

Indiana Bat

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Scientific Name *Myotis sodalis*
Miller & Allen, 1928

Family Name Vespertilionidae
Vesper Bats

Did you know?

The Indiana bat hibernates in mines and caves, but males and females roost in crevices and under the bark of trees during the warmer months of the year. Female Indiana bats form maternity colonies, giving birth and raising their young in these tree roosts.

Summary

Protection Endangered Species in New York State, listed as Endangered federally.

This level of state protection means: any species which meet one of the following criteria:
1) Any native species in imminent danger of extirpation or extinction in New York. 2) Any species listed as endangered by the United States Department of the Interior.

This level of federal protection means: this species is formally listed as endangered.

Rarity G2, S1

A global rarity rank of G2 means: Imperiled globally because of rarity (6 - 20 occurrences, or few remaining acres, or miles of stream) or very vulnerable to extinction throughout its range because of other factors.

A state rarity rank of S1 means: Typically 5 or fewer occurrences, very few remaining individuals, acres, or miles of stream, or some factor of its biology makes it especially vulnerable in New York State.

State Ranking Justification

There are 10 extant hibernacula that appear to be stable, but overall the population remains vulnerable due to large concentrations of overwintering bats at a few of these sites. Many of the thirteen general areas where maternity and bachelor colonies are known to occur are in areas that are subject to increasing development.

Conservation Issues

Management Considerations

Continue to monitor populations at hibernacula every other year as recommended by the United States Fish and Wildlife Service.

Research Needs

Additional research is needed to locate new maternity and bachelor colonies and to determine habitat use surrounding these areas.

Short Term Trends

The maximum total count has increased from approximately 13,000 to 41,000 Indiana bats. This increase in numbers is largely the result of discovery of new hibernacula and improved methods of counting overwintering bats. However, part of the increase may actually reflect an increase in the overall size of the population.

Habitat

Indiana bats hibernate in caves and mines during the winter. Predominately female Indiana bats radio-tracked from hibernacula in Jefferson, Essex, and Ulster Counties were found to move between approximately 12 and 40 miles to roost location on their foraging grounds. The roosts consisted of living, dying, and dead trees in both rural and suburban landscapes.

Associated Ecological Communities

Appalachian Oak-hickory Forest

A hardwood forest that occurs on well-drained sites, usually on ridgetops, upper slopes, or south- and west-facing slopes. The soils are usually loams or sandy loams. This is a broadly defined forest community with several regional and edaphic variants. The dominant trees include red oak, white oak, and/or black oak. Mixed with the oaks, usually at lower densities, are pignut, shagbark, and/or sweet pignut hickory.

Beech-maple Mesic Forest

A hardwood forest with sugar maple and American beech codominant. This is a broadly defined community type with several variants. These forests occur on moist, well-drained, usually acid soils. Common associates are yellow birch, white ash, hop hornbeam, and red maple.

Calcareous Cliff Community

A community that occurs on vertical exposures of resistant, calcareous bedrock (such as limestone or dolomite) or consolidated material; these cliffs often include ledges and small areas of talus.

Calcareous Talus Slope Woodland

An open or closed canopy community that occurs on talus slopes composed of calcareous bedrock such as limestone or dolomite. The soils are usually moist and loamy; there may be numerous rock outcrops.

Deep Emergent Marsh

A marsh community flooded by waters that are not subject to violent wave action. Water depths can range from 6 in to 6.6 ft (15 cm to 2 m). Water levels may fluctuate seasonally, but the substrate is rarely dry, and there is usually standing water in the fall.

Floodplain Forest

A hardwood forest that occurs on mineral soils on low terraces of river floodplains and river deltas. These sites are characterized by their flood regime; low areas are annually flooded in spring, and high areas are flooded irregularly.

Hemlock-northern Hardwood Forest

A mixed forest that typically occurs on middle to lower slopes of ravines, on cool, mid-elevation slopes, and on moist, well-drained sites at the margins of swamps. Eastern hemlock is present and is often the most abundant tree in the forest.

Limestone Woodland

A woodland that occurs on shallow soils over limestone bedrock in non-alvar settings, and usually includes numerous rock outcrops. There are usually several codominant trees, although one species may become dominant in any one stand.

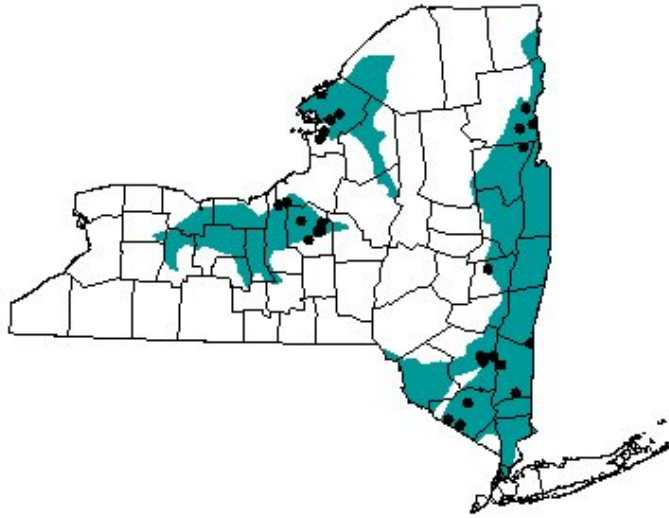
Maple-basswood Rich Mesic Forest

A species rich hardwood forest that typically occurs on well-drained, moist soils of circumneutral pH. Rich herbs are predominant in the ground layer and are usually correlated with calcareous bedrock, although bedrock does not have to be exposed. The dominant trees are sugar maple, basswood, and white ash.

Associated Species

Big Brown Bat (*Eptesicus fuscus*)
Eastern Small-Footed Myotis (*Myotis leibii*)
Little Brown Bat (*Myotis lucifugus*)
Northern Myotis (*Myotis septentrionalis*)
Eastern Pipistrelle (*Pipistrellus subflavus*)

Range



The map shows the known locations for indiana bat (black dots) based on the New York Natural Heritage Program database . A general approximation of the potential range (blue shading) throughout the state is based on the U.S. Forest Service Ecological Units (Keys et al. 1995).

Data Sources

- New York Natural Heritage Program (Natural Heritage Element Occurrences)
- NYS GIS Data Sharing Cooperative, simplified by NYS Department of Environmental Conservation, Habitat Inventory Unit (County Boundary for New York State)
- U.S. Department of Agriculture, Forest Service (Subregions of the conterminous United States)

New York State Distribution

Ten Indiana bat hibernacula are known to be extant. These hibernacula occur in the following counties: Albany (1), Essex (2), Jefferson (1), Onondaga (1), Ulster (4), and Warren (1). One of the Ulster County sites is among the 10 largest hibernacula for the species in the country. Maternity colonies have been identified through radio-telemetry studies and mist-net captures in Dutchess, Essex, Jefferson, Onondaga, and Ulster counties. Bachelor colonies have also been identified through radio-telemetry studies and mist-net captures in Albany, Dutchess, Jefferson, Orange, and Ulster counties.

Global Distribution

The range of the Indiana bat includes much of the eastern half of the United States, from Vermont south to Massachusetts, Connecticut, and northern New Jersey, southwest to northwestern Florida and eastern Oklahoma, and north to southwestern Wisconsin. The largest hibernating populations are found in Indiana, Missouri, and Kentucky with other large hibernation sites in Arkansas, Illinois, New York, Ohio, Tennessee, Virginia, and West Virginia (USFWS 1999).

Identification Comments

Identifying Characteristics

The Indiana bat is a small bat, approximately 2 inches (51 mm) in length and weighing approximately 0.2 to 0.3 ounces (6-9 grams) (Harvey et al. 1999; NYSDEC 2006). The pelage is very fine and fluffy and is dark gray to grayish-brown in color and the nose is pinkish in color (NYSDEC 2006). The feet have few hairs that do not extend beyond the tips of the toes. Indiana bats have a keeled calcar, which is a cartilaginous projection from the foot which helps support the membrane between the foot and the tail (NYSDEC 2006).

Characteristics Most Useful for Identification

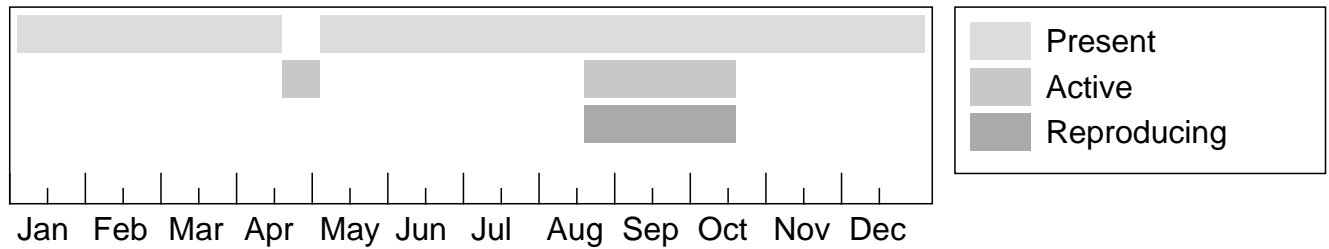
When in hand, the gray-brown pelage, pinkish nose, toe hairs that don't extend beyond the tips of the toes, and keeled calcar are used in combination to distinguish Indiana bats from little brown bats. Hibernating Indiana bats are distinguished from other bats by their tight clusters, grayish-brown pelage and pinkish noses.

Behavior

Most Indiana bats migrate seasonally between traditional winter and summer roost sites. Hibernation sites include both natural caves and mines. Caves and mines chosen for hibernation have been reported to have stable temperatures below 10 degrees Celsius (50 degrees Fahrenheit) and preferably from 4-8 degrees Celsius (39 - 46 degrees Fahrenheit). Relative humidities are fairly high at hibernation sites, usually above 74 % (Hall 1962; Humphrey 1978). Depending on local weather conditions, Indiana bats hibernate from October through April (Hall 1962). Summer foraging habitat consists of wooded or semi-wooded areas and may be along streams. Indiana bats have strong fidelity to summer colony areas, roosts, and foraging habitat (USFWS 1999), and radio-telemetry studies in New York have shown this to be true for maternity roost locations. Maternity colonies are generally in hollow trees or under loose bark of living or dead trees that are often exposed to direct sunlight. Although the majority of maternity sites reported have been in riparian areas, recent studies in New York and elsewhere indicate that upland habitats are used more than previously thought (Humphrey et al. 1977; Garner and Gardner 1992).

Diet

Indiana bats feed entirely on flying insects and the food items reflects the environments in which they forage. Prey items may include moths (Lepidoptera), caddisflies and flies (Diptera), mosquitos and midges, bees, wasps, and flying ants (Hymenoptera), beetles (Coleoptera), leafhoppers and treehoppers (Homoptera), stoneflies (Plecoptera), and lacewings (Neuroptera) (NatureServe 2006).



The time of year you would expect to find Indiana Bat in New York.

Similar Species

Little Brown Bat(*Myotis lucifugus*): The little brown bat differs from the Indiana bat in that it has brown pelage and its ears and nose are slightly darker than the fur (NYSDEC 2006). Little brown bat feet are also larger and with more hairs that extend beyond the tips of the toes (NYSDEC 2006). Indiana bats have a keeled calcar, which is absent in Little brown bats.

Taxonomy

Kingdom Animalia
 └─ **Phylum** Craniata
 └─ **Class** Mammals (Mammalia)
 └─ **Order** Bats (Chiroptera)
 └─ **Family** Vespertilionidae (Vesper Bats)

Additional Resources

Links

NatureServe Explorer

<http://natureserve.org/explorer/servlet/NatureServe?searchName=MYOTIS+SODALIS>

New York State Department of Environmental Conservation

<http://www.dec.ny.gov/animals/6972.html>

Bat Conservation International

<http://www.batcon.org/home/default.asp>

Google Images

<http://images.google.com/images?q=MYOTIS+SODALIS>

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