

Kaweah Project

Technical Study Plan Objectives

Aquatic Resources

AQ 1 – Instream Flow Technical Study Plan

- The overall study objective is to characterize aquatic and riparian habitat as a function of flow using ecological principles and site-specific hydraulic and habitat modeling (e.g., Bovee et al. 1998). The information developed from this study, in combination with other resource studies (e.g., water temperature, fish passage, fish population, and special-status amphibian and reptile studies), will provide a basis for streamflow-related resource management decisions.
- The specific objectives of the study include:
 - Delineate the bypass rivers into segments with similar hydrology and channel characteristics (e.g., slope, channel dimensions, channel pattern);
 - Map the mesohabitat types (e.g., pool, run, riffle) in the bypass river segments;
 - Quantify the habitat versus flow relationships for fish, special-status amphibian, benthic macroinvertebrate, and riparian resources in the bypass river segments;
 - Use the habitat versus flow relationships to develop a time series analysis of aquatic habitat under existing and unimpaired flow scenarios for the bypass river segments;
 - Identify the time periods, flow conditions, and life stages when habitat may be a limiting factor for fish, benthic macroinvertebrate, special-status amphibian, and riparian populations for the existing and unimpaired scenarios; and
 - Provide information necessary to quantify the potential effects of other alternative flow scenarios on aquatic and riparian habitat.

AQ 2 – Fish Population Technical Study Plan

- Document fish species composition, distribution, and abundance in the bypass river reaches.
- Characterize fish growth, condition factor, and population age structure in the bypass river reaches.

AQ 3 – Macroinvertebrate Technical Study Plan

- Document the density and size distribution of drifting macroinvertebrates in selected bypass river reaches for input to bioenergetics growth analysis.
- Document the benthic macroinvertebrate community in the bypass reaches and reference reaches to characterize general habitat conditions.

AQ 4 – Water Temperature Modeling Technical Study Plan

- Characterize the relationship between flow and water temperature in bypass river reaches using an appropriate model supported by existing water temperature data.
- Assess the potential effects of increased air temperature due to global warming on water temperatures over the term of the new Federal Energy Regulatory Commission (FERC) license.
- Document the availability of cold water temperature refugia in bypass river reaches.

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AQ 5 – Geomorphology Technical Study Plan

- Document sediment conditions in the bypass river reaches.
- Characterize sediment capture in diversion pools.
- Develop information to assist in the identification of flows necessary to maintain geomorphic processes in the bypass river reaches.
- Identify sources of sediment (major gullies, areas of vegetation and soil loss, and hillslope destabilization and erosion), including documentation of erosion resulting from spills from Project forebays and historic flume failures.

AQ 6 – Water Quality Technical Study Plan

- Characterize physical, chemical, and bacterial water quality conditions in the bypass river reaches and comparison reaches, and compare to the Water Quality Control Plan for the Tulare Lake Basin (CVRWQCB 2004) objectives and water quality standards.

AQ 7 – Special-status Amphibian and Aquatic Reptile Technical Study Plan

- Identify and map potential habitat for FYLF in the study area.
- Document the distribution and abundance of FYLF populations in the study area.
- Document the timing and length of FYLF breeding season, if FYLF are present.
- Characterize the water stage, velocity, and temperature of various flow regimes as it relates to FYLF habitat through coordination with the instream flow and water temperature studies.
- Document the presence of WPT during FYLF surveys.
- Document the presence of potential WPT nesting habitat.

AQ 8 – Fish Passage Technical Study Plan

- Document the location, nature, and characteristics of fish barriers in bypass river reaches.
- Identify Project facilities and operations (e.g., diversion structures, instream flow releases) that may affect fish passage.

AQ 9 – Entrainment Technical Study Plan

- Characterize Project diversions, flowlines, powerhouse turbines, and operations in relation to factors that may affect entrainment or mortality.
- Directly estimate the potential for entrainment and mortality by sampling fish entrainment in the Project flowlines.
- Develop the information necessary to assess the potential fish population/production effects of entrainment.

Kaweah Project Technical Study Plan Objectives

Cultural Resources

CUL 1 – Cultural Resources Technical Study Plan

- Identify all known and currently undiscovered cultural resources that could potentially be affected by Project operation and maintenance activities.
- Evaluate newly discovered cultural resources to determine if they are eligible for listing in the NRHP.

Land Management

LAND 1 – Transportation System Technical Study Plan

- Inventory and assess condition of Project roads and trails.
- Characterize SCE's use of Project roads and trails, including season of use and level of use.
- Characterize SCE's current maintenance practices and responsibilities.
- Identify existing agreements related to Project roads and trails (e.g., maintenance agreements, easements, rights of way, special use permits).
- Identify the location, condition, use, and maintenance of helicopter landing sites utilized for routine operation and maintenance of the Project.

LAND 2 – Aesthetic Resources Technical Study Plan

- Identify and map visual resources in the vicinity of the Kaweah Project, including visual management objectives established by the Bureau of Land Management (BLM), Tulare County, and/or the National Park Service (NPS), as appropriate.
- Document the existing visual condition (EVC) of Project facilities from Key Observation Points (KOPs) established in consultation with the BLM, Tulare County, and/or the NPS, as appropriate.
- Determine whether the Project facilities meet established BLM, Tulare County, and/or NPS visual resource management objectives and assess compatibility of Project facilities with surrounding landscape.
- Assess helicopter noise associated with routine operation and maintenance of the Project.
- Assess visual condition and noise associated with spills from the Kaweah No. 3 Forebay.

Kaweah Project Technical Study Plan Objectives

Recreation

REC 1 – Recreation Use Technical Study Plan

- Identify, map and describe all developed recreation facilities (public and private) in the vicinity of the Kaweah Project, including capacity and ownership;
- Identify, map and describe any existing Project-related recreation facilities/area (i.e., “Edison Beach”), including capacity, condition, user conflicts, consistency with applicable accessibility requirements, and operation and maintenance responsibilities;
- Characterize recreation use and opportunities in the immediate vicinity of the Project facilities and in the bypass reaches;
- Document recreation needs identified in current relevant State or local recreation plans and determine whether those needs can be accommodated by existing recreation facilities;
- Characterize commercial and private whitewater boating use in the bypass reaches;
- Identify the range of flows in the bypass reaches that accommodate whitewater boating;
- Identify existing mechanisms for disseminating flow information to the public; and
- Document potential safety issues and existing features or measures that are implemented to protect the public.

Terrestrial Resources

TERR 1 – Botanical Resources Technical Study Plan

- 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.

TERR 2 – Wildlife Resources Technical Study Plan

- 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 Plan (TSP).
- 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.