BIO-1 FOOTHILL YELLOW-LEGGED FROG STUDY PLAN

KERN RIVER NO. 3 HYDROELECTRIC PROJECT
FERC PROJECT NO. 2290

PREPARED FOR:

SOUTHERN CALIFORNIA EDISON®

Energy for What's Ahead®

KERNVILLE, CALIFORNIA

July 2022

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1.0 POTENTIAL RESOURCE ISSUE

- Potential effects on foothill yellow-legged frog (*Rana boylii*) and their habitat.

2.0 PROJECT NEXUS AND HOW THE RESULTS WILL BE USED

- Kern River No. 3 (KR3) Hydroelectric Project (Project) operations affect streamflows, which may affect the state-endangered foothill yellow-legged frog in the Project Area.
- Results of this study will be used to examine Project operations and maintenance activities.

3.0 STUDY GOALS AND OBJECTIVES

This study will:

- Evaluate habitat suitability for all foothill yellow-legged frog life stages (i.e., egg masses, tadpoles, post-metamorphs) in the study area; and
- Determine whether any life stage of the foothill yellow-legged frog is present within the study area.

4.0 STUDY AREA AND STUDY SITES

The study area includes Project forebays and Project-affected stream reaches (Figure 4-1). The habitat suitability assessment area includes: (1) North Fork Kern River (NFKR) immediately upstream and around Fairview Dam, (2) Fairview Dam Bypass Reach (the 16-mile bypass reach of the NFKR between Fairview Dam and the KR3 Powerhouse tailrace), (3) NFKR between the KR3 Powerhouse and Kernville, (4) Salmon Creek Diversion Bypass Reach (the 0.4-mile reach from Salmon Creek Diversion downstream to the confluence with the NFKR), (5) Corral Creek Diversion Bypass Reach (the 1.1-mile reach from Corral Creek Diversion downstream to the confluence with the NFKR), and (6) Cannell Creek between the siphon spillway and the NFKR.

Specific sites for environmental deoxyribonucleic acid (eDNA) sampling and visual encounter surveys (VESs) will be selected using habitat suitability assessment information including habitat quality or value, species-specific habitat criteria, suitability for eDNA sampling, and safety and access considerations. The actual number of survey sites will depend on the results of the habitat assessment. Surveys will occur at 6 to 11 sites depending on the availability of habitat, including:

- One to two sites in the NFKR upstream of Fairview Dam
- One to four sites in the Fairview Dam Bypass Reach
- One to two sites in the NFKR between the KR3 Powerhouse and Kernville
- One site in the Salmon Creek Diversion Bypass Reach

- One site in the Corral Creek Diversion Bypass Reach
- One site in Cannell Creek

An additional study site upstream of the Project with contemporary documented occurrences of foothill yellow-legged frogs may be included as a reference site for eDNA sampling.

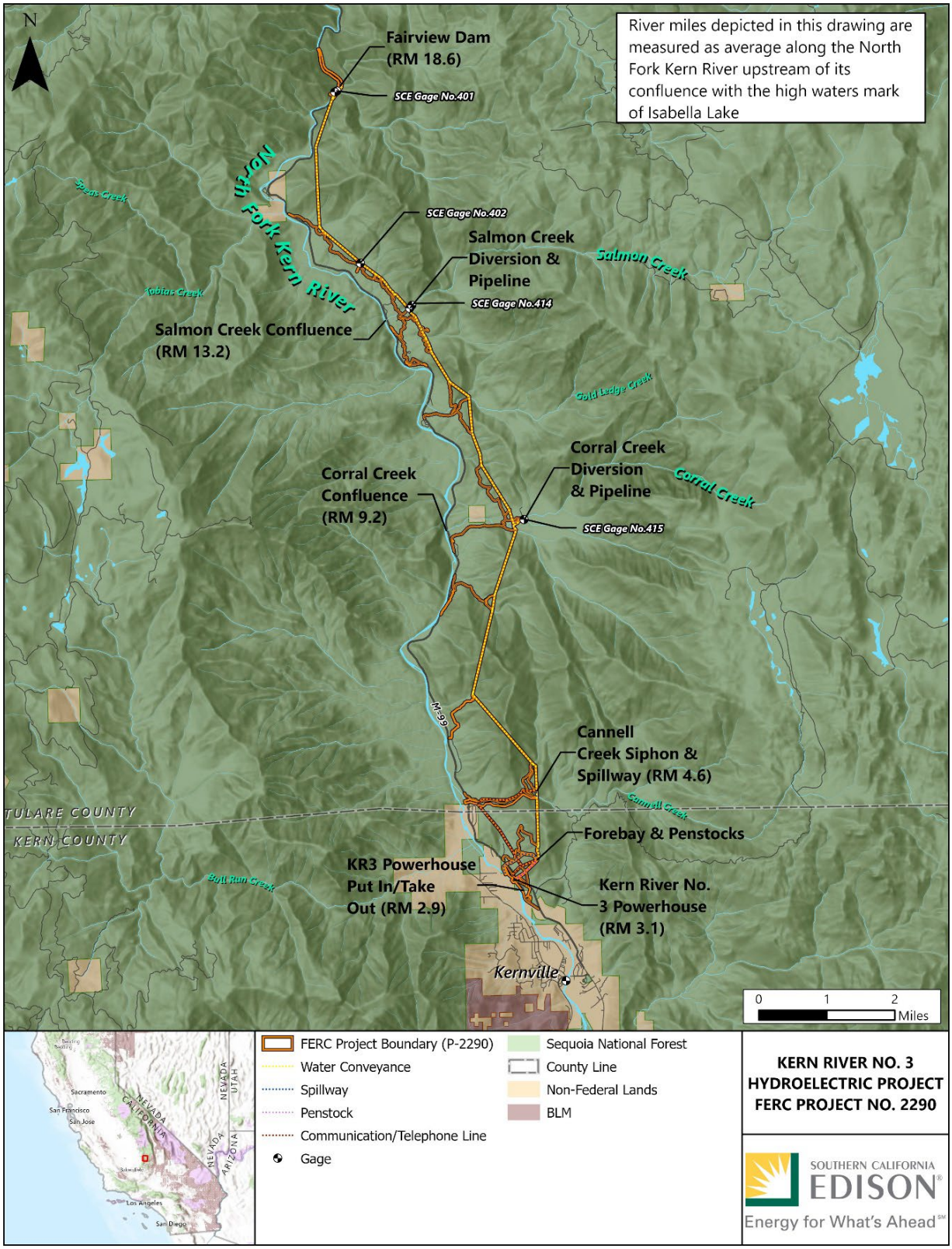


Figure 4-1. Foothill Yellow-legged Frog Study Area.

5.0 EXISTING INFORMATION

- Historically, foothill yellow-legged frogs were observed in the Project Area, including along the NFKR downstream of Fairview Dam at the confluence of Salmon Creek, and upstream of Cannell Creek, although all observations were recorded prior to 1972 (CDFW, 2020).

- The Eastern/Southern Sierra clade of foothill yellow-legged frog was listed as endangered by the California Fish and Game Commission on February 21, 2020 (California Fish and Game Commission, 2020).

- Biological evaluation surveys within stream reaches have not documented foothill yellow-legged frog; however, contemporary focused foothill yellow-legged frog surveys have not been conducted within Project-affected stream reaches (Psomas, 2004, 2013a, 2013b, 2013c; SCE, 2012).

- The nearest recorded observations to the Project Area are in Sequoia National Forest approximately 5 miles northeast from Fairview Dam. Two small, isolated populations were observed in two unnamed tributaries to the NFKR, locally referred to as Jywood Creek and Ash Creek, during multiple surveys between 1998 and 2018 (CDFW, 2020; Hayes et al., 2016).

6.0 STUDY APPROACH

A three-phased approach is being developed, as outlined below.

- Phase I: Assess the general study area for suitable habitat and select survey and sampling sites.

- Phase II: Implement eDNA and VES protocols.

- Phase III: Pending positive identification in any Project-affected stream reaches, additional data collection may be conducted.

6.1. PHASE I: IDENTIFICATION OF SUITABLE HABITAT AND SELECTION OF SURVEY SITES

- Available data sources such as online databases, aerial imagery, and video will be reviewed prior to the reconnaissance visit to aid in identifying areas of potential habitat for the foothill yellow-legged frog.

- A field reconnaissance visit will be conducted at specific locations to support the identification of suitable foothill yellow-legged frog habitat, select study sites, and test eDNA methods prior to sampling.

- Sites will be selected to provide reasonable coverage of representative suitable habitat and stream conditions suitable for eDNA sampling at access points that do not compromise surveyor safety.

The following are foothill yellow-legged frog habitat suitability ranking categories.

- High: areas containing suitable habitat for all life stages, especially breeding. These stream segments would provide protection for egg mass deposition and larval maturation (e.g., wide channel areas with edgewater and backwater areas sheltered from flow; banks with shallow slopes).

- Moderate: areas containing suitable habitat for most life stages, although areas may lack potential habitat for one or more life stages (e.g., some habitat may be exposed to the main flow; there may be moderately steep or incised banks).

- Low: areas containing little or no suitable habitat for breeding or larval development and minimal refugia for post-metamorphic life stages (young-of-year, juveniles, adults). Habitat may function as a dispersal corridor.

- Not suitable: areas containing no potentially suitable habitat for any life stage.

Site selection will focus on areas with high habitat suitability; sites with moderate or low suitability will be selected if highly suitable sites are not identified.

6.2. PHASE II: CONDUCT FIELD SURVEYS

To minimize the potential spread of invasive species and pathogens (e.g., Chytrid fungus [*Batrachochytrium dendrobatidis*]), appropriate standard and currently accepted decontamination protocols will be followed prior to each aquatic-based field effort.

6.2.1. ENVIRONMENTAL DNA SAMPLING

eDNA field collection methods are based on current eDNA sample collection literature and protocols (e.g., Halstead et al., 2020; Bedwell and Goldberg, 2020; Carim et al., 2016; Laramie et al., 2015; Goldberg et al., 2015; and Pilliod et al. 2014).

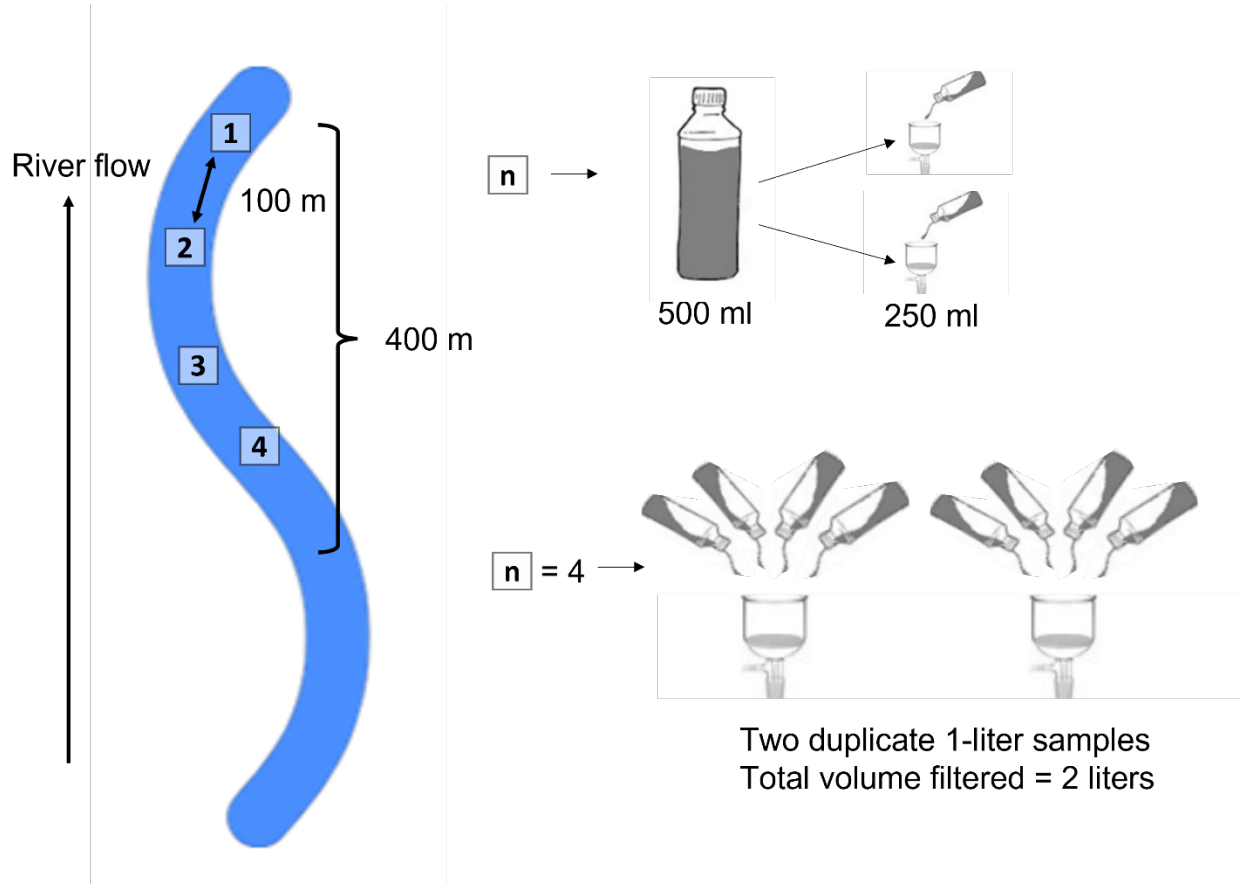
6.2.1.1. Sample Timing

eDNA samples will be collected between July and August. Detection rates in lotic systems for foothill yellow-legged frogs improve later in the season, as drying of sites lead to increased population densities and concentrations of DNA (Bedwell and Goldberg, 2020). Additionally, any larvae foothill yellow-legged frogs would be present in July and August, increasing chances of eDNA detection as yellow-legged frog larvae are exclusively aquatic.

6.2.1.2. Sample Collection

A minimum of four (n≥4) 500-milliliter water samples will be collected at each site (see Section 4.0, Study Area and Study Sites, for site information). Water samples will be collected every 100 meters. Surveyors will split the waters sample into two (n≥8) 250-milliliter samples. To create duplicate (n≥2) 1-liter samples, surveyors will combine the 250-mililiter samples (see Figure 6.2-1 for eDNA sampling design). Surveyors will extend

sampling locations (n>4 sampling locations per site) if suitable habitat/high quality habitat is observed. If a filter clogs prior to filtering 1 liter, an additional filter will be used, resulting in a 2-liter minimum volume sampled at each site as recommended by Bedwell and Goldberg (2020). Surveyors will collect all samples from the water's surface and target sampling locations in habitats/micro-habitats that appear high quality foothill yellow-legged frog habitat (e.g., backwaters, rocky slow-moving streams). To prevent downstream contamination, surveyors will collect all samples from downstream to upstream, and where possible surveyors will avoid entering the riverine system. All boots, equipment, and other material that come in contact with the water will be decontaminated with a 10 percent bleach solution for 10 minutes prior to changing sampling sites.



m = meter; ml = milliliter

Figure 6.2-1. eDNA Sampling Protocol Design

6.2.1.3. Sample Filtration

To filter all water samples, surveyors will use 0.45- to 5.00-micron filters and a polypropylene vacuum flask with a rubber stopper fixed to a hand pump or peristaltic pump. Surveyors will filter all water samples in the field or store the filters in a cooler/refrigerator and filter within 24 hours. To remove the filter membrane after filtration, surveyors will use single-use forceps or forceps soaked in a 50 percent bleach solution

and rinsed in distilled water. All personnel will wear disposable latex gloves during sample collection and changed gloves prior to handling the filter membrane. To create a field blank (i.e., control sample), surveyors will filter 1 liter of distilled water at each site or at the end of each day following collection. Following filtration, surveyors will either desiccate filters or store filters in 95 percent ethanol. All filters will be kept in cool areas out of the sun and will be extracted within 6 months post collection.

6.2.1.4. eDNA Extraction and Analysis

eDNA samples will be extracted and analyzed by a recognized laboratory that conducts eDNA analysis. The laboratory will extract the eDNA in a "clean" room where no quantitative polymerase chain reaction (qPCR) products or high-quality DNA (i.e., tissue or blood samples) is handled. Laboratory personnel will follow best practices for eDNA extraction and create and analyze an extraction and qPCR negative with every extraction batch and qPCR plate. All eDNA samples will be analyzed with an internal positive control to ensure samples are not inhibited and that a negative result signifies DNA was not detected (not a failed qPCR reaction). Laboratory personnel will analyze the samples for foothill yellow-legged frogs using previously published assays that have been peer reviewed as well as tested *in situ* and *in vivo*.

6.2.2. VISUAL ENCOUNTER SURVEYS

- A single VES for foothill yellow-legged frog will be conducted along with eDNA sampling at each site.

- The survey area will include safely accessible aquatic features within approximately 100 meters upstream (greater than or equal to 400 meters total survey distance) of the eDNA sample location.

- Surveys will be conducted by a minimum of two surveyors working in tandem. Surveyors will wade or walk the shoreline and shallow-water habitats where possible, scanning ahead and searching stream banks, back-channel areas, and instream habitats for larvae (tadpoles) and post-metamorphic frog life stages (juveniles and adults) on both sides of the river, where possible.

- All other amphibian and aquatic reptile species observed during the surveys will be recorded. Each species' detection will be recorded by life stage along with associated habitat data. Data collected will include species information, microhabitat characteristics where the individual was detected (e.g., air and water temperature, substrate, location in the stream, associated vegetation or cover), and Universal Transverse Mercator (UTM) coordinates.

- Biologists will also note any incidental observations of non-native invasive aquatic species (e.g., bullfrog, crayfish, Asian clams, and invasive fishes) and other key species of interest (e.g., special-status freshwater mussels, bald eagle, osprey, and Great blue heron) on data sheets and will report this information in the Technical Report for use by other studies during the relicensing process.

- A California Native Species Field Survey Form will be completed for any special-status species observed during the field surveys and will be submitted to the California Natural Diversity Database (CNDDB).

6.3. PHASE III: ADDITIONAL FIELD SURVEYS

If the results of field surveys indicate that foothill yellow-legged frogs are present in any stream reach, additional studies may be developed in consultation with Stakeholders to characterize the population of foothill yellow-legged frog (e.g., multi-life stage surveys) that may be affected by Project operations.

7.0 REPORTING

SCE will file an Initial Study Report (ISR) within 1 year following FERC's Study Plan Determination (estimated August 3, 2023) and an Updated Study Report (USR) no later than 2 years after FERC's Study Plan Determination. The ISR and USR will provide an update on SCE's overall progress in implementing the Study Plan and schedule and the data collected, including an explanation of any variance from the Study Plan and schedule. A Technical Memo will be appended to either the ISR or USR filing, as applicable. Confidential information (e.g., precise locations of any incidental special-status species observations) will be provided directly to relevant agencies and filed as "Privileged Information" with FERC. Standard geographic information system (GIS) shapefiles, including metadata, will be provided to relevant agencies upon request. The information provided in the Technical Memo will be summarized in, and appended to, the Application for New License.

In addition, SCE may prepare interim reports during the study year to apprise Stakeholders on study implementation progress and to support consultation with Stakeholders.

8.0 SCHEDULE

One year of data collection will occur for foothill yellow-legged frog; a second year of data collection would be considered in consultation with relevant agencies if the results of eDNA and field surveys indicate that this species is present in any of the study areas.

Date	Activity
Spring–Fall 2022	Conduct desktop analysis and field surveys
Winter 2022/2023	Analyze data and prepare Technical Memo
Spring–Summer 2023	If needed, conduct additional field surveys pending consultation with relevant agencies
August 2023	Provide Technical Memo with ISR
August 2024	Provide updated Technical Memo with USR, if applicable

ISR = Initial Study Report; USR = Updated Study Report

9.0 LEVEL OF EFFORT AND COST

The estimated cost (2022 dollars) for the study is $100,000, which includes field work, data compilation and analysis, and reporting.

10.0 REFERENCES

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