

SPECIES PROFILE

Eastern Pipistrelle

Pipistrellus subflavus

Federal Listing: Not listed

State Listing: Not listed

Global Rank: G5

State Rank: S1N,SUB

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ELEMENT 1: DISTRIBUTION AND HABITAT

1.1 Habitat Description

Eastern pipistrelles hibernate in caves or mines, although they occasionally use other structures. For successful hibernation, eastern pipistrelles require habitat with low levels of human disturbance and a proper microclimate (e.g., temperature stability). Although eastern pipistrelles hibernate singly or in groups of two or three, individual hibernacula can have large populations of eastern pipistrelles, including over 750 individuals from a single mine in New York (Hicks 2003). Therefore, the protection of hibernacula is an important conservation concern.

No available data describe the summer habitat requirements of eastern pipistrelles in New Hampshire. The few available data on summer habitat use and life history come from the Midwest (Veilleux et al. 2003, Veilleux et al. 2004, Veilleux and Veilleux 2004). After leaving hibernacula, female eastern pipistrelles form maternity colonies in live or dead foliage of deciduous trees (Veilleux et al. 2003), although individuals in New Brunswick have roosted in Old Man's Beard (*Climatis vitalba*; H. Broders, personal communication) and individuals from the southeastern United States have roosted in Spanish moss (*Tillandsia useoides*; Davis and Mumford 1962). The birth and weaning of young occur within these foliage roosts. Some data indicate that females prefer to roost in oak (*Quercus alba* and *Q. rubra*) and

maple (*Acer saccharum*) trees (Veilleux et al. 2003). Although eastern pipistrelles are a foliage-roosting species, individuals occasionally roost in man-made structures (Whitaker 1998).

1.2 Justification

Populations of eastern pipistrelles, like many other bat species, are believed to be decreasing. The likely reasons for the possible declines are the destruction or degradation of winter habitat (hibernacula) and summer habitat (roosting and foraging areas). Like other bat species, the eastern pipistrelle's life history is different from the typical life history of small mammals. Individuals are relatively long-lived and have a low reproductive rate. Eastern pipistrelles give birth to two young per year (Fujita and Kunz 1984), although only one may survive to reproductive age. The slow reproductive rate would, in turn, lead to a slow population recovery time. Since eastern pipistrelles are found in cave/mine habitats that are relatively rare and at risk, this species is at risk of population decline if such habitats are lost or degraded. Eastern pipistrelles are of conservation concern in New Hampshire for the above reasons and because of the lack of knowledge about the species' population status in New Hampshire (see section 1.4).

3.3 Protection and Regulatory Status

No specific ESA or RSA 212 regulations govern the take, transport, or use of this species. Scientific collecting or research involving the capture of individuals requires a permit through NHFG. Possession of live bats requires a permit under NHFG FIS 800. (?)

1.4 Population and Habitat Distribution

Data on the current and historic range of eastern

pipistrelles in New Hampshire are too few to allow a regional population comparison. The winter distribution data of eastern pipistrelles are limited to three mine localities with as many as five individuals in Mascot Lead Mine, three individuals in Mt. Kearsarge Lead Mine (Merrimack County), and one individual in Red Mine (Grafton County). One individual was also collected at Ruggle's Mine in Grafton (Grafton County), which is a potential but unsurveyed hibernaculum. Five definite summer records are known from New Hampshire. One individual is known from Canaan (Grafton County) and Chengler (2005) reported single individuals captured in the towns of Bartlett (Carroll County), Bean's Purchase (Coos County), Wentworth (Grafton County) and Warren (Grafton County). Possible echolocation call sequences have been recorded from Albany (Carroll County), Bartlett (Carroll County), New Boston (Hillsborough County), and possibly Nottingham (Rockingham County). These data indicate a potentially broad summer distribution of eastern pipistrelles in New Hampshire.

1.5 Town Distribution Map

1.6 Habitat Map

1.7 Sources of Information

Town data on the eastern pipistrelle's winter distribution were compiled from New Hampshire Natural Heritage Inventory – Bat Hibernaculum Record data sheets museum specimens, and college/university teaching collections. Summer distribution was determined from the published and gray literature of bat research in New Hampshire, as well as from specimen collections.

1.8 Extent and Quality of Data

Data on the distribution of eastern pipistrelles in New Hampshire are extremely limited (see section 1.4) but of high quality because qualified bat biologists identified the animals. The major knowledge gap is the paucity of occurrence records and research into distribution patterns.

1.9 Distribution Research

Priority research on the winter distribution of eastern pipistrelles should include surveys of potential hibernacula. Research on the summer distribution should include long-term mistnetting surveys accompanied by echolocation surveys (using Anabat acoustic survey methods). Mistnetting surveys should incorporate banding into the capture protocol and record all banding records in the Northeast Banding Database developed by the Northeast Working Group on Bats (NEWGB). An intensive banding program using state-issued wing bands would yield data on the summer distribution of all bat species in New Hampshire and may provide insight into overwintering areas.

ELEMENT 2: SPECIES/HABITAT CONDITION

2.1 Scale

Due to the small number of mines in New Hampshire that provide or potentially provide habitat for this species, each mine has been treated as a conservation planning unit under the habitat profile.

2.2 Relative Health of Populations

See section 1.4. The sparse data on winter or summer occurrences of eastern pipistrelles in New Hampshire prevent an analysis of the trends and viability of winter or summer populations. Priority conservation actions include winter surveys at New Hampshire mines that have not been surveyed.

2.3 Population Management Status

No population management efforts are directed at the conservation of eastern pipistrelles.

2.4 Relative Quality of Habitat Patches

NHNHB has ranked both Mt. Kearsarge and Mascot Lead Mine as "B/C", indicating "fair to good quality and prospects for long-term conservation". Red Mine was ranked "B", indicating "good quality and prospects for long-term conservation". Ruggle's Mine has not been ranked by NHNHB. Although each mine with known wintering bats has been assessed for long-term conservation prospects, no research has

determined the microclimate quality.

2.5 Habitat Patch Protection Status

Red Mine and Ruggle's Mine are located on private land, while the DRED manages the Mascot Lead Mine and the Mt. Kearsarge Mine hibernacula.

2.6 Habitat Management Status

The only ongoing habitat management action occurring in New Hampshire is the bat gate at the Mascot Lead Mine (see Caves and Mines habitat profile). A census prior to gate installation (in 1992) found no eastern pipistrelles, and two were documented in the winter following installation. The 2004 winter survey documented five eastern pipistrelles.

2.7 Sources of Information

The winter distribution of eastern pipistrelles at known hibernacula was determined from New Hampshire Natural Heritage Survey – Hibernacula Survey Data Sheets. Scott Reynolds and Heather Durham conducted 1999 and 2000 winter surveys (Durham 2000). To determine habitat patch protection status, each potential and known hibernaculum was mapped on the Conservation Lands GIS data layer (GRANIT – 2003 data).

2.8 Extent and Quality of Data

The quality and extent of data varied between mines. For example, there have been four winter surveys at the Mascot Lead Mine since 1987; two were conducted since the installation of the bat gate in 1992. Since 1986, the Red Mine has been surveyed four times and the Mt. Kearsarge Lead Mine has been surveyed five times. With the exception of data collected in 1999 and 2000 at Red Mine and Mt. Kearsarge Lead Mine (Durham 2000), no microclimate data have been collected at any of these sites. Ruggle's Mine has not been surveyed.

2.9 Condition Assessment Research

The research priority for overwintering eastern pipistrelles is to obtain microclimate data (primarily temperature) at each hibernaculum. These data

can then be used to assess microclimates at potential hibernacula. The research priorities for eastern pipistrelles during the summer include a statewide mistnetting survey, telemetry studies to determine roosting and foraging habitats, life history studies, and diet analysis.

ELEMENT 3: SPECIES AND HABITAT THREAT ASSESSMENT

3.1.1 Recreation

See Caves and Mines habitat profile

3.1.2 Development (Habitat Loss and Conversion), Unsustainable Harvest (Forestry Operations and Management)

(A) Exposure Pathway

As land in New Hampshire is deforested, eastern pipistrelles may experience summer habitat loss and degradation. Bats (particularly non-volant young) may also be killed if deforestation occurs during the parturition/lactation period (late May through mid-July). The additive results of habitat loss, degradation, and possible direct mortality could lead to a reduction in population size.

(B) Evidence

Recent data on colonial bat species indicate that bats occupy individual roost trees within a forest on a year-to-year basis (Barclay and Brigham 2001) and that individual bats return to the same roosting area each summer (Veilleux and Veilleux 2004). Bat biologists hypothesize that strong fidelity to roost areas (and possibly roost trees) allows individuals to relocate colony mates after emerging from hibernation. The removal of roost trees and forest habitat may disrupt the process of colony formation, with a corresponding reduction in individual fitness and population recruitment.

3.2 Sources of Information

Sources of information on threats to eastern pipistrelles include peer-reviewed scientific articles, gray literature, and expert review by John O. Whitaker, Jr. of Indiana State University.

3.3 Extent and Quality of Data

Fidelity of bats to specific roost areas (elements 3.1.3 and 3.1.4) is fairly well documented, but data on the effects of removing roost areas on colony dynamics are not available. Additional data on roost areas and roost trees are needed.

3.4 Threat Assessment Research

The final assessment effort for elements 3.1.3 and 3.1.4 would be to document roost areas in New Hampshire with relatively high numbers of eastern pipistrelles during the summer. Radiotelemetry studies would allow managers to determine the location of a roost area for a small population of eastern pipistrelles. Several years of capture and telemetry data at the roost areas would determine whether individual bats return to the same roost area. Such data would allow managers to assess the impact of removing forested habitat where eastern pipistrelles are known to occur.

ELEMENT 4: CONSERVATION ACTIONS

4.1.1 Gating, Habitat Protection

See cave/mine habitat profile.

4.1.2 Delineate habitat for conservation planning, Habitat Protection

(A) Removal of summer roosting habitat due to development, removal of summer roosting habitat due to logging.

(B) Justification

- 1) Sparse data on summer distribution patterns and population demographics of eastern pipistrelles limit the ability to determine whether documenting roosting habits (i.e. inter-annual fidelity to roost areas) will result in a measurable ecological response of population in the state. Since eastern pipistrelles breed in New Hampshire during the summer, it is important to understand their breeding habitat requirements and use this information to assess the potential impacts of habitat modification.
- 3) Veilleux and Veilleux (2004) reported that females return to very small summer roost areas each year. Minimum roost areas containing roost

trees used by the same bats during two consecutive years ranged in size from 0.6 to 2.3 ha. Since development and logging can disrupt forested habitat at these small scales, it may be appropriate to limit or mitigate small-scale development or logging to protect eastern pipistrelles.

(C) Conservation Performance Objective

Integrate critical roosting habitats into a wildlife database. By protecting an entire habitat area, the smaller scale habitat needed by eastern pipistrelles (e.g., the preferred species of roost tree) will likely be protected as well.

(D) Performance Monitoring

To determine whether limiting or mitigating development and/or logging can maintain summer populations of eastern pipistrelles at specific habitat sites, managers can monitor whether eastern pipistrelles continue to use the habitat area over a long period (10 years).

(E) Ecological Response Objective

The habitat protection response objective is to maintain the current number of eastern pipistrelles roosting during summer within New Hampshire's forested habitats. Since data are too few to allow a valid estimate of the current eastern pipistrelle population status at summer roost areas, the minimal ecological response should be to maintain the initial populations located by biologists.

(F) Response Monitoring

To determine whether eastern pipistrelle summer populations are being maintained, known habitat areas should be monitored every three years. Such monitoring efforts will provide detailed data on whether eastern pipistrelles remain faithful to specific roost areas during the summer. These data will in turn allow managers to make informed decisions about eastern pipistrelle populations in areas threatened by high levels of development or logging.

(G) Implementation

Data on summer bat locations must be gathered. After summer habitat areas are identified, the state should initiate an intensive radio-telemetry study (1 to 2 years) to determine specific patterns of habitat use by individual bats, and establish a long term

(10-year) monitoring program to determine if eastern pipistrelles remain faithful to small summer roost areas.

(H) Feasibility

The technical abilities are available in the region to determine both summer habitat areas (through mistnetting) and roosting habits (through radiotelemetry). The overall feasibility of conducting this research is limited by the availability of funding.

4.2 CONSERVATION ACTION RESEARCH

ELEMENT 5: REFERENCES

5.1 Literature

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Distribution of the Eastern Pipistrelle in New Hampshire

Distribution
Known
Potential



0 10 20 40 Miles

Known = confirmed winter and summer observations obtained from hibernacula and mistnet surveys conducted by professional wildlife biologists.
Potential = evidence of species presence from recorded echolocation calls.

