



Bat Research at Palmetto Bluff

Seminole Bat Roosting Ecology

The Seminole bat (*Lasiurus seminolus*) is a common foliage-roosting species found throughout the southeastern United States and is the most commonly captured species at Palmetto Bluff. Instead of roosting in tree hollows or under sloughing bark, the Seminole bat roosts in the canopy of trees, clinging to branches, pinecones, or clusters of pine needles. Bats that roost this way are known as tree bats.

Even though it is a common species, very little is known about how and where Seminole bats roost during the day. Many state and federal agencies are restricted to monitoring threatened and endangered species and rarely get the opportunity to study more common ones. Due to how the Conservancy is funded, we have the flexibility to design our projects around knowledge gaps rather than only studying rare species. Therefore, we decided to conduct research on Seminole bat roosting ecology to better understand how this species uses the landscape.

During the summer of 2020, all bat handling was put on hold while determining bat susceptibility to SARS-CoV-2. Once allowed to handle bats again, we wanted to start a project to make the most of a disappointing year. With a handful of leftover transmitters from a previous project, we decided to track male Seminole bats in the fall to determine important habitat characteristics at their roost sites. The following summer, we started a similar project that included tracking females to their roost sites. These two projects will help us answer several questions related to their roosting ecology: Are there seasonal differences in roost selection for males? Do males and females have different needs for roosting?

Other tree bats, like the closely related eastern red bat (*Lasiurus borealis*), are facing severe population declines due to wind farm collisions. As wind energy moves into the Southeast, there is concern that the Seminole bat will fall victim to these collisions as well. These studies will help us answer baseline questions about their roosting ecology so the Seminole bat does not end up like the northern long-eared bat with insufficient data for management if the species becomes rare.

Eastern red bats, hoary bats, and silver-haired bats have been listed as endangered in Canada due to collisions at wind energy facilities.

[Click here to learn more.](#)

Bats at the Bluff

Bats are one of the most diverse groups of mammals, with over 1400 species found on six of the seven continents. They are the only mammals capable of true flight with wings made of adapted hand and finger bones. While most bats consume insects (~70%), some species eat fruit, nectar, or other small animals like fish, frogs, and mice. Most species of bat give birth to only one pup a year and live for several years. The oldest bat ever recorded was a small 7-gram bat that lived for 41 years in the wild.

South Carolina is home to 15 different species of bat, nine of which have been visually documented here at Palmetto Bluff. Bats in South Carolina eat a wide variety of insects, including moths, leafhoppers, beetles, flies, and mosquitos. South Carolina's bats play a significant role in our ecosystem as the top predator of night-flying insects and greatly benefit farmers by acting as a natural pesticide. On average, bats save the United States agricultural industry \$23 billion annually by suppressing pest insect populations.

Bats are often associated with caves, but they actually use a wide variety of roosting structures. In South Carolina, bats can be found roosting in trees under loose bark, in tree cavities, in tree foliage, in bridges and culverts, and in bat houses (see section below on putting up your own bat house). Occasionally, bats will find their way into an attic or chimney but mainly roost in trees.

White-Nose Syndrome

Bats are facing multiple threats today, including habitat loss, climate change, wind farm collisions, and disease. Many bat species are in rapid decline due to a fungal disease known as white-nose syndrome (WNS). This disease is caused by a cold-loving fungus called *Pseudogymnoascus destructans* or Pd for short. Since the fungus grows well in colder conditions, caves are the perfect reservoir for it to thrive. Pd grows on the face and wings of bats while they are inactive during hibernation. This damages their skin and causes bats to wake up and waste vital energy needed to survive the winter, resulting in starvation. WNS killed more than 6 million bats in the first six years after its discovery in 2006 and continues to decimate populations throughout the United States and Canada, resulting in severe population declines for some species.

We are fortunate that we have not documented WNS or the fungus that causes it here in the Lowcountry yet. Our coastal bats are active year-round, using shortened bouts of metabolic inactivity (called torpor) instead of longer periods of hibernation when it becomes cold. We remain hopeful that, even if we were to document the Pd fungus, our coastal populations may not develop WNS.

[Click here for more information on WNS and the areas it is affecting.](#)

Protected Species at Palmetto Bluff

Northern Long-eared Bat

The northern long-eared bat (*Myotis septentrionalis*) is a medium-sized bat (5-8 grams) found in the eastern United States and parts of Canada. It consumes insects such as moths, leafhoppers, flies, caddisflies, and small beetles. Northern long-eared bats use caves for hibernation during winter, but roost in tree cavities and under sloughing bark during the warmer months. Coastal populations are presumed to use trees year-round due to mild winters and the lack of caves in the Lowcountry.

Northern long-eared bat populations are currently in rapid decline. The species was listed as threatened in 2015 and uplisted to endangered in 2023. It was once one of the most common bats on the landscape but has seen devastating population declines of over 95% due to white-nose syndrome (WNS). Unfortunately, there was little research on their roosting habitat pre-WNS, which has made it difficult for biologists to develop management strategies. The northern long-eared bat was once thought to be restricted to the Blue Ridge region in South Carolina until it was discovered along the coast at Palmetto Bluff in 2016. Since then, small populations of northern long-eared bats have been found in multiple locations along the North and South Carolina coasts. These small coastal populations are especially important because neither WNS - nor the fungus that causes it - have been detected on our coast. Since WNS thrives mostly in consistently cold cave systems, these cave less, coastal areas may serve as a refugia for the species and will play a vital role in its recovery.

We caught six northern long-eared bats at Palmetto Bluff during 2015 - 2023. One individual was captured in three different summers, showing evidence of summer residency. We were able to track three of the six bats to their roosts - two roosted under the bark of pine trees and one roosted in the basal cavity of a black gum. We are continuing to document northern long-eared bats at Palmetto Bluff, and submit our annual capture and tracking records to the South Carolina Department of Natural Resources and the U.S. Fish and Wildlife Service.

Tri-colored Bat

The tri-colored bat (*Perimyotis subflavus*) is a small (4-8 grams) foliage-roosting species found in the eastern United States and four Canadian provinces. It consumes small insects such as moths, wasps, flying ants, caddisflies, and beetles. Tri-colored bats use caves in the winter but tend to roost in dead leaf clusters or Spanish moss in the summer. Like the northern long-eared bat, coastal populations are presumed to use trees year-round due to mild winters and the lack of caves on the coast.

Tri-colored bat populations are in decline, and it is currently proposed for listing as endangered under the Endangered Species Act. If listed, it will be the second species listed as endangered in the United States due to white-nose syndrome (WNS), and the second federally protected bat species residing at Palmetto Bluff. Tri-colored bat hibernaculum impacted by WNS have seen population declines of 90-100%.

We have hope here on the coast. The tri-colored bat is the fourth most common species we catch at Palmetto Bluff, making up about 1/6th of our captures. Our capture records and the records from other localities along the coast indicate that tri-colored bats continue to persist here in the Lowcountry. Though most of the tri-colored bat's range is affected by WNS, the coast remains free of WNS and the fungus that causes it, providing an opportunity for this species to recover.

[Click here to read more about the decline of northern long-eared bats and tri-colored bats due to WNS.](#)

Bat Houses

Putting up a bat house is a fun way to support bats from your own backyard! Similar to putting up a birdhouse, adding a bat house to your yard can benefit bats by giving them a new, safe roosting structure. There are many different styles of bat houses, but two that seem to work well for bats in our area are the rocket box and the multiple-chambered (2-4 chambers) bat box. The inner wood should be rough or grooved so the bats have something to grip. Do NOT use mesh as a substitute. It often becomes loose and could injure or entangle bats. Two rocket box-style bat houses, donated by Jackson Bischoff for his Eagle Scout Service Project, can be viewed here at Palmetto Bluff. To view these boxes, visit The Farm, where one is mounted behind the pond or in Moreland near the Conservancy's pollinator garden.

Bats can be extremely picky when selecting a new place to roost, so hanging your bat house in the correct place is the key to success. Bat houses need plenty of sunlight (6-8 hours/day), and the entrance needs to be at least 12 feet off the ground (15-20 feet is better) with no obstructions below the opening. Young bats are not great at flying and need this space in order to drop into flight. Research suggests that painted bat houses are more likely to attract bats than bare wood. Selecting the correct type and shade of paint is an important step so as not to harm the bats. Never use a stain or varnish on a bat house, as the fumes can be lethal to bats. An outdoor, water-based paint with low-VOC (volatile organic compound) is ideal. In South Carolina, bat houses should be painted a medium to light shade of paint like gray, green, or brown.

To learn more about building and hanging bat boxes, visit Bat Conservation International's website or [download this helpful PDF.](#)

Bat-Human Interactions

What To Do If You Find A Bat

If you come across a bat on the ground, it is important not to touch it. Although the majority of bats (<1%) are not infected with rabies, you should still exercise caution. If the bat is not in a heavily trafficked area or in an area used by pets, it is best to just leave the bat alone. It will most likely move on its own. If you are bitten or scratched by a bat, you should seek immediate medical attention. Rabies is a completely preventable disease, but if left untreated is fatal.

Check out these websites for more information on bats and rabies:

- [SCDHEC](#)
- [CDC](#)

Bats In Your Home

Some species of bat like to roost in hollow structures like trees but may take up residence in an attic or chimney. If you find bats roosting somewhere inside your home, you should first find where the bats are coming in. You may have a torn attic screen or a broken chimney cap allowing the bats to enter. Bats can squeeze through gaps as small as 3/8", so finding the entry hole can be challenging.

The best practice to ethically remove bats from your home is through a process known as exclusion. This process involves setting up a one-way exit so the bats can leave but not get back in. Exclusion can be very

difficult depending on the complexity of the area the bats are using, so hiring a wildlife professional may be the easiest solution. It is also important not to exclude bats during the maternity season (May-July). If you exclude during this time, you may be trapping baby bat pups inside with no way for the mother to get to them. There is no way to ethically exclude bats during this period.

Another common place bats are found around homes is in closed patio umbrellas. A bat using your umbrella does not pose an immediate risk but may startle you when the umbrella is opened. The bat will leave the umbrella at nighttime to forage but may come back by morning. To prevent the bat from coming back, you can store your umbrella indoors at night.

[Click here to check out a resource from the SC Department of Natural Resources to learn more about how to deal with bats in your home.](#)

Join us on a Research Excursion for a chance to see
some of your nighttime flying neighbors!

More information on bats in the Lowcountry and surrounding area:

- Bats of South Carolina - <https://www.dnr.sc.gov/wildlife/bats/index.html>
- Bats of Georgia - <https://georgiawildlife.com/GeorgiaBats>
- Bats of the Savannah River Site- https://www.srs.fs.usda.gov/pubs/gtr/gtr_srs068.pdf