Bat Conservation in NH

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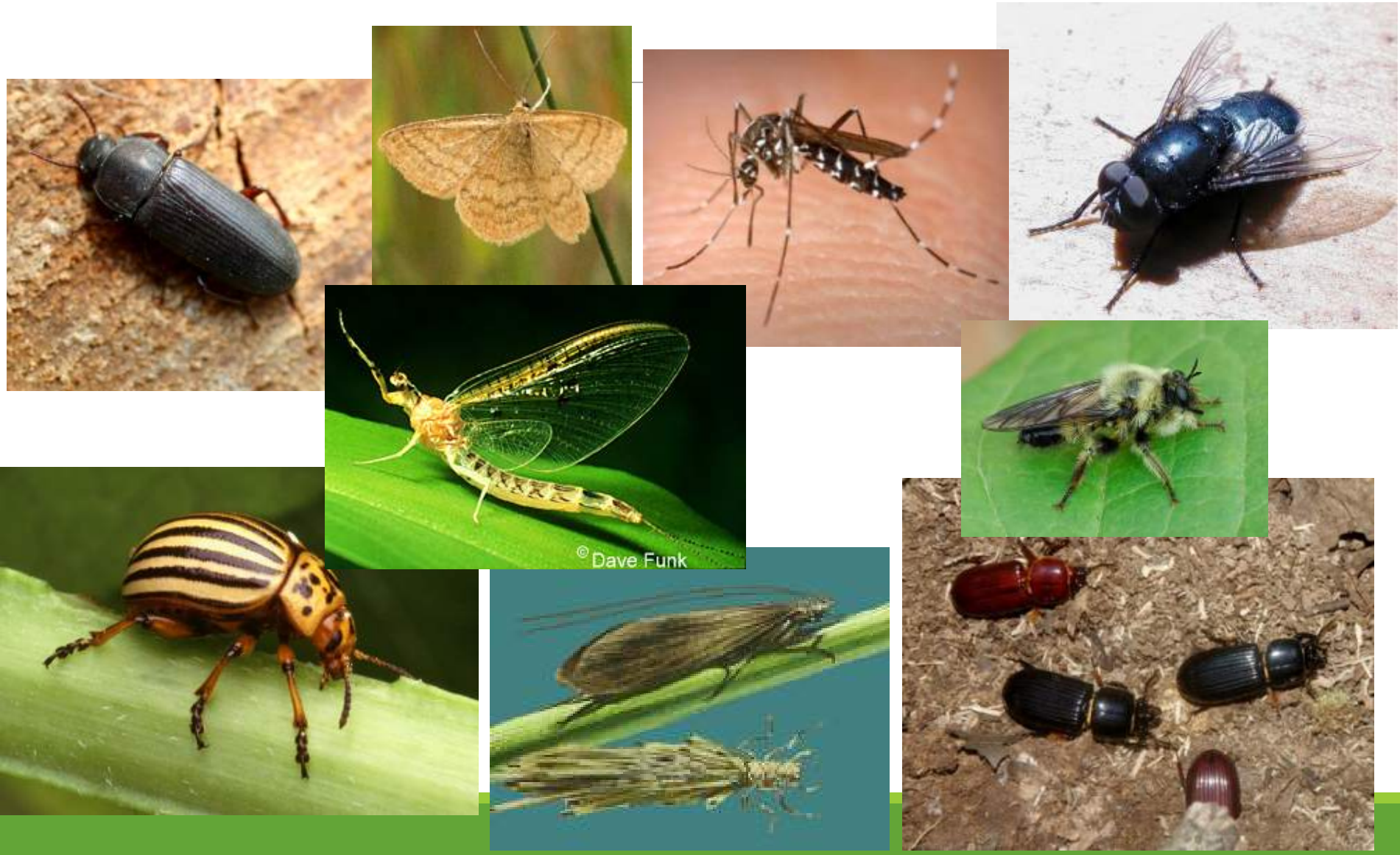
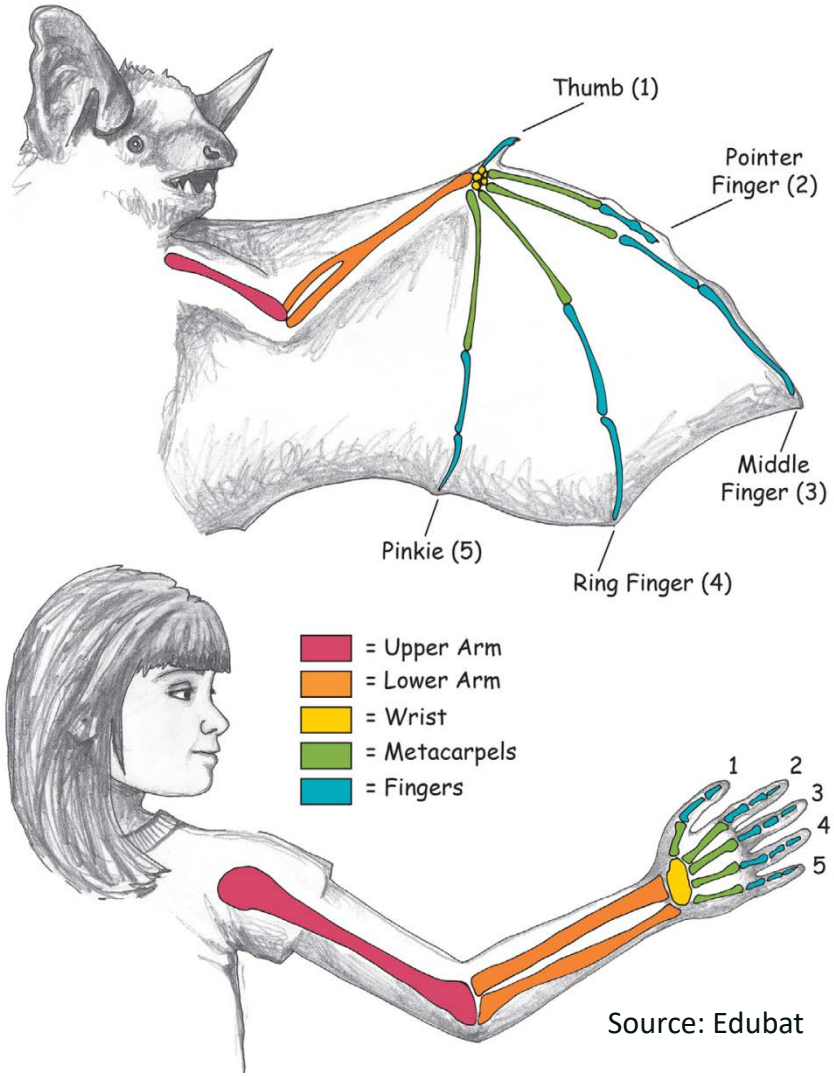
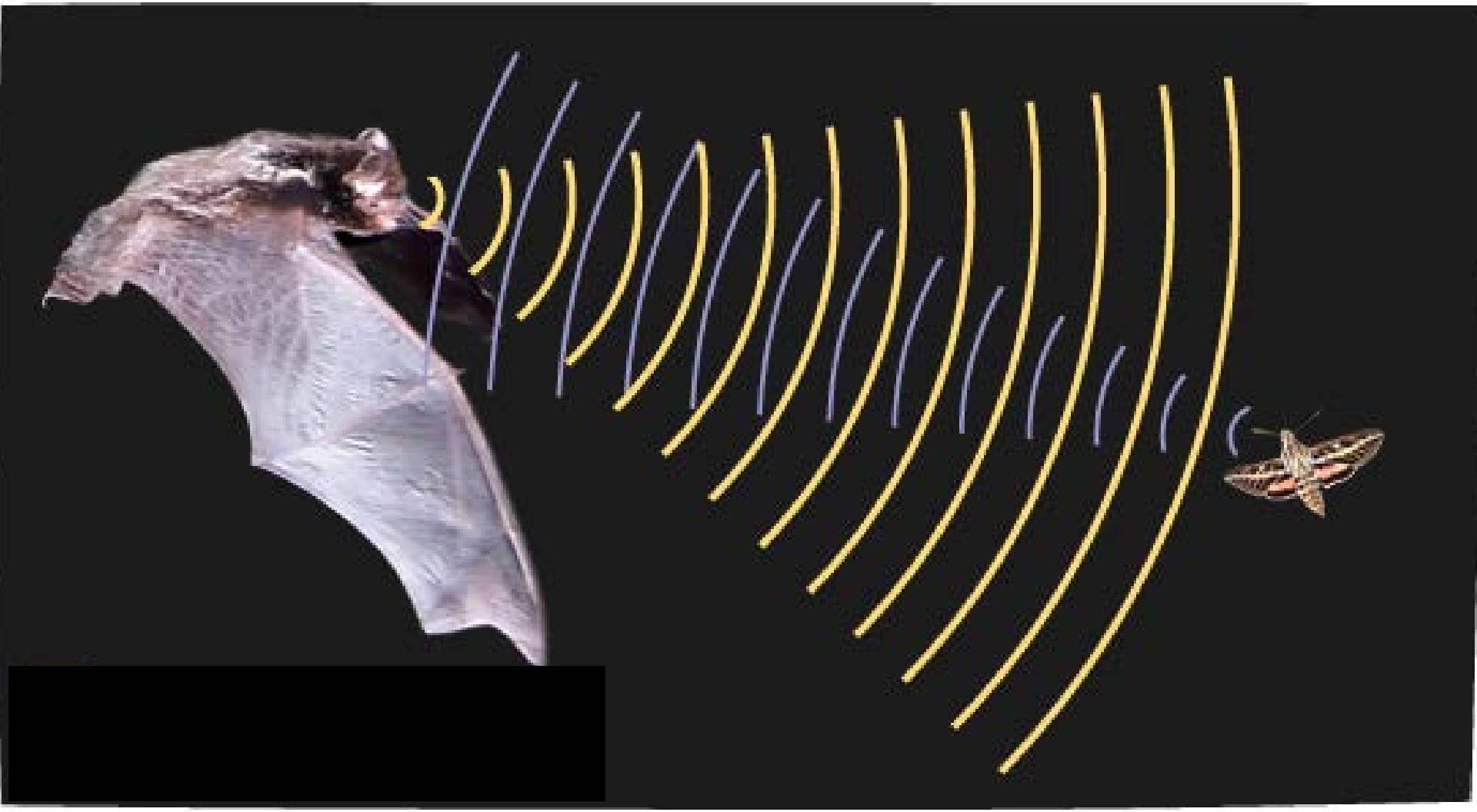
Bats Eat Insects – Lots of them!





Source: Edubat

Echolocation




Light, small, long lifespan, slow reproduction
Photo by Vermont Fish and Wildlife

A year in the life of a bat

Spring (mid-April) emergence

Maternity colony formed

Pups born (mid-June)

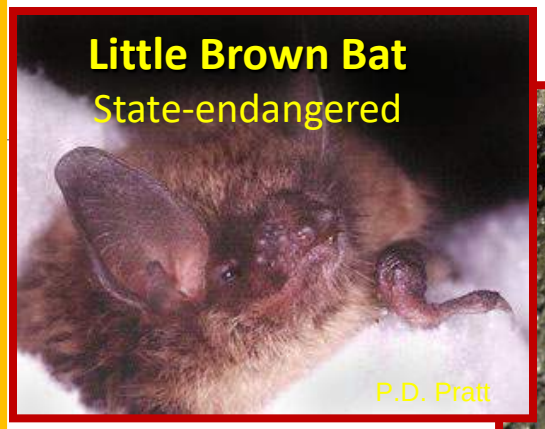
Fall Swarming

Hibernation (Oct – April)

Pregnancy initiated

Mating (Aug-Oct)

All NH Bats Are Declining



Red Bat

(*Lasiurus borealis*)

- Wingspan: 11-13 inches
- Weight: 7-12 grams (larger bat)
- Roost: hangs in or below foliage
- Migrates to southeastern US

Hoary Bat
(*Lasiurus cinereus*)

- Wingspan: 13-16 inches
- Weight: 20 to 35 grams (very large bat)
- Roost: hangs in or below foliage
- Migrates south

Silver-haired Bat
(*Lasionycteris noctivagans)*

- Wingspan: 11-13 inches
- Weight: 7-12 grams (larger bat)
- Roosts in tree hollows and under bark
  - Often roosts closer to ground
  - May roost singly or in small groups
- Migrates south

Photo C. Stihler

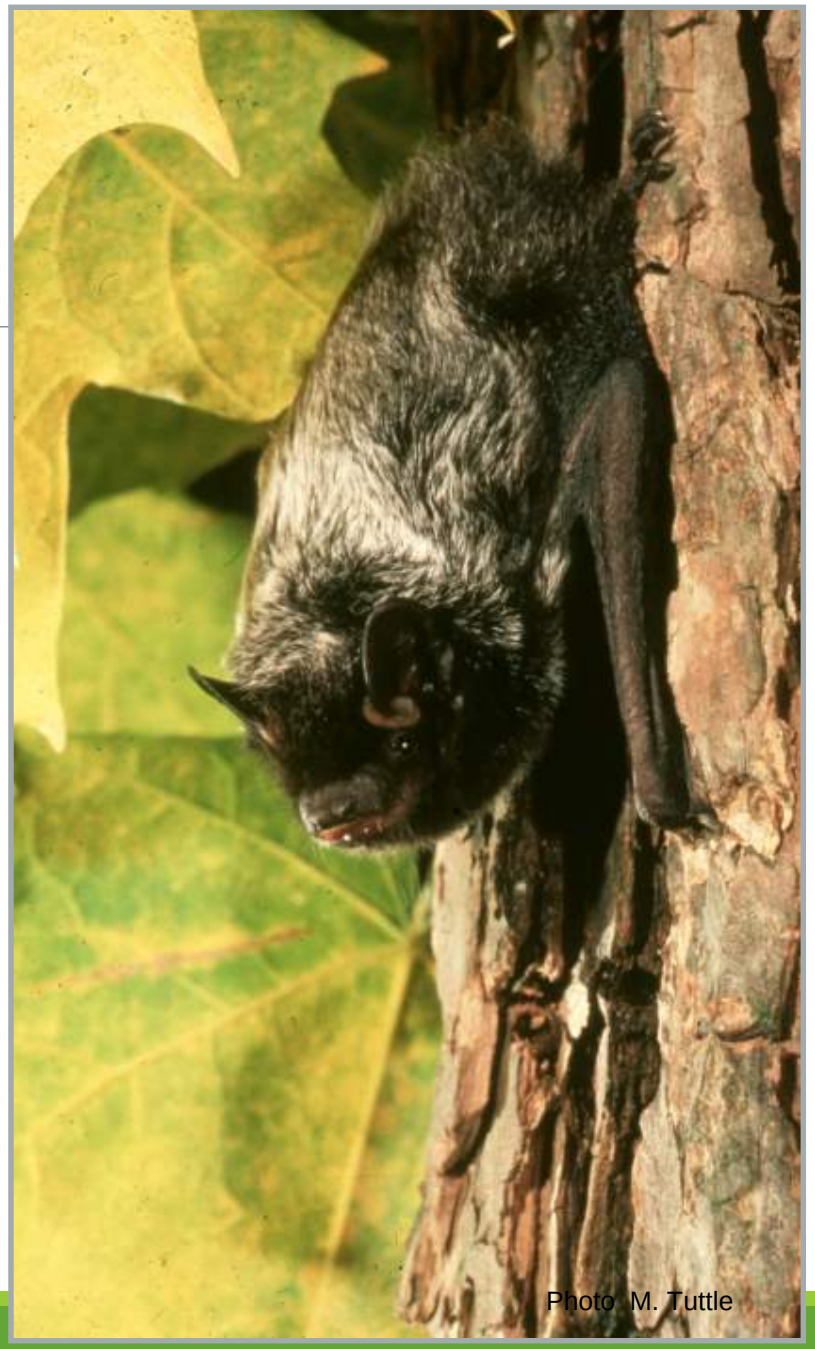


Photo M. Tuttle

Northern Long-eared Bat

(*Myotis septentrionalis*)
Federally Threatened and
State Endangered

- Wingspan: 9-11 inches
- Weight: 5-9 grams
- Roosts in cavities, crevices, and under bark of dead and declining trees
- Prior to WNS, one of the most common bats
- Since WNS, 99% population decline

5.6 grams

Eastern Small-footed Bat
(*Myotis leibeii*) Endangered in NH

- Wingspan: 8-10 inches
- Weight: 4-8 grams
- Roosts in rocky slopes, crevices, and hillsides
- Uncommon prior to WNS

A. Hicks, NYDEC

Tricolored Bat

formerly Eastern Pipistrelle
(*Perimyotis subflavus*)
Endangered in NH

- Wingspan: 8-10 inches
- Weight: 4-10 grams
- Roosts within foliage, often clusters of dead leaves

Little Brown Bat

(*Myotis lucifugus*)
Endangered in NH

- Wingspan: 9-11 inches
- Weight: 5-14 grams
- Roosts
  - Females form larger maternity colonies that roost in warmer sites and exposures
  - Roost in attics, barns and other structures
  - May also roost in hollows and under bark of dead and declining tree

Big Brown Bat
(*Eptesicus fuscus*)

- Wingspan: 13-16 inches
- Weight: 5-14 grams
- Roosts in attics, barns and other structures
  - May also roost in hollows, crevices and under bark of dead and declining trees
- Hibernates in mines/caves and manmade structures

A New Threat – White-nose Syndrome

'They're dead. They're gone.'

EMILY BRUNKHURST, biologist with the New Hampshire Fish and Game Department, on the state's bats; in 2009, New Hampshire lost half its hibernating bats to white-nose syndrome, an ailment that has killed bats across the U.S.

TIME Magazine, Jan. 2011

Symptoms

Mortality

What do we know now??

- The fungus is new to science and is named *Pseudogymnoascus destructans.* Its genome has been mapped.
- It grows into the skin, especially on the wings, destroying the tissue.
- Bats, caves/mines, and human gear can transmit the fungus.
- Bats appear to die from disruption of their metabolism.

Winter population

2008

2009

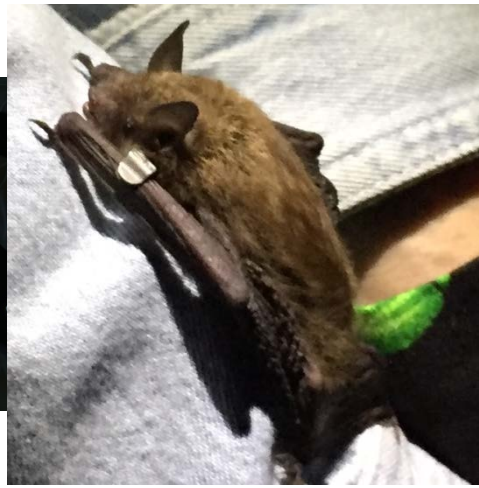
2010

2011

2012

2018

Summer population

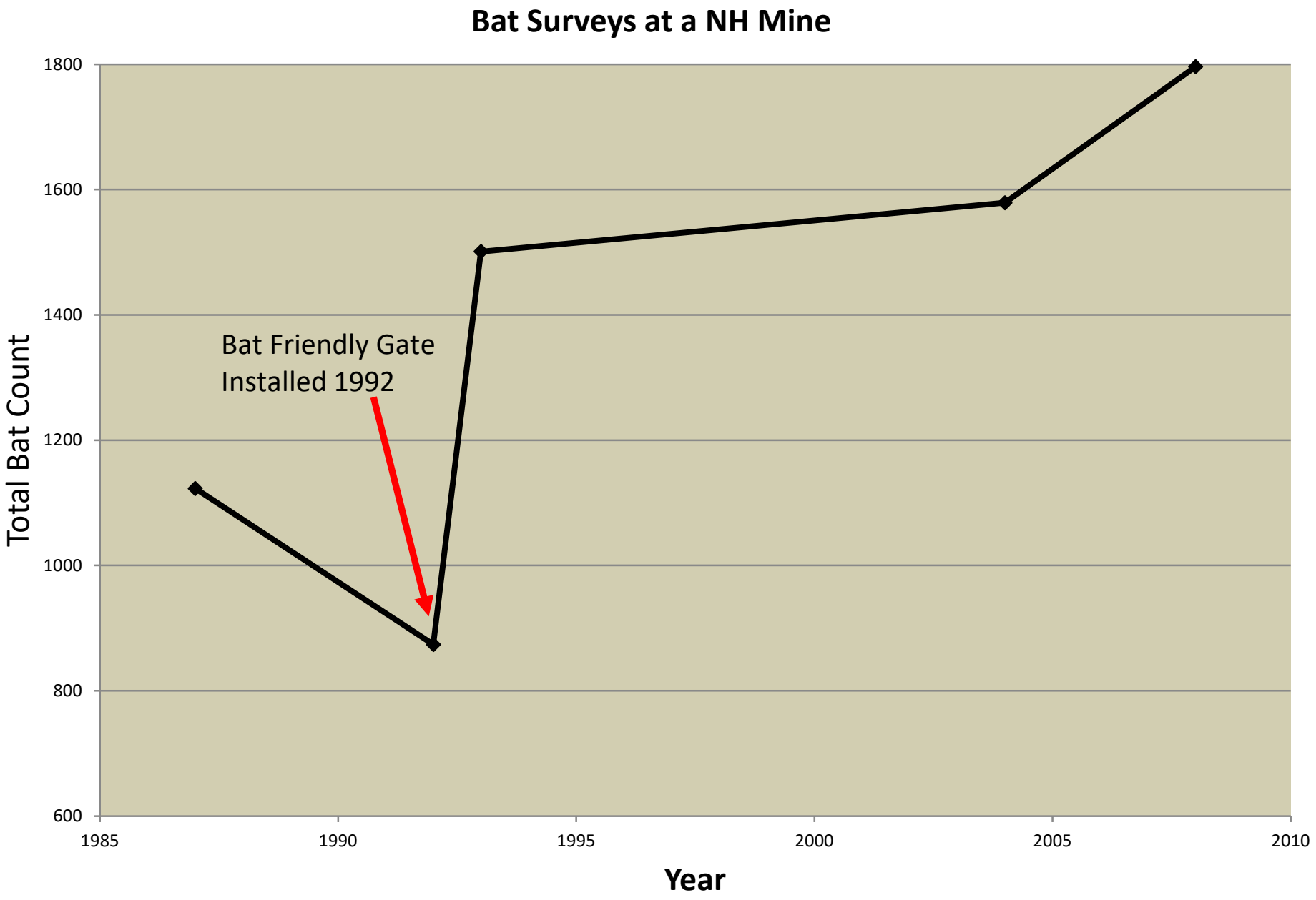


Bats are measured, weighed, checked for wing damage, and banded with individual numbers

Summer population

What You Can Do:
Protect Hibernating Bats

- Stay out of closed caves and mines
- Follow decontamination procedures between caves
- Protect winter habitats


Bat Surveys at a NH Mine
1800
1600
1400
1200
1000
800
600
Total Bat Count
Bat Friendly Gate
Installed 1992
1985
1990
1995
2000
2005
2010
Year

What You Can Do: Let them use your barn.

What you can do: Report Bats

- Report information about your maternity colonies.

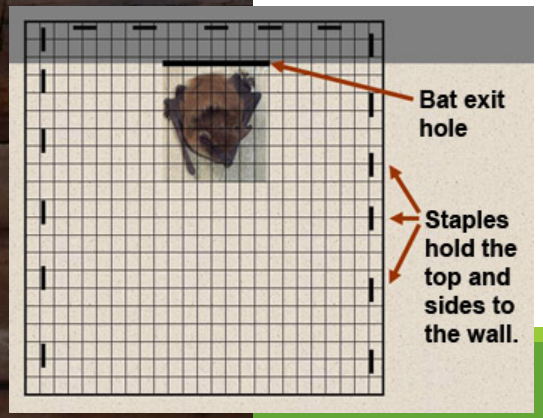
- Use reporting form on the NHFG website www.wildNH.com Or call 271-2461 or email **wildlife@wildlife.nh.gov**

Photo credit: Susi von Oettingen

What you can do: Volunteer

- Be a summer bat counter
- Count bats as they emerge at night
- Help us find new maternity colonies

What You Can Do: Protect Maternity Colonies



- Offer homeowner solutions
- No exclusions mid-May through August
- Offer bat houses as replacements

What You Can Do: Install a bat house

- Large Size
- Dark color
- Install at least 12 feet high
- Southeast location

Practices for Maintaining Functional Bat Habitat in NH's Forest Landscapes

A PRESENTATION FOR THE

2018 SAVING SPECIAL PLACES CONFERENCE

Ecosystem Function

Ecosystem function refers to biological, geochemical and physical processes and components that take place or occur within an ecosystem.

This may include a good or service that provides benefit to people (ecosystem services)

Biologists often apply this concept to habitats and their ability to provide a service to wildlife

Habitat and Function Example

Large wetland habitat functions as a feeding area and drinking area for 8 species of bats.

Riparian forest habitat may also function as a roosting area for 5-6 species of bats.

Critical Habitat Functions for Bats

Forage

Drink

Roost

Hibernacula

Fall Swarm/Spring Staging

Forage-

- ✓ Bats primarily hunt insects on the wing
- ✓ Require healthy insect populations
- ✓ Variable in amount of clutter free space needed

Drink-

- ✓ Bats drink on the wing
- ✓ Require still or slow moving surface waters free/partially free of vegetation
- ✓ Variable in amount of clutter free space needed

Critical Habitat Functions for Bats

Forage

Drink

Roost

Hibernacula

Fall Swarm/Spring Staging

Roost-

- ✓ During summer, bats sleep and raise pups in roosts
- ✓ Roosts vary depending on species
  - ✓ Cavities, crevices, and under exfoliating bark
  - ✓ Other bats roost in or under pockets of dense foliage
- ✓ Pregnant and lactating bats generally roost in groups
- ✓ Males and non-breeding females are more likely to roost singly or in small groups

Critical Habitat Functions for Bats

Forage

Drink

Roost

Hibernacula

Fall Swarm/Spring Staging

Hibernacula-

- ✓ Shelters occupied during the winter by a dormant animal
- ✓ Require stable environments with suitable temperature and humidity for hibernation
- ✓ Little or no winter disturbance
- ✓ Some variance between species, but mines, caves, and occasionally structures may function as hibernacula

Critical Habitat Functions for Bats

Forage

Drink

Roost

Hibernacula

Fall Swarm/Spring Staging

Fall Swarm/Spring Staging-

- ✓ Late summer and fall, bats assemble and mate around hibernacula
- ✓ Spring bats emerge and stay near hibernacula
- ✓ Concentrated use of the hibernacula entrance and nearby feeding, drinking, and roosting resources
- ✓ Bats may visit multiple hibernacula during swarm

Common Habitats and Features of NH's Forested Landscape and their Function for Bats

Mines and Caves	Forest	Ponds, Rivers, Streams, and Wetlands	Openings
Hibernacula Fall Swarm Spring Staging	Roost Forage	Drink Forage Roost	Forage Roost

Forests

- Forests function as roosting areas for seven species of bats.
- NLEB roost in cavities, crevices, and under exfoliating bark
  - Often in dead and declining trees.
  - Prefers deciduous trees and white pine in deciduous or mixed forests
- Tri-colored bats, red bats, and hoary bats roost by hanging in foliage
- Males and non-reproductive female little brown and big brown bats also roost in cavities, crevices, and under exfoliating bark

Forests

- Not all roost trees are created equal. Generally bigger is better.
  - Multiple species show a preference for the largest/tallest trees
  - Better able to accommodate maternity colonies
  - More micro-sites
  - Large snags/cavity trees often remaining standing longer
- Supracanopy trees are an important roosting resource
  - More open flyways
  - More solar radiation
- Evidence that multiple species prefer a more mature forest for roosting

NLEB Lower Canopy Roost Tree

NLEB Upper Canopy Roost

Red Bat Roosting in Foliage

Hoary Bat Roosting in Foliage

Forests

- Forests function as foraging areas for NLEB and other more maneuverable bats
  - NLEB foraging activity is often higher in slightly more open forest
- Forest trails and roads used as foraging areas and travel corridors
  - NLEB and other more maneuverable bats able to forage along smaller more cluttered roads and trails
  - Large bodied, less maneuverable bats primarily restricted to larger, less cluttered forest roads

Partially harvested forest and logging trail with NLEB, Little Brown, Big Brown, Hoary, and Silver-haired activity. NLEB activity includes foraging, while most of the other species appeared to be mostly commuting along the trail or above the canopy.

Closed canopy forest and older logging trail with moderate to high amounts of clutter. No activity recorded along trail. Big Brown, Hoary, and Silver-haired activity above the main canopy .

Forests

CONSERVATION AND ENHANCEMENT

- Plan the timing of any tree cutting to minimize impacts on young bats when they are not yet capable of flight by:
  - (1) cutting trees only in the winter (best for the bats) or
  - (2) cutting trees anytime but June and July (good for the bats).
- If a June or July harvest or tree cutting is necessary , conduct a bat survey to determine bat presence/absence. If NLEB or tri-color is present, consider a winter operation
- Maintain a mature forest across the majority of the property, but utilize timber harvesting to encourage a variety of tree sizes, ages, and openings
  - Set aside some forest as a reserve, allowing old forest conditions to develop

Forests

CONSERVATION AND ENHANCEMENT

- Except where safety or forest health risks are any issue, retain all snags, cavity trees, and other potential high value roost trees.
- During a commercial timber harvest, maintain or enhance roosting functions by creating clusters of 6-8 snags per acre
- Do not cut trees within 150ft of a known NLEB roost tree
  - Property owners within 150ft of a known NLEB roost tree should consult with USFWS
- Keep forests as forest. If you have a large forestland consider conservation

Openings

- Openings in forested landscapes may include
  - Log landings, areas of regenerating forest, clearcuts, patch cuts
  - Fields, wildlife food plots, or other areas lacking tree cover
- Varied preference among species, but openings important foraging areas for all species.
  - NLEB may avoid larger openings or center of larger openings
  - Little brown and tri-colored bat forage in a variety of opening sizes
  - Larger bodied, less maneuverable bats (big brown, hoary, red, and silver-haired) require larger openings and openings with less retention/clutter

Small, cluttered seepage opening with NLEB Activity

Large log landing (~1-acre) with no clutter. Big brown, hoary, and red bat activity

Openings

CONSERVATION AND ENHANCEMENT

- Larger openings should be created in moderation
  - Openings represent a loss in NLEB roosting function
  - Other ecological consequences (invasives, fragmentation, nest parasitism)
- If openings and associated foraging functions are limited on the property and surrounding landscape, consider
  - creating some larger openings with patch cuts of 1-3 acres in size
  - maintaining old fields with rotary mowing
- Maximize the foraging function by creating feathered and non-linear edges

Ponds, Rivers, Streams, and Wetlands

- Slow moving waterways free/partially free of vegetation function as drinking areas for all species of bats
- Air space above important foraging areas for all species
  - Higher insect diversity and concentration
- Riparian areas preferred roosting location for NLEB, Little Brown Bat (males and non reproductive females), Big Brown Bat (males and non reproductive females), Red Bat, and Silver-Haired Bat
  - Higher concentration of declining and dead trees
  - Increased solar radiation and adjacent flyways

Partially forested pond with clear flyways. Extensive little brown and big brown activity. Also NLEB, silver-haired, hoary, and red bat.

Vernal pool surrounded by closed canopy forest with lots of clutter in the midstory and with no clear flyways. No bat activity at pool.

Ponds, Rivers, Streams, and Wetlands

CONSERVATION AND ENHANCEMENT

- Maintain or establish continuous riparian forest and wetland buffers. The bigger the better
  - If your property lacks a forested riparian buffer, consider a riparian buffer planting
  - Within forested buffers, consider enhancing roosting functions by creating 6-8 snags per acre
- During a timber harvest
  - Maintain forest buffers with no cutting/partial cutting STA
  - Meet all state BMPs/AMPs for erosion control and water quality

Ponds, Rivers, Streams, and Wetlands

CONSERVATION AND ENHANCEMENT

- Consider connecting disjunct water sources to existing forest patches
- If your property includes high quality surface waters, wetlands, or riparian area, consider conserving your land
- If your property includes a mix of forests and surface waters or wetlands, consider developing a management plan that specifically addresses bats

For More Information

US Fish and Wildlife Service
WhiteNoseSyndrome.org

NH Fish and Game
wildlife.state.nh.us/nongame/bats-nh.html

US Geological Survey
nwhc.usgs.gov/disease_information/white-nose_syndrome

Bat Conservation International batcon.org


1988
30
2018
NONGAME
& Endangered Wildlife
PROGRAM


LIVE FREE OR DIE
THANKS
New
HAMPSHIRE
MONTH
YEAR