Visiting a wetland without the chirping of frogs on a warm summer night might make you feel uneasy – and it probably should. Around the world, frog and toad populations are declining or have vanished due to habitat loss, increased pollution and disease. A healthy wetland can provide many species of frogs and toads with ideal habitat, and the absence of frogs and toads in a wetland may indicate something has gone wrong.

With their semi-permeable skins and a life cycle in which they spend part of their lives in water and part on land, frogs and toads are sensitive to contaminants in both terrestrial and aquatic areas within a wetland. They are also sensitive to wetland degradation caused by invasive species, sedimentation and habitat fragmentation.

And just as frog and toad populations are influenced by changes in the wetland, wetland ecosystems are also sensitive to changes in frog and toad populations. Frogs and toads provide food for other animals and help control insect populations. And tadpoles eat large quantities of algae and plankton, helping the wetland maintain a healthy nutrient balance. For these reasons and many others, volunteers around the country have mobilized to monitor frogs and toads with calling surveys.

About Frog & Toad Surveys

Frogs and toads are part of the Amphibia animal class and are often referred to by their taxonomic order as anurans. Using a frog and toad calling survey, a volunteer monitoring group can readily determine what anuran species live in their wetland. Calling surveys can be conducted with limited resources and expertise and are practical as a volunteer wetland monitoring activity.

Data collected on anurans can contribute to an inventory of animals using your wetland and provide evidence about the types of habitats the wetlands harbors. Anuran species vary in their habitat preferences. Wood frogs, for example, like to breed in ephemeral forest ponds, whereas, leopard frogs, spring peepers and chorus frogs are more closely associated with open wetlands.
About Frog & Toad Surveys – continued from front page

In some cases, anuran data collected by wetland volunteers might also be used to help state biologists better understand the distribution of Wisconsin anurans. And if a rare species is identified in a new area, the identification might be included in the Department of Natural Resources’ Natural Heritage Database. The database is used to locate and document occurrences of wildlife species and natural communities, including state and federally endangered and threatened species.

If a volunteer group conducts a frog and toad calling survey using consistent methods over many years, they might establish an index of relative abundance of anuran species in their wetland. Once an index of relative abundance has been established, monitoring may detect unusual and abrupt population changes. Determining what abrupt changes mean, however, can be very tricky even for trained biologists. Monitoring doesn’t tell you why a population change occurred, only that something happened. And abrupt population declines are not always due to human activities. Long-term cycles and natural events can also trigger an abrupt decline. A very cold winter with little snow cover, for example, can kill overwintering anuran populations and particularly wood frogs, peepers, chorus frogs and other species that overwinter on land rather than in underwater sediments. And while the presence of few anuran species might indicate the wetland has been degraded, it might also indicate the wetland has been isolated by landscape barriers that prevent in-migration of anurans or that an abundant fish population is eating anuran eggs.

Using data collected on anurans as an indication of wetland health is more useful when it is correlated with other evidence suggesting possible changes in the wetland. If properties surrounding your wetland have recently been developed with manicured lawns and soil and water testing indicate elevated levels of lawn care related contaminants, for example, a sudden decline in frog and toad populations might serve as a red flag.
The monitoring methods we outline in this publication are for the most part adapted from the protocol developed for volunteers participating in the state-wide Wisconsin Frog and Toad Survey. The Wisconsin Frog and Toad Survey is a citizen-based monitoring program coordinated by the Wisconsin Department of Natural Resources, in cooperation with the U.S. Geological Survey and the North American Amphibian Monitoring Program. The Wisconsin Frog and Toad Survey was designed to be used along DNR approved survey routes throughout the state, rather than for use within a particular wetland. But many of the survey methods can be adapted for use by site-level monitoring groups as a means of standardizing their own methods and maximizing species detection.

**Supplies and Equipment**

At a minimum, your frog call survey team will need **frog call identification audio materials**, **headlamps** or **flashlights**, **mosquito head nets**, **field data recording sheets**, a **pen or pencil**, and a detailed **map of survey sites**. Frog call identification audio materials and a **visual identification booklet** can be obtained through the Madison Audubon Society (see Informational Resources & Contacts on back page). For more detailed data recording, volunteers might also want a **thermometer** for taking water temperatures. And if your wetland’s survey sites are difficult to map, volunteers might need a **global positioning system (GPS) unit** for marking and relocating survey sites. Volunteer groups that do not have their own GPS units can borrow them from one of 20 technology libraries available around the state (see Informational Resources & Contacts).

**Survey Participants**

Just about any volunteer can participate in a frog and toad calling survey. Monitoring frogs requires volunteers to develop moderate identification skills and to be dedicated to do a good job. For the most part anuran calls are easy to distinguish, and most volunteers can learn the calls of Wisconsin’s 12 anuran species with minimal training. Aside from being able to accurately identify frog calls, survey participants will also need to accurately record data. Monitoring team leaders should ensure volunteers are clear about how to record data to prevent sloppy recording from ruining a survey.

Ideally, a frog and toad call monitoring group should be kept small to minimize disturbance. Generally two or three volunteers is best. Just one of the team’s volunteers should be designated to make calling observations while a second team volunteer can record their observations. A third volunteer might come along as a volunteer in training. It’s always a good idea to have extra volunteers trained to conduct surveys in case one or more of the survey’s usual volunteers is unable to conduct a particular survey or needs to discontinue their participation in the survey project.
Surveying – When & Where

If you plan to collect long-term data, it is a good idea to establish a survey route made up of permanent listening stations. When establishing listening stations, locate them in places accessible at night, where there are likely to be breeding anurans and where ambient noises, such as barking dogs and traffic, will not make it difficult to hear. Stations should be established to represent a range of potential anuran habitats within the surveyed area and where anurans are likely to call. Good habitat locations can include permanent or temporary ponds, open or shrubby areas and areas with stagnant or flowing water. Streams with fast-moving water and lakes with little or no shoreline vegetation are likely to harbor few anurans.

You will likely want to determine how many stations to establish based on the volunteer support you have and the size of your wetland. Each monitoring team should have at least two volunteers, and each team should be assigned to monitor no more than 11 or 12 listening stations in a single evening. In the first year of monitoring you may want to establish a route that includes one or more stations than you want to include in your permanent route. Sometimes in the first year of monitoring, volunteers will find that a site represents poor breeding habitat and generates few calls or is unsuitable due to noise. Sites should be marked on a topographic map or documented with GPS coordinates.

Listening stations can be difficult to find at night and volunteers must take care to make sure they monitor from the correct locations. Monitoring from locations other than the designated listening stations will result in inconsistent data between surveys. If volunteers are not already very familiar with where listening stations are, they should scout out the sites during daylight hours. Volunteers must resist the urge to change a station’s location because anurans are no longer calling. Sometimes wetland areas dry up, or other things change. No one wants to stop at a site where there are no anuran calls, but recording an absence of calls is as important to detecting population trends within the wetland as is recording presence.

Just three surveys need to be collected per year, but each must fall into one of three distinct periods. Various species of anurans call for mates at different times, from early
spring to midsummer. Some species overlap in their calling periods and others do not. By surveying once within each of three specified periods, monitors maximize their chances of detecting the breeding calls of all or most of the species present within a wetland. The three survey periods are based on minimum water temperatures of 50°, 60° and 70° F and run from April 8 to April 30, May 20 to June 5 and July 1 to July 15. Springs have been arriving earlier and water temperatures warming a little faster so the time windows for the surveys may be changed. Monitoring groups should keep an eye on the Wisconsin Frog and Toad Survey Web site for possible adjustments in the appropriate periods for surveying. As for the ideal time of day for monitoring, surveys should be conducted after dark on nights when winds are blowing at less than 12 miles per hour. Warm, cloudy and humid nights with winds of seven miles per hour or less are ideal.

Conducting surveys during the designated time periods can be challenging. The periods within which surveys are supposed to take place are short and conditions do not always align with volunteer availability. The second survey period, from May 20 to June 5, for example, is only two weeks long. And if some of the evenings within the designated time period are rainy or too windy, it can become even more difficult to complete the survey within the time frame required.
For the most part, the calls of Wisconsin’s 12 anuran species are easily distinguished. However, special attention should be paid to a small number of species with similar calls, such as the gray treefrog and the Cope’s gray treefrog. Bringing a recorded copy and audio player into the field can help volunteers refresh their memories and make distinctions between similar sounding species. These should not be played while actively surveying at a site, but can be played between site surveying stops.

Even though only a limited number of species are expected to call during certain periods there can be overlap, so it is important to be familiar with all of the species’ calls. Also, detecting frog calls that would not usually be expected during a certain period or in a certain area is important because it helps biologists keep track of shifts in calling phenology, behavior, breeding seasons and species distribution.

Data Collection & Record Keeping

When conducting the survey, volunteers should stop and listen for anuran calls at each station for five to ten minutes. For documenting the calls, we recommend volunteer groups download field data recording sheets from the Wisconsin Frog and Toad Survey (WFTS) Web site and use the index values listed below the data recording table for documenting calls. WFTS has established three index values for documenting the relative abundance of each anuran species heard. Monitors report an index value of “1” when they can distinguish the calls of individuals, there is space between their calls and the calls do not overlap. Monitors report an index of “2” when they can distinguish the calls of individuals, but some of them overlap. Finally, monitors report an index of “3” when they hear a full chorus of a species of anuran and their calls are continuous and overlapping. Ideally, monitors will also want to use a water thermometer to measure and document water temperatures, as indicated on the data sheets.

If you would also like to document your wetland...
anuran data in an online database, you may want to refer volunteers to the University of Wisconsin-Milwaukee Field Station Herp Atlas Project. The atlas project uses volunteer-submitted data to help create distribution maps of Wisconsin Anuran species throughout the state.
RESOURCES & CONTACTS

Wisconsin Frog and Toad Survey
This is a citizen-based monitoring program coordinated by the Wisconsin Department of Natural Resources, in cooperation with the U.S. Geological Survey and the North American Amphibian Monitoring Program. The survey was not designed for site-level monitoring, but many of its protocols can be adapted for use by site-level volunteer monitoring groups as a means of standardizing their methods and maximizing their ability to detect species.
http://wiatri.net/inventory/FrogToadSurvey

University of Wisconsin-Milwaukee Field Station Herp Atlas Project
The Wisconsin Herp Atlas tracks the distributions of Wisconsin amphibians and reptiles including frogs and toads. The Herp Atlas uses museum collection records, field surveys, literature and volunteer observation entered into a computerized database to map distributions and can provide a place where volunteer monitoring groups can share their observations.
http://www4.uwm.edu/fieldstation/herpetology/atlas.html

United States Geological Survey online frog call quiz
Volunteers can use this Web site to strengthen their frog and toad identification skills by taking frog call quizzes. Quizzes are state specific.
http://www.pwrc.usgs.gov/frogquiz

Madison Audubon Society anuran audio and booklet identification materials
Through this Web page, the Audubon Society sells anuran call tapes and CDs and identification booklets for volunteers trying to learn Wisconsin anuran species.
www.madisonaudubon.org/audubon/html/frogtape.htm
or (608)255-2473

Technology Libraries
This Invasive Plants Association of Wisconsin Web page lists the addresses and contacts for Technology libraries, from which monitoring groups can borrow global positioning system (GPS) units.

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