

Frequently Asked Questions White-nose Syndrome (WNS)

What is White-nose Syndrome?

White-nose Syndrome (WNS) is a disease estimated to have killed over five million bats across the northeast U. S., Mid-Atlantic states, and Canada since 2006, with no apparent decrease in mortalities or spread. It is caused by the invasive fungus, *Geomyces destructans*, which thrives in cold and humid microclimates found in caves and abandoned mines where bats hibernate. Bats require these same cold and humid microclimates for hibernation.

The fungus invades the skin of hibernating bats, causing destruction of tissues and disruption of metabolic processes. These factors cause the bats to arouse from hibernation during winter, which utilizes their very limited fat reserves and can ultimately lead to starvation before spring when their insect prey are available.

Bats with WNS may exhibit a white fungus growing on their muzzles, ears, or wings while in their hibernacula during winter months. Abnormal congregations of bats near the entrances to caves during winter, exiting and flying around in the daytime during cold winter weather, and lethargic response to human disturbance are also behaviors associated with WNS. The first signs that WNS has reached our bat populations in the Pacific Northwest include increased numbers of bats flying during freezing temperatures and dead bats in their neighborhoods during the winter or early spring.

What proof do you have that people are contributing to the spread of White-nose Syndrome?

While all mechanisms of transmission have yet to be identified, the rapid spread of WNS to numerous sites in many states and provinces by 2012 has been attributed primarily to direct bat-to-bat and bat-to-cave contact.

However, the evidence collected to date suggests that *Geomyces destructans* may have been introduced in the U.S. from Europe via a human visitor. Continued human activity in caves may have assisted the spread of WNS by being transported inadvertently from site-to-site on footwear, clothing, and gear of cave visitors. Although the fungal spores can persist in caves year-round, the fungus has only been found actively growing on hibernating bats. Microscopic fungal spores and hyphae can easily become attached to skin, hair, clothing, and equipment and can remain viable for weeks, months, or years after leaving a subterranean environment, even when subjected to seemingly unsuitable conditions, such as the inside of a vehicle during hot summer weather.

Evidence shows human activity may also be responsible for spreading WNS, even during seasons when bats are not occupying caves. The discontinuous nature of the rapid spread of WNS and the associated fungus suggests that something other than bat-to-bat transmission is also contributing to the spread of WNS and the fungus. The potential for human-assisted spread is further supported by the fact that *G. destructans* fungal spores have been found on gear after it was taken into affected caves.

Does White-nose Syndrome pose a risk to human health?

White-nose Syndrome is affecting bats in caves that have been visited by many people during the past four years, yet there have been no reported human illnesses attributable to WNS. The associated fungus, *G. destructans*, does not thrive in warmer temperatures that exist within or on a human.

Are agencies closing their caves?

Yes. The US Fish and Wildlife Service (USFWS) maintains a web page that lists all current cave closures. Federal and state agencies, The Nature Conservancy, and speleological organizations have all closed access to caves to some degree over the past year.

The USFWS issued a cave advisory on March 26, 2009:

1. *There is a voluntary moratorium, effective immediately, on all caving activity in states known to have hibernacula affected by White-nose Syndrome, and all adjoining states, unless conducted as part of an agency-sanctioned research or monitoring project.* Caves infected with the WNS fungus may not show any obvious signs of its presence, and the actual geographic distribution of all affected sites is not known. Human activity in affected caves may cause fungal spores and particles to become airborne, thereby contaminating exposed materials and allowing for transport.
2. *Cavers in regions outside the White-nose Syndrome-affected and adjacent states should be using clothing and gear that has never been used in caves in the affected or adjacent states.* There are indications that a significant period of time (up to, or more than, a year) may pass between the time of introduction/exposure to WNS or the fungus and the first visible evidence of its presence. For this reason, we cannot be certain that apparently unaffected sites do not pose a risk for contamination.

*To minimize the risk that *G. destructans* could travel across state, regional, or national boundaries on clothing and equipment, the USFWS is advising that clothing and equipment used inside the affected region remain in the affected region.* Gear from other regions should be decontaminated between cave visits following the protocols available on the USFWS White-nose Syndrome Web site: http://www.fws.gov/northeast/white_nose.html

3. In the Pacific Northwest (PNW), existing winter cave closures have been extended to start November 1 and continue to April 1 at select sites. These include Lava River Cave on the Deschutes NF and Boulder Cave on the Okanogan-Wenatchee NF. A Region-wide emergency cave closure on federal or state lands has not been implemented in the PNW.
4. Abandoned mine entry is dangerous and can be deadly to humans because of toxic air, potential collapse, or obscure holes. A “stay out, stay alive” approach is the best approach for abandoned mines any time of year.

Why is commercial cave access allowed to continue?

Commercial caves are critical contact points with the public. Commercial caves on public lands allow for public education on WNS, controlled entry, and WNS gear decontamination procedures to be implemented. Commercial caves on private land are not subject to the same legal restrictions as those on state or federal land.

The USFWS and other agencies work with the owners and operators of commercial caves to help them employ methods to minimize the potential for contaminated materials from entering or leaving their sites (such as employing shoe baths upon entering and exiting or providing disposable booties).

Why care about bats?

There are over 1,000 different species of bats worldwide and they make up about one fifth of all mammal species. They are important insect predators and natural pollinators of such plants as agave, mango, banana, and cashews. Fruit-eating bats act as seed dispersers and are very important in rain forest regeneration. They spread over half of the initial seeds in a cleared rain forest.

Bats are an important part of the ecosystem. Entire cave ecosystems depend upon the nutrients brought in by bats and released from their guano (feces). Bats act as natural biological controls, keeping in check nocturnal insects, including many of the worst agricultural pests, as well as those annoying to man. For example, 70% of all the bats in the world eat insects, and many of them use echolocation to find food and move around in the dark.

Almost any insect that is active at night can be food for a bat, including moths, beetles, flies, crickets, gnats, mayflies, wasps, and mosquitoes. Many small insect-eating bats can eat more than 1,000 mosquito-sized insects in one hour. Another way to look at it is an individual bat can eat up to its body weight in insects in one night. With bats eating so many insects, fewer pesticides are needed to protect agricultural crops. A recent study showed that nationwide, bats save farmers \$3 billion a year in pest control costs.

Bats have contributed much to human knowledge through scientific studies of their echolocation abilities, their biology, and certain aspects of their physiology. There is even a component of vampire bat saliva used to treat human stroke victims.

Bat populations all over the world are declining. In the United States, nearly 30 percent of our bat species are either listed as endangered by the federal government, or are candidates for such listing.

They are long-lived animals that reproduce slowly and are unlikely to recover quickly from the devastating mortalities associated with WNS.

Where can I find out more about White-nose Syndrome, cave closures, and bats?

The U. S. Fish and Wildlife Service is maintaining a web site with the latest scientific information about White-nose Syndrome, including a list of all cave closures across the United States, as well as the most up-to-date decontamination protocol that is advised or required for all caves in the U.S.:
<http://www.fws.gov/WhiteNoseSyndrome/>.

Bat Conservation International, Inc. provides an array of educational information about bats on its web site: <http://www.batcon.org/>.

The U. S. Geological Survey has a web site that details why White-nose Syndrome is a concern to bat diversity, including endangered bats:
<http://www.fort.usgs.gov/WNS/>

The National Wildlife Health Center's website offers information related to the fungal pathogen tied to White-nose Syndrome:
http://www.nwhc.usgs.gov/disease_information/white-nose_syndrome/index.jsp

The National Speleological Society maintains a website that contains media information about White-nose Syndrome, cave closures, and the U. S. Fish and Wildlife Service's decontamination protocol: <http://www.caves.org/>.

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