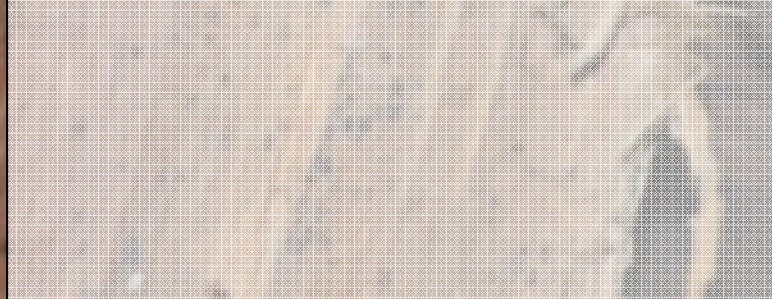




BATS
of New Jersey



CONSERVE WILDLIFE
FOUNDATION OF NEW JERSEY

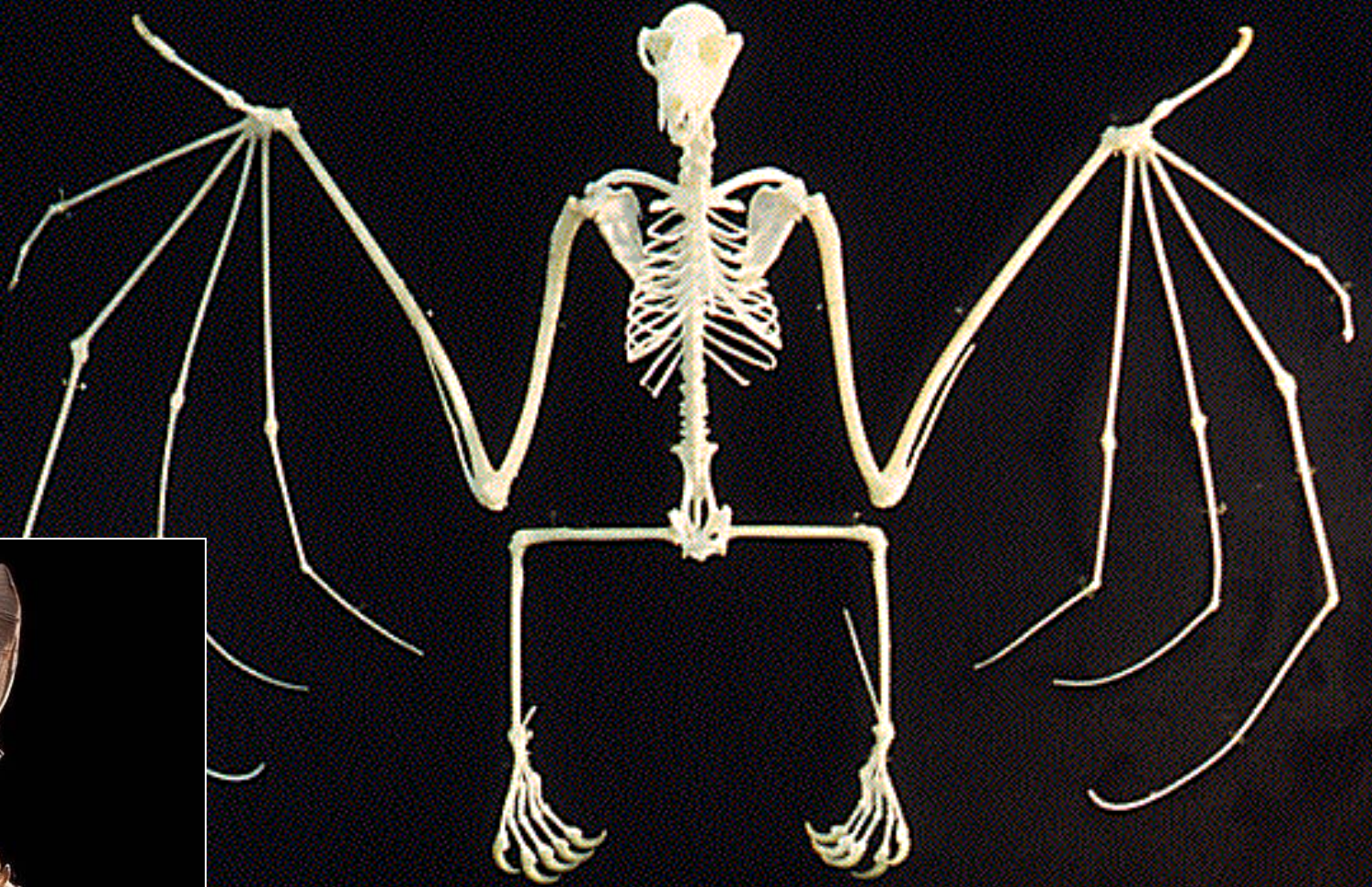


Bats comprise $\frac{1}{4}$ of all mammal species



Bats are second only to rodents in number

Order *Chiroptera*, meaning “Hand-wing”



Bats are the only true flying mammals

Fossils date back 50 million years!

Bats REPRODUCE SLOWLY
Bats have LONG LIVES

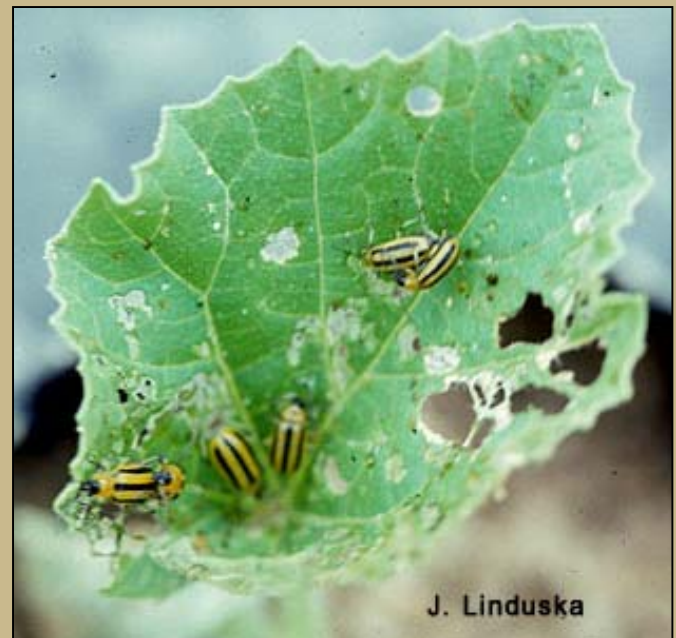


All of New Jersey's bats are *insectivores*



© Michael Durham

**One little brown bat can catch 1,200 insects an hour, 3,000 nightly.
A nursing mother can eat more than her own body weight nightly!**



Bats prey on **pest insects**

Bats reduce insect-borne **illnesses**

Bats deter **garden pests**



UGA08861



Forest Pests



UGA000004b

Ecological Value: Bats as Insect Pest Regulators



150 big brown bats:
prevent production of 20
million
corn rootworm larvae

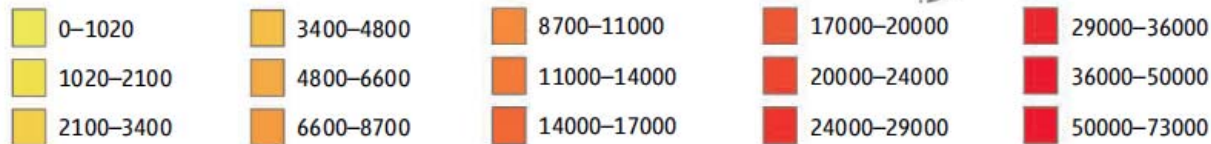
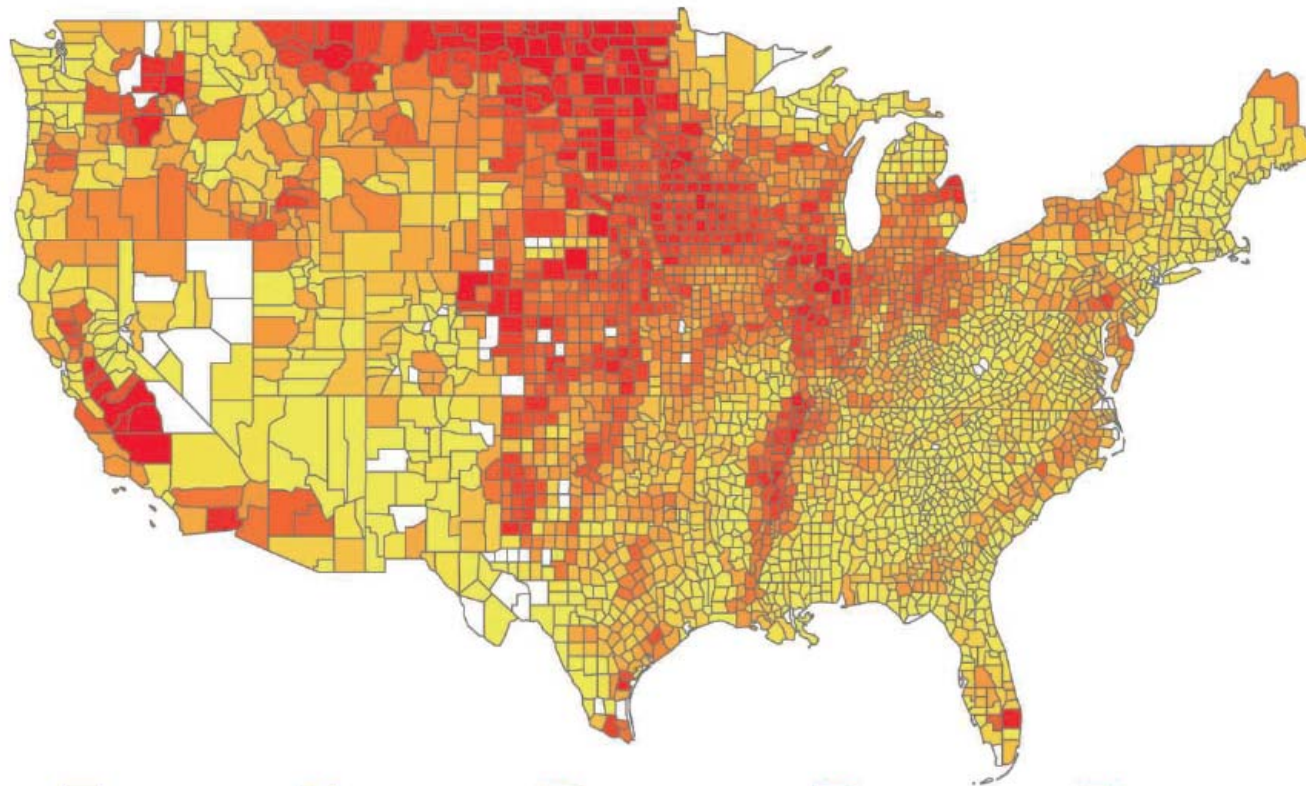
1,000 bats:
0.66-1.32 metric tons of
insects annually

Documented Prey Species

June beetles	click beetles
leafhoppers	planthoppers
cucumber beetles	Asiatic oak weevils
stink bugs	corn earworm moths
cutworms	coneworms
gypsy moths	tent caterpillars
beet armyworms	European corn borers
mosquitoes	Japanese beetles

...and many others!

Economic Value: Bats as Insect Pest Regulators



Crop Protection and Avoided Cost Value:

\$74/acre annually

\$22.9 billion/year in US

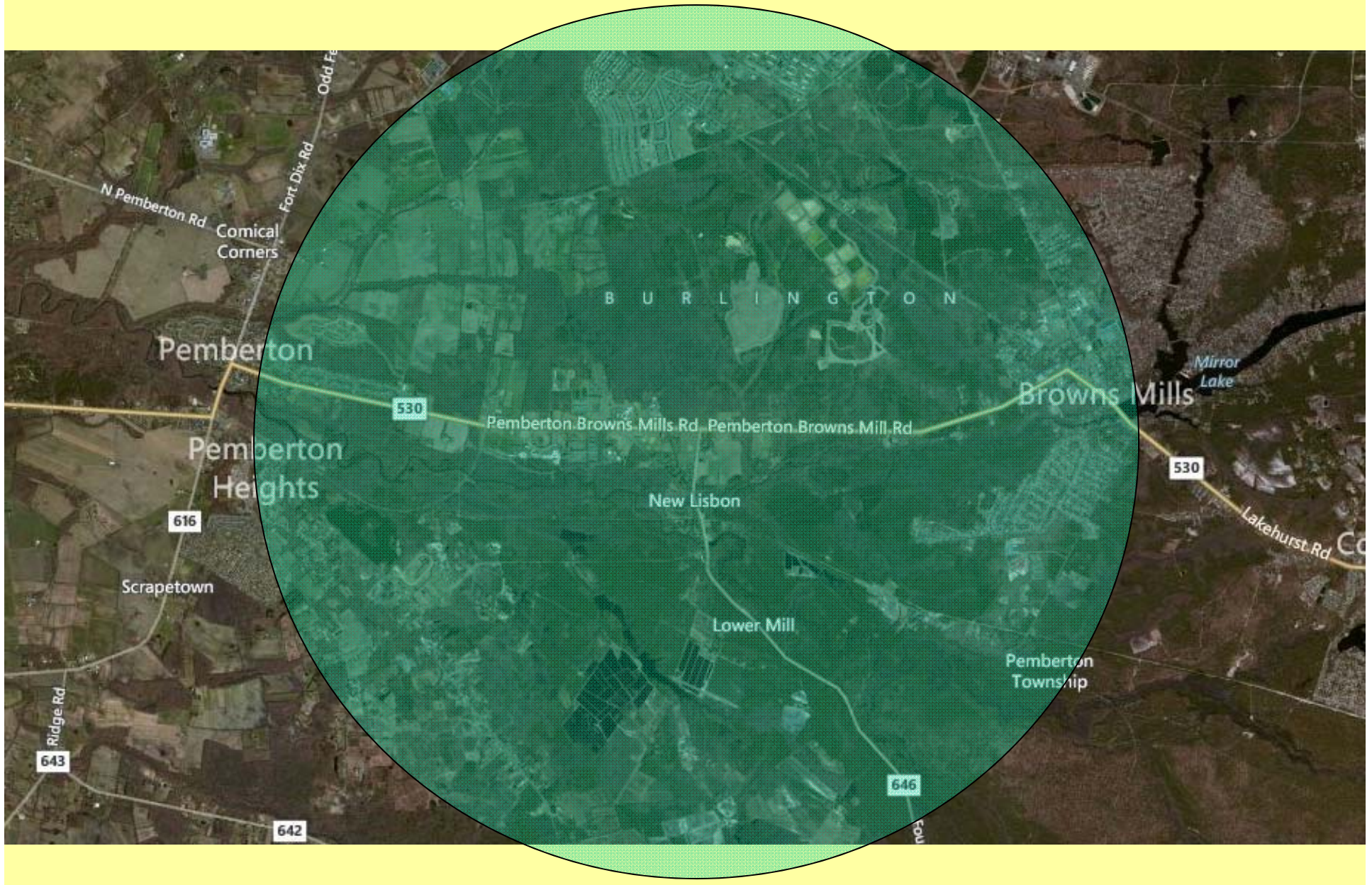
reduced costs of
pesticides, labor & fuel
for application

Excludes:
evolved insect resistance
to pesticides

environmental impacts
of pesticides

(Boyles et al. 2011)

Big Brown Bat Foraging Radius (~3 miles)



“Tree Bats”



Hoary bat
Lasiurus cinereus



Silver-haired bat
Lasionycteris noctivagans



Eastern red bat
Lasiurus borealis



Roosting

Kristina Necovska



Foraging



Migration (or not)

“Cave Bats”

Northern Long-Eared Bat
(Myotis septentrionalis)



© Merlin Tuttle

MacKenzie Hall



Indiana Bat *(Myotis sodalis)*

Tri-Colored Bat *(Perimyotis subflavus)*



© gancave.com

Dr. J. Scott Altenbach



Eastern small-footed bat
(Myotis leibii)

Little Brown Bat *(Myotis lucifugus)*

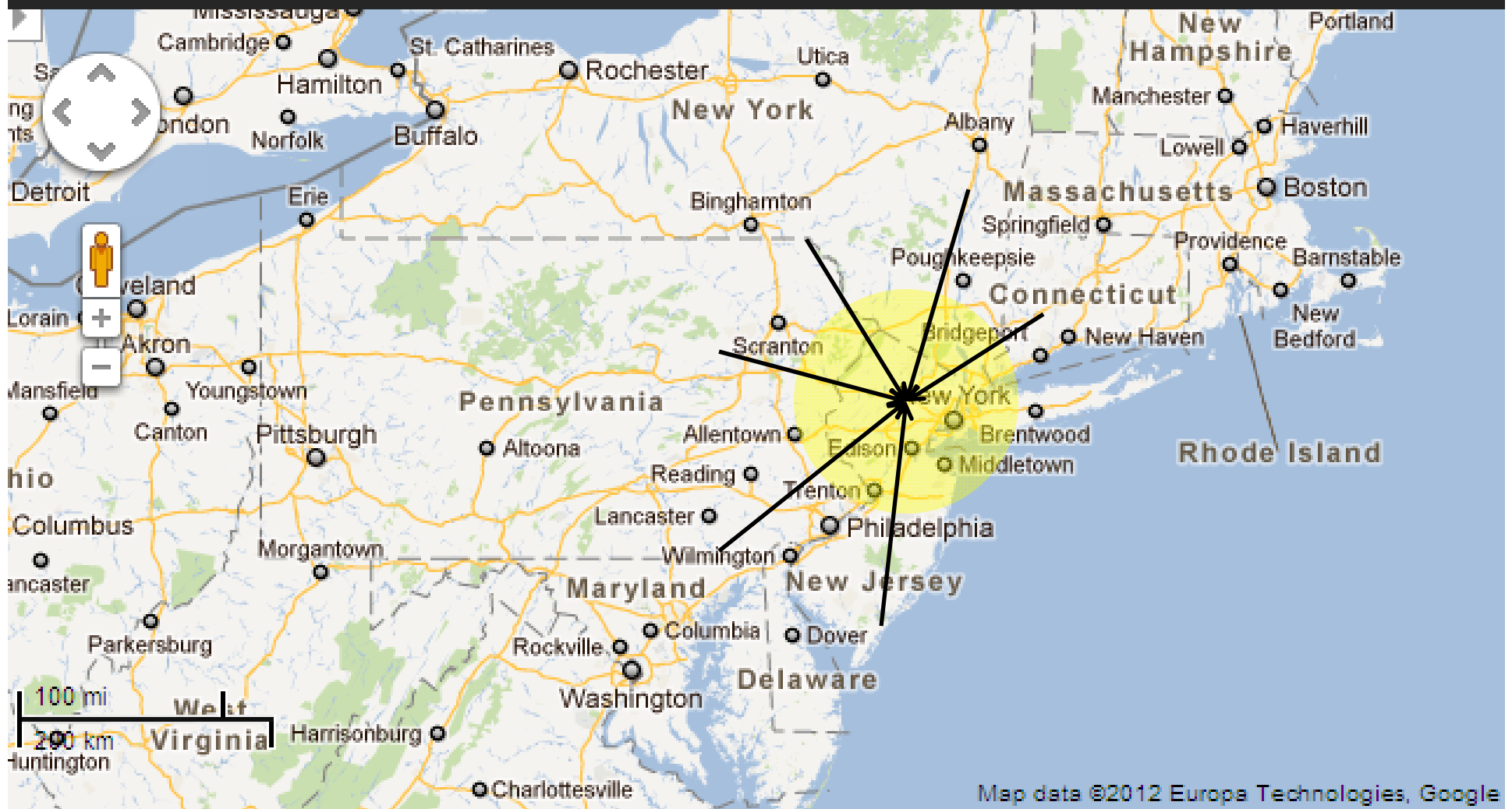


Phil Wooldridge



Big Brown Bat *(Eptesicus fuscus)*

Autumn







Winter

Hibernate in mines, caves, railroad tunnels

Changes in heart rate, respiration, body temp

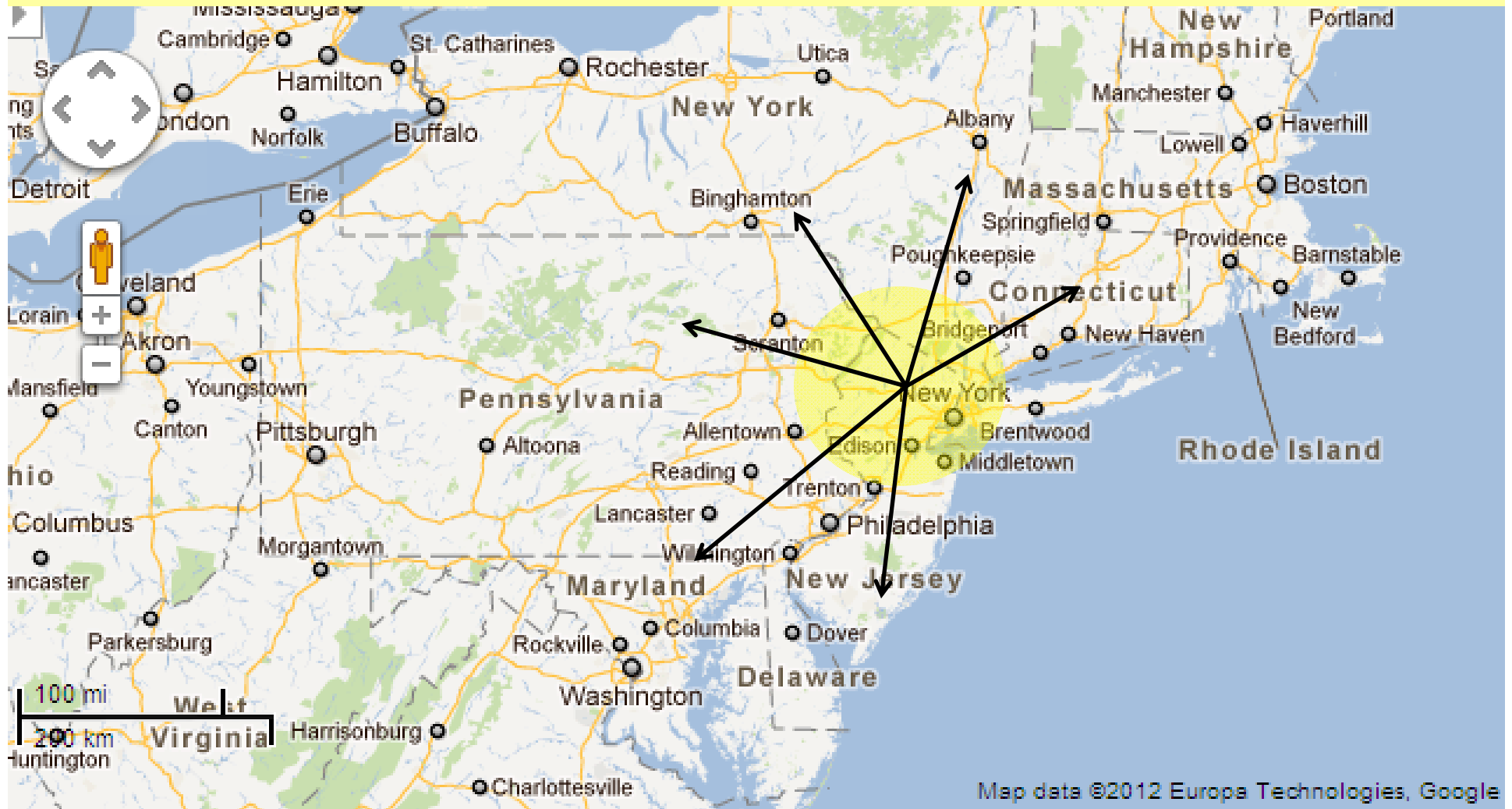
Vulnerable to disturbances during hibernation



Hibernia Mine, Morris County
Photos by Melissa Craddock



Spring



Males disperse; females form colonies



Natural Tree Roosts



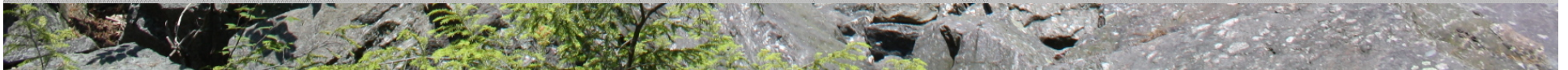
Roost Switching & Foraging

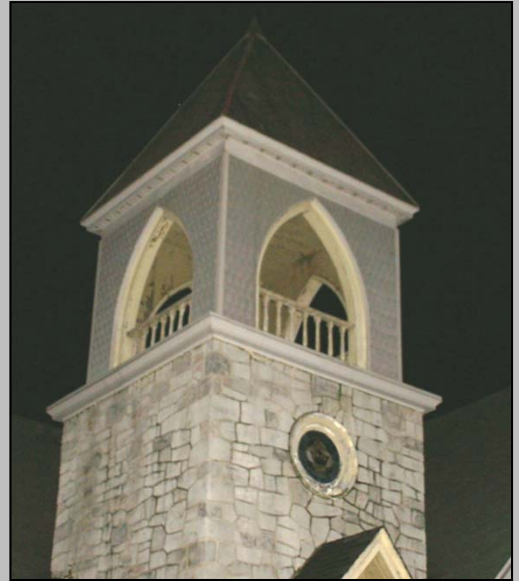


Foraging



Not All Bats Roost In Trees!





Artificial Roosts







Service Projects



More with Artificial Roosts



Pups!
Do Not Disturb...



Wind Energy



- BIG problem, esp. during fall (Aug-Nov) and spring (late April-May) migrations
- In the east, ~46 bats die per turbine per year; projecting 10,000 turbines in the east by 2030 which could potentially cause ~500,000 bat deaths per year
- Lower wind speeds = increased bat activity.....therein lies the solution!
- Typical cut-in speed for energy production is 3.5-4.0 m/s. Experimental cut-in speeds of ~5.0-6.5 m/s have shown a 44-93% reduction in bat deaths
- Off-shore: Bats have been detected at stations/buoys up to 15 miles



White-Nose Syndrome



<http://whitenosesyndrome.org/>

Aeolus Cave, VT (Jan 2009)



©Jonathan Reichard



Carbondale, PA (Feb 2009)

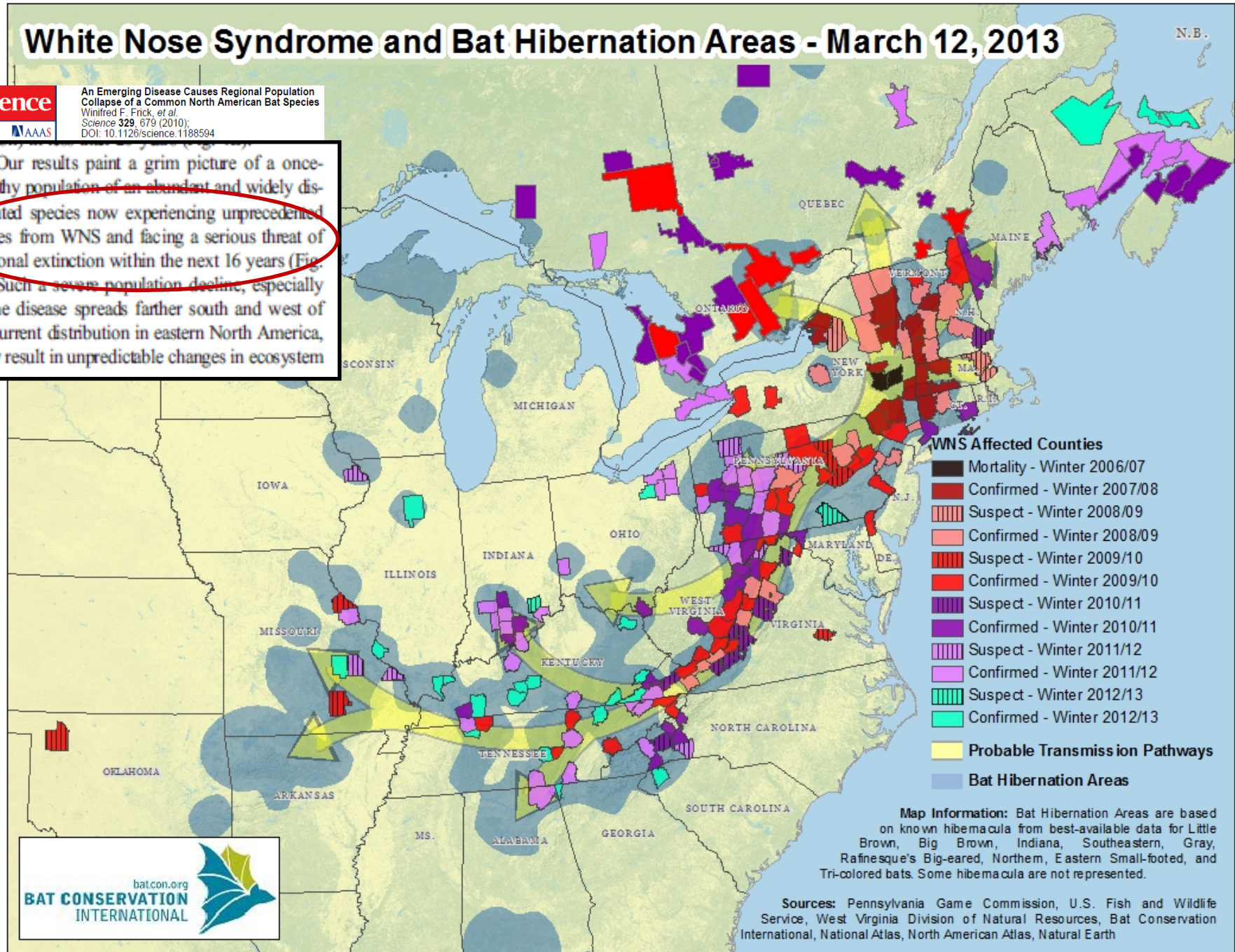
©Kevin Wenner, PGC

White Nose Syndrome and Bat Hibernation Areas - March 12, 2013

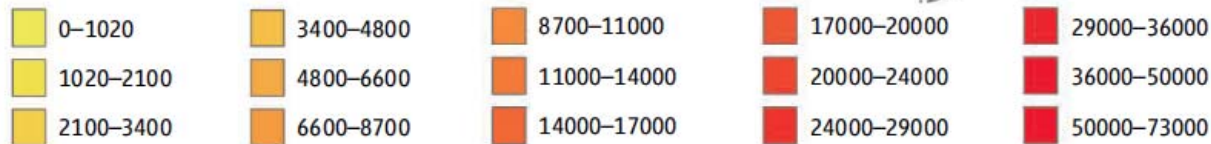
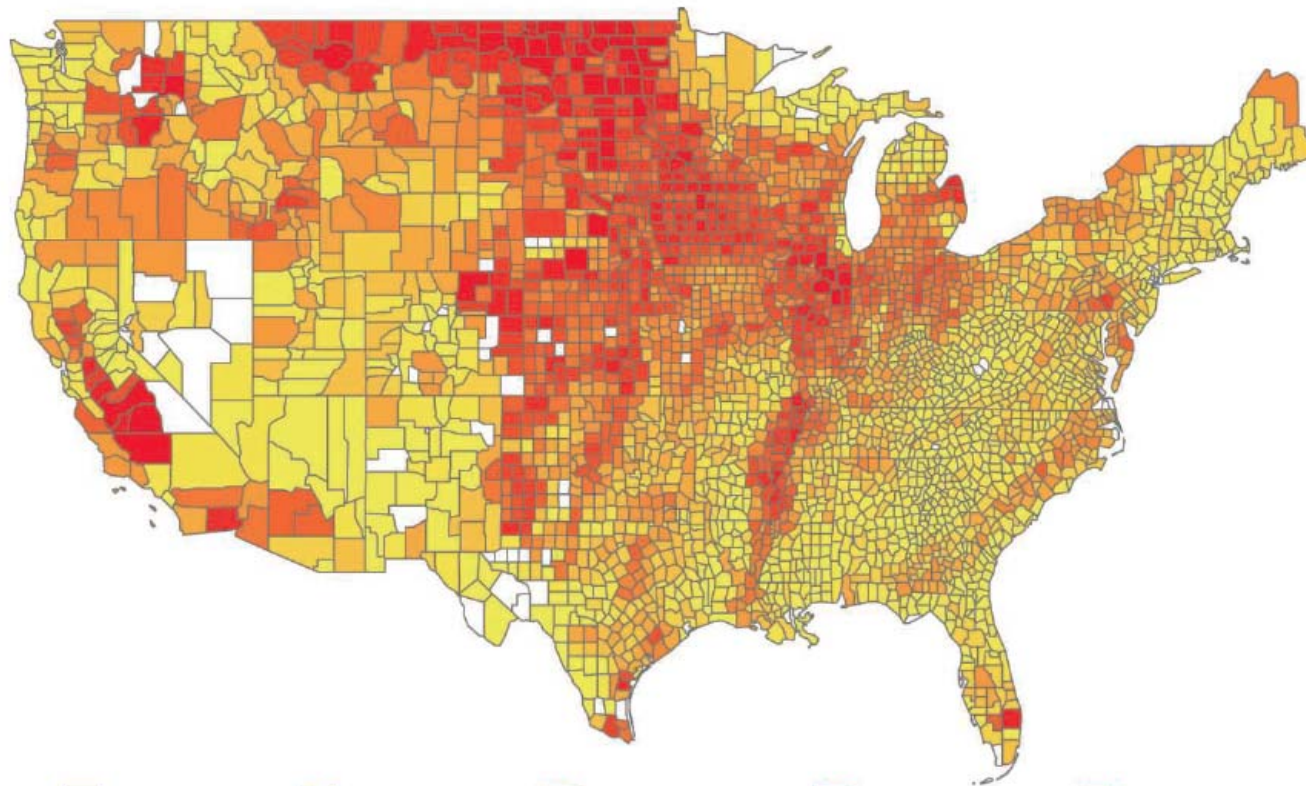
Science

An Emerging Disease Causes Regional Population Collapse of a Common North American Bat Species
 Winifred F. Frick, et al.
 Science 329, 679 (2010);
 DOI: 10.1126/science.1188584

Our results paint a grim picture of a once-healthy population of an abundant and widely distributed species now experiencing unprecedented losses from WNS and facing a serious threat of regional extinction within the next 16 years (Fig. 4). Such a severe population decline, especially if the disease spreads farther south and west of its current distribution in eastern North America, may result in unpredictable changes in ecosystem



Economic Value: Bats as Insect Pest Regulators



White-Nose Consequence

A single little brown bat can consume 4 to 8 g of insects each night during the active season.

6 million dead bats from WNS means up to

7,600 metric tons of insects not being eaten this year.



Research & Monitoring in NJ: Different Species, Different Tactics





Summer Bat Count

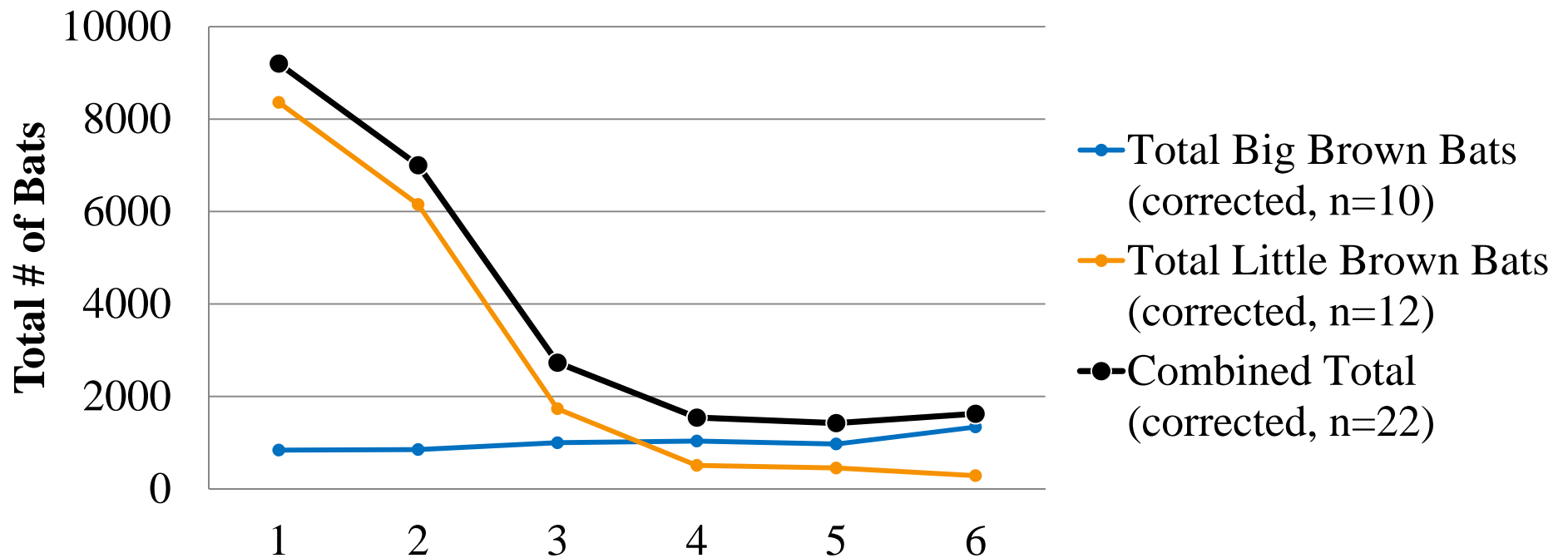
Got BATS?

Report your colony to Conserve Wildlife Foundation!



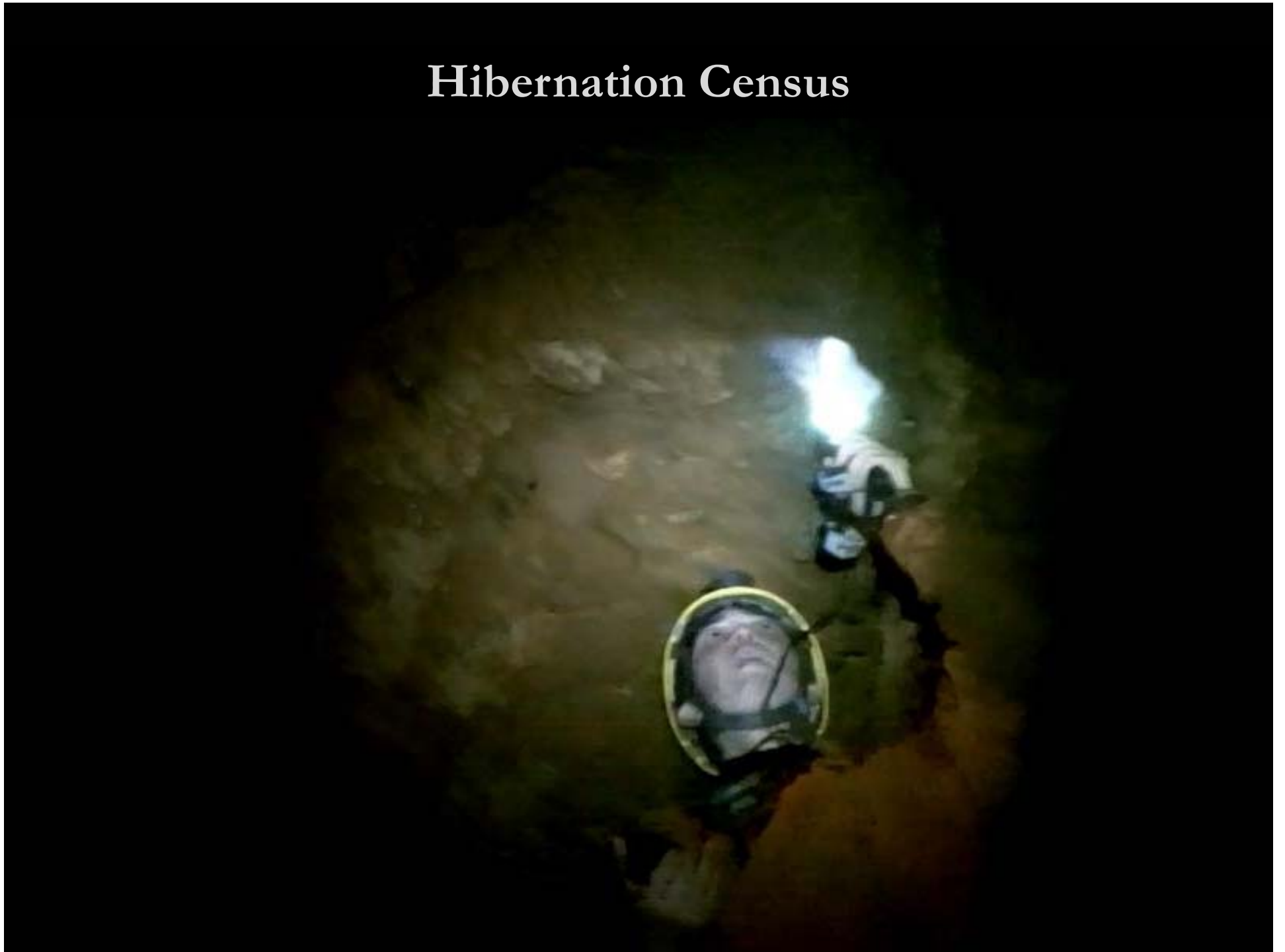


Summer Bat Count Annual Totals



	Baseline	2009	2010	2011	2012	2013	% Change in # Bats
Total Big Brown Bats	839	850	998	1,034	971	1,339	59.6%
Total Little Brown Bats	8,361	6,153	1,734	508	451	286	-95.4%
Combined Total	9,200	7,003	2,731	1,542	1,423	1,625	-82.3%

Hibernation Census



Banding & Survivorship



- 1,348 Hibernia bats banded since 2009
- 574 counted in March 2013
- Long-term survival appears low
 - Adults vs. juvs?

UV Light for WNS Monitoring





- Confirming *Pd*
- Early detection





Research &
Monitoring
in NJ





Maternity Colony Surveys



Erica Fischer



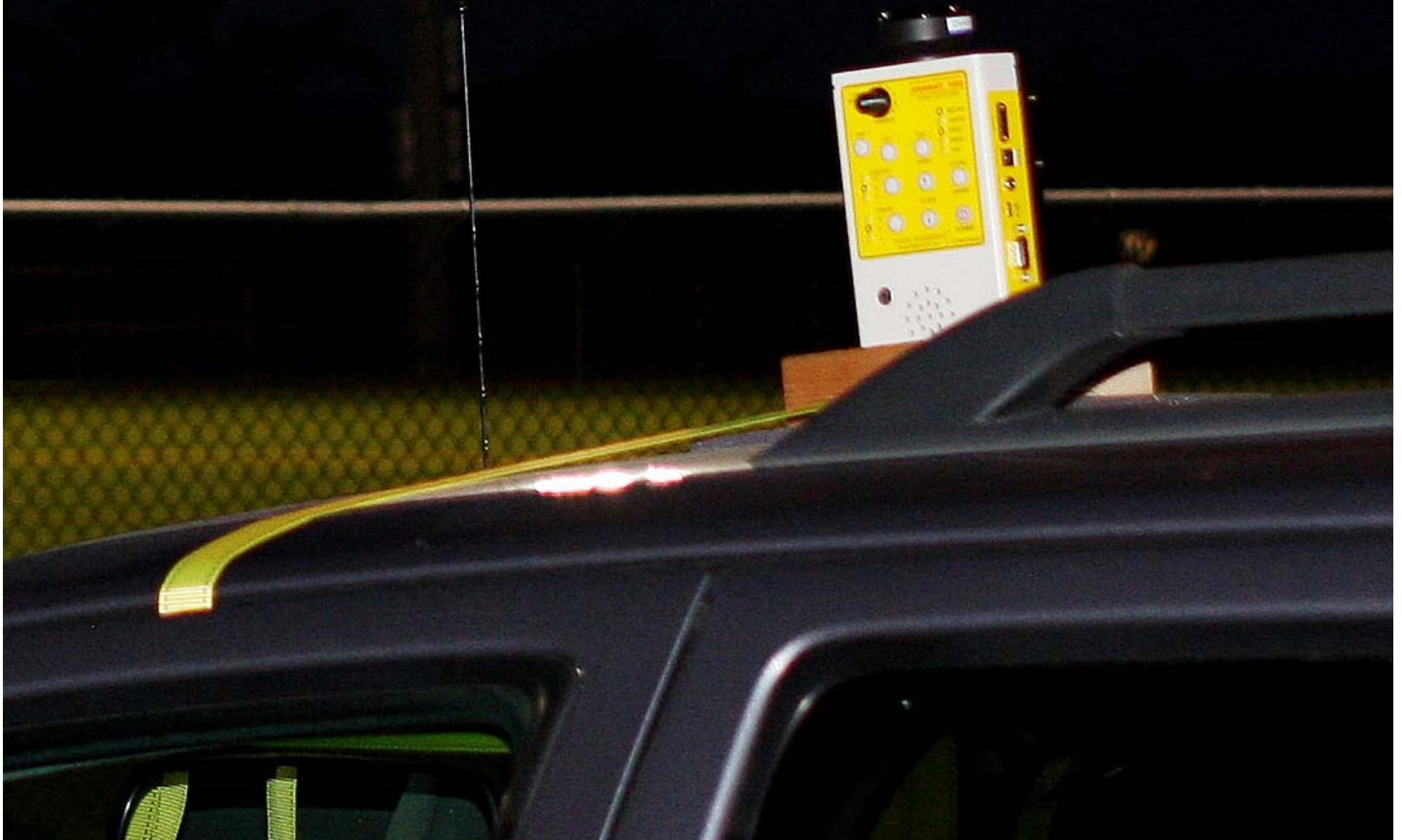
Kristen Pakonis

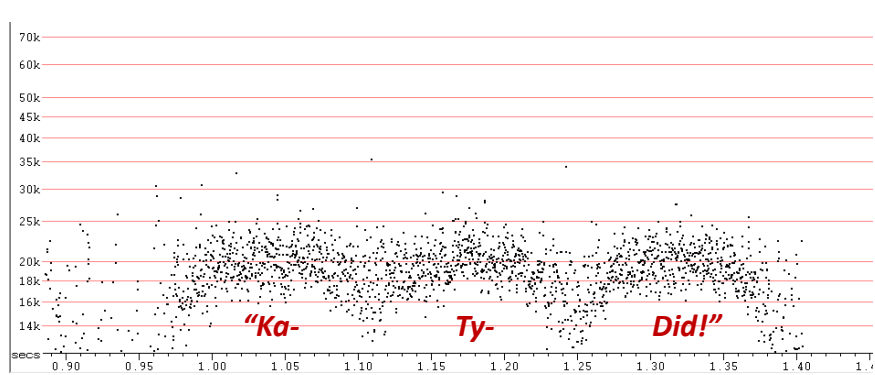
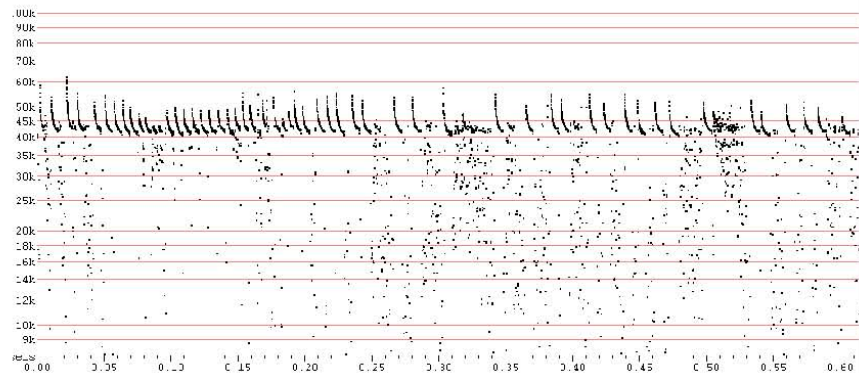
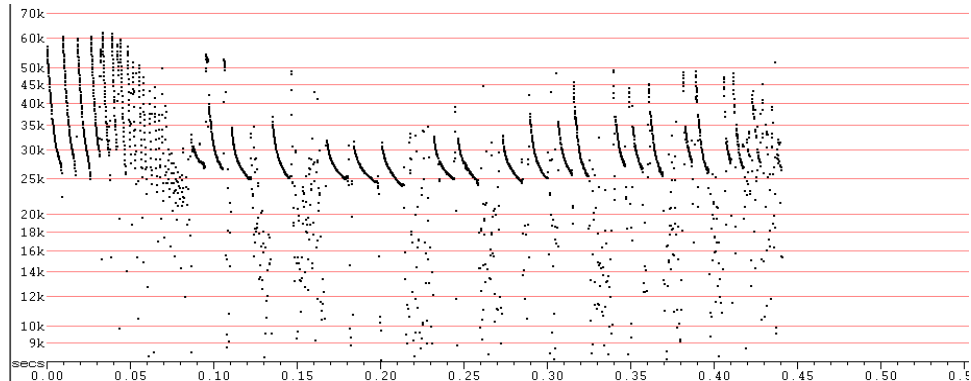
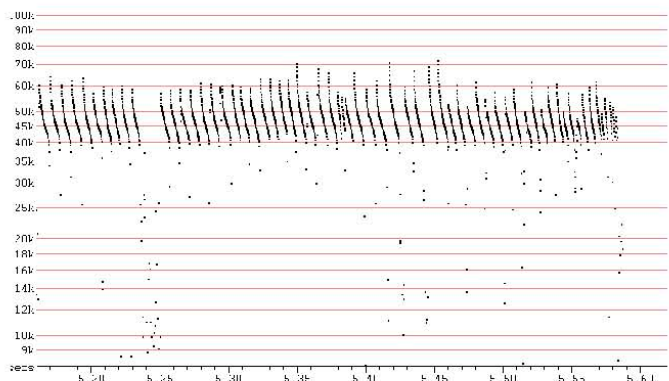
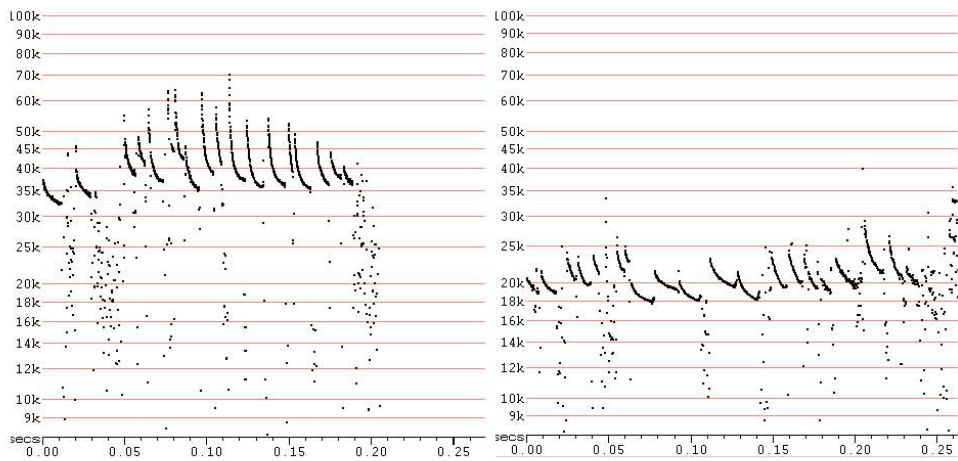


*Rule
Breaker!*



Acoustic Detection



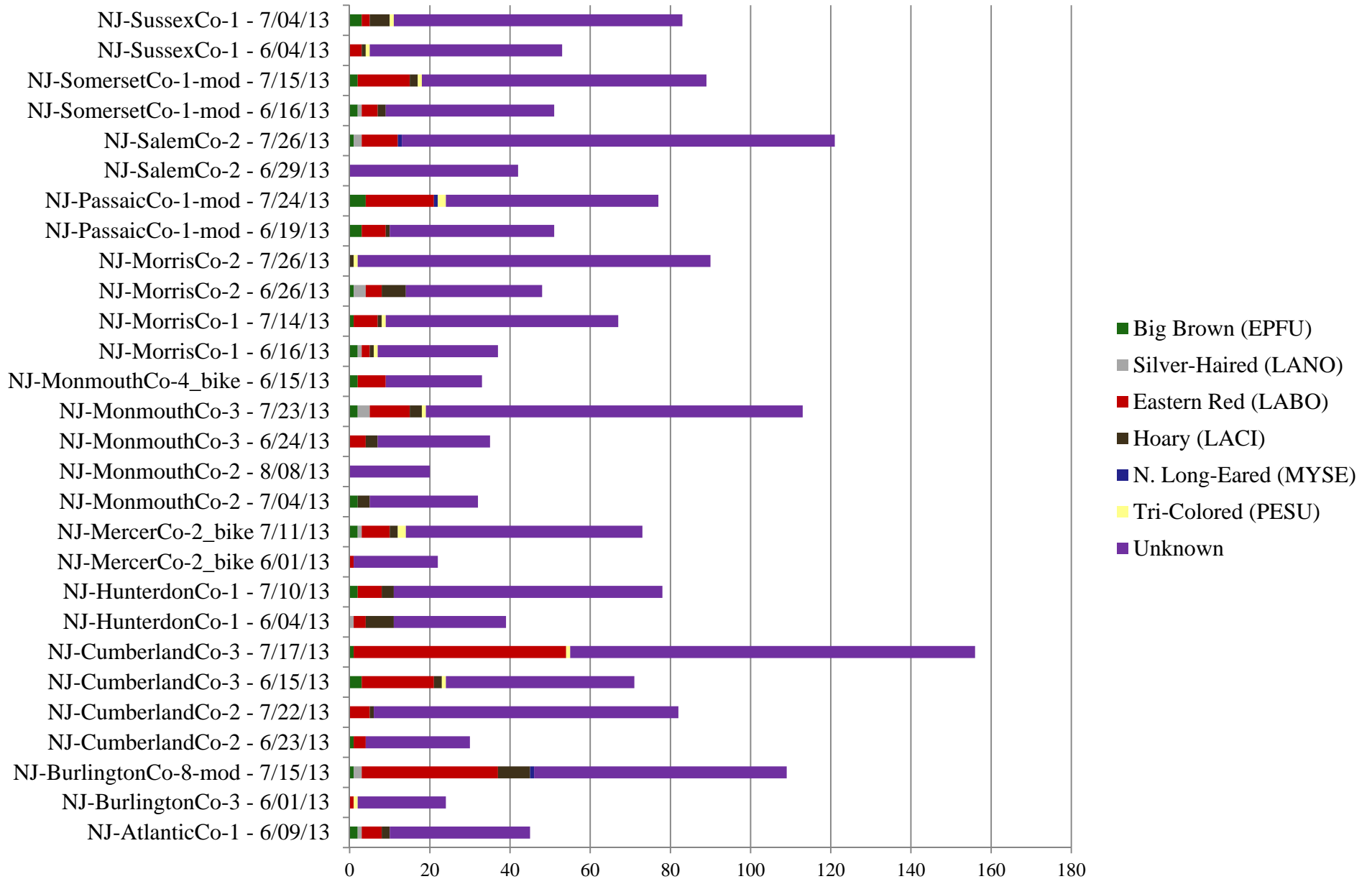




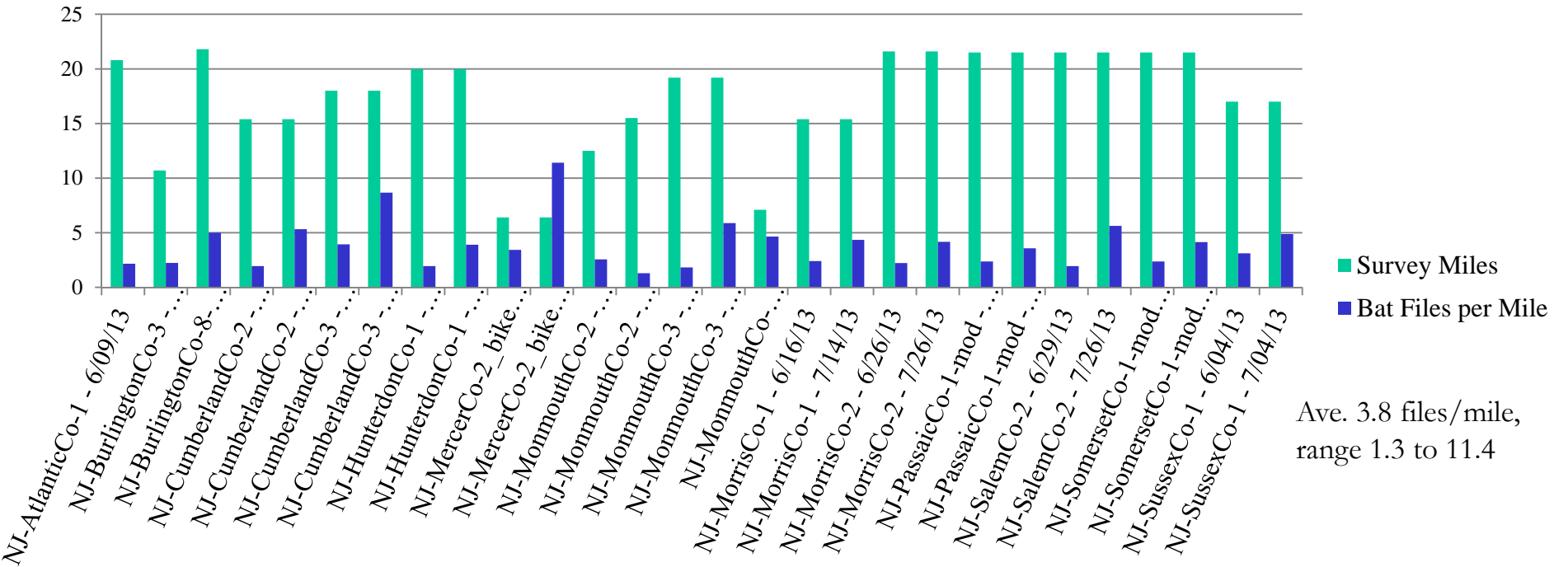
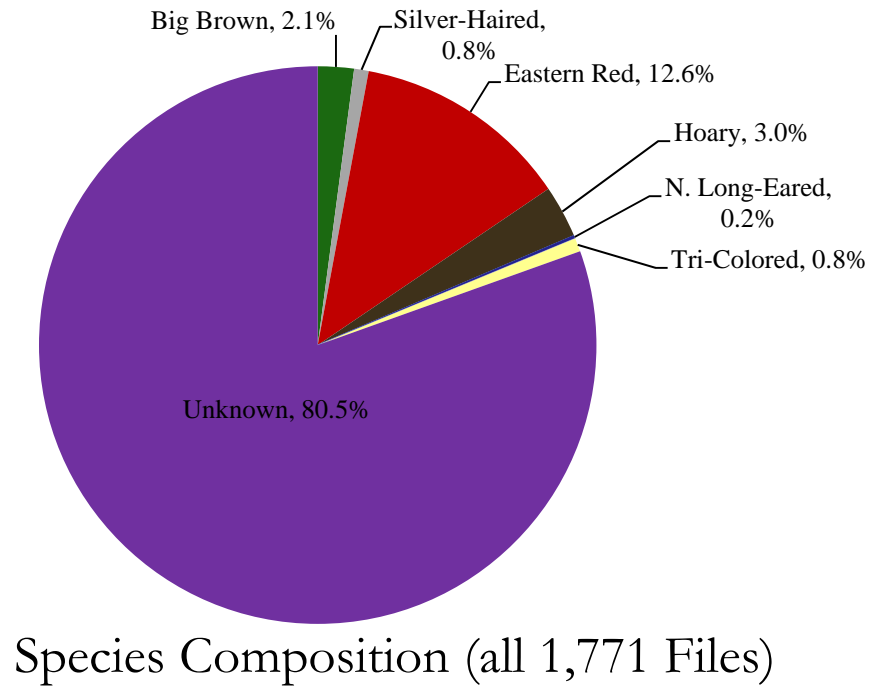
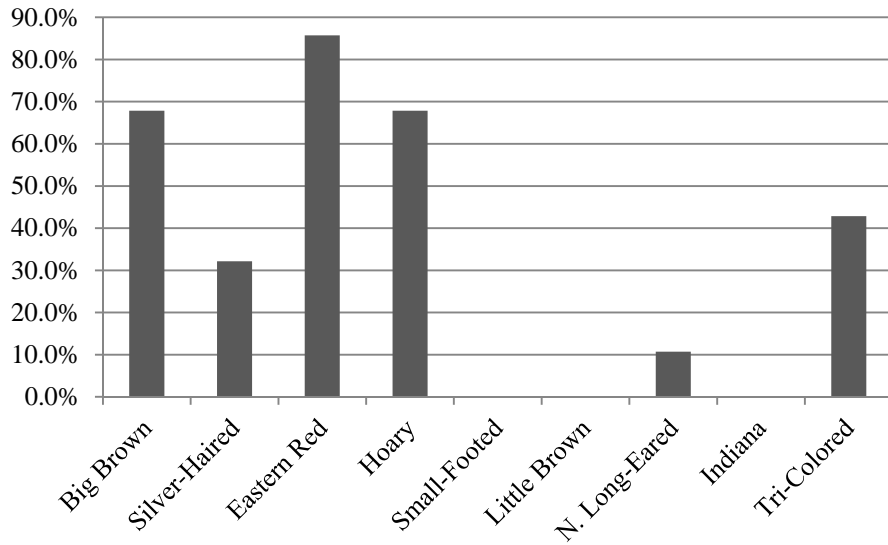
- 16 mobile transects
- Ave 17.3 miles long
- Followed standard national protocol
- 483.4 miles surveyed
- 1,771 bat files recorded
- Used auto-ID software to process files



Abundance & Diversity of Bats By Route, 2013



Percent of Surveys Present by Sp.





Other Uses For Acoustics





Big Brown Bat Hibernation Study





INVITE





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Bat Project

Read about our work to help protect New Jersey's bat population.



Zoom+ Big brown bats in an attic space. © Phil Woolldridge

Donate

BENEFITS OF BATS

Bats have a reputation as being spooky or even dangerous, but they are actually some of the most beneficial animals to people.

All of New Jersey's bats are insectivores. They feed on a huge variety of night-flying insects, including the beetles that devour our crops, the gypsy moths that denude our forests, and of course, those *awful* mosquitoes. A single little brown bat can eat 3,000 mosquito-sized insects per night! And big brown bats have even been found to eat stink bugs.



ADOPT AN INDIANA BAT!



Adopt an Indiana bat and help Conserve Wildlife Foundation protect this endangered species in New Jersey.

[Adopt >>](#)



This certificate is awarded to
YOUR NAME HERE
for adopting an Indiana bat to help save New Jersey's endangered & threatened wildlife.

Margaret O'Gorman, Executive Director
Conserve Wildlife Foundation of New Jersey



CERTIFICATE OF APPRECIATION

