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Biologists probe bat plague mystery

By Candace Page, Free Press Staff Writer

PLYMOUTH — Fish and Wildlife specialist Joel Flewelling swooped the beam of his flashlight through the inky darkness of Plymouth Cave until it froze on a cluster of tiny brown bats clinging to the damp wall like a bunch of furry grapes.

“Joel, do you have fungus there?” bat biologist Scott Darling called in a hoarse whisper from across the cave.

Flewelling played the light across the tightly packed bats, their bodies silvered with cold drops of dew.

“No, I think it’s just the reflection of the light,” he whispered back.

No news was good news at Plymouth Cave last week: Darling and his crew found 617 bats hibernating normally. No dead bats. No bats with white fungus on their noses, the mark of a mysterious, fatal bat illness ravaging the Northeast.

That was in stark contrast to the field report from the department’s Jan. 13 survey of the state’s largest bat cave, Aeolus in Dorset:

“Evidence of many predator (coyote and foxes) tracks leading to cave... Numerous bat parts scattered in front of cave along with several intact frozen carcasses that hadn’t been scavenged yet. Approximately 30+ bats flying around cave entrance.. Near the gate we estimated approximately 200 bat carcasses on the ground,” the biologists reported.

The Aeolus bats died of white-nose syndrome, an illness first spotted in 2006 in a cave outside Albany, N.Y. Since then, it has spread to dozens of caves as far west as eastern Pennsylvania.

More than 100,000 bats have died, scientists estimate. Mortality in some hibernating colonies has climbed as high as 90 percent.

And scientists still are asking the most basic questions about the epidemic: Is the white fungus found on noses and wings of sick bats the cause or a symptom of their illness? Is some other pathogen the cause? Does the illness spread from bat to bat? Through the atmosphere? Have humans played a role in spreading the illness?

They are scrambling for answers because the decimation of the Northeast’s bat population could be devastating to the natural ecosystem and human uses of the landscape: Bats play a crucial role in controlling insects, pollinating plants and spreading seeds.

“We’ve all seen the Dracula movies,” Darling said, but bats don’t deserve that bad name.

“Last year, we estimated that 500,000 to 600,000 bats hibernated in the caves and mines affected by white-nose syndrome. Those bats, should they all die, would have consumed about 2 billion insects per night.

“We need to get out the message that our ecological infrastructure may be crumbling,” he said.

Fungus invades Greeley Mine

Plymouth Cave sits on a side-hill above Vermont 100, its mouth a dark hole in the deep snow of January. It's a tiny bat cave compared to places like Aeolus, where tens of thousands of bats crowd in.

Darling's recent plunge into the cave was part of a multi-state effort to survey all major bat hibernacula in the East, particularly caves that house the endangered Indiana bat. Vermont biologists are counting healthy and infected bats, taking soil samples and installing temperature sensors on bats . In labs in other states, scientists are attacking the mystery from all sides, including studies with captive bats to see under what conditions the illness spreads.

Darling is a stocky man who began his career as a state Fish and Wildlife biologist working with deer, turkey and bear populations. Now, bats consume nearly all his time.

"They say it takes a little different personality to work with these creatures of the night," he said. "When you pick one up and hold it at eye level, they are fascinating creatures, simply fascinating."

He led his crew through deep snow toward the entrance of Plymouth Cave with mixed hopes and fears.

On the one hand, Plymouth had been fungus-free in 2008.

On the other hand, the thousands of bats at Greeley Mine in Stockbridge also were free of white-nose last winter. When department workers returned in November 2008 to install temperature sensors on 30 bats, they found the first signs of the white fuzz. By January, two of those 30 bats already were dead.

Outside Plymouth Cave, the first signs were good: No bats flitted through the birch grove around the entrance.

Bats hibernate from early fall to mid-spring. Although they rouse a bit each week, it is only bats with white-nose syndrome — and the extreme emaciation that accompanies it — that leave the cave. That's why the Fish and Wildlife Department has asked Vermonters to report any unusual bat activity they observe.

Research, in whispers

Darling, Flewelling, department biologist Ryan Smith and David McDevitt of the Nature Conservancy, owner of the cave, stopped to don protective suits, boots, helmets and headlamps.

Since scientists do not know how white-nose syndrome spreads, they take extra precautions to make sure they do not carry it themselves from one cave to another, either discarding or disinfecting their gear after each visit.

"We'll be looking to see if white-nose is present," Darling briefed the crew. "If it is, we'll take samples. It's also a great opportunity for us to shore up our identification of at least the three species that are probably here, eastern pipistrelles, little brown bats and northern long-eared bats."

"When we get in we'll whisper," he continued, to avoid disturbing the hibernating bats.

One by one, each member of the group lowered himself into the cave, moving awkwardly in the bulky suits and down the slippery quartzite boulders and ledges of the cave opening.

Inside, the walls of the small first chamber glistened with wet. Here and there bats hung individually or in small clusters. In teams of two, the crew began counting bats; one man hoarsely whispering "my-lu, cluster of four," and "my-lu, cluster of 10," using shorthand for the little brown bat's scientific name, Myotis lucifugus

Now and then, a small form flitted through the air; occasionally a little shiver would run across a cluster, as if the bats were rousing slightly — another good sign. "Bats with white-nose fall into a deep torpor and don't rouse at all," Darling said.

‘Meanwhile, bats continue to die’

A chill began to seep through the crew’s Tyvek suits, though the underground rooms were warmer than the 20-degree temperature outside. Plymouth may be a comparatively “dry” cave, but thick dew draped some of the bats in a cloak of diamonds that sparkled in the beams of light.

Smith, Flewelling and McDevitt clambered deeper into the cave, counting more bat clusters into two smaller rooms. They shimmied and squeezed through a jagged edged tunnel into a final, tiny chamber.

The verdict: No white nose, and, when the count was completed, just 10 fewer bats than the last census, in 2007.

Darling and the others pulled themselves out of the cave, bundled their cave suits into plastic bags for later disinfection and packed away the samples of bat guano they collected.

In some ways, the continued health of the Plymouth Cave bats deepens the mystery of white-nose syndrome. Why have these bats escaped?

Darling’s current theory is that a cave’s humidity may play a role. Plymouth is a comparatively dry cave, which may make it more difficult for the cold- and damp-loving fungus to spread.

“Science is a slow, step-by-step process. We have to test the many hypotheses one by one,” he said. “Meanwhile, the bats continue to die.”

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To report sick bats

As part of its research into the deadly bat illness known as white-nose syndrome, the Fish and Wildlife Department is asking Vermonters to report unusual bat activity, including:

• Sightings of bats during the winter months

• Bats having trouble flying

• Bats dying

• Bats exhibiting a white fungus on the face or wings

The department is particularly interested in reports from the Champlain Valley, the summer home of threatened Indiana bats.

• To report unusual bat activity, go to: www.vtfishandwildlife.com