

What's Killing the Bats?

Investigating Causes of Population Decline

By Dana Limpert

For decades now, biologists have been concerned about declining bat populations throughout the U.S.

Although the winged mammal doesn't enjoy a beloved spot in the popular culture, bats serve a vital ecological role as the primary predator of night-flying insects. A single bat can consume over a thousand insects each night. During the maternity season, female bats can eat nearly their weight in insects each night and still fly!

When biologists studied a colony of 150 big brown bats (*Eptesicus fuscus*) they found that females ate 38,000 cucumber beetles, 16,000 June beetles, 19,000 stinkbugs and 50,000 leafhoppers in one summer. Eating 38,000 adult cucumber beetles means that 18 million rootworms, a major agricultural pest, were not produced.

There's also evidence that insects such as moths, crickets, praying mantids, green lacewings, flies and beetles, can hear bat echolocation and avoid colony areas.

But the bat populations appear to be in rapid decline throughout the Eastern United States. Scientists haven't pinpointed

an exact cause. It's likely there are a number of factors.

Turbine Trouble

We know from 19th century naturalists that hundreds of eastern red bats (*Lasiurus borealis*) migrated in flocks during the day, roosting in trees. But widespread clear-cutting in the early 1900s eliminated much of their roosting places and diurnal migrations became a distant memory.

Red bats rebounded with the advent of reforestation, only to face a new threat as people looked for new sources of clean, green energy—clipped in flight by the turning blades of wind turbines along forested mountain tops.

Eleven different species of bats have been found dead at wind turbine sites, including long distance migrant tree bats such as eastern red bats, hoary bats (*Lasiurus cinereus*), and tree cavity dwelling silver-haired bats (*Lasiurus noctivagus*). Based on current fatality rates and estimated wind power development, biologists project that the cumulative fatalities in the Mid-Atlantic by 2020 will be 59,000 to 111,000 bats.

The scientific community and wind energy interests have focused money and resources in trying to discover why so many bats are

colliding with wind turbine blades. Recently, Canadian biologists reported that dead bats examined at a wind farm in British Columbia had internal injuries consistent with barotrauma, caused by a change in air pressure.

The researchers theorized that the spinning blade tips create a drop in air pressure that causes the bats' lungs to expand rapidly to the point of rupturing. Meanwhile, other researchers are searching for a bat repellent that will keep bats away from wind farm areas.

Dead Bats Flying

It's not just migratory tree bats that are threatened. Biologists in New York over the past two years have been finding bats flying out of their hibernating dens, or hibernacula, in 20-degree weather with snow covering the ground, their fat reserves completely exhausted.

Researchers do not know why the bats are leaving hibernation early or what happened to the animals' fat reserves. But it's clear this is a widespread phenomenon. This year, biologists captured footage of these bats flying in winter and landing on people's houses located near the hibernacula. Many of the bats had a white fungus on their muzzles, leading biologists to name the new threat White Nose Syndrome, although it is believed the fungus is a symptom, not the cause of death.

"Dead bats flying," noted one biologist grimly, incredulous that the bats he's studied are dying by the thousands.

Estimates are that tens of thousands of bats died

Eastern Pipistrelle Bat





LEFT: Hoary Bat
BELOW: Silver-haired Bat

state as a precaution and have increased monitoring of key locations.

Like wind turbines, money and resources have been diverted to attempt to detect the cause of this new threat, yet most aspects of White Nose Syndrome remain nebulous and troubling.

Bats in the Belfry

Bats trying to survive in Maryland face another threat—finding a safe place to raise their pups.

Historically, bats that hibernate in caves and mines during the winter would make their summer home in a nice big old hol-

low tree to escape but not return, and then sealing the holes.

Timing is everything, however. Pups that haven't learned to fly yet can be trapped inside and die, creating an odor problem. The process might also cause mothers to fly around outside the house for a period of time looking for a way to get in and nurse their pups.

Both situations increase the possibility that bats will get into human living spaces, which can be uncomfortable for people and bats, alike. Sadly, bat colonies are killed out of ignorance, both on the part of homeowners and the companies hired to help them. The only effective method for solving the house bat problem is exclusion. No chemical is licensed for use with bats and ultrasonic gadgets and repellents don't work.

Bats will come back to the same house each year. If they can't enter their primary roost, they will travel to a secondary roost, probably a neighbor's house. Homeowners can take exclusion measures themselves or hire a wildlife control cooperator permitted by DNR.

Protecting the Bat Population

DNR also recommends installing bat roosting boxes in areas where bat colonies are consistently evicted year after year. Colonies stabilized in boxes where people will tolerate them creates a situation where both bats and people win. A bat colony in the vicinity can deter many flying insects.

These methods allow humans and bats to live together in harmony, rather than in conflict. ■

For more information on how to deal with roosting bats, go to DNR's web site: www.dnr.maryland.gov/wildfie/bats/batsin-home.asp

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during the last winter alone in New York, Connecticut, Massachusetts, and Vermont, primarily little brown bats (*Myotis lucifugus*), northern long-eared bats (*Myotis septentrionalis*), small-footed bats (*Myotis leibii*), a state endangered species in Maryland, eastern pipistrelles (*Perimyotis subflavus*, formerly *Pipistrellus subflavus*), and the federally endangered Indiana bat (*Myotis sodalis*).

White Nose has not been detected in Maryland. The fungus has been noted on hibernating bats in Pennsylvania without any detected mortality. Biologists at the Maryland Department of Natural Resources have recommended closing caves and mines known to be bat hibernacula in the

low tree. But hollow trees have become scarce in most neighborhoods and bats have discovered that people's attics make a very nice substitute.

The active colony season, which is when pregnant females gather to form colonies, can begin as early as April with pups being born anywhere from late April to early July depending on spring conditions. In Maryland, with the cool wet springs we have experienced over the last several years, some pups have been born in June and early July.

A process called exclusion is the best way to remove bats from the belfry. Exclusion involves locating how the bats get in and out, setting one-way doors that