

Survey participants are treated to secondary benefits including nights filled with various wildlife sounds.

A male Blanchard's cricket frog calling. This is a state endangered species.

Wisconsin Frog and Toad Survey

THIRTY-FIVE YEARS OF MONITORING IN WISCONSIN.

Rori Paloski

It's an exciting year for frog monitoring in Wisconsin — it marks the 35th anniversary of the Wisconsin Frog and Toad Survey (WFTS). The WFTS, coordinated by the Department of Natural Resources, monitors all Wisconsin frog species and is composed, almost entirely, of volunteers. The primary goals of the WFTS, the longest running amphibian monitoring project in North America, are to collect data on abundance, distribution and population trends of Wisconsin frogs.

Wisconsin is home to 12 frog species: one toad (American toad), five tree frogs (Blanchard's cricket frog, gray treefrog, Cope's gray treefrog, spring peeper and boreal chorus frog), and six "true" frogs (American bullfrog, green frog, pickerel frog, northern leopard frog, mink frog and wood frog). Many of these species are found throughout Wisconsin, while some, such as the Blanchard's cricket frog and mink frog, have very restricted ranges in Wisconsin.

Wisconsin frogs' habitat preferences vary as much as their ranges. The mink frog is almost exclusively aquatic and is rarely seen on the shoreline, while the northern leopard frog breeds in the water but spends the summers foraging up to a mile from water. Wood frogs, as their name implies, spend the majority of their time in wooded habitats while the Blanchard's cricket frog prefers open or semi-open canopy habitats. Species' susceptibility to human disturbance varies as well. Boreal chorus frogs are often heard calling in urban ponds and cattail

ditches, while the pickerel frog prefers less disturbed natural springs and adjacent waterbodies.

Survey history

The WFTS was created in 1981 by Ruth Hine and Mike Mossman of the Department of Natural Resources, in response to concerns over declining frog populations, primarily northern leopard frogs, Blanchard's cricket frogs, pickerel frogs and American bullfrogs. Mossman was involved with amphibian research at the time and Hine, a wildlife ecologist, had just finished editing Dick Vogt's classic book, "Natural History of Amphibians and Reptiles of Wisconsin." Hine decided to create a roadside survey to monitor frogs, similar to the highly successful federal Breeding Bird Survey.

In addition to noted declines in Wisconsin frog species, alarming declines in amphibian populations throughout the world have been observed for several decades.

"The decline of amphibian popula-

tions around the globe has been greater than that of any other vertebrate group," explains Tara Bergeson, a DNR amphibian specialist and conservation biologist. "There are a number of contributing factors, including habitat loss or degradation, chemical contamination, climate change, disease, deformities and non-native species introductions."

University of Wisconsin-Stevens Point professor Ray Anderson and graduate student Debra Jansen, also assisted in designing the WFTS. Anderson and Jansen decided on three survey periods to cover each species' breeding period, as well as the call index, which is used to rate the strength of each species' calling on a scale of 0 to 3.

Frog breeding seasons, often considered a characteristic sign of spring, are easily recognizable as male frogs produce a breeding call that is unique to each species. The timing and duration of breeding periods also varies by species. Some species, like the green frog, call and breed over a period of several months, while other species, like the American toad, are considered "explosive" breeders — the species completes its entire breeding season within only a few weeks. Breeding call surveys, such as those used in the WFTS, are commonly used by researchers to survey for and monitor frog populations.

The first three years of the WFTS (1981 through 1983) were spent testing survey methods, especially regarding the number of stations that could be surveyed realistically in one night and the length of the survey period at each stop. Mossman

recounts the detailed work of setting up such a large scale survey, but also the interaction with the initial citizen volunteers.

“We spent a lot of time in the early years, with letters and phone calls to our current and potential volunteers, way before the advent of email — everything from the mundane reminders for everyone to carefully document their routes and station locations (no GPS!), to ensuring correct frog identification, eliciting feedback and just thanks,” Mossman says. “We learned a lot from one another.”

After three years of refining techniques, it was determined that each volunteer would conduct one survey during each of three survey periods (April 15 through 30, May 20 through June 5, and July 1 through 15) at 10 survey sites (wetlands, ponds, lakes, streams or rivers) for a period of five minutes per site. In addition to finalizing survey methods, additional statewide routes were added in 1984.

Mossman is extremely pleased with the success of the survey.

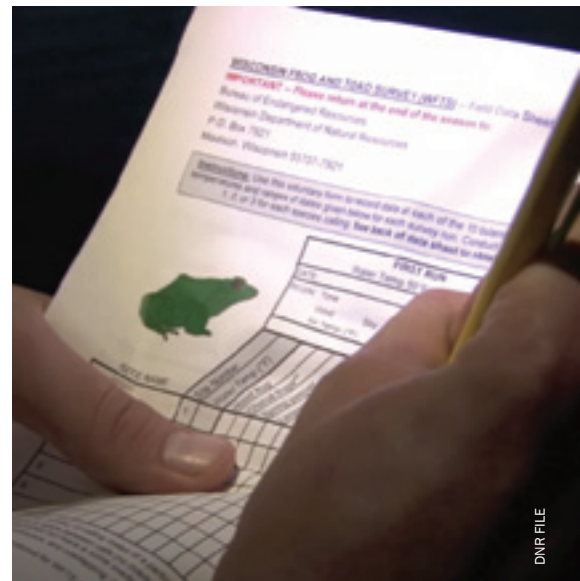
“Not only did we build the nation’s longest-running auditory, frog monitoring program, but we made great progress on one of the most important goals of the project from the outset: to get people out at night, patiently and quietly listening to frogs, engaging in the realm of nocturnal wildlife, and building deeper connections with these animals and the wetlands they rely on us to protect.”

Volunteers also often comment on these secondary benefits of survey par-

ticipation as well. Ron Eckstein, a retired DNR wildlife biologist and 30-plus year volunteer with the WFTS, enjoys contributing to the surveys, as well as “those wonderful nights that include common loons, barred owls, and whip-poor-wills with occasional northern lights and Milky Ways.”

The WFTS methodology has remained relatively unchanged since 1984, although the first calling period now begins on April 8 and is also adjusted occasionally to accommodate unusually warm or cool springs. To help monitor this changing phenology (i.e., the timing of annual biological events, such as when frogs start calling each spring), phenology surveys have also recently been added to the WFTS. Phenology surveys use the same call index and 5-minute calling period as the original surveys, but instead of visiting 10 predefined routes three times each year, volunteers select their own single site to monitor throughout the spring and early summer.

Volunteers may choose a pond on their own property, a lake they like to visit often or a stream crossing located on their commute home from work. Information collected as a result will help paint a better picture of the beginning and ending calling periods of each Wisconsin frog species, as well as how these periods may be shifting over time. A secondary benefit of adding phenology surveys is that additional volunteers can be involved in the WFTS. Standard WFTS surveys are limited to approximately two routes per county (although some



Volunteers conduct one survey during each of three survey periods.

counties have had additional routes grandfathered in). In contrast, the WFTS phenology surveys are open to an unlimited number of volunteers.

WFTS data are still heavily relied upon in the department’s amphibian conservation efforts today.

“One way that we keep our eye on the pulse of our native frog species is through the Wisconsin Frog and Toad Survey,” explains Bergeson. “Because it is a standardized long-term monitoring effort, it helps us track trends for most of our species throughout the state. And, while the survey itself can’t tell us what is causing an observed change, it can give us early warning that something might be going on and that we need to investigate further.”

WFTS volunteer Heidi Conde says, “The most rewarding part of being involved in the survey is knowing that I am contributing data to a longstanding and important survey effort.”

Survey results

WFTS surveys have provided an abundance of data for all Wisconsin species and trend data for most Wisconsin species over the past 35 years.

American toads are commonly recorded during WFTS surveys but due to their short breeding season, they are likely missed during surveys some years. Toad populations appear to have been relatively stable over the past 35 years.

Gray treefrogs are one of the most commonly recorded species during WFTS surveys. Gray treefrog populations appear to have been stable or



A juvenile American bullfrog. This is one of the species whose decline initiated the WFTS.

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A Blanchard's cricket frog.

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An American toad nearly camouflaged.

MARK LA BARBERA

slightly increasing over the past 35 years.

Cope's gray treefrogs also are commonly recorded during WFTS surveys and their populations appear to have been relatively stable over the past 35 years.

Spring peepers and boreal chorus frogs are the two most commonly recorded species during WFTS surveys. Their populations appear to have been relatively stable over the past 35 years.

American bullfrogs, one of the species whose decline initiated the WFTS, are not often recorded during WFTS surveys. This special concern species is still considered to be somewhat rare in the state and is not often found in large numbers at any given site. Bullfrog populations appear to have been stable or slightly increasing over the past 35 years.

Green frogs are one of the most commonly recorded species during WFTS surveys and their populations appear to have been stable over the past 35 years.

Pickereel frogs, one of the species whose decline initiated the WFTS, are not often recorded during WFTS surveys, likely because this special concern species is still quite rare in Wisconsin. Pickereel frog populations appear to have been declining over the past 35 years.


Northern leopard frogs, another species whose decline initiated the WFTS,

are commonly recorded during WFTS surveys. Northern leopard frog populations appear to have been declining over the past 35 years.

Wood frogs are commonly recorded during WFTS surveys but due to their short breeding season, they are likely missed during surveys some years. Wood frog populations appear to have been relatively stable over the past 35 years.

Due to the extremely restricted range of the state endangered Blanchard's cricket frog and special concern mink frog, trend data cannot be calculated for these species. However, in addition to providing population trend information, WFTS reports of Blanchard's cricket frogs and mink frogs assist DNR researchers in other ways by identifying potential populations and helping focus research and monitoring efforts.

Since 1981, WFTS volunteers have conducted a staggering 78,914 site surveys throughout Wisconsin!

WFTS volunteer coordinator Andrew Badje believes, "The WFTS has the best citizen scientists out there." And given the longevity of the survey and dedication of the volunteers, that may just be true. 

Rori Paloski is a conservation biologist in DNR's Bureau of Natural Heritage Conservation.

>>> JOIN THE FUN

For more information on the WFTS or to participate in standard or phenology surveys, visit the Wisconsin Frog and Toad Survey website: <http://wiatri.net/inventory/FrogToadSurvey/>.

There are currently 172 active original WFTS routes throughout Wisconsin.



Northern leopard frog.

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Did you know?

Amphibians include frogs, salamanders and the little-known caecilian, a legless animal that resembles a worm and is found throughout the world in tropical and sub-tropical habitats.

The Cope's gray treefrog and gray treefrog are so similar they were once considered the same species. The two species can only be definitively differentiated by their breeding call, through genetic testing or by chromosome number (the Cope's gray treefrog has two sets of chromosomes while the gray treefrog has four sets of chromosomes).

Wisconsin frogs use a variety of techniques to survive winter weather. Some species, like the American bullfrog, green frog, pickereel frog, northern leopard frog and mink frog overwinter underwater on the bottom of ponds, lakes, streams and rivers. Gray treefrogs, Cope's gray treefrogs, wood frogs, spring peepers and boreal chorus frogs freeze solid when they overwinter under leaf litter and other debris in the uplands — amazingly, a natural glucose-based antifreeze in their blood protects their cells from breaking! American toads burrow in the soil below the frost line to avoid freezing completely. And finally, the Blanchard's cricket frog cannot survive underwater and cannot withstand freezing so this frog seeks out crayfish burrows, small mammal burrows and other cracks and crevices in the soil near water that allow for a microclimate with air temperatures just above freezing.

Most species of tadpoles metamorphose (develop into juvenile frogs) over the summer and the entire population prepares to overwinter each fall as adult frogs. However a few Wisconsin species, such as the American bullfrog, green frog and mink frog may remain tadpoles for two or even three years before metamorphosing.