
Appendix I
Study Plan Outlines

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APPENDIX I**STUDY PLAN OUTLINES**

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STUDY PLAN OUTLINE 1. AQUATIC INVASIVE SPECIES

Summary of Existing Information and Additional Information to be Developed by the Study

Existing, relevant, and reasonably available information regarding AIS in the proposed Project boundary is provided in Section 4.5. Licensees found four documented AIS observations of AIS in Pyramid Lake (American bullfrog, African clawed frog, sago pondweed and coontail), and identified nine additional AIS that have not been found in the proposed Project boundary, but have a potential to be introduced from recreationists using reservoirs where these species occur. Currently, Licensees conduct early detection monitoring for both veliger and adult stages of quagga mussel and zebra mussel in Project reservoirs, and has not found either of the species. Additional information, which would be provided by this study, would be the presence/absence of AIS in Project waters, and the relative distribution and abundance of the AIS, if they are present.

Study Area, Methods and Analysis

The study area would consist of Pyramid Lake. The study area would not include Quail Lake or Elderberry Forebay since recreation contact, the primary vector for introducing AIS to water is prohibited. Only non-water contact recreation is permitted at Quail Lake and Elderberry Forebay is closed to the public due to safety concerns.

The study would consist of four steps: (1) gather any known data and prepare for fieldwork; (2) conduct surveys; (3) prepare data and perform quality assurance; and (4) prepare a study report. Surveys would be conducted in the study area for AIS plants by boat, following standard CDFW plant survey methodology, as modified for in-water surveys. Surveys would occur between May and September when AIS plants are most readily identifiable. Surveys would be conducted for AIS mollusks using standard methods in malacology, including dip netting, sieving, and visual surveying. These surveys would be performed during the same approximate time as the AIS plant surveys. Licensees would continue conducting early detection monitoring for both the veliger and adult stages of quagga mussel and zebra mussel. Other AIS, which have not been found in Quail Lake or Pyramid Lake, if observed during the study or other Licensees' relicensing studies, would be noted as incidental sightings. Where applicable and relevant to the potential introduction or establishment of AIS in the study area, water quality would be reviewed. A study report summarizing methods and results would be prepared and included in Licensees' Initial Study Report (ISR) and in Licensee's DLA and FLA.

Consistency of Methodology with Generally Accepted Scientific Practices

The study methods would be consistent with methods used to perform AIS surveys, including 2014 surveys for Asian clams in New York and 2010 surveys for New Zealand mudsnails in Washington, as well as the CDFW's 2009 protocol for botanical surveys, which generally would follow the methods for surveying invasive aquatic plants.

STUDY PLAN OUTLINE 2. QUAIL LAKE FISH POPULATIONS

Summary of Existing Information and Additional Information to be Developed by the Study

Existing, relevant, and reasonably available information regarding fish populations in Quail Lake is provided in Section 4.5. As a summary, Licensees found little information regarding fish populations in Quail Lake. A single DWR brochure describes six species of fish that can be found there, including striped bass, channel catfish, blackfish, tule perch, threadfin shad, and hitch. Quail Lake is not stocked. Additional information, which would be provided by the study, includes a current characterization of fishes in Quail Lake.

Study Area, Methods and Analysis

The study area would consist of the area within the proposed Project boundary surrounding Quail Lake.

The study would consist of four steps: (1) conduct planning; (2) conduct fieldwork; (3) prepare data and perform quality assurance; and (4) prepare a report. The shoreline of Quail Lake would be sampled using boat electrofishing at night. Sampling would employ an approach similar to that used by CDFW in 2013 at Pyramid Lake. The shoreline would be divided into six, 0.5-miles-long sites and each would be sampled for a minimum of 10 minutes of pulsed direct current applied to the water. Electrofishing would be done in a leap frog manner, parallel to the shoreline in roughly 50-foot segments. Surveys would occur on one night in the spring (May) and one night in the fall (October). Fish would be identified by species, and lengths and weights would be recorded for the first 25 fish of each species collected at each site. Length frequency distribution, length-weight relationships, relative weights, and (if an adequate number are captured) relative stock density would be evaluated for sport fish species. Relative stock density would be calculated as the percentage of fish sampled greater than 6 inches. Standing stock estimates would be reported as number and weight of fish by species per pounds per acre, and kilograms per hectare. A study report summarizing methods and results would be prepared and included in Licensees' ISR and in Licensee's DLA and FLA.

Consistency of Methodology with Generally Accepted Scientific Practices

The study methods would be consistent with the methods used by CDFW in recent electrofishing studies at Pyramid Lake (CDFW 2013).

STUDY PLAN OUTLINE 3. PYRAMID REACH FISH POPULATIONS

Summary of Existing Information and Additional Information to be Developed by the Study

Existing, relevant, and reasonably available information regarding fish populations in Pyramid reach is provided in Section 4.5. As a summary, surveys conducted by CDFW in Pyramid reach in 1987 detected two native species (rainbow trout and prickly sculpin) and five introduced fishes (bluegill, green sunfish, largemouth bass, catfish, and brown trout). CDFW stocked Pyramid reach with rainbow trout and largemouth bass in the 1930's, and with rainbow trout from the 1940's to August 2008 when CDFW suspended fish stocking in the reach as part of a settlement to end a CEQA lawsuit. Additional information, which would be provided by the study, includes a current characterization of fishes in Pyramid reach.

Study Area, Methods and Analysis

The study area would consist of Pyramid reach (i.e., the 18.4-mile-long section of Piru Creek from Pyramid Dam to the NMWSE of Lake Piru).

The study would consist of six steps: (1) conduct mesohabitat mapping; (2) select sampling sites; (3) collect data; (4) prepare data and perform quality assurance; (5) analyze data; and (6) prepare a report. Habitat would be mapped using a combination of ground-based surveys and aerial imagery. Areas mapped using aerial imagery would be ground-truthed with ground-based mapping data to assure overall accuracy of the habitat mapping results. Ground based mapping would follow a three-tiered habitat mapping classification system developed by Hawkins et al. (1993), and would be used to assist in the identification of individual habitat units in the field. Level III categories generally modified/adopted from McCain et al (1990) would be used. Three sites would be selected, one in the 2-mile-long section of Pyramid reach between Pyramid Dam and the concrete weir upstream of Frenchman's Flat; one within a mile downstream of Frenchman's Flat; and the third within one mile upstream of Blue Point Campground. The sites would be selected at accessible locations, would represent the overall habitat ratios found in the reach using habitat mapping data available for the reach, and would be in areas with minimal recreational fishing. Sampling would be conducted in the spring (April) and fall (October). Two sampling events would provide information about changes in the fish community related to seasonal changes in habitat. A three-pass removal protocol as described by Temple et al. (2007), utilizing electrofishing, would be used at all sites. If permits cannot be acquired for electrofishing, then a visual observation protocol described by Hankin and Reeves (1988) would be utilized for snorkel sampling of each site. In the case that electrofishing is used for data collection, all fish captured would be identified by species, counted, and measured for length and weight. In addition, prior to electrofishing, a biologist would walk both banks of the survey area to be sure no ESA-listed or SSC species are present that could be disturbed by the electrofishing. If snorkeling is used, fish would be identified by species, counted, and put into predetermined length bins based on two-inch intervals.

Habitat data would be collected for each site. Water quality data including temperature, conductivity, and dissolved oxygen would be recorded. The average and maximum depth, wetted width and flood prone width, thalweg length, substrate including estimate of potential spawning habitat, and cover would be recorded for each site. A discharge measurement would also be taken at each site.

Analyses would focus on three key constituents of fish populations: (1) individual condition factor; (2) individual species populations and biomass; and (3) community analysis. Fish size and weight data would be examined to establish a baseline for condition factor at each site for the general health of individuals. Population level analysis would include size structure based on relative stock densities as calculated based on Anderson and Neumann (1996). Relative stock density would be calculated as the percentage of fish sampled greater than 6 inches. Standing stock estimates would be reported as number and weight of fish by species per 100 meters of stream, number per mile, pounds per acre, and kilograms per hectare. Additional population level analysis would include length frequency analysis to evaluate the age structure of each population of fish. Analysis would also include species composition and relative abundance as data allows. The condition of fish communities would be evaluated based on the rigor of the collected data described above at three levels of organization: (1) the individual; (2) the population; and (3) the community level as described in Moyle et al. (2002) and Moyle and Marchetti (1998). A study report summarizing methods and results would be prepared and included in Licensees' ISR and in Licensee's DLA and FLA.

Consistency of Methodology with Generally Accepted Scientific Practices

These methods would be generally consistent with the methods used for recent FERC hydroelectric relicensing efforts in California, including for the Drum-Spaulding Project (FERC Project No. 2310), Yuba-Bear Hydroelectric Project (FERC Project No. 2266) and Yuba River Development Project (FERC Project No. 2246).

STUDY PLAN OUTLINE 4. SPECIAL-STATUS AQUATIC AMPHIBIANS AND SEMI-AQUATIC SNAKES STUDY

Summary of Existing Information and Need for Additional Information to be Developed by the Study

Existing, relevant and reasonably available information regarding special-status aquatic and semi-aquatic species and their habitat within the proposed Project boundary is provided in Section 4.5 of the PAD. As a summary, Licensees determined that two aquatic-breeding special-status amphibians and two semi-aquatic snake species have the potential to occur: western spadefoot (*Spea hammondi*), foothill yellow-legged frog (FYLF) (*Rana boylei*), two-striped garter snake (*Thamnophis hammondi*), and “South Coast garter snake” (defined as a form of California red-sided garter snake [*Thamnophis sirtalis infernalis*] from the coastal plain from the Santa Clara River Valley in Ventura County to San Diego County, possibly extending into adjacent foothills [Jennings and Hayes 1994]). There are recent records for two-striped garter snake within or near the Project boundary and along Piru Creek. FYLF is described as apparently extirpated on Piru Creek and throughout southern California south of Monterey County (Jennings and Hayes 1994). Additional information, which will be provided by this study, includes field reconnaissance to identify potential habitat for these species in the study area and results of surveys within these identified habitats in relation to Project facilities and normal O&M activities.

Study Area, Study Methods and Analysis

The study area would consist of the area within the proposed Project boundary, excluding lands overlying the Angeles Tunnel on which Licensees do not perform any Project activities. In addition, the study area would include Pyramid reach, excluding the lowermost uppermost 4.5-mile-long section where existing information is fully adequate as a result of annual sensitive species monitoring since 2010.

The study would consist of four steps: (1) summarize existing information and preliminary identification of potential habitat; (2) perform a field reconnaissance and surveys where additional information is needed, and where accessible; (3) prepare the data and perform quality assurance; and (3) prepare a report. Survey methods would be appropriate to each species. FYLF is a diurnally active, stream species easily differentiated from other frog species and detectable by observation of one or more life stages (i.e., adults, juveniles, larvae, or egg masses) in suitable habitat. Western spadefoot is a terrestrial and fossorial species, which breeds somewhat unpredictably by season and location, and therefore can be difficult to document. Surveys would focus on potential breeding habitats, where larvae may be observed, including vernal pools and seasonal pools within intermittent streams or washes. The two garter snake species are semi-aquatic, closely associated with streams and wetlands, particularly where amphibians and small fish occur, and are diurnally active. Therefore, although there are no established survey protocols, these species are likely to be detected, if present, by multiple inspections of potential habitat. Up to three surveys would be performed in areas of potential habitat. Identification materials for each species would be provided to

biologists engaged in other relicensing studies for the Licensees with instructions to document and report any incidental observations of these species. Any species observations would be recorded and reported to the CNDDDB and appropriate agencies. Where the species are documented, Biologists would review Project O&M activities, including vegetation control and recreation use areas to areas with a Project nexus. After completion of the surveys, Licensees would identify any Project O&M and recreational activities that occur in the vicinity of where the species were documented. A study report summarizing methods and results would be prepared and included in Licensees' ISR and in Licensee's DLA and FLA.

Consistency of Methodology with Generally Accepted Scientific Practices

This study is consistent with the goals, objectives, and methods outlined for recent FERC hydroelectric relicensing efforts in California for areas where these or similar special-status species potentially occur.

STUDY PLAN OUTLINE 5. BOTANICAL RESOURCES

Summary of Existing Information and Additional Information to be Developed by the Study

Existing, relevant, and reasonably available information regarding special-status plants within the proposed Project boundary is provided in Section 4.6 and Section 4.7. As a summary, Licensees found that no comprehensive plant surveys or vegetation habitat mapping have been performed recently in the Project area. Existing mapping (NWI data and CalVeg data) is based on remote sensing, aerial photograph interpretation, or both, with little to no field verification. These limited data available from field surveys indicate that sensitive habitats, including wetlands, riparian areas, and littoral zones, exist in the proposed Project boundary, but the locations, extent, and conditions are not known. A number of special-status plants have the potential to occur in the proposed Project boundary based on the proximity to other recorded occurrences and suitable elevation range and habitat requirements, but no special-status plant surveys have been conducted aside from surveys in isolated locations related to other projects. Additional information, which would be provided by this study, would include a determination of vegetation types, wetland and riparian conditions and special-status plants in the proposed Project boundary.

Study Area, Methods and Analysis

The study area would consist of the area within the proposed Project boundary, excluding lands overlying the Angeles Tunnel on which Licensees do not perform any Project activities.

The study would consist of four steps: (1) map vegetation types in the study area using aerial imagery and existing information (NWI, CALVEG, etc.); (2) conduct field surveys to verify vegetation mapping, collect data on wetland and riparian area quality, and identify the locations of special-status plant species if present; (3) prepare data and perform quality assurance; and (4) prepare a study report. Representative vegetation types would be visited during field surveys to confirm boundaries and to collect vegetation data using the CNPS rapid assessment vegetation sampling technique. Under this method, vegetation data would be collected and habitats would be described using the Manual of California Vegetation field-assessed vegetation alliance name. Wetlands and riparian areas mapped during the desktop review would be visited during the field survey to assess the condition of the habitat using the Proper Functioning Condition qualitative method in Pritchard et al (1998) and in Pritchard et al (2003). All areas of potentially suitable habitat for special-status plant species would be surveyed. Special-status plant species surveys would be conducted following CDFW's Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities. After completion of vegetation type and special-status plant species mapping, Licensees would identify any Project O&M and recreational activities that occur in the vicinity of the identified sensitive communities or special-status plants. A study report summarizing methods and results would be prepared and included in Licensees' ISR and in Licensee's DLA and FLA.

Consistency of Methodology with Generally Accepted Scientific Practices

The methods would be generally consistent with the methods used for recent FERC hydroelectric relicensing efforts in California, including the Don Pedro Project (FERC No. 2299), Yuba River Development Project and Merced River Hydroelectric Project (FERC No. 2174), and would use standard botanical survey methods as defined by CDFW.

STUDY PLAN OUTLINE 6. NON-NATIVE INVASIVE PLANTS

Summary of Existing Information and Additional Information to be Developed by the Study

Existing, relevant, and reasonably available information regarding NNIP within the proposed Project boundary is provided in Section 4.6 and Section 4.7. As a summary, Licensees found that several NNIP species have been reported in the Project area, but no comprehensive NNIP surveys have been performed. Additional information, which would be provided by this study, would include a determination of presence and general quantity of NNIPs in the proposed Project boundary.

Study Area, Methods and Analysis

The study area would consist of the area within the proposed Project boundary, excluding lands overlying the Angeles Tunnel on which Licensees do not perform any Project activities.

The study would be performed in conjunction with DWR's relicensing Botanical Resources Study, and would consist of four steps: (1) conduct field surveys for NNIP; (2) prepare data and perform quality assurance; and (3) prepare a study report. All areas of potentially suitable habitat for NNIP would be surveyed. The locations of any NNIP encountered during surveys would be mapped, and the number of individual plants estimated. After completion of NNIP mapping, DWR would identify any Project O&M and recreational activities that occur in the vicinity of the NNIP. A study report summarizing methods and results would be prepared and included in Licensees' ISR and in Licensee's DLA and FLA.

Consistency of Methodology with Generally Accepted Scientific Practices

The methods would be generally consistent with the methods used for recent FERC hydroelectric relicensing efforts in California, including the Yuba River Development Project and Merced River Hydroelectric Project, and would use standard botanical survey methods as defined by CDFW.

STUDY PLAN OUTLINE 7. SPECIAL-STATUS TERRESTRIAL WILDLIFE SPECIES

Summary of Existing Information and Additional Information to be Developed by the Study

Existing, relevant, and reasonably available information regarding special-status terrestrial wildlife species and their habitat within the proposed Project boundary is provided in Section 4.6. As a summary, Licensees found no recent special-status species wildlife survey information. Based on available information, several special-status species are likely or known to inhabit the proposed Project boundary including: coast horned lizard, loggerhead shrike, loon (wintering), golden eagle (non-nesting), bald eagle (wintering), northern harrier, tricolored blackbird, yellow warbler, Townsend's big-eared bat, western mastiff bat, and ringtail. Additional information, which would be provided by this study, would include field-based habitat mapping to determine the presence/absence of special-status wildlife species habitat within the proposed Project boundary.

Study Area, Methods and Analysis

The study area would consist of the area within the proposed Project boundary, excluding lands overlying the Angeles Tunnel on which Licensees do not perform any Project activities.

The study would consist of five steps: (1) conduct current CNDDDB analysis; (2) prepare habitat association maps based on WHR system protocols; (3) conduct field visits to representative locations to confirm habitat types and quality, and determine presence/absence of habitat; (4) prepare data and perform quality assurance; and (5) prepare a study report. Field verification efforts would focus on habitat type, habitat continuity, surrounding land uses and the probability of the habitat supporting special-status wildlife species. Surveys would be conducted at a time of year that would yield the best opportunity to observe special-status wildlife species (i.e., nesting season). Biologists would note Project O&M activities, including vegetation control and recreation use areas that overlap with the location of special-status wildlife habitat. A study report summarizing methods and results would be prepared and included in Licensees' ISR and in Licensee's DLA and FLA.

Consistency of Methodology with Generally Accepted Scientific Practices

The study methods would be consistent with the methods used for recent FERC hydroelectric relicensing efforts in California, including the Oroville Facilities relicensing (FERC No. 2100).

STUDY PLAN OUTLINE 8. ESA-LISTED PLANTS

Summary of Existing Information, and Additional Information to be Developed by the Study

Existing, relevant, and reasonably available information regarding ESA-listed plants within the proposed Project boundary is provided in Section 4.8. As a summary, Licensees found no recent surveys for ESA-listed plants or documented occurrences of ESA-listed plants within the proposed Project boundary. Existing information suggests that seven ESA-listed plants (slender-horned spineflower, San Fernando Valley spineflower, marsh sandwort, Nevin's barberry, Gambel's watercress, spreading navarretia, and California orcutt grass) could potentially occur if there is suitable habitat within the proposed Project boundary. Additional information, which would be provided by this study, is the presence/absence of these and other ESA-listed plants within the proposed Project boundary, and their relative abundance and location, if they occur.

Study Area, Methods and Analysis

The study area would consist of the area within the proposed Project boundary, excluding lands overlying the Angeles Tunnel on which Licensees do not perform any Project activities.

The study would be performed in conjunction with Licensees' relicensing Botanical Resources Study, which consists of a comprehensive floristic survey within the study area. The study would consist of four steps: (1) identify potential habitat for ESA-listed plants; (2) conduct surveys; (3) prepare data and perform quality assurance; and (4) prepare a study report. Surveys would follow methodology described in the botanical survey section of CDFW's Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities. Additional efforts would focus on habitats with a higher probability of supporting ESA-listed plants. Taxonomy and nomenclature would be based on The Jepson Manual. If an ESA-listed plant occurrence is identified, Project O&M and recreation activities that occur in the area would be noted. A report summarizing study methods and results would be prepared and included in Licensees' ISR and in Licensee's DLA and FLA. If any ESA-listed plants are found, the report would be considered "Privileged," and would only be provided to FERC, USFWS, and CDFW, and to the USFS if any ESA-listed plants are found on NFS lands.

Consistency of Methodology with Generally Accepted Scientific Practices

The study methods would be consistent with the methods used for recent FERC hydroelectric relicensing efforts in California, including the Don Pedro Project, Yuba River Development Project and Merced River Hydroelectric Project, and would use standard botanical survey methods as defined by CDFW.

STUDY PLAN OUTLINE 9. ESA-LISTED AMPHIBIANS, CALIFORNIA RED-LEGGED FROG

Summary of Existing Information, and Additional Information to be Developed by the Study

Existing, relevant, and reasonably available information regarding CRLF within the proposed Project boundary is provided in Section 4.8. As a summary, CRLF has not been reported to occur within the proposed Project boundary. Nor was CRLF detected during annual surveys performed since 2010 in Pyramid reach. However, occurrences of CRLF have been reported in the Project area. Additional information, which would be developed by the study, would include site-specific assessment of habitat suitability for CRLF in the proposed Project boundary.

Study Area, Methods and Analysis

The study area would consist of the area within the proposed Project boundary, excluding lands overlying the Angeles Tunnel on which Licensees do not perform any Project activities. In addition, the study area would include an area extending one mile from potential aquatic habitat in the Project boundary due to the known migratory behavior of CRLF. The study area would not include Pyramid reach because the area is surveyed annually for CRLF.

The study would consist of four steps: (1) summarize existing information and identify potential aquatic habitat for CRLF; (2) complete a desktop site assessment, supplemented by field reconnaissance where additional information is needed and where accessible; (3) prepare data and perform quality assurance; and (4) prepare a report. Known occurrences of CRLF within the study area would be identified and mapped, based on agency records, museum records, and other existing information. Locations of habitats in the study area potentially suitable for CRLF breeding would then be identified and mapped based on review of existing aerial imagery, NWI maps, and any existing on-the-ground photographs. Other aquatic habitats potentially affected by the Project that may be utilized by CRLF for dispersal, foraging, or predator avoidance would also be identified and mapped. If habitat mapping indicates the presence of habitats potentially suitable for CRLF breeding within the study area, Licensees would conduct a field reconnaissance of these areas, where accessible, in accordance with USFWS (2005) guidelines. A Habitat Site Assessment Data Sheet would be completed at each site that is examined, along with photographs depicting habitat and other notable findings. Data to be collected during field reconnaissance would include flow and water depth at the time of the site assessment, bank-full depth, stream gradient (i.e., percent slope), substrate, and description of bank. The presence of fish, non-native crayfish, and American bullfrog would be noted. Aquatic habitats would be mapped and characterized by habitat type (e.g., pond, creeks, or pool) and apparent seasonality. Upland habitats within the study area would be characterized based on description of upland vegetation communities, land uses, and any potential barriers to CRLF movement. Once the site assessment has been completed, Licensees would note Project O&M and recreation that typically occurs in the area. A report summarizing

study methods and results would be prepared and included in Licensees' ISR and in Licensee's DLA and FLA. If any CRLF are found, the report would be considered "Privileged," and would only be provided to FERC, USFWS, and CDFW, and to the USFS if CRLF are found on NFS lands.

Consistency of Methodology with Generally Accepted Scientific Practices

The study methods would be consistent with methods used for recent FERC hydroelectric relicensing efforts in California, including the Yuba River Development Project and Merced River Hydroelectric Project, and follows methodology recommended by USFWS.

STUDY PLAN OUTLINE 10. ESA-LISTED BIRD SPECIES, SOUTHWESTERN WILLOW FLYCATCHER AND LEAST BELL'S VIREO RIPARIAN HABITAT EVALUATIONS

Summary of Existing Information, and Additional Information to be Developed by the Study

Existing, relevant, and reasonably available information regarding southwestern willow flycatcher and least Bell's vireo within the proposed Project boundary is provided in Section 4.8. As a summary, Licensees found no existing information regarding the species within the proposed Project boundary. The most recent known surveys were performed in 2002 and 2003, and the nearest known occurrence for either species is downstream of Elderberry Forebay, and non-breeding, migrating willow flycatchers (sub-species not determined) were detected on Castaic Creek upstream of Elderberry Forebay. Additional information, which would be provided by this study, would include determining the occurrence and identification of breeding habitat of southwestern willow flycatcher or least Bell's vireo in the proposed Project boundary, if they occur.

Study Area, Methods and Analysis

Since southwestern willow flycatcher and least Bell's vireo utilize riparian habitat, the study area would consist of riparian habitat within the proposed Project boundary, excluding lands overlying the Angeles Tunnel on which Licensees do not perform any Project activities.

The study would be coordinated with Licensees' relicensing Botanical Resources Study, which would identify, map, and describe vegetation areas, including riparian habitat, within the study area. The study would consist of four steps: (1) identify riparian habitat areas that may be affected by Project O&M and recreation; (2) conduct surveys in these areas; (3) prepare data and perform quality assurance; and (4) prepare a study report. Surveys would be performed in riparian areas in the study area potentially affected by Project O&M and recreation. All surveys would be performed following USFWS standard protocols for southwestern willow flycatcher and least Bell's vireo. Detection surveys conducted by trained personnel for southwestern willow flycatcher require at least five survey visits, distributed within the May through July period, whereas surveys for least Bell's vireo require at least eight survey visits between April 10 and July 31. Where habitat is documented, Licensees would note Project O&M and Project recreation in the area. A report summarizing study methods and results would be prepared and included in Licensees' ISR and in Licensee's DLA and FLA. If any occurrences of willow flycatcher or least Bell's vireo are found, the report would be considered "Privileged," and would only be provided to FERC, USFWS, and CDFW, and to the USFS if any occurrences of southwestern willow flycatcher or least Bell's vireo are found on NFS lands.

Consistency of Methodology with Generally Accepted Scientific Practices

The study methods would follow survey protocol methods that are recommended by USFWS. Therefore, the study would be consistent with standard methods accepted by the scientific community, USFWS and CDFW for assessing the presence of breeding southwestern willow flycatcher and least Bell's vireo.

STUDY PLAN OUTLINE 11. RECREATION FACILITIES DEMAND ANALYSIS AND CONDITION ASSESSMENT

Summary of Existing Information, and Additional Information to be Developed by the Study

Existing, relevant, and reasonably available information regarding recreational resources within the proposed Project boundary is provided in Section 4.9. As a summary, existing data includes a basic inventory of Project recreation facilities, maps showing locations of existing recreational trails, statistics on visitor use, and management guidelines and regional needs assessments from relevant regional resource management plans, including the SCORP and the Angeles and Los Padres National Forests' LRMP. Licensees also have 2015 and historical annual occupancy information for Pyramid Lake recreation facilities. Recreation use information for Project day use areas and dispersed use areas is collected every six years for FERC Form 80 reporting; the most recent collection year was 2014. Additional information, which would be provided by this study, would include an inventory and comprehensive assessment of Project recreation facilities.

Study Area, Methods and Analysis

Recreation Demand Component

To assess future day use and overnight based recreation in the vicinity of Pyramid and Quail Lakes, various information sources will be examined. The demand and need for recreation is contingent upon the supply of existing resources and user preferences. The first step in the preparation of a needs analysis will be to compile a detailed inventory of all existing recreation facilities in the vicinity of the Project. The next step will be to gather and review recent relevant California-based user preference surveys and other outdoor recreation surveys. These reviews will include the 2007 California Outdoor Recreation Survey and 2012 Survey of Public Opinions and Attitudes on Outdoor Recreation in California as well as more current surveys that show outdoor recreation participation rates and growth needs in the greater Los Angeles area. Studies at various scales, covering California, but especially those addressing Southern California will be reviewed for their applicability to the Project area.

Recreation activity and participation trends will be examined from the existing literature, interviews with regional and local recreation providers and user groups, Forest Service reports, FERC Form 80 filings, and data collected by Licensees. The recreation demand analysis will compare demand with the existing supply of recreation opportunities and use patterns. A gap analysis will be performed by comparing relative demand to supply, with consideration for trends and cultural variations in user groups based on research and forecasts of population growth. By comparing this information with a detailed inventory of existing recreation opportunities, it will be possible to determine whether there is a need for modifications to existing facilities or additional new facilities and recreation amenities.

Determinations from this assessment can be used to make appropriate policy, allocation and site specific decisions to inform an updated recreation plan for the Project.

Condition Assessment Component

The study area would consist of Project recreation facilities within the proposed Project boundary surrounding Quail Lake and Pyramid Lake. The study area would not include Elderberry Forebay since the forebay is closed to the public due to safety concerns.

The condition assessment would consist of five steps: (1) create forms and templates for assessment; (2) conduct site condition assessments completing detailed inventory conditions forms; (3) assemble results and create maps; (4) prepare data and perform quality assurance; and (5) prepare a study report. Inventory would include assessments of parking areas, and the location and number of parking spaces, picnic and camping units, boat and trailer parking spaces, accessible parking spaces, and facility components. Trailheads would be inventoried for signage, types of improvements, general widths, and general trail conditions. The field reconnaissance would include a physical inspection of existing Project recreation facilities and user-defined and designated Project trails. The reconnaissance would be used to identify use patterns and help determine and verify recreation amenities as related to likely user experiences and common access points and travel routes. Observable resource impacts at developed and dispersed Project recreational sites would be noted.

A report summarizing the recreation demand analysis and condition assessment results would be prepared and included in Licensees' ISR and in Licensee's DLA and FLA.

Consistency of Methodology with Generally Accepted Scientific Practices

A demand analysis that compares recreation demand with existing supplies of recreation opportunities along with an inventory of recreation opportunities/facilities using existing information and information collected during a site visit, would be consistent with generally accepted practices employed during hydroelectric relicensings in California, including Bucks Creek (FERC No. 619) and Big Creek Hydroelectric Project (FERC No. 2175). Evaluating outdoor recreation facilities per the Architectural Barriers Act Accessibility Guidelines would be a common technique to establish the level of accessibility at outdoor recreation areas, parks, and recreation facilities.

STUDY PLAN OUTLINE 12. CULTURAL RESOURCES

Summary of Existing Information, and Additional Information to be Developed by the Study

Existing, relevant, and reasonably available information regarding cultural resources within the proposed Project boundary is provided in Section 4.11. As a summary, in the Project area Licensees identified 55 previous cultural resources investigations that identified 46 archaeological sites and four historic built environment resources. Only one archaeological site has been previously evaluated and was found not to be eligible for the NRHP. Two of the historic built environment resources have been evaluated as eligible for listing on the NRHP. Licensees review of historical maps indicates that approximately 100 to 125 potential historic-era sites or features may be located in the Project area. Additional information, which would be provided by this study, would include the location of historic properties in the proposed Project boundary.

Study Area, Methods and Analysis

The study area would consist of the area within the proposed Project boundary, excluding lands overlying the Angeles Tunnel on which Licensees do not perform any Project activities.

The study methods would consist of five steps: (1) archival research; (2) field surveys; (3) NRHP evaluations of resources that can be evaluated at the survey level without additional investigation; (4) prepare data and perform quality assurance; and (5) prepare a study report. Under step 1, additional archival research would be used to augment the data collected for the PAD to provide the prehistory and history specific to the study area. The research would be used to prepare the historic contexts against which identified resources may be understood and, if possible at the survey level, evaluated for the NRHP. The field surveys conducted under step 2 would be supervised by qualified, professional archaeologists and others who meet the Secretary of the Interior's Standards for professional archaeologists, historians, and/or architectural historians. Fieldwork would follow the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation and the California Office of Historic Preservation's Instructions for Recording Historical Resources. In step 3, NRHP evaluations would be completed for archaeological sites and historic built environment resources for which the data gathered during steps 1 and 2 are sufficient to assess significance against the NRHP criteria found at 36 CFR § 60.4. A report, conforming to the guidelines of the Archaeological Resources Management Reports, would be prepared and included in Licensees' ISR and in Licensee's DLA and FLA as "Privileged" information, and would only be provided to FERC, SHPO, and interested Native

American tribal chairs or their designated tribal representatives, and to the USFS if any cultural resources are found on NFS lands.

Consistency of Methodology with Generally Accepted Scientific Practices

The study methods would be consistent with the methods used for recent FERC hydroelectric relicensing efforts in California, including for the Don Pedro Project, Yuba River Development Project and Merced River Hydroelectric Project. The methods would be consistent with the ACHP's guidelines.

STUDY PLAN OUTLINE 13. TRIBAL RESOURCES

Summary of Existing Information, and Additional Information to be Developed by the Study

Existing, relevant, and reasonably available information regarding tribal resources within the proposed Project boundary is provided in Section 4.13. As a summary, in the Project area Licensees identified 40 previous cultural resources investigations, none of which identified any TCPs, ITA's or other cultural resources of tribal significance. Licensees found the entire proposed Project boundary has not been surveyed, and interested tribes have not been consulted regarding their interests. Additional information, which would be provided by this study, would include tribal interests in proposed Project boundary.

Study Area, Methods and Analysis

The study area would consist of the area within the proposed Project boundary, excluding lands overlying the Angeles Tunnel on which Licensees do not perform any Project activities.

The study would consist of six steps: (1) archival research; (2) tribal consultation; (3) site visits with tribal representatives; (4) NRHP evaluations of resources that can be evaluated at the study level; (5) prepare data and perform quality assurance; and (6) prepare study report. Under step 1, additional archival research would be used to augment the data collected for the PAD to provide the prehistory and ethnography specific to the Project, and that research would be used to prepare the historic context against which identified tribal resources may be understood and evaluated for the NRHP. In step 2, a professional ethnographer/oral historian would meet and consult with interested tribal members to conduct interviews regarding past and traditional tribal use and activities in the study area, and may visit archaeological sites or other locations within the study area with the tribes under step 3 to further gain knowledge relevant to tribal interests and resources. Identified tribal resources would be documented during step 3 and evaluated for the NRHP under step 4, unless additional investigation is required to conduct the NRHP evaluation. The documentation and NRHP evaluation of tribal interests would be consistent with National Register Bulletin No. 38, Guidelines for Evaluating and Documenting Traditional Cultural Properties. A report, conforming to National Register Bulletin No. 38, would be prepared and included in Licensees' ISR and in Licensee's DLA and FLA as "Privileged" information, and would only be provided to FERC, SHPO, and interested Native American tribal chairs or their designated tribal representatives, and to the USFS if any tribal resources are found on NFS lands.

Consistency of Methodology with Generally Accepted Scientific Practices

The study methods would be consistent with the methods used for recent FERC hydroelectric relicensing efforts in California, including for the Don Pedro Project, Yuba River Development Project and Merced River Hydroelectric Project. The methods would be consistent with the ACHP's guidelines.