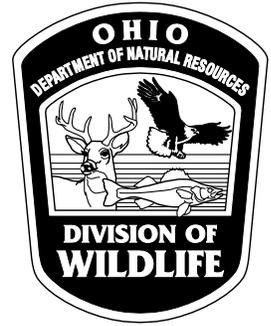


Ohio Division of Wildlife
Life History Notes

Little Brown Bat

Scientific Name: *Myotis lucifugus*



Publication 371
(399)

Introduction

Because they are active at night, bats are a mystery to most people. Although we don't often see them, bats are very important to the environment, agriculture, science, and in some instances to the economy. Worldwide, many plant species depend on bats for their propagation; bats facilitate the pollination and/or seed dispersal of bananas, avocados, dates and cashews. All bats in Ohio eat insects, including the little brown bat, and they significantly reduce insect populations. Bats are important animals in scientific research, providing insights into the biology of hibernation and sonar mechanisms.

There are many things that distinguish bats in the animal world. Bats are the only mammals capable of flight. For mammals, they are an evolutionarily old group with fossil records dating back 50 million years. The ears of most bats are unusually long in relation to their overall body size. There is a small flap called the tragus on their ears. It probably has a role in the bat's acute hearing and echolocation abilities. The tragus can also be used as an identifying feature in determining the species of bat.

The little brown bat is one of 13 bat species recorded in Ohio. It is common throughout the state, and although it is probably the most abundant species of bat, there is some concern about recent rangewide declines. There is no consensus on the cause(s) of the decline. Most of these bats migrate to caves south of Ohio for hibernation.

Description

Little brown bats are distributed widely throughout North America and are most common in the northern half of the United States and southern Canada.

Its name goes a long way toward describing its appearance. Its fur is uniformly dark brown on the upper parts, with slightly paler, grayish underparts. The wing membranes are dark brown. The bats are between 4.6 to 5.6 inches long and weigh 0.19 to 0.34 ounces. Their total wingspan is 8.7 to 10.6 inches wide.

The teeth are typical of an insectivore—they are all relatively sharp, including the molars. Bats have prominent canines to grasp hard-bodied insects in flight. There is very little surface for grinding, as would be found in an herbivore or omnivore, categories in which bats in other parts of the world fall.

The bones of the lower skeleton are reduced in size and thickness to lighten the load a bat must carry in flight. This is part of the reason why bats hang upside down. The reduced skeletal structure is simply incapable of supporting a bat in an upright or roosting position like a bird.

The bat's femur (thigh bone) is rotated, resulting in a backward orientation of the knee. This also helps explain why they hang upside down.

Habitat and Habits

There are two primary types of habitats for many bats, including the little brown bat: hibernation sites used during the winter and roosting sites for reproduction during the summer.

During hibernation, little brown bats occur as individuals or in groups that form loose clusters. During the summer, maternity roosts consist entirely of females with their young. Males mostly spend the summer as solitary individuals. Common sites for male roosts include buildings, tree cavities, caves, mines, and the expansion joints in some bridges.

Hibernation sites are usually in caves, and many little brown bats from Ohio migrate to spend the winter in large caves in Kentucky and Tennessee. Some individuals overwinter in Ohio, using small caves, old coal mines, and man-made structures as hibernation spots. It is critical that a hibernation site be cool, but have temperatures that remain above freezing. They also need to be relatively free of human disturbance, because if a bat is aroused from hibernation too often, it will draw down its fat reserves too rapidly to make it through the winter. Generally bats don't feed during the hibernation period.

In addition, bats use night and transient roosts. Night roosts are used for resting between foraging rounds and for social interactions within the species. Transient roosts are used in the spring and fall during migration. Bats have very good homing and navigation abilities and often show a strong attachment to particular roost sites.

Little brown bats are nocturnal (active at night), and their diet consists of insects that are caught and eaten during flight. These bats feed mainly over water on small aquatic insects (midges, mayflies, caddisflies, mosquitoes) that can be found in large numbers over or near open water. The insects are located by a highly developed sense of echolocation. In this process, the bats emit high-frequency sounds, which bounce off the prey and return to the bats' ears. They use the information gained from the speed and direction of the returning sound signals to pinpoint and identify prey.

Reproduction and Care of Young

Little brown bats are polygamous. This means that males mate with a large number of females and have no role in the rearing of young. Breeding takes place during the late summer and early fall during a behavioral phenomenon known as "swarming." At this time, large numbers of bats visit and congregate in a succession of caves just prior to hibernation. Although sperm is transferred to the female during copulation that occurs in the fall, ovulation and fertilization of the egg are delayed until the females arouse from hibernation the following spring.

During the summer, females form maternity colonies, mostly in man-made structures, although some will roost in tree cavities or under the peeling bark of dead trees. Some colonies can consist of thousands of individuals. Sum-

mer roosts are typically warm (80° F to 90° F during at least part of the day), and relatively dark.

A single young is born in early summer, and is fed milk from the female. The females actually hang "right side up" during the birth process. In the first few days after birth, the female may carry the young with her on nocturnal feeding flights. Generally, though, the young are left in the roost during the mother's foraging bouts. Despite leaving their young in sometimes dense maternity colonies when they leave to forage, each female is able to find her own young upon returning. The young can fly after about three weeks, and begin to leave the roost around four weeks of age.

The low reproductive rate indicates a longer-lived species and individuals up to 30 years of age have been found in the wild. One reason for this relatively long life-span is thought to be the fact that these bats spend a great deal of time in a state of reduced metabolic activity (much like suspended animation). During the warm months of the year, these bats lower their body temperatures on a daily basis and enter a state of torpor. In winter, when their insect food is not available, the bats store fat and enter hibernation, a long-term form of deep sleep during which time their heartbeats and respiration rates decrease. This is thought to prevent some of the "wear and tear" on the body allowing it to "last" longer.

Management Plans

There is a relatively high level of interest in bats, and the Division has funded several bat management and education projects through its Wildlife Diversity Grant Program.

Information is available from the Division of Wildlife on the design and placement of bat houses, and little brown bats are one of the species most likely to utilize a bat house.

The Division also works closely with the Ohio Department of Health, sharing information in regard to public health, especially concerning rabies. Although bats are currently the most frequent rabies-positive animals examined by the Ohio Department of Health each year, this only translates to 6 to 25 positive animals per year, out of hundreds that are tested, and no Ohioan has contracted rabies from a bat. Rabies is something to be cautious about; however, most bats are healthy and are an important and positive part of the state's biodiversity.

Little brown bats, and all bats in general, have been saddled with many inaccurate descriptions, including their role in the transmission of rabies. Rabies cycles through wildlife populations, its prevalence varying over time. In the 1960s and '70s, very few rabid bats were recorded in Ohio; skunks and foxes had the highest incidence during these decades. In the near future, it is likely that the most common rabies-positive animal in Ohio will be the raccoon.

Viewing Opportunities

The best time to view bats is around one-half hour after sunset in the summer months. The best locations are around ponds and lakes, or around street lamps where insects concentrate. Ultrasonic sound detectors can be purchased, which allow you to hear the bats' echolocation calls.

Do Something Wild!

The little brown bat contributes to the diversity of wildlife in the state. And as indicated earlier, the Division has awarded Wildlife Diversity Grants for bat education and management projects. The funding for the Wildlife Diversity Grant Program comes from the Do Something Wild! state income tax checkoff program. Through the generosity of Ohio citizens, who either donated through the checkoff or their direct contribution to the Endangered Species Special Account, the Division is able to sponsor a variety of special projects to benefit wildlife diversity in the state.

Tax time is not the only time you can help. Contributions to our Endangered Species and Wildlife Diversity Program are accepted throughout the year. To make a donation, please send a check to: Endangered Species Special Account, Ohio Division of Wildlife, 2045 Morse Road, Columbus, Ohio 43229-6693. All contributions, whether made on your tax return or directly, are tax deductible.

At a Glance

Mating: Polygamous

Peak Breeding Activity: September and October

Gestation Period: 50-60 days

Young are Born: May and June

Number of Litters per Year: 1. Young bats are called pups and they are dependent on their mothers.

Adult Weight: 0.19-0.34 ounces

Adult Length: 4.6-5.6 inches

Life Expectancy: 1-30 years

Migration Pattern: Both year-round resident and migrant. Little brown bats live in colonies. They home in on site specific locations to live. Little is known about the dispersal of young.

Feeding Periods: One hour or two after sunset and before sunrise

Typical Foods: Insects, especially small-bodied aquatic insects (caddisflies and mayflies), moths, leaf hoppers, and plant hoppers.

Native to Ohio: Yes

Active or Potential Nuisance Species: Occasionally

Facts and Falsehoods About Bats

* Most bats do not carry rabies.

* Attacks by bats are extremely rare, even when the animals are provoked.

* Bats are not blind, nor are they interested in anyone's hair.

Additional Reading

House Bat Management (USFWS Resource Publication 143) by A. M. Greenhall.

America's Neighborhood Bats by M. D. Tuttle. Available from most bookstores or Bat Conservation International, P.O. Box 162603, Austin, Texas, 78716-2603. \$9.95.

The Bat House Builder's Handbook by M. D. Tuttle and D. L. Hensley. Available from the same address as above for \$6.95.

The Division of Wildlife extends its thanks to Dr. Jacqueline J. Belwood for her assistance in the preparation of this Life History Note.