Study 5.3

ESA-LISTED AMPHIBIANS – CALIFORNIA RED-LEGGED FROG

January 2017

1.0 Project Nexus

South Sutter Water District's (SSWD) continued operation and maintenance (O&M) of the Camp Far West Hydroelectric Project (Project) and Project recreation have the potential to affect California Red-legged Frog (CRLF) (*Rana draytonii*), which is listed as threatened under the Endangered Species Act (ESA).

2.0 Study Goals and Objectives

The goal of this ESA-Listed Amphibians - California Red-legged Frog Study (Study) is to supplement existing information regarding CRLF.

The objective of the study is to collect data adequate to meet the study goals.

This Study does not include Section 7 ESA informal consultation with the United States Department of the Interior, Fish and Wildlife Service (USFWS).

The Study does not include the development of potential requirements in the new license.

3.0 Existing Information and Need for Additional Information

Existing and relevant information regarding known occurrences of CRLF in the Project Vicinity[1] is provided in Section 3.2.5 of SSWD's Pre-Application Document (PAD). Table 3.0-1 summarizes CRLF habitat requirements by life stage.

[1] For the purposes of the relicensing, the "Project Vicinity" is defined as the area surrounding the Project in the order of a county or USDOI, United States Geological Survey (USGS) 1:24,000 topographic quadrangle.

Table 3.0-1. California red-legged frog habitat requirements by life stage.

Egg Masses	Larvae	Juveniles and Adults
In ponds or backwater pools of streams, usually attached to emergent vegetation (cattail and bulrush). Sometimes found at sites without emergent vegetation (e.g., some stock ponds). The presence of dense riparian vegetation (particularly willows) 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.	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, willows; cattail, bulrush, and willow are good indicators for suitable habitat. Associated with deep (<0.7 – 1.5 m), 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 under boulders, logs, watering troughs, etc.

Additional information, which will be provided by this Study, is needed to address the Study goal. The Study will include a site specific assessment of habitat suitability for CRLF in relation to Project facilities and normal O&M activities that might affect CRLF.

4.0 Study Methods

4.1 Study Area

For the purpose of this Study, the Study Area consists of the area within the existing Federal Energy Regulatory Commission (FERC) Project Boundary and an area extending 1 mile from the boundary. USFWS describes a "project action area" as the area directly or indirectly affected by the proposed action. This area will usually be larger than the "project footprint" and should cover the range of impacts. For the purposes of SSWD's Project, the project action area is a 1-mile[2] area around the FERC Project Boundary, as generally advised by USFWS (2005). The Study Area is shown in Figure 4.1-1.

[2] Based on studies that tracked movements of adult CRLF with attached radio-transmitters, 1.0 mile is within the known range of long-distance movements, although most individuals moved less than 0.34 miles (Bulger et al., 2003, Fellers and Kleeman 2007).

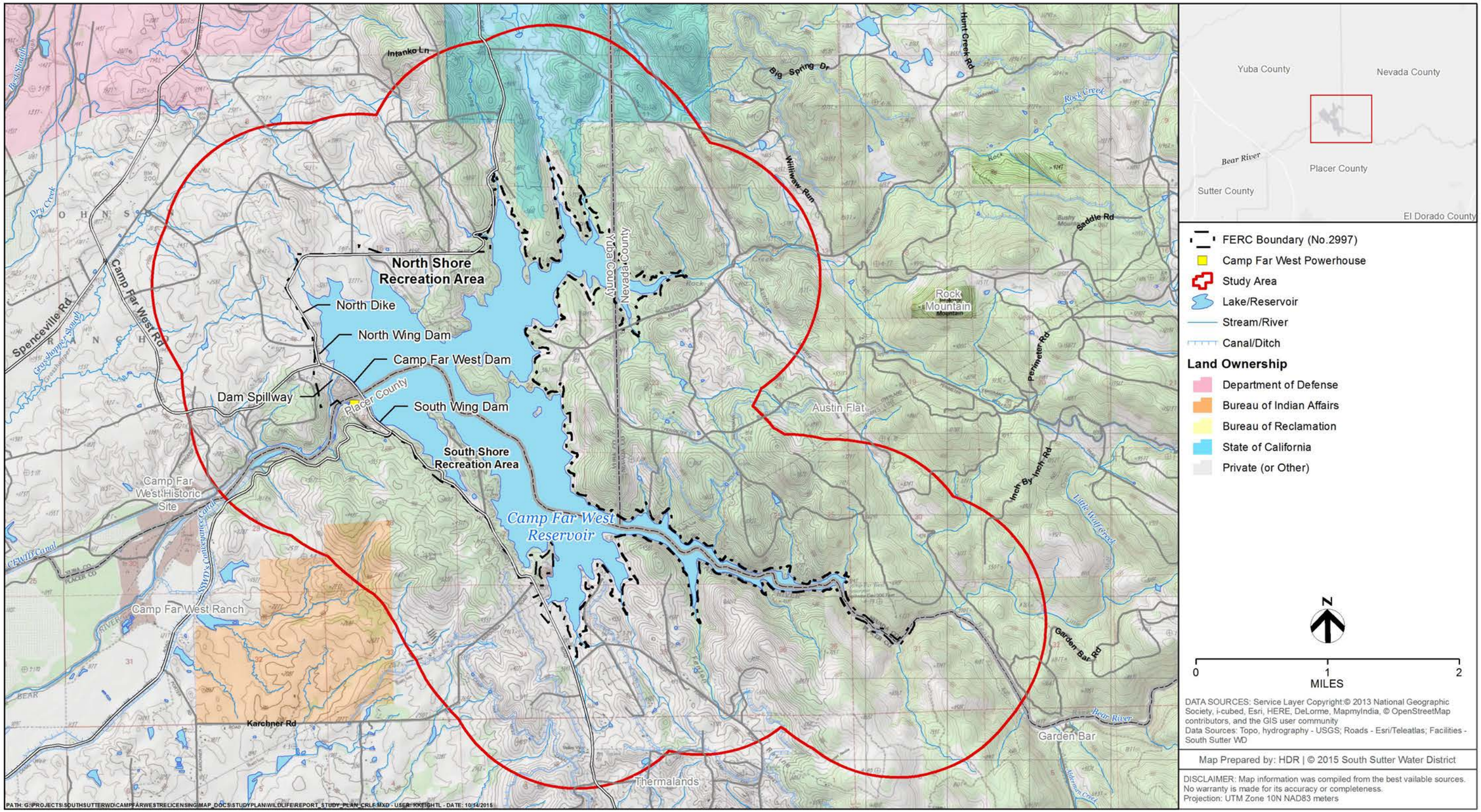

Figure 4.1-1. Study Area for ESA-listed Amphibians – CRLF.

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4.2 General Concepts and Procedures

The following general concepts and practices apply to all SSWD relicensing studies:

- Personal safety is the most important consideration of each fieldwork team.
- If required for the performance of the study, SSWD will make a good faith effort to obtain permission to access private property well in advance of initiating the study. SSWD will only enter private property if such permission has been provided by the landowner.
- SSWD will acquire all necessary agency permits and approvals prior to beginning fieldwork for a study that requires them.
- Field crews may make variances to the study plan in the field to accommodate actual field conditions and unforeseen problems. When a variance is made, the field crew will follow to the extent applicable the protocols in and intent of the study plan.
- SSWD's performance of the study does not presume that SSWD is responsible in whole or in part for measures that may arise from the study.
- If Global Positioning System (GPS) data are required by a study plan, they will be collected using either a Map Grade Trimble GPS (i.e., sub-meter data collection accuracy under ideal conditions), a Recreation Grade Garmin GPS unit (i.e., 3-meter data collection accuracy under ideal conditions), or similar units. GPS data will be post-processed and exported from the GPS unit into Geographic Information System (GIS) compatible file format in an appropriate coordinate system using desktop software. The resulting GIS file will then be reviewed by both field staff and SSWD's consultant's relicensing GIS analyst. Metadata will be developed for deliverable GIS data sets. Upon request, GIS maps will be provided to NMFS, USFWS, Cal Fish and Wildlife or SWRCB in a form, such as ESRI Shapefiles, GeoDatabases, or Coverage with appropriate metadata. Metadata will be Federal Geographic Data Committee compliant.
- SSWD's field crews conducting relicensing studies will record incidental records of aquatic, botanical and wildlife species observed during the performance of a study. All incidental observations will be reported in the DLA and FLA. The purpose of this effort is not to conduct a focused study (i.e., no effort in addition to the specific field tasks identified for the specific study plan) or to make all field crews experts in identifying all species, but only to opportunistically gather data during the performance of a relicensing study. Species included for incidental observation will include, but are not limited to: bald eagle (*Haliaeetus leucocephalus*); golden eagle (*Aquila chrysaetos*); osprey (*Pandion haliaetus*); any bats or positive sign of bats; Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (*O. mykiss*), including redds and carcasses; northern western pond turtle (*Actinemys marmorata*); foothill yellow-legged frog (*Rana boylii*); American bullfrog (*Lithobates catesbeianus*), blue elderberry (*Sambucus nigra ssp. caerulea*); and aquatic invasive species.

- Field crews will be trained on, provided with, and use materials (e.g., Quat disinfectant) for decontaminating their boots, waders, and other equipment between water-based study sites. Major concerns are amphibian chytrid fungus, and invasive invertebrates (e.g., zebra mussel, *Dreissena polymorpha*).
- If in the performance of a study, SSWD observes an ESA-listed or special-status species, within 30 days of the observation SSWD will submit to Cal Fish and Wildlife's California Natural Diversity Database a record, on the appropriate form, of the observation.
- If a study plan requires collection and reporting of time series data, the data will be provided at a minimum in HEC-DSS format. A viewer for these files (HEC-DSSVue) can be obtained from the United States Army Corps of Engineers at the following website as of March 2008: http://www.hec.usace.army.mil/software/hec-dss/hecdssvue-dssvue.htm in both Microsoft® Excel and *.DSS formats.
- If a field crew encounters human remains during field work, all work within a 100-foot radius of the discovery will stop immediately. The field crew will not disturb the remains in any way. The field crew will secure the area to the best of its ability, mark the location with flagging tape in such a way as to not draw attention to the remains, and record the location using a GPS unit or plot the location by hand on a map if no GPS unit is available. As soon as possible thereafter, the field crew will contact SSWD and the relicensing Cultural Resources Lead to report the discovery. SSWD will report the finding and initiate the appropriate steps required under State of California and federal law to address the discovery. Any human remains encountered will be treated with respect, and the field crew members will keep the location confidential and will not disclose the location of the discovery to the public or to any other study crews. The field crew will keep a log of all calls/contacts it makes regarding the discovery and that details the event. Work will not proceed in the secured area of the discovery until provided clearance by SSWD.

4.3 Methods

The Study will be completed in three steps: 1) perform a site assessment to describe and map aquatic and terrestrial habitats in the study area; 2) perform quality assurance/quality control (QA/QC) of data; and 3) consult with Project operations staff. Each step is described below.

4.3.1 Step 1 – Site Assessment

SSWD will perform a site assessment that will include the following elements. Known occurrences of CRLF within the Study Area will 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 will then be identified and mapped based on review of existing aerial imagery, National Wetland Inventory 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 will also be identified and mapped.

If habitat mapping indicates the presence of habitats potentially suitable for CRLF breeding within the existing FERC-Project Boundary, SSWD will conduct a field reconnaissance of these areas in accordance with USFWS (2005) guidelines. A Habitat Site Assessment Data Sheet (Appendix D of USFWS 2005) will be completed at each site that is examined, along with photographs depicting habitat and other notable findings. Data to be collected during field reconnaissance will include 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 will be noted.

To obtain additional information regarding American bullfrog occurrence, three site visits will be performed at the two sewage lagoons associated with the North and South Recreation Areas and Camp Far West Reservoir. These visits will occur in warm weather periods when bullfrogs are typically active and separated by about 2-3 weeks. During each visit the surveyors will record the number of American bullfrogs of any life stage that are observed and heard at each location. Before closely approaching each site, the surveyors will sit quietly and listen for 15 minutes, noting the estimated number of calling male bullfrogs (i.e., males produce advertisement calls, a loud, deep, sonorous "jug-o-rum" or similar sound). The surveyors will also walk along the shorelines approximately 2 meters from the edge of the water and note the number of bullfrogs that jump into the water upon approach, including counts of juvenile bullfrogs, which often make an "alarm" call (i.e., high pitched squawk, chirp, or bleat) as they leap. At Camp Far West Reservoir, surveyors will identify areas that appear suitable for bullfrogs and will perform the auditory surveys as described above at these locations up to a maximum of six sites.

Habitats within the Study Area outside of the existing FERC Project Boundary will be characterized from aerial imagery, existing site photographs, and other existing descriptive information. Aquatic habitats will be mapped and characterized by habitat type (e.g., pond, creeks or pool) and apparent seasonality. Upland habitats within the Study Area will be characterized based on description of upland vegetation communities, land uses, and any potential barriers to CRLF movement.

4.3.2 Step 2 – Perform QA/QC Review of Data

Following desktop information gathering and any field reconnaissance, SSWD will develop GIS maps depicting aquatic habitat locations, Project facilities and features, and other information collected during the study. Field data will then be subject to QA/QC procedures, including spot-checks of transcription and comparison of GIS maps with field notes.

4.3.3 Step 3 – Consult with Project Operations Staff

Once the site assessment has been completed, Project operations staff will be consulted to identify Project O&M and Project-related activities that typically occur near suitable habitat for CRLF.

5.0 Consistency of Methodology with Generally Accepted Scientific Practices

This Study is consistent with the goals, objectives, and methods outlined for most recent FERC hydroelectric relicensing efforts in California, including the Yuba River Hydroelectric Project (FERC No. 2246), Merced River Hydroelectric Project (FERC No. 2179), and Yuba River Development Project (FERC Project No. 2246). The Study utilizes standard site assessment methods.

6.0 Schedule

SSWD anticipates the schedule to complete the study as follows:

Planning ..... April 2017
Desktop Data Review ..... April 2017 – May 2017
Field Reconnaissance ..... May – July 2017
QA/QC Review ..... July 2017

The Study information will be included in SSWD's DLA and FLA. If SSWD completes the Study before preparation of the DLA, SSWD will post the information on SSWD's Relicensing Website and issue an e-mail to Relicensing Participants advising them that the report is available.

7.0 Level of Effort and Cost

SSWD estimates the cost to complete this study in 2016 dollars is between $15,000 and $20,000.

8.0 References Cited

Bulger, J.B., N.J. Scott, Jr., and R.B. Seymour. 2003. Terrestrial activity and conservation of adult California red-legged frogs *Rana aurora draytonii* in coastal forests and grasslands. Biological Conservation 110:85–95.

Fellers, G.M. and P.M. Kleeman. 2007. California red-legged frog (*Rana draytonii*) movement and habitat use: implications for conservation. Journal of Herpetology 41:276–286.

United States Fish and Wildlife Service (USFWS). 2005. Revised guidance on site assessments and field surveys for California red-legged frog. August 2005.