

Indiana bat (*Myotis sodalis*)

Pennsylvania Endangered Species

State Rank: SUB (not yet assessed, breeding), S1N (critically imperiled, non-breeding), **Global Rank:** G2 (imperiled)

Identification

The Indiana bat, *Myotis sodalis*, is small (7.1 to 9 centimeters, or about 3 to 3.5 inches) and grayish-brown, similar to the much more common little brown bat (*Myotis lucifugus*). *M. sodalis* is distinguishable from its cousin, however, by its duller brown fur, unique triple bands of color running down each of its hairs, and its tight clustering during hibernation – Indiana bats huddle on cave walls at densities of up to 2,700 individuals per square meter (250 per square foot).

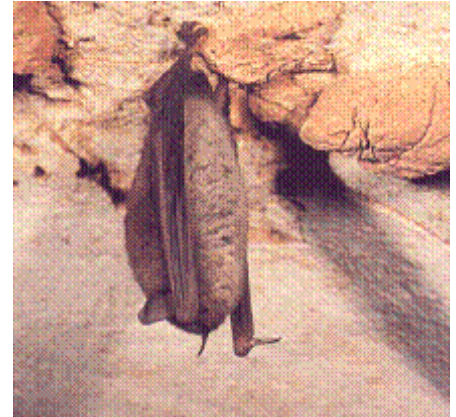
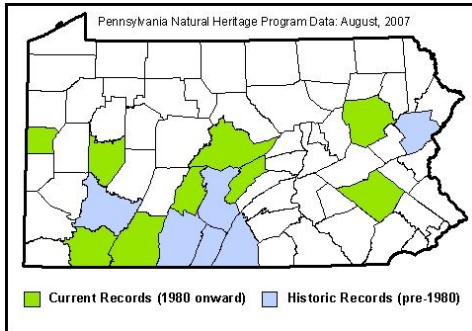


photo source: WPC 2002

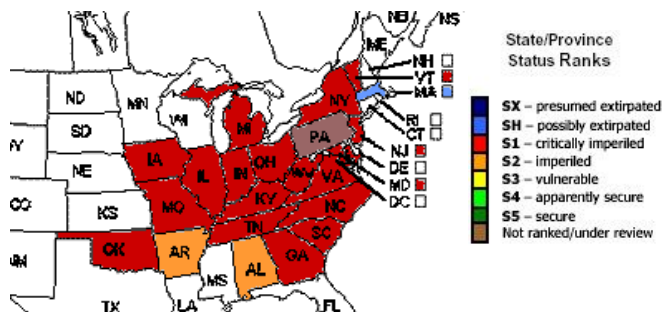


Habitat/Behavior

Indiana bats hibernate in caves and abandoned mines, generally near the cave entrance where winter temperatures are cooler – at lower temperatures, the bats' metabolisms slow down, so they use less of their fat reserves as they hibernate. In the summer, the bats frequent wooded areas near streams, roosting in crevices under tree bark or in hollow trees; trees that receive direct sunlight during the day are preferred. Females roost alone or in colonies to bear young. At the south of their range, which runs from the eastern seaboard west to Oklahoma, Indiana bats eat mostly terrestrial insects, including beetles and lepidoptera (moths and butterflies). In the north, and nearer the Great Lakes, they eat more aquatic species, such as caddisflies.

North American State/Province Conservation Status

Map by NatureServe (July, 2007)



Status

The Indiana bat is vulnerable to human disturbance of its roosting sites, especially during its winter hibernation – if the bats are aroused while hibernating, they expend the fat reserves they need in order to survive until spring. Contamination of their food supply through the use of pesticides in agricultural areas and loss of summer habitat may also be contributing to the species' decline. A 1995-97 census showed population declines of around 60 percent since monitoring began in the 1960s. The species is protected under the U.S. Endangered Species Act.

Conservation

Preservation of caves used by Indiana bats for hibernation presents an interesting challenge. Access to the caves should be restricted to prevent human disruption of the bats' hibernation; but access restrictions such as doors or walls can block the caves' airflow and raise the temperature inside, preventing the bats from hibernating as deeply and causing them to use their fat reserves more quickly. Such alterations in airflow can have a large impact: Richter et. al (1993) report that replacement of a cave's door with steel bars (which did not impede airflow) was associated with a 10,000-individual increase in the cave's bat population.

Although more research is needed to understand the summer habitat requirements of the Indiana bat, it is known that they roost under the bark of mature trees or dead snags in forests. Increase of old-growth forest acreage and forest contiguity, especially within several miles of hibernation sites, will likely improve prospects for this species. Understanding the pesticide load which bats are exposed to in areas where they summer is also important to determining whether the bats are being significantly impacted by these chemicals.

References

- Johnson, Scott A., Virgil Brack, Jr., and Robert E. Rolley. 1998. "Overwinter Weight Loss of Indiana Bats (*Myotis sodalis*) from Hibernacula Subject to Human Visitation." *American Midland Naturalist*, 139(2): 255-61.
- Kurta, Allen and John O. Whitaker, Jr. 1998. "Diet of the Endangered Indiana Bat (*Myotis sodalis*) on the Northern Edge of its Range." *American Midland Naturalist*, 140(2), 280-6.
- Merritt, Joseph F. 1987. *Guide to the Mammals of Pennsylvania*. Pittsburgh: University of Pittsburgh Press. 90-3.
- NatureServe. 2007. NatureServe Explorer: An online encyclopedia of life [web application]. Version 6.2. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: September 4, 2007).
- Richter, Andreas R., Stephen R. Humphrey, James B. Cope, and Virgil Brack, Jr. 1993. "Modified Cave Entrances: Thermal Effect on Body Mass and Resulting Decline of Endangered Indiana Bats (*Myotis sodalis*)." *Conservation Biology*, 7(2): 407-15.