

White Nose Syndrome Killing Bats in Northeastern US

By Jessica Soine

White Nose Syndrome (WNS) is a mysterious affliction killing thousands of bats in the northeastern United States. The white fungal growth around the muzzle of the bat, after which this affliction is named, is just one symptom of the mysterious killer. However, the main symptom and likely cause of death for the bats is starvation. First reported in the winter of 2006-2007 in Albany, New York¹, WNS is on the rise, having spread to Vermont, New Jersey, Virginia, Massachusetts, Pennsylvania², West Virginia, Connecticut, and most recently, New Hampshire.



Credit: U.S. Geological Survey
Department of the Interior/USGS
U.S. Geological Survey

Cluster of bats hibernating in a Vermont cave.

WNS has only been seen to affect and kill bats in hibernacula, the caves and mines in which they winter. Typical evidence of WNS is bats flying in the daytime hours during winter, dead bats outside near cave and mine entrances, bats roosting nearer cold cave entrances, and a white fungal growth on muzzle and wing membranes. Carl G. Roe, Pennsylvania Game Commissioner executive director, observed that "[T]he disorder seems to arouse bats from hibernation prematurely. Once they depart from caves and mines, they quickly sap their energy reserves and die on the landscape. Mortality in some colonies [in New York and New England] has exceeded 90 percent, ensuring that any local recovery will be quite lengthy given the low reproductive rate of bats. Little brown and the federally-endangered Indiana bats produce only one young per year."³



Credit: U.S. Geological Survey
Department of the Interior/USGS
U.S. Geological Survey
Photograph by Al Hicks, New York
Department of Environmental Conservation

Little brown bat with fungus.

From New York to Pennsylvania outbreaks of WNS follow a predictable spread pattern, showing up in caves nearby those previously affected. However, what is causing the spread of the disease is unknown⁴, like much about the WNS itself. Though the fungal growth that is a sure sign of WNS appears on most afflicted bats, sometimes bats exhibit no outward signs of fungal growth. The fungal growth doesn't even seem to be killing the bats; starvation due to loss of fat reserves is so far the best theory. But what caused the loss of fat reserves?

Greg Turner, a Game Commissioner biologist has many similar questions. "Why do bats appear to be starving to death? Is it that they're not putting on enough fat in the fall to make it through the winter, or is it that they are able to store enough fat, but something is happening to them while they are in hibernation that causes them to burn up body fat at a much quicker pace than normal? Is the fungus or some unknown pathogen directly causing the mortality, or are contaminants somehow involved by directly affecting either the bats or their food supply? Or is there some sort of combination of factors?"⁵

These are just a few of the questions researchers are trying to answer as WNS spreads into its seventh state in the winter of 2009. Other aspects of the disease that researchers are studying are whether or not it appears in the summer roosts and maternity sites of bats; whether WNS remains in the hibernation cave without the presence of bats; and whether or not there is anything they can do to slow or halt the spread of WNS.

Taking only two years to wipe out 80 to 90 percent of bat populations in hibernaculum⁴, WNS causes major concerns about what the loss of the bat population means for bats human neighbors. Bats collectively eat billions of bugs every summer night, freeing us from the pesky winged visitors. However, more people know only that bats might carry rabies (a very rare occurrence) than about their beneficial affects, such as keeping farming costs down due to reduced pesticide use.

Unfortunately, since the general public knows little about bats, it is hard for researchers to find funding to study bat populations and migrations. Only in recent years has bat conservation and research efforts really been on the rise.

Aside from the immediate efforts of those on the line of defense against WNS, other states have been forming their own bat conservation programs. Wisconsin is one such state. The Wisconsin Department of Natural Resources (WDNR) in conjunction with several research facilities and universities across the state started a bat research program in 2007. One aspect of this research includes five permanent bat detection sites across the state of Wisconsin that uses acoustic monitoring to identify bats species and density⁶ over the course of the year. Each day the long-term bat monitoring stations begin recording ultrasound activity a half hour before sunset and then stop recording a half hour after sunrise. These stations will offer a unique look at daily bat activity and when seasonal (spring migration, summer residency, fall migration) movements occur.

In addition to five permanent bat detection sites, the Citizen Science Center at Beaver Creek Reserve participates in a similar project by training volunteers to conduct mobile acoustic bat surveys of local parks, neighborhoods, lakes and trails using a bat detector attached to a PDA (Personal Digital Assistant) with GPS (Global Positioning System). The bat detector picks up the echolocation calls emitted by bats and translates it to a frequency the human ear can hear. The echolocation calls are recorded and then viewed on the PDA, while the GPS tracks your route and provides a location for each bat encounter. This system, dubbed the "Bat Monitoring Kit" is checked out of the Citizen Science Center for 1-3 nights so volunteers can conduct surveys of selected or designated sites. Each survey generally lasts 1-3 hours and is to be completed during a six month period beginning in April and ending in September.



USFWS and MA Division of F&W biologists in MA mine containing bats with WNS. And, a little brown bat being inspected in Vermont.

Credit: U.S. Geological Survey Department of the Interior/USGS U.S. Geological Survey

Each Acoustic Bat Monitoring System records information about phenology and species presence. Data is entered into the Wisconsin Bat Monitoring Program database, with the long-term scope of this project to compile information about phenology, species presence, migration timing vs. residence, and trends of the bat species in Wisconsin.

Bat monitoring in Wisconsin might prove crucial if WNS should ever happen to travel this far west.

For more information about WNS or about the Citizen Science Center's Acoustic Bat Monitoring project visit the links below or look in the sources cited in this article.

Unusual Winter Mortality Events at Four New York Hibernacula during 2007

<http://www.batmanagement.com/wns/wns-hicks-poster.pdf>

White Nose Syndrome: Background and Current Status

<http://www.batmanagement.com/wns/wns3-30-08.pdf>

White-Nose Syndrome in Bats: Something is Killing Our Bats

http://www.fws.gov/northeast/white_nose.html

Wisconsin EcoAtlas: A Guide to Wisconsin Natural Resource Information

<http://wiatri.net/ecoatlas/>

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Photographs

"White Nose Syndrome Photo Gallery" USGS National Wildlife Health Center. U.S. Geological Survey Department of the Interior/USGS U.S. Geological Survey.
http://www.nwhc.usgs.gov/disease_information/white-nose_syndrome/gallery.jsp

Sources

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