



BATS AND WHITE-NOSE SYNDROME

meeting the challenges of public data reporting

Mylea L. Bayless, Bat Conservation International

with special thanks to Lisa Williams, Pennsylvania Game Commission

BATS 101 : THE SHORT VERSION

Worldwide over 1,100 species identified



One in every five species of mammal is a bat!



Bats are the slowest-reproducing mammals for their size.

A few species give birth to two to four pups, but most only have one pup per year.

Bats Pollinate Plants



.....and Disperse Seeds



COMMERCIAL FRUITS



TEQUILA



REFORESTATION

Others Are Carnivores..





Insectivorous bats are important for keeping crop and forest pests in check

70% of Bat Species Worldwide Eat Insects
Nearly All US Species are Insectivores



Many insectivorous bats can eat 60% of their body weight in insects every night.

White-Nose Syndrome (WNS) 101



Unidentified agent or agents is causing mass mortalities at a growing number of bat hibernacula in Eastern United States.



Clinical signs:

- A white fungus evident on the nose, ears, or wings of most affected animals
- Wing damage
- Depleted body fat



Jonathan Reichard

Behavioral signs



Abnormal behavior:

- Bats flying outside in daylight
- Dead bats near cave entrances or on landscape





Fungal Biology – Mycology

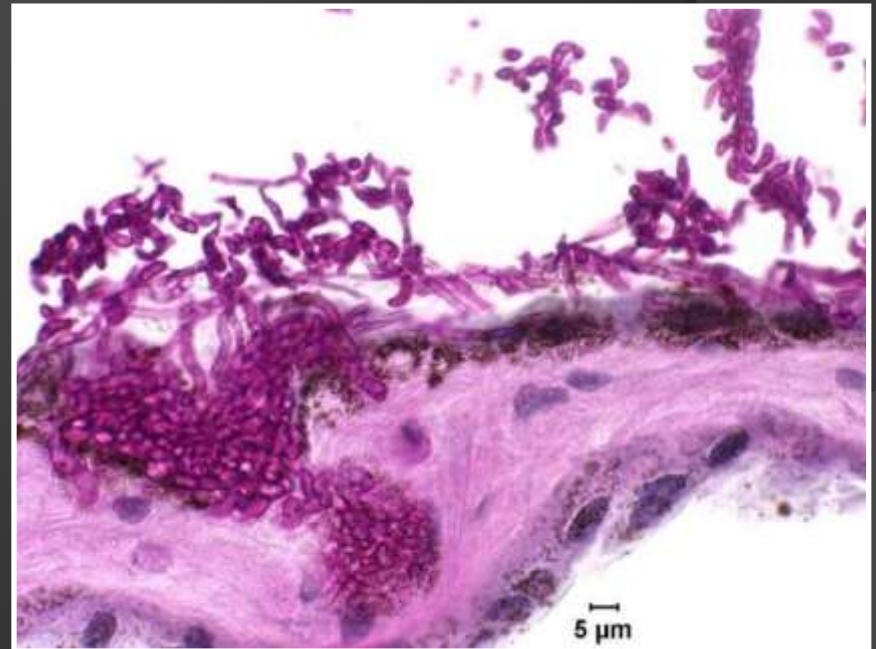
- Parasitology: Disease causing parasites not found.
- Virology: No known viral pathogens identified.
- Bacteriology: No consistent findings.

- Fungus requires cold for growth.
- It cannot grow at room temperature ($> 20^{\circ} \text{C}$).
- Common on sick bats.
- Absent from healthy bats.
- All isolates are identical.
- Fungus is a new species
- *Geomyces destructans*

Bat Wings – In addition to flight, they are critical for:

- Heat Dissipation
- Water Control
- Gas Exchange
- Blood Pressure Regulation

NYS DOH
Photo by M. Behr



- **> 90% mortality**
- **Spreading rapidly**
- **All 6 northeastern cave bat species affected**
- **1 Fed. listed species**



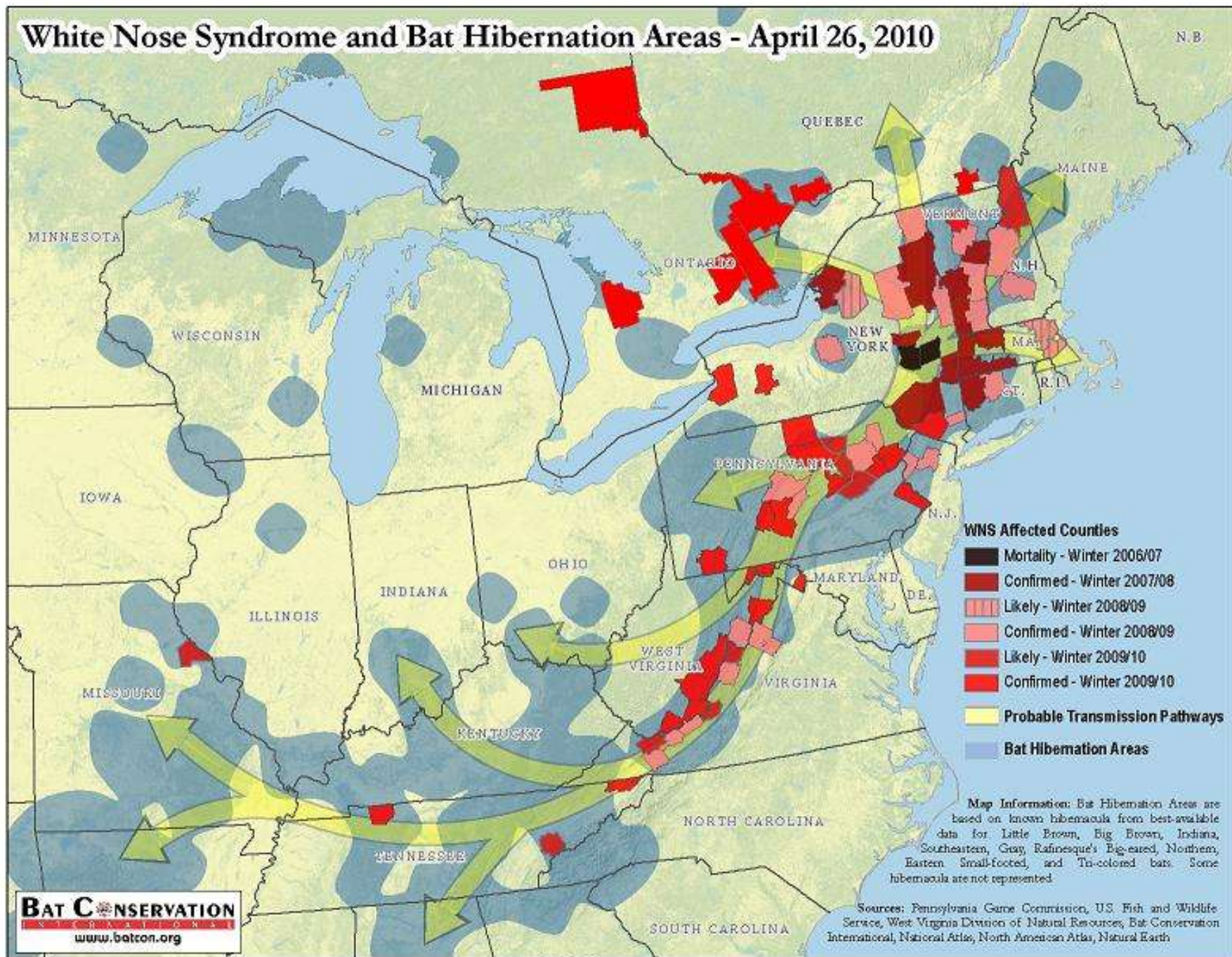
Courtesy: Jonathan Reichard

“White-Nose Syndrome (WNS) is a devastating disease of hibernating bats that has caused the most precipitous decline of North American wildlife in recorded history.....”

If the spread of WNS is not slowed or halted, further losses could lead to the extinction of entire species and could more than quadruple those that are federally listed as endangered in the U.S. Such losses alone are expected to have unprecedented consequences on ecosystem health throughout North America, with unknown economic consequences.”

From the Consensus Statement of the Second WNS Emergency Science Strategy Meeting

White Nose Syndrome and Bat Hibernation Areas - April 26, 2010



WNS: A European Connection.....

Hungary



Photo: Tamas Gorfol

Switzerland



© photo René Göttinger, 12 March 2009
Andres Beck & Fabio Bontadina, bat conservation Switzerland, fb@swild.ch

Netherlands



Photo: Annemarieke Haarsma

Romania



Photo: Szilard Bucs

Why are bats vulnerable?



Many are cave hibernators:

- **Clustering behavior promotes pathogen transmission**
- **Limited energy resources during hibernation**

Bats are slow to reproduce, which will limit population recovery.

Geographic Spread

Transmission:

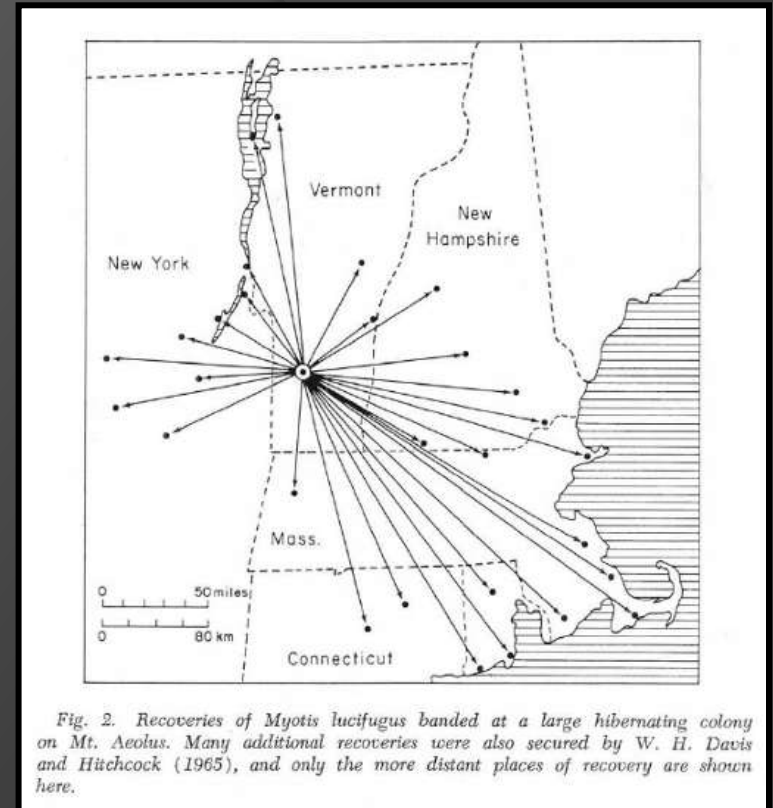
Bat-to-bat

Little brown bat movement to summer colonies from Mt. Aeolus, VT hibernaculum

Anthropogenic

- May be spread by human activity

- FWS has requested voluntary ban on caving



Six Species Currently Impacted



Indiana bat



little brown bat



tricolored bat



big brown bat



small-footed bat



northern long-eared bat

Potential to impact the 25 species of hibernating bats in the US and Canada...and what about in Mexico?

This Year?

Next Year?

Which Species
Are Next?





WNS CHALLENGES

- Ongoing investigation
 - time is of the essence
- Complex coordination needs
- Control presents biological and social challenges
- Three listed species vulnerable now
- Potential to impact 25 N. A. bat species
- Future litigation and/or petitions likely
- Grassroots interest in bat conservation

WHO IS GOING TO BE DEALING WITH WNS?



July 20, 2009

Sources: Pennsylvania Game Commission, West Virginia Division of Natural Resources, Ontario Ministry of Natural Resources, National Atlas, North American Atlas, Natural Earth

BAT CONSERVATION
INTERNATIONAL
www.batcon.org

HOW ARE YOU GOING TO RESPOND TO WNS?

WNS STATE RESPONSE PLAN ?



SURVEILLANCE / MONITORING / EARLY DETECTION?

- What is happening “real-time”
- Providing public safety
- Tracking progression of WNS

HOW DO YOU ALLOCATE RESOURCES?

- Limited # of biologists available for surveillance
- Citizens monitoring landscape for you – use your biologists strategically

WNS MANAGEMENT CHALLENGES

- DISTURBANCE AT HIBERNATION SITES?
- WELL-INTENTIONED INTEREST FROM PUBLIC
- ACCOUNTABILITY TO TAXPAYERS / CONSITUENTS



Photo courtesy VT Fish & Wildlife Dept.

“WHAT CAN WE DO????”

CONSIDER A PUBLIC DATA REPORTING SYSTEM

1) ALLOWS YOU TO BUILD AN ORGANIZED CAPACITY FOR RESPONSE

2) CITIZEN SCIENCE CAN SUPPORT SURVEILLANCE

3) TIE CITIZEN REPORTING INTO WNS RESPONSE

- elements of the emerging WNS national plan
- individual state or agency response plan

4) OPPORTUNITY FOR RESEARCH COLLABORATION

- specimen collection
- early detection
- rate of transmission (modeling epidemiology)

DESIGN

DEVELOP A SYSTEM TO GET YOU RELEVANT RESULTS

- simple reporting
- clear and concise message



From PA reporting page

We'd like to hear from you if you've seen any of the following:

- Bats that are dying or dead in groups of 5 or more
- Bats with a white fungus on their face or wings
- Missing or greatly-reduced summer bat colonies

DATA

ORGANIZE DATABASE TO MAKE YOUR JOB EASIER

- Contact information
- Location of Report (city, county, google earth?)
- Reporting codes (e.g. bat flying, dead bat, cave location etc.)
- Required fields to choose from
- Regional codes / reporting codes
- Invisible relevancy codes on back end



OUTREACH

PUBLIC AWARENESS / OUTREACH / PARTICIPATION

- link on every relevant landing page
- combine with press releases / media reports

Joe Manchin III, Governor
Frank Jezioro, Director

News Release: February 23, 2010

Hoy Murphy, Public Information Officer (304) 558-2003 ext. 365 hoy.r.murphy@wv.gov

Contact: WVDNR - Craig Stihler 304-637-0245
USFWS - Diana Weaver 413-253-8329;
Barbara Douglas 304-636-6586

West Virginia's Most Important Bat Cave Has White-Nose Syndrome

Biologists from the West Virginia Division of Natural Resources (WVDNR) and the U.S. Fish and Wildlife Service (USFWS) report that white-nose syndrome (WNS) has been confirmed in a bat in Hellhole, Pendleton County, West Virginia, by the Southeastern Cooperative Wildlife Disease Study in Athens, Ga. If the effects of WNS on the bats in Hellhole are similar to those seen elsewhere, biologists expect that WNS will devastate the bat population in this cave, including endangered species.

Hellhole is the largest and most important bat cave in the state. An estimated 200,000 bats spend the winter hibernating in the cave. The cave is also important on a national level as it is designated critical habitat for two federally endangered species, the Indiana bat and the Virginia big-eared bat. Hellhole supports nearly 13,000 Indiana bats and 5,000 Virginia big-ears. The other bats in the cave are mostly the more common



RESPONSE

WHAT ARE YOU WILLING AND ABLE TO DO & WHY?

1) Decide how you will respond to reports ? Internet / Mail / Phone

2) Centralized system ensures quality response and data collection

-Designated person to respond to each message?

- 24 hour response time?

-Different responses for different types of reports.

-Is it a public health threat?

-Is it a new area with no previous WNS history?

-Do you need to follow up by phone?

-Do you need to follow up in person?

“If you don’t do it right – it could be bad public outreach”

RESULTS

From Pennsylvania ...

- Found unknown hibernacula
- Busy week is 100 citizen reports
- Coordinate with Regional Offices
(85% of reporters also called regional office)
- Connected with public – the public cares...



PA citizen report:

“The last 2 weeks we've found bats flying around during the DAY looking "lost" if that is possible. Only to see them the next morning dead on the porch. One was hanging on my window screen dead. One was that tired it landed on my father in laws shoulder, just to sit there and not leave. They look very skinny and not the normal round belly. Very sad.”

EXAMPLE REPORTING SYSTEMS

PENNSYLVANIA, DELAWARE, VERMONT & NEW HAMPSHIRE

PROS

- 1) Internal control / development
- 2) Keep \$\$ in – house
- 3) Sole access to data



CONS

- 1) More difficult to share or combine with other states for regional comparisons
- 2) Requires internal staff to build / maintain

EXAMPLE REPORTING SYSTEMS

KESTREL -- NEW PUBLIC REPORTING SYSTEM DEVELOPED BY NATURESERVE

PROS

- 1) Centralized data in database
- 2) Flexible data model
- 3) Individual portals but shared database
- 4) Reporting options
- 5) Opportunity to look at data regionally
- 6) Data security available

CONS

- 1) Purchase agreement
- 2) Data not in-house

<https://kestrel.natureserve.org>

WNS INFORMATION

Up-To-Date Information and Summaries Available at :

White-nose Syndrome



Science Strategy
Meeting II

May 27-28, 2009
Austin, Texas

U.S. Fish and Wildlife

http://www.fws.gov/northeast/white_nose.html

U.S. Geological Survey

<http://www.fort.usgs.gov/WNS/>

Bat Conservation International

<http://www.batcon.org/WNS/>

National Speleological Society

<http://www.caves.org/WNS/>

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QUESTIONS ??