



## U.S. Fish & Wildlife Service

### *Threatened and Endangered Species*

# Indiana Bat (*Myotis sodalis*)

The Indiana bat is an endangered species. Endangered species are animals and plants that are in danger of becoming extinct. Threatened species are those that are likely to become endangered in the foreseeable future. Identifying, protecting, and restoring endangered and threatened species are primary objectives of the U.S. Fish and Wildlife Service's endangered species program.

#### What is the Indiana Bat?

**Description** - The scientific name of the Indiana bat is *Myotis sodalis* and is an accurate description of the species. *Myotis* means "mouse ear" and refers to the relatively small, mouse-like ears of the bats in this group. *Sodalis* is the Latin word for "companion." The Indiana bat is a very social species; large numbers of Indiana bats cluster together during hibernation. The species is called the Indiana bat because the first specimen described to science was found in southern Indiana's Wyandotte Cave in 1928.

The Indiana bat is quite small, weighing only three-tenths of an ounce (about the weight of three pennies). In flight, it has a wingspan of 9 to 11 inches. The fur is dark - brown to black - and the bat is similar in appearance to many other related species. Species experts can distinguish Indiana bats by other characteristics, such as the structure of the foot and color variations in the fur, compared to other species.

**Habitat** - Indiana bats hibernate in caves, or occasionally abandoned mines, during the winter. Indiana bats require cool, humid caves with stable temperatures for hibernation. There are very few caves within the range of the species that have conditions suitable for hibernation. Hibernation is an adaptation for survival during the cold winter months, when there are no



Photo by Rich Fields

*Indiana bats eat up to half their body weight in insects each night.*

insects available for bats to eat. Bats must store energy, in the form of fat, prior to hibernation. The stored fat is the only source of energy available during the 6 months of hibernation. Disturbance by humans or increased cave temperatures increase the energy needed for hibernation and may result in starvation of hibernating bats.

After hibernation, Indiana bats migrate to their summer habitats where they usually roost under loose tree bark on dead or dying trees. During summer, males roost alone or in small groups, while females roost in larger groups of up to 100 bats or more. Indiana bats also forage in or along the edges of forested areas.

**Reproduction** - Indiana bats mate during fall before they enter caves for hibernation. Females store the sperm through the winter and become pregnant in spring soon after emerging from caves. In spring, bats migrate to their summer areas. Females roost under the

peeling bark of dead and dying trees in groups of up to 100 or more. Such groups are called maternity colonies. Each female in the colony gives birth to only one pup per year. Young bats are nursed by the mother, who leaves the roost tree only to forage for food. The young stay with the maternity colony throughout most of their first summer.

**Feeding Habits** - Indiana bats eat a variety of flying insects found along rivers or lakes and in upland areas. Indiana bats, like all insect-eating bats, benefit people by consuming insects that are considered pests or otherwise harmful to humans. Their role in insect control is not insignificant - Indiana bats eat up to half their body weight in insects each night.

**Range** - Indiana bats are found over most of the eastern half of the United States. The largest wintering populations are found in Indiana; half of all Indiana bats hibernate in caves in southern Indiana. Large hibernating populations are also

found in Illinois, Kentucky, Missouri, New York, Ohio, Tennessee, and West Virginia. Smaller populations of Indiana bats at either winter hibernation sites or at summer roost sites have been found in Alabama, Arkansas, Connecticut, Florida, Georgia, Iowa, Maryland, Massachusetts, Michigan, Mississippi, New Jersey, North Carolina, Oklahoma, Pennsylvania, Vermont, and Virginia. The current population estimate is about 380,000 Indiana bats, a 60 percent decline since the species was listed as endangered in 1967.

#### **Why is the Indiana Bat Endangered?**

**Human Disturbance** - Indiana bats, because of their habit of hibernating in large numbers in only a few caves, are extremely vulnerable to disturbance. During hibernation, bats cluster in groups of up to 484 bats per square foot. Because the largest hibernation caves support from 20,000 to 50,000 bats, it is easy to see how a large part of the total population can be affected by a single event. Episodes of large numbers of Indiana bat deaths have occurred due to human disturbance during hibernation.

**Cave Commercialization and Improper Gating** - The commercialization of caves – allowing visitors to tour caves during hibernation – drives bats away. Changes in the structure of caves, such as blocking an entrance, can change the temperature in a cave. A change of even a few degrees can make a cave unsuitable for hibernating bats. Some caves are fitted with gates to keep people out, but improper gating that prevents access by bats or alters air flow, temperature, or humidity can be harmful. Properly constructed gates can be beneficial because they keep people from disturbing hibernating bats while maintaining temperature and other requirements and allowing access for bats.

**Habitat Loss or Degradation** - Indiana bats use trees as roosting and foraging sites during summer months. Loss of forested habitat, particularly stands of large, mature trees, can affect bat populations. Fragmentation of forest habitat may also contribute to declines.

**Pesticides** - Insect-eating bats may seem to have an unlimited food supply, but in local areas, insects may not be plentiful because of pesticide use. This can also affect the quality of the bats' food supply. Many scientists believe that population declines occurring today might be due to pesticide use, possibly through eating contaminated insects, drinking contaminated water, or absorbing the chemicals while feeding in areas that have been recently treated.

#### **What is Being Done to Prevent Extinction of the Indiana Bat?**

**Listing** - The Indiana bat was added to the U.S. list of endangered and threatened wildlife and plants on March 11, 1967 due to drastic declines in the species' population. Under the Endangered Species Act, listing protects the Indiana bat from take (harming, harassing, killing) and requires Federal agencies to work to conserve it.

**Recovery Plan** - The Endangered Species Act also calls for development of recovery plans for all listed species. The U.S. Fish and Wildlife Service developed a recovery plan in 1976, followed by a revised plan in 1983. A new revision is currently underway. The recovery plan describes actions needed to help the bat survive.

**Habitat Protection** - Public lands like National Wildlife Refuges, military areas, and U.S. Forest Service lands are managed for Indiana bats by protecting forests. This means ensuring there are the size and species of trees needed by Indiana bats for roosting; and providing a supply of dead and dying trees that can be used as roost sites. In addition, caves used for hibernation are managed to maintain suitable conditions for hibernation and eliminate disturbance.

**Education and Outreach** - Understanding the important role played by Indiana bats is a key to conserving the species. Helping people learn more about the Indiana bat and other endangered species can lead to more effective recovery efforts.

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