Michigan Bats: Habitat, Health and Hereafter

Michigan Society of American Foresters
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Habitats, Health, and Hereafter

- Native Michigan Bats
- Natural History
- Threats…. why we should care
- Regulatory Outlook

Native Michigan Bats Species

- Indiana Bat (*Myotis sodalis*)
- Northern Long-eared Bat (*Myotis septentrionalis*)
- Little Brown Bat (*Myotis lucifugus*)
- Evening Bat (*Nycticeius humeralis*)
- American Perimyotis* (*Perimyotis subflavus*)
- Big Brown Bat (*Eptesicus fuscus*)
- Eastern Red Bat (*Lasiurus borealis*)
- Hoary Bat (*Lasiurus cinereus*)
- Silver-haired Bat (*Lasionycteris noctivagans*)

** The bat frequently referred to as the Tri-colored Bat and formerly known as the Eastern Pipistrelle*

Little Brown Bat

Big Brown Bat

Hoary Bat

Eastern Red Bat

Silver-haired Bat

Migratory Habits

- Long-distance migrants (>500 miles)
  - Hoary Bat
  - Red Bat
  - Silver-haired Bat
- Summer residents only
- Don’t hibernate
- Spend winter in southern tier of states
- Frequently referred to as the “tree bats”

Migratory Habits

- Short-distance/Non migrants (<300 miles)
  - Indiana Bat
  - Northern Long-eared Bat
  - Little Brown Bat
  - Evening Bat
  - American Perimyotis
  - Big Brown Bat
- Overwinter in caves and mines (hibernacula) and structures

General Distribution in Michigan

- Indiana Bat – Southern part of the Lower Peninsula and the Manistee area
- Evening Bat – Southern tier of counties, primarily around Lenawee and Hillsdale Counties
- Rest of the species – throughout the state, though Big Brown Bats more prevalent in south and Little Brown Bats and Northern Long-eared are more prevalent in the north

Seasonal Distribution Among Habitats

- Fall-Winter
  - Mines and Caves "hibernacula"
  - Structures(?)

"Cave bats" and Big Brown Bats

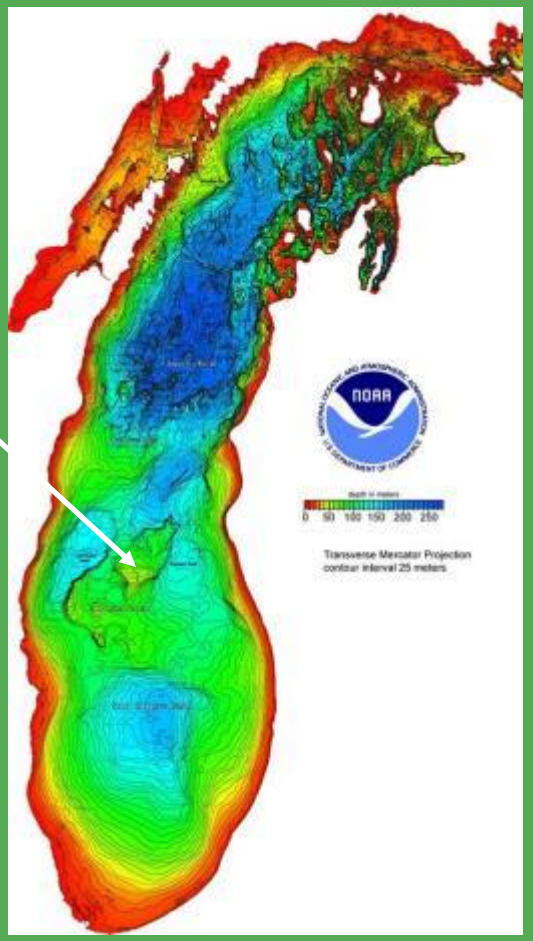
Seasonal Distribution Among Habitats

- Feeding habitat – Almost everywhere
  - Any wooded area
  - Agricultural fields
  - Open water
    - Ponds
    - Rivers
  - Food – insects, mainly beetles, moths, caterpillars
  - Catch while flying, or glean off vegetation

Bats in Over-the-Horizon Lake Michigan

- 4,000+ calls
- Throughout summer
- Primarily the tree bats

- Mid-lake Plateau of Lake Michigan



Seasonal Distribution Among Habitats

- Roosting habitat
  - Any wooded area
  - Structures

Reproduction Cycle of the Cave Bats

e.g. Northern Long-eared Bat

Photo by "Jurgamat"

Reproductive Cycle of the “Cave Bats”

- Swarm in the late summer and fall in vicinity of hibernacula
- Enter into hibernation from mid August until late October

Reproductive Cycle of the “Cave Bats”

- Mating takes place before entering the hibernaculum
- Females store sperm until spring
- Fertilization and implantation occurs at end of hibernation

Reproductive Cycle of the “Cave Bats”

- Bats emerge from hibernaculum in mid-Spring (early April)
- Give birth to 1-2 pups
- Females form “maternity colonies” in forest, using “roost” trees to shelter during the day

Reproductive Cycle of the “Cave Bats”

- Maternity Roost Trees
  - Live trees or snags
  - Exfoliating bark, crevices or hollows
  - No vines
  - 4’ clearance all around
  - >~ 15 feet tall
  - Good sun exposure

Reproductive Cycle of the "Cave Bats"

- Bats emerge from hibernacula in mid-Spring (early April)
- Give birth to 1-2 pups
- Females form "maternity colonies" in forest, using trees with exfoliating bark to shelter during the day
- Pups are independent by mid-August

Outlook for the Future

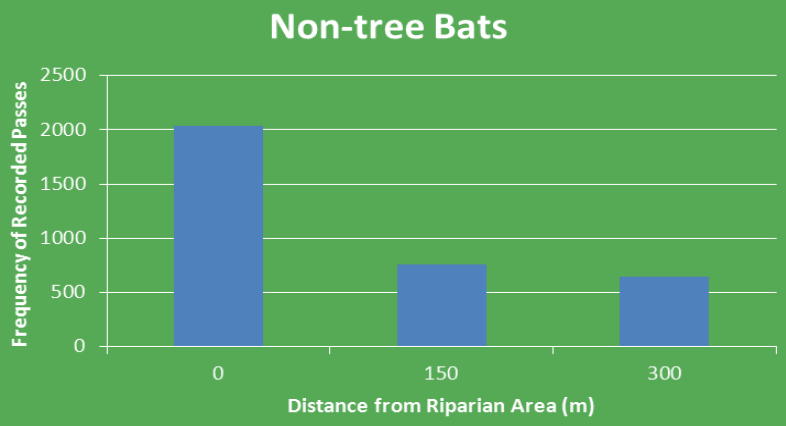
- Threats
  - Wind Energy
  - White Nose Syndrome

Wind Energy

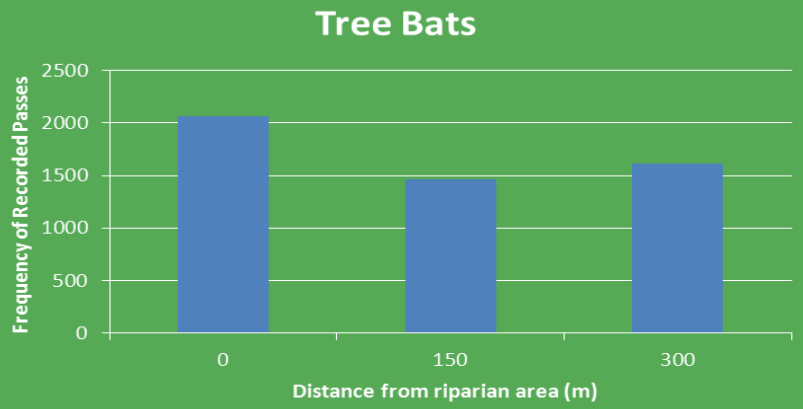
- Bat fatalities
  - 24-34 bats/turbine/year
  - 75% of fatalities accounted for by
    - Eastern Red Bat
    - Silver-haired Bat
    - Hoary Bat
  - Mechanism
    - Collide with monopole or blades
    - Barotrauma (lung damage from low pressure vortex)

Michigan Natural Features Inventory

MICHIGAN STATE UNIVERSITY | Extension



Non-tree bats stay nearer wooded areas



Tree bats frequent open areas more than non-tree bats

Wind Energy

- Mortality can be reduced by 60%+ with higher “cut-in speeds” for the turbines (i.e. higher wind speed before turbine is engaged)
- Michigan is part of multi-state, multi-species Habitat Conservation Plan effort

White Nose Syndrome

- European Fungus – *Pseudogymnoascus destructans*
- Detected in NY in 2006-2007
- Affects the “cave bats”
- Too frequent arousal from hibernation depletes energy stores
- Has killed 90% of all Little Brown Bats in the NE US
- No effective cure yet
  - *Rhodococcus rhodococcus* being field tested

White Nose Syndrome

- Detected 2 years ago in MI
- Major die-offs this past winter

Why should we care……?

Why We Should Care

- Pest Control
  - Maine and Boyles PNAS 2015
    - Reduce corn damage by 60%
    - Saves $1 billion in damage worldwide annually
  - Guesstimate: saves $23 billion annually in crop damage worldwide
- Pollination
- Fruit dispersal

Regulatory Status

- Federally and State Endangered
  - Indiana Bat (*Myotis sodalis*)
- Federally Threatened
  - Northern Long-eared Bat (*Myotis septentrionalis*)
- State Threatened
  - Evening Bat (*Nycticeius humeralis*)
- Special Concern
  - Little Brown Bat (*Myotis lucifugus*)
  - American Perimyotis (*Perimyotis subflavus*)

Interim 4(d) Rule for NLE

- Prohibits direct take except from structures or to study (requires permit)
- Exemptions for incidental take within WNS affected region:
  - Forest management practices,
  - Some transportation activities
  - Prairie habitat management,
  - Limited tree removal projects, provided these activities protect known maternity roosts and hibernacula,
  - Removal of hazardous trees,

as long as these activities include these measures……

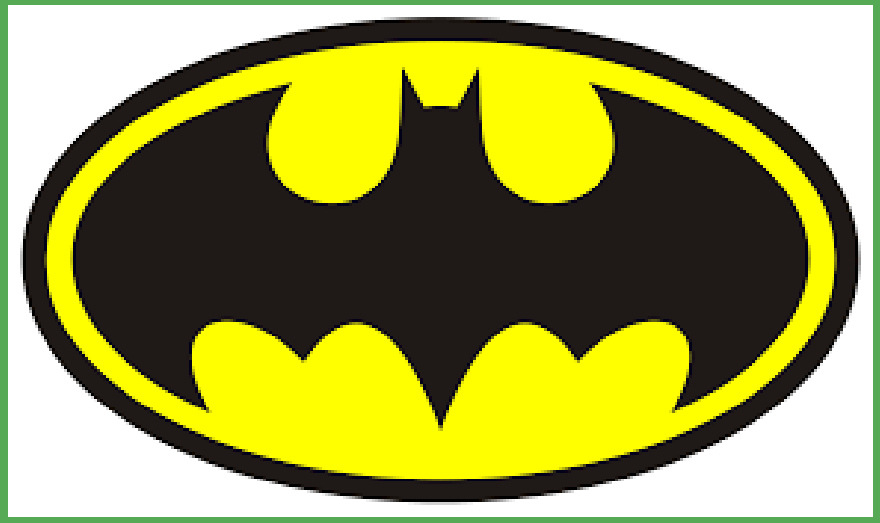
Interim 4(d) Rule

these measures……

- (i) Activity occurs more than 0.25 mile (0.4 km) from a known, occupied hibernacula.
- (ii) Activity avoids cutting or destroying known, occupied roost trees during the pup season (June 1–July 31).
- (iii) Activity avoids clearcuts (and similar harvest methods, e.g. seed tree, shelterwood and coppice) within 0.25mile (0.4 km) of known, occupied roost trees during the pup season (June 1–July 31).

What May be in the Future

- Interim 4(d) Rule is Interim
- Assessments Similar to Indiana Bat Rules?
  - Habitat Assessment
    - Presence of potential maternity roost trees that are >3” DBH
  - Demonstrate Presence or Likely Absence
    - Acoustic Monitoring
    - Mist-netting
- Possible Federal listing of Little Brown Bat
- Possible that all cave bats in MI will be added to state T&E list
- MDNR developing a Habitat Conservation Plan for forestry practices… just starting



Stay Tuned