

# BATS of WISCONSIN

Wisconsin Lakes  
Partnership Convention  
March 31.2016

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Bureau of Natural Heritage Conservation

You need bats.  
Bats need you!



WISCONSIN  
BAT PROGRAM







# Why bats need protection



Gather in large numbers



Reliance on critical habitat



Long-lived



One baby (pup) per year



# Bat predators



Snakes



Owls



Hawks



Raccoons



Cats

Photo: [Alperry.com](http://Alperry.com)





# Wisconsin bats



Insectivorous



Predators



Hungry!





## Wisconsin bats are valuable



Bats eat agricultural pests which means fewer pesticides used



Corn borers, cutworm moths, potato beetles, & grasshoppers



\$658 million - \$1.5 billion annually in Wisconsin alone



# Wisconsin bat groups:



## Tree Bats



Silver-haired Bat



Red Bat



Hoary Bat

## Cave Bats



Little Brown Bat



Big Brown Bat



Eastern Pipistrelle/Tri-colored Bat



Northern Long-eared Bat



# Bats of Wisconsin – Tree Bats



Photo by Paul Cryan

Photo by Lynn Robbins



# Overwintering above ground?

In temperate zones,  
flying insects are only  
abundant for about half  
the year

Photo: WDNR



A large group of hibernating bats, likely of the species *Myotis*, are clustered together on a piece of cork bark. The bats are densely packed, with their heads and wings visible. They appear to be in a state of hibernation, with their wings folded and their bodies pressed against each other. The background is a blurred, reddish-brown surface, possibly the interior of a cave or a natural habitat.

The solution: Hibernate

Many species of bats spend  $>$  half their lives hibernating



# Survival by Hibernation



- Deep torpor for prolonged periods
  - Air temperatures 0-15°C
  - Body temperatures 1-2°C above air temperature
- Energy expenditure minimal in hibernation
- Most fat energy goes into periodic arousals (warming)
  - Drink, urinate, mate, move
- Hibernation usually safe

WISCONSIN BATS *Eptesicus fuscus*

# Big brown bat



- Cave bat
- Eats beetles
- Roost in buildings and bat boxes
- Hibernates in cold, dry conditions
- Status: state threatened





## WISCONSIN BATS *Myotis lucifugus*



# Little brown bat

- Cave bat
- Roosts in trees, attics, buildings
- Hibernates in stable, humid conditions
- Status: **state threatened**



WISCONSIN BATS *Perimyotis sublavus*

# Eastern pipistrelle

- Cave bat
- Smallest WI bat
- Solitary in summer & winter
- Hibernates in warmer, more humid conditions
- AKA "tri-colored" bat
- Status: state threatened





WISCONSIN BATS *Myotis septentrionalis*

# Northern long-eared bat

- Cave bat
- Little known about summer habits
- Hibernates in cracks & crevices
- Status: state threatened & federally threatened



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broach

Prevent extinction, manage  
while implementing  
sustain or  
rese

s,

**Keep them here**

**Keep them healthy**

**For as long as possible**

conservation strategies



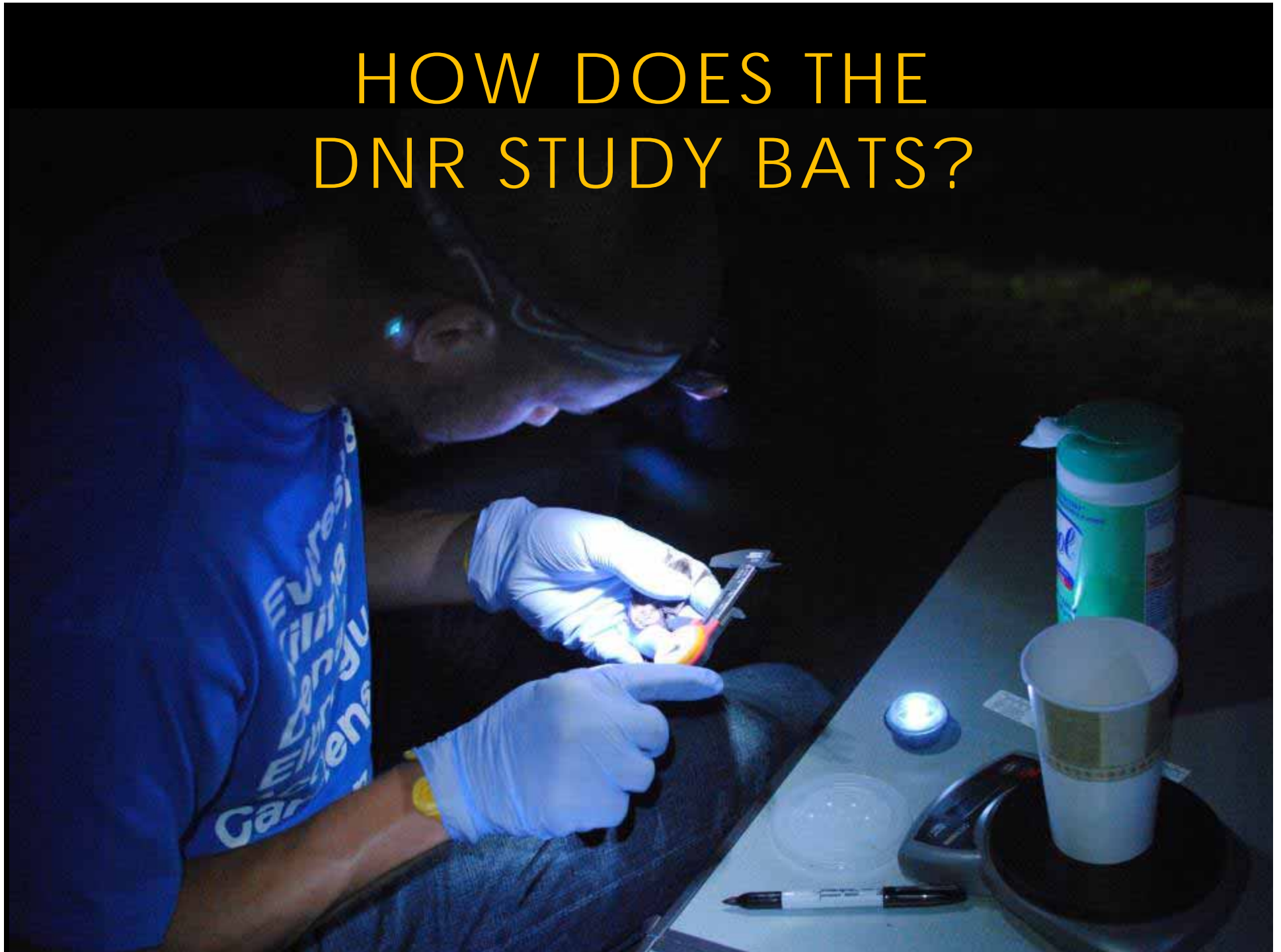
# Bats need protection.

## Threats to bats worldwide & close to home-

- Habitat loss and destruction
  - Winter and summer habitat
- Human interaction
  - Direct killing, poisoning, extermination, food
  - Pesticide impacts
  - Lack of public understanding of their benefits
- Climate change
- Wind farms
- Disease
  - **White-nose syndrome (WNS)**



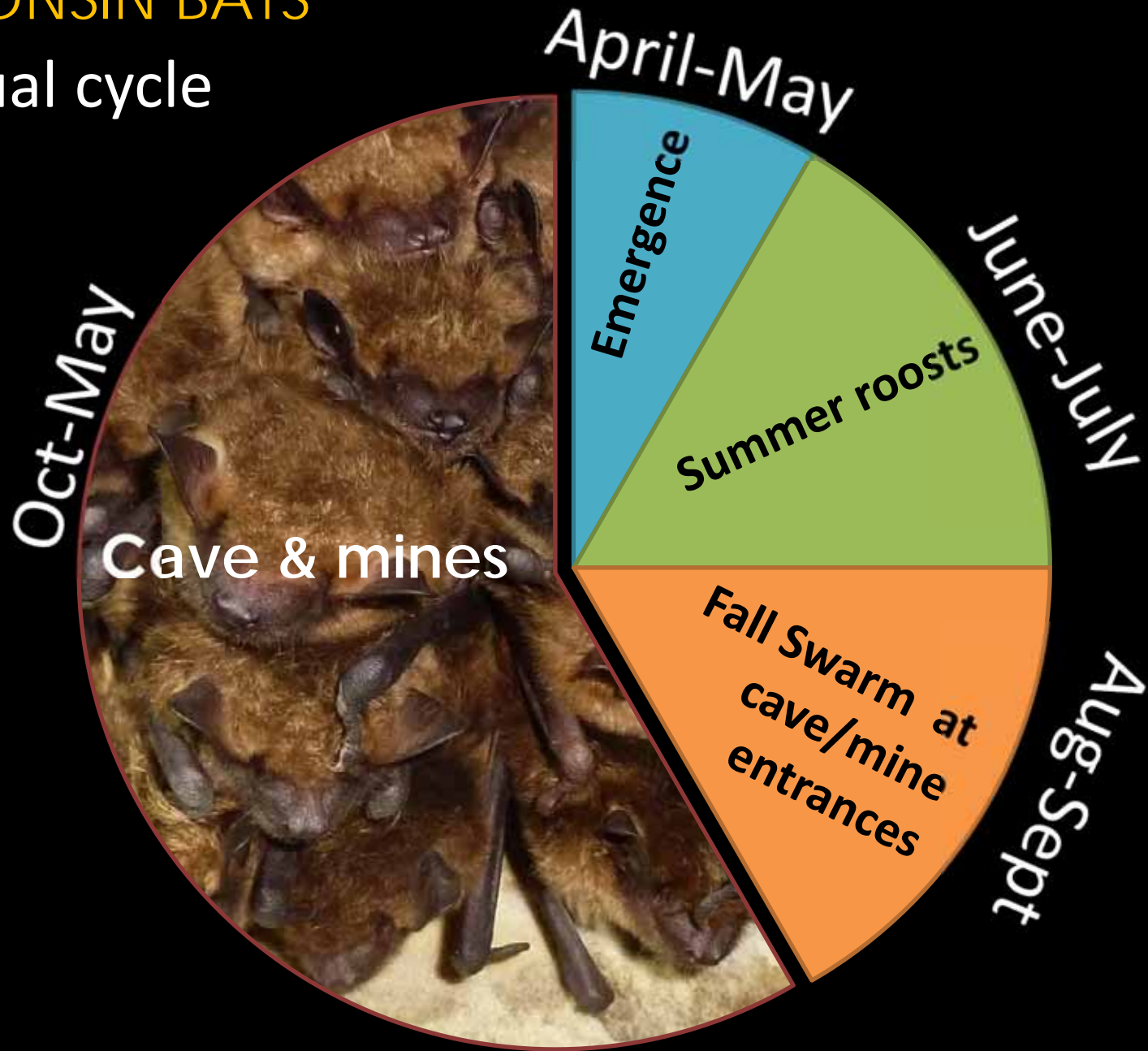
# HOW DOES THE DNR STUDY BATS?





# WISCONSIN BATS

Annual cycle



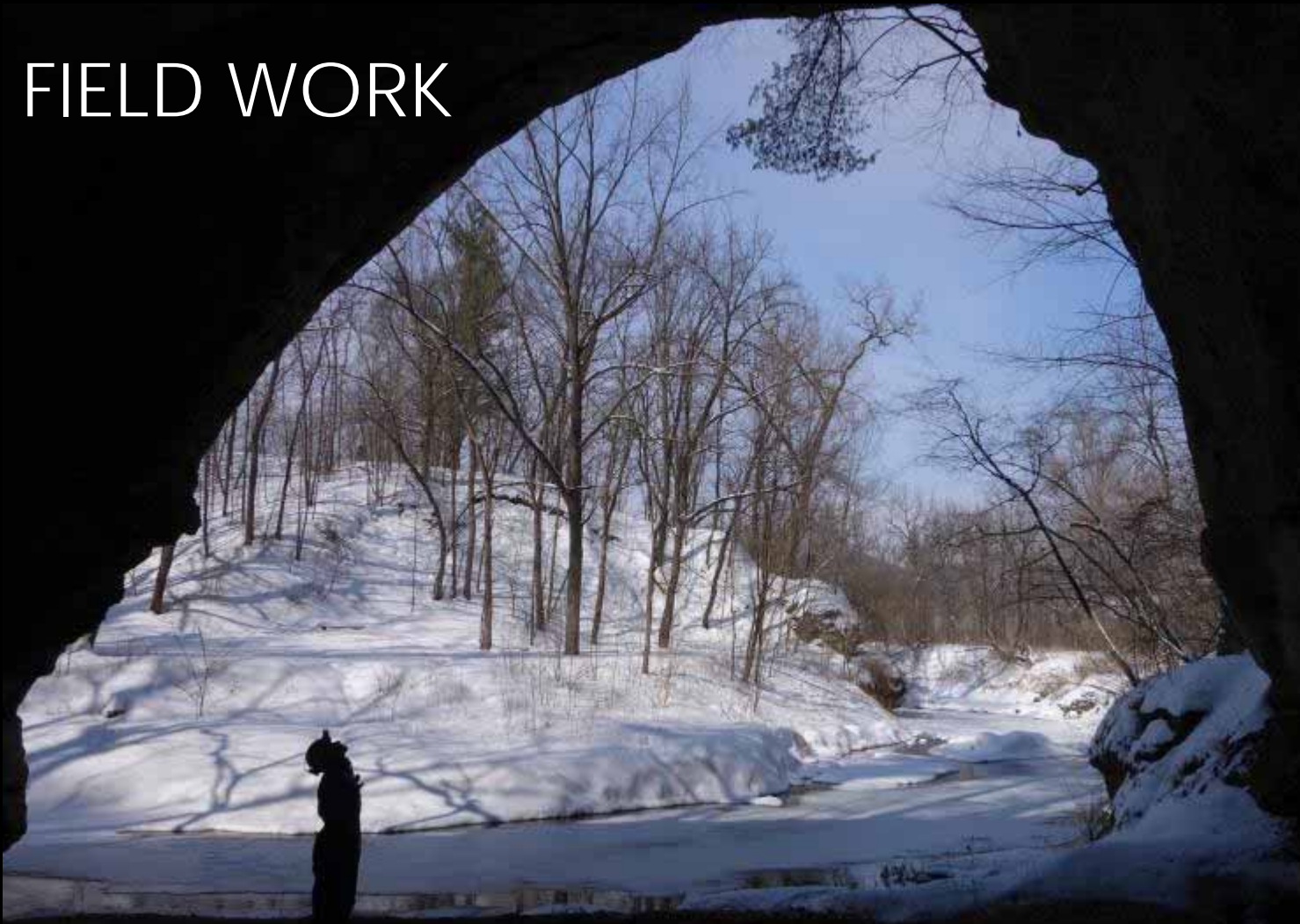


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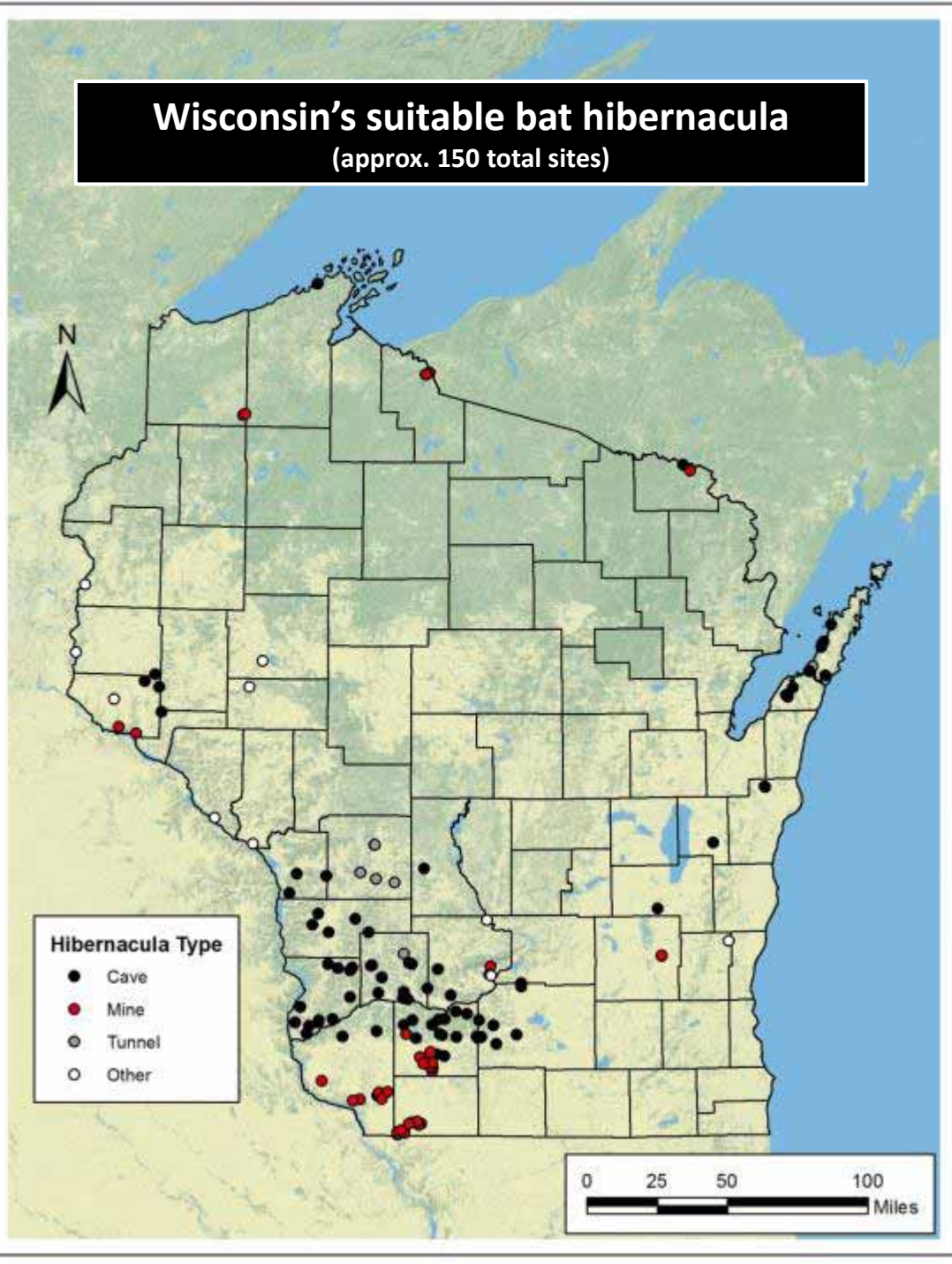
Winter

# WINTER FIELD WORK

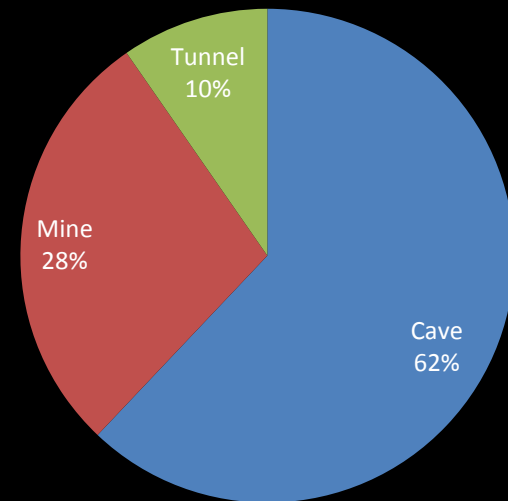


# Wisconsin's suitable bat hibernacula

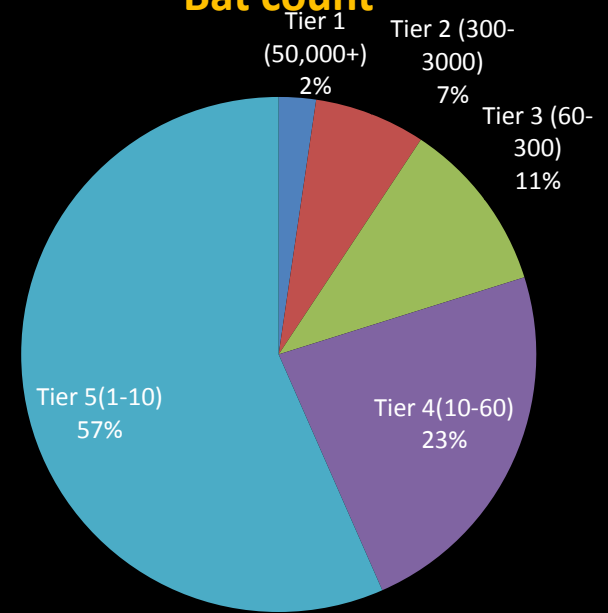
(approx. 150 total sites)



## Type of site



## Bat count

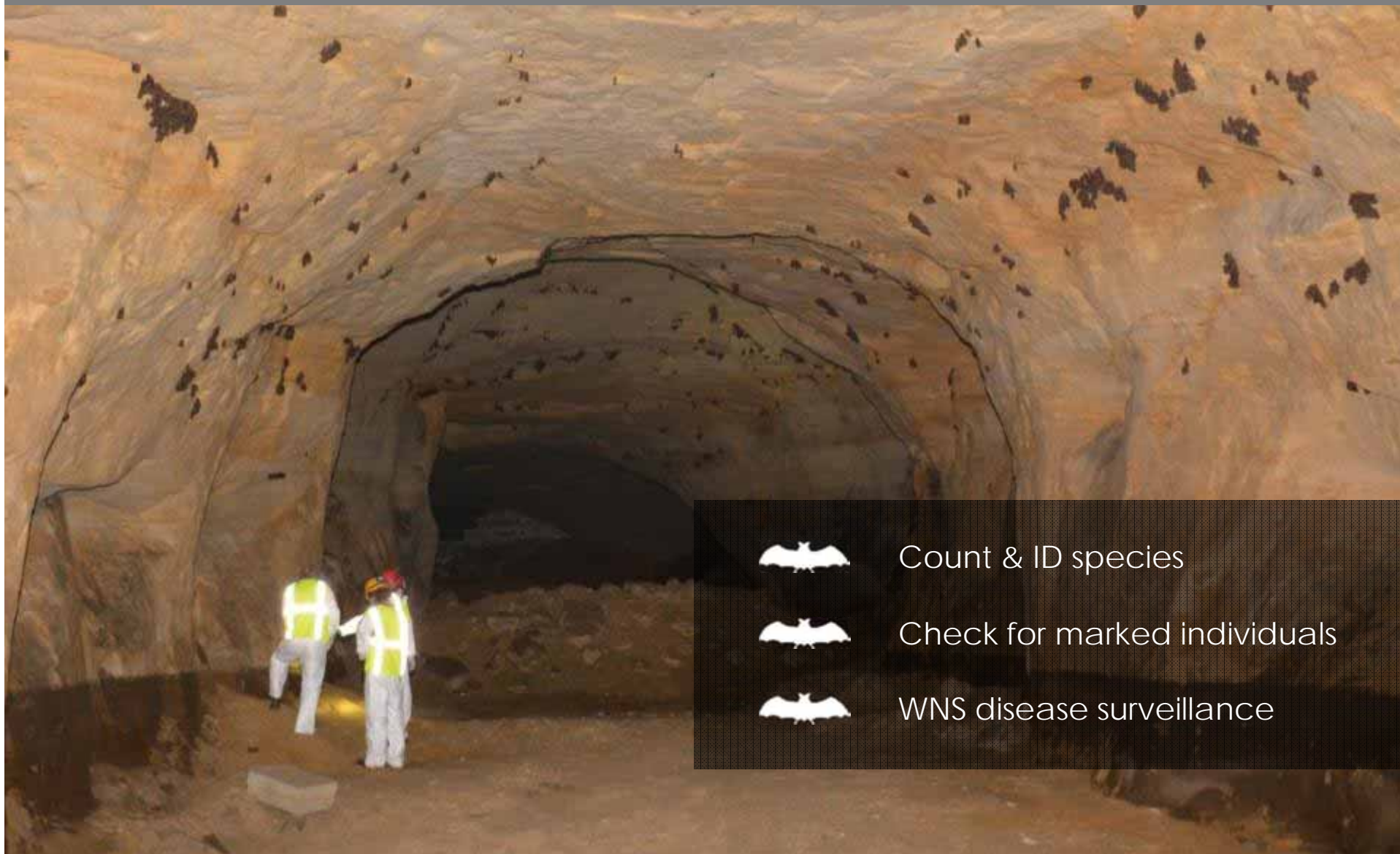




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## DNR hibernacula monitoring



Count & ID species



Check for marked individuals



WNS disease surveillance

# WNS: WHITE-NOSE SYNDROME



*The most precipitous decline in North American wildlife in recorded history. -USFWS*

<http://whitenosesyndrome.org/>



# WNS: SIGNS & SYMPTOMS

**Wing damage & low body weight**



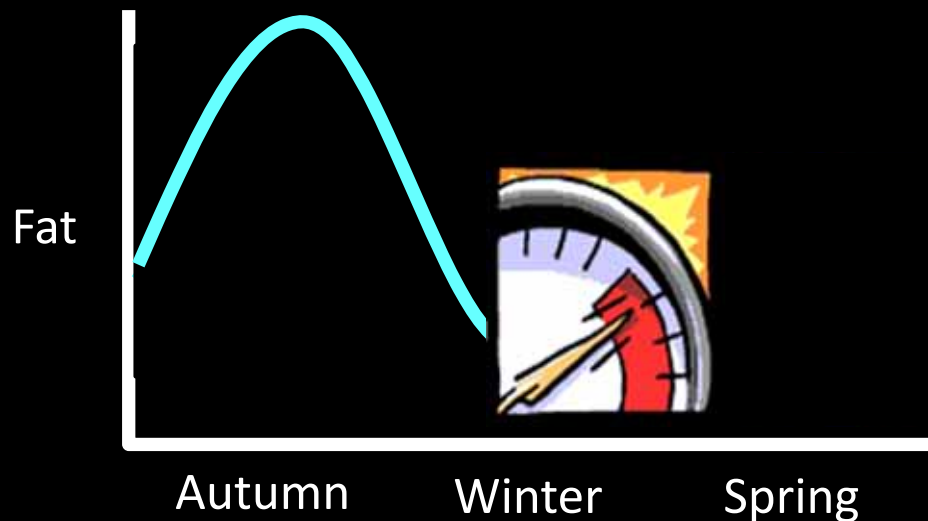
**Presence of fungus**



**Altered behavior**

# When Hibernation Goes Wrong

- Things that increase arousals from hibernation can deplete a bat's winter fat reserve too fast
  - Disturbance
  - Grooming
  - Dehydration
  - Irritation or pain
- Fungal infection may also injure bats enough to directly cause death





WNS: OVERALL DECLINE OF 95% OR GREATER



Ann Froschauer/USFWS

## WNS: SUMMARY



*Nearly half of the 47 species in N. America  
rely on hibernation for winter survival*

### Cause

Cold-loving fungus

Detected in NY state in 2006

*Pseudogymnoascus destructans*

### Presence

27 states & 5 Canadian provinces  
(2016)

### Affected

7 species of hibernating bats (2014)

### Dead

6 million+ bats (2012)



## WNS: TRANSMISSION

### Bat → bat

fall swarm, hibernation

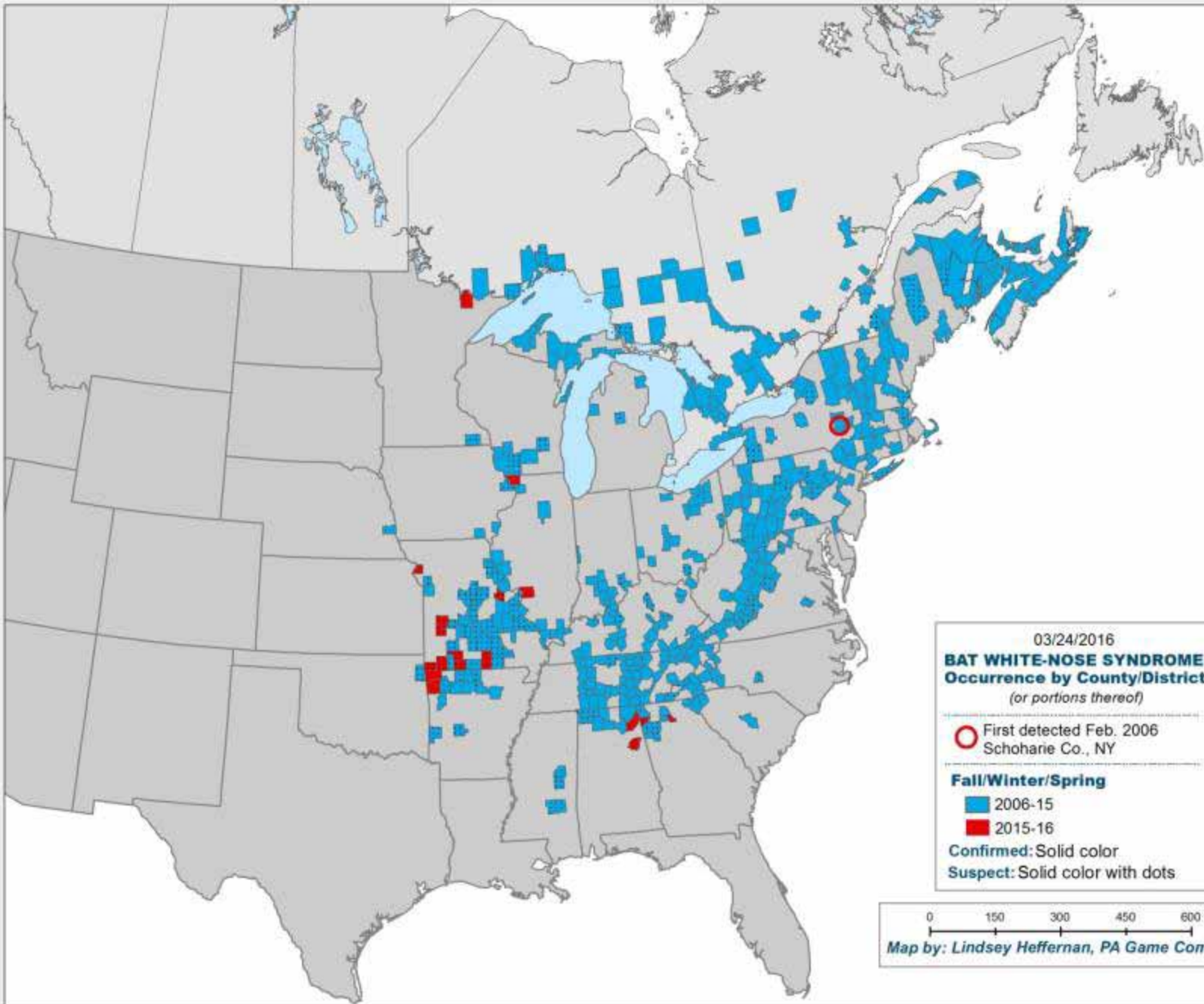
### Cave → bat

fungus spores present on walls and in sediment

### Cave → human → bat



mud picked up by individuals during cave visitation may contain fungal spores



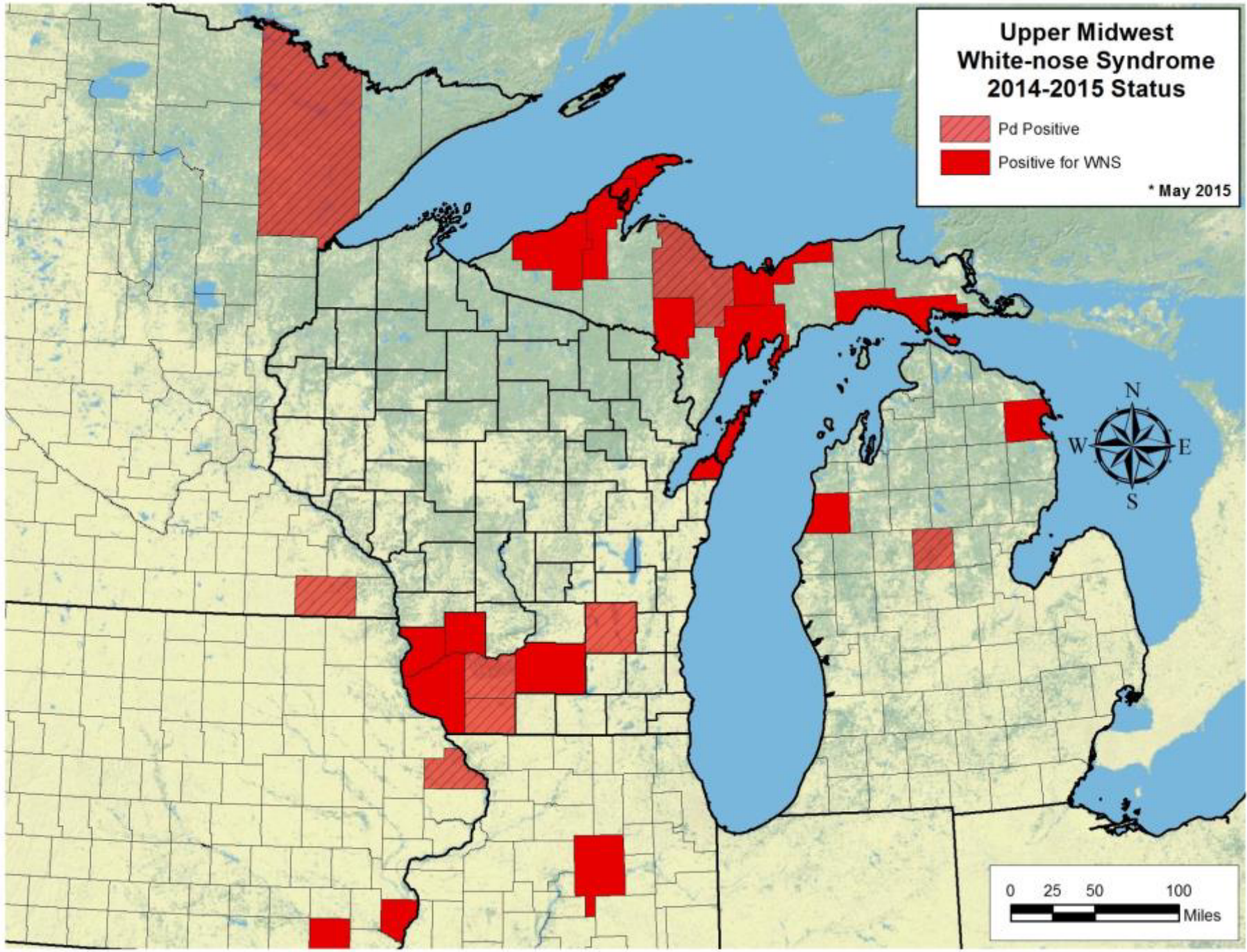




### Upper Midwest White-nose Syndrome 2014-2015 Status

-  Pd Positive
-  Positive for WNS

\* May 2015



# WNS: REGIONAL EXTINCTIONS





# WNS: WDNR RESPONSE



Established partnerships



Established baseline in advance



WNS research participation



Planning for the future: implementation strategy, education, establishing funds



Legal protections & listings



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Summer

SUMMER FIELD WORK





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Summer

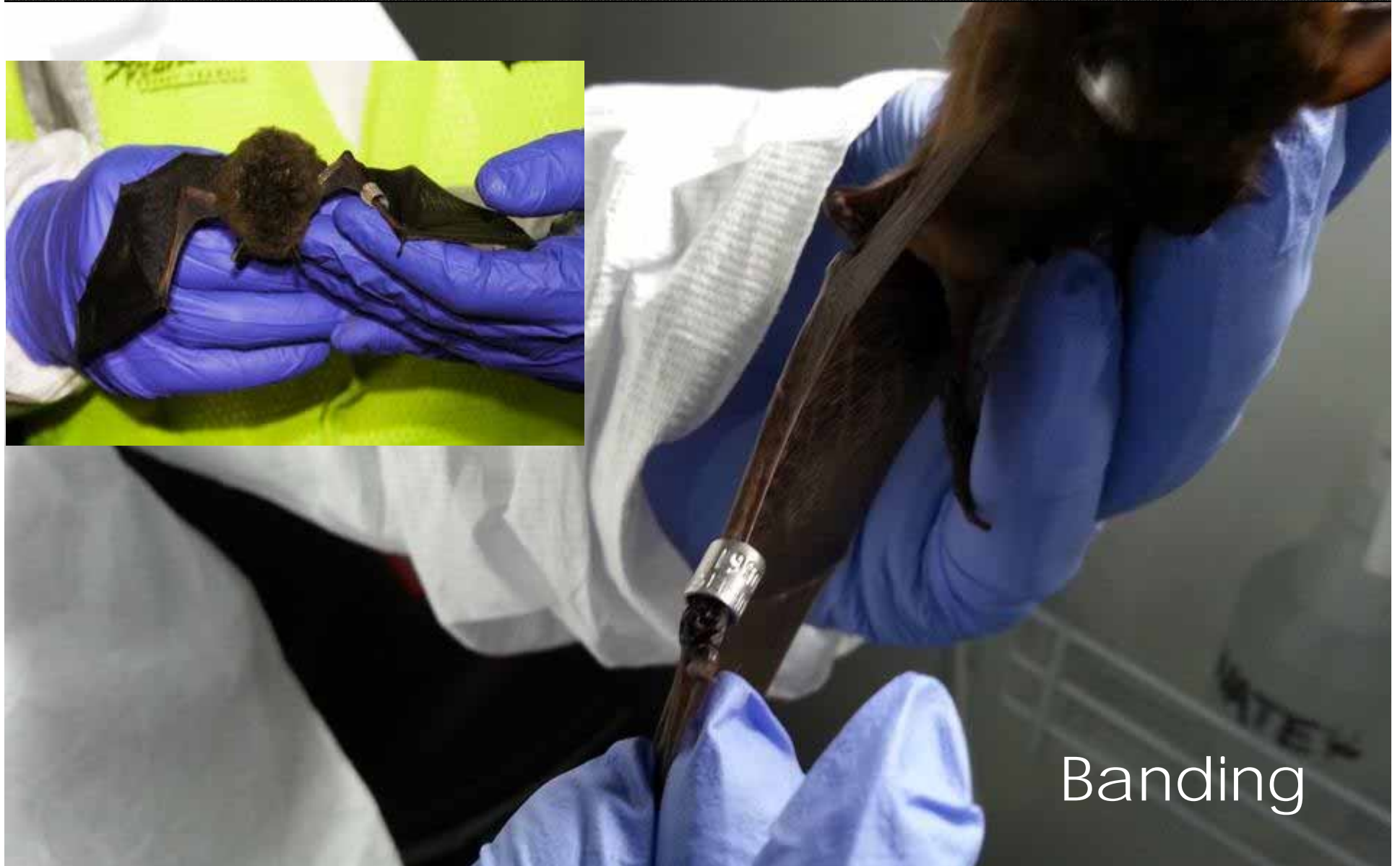
Mist netting



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Summer



Banding



# WISCONSIN BAT PROGRAM



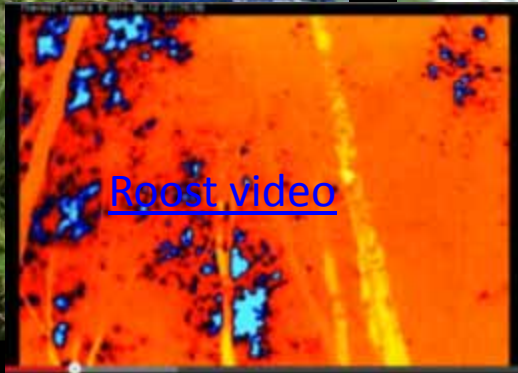
Summer



Telemetry









# WISCONSIN BAT PROGRAM



## Citizen-based monitoring





Most roosts are maternity colonies where females gather to birth, nurse, and rear their pups



Volunteers count bats as they emerge from roosts just after sunset; enter data on website

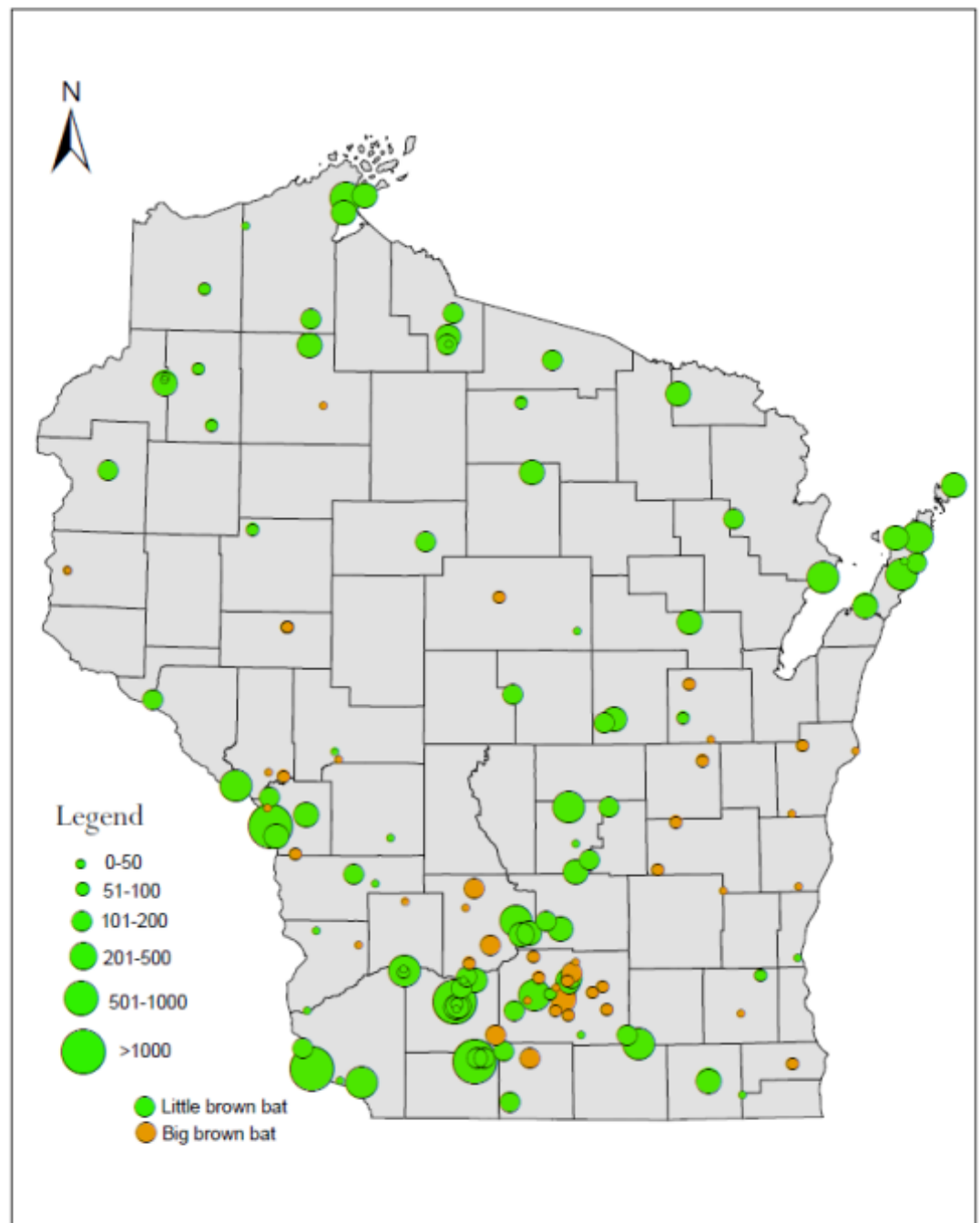


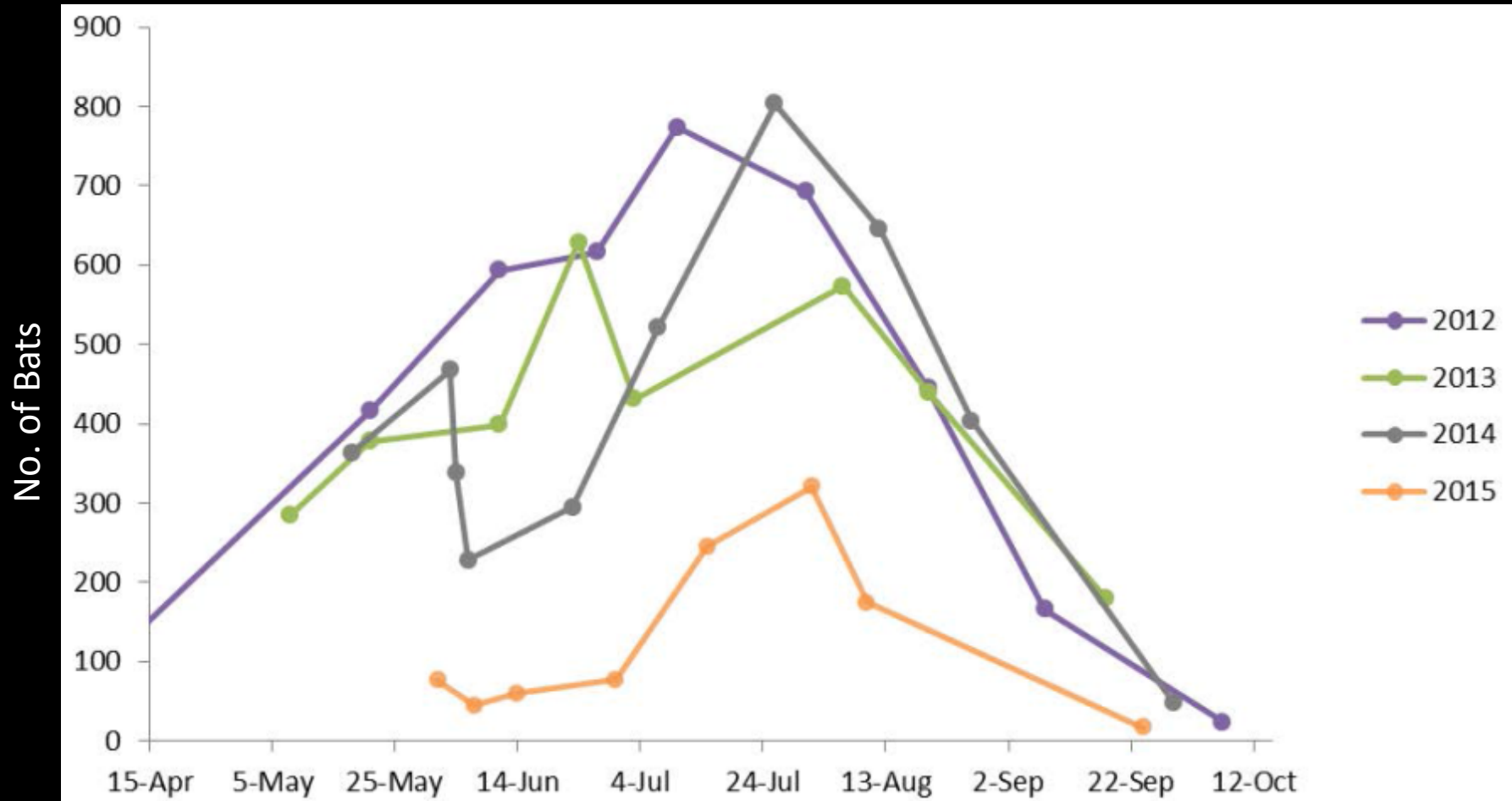
Goal is to conduct one count in June before pups can fly and a second count later in summer when the pups also emerge





## Wisconsin Bat Roosts by Colony Size









- **2<sup>nd</sup> Annual Count:** Count as many roosts as possible in a single weekend
- **1<sup>st</sup> Count:** June 3-5
- **2<sup>nd</sup> Count:** July 29-31

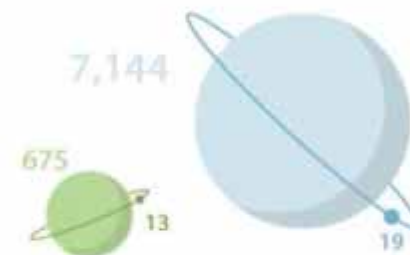
For more information please contact  
[Heather.Kaarakka@Wisconsin.gov](mailto:Heather.Kaarakka@Wisconsin.gov)

## Great Wisconsin Bat Count

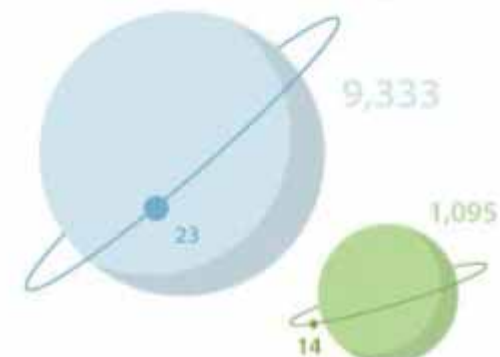
*The goal was to count as many roosts as possible in a single weekend.*

- Little brown bats counted
- Little brown bat surveys
- Big brown bats counted
- Big brown bat surveys

June 14, 2015



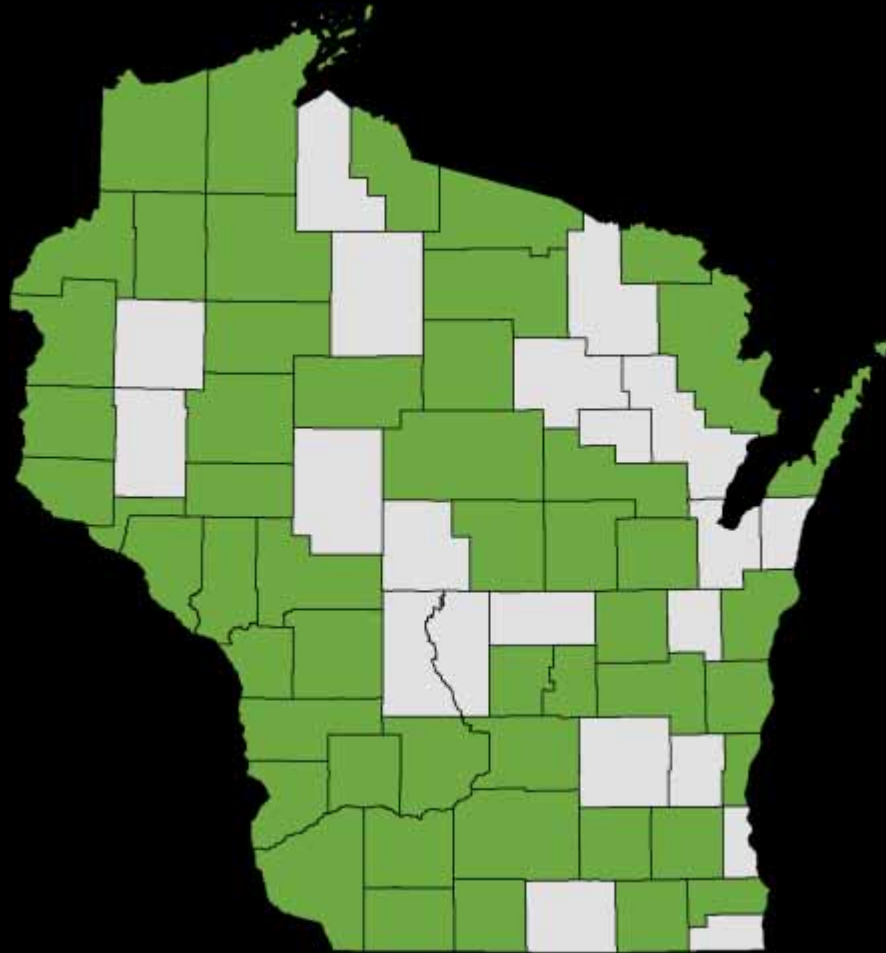
August 1, 2015



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Roosts Unknown





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## Citizen Acoustic bat monitoring



Who is here? Where are they?



Trained volunteers conduct surveys



Driving, boating, or walking routes



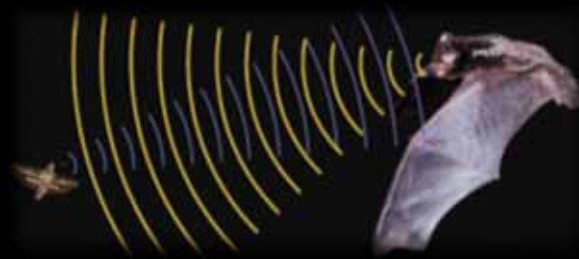
They collect data, we analyze it



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## Echolocation



High frequency noises emitted through mouth or nose & listening for returning echoes



Used for navigation & capturing prey in the dark

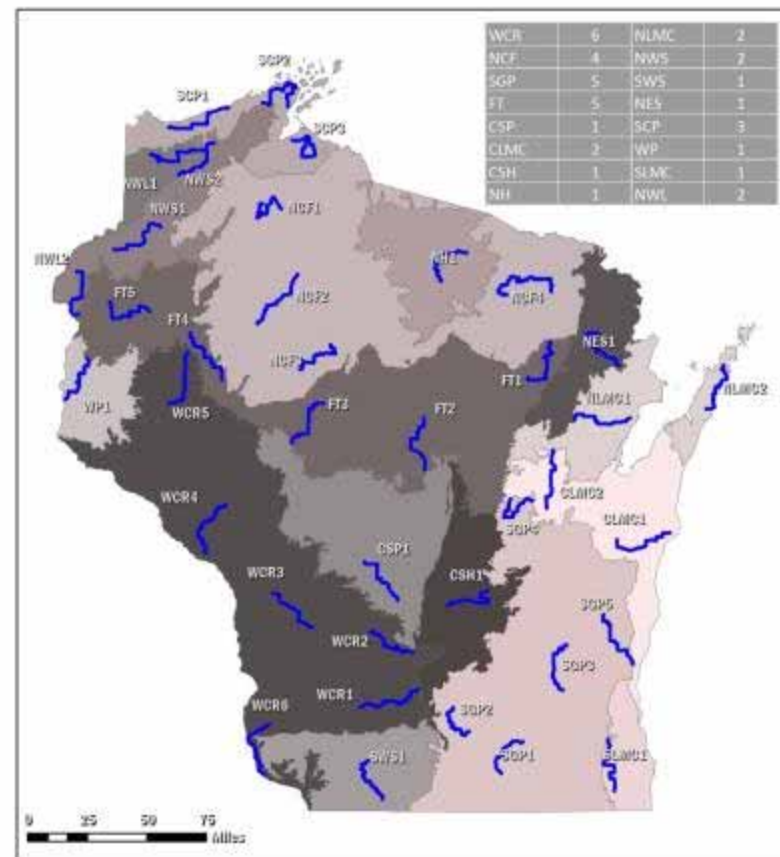
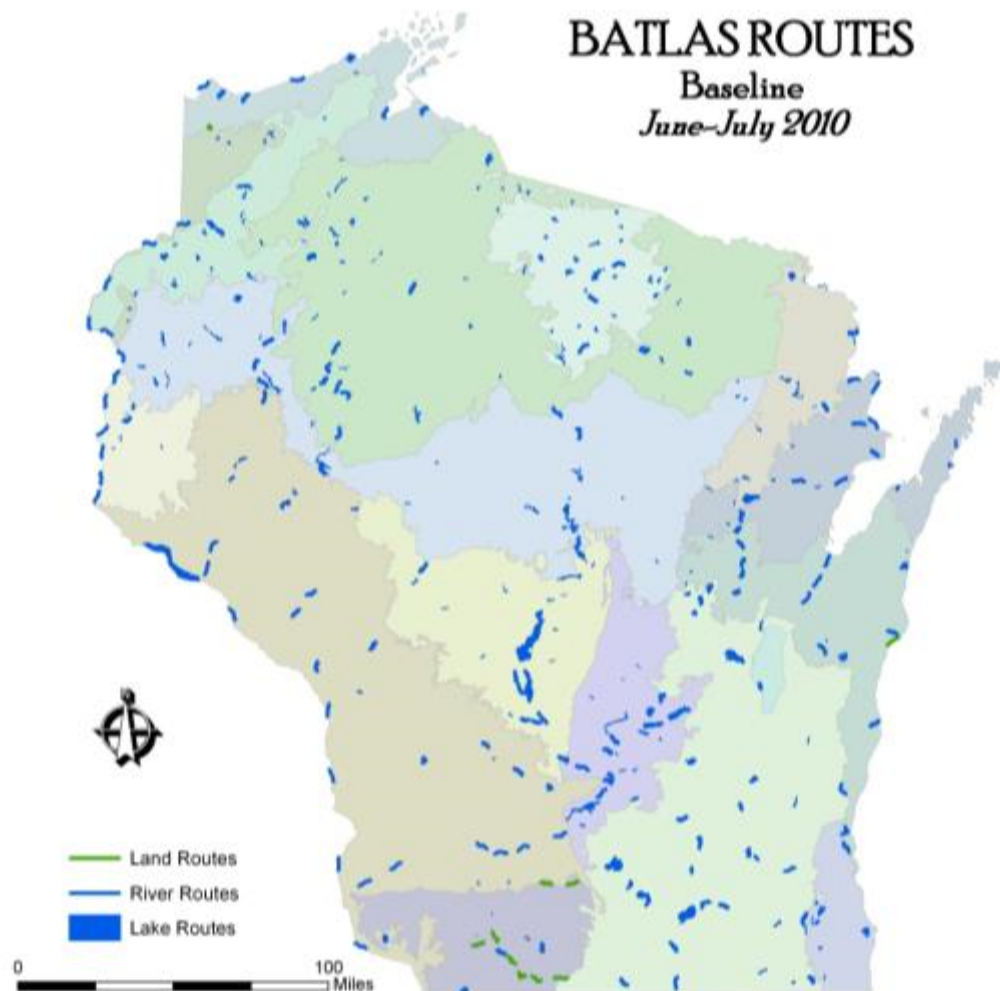


# WISCONSIN BAT PROGRAM



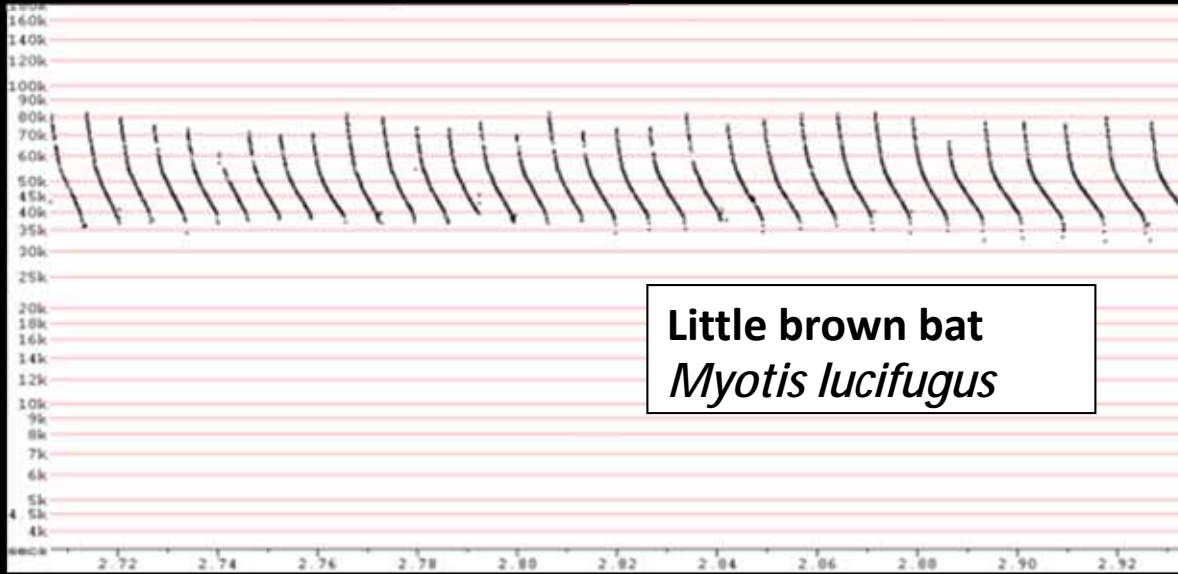
## Pre-determined acoustic routes

### BATLAS ROUTES Baseline June-July 2010

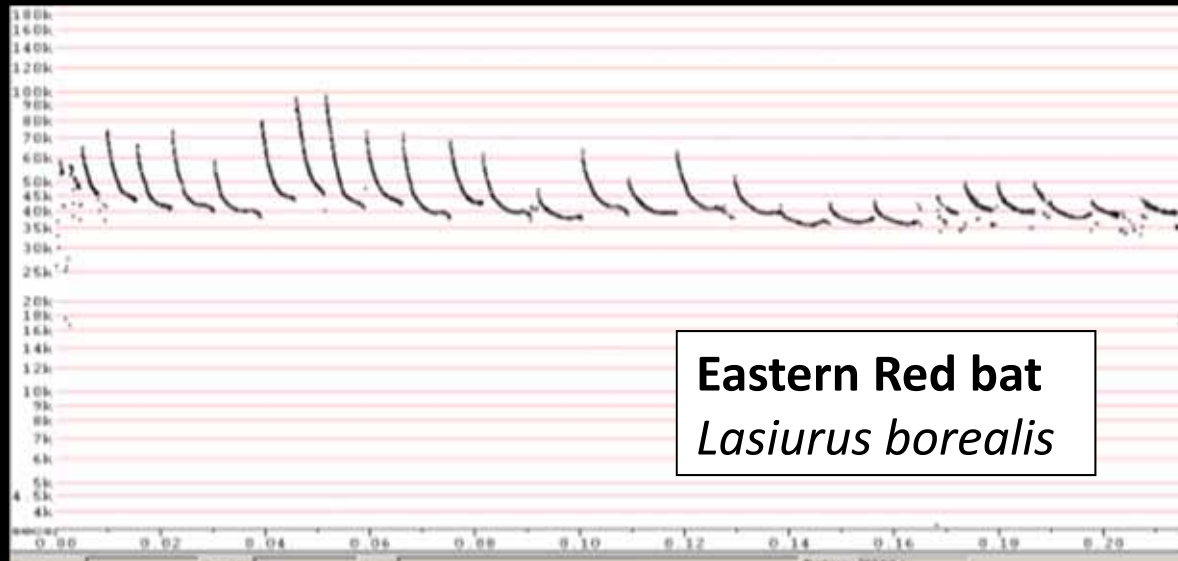


Wisconsin Bat Monitoring Program  
Acoustic Bat Survey Driving Routes

— Driving Route



**Little brown bat**  
*Myotis lucifugus*

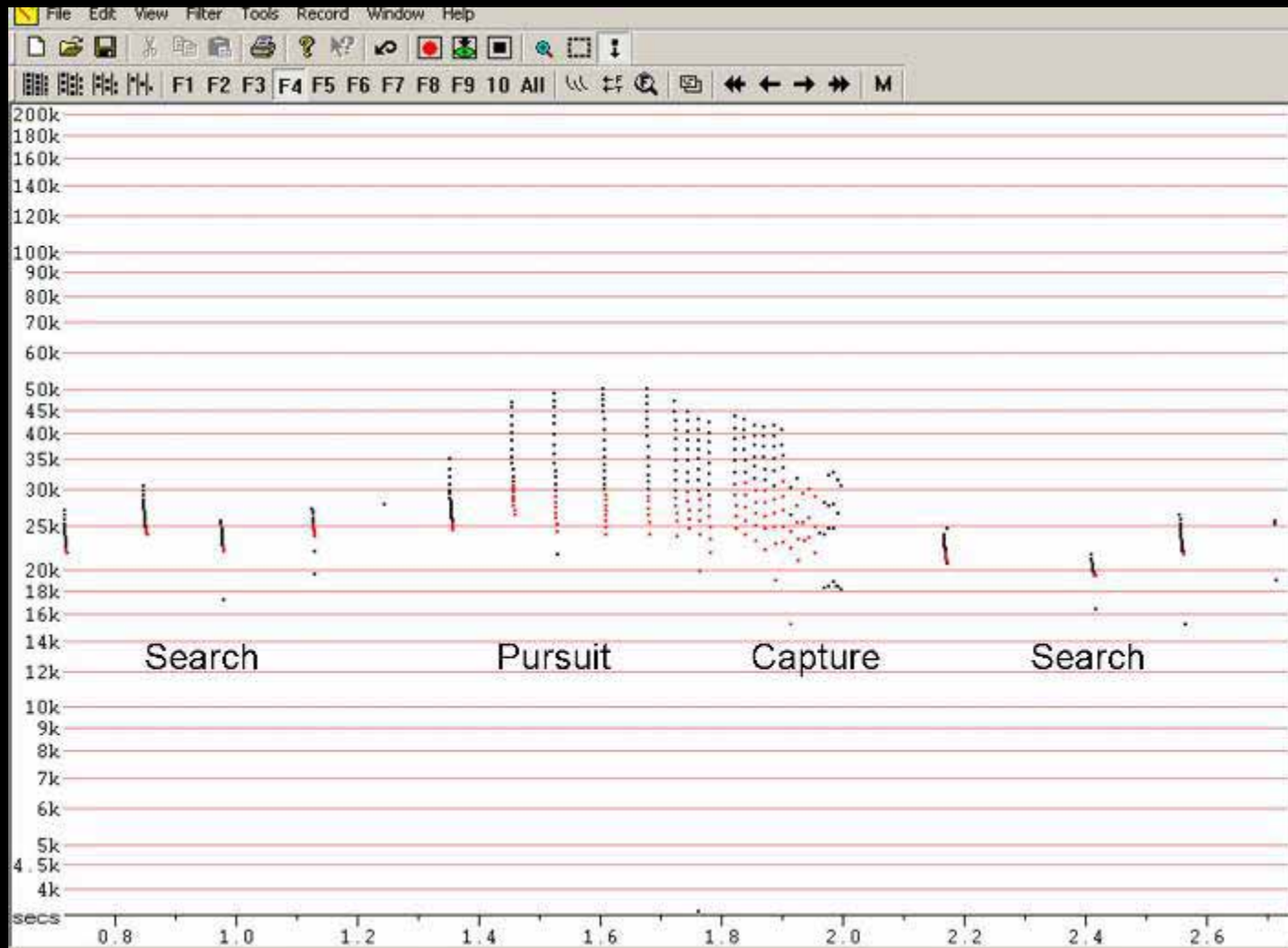


**Eastern Red bat**  
*Lasiurus borealis*





# Hoary bat (*Lasiurus cinereus*) capturing an insect



# Sauk County: Devil's Lake State Park (RT 258)

**Legend**

**Survey Route**

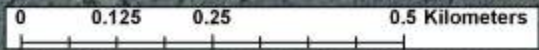
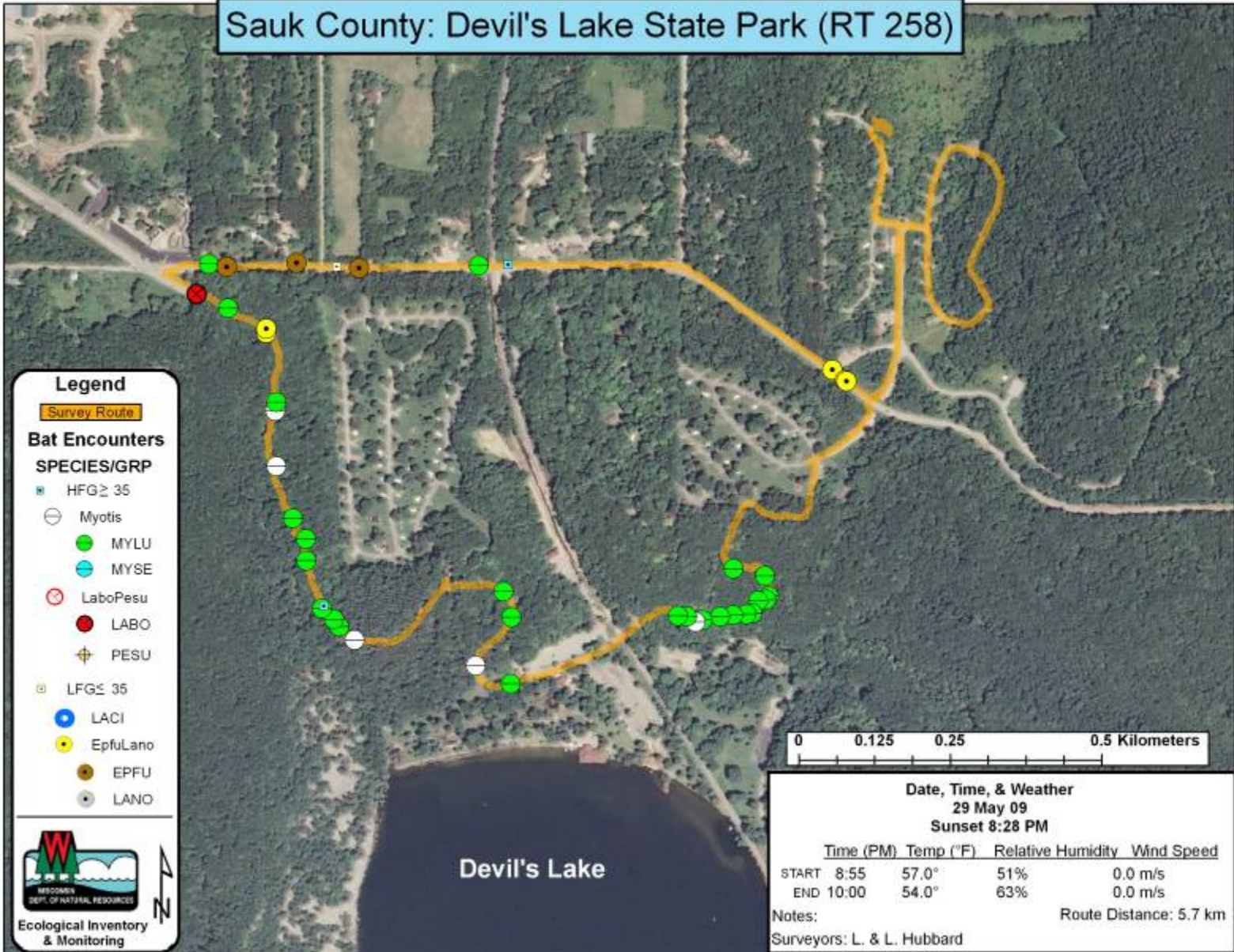
**Bat Encounters**

**SPECIES/GRP**

- HFG ≥ 35
- Myotis
- MYLU
- MYSE
- ⊗ LaboPesu
- LABO
- ⊕ PESU
- LFG ≤ 35
- LACI
- EpfuLano
- EPFU
- LANO



Ecological Inventory & Monitoring



**Date, Time, & Weather**  
 29 May 09  
 Sunset 8:28 PM

	Time (PM)	Temp (°F)	Relative Humidity	Wind Speed
START	8:55	57.0°	51%	0.0 m/s
END	10:00	54.0°	63%	0.0 m/s

Notes: Route Distance: 5.7 km  
 Surveyors: L. & L. Hubbard

Devil's Lake




Iowa County: Cox Hollow Lake [Governor Dodge State Park] (RT 274)

**Legend**

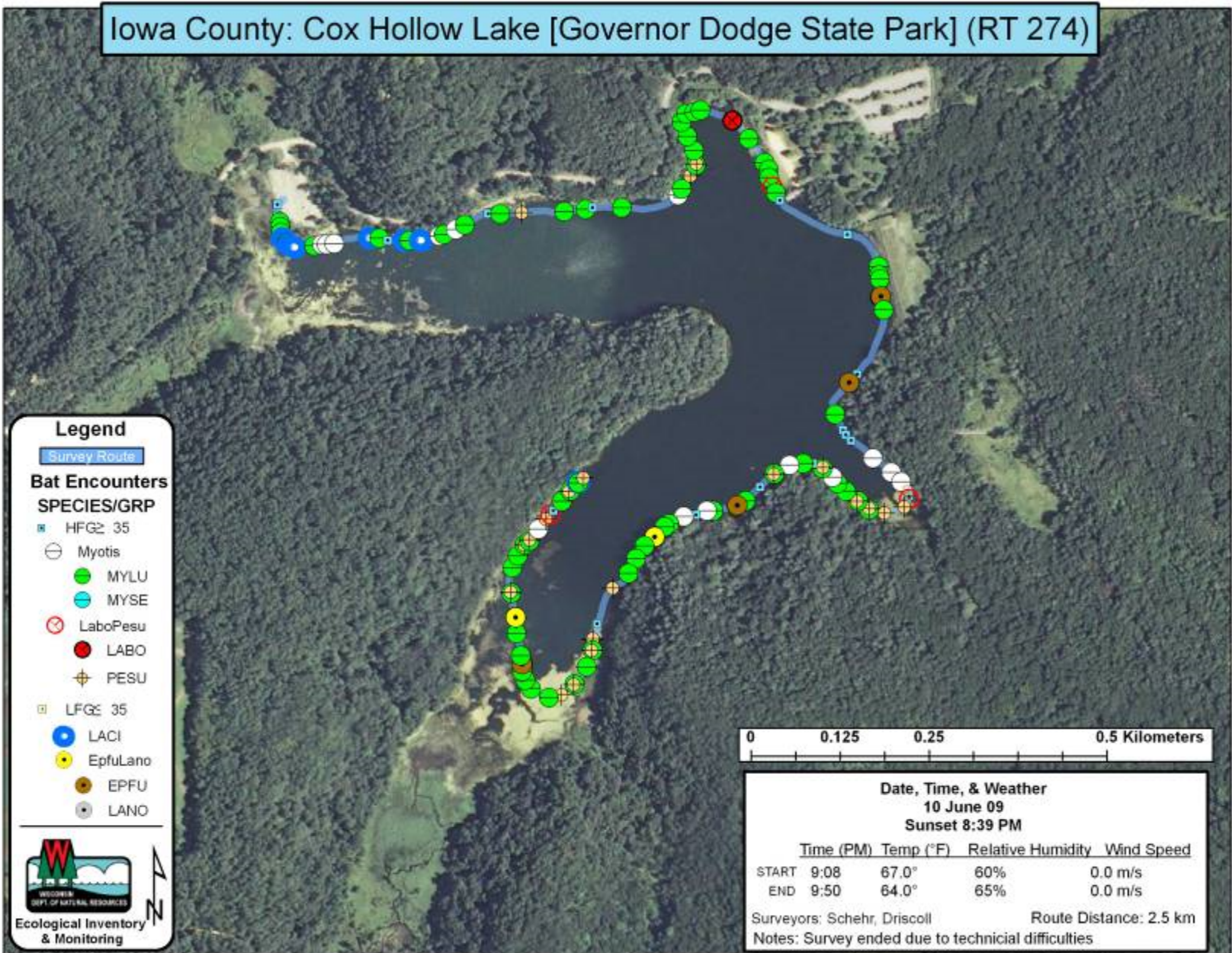
Survey Route

**Bat Encounters**  
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Ecological Inventory & Monitoring



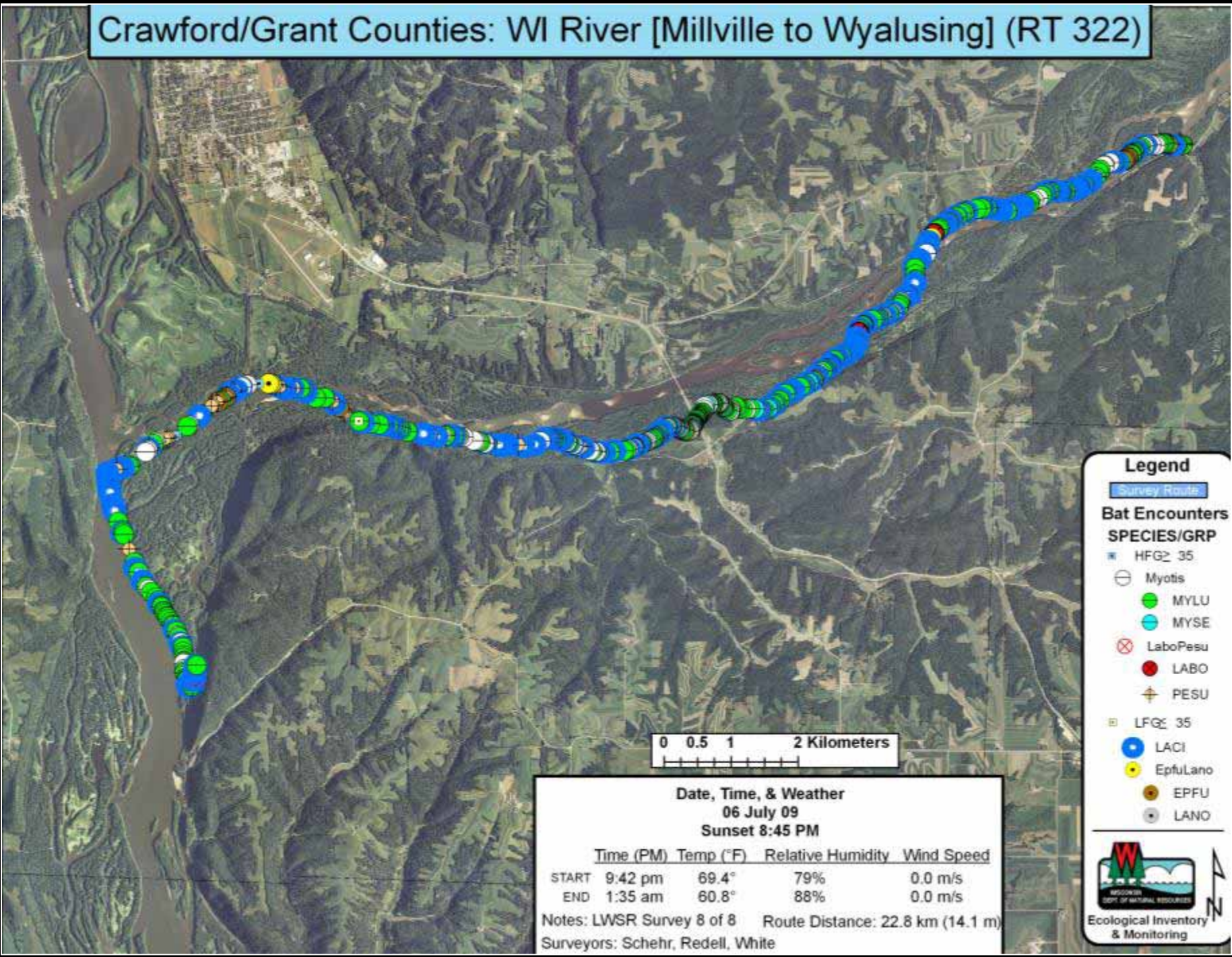
**Date, Time, & Weather**  
10 June 09  
Sunset 8:39 PM

	Time (PM)	Temp (°F)	Relative Humidity	Wind Speed
START	9:08	67.0°	60%	0.0 m/s
END	9:50	64.0°	65%	0.0 m/s

Surveyors: Schehr, Driscoll      Route Distance: 2.5 km  
Notes: Survey ended due to technical difficulties



# Crawford/Grant Counties: WI River [Millville to Wyalusing] (RT 322)

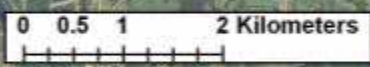


**Legend**

Survey Route

**Bat Encounters**  
SPECIES/GRP

- ⊛ HFG ≥ 35
- ⊖ Myotis
- MYLU
- MYSE
- ⊗ LaboPesu
- LABO
- ⊕ PESU
- ⊠ LFG ≥ 35
- LACI
- EpfuLano
- EPFU
- LANO



**Date, Time, & Weather**  
06 July 09  
Sunset 8:45 PM

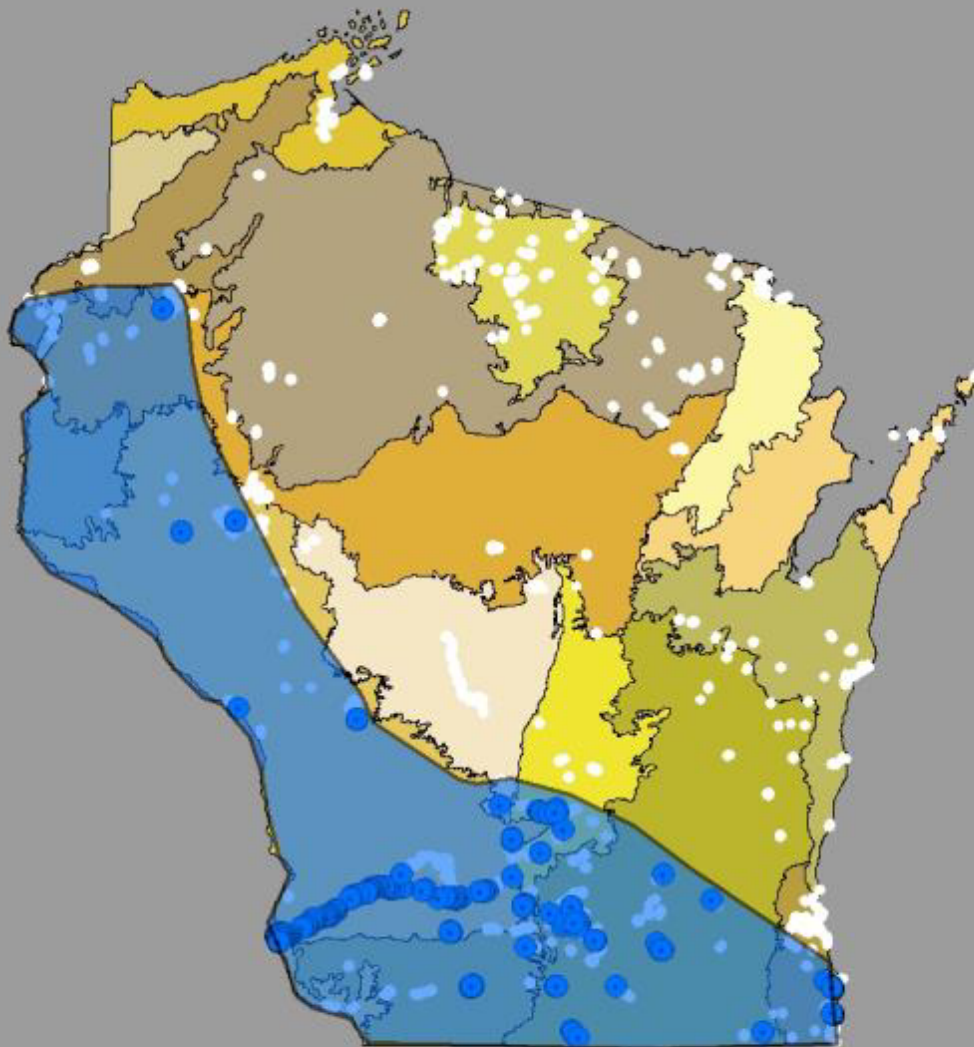
	Time (PM)	Temp (°F)	Relative Humidity	Wind Speed
START	9:42 pm	69.4°	79%	0.0 m/s
END	1:35 am	60.8°	88%	0.0 m/s

Notes: LWSR Survey 8 of 8    Route Distance: 22.8 km (14.1 m)  
Surveyors: Schehr, Redell, White





**Range of Eastern Pipistrelle Based on  
Acoustic Bat Surveys 08'-11'**





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## Sick and Dead Bat Reports





- Track and Respond to wildlife diseases
- Collect carcasses for research studies
- Discover previously unknown maternity colonies or caves/mines.
- Education and Outreach





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Bats need you.  
Put up a bat house.

- Minimum of 8 feet off the ground
- Not on a tree
- In full sun (facing south-east or south-west)
- Away from nearby trees
- Away from disturbance



Photo by WI Bat Program

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BAT PROGRAM



Bats need you.  
Donate.



Support WI Bat Work in Perpetuity:  
Wisconsin Bat Conservation Fund  
<http://www.wisconservation.org/>





# Questions?

