Once plentiful, northeastern bats now threatened by mysterious white-nose syndrome

November 2 2015, by Matt Swayne

A healthy little brown bat, Myotis lucifugus, hangs from the ceiling of a limestone cave. Credit: U.S. Fish and Wildlife Services/Ann Froschauer

For summer visitors at Shaver's Creek Environmental Center, the show

started at dusk.

Like a dependable flock of third-shift insect-control workers, little brown bats emerged from the wildlife educational center's bat boxes and fluttered in a cloud over the heads of the families pausing during night hikes to watch the show. This spectacle was a nightly summer tradition for thousands of area residents that rivaled drive-ins and double-headers.

For the past few years, these families waited alone.

During the last decade, a mysterious fungal disease has decimated much of the region's cave-dwelling bat populations, the once plentiful nocturnal master of the summer nights in the northeast, and cratered entire bat species. In some areas, colony populations fell 80 to 100 percent.

Penn State researchers are still holding out hope that these mammals, often considered the official "spokescreature" of horror movies and spooky Halloween tales, won't remain forever relegated to the fringes of folklore and the recesses of the human imagination, but will be restored to the inky black night time skies and returned to their important ecological function.

About 10 years ago, researchers documented the first case of the fungal disease—later dubbed white-nose syndrome (WNS)—affecting bats in New York, according to Michael Gannon, professor of biology at Penn State Altoona and one of the experts on the front lines of preserving the bat population. A few years later, millions of bats—including some of the area's most common, such as the little brown bat, the Indiana bat and the small-footed bat—were dead, and colonies of the area's leading consumer of insects and pests were whittled down to fractions of their former sizes.

While the exact mechanism behind the disease is still unknown, researchers suggest that the white-nose fungus causes the cave-dwelling bats to wake early from their winter hibernation. Once roused, without any insects to feed on and facing cold winter temperatures, the bats starve to death or die from exposure.

Ecological—and Educational—Loss

As a naturalist and program director at Shaver's Creek Environmental Center, Doug Wentzel witnessed the devastation of the bat population first-hand and, as an educator, continues to endure the aftereffects of one of the center's favorite exhibits.

Wentzel began his career as an intern in 1990, when the center's little brown bat population thrived. The center even built bat boxes next to the bald eagle cage of Shaver's Creek's raptor center, to better incorporate the creature into the center's everyday educational programs.

"In the summer of 1990, as an intern, I was treated to the joy of watching these bats come out of the bat boxes," said Wentzel. "Every summer during our Friday night campouts, people would gather and watch the bats stream out, which became a summer tradition at Shaver's Creek."

In 2007, coincidentally just about the time white-nose syndrome began its deadly march through bat colonies, Shaver's Creek staff began to count their bats each year. In that year, there were 1,400 little brown bats. The next year there were 1,300.

A little brown bat showing symptoms of white-nose syndrome. Credit: Ryan von Linden/New York Department of Environmental Conservation

Wentzel then ticked off the population numbers, emphasizing how severe the effects of the syndrome were. In 2010, the center was down to 900 bats and in 2011, there were 151, he said. When the staff counted again in 2012, there were 69 bats, and they found only 9 in 2013.

"Last year and this year, we have two bats," Wentzel added. "Part of Shaver's Creek mission is to connect people to the natural world and part of me feels like we just lost this ambassador for the natural world, this beautiful phenomena that kids at summer camp are going to miss out on."

Economic Loss

Losing bats—and their voracious appetites for insects—could cost Pennsylvania millions of dollars a year and result in billions of additional costs country-wide, according to Gannon, who has written several books about bats, including Bats of Pennsylvania.

Each bat can eat about 3,000 insects every night. Without these flying pest-control workers on duty, federal and state agencies are expecting that 2.4 million pounds of insects, including many crop pests, will not get eaten—and, according to Gannon, that number does not include the millions of more pounds of offspring that these insects would have during the summer.

Farmers would be expected to pick up the additional costs of insect control. Gannon added that each bat is worth approximately $74 each year to farmers who will now need to find insect-control alternatives.

Some of those options to curb the insect population will not be the most environmentally friendly.

"The bats provide what is essentially insect control, basically for free, but if they are not there, ultimately farmers will have to pay additional money for pesticides and, of course, there are all sorts of other problems associated with pesticides in the environment," said Gannon.

Researchers nationally are investigating how to combat white-nose syndrome, including bat inoculation, hibernaculum disinfection and bacterial treatments, with some insights slowly gained.

A cluster of hibernating little brown bats in Aeolus Cave, East Dorset, Vermont. Credit: USFWS/Keith Shannon

"We know more than we did ten years ago," said Gannon. "But I don't think the research is there, yet."

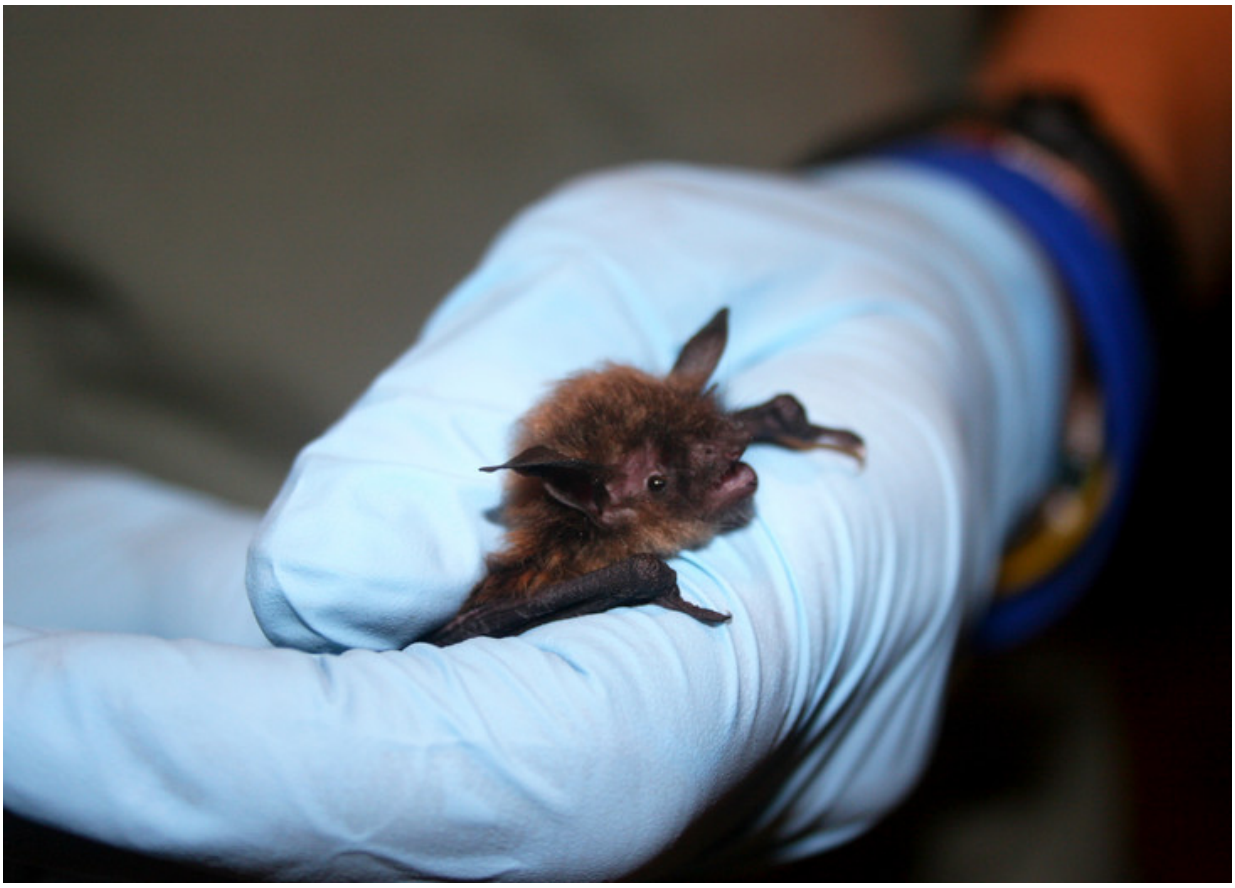
Gannon said he has some concerns about plans to disinfect caves or inoculate bats, and if there may be unintentional negative effects to the environment. Nature and evolution are ultimately in charge of the recovery process, he added. Some bats have survived the disease, which may increase the likelihood that their offspring will also adapt.

"At this point, I don't see that there's anything that we can do to alleviate this problem, other than to wait it out and hope for the best," he said.

"The bats will eventually co-evolve with this and develop an immunity, or it would cause them to go into extinction."

Regardless of these efforts, the level of decimation to the bat population is such that any recovery will be a long, slow process.

"Even if they start recovering, we won't see the numbers the way they were for many, many years," said Gannon. "The reason for that is because bats only produce one offspring a year, so it takes a very long time for those numbers to increase again."



A little brown bat is held by a U.S. Fish and Wildlife Services biologist. Credit: USFWS/Ann Froschauer

If—or, let's be optimistic—when bats do return, Penn State experts hope that, in their absence, the hearts of many will have grown fonder for the once-maligned mammal. Once mistakenly feared as rabies-carrying, blood-sucking, possible vampires, bats are now more likely seen as a helper, and even beautiful, in a mouse-with-wings-and-claws kind of way.

"Certainly a sad story, as bats were gaining in popularity, and people were putting up bat boxes," said Wentzel. "But, in the long view, maybe they will rebound and will be treasured more than ever before."

Bat boxes on the side of the bald eagle enclosure offer summer shelter for the maternity colony of little brown bats at Penn State's Shaver's Creek Environmental Center. Justin Raymond

What You Can Do To Help

- Stay out of caves and mines where bats are known or suspected to hibernate in the winter. Respect signs and barriers prohibiting access to such locations.
- Don't disturb or touch hibernating bats if you come across them.
- Report unusual bat behavior to your state's natural resource agency. Unusual behavior includes bats flying during the day when they should be hibernating (December through March); bats roosting on the outside of structures in the sunlight; or bats unable to fly or struggling to get off the ground. Don't touch bats if you find them in these situations.
- Reduce disturbance to natural bat habitats around your home, for example: reduce outdoor lighting, minimize tree clearing, and protect streams and wetlands.
- Provide or construct homes for bats (see below websites for more information on how to build your own). The second annual International Bat Week is being celebrated Oct. 25-31. On Oct. 31 an attempt will be made in the U.S. to break the world record for the most bat boxes built in a day.
- If bats are in your home and you don't want them there, work with your local natural resource agency to remove them without harming them, after the end of the maternity season.
- Volunteer with organizations working to raise awareness and gather information about bat populations. Attend community events, such as a bat watch or a bat count. Contact your state natural resource agency or local conservation groups for

opportunities.

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