

Assessing the Presence and Impacts of White-nose Syndrome on Montana's Bat Populations through Disease Surveillance and Long-term Acoustic Monitoring

Emily AlMBERG*, Montana Fish, Wildlife and Parks, Bozeman
Kristina Smucker, Montana Fish, Wildlife and Parks, Helena
Dan Bachen, Montana Natural Heritage Program, Helena
Kathi Irvine, US Geological Survey
Christian Stratton, Montana State University, Bozeman
Justin Gude, Montana Fish, Wildlife and Parks, Helena
Jennifer Ramsey, Montana Fish, Wildlife & Parks, Bozeman

*Indicates Presenter

**Indicates Student Presentation

In 2019, Montana Fish, Wildlife and Parks, the U.S. Geological Survey, and the Montana Natural Heritage Program designed a plan to assess how the invasion and spread of the fungus *Pseudogymnoascus destructans* (Pd), which causes the disease White-Nose Syndrome (WNS), might impact bats across Montana. The resulting project involves annual, statewide surveillance for Pd and WNS to estimate the arrival and distribution of the disease, and long-term acoustic monitoring to assess bat occupancy and activity. Pd was first detected in Montana in 2020. In 2021, we surveyed 35 sites across the state, 9 of which were Pd-positive. WNS was first confirmed in 2021 among little brown bats (*Myotis lucifugus*) in Fallon, Carter, and Phillips Counties. As of 2021, Pd and WNS detections remain restricted to the eastern half of the state. During the summer of 2021, volunteers and staff from state, federal, and non-profit organizations deployed acoustic detectors at 87 North American Bat Program grid cells. We will use a Bayesian hierarchical model to estimate both occupancy and relative activity before versus after the arrival of WNS. Understanding the impacts of WNS on Montana's bats will inform decisions about how Montana pursues bat management and conservation strategies—whether it be treatments specific to WNS or ecological approaches toward offsetting the costs of disease. Wildlife and land management agency staff in Montana are currently engaged in a structured decision-making process to understand how best to respond to WNS while trying to maximize the abundance and distribution of bats across the state.