Study 7.3

ESA-LISTED AMPHIBIANS – CALIFORNIA RED-LEGGED FROG

November 2010

1.0 Project Nexus

Yuba County Water Agency's (YCWA or Licensee) continued operation and maintenance (O&M) of the Yuba River Development Project (Project) has a potential to effect California red-legged frog (CRLF) (*Rana draytonii*), a species listed as threatened under the federal Endangered Species Act (ESA).

2.0 Resource Management Goals of Agencies with Jurisdiction Over the Resource to be Studied

[Relicensing Participants - This section is a placeholder in the Pre-Application Document (PAD). Section 5.11(d)(2) of 18 CFR states that an applicant for a new license must in its proposed study *"Address any known resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied."* During 2010 study proposal development meetings, agencies advised Licensee that they would provide a brief written description of their jurisdiction over the resource to be addressed in this study. If provided before Licensee files its Proposed Study Plan and Licensee agrees with the description, Licensee will insert the brief description here stating the description was provided by that agency. If not, prior to issuing the Proposed Study Plan, Licensee will describe to the best of its knowledge and understanding the management goals of agencies that have jurisdiction over the resource addressed in this study. Licensee]

3.0 Study Goals and Objectives

The goal of this study is to develop information concerning CRLF associated with reservoirs, ponds within the existing Federal Energy Regulatory Commission (FERC) Project Boundary, and stream reaches potentially affected by the Project, and assess potential effects.

The objectives of this study are to:

- Identify and map known occurrences of CRLF and the distribution of suitable habitats for CRLF.
- Evaluate the likelihood that CRLF currently exists in the FERC Project Boundary using habitat assessments and historical records.
- If deemed warranted by USFWS at specific locations, perform CRLF surveys to document whether CRLF occurs at that location.
- Compile incidental observations of CRLF observations from other aquatic studies.

- Through incidental observations, document the presence and provide estimates of number of exotic species (e.g., bullfrogs, non-native crayfish, bass, catfish, or mosquito fish) (USFWS 2002), which may limit the occurrence of CRLF in otherwise suitable habitats.
- Develop information on Project-affected streams or non-stream areas to allow for evaluation of potential Project-related effects on CRLF populations.
- Provide information that can be used to develop PM&E measures.

4.0 Existing Information and Need for Additional Information

Existing and relevant information regarding known and potentially occurring locations of CRLF in the Project Vicinity[1] is available from California Natural Diversity Database (CNDDB), the USFWS, and other sources. This information and a life history description of CRLF, included in Section 7.7 of the Preliminary Information Package (PIP) (YCWA 2009), are useful in identifying preferred habitats and documenting where the species has been found to date. Table 4.0-1 summarizes CRLF habitat requirements by life stage, and briefly summarizes historically known occurrences in the Project Vicinity.

Table 4.0-1. California red-legged frog habitat requirements by life stage and summary of records in Project Vicinity.

Egg Masses	Larvae	Juveniles and Adults	Occurrence in Project Vicinity[1]
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 submergent 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 submergent vegetations.	CNDDB (2009) reports the occurrence of CRLF at one location in the Project Vicinity: Little Oregon Creek (east of Oregon Hill Road). The site is described as two spring-fed tailings ponds near Little Oregon Creek which were covered by dense blackberry scrub vegetation prior to a fire in 1999 (CRLF were discovered at the site in 2000). USFWS (2006) has designated critical habitat for CRLF (habitat unit YUB-1) associated with this occurrence.

Records were reviewed from the following sources: CAS (2009), CDFG (2009), MVZ (2009), USFWS (2005), and Vindum and Koo (1999).

The historical range of the CRLF includes the west slope foothills of the Sierra Nevada Range, although there are only eight known extant populations in the Sierra Nevada region, most of which contain few adults (Shaffer et al. 2004; USFWS 2006, Tatarian and Tatarian 2010).

CRLF is primarily associated with perennial ponds or pools, and perennial or seasonal streams where water remains long enough for breeding and development of young to occur (i.e., a minimum of 20 weeks) (Jennings and Hayes 1994; USFWS 2006). The absence or near-absence of introduced predators such as American bullfrog (*Lithobates* [*Rana*] *catesbeianus*) and predatory fish, particularly centrarchids (i.e., bass and sunfishes), is generally predictive of

[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 United States Geological Survey 1:24,000 topographic quadrangle.

habitat quality (Hayes and Jennings 1988). Freshwater wetlands, plunge pools in intermittent streams, seeps, and springs that are not suitable for breeding may provide habitat for aestivation, shelter, foraging, predator avoidance, and juvenile dispersal. During wet periods, long distance dispersal of up to a mile may occur between aquatic habitats, which may require traversing upland habitats or ephemeral drainages (USFWS 2006).

Licensee has implemented measures to minimize potential effects of Project-related recreation on CRLF in the vicinity of the Little Oregon Creek population. The existing Project recreation plan includes annual gated closure of Moran Road from October 15 – May 1 to protect CRLF, as well as bald eagle and to assure public safety.

Existing information is not adequate to meet the goal of the study. Information necessary to address the study goal includes a site specific assessment of habitat suitability for CRLF and, if determined to be warranted during consultation with USFWS under the ESA, results of protocol-level surveys for CRLF (USFWS 2005) occurrence in relation to Project facilities and normal O&M activities that might affect CRLF.

5.0 Study Methods and Analysis

5.1 Study Area

For consultation under the ESA, the 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 Licensee's Project, the proposed project action area is 1 mile area around Project developments, including Project-affected reaches. For the purpose of this study, this includes: 1) the Middle Yuba River from and including Our House Diversion Dam Impoundment to the confluence with the North Yuba River, 2) Oregon Creek from and including the Log Cabin Diversion Dam Impoundment to the confluence with the North Yuba River, 3) the North Yuba River from and including New Bullards Bar Dam Reservoir to the confluence with the Middle Yuba River, 4) the portion of the Yuba River from the confluence of the North and Middle Yuba rivers to the united States Army Corps of Engineer's (USACE) Englebright Reservoir; and 5) the Yuba River from USACE's Englebright Dam to USACE's Daguerre Point Dam. These boundaries coincide with USFWS guidelines for CRLF habitat assessment and surveys (USFWS 2005), which advise a one-mile radius around the normal high water line.

If YCWA proposes an addition to the Project, the study area will be expanded if necessary to include areas potentially affected by the addition.

5.2 General Concepts and Procedures

The following general concepts and practices apply to the study:

- Personal safety is the most important consideration of each fieldwork team.

- Licensee will make a good faith effort to obtain permission to access private property where needed well in advance of entering the property.
- Field crews may make minor variances to the FERC-approved study in the field to accommodate actual field conditions and unforeseen problems. When minor variances are made, Licensee's field crew will follow the protocols in the FERC-approved study.
- When Licensee becomes aware of major variances to the FERC-approved study, Licensee will issue an e-mail to the Relicensing Contact List describing the variance and reason for the variance. Licensee will contact by phone the Forest Service (if the variance is on National Forest System land), USFWS, SWRCB and CDFG to provide an opportunity for input regarding how to address the variance. Licensee will issue an e-mail to the Relicensing Contact List advising them of the resolution of the variance. Licensee will summarize in the final study report all variances and resolutions.
- Licensee's performance of the study does not presume that Licensee is responsible in whole or in part for measures that may arise from the study.
- Global Positioning System (GPS) data will be collected using either a Map Grade Trimble GPS (sub-meter data collection accuracy under ideal conditions), a Recreation Grade Garmin GPS unit (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 Licensee's relicensing GIS analyst. Metadata will be developed for deliverable GIS data sets.
- Licensee's field crews will record incidental observations of aquatic and wildlife species observed during the performance of this study. All incidental observations will be reported in the appropriate Licensee report (e.g., incidental observations of special-status fish recorded during fieldwork for the Special-Status Turtles – Western Pond Turtle Study will be reported in Licensee's Stream Fish Populations Study report). The purpose of this effort is not to conduct a focus study (i.e., no effort in addition the specific field tasks identified for the specific study) or to make all field crews experts in identifying all species, but only to opportunistically gather data during the performance of the study.
- Field crews will be trained on and provided with materials (e.g. Quat) for decontaminating their boots, waders, and other equipment between study sites. Major concerns are amphibian chytrid fungus, and invasive invertebrates (e.g. zebra mussel, *Dreissena polymorpha*). This is of primary importance when moving: 1) between tributaries and mainstem reaches; 2) moving between basins (e.g. Middle Yuba River, Yuba River, and North Yuba River); and 3) moving between isolated wetlands or ponds and river or stream environments.

5.3 Study Methods

Described below is the approach to complete a protocol-level site assessment and survey for CRLF.

5.3.1 Step 1 – Field Reconnaissance and Site Assessments

Known occurrences of CRLF within the study area will first be identified and mapped, based on agency consultation, 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 photography and videography, National Wetland Inventory (NWI) maps, on-the-ground photographs, and other pertinent resource agency Geographic Information System (GIS) layers as available. 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.

After habitat mapping is completed, a field reconnaissance of potentially suitable aquatic habitat will be conducted in accordance with *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* (USFWS 2005). Licensee will select locations in the study area for site evaluations in order to further characterize habitats. 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. Areas that do not appear to represent suitable habitat will not be field examined but will instead be characterized from aerial imagery, existing site photographs, and other existing descriptive information. CRLF are typically associated with low gradient streams (Hayes and Jennings 1988), backwaters, and lentic habitat with emergent vegetation, although habitats lacking vegetation are sometimes used. Large, deep backwater pool areas; ponds, and reservoir edges with appropriate vegetation characteristics may constitute suitable habitat for CRLF; other potential habitats as described in USFWS (2005) will also be considered. Locations for site evaluations will be selected as follows:

- All areas of potentially suitable aquatic habitat within the existing FERC Project Boundary[2].
- Other accessible areas of potentially suitable aquatic habitat within 1.0 mile of the existing FERC Project Boundary.

Based on this reconnaissance assessment, aquatic habitats will be mapped and characterized by habitat type (e.g., pond, creeks, or pool), apparent seasonality, dominant vegetation type (e.g., emergent or overhanging shrubs), 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, American bullfrog, and other incidental observations of amphibians and reptiles will be noted. American bullfrog occurrence will be assessed by listening for calls, scanning suitable areas with binoculars or spotting scope for egg masses and basking frogs, and looking in shallow edges for larvae. At least one observer will walk along the shoreline listening and scanning ahead for jumping frogs - juvenile American bullfrogs often vocalize as they jump in alarm. If site conditions warrant, aquatic funnel traps ("minnow traps") may also be deployed to verify the presence of American bullfrog larvae. Funnel traps will not be employed in areas where CRLF may occur. Upland habitats will be characterized based on description of upland vegetation communities, land uses, and any potential barriers to CRLF movement.

[2] The existing FERC Project Boundary is the area Licensee uses for normal Project operations and maintenance and is shown on Exhibits J, K and G of the current license.

Once the locations of CRLF habitat in the study area are defined, Project Operations staff will be consulted to identify Project O&M activities in those areas that typically occur and have a potential to adversely affect the population.

A Site Assessment Report will be prepared for submittal to the United States Department of Interior (USDOI), Fish and Wildlife Service (USFWS). The report will document the results of all site assessment, along with separate accounts of site assessments that take place on public land administered by the USDOI), Bureau of Land Management, and site assessments that take place on public land managed by the United States Department of Agriculture, Forest Service. The report will include the following:

- Copies of data sheets
- Copies of field notes
- GPS data for all field reconnaissance sites
- List of known occurrences of CRLF locations within the study area
- Photographs of the reconnaissance sites including a map of photo locations
- GIS map of potential CRLF habitat
- Potential Project effects

If American bullfrog is detected at a publically accessible field reconnaissance site within the FERC Project Boundary or on NFS land, the field crew will extend the field reconnaissance or conduct additional surveys to determine the extent, relative abundance and lifestage distribution of bullfrogs at the site using the "toolbox approach" described by Olson and Leonard (1997). A variety of active search (e.g., "visual encounter" and net capture) and passive search (e.g., aquatic funnel traps) techniques may be used depending on site conditions.

5.3.2 Step 2 – Conduct Protocol-level Surveys (if needed)

Following submittal of the Site Assessment Report to USFWS, Licensee will consult with USFWS to determine if Protocol-level CRLF surveys are needed. The Site Assessment Report will provide a basis for discussions with USFWS regarding the potential for occurrence of CRLF within project-affected areas. For areas where surveys are required, Licensee will complete the surveys in accordance with the *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog, August 2005* (USFWS 2005). USFWS decontamination guidelines will be implemented during the surveys.

CRLF surveys will be completed in areas that are accessible and can be safely surveyed by a pair of qualified biologists. If there are any incidental sightings of CRLF during implementation of any Relicensing studies, follow-up surveys will also be conducted at those locations.

Protocol-level surveys consist of up to eight visits (i.e., two day visits and four night visits during the breeding season and one day and one night visit during the non-breeding season). If necessary, survey protocols will be modified, in consultation with USFWS, to provide for safety of survey personnel.

A CRLF survey report will be prepared that includes the following:

- Copies of datasheets
- Copies of field notes
- GPS locations for all surveyed sites
- Photographs of individual CRLF observed during surveys and habitats where the individual was observed
- GIS map documenting the location of each individual CRLF observed during the surveys

The report will be provided to USFWS for all CRLF occurrences and also to BLM for occurrences on public land administered by BLM and to the Forest Service for occurrences on public lands managed by USFS.[3]

5.3.3 Step 3 – Prepare, Format, and Quality Assurance/Quality Control Data

Following field surveys, Licensee will develop GIS maps depicting CRLF occurrences, potential habitat, project facilities and features, and other information collected during the study. Field data will then be subject to quality assurance and quality control (QA/QC) procedures, including spot-checks of transcription and comparison of GIS maps with field notes on locations of any CRLF occurrences.

5.3.4 Step 4 – Prepare Report

Licensee will prepare a report for entire study that includes the following sections: 1) Study Goals and Objectives; 2) Methods; 3) Results; 4) Conclusions; and 5) Description of Variances from the FERC-approved study proposal, if any. Confidential information will not be included in the report, but provided to appropriate agencies. At a minimum, the report will provide summaries and maps of site habitat assessments. If CRLF surveys are required, the following data presentations will be provided, along with the supporting data in Excel spreadsheet and GIS layers, as appropriate:

- Presence/absence of species by survey period at each survey site
- Abundance of each life stage by survey period at each survey site

If Licensee observes any CRLF, Licensee will notify the USFWS within 3 working days after the observation. If the CRLF is on public land administered by BLM or managed by the Forest Service, Licensee will also notify the appropriate land management agency.

For all ESA-listed plant species observations, Licensee will complete the appropriate CNDDB form and transmit the form to the CNDDB. If the CRLF is on public land administered by BLM

[3] Since this information may be considered "Confidential" by USFWS, BLM and USFWS, Licensee will make a summary of the information available to Relicensing Participants unless otherwise directed by the federal agencies.

or managed by the Forest Service, Licensee will also provide a copy of the CNDDB form to the appropriate land management agency.

6.0 Study-Specific Consultation

The study proposal includes the following specific consultation:

- Licensee will consult with USFWS, BLM and Forest Service regarding the known occurrence of CRLF habitat and populations in the study area.
- Licensee will consult with USFWS regarding the results of the site assessment and need for CRLF surveys if potentially suitable habitat is identified.

7.0 Schedule

Licensee anticipates the schedule to complete the study as follows assuming the Pre-Application Document (PAD) is filed on November 1, 2010, and FERC issues its Study Determination by October 4, 2011:

Planning, Site Assessment, and Site Assessment Report (Step 1).....March 2011 – June 2011
Protocol Surveys (Step 2, if needed).....July 2011 – August 2011, April 2012–June 2012
A/QC (Step 3) .....September 2011 – October 2012
Consult with Project Operations Staff (Step 4).....October 2012
Prepare Report (Step 5)..... October 2012 – March 2013

8.0 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 where CRLF has a potential to be affected.

9.0 Level of Effort and Cost

[Relicensing Participants – Licensee will include a cost range estimate for this study in its Proposed Study Plan. Licensee]

10.0 References Cited

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