

SPECIES PROFILE

Hoary Bat

Lasiurus cinereus

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

Hoary bats leave New Hampshire in the autumn to spend winter months in the South. During spring, they return north to their summer habitat (Cryan and Veilleux in press). No data describe the summer habitat of hoary bats in New Hampshire, though elsewhere they roost in tree foliage or even in woodpecker holes and squirrel nests (Shump and Shump 1982, Whitaker and Hamilton 1998).

Bats are not colonial, but roost singly during all times of the year (except for reproductive females, who birth and wean their young within the roost) (Shump and Shump 1982). Limited research suggests that hoary bats almost exclusively prefer the foliage of white spruce (*Picea glauca*) for their summer roosting (Willis and Brigham 2005). A study by Willis and Brigham (2005) demonstrated that, on average, hoary bats roosted 2 m from the tree trunk and in branches located 12.7 m from the ground. Roosts were oriented to the southeast (mean angle = 158.6). Roosts are typically sheltered by dense, overhanging foliage that forms an umbrella shape above the bats. The southeast exposure, lower canopy closure, and relative roost height may increase exposure of bats to sunlight, thereby providing warmer roost temperatures (Willis and Brigham 2005). Koehler and Barclay (2000) reported hoary bats from Manitoba, Canada, roosting at heights of 8-18 m in the foliage,

and occasionally on the bark of trees. Trees bordered clearings or rose above nearby trees in the forest. Willis and Brigham (2005) observed reduced forest density on the roosting side of roost trees, possibly providing an open 'flyway' for bats returning to and leaving the roost. Hoary bats also roost at lower elevations, possibly due to lower wind levels and the abundance white spruce.

1.2 Justification

Hoary bats are relatively long lived and have a low reproductive rate, typically giving birth to 2 young per year (Koehler and Barclay 2000; Shump and Shump 1982). Habitat loss and degradation may lead to population declines, which are compounded by slow reproductive rates.

Only 6 individuals have been captured in New Hampshire, including 1 female in the WMNF (Krusic et al. 1996) and 1 juvenile female and 1 adult female in Livermore, Grafton County (D.B. Sasse, Arkansas Game and Fish Commission, personal communication). LaGory et al. (2002) captured an adult female and adult male at the New Boston Air Force Base in New Boston, Hillsborough County, and a single hoary bat was collected in Conway, Carroll County. Based on echolocation calls, Reynolds (1999) reported the presence of hoary bats at Gile State Park, Springfield, Sullivan County and Pawtuckaway State Park, Nottingham, Rockingham County. Chenger (2005) reported echolocation calls from Gorham (Coos County) and Albany (Carroll County).

These data indicate that hoary 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 hoary 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 take, transport, or use of this species. Scientific collection or research requiring 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 that describe the range of hoary bats in New Hampshire are too few to allow a regional comparison of hoary bat populations. See section 1.2.

1.5 Town Distribution Map

Not completed for this species.

1.6 Habitat Map

1.7 Sources of Information

Data on species distribution were compiled by searching for specimens deposited in museums and college/university teaching collections and by examining published and gray literature of research on bat populations in New Hampshire.

1.8 Extent and Quality of Data

There are limited data on the distribution of hoary bats in New Hampshire but data quality is believed to be good. Hoary bats are morphologically unique and identifications should be accurate.

1.9 Distribution Research

Research to determine summer distribution of hoary bats should include a long-term, statewide mist-netting survey, accompanied by echolocation surveys (e.g. use of Anabat acoustic survey methods when mistnetting).

ELEMENT 2: SPECIES/HABITAT CONDITION

2.1 Scale

Scale for an appropriate conservation planning unit has not been resolved by the Lowland Spruce-Fir Forest habitat mapper (Carol Foss, NHA).

2.2 Relative Health of Populations

Hoary bats have been captured at 3 localities in New Hampshire: WMNF (n = 3), Conway (n = 1) and New Boston (n = 2). Echolocation calls have been recorded in Albany, Gorham, Nottingham, and Springfield. Population trends and viability cannot be assessed with so little data.

2.3 Population Management Status

Hoary bats are not currently managed in New Hampshire.

2.4 Relative Quality of Habitat Patches

Scale for an appropriate conservation planning unit has not been resolved by the Lowland Spruce-Fir Forest habitat mapper, and therefore the data for determining the relative quality of such patches are unavailable.

2.5 Habitat Patch Protection Status

See 2.4.

2.6 Habitat Management Status

See 2.4.

2.7 Sources of Information

See 2.4.

2.8 Extent and Quality of Data

See 2.4.

2.9 Condition Assessment Research

Research of hoary bats during summer should include a statewide mist-netting survey to determine state distribution, telemetry studies to determine habitat use (roosting and foraging habitat), 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, hoary 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)

(B) Evidence

Recent data indicate that individual roost trees are occupied by bats on a year-to-year basis (Barclay and Brigham 2001), and that individual bats return to the same, small summer roosting area each year (Veilleux and Veilleux 2004). These data are for colonial bat species, but may also apply to solitary species (C. Willis personal communication). Bat biologist hypothesize that strong fidelity to roost areas indicates that the habitat area offers a particularly high quality area for breeding; thus, deforestation may reduce the quality of the habitat patch. If the quality of the habitat patch is reduced, reduction in individual fitness and population recruitment may occur.

3.1.2 Energy and Communication Infrastructure

3.2 Sources of Information

Sources of information on threats to hoary bats included 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

The threats described under element 3.1, and their potential impact on bat populations, are well documented. Data describing the long-term negative effect of habitat conversion (development and logging) is not well understood. Although fidelity to roost areas is well documented in other bats, it is not documented for hoary bats. Data on how hoary bats use roost areas and roost trees on a long-term basis are needed.

3.4 Threat Assessment Research

Areas in New Hampshire with high numbers of hoary bats during summer months should be documented. Radio-telemetry studies will allow managers to determine the location of a roost areas, and several years of

capture and telemetry data would determine whether individual bats return to the same roost areas each year. Such data would also allow managers to assess the effects of deforestation on hoary bats.

ELEMENT 4: CONSERVATION ACTIONS

4.1.1 Documenting roosting habits, Habitat Protection

(A) Deforestation

(B) Justification

- Identifying summer roost areas and determining roost fidelity will allow managers to assess the effects of deforestation.
- No data on the spatial scale of summer roosting exist, though Veilleux and Veilleux (2004) reported individual female eastern pipistrelles, another foliage roosting species, returning to very small summer roost areas across years. Minimum roost areas containing roost trees used by the same bats during 2 consecutive years ranged between 0.6 and 2.3 ha. Since development can disrupt forested habitat at such small scales, it is appropriate to plan management accordingly.

(C) Conservation Performance Objective

Integrate critical roosting habitats into a wildlife database. Determining summer habitat requirements for populations of hoary bats is intended to allow managers to make good decisions about logging and development. By protecting a habitat area, the smaller scale attributes of a habitat (e.g. a preferred species of roost tree) will likely be protected as well (i.e., a coarse filter approach).

(D) Performance Monitoring

To determine whether limiting or mitigating deforestation results in the maintenance of summer populations of hoary bats, managers can monitor whether hoary bats continue to use a site over a long time period (periodic monitoring over a 10-year period).

(E) Ecological Response Objective

The habitat protection response objective is to maintain the current number of hoary bats roosting during summer within forested habitats. Since current data

are too few to allow an estimate of hoary bat population at summer roost areas, the minimal ecological response should be the maintenance of those populations initially located by biologists.

(F) Response Monitoring

Summer surveys at a known habitat area every three years will determine whether hoary bat populations are being maintained and whether bats remain faithful to specific roost areas during summer. These data will in turn allow managers to make better informed decision about the maintenance of hoary bat 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 individuals bats, and establish a long term (10-year) monitoring program to determine if hoary bats remain faithful to small summer roost areas.

(H) Feasibility

The technical competence to determine general summer habitat areas of hoary bats (mist-netting) and detailed patterns of their roosting habits (radio telemetry) is available. Research is limited by funding.

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

(A) Wind Resource Development

4.2 Conservation Action Research

ELEMENT 5: REFERENCES

5.1 Literature

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Distribution of the Hoary 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.

