

To: Natural Resource/Conservation Managers
From: Jonathan Sleeman, Director, USGS National Wildlife Health Center
Title: Update on White-Nose Syndrome
Date: December 11, 2009

The USGS National Wildlife Health Center (NWHC) continues to investigate bat white-nose syndrome (WNS) in efforts to further understand this disease and the unprecedented mortalities among hibernating populations of bats in the Eastern United States. This Bulletin provides background about WNS, informs people about the Center's preliminary laboratory findings, gives contact information for reporting cases, and provides information about NWHC submission guidelines for bat samples. A WNS National Plan is currently being developed jointly by a number of state and federal agencies; more information about the Plan will be forthcoming. The U.S. Fish and Wildlife Service also recently completed a summary of an exercise that used [Structured Decision Making](#) as a tool to evaluate WNS management options (see links at the end of bulletin).

Background

White-nose syndrome is a disease associated with massive bat mortality in the northeastern and mid-Atlantic United States. Since the winter of 2006–2007, bat population declines ranging from 80–97% have been documented at surveyed hibernacula that have been most severely affected (Blehert et al., 2009). Although exact numbers are difficult to determine, biologists estimate that losses may exceed one million bats since 2007. This mortality represents the most precipitous decline of North American wildlife caused by infectious disease in recorded history. Affected hibernating bats often have visually striking white fungal growth on their muzzles, ears, and/or wing membranes as the result of infection by a newly described species of fungus, *Geomyces destructans* (Gargas et al., 2009). Histopathological examination indicated that *G. destructans* infection of skin causes characteristic epidermal erosions and ulcers that can also progress to invade underlying connective tissue (Meteyer et al., 2009).

Research Updates

Preliminary findings from a collaborative study funded by the U.S. Fish and Wildlife Service, the U.S. Geological Survey, the U.S. Forest Service, the National Speleological Society, and Symbiology, LLC, indicated that a genetic signature of *G. destructans* was present in sediments collected in WNS-infested hibernacula. However, the genetic signature has thus far not been detected in environmental samples or on bats collected from outside the known WNS-infested region. Identification of *G. destructans* genetic material in environmental samples suggests that the fungus is present, and the potential exists for fungus to be transmitted between bat hibernation caves as an unwanted hitch-hiker upon humans, their clothing, or caving gear.

Preliminary data from WNS infection studies conducted at NWHC suggest *G. destructans* can be transmitted from bat-to-bat in a controlled environment. This finding, coupled with the recently confirmed first case of WNS this fall from a bat collected on November 4, 2009 in Virginia, suggests that WNS transmission may occur during the fall bat swarm, as well as during hibernation.

The NWHC has developed a rapid PCR test that can quickly screen samples for the genetic signature of *G. destructans*. This test will be used for surveillance and monitoring efforts this winter. Also, genome

sequencing of *G. destructans* is underway at the Microbial Sequencing Center of the Broad Institute with funding provided by the National Human Genome Research Institute and the U.S. Geological Survey. Determination of the *G. destructans* genome sequence will facilitate future research into mechanisms of WNS pathogenesis and will enable molecular epidemiological studies into the origin of *G. destructans*. Future WNS research directions include predicting the potential for WNS spread, evaluating possible treatment and control options, examining the persistence of *G. destructans* in the environment, and determining the cycle of WNS transmission.

Sample Collection Protocol

The NWHC has established a sample collection protocol to be used by state and federal biologists surveying bat hibernacula or evaluating unusual bat morbidity and mortality during the fall/winter 2009–2010. The guidelines are designed to assist with triaging samples and submissions from different geographic areas with a focus on identifying new sites with WNS. The NWHC sample submission protocol is available at <http://www.nwhc.usgs.gov/> (under Hot Topics). Please contact a field investigation team member (listed below) prior to submitting samples.

Web Sites for Additional Information

More information on WNS in bats can be found at:

- ❖ U.S. Fish and Wildlife Service, Northeast Region: http://www.fws.gov/northeast/white_nose.html
Structured Decision Making Report: <http://www.fws.gov/northeast/wnsplanning.html>
USFWS News Release: [Cave closures likely key to slowing deadly WNS spread](#)
- ❖ USGS National Wildlife Health Center: http://www.nwhc.usgs.gov/disease_information/
- ❖ USGS Fort Collins Science Center: <http://www.fort.usgs.gov/WNS/>

To report or request assistance for wildlife mortality events or health issues, visit

http://www.nwhc.usgs.gov/mortality_events/reporting.jsp or contact Dr. Krysten Schuler, 608-270-2447, kschuler@usgs.gov, Dr. Anne Ballmann, 608-270-2445, aballmann@usgs.gov, Dr. LeAnn White, 608-270-2491, clwhite@usgs.gov, or Jennifer Bradsby, 608-270-2443, jbradsby@usgs.gov.

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