

A deadly fungus that has killed millions of bats in Northeast has spread to Texas

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Big eared townsend bat (*Corynorhinus townsendii*) Credit: Public Domain

Bad news for bats: White-nose syndrome, a disease caused by a fungus that has been killing millions of bats across the Northeast, has reached Texas.

Conservationists and state and federal wildlife officials confirmed in

March that the fungal infection has been detected in bats in the Texas panhandle.

The encroachment onto the Southwest has hit three species - the tri-colored bat, cave myotis and Townsend's big-eared bat - the latter two of which are primarily western species who have been largely unaffected until now.

"It is a turning point," said Jonah Evans, a state mammologist for the Texas Parks and Wildlife Department. "It is the first time that we've detected it in bats with a primarily western distribution."

White-nose syndrome was first discovered in New York in 2007, and has spread out from that epicenter in the decade since. The disease is caused by a [fungus](#) called *Pseudogymnoascus destructans*, or Pd, which thrives in the cold and damp environments where many bat species typically hibernate in large numbers during the winter. Infected bats typically show white noses, as well as wings, ears or tail, from the fungus. They can often be seen flying in the winter, when they're supposed to be hibernating in caves.

Normally, a bat could preen off much of the invading fungus; in fact, its warm body temperature and active immune system usually fend off any invasion from the cold-loving Pd.

But Northeastern bats hibernate during the frigid winter months, in cold caves that are perfect for the fungus and in large numbers that make it easy to spread. While hibernating, bats' bodies go into what's known as "torpor" to preserve precious fat reserves, lowering both their body temperature and their immune system activity. This allows the fungus to spread so much that it finally wakes the animals up, usually in the dead of winter. The weakened bat then must go looking for food in the cold, and often dies of starvation.

"They're sitting ducks," said Jeremy Coleman, national [white-nose syndrome](#) coordinator for the U.S. Fish and Wildlife Service.

In some caves in the Northeast, the fungus has killed off around 95 percent of the bat population, officials said.

"It is truly the most devastating wildlife disease that we have to deal with right now," said Katie Gillies, director of Bat Conservation International's imperiled species program. "In North America we've never seen anything like this."

(The only thing that compares, she added, is the massive die-off of frogs, toads and other amphibians, also due to a fungus.)

Scientists think Pd is an invasive species whose native grounds lie in Europe and Asia. European bats appear to be resistant to the fungus; American hibernating species, which did not evolve in the presence of this threat, are not.

Because this is a cold-loving species that takes advantage of hibernation periods, some scientists hoped that the fungus would remain a northeastern problem, and not make it to warmer regions. But the fungus has since spread to Mississippi and to Georgia, and even to Washington state (a jump probably enabled by a human traveler who brought it into a cave with contaminated gear, clothing or other belongings).

"I think a lot of people have kind of stuck their heads in the sand hoping that it wouldn't show up in the South and hoping it wouldn't show up in the West," Gillies said. "But every single time that people hang their hat on that hope, the fungus dashes it."

So scientists have still been preparing for the spread, testing bats in the northern regions of the Lone Star State - areas most likely to first see

infected bats. The scientists would visit caves and rub cotton swabs across the slumbering bats' snouts, causing them to wriggle and squirm and their mouths to gape open.

"They're usually a little crabby about it ... they kind of squawk at you in really cute slow motion, if you can just picture that," Gillies said of her groggy subjects.

Scientists then send them to the lab for genetic analysis. This year, researchers discovered low levels of the fungus' presence in three species: the tri-colored bat, cave myotis and Townsend's big-eared bat. Except for an isolated eastern subspecies of Townsend's called the Virginia big-eared bat, the two latter species have a western distribution and previously had not been infected with the fungus. With a toehold on these two species, the infection could potentially now spread farther west.

Texas is a sort of Grand Central station for bats: With 32 species, it has the highest level of bat diversity in the nation. While many bats stick to the eastern states and others stay in the West, the edges of their ranges overlap in the Lone Star State.

To ecologists, this makes Texas a worrisome transfer point. They fear that southwestern and western bats will contract the fungus and carry it even farther, to species whose behaviors, movements and reactions to the disease are not well known.

"We need to continue to develop a wide suite of tools that we can use for those conditions that are slightly different," Coleman said.

Texas is home to the Mexican (also known as Brazilian) free-tailed bats; in the summer, the Congress Avenue Bridge in Austin features the largest urban bat colony in North America. While those bats migrate

during the winter instead of hibernating, and may not be susceptible to the fungus, they fly long distances and could carry it to other bat species who may be vulnerable to infection.

The fungus' arrival in the Texas panhandle, then, marks a significant turning point in the fungus' advance, scientists said.

Pd's spread could not only affect the rich diversity of [species](#) in North America; it could also have profound economic impacts. Many of these insectivorous [bat species](#) eat crop pests, performing vital agricultural services for farmers valued at about \$1.4 billion in Texas alone.

Across North America, according to a study in the journal *Science*, bats' agricultural contribution is estimated to be around \$22.9 billion (with an estimated range of \$3.7 billion to \$53 billion).

In a worst-case scenario - if bats such as the Brazilian free-tailed bat and others that are thought to be less susceptible do get hit hard by the disease, it could have significant implications for the economy, scientists pointed out.

"That's almost like a national security concern," Evans said. "That's a massive loss if Mexican free-tailed bats are impacted. ... So we're just hopeful that some of our bats are more resilient to it."

As the fungus spreads, researchers say they are trying to learn what they can and find ways to save [bats](#) or fight the disease, before it spreads deeper south and west.

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