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Species ***Myotis sodalis***

## ***Myotis sodalis***

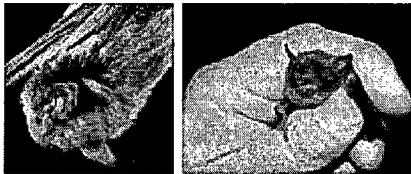
Indiana bat

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2008/01/20 06:10:57 US/Eastern

By Toni Lynn Newell

### **Geographic Range**

Kingdom: Animalia  
Phylum: Chordata  
Subphylum: Vertebrata  
Class: Mammalia  
Order: Chiroptera  
Family: Vespertilionidae  
Subfamily: Myotinae  
Genus: *Myotis*  
Species: ***Myotis sodalis***

Indiana bats are found in the cavernous limestone areas of the midwestern, southern, and eastern United States. This range extends from the Ozarks of Oklahoma in the west, north to southern Wisconsin, as far east as Vermont, and as far south as northern Florida. During their winter hibernation, they are found throughout the Ohio Valley but are absent from southern Michigan, northern Indiana, and south of Tennessee (Thomson, 1982). Two hibernacula in Ohio have recently been reported: one in Lawrence County, another in Preble County, numbering upwards of 10,000 wintering bats. (U.S. Fish and Wildlife Service, 1991)

**Biogeographic Regions:**  
nearctic Q (native Q).

### **Habitat**

In winters, Indiana bats live in caves and mines that are appropriate for hibernation, with a cool, stable temperature. It is not clear where males are found and roost during the summer. Females and their young roost mainly under the loose bark of large trees

(Thompson, 1982).

**These animals are found in the following types of habitat:**

temperate ☞; terrestrial ☞.

**Terrestrial Biomes:**

forest ☞.

**Other:**

caves.

## Physical Description

**Mass**

6 to 11 g; avg. 8.50 g  
(0.21 to 0.39 oz; avg.  
0.3 oz)

**Length**

73 to 100 mm  
(2.87 to 3.94 in)

The body of Indiana bats is about the same size as a mouse (Baker, 1983), ranging in length from 73 to 100 mm and weighing 6 to 11 grams. Their dorsal fur varies from black to light brown, but the overall color is dull gray. Ventral fur has a pinkish-white tint to it (Thomson, 1982). The tragus is short and blunt (Baker, 1983). Females' forearms are, on average, larger than the males' (Thomson, 1982). These bats are similar in appearance to *Myotis lucifugus*, but differ in possessing a strongly keeled calcar and dorsal fur that is dull, rather than glossy, as in *M. lucifugus*. (Kurta, 1995; U.S. Fish and Wildlife Service, 1991)

**Some key physical features:**

endothermic ☞; heterothermic ☞; bilateral symmetry ☞.

**Sexual dimorphism:** ☞female larger.

## Reproduction

**Breeding interval**

Indiana bats breed once per year.

**Breeding season**

Indiana bats breed in the fall.

**Number of offspring**

1 to 1; avg. 1

**Gestation period**

60 days (average)

**Time to independence**

25 to 37 days

In the fall, Indiana bats swarm around their hibernation sites, and this activity accompanies

mating. Females enter into hibernation soon after they reach the cave, but the males hold out to copulate with the incoming females.

#### **Mating systems:**

polygynandrous (promiscuous) ♀.

Mating occurs in the fall, but ovulation, fertilization, and implantation do not occur until after the female has left the hibernation site. The young bats are born in late June or early July, after a gestation period of about 60 days. One young is born per year and the bats become independent from their mothers after 25 to 37 days. Cold temperatures may affect the rate of development of the young bat (Thomson, 1982). (Kurta, 1995)

#### **Key reproductive features:**

iteroparous ♀; seasonal breeding ♀; gonochoric/gonochoristic/dioecious (sexes separate); sexual ♀; viviparous ♀; sperm-storing ♀; delayed fertilization ♀.

Like all female mammals, Indiana bats provide their young with milk. The young become independent after about 25 days.

#### **Parental investment:**

pre-fertilization (protecting: female); pre-hatching/birth (provisioning: female, protecting: female); pre-weaning/fledging (provisioning: female, protecting: female); pre-independence (provisioning: female, protecting: female).

### **Lifespan/Longevity**

Indiana bats live to be 14 years old in the wild. (Kurta, 1995)

### **Behavior**

**Average lifespan  
(wild)**

14 years

**Typical lifespan  
(wild)**

In the early fall, Indiana bats swarm and mate at the hibernation sites. Bats enter the warmer parts of the cave and remain alert. For a while, they leave the cave at night to forage and build up body fat. During hibernation, they gather on a flat surface, either a ceiling or a wall. The groups are smaller in the warmer parts of the cave. These bats are known as "cluster bats" because they form large, dense groups during hibernation. As winter progresses, Indiana bats move to cooler parts of the cave. Those living in the warmer parts of the cave may wake up during hibernation and leave the roost before the winter ends. Normally, they leave the hibernation sites from April to June (Thomson, 1982). In the summer, males and females live apart from each other, with the females forming nursery colonies in hollow trees or under bark. Indiana bats leave their roosts about a half an hour after sunset to forage. They prefer to forage near the canopy in dense forests. (Kurta, 1995)

### **Home Range**

In the summer, female Indiana bats have home ranges of about 52 hectares (128 acres). This range expands to 94 hectares (232 hectares) after the young are born. (Kurta, 1995)

#### **Key behaviors:**

flies; nocturnal ♀; motile ♀; migratory ♀; hibernation ♀; colonial ♀.

### **Communication and Perception**

Indiana bats use echolocation to find their way around. They use their vision for long distance homing and navigation. These bats have excellent hearing, and no doubt communicate with each other using sound.

**Communicates with:**

acoustic Q.

**Perception channels:**

visual Q; tactile Q; echolocation Q; chemical Q.

**Food Habits**

The diet of Indiana bats consists of small, soft-bodied insects but may also include moths and beetles. The end of the summer correlates with the bats changing from eating soft to hard bodied insects (Thomson, 1982).

**Primary Diet:**

carnivore Q (insectivore Q).

**Animal Foods:**

insects.

**Predation**

Indiana bats rarely have to fear predators. Their biggest threat is habitat destruction by humans. (Kurta, 1995)

**Ecosystem Roles**

Indiana bats have an important role in the ecosystem as consumers of large quantities of insects.

**Economic Importance for Humans: Negative**

Like all bats, Indiana bats are potential reservoirs of diseases such as rabies and histoplasmosis.

**Ways that these animals might be a problem for humans:**

injures humans (carries human disease).

**Economic Importance for Humans: Positive**

Where large numbers are found, these bats help control populations of harmful insects.

**Ways that people benefit from these animals:**

controls pest population.

**Conservation Status****IUCN Red List: [link]:**

Endangered.

**US Federal List:****[link]:**

Endangered.

**CITES:** [link]:  
No special status.

**State of Michigan  
List:** [link]:  
Endangered.

Indiana bats are listed by the USESA, the IUCN red list, and the state of Michigan as endangered (Wilson, 1993). While fairly large numbers of individuals remain, they are restricted to very few caves during the winter and are therefore especially vulnerable to disturbance at those sites. The decline in populations over the past few decades is a result of natural disasters, human interference, and a changing microclimate in the hibernation caves. The range of the Indiana bat has decreased as well. Humans are working at increasing the population by protecting the existing roost sites and restoring habitats in the previous range (Thomson, 1982).

## Other Comments

The hibernation caves of Indiana bats are popular tourist attractions. This is nice for humans, but the winter disturbance may not be good for the bats (Baker, 1983). You may be able to view a video clip of roosting *Myotis sodalis* at <http://www.cavebiota.com>.

## Contributors

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## References

Baker, R.H. 1983. Michigan Mammals. Michigan State University Press. United States of America.

Thomson, C.E. (25 May 1982) "Myotis sodalis." Mammalian Species. The American Society of Mammalogists, 163.

Kurta, A. 1995. *Mammals of the Great Lakes Region*. Ann Arbor: The University of Michigan Press.

Ravenswood Media, Inc., 2005. "Cave Biota . . . an evolving "webumentary"" (On-line). Accessed July 05, 2005 at <http://www.cavebiota.com/>.

U.S. Fish and Wildlife Service, D. 1991. "Indiana Bat" (On-line). U.S. Fish and Wildlife Service, Division of Endangered Species: Species Accounts. Accessed August 23, 2003 at <http://endangered.fws.gov/i/a/saa08.html>.

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