

Montana Fish, Wildlife and Parks' White-nose Syndrome Surveillance and Management

Summary prepared for the Natural Resources and Transportation Appropriations Subcommittee

What is White-nose Syndrome (WNS)?

- WNS is a disease caused by the cold-adapted non-native fungus, *Pseudogymnoascus destructans* (*Pd*), that has killed an estimated 5.7 to 6.7 million bats in eastern and central North America.
- WNS kills bats by reducing their ability to survive the winter as *Pd* is thought to disrupt bats during hibernation causing them to lose critical fat resources needed to survive the winter.
- *Pd* is also thought to impact physiological processes in ways less understood to date.
- *Pd* is transmitted through direct animal-to-animal contact or contact with the fungus at roost sites such as caves.
- *Pd* can be detected through direct sampling of bats, in guano after the fungus has passed through the bats digestive system after grooming and in soil where the fungus can live for long periods of years.
- Mortalities from *Pd* infections are typically detected two years after the fungus is first detected in the environment.
- Some individual bats in controlled laboratory experiments or in the wild have been found to survive exposure to *Pd*, however mortality rates of 90-100% have been observed in localized populations (e.g., one cave roost).
- Seven of Montana's 15 bat species have been found to be identified with diagnostic symptoms of the disease in eastern or central U.S. states.
- Four of Montana's 15 bat species have been found to carry the fungus but appear unimpacted by WNS.
- There is currently no treatment to remove *Pd* from the environment, increase immunity in bats, or treat sick bats.

When and how did WNS come into the US and MT?

- Bat mortalities from the disease were first detected in 2006 in New York.
- It is likely humans somehow transmitted *Pd* to the U.S from Europe where bats are less impacted by WNS.
- Mortalities and the presence of *Pd* have been marching westward since 2006 with positive detections in the surrounding states of South Dakota and Wyoming in 2017 and North Dakota in 2019.
- *Pd* was detected in Montana for the first-time during 2020 spring surveillance efforts.
- *Pd* was found in the following counties in 2020: Sheridan, Daniels, Valley, Phillips, Fallon, and Richland. A 'probable' positive was found in Garfield county.
- Counties sampled, but not positive for *Pd* in 2020: Petroleum, Musselshell, Yellowstone, Stillwater, and Carbon.
- FWP expects to find at least *Pd*, if not bat mortalities, across much of eastern Montana and central Montana in 2021.

What are the implications for wildlife and livestock?

- There is no impact of *Pd*/WNS on humans, livestock, or other species of wildlife.
- Several bat species' populations in the eastern and central U.S. have been significantly reduced and petitioned for listing, or already listed under the U.S. Endangered Species Act.
- Important questions remain about how the disease will play out among western bat populations that have very different winter roosting ecologies than their counterparts back east.



What is FWP doing about WNS?

- FWP and partners developed surveillance, prevention, and response plans in 2014.
- In 2019, FWP developed a plan with the goal of documenting the arrival and spread of *Pd*/WNS in Montana and understanding the disease's impacts on our bat populations Montana.
- Increased surveillance to cover sites across the state are planned for the late winter and spring of 2021.
- FWP and partners have begun a multi-year project to address the following objectives: 1) conduct surveillance to establish the timing of *Pd*/WNS occurrence across the state, 2) conduct state-wide acoustic monitoring over time in accordance with the North American Bat Program guidelines, 3) analyze long-term acoustic data for changes in occupancy and activity associated with WNS.
- FWP has worked with the recreational caving community since 2010 in an effort to reduce the transmission of *Pd* from one site to another by recreational cavers.
- Decontamination protocols designed by the National Wildlife Health Center are followed by FWP and Montana Natural Heritage Program staff conducting disease surveillance or bat population monitoring that involves live bat capture or roost visitation.
- Decontamination protocols are followed by recreational cavers through voluntary commitment.

What is the history of FWP's efforts?

- Bat population monitoring has been conducted across Montana since the late 1990s, with specific monitoring for *Pd* and signs of WNS since 2010.
- Since 2017 FWP and partners have submitted samples for testing from important winter hibernacula, (e.g., caves) found in western and central Montana.
- Roughly 150 samples per year have been submitted for testing as part of national surveillance efforts. Samples consist of skin swabs from live bats, guano in which the fungus passed through the system of a bat after grooming can be found, and soil from roost sites where the fungus can live in the substrate for years.
- As there are no known occupied hibernacula in eastern Montana, surveillance has been limited to the part of the state where the fungus was found in 2020.
- Surveillance of sites where bats, guano, or soil under roosts could be found was ramped up in the spring and early summer of 2020 after bats killed from WNS were found within 50 miles of the Montana border in North Dakota.
- Passive surveillance of dead bats found throughout the year is done when circumstances indicate the cause of death could be WNS. The number of dead bats submitted each year for this type of surveillance is <20.

Are our efforts working, and to what end?

- Our efforts to prevent the spread of *Pd* or mortalities from WNS are limited by the lack of treatment to remove *Pd* from the environment, increase immunity in bats, or treat sick bats.
- The scale of conservation efforts needed to maintain healthy bat populations into the future are unknown.
- The success of efforts to reduce the human spread of the fungus from one hibernaculum to another are thought to be working here in Montana, however this remains to be confirmed since documentation of the fungus occurred just recently.
- More Montanans are recognizing the important role bats play in healthy ecosystems due to the efforts of FWP and partners to educate the public on WNS and bat ecology. More than 500 people a year are reached through annual targeted education efforts during national 'bat week.'



What is the potential for WNS to spread into other areas of MT? What can we do to prevent that spread?

- It is likely that *Pd* and WNS will spread across the state through natural transmission from bat movements.
- We hope to slow the spread by reducing the likelihood of human-caused spread by those working with bats and those recreating in bat roost sites, like caves.

What are we spending on WNS? What is the funding source?

- FWP is spending \$50,000 in FY2021, to analyze acoustic call information collected in 2020 as part of the long-term project to analyze changes in occupancy and activity associated with WNS. This work is being supported by a grant from the U.S. Fish and Wildlife Service.
- FWP is spending \$17,000 for *Pd*/WNS surveillance in FY21 to sample roost sites and bat populations across the state. The work is being supported by Pittman-Robertson and Nongame Tax Checkoff funds and supports sampling in about half of the state. Sampling in the other half of the state will be funded by the U.S. Geological Survey, National Wildlife Health Center.
- The full cost of the seven-year long-term project to monitor the presence of the disease and any impacts it may be having on bat populations is \$1.6 million. No funding sources have been identified.

What is the path forward? What do we understand and what questions do we still have?

- *What we understand:*
 - The fungus that causes WNS is now present in Montana. It is a matter of time before we find mortalities from WNS.
 - *Pd* and bat mortalities from WNS will likely be detected across the state in the next three to five years based on the rate of spread in states east of Montana.
 - Losses from WNS as it moves through Montana bat populations could be significant.
 - Bat mortalities from WNS will be additive to other mortality causes, such as habitat loss or alteration and human persecution.
 - There is currently no treatment to remove the fungus from the environment, increase immunity in bats, nor treat sick bats.
 - Reducing the human-caused spread of the fungus is important.
 - WNS is not a threat to humans nor a reason to destroy local bat populations.
 - North American bats do not appear to carry the virus that causes Covid-19 in humans.
- *What questions do we still have?*
 - What impact exactly will WNS have on local bat populations in Montana?
 - Where do the majority of bats present in Montana during the summer spend the winter?
 - How significant are other causes of mortality to bat populations and what are effective ways to reduce those causes?

