

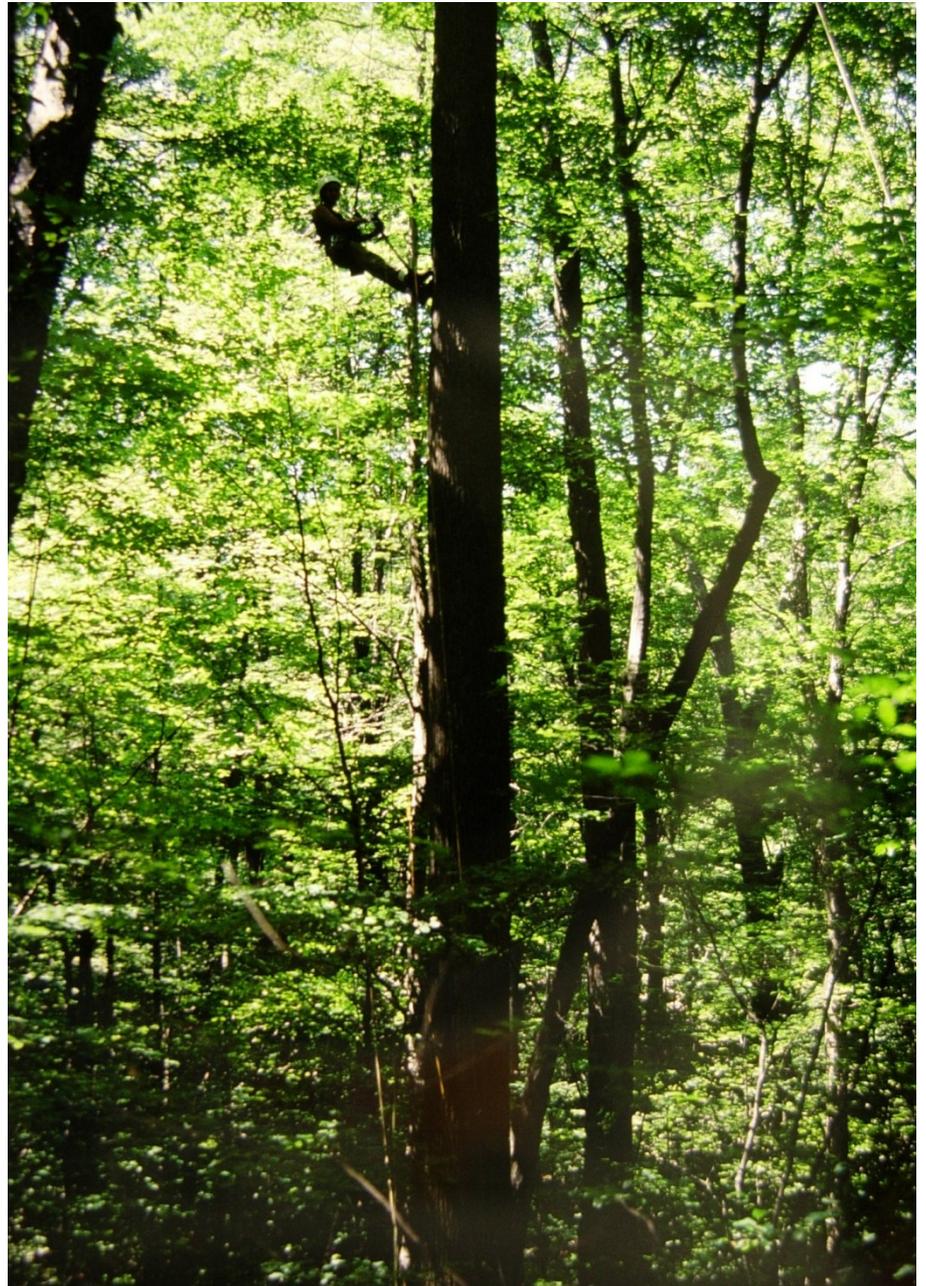
# BAT ECOLOGY IN THE PINELANDS WITH A FOCUS ON THE NEWLY- LISTED NORTHERN LONG-EARED BAT (*MYOTIS SEPTENTRIONALIS*)

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# Generalities



# Bats of NJ (Small-bodied species)

- Indiana (*Myotis sodalis*)      **ENDANGERED**
  - NJ: Endangered
- Northern Long-eared (*M. septentrionalis*)      **THREATENED**
  - NJ: Endangered (rec)
- Little Brown (*M. lucifugus*)
  - NJ: Endangered (rec)
- Eastern small-footed (*M. leibii*)
  - NJ: Endangered (rec)
- Tri-colored (*Perimyotis subflavus*)
  - NJ: Endangered (rec)

# Bats of NJ (Large-bodied species)

- Big brown (*Eptesicus fuscus*)
  - NJ: Special Concern (rec)
- Eastern red (*Lasiurus borealis*)
  - NJ: Special Concern (rec)
- Hoary (*L. cinereus*)
  - NJ: Special Concern (rec)
- Silver-haired (*Lasionycteris noctivagans*)
  - NJ: Special Concern (rec)
- Rec = Recommended by Endangered and Nongame Species Advisory Committee

# White-nose Syndrome

- Disease agent: Fungus (*Pseudogymnoascus destructans*)
  - From Europe?
- First observed in US: Winter 2006, near Albany, NY
- NJ: Winter 2009

**Appearance of  
fungus on  
hibernating bats  
([www.fws.gov](http://www.fws.gov))**



# WNS survey, Supawna Meadows NWR

Fungus  
damage



Annette Scherer, US FWS

Mick Valent, NJ DEP ENSP

ID#: NJ073009AMS122  
Right Wing



© John K. Floyd

# Hibernia iron mine (summer 2014)

-New Jersey's largest hibernaculum



# WNS Affected Species (Meteyer et al. 2009)



• *Myotis lucifugus*



• *Myotis septentrionalis*



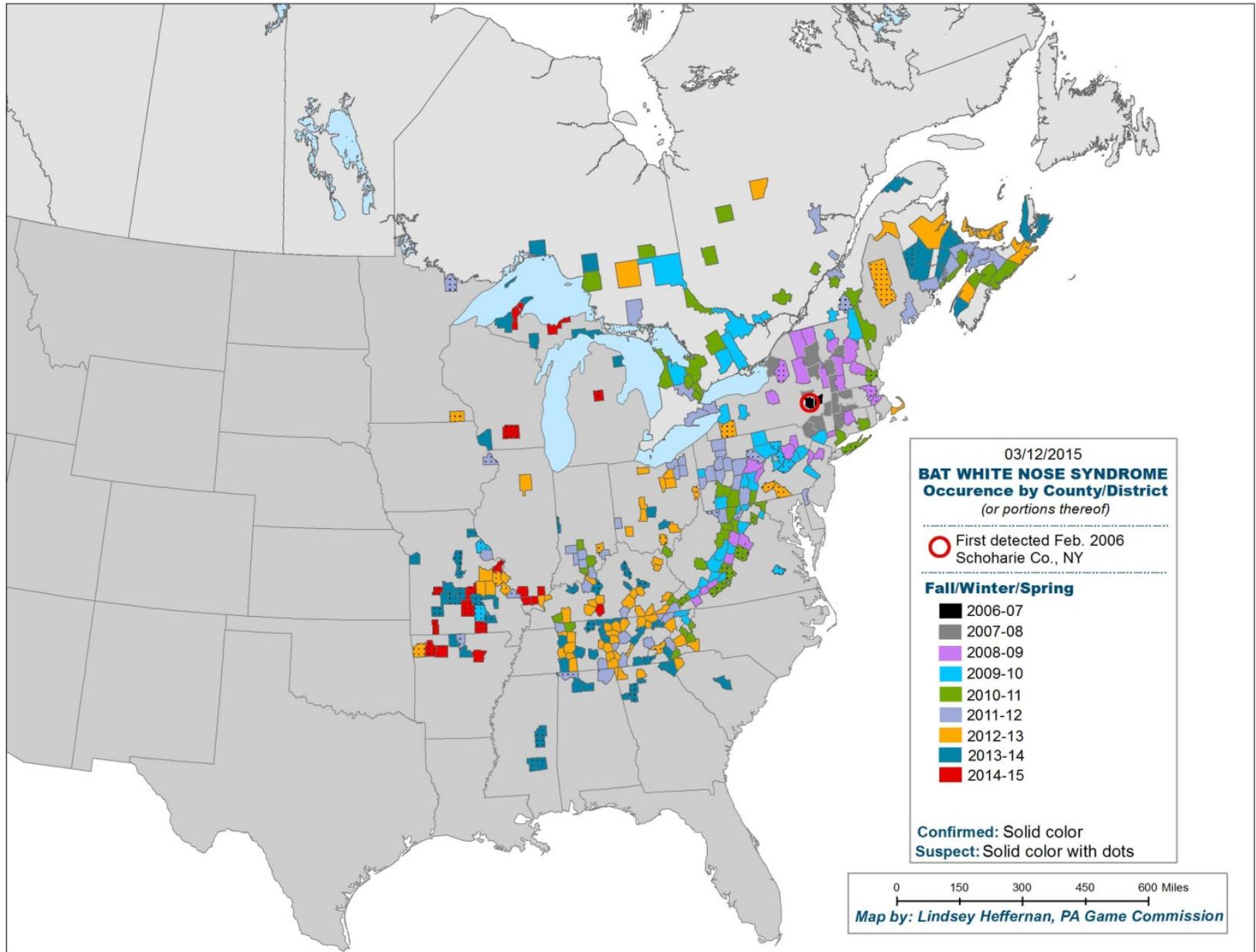
• *Myotis sodalis*



• *Perimyotis subflavus*

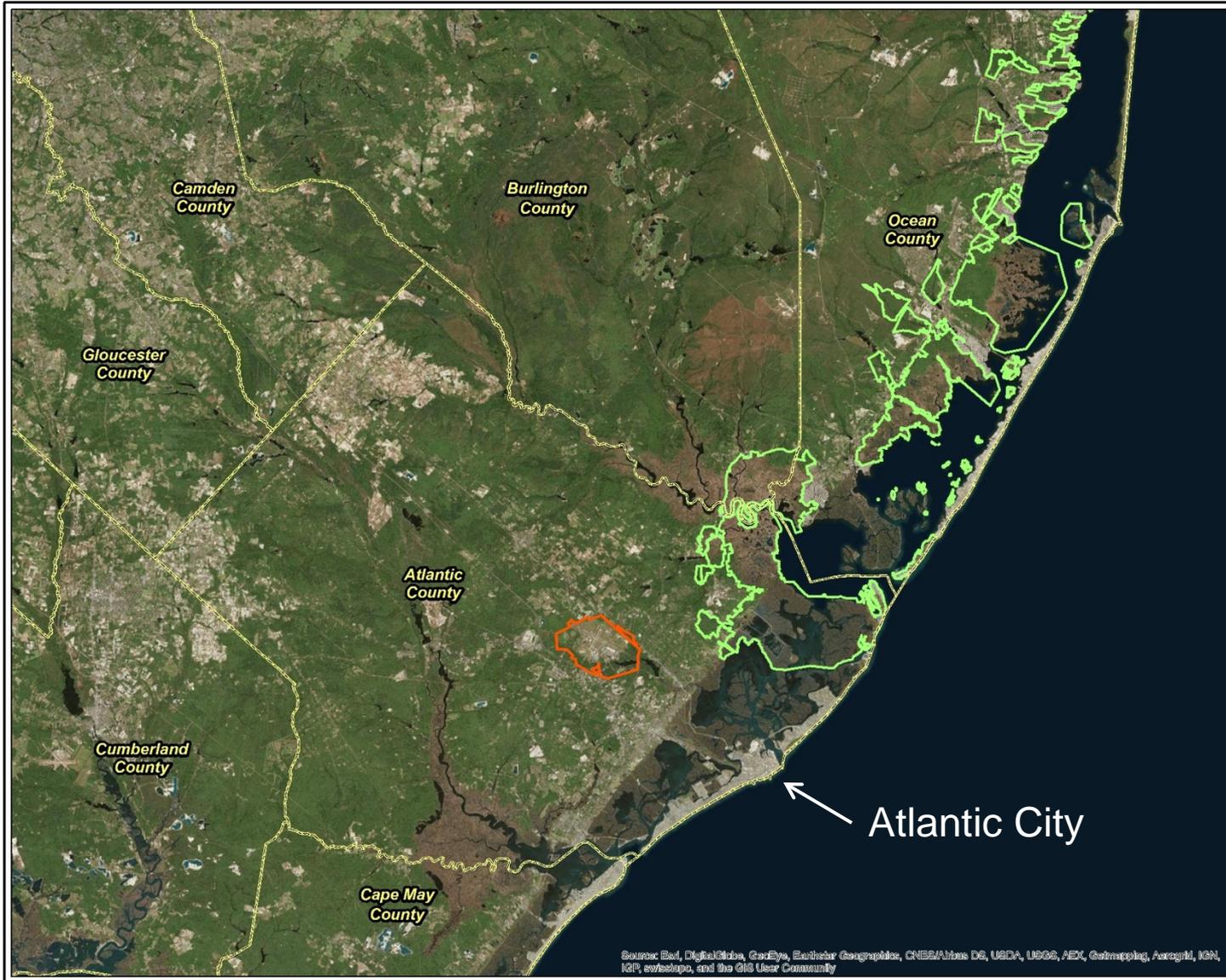


• *Eptesicus fuscus*



What do we know about bats in the NJ  
Pinelands?

# FAA Property (O), Forsythe NWR (G)

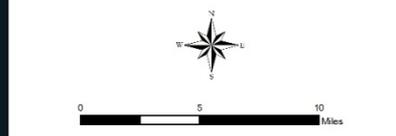


Federal Aviation Administration  
 William J. Hughes Technical Center  
 Center Boundary & Forsythe  
 National Wildlife Refuge Extent



**Map Legend**

- Tech Center Property Boundary
- Edwin B. Forsythe National Wildlife Refuge
- New Jersey County Boundaries



DEPARTMENT OF TRANSPORTATION  
 FEDERAL AVIATION ADMINISTRATION  
 WILLIAM J. HUGHES TECHNICAL CENTER  
 ATLANTIC CITY, NEW JERSEY 08405

United States Fish and Wildlife Service (USFWS) property boundary information was downloaded from the USFWS cadastral property data website.  
 Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

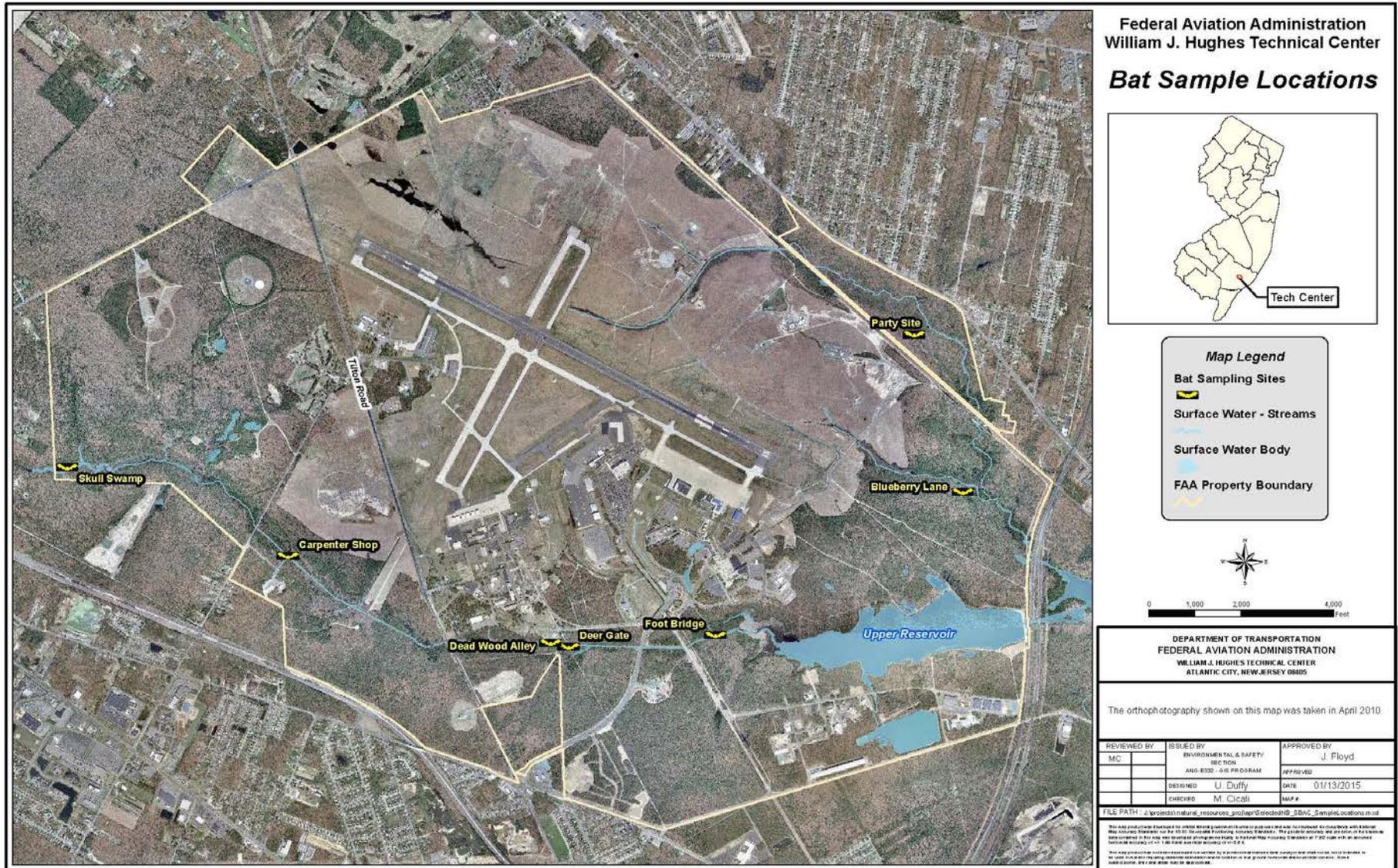
REVIEWED BY	ISSUED BY	APPROVED BY
MC	ENVIRONMENTAL & SAFETY SECTION ANG-8332 - GIS PROGRAM	J. Floyd
	DESIGNED	DATE
	U. Duffy	01/13/2015
	CHECKED	MAP #
	M. Cicalli	

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 This map was produced using data from various sources. The data is provided as is and the user assumes all liability for any errors or omissions. The data is provided as is and the user assumes all liability for any errors or omissions. The data is provided as is and the user assumes all liability for any errors or omissions.

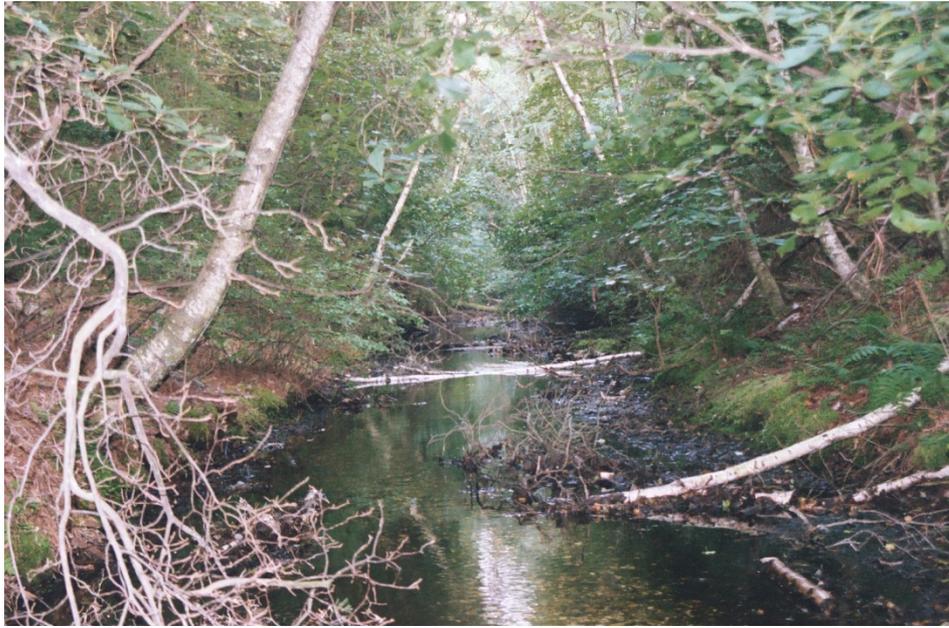
# Background

- FAA – William J. Hughes Technical Center (surrounds Atlantic City Airport)
- Coastal plain: NJ Pinelands National Reserve
- Env. contaminants; water table manip.
- Mist nets (some telemetry): June - July
- 13 years (2001-2014, not 2013)
  - WNS - 2009

# Net Sites on FAA Property



1 km



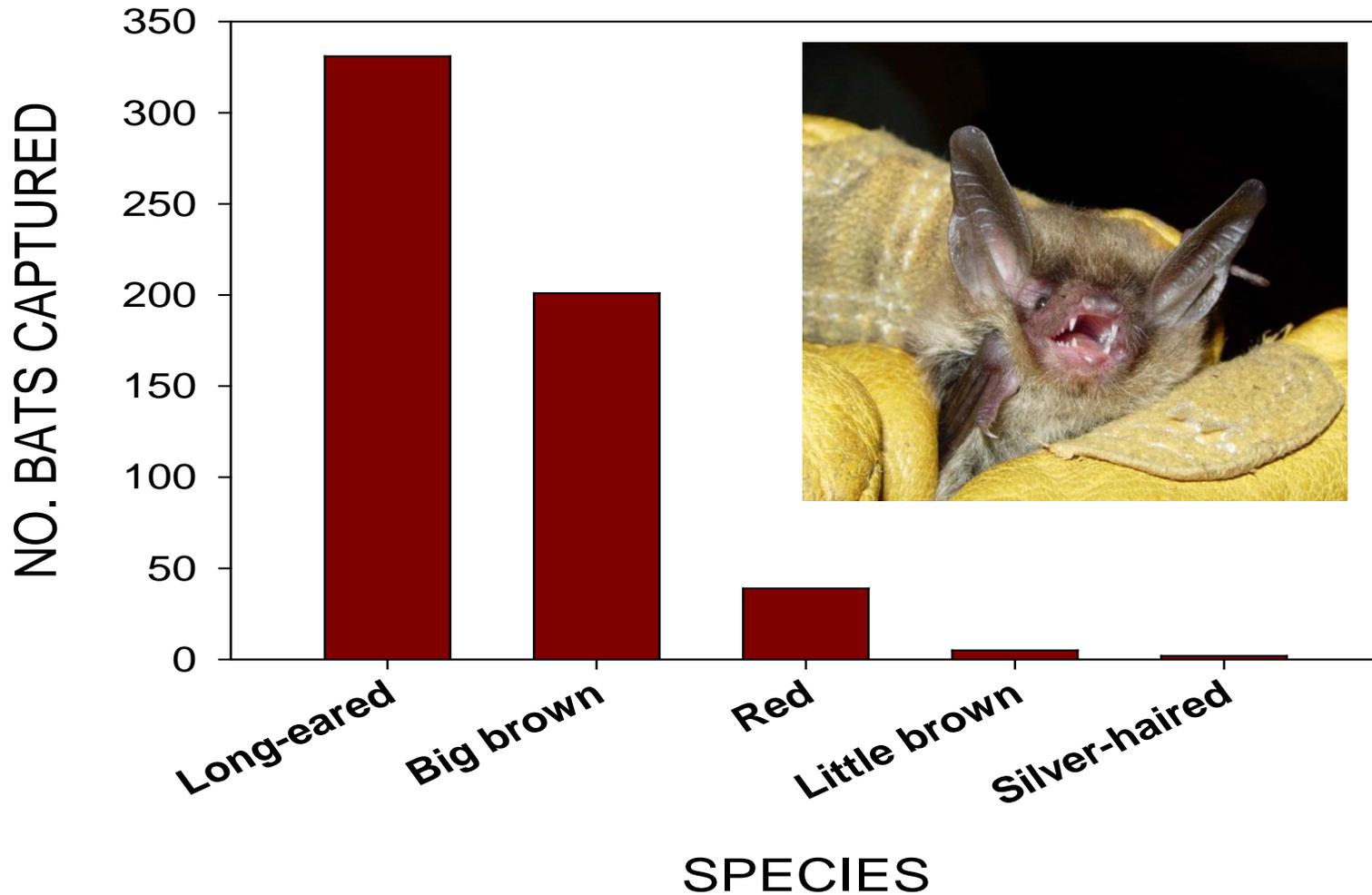
# FAA Net Sites



# Net Sites in Wharton State Forest

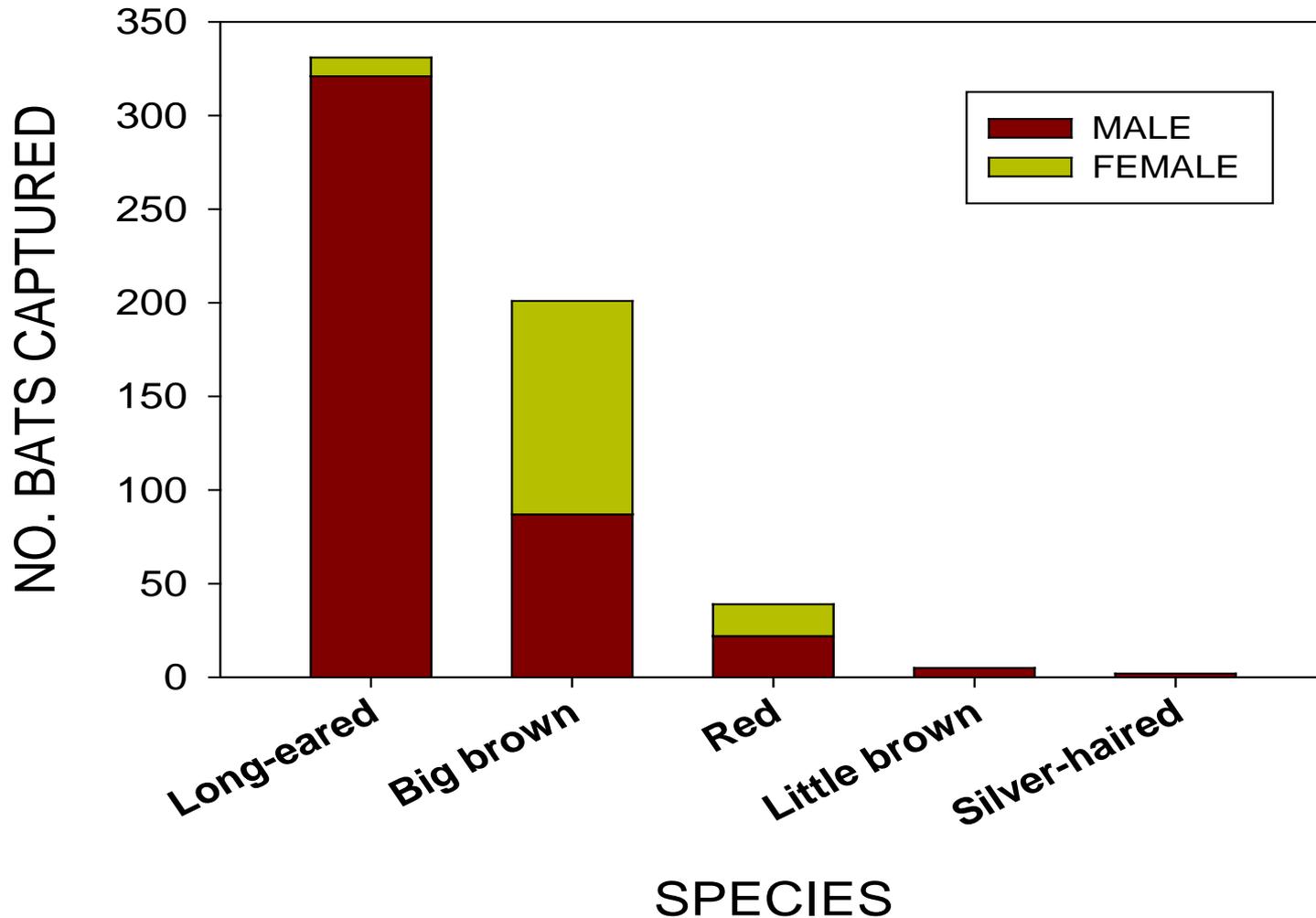


# Total Captures (Long-eared dominant)



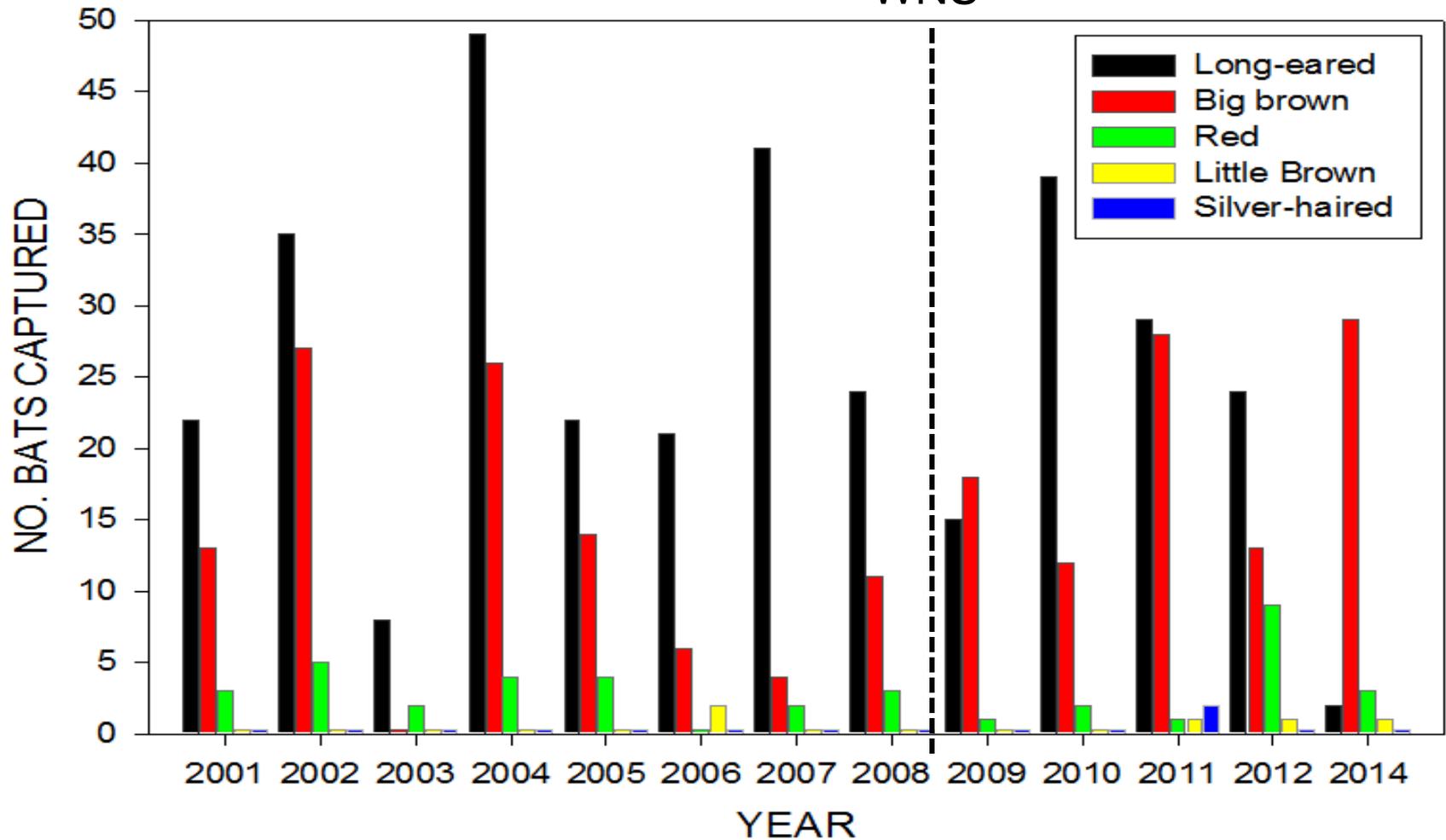


# Sex Ratios (note asymmetry)



# Annual Captures (2014 different)

WNS

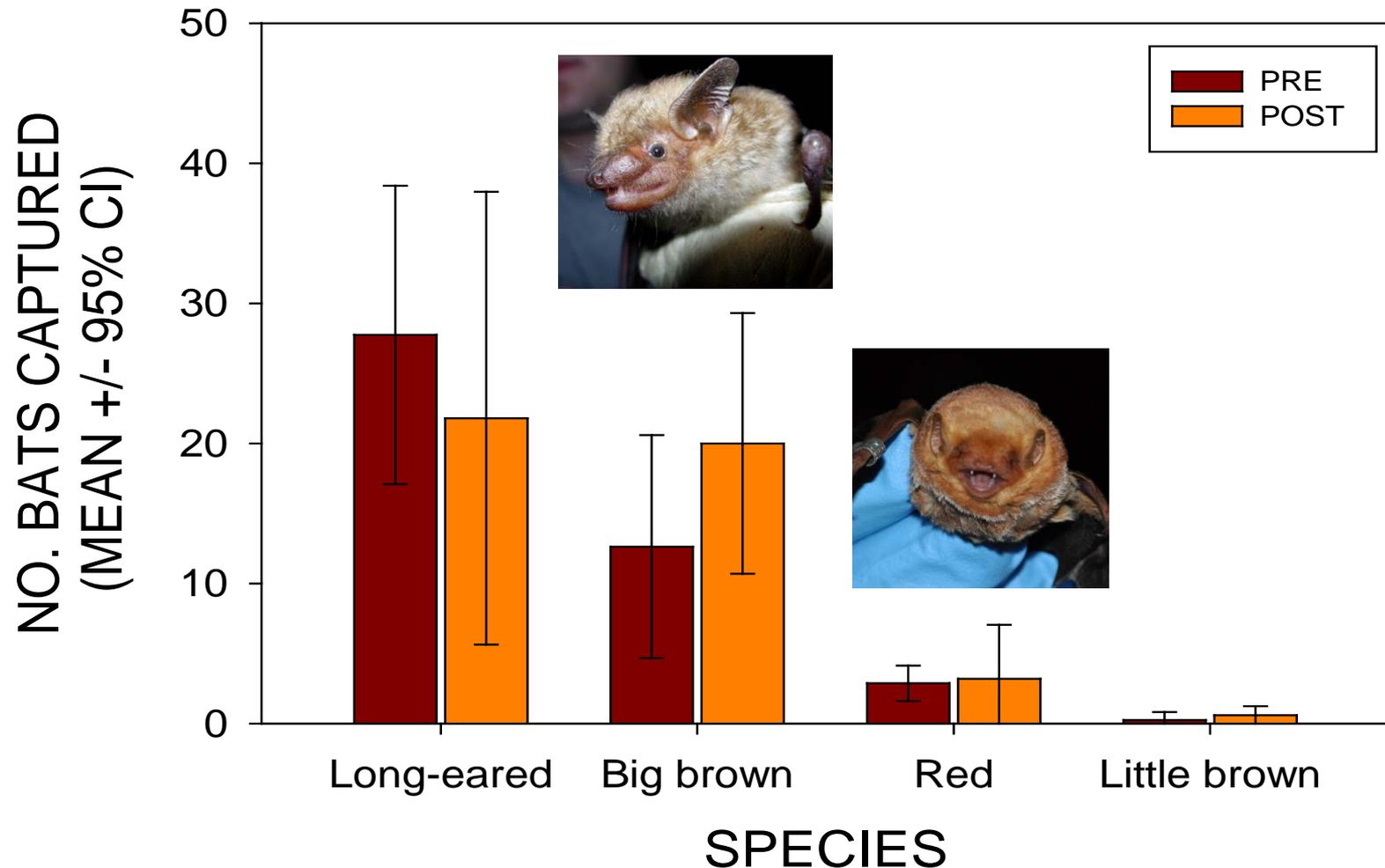


# WNS (damage decrease)

YEAR	Long-eared	Big brown
2009	53.3% (8/15)	92.3% (12/13)
2010	37.8% (14/37)	33.3% (3/9)
2011	35.7% (10/28)	19% (4/21)
2012	14.3% (3/21)	8.3% (1/12)
2013	-----	-----
2014	0% (0/2)	25% (5/20)

Note: Reichard scores mostly 0 or 1. A single 2 in 2009

# Pre- and Post-WNS Captures (per year)



# Recapture Summary

Long-eared	Big brown	Red	Little brown
26 (12.7%)	12 (16.8%)	0	0

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Long-eared						
Same Yr	1 yr	2 yr	3 yr	4 yr	5 yr	6 yr
5	7	9	1	1	2	1
Big brown						
0	4	5	2	0	1	0

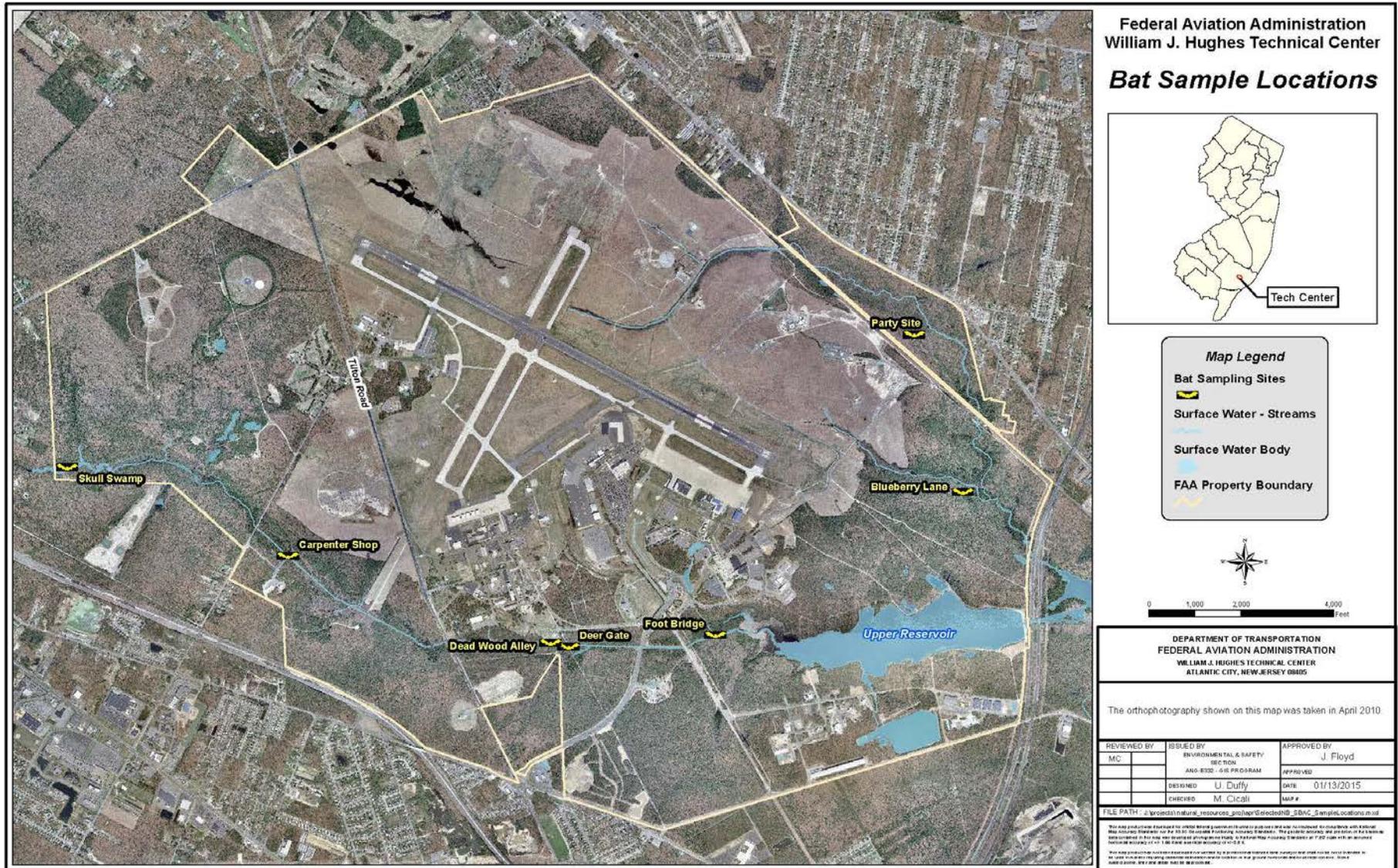
# Recaptures: Fidelity (High)

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SPECIES	TIMING	SAME SITE	DIFFERENT SITE (always < 1.5km)
Long-eared	16.3 days	92.3%	7.7%
Big brown	16.8 days	91.7%	8.3%

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# Net Sites on FAA Property



1 km

# Telemetry: Long-eared bat roost trees

Roosts in  
Cedar and  
Hardwood  
swamps  
(1 shed)

Nomadic?



# Why was 2014 so different?

Long winter?

Weather extremes:  
microbursts (photos),  
Hurricane Sandy,  
Nor'easters?

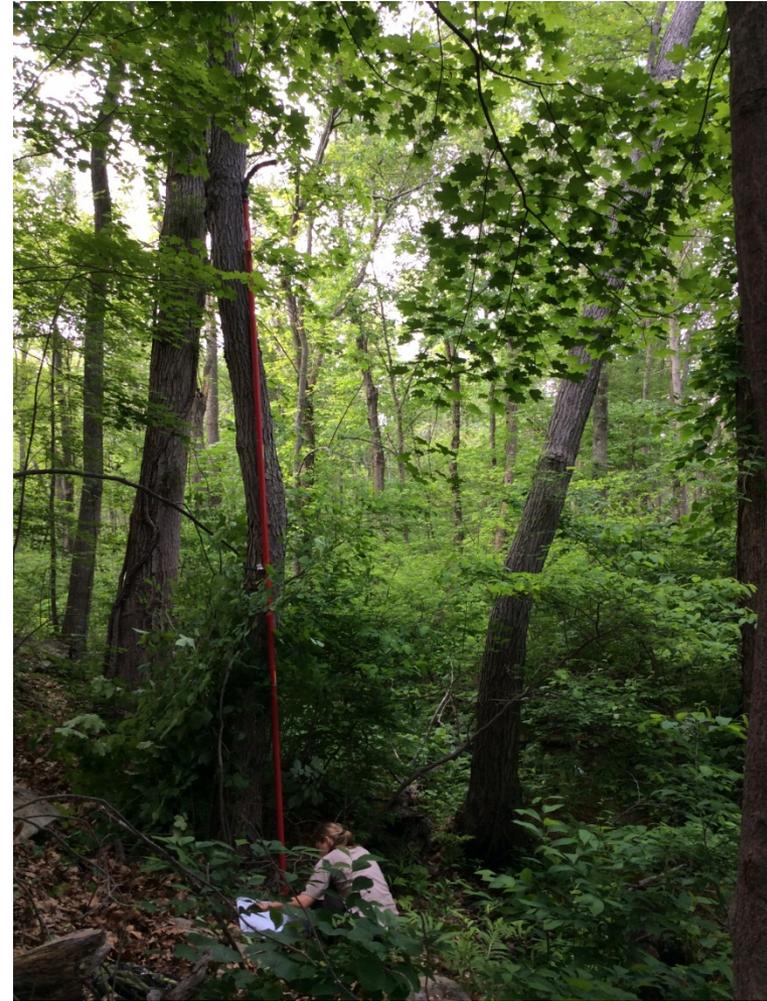
WNS?



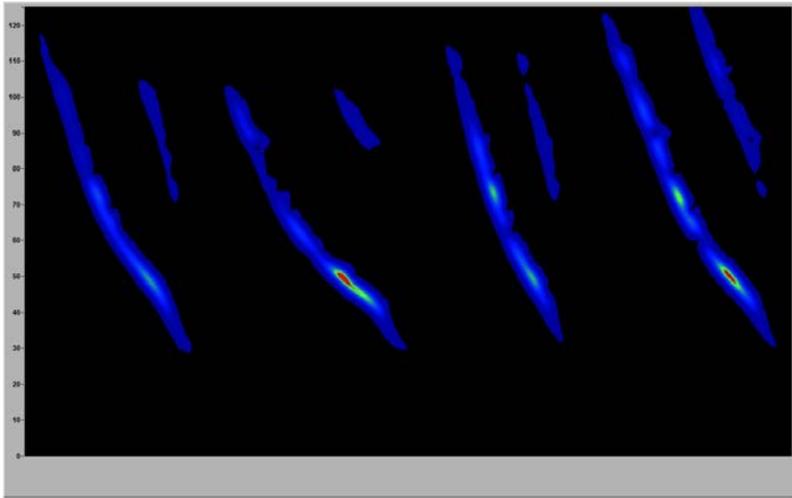
# Summary

- Dominates in pinelands wetlands
  - Mostly males
- Considerable interannual variability
- High site fidelity
- Roosts in wetlands, but transient
- What will happen in 2015?

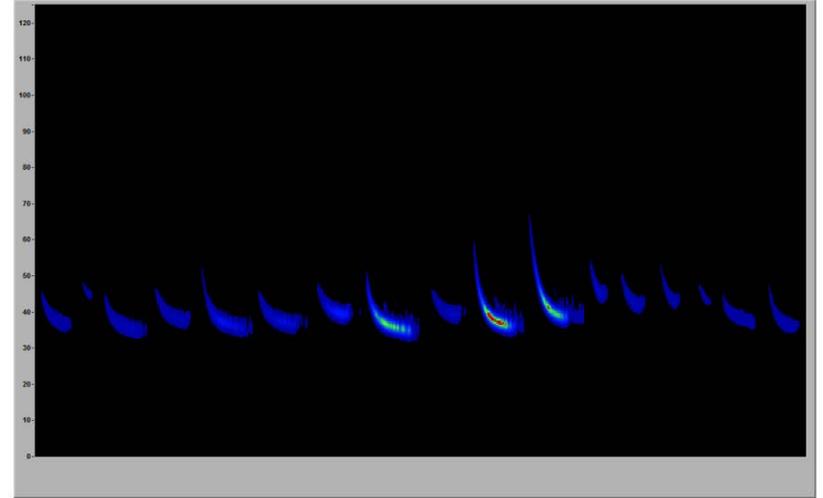
# Acoustic monitoring:



# Acoustic monitoring:



Long-eared



Red



# Acknowledgements

- US FAA: John Floyd, Tom Hupf
- TRC: Scott Heim
- WP Bat Crew: >30 student assistants

