b

CWHR Habitats Occurring within 1 Mile of the Kaweah Project

0 500 1,000 2,000 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 1/11/2019

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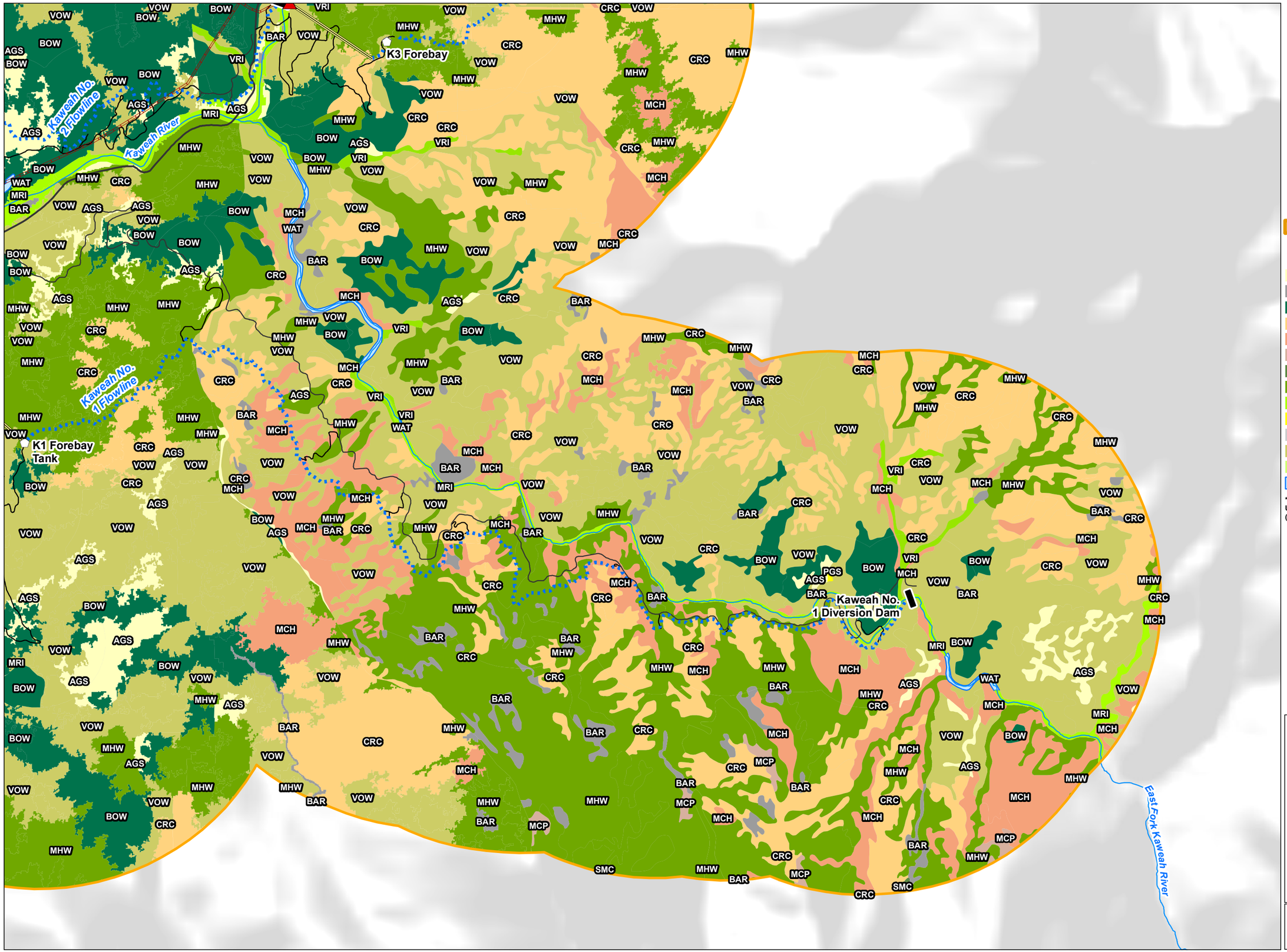

Facilities

- Powerhouse
- Diversion
- Utility
- Forebay
- Flowline
- Penstock
- Transmission Line

Other Features

- Highway/Road
- Watercourse
- 1 Mile Buffer of FERC Boundary

CWHR Habitats*

- Annual Grassland (AGS)
- Barren (BAR)
- Blue Oak Woodland (BOW)
- Chamise-Redshank Chaparral (CRC)
- Mixed Chaparral (MCH)
- Montane Chaparral (MCP)
- Sierran Mixed Conifer (SMC)
- Montane Hardwood (MHW)
- Montane Riparian (MRI)
- Perennial Grassland (PGS)
- Urban (URB)
- Valley Oak Woodland (VOW)
- Valley Foothill Riparian (VRI)
- Water (WAT)

*Source: Hexagon Imagery 2016, USDA-FS 2017a, USDA-FS 2017b, (with 2018 desktop and field data updates)

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Map TERR 2-2c

CWHR Habitats Occurring within 1 Mile of the Kaweah Project

0 500 1,000 2,000 Feet

Date: 1/11/2019

Projection: UTM Zone 11
Datum: NAD 83

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CONFIDENTIAL

The following map is being withheld from public disclosure in accordance with applicable regulations. This map contains details on the locations of special-status biological resources and qualifies as Confidential Information [18 CFR §385.1112]. Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings visit http://www.ferc.gov/legal/ceii-foia/foia.asp.

Map TERR 2-3. Special-Status Wildlife Species Known to Occur within 1 Mile of the Kaweah Project (CONFIDENTIAL)

This map 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) 302-9494, or david.moore@sce.com.

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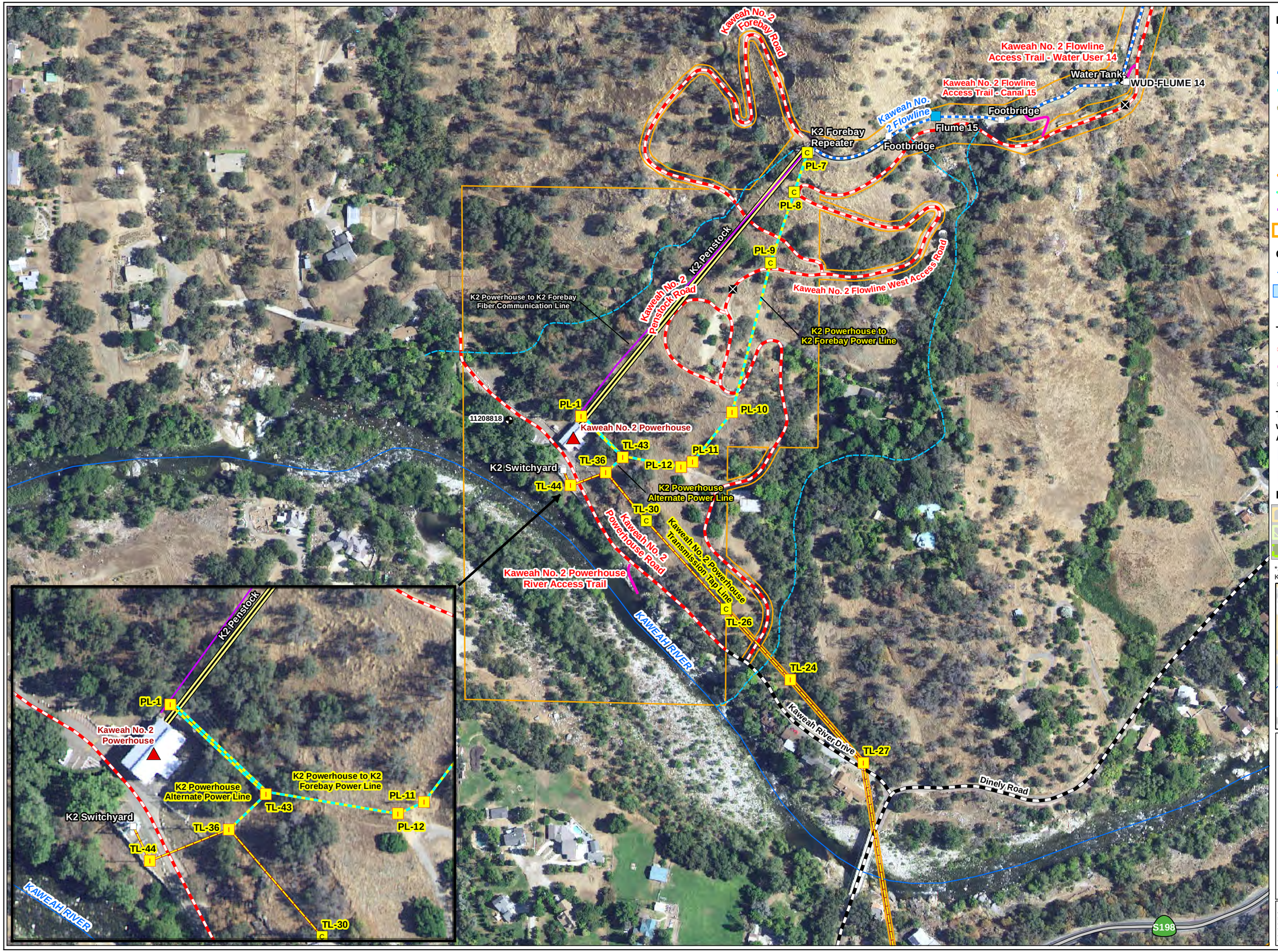


Facilities

- Powerhouse
- Diversion
- Flowline
- Spillway Channel or Pipe
- Penstock
- Flume Segment
- Ancillary Facility
- Gage
- Transmission Line
- Power Line
- Communication Line
- FERC Boundary

Other Features

- Watercourse
- Water Body
- Water User Diversion

Transportation

- Project Road
- Project Trail
- Non-Project General Access Road
- Gate

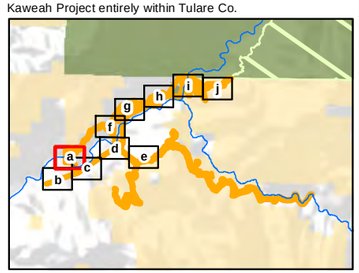
Transmission Line / Power Line with Configuration Type ID # and APLIC Consistency Determination

- C - Pole Configuration is Consistent with APLIC Guidelines
- I - Pole Configuration is Inconsistent with APLIC Guidelines

Land Jurisdiction*

- Bureau of Land Management
- Wilderness Area
- National Park Service

*SOURCE: BLM 2016
Kaweah Project entirely within Tulare Co.



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FERC Project No. 298

Map TERR 2-4a

Consistency of Project Transmission Line, Transmission Tap Line, and Powerline Configurations with APLIC Guidelines

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 1/14/2019

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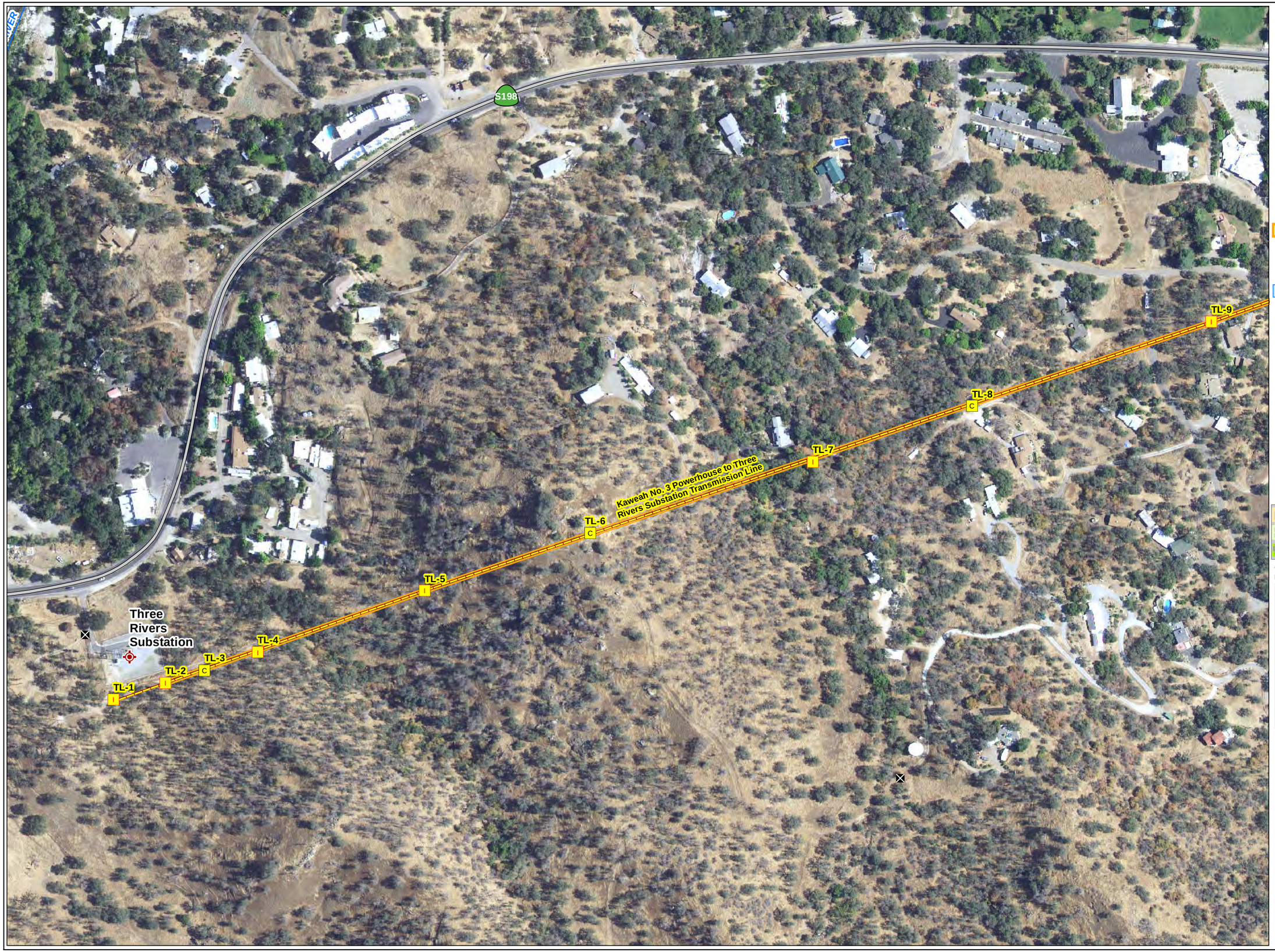


Facilities

- Powerhouse
- Diversion
- Flowline
- Spillway Channel or Pipe
- Penstock
- Flume Segment
- Ancillary Facility
- Gage
- Transmission Line
- Power Line
- Communication Line
- FERC Boundary

Other Features

- Watercourse
- Water Body
- Water User Diversion

Transportation

- Project Road
- Project Trail
- Non-Project General Access Road
- Gate

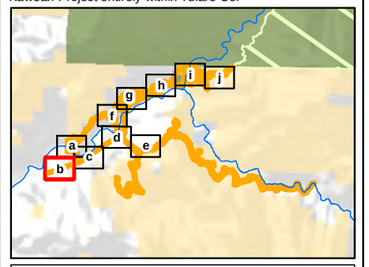
Transmission Line / Power Line with Configuration Type ID # and APLIC Consistency Determination

- C - Pole Configuration is Consistent with APLIC Guidelines
- I - Pole Configuration is Inconsistent with APLIC Guidelines

Land Jurisdiction*

- Bureau of Land Management
- Wilderness Area
- National Park Service

*SOURCE: BLM 2016
Kaweah Project entirely within Tulare Co.



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Map TERR 2-4b

Consistency of Project Transmission Line, Transmission Tap Line, and Powerline Configurations with APLIC Guidelines

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 1/14/2019

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Facilities

- Powerhouse
- Diversion
- Flowline
- Spillway Channel or Pipe
- Penstock
- Flume Segment
- Ancillary Facility
- Gage
- Transmission Line
- Power Line
- Communication Line
- FERC Boundary

Other Features

- Watercourse
- Water Body
- Water User Diversion

Transportation

- Project Road
- Project Trail
- Non-Project General Access Road
- Gate

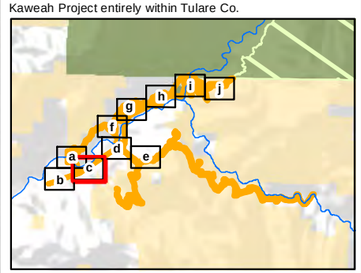
Transmission Line / Power Line with Configuration Type ID # and APLIC Consistency Determination

- C - Pole Configuration is Consistent with APLIC Guidelines
- I - Pole Configuration is Inconsistent with APLIC Guidelines

Land Jurisdiction*

- Bureau of Land Management
- Wilderness Area
- National Park Service

*SOURCE: BLM 2016
Kaweah Project entirely within Tulare Co.



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FERC Project No. 298

Map TERR 2-4c

Consistency of Project Transmission Line, Transmission Tap Line, and Powerline Configurations with APLIC Guidelines

N W E S

0 125 250 Feet

Date: 1/14/2019

Projection: UTM Zone 11
Datum: NAD 83

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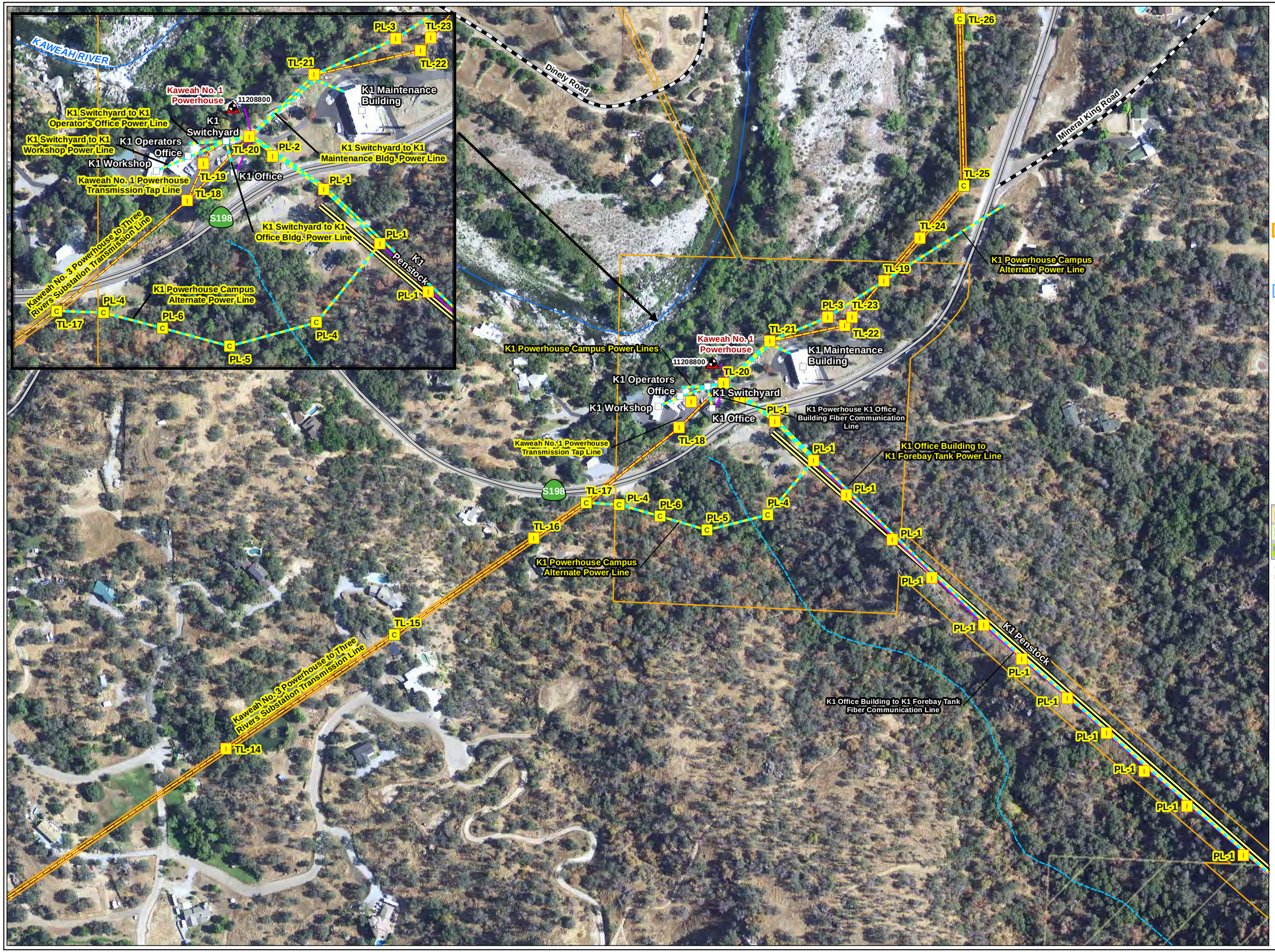


Facilities

- Powerhouse
- Diversion
- Flowline
- Spillway Channel or Pipe
- Penstock
- Flume Segment
- Ancillary Facility
- Gage
- Transmission Line
- Power Line
- Communication Line
- FERC Boundary

Other Features

- Watercourse
- Water Body
- Water User Diversion

Transportation

- Project Road
- Project Trail
- Non-Project General Access Road
- Gate

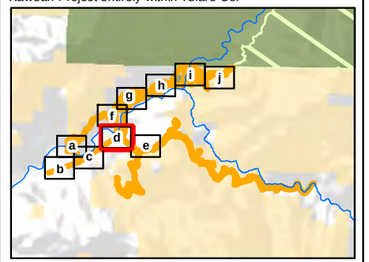
Transmission Line / Power Line with Configuration Type ID # and APLIC Consistency Determination

- C - Pole Configuration is Consistent with APLIC Guidelines
- I - Pole Configuration is Inconsistent with APLIC Guidelines

Land Jurisdiction*

- Bureau of Land Management
- Wilderness Area
- National Park Service

*SOURCE: BLM 2016
Kaweah Project entirely within Tulare Co.



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FERC Project No. 298

Map TERR 2-4d

Consistency of Project Transmission Line, Transmission Tap Line, and Powerline Configurations with APLIC Guidelines

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 1/14/2019

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Facilities

- Powerhouse
- Diversion
- Flowline
- Spillway Channel or Pipe
- Penstock
- Flume Segment
- Ancillary Facility
- Gage
- Transmission Line
- Power Line
- Communication Line
- FERC Boundary

Other Features

- Watercourse
- Water Body
- Water User Diversion

Transportation

- Project Road
- Project Trail
- Non-Project General Access Road
- Gate

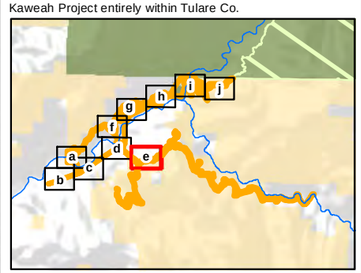
Transmission Line / Power Line with Configuration Type ID # and APLIC Consistency Determination

- C - Pole Configuration is Consistent with APLIC Guidelines
- I - Pole Configuration is Inconsistent with APLIC Guidelines

Land Jurisdiction*

- Bureau of Land Management
- Wilderness Area
- National Park Service

*SOURCE: BLM 2016
Kaweah Project entirely within Tulare Co.



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FERC Project No. 298

Map TERR 2-4e

Consistency of Project Transmission Line, Transmission Tap Line, and Powerline Configurations with APLIC Guidelines

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 1/14/2019

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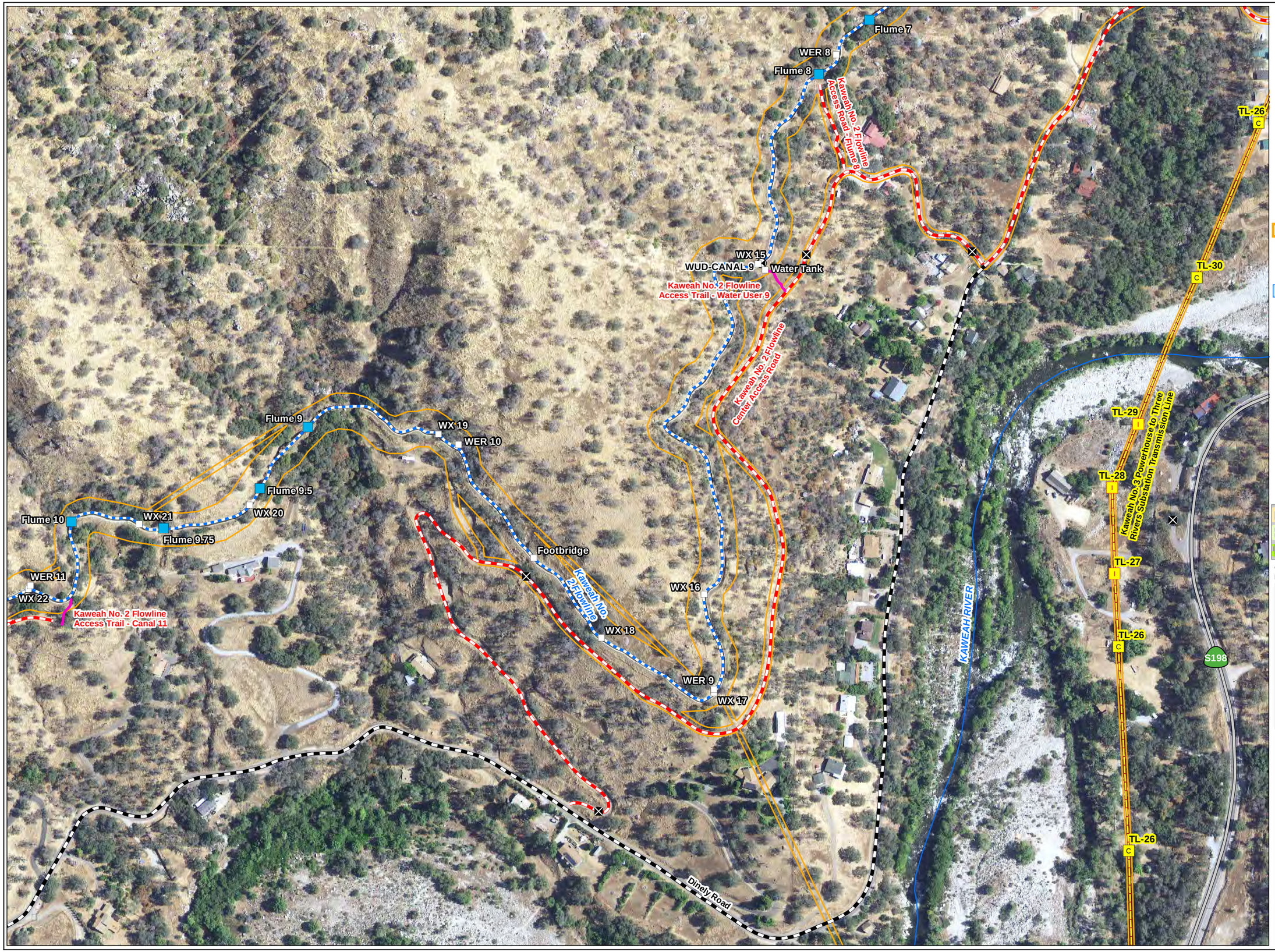


Facilities

- Powerhouse
- Diversion
- Flowline
- Spillway Channel or Pipe
- Penstock
- Flume Segment
- Ancillary Facility
- Gage
- Transmission Line
- Power Line
- Communication Line
- FERC Boundary

Other Features

- Watercourse
- Water Body
- Water User Diversion

Transportation

- Project Road
- Project Trail
- Non-Project General Access Road
- Gate

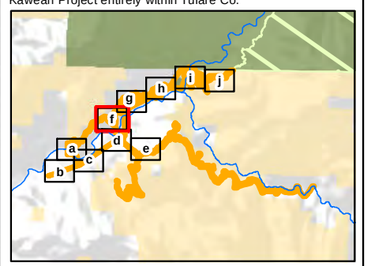
Transmission Line / Power Line with Configuration Type ID # and APLIC Consistency Determination

- C - Pole Configuration is Consistent with APLIC Guidelines
- I - Pole Configuration is Inconsistent with APLIC Guidelines

Land Jurisdiction*

- Bureau of Land Management
- Wilderness Area
- National Park Service

*SOURCE: BLM 2016
Kaweah Project entirely within Tulare Co.



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FERC Project No. 298

Map TERR 2-4f

Consistency of Project Transmission Line, Transmission Tap Line, and Powerline Configurations with APLIC Guidelines

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 1/14/2019

S:\SHARED\Holton\GIS\Cardno\30735240_SCE_EasternHydro\map\Kaweah\TerrestrialMaps\SCE_Eastern_KAWEAH_TPLineConfigs_APLIC_3K_17i11i_01.mxd

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Facilities

- Powerhouse
- Diversion
- Flowline
- Spillway Channel or Pipe
- Penstock
- Flume Segment
- Ancillary Facility
- Gage
- Transmission Line
- Power Line
- Communication Line
- FERC Boundary

Other Features

- Watercourse
- Water Body
- Water User Diversion

Transportation

- Project Road
- Project Trail
- Non-Project General Access Road
- Gate

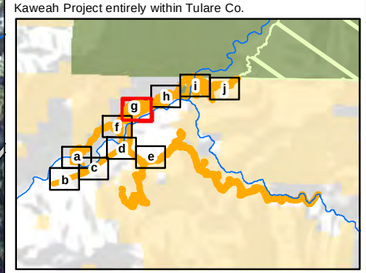
Transmission Line / Power Line with Configuration Type ID # and APLIC Consistency Determination

- C - Pole Configuration is Consistent with APLIC Guidelines
- I - Pole Configuration is Inconsistent with APLIC Guidelines

Land Jurisdiction*

- Bureau of Land Management
- Wilderness Area
- National Park Service

*SOURCE: BLM 2016
Kaweah Project entirely within Tulare Co.



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FERC Project No. 298

Map TERR 2-4g

Consistency of Project Transmission Line, Transmission Tap Line, and Powerline Configurations with APLIC Guidelines

0 125 250 Feet

Date: 1/14/2019

Projection: UTM Zone 11
Datum: NAD 83

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Facilities

- Powerhouse
- Diversion
- Flowline
- Spillway Channel or Pipe
- Penstock
- Flume Segment
- Ancillary Facility
- Gage
- Transmission Line
- Power Line
- Communication Line
- FERC Boundary

Other Features

- Watercourse
- Water Body
- Water User Diversion

Transportation

- Project Road
- Project Trail
- Non-Project General Access Road
- Gate

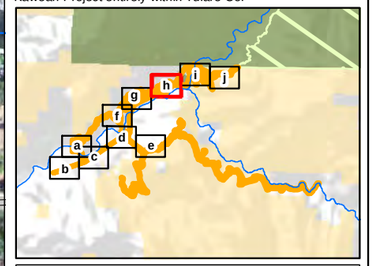
Transmission Line / Power Line with Configuration Type ID # and APLIC Consistency Determination

- C - Pole Configuration is Consistent with APLIC Guidelines
- I - Pole Configuration is Inconsistent with APLIC Guidelines

Land Jurisdiction*

- Bureau of Land Management
- Wilderness Area
- National Park Service

*SOURCE: BLM 2016
Kaweah Project entirely within Tulare Co.



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FERC Project No. 298

Map TERR 2-4h

Consistency of Project Transmission Line, Transmission Tap Line, and Powerline Configurations with APLIC Guidelines

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 1/14/2019

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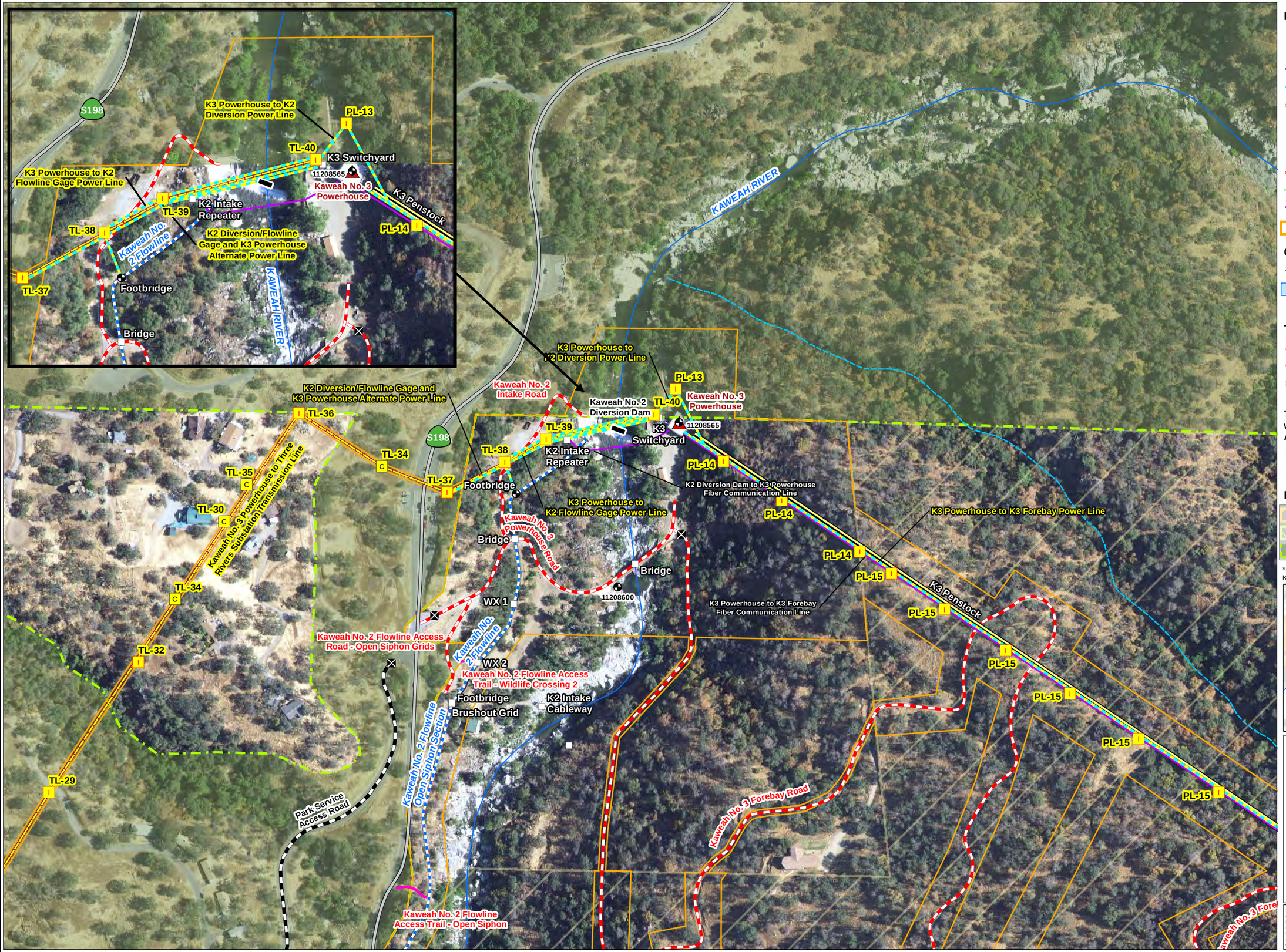


Facilities

- Powerhouse
- Diversion
- Flowline
- Spillway Channel or Pipe
- Penstock
- Flume Segment
- Ancillary Facility
- Gage
- Transmission Line
- Power Line
- Communication Line
- FERC Boundary

Other Features

- Watercourse
- Water Body
- Water User Diversion

Transportation

- Project Road
- Project Trail
- Non-Project General Access Road
- Gate

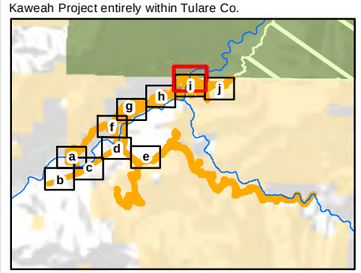
Transmission Line / Power Line with Configuration Type ID # and APLIC Consistency Determination

- C - Pole Configuration is Consistent with APLIC Guidelines
- I - Pole Configuration is Inconsistent with APLIC Guidelines

Land Jurisdiction*

- Bureau of Land Management
- Wilderness Area
- National Park Service

*SOURCE: BLM 2016
Kaweah Project entirely within Tulare Co.



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FERC Project No. 298

Map TERR 2-4i

Consistency of Project Transmission Line, Transmission Tap Line, and Powerline Configurations with APLIC Guidelines

Date: 1/14/2019

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

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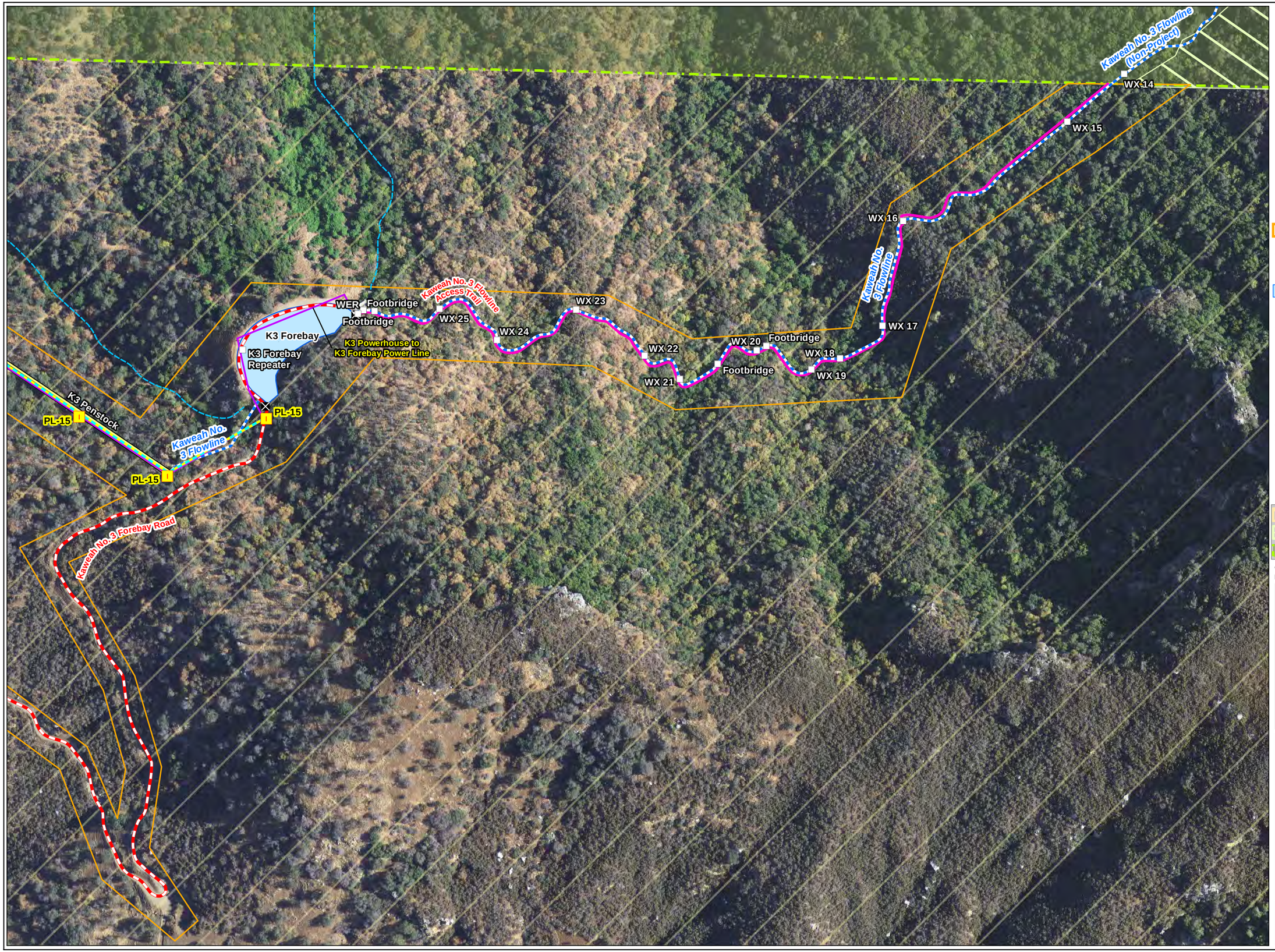


Facilities

- Powerhouse
- Diversion
- Flowline
- Spillway Channel or Pipe
- Penstock
- Flume Segment
- Ancillary Facility
- Gage
- Transmission Line
- Power Line
- Communication Line
- FERC Boundary

Other Features

- Watercourse
- Water Body
- Water User Diversion

Transportation

- Project Road
- Project Trail
- Non-Project General Access Road
- Gate

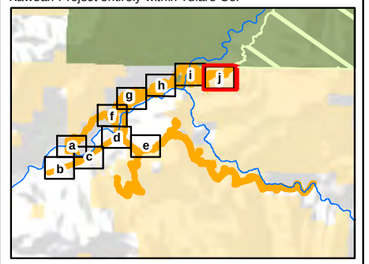
Transmission Line / Power Line with Configuration Type ID # and APLIC Consistency Determination

- C - Pole Configuration is Consistent with APLIC Guidelines
- I - Pole Configuration is Inconsistent with APLIC Guidelines

Land Jurisdiction*

- Bureau of Land Management
- Wilderness Area
- National Park Service

*SOURCE: BLM 2016
Kaweah Project entirely within Tulare Co.



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FERC Project No. 298

Map TERR 2-4j

Consistency of Project Transmission Line, Transmission Tap Line, and Powerline Configurations with APLIC Guidelines

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 1/14/2019

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CONFIDENTIAL

The following map is being withheld from public disclosure in accordance with applicable regulations. This map contains details on the locations of special-status biological resources and qualifies as Confidential Information [18 CFR §385.1112]. Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings visit http://www.ferc.gov/legal/ceii-foia/foia.asp.

Map TERR 2-5. Bat Roosts Identified During Reproductive Roost Surveys (CONFIDENTIAL)

This map 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) 302-9494, or david.moore@sce.com.

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CONFIDENTIAL

The following map is being withheld from public disclosure in accordance with applicable regulations. This map contains details on the locations of special-status biological resources and qualifies as Confidential Information [18 CFR §385.1112]. Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings visit http://www.ferc.gov/legal/ceii-foia/foia.asp.

Map TERR 2-6. Special-Status Bats Observed During Reproductive Acoustic and Mist Net Sampling (CONFIDENTIAL)

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CONFIDENTIAL

The following map is being withheld from public disclosure in accordance with applicable regulations. This map contains details on the locations of special-status biological resources and qualifies as Confidential Information [18 CFR §385.1112]. Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings visit http://www.ferc.gov/legal/ceii-foia/foia.asp.

Map TERR 2-7. Special-Status Bats Observed During Seasonal Use Acoustic and Mist Net Sampling (CONFIDENTIAL)

This map 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) 302-9494, or david.moore@sce.com.

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APPENDIX A

CNDDB Forms Submitted for Special-Status Species Observations (CONFIDENTIAL)

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CONFIDENTIAL

The following appendix is being withheld from public disclosure in accordance with applicable regulations. This appendix contains details on the locations of special-status biological resources and qualifies as Confidential Information [18 CFR §385.1112]. Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings visit http://www.ferc.gov/legal/ceii-foia/foia.asp.

Appendix A. CNDDB Forms Submitted for Special-Status Species Observations (CONFIDENTIAL)

This appendix 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) 302-9494, or david.moore@sce.com.

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APPENDIX B

Consistency Evaluation of Project Transmission Line, Transmission Tap Line, and Power Line Pole Configuration Types with APLIC Guidelines

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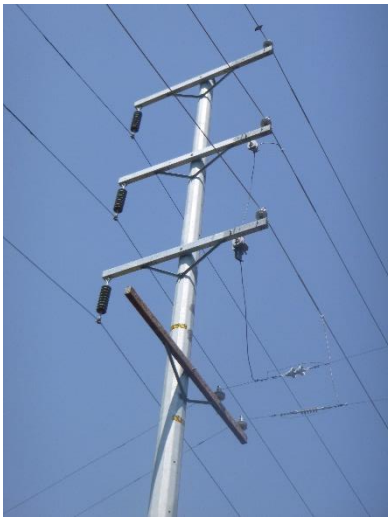
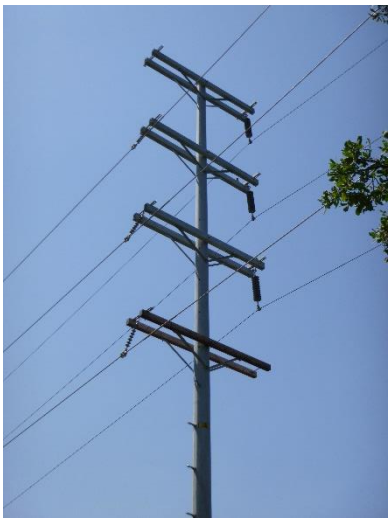
Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
TL-1	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard • Uninsulated or partially uninsulated jumper or transformer cables	
TL-2	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard • Uninsulated or partially uninsulated jumper or transformer cables	
TL-3	Consistent	

Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
TL-4	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard • Uninsulated or partially uninsulated jumper or transformer cables	
TL-5	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	
TL-6	Consistent	

Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
TL-7	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	
TL-8	Consistent	
TL-9	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	

Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
TL-10	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	
TL-11	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard • Uninsulated or partially uninsulated jumper or transformer cables	
TL-12	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	

Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
TL-13	Consistent	
TL-14	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard • Uninsulated or partially uninsulated jumper or transformer cables	
TL-15	Consistent	

Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
TL-16	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	
TL-17	Consistent	
TL-18	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	

Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
TL-19	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	
TL-20	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard • Uninsulated or partially uninsulated jumper or transformer cables	
TL-21	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	

Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
TL-22	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	
TL-23	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	
TL-24	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	

Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
TL-25	Consistent	
TL-26	Consistent	
TL-27	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard • Uninsulated or partially uninsulated jumper or transformer cables	

Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
TL-28	Inconsistent • Uninsulated or partially uninsulated jumper or transformer cables	
TL-29	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	
TL-30	Consistent	

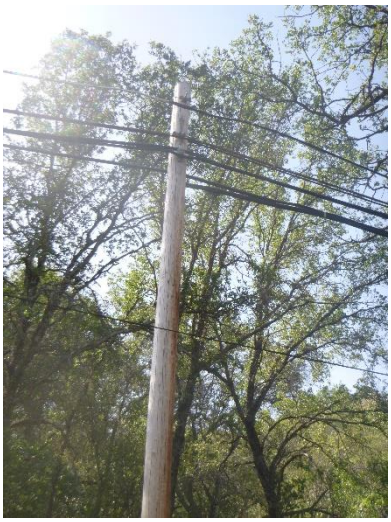
Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
TL-31	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	
TL-32	Inconsistent • Uninsulated or partially uninsulated jumper or transformer cables	
TL-33	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard • Uninsulated or partially uninsulated jumper or transformer cables	

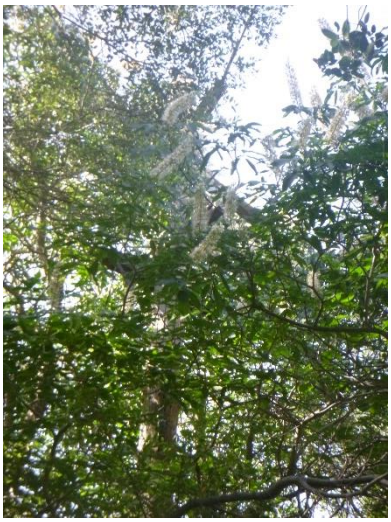
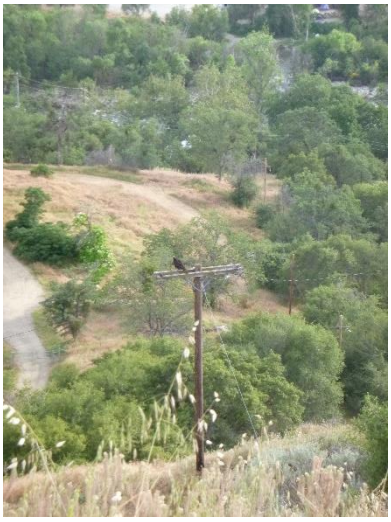
Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
TL-34	Consistent	
TL-35	Consistent	
TL-36	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard • Uninsulated or partially uninsulated jumper or transformer cables	

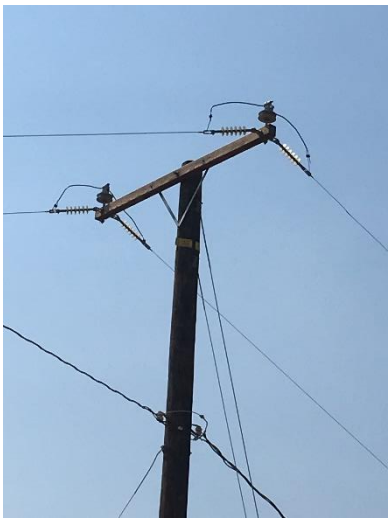
Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
TL-37	Inconsistent • Uninsulated or partially uninsulated jumper or transformer cables	
TL-38	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard • Uninsulated or partially uninsulated jumper or transformer cables	
TL-39	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	
TL-40	Inconsistent • Uninsulated or partially uninsulated jumper or transformer cables	

Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
TL-41	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard • Uninsulated or partially uninsulated jumper or transformer cables	
TL-42	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard • Uninsulated or partially uninsulated jumper or transformer cables	
TL-43	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	

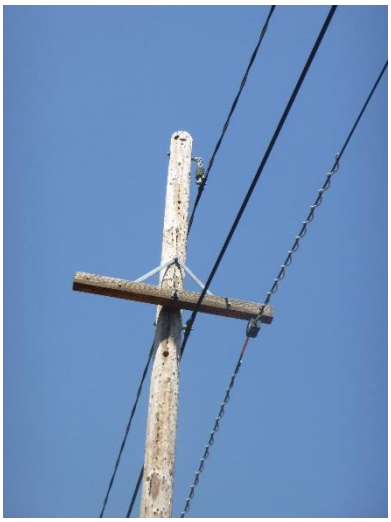
Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
TL-44	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard • Uninsulated or partially uninsulated jumper or transformer cables	
PL-1	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	
PL-2	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard • Uninsulated or partially uninsulated jumper or transformer cables	

Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
PL-3	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	
PL-4	Consistent	
PL-5	Consistent	

Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
PL-6	Consistent	
PL-7	Consistent	
PL-8	Consistent	

Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
PL-9	Consistent	
PL-10	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard • Uninsulated or partially uninsulated jumper or transformer cables	
PL-11	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard • Uninsulated or partially uninsulated jumper or transformer cables	

Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
PL-12	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	
PL-13	Inconsistent • Uninsulated or partially uninsulated jumper or transformer cables	
PL-14	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	

Pole Configuration Type	Consistency with APLIC Guidelines	Pole Configuration Photograph (Example)
PL-15	Inconsistent • Uncovered phase conductors <60 inches apart with no perch guard	

APPENDIX C

Bat Acoustic Activity Levels during Reproductive and Seasonal Acoustic Monitoring

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Bat Species Detected[2]	Acoustic Activity Levels at Project Facilities (Number of Detectors Deployed)[1]											
	Acoustic Units 1 & 2 • Kaweah No. 2 Powerhouse and Switchyard			**Acoustic Units 3 & 4** • Kaweah No. 1 Powerhouse and Switchyard • East Fork Kaweah River Conduit 1 at Power Plant near Hammond CA (USGS Gage No. 11208800) (SCE Gage No. 200a) • Kaweah No. 1 Powerhouse Campus			**Acoustic Units 5 & 6** • Kaweah No. 3 Powerhouse and Switchyard • Middle Fork Kaweah River Conduit No. 3 at Power Plant near Hammond CA (USGS Gage No. 11208565) (SCE Gage No. 206a) East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)		**Acoustic Units 7–12** • Kaweah No. 1 Flowline		**Acoustic Units 13 & 14** • Kaweah No. 1 Diversion Dam and Pool (East Fork Kaweah River) • East Fork Kaweah River near Three Rivers CA (USGS Gage No. 11208730) (SCE Gage No. 201)	
	Reproductive		**Seasonal Use**	**Reproductive**		**Seasonal Use**	**Reproductive**	**Seasonal Use**	**Reproductive**	**Seasonal Use**	**Reproductive**	**Seasonal Use**
	June	**August[3]**	**October**	**June**	**August[3]**	**October**	**June**	**October**	**June**	**October**	**June**	**October**
Special-Status Species												
Antrozous pallidus pallid bat	23.00	10.40	10.14	2.83	2.20	0.86	11.60	5.00	3.85	3.58	6.72	4.28
Corynorhinus townsendi Townsend's big-eared bat	0.25	0.40	2.43	—	0.20	0.86	0.46	1.00	3.44	1.71	0.14	0.86
Euderma maculatum spotted bat	0.33	0.40	0.14	—	—	—	—	—	—	—	—	—
Eumops perotis western mastiff bat	—	1.80	8.28	—	2.00	7.71	4.79	27.57	0.29	15.28	—	0.14
Lasiurus blossevillii western red bat	0.92	—	—	1.25	—	—	2.10	—	2.15	—	1.14	—
Myotis evotis long-eared myotis	—	—	—	—	—	—	0.46	—	2.99	—	1.14	—
Myotis thysanodes fringed myotis	—	—	—	—	—	—	1.31	—	—	—	—	—
Myotis yumanensis Yuma myotis	93.17	94.80	169.57	23.42	72.40	441.57	446.69	85.43	56.43	66.87	102.57	82.71
Common Species												
Eptesicus fuscus *big brown bat*	291.92	69.20	36.28	46.92	42.40	137.28	16.76	4.28	46.86	14.43	21.71	4.00
Lasiurus cinereus hoary bat	35.92	16.20	26.14	97.33	25.60	344.43	17.21	304.86	29.86	119.57	3.00	18.57
Myotis californicus California myotis	43.92	36.00	230.72	32.17	110.20	138.43	326.79	66.43	191.99	159.71	32.57	62.00
Myotis lucifugus little brown bat	59.00	3.00	57.08	—	1.60	3.72	1.00	3.43	4.14	1,883.58	1.29	3.43
Pipistrellus hesperus western pipistrelle	62.42	314.60	143.57	64.33	727.20	71.29	265.17	306.71	206.86	127.01	156.43	31.00
Tadarida brasiliensis Brazilian free-tailed bat	1,211.50	273.80	46.85	1,823.08	784.60	1,189.00	74.19	22.72	105.57	98.01	95.43	24.00

Notes:

[1] Acoustic activity levels are measured as the average number of files recorded per species per day.

[2] Bat activity was assessed using the Kaleidoscope Pro 4.5.5 software system, which typically has an accuracy rating between 70-80%. Therefore, this table does not represent final confirmation of species, but rather, allows a relative comparison between activity levels of different species.

[3] Because of detector malfunction, acoustic monitoring in June did not meet the minimum requirement of five consecutive nights of sampling. Therefore, detectors were deployed again in August at these sites.

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