

## SPECIES PROFILE

# Eastern Red Bat

*Lasiurus borealis*

**Federal Listing:** Not listed

**State Listing:** Not listed

**Global Rank:** Not ranked

**State Rank:** Not ranked

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## ELEMENT 1: DISTRIBUTION AND HABITAT

### 1.1 Habitat Description

Eastern red bats inhabit New Hampshire during the summer. Individuals migrate to southern states in the fall and return to New Hampshire and other northern states in the spring (Cryan and Veilleux *in press*). No available data describe the summer habitat requirements of eastern red bats in New Hampshire. During the summer, eastern red bats roost in tree foliage (Shump and Shump 1982, Whitaker and Hamilton 1998). Adult males and non-reproductive females roost singly; reproductive females are colonial and roost with their young (Mumford 1973, Shump and Shump 1982, Hutchinson and Lacki 2000). Females give birth and wean their young within foliage roosts.

Studies have found that red bats roost in a variety of deciduous tree species, in the largest trees, often high off the ground near the outer canopy edge. Hutchinson and Lacki (2001) suggest that eastern red bats roosting at such locations are sheltered from high temperatures caused by direct solar insolation and benefit from the cooling effects of wind caused by evaporative/convective heat loss. Eastern red bats roosting in fragmented habitats, such as urban areas and farmland, may roost nearer the ground. This behavior may reflect the lower height of tree canopies in such areas, as well as benefits from the cooling effects of wind.

Roost trees are typically located close to permanent water sources (Hutchinson and Lacki 2000). Menzel et al. (1998) reported the mean roost area (the area containing all roost trees) at 2.6 ha, while Mager and Nelson (2001) reported a mean roost area of 90 ha. Veilleux and Veilleux (2004) reported individual female eastern pipistrelles, another foliage roost species, return to very small summer roost areas across years.

### 1.2 Justification

Like other bat species, the eastern red bat's life history is different from the typical life history of small mammals. Individuals are relatively long-lived and have a low reproductive rate with a mean litter size of three young per year (Shump and Shump 1982). Habitat loss and degradation may lead to population declines, which, when coupled with their slow reproductive rate, could lead to a slow population recovery time.

Eastern red bats 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. Only 11 individuals have been captured in New Hampshire. Sasse and Pekins (1996) reported 2 individuals captured in Livermore (Grafton County) and Bartlett (Carroll County). Chenger (2005) captured seven in the White Mountain National Forest, including two from Gorham (Coos County), three from Bean's Purchase (Coos County) and one from both Bartlett (Carroll County) and Piermont (Grafton County). LaGory et al. (2002) captured two at the New Boston Air Force Base in New Boston (Hillsborough County).

Based on echolocation calls, Krusic et al. (1996) reported the presence of eastern red bats in Bartlett (Carroll County). Reynolds (1999) reported echolocation calls recorded at three sites: Giles State Park in Springfield (Sullivan County), MacDowell Lake-

Woodcock in Peterborough (Hillsborough County), and Pawtuckaway State Park in Nottingham (Rockingham County). Chenger (2005) reported echolocation calls from Albany (Carroll County). The above data indicate that eastern red bats may have a wide summer distribution in New Hampshire. The current lack of detailed data on the distribution, habitat use, and life history of eastern red bats in New Hampshire is largely due to a lack of research.

### 1.3 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 historical ranges of eastern red bats in New Hampshire are too few to allow a regional population comparison. Available data indicate that eastern red bats may have a wide summer distribution in New Hampshire.

### 1.5 Town Distribution Map

*Not completed for this species.*

### 1.6 Habitat Map

### 1.7 Sources of Information

Town data on the eastern red bat's summer distribution were compiled from museum specimens, college and university teaching collections, and the published and gray literature of bat research in New Hampshire.

### 1.8 Extent and Quality of Data

Data on the distribution of eastern red bats in New Hampshire are extremely limited, but the quality of existing data is believed to be good because eastern red bats are morphologically unique and easy to identify. The major knowledge gap is the paucity of occurrence records and research into distribution patterns.

### 1.9 Distribution Research

Priority research to determine the summer distribution of eastern red bats should include a long-term mistnetting survey of New Hampshire accompanied by echolocation surveys (using Anabat acoustic survey methods). A statewide mistnetting survey would also yield data on the summer distribution of New Hampshire's other six bat species of conservation concern.

## ELEMENT 2: SPECIES/HABITAT CONDITION

### 2.1 Scale

Scale for an appropriate conservation planning unit has not been resolved by the upland forest habitat mapper (Steve Fuller, NHFG).

### 2.2 Relative Health of Populations

The paucity of data on summer occurrences in New Hampshire prevents an analysis of the population trends and viability of eastern red bats.

### 2.3 Population Management Status

Eastern red bats are not currently managed in New Hampshire. Lack of data on the distribution of eastern red bats in New Hampshire prohibits the identification of conservation opportunities.

### 2.4 Relative Quality of Habitat Patches

*See section 2.1*

### 2.5 Habitat Patch Protection Status

*See section 2.1*

### 2.6 Habitat Management Status

*See section 2.1*

### 2.7 Sources of Information

*See section 2.1*

### 2.8 Extent and Quality of Data

*See section 2.1*

## 2.9 Condition Assessment Research

The research priorities for eastern red bats include a statewide mist-netting to better understand distribution, telemetry studies to determine habitat use, life history studies, and diet analyses.

### ELEMENT 3: SPECIES AND HABITAT THREAT ASSESSMENT

#### 3.1.1 Development (Habitat Loss and Conversion)

##### (A) Exposure Pathway

As land in New Hampshire is deforested, eastern red bats will 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 cumulative effects of habitat loss, degradation, and possible direct mortality could reduce population size.

##### (B) Evidence

Recent data 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, small roosting area each summer (Veilleux and Veilleux 2004). These data are for colonial bat species, but may also apply to solitary species (C. Willis, personal communication). Bat biologists hypothesize that strong fidelity to roost areas indicates that these sites are high quality breeding sites. The removal of roost trees and loss of forested habitat may reduce the quality of the habitat patch and a corresponding reduction in individual fitness and population recruitment.

#### 3.1.2 Energy and Communication Infrastructure

*See Cave and Mine Habitat Profile*

### ELEMENT 4: CONSERVATION ACTIONS

#### 4.1.1 Documenting roosting habits, Habitat Protection

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

##### (B) Justification

- 1) Identifying summer roost areas for eastern red bats and determining whether individual bats return to specific roost areas will allow managers to better assess the impact of development and logging.
- 2) Limited data exist on the spatial scale of the summer roosting habitat used by eastern red bats. Since development and logging can disrupt forested habitat, it may be appropriate to limit or mitigate small-scale development or logging in critical habitat.

##### (C) Conservation Performance Objective

Critical roosting habitats should be entered into a wildlife database. The summer habitat requirements for populations of eastern red bats will enable managers to assess how development or logging might impact eastern red bat populations. By protecting an entire habitat area, the smaller scale habitat needed by eastern red bats (e.g. the preferred species of roost tree) will likely be protected as well.

##### (D) Performance Monitoring

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

##### (E) Ecological Response Objective

The habitat protection response objective is to maintain the current number of eastern red bats roosting within New Hampshire's forested habitats. Since the data are too few to allow a valid estimate of the current eastern red bat population, the minimal ecological response should be to maintain the initial populations located by biologists.

##### (F) Response Monitoring

To determine whether eastern red bat populations are being maintained, known habitat areas should be monitored every three years. These data will in turn allow managers to make better decisions about eastern red bat populations in areas threatened by high levels of development or logging.

##### (G) Implementation

To document the summer roosting habits of eastern

red bats, preliminary data on summer locations must be gathered. After summer habitat areas are identified, the state should coordinate an intensive short-term (1-2 year) radiotelemetry study to determine the specific patterns of habitat use by individuals, and a long-term (10 year) monitoring program with periodic 3-year monitoring to determine if eastern red bats remain faithful to small summer roost areas.

#### (H) Feasibility

The technical abilities are available 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.

#### 4.1.2 Site-Selection and Pre-Construction Regulations, Regulation and Policy

*See Cavel/Mine Habitat profile*

#### 4.2 Conservation Action Research

### ELEMENT 5: REFERENCES

#### 5.1 Literature

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## Distribution of the Eastern Red Bat in New Hampshire

**Distribution**  
Known  
Potential



0 10 20 40 Miles

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

