

USFWS and Vermont Department of Fish and Wildlife Cooperative Agreement Report

Agreement No. 50181 – 9 – J106A

White Nose Syndrome Regional Surveillance 2009

Final Report – December 30, 2009

Background

The emergence of white-nose syndrome (WNS) in the northeastern United States has caused unprecedented mortality of six species of cave bats. This includes the federally endangered Indiana bat (*Myotis sodalis*). This disease was first documented in New York State during the winter of 2006, and quickly spread to Vermont, Massachusetts and Connecticut. Mortality estimates range from 75% upwards to 99% in selected hibernacula. Typically, signs of WNS include fungus on the muzzle, ear or wing membranes, abnormal activity patterns, staging near the entrance of hibernacula and delayed arousal when disturbed. A psychrophillic fungus *Geomyces destructans* has been cultured from the affected bats. Current research indicates that this fungus is most likely the leading candidate for the cause of the abnormal mortality associated with WNS.

Objectives

The objectives of this collaborative agreement include providing coordinated field surveillance for WNS in Vermont, Massachusetts and New Hampshire. This includes, but is not limited to, WNS surveillance, research projects, data collection, hibernacula surveys, specimen collection and submission, and public outreach.

Approach

A WNS regional field biologist was hired and staffed with the Vermont Fish and Wildlife Department (VTFWD). This grant provided \$30,000 for WNS regional surveillance. Research activities and surveillance were identified and prioritized through a coordinated multiagency approach, outlining highest priority research, outreach and surveillance needs. The field biologist coordinated with other state and federal agencies to provide efficiency and consistency when conducting WNS research and surveillance across state lines.

Results

Citizen Reports and Online Database

VTFWD developed an online bat reporting database for public reporting of sick and dead bats for Vermont and New Hampshire residents. This effort resulted in approximately 596 online reports of abnormal bat activity during the winter and spring of 2009. Citizens also reported bat activity via the telephone where 102 reports were received. A database was created summarizing all of the reports, and a map of all of the reports was created. New Hampshire reports were forwarded to the NH Fish and Game Department. Many of the citizen reports required contacting the citizen for follow up

information regarding rabies exposure, specimen collection and missing information. The vast majority of citizens who made reports requested a response concerning WNS issues. All such requests were responded to in a timely manner. This proved to be a very valuable and time-consuming public outreach activity. The online reporting and database was initiated again on December 1, 2009 and 10 reports were received as of December 30.

WNS Bat Acoustical Work: WNS Monitoring on Grandpa's Knob

In the spring of 2009, an acoustical survey was developed by VTFWD, USFWS and Stantec (independent contractor) to monitor the affects of WNS on local bat populations. During the summers of 2007 and 2008, Stantec conducted an acoustic monitoring study at Grandpa's Knob, a wind farm development site. The 2009 study was designed to replicate the prior two summer's survey results in order to compare the baseline pre-WNS data against 2009's numbers. The WNS regional field biologist was responsible for working with Stantec to set up acoustical monitoring devices at the site. Five Anabat acoustic detectors were set up to monitor bat calls beginning in mid-May and continuing through the end of August. VTFWD was responsible for maintaining and downloading the Anabat data throughout the summer. This consisted of spending 1.5 to 2 days every 2 weeks to download data from the detectors. The results of the comparison study will be available in early 2010.

Winter Hibernacula Surveys

The WNS regional field biologist participated in ten winter hibernacula surveys in Vermont and seven in Massachusetts. Please see Attachment A for survey reports. At all sites, complete counts were conducted when possible; several of the sites had rooms and passages that were not accessible. All sites were surveyed for the presence of WNS symptoms. Three sites in Vermont and two in Massachusetts exhibited no symptoms of WNS. Specimens and fungal tape samples were collected from hibernating bats to document the presence of *G.destructans*.

Aeolus Bat Cave WNS Research

VTFWD collected 500 *Myotis lucifugus* carcasses from the floor of Aeolus bat cave in Dorset, VT for the American Museum of Natural History as a specimen record for future analysis (e.g. genetic). Two hundred and five male and 295 female specimens were collected on February 22, 2009, and shipped to the Museum collections department. On March 12, 2009 VTFWD collected 10 *M. lucifugus* specimens to be shipped to John O. Whitaker of the Center for North American Bat Research Conservation. On March 12, VTFWD also collected 7 *M. lucifugus* specimens for fat analysis testing at Boston University. On August 28, 2009, 3 male *M. lucifugus* specimens were collected and sent to the National Wildlife Health Center for fungal analysis; preliminary results indicate no *G.destructans*, but additional tests will be conducted.

WNS National Sign Order

Most research indicates that WNS is a pathogen that affects bats inside of hibernacula and that it is primarily spread through bat-to-bat contact. However, it is possible that it is also spread by people,

especially by the caving community. As such, the USFWS issued a cave closure recommendation. Outreach strategies were an essential element to successful implementation of the recommendation. Cave closure signs became a central requirement in this outreach effort. The regional field biologist was put in charge of coordinating with all states and agencies within or near the current WNS range to determine specific sign needs. A multi-state order was developed and placed with VOSS signs of Manlius, N.Y. A total of 969 cave closure signs were purchased and distributed to 7 different states which included Kentucky, Pennsylvania, Vermont, Virginia, Wisconsin, Tennessee and Alabama.

2009 WNS Transmission Study

This study was initiated to test these hypotheses:

1. The causative agent of the disease (fungus or other) persists in hibernacula after the bats are no longer present.
2. Infected animals will exhibit clear signs of infection in their first winter of infection.

Beginning in the spring of 2009, New York Department of Environmental Conservation (NYDEC) and VTFWD, along with other state and federal agencies began working on drafting a proposal for the WNS transmission study. A final research proposal was developed and the initial phases of the study began during the summer of 2009. Landowner permission was acquired to conduct this research and a 3-year agreement was reached between the VTFWD and landowner for WNS bat research at the Bridgewater site. VTFWD had bat gates constructed at the Bridgewater Gold Mine to reduce potential human disturbance during the duration of the study. The WNS regional field biologist was responsible for conducting the majority of the field work to prepare for this major research project.

Outreach Presentations

The WNS regional biologist conducted two outreach presentations on bats of the Northeast and WNS. These presentations occurred at Burr and Burton High School in Manchester, VT and Wallingford Conservation Commission in Wallingford, VT.

WNS Reporting and Coordination

WNS regional biologist participated in bi-weekly WNS conference calls to report current research results, priorities and general WNS research activities occurring in Vermont, New Hampshire and Massachusetts. The WNS regional biologist also participated in the Mammals SAG meeting discussing WNS and the potential listing of bat species in Vermont. The field biologist also attended the 2009 WNS regional symposium in Pittsburg, PA from August 12-14. WNS regional biologist participated in a web meeting discussing the use of acoustic transects to document changes in bat distribution and abundance on December 9, 2009. WNS biologist participated in chemical control of fungus conference calls during the fall and early winter of 2009.

Media Contacts

Media inquiries about WNS were prevalent. The WNS regional field biologist participated in media requests from New England Cable News, WCAX-TV 3, WPTV Channel 5 News, *The Rutland Herald*, *Keene Sentinel*, Vermont Public Radio, National Public Radio, Massachusetts Public Radio, New York Public Radio, *The Burlington Free Press*, CBS national news, and *The Boston Globe Magazine*.

Maternal Colony Research

The WNS regional biologist participated in three maternal colony trapping nights. Two of these nights were in New Hampshire: a barn in Canterbury and a barn in Charlestown. One trap night was in Milton, VT at a barn in the Sandbar Wildlife Management Area. See table 1 for survey results.

Table 1

Date Trapped	Location	Number/Species
7/13/2009	Charlestown Barn Charlestown, NH	149 <i>M. lucifugus</i>
7/20/2009	Canterbury Barn Canterbury, NH	137 <i>M. lucifugus</i> 3 <i>Eptesicus fuscus</i>
7/27/2009	Sandbar Bar Barn Milton, VT	15 <i>M. lucifugus</i>

On June 26, 2005 an exit count was conducted at the Sand bar barn and 380+ bats were counted. On July 27, 2009 VTFWD conducted an exist count at the same barn and a total of approximately 100 bats were counted. WNS has reduced this maternal colony by approximately 75 percent.

Fall Swarming Work

The WNS regional biologist assisted with fall swarm capture work at two sites in Vermont; Aeolus bat cave and Elizabeth Mine, and one site in New Hampshire at the Paddock Copper Mine. See table 2 for survey results.

Table 2

Date Trapped	Location	Number/Species
9/9/2009	Paddock Cooper Mine Lyman, NH	22 <i>Myotis septentrionalis</i> 24 <i>Myotis lucifugus</i>

9/10/2009	Elizabeth Mine Strafford, VT	1 <i>M. lucifugus</i>
8/28/2009	Aeolus Bat Cave Dorset, VT	18 <i>M. lucifugus</i>

The research effort at Paddock Copper Mine was conducted for the first time in the fall of 2009. This research was focused at documenting the movements of bats from the fall swarm to the hibernacula. All bats were banded during the survey and will hopefully be relocated during subsequent winter hibernacula surveys in three adjacent mines. The 3 mines that will be searched are all located within approximately 3 kilometers of each other. These hibernacula surveys will be conducted during the winter of 2009/2010 and results will give us insight on bat movements from fall swarm location to hibernation location.

VTFWD started fall swarm research at Elizabeth Mine in 2002 when 842 bats were captured, and numbers peaked in 2006 when 951 bats were captured. WNS was first documented at this site during the winter of 2007/08, during the 2008 fall swarm survey only 94 bats were captured and in 2009 only 1 bat was captured. If fall capture rates accurately reflect the numbers of hibernating bats in this site, than WNS has reduced the over wintering bat population by virtually 100 percent. See table 3 for survey results.

Table 3.

Elizabeth Mine Fall Swarm Survey Results

Year Surveyed	Bats Captured	Bats captured per hour
2002	842	58.07
2005	329	73.11
2006	951	163.12
2008	94	25.68
2009	1	0.20

The WNS regional biologist was responsible for collecting and organizing biological specimens that were collected during the fall swarm research at Aeolus bat cave, Red Mine, Carter Mine and Paddock Copper Mine. These specimens were shipped to Sybill Amelon at the USFS Northern Research Station in Columbia, MO and Tim King of the USGS in Kearneysville, WV.

Cave and Mine Measurements and Landowner contacts

The WNS regional biologist visited Red Mine and Carter Mine in Lyman, New Hampshire on July 20, 2009 and photographed and measured the entrances of both of the mines. On March 12, 2009 the WNS regional biologist visited Aeolus bat cave and measured the entrance. The WNS regional biologist contacted the landowners of Carter mine and Red mine to discuss the possibility of conducting WNS research and the possibility of gating each site.

2010 Surveillance Plan

The WNS regional biologist is responsible for writing the 2010 WNS surveillance and monitoring plan for VT. This plan will be in accordance with the White-nose Syndrome Surveillance and Population Monitoring for Cave Dwelling Bats document. This document was derived from the 2009 WNS regional symposium.

USFWS Harp Trap Assembly

The WNS regional biologist assembled USFWS Region 5 harp trap.

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