

A DISTURBING UNKNOWN

When will we learn what is troubling the Northeast's bats?

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HARRISBURG - Pennsylvania Game Commission bat biologists still have not found evidence that White-Nose Syndrome - responsible for killing tens of thousands of cave bats in New York and New England - has reached Pennsylvania. But, the deadly disorder is expected to once again turn the world of bats upside-down in the Northeast this winter.

Wildlife officials say that white-nose syndrome (WNS) is as mysterious today as when it first surfaced in a cave near Albany, New York, in 2006. Despite the coordinated efforts of an incredibly talented team of more than two dozen wildlife agencies, universities and institutions, WNS continues to baffle researchers who are trying to unravel the tangled mess cave bats now find themselves in. There are plenty of clues and few conclusions.

"We still don't know what causes WNS, where it came from, or if we can stop its spread to other states," said Carl G. Roe, Game Commission executive director. "But, the Game Commission is committed to finding answers that will help wildlife managers better understand WNS and hopefully find ways to limit its impact."

WNS was named originally for the white fungus that grew on the muzzles of afflicted bats in New York. Whether the fungus is the cause or a symptom of WNS continues to be debated. Researchers have now isolated and genetically sequenced the white fungus found on the muzzles of afflicted bats. They believe this fungus grows best in the cold, clammy caves and mines bats use as hibernacula, or hibernation sites.

"Our window to develop a response strategy to this threat is incredibly narrow, because we want to have a basic game plan in place before bats head into hibernation," said Lisa Williams, a Game Commission wildlife diversity biologist. "If White Nose appears in Pennsylvania this year, we'll be on the front line of the Syndrome's expansion. If it doesn't appear, we'll still be collecting baseline data on our bats and cave environments to help establish if they might be resistant or if the disorder is geographically isolated or climate sensitive."

In early June, researchers from eight universities, U.S. Fish and Wildlife Service personnel, and biologists from across the country got together in Albany to discuss what has been learned to date about WNS. These discussions included developing hypotheses on what may be causing WNS and team-building to mount a coordinated response to this taxing enigma.

"We're networking to minimize the potential expansion of WNS and working together to determine what the cause may be," Williams said. "At the Albany meeting, we developed several hypotheses to try and find the cause of WNS."

Greg Turner, a Game Commission biologist who is leading Pennsylvania's WNS field investigation, summarized the hypotheses, which explore a variety of possibilities.

"Why do bats appear to be starving to death?" Turner questioned. "Is it that they're not putting on enough fat in the fall to make it through the winter, or is it that they are able to store enough fat, but something is happening to them while they are in hibernation that causes them to burn up body fat at a much quicker pace than normal? Is the fungus or some unknown pathogen directly causing the mortality, or are contaminants somehow involved by directly affecting either the bats or their food supply? Or is there some sort of combination of factors?"

Bats are a tremendous asset to wildlife communities and people.

Collectively, they eat insects by the tons and spare Pennsylvanians from myriad backyard flying pests and crop-damage problems. Unfortunately, most people know more about elephants than they do bats. So misinformation about bats often overshadows the good they do and their importance in Pennsylvania's biodiversity.



PGC Photo/Cal Butchkoski

Hibernation Blues: White-Nose Syndrome is turning the world of bats upside-down.

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Pennsylvania is in the unenviable position of being one of the next likely destinations for this troubling bat disorder that has spread to Connecticut, Massachusetts and Vermont since it was uncovered in New York. It already has been confirmed in a cave just 11 miles north of Pennsylvania. Game Commission biologists consequently have been concentrating on monitoring summer roosts and maternity colonies and developing a strategy to assess the condition of bats heading into hibernacula this fall.



PGC Photo/Joe Kosack

Point Man: Biologist Greg Turner is leading the Game Commission's WNS probe.

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So far this summer, Game Commission biologists have checked the state's largest bat maternity colonies for both juvenile and adult mortality. Agency employees also have trapped bats with mist-nets at several locations throughout the state to check bats for abnormalities. The fieldwork indicated there was no abnormal mortality at the maternity colonies. However, small white spots were found on the some bats' wing membranes when they were backlit with a flashlight.

"This is the first summer following documentation of a high mortality event and since wing membranes were not scrutinized to this degree in the past, exactly what the white spots represent is open to discussion," Turner explained. 'Some researchers believe they may be the early stages of WNS. Others suggest they are the result of parasite bites. The jury's still out on that. But we're about 99 percent sure that bats spread WNS bat-to-bat, because it has appeared in gated hibernacula that haven't been visited by people for years. We also know none of the dead bats in the affected areas had rabies - they all were tested. After that, nothing is certain."

At the moment, everything seems relatively normal across Pennsylvania, with the exception of these small white wing spots, which may mean something - or may not. The good news is there wasn't significant summer mortality. The next hurdle will come when bats head underground to hibernate this fall.

The only way to identify WNS in bats currently is when they are thoroughly consumed by the disorder. Dead bats at the entrance to hibernacula, large numbers of bats flying during the day and leaving their hibernacula in midwinter, and white fungus on muzzle, ears, and wings are the primary signs. Although a great deal of time and effort have been poured into coordinating WNS research and fieldwork at the state and regional level since spring, researchers are still in the dark about where it came from and how exactly it compromises a bat's health.



PGC Photo/Greg Turner

Spot Check: Researchers are taking a closer look at white spots that are appearing on the flight membranes of some bats.

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"Bats are starving to death and our job is to find out why," Turner said. "We are preparing to mount an aggressive campaign that will monitor the physical condition of bats from the time they enter hibernacula in the fall until they leave in the spring. Our plan is to select large hibernacula across Pennsylvania and check for abnormalities and dead bats. We'll use a small experienced party of three to check bats with fungus, dead bats, and for shifts in roosting or hibernating bats from deep within hibernacula to areas near entrances - a behavior documented in affected areas in New York and New England."

Efforts also will focus on the hibernating patterns of bats. Working with Dr. DeeAnn Reeder, a bat eco-physiologist at Bucknell University, Turner will try to uncover whether bats are heading into hibernation ill-prepared, or if there is a problem occurring during hibernation that causes premature depletion of a bat's energy reserves.

There's hope that bats can hang in there until wildlife managers can figure out a way to intervene or help. But the truth is there may not be a silver bullet for this bat disorder. Nature may have to run its course, like it

currently is with Chronic Wasting Disease in elk and white-tailed deer.

Bat conservation is still in its infancy when comparing it to the time and money dedicated to managing deer, wild turkeys and waterfowl over the past 50 years. But to be fair, up until recently, most people didn't care about bats, because they didn't understand their importance as insect predators. Attitudes are changing, however, because of outreach by the Game Commission and organizations such as Bat Conservation International. Technological advances - minute transmitters, night scopes, specialized traps - also have improved the ability of researchers to study bats.

One of the largest obstacles bats - and their wildlife managers - still must face is the lack of funding available to get the job done. Insufficient funding to manage non-hunted species has been a problem for decades. Although there is great cooperation among agencies and research institutions, a lack of funding has limited investigations into WNS. The problem is wildlife management dollars are always limited - more so now than ever - and agency budgets simply can't handle much more than routine management.

"It's not that wildlife management agencies aren't concerned," explained Calvin W. DuBrock, Game Commission Bureau of Wildlife Management director. "Their budgets just aren't equipped to handle unexpected expenses and threats of this magnitude. Pennsylvania, like many of our neighboring states, is doing everything it can -within reason and budgetary restrictions - but if things get worse, we'll be hard-pressed to ramp up our efforts. The public can help by making donations."

Donations to the Game Commission can be made by visiting the agency's website at www.pgc.state.pa.us and clicking on the "**Donations**" icon in the right column.

"The upcoming winter will shed light on whether WNS has expanded to Pennsylvania," DuBrock said. "But for now, it is important to remember that all we have in Pennsylvania currently is great concern and suspicion. No significant numbers of dead bats have been found anywhere in the Commonwealth to date."

This fall, the Game Commission is asking the public to keep an eye on Pennsylvania's bats. It is not unusual to see bats hanging in odd places around buildings in September and October as they fatten up before hibernation. However, if you find multiple dead bats or you repeatedly find dead bats in a particular area, please report the incidents to the nearest Game Commission region office. Office phone numbers are available on the agency's website - www.pgc.state.pa.us - and in local telephone directories. Throughout winter, if you see multiple bats flying outside caves from November through April - the annual hibernation period - please report this sighting to the Game Commission region office in your area.

For more information on [bats](#), visit the Game Commission's website (www.pgc.state.pa.us), select "Wildlife" and then click on the photo of the [bat](#). To learn more about WNS, visit the USFWS's website at www.fws.gov/northeast/white_nose.html.

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PGC Photo/Joe Kosack

Cloudy Future: It's still unclear what WNS is and what lasting effects it will have on cave bats.

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