

Bats in Peril

As a mysterious fungus decimates bat populations in the eastern U.S., researchers race to find a cure

by RUTHANNE JOHNSON

When Vermont wildlife officials and caving enthusiast Peter Youngbaer approached the entrance to the Mount Aeolus Bat Cave in February 2008, what they found confirmed their worst fears. “We saw bats outside on the snow and bats clinging to the outside of the cave,” Youngbaer says, “and we said, ‘This isn’t right.’”

Inside, the scene was even grimmer. “We could barely get past the entrance room because the place was just littered with dead bats, and the walls were covered with bats that normally are hibernating much deeper in the cave,” he says.

The colony was suffering from white-nose syndrome (WNS), a fungal infection that invades bats’ hair follicles and oil

glands, eroding the outer skin of their wings and ears and leaving telltale white patches on their faces. Infected animals rouse from hibernation in midwinter and often begin flying around, depleting their fat reserves months before their normal springtime emergence.

As vice president of the Northeastern Cave Conservancy, Youngbaer had witnessed the effects of the disease two years earlier among a group of 22 bats in New York. But that experience didn’t prepare him for the sight of thousands of dead and dying bats at Mount Aeolus, many of them still clinging to the

cave walls in a frozen death grip. On a visit later in 2008 to the same Vermont cave—the state’s largest hibernaculum, with an estimated 200,000 to 300,000 overwintering bats—officials found more than 20,000 dead animals in just one chamber. Two years later, the state’s fish and wildlife agency estimated the Aeolus population had declined by 90 percent.

Other colonies have been similarly devastated; a New Hampshire colony in existence for at least 40 years plummeted from 2,000 to fewer than 100 animals, while Massachusetts’ largest colony of 8,000 to 10,000 hibernating bats has died off entirely.

First identified in Howe Cave, N.Y., in 2006, the fungus has since spread to dozens of hibernacula from eastern Canada to Missouri and infected more than 1 million bats from at least six species, including the hardest-hit little brown bat and the federally endangered Indiana bat.

While scientists hope the animals will eventually develop resistance, it could come too late for endangered species and push others to the brink. Bats’ slow reproductive rate—most species produce just one pup a year—adds to the dire situation, and many experts are predicting extinctions.

“This is the most devastating disease that’s hit any wildlife population in anyone’s recent memory,” says John Griffin, director of The HSUS’s Humane Wildlife Services. “We’re losing 90 percent of the bats in some of the areas where this is happening, and it’s spreading.”

This isn’t just bad news for bats: Plummeting populations of these winged mammals could spell ecological disaster. Millipedes, cave crickets, tiny crustaceans, and other cave-dwelling species depend on bat droppings as a nutrient source. Bats also help control mosquitoes, cucumber beetles, cotton bollworms, and other insects who damage crops or transmit diseases; they can devour up to 1,000 bugs an hour, reducing the demand for chemical pesticides.

These feeding habits can help keep


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tons of insects would have been consumed by the 1 million North American bats who have died of WNS to date*

problem species in check, notes Jeremy Coleman, national WNS coordinator for the U.S. Fish and Wildlife Service. Of the bats infected so far, “their primary prey are moths and potential forest insects that, if released from the predator pressure, could develop into major pests,” he says. With large bat die-offs, “we could be looking at a gypsy moth outbreak like we had in the ’80s or tent caterpillars that could seriously impact forest health in the Northeast.”

With so much at stake, scientists have been scrambling to learn more about the mysterious disease and find a solution, doing the best they can with modest research funding. They are documenting mortality, gathering samples, and searching for newly affected sites, as well as trying to

determine how WNS is transmitted.

Last year, they were able to identify the fungus as *Geomyces destructans*, which though new to North America is found in cave-dwelling bats in Germany, France, Switzerland, and Hungary. “European bats may have coevolved with the fungus and consequently developed a resistance to it,” says David Blehert, a microbiologist at the U.S. Geological Survey’s National Wildlife Health Center in Madison, Wis. European bats also hibernate in smaller groups than their U.S. counterparts, an adaptation that may help prevent the syndrome’s spread.

But figuring out a cure still remains an elusive goal, notes bat rehabilitator Leslie Sturges. As director of the Northern Virginia chapter of Bat World—a rehabilitation



A tri-colored bat at Woodward Cave in central Pennsylvania shows telltale signs of white-nose syndrome.



Rallying for Bats

White-nose syndrome may present a bleak future for bats, but you can help strengthen their odds of survival through the following strategies:

NEIGHBORHOOD WATCH: Inform your state wildlife agency about any unusual bat activity—such as bats flying around during their fall-winter hibernation period, landing on your house, or dying from unknown causes. You also should report the disappearance or diminished numbers of a historical summer roost. If you find a sick or injured bat, call a wildlife rehabilitator or your state wildlife agency.

CITIZEN SLEUTHING: To track bat populations, state and federal agencies are using acoustic monitoring during the summer months in certain states. Trained volunteers may be able to help by carrying car-top ultrasonic detectors that record echolocation calls while they drive slowly along designated roadways. Contact your state wildlife agency’s nongame biologist to find out more.

HA-BAT-AT: In summer, mother bats raise their young in maternal colonies. Provide a safe place for them to roost by installing bat houses on your property. When possible, leave dead trees standing to provide additional roosting sites. You can also organize a neighborhood bat-house area. If bats are roosting in your attic and you want them gone, call a humane wildlife service company that can remove the animals without causing harm and then help you take steps to prevent their return.

KEEP IT CLEAN: Researchers believe the white-nose fungus may catch a ride on the shoes and equipment of people visiting infected caves. To prevent transmission, always check federal, state, and local cave advisories and closures before

entering a cave, and follow the U.S. Fish and Wildlife Service’s decontamination procedures.

BAT ADVOCACY: In 2009, scientists asked Congress for \$55 million over five years for WNS research and related work. Of that request, \$1.9 million was approved in October, says Peter Youngbaer of the Northeastern Cave Conservancy, but more money is needed for in-depth studies. Encourage your state and federal legislators to allocate more funds. Tell your friends and family why bat protection is important and ask them to do the same.

➤ **LEARN MORE** about building bat houses, look up solutions to common problems with bats, and link to the U.S. Fish and Wildlife Service’s WNS page at humansociety.org/magazine.

network with 20 rescue centers nationwide—Sturges has been helping draft a treatment protocol for infected bats. “There is hope they can survive with supportive care,” she says, “but the big question is, ‘Then what?’ You release them and they go back to the same cave, and they are going to eventually succumb.” Scientists also fear that fungicides could kill more than the fungus, including other cave-dwelling organisms or even the bats themselves.

Bat rehabilitators like Sturges are contributing to WNS research by providing information on sick or injured bats in their care. Cavers are also getting involved in the detective work. Youngbaer was part of a

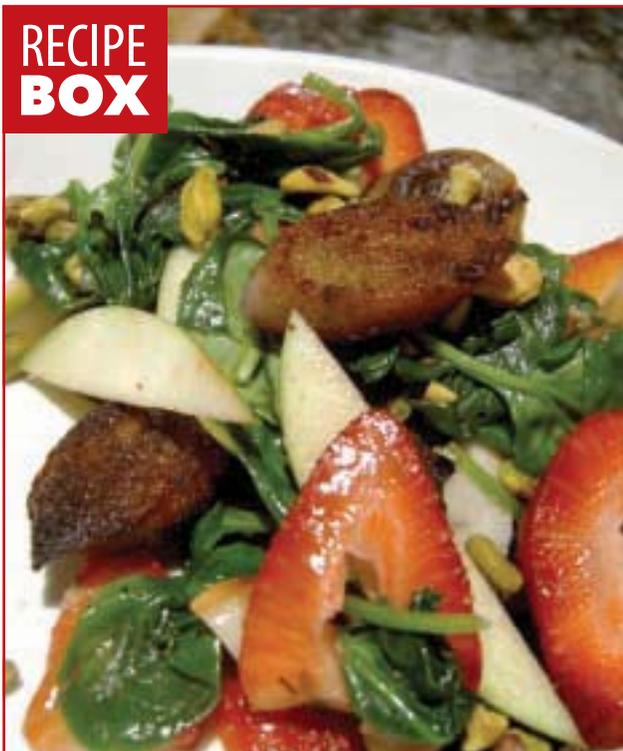


Far from their reputation as bloodthirsty creatures, bats are intelligent like other mammals, says rehabilitator Leslie Sturges, noting that they form close relationships with each other and can find objects through echolocation, a type of sonar navigation.

team that visited West Virginia’s Hellhole Cave in February to survey the hibernating bats, estimated to number more than 100,000. Snow glistened outside the entrance as bats flew around in broad daylight—a scene eerily similar to the one he had witnessed in Vermont. “These guys were wing-walking on the snow and heading off to the river to look for bugs ... that aren’t there this time of year,” Youngbaer says. “... There were also lots of bats on the wall, lots flying outside. I mean, this cave was infected.”

The research team took photographs, collected bags of carcasses, and left. With no cure or treatment for the dying animals, it was the best they could do.

RECIPE BOX



From Field to Fork

Chef David Lee founded Seattle-based Field Roast in 1997 as part of a quest to create a healthy alternative to meat that would appeal to people of all palates. Lee developed his grain-based products—sausages, deli slices, cutlets, and loaves—by adapting ancient Buddhist techniques of rinsing starch from wheat dough and kneading the leftover substance into a meaty texture rich in protein.

He adds vegetables, garlic, spices, and oils to give each product a distinct personality. The Italian sausage is made with fresh eggplant, fennel, and red wine; the meatloaf, with carrots, celery, onions, and organic palm fruit oil. “When I use an element in the flavor profile,” he says, “I want to stand out and make a statement.”

Sweet yet savory, Field Roast’s signature smoked apple sage sausage features Yukon gold potatoes and is the centerpiece of this warm spinach salad recipe created specially for *All Animals* readers. To find retailers of Field Roast products in your area, visit fieldroast.com.

— Ruthanne Johnson

Wilted Spinach Salad with Smoked Apple Sage “Sausage” and Strawberries — Serves 4 to 6

- 4 Field Roast smoked apple sage sausages
- 1 pint sliced strawberries
- 1 diced Granny Smith apple
- 1 pound fresh spinach
- 4 ounces shelled pistachio nuts
- 3 tablespoons olive oil

1. Sauté sausage with olive oil over medium heat until browned on both sides.
2. Add spinach and stir until well mixed.
3. Once spinach has begun to wilt, turn off the heat.
4. Add strawberries and apples.
5. Serve warm and garnish with pistachio nuts.



WEB EXTRAS: Find more exclusive Field Roast recipes and read an interview with Lee at humansociety.org/magazine.