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White-nose Syndrome

Whole populations of bats in the eastern North America are dying as they hibernate in caves and mines. The bats lose their fat reserves (needed to survive hibernation) long before winter is over, and die of starvation. Scientists have estimated **well over a million bats** have already died.

Scientists describe white-nose syndrome as **“the most precipitous wildlife decline in the past century in North America.”** It threatens ecosystems both in caves and aboveground, and presents new challenges for broader cave conservation efforts.

The earliest evidence of WNS was in a 2006 photograph taken in a non-commercial, rarely visited section of a show cave in New York. However, the condition wasn't recognized until a year later when hundreds of dead bats were found in nearby caves.

For 70 years, the NSS and its members have been at the forefront of efforts to conserve and study caves, their unique geology and environments, and the life they contain. Now, we are collaborating with wild-life managers and scientists to combat WNS.

The Cause

WNS received its name from the telltale white fungus growing on the noses of infected bats. This previously undescribed fungus, *Geomyces destructans*, may also appear on a bat's wings, ears, and tail. Additionally, the fungus has been found in WNS-infected cave sediments, thriving in the cold, humid conditions.

Although *G. destructans* infects the skin of bats, the fungus isn't always apparent, and bats instead may display abnormal behavior.

Scientists have not yet confirmed that *G. destructans* is the actual cause of WNS deaths, or if the fungus is merely an opportunistic pathogen, taking advantage of bats' immune systems weakened by a biological, chemical, or other environmental factor.

Bats Are Dying

Mortality rates of up to 100% have been documented in many hibernacula found to have WNS. **Little brown bats**, our most common species, have the highest mortalities (90+%). The federally **endangered Indiana bat** appears to be more resilient, with about a 50% mortality rate.

In caves where fewer than 100% of bats died the first year, populations continued to decline in successive years. Damage to wings and bodies persists in bats that survive a winter in WNS-affected populations.

Cave microclimates (humidity and temperature) seem to affect the ability of the disease to progress. These factors, matched with the roosting preferences of different species of bats, may hold some hope for survival.



Photo: © J. Chenger

Additional Signs of WNS

- Bats flying outside during the day in near-freezing weather.
- Bats clustered in the winter in sections of caves or mines not normally used for winter roosts, especially near the entrance.
- Dead or dying bats on the ground or on buildings, trees, or other structures during the winter.
- Bats not arousing after being disturbed.

How WNS Is Spread

- **Bat-to-Bat** - The pattern in which WNS has spread between caves over three years indicates that bat-to-bat is the primary method of transmission. Bat-to-bat transmission of *G. destructans* has been proven in a laboratory environment.
- **Cave to Humans to Bats?** - While not proven, many believe it possible that human cave visitors could inadvertently help spread WNS. As a precaution, clean and disinfect clothes and equipment according to the latest protocols, which may be found at www.caves.org/WNS.

It is particularly important that gear used in a WNS site is not taken into caves outside a WNS-affected area.

Bats Matter!

Bats are an essential, beneficial part of our ecosystem. Decimation of our bat populations will cause a substantial ecological ripple effect, with far-reaching consequences.

Guano from cave-roosting bats provides vital nutrients for cave ecosystems, and often is the basis of a cave's food chain. It is used by micro-organisms and invertebrates, which become food for fish, salamanders, frogs, and other larger animals.

Additionally, bats are food for other animals, including hawks, raccoons, skunks, and owls.

Consuming over half their body weight in insects each night, bats are the major predator of night-flying insects. ***Bats in the U.S. eat thousands of tons of insects nightly, including agricultural pests.***

Bats are important to science and medicine as well, enabling advancements in vaccines, sonar, and blood coagulation, to name a few.

**WNS not only affects bats.
It impacts our whole ecosystem.
WNS affects us.**