Standard Operating Procedure (SOP) 4.4.2.1

Amphibian and Reptile Survey Protocol

Coyote Creek Riparian Station and the San Francisco Estuary Institute originally prepared this protocol for the Clean Water Team. This edition reflects changes made in 2006 by the Clean Water Team.

MATERIALS:

- 10 meter line marked off in 1 meter sections
- Data sheet with clipboard and pens (ball-point and waterproof marker)
- Survey tape
- Hip waders (or other as needed for wading)
- Binoculars (should be able to focus as close or closer than 2 meters)
- Stebbin's *Western Reptiles and Amphibians*
- Watch
- Thermometer
- Tally counter
- Optional
    - GPS
    - Camera

METHOD:

Teams should be comprised of two surveyors. A 500-meter station is to be surveyed by each team. Teams enter the creek at their station marker and each member will take either end of a ten-meter line. One member will be designated as lead; this person will use binoculars to study the section of stream immediately upstream. The second member will use this time to record weather and temperature.

The lead will then proceed upstream while the second member remains stationary. The lead will search for animals by studying the banks and stream bottom; by peering into overhangs and into root tangles; and by casual turning of cover objects such as rocks and boards. Each time the lead moves an object it should be placed in its original orientation. For each object moved a count will be made on a hand counter. If animals are noted, the lead will call the data back to the second member to record. Record any reptiles or amphibians you see whether or not they are associated with the water. The second member will watch as the lead searches to record any animals that are not seen by the lead.

When the ten-meter line is fully extended, the lead will pause while the second member proceeds upstream at the same pace used by the lead and searches in the same manner as did the lead.

The second member will also keep track of the distance taken up by pool habitat. While the second member is searching, the lead will study the next section of creek with

binoculars. When the second member has arrived at the lead's position, the two members will confer and complete the data recording for that ten-meter section, including animals observed and number of pools crossed. This process is repeated until the next 500 meter station marker is reached.

Unusual sightings (California red-legged frog or other sensitive species; threats to habitat/wildlife...) should also be noted on a map of that creek section drawn in the spaces on the back of the data sheet.

Note: DO NOT catch or attempt to catch any animals. State law has regulations on the collection of wildlife and prohibits harassing some species. Identifications should be by sight alone. DO NOT wade waters where you suspect animals are breeding. DO NOT pick up or approach pond turtles, especially if they are away from water, unless it is necessary to save their lives (i.e. they are on a heavily traveled road). Harassing a female pond turtle when she is attempting to nest may prevent her from laying eggs that year.

SPECIAL NOTES ON *RANID* FROGS

It is especially important to distinguish bullfrogs from native red-legged and yellow-legged frogs in your survey. Bullfrogs are exotic and may be one of the causes for declines in native species of frogs. As you survey the creek, frogs may leap into the water before you have had a chance to visually identify them. Here are some tips to follow:

- Ranid frogs (members of the genus *Rana*) will be the only large aquatic frogs you will see.
- Tree frogs and toads will usually be visible in the water after they jump and will be easy to identify.
- Bullfrogs frequently give an alarm call when startled.
- If the frogs leap without a sound, record them as OTH on the data sheet and record "unknown frog" or, if it is large enough to be distinguished from a treefrog, "unknown ranid" in the Notes column.
- If a frog should give a short "yip" or barking noise as it leaps, record "BUL" in the Species column and write "by call" in the Notes column on your data sheet. DO NOT assume a frog is a red-legged frog until you have noted the black mask, white jaw stripe and dorsolateral fold that characterizes it.

SAFETY

Sampling for reptiles and amphibians is relatively safe; however, some basic precautions should be taken. It is valuable to have knowledge of first aide and to have directions and contact information for emergency health care.

Poison oak/stinging nettle

Learn to recognize poison oak and stinging nettle before going out into the field. Wearing long-sleeved shirts and gloves will help prevent you from getting infected or stung.

Rattlesnakes

The ONLY venomous reptile you might encounter in your survey will be the rattlesnake. In order to avoid being bitten you MUST watch where you put your hands and feet.

Rattlesnakes are often well camouflaged. Make sure you can see through to the ground wherever you step. When you turn over objects, PULL on the far side of the object so that the object is between you and whatever might be underneath. If you should hear the rattle of a rattlesnake (it sounds a little bit like hissing steam), freeze until you can tell exactly where the snake is. Record it on your data sheet and then avoid that area for the rest of your survey.

Scorpions and spiders
By uncovering objects or stirring duff you risk being stung or bitten by a scorpion or spider. Wearing gloves tucked into a long sleeved shirt should prevent most incidents of this kind.

Ticks
Ticks might be lurking where you will be surveying. Ticks normally climb onto people around their ankles and then move their way upwards. Try tucking pants into socks or high boots, or wear gaiters to keep them from attaching to you. Always search yourself and your colleague carefully after surveys. Permethrin spray also helps to repel ticks.

Yellow jacket wasps
When turning over cover items and digging into brush you may run the risk of disturbing a yellow jacket nest. By being aware of your surroundings and noting the presence of yellow jackets nearby you should be able to locate the nest before the yellow jackets locate you. If you should come upon a nest, RUN FAR AWAY. The wasps may already have been alerted to your presence and might be on their way to attack you; the best defense is to put some distance between you and them. If there is enough water in the creek and wasps are crawling all over you, immerse yourself and wait for them to fly away. Note any aquatic animals you see and then continue your survey.

Other Safety Issues
Other health and safety issues may be occur in the area to be surveyed. Prior to the survey reconnoiter for health and safety concerns and then prepare a hazard communication plan.

EXPLANATION OF DATA SHEET FIELDS
Print all data. If possible, use waterproof red pen. One sheet is used for every 10 sections surveyed.

Background Data:

Date: Record the survey date as month - day - year separated by dashes.
Example: June 5, 1994 should be written 6 - 5 - 94.

Observers: Write first initial and last name of the two members of the survey team.
Example: I. M. Green

Waterbody: Record the full name of the waterbody creek being surveyed.
Example: San Francisquito Creek.

Cloud cover: Record an estimate of the percent cloud cover to the closest ten percent. Do not write the percent sign.

Wind speed: Estimate the wind speed using the Beaufort Scale, found within this document.

Wind direction: Circle the letter that represents the direction from which the wind is blowing. If a two-direction designation (i.e. "northwest") is needed, put one oval around the two letters representing that designation.

Air and water temperature: Circle the scale used (C for centigrade, F for Fahrenheit) and write the number.

Precipitation: Circle the appropriate kind of precipitation. Write the number zero if none, otherwise write "light", "med" (for medium) or "heavy."

Begin time: Write in 24 hour notation the exact time to the minute that surveyors commence looking for animals.
Example: 10:15am (in the morning) should be written 1015. 2:30pm (in the afternoon) should be written 1430.

End time: Write in 24 hour notation the exact time to the minute when the final ten meter section of the data sheet was completed.
Example: See example for Begin time.

Station Number: Enter the number of the 500-meter marker.
Example: See example sheet.

Begin section number: Copy the first line in the "Section #:" column here.
Example: See example sheet.

End section number: When the sheet is completed, copy the last line from the "Section #" column here.
Example: See example sheet.

Column data

Section number: Record the two digit number of the section to be searched starting with "00."
Example: See example sheet.

Species: Record the code from the box at the bottom of the sheet. If you use the OTH code, BRIEFLY describe the animal in the Notes section and why you could not identify it.
Example: If a large tadpole couldnot be distinguished as to species. Write OTH and "Large, possible ranid tadpole" in the Notes column.

Age: Use the box at the bottom of the sheet to find the appropriate code. Salamander larvae will usually be "3" because they normally have four legs early in their development. Assignation of Adult or Juvenile status will vary by species.

Note: If two age classes of animal are found in each section, dedicate a line to each size class.

Example: See example field data sheet.

Number: Record the number of the species given for each age class observed.

Pools: Record pool length, in meters. Pools are defined for this survey as any area present which has slow or no water movement and may provide habitat for breeding/larval amphibians. Team members should receive instruction on identifying pools during a training process.

Dry: Record the closest distance in meters between any two non-continuous portions of "wet" creek.

Objects: Record the number of cover objects turned.

Notes: Priority in this space should be given to clarification(s) of data in the preceding columns. A brief narrative note on observed threats, chance occurrences, other species noted etc. should be written in the space remaining in the notes column after comments for the data sheet has been completed. A vertical line should separate notes that do not apply to data. They should be to the left of the Notes column.

Diagrams: Draw map of section containing unusual sighting. Indicate access routes. This can be done on to a legible copy of a topographic map and/or with a GPS.

BEAUFORT SCALE FOR DETERMINATION AND REPORTING OF WIND SPEED

NAME	MPH	DESCRIPTION
Calm	less than 1	Calm; smoke rises vertically.
Light Air	4 to 7	Wind felt on face; leaves rustle, vane moved by wind.
Gentle Breeze	8 to 12	Leaves and small twigs in constant motion; wind extends flag.
Moderate Breeze	13 to 18	Raises dust and loose paper; small branches are moved.
Fresh Breeze	19 to 24	Small trees in leaf begin to sway; crested wavelets form on inland water.
Strong Breeze	25 to 31	Large branches move, telegraph wires whistle, umbrellas used with difficulty.
Moderate Gale	32 to 38	Whole trees in motion; inconvenience in walking against wind.
Fresh Gale	39 to 46	Twigs break off trees; generally impedes progress.
Strong Gale	47 to 54	Slight structural damage occurs.
Whole Gale	55 to 63	Trees uprooted; considerable structural damage
Storm	64 to 72	Very rarely experienced; accompanied by widespread damage.
Hurricane	73 to 136	Devastation occurs (do not attempt census).

SPECIES LIST

Prepare yourself by studying a field guide(s) describing the species within your geographical area of interest. The following is a statewide list. Not all species occur in the same area.

AMPHIBIANS

Salamanders:
California tiger salamander (CTS)
Pacific giant salamander (PGS)
Brown salamander; AKA Northwestern salamander (BNS)
Long-toed salamander subspecies: Southern (LTS) and Santa Cruz (SCS)
Olympic salamander (OLS)
California tiger salamander (CTS)
Rough-skinned newt (RSN)
California newt subspecies: Coast Range newt (CRN) and Sierra newt (SIN)
Red-bellied newt (RBN)
Ensatina (ENS); many subspecies
Dunn Salamander (DUS)
Del Norte Salamander (DNS)
Slender Salamander (SLS); many subspecies
Arboreal salamander (ARS)

Frogs and toads:
Great Basin spadefoot (GBST)
Couch spadefoot (CST)
Tailed Frog (TLF)
Western toad subspecies: Boreal toad (BRT) and California toad (CAT)
Yosemite Toad (YOT)
Arroyo (Southwestern) Toad (ART)
Woodhouse toad (WHT)
Great Plains Toad (GPT)
Colorado River (Sonoran) toad (CRT)
Pacific treefrog (PTF)
California treefrog (CTF)
Bullfrog (introduced to CA) (BUF)
Red-legged frog (RLF); subspecies California (CRLF) and Northern (NRLF)
Foothill yellow-legged frog (YLF)
Mountain yellow-legged frog (MLF)
Leopard frog (introduced to CA) (LEF)
African clawed frog (introduced to CA) (ACF)

REPTILES

Turtles:
Southwestern pond turtle
Desert tortoise
Spiny softshell, AKA western spiny softshell turtle
Green Turtle, AKA green sea turtle

Lizards:
Leaf-toed gecko
Western banded gecko
Barefoot gecko
Desert night lizard
Granite night lizard
Common Chuckawalla, AKA Western Chuckawalla
Desert iguana
Zebra-tailed lizard
Long-nosed leopard lizard, AKA large spotted leopard lizard
Blunt-nosed leopard lizard
Desert collared lizard; subspecies Baja California collared lizard and Great Basin collared lizard
Desert spiny lizard; subspecies barred spiny lizard and yellow-backed spiny lizard
Granite spiny lizard
Western fence lizard; subspecies Northwestern fence lizard, Sierra fence lizard and Great Basin fence lizard
Sagebrush lizard; subspecies Northern, Western, and Southern
Tree lizard
Long-tailed brush lizard, AKA western long-tailed brush lizard
Side-blotched lizard
Coast horned lizard
Desert horned lizard
Flat-tailed horned lizard
Gilbert skink; subspecies greater brown skink, Northern brown skink, Western red-tailed skink, and variegated skink
Western skink; subspecies Skilton skink and Coronado skink
Western whiptail; subspecies California whiptail, Great Basin whiptail, and Coastal Whiptail
Orange-throated whiptail
Southern alligator lizard; subspecies Oregon alligator lizard, California alligator lizard, and San Diego alligator lizard
Northern alligator lizard; subspecies Shasta alligator lizard, San Francisco alligator lizard Sierra alligator lizard
Panamint alligator lizard
California legless lizard; subspecies silvery legless lizard and black legless lizard

Snakes:

Western blind snake
Rosy boa; subspecies Coastal and Desert
Rubber boa; subspecies Pacific and southern
Ringneck snake; subspecies Northwestern, Pacific, San Bernardino, Monterey and Prairie
Sharp-tailed snake
Spotted leaf-nosed snake
California whipsnake; subspecies Chaparral and Alameda whipsnakes
Coachwhip, subspecies San Joaquin and Red coachwhip
Western yellow-bellied racer, AKA yellow-bellied racer
Western patch-nosed snake; subspecies Desert, Coast and Mojave patch-nosed snakes
Gopher snake; subspecies Great Basin, Pacific, San Diego, and Sonoran gopher snakes
Glossy snake; subspecies Great Basin, California, and Desert glossy snakes
California mountain kingsnake; subspecies Sierra, Saint Helena, Coast, and San Diego mountain kingsnakes
Common kingsnake, AKA California kingsnake
Long-nosed snake, AKA Western long-nosed snake
Checkered garter snake
Common garter snake; subspecies Valley garter snake, California red-sided garter snake, and San Francisco garter snake
Western terrestrial garter snake; subspecies Coast, and Mountain garter snakes
Western aquatic garter snake; subspecies Oregon, Sierra, Giant, aquatic and Santa Cruz garter snakes
Two-striped garter snake, AKA Hammond's garter snake
Ground snake
Western shovel-nosed snake; subspecies Mojave, Nevada and Colorado shovel-nosed snakes
California black headed snake
Southwestern black headed snake
Night snake
Lyre snake
Western rattlesnake; subspecies Great Basin, Northern Pacific, and Southern Pacific Rattlesnake
Western diamondback rattlesnake
Sidewinder; subspecies Mojave, Colorado Desert sidewinders
Red diamond rattlesnake, AKA Northern red rattlesnake
Speckled rattlesnake; subspecies

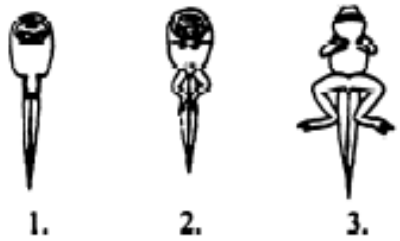
"EXAMPLE OF A FIELD DATA SHEET FOR AMPHIBIAN SURVEYS"

Date:	Observers:					
Creek:	Cloud cover %:	Wind speed MPH:	Wind direction: N W E S	Temp: C Air Water	Precip: Rain Frost Snow	

Begin time:	End time:	Station #:	Begin section#:	End section#:

Section #:	Species:	Age:	Number:	Pool:	Dry:	Objects:	Notes :

Age codes:



A = Adult
J = Juvenile
1 = Hatchling larva
2 = Larva with hindleg(s)
3 = Larva with foreleg(s)

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