STUDY DESCRIPTION AR-7
ESA-Listed Amphibian and Aquatic Reptile Visual Encounter Surveys
November 3, 2026

This Study Description is developed to address information gaps identified by Calaveras County Water District (CCWD) for the relicensing of its North Fork Stanislaus River Hydroelectric Project (Project).

Four federal Endangered Species Act (ESA) listed amphibian species and one aquatic reptile species proposed for ESA-listing have the potential to occur within the proposed Federal Energy Regulatory Commission (FERC) Project Boundary and/or stream reaches potentially affected by the Project, as identified in the Pre-Application Document (PAD): Yosemite toad (*Anaxyrus canorus*), foothill yellow-legged frog (*Rana boylii*; South Sierra Distinct Population Segment [DPS]), California red-legged frog (*Rana draytonii),* Sierra Nevada yellow-legged frog (*Rana sierrae*), and northwestern pond turtle (*Actinemys marmorata*). Two of these have been documented within the PAD's aquatic resource Assessment Area (i.e., the FERC Project Boundary, Project-affected stream reaches,[1] and a 0.25 mile buffer)—foothill yellow-legged frog and Sierra Nevada yellow-legged frog—while the other three have been documented outside, but within 5 miles, of the aquatic resources Assessment Area.

This study will use Visual Encounter Surveys (VES) to inform the distribution and habitat use by ESA-listed species within Project reservoirs and Project-affected reaches. This study will be conducted alongside Study AR-6 (*Special-status Amphibian and Aquatic Reptile eDNA Sampling*); environmental deoxyribonucleic acid (eDNA) sampling will serve to supplement this study's findings.

STUDY AREA

The Study Area includes safely accessible areas within 0.25 mile of the proposed FERC Project Boundary, which includes the project impoundments (i.e., North Fork Diversion Dam impoundment, New Spicer Meadow Reservoir, Beaver Creek Diversion Dam impoundment, and McKays Point Reservoir). The Study Area also includes stream reaches downstream of project dams that have the potential to be affected by Project operations or activities, including portions of Highland Creek, North Fork Stanislaus River, Beaver Creek, and Stanislaus River.

The elevation range of the Study Area is from approximately 6,700 to 1,100 feet above mean sea level.

[1] Project affected streams reaches include reaches downstream of project dams or other release points that have the potential to be affected by Project operations or activities, including portions of Highland Creek, North Fork Stanislaus River, Beaver Creek, and Stanislaus River.

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Survey Locations

General survey locations and the target species are listed in Table 1, which includes the waterbody, general location of the site, and the proposed site length (if applicable). General survey locations are distributed along Project-affected waterbodies and each location was evaluated for target species based on their life history requirements. Biologists will determine the exact location and extent of each site based on accessibility (e.g., landowner approval, terrain), habitat suitability (detailed in Section 3.6 *Endangered Species Act-listed Species* of the PAD), and safety (described in the Concepts and Practices Applicable to All Relicensing Studies document developed by CCWD). Survey locations may target multiple ESA-listed species where suitable habitat is co-occurring (e.g., North Fork Diversion Impoundment targets Yosemite toad and Sierra Nevada yellow-legged frog). Approximate locations are shown in Figure 1.

Table 1. General survey locations for Study AR-7, *ESA-listed Amphibian and Aquatic Reptile Visual Encounter Surveys*.

Waterbody	General Survey Location (Approximate River Mile[1])	Type	Approximate Site Length (mile)	Target Species				
				YT	SNYLF	CRLF	FYLF	NWPT
North Fork Diversion Impoundment	Accessible shoreline areas with suitable meadow/ wetland habitat	Reservoir	NA[2]	X	X	--	--	--
New Spicer Meadow Reservoir	North Fork Diversion Tunnel outlet channel	Stream	0.20[3]	--	X	--	--	--
	Accessible shoreline areas with suitable meadow/ wetland habitat	Reservoir	NA[2]	X	X	--	--	--
Highland Creek	Downstream of New Spicer Meadow Reservoir (HC 5.5)	Stream	0.25	--	X	--	--	X
North Fork Stanislaus River	North Fork Stanislaus River or Duck Creek upstream of North Fork Diversion impoundment (NF 33.3)	Stream	0.25	X	X	--	--	--
	Downstream of North Fork Diversion Dam (NF 32.7)	Stream	0.25	--	X	--	--	--
	Pioneer Walking Bridge upstream of confluence with Highland Creek (NF 27.8)	Stream	0.25	--	X	--	--	X
	Wakalu Hep Yo Campground Area (NF 16.2)	Stream	0.25	--	--	X	X	X
	Upstream of Boards Crossing Road (NF 14.5)	Stream	0.25	--	--	X	X	X

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Table 1. (Continued).

Waterbody	General Survey Location (Approximate River Mile[1])	Type	Approximate Site Length (mile)	Target Species				
				YT	SNYLF	CRLF	FYLF	NWPT
North Fork Stanislaus River	Stanislaus River Day Use Area near Lava Bluffs Trailhead (NF 11.2)	Stream	0.25	--	--	X	X	X
	Downstream of McKays Diversion Dam (NF 7.7)	Stream	0.25	--	--	X	X	X
McKays Point Reservoir	Accessible shoreline areas with suitable habitat	Reservoir	NA[2]	--	--	X	--	X
Beaver Creek Diversion Impoundment	Accessible shoreline areas with suitable habitat	Reservoir	NA[2]	--	--	X	--	X
Beaver Creek	Downstream of Beaver Creek Diversion Dam (BC 3.0)	Stream	0.25	--	--	X	X	X
Stanislaus River	Near confluence of Collierville Powerhouse Tailrace	Stream	0.25	--	--	X	X	X

Notes: CRLF = California red-legged frog; FYLF = foothill yellow-legged frog; NA = not applicable; NWPT = northwestern pond turtle; SNYLF = Sierra Nevada yellow-legged frog; YT = Yosemite toad;

[1] For survey locations in stream reaches, approximate river miles are provided.

[2] Reservoirs or impoundment shoreline surveys will include up to 0.25 miles of combined shoreline focusing on suitable habitat for target species that is safely accessible.

[3] Surveys will be conducted in the open, accessible portion of the tunnel outlet channel near the confluence with New Spicer Meadow Reservoir and Hobart Creek. Enclosed portions of the North Fork Diversion Tunnel will not be surveyed.

Because Yosemite toad spends a substantial portion of its adult life stage in terrestrial habitats and may use upland areas up to 0.78 mile from suitable breeding habitat (Liang 2013), a desktop habitat assessment will be used to identify additional potential survey locations (e.g., meadows, ponds, or other suitable breeding features) to assess the species distribution in the FERC Project Boundary. Habitat may be included as an additional survey location if it meets the following criteria: (1) contains suitable aquatic breeding habitat for Yosemite toad; (2) occurs within 0.78 mile of the FERC Project Boundary and above 6,400 feet in elevation (e.g., areas around North Fork Diversion Impoundment, New Spicer Meadow Reservoir, and Spicer Reservoir Campground); (3) the breeding habitat or surrounding uplands (within 0.78 mile of the FERC Project Boundary) have the potential to be affected by routine Project operation and maintenance activities or Project-related recreation; and (4) is safely accessible with appropriate landowner approval(s). The desktop habitat assessment will use existing data including National Wetland Inventory maps, U.S. Geological Survey 1:24,000 topographic quadrangle maps, hydrologic data, and aerial imagery.

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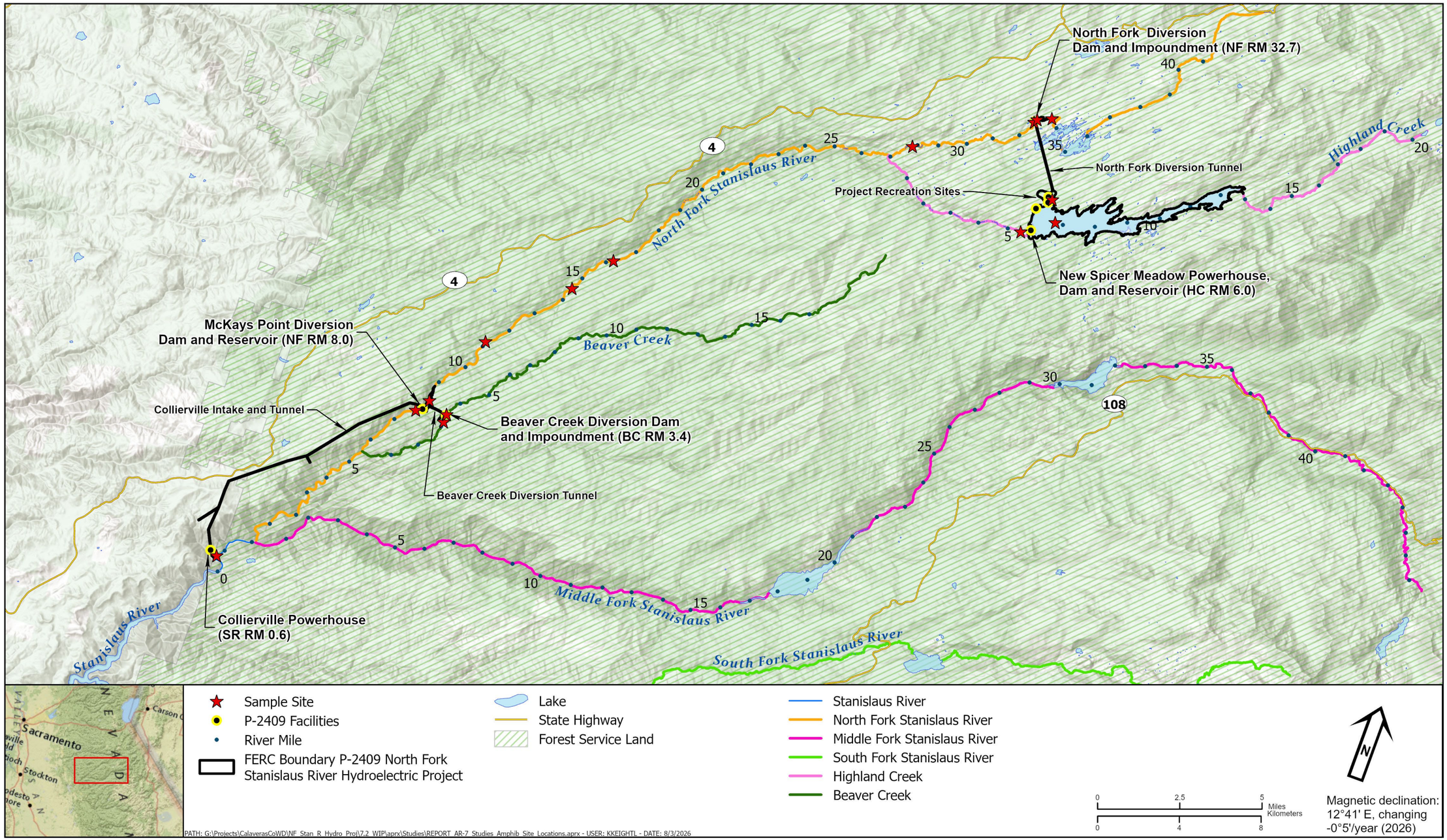


Figure 1. AR-7 Approximate Survey Locations.

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STUDY METHODS

Field Survey Methods

Field surveys will include visual encounter surveys (VESs) for target species based on aquatic habitat associations and established or recommended methods. Survey methods and frequencies were developed based on available survey guidance, species-specific recommendations, and the information needs of the relicensing process. The proposed surveys are intended to characterize the presence, distribution, habitat use, and life-stages of target species within the Study Area and provide information sufficient to support an analysis of Project-related effects. The study is not intended to satisfy all species-specific occupancy determination protocols or presence/absence survey requirements that may apply in other contexts. Appropriate scientific permitting (e.g., handling permit, scientific collecting permit) for ESA-listed species will be sought from the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) prior to initiating surveys.

For all target species except Yosemite toad, surveyors will conduct a total of three VESs at the survey locations included in Table 1. For Yosemite toad, two spring surveys will be conducted because breeding is concentrated within a relatively narrow seasonal window; surveying during spring and suitable breeding conditions is the most effective period for detecting adults, egg masses, and/or larvae. Exact timing for each survey will be determined based on the target species' breeding seasons and environmental conditions (e.g., snowmelt, temperature, and accessibility) for that year. Surveys for multiple target species may be conducted concurrently based on elevational or target species ranges. For instance, the North Fork Stanislaus River near the Wakalu Hep Yo Campground Area has the potential for four target species (Table 1).

Habitat conditions will be recorded during each survey with notes relevant to each target species, such as habitat type, stream type (i.e., perennial, intermittent, or ephemeral), aquatic and terrestrial vegetation, stream gradient, stream bankfull width estimates, aquatic substrate, water temperature, stream channel characteristics, water clarity, and presence of potential predators. Additionally, during all targeted field surveys, incidental observations of all amphibian or aquatic reptile species will be noted and detailed data will be collected (e.g., location, life stage, habitat description). If American bullfrog (*Lithobates catesbeianus*) are observed, observation data will be uploaded online via CDFW's Statewide Bullfrog Reporting Form.

Yosemite Toad. VESs will be conducted using survey methods and recommendations for Yosemite toad outlined in Brown et al. (2012 and 2015) and Brown and Olsen (2013). Two surveys will be conducted in one calendar year (the first will be approximately 2 weeks after snowmelt and the second 4–6 weeks after snowmelt), targeting the species' breeding season when egg masses, tadpoles, and/or breeding adults could be present. If Yosemite toads are observed during the initial surveys (i.e., first year surveys), no additional surveys are needed. If no Yosemite toads are observed during the initial year, the survey effort will be repeated in the following year. Surveys may be timed concurrent with the first Sierra Nevada yellow-legged frog survey. Biologists will aim to conduct surveys after snowmelt when monitoring sites (i.e., breeding areas) are free of snow, but snow may still be present in the uplands. To determine the timing of the surveys,

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biologists will work with CCWD to get frequent condition updates and access reports and may also use current snowpack, snow depth maps, and/or forecasts. Surveys will be conducted during conditions that are ideal for detecting amphibians (e.g., clear or partially cloudy skies, warm weather), if adverse weather is observed (e.g., rain, snow, dense fog) the crew will delay the survey until conditions improve.

CCWD will install audio recorders at suspected Yosemite toad breeding locations before snowmelt begins to capture calling during Yosemite toad breeding (if conditions allow).

Foothill Yellow-legged Frog. VESs will be conducted using survey methods and recommendations for foothill yellow-legged frogs outlined in Peek et al. (2017). Three surveys will be conducted in one calendar year between early spring and early fall to target and document all life stages of the species: adults, subadults, tadpoles, and egg masses.

California Red-legged Frog. VESs will be conducted following daytime and, where feasible, nighttime survey methods and recommendations described in USFWS (2005). Three daytime surveys will be conducted at sites with suitable habitat, with survey timing aligned with foothill yellow-legged frog and northwestern pond turtle surveys to the extent practicable. During the daytime survey, surveyors will assess if the site can be feasibly surveyed at nighttime as well (e.g., safely surveyable based on terrain, access, and water safety). If it is deemed feasible, up to three nighttime surveys will be conducted following the daytime survey.

Sierra Nevada Yellow-legged Frog. VESs will be conducted following survey methods and recommendations for Sierra Nevada yellow-legged frogs outlined in CDFW (2022) and using techniques described in Brown and Olsen (2013), Brown et al. (2014), and Brown et al. (2019). Three surveys will be conducted in one calendar year between early spring and early fall (an early-, mid-, and late-season survey) to target and document all life stages of the species and to document presence of the species in and near Project-affected reservoirs and reaches.

Northwestern Pond Turtle. Methods of surveying for this species in lentic and lotic habitats will follow visual survey methods (i.e., pedestrian surveys) and recommendations for pond turtles outlined in USGS (2006) and Bury et al. (2012). Three surveys will be conducted concurrently with surveys for Sierra Nevada yellow-legged frog (where species' range overlaps), California red-legged frog, and/or foothill yellow-legged frog at sites with suitable aquatic habitat.

Analysis

Species presence and distribution data will be tabulated, summarized, and checked for quality. Habitat conditions, photographs, and other field notes collected during VESs will be used to identify suitable habitat for target ESA-listed amphibian and reptile species within the proposed FERC Project Boundary or potentially affected by the Project.

Occupancy status for Yosemite toad and Sierra Nevada yellow-legged frog will be evaluated using the guidelines outlined in U.S. Department of Agriculture, Forest Service (Forest Service) and USFWS (2014 and 2017) Programmatic Biological Opinions (PBOs), where applicable. These

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PBOs provide relevant guidelines for evaluating survey data and habitat use for Yosemite toad and Sierra Nevada yellow-legged frog on National Forest System lands[2] and will be used to inform interpretation of survey results, where applicable. If prior surveys have been conducted within the previous ten years, those data will be evaluated in conjunction with results of this Study to determine if there is sufficient data to support a suitability and occupancy determination (e.g., unsuitable or suitable habitat—utilized, utilization unknown, or unutilized potential; USFWS 2017) to support the Project effects analysis.

REPORTING

CCWD will analyze the results of desktop and field efforts as described above. Study data will be made available to interested parties and standard GIS shapefiles, including metadata, if developed will be provided.[3]

SCHEDULE

CCWD anticipates the schedule for Study completion as follows:

Desktop breeding habitat assessment for Yosemite toad	December 2026–February 2027
Field surveys for target species	February–October 2027
Analysis	October–December 2027
Reporting	December 2027–February 2028
Field surveys for Yosemite toad (if needed)	February–June 2028

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[2] For Yosemite toad occupancy determinations, the PBOs require three VESs, over three separate calendar years, during a ten-year period, with at least one survey during a water year where snowpack is ≥80% of normal. For Sierra Nevada yellow-legged frog occupancy determinations, the PBOs require three surveys within a ten-year period (within one season or in separate years) with one survey conducted in a water year where snowpack is ≥80% of normal.

[3] In addition to the details provided in this section, reporting will also follow the "Concepts and Practices Applicable to All Relicensing Studies" developed by CCWD.

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