

Western Pennsylvania National Parks

National Park Service
U.S. Department of the Interior
Northeast Region



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Bat Population Monitoring and White-nose Syndrome

Why is the National Park Service interested in bats?

Bats are an important part of ecosystems and food webs. They consume huge numbers of insects every night, filling a unique ecosystem role as nocturnal insect predators. Unfortunately, a new disease called white-nose syndrome is affecting bats across the United States. To better protect bats, the National Park Service is studying how bat populations are changing.

How do bats contribute to ecosystems?

Due to their massive appetites, bats are a valued component of biodiversity. Bats can eat more than half their body weight every night—that's hundreds to thousands of bugs! Some of these insects, such as mosquitoes, can transmit human diseases. Scientists also estimate that bats save U.S. farmers almost \$3.7 billion per year by eating crop-destroying insects.

What's white-nose syndrome? Which bats get the disease?

White-nose syndrome is a bat disease caused by the fungus *Pseudogymnoascus destructans*. The disease is named for the white fungal growth that occurs on bats' faces and wings. The fungus was first observed in 2006 in a New York cave and is

believed to have originated in Europe. In Pennsylvania, the disease has reduced some bat populations by more than 90%.

Many species of bats spend the winter hibernating in caves, mines, buildings, or rock outcrops. Bats that hibernate in caves and mines are most likely to get the disease. Other bat species migrate south to warmer climates in the winter. These bats, in general, are not susceptible to the fungus.

How are bats infected?

Once introduced, the white-nose fungus can persist in the cold, humid environment of caves and mines, infecting bats when they return to hibernate. The fungus can also spread from bat to bat when they touch. Bats that hibernate in large groups are most susceptible. Humans don't get the disease but can spread it from cave to cave on contaminated clothing or equipment.

What happens when a bat is infected?

Ongoing studies suggest that the fungus irritates and damages the skin of an infected bat. The infection causes the bat to wake up more frequently during winter hibernation. When bats wake up, they use precious energy to stay warm. If they wake up too frequently, they can die of starvation before spring arrives.

Want to learn more about bats? Let's bust some bat myths!

Are bats blind?

No! Bats found in Pennsylvania use echolocation to find their food. That said, they can still see, particularly in dark conditions. Some tropical bats can see better than people!

Do bats get stuck in your hair?

Bats have no desire to land on your head! Even in the dark, they can use their well-adapted eyesight and amazing echolocation to avoid hitting you.

Do bats want to suck your blood?

No, they don't. There are no vampire bats in the United States. Vampire bats do live in Central and South America, but they generally feed on cattle.

Aren't bats a little bit evil?

Not at all! Bats are gentle, intelligent, and social creatures. For example, some mother bats group together in special roosts after having babies. When a mom leaves the "maternity roost" to hunt, the other moms will take care of her baby until she returns.

National Parks in This Study:

- Allegheny Portage Railroad National Historic Site
- Flight 93 National Memorial
- Fort Necessity National Battlefield
- Friendship Hill National Historic Site
- Johnstown Flood National Memorial

How do biologists study bats? What have they learned about bats in western Pennsylvania national parks?

Biologists have creative ways of studying these unique animals. Bats use echolocation to navigate and catch insect prey during the dark of night. People can't hear these bat calls, so biologists use special microphones, called acoustic detectors, to record the sounds. By analyzing the bat calls, biologists can identify which specific bat species are present in an area during certain times of the year.

Scientists recently examined bat populations in five national parks in western Pennsylvania. They compared pre-white-nose syndrome results to information they had collected from the parks prior to the occurrence of the disease.

During 2005-2006, before white-nose syndrome began infecting bats, scientists used acoustic detectors to measure bat activity. They also used nets to catch bats during the night. Biologists sampled bat populations again in 2015, after white-nose syndrome began affecting bats. In all, seven species were detected and it is clear that the abundance of several species has declined dramatically. White-nose syndrome is almost certainly to blame.



Acoustic detectors, like this one, record bat calls over a period of weeks or months. Biologists then use special computer programs to analyze the calls. Since different species use unique calls, biologists can identify which species are present based on sounds alone. NPS photo.

The little brown bat (*Myotis lucifugus*) was the most commonly captured bat prior to the arrival of the fungus. Unfortunately, little brown bats now appear to have been essentially eliminated from these national parks. The northern long-eared bat (*Myotis septentrionalis*), which is protected by the Endangered Species Act, has also nearly disappeared from these areas.



After a bat is captured, biologists can check the wings for damage from white-nose syndrome. NPS photo.

Not all bats species have declined. Big brown bats (*Eptesicus fuscus*), which are less susceptible to white-nose syndrome, may even be increasing in number in these national parks.

What is the National Park Service doing to help bats?

The data being collected on bats will help park managers conserve bats and their habitat. Protecting hollow trees and snags where bats raise their young and preserving mature hardwood forests will help reduce the impacts of the disease. White-nose syndrome remains an extraordinarily dangerous threat to bat populations—sadly, some species may ultimately disappear from the region. To learn more about bats, visit www.nps.gov/subjects/bats or www.whitenosesyndrome.org.

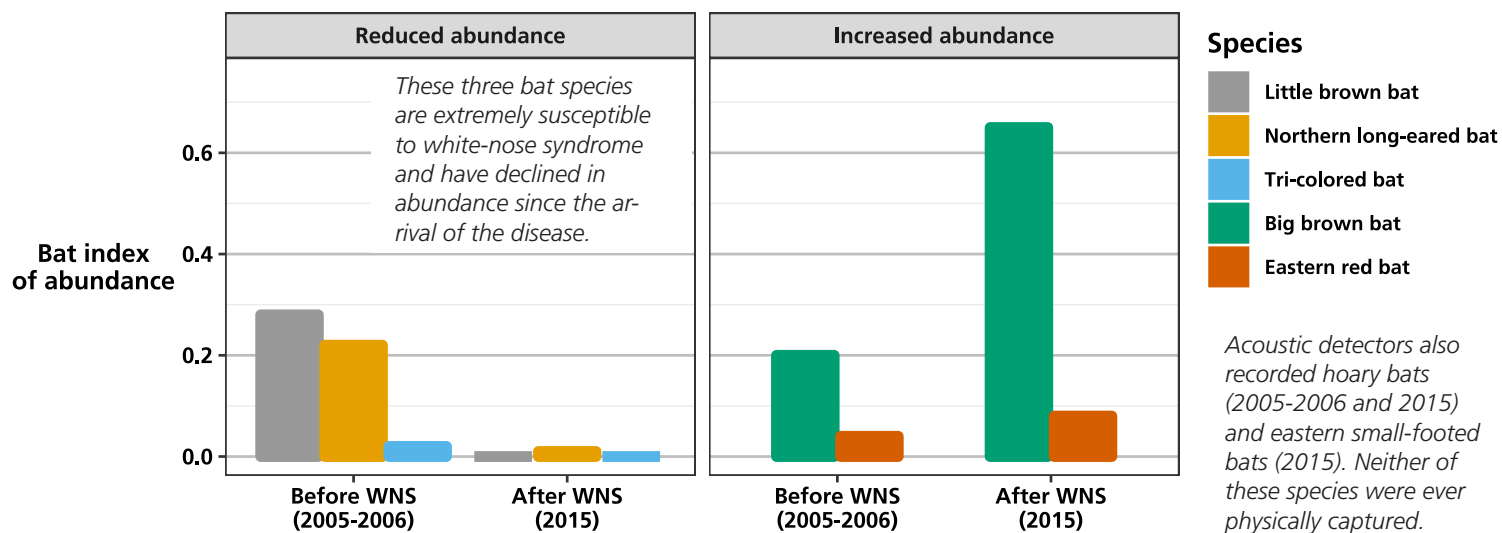


Figure 1. Bat index of abundance [(number of captures / (mist net area (m²) x hours) x 100)] in western PA national parks before (2005-2006) and after (2015) white-nose syndrome (WNS) introduction. Note: Individual park data, including species presence or absence, may vary.