

#### **4.1.4 Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study**

##### **4.1.4.1 Project Nexus**

Continued Project O&M and Project-related recreation activities have potential to affect the following special-status aquatic amphibians and semi-aquatic snake species, each of which is classified as SSC by CDFW: western spadefoot (*Spea hammondi*), FYLF (*Rana boylei*), two-striped garter snake (*Thamnophis hammondi*), and South Coast garter snake (*Thamnophis sirtalis infernalis*).

##### **4.1.4.2 Existing Information and Need for Additional Information**

Existing, relevant, and reasonably available information regarding special-status aquatic amphibians and semi-aquatic snake species and their habitat within the proposed Project boundary is limited in extent and provided in Section 4.5 of the Licensees' PAD. As a summary, the Licensees determined that two aquatic-breeding special-status amphibians and two semi-aquatic snake species have the potential to occur within the proposed Project boundary. Three of these species have been documented in the vicinity of the Project by the California Natural Diversity Database (CNDDDB) (CDFW 2015) or other sources (i.e., Project and adjacent areas covered by USGS 7.5-minute topographic quadrangle maps). However, only the two-striped garter snake has a high probability of occurring, with recent observations documented in areas adjacent to Piru and Castaic creeks, including observations each year during annual sensitive species surveys performed by the Licensees in the Pyramid reach (ESA 2010, 2011, 2012, 2013, 2014, 2015). South Coast garter snake is currently considered a geographic isolate (i.e., Ventura County to San Diego County) of the more widely distributed California red-sided garter snake (Humboldt County to San Diego County). Jennings and Hayes (1994) describe habitats of the South Coast garter snake as "marsh and upland habitats near permanent water that have good strips of riparian vegetation." Most records of South Coast garter snake are from the coastal plain; however, the range may extend an unknown distance into the adjacent foothills (Jennings and Hayes 1994). Table 4.1-2 below summarizes habitat requirements and known occurrences of the four species.

**Table 4.1-2. Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Potentially Occurring in the Proposed Project Boundary**

| Species                     | Habitat Requirements   | Known Occurrences in Project Vicinity (USGS Quadrangle Maps)  |
|-----------------------------|--|---|
| Western spadefoot           | Breeds in vernal pools and other ponds that dry seasonally (rarely in permanent ponds), including stock ponds, storm-water detention basins, and pools on compacted soil, and occasionally in pools within intermittent streams. Non-breeding habitat is terrestrial in grasslands, oak woodlands, and occasionally chaparral.                 | Mint Canyon, Newhall, Val Verde, and Whitaker Peak. (No known occurrences within proposed Project boundary.)          |
| Foothill yellow-legged frog | Aquatic in low to moderate-gradient, permanent streams and seasonal tributaries. Eggs are deposited in locations with low water velocity, including edgewater, pools, and pool tail-outs, and usually on cobble/boulder substrates and in shallow water. Generally not abundant in habitats where introduced fish and American bullfrog occur. | Cobblestone Mountain and Piru. (Documented in Piru Creek, but no recent records.)                                     |
| Two-striped garter snake    | Aquatic-feeding specialist closely associated with areas of permanent water, especially in and along rocky streams and ponds with riparian vegetation. Habitat suitability likely related to presence of aquatic vertebrate prey (i.e., amphibians and small fish).  | Green Valley, Lebec, Piru, Mint Canyon, Val Verde, and Whitaker Peak. (Known along parts of Piru and Castaic creeks.) |
| South Coast garter snake    | Shallow, permanent, low gradient water and associated dense, multi-storied vegetation. Closely associated with marshes and adjacent upland habitat. May be an aquatic-feeding specialist.  | No records in CNDDDB. Jennings and Hayes (1994) shows a record from Piru Creek south of Lake Piru (Piru quad).        |

Additional information, which will be provided by this *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study*, is needed to determine presence or absence of these special-status species within the study area for the *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study*.

#### **4.1.4.3 Study Goals and Objectives**

The goals of this *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study* are to: (1) identify habitats suitable for special-status aquatic amphibians and semi-aquatic snake species; and (2) perform surveys to determine if these special-status species occur in the proposed Project boundary.

The objective of this *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study* is to gather sufficient data necessary to fill gaps in existing information about the species' likely presence or absence.

#### 4.1.4.4 Study Methods

##### Study Area

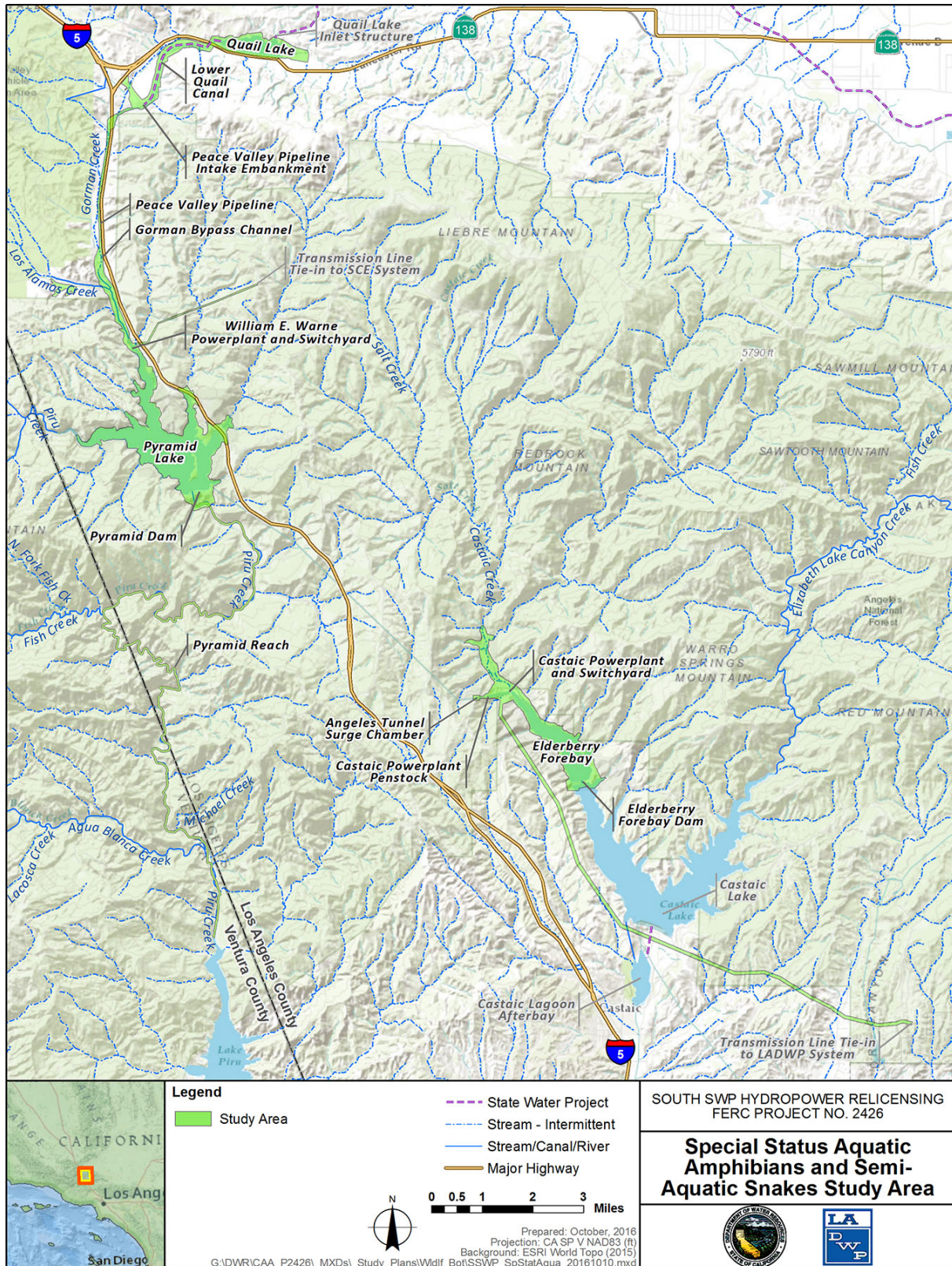
The study area for the *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study* consists of the area within the proposed Project boundary, excluding lands overlying the Angeles Tunnel on which the Licensees do not perform any Project O&M activities. In addition, the study area for the *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study* will include the Pyramid reach (Figure 4.1-9).

##### 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 *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study* will begin after FERC issues its Study Plan Determination.
- The *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study* does not include the development of requirements for the new license, which will be addressed outside this Study.
- The *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study* focuses specifically on special-status aquatic amphibians and semi-aquatic snakes within the proposed Project boundary, but the study area for the *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study* is specific to locations that can support that resource.
- If required for the performance of the *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes 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 *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study*.
- Field crews may make variances to the *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study* in the field to accommodate actual field conditions and unforeseen problems. Any variances from the *Special-Status Aquatic*

*Amphibians and Semi-Aquatic Snakes Study* will be noted in the data resulting from the *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes 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 4.1-9. Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study Area**

## **Methods**

The *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study* will consist of three steps: (1) identify potential habitat; (2) conduct field reconnaissance and surveys; and (3) prepare results. These steps are described below. Biologists performing the surveys will have the necessary permits, including a USFWS Section 10(a)(1)(A) species recovery permit for arroyo toad in order to perform special status-species surveys in areas where arroyo toad is likely to occur.

**Step 1 – Identify Potential Habitat.** The Licensees will use existing information, including known habitat requirements of the four target species, records of occurrence, aerial photographs, ground photographs, and field observations of habitat from the Licensees' other relicensing studies for preliminary identification of potential habitat that could support each of the species. Licensees will then prepare maps for Step 2, indicating these areas of potential habitat.

**Step 2 – Conduct Field Reconnaissance and Surveys.** Where additional information is needed to assess habitat suitability the Licensees will perform field reconnaissance of accessible potential habitat identified in Step 1 and to identify additional areas where potential habitat may occur. The information to be collected during field reconnaissance will include evidence that aquatic habitats are sufficient in duration to support the species, incidental observations of garter snake prey species (especially amphibians and small fish), presence of vernal pools or other flooded depressions too small to detect on aerial photographs, and potential egg deposition habitat for FYLF. Following review of this information, the Licensees will perform species surveys in areas determined to be potentially suitable habitat or at a representative set of sites if potentially suitable habitat for a species is determined to be abundant. A lower priority for survey sites may also apply to habitats within the 4.5-mile segment of the Pyramid reach between Ruby Canyon and the Blue Point Campground, which are surveyed annually for sensitive species, including two-striped garter snake, and thus survey data has already been collected from this segment.

The selection of survey sites will also take into account site-specific conditions, including safety, accessibility (i.e., road or trail access, topography), and permission from landowners to survey on private lands. Surveyors will include biologists or scientists that are qualified to identify each of the target species and their habitats, as well as other possibly occurring amphibians and snakes.

Survey methods will 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. Visual encounter surveys for FYLF consisting of three survey periods will be performed in the upper portion of the Pyramid reach, if suitable habitat is documented. Two surveyors working in tandem will search along both banks of streams, back channel areas, and potential instream habitats for FYLF walking slowly while one observer scans ahead. Habitats along each bank will be searched. To aid in the detection of eggs

and larvae, surveyors will use a viewing box in shallow margin areas. Surveyors will exercise care to avoid disturbing egg masses and tadpoles of arroyo toad in areas where this species occurs. Each FYLF detection will be recorded by life stage along with water temperature, water depth, and substrate characteristics.

Western spadefoot is a fossorial species during terrestrial life stages and breeds somewhat unpredictably by season and location. Accordingly, surveys will focus on potential breeding habitats identified by the Licensees, which will be visually searched and dip-netted for larvae. Dip-netting will not occur in areas where arroyo toad individuals or arroyo toad egg masses are present. Two surveys per site will be performed, unless western spadefoot is detected on the first survey.

Both 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 visual inspections of potential habitat while walking and scanning suitable basking locations with binoculars. The Licensees will perform three visual surveys of potential habitat, covering representative habitat, or two surveys of entire habitat patches, if few suitable sites exist; however, the number of surveys per site may be reduced if target species are documented with fewer surveys.

Step 3 – Prepare Results. Following the surveys, the Licensees will develop summary text from field notes describing survey results and GIS maps depicting survey locations, special-status species occurrences, Project facilities, features, and specific Project O&M and Project-related recreation activities.

### **Quality Assurance and Quality Control**

Field data will be collected in a manner that promotes high quality results, and will be subject to appropriate QA/QC procedures, including spot-checks of transcription and comparison of GIS maps with field notes to verify locations of sensitive habitats and species.

### **Analysis**

Once the location of the special-status species in the study area for the *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study* is determined, the Licensees will identify any Project O&M and Project-related recreation activities that occur in the vicinity where the species were documented.

### **Reporting**

*Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study* methods and results will be summarized and included, to the extent completed and ready for inclusion in the Licensees' ISR, USR, DLA, and FLA.

#### **4.1.4.5 Consistency of Methodology with Generally Accepted Scientific Practices**

This *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes Study* is consistent with the goals, objectives, and methods outlined for special-status species on recent FERC hydroelectric relicensing efforts in California, including the Don Pedro Project (FERC Project No. 2299), the Yuba River Development Project (FERC Project No. 2246), and the Merced River Hydroelectric Project (FERC Project No. 2174). Survey methods for the two garter snake species, for which no standard survey protocols exist, follow general practices accepted by the scientific community.

#### **4.1.4.6 Schedule**

The *Special-Status Aquatic Amphibians and Semi-Aquatic Snakes 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 – March 2018   |
| Fieldwork                   |                             |
| Field Reconnaissance        | July 2017                   |
| Surveys                     | March 2018 – September 2018 |
| Data QA/QC                  | October 2018                |
| Data Analysis and Reporting | October 2018 – June 2019    |

#### **4.1.4.7 Level of Effort and Cost**

Based on the work effort described above, the Licensees estimate the current cost to complete this Study is between \$101,000 and \$135,000.

#### **4.1.4.8 References**

- CDFW. 2015. CNDDDB. RareFind Version 5. Available online: [nrmsecure.dfg.ca.gov/cnddb/view/query.aspx](http://nrmsecure.dfg.ca.gov/cnddb/view/query.aspx). Accessed July 31, 2015. Last updated July 7, 2015. California Department of Fish and Wildlife, Biogeographic Data Branch. Sacramento, CA.
- DWR. 2010. The Quagga and Zebra Mussel Rapid Response Plan for the State Water Project. 93 pp. CONFIDENTIAL/PRIVILEGED – Not for Public Distribution.
- Environmental Science Associates. 2010, 2011, 2012, 2013, 2014, 2015. Middle Piru Creek arroyo toad (*Anaxyrus californicus*) clutch surveys and sensitive species monitoring. Prepared for DWR. Annual Reports.
- 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.