White-nose syndrome in Washington

Katie Haman, DVM, MSc
Fish and Wildlife Veterinarian
Washington Department of Fish and Wildlife

Before we start . . . Bats are important!

Provide ecosystem services:

- Billions of dollars of free pest-control services
- Pollinators
- Seed dispersers

Bats in Washington

- 15 species
- Not all hibernate – winter activity
- Those that do – very few in caves
  - Others - root balls, talus slopes ??
  - No known large aggregations (>few hundred)

White-nose Syndrome in bats – Unprecedented Crisis

- Devastating fungal disease that affects hibernating bats
- *Pseudogynmoascus destructans* – Causative agent
- National response plan – coordinated by **USFWS**

  whitenosesyndrome.org
- **NOT KNOWN to infect humans or other wildlife.**

White-nose Syndrome in bats – Unprecedented Crisis

MIGRANTS OR SPECIES NOT KNOWN TO HIBERNATE

	Species name	Common name
1	*Mormoops megalophylla*	Ghost-faced bat
2	*Choeronycteris mexicana*	Mexican long-tongued bat
3	*Leptonycteris nivalis*	Greater long-nosed bat
4	*Leptonycteris yerbabuenae*	Lesser long-nosed bat
5	*Macrotus californicus*	California leaf-nosed bat
6	*Lasionycteris noctivagans*	Silver-haired bat
7	*Lasiurus blossevillii*	Western red bat
8	*Lasiurus borealis*	Eastern red bat
9	*Lasiurus cinereus*	Hoary bat
10	*Lasiurus ega*	Southern yellow bat
11	*Lasiurus intermedius*	Northern yellow bat
12	*Lasiurus seminolus*	Seminole bat
13	*Lasiurus xanthinus*	Western yellow bat
14	*Eumops floridanus*	Florida bonneted bat
15	*Eumops perotis*	Greater mastiff bat
16	*Eumops underwoodi*	Underwood's mastiff bat
17	*Molossus molossus*	Pallas' mastiff bat
18	*Nyctinomops femorosaccus*	Pocketed free-tailed bat
19	*Nyctinomops macrotis*	Big free-tailed bat
20	*Tadarida brasiliensis*	Brazilian free-tailed bat

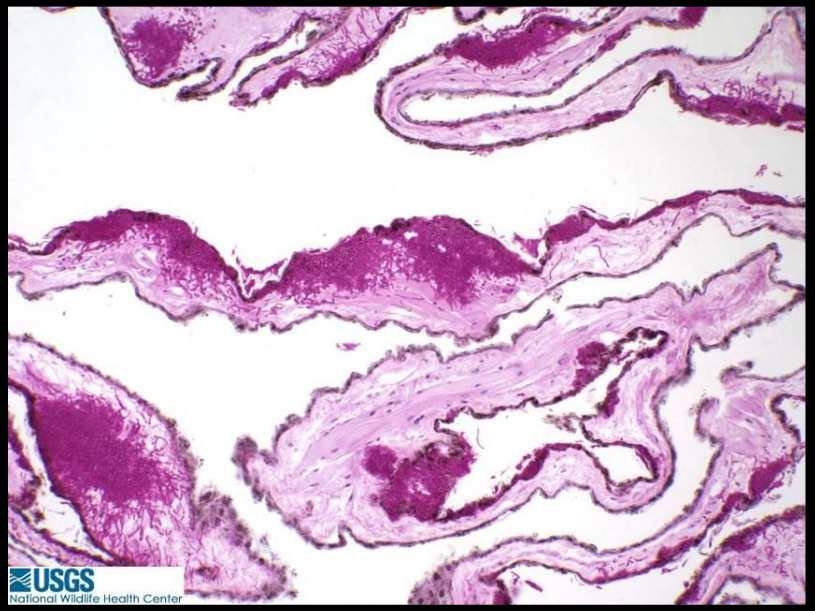
SPECIES THAT HIBERNATE

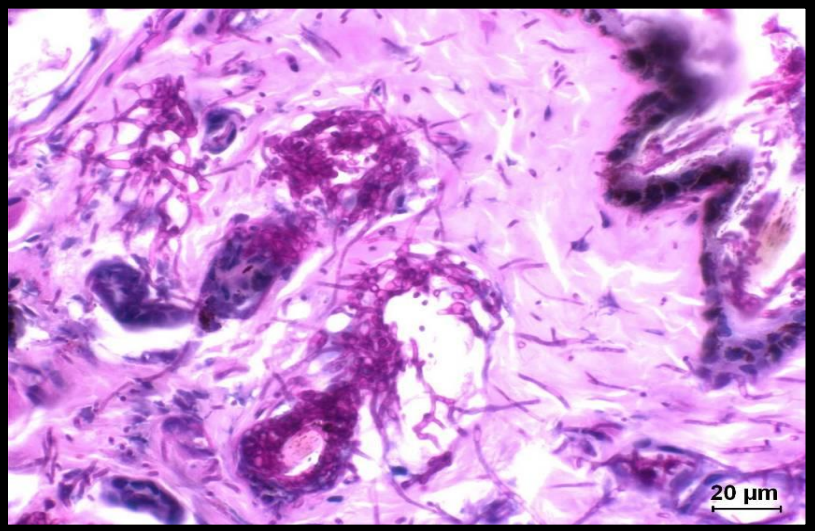
	Species name	Common name
1	*Myotis auriculus*	Mexican long-eared bat
2	*Myotis austroriparius*	Southeastern bat
3	*Myotis californicus*	California bat
4	*Myotis ciliolabrum*	Western small-footed bat
5	*Myotis evotis*	Western long-eared bat
6	*Myotis grisescens*	Gray bat
7	*Myotis keenii*	Keen's bat
8	***Myotis leibii***	**Eastern small-footed bat**
9	***Myotis lucifugus***	**Little brown bat**
10	*Myotis occultus*	Occult bat
11	***Myotis septentrionalis***	**Northern long-eared bat**
12	***Myotis sodalis***	**Indiana bat**
13	*Myotis thysanodes*	Fringed bat
14	*Myotis velifer*	Cave bat
15	*Myotis volans*	Long-legged bat
16	*Myotis yumanensis*	Yuma bat
17	*Nycticeius humeralis*	Evening bat
18	*Parastrellus hesperus*	Canyon bat
19	***Perimyotis subflavus***	**Tricolored bat**
20	*Corynorhinus townsendii*	Townsend's big-eared bat
21	*Corynorhinus rafinesquii*	Rafinesque's big-eared bat
22	***Eptesicus fuscus***	**Big brown bat**
23	*Antrozous pallidus*	Pallid bat
24	*Euderma maculatum*	Spotted bat
25	*Idionycteris phyllotis*	Allen's big-eared bat

Source: Paul Cryan, USGS

Photo credit: Deborah Springer

WNS in bats – Unprecedented Crisis



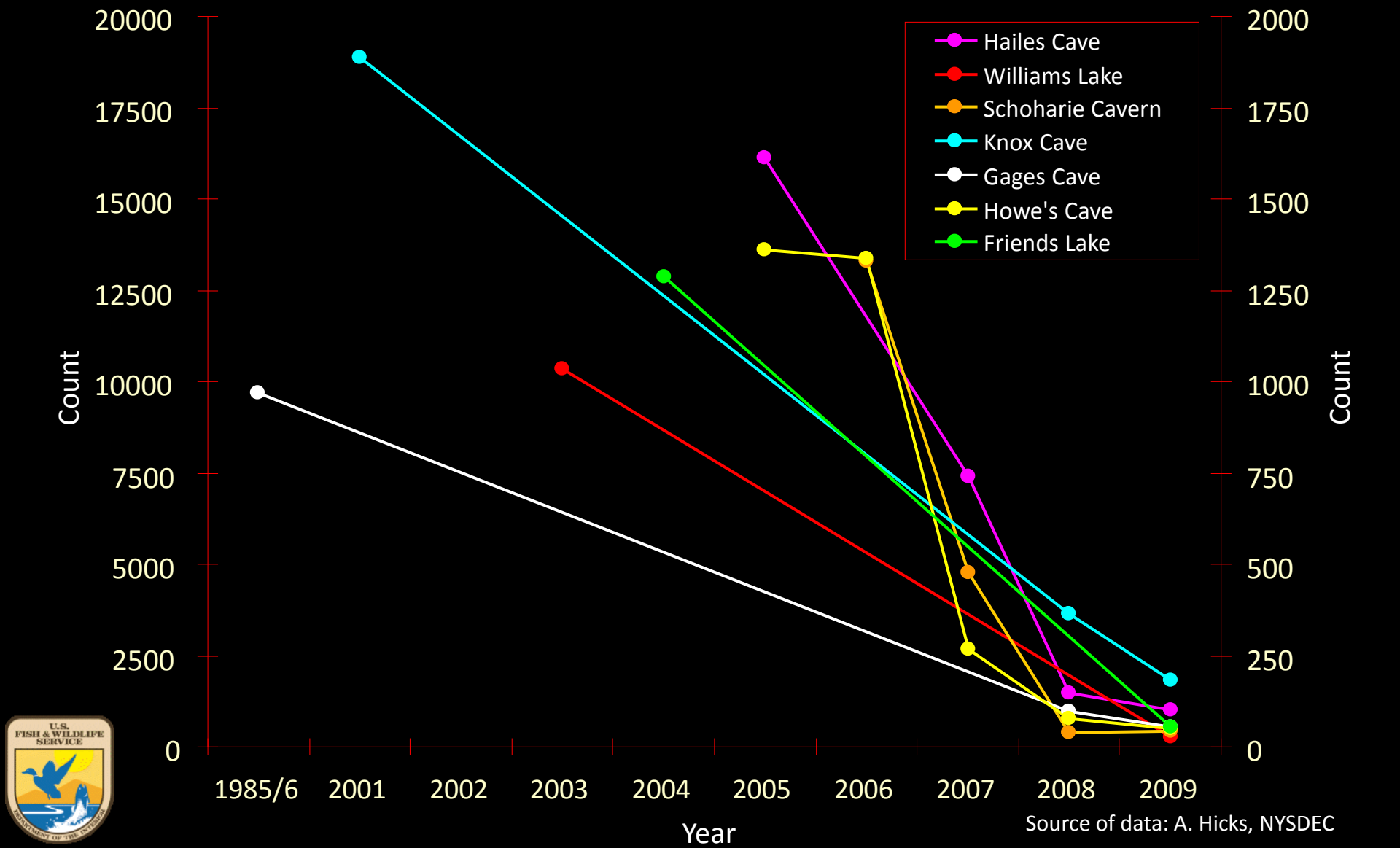


- Wing damage
  - Physiological implications
- Roused from hibernation
  - Starvation

WNS in bats – Unprecedented Crisis

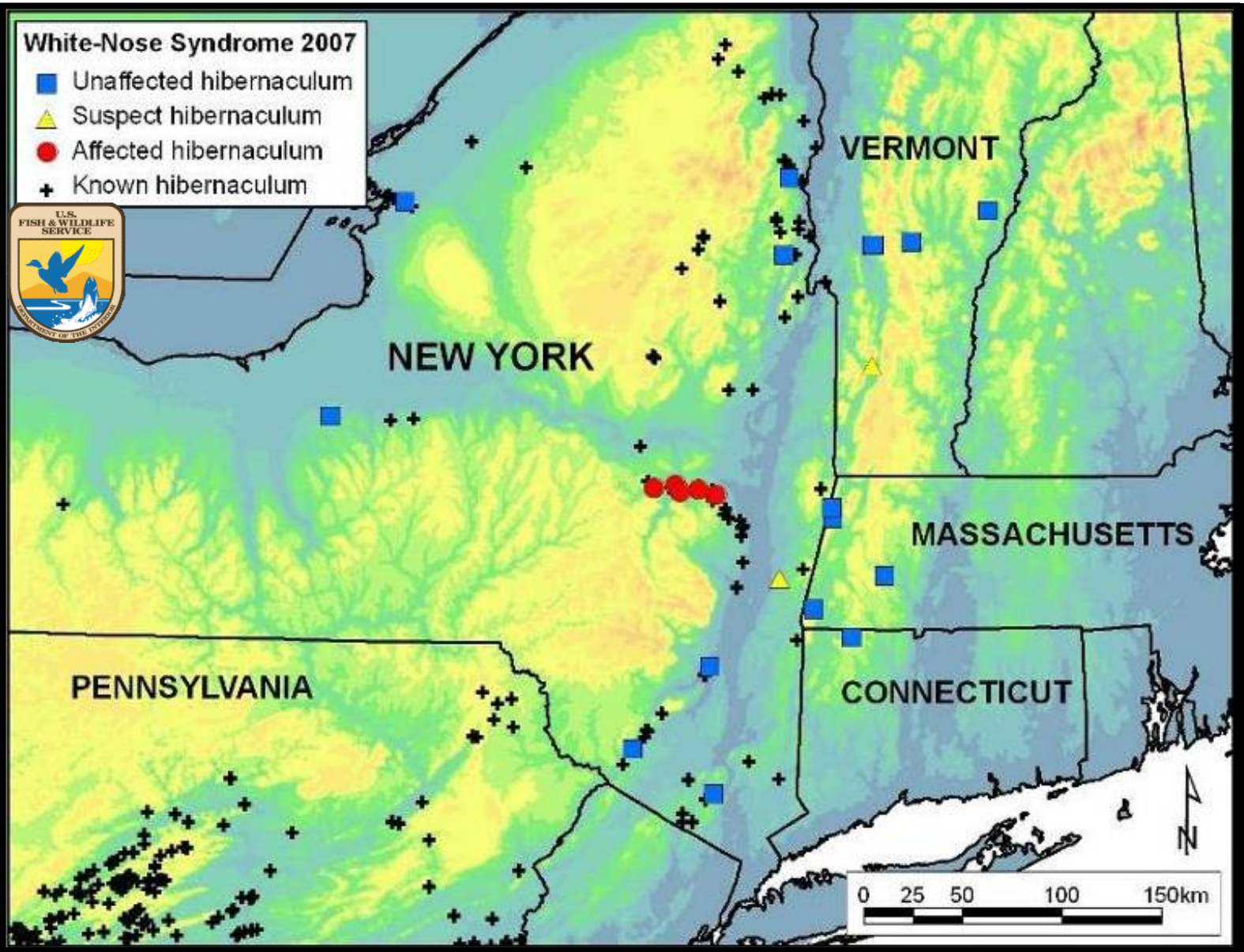
- Has killed >6 million bats in eastern North America
- In some hibernacula, 100% mortality rates
- Discovered in New York in 2006
- Typical spread from a point source
  - Until March 2016

WNS devastation – New York site counts

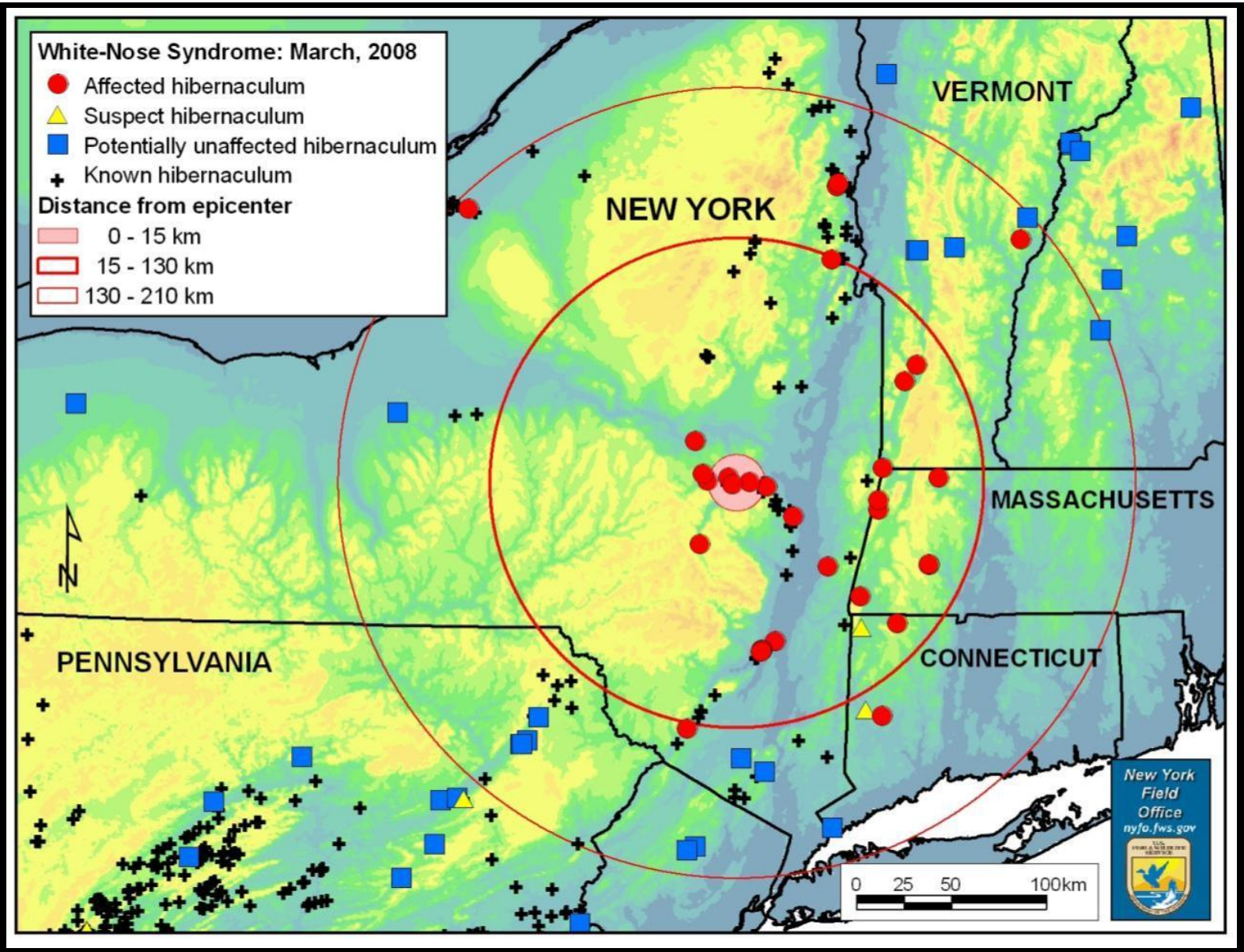


Source of data: A. Hicks, NYSDEC

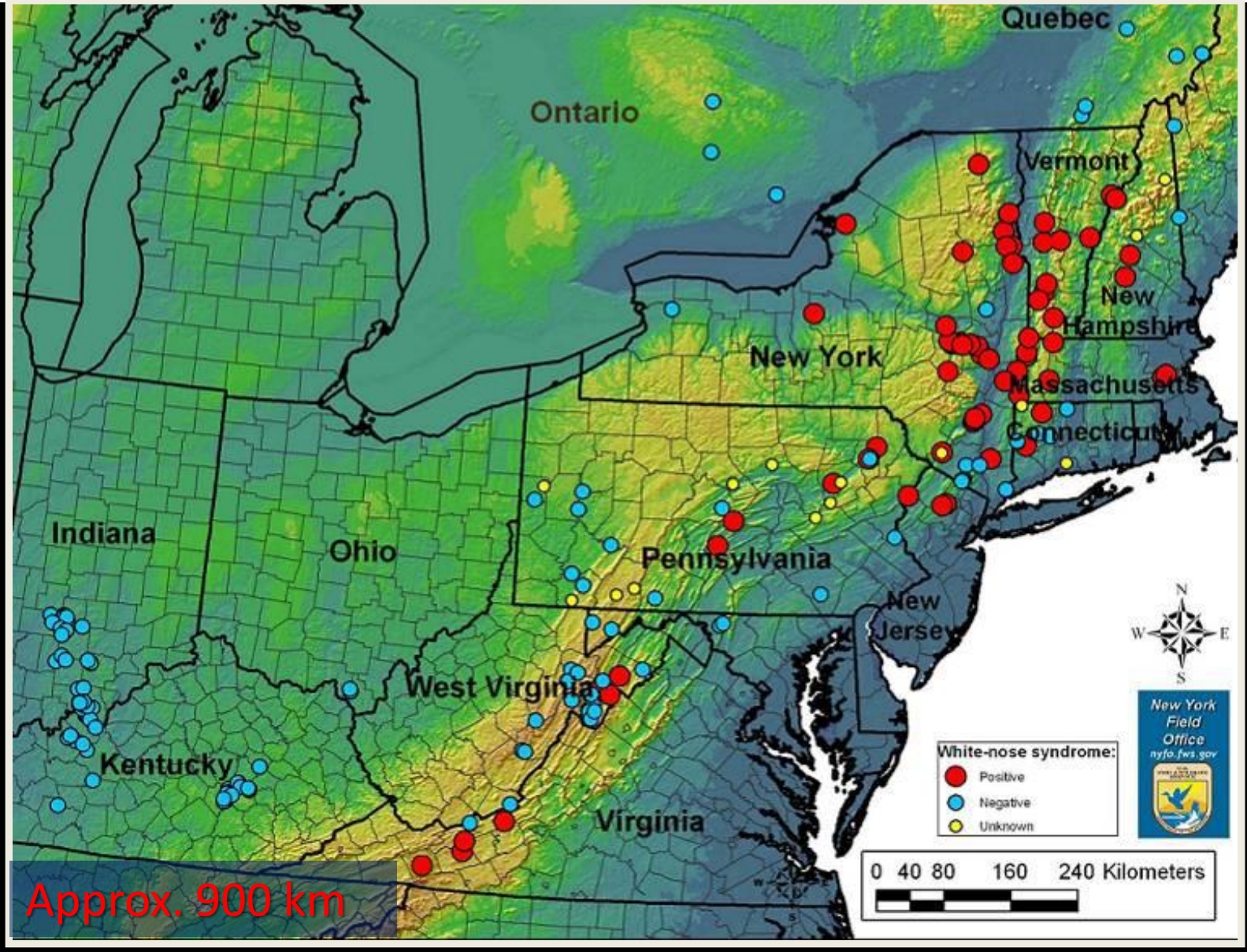
WNS in bats – 2007 – 1 state, 5 hibernacula



WNS in bats – 2008 – 4 states, 42 known hibernacula



WNS in bats – 2009 – 9 states, 88 known hibernacula



WNS in bats – Devastating impacts

	2000	2010
Little brown myotis	183,542	2,049
Northern myotis	440	0
Indiana myotis	104	0
Tri-colored bat	194	2
E. small-footed myotis	721	485
Big brown bat	18	9

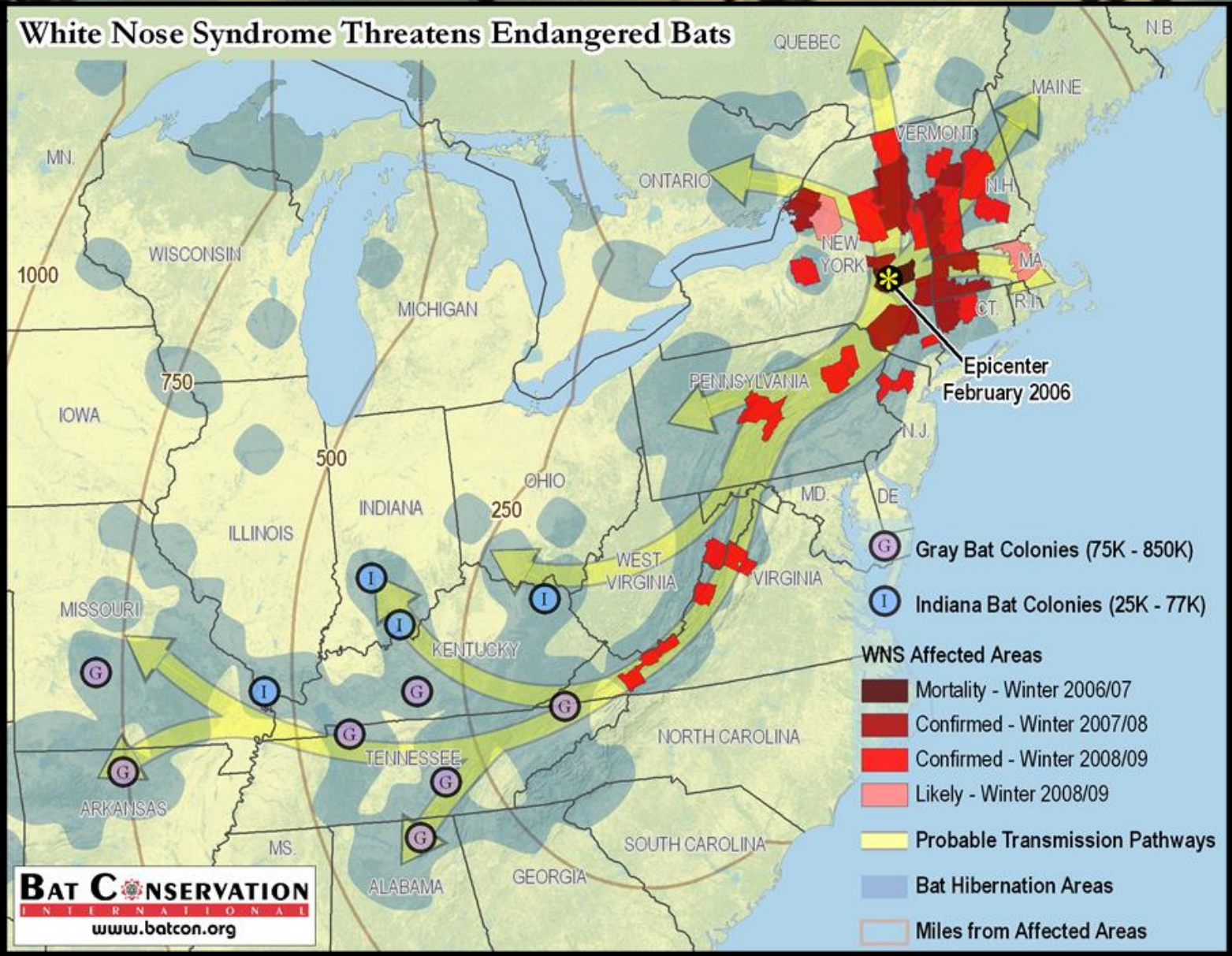
Photo and data: Alan Hicks, NYSDEC

Economic impacts of WNS

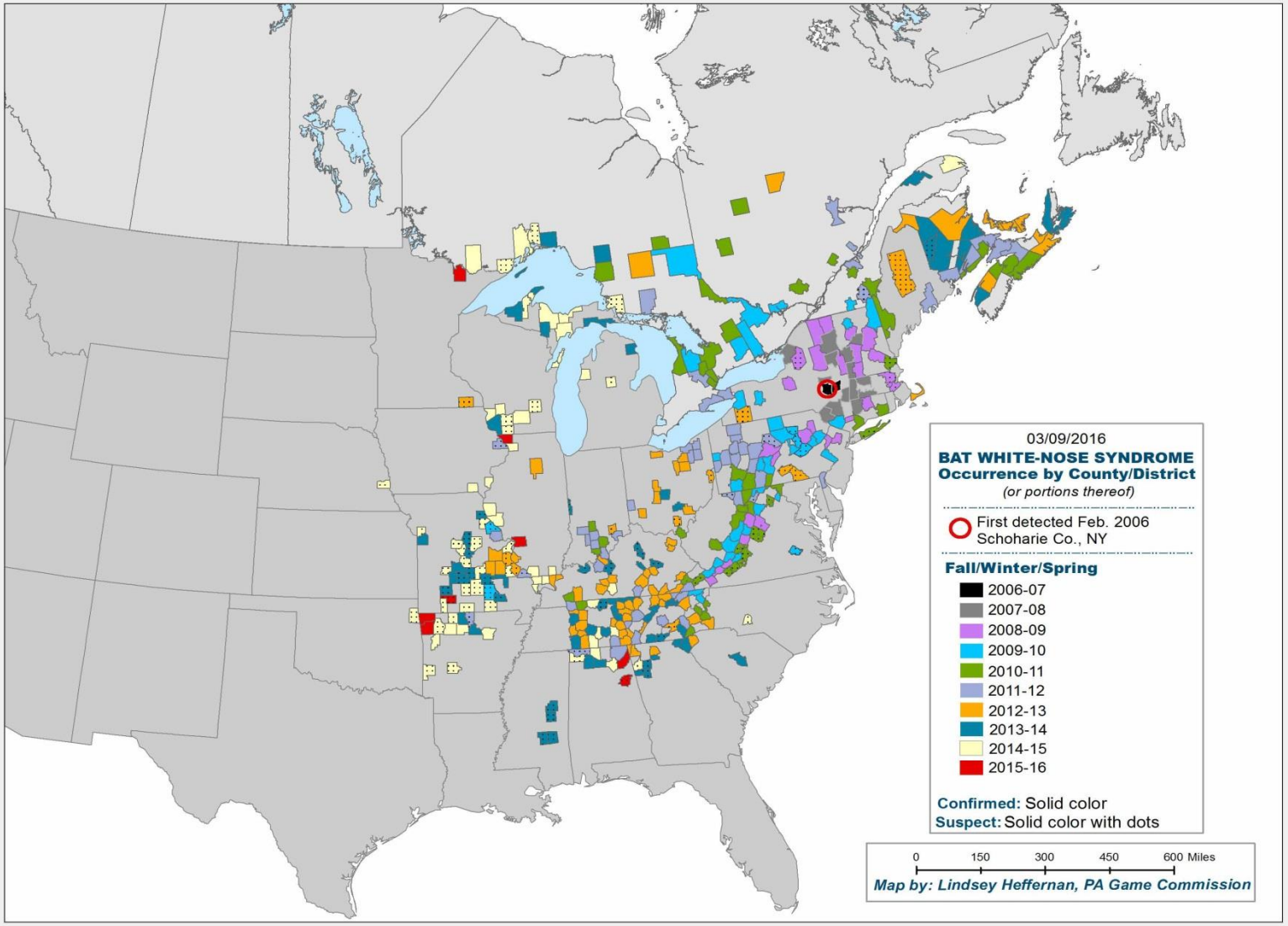
- Single bat eats 4-8g insects/night
  - Extrapolate to the 6million killed by WNS
  - **That's 8000 metric tons/year of insects!!!**
- 150 big browns = 1.3 million insects a year!!
- Economic loss may be devastating
  - $23 billion / year lost!! (Boyles et al., 2011, Science Vol 332)

De Meester / Zumapress

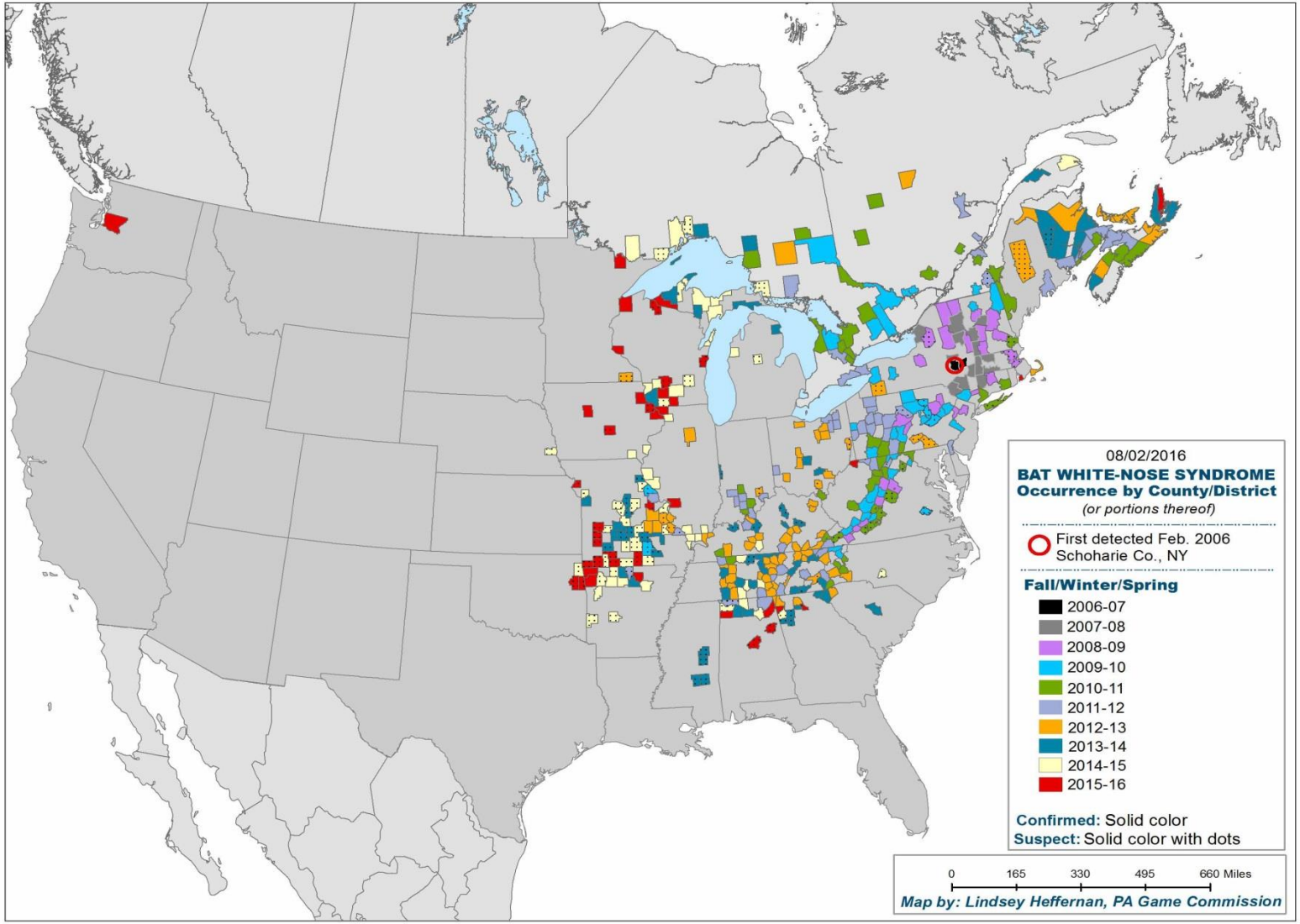
WNS in bats


White Nose Syndrome Threatens Endangered Bats
QUEBEC
N.B.
MAINE
VERMONT
N.H.
MA.
R.I.
CT.
N.J.
MD.
DE
MN.
ONTARIO
WISCONSIN
MICHIGAN
NEW YORK
PENNSYLVANIA
IOWA
ILLINOIS
INDIANA
OHIO
WEST VIRGINIA
VIRGINIA
MISSOURI
KENTUCKY
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
ARKANSAS
MS.
ALABAMA
GEORGIA
1000
750
500
250
Epicenter
February 2006
Gray Bat Colonies (75K - 850K)
Indiana Bat Colonies (25K - 77K)
WNS Affected Areas
Mortality - Winter 2006/07
Confirmed - Winter 2007/08
Confirmed - Winter 2008/09
Likely - Winter 2008/09
Probable Transmission Pathways
Bat Hibernation Areas
Miles from Affected Areas
BAT CONSERVATION INTERNATIONAL
www.batcon.org

Distribution of WNS March 9, 2016



Distribution of WNS March 31, 2016



White-nose Syndrome in Washington

Initial detection

- March 11th - RP discovered bat → taken to PAWS
  - Died in captivity and submitted to USGS-NWHC
- Confirmed Pd/WNS 22nd March 2016
- WDFW launched response plan with partners

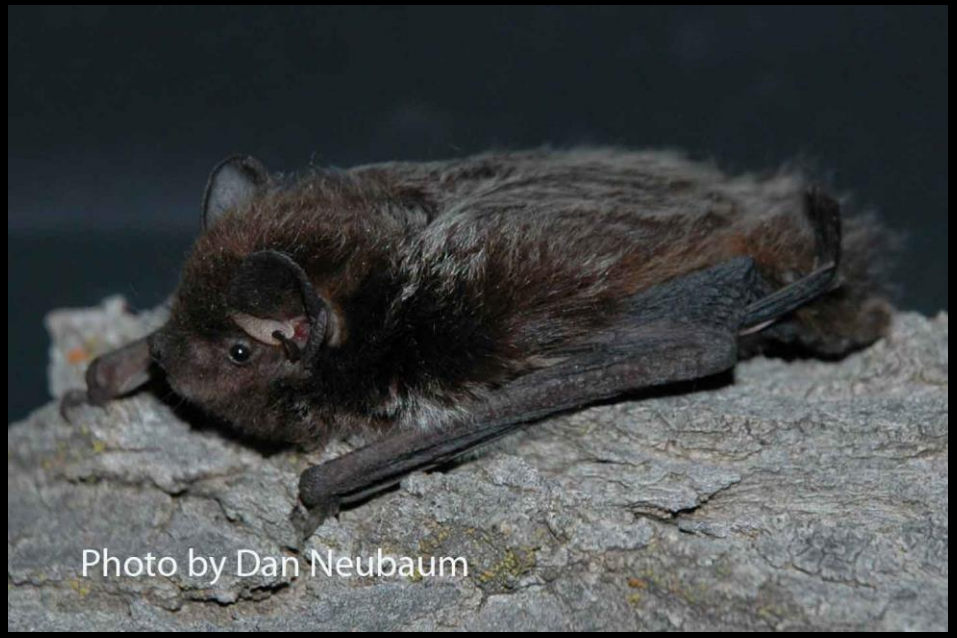
Photo credit: PAWS

Photo credit: PAWS

White-nose Syndrome in Washington

Two additional Pd-detections:

- Silverhaired bat – submitted for rabies testing
  - Pd+ only → No WNS
- Guano – from bridge on I-90
  - **Importance of this finding!!!**



I-90 Bridge

I-90 Bridge – Guano Traps

White-nose Syndrome in Washington

AMERICAN SOCIETY FOR MICROBIOLOGY | mSphere™

OBSERVATION
Clinical Science and Epidemiology

First Detection of Bat White-Nose Syndrome in Western North America

(Lorch et al., 2016)

- Genetically similar to eastern strain
- Still many unknowns . . .

White-nose Syndrome in Washington

- Key differences in eastern vs western NA make surveillance more difficult

White-nose Syndrome in Washington

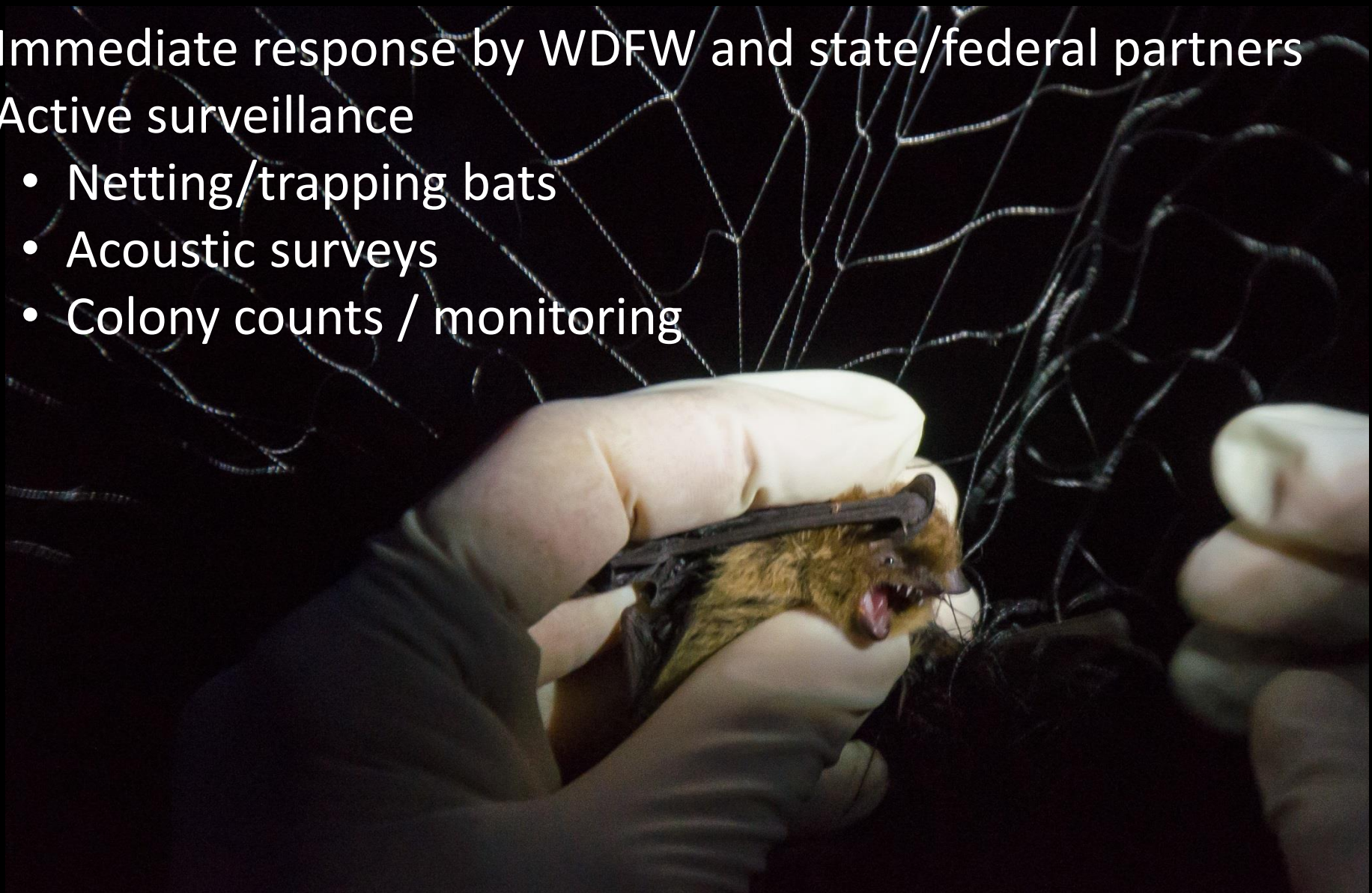
Key differences in eastern vs western NA make surveillance more difficult

- Not just habitat → Clinical presentation . . . ??

Photo credit - PAWS

White-nose Syndrome in Washington !!

- Immediate response by WDFW and state/federal partners
- Active surveillance
  - Netting/trapping bats
  - Acoustic surveys
  - Colony counts / monitoring



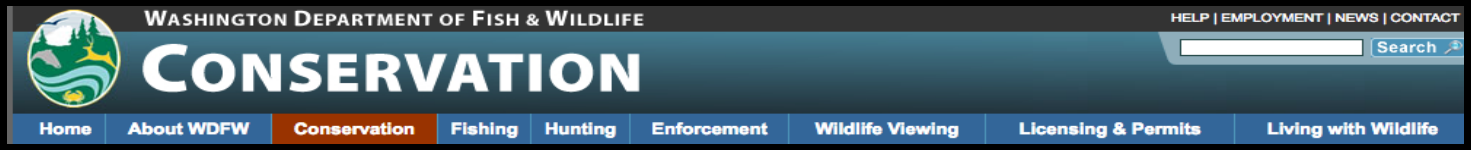
White-nose Syndrome in Washington !!

- Immediate response by WDFW and state/federal partners
- Passive surveillance
  - DOH rabies submissions (historical cases)
  - Rehabilitation facilities
  - WCOs, Animal Control, etc
  - Citizen reports

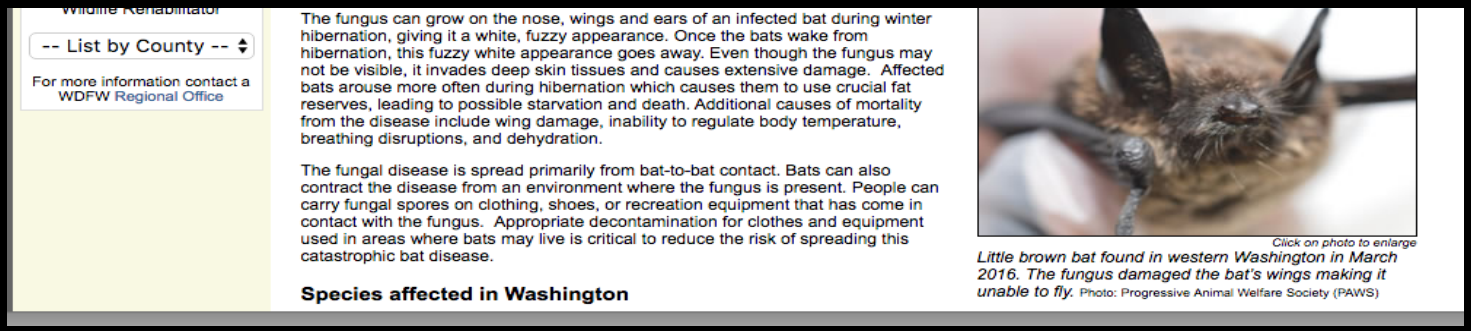
Photo credit - PAWS

White-nose Syndrome in Washington

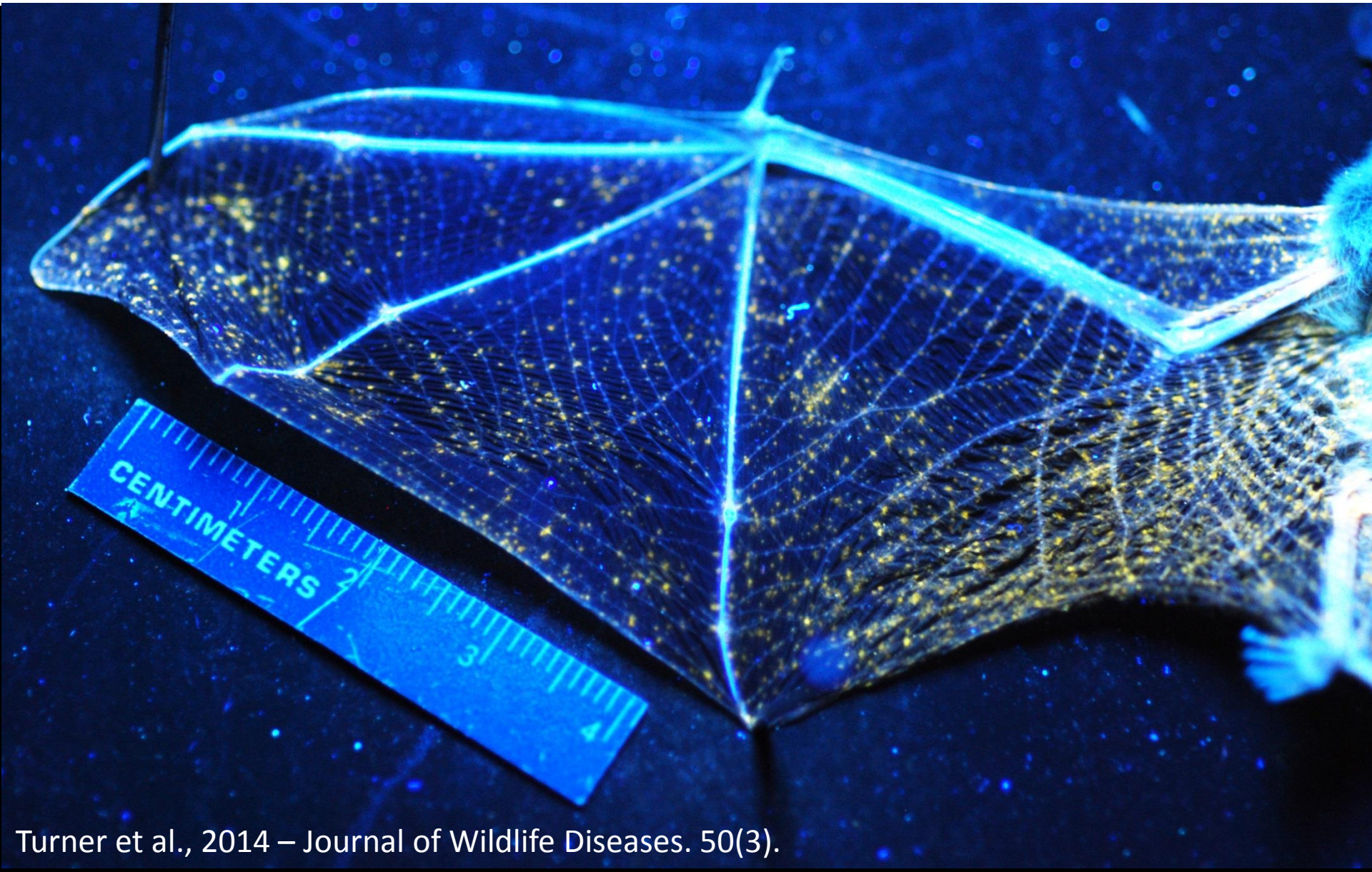
- WDFW is asking citizens to report *sick/dead bats* and *groups of bats*
- This is critical in our WNS surveillance efforts!!



But it also means increased risk of exposure and likely rabies submissions. . .



White-nose Syndrome in Washington



Turner et al., 2014 – Journal of Wildlife Diseases. 50(3).

White-nose Syndrome in Washington

- WDFW needs your help!!! **Please** report bats to WDFW
  http://wdfw.wa.gov/conservation/health/wns/
- Be aware of the risks!! When in doubt → Contact DOH!
- Don't spread the fungus!! → Decontamination is key!
  https://www.whitenosesyndrome.org/topics/decontamination
- Specific information: whitenosesyndrome.org

Katherine.haman@dfw.wa.gov
Abigail.tobin@dfw.wa.gov

Photo credit: Ryan von Linden/NY Dept of Environmental Conservation

Photo Credit: Utah DWR

Photo credit: PAWS

Questions?

Katherine.haman@dfw.wa.gov

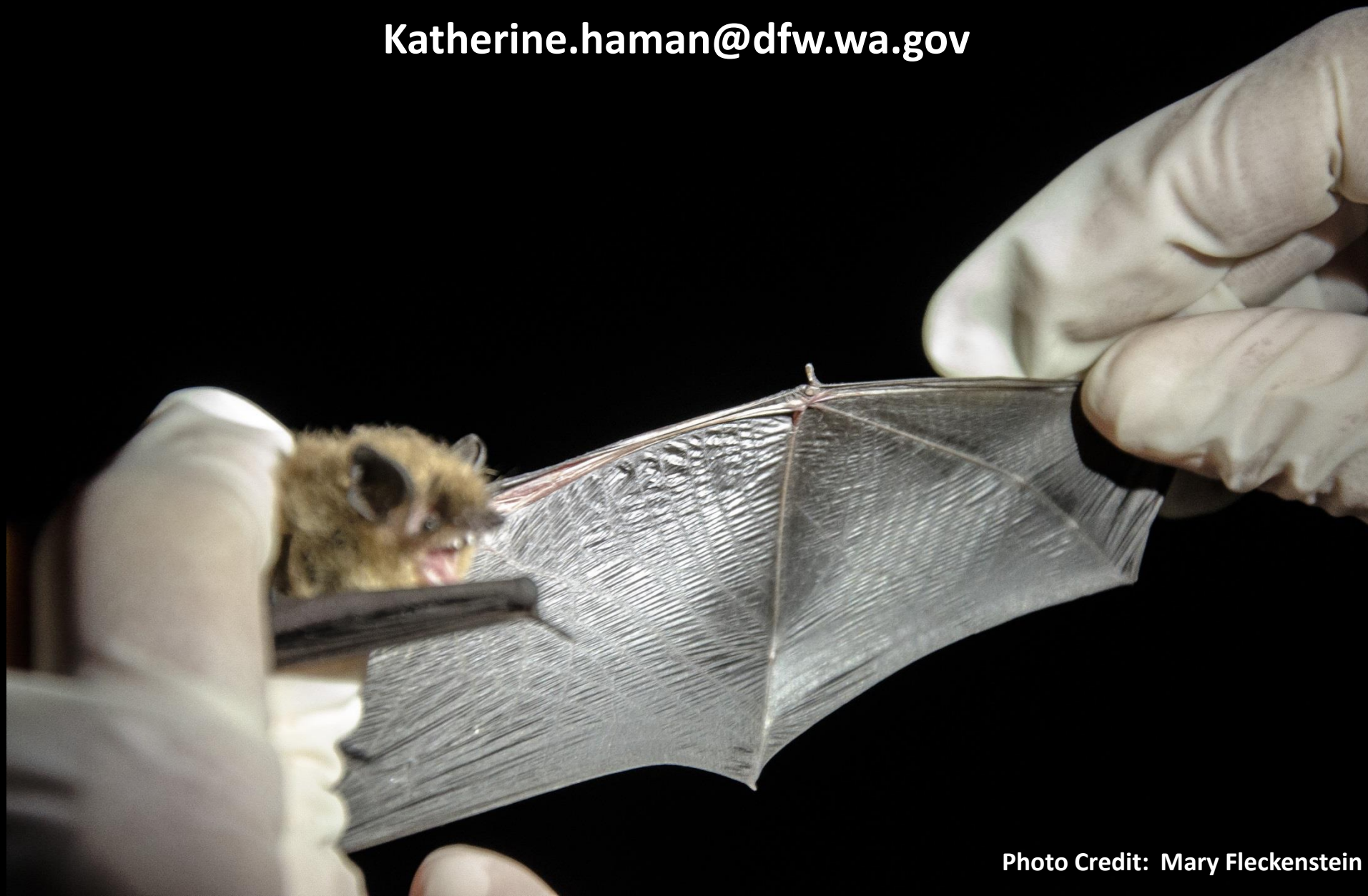


Photo Credit: Mary Fleckenstein