

# Oklahoma Bats



... Coming Out of the Dark

## **Nongame Wildlife Program**

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## The World of Bats

Bats are the only flying mammals. The bones in a bat's wing are the same as those of the human arm and hand, but a bat's finger bones are elongated and support a tough, elastic membrane.

Although bats have relatively good eyesight, they depend on a well-developed echolocation system, similar to sonar. Bats emit pulses of very high frequency sound, which are not audible to human ears, at a rate of a few to more than 500 per second! By listening to the echoes that reflect back to them, they are able to maneuver around objects in their path and capture tiny flying insects.

All bats in Oklahoma feed on insects such as moths, mosquitoes, cucumber and June beetles, leafhoppers and even scorpions, to name just a few. In fact, bats are the only major predator of these night-flying insects. Some bats can consume more than 3,000 mosquitoes each night!

Bats generally mate in fall and delay fertilization until spring, when the female usually gives birth to one offspring. Red bats, however, may produce twins or quadruplets. Young bats develop rapidly and most are able to fly about two to five weeks after birth.

### Bat Trivia

**Do bats lay eggs?** No. All bats give birth to one or two naked young a year. A newborn bat has well developed feet and claws that it uses to cling to its mother or to roost when the mother leaves to eat. Disturbances of maternity roosts can result in large numbers of young bat deaths. When disturbed, the mother bat becomes excited and flies, jerking the young bats and causing them to fall.

**Are bats blind?** No. Bats have small eyes that are functional and sensitive to light. Several Oklahoma bats, such as Rafinesque's and Townsend's big-eared bats, have greatly enlarged ears to help in echolocation, but bats also use sight to perceive their environment.

**How do bats eat?** Once they locate an insect, they often trap it with their wing or tail membranes and then reach down and take the insect into their mouth. This action, as well as the chase, results in the erratic flight most people are familiar with when they observe bats feeding in the late evening or around lights at night.

**Are bats dangerous?** All healthy bats try to avoid humans by taking flight and are not purposely aggressive. Most bats in Oklahoma are about the size of a mouse and use their small teeth and weak jaws to grind up insects. You should avoid handling bats because several species, such as the hoary and big brown bats, have large teeth that can puncture skin if they are handled improperly.

**What about bats and rabies?** Less than one percent of the population contracts the disease, a lower rate of inci-

dence than other mammals such as skunks. Still, you should not handle or disturb bats, especially those that are active and appear sick during daylight hours. All bat bites should be washed immediately with soap and water, and a physician should be consulted.

**Are there really vampire bats?** Yes, but not in Oklahoma. Of the three species of vampires in North America, only a single specimen has been recorded for the United States in extreme southwest Texas. Vampires do not suck blood — they make a small incision with their sharp front teeth and lap up the blood with their tongue. Vampires in Mexico and South America feed on the blood of livestock such as cattle and horses, as well as deer, wild pigs and even seals.

**Where do bats live?** In general, bats seek out a variety of daytime retreats such as caves, rock crevices, old buildings, bridges, mines and trees. Different species require different roost sites. Some species, such as the Mexican free-tailed and gray bats live in large colonies in caves. A few solitary species, such as the red bat, roost in trees.

**Do bats hibernate?** Yes. Oklahoma bats either hibernate in winter or migrate to warmer areas. Those that hibernate build up a fat reserve to sustain them through the winter. If they are disturbed, their fat reserve could become exhausted and they could die prior to spring.

### Oklahoma Bats

Oklahoma has 22 bat species, several of which are migratory and leave the state for the winter. Following are the species found in the state, with scientific names provided by *Mammals of Oklahoma*, William Caire...et al., 1989.

Southeastern Bat (*Myotis austroriparius*)

Gray Bat (*M. grisescens*)

Keen's Bat (*M. keenii*)

Small-footed Bat (*M. leibii*)

Little Brown Bat (*M. lucifugus*)

Indiana Bat (*M. sodalis*)

Cave Myotis (*M. velifer*)

Yuma Bat (*M. yumanensis*)

Silver-haired Bat (*Lasionycteris noctivagans*)

Eastern Pipistrel (*Pipistrellus subflavus*)

Western Pipistrel (*P. hesperus*)

Big Brown Bat (*Eptesicus fuscus*)

Evening Bat (*Nycticeius humeralis*)

Pallid Bat (*Antrozous pallidus*)

Rafinesque's Big-eared Bat (*Plecotus rafinesquei*)

Townsend's Big-eared Bat (*P. townsendii pallescens*)

Ozark Big-eared Bat (*P. t. ingens*)

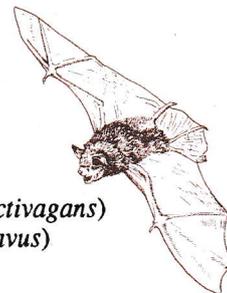
Red Bat (*Lasiurus borealis*)

Hoary Bat (*L. cinereus*)

Seminole Bat (*L. seminolus*)

Mexican Free-tailed Bat (*Tadarida brasiliensis*)

Big Free-tailed Bat (*T. macrotis*)



## Oklahoma Bats in Trouble

In recent years, bat research scientists have noted serious population declines in several species. Oklahoma has three species on the federal list of endangered species — the Indiana, gray and Ozark big-eared bats — and three candidate species — Southeastern, small-footed and Rafinesque's big-eared bats. Three main causes for the decline in bat populations are:

- **Loss of habitat** from surface mining operations, urbanization, lake and reservoir construction, and cave commercialization.
- **Vandalism** from people not understanding the important role bats play in the ecosystem. They needlessly kill and disturb bats in maternity caves and during hibernation.
- **Pesticides** entering bats via the numerous insects they eat which have been sprayed with agricultural pesticides.

## Why Build a Bat House?

Due to decades of unwarranted human fear, vandalism and habitat loss, bat populations are declining in numbers. By putting up a bat house, you can help protect Oklahoma's valuable bat resource and benefit from their remarkable ability to control insect pests.

## Bat House Success Secrets

A successful bat house depends upon many factors. In Oklahoma, the following factors should be taken into consideration:

- Bat houses must be located a quarter mile or less from a stream, river or pond larger than three acres.
- Bat houses must receive no more or less than four hours of daily sun.
- In areas south of Interstate-40, paint houses white to protect bats from overheating.
- In areas north of Interstate-40, paint the top half of the house light brown and the bottom half white.
- Mount houses 15 feet or more above the ground. Houses mounted on the sides of buildings or poles are more attractive to some bats than houses placed on trees.
- If possible, erect houses in groups of three or more. Houses on the sides of buildings should be placed close together. Pole-mounted houses can be placed facing different directions where they won't receive too much sunlight.

## No Bats in Your Belfry?

If bats don't occupy houses after two summers, experiment! Bat roosting preferences are still not completely understood. Try moving the bat house a few feet to receive more or less sun or try raising it higher off the ground.

Double check your assessment of the house's location. Have all criteria for bat house placement been met?

Bats may not be able to live in your area due to heavy pesticide use, inadequate food supply or because they already have sufficient local roosts. Generally, do not expect bats to use your house during the winter.

## Bat House Management

- √ If wasps become a problem, blast them with a high-pressure hose. Scrape mud dauber nests early in the season for better control. **DO NOT USE PESTICIDES!**
- √ Check bat houses for bats once or twice a month in summer and then once each fall and winter. After bats are established, check only a few times per season.
- √ To check bat houses, **briefly** shine a flashlight into the house. Be careful not to touch the house and be as quiet as possible.
- √ If the wood of your bat houses begins to warp, especially near the top, seal any gaps with silicon caulking. If the warping is significant, build a new house. Drafts keep bats from efficiently trapping body heat and from maintaining optimum conditions for rearing young.
- √ Besides mounting bat houses, you might consider wrapping corrugated metal around tree trunks to provide summer roosts for tree-dwelling bats.

## Bats Most Likely to Use a House

The following bats would be the most likely species to occupy bat houses. In general, any species that naturally roosts in buildings, under bridges, or in trees and cavities is a bat house candidate.

- Little Brown Bats are not common in the state, but houses probably would be used by males for summer roosts.
- Cave Myotis are found in the western half of the state. Houses probably would be used for late summer and early fall roosting.
- Eastern Pipistrel are very abundant in the eastern third of the state. Houses might be used for summer roosts.
- Big Brown Bats are widespread through the eastern half of the state. Houses could be used for nursery colonies, summer roosts or hibernation.
- Evening Bats are most abundant in the eastern half of the state. Houses would be used for rearing young and for summer roosts.
- Pallid Bats are found in Cimarron, Woodward and Woods counties and in the Wichita Mountains. Houses probably would be used for summer roosts.
- Mexican Free-tailed Bats migrate each fall to South America but return in spring to set up nursery colonies in gypsum caves in the western third of the state. Houses could be used for rearing young or as roosts by transients.

## BUILD A BAT HOUSE

Bat houses, like the one shown here, provide needed roosts for bats as they face an increase in habitat destruction. This house can hold up to 30 bats.

### MATERIALS:

One - 1" x 7 1/2" x 6' board of rough-cut lumber, preferably cedar (Figure 1); 28 - 1 1/2" flathead wood screws number eights; two - 10-penny nails

### TOOLS:

Pencil, tape measure, saw, screwdriver, carpenter's square, drill with 1/8" drill bit

### CONSTRUCTION:

1. With a pencil, measure one piece 7 1/2" x 3 1/2" (Roof - A); one piece 7 1/2" wide x 25" long (Back - B); one piece 7 1/2" wide x 21 1/2" long (Front - C); two pieces 21 1/2" long x 1 1/2" wide (Side - D); one piece 3/4" wide x 6" long (Entrance Spacer - E) and one piece 1 1/2" wide x 6" long (Ceiling - F).
2. Cut out measured boards; make sure inside-facing surfaces are roughened. Depending on your location, paint the houses according to "Bat House Success Secrets" section on the opposite side of this brochure.
3. Drill two 1/8" holes in the upper portion of the back (B) for hanging completed bat house.
4. Assemble boards according to Figure 2, making sure that the painted surfaces face out. Add some insulating material (insulation, cotton balls, etc.) before installing ceiling (F). Secure assembled box with wood screws.
5. Locate a spot at least 15 feet above the ground that receives about four hours of sun daily. After matching the holes in the back (B), hammer the 10-penny nails into the location, which should probably be either the side of a building or a pole. Hang bat house on these nails.

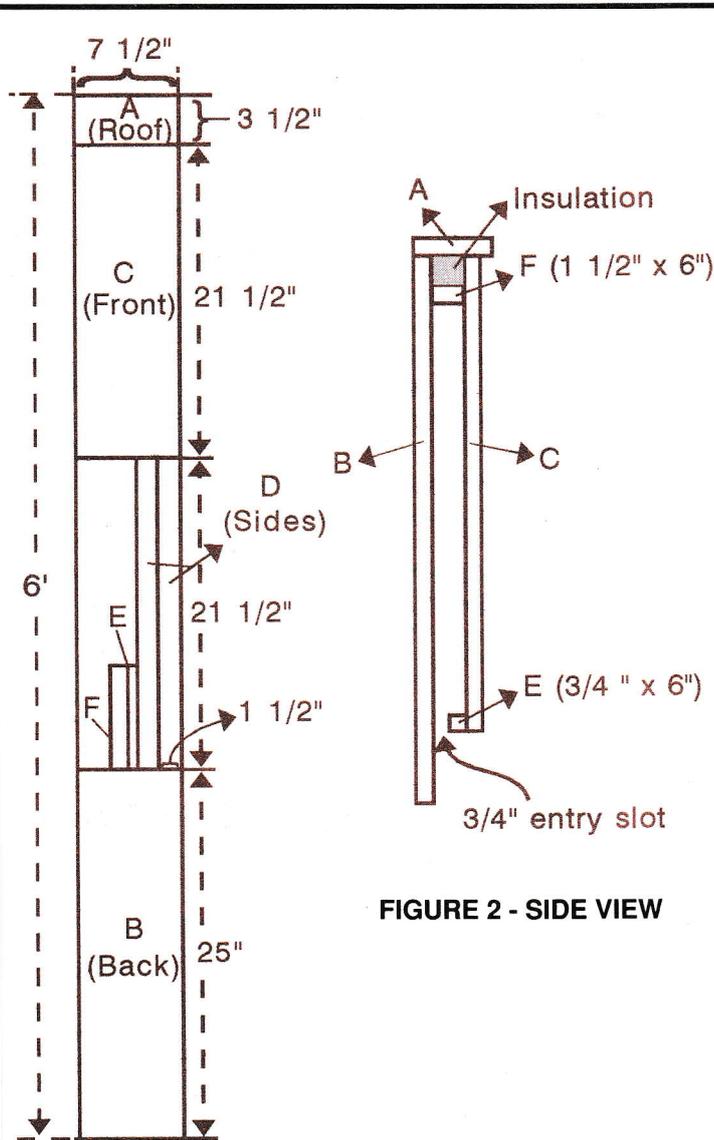


FIGURE 2 - SIDE VIEW

FIGURE 1

## Additional Sources

■ If you have a bat house already mounted or know of a roosting area for bats, the Nongame Wildlife Program would like to hear from you. Call or write for the "Bat House / Bat Roosting Survey."

■ To learn more about Oklahoma's endangered bats, request "Oklahoma's Endangered Species" booklet from the Nongame Wildlife Program.

■ **Dr. William Caire**, co-author of this brochure, is a recognized mammologist specializing in bats. Write to him at the Biology Department, University of Central Oklahoma, 100 University Drive, Edmond, OK 73034.

■ **Bat Conservation International** is recognized as the international leader in conservation initiatives that protect bats and their habitats. They have an "Adopt-A-Bat" program that people can support. Write BCI, P.O. Box 162603, Austin, TX 78716, or call (512) 327-9721.