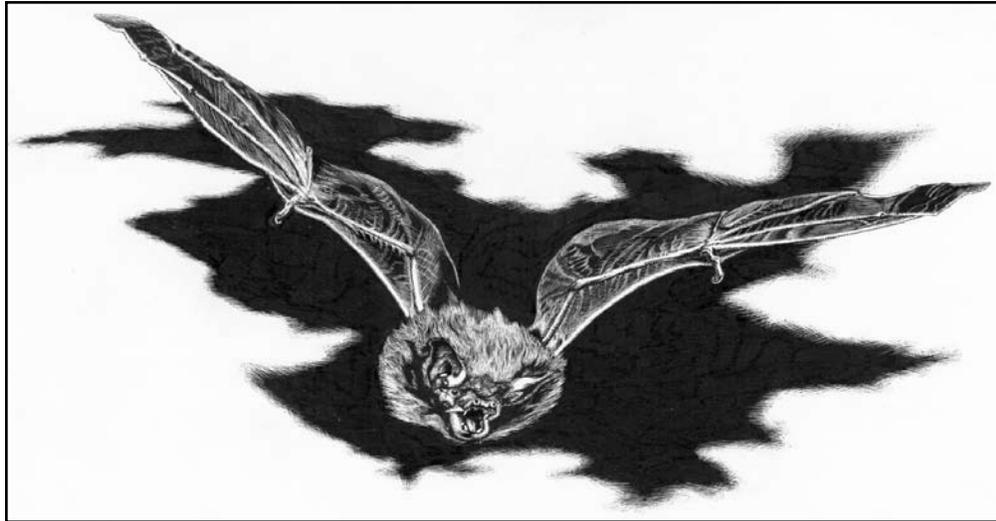
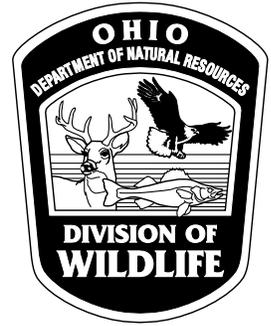


# Big Brown Bat

Scientific Name: *Eptesicus fuscus*



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## 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 big 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 usually 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 big brown bat is one of 13 bat species recorded in Ohio. It is likely the second most abundant species of bat in the state (the little brown bat is thought to be the most abundant species in the state). It will readily use man-made structures for hibernation, as well as for maternity colonies.

## Description

Big brown bats are distributed widely throughout North America. They are found throughout Ohio.

As with the little brown bat, the big brown bat's name is highly descriptive. Its fur is uniformly medium to dark brown on the upper parts, with slightly paler underparts. The fur is relatively long and silky in appearance, compared to other Ohio bats. The ears and wing membranes are dark brown.

Males of this species average about five percent smaller than females. These bats are between 5.9 to 7 inches long and weigh 0.46 to 0.88 ounces. The total wingspan of the big brown bat is 12.8 to 13.8 inches.

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.

There's a general rule of thumb in nature that

smaller creatures—mice, shrews, birds, butterflies—have shorter life-spans than do the larger animals like elephants, whales, and man. Bats, in general, are an exception. The big brown bat can live as long as 18 years, unusual for an animal its size. 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.

## Habitat and Habits

During the warm months of the year, big brown bats feed over a variety of habitats, including water, fields, forest openings, and urban and suburban areas.

Big brown bats use two distinctive types of roosting sites, which may or may not be near optimal foraging habitat. Hibernation sites are used for long-term periods of inactivity in the winter. Summer roosts are used during the warm months of the year and can consist of bachelor roosts for lone males, or colonial female nursery roosts where the young develop, are born, reared, and cared for by their mothers. Regardless of roost type, big brown bats have a highly developed homing ability and return to the same caves and roosts, both winter and summer, year after year.

Hibernation sites are in caves, old mines, and man-made structures. Big brown bats do not travel great distances between summer and winter roosts, and most individuals probably remain in Ohio over the winter. It is critical that a hibernation site be cool, but have temperatures that remain above freezing. The site also needs to be relatively free of human disturbance, because if a bat is aroused from hibernation too many times, it will use its fat reserves at too great a rate to make it through the entire winter. Big brown bats seem to be the hardiest of the bats that hibernate in Ohio, usually being found closer to the entrances of mines and caves. They will arouse from hibernation on warm winter days (above 60°F), and make brief foraging flights outside.

In addition, the bats use night and male roosts. Night roosts are used for resting between foraging rounds and for social interactions within the species. Male roosts are segregated areas from nursery roosts, and usually consist of single males. Common sites for male roosts include buildings, tree cavities, caves, mines,

and bridges. Bats have very good homing and navigation abilities and often show a strong attachment to particular roost sites.

Big brown bats are nocturnal (active at night), and their diet consists of insects that are caught and eaten in flight. The insects are located by a highly developed sense of echolocation. In this process, the bats emit high-frequency sounds, which bounce off potential prey and return to the bats’ ears as echoes. They use the information gained from the speed and direction of the returning sound signals to pinpoint and identify the prey. Some species of insects, notably some moths and lacewings, have evolved structures that allow them to detect the high frequency sounds of bats. When these insects hear an approaching bat, they either fly in another direction or perform complicated acrobatics to avoid being caught and eaten.

## Reproduction and Care of Young

Big 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, especially barns. At this time, big brown bats avoid some of the higher roost temperatures tolerated by little brown bats, and will abandon any area that gets above 95° F.

Two young are born in early summer (most in June), and are fed milk from the female. The females actually hang “right side up” during the birthing process. The young can fly after about four weeks.

## 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 big brown bats are one of the species most likely to use them.

The Division also works closely with the Ohio Department of Health, sharing information in regard to public health, especially concerning rabies. Big brown bats are the bats most frequently found to be rabies-positive in Ohio. Although bats as a group 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.

Big 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 big 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 contributions 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, Bldg. G, 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: August through October

Gestation Period: Approximately two months

Young are Born: May and June

Litter Size: 2

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

Adult Weight: 0.46-0.88 ounces

Adult Length: 5.9-7 inches

Life Expectancy: 1-18 years

Migration Patterns: Year-round resident. Big brown bats appear to 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 agricultural pests, including June and cucumber beetles, moths, and stinkbugs

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.

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