

# Fire Island National Seashore

National Park Service  
U.S. Department of the Interior

Northeast Region



## Bat Population Monitoring and White-nose Syndrome



### Why is the National Park Service interested in bat populations?

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 seashore is working to understand how local 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. Others can be agricultural or forest pests. Scientists estimate that bats save U.S. farmers almost \$3.7 billion per year by eating crop-destroying insects.

### What habitats do bats need?

During the summer, bats use a variety of forests, fields, and wetland habitats for foraging. Live and dead trees, as well as buildings, are utilized by many species for roosting and raising their young. Bats that hibernate need secure caves, mines, buildings, or rock outcrops during winter seasons.

### What's white-nose syndrome?

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 the Northeast, the disease has reduced some bat populations by more than 90%.

### Which bat species get the disease?

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 for the winter. These migratory species, collectively called "tree bats," are generally not susceptible to white-nose syndrome.

### Highlights

- Seven species of bats have been documented at the seashore, including a federally and state threatened species—the northern-long eared bat.
- Excitingly, northern long-eared bats are now known to be reproducing near the William Floyd Estate.
- It is possible that Long Island is serving as a refuge for this rare species.

### How are bats infected? What happens?

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.

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 or dehydration before spring arrives.



After capturing a bat, biologists can examine the wings for damage from white-nose syndrome. See page 2 to learn what methods biologists use to study bats.

NPS photo

## How do biologists study bats? What have they learned about bats at the seashore?

Biologists use a variety of techniques to study bats. Bats use echolocation to navigate and catch insect prey during the night. People can't hear these bat calls, but biologists can use special microphones, called acoustic detectors, to record the sounds. By analyzing the bat calls, biologists can identify which bat species are present in an area.



Acoustic detectors record bat calls over a period of weeks or months. Biologists then use computer programs to analyze the calls. Since different species use unique calls, individual species can be identified based on sounds alone.

NPS photo

To date, seven species of bats have been documented across Fire Island and at the William Floyd Estate, a separate unit of the seashore located on Long Island. In 2017, two acoustic detectors were deployed at the William Floyd Estate. At one site, eastern red bats (*Lasiurus borealis*) were the most commonly detected species. Eastern red bats migrate south for the winter and are not susceptible to white-nose syndrome. At the second site, the most frequently detected bat was the federally threatened and state endangered northern long-eared bat (*Myotis septentrionalis*).

Across the Northeast, northern long-eared bat populations have been decimated by white-nose syndrome. Excitingly, in 2018, researchers determined that northern long-eared bats were reproducing at the William Floyd Estate. Over the next

few years, biologists plan to study this local northern long-eared bat population. Female northern long-eared bats can be captured and outfitted with tiny radio tracking devices. Biologists can then track the females to the “maternity roost” where the bats are raising their young. Once the location of the maternity roost is identified, the roost site (e.g. hollow tree, building, etc.) can be better protected by seashore managers.

Additional data indicates that northern long-eared bats remain relatively common on Long Island, and it's possible that Long Island is serving as a refuge for these rare bats. Why is this the case? Scientists aren't sure, but ongoing research will hopefully help answer this important question.

## What is the seashore doing to help bats?

The data being collected on bats is helping seashore managers conserve bats and their habitat. Protecting maternity roosts where bats raise their young will help local populations while scientists study how to better manage the disease. There is still much to learn and research efforts will continue.

White-nose syndrome is an extraordinarily dangerous threat to bats—sadly, some species may ultimately disappear from the region. To learn more, visit [www.nps.gov/subjects/bats](http://www.nps.gov/subjects/bats) or [www.whitenosesyndrome.org](http://www.whitenosesyndrome.org).



A northern long-eared bat being examined by a biologist.

NPS photo / Morgan Ingalls

### Bat species found at Fire Island National Seashore

#### Hibernating bats (“cave bats”)

- Big brown bat (*Eptesicus fuscus*)\*
- Eastern small-footed (*Myotis leibii*)\*
- Northern long-eared bat (*Myotis septentrionalis*)\*
- Tri-colored bat (*Perimyotis subflavus*)\*

#### Migratory bats (“tree bats”)

- Eastern red bat (*Lasiurus borealis*)
- Hoary bat (*Lasiurus cinereus*)
- Silver-haired bat (*Lasionycteris noctivagans*)

\* species susceptible to white-nose syndrome

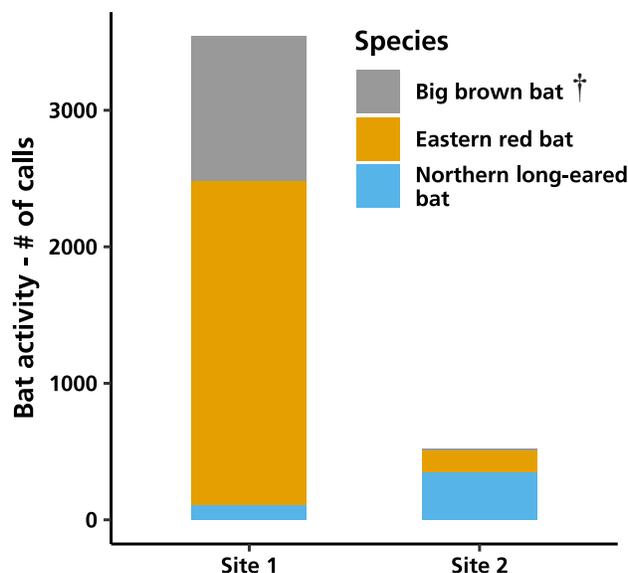


Figure 1. Number of recorded bats calls for the three most common species at two sites at Fire Island National Seashore (April - Oct., 2017). Activity was very different between sites and biologists are studying why.

† Big brown bats do get white-nose syndrome, but they suffer much less mortality than other species.