

# FrogWatch USA™

## Field Guide



## Santa Barbara Zoo FrogWatch

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## African Clawed Frog (*Xenopus laevis*)

**DESCRIPTION:** 2-3 3/4" (5-9.5 cm). Olive-brown or gray, with darker marks and mottling. No external eardrums, tongue, or teeth. Horny black claws on outer 3 toes of hind feet. Hind toes fully webbed. Male smaller than female; has dark nuptial pads on front limbs.

**RANGE:** Introduced from Africa into California - Orange and San Diego counties.

**VOICE:** Despite absence of vocal sacs, males give a loud, rattling croak while swimming.

**COMMENTS:** Nocturnal. Although mainly aquatic, African Clawed Frogs sometimes turn up in rainpools, indicating land passage. When not actively foraging or mating, they rest quietly on the bottom or hide under rocks. They are highly carnivorous and eat anything they can catch.



African Clawed Frog  
© John H. Tashjian



# American Bullfrog (*Lithobates catesbeianus*)

**DESCRIPTION:** 3 1/2-8" (9-20.3 cm). The largest frog in North America. Green to yellow above with random mottling of darker gray. Large external eardrum; hind feet fully webbed except for last joint of longest toe. No dorsolateral ridges. Belly cream to white, may be mottled with gray.

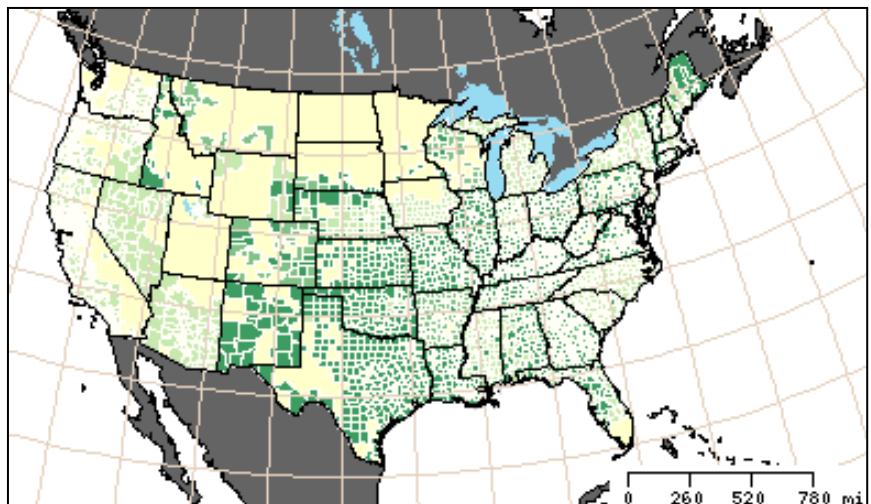
**RANGE:** Eastern and central United States; also New Brunswick and parts of Nova Scotia. Extensively introduced in the West.

**VOICE:** Deep-pitched jug o'rum call can be heard for more than a quarter mile on quiet mornings.

**COMMENTS:** Nocturnal. Large specimens have been known to catch and swallow small birds and young snakes; its usual diet includes insects, crayfish, other frogs, and minnows. Attempts to commercially harvest frog legs have prompted many introductions of the American Bullfrog outside its natural range. Invasive species in CA.



American Bullfrog  
© Michael P. Gadowski/Photo Researchers, Inc.





## Arroyo Toad (*Anaxyrus californicus*)

**DESCRIPTION:** 1 4/5 - 3 2/5" (4.6 - 8.6 cm).

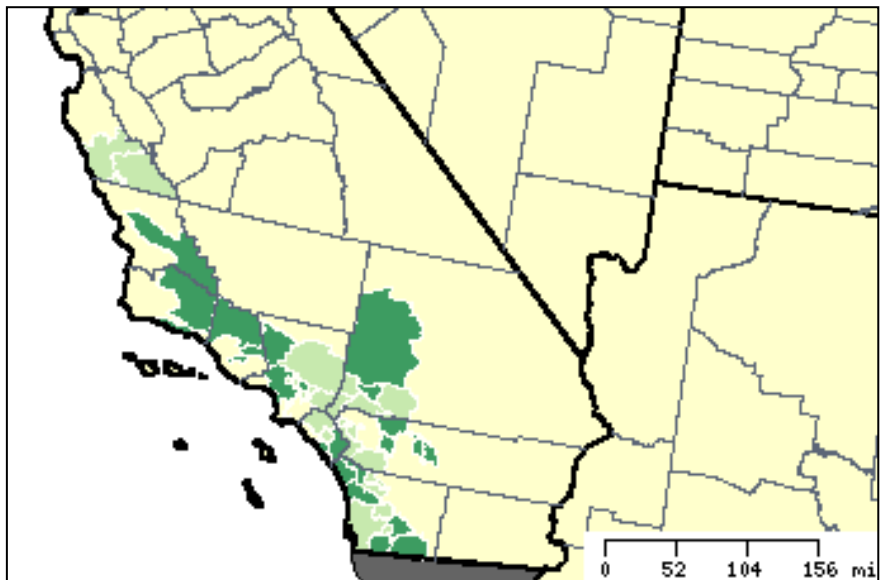
Coloration ranges from olive green or gray to light brown. A prominent white "v-shaped" stripe crosses the top of the head between the eyes. It lacks a middorsal stripe. The belly is buff-white and often lacks spots.

**RANGE:** Endemic to California and northern Baja California. Ranges west of the desert in coastal areas from the upper Salinas River system in San Luis Obispo County to northwestern Baja California.

**VOICE:** Fast musical trill, about 10 seconds, rising in pitch, and ending abruptly.

**COMMENTS:** This toad is listed as a Federally Endangered species and is estimated to be absent from 65 to 75 percent of its historic range. These

remaining populations are extremely vulnerable due to isolation from other populations, and to specialized habitat needs which include fragile sandy streamside habitat and streams that have not been heavily silted. The loss or degradation of this specialized habitat is a major problem. Causes for habitat loss include the results of mining, urban development, grazing cattle, and other sources of stream trampling such as excessive human recreational use, including campgrounds and vehicles driving across streams. Streamside trampling crushes and destroys all the juveniles, since they feed by remaining on sandy stream-banks. Exotic aquatic predators such as bullfrogs, fish and crayfish, also reduce toad populations.



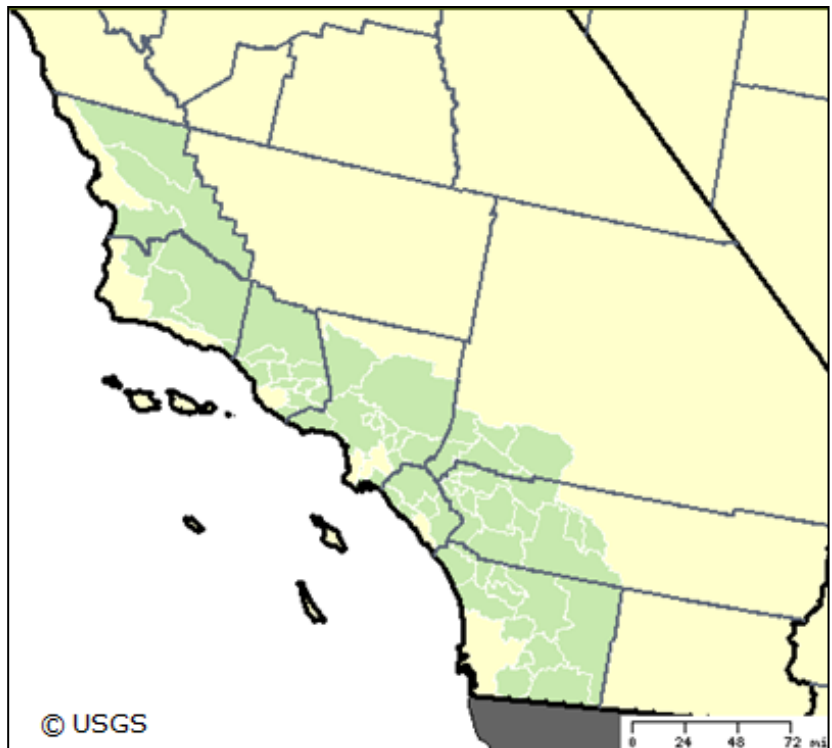
## California Chorus Frog (*Pseudacris cadaverina*)

**DESCRIPTION:** 1-2" (2.5-5.1 cm). Skin is rough, gray, with dark blotches. Lacks a dark stripe through the eye typical of many chorus frogs. Expanded toe pads; webbing extends to tip of fifth toe of hind foot. Male has gray throat.

**RANGE:** From SW California into N Baja California.

**VOICE:** An abrupt low-pitched quack, given during the day as well as at night. Males usually call while sitting in the water, often at the base of a rock.

**COMMENTS:** Primarily nocturnal. It seeks shade during the day among the rock crevices near water. Protective coloration helps it avoid daytime predators. When disturbed, it leaps into the water but returns almost immediately to shore. This species has undergone name changes, and has previously been called California Tree Frog (*Hyla cadaverina*).





## CA Red-Legged Frog (*Rana draytonii*)

**DESCRIPTION:** 1 1/2-5" (3.8-12.8 cm). Large; reddish-brown to gray, with many poorly defined dark specks and blotches; blotches on back have light centers. Dorsolateral folds present. Dark mask bordered by light stripe on jaw. Eardrum smooth. Underside washed with red on lower abdomen and hind legs. Toes not fully webbed. Male has enlarged forearms and swollen thumbs.

**RANGE:** Historically, throughout Central Valley and Sierra Nevada foothills south to N Baja California. Now found from Sonoma and Butte Counties south to Riverside, but mainly in Monterey, San Luis Obispo, and Santa Barbara Counties.

**VOICE:** Series of weak throaty notes, rather harsh, lasting 2-3 seconds, and ending with a grunt.

**COMMENTS:** Diurnal. Found predominately in the state of California, the species is currently listed as threatened due primarily to habitat loss and degradation.



## Foothill Yellow-legged Frog (*Rana boylii*)

**DESCRIPTION:** 2-3 1/4" (5.1-8 cm). Brown with black or dark-brown spots or lichen-like markings. Dorsolateral ridges present, but may be indistinct. No dark mask. Eardrum smooth. Belly yellow to pale orange. Toes fully webbed, and toe tips dark. Male has swollen thumbs.

**RANGE:** The Sierra Nevada Mountains of California and extreme W Nevada. Separate population in the San Gabriel, San Bernardino, San Jacinto and Palomar mountains of southern California.

**VOICE:** A faint one-note low-pitched, raspy series of 4 - 6 notes per second, with grunts, oinks and rattling.

**DISCUSSION:** This is the only frog in the high Sierra, from 6,000-12,000' (1,800-3,600 m). In the south it occurs from 1,200-7,500' (365-2,300 m). It has a pungent, musky odor. Primarily diurnal.





## Baja California Chorus Frog (*Pseudacris hypochondriaca*)

**DESCRIPTION:** 3/4-2" (1.9-5.1 cm). Skin rough; varies greatly from green to light tan to black, often with dark spots. Black stripe through eye and usually a dark triangle between the eyes. Large toe pads. Male has gray throat.

**RANGE:** From S British Columbia to Baja California east to Montana, Idaho, and Nevada. Also, Channel Islands off S California.

**VOICE:** A high-pitched, 2-part musical note.

**COMMENTS:** This commonly heard frog of the Pacific coast, active both day and night, is found from sea level to over 10,000' (3,000 m). When Hollywood moviemakers need an authentic outdoor nighttime sound, they often record its call. As a consequence, this frog has been heard around the world. This species has undergone a few name changes, and has been historically called Pacific Chorus Frog (*Pseudacris regilla*) and Pacific Tree Frog (*Hyla regilla*).



## Western Spadefoot (*Spea hammondi*)

**DESCRIPTION:** 1 1/2-2 1/2" (3.8-6.4 cm).

Stout-bodied toad with wedge-shaped spade on each hind foot and no hump between eyes. External eardrum apparent. Dusky-olive to gray, with irregular light stripes and random darker blotches. Skin relatively smooth with scattered small tubercles, red- or orange-tipped in some specimens. Belly white. Iris light gold.

**RANGE:** North-central California south through the Central Valley and foothills into northern Baja California.

**VOICE:** A rolling trill like the purr of a cat lasting less than 1 second. Males call while floating on surface of water.

**COMMENTS:** Nocturnal. They are often numerous where soil conditions are favorable for burrowing. Deep burrows provide a microhabitat with moderate temperatures and humidity. They secrete a substance when handled that can inflame the skin or cause hay fever like symptoms like runny nose and watery eyes.



© USGS – Chris Brown





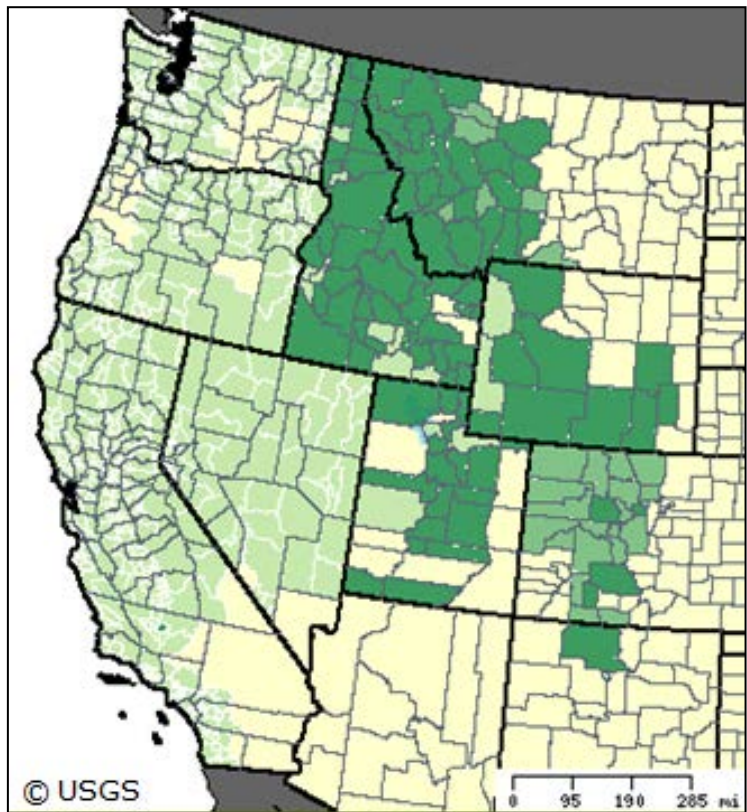
## Western Toad (*Anaxyrus boreas*)

**DESCRIPTION:** 2 1/2-5" (6.4-12.8 cm). Large; lacks cranial crests but has oval parotoid glands. Gray to green, with light-colored stripe down middle of back. Warts tinged with red and surrounded by black blotches. Male has pale throat

**RANGE:** Pacific Coast from southern Alaska to Baja California, east to Alberta, Montana, Wyoming, Utah, Colorado, and Nevada.

**VOICE:** Like the weak peeping of baby chicks. No vocal sacs.

**COMMENTS:** Active at twilight. At higher elevations, where nighttime temperatures are low, it is often active during the day. It lives in burrows of its own construction or those of small rodents





## Field Guide Charts

### Call Dates for Frogs & Toads in Santa Barbara County, California

Common Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
African Clawed Frog	J	F	M	A	M	J	J	A	S	O	N	
American Bullfrog					M	J	J	A				
Arroyo Toad			M	A	M	J	J					
California Chorus Frog		F	M	A	M	J	J	A	S	/		
California Red-Legged Frog	J	F	M	A							/	D
Foothill Yellow-Legged Frog				A	M	J	/					
Baja California Chorus Frog	J	F	M	A	M	J	J			/	N	D
Western Spadefoot	J	F	M	A	M							
Western Toad	J	F	M	A	M	J	/					

/ = part of the month.

### Call Description Chart

Species	Description of Call
African Clawed Frog	A 2-part trill, about 1/2 second, repeated up to 100 times per minute. Only faintly heard in air.
American Bullfrog	Deep-pitched jug o'rum call
Arroyo Toad	Fast musical trill, about 10 seconds, rising in pitch, and ending abruptly.
California Chorus Frog	An abrupt low-pitched quack, given during the day as well as at night.
CA Red-legged Frog	Series of weak throaty notes, rather harsh, lasting 2-3 seconds, and ending with a grunt.
Foothill Yellow-Legged Frog	A faint one-note low-pitched, raspy series of 4 - 6 notes per second, with grunts, oinks and rattling.
Baja California Chorus Frog	A high-pitched, 2-part musical note.
Western Spadefoot	A rolling trill like the purr of a cat lasting less than 1 second.
Western Toad	Like the weak peeping of baby chicks. No vocal sacs.

## Wetland Chart

Wetland	Description
<b>Marshes</b>	Frequently or continually covered in water varying in depth from 1 inch to 3 feet. Have emergent soft stemmed vegetation which are adapted to saturated water and soil conditions. Marshes are typically fed from surface runoff or groundwater flows. Can be tidal or non tidal.
<b>Vernal Pools</b>	Bodies of standing water that form in the spring and are often dry by mid-summer. Can be naturally or formed by man-made depressions.
<b>Swamps</b>	Wetlands whose plant life is dominated by woody plants, either shrubs or trees. Saturated with water during the growing season and can have standing water at other times of the year.
<b>Bogs</b>	Defined by spongy peat deposits with green and/or red mosses, receive almost all of their water from precipitation, and have highly acidic water which leads to a low diversity of plant life.
<b>Fens</b>	Fens are like bogs but they receive their water from other sources such as groundwater. Additional minerals and nutrients from alternative water sources mean more diverse plant life and lower acidity.
<b>Wet Meadows</b>	Commonly occur in poorly drained areas. Often resemble grasslands and are drier than other marshes during seasonal high water
<b>Ponds</b>	Ponds are open bodies of water that have a surface area of less than 10 acres. They do not dry up during summer months.



### Species Habitat Chart

Species	Habitat
African Clawed Frog	Standing water, from slow-moving permanent streams to ponds and marshes.
American Bullfrog	Aquatic. Prefers ponds, lakes, and slow-moving streams large enough to avoid crowding and with sufficient vegetation to provide easy cover.
Arroyo Toad	Inhabits washes, arroyos, sandy riverbanks, riparian areas. Needs exposed sandy stream sides with stable terraces for burrowing with scattered vegetation for shelter, and areas of quiet water or pools sandy or gravel bottoms without silt for breeding.
California Chorus Frog	Near slow streams and rocky washes with permanent pools. Deserts to mountains, sea level to over 5,000' (1,500 m).
CA Red-legged Frog	Usually found near sheltered ponds or other permanent water with extensive vegetation. Also seen during rains traveling over land between ponds or other waters
Foothill Yellow-Legged Frog	Aquatic. Prefers gravelly or sandy streams with sunny banks and open woodlands nearby. From sea level to about 6,000' (1,800 m).
Baja California Chorus Frog	On the ground among shrubs and grass, close to water.
Western Spadefoot	Tolerates wide range of conditions from semiarid to arid. Prefers short grass plains and sandy, gravelly areas such as alkali flats, washes, and river floodplains.
Western Toad	Near springs, streams, meadows, woodlands.

# Equipment Kit

FrogWatch USA monitoring equipment kit.

## Recommended

- ☐ FrogWatch USA Monitoring Protocol
- ☐ FrogWatch USA Datasheets
- ☐ Stopwatch or wristwatch with a second hand
- ☐ Clipboard or other firm, flat writing surface
- ☐ Pencil or indelible ink pen
- ☐ Thermometer
- ☐ Written permission for private property use from property owner (if necessary)
- ☐ First aid kit
- ☐ Flashlight
- ☐ Cell phone

## Optional

- ☐ Rain gear
- ☐ Tape recorder
- ☐ Insect repellent
- ☐ Amphibian field guide

# Safety

Safety is extremely important and it is recommended that when visiting the survey site volunteers:

- Carry a fully charged cell phone and be sure it has a signal at the survey site.
- Monitor with a partner or let someone know where they are and when the volunteer intends to return.
- Park in a safe location that does not block traffic.
- Become familiar with the survey site by visiting during daylight hours.
- Watch for poison ivy and other types of poisonous vegetation as well as ticks, hornets, and other types of wildlife.
- Bring a first aid kit.
- Wear long sleeves and pants to protect against insects.

It is also important to recognize that there may be instances when weather conditions are unsuitable for data collection. Monitoring should only be conducted if the air temperature is warmer than 35°F (2°C), it is not raining too hard (heavy rain interferes with the ability to hear frog calls), and the wind is not stronger than 3 according to the Beaufort Wind Scale.

## Measuring Ambient Temperature

The ambient air temperature can be measured with a thermometer to provide information about the temperature of the surrounding air at that moment but it does not take into account amount of humidity that is in the air. The ambient air temperature should be documented immediately before the initiation of the monitoring session. To accurately measure the ambient air temperature:

- Let the thermometer adjust to the ambient air temperature for 3 minutes.
- Avoid handling the glass of the thermometer when taking readings as the heat from hands may cause temperature to rise.
- The thermometer should be held vertically and the volunteer's eyes should be level with the top of the liquid in the glass tube when reading the temperature.
- Most thermometers have two temperature scales: Fahrenheit and Celsius. Both scales are divided in two-degree increments.
- Read the temperature and enter it in the appropriate space on the Datasheet, being sure to delineate if the reading is in Fahrenheit or Celsius

## Wind Speed

Admiral Sir Francis Beaufort (1774– 857) of the British Navy introduced the 0 to 5 Beaufort Wind Scale in 1806 to describe wind speeds for ships but the scale was later adapted to describe wind speeds for land, as well. The Beaufort Scale is used to determine if wind noise might interfere with hearing frog and toad breeding calls. Use the Beaufort Wind Scale below to determine the wind speed immediately before the initiation of the monitoring session. It is too windy to monitor if the wind is rated 4 or 5.

<u>Beaufort Wind Scale</u>		
1	Calm:	Smoke rises vertically
2	Light Air:	Rising smoke drifts, weather vane inactive
3	Light Breeze:	Leaves rustle, can feel wind on face
4	Gentle Breeze:	Leaves/twigs in constant motion, small flags extend
<i>Too windy for Monitoring:</i>		
5	Moderate Breeze:	Moves small branches, raises dust and loose paper
6	Fresh Breeze:	Small trees begin to sway



# Monitoring Protocols

Standardized monitoring protocols have been developed and consistent implementation of them across volunteers and Chapters nationwide is required to ensure high levels of scientific integrity. Valid data can be analyzed and used in a variety of scientific capacities to describe species diversity, identify rare and/or invasive species, and even suggest shifts in species diversity, range, and/or phenology. FrogWatch USA volunteers are required to follow the protocols listed below each time they monitor so the data collected is valid and useful.

## Prior to Arrival:

- Know the time of year to expect frogs to begin calling in your survey site before monitoring.
- Prepare and pack your FrogWatch USA monitoring equipment kit.
- Plan to initiate all monitoring sessions 30 minutes (or later) after sunset.

## Upon Arrival:

- Respect the area in which you are in and minimize any disturbance.
- Stay five feet (1.5 meters) from the edge of the main water body when monitoring your site.
- Note any changes to your site (i.e., localized flooding, mowing, or other habitat alteration) and enter this information in the Notes section of the Datasheet.
- Silence all electronic equipment (cell phone, stopwatch, wristwatch, etc.)
- Enter the date and all required volunteer and site information on the FrogWatch USA Datasheet.
- Measure and record all weather information required on the FrogWatch USA Datasheet.

## Monitoring:

- Sit or stand quietly for at least 2 minutes before initiating the monitoring session so the frogs and toads acclimate to your presence. Use your stopwatch or wristwatch to time this duration accurately.
- Monitoring sessions are exactly 3 minutes in duration. Use your stopwatch or wristwatch to time this duration accurately.
- Cup your hands around your ears and listen for precisely 3 minutes.
- Remain quiet and still during the entire 3 minute monitoring session.
- Listen to, identify, and remember all breeding calls occurring in the session.
- If the monitoring session is interrupted by noise (i.e., an airplane, dog running by, etc.) it must be restarted (including the 2 minute acclimation period).

## Data Recording:

- Immediately following the termination of the 3 minute monitoring session, enter the start and stop times of the monitoring session.
- List all species heard during the monitoring session.
- Rate the call intensity for each of these species.
- If no calls were heard during the monitoring session, enter "No Calls Heard" in the Species field of the Datasheet. It is important to note that good data is derived not only from documenting the presence of breeding calls, but just as importantly, from the absence of breeding calls. Datasheets should be submitted even if calls were not heard.

## Data Submission

FrogWatch USA Datasheets must be completed in their entirety and should be submitted as soon as possible after each monitoring session. Timely submissions allows you to review your notes while they are still fresh in your mind, minimizes the likelihood of forgetting to submit them, and allows FrogWatch USA to make current data available more quickly.

The first 4 datasheets should be submitted electronically to [frogwatch@aza.org](mailto:frogwatch@aza.org) for review. If email is not available, datasheets may be sent via U.S. mail to:

FrogWatch USA Coordinator  
c/o Santa Barbara Zoo  
500 Niños Drive  
Santa Barbara, CA 93103

## SAMPLE DATA SHEETS TO FOLLOW



## Survey Site Registration

**Volunteer Information:**

Observer Name:

Organization (if relevant):

Address:

City, State, Postal Code:

Phone Number:

Email Address:

**Survey Site Information:**

Site Name:

Site City, County, State:

Describe Your Site (check one)

Suburban

Urban

Rural

Other (describe):

**Site Habitat (check one)**

Swamp or Woodland Swamp

Freshwater Marsh

Bog or Fen

Vernal Pool

Wet Meadow

Pond

Prairie Pothole

Ditch

Other:

**Wetland Origin (check one)**

Natural

Formed by a Beaver Dam

Human-made

Artificially Altered

Not Known

**Water Presence (check one)**

Permanent

Temporary Some Years

Temporary Every Year

Not Known

**Water Source (check one)**

Pond

Lake

Stream or River

Precipitation or Runoff

Groundwater

Not Known

**Describe Additional Survey Site Characteristics:**

**Longitude/Latitude:** If you do not have a GPS unit, use [www.terraser.com](http://www.terraser.com) or another online mapping tool and search by address. Remember that all longitudes in the United States must include a negative symbol.

Latitude:

Longitude:

Submit your Site Registration form electronically to: [frogwatch@aza.org](mailto:frogwatch@aza.org)

Or via U.S. Postal mail: FrogWatch USA Coordinator \* Association of Zoos and Aquariums

8403 Colesville Road, Suite 710 \* Silver Spring, MD 20910

FrogWatch USA ☐ is a program of the Association of Zoos and Aquariums

### Volunteer and Site Information

Observer Name:

Site Name:

### Visit Information

Date:

Start Time:

End Time:

*End time should be **exactly three minutes** after start time!*

### Weather Conditions

Air Temperature (Indicate °C or °F):

Wind Speed using Beaufort Wind Scale (see below for table of Beaufort Wind values):

0                      1                      2                      3                      4                      5

Precipitation during visit:

None   Fog/Mist   Light Rain/Drizzle   Medium Rain   Hard Rain   Hail   Snow

Has there been precipitation in the past 48 hours?

No Precipitation                      Some Precipitation                      Much Precipitation

The temperature during the past 48 hours has primarily been:

Above Freezing                      Below Freezing

### Beaufort Wind Scale

0                      Calm: smoke rises vertically.

1                      Light Air: rising smoke drifts; weather vane inactive.

2                      Light Breeze: leaves rustle; can feel wind on face.

3                      Gentle Breeze: leaves and twigs in constant motion; small flags extend.

*Too windy for Monitoring:*

4                      Moderate Breeze: moves small branches; raises dust and loose paper.

5                      Fresh Breeze: small trees in leaf begin to sway.

### Frog & Toad Observations

Species Name

Calling Intensity

0   1   2   3

0   1   2   3

0   1   2   3

0   1   2   3

0   1   2   3

0   1   2   3



Calling Intensity Index	
0	No frogs or toads heard calling.
1	Individuals could be counted; there was space between calls.
2	Calls of individuals could be distinguished, some overlapping of calls
3	Full chorus, calls were constant, continuous and overlapping

Additional Notes:

Submit your Datasheet electronically to: [frogwatch@aza.org](mailto:frogwatch@aza.org)

Or via U.S. Postal mail: FrogWatch USA Coordinator \* Association of Zoos and Aquariums  
8403 Colesville Road, Suite 710 \* Silver Spring, MD 20910

FrogWatch USA is a program of the Association of Zoos and Aquariums



The Association of Zoos and Aquariums (AZA) is a 501(c)(3) nonprofit organization dedicated to the advancement of zoos and aquariums in the areas of conservation, education, science, and providing opportunities for families to develop personal connections with animals. AZA is committed to building North America's largest wildlife conservation movement. While other organizations have larger mailing lists or budgets, AZA's assets – 221 accredited institutions, nearly 6,000 individual professional members, 180 million visitors and more than 700,000 live animals – provide a uniquely important link to inspire and generate support for wildlife and habitat conservation. AZA's professional staff maintains a structure of committees and animal management programs involving more than 1,000 committed zoological professionals. These programs include animal welfare, conservation breeding, field conservation, professional training, and animal health. AZA also maintains its Conservation Endowment Fund, which supports the conservation education and scientific research efforts of its individual members through grants.

*Science Education:* In the last 10 years, AZA has worked with accredited zoos and aquariums to formally train more than 400,000 teachers, supporting science curricula with effective teaching materials and hands-on opportunities. More than 50,000,000 children visit these institutions each year, including more than 15,000,000 students who visit on school field trips.

*Endangered Species:* AZA-accredited zoos and aquariums are leaders in the protection of endangered and threatened species. Twenty years ago, AZA established the Species Survival Plan® (SSP) program—a long-term plan involving conservation breeding, habitat preservation, public education, field conservation, and supportive research to ensure survival for many of the planet's threatened and endangered species. Currently, AZA members are involved in 114 SSPs working to save 182 species. Dozens of species, from the American Bison to the Arabian Oryx to the Puerto Rican Crested Toad, would be extinct today if not for the efforts of AZA and its members.

*Amphibians:* In 2008, in response to the global amphibian conservation crisis, AZA spearheaded a "Year of the Frog" conservation and education initiative in the United States, in conjunction with other international zoological associations. AZA and accredited zoos and aquariums remain committed to amphibian conservation, both in our backyards and around the world. The FrogWatch USA program is a flagship for AZA's engagement of citizen scientists in caring for species and habitats at risk.

*Accreditation:* Founded in 1924, AZA is the only independent accrediting organization for zoos and aquariums with comprehensive, mandatory standards in the United States. AZA admits only those institutions meeting rigorous requirements for animal care, education, wildlife conservation and science.