

Going to bat...for bats

Wisconsin responds when a deadly disease comes knocking.

White-nose syndrome hits hibernators

A fatal disease is rapidly spreading among hibernating cave bats. It hasn't reached Wisconsin yet, but experts predict that it is just a matter of time. White-nose syndrome (WNS) is a fuzzy fungus that has adapted to cold conditions and appears on faces, ears, wings and feet of hibernating bats. Scientists believe it is spread bat-to-bat as they cluster in caves and mines. It also may be transferred on the footwear, clothing and gear of people exploring caves.

The first cases of WNS in North America were noted among dead and hibernating bats found in tourist-friendly caves near Albany, N.Y. beginning in 2006.

Flash forward just four years.

Finding the invasive fungus in Missouri last spring represents significant westward movement. WNS, which researchers speculate came to the United States from Europe, is just 250 miles from Wisconsin and moved more than 500 miles just last year. To date, Wisconsin DNR bat ecologist Dave Redell says biologists have documented more than a million dead and dying bats in 14 states and two Canadian provinces.

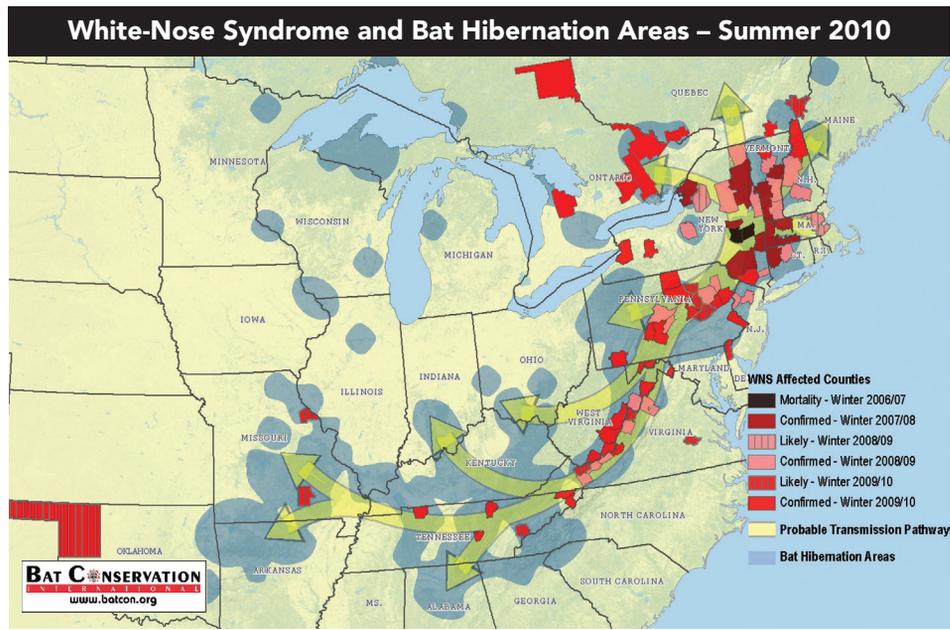
Such losses, Redell says, are expected to have unprecedented consequences on ecosystem health throughout North America, with unknown economic consequences. Most bat species in



White-nose syndrome appears as a fuzzy white fungus on the faces, ears, wings and feet of hibernating bats.

North America feed on night-flying insects. These insects are considered pests of forests, agriculture and garden crops or pose risks to human

health. The number of insects consumed annually by one million bats is staggering — equal to 694,456 tons.



This map shows the spread of white-nose syndrome westward as of summer 2010.

Sources: Pennsylvania Game Commission, U.S. Fish and Wildlife Service, West Virginia Division of Natural Resources, Bat Conservation International, National Atlas, North American Atlas and Natural Earth

A call for

Wisconsin bats use one of two strategies for dealing with winter. Hibernating bats, or cave bats as they are often called, use locations like caves buffered from freezing temperatures to spend the winter while food resources are limited. Migratory bats, which are usually referred to as tree bats, move toward warmer climates during winter.

White-nose syndrome causes bats to awaken more often during hibernation and use up the stored fat reserves they need to get through the winter. Infected bats often emerge too soon from hibernation and are seen flying around in midwinter. These bats usually freeze or starve to death. Mortality rates approaching 100 percent are reported at some sites.

The U.S.G.S. National Wildlife Health Center has detected the fungus *Geomyces destructans* as the likely cause of white-nose syndrome.

In general, Redell says, bat populations are susceptible to decline because of low reproductive rates (mothers typically give birth to just one pup per year) and many species congregating at hibernacula and maternity colonies.

"We have a short amount of time to figure out the concentration of bat species we have in Wisconsin and apply any management or conservation effectively," Redell says. "We need to set a baseline level of bats in the state if white-nose syndrome comes and wipes out our bats. We are looking at possible species extinction."



A necropsy must be performed to confirm white-nose syndrome.

NATIONAL WILDLIFE HEALTH CENTER

Be on the lookout

If you observe the following signs in or around bat winter hibernation sites, please report them to wiatri.net/inventory/bats/

- Bats with white or gray powdery fungus around the muzzle, ears, wings, limbs and tail.
- Excessive or unexplained bat mortality at or near a hibernation site.
- Aberrant bat behaviors (bats found on the ground outside the hibernacula).

Wisconsin bat species

Eight bat species have been recorded in Wisconsin. Five are cave-dwelling, which makes them most susceptible to white-nose syndrome, and three are migratory.

Cave bats:

- Little brown myotis (*Myotis lucifugus*)
- Northern long-eared myotis (*Myotis septentrionalis*)
- Big brown bat (*Eptesicus fuscus*)
- Eastern pipistrelle (*Perimyotis subflavus*)
- Indiana bat – not found in Wisconsin since the 1950s (*Myotis sodalis*)

Tree bats:

- Eastern red bat (*Lasiurus borealis*)
- Hoary bat (*Lasiurus cinereus*)
- Silver-haired bat (*Lasionycteris noctivagans*)

John Paul White, a DNR conservation biologist, says lack of information on bat species distribution and abundance is one of the greatest limitations to bat conservation. In fact, bats rank among the continent's least studied wildlife.

The Department of Natural Resources is trying to better understand bat distribution in the state and if need be, use that information for recovery plans. With WNS on Wisconsin's horizon, there is urgency in White's request for help.

While some bat sites, especially those on state-owned lands, are well documented, much of the state, which is under private land ownership, has not been surveyed for bats. The Department of Natural Resources is asking people to report mines, caves and other habitat in use by bats like barns, cabins, hollow trees, bridges and ledges.

With growing monitoring demands, the Department of Natural Resources has turned to the Wisconsin Citizen-Based Monitoring Network for help. By using trained volunteers to collect bat data, the Department of Natural Resources hopes to have an economical solution to gathering large-scale inventory and monitoring data. Last year, about 180 volunteers conducted 250 bat surveys.

"We are finding that as people learn about bats they become interested in being a part of finding and protecting them," White says.

Bats are difficult to study because they are nocturnal and fast-flying mammals whose calls are above the range of human hearing. All Wisconsin bats use echolocation to locate and intercept insects in flight.

Using hand-held ultrasound detectors combined with GPS technology, volunteers can "listen" to bats and record their calls. Each bat species has its own distinct call. Citizens can hike or boat along routes recording bats. "There seems to be a higher percent of bats closer to water routes," White says, "because they rely heavily on water."

Results are analyzed by DNR bat experts and presented on the Wisconsin Bat Monitoring Program website.

"I think we are on the right



citizen help



NATASHA KASSULKE

Volunteers are trained to use ultrasound detectors and GPS technology to find bats.

track," White says. "There are over 150 volunteer groups in Wisconsin monitoring everything from earthworms to birds, butterflies and now bats. People are intrigued and want to help. We just have to show them how."

Visit wiatri.net/inventory/bats for more information.

Identify bat maternity roosts

The Department of Natural Resources also needs help identifying bat maternity colonies, clusters of pregnant or nursing females that begin to disband in late summer and early fall. At this time, males and females of hibernating species begin to swarm together. Most U.S. bats breed in autumn and then the females store sperm until the following spring when fertilization takes place. The gestation period is only a few weeks and pups are born in May and June.

Some maternity colonies of little brown and big brown bats roost in attics. The best way to evict a maternity roost from your house is to seal off the bat's entrance holes and then provide the colony with an alternate roost such as a bat box. To identify entrance holes look for signs of bat droppings.



HEATHER KAARAKKA

Bat ecologist David Redell has started a fund for bat conservation and research.

One important aspect to consider, though, is timing. Because pups remain confined in the roost until they are old enough to fly, bat proofing should not be done May through mid-August. Otherwise, the young may be trapped inside. The best time to bat proof is in the fall after bats have left or in the spring before they begin to roost.

Fund bat research

There are other ways to get involved in bat protection such as supporting the Bat Conservation Endowment Fund. Wisconsin bat ecologist David Redell seeded the fund, which is managed through the Natural Resources Foundation of Wisconsin. Redell hopes the fund will encourage others to take an interest in these misunderstood animals.

"My hope is that more people will understand the benefit of bats and be inspired to get involved," Redell says. The endowment will be used for research projects and long-term bat conservation in Wisconsin. Contributions to the fund are tax-deductible and can be made through the Natural Resources Foundation of Wisconsin, Attn: *Wisconsin Bat Conservation Endowment Fund*, PO Box 2317, Madison, WI 53701 or by donating online at wisconservation.org/.

Bats in your home?

To exclude bats from your home, work with a local animal control service to remove them without hurting them after the end of the maternity season. The Department of Natural Resources can provide you with a list of animal control services that are sanctioned by Bat Conservation International.

You also may remove the bat yourself. Open all windows and doors leading outside to give the bat a chance to escape. Do not try to herd the bat to a window. Just give it time to settle down and locate the open window on its own. If the bat lands, you may put on heavy gloves and place a container such as a shoebox or large plastic bowl over the bat as it rests on the wall. Slide a piece of cardboard between the container and the wall to trap the bat and carry the container outside to let the bat go.

Report dead bats or odd bat behavior online at wiatri.net/inventory/bats/. Dead bats may be collected (use gloves) and stored in double plastic bags in the freezer until they can be collected by the Department of Natural Resources. The agency's wildlife health team performs necropsies to determine the cause of death.

Build bat houses

You can help bats by giving them a home, and you will also benefit from having fewer yard and garden pests.

Bats like tight spaces. They also need it nice and warm for the pups. Bat houses should be located near a permanent source of water. They should be placed in the sun and at least 15 feet above the ground in a location where entry is unobstructed. Bat houses may be placed on a pole or attached to the side of a building such as a house or garage.

Research shows that as the number of chambers increase, the occupancy rate rises. Some bat houses are single chambered and can be occupied by 50 to 100 bats. Maternity roosts, which have



HEATHER KAARAKKA

Hang bat houses in late winter.



DAVE REDELL

Wisconsin has more than 400 identified caves, which are critical bat hibernacula.

multiple chambers, may house 150 to 250 bats. Bat condos can house 5,000 to 10,000 bats depending on the plans used. Remember, once you put up the bat house, it may take some time for bats to find it. They will come looking in the springtime, so ideally it should be hung by late winter.

For directions on how to build a bat house visit wiatri.net/inventory/bats/.

Cavers who care

For some states, the most visible response to WNS has been to declare caves and mines off-limits to visitors.

"As cavers, we care about the environment whether we are going in for scientific exploration or recreation," says Jennifer Schehr, DNR cave and mine specialist. "When white-nose syndrome came on the radar, we were concerned because we care about bats. Cavers all over the nation are cooperating and concerned."

For some cavers, that concern translates into voluntarily staying out of caves to eliminate the risk

of human transfer of WNS. The U.S. Fish and Wildlife Service also issued a caving moratorium to eliminate that risk.

"We view cavers as valuable partners and we're working in collaboration with cavers and cave owners to find the best means of conducting surveillance and monitoring. Cavers are familiar with the site locales and know what is normal for those caves," Schehr says.

And Wisconsin is a cave state. While not known for large caves like Kentucky, Wisconsin boasts about 400 identified caves and mines that serve a great number of bats for the six to seven months of the year they are hibernating. According to Redell, the largest known hibernaculum in Wisconsin is the Neda Mine State Natural Area in Dodge County, where his census found 143,000 bats.

The DNR is asking landowners with caves and mines on their property to contribute to the state cave and mine catalogue to better understand where bats are located in the state. To report a cave call (608) 266-5216 or e-mail DNRbats@wisconsin.gov.



MARVIN MORIARTY/USFWS

With the anticipated arrival of WNS, the Department of Natural Resources is involved in several efforts to respond to the disease's potential spread. Erin Crain, chief of DNR's Ecological Inventory, Monitoring and Review section, says Wisconsin is part of the Midwest Bats Working Group and has developed a WNS Contingency Response Plan as required by the U.S. Fish and Wildlife Service. The state also participates in national and regional task groups to develop sound management solutions, and is taking part in efforts to research and identify underlying mechanisms causing WNS.

"We are working closely with neighboring states," Crain says, "because we share bats."

"Right now bats have very little protection," Crain says. "We want to work with landowners and others to create volunteer agreements for bat protection." In addition, the Department of Natural Resources wants to work with homeowners, animal control services and others.

Crain says the bat program can learn from other states' responses to WNS as well as the department's own experience with wildlife diseases.

"From responses to the outbreaks of these diseases, we have learned the importance of having a strong public education component in any response," Crain says. "We need to tell people what to expect, what they can do and how to respond appropriately."

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