



Biological Resources

**Threatened, Endangered, and Special-
Status Species Surveys and Permitting**

**Special-Status Species Permits
and Survey Capabilities**

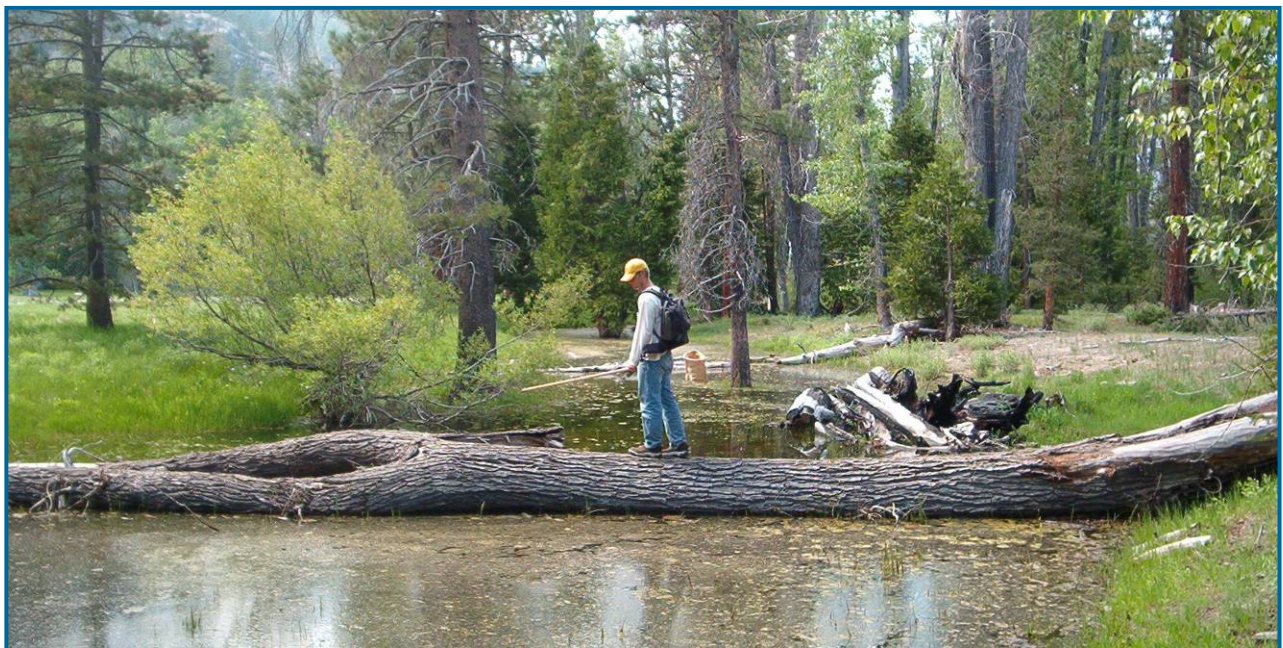
**Amphibian Ecology, Surveys and
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ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Threatened, Endangered, and Special-Status Species Surveys and Permitting

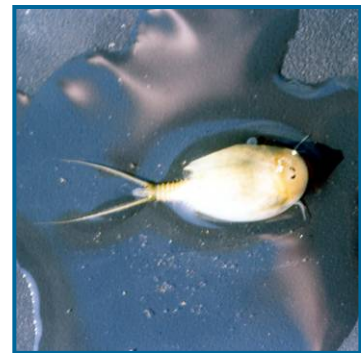


ECORP biologists provide habitat assessments and conduct determinate surveys for special-status plant and wildlife species including those protected under the federal and state Endangered Species Acts. Our staff has statewide experience working within a variety of habitats and natural communities. Our biologists are familiar with species' habitat components, life histories, and agency-approved survey methodologies. ECORP staff assess project-related impacts and consult with regulatory agencies to avoid, minimize, and/or mitigate habitat impact.



Services Provided

- Compilation and analysis of baseline data and field inventory for listed/candidate and other special-status plants and animals
- Inventory and identification of special-status plants and animals by permitted staff specialists
- Implementation of agency-recommended protocols for presence/absence determination of special-status species
- Preparation of Biological Assessment (BA) documents
- Formal and informal consultation with U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Forest Service, California Department of Fish and Game, and local agencies





Special-Status Species Permits and Survey Capabilities

ECORP has highly qualified staff with the expertise and necessary federal and state permits to conduct habitat assessments and protocol-level surveys. ECORP biologists hold current permits and perform surveys for numerous special-status species including:



Invertebrates

- Conservancy fairy shrimp
- Longhorn fairy shrimp
- Vernal pool fairy shrimp
- San Diego fairy shrimp
- Riverside fairy shrimp
- Vernal pool tadpole shrimp
- Quino checkerspot butterfly
- Mission blue butterfly



Amphibians

- California tiger salamander
- Arroyo toad
- California red-legged frog
- Foothill yellow-legged frog
- Mountain yellow-legged frog
- Sierra Nevada yellow-legged frog
- Chiricahua leopard frog
- Western spadefoot



Fish

- Southern California steelhead ESU
- Delta smelt
- Arroyo chub
- Hardhead minnow
- Santa Ana speckled dace
- Santa Ana sucker
- Unarmored threespine stickleback
- Tidewater goby



Reptiles

- Western pond turtle
- Desert tortoise
- Giant garter snake
- Alameda whipsnake
- Flat-tailed horned lizard

Mammals

- California bat species
- San Joaquin kit fox
- Stephens' kangaroo rat
- San Bernardino kangaroo rat
- Mohave ground squirrel
- Palm Springs round-tailed ground squirrel
- Palm Springs pocket mouse
- White-eared pocket mouse

Birds

- Burrowing owl
- Least Bell's vireo
- California gnatcatcher
- Swainson's hawk
- Willow flycatcher
- Migratory species

Plants

- Rare, threatened, and endangered plant vouchers
- Identification of *Caulerpa taxifolia* algae



Amphibian Ecology, Surveys and Aquatic Habitat Assessments



ECORP's biological expertise includes amphibian ecology, survey capabilities and Endangered Species Act and special-status species compliance (listed, special-status, and other species). ECORP amphibian biologists have extensive experience conducting habitat assessments, presence/absence surveys, and consultations for several state and federally listed species and other special-status species throughout California. ECORP has extensive experience designing and conducting studies and surveys for special-status amphibian species in California's Central Valley as well as in montane habitats throughout the Sierra Nevada Mountains, the Coast Range, and the southern portion of the Cascades Range.

Our biologists have training and experience conducting amphibian surveys using state and federal agency protocols, and have developed standardized methodologies for conducting habitat assessments and visual encounter surveys for a variety of amphibian species. ECORP performs surveys for special-status amphibians throughout California, and has developed management strategies; prepared avoidance, conservation, and mitigation measures; and designed monitoring plans for the following species:

- California red-legged frog
- California tiger salamander
- Western spadefoot
- Yosemite toad
- Arroyo toad
- Sierra Nevada yellow-legged frog
- Foothill yellow-legged frog
- Cascades frog
- Western pond turtle



Services Provided

- General and species-specific habitat assessments and formal surveys
- Constraints analyses and recommendations
- Baseline studies in support of hydroelectric relicensing and post-license monitoring
- Threatened and endangered species studies
- Hydrogeomorphic assessments and flow/habitat studies
- Impact evaluations
- Conservation, mitigation, and monitoring plans
- USFWS Biological Assessments, resource agency liaison and negotiation



Botanical Services



ECORP offers a wide range of botanical services within California's diverse plant communities. Our botanists are fully qualified to conduct plant surveys to support National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) documentation and Biological Assessments for consultation with the U.S. Fish and Wildlife Service (USFWS). Our botanists are highly trained in plant taxonomy and identification. We routinely utilize on-line databases and archives, reference populations, and local herbaria to assist with accurate identification of California's flora. We also hold the necessary permits to properly identify and voucher rare, threatened, and endangered plants encountered during our surveys.

ECORP botanists use the latest techniques and protocols approved by the USFWS, California Department of Fish and Game, and California Native Plant Society to conduct plant surveys. Vegetation mapping and plant community classification is conducted in accordance with the well recognized Sawyer and Keeler-Wolf and Holland systems.

Services Provided

- Site assessments
- General botanical surveys
- Special-status plant surveys
- Vegetation mapping
- Mitigation planning and monitoring
- Arborist surveys/tree inventory
- Exotic vegetation control

Vegetation Communities

- Vernal pool/grassland
- Riparian
- Chaparral
- Serpentine/gabbro associations
- Oak woodland
- Coastal sage scrub
- Sierra Nevada foothills
- Montane/alpine
- Freshwater and salt marsh
- Desert



Bat Surveys



ECORP has highly qualified staff with expertise and necessary permits to conduct the full range of bat surveys to meet the requirements of regulatory agencies in addition to complying with county and city environmental ordinances. ECORP biologists assist project proponents in designing and implementing projects that avoid or minimize impacts to local bat populations.

Services Provided

- Initial site assessment for bat habitat suitability and potential roost identification
- Bridge assessments and surveys
- Roost surveys using a Treetop Peeper™ camera
- Day/night roost surveys
- Roost exit surveys
- Active acoustic surveys (using Anabat II™ broad-band detector with laptop)
- Passive acoustic monitoring (using Anabat II™ broad-band detector with storage ZCAIM)
- Mist netting surveys
- Abandoned mine and cave assessment surveys
- Developing and implementing California Environmental Quality Act (CEQA) mitigation
- Bat-related education programs



Benthic Macroinvertebrate Bioassessment Studies



ECORP ecologists conduct benthic macroinvertebrate (BMI) and algal bioassessments to determine overall stream health or habitat impacts and community structure impairment resulting from altered stream flows, sediment deposition, or contaminant release (e.g., downstream releases from dams, diversions, accidental spills, and hydroelectric power facilities). Our aquatic invertebrate laboratories are located in Rocklin and Santa Ana and provide

statewide services. We are approved by California Department of Fish Game (CDFG) to perform California Stream Bioassessment Procedure (CSBP) and Surface Water Ambient Monitoring Program (SWAMP) protocols. Our staff are members of the Southern California Association Marine Invertebrate Taxonomists (SCAMIT) and Southwest Association of Freshwater Invertebrate Taxonomists (SAFIT).

Services Provided

- BMI and algal sample collection pursuant to CSBP or SWAMP protocols
- Sample processing and identification, data analysis and condition assessments
- Taxonomy of BMI using SWAMP (Levels 1 and 2) or other established methodologies
- Natural Resource Damage Assessment (NRDA), including liaison with federal/state Trustees
- Estuarine and marine benthic ecology and taxonomy
- Routine in-house and CDFG audits for taxonomic verification
- Rapid bioassessment monitoring for pre- and post-construction activities
- Bioassessment monitoring for California State and Regional Water Quality Control Board clean up and abatement orders
- NPDES Bioassessment compliance



Fisheries and Aquatic Habitat Assessments



ECORP's fisheries and aquatic staff design and conduct environmental assessment studies in all of California's aquatic habitats, including riverine, lacustrine, estuarine, and marine systems. We conduct technical studies and prepare supporting documentation for Biological Assessments and Section 7 consultations for salmonids (National Marine Fisheries Service (NMFS)) and non-salmonids (U.S. Fish and Wildlife Service (USFWS)) under the Endangered Species Act.

ECORP biologists hold federal incidental take permits (or are routinely approved by NOAA Fisheries on a project basis) for numerous federally-listed species in California, including the various races and Evolutionarily Significant Units (ESUs) of Chinook salmon and steelhead, tidewater goby, Santa Ana sucker, and unarmored threespine stickleback.



Our biologists work with hydraulic engineers to evaluate existing and predictive fish habitat (PHABSIM modeling), affects to fish and habitat from altered streamflows (dam and bypass releases), fish passage, fish screening, and fish entrainment. ECORP conducts field-level stream and riparian habitat mapping using USFWS protocols, and channel classification using the Rosgen multi-level approach. ECORP biologists are proficient with hydroacoustic assessments, acoustic tagging, and mobile tracking methodologies.

Services Provided

- Fisheries and aquatic habitat study design
- Estuarine habitat/eelgrass assessments
- Aquatic, riparian, and estuarine habitat restoration
- Estuarine/marine fish ecology and study design
- Acoustic fish tagging/tracking
- Entrainment evaluations
- Fish passage assessments
- Water project operations impact assessments
- Mitigation planning and design
- Alternatives analyses
- Limiting factor analyses
- Watershed and ecosystem restoration planning
- Section 7 Endangered Species Act compliance
- Fish relocation and salvage



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Marine Science Services



ECORP's marine biologists and fisheries scientists have many years of experience designing and conducting marine resource surveys, including fish community/population assessment, benthic infaunal assessments, eelgrass bed delineation and density, and monitoring of Harmful Algal Blooms (HABs). ECORP scientists have proficient knowledge in coastal ecology, designing and implementing wetland evaluations, and salt marsh and eelgrass habitat assessment and restoration.



ECORP maintains a dedicated laboratory for processing of plankton, fish and sediment samples, including taxonomy of benthic infauna. Staff are proficient in the use of otter trawl, beam trawl, box core samplers, seines, traps, direct observation (SCUBA and snorkel) and other methodologies. ECORP provides for vessel sampling support as well as diver-based platforms, and maintains a 17-foot Boston Whaler and support craft.



Services Provided

- Marine fisheries assessment/population modeling
- Marine fish habitat delineation and assessment
- Estuarine and tidal marsh/seasonal wetland studies
- Marine trawling and benthic infaunal assessments
- Marine benthic taxonomic services
- Bay and baylands fisheries habitat assessment
- Eelgrass bed density evaluation and monitoring
- Kelp bed and rocky reef dive surveys
- Restored tidal marsh habitat monitoring
- Caulerpa presence/absence surveys

