

POTENTIAL RESOURCE ISSUES:

- Protection of vegetation alliances and associated wildlife habitats;
- Protection of special-status plant, lichen, and moss populations; and
- Prevention of the introduction or spread of non-native invasive plants (NNIPs).

PROJECT NEXUS:

- Project operations and maintenance could result in direct loss or degradation of vegetation alliances and wildlife habitats, including communities afforded special recognition by state and federal agencies (e.g., riparian areas and jurisdictional Waters of the United States).
- Project maintenance activities could result in removal or disturbance of special-status plant, lichen, and moss populations.
- Project maintenance activities could result in introduction or spread of NNIPs.

POTENTIAL LICENSE CONDITION:

- Vegetation and Integrated Pest Management Plan

STUDY OBJECTIVES:

- Document vegetation alliances and wildlife habitats adjacent to Project facilities.
- Document riparian vegetation alliances along bypass reaches and Project diversion pools and forebays.
- Document special-status plant 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 Technical Study Plan (TSP).

EXTENT OF STUDY AREA: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); and
- For riparian vegetation alliances, the study area includes streambanks of the bypass reaches and the shoreline of Project diversion pools and forebays.

Special-Status Plants and Non-Native Invasive Plants

For the purposes of the special-status plants and NNIP studies, the study area includes:

- All public lands within the Federal Energy Regulatory Commission (FERC) Project boundaries where operations and/or maintenance activities are conducted, plus a protective buffer. Refer to Table TERR 1-2 for the survey area by facility type.

- For surveys at or around Project facilities that are located outside of the FERC Project Boundary and on private property, SCE will take 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.

STUDY APPROACH:

Vegetation Alliances and Wildlife Habitats

- Develop vegetation alliance maps of the study area based on Classification and Assessment with LANDSAT of Visible Ecological Groupings (CALVEG) mapping and vegetation alliance descriptions.¹
 - Preliminary vegetation alliance information is presented in the Kaweah Project (FERC No. 298) Draft Existing Resource Information Report (SCE 2015), including the following:
 - Chapter 3.6 (Botanical and Wildlife Resources) provides a draft map of CALVEG vegetation alliances within 1 mile of Project facilities; and
 - Chapter 3.9 (Riparian Resources) provides a draft map showing CALVEG riparian vegetation alliances along the bypass reaches.
- Verify the accuracy of CALVEG data and update vegetation alliances using recent aerial photographs.
- Conduct ground-truthing of vegetation alliances within 0.25-mile of Project facilities, concentrating in areas where concerns about vegetation community identification or boundaries arise from review of aerial photographs. Inaccessible areas will not be ground-truthed. Ground-truthing will only be completed on lands within the FERC Project boundary or on private property where SCE has obtained land owner authorization.
- Cross-reference CALVEG vegetation alliances with California Wildlife Habitat Relationship (CWHR) System wildlife habitats, using the CALVEG–CWHR Crosswalk (U.S. Department of Agriculture – Forest Service [USDA-FS] 2014). This crosswalk was developed by USDA-FS and the California Department of Fish and Wildlife (CDFW) as a way to determine which wildlife habitats are likely to be present based on existing vegetation alliances and forest structural characteristics. Preliminary information is presented in the Kaweah Project (FERC No. 298) Draft Existing Resource Information Report, Chapter 3.6 (Botanical and Wildlife Resources) (SCE 2015).

¹The CALVEG system was developed by U.S. Department of Agriculture – Forest Service (USDA-FS) 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. CALVEG data for the Southern Sierra were updated by USDA-FS in 2014.

- Develop a Geographic Information System (GIS) map of vegetation alliances and wildlife habitats and overlay information on Project facilities.
- Develop a GIS map of riparian vegetation alliances and overlay information along the bypass reaches and Project diversion pools and forebays.

Special-Status Plants

For the purposes of this study plan, a special-status plant 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 (BLM 2013). In California, this includes all plants on BLM lands that are listed as FC, California state threatened (ST), endangered (SE), and rare (SR); 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.

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), special-status plants are also defined to include those species identified in the California Native Plant Society (CNPS) California Rare Plant Rank (CRPR) 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 study approach for special-status plants is provided below.

- Identify and map known occurrences of special-status plants within the study area, based on agency consultation and a review of existing information. Preliminary information is presented in the Kaweah Project (FERC No. 298) Draft Existing Resource Information Report, Chapter 3.6 (Botanical and Wildlife Resources) (SCE 2015).
- Develop a list of special-status plant species potentially occurring in the Project area based on literature review and agency consultation. A preliminary list is provided in the Kaweah Project (FERC No. 298) Draft Existing Resource Information Report, Chapter 3.6 Botanical and Wildlife Resources, Table 3.6-2 (SCE 2015).
- Conduct focused special-status plant surveys, according to the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2009).

- Field surveys will be 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 will be conducted, one in April and one in June (Table TERR 1-3).
- Timing of surveys will be verified based on reference population monitoring. Agencies will be notified of survey population monitoring results and proposed survey dates prior to implementation of surveys.
- Systematic field techniques will be implemented (e.g., zigzag patterns, random meandering, and linear transects) in the study area.
- If a special-status plant species population is identified on the perimeter of the study area, the study area will be expanded to document the full extent of the population.
- Surveys will be floristic in nature and taxonomy will be based on The Jepson Manual (Baldwin et al. 2012). A comprehensive list of species observed during field surveys will be compiled.
- Digital photographs, Global Positioning System (GPS) information, an estimate of the number of individuals present, and a description of associated vegetation alliance will be collected for each special-status plant population observed.
- Moss specimens will be collected and labeled with the date and collection location. Moss specimens will later be identified to species by a qualified bryologist.
- Develop a GIS map of special-status plant populations and overlay information on Project facilities.
- Prepare and submit California Native Species Field Survey Forms for all special-status plant populations recorded to California Natural Diversity Database (CNDDDB).

Non-Native Invasive Plants

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).

The study approach for NNIPs is provided below.

- Identify and map known occurrences of NNIPs based on agency consultation and a review of existing information. Preliminary information is presented in the Kaweah Project (FERC No. 298) Draft Existing Resource Information Report, Chapter 3.6, Botanical and Wildlife Resources (SCE 2015).
- Develop a list of priority NNIPs for focused NNIP surveys. This list will incorporate priority NNIPs identified through consultation with agencies.
- Conduct focused NNIP surveys in conjunction with special-status plant surveys.
- Collect data and report survey results as follows:
 - Data collected will include species, location, and number of acres infested by NNIPs.
 - If a NNIP population is identified on the perimeter of the study area, the study area will be expanded to document the extent of the population.

- Levels of infestation will be reported as: low (<5% cover); moderate (6–25% cover), and high (>25% cover). Areas that have been surveyed and found to be weed-free will also be identified.
- Develop a GIS map of noxious weeds and invasive non-native plants and overlay information on Project facilities.

SCHEDULE:

Date	Activity
April and June 2018	Conduct field surveys
July–October 2018	Analyze data and prepare draft report
November 2018	Distribute draft report to stakeholders
December 2018–February 2019	Stakeholders review and provide comments on draft report (90 days)
March–May 2019	Resolve comments and prepare final report
August 2019	Distribute final report in Draft License Application

REFERENCES:

- Bruce G. Baldwin (Editor), Douglas Goldman (Editor), David J Keil (Editor), Robert Patterson (Editor), Thomas J. Rosatti (Editor). 2012. The Jepson Manual, Vascular Plants of California. Second Edition.
- Bureau of Land Management (BLM). 2013. Special Status Plants under the Jurisdiction of the Bakersfield Office (September 10, 2013).
- California Department of Fish and Wildlife (CDFW). 2009. Evaluating Impacts to Special Status Native Plant Populations and Natural Communities
- California Invasive Plant Council (Cal-IPC). 2006. California Invasive Plant Inventory. Cal-IPC Publication 2006-02. California Invasive Plant Council: Berkeley, CA. Available at: www.cal-ipc.org.
- Esri. 2015. Service Layer for ArcGIS version 10.3. Compiled from various sources including Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, U.S. Department of Agriculture, U.S. Geological Survey, AEX, GETmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS Use Community.
- Southern California Edison Company (SCE). 2015. Kaweah Project (FERC No. 298) Draft Existing Resource Information Report.
- U.S. Department of Agriculture – Forest Service (USDA-FS). 2014. GIS data and vegetation descriptions. South Sierran Ecological Province. Available at: <http://www.fs.usda.gov/detail/r5/landmanagement/resourcemanagement/?cid=stelprdb5347192>.

TABLES

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	X			
Kaweah No. 2 Forebay and Spillway	X			
Kaweah No. 3 Forebay and Spillway	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			
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 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			

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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
Power Lines (continued)				
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			
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			

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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
Stream Gages (continued)				
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 – Lower Pine	X			
Kaweah No. 1 Flowline Access Road – Lumberyard	X			
Kaweah No. 1 Flowline Access Road – Slick Rock	X		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. 1 Forebay Road	X			
Kaweah No. 1 Intake Road	X		X	
Kaweah No. 2 Development				
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 8	X			
Kaweah No. 2 Flowline Access Road – Flume 11	X		X	
Kaweah No. 2 Flowline Access Road – Open Siphon Grids	X			
Kaweah No. 2 Flowline Access Road – Red Barn	X		X	
Kaweah No. 2 Flowline Center Access Road	X		X	
Kaweah No. 2 Flowline East Access Road	X			
Kaweah No. 2 Flowline West Access Road	X		X	
Kaweah No. 2 Forebay Road	X			
Kaweah No. 2 Intake Road	X			X

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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
Project Access Roads (continued)				
Kaweah No. 2 Development (continued)				
Kaweah No. 2 Penstock Road	X			
Kaweah No. 2 Powerhouse Road	X			
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 – Grand Canyon	X		X	
Kaweah No. 1 Solar Panel Access Trail		X		
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	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			
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		

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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
Ancillary and Support Facilities (continued)				
Kaweah No. 1 Grapevine Satellite Repeater	X			
Kaweah No. 2 Powerhouse River Access Parking	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			

Notes:

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

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 (May 2015)
 Parcel Vintage: 02/12/2013
 Attribute Vintage: 02/17/2015

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

Project Facility	Survey Area¹
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

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

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

Table TERR 1-3. Blooming Periods for Special-Status Plants Identified by Resource Agencies as Potentially Occurring in the Kaweah Project Vicinity.

Scientific/Common Name	Blooming Period											
	January	February	March	April	May	June	July	August	September	October	November	December
<i>Brodiaea insignis</i> Kaweah brodiaea												
<i>Eriogonum nudum</i> var. <i>murinum</i> mouse buckwheat												
<i>Iris munzii</i> Munz's iris												
<i>Brasenia schreberi</i> Watershield												
<i>Carex praticola</i> northern meadow sedge												
<i>Caulanthus californicus</i> California jewelflower ¹												
<i>Clarkia springvillensis</i> Springville clarkia ¹												
<i>Delphinium purpusii</i> rose-flowered larkspur												
<i>Delphinium recurvatum</i> recurved larkspur ¹												
<i>Eremalche</i> (= <i>Malvastrum</i>) <i>kernensis</i> ¹												
<i>Eryngium spinosepalum</i> spiny-sepaled button-celery ¹												
<i>Fritillaria striata</i> striped adobe-lily												
<i>Glyceria grandis</i> American manna grass												
<i>Leptosiphon serrulatus</i> Madera leptosiphon												
<i>Mimulus norrisii</i> Kaweah monkeyflower												
<i>Mimulus pictus</i> calico monkeyflower												
<i>Pseudobahia peirsonii</i> San Joaquin adobe sunburst												
<i>Ribes menziesii</i> var. <i>ixoderme</i> aromatic canyon gooseberry												
<i>Sidalcea keckii</i> Keck's checker-mallow												

¹ Species is unlikely to occur. Project area outside species' known range (per BLM communication April 2016).