

Deadly bat disease is spreading west

June 22 2010, By Rachel Bernstein

A disease killing more than 1 million with a mortality rate close to 100 percent continues to sweep across the country. First detected in New York in 2006, it is now found in 14 states in the East and South, leaving starvation and death in its wake, and is working its way westward.

This disease affects not people but hibernating bats. White-nose syndrome, so named because of the white [fungus](#) that grows on infected bats' noses, was discovered last month in Oklahoma, the farthest west it has been seen. Since it first appeared in a cave near Albany, N.Y., four years ago, more than 1 million bats have died, and its reach now extends northward to Ontario, Canada, and southward to Tennessee.

The discovery in Oklahoma is particularly worrisome because the bats there share caves with Mexican bats that migrate to and from Argentina. If the Mexican bats come in contact with the fungus, they could spread it widely.

"I'm afraid of what next year's map is going to look like," said biologist DeeAnn Reeder of Bucknell University in Pennsylvania. "It got farther than I expected this year."

One possible nugget of good news: The fungus that is linked to the disease grows only in [cold temperatures](#), so bats in milder climates with shorter winters may find a reprieve. "Everyone's crossing their fingers that there's a climate barrier," said Nina Fascione, executive director of Texas-based Bat Conservation International.

In 2008, researchers linked the fungus to the syndrome *Geomyces destructans*. How it kills the bats is a mystery, although scientists know it infects the bats' skin and appears to interfere with hibernation patterns.

During winter, healthy [hibernating bats](#) arouse about once every two weeks and in the two hours or so that they are awake, use more calories than in the entire two weeks of hibernation. But infected bats wake up as frequently as every four days, speeding the depletion of their precious energy stores and in some cases leading to starvation.

"We've got to connect these dots to figure out how you go from skin infection to death," said Reeder, who conducted the hibernation study.

Although some scientists believe that the sick bats wake up more frequently because the fungus is itchy and irritating, Reeder thinks the situation is more complex. She suspects that the first time a bat wakes in the winter, the immune system -- mostly shut down during hibernation -- detects the fungus. The animal's system then attempts to mount a protective immune response, burning calories in the process. That leaves fewer resources to help the bat last out the winter.

Part of this response may include the production of chemicals that can travel to the brain and change behavior -- maybe causing the bat to wake up more frequently, Reeder said.

As the white-nose syndrome continues to spread, the importance of bats to the environment is coming sharply into focus.

"These bats are major regulators of ecosystems," Reeder said. "For those million bats that are dead, 692 tons of insects are not being eaten this summer. You can put numbers on the amount of pesticides that farmers don't have to put out because of those bats."

Bat-lovers are particularly concerned about how this disease is affecting threatened species. The numbers of gray bats in the South had been recovering in the last 30 years, and the species was poised to be removed from the endangered species list. But its prognosis again looks grim.

Although many unknowns remain about the syndrome, researchers continue pushing forward. "It's probably going to make it all the way to California before we can do anything to stop the disease," said Thomas Tomasi, a biologist at Missouri State University. "But if we can slow it down ... it's worth a shot."

In an interesting twist, the fungus that may be responsible for the syndrome was also discovered in bats in France in 2009. However, it doesn't appear to kill the bats there. Some researchers speculate that the fungus swept through Europe 100 to 200 years earlier, killing off most of the population but leaving behind a small number of genetically resistant bats. Those [bats](#), the theory goes, then repopulated the region.

This suggests that, in time, the U.S. bat population may recover as well.

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