

Bats



A bat hangs out in a cave in Brazil.

This time of year ghosts and goblins and bats are part of the standard decorations for Halloween. The poor bats are depicted as scary creatures to be abhorred, when in reality most are benign critters that live their lives eating insects or pollinating plants. Bats are important pollinators of some night-flowering plants, particularly in the tropics. These plants typically have white petals and are fragrant. Bats are essential for pollination and seed dispersal for many plants in rain forest ecosystems, including the wild types of many agricultural crops including bananas, breadfruit, mangoes, cashews, dates and figs. Bats in temperate areas of the world are almost exclusively insectivorous.

There are about 1,000 species of bats worldwide (almost $\frac{1}{4}$ of all mammal species), with 47 found in North America. They range in weight from the tiny bumblebee bat that is only 0.07 oz and just a little over an inch in length (also called Kitt's hog-nosed bat, from Thailand), to about 3 pounds for the large flying fox (a fruit-eating bat of the tropics).



A long-nosed bat feeds on agave flowers in Bonaire, Netherlands Antilles.

The species of bats found in the Midwest are all insectivorous, and can be considered beneficial because of the huge quantity of insects they consume. These nocturnal hunters have (or soon will) gone into hibernation for the winter now, but in the spring they will be active again. There are 7 species of bats commonly found in Wisconsin:

- **Big Brown Bat** (*Eptesicus fuscus*) is one of the most common and widespread species in North America, and the most common in Wisconsin. It is very tolerant of cold temperature and will live year round in buildings (wall spaces, attics and other structures), but also roosts in large colonies in tree hollows and hibernates in caves and abandoned mines.
- **Little Brown Bat** (*Myotis lucifugus*) is the most common *Myotis* species in the northern two-thirds of the United States and the species most frequently found in buildings. It roosts in colonies in tree hollows and buildings during the summer, often with big brown bats, and hibernates in caves or abandoned mines. It is generally found near water, but will also hunt among open trees.
- **Northern Myotis** (*Myotis septentrionalis*) is similar to, but not as common in Wisconsin, as the little brown bat. It roosts in buildings and trees on forested hills singly or in small groups, and hibernates in abandoned mines and small caves.
- **Silver-Haired Bat** (*Lasionycteris noctivagans*) is a migratory species that spends summers in wooded areas of the U.S. and Canada, foraging along forest edges and over water. Females roost in small colonies in tree hollows. This species hibernates in rock crevices and tree hollows in central and southern states.
- **Red Bat** (*Lasiurus borealis*) is a solitary migratory species that summers in deciduous forests of the northern US and Canada where it feeds primarily on moths along forest edges. It hibernates in tree hollows or under leaf litter in central and southern states.
- **Hoary Bat** (*Lasiurus cinereus*) is widely distributed in the US but rarely noticed as they are solitary during much of the year. They tend to roost in evergreen trees in forested areas, feeding preferentially

on moths. They migrate seasonally to and from sub-tropical and tropical areas where they spend the winter in warmer habitats.

- **Eastern Pipistrelle** (*Pipistrellus subflavus*) is the smallest bat found in Wisconsin (up to 3" body and 7" wingspan). They come out earlier in the evening than most other bats, and often forage over water, with a rather slow and erratic flight pattern. This species occurs in wooded areas, roosting in trees, and roosts and hibernates in caves. It is not very cold tolerant, so goes into hibernation earlier than other species.

There is also a single documented record of the federally endangered Indiana Bat (*Myotis sodalists*) occurring in Wisconsin.

Bats feed beginning at dusk and into the night, capturing night-flying insects. Midwestern bats need to eat anywhere from 25 to 50% of their body weight every night (and nursing mothers even more) – so that the average-sized bat will consume between 4 and 8 pounds of insects annually. That's a lot of mosquitoes, moths, beetles, and other insects, including many agricultural pests. Most bats do not target certain insect species, but are opportunistic hunters feeding on a wide variety of insects. In the US, bats most commonly consume moths (Lepidoptera), beetles (Coleoptera), and flies (Diptera). So although they are not considered biological control agents for specific insect pests, they do contribute greatly to natural control of many insects.

Individual bats can catch and eat 500-1200 insects per hour. There aren't any bats that are mosquito specialists, but some species do eat more than others. For example, the big brown bat feeds primarily on leafhoppers, moths, June beetles, cucumber beetles and stink bugs, while the little brown bat eats mainly spiders, mosquitoes and various types of true flies. But mosquitoes comprise less than 1% of any bat's diet. Because mosquitoes don't swarm in large concentrations (although it didn't seem like that this summer while picking raspberries!) they aren't easy pickings like many other insects are. Mosquitoes provide a relatively small amount of food (especially for larger bats) and they also tend to occur primarily around vegetation instead of out in the open where bats prefer to fly.

At one time bat roosts were built in Florida and Texas to attempt to utilize bats for controlling malaria by eating mosquitoes. If you live in an area where little brown bats occur, putting up a bat house for them might have a slight impact on mosquito populations – but will not make any difference if big brown bats (that don't feed on mosquitoes) take up residence in your bat house. But even if the bats are not effective as mosquito control agents, encouraging these winged mammals by providing roosting sites is important since one of the biggest reasons for the decline of bat populations in the US is the direct or indirect destruction of natural roosts. Bat houses in residential areas typically only provide alternate housing for bats already present rather than bringing in new populations (but this helps colonies excluded from former roosting sites or when structures they formerly used are replaced by something unsuitable).

– Susan Mahr, University of Wisconsin - Madison

Additional Information:

- Bat Conservation International at www.batcon.org and Bat Conservation of Wisconsin at www.batcow.org/
- Insect Pest Management Services Provided by Bats – a University of Florida IFAS Extension article at edis.ifas.ufl.edu/uw289
- Bats: Information for Wisconsin Homeowners – UW-Extension publication G3096 at learningstore.uwex.edu/assets/pdfs/G3096.PDF

- Bat World – an organization that provides bat rescue, rehabilitation, and conservation at www.batworld.org/
- BATS: Biological Alternative to Spraying – a video from New Mexico on YouTube at www.youtube.com/watch?v=aSB10CjOt1Y
- The book *America's Neighborhood Bats* by Merlin Tuttle