



Natural Heritage & Endangered Species Program

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Massachusetts Division of Fisheries & Wildlife

Indiana Myotis *Myotis sodalis*

State Status: **Endangered**
Federal Status: **Endangered**

DESCRIPTION: The Indiana Myotis is an insectivorous, migratory bat of medium size (about 3.25 inches in total length). As with most Vespertilionids, the Indiana Myotis has a simple muzzle, lacking the epidermal flap called the noseleaf. Other distinguishing characteristics include a short, blunt tragus (a specialized ear projection), small hind feet, a strongly keeled calcar (the cartilage support at outer edge of tail membrane), and a long tail.

SIMILAR SPECIES: The Indiana Myotis resembles the Little Brown Myotis (*Myotis lucifugus*), but the latter species has more conspicuous toe hairs, longer hind feet, and a mostly unkeeled calcar. The Indiana Myotis also has a distinctive pinkish-brown color of fur.

RANGE: The Indiana Myotis ranges throughout the eastern United States, from Vermont, New York, and Michigan south to Mississippi, Alabama, and Georgia, and east-west from the coast to Iowa, Missouri, and Arkansas. Northern populations migrate south to wintering hibernacula; currently, this species hibernates in Indiana, Kentucky, and Missouri. About half of all Indiana Myotis hibernate in southern Indiana in a few caves.

HABITAT: In the summer, Indiana Myotis roost in hollow trees and beneath tree bark. In winter, the bats hibernate in caves and abandoned mines. The last known observation of Indiana Myotis in Massachusetts was in 1939. Formerly, it was known to hibernate at sites in Berkshire and Hampden counties.

LIFE CYCLE/BEHAVIOR: In summer, female Indiana Myotis with young often roost together in what are called maternity roosts. These small summer colonies, ranging from a couple to a few dozen bats, are usually under the loose bark of standing dead trees, but occasionally are under the bark of live trees or in



Photo: Joy O'Keefe, from Myers, P., R. Espinosa, C. S. Parr, T. Jones, G. S. Hammond, and T. A. Dewey. 2012. *The Animal Diversity Web* (online). Accessed at <http://animaldiversity.org>.

cavities. Female bats bear one young per year, in late June. The young bats are weaned in about a month and can be flying by mid-July. Male bats and females with no young roost elsewhere in small colonies in summer.

Indiana Myotis begin migrating back to their winter hibernacula as early as late July, but most arrive back in September and October. Breeding usually occurs as the bats settle into their hibernacula, but may occur in spring, as well.

Unlike many bat species that hibernate in North America, Indiana Myotis only hibernate in a few select caves and abandoned mines. These large aggregations of hibernating bats are very susceptible to disturbance by humans in winter and, in recent years, to infection with White-nose Syndrome.

White-nose Syndrome is caused by *Geomyces destructans*, a fungal 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

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

Massachusetts Division of Fisheries & Wildlife

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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.

In spring, the bats emerge from their hibernacula in April and May, and begin migrating to their summer feeding areas.

POPULATION STATUS IN MASSACHUSETTS, INCLUDING THREATS: The Indiana 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.

MANAGEMENT RECOMMENDATIONS: The U.S. Fish & Wildlife Service is working with government and non-profit groups to understand the spread of the fungus and potentially stop its spread, as well as explore opportunities for captive breeding of the most vulnerable species. Access to suitable, undisturbed hibernacula is essential to the survival of the Indiana 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:

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- U.S. Fish & Wildlife Service. 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. http://ecos.fws.gov/docs/recovery_plan/070416.pdf
- U.S. Fish & Wildlife Service. 2012. "Indiana Bat (*Myotis sodalis*)."
<http://www.fws.gov/midwest/endangered/mammals/inba/index.html>
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<http://whitenosesyndrome.org/>

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