

Bats facing regional extinction from rapidly spreading disease

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A new infectious disease spreading rapidly across the northeastern United States has killed millions of bats and is predicted to cause regional extinction of a once-common bat species, according to the findings of a University of California, Santa Cruz researcher.

The disease, white-nose syndrome, first discovered near Albany, N.Y. in 2006, affects hibernating bats and has caused millions to perish, writes lead author Winifred F. Frick, in a study published in the August 6 issue of *Science*.

Frick, a UC Santa Cruz graduate who is now a post-doctoral researcher in UCSC's Environmental Studies department, said the disease is spreading quickly across the northeastern U.S. and Canada and now affects seven bat species. If death rates and spread continue as they have over the past four years, this disease will likely lead to the regional extinction of the little brown myotis, previously one of the most common species in North America, she said.

"This is one of the worst wildlife crises we've faced," Frick said. "The bat research and conservation communities are trying as hard as possible to find a solution to this devastating problem."

Frick notes that "bats perform valuable ecosystem services that matter for both the environments they live in and have tangible benefits to humans as well. Bats affected by this disease are all insect-eating species, and an individual bat can consume their body weight in insects

every night, including some consumption of [pest insects](#)," Frick said.

"The loss of so many bats is basically a terrible experiment in how much these animals matter for [insect control](#)," she said.

Frick received her BA in environmental studies at UCSC in 1998. She completed her Ph.D. at Oregon State University in 2007 and is currently a National Science Foundation Bioinformatics Postdoctoral Fellow with a joint appointment at UCSC and Boston University. She is also the research director of the Central Coast Bat Research Group in Aptos, Calif.

White-nose syndrome is associated with a newly discovered fungus that grows on the exposed tissues of [hibernating bats](#).

Frick and the study's co-authors, including Jacob F. Pollock, in the department of ecology and evolutionary biology at UCSC, and noted bat experts Thomas H. Kunz and D. Scott Reynolds at Boston University, analyzed bat population data collected over the last 30 years, from 22 caves and other hibernating sites, in five states throughout the northeastern U.S.

The serious population declines of the little brown myotis were recognized based on surveys made by officials from state departments of natural resources going back to 1979. Surveys in the winter of 2006-2007 revealed evidence of white fungal growth on bats' noses, ears, and forearms, aberrant behavior, and an unusually high number of dead bats. As many as 500,000 bats may occupy a single cave.

Decreases in the number of [bats](#) counted range from 30 percent to 99 percent compared with earlier counts before the disease struck. Since its discovery four years ago, white-nose syndrome has now been confirmed in at least 115 bat hibernating locations in the U.S. and Canada, and as

far west as Oklahoma.

Current research suggests that the fungus disrupts the bats' hibernation, causing them to awake early, behave oddly, and lose critical fat reserves, resulting in death. The researchers predict a "99 percent chance of regional [extinction](#) of little brown myotis within the next 16 years" if mortality and spread continue unabated.

"Our results paint a grim picture of a once-healthy population of an abundant and widely distributed species now experiencing unprecedented losses," the authors write.

"The rapid decline of a common bat species from white-nose syndrome draws attention to the need for increased research, monitoring, and management to better understand and combat this invasive wildlife disease," the authors conclude.

The researchers said it is possible the deadly fungus came from Europe from human trade or travel based on evidence that the same fungus has been observed on hibernating bat species in Europe.

Provided by University of California - Santa Cruz

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