

# MOUNTAINS

WORD FROM THE SMOKIES

## Bats hang in the balance in wake of disease



**Aaron Searcy**  
Word from the Smokies



Research suggests that big brown bats have largely evaded the catastrophic losses experienced by many other bat species as a result of white nose syndrome. Big brown bats may benefit from natural resistances or adaptations that make them more resilient to WNS. PROVIDED BY ANN FROSCHAUER, USFWS

Bats seem to be everywhere this time of year.

Their little silhouettes hang as holiday decorations fashioned out of plastic on festive front porches and shop windows, just next to the skeletons and giant spiders. As for our real bats — the living, breathing keystone species that spend their nights hunting for insects on the wing — those bats are much harder to come by.

“They are in a fragile state right now,” said Karah Jaffe, a biologist who regularly surveys bats in North Carolina and Tennessee as part of her graduate research at East Tennessee State University. “There are still some heavily impacted species in the area, so I think there’s some hope — just as long as nothing else comes along.”

Precipitous declines in many bat populations across the region began a little more than a decade ago with the arrival of a deadly fungal disease originating in Europe known as white nose syndrome, which takes its name from the white fungal growth that appears on the muzzles and wings of infected bats. Although the infection is not necessarily lethal by itself, it interrupts bats’ winter hibernation, causing them to expend valuable stores of fat and energy and ultimately starve.

Small surviving colonies of several native bat species persist but remain vulnerable in the wake of the disease. In Great Smoky Mountains National Park, three bat species have nearly disappeared altogether. Surveys revealed that Indiana, little brown and tricolored bats lost 91% to 95% of their populations after WNS was detected in the park in 2010.

“The park, with its research partners, conducted extensive research into bat abundance and distribution ahead of WNS coming into the area, so we have a good understanding of which species were hit hard,” said Paul Super, science coordinator at the Appalachian Highlands Science Learning Center at The Purchase. “Some of the more solitary species, like the beautiful red bat, have not suffered much of a hit to their pop-

ulation, while those that roost and hibernate in groups are down to very small numbers.”

Beyond the Smokies, biologists working through the North Carolina Wildlife Resources Commission and the U.S. Fish and Wildlife Service tracked similarly alarming declines in little brown and tricolored bats among others in their own surveys across the state. Altogether, WNS has killed more than six million bats across North America and brought about one of the fastest declines of wild mammal populations to date.

Although the rate of loss appears to have stabilized in recent years, it’s not just biologists who have cause for concern, according to Jaffe.

“Bats contribute a lot to our agriculture and economy,” she said. “They save a tremendous amount of money for agriculture in the pest services they provide.”

Bats may consume their entire body weight in insects in a single night, and collectively, they play an important role in regional ecosystems as insectivorous predators. Since much of their diet consists of insects that are considered pests for crops, the US Geological Survey estimates that the complete disappearance of bats in North America

would result in agricultural losses amounting to more than \$3.7 billion a year.

With the health of ecosystems and agriculture at stake and the added urgency of addressing WNS, the issue is drawing greater public attention. Bat Week, an international campaign running Oct. 24-31, celebrates and raises public awareness about the critical roles that bats play in nature and in human economies.

In Southern Appalachia, Jaffe is one of many biologists working to better understand the sensitive populations that remain. And there are some signs that the remaining populations of some WNS-impacted bats in the region may be on the path to recovery.

“One of the biggest things that has changed in the past year is that more populations of the gray bat have been found in Western North Carolina,” said Jaffe. “Gray bats are federally listed as an endangered species, so that’s a very good sign.”

Though her own research involves using thermal cameras mounted onto drones to count emerging bats more accurately and efficiently, Jaffe says there are a number of ways anyone can help bats in their own area.

“Other than putting up a bat box, for

those who have the space and the means to do so, I think one of the best things you can do is just to keep an eye out for bats in your own neighborhood,” said Jaffe. “Just seeing them and taking note of where they are can be a really helpful form of community science.”

Observations shared through apps like iNaturalist can provide valuable for biologists.

Now is a good time for bat watching, too. Hibernating bats are typically most active in autumn as they gather to find mates, socialize, and busy themselves hunting in order to store up fat reserves for the long winter ahead.

It’s also important to give bats space. Staying out of caves and structures where bats are known to roost helps limit disturbances at sensitive times and curtails the spread of disease.

“It’s just a really important time for bats in Western North Carolina and East Tennessee,” said Jaffe. “But the message I’d say at the moment is ultimately one of hope.”

Aaron Searcy is a publications associate for the 29,000-member Great Smoky Mountains Association, an educational nonprofit partner of Great Smoky Mountains National Park. Learn more at [SmokiesInformation.org](http://SmokiesInformation.org). Reach the author at [aaron@gsmassoc.org](mailto:aaron@gsmassoc.org).



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