

# White-Nose Syndrome and Efforts to Prepare for It in the Southeast

## *Conservation Issues in the Asheville Field Office*



*placing a transmitter on an Indiana bat to track how frequently it wakes up during hibernation*

Tens of thousands of hibernating bats died in the Northeast during the winter of 2007-2008, and we don't know why. In and around caves and mines in Vermont, eastern and upstate New York, western Massachusetts, and northwestern Connecticut, biologists found sick, dying, and dead bats in unprecedented numbers, including several hundred endangered Indiana bats, all apparently infected by a fungus that often forms white tufts on the bats' muzzles, giving it the name "white-nose syndrome," or WNS.



*Indiana bat*

In addition to the white muzzles, the dead bats appeared to have used up their winter fat stores and have congregated much closer to cave entrances than usual. Researchers are trying to determine if the fungus itself is responsible for the deaths or if its presence is symptomatic of another problem.

In the U.S. Fish and Wildlife Service's (Service) Southeast Region, Indiana bats are known to hibernate in Kentucky, Tennessee, Alabama, and Arkansas, while during the summer they can be found in several more Southeastern states. Biologists from the Service's field offices in Frankfort, Kentucky; Cookeville, Tennessee; and Asheville, North Carolina, are collecting information about the Indiana bat to prepare for a potential WNS outbreak in the Southeast. A symptom of WNS is an especially low hibernation body weight; however, biologists in the Northeast were handicapped when they didn't have enough data to quantify weight loss and gain a clear idea of what's abnormal. Service biologists in the Southeast recently teamed with other federal, state, and private partners in Tennessee and Kentucky to collect data on the prehibernation weight of Indiana bats, providing a much-needed baseline for future comparisons. The scientists also put sensors on 20 bats in a Kentucky cave, which will provide information on their body temperature throughout hibernation. Since body temperature rises when a bat is awake, this gives biologists an idea of how often healthy

bats wake up during hibernation; this is important information since frequent arousal from hibernation uses up fat reserves and can lead to low body weight.

In researching why bats are dying, much attention has been on the fungus. Researchers recently made a breakthrough--the fungus is apparently new to science. Genetic work relates the mysterious fungus to the genus *Geomyces*, a group of fungi that grow on animal skin in cold climates. Oddly, however, the fungus looks like no other member of this group. When growing the fungus under lab conditions, researchers found it grew best between 41 and 50 degrees Fahrenheit, generally in line with the seasonal temperature range in the caves where WNS has been reported.

But questions still linger. Is the fungus the problem or a contributor to the problem, or does it thrive only after the bat has been dealt a knockout blow? Research into the identity of the fungus also raises questions. Is it an exotic fungus introduced into the caves? Was it there all along; if so, why is it a problem now? Biologists are not certain if the bats are transmitting WNS among themselves, if people are the vector, if both bats and people are spreading it, or if it comes from some other source.



**In order to help control the spread of WNS, the Service provides these recommendations:**

- Do not touch any bats (living or dead), especially those with a white muzzle/nose.
- If you are in a cave and see bats with white muzzles or noses, exit the cave immediately, avoiding contact with other bats, and decontaminate your clothing and gear before entering other caves.
- Contact your state's fish and wildlife agency or the nearest Service field office to report your observations.
- Remove your caving gear when you get to the vehicle and put it in a closed plastic bag to prevent contamination of the trunk.
- Wash caving clothes, using hot water, detergent, and bleach.
- Dry the clothes thoroughly, at hot temperatures.
- Scrape the dirt from boots and soak them in a 10-percent bleach solution (one part chlorine bleach, to nine parts water); soak porous boots longer than nonporous boots.
- Do not forget to wash or soak cave packs and to thoroughly clean helmets/lights with a 10-percent bleach solution or a similarly effective disinfectant.

In the summer of 2008, people reported dead and dying little brown bats at their summer roosts in attics, barns, and other outbuildings in New York, Vermont, Massachusetts, and Connecticut, with confirmed WNS in New Hampshire and Pennsylvania, though neither has confirmed WNS in winter hibernacula. While conducting surveys of forested areas, biologists also caught bats that had abnormal wing tissue, including white spots, holes, and tears. We are also seeing a higher than usual number of pups falling to the ground and dying. We do not know if these summer bat deaths are caused directly by WNS or if the bats are weakened from fighting off WNS in the winter hibernacula and have not been able to recuperate.

Bats are an important part of our ecosystem. One bat may eat from 50 to 75 percent of its body weight in flying insects a night during the summer months. Because females produce just

one pup a year, the plunging bat numbers (apparently as much as a 90-percent loss in some hibernacula) translate into a crisis in bat populations in the affected states, with no end in sight and potentially far-reaching effects--an ecological disaster in the making.

Additional information about WNS and Indiana bats can be found on the Internet at: <http://www.fws.gov/midwest/Endangered/mammals/inba/BatAilment.html>.

January, 2009