

“Got Bats?” The Nockamixon Bat Project

Few visitors to Nockamixon State Park in Quakertown, Pennsylvania ever encounter folks from the Bat Group meandering through its scenic grounds. That’s because, like bats, the elusive members of this team emerge as darkness descends.

Led by Carey Friel – “The Bat Lady” – as she’s known to park employees, the merry band of volunteers sets up shop just before sunset on suitable evenings from April through September, to partake in a biweekly citizen science effort: counting bats.

Group members are armed with high-powered flashlights, click counters, and nifty devices like the Echo Meter Touch II (EMTII), an acoustic monitoring tool. Their mission? To quantify bats emerging from their roosts at sunset.

The nocturnal bat navigates and hunts in low light via echolocation: emitting ultrasonic chirps that are largely inaudible to humans. These sonic frequencies bounce off objects, allowing the bat’s ears to map terrain and pinpoint prey. The EMTII translates signals into sounds that humans can hear. It also helps volunteers identify particular bat species and record flight paths.

The Bat Group focuses on emergence counts of maternity colonies. But they also conduct park-wide surveys to determine the extent of bat hunting grounds and seasonal movements, such as when populations have left for their hibernacula in the fall. Their work is weather-dependent. Rain, thunder, or winds above a certain speed will thwart a count.

Volunteers record GPS data, weather conditions, and the presence of other wildlife in the vicinity. They also note any unusual behavior within the colony.

The group builds, installs, and repairs numerous bat boxes located within the park boundaries. They keep a watchful eye out for invading predators and rid the boxes of remnant wasp nests during the colder months.

Carey began volunteering at Nockamixon State Park in 2012 when she surveyed the existing bat population by herself. After two years, she recruited a handful of interested volunteers, and the project evolved to where it is today. She is quite vocal about her great appreciation for these fellow bat-aficionados. “I couldn’t have done any of this without the help of the rest of the group.”

A former Environmental Interpretive Technician at Jacobsburg State Park, Carey has fostered a lifelong love of the outdoors, and bats in particular. “As a kid I was always outside. I remember being fascinated by bats flying near the pool, these flying mammals that could sky dance. I loved all animals but always thought that bats didn’t get nearly as much attention as the others.”

Today, you can easily locate Carey's car, dubbed "The Batmobile," with its numerous winged logos, including the famous "Bat Protection Squad" sticker. She is clearly batty about bats, and her enthusiasm is catching.

"Bats are fascinating creatures. They remember us through our voices, scent, and appearance," she recounts. "When we have a new volunteer, the bats won't act normal. They are more skittish and don't make as much noise in the roost as they normally would."

The group has noted similar behavioral changes in colonies when there is excessive noise or air quality issues. They find bats to be docile even when injured. And they enjoy the satisfaction that results from having too many bats flying around to count. "We watch juveniles coming out from their roost and learning to fly," Carey comments. "They are more adventurous, just like teenagers. You can tell when they find an insect."

She humorously recalls a time when a pregnant bat became momentarily lodged in the opening of a bat box roost, the mother bat's consternation evidenced by her irritated chirps.

It's clear that hanging out with the Bat Group makes for a fun time. One summer evening, volunteers were curious about where the bats roosted at night after resting all day in their larger, primary hideouts. Armed with coffee and donuts, the group decided to return to the park at four in the morning to find out. While middle-of-the-night wanderings aren't typical, the adventure provided insight about just what these elusive animals were up to in the wee hours.

Nockamixon volunteers routinely transport injured and orphaned bats to the Pennsylvania Bat Conservation and Rehabilitation (PBCR) facility, located in northeast Berks County. After a stint there, most bats are successfully released back into the wild at preserved land areas.

"We were able to witness the release of Mixon, a bat rehabbed by PBCR," recalls Carey. "She caught an insect, emitted some chirps, took off in a normal hunting pattern, then circled back to us before heading out into the night."

Perhaps Mixon was offering a show of thanks to the group responsible for her safe return to the wild.

The Bat Group submits their data every season to the Pennsylvania Game Commission (PGC), which operates the Appalachian Bat Count. This volunteer citizen science effort monitors bat species at summer roosts and locates new roosts of local populations. Data collected from mid-spring through late summer can show how a colony has grown once its pups are flying. The program also partners PGC with the Pennsylvania Department of Conservation and Natural Resources (DCNR) to install artificial bat roosts on state lands.

These efforts couldn't come at a more important time. Several species of bats in Pennsylvania, as is the case across North America, have seen a sharp decline in numbers over the last fifteen years. And according to Bat Conservation International, fifty-three percent of North American bats face a high risk of extinction over the next fifteen years. Climate change, habitat loss, and conflicts with

wind turbines have all contributed to their demise.

But the greatest threat faced by Pennsylvania bats remains exposure to the fungal villain known as *Pseudogymnoascus destructans*, which causes the disease known as White-Nose Syndrome (WNS). This organism thrives under cold, damp conditions, such as in caves where bats hibernate during winter months. Infected bats become agitated, emerging unwillingly from their winter torpor. As they fly around, bats use up their fat reserves and essentially starve to death.

White-Nose Syndrome carries a 90 to 100 percent fatality rate. Unfortunately, the disease spreads rapidly among bats hibernating in close proximity. And the slow reproduction rate of one pup per year for most species places bats at an additional risk.

Pennsylvania is currently home to nine species of bats. As Carey notes, “In the past, Nockamixon had at least a few of every bat known to be in Pennsylvania. Now, the only confirmed species are big brown, little brown, red, silver-haired, and hoary bats. Small-footed, tricolored, and northern long-eared bats might not be present anymore. They have not been heard or seen here recently.”

The little brown bat (*Myotis lucifugus*) is state endangered in Pennsylvania, and currently under review by the U.S. Fish and Wildlife Service for federal listing. The tricolored bat (*Perimyotis subflavus*) is state-endangered, while the northern long-eared (*Myotis septentrionalis*) and Indiana bats (*Myotis sodalist*) are both federally endangered.

Some might wonder what the big deal is. After all, aren't bats just blind, flying vermin that carry rabies, lying in wait to bite us in our sleep and suck out all our blood?

Quite the contrary. Bats are more like us than you'd think.

Members of the order *Chiroptera* (Latin for “hand wing”), the bones in bat wings are arranged like our own hands, with a thumb and four digits. And, just like humans, bats give birth to live young and nurse their pups. Their vision is as good or better than ours, and they don't carry rabies any more than other mammals. You're more likely to catch rabies from a skunk or feral cat.

Bats remain the only flying mammal, portrayed in movies, television, and on Halloween as terrifying creatures of the night. Yet they are more afraid of you than you are of them. Of 1,500 bat species identified worldwide, only three feed on blood – typically of livestock – and those are found in Central and South America.

These highly misunderstood animals benefit humans in a plethora of ways. World-wide, bats play major roles in pollination and seed dispersal. Pennsylvania bats in particular are insectivores, saving farmers millions of dollars annually by eating crop pests and reducing the need for pesticides. Of course, they are also important in their relative ecosystems as both predator and prey.

Monitoring bat populations is critical to evaluate how bats are doing in our area. Today, some

numbers of little brown bats appear to be growing in the largest maternity colonies across the state. This overall trend is echoed at Nockamixon State Park. Hopefully this is an indicator that remaining populations might be developing some resilience to WNS. Data gathered by the Bat Group aids PGC, U.S. Fish and Wildlife, and academic institutions as they conduct research and develop policies to protect bats.

Retiring from her role as Bat Project Leader later this year, Carey notes the need for future volunteers to continue this important work. “I think it’s time to train and pass this project onto the next generation,” she reflects. “I want it to continue into the future. We will not see historic numbers of bats in our lifetime. So we are doing what we can to support and protect the few bats that are left.”

Friends of Nockamixon State Park would love to see a “boost in the roost” for both bat and volunteer populations. We welcome you to join the Bat Group and continue the legacy of behind-the-scenes work that helps protect our nocturnal Nockamixon natives.

Here are ten other ways you can go to bat for bats:

1. Start by spreading the word to dispel common myths about bats.
2. If you find a bat in your home, contact your local wildlife rehabilitation facility.
3. Never disturb a bat in its roost.
4. Keep your cats indoors.
5. Install a bat house in your yard.
6. Create a “bat-friendly” garden by planting natives that attract insects.
7. Avoid using pesticides or herbicides on your property.
8. Minimize light pollution by using outdoor lights only when and where needed. Buy energy-efficient warm white or amber bulbs and direct their beams downward.
9. Get involved in Pennsylvania Game Commission’s Appalachian Bat Count.
10. Considering supporting a bat conservation non-profit.

-Jennifer Foulk