



Natural Heritage & Endangered Species Program

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Massachusetts Division of Fisheries & Wildlife

Little Brown Myotis *Myotis lucifugus*

State Status: **Endangered**
Federal Status: **None**

DESCRIPTION: The Little Brown Myotis (or Little Brown Bat) has glossy brown fur, varying in tone from dark brown to reddish brown, to golden brown, to olive. On its back, the hairs are two-toned, appearing dark at the base and light at the tip. On its underside, the fur is lighter and tipped with buff. The bat's face is furry, with only the nostrils and lips bare. The Little Brown Myotis averages 60-102 mm in total length, with a tail of 31-41 mm. Its weight in summer averages 4.5 g, but as winter approaches, the bat accumulates fat, and before hibernation average weight approaches 7.5-8.5 g. This widely distributed, once-common bat is found in a variety of habitats, including human habitations.

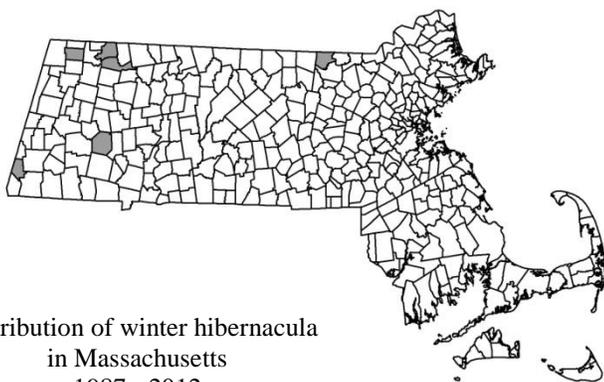
SIMILAR SPECIES: The Big Brown Bat is the only other bat commonly found in houses. It is larger in size than the Little Brown Myotis, with a forearm length exceeding 44 mm, and it has a broader nose and less furry face. The rare Indiana Bat is also similar in appearance, but it has a keeled calcar (a ridge of cartilage between the foot and the tail), which the Little Brown Myotis lacks. The Little Brown Myotis can be distinguished from other species in Massachusetts by its



Photo: Bill Byrne, MassWildlife

bicolored fur, hairless interfemoral membrane (the skin stretching between the legs and tail), lack of a black face mask (which the Small-footed Myotis has), and ears which do not extend more than 4 mm beyond its nose when laid forward.

HABITAT IN MASSACHUSETTS: During the warmer months, Little Brown Myotis occupy day and night roosts in small caves, buildings, trees, under rocks, and in piles of wood. They are most commonly found in the evening foraging along forest roads, trails, and water bodies in forest-dominated landscapes. However, they can be found wherever flying insects are abundant. These bats are widespread in Massachusetts, and have been found in 13 of 14 counties. In winter, Little Brown



Distribution of winter hibernacula
in Massachusetts
1987 - 2012

Based on records in the
Natural Heritage Database

A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

Massachusetts Division of Fisheries & Wildlife

1 Rabbit Hill Rd., Westborough, MA; tel: 508-389-6300; fax: 508-389-7890; www.mass.gov/dfw

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Myotis hibernate in limestone caves, abandoned mines, and old aqueducts, where humidity is high and temperatures rarely drop below freezing. Winter hibernacula (hibernation sites) have been reported in Berkshire, Franklin, Hampden, Middlesex, and Worcester counties.

RANGE: Little Brown Myotis are found across the United States, north into southern Alaska and Canada, and south into the higher elevation forests of Mexico. Across the northern part of their range, they were historically the most abundant bat species. They were also common across much of the south, though absent from parts of southern California, the Great Plains, Florida, and coastal North Carolina and Virginia.

LIFE CYCLE/BEHAVIOR: In the summer months, Little Brown Myotis emerge at dusk from daytime roosts for the first in a series of night-time flights. Little Brown Myotis use echolocation to locate the insects on which they feed, often catching them in their tail or wing membranes. By the end of summer, the bats have accumulated stored fat, often comprising up to 45% of their body weight. They begin to “swarm” around the entrances of caves, and are thought to be testing the air of possible hibernacula. By the end of October, the bats enter hibernation sites. Their metabolisms slow and they enter torpor, rousing occasionally through the winter to drink water. Little Brown Myotis may migrate long distances between winter and summer habitats. Individuals banded in breeding colonies in Massachusetts have been found hibernating at sites in Vermont and Connecticut up to 168 miles away.

Female bats congregate and tend to remain separate from males, except during breeding. Breeding occurs in the fall during swarming, and inactive sperm are stored by the females until spring, when eggs are fertilized. A second mating sometimes occurs in the spring, with males mating with torpid females before they have emerged from their winter quarters. Females bear single young in mid-June to early July. The new, nearly naked babies are not carried with the mother, but remain at the roosting site, where they continue to grow and develop. Young bats make their first flight at around three weeks of age, and reach adult size and leave the roost site at around four weeks old. The longevity record for the Little Brown Myotis is over 31 years; records of bats over 10 years old are common.

POPULATION STATUS IN MASSACHUSETTS, INCLUDING THREATS: The Little Brown Myotis is listed as Endangered under the Massachusetts Endangered Species Act. All listed species are protected from killing, collecting, possessing, or sale and from activities that would destroy habitat and thus directly or indirectly cause mortality or disrupt critical behaviors. In addition, listed animals are specifically protected from activities that disrupt nesting, breeding, feeding, or migration.

Once the most abundant bat species in the northern United States, the Little Brown Myotis has been devastated by White-nose Syndrome. Infected hibernacula in the Northeast have seen catastrophic losses of 90-100% of the population. White-nose Syndrome is caused by *Geomyces destructans*, a species new to science, but closely related to fungi that naturally grow in caves. The fungus grows over bats while they hibernate, causing them to rouse from dormancy frequently, lose valuable stored fat, and fail to survive the winter. The fungus is believed to be passed from cave to cave primarily by the movements of breeding male bats, but human transport is also thought to be responsible for the infection of some hibernacula.

MANAGEMENT RECOMMENDATIONS: The U.S. Fish & Wildlife Service is working in concert with government and non-profit groups to understand the spread of the fungus and potential for stopping its spread, as well as exploring opportunities for captive breeding of the most vulnerable species. Access to suitable, undisturbed hibernacula is essential to the survival of the Little Brown Myotis, and protection of known sites is paramount. Human disturbance of hibernacula can be discouraged or prevented with the use of gated entrances, in order to avoid arousal of hibernating bats and the spread of fungal spores.

REFERENCES:

- Davis, W.H., and H.B. Hitchcock. 1965. Biology and migration of the bat, *Myotis lucifugus* in New England. *Journal of Mammalogy* 46 (2): 296-313.
- French, T.W., J.E. Cardoza, and G.S. Jones. *Homeowner's Guide to Bats*. Massachusetts Department of Fisheries & Wildlife: Westborough, MA.
- Hamilton, Jr., W.J., and J.O. Whitaker, Jr. 1979. *Mammals of the Eastern United States*, Second Edition. Cornell University Press: Ithaca, NY.
- U.S. Fish & Wildlife Service. 2012. “White-nose Syndrome.” <http://whitenosesyndrome.org/>

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A Species of Greatest Conservation Need in the Massachusetts State Wildlife Action Plan

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