4.1.9 ESA-Listed Amphibians, California Red-legged Frog Study

4.1.9.1 Project Nexus

Continued Project O&M and Project-related recreation activities may have potential to affect CRLF, an amphibian listed as threatened under the federal ESA.

4.1.9.2 Existing Information and Need for Additional Information

Existing, relevant, and reasonably available information regarding CRLF within the proposed Project boundary is provided in Section 4.8 of the Licensees' PAD. In summary, CRLF is an aquatic-breeding frog primarily associated with perennial ponds or pools, and slow-moving perennial or seasonal streams or pools within streams where water remains continuously for a minimum of 20 weeks beginning in the spring (i.e., sufficiently long enough for breeding to occur and larvae to complete development) (Jennings and Hayes 1994; 71 Federal Register [FR] 19244). Suitable aquatic habitats include natural and manmade ponds, backwaters within streams and creeks, marshes, lagoons, and dune ponds. Deep lacustrine habitats larger than 50 acres do not represent breeding or dispersal habitat (75 FR 12816). Juvenile and adult CRLF also utilize terrestrial (riparian and upland) habitats for foraging, aestivation, and seasonal dispersal, particularly where vegetation and other structural features provide hiding cover and cool, moist sites. Under suitable wet conditions, long-distance dispersal of one mile or more may occur between aquatic habitats, including movement through upland habitats or ephemeral drainages (71 FR 19244). Table 4.1-8 summarizes CRLF habitat requirements by life stage.

Table 4.1-8. California Red-legged Frog Habitat Requirements by Life Stage

Egg Masses	Larvae	Juveniles and Adults
In ponds or backwater pools within streams, usually attached to emergent vegetation (cattail [*Typha* spp.] and bulrush [*Schoenoplectus* spp.]. Sometimes found at sites without emergent vegetation (e.g., some stock ponds). The presence of dense riparian vegetation (particularly willows [*Salix* spp.]) is also a positive indicator of suitable breeding habitat. Permanently or seasonally flooded water bodies may be used.	Same habitat as eggs; also in slow-moving, shallow riffle zones, and shallow margins of pools. Larvae spend most time in submerged vegetation or organic debris. Emergent vegetation, undercut banks, and semi-submerged root wads may provide hiding cover. Larvae typically metamorphose between July and September	Frogs may stay at breeding sites or move to summer habitats. Emergent and/or riparian vegetation, undercut banks, semi-submerged root masses; open grasslands with seeps or springs with dense growths of woody riparian vegetation; cattail, bulrush, and willow are good indicators for suitable habitat. Associated with deep (<0.7 – 1.5 meters), still or slow-moving water. Juveniles prefer open, shallow aquatic habitats with dense submerged vegetation. In seasonally dry areas, frogs may aestivate in moist spaces (e.g., under boulders, logs, watering troughs, and small-mammal burrows). Juveniles and adults also utilize riparian and adjacent upland areas for foraging and shelter, often where upland shrubs and grasses occur.

CRLF has not been reported to occur within the proposed Project boundary. However, USFWS (2002) indicates the presence of CRLF in Pyramid reach and describes the population as being in decline. Hubbartt and Murphey (2005) did not detect CRLF in Pyramid reach or its tributary, Agua Blanca Creek, about 16.5 miles downstream of Pyramid Lake during surveys performed for the USGS from 1999 to 2000. Critical habitat unit VEN-2 is located in the Pyramid reach and its tributary Agua Blanca Creek. Sandburg (2006) reported observing larval CRLF in 2005 in a 7-foot-deep pool with cattails in Pyramid reach more than 10 miles downstream of Pyramid Lake and in a 3-foot-deep pool in Agua Blanca Creek. Annual arroyo toad and sensitive species surveys performed by the Licensees from 2010 to present have not resulted in observations of the CRLF in the 1.3 mile section of Agua Blanca Creek, or the 4.5 mile segment of the Pyramid reach between Ruby Canyon and the Blue Point Campground. Methods for these surveys meet most of the conditions for CRLF presence/absence surveys (USFWS 2005), with intensive surveys during the breeding season, including four or more night surveys, but do not include surveys during the non-breeding season (i.e., July 1 to September 30).

Information in addition to that provided by the Licensees' annual surveys is needed and will be gathered during this *ESA-listed Amphibians, CRLF Study* to determine locations of habitat suitable for CRLF that could be affected by the Project within the proposed Project boundary.

4.1.9.3 Study Goals and Objectives

The goals of this *ESA-listed Amphibians, CRLF Study* are to: (1) identify and map known CRLF locality records and the distribution of suitable habitats for CRLF within the proposed Project boundary and aquatic habitat within the surrounding one-mile radius from the proposed Project boundary; (2) perform a desktop site assessment to characterize mapped aquatic habitats and surrounding upland habitats, supplemented by field reconnaissance; and (3) evaluate the likelihood that CRLF may occur at locations within the proposed Project boundary based on the final reporting of the descriptive site assessment and historical records.

The objective of this *ESA-listed Amphibians, CRLF Study* is to gather sufficient data necessary to fill these recognized information gaps.

4.1.9.4 Study Methods

Study Area

The study area for the *ESA-listed Amphibians, CRLF Study* consists of the area within the proposed Project boundary, excluding lands overlying the Angeles Tunnel on which the Licensees do not perform any Project O&M activities. For the purpose of developing the desktop assessment map described below, aquatic habitats and existing locality records will also be mapped within a one-mile radius of the proposed Project boundary. The study area for the *ESA-listed Amphibians, CRLF Study* is shown in Figure 4.1-14 below.

General Concepts and Procedures

- Personal safety is the most important consideration of each fieldwork team. Fieldwork will only occur in safely accessible areas and under conditions deemed safe by the field crews. Locations within the study area that cannot be accessed in a safe manner (e.g., locations containing dense vegetation or unsafe slopes) and areas inundated when the surveys are performed, will not be surveyed; these areas will be identified in the data summary and an explanation for survey exclusion will be provided.

- The *ESA-listed Amphibians, CRLF Study* will begin after FERC issues its Study Plan Determination.

- The *ESA-listed Amphibians, CRLF Study* does not include the development of requirements for the new license, which will be addressed outside the study.

- This *ESA-listed Amphibians, CRLF Study* focuses on CRLF within the proposed Project boundary, but the study area for the *ESA-listed Amphibians, CRLF Study* is specific to the locations providing suitable habitat for this species.

- If required for the performance of the *ESA-listed Amphibians, CRLF Study*, the Licensees will make a good faith effort to obtain permission to access private

property well in advance of initiating the study. The Licensees will only enter private property if permission has been provided by the landowner.

- The Licensees will acquire all necessary agency permits and approvals prior to beginning fieldwork for the *ESA-listed Amphibians, CRLF Study*.

- Field crews may make variances to the *ESA-listed Amphibians, CRLF Study* in the field to accommodate actual field conditions and unforeseen problems. Any variances in the *ESA-listed Amphibians, CRLF Study* will be noted in the data resulting from the *ESA-listed Amphibians, CRLF Study*.

- To prevent the introduction and transmittal of amphibian chytrid fungus and invasive aquatic species (e.g., quagga mussels, zebra mussel, and Asian clams), field crews will be trained on, provided with, and use materials (e.g., Quat) for decontaminating their boots, waders, and other equipment when leaving or traveling between water-based study sites. Field crews will follow DWR's Quagga and Zebra Mussel Rapid Response Plan and CDFW's Aquatic Invasive Species Decontamination Protocol which can be found at the following link: (https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=43333). All boats used during the study will follow cleaning protocols, including inspections before and after use. All decontamination requirements in place at Project reservoirs including those of DWR's *Quagga and Zebra Mussel Rapid Response Plan* for the SWP will be strictly followed (DWR 2010).

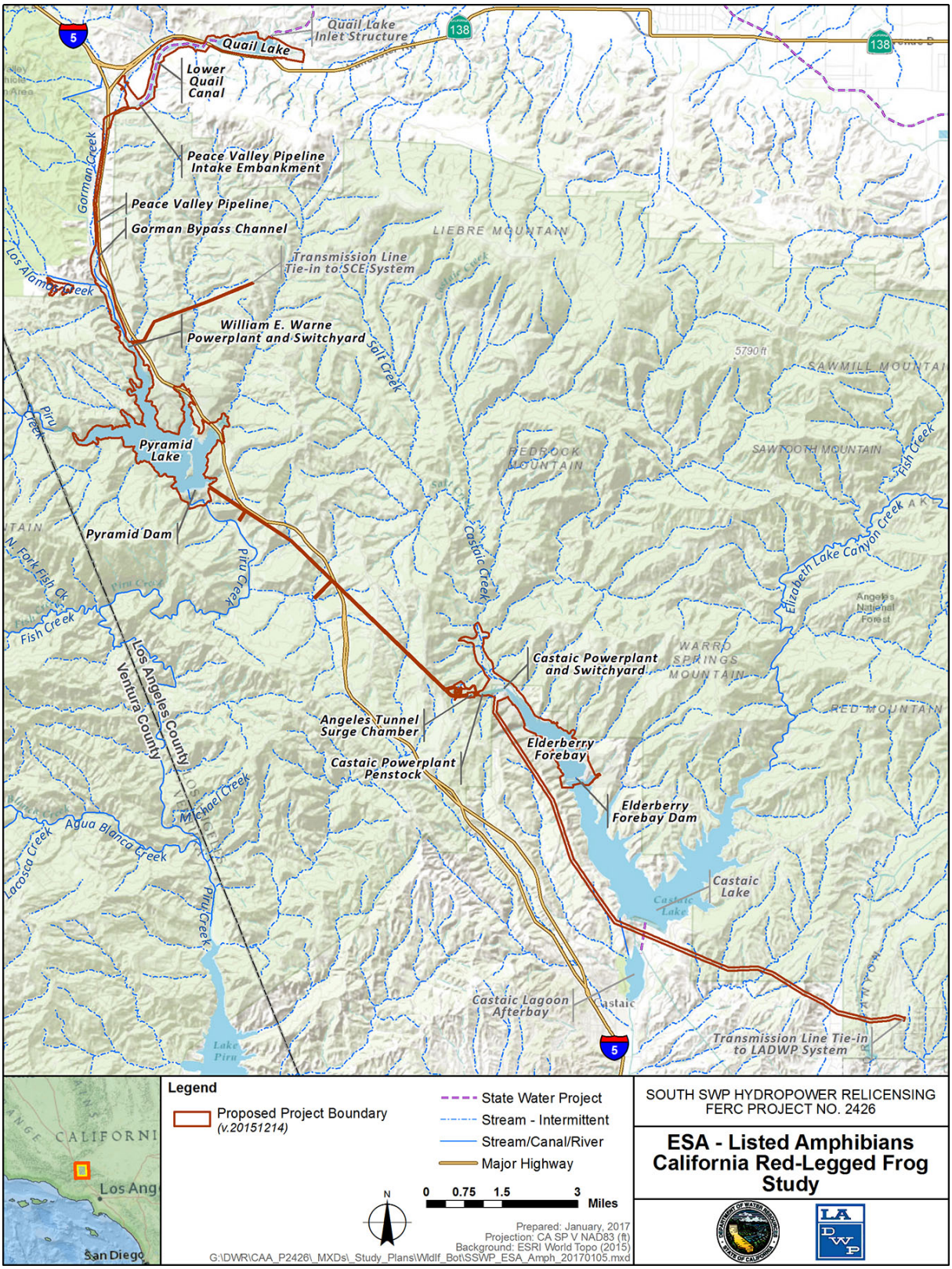

Figure 4.1-14. ESA-listed Amphibians, CRLF Study Area (i.e., Proposed Project Boundary, with a One-mile Radius for the Desktop Assessment)

Methods

The *ESA-listed Amphibians, CRLF Study* will consist of three steps: (1) identify and map locality records and potential aquatic habitat for CRLF; (2) desktop site assessment and field reconnaissance; and (3) prepare data. These steps are described below.

Step 1 – Identify and Map Locality Records and Potential Aquatic Habitat for CRLF. Prior to conducting the field assessments, the Licensees will identify and map known locality records of CRLF and locations of aquatic habitats in the study area for the *ESA-listed Amphibians, CRLF Study* potentially suitable for CRLF breeding. In addition to the CNDDB, sources of locality records may include inquiries to "biological consultants, local residents, amateur herpetologists, resource managers and biologists from municipal, State, and Federal agencies, environmental groups, and herpetologists at museums and universities" (USFWS 2005). Potential CRLF breeding habitat will be identified from existing aerial imagery, NWI maps, and any existing on-the-ground photographs, along with observations of aquatic areas from the Licensees' relicensing *Botanical Resources Study*. Other aquatic habitats potentially affected by the Project that may be utilized by CRLF for dispersal, foraging, or predator avoidance will also be identified and mapped.

Step 2 – Desktop Site Assessment and Field Reconnaissance. The Licensees will complete a desktop site assessment to characterize aquatic habitats mapped in Step 1, as well as the surrounding upland habitats, supplemented by field reconnaissance of aquatic sites and adjacent riparian and upland habitats in accordance with USFWS (2005) guidelines. Sites for field reconnaissance at locations within the proposed Project boundary will be selected based on accessibility and where additional information on site characteristics is needed. Field reconnaissance surveys will be completed by biologists or scientists with experience performing CRLF habitat assessments and who are qualified to identify amphibians and their habitats. A Habitat Site Assessment Data Sheet (USFWS 2005) will be completed at each site that is examined, and photographs will be taken depicting habitat and other notable findings. Data to be collected during field reconnaissance will include water flow and depth at the time of the site assessment, bank-full depth, stream gradient (i.e., percent slope), substrate, description of bank, and associated aquatic, riparian vegetation, and adjacent uplands. Consistent with the USFWS (2005) guidelines, field reconnaissance will not include formal surveys for CRLF or repeated visits to sites, and will not include activities that will require federal or state permits (e.g., dip-netting or use of traps, or handling CRLF) unless directed or authorized by USFWS to collect additional information. However, observation of CRLF of any life stage will be noted and documented by photographs if possible. USFWS decontamination guidelines will be implemented. Detections of any life stage of CRLF will be reported within three days to CDFW and USFWS. The presence of fish, non-native crayfish, and American bullfrog will also be noted during the site assessments. Aquatic habitats will be mapped and characterized by habitat type (e.g., pond, creek, or pool) and apparent seasonality. Upland habitats within the study area for the *ESA-listed Amphibians, CRLF Study* will 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, the Licensees will note Project O&M and Project-related recreation that typically occurs in the area.

Step 3 – Prepare Data. Following the field reconnaissance, the Licensees will develop summary text from field notes describing survey results and GIS maps depicting survey locations, locations of CRLF observations, Project facilities, features, and specific Project-related activities that may have an effect on CRLF.

Quality Assurance and Quality Control

Field data gathered during this *ESA-listed Amphibians, CRLF Study* will be collected in a manner that promotes high quality results, and will be subject to appropriate QA/QC procedures including checking field data sheets for accuracy and completeness.

Analysis

Once the locations of potentially suitable upland and aquatic habitats in the study area for the *ESA-listed Amphibians, CRLF Study* are determined, the Licensees will identify continuing Project O&M and Project-related recreation activities that occur in these areas.

Reporting

ESA-listed Amphibians, CRLF Study methods and results will be prepared and included, to the extent that they are completed, in the Licensees' ISR, and all results reported in the USR, DLA, and FLA. If any CRLF are found during this *ESA-listed Amphibians, CRLF Study* or observed incidentally during other relicensing studies being performed by the Licensees, a report considered "Privileged" will be developed and provided only to FERC, USFWS, and CDFW. If any CRLF are found on NFS lands, this Privileged report will also be provided to USFS. The report will also include a summary of historical records of CRLF from agency records, museum records, and other existing information.

4.1.9.5 Consistency of Methodology with Generally Accepted Scientific Practices

This *ESA-listed Amphibians, CRLF Study* is consistent with the goals, objectives, and methods outlined for most recent FERC hydropower relicensing efforts in California, including the Yuba River Development Project (FERC No. 2246) and the Merced River Hydroelectric Project (FERC No. 2174), and will use methodology recommended for site assessments by USFWS.

4.1.9.6 Schedule

The *ESA-listed Amphibians, CRLF Study* will begin after FERC issues its Study Plan Determination. The Licensees anticipate the schedule below will be followed to complete the study.

Fieldwork Preparation	January 2018 – April 2018
Fieldwork	April 2018 – July 2018
Data QA/QC	July 2018 – August 2018
Data Analysis and Reporting	August 2018 – June 2019

4.1.9.7 Level of Effort and Cost

Based on the work effort described above, the Licensees estimate the current cost to complete this *ESA-listed Amphibians, CRLF Study* will range between $60,000 and $80,000.

4.1.9.8 References

DWR. 2010. The Quagga and Zebra Mussel Rapid Response Plan for the State Water Project. 93 pp. CONFIDENTIAL/PRIVILEGED – Not for Public Distribution.

Hubbartt, V.K. and T.G. Murphey. 2005. Surveys for California red-legged frog and arroyo toad on the Los Padres National Forest. USFS General technical report PSW-GTR-195.

Jennings, M.R. and M.P. Hayes. 1994. Amphibian and reptile species of special concern in California. Report to the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California. 255 pp.

Sandburg, N.H. 2006. Middle Piru Creek arroyo toad (*Bufo californicus*) clutch surveys 2005. Report to DWR. February 2006.

USFWS. 2005. Revised guidance on site assessments and field surveys for California red-legged frog. August 2005.

USFWS. 2002. Recovery Plan for the California red-legged frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service. Portland, Oregon.