

Illinois Bats



eastern red bat

Lasiurus borealis



hoary bat

Lasiurus cinereus



Rafinesque's big-eared bat

Corynorhinus rafinesquii



silver-haired bat

Lasionycteris noctivagans



big brown bat

Eptesicus fuscus



tri-colored bat (eastern pipistrelle)

Perimyotis subflavus



evening bat

Nycticeius humeralis



gray bat

Myotis grisescens



southeastern bat

Myotis austroriparius



northern long-eared bat

Myotis septentrionalis



eastern small-footed bat

Myotis leibii



little brown bat

Myotis lucifugus



Indiana bat

Myotis sodalis

Thirteen species of bats are currently recognized as living in Illinois. They are small mammals, and all of the bats of Illinois feed on insects. Because insects are not available year-round in Illinois, bats must hibernate, migrate or adjust their activity in some manner to survive the winter. Bats are the only mammals with true flight. Their wings are made of the skin of the arm, hand and fingers. Mating occurs in late summer or fall with fertilization delayed until late winter or spring. Female bats bear live young and feed them after birth with milk produced from the mammary glands until they are able to hunt on their own. Predators of bats include cats, raccoons, hawks, owls, shrikes, opossums, skunks, snakes and weasels. Six of the 13 bat species in the state are listed as endangered or threatened. Cave closures, habitat loss and/or disturbance (for roosting and feeding), accumulation of insecticides, intentional killing, wind turbines and diseases, such as white-nose syndrome, are all contributing factors to the reduction of bat populations. Human fears and misunderstandings also negatively impact bats.

Species List

Kingdom Animalia
Phylum Chordata

Class Mammalia

Order Chiroptera

Family Vespertilionidae

eastern red bat

Lasiurus borealis

hoary bat

Lasiurus cinereus

Rafinesque's big-eared bat

Corynorhinus rafinesquii

silver-haired bat

Lasionycteris noctivagans

big brown bat

Eptesicus fuscus

tri-colored bat (eastern pipistrelle)

Perimyotis subflavus

- endangered in Illinois
- endangered in Illinois and federally
- threatened in Illinois
- threatened in Illinois and federally

evening bat

Nycticeius humeralis

gray bat

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southeastern bat

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little brown bat

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Indiana bat

Myotis sodalis

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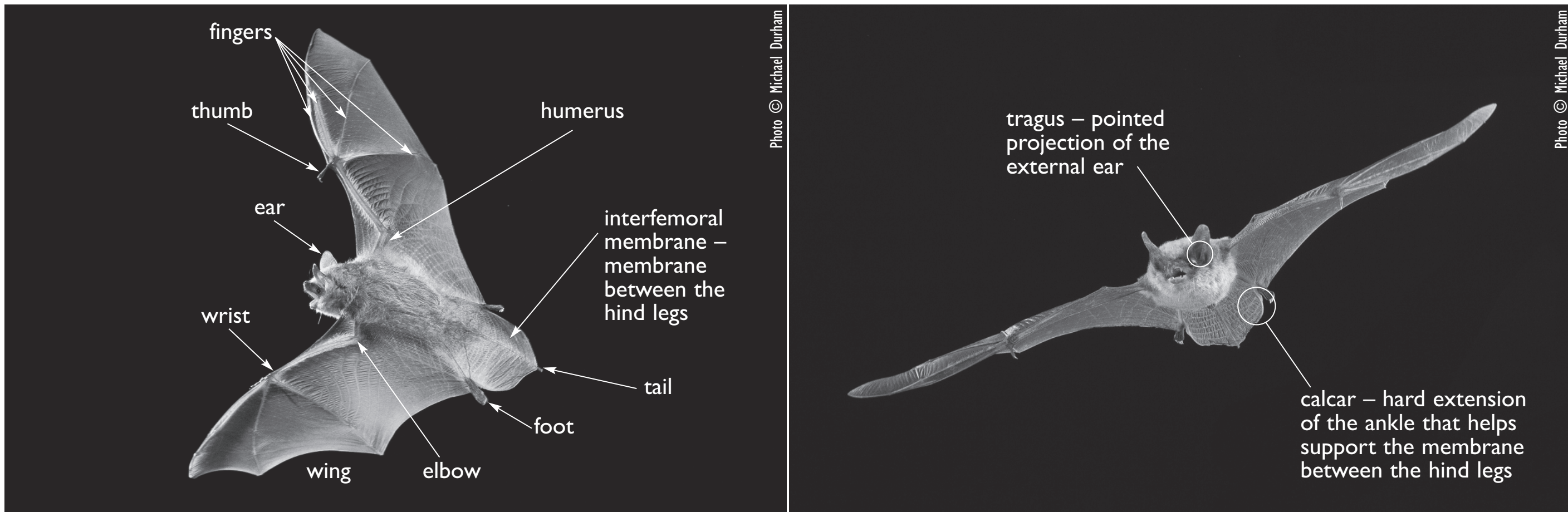
Decatur Audubon Society,
Decatur, Illinois
Funding for this poster was made possible in part by a grant from the Decatur Audubon Society.

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Bats are not shown in equal proportion to actual size. Classification and nomenclature are based on the following source. Other authors may differ on the classification and nomenclature associated with these species. Feldhamer, George A., Hofmann, Joyce A., Carter, Timothy C., and Joseph A. Kath, 2015, *Bats of Illinois*, Indiana State University Center for Bat Research, Outreach and Conservation, Terre Haute, Indiana. 84 pp.

Illinois Bats

External Structures



Species Descriptions

Illustrated on the front of this poster are the 13 species of bats that are currently recognized as living in Illinois. The bats in Illinois are small, and all of them feed on insects. Some catch insects in flight. Some glean insects that they find crawling on vegetation. Others use a combination of both techniques. Because insects are not available year-round in Illinois, bats must hibernate, migrate or adjust their activity in some manner to survive the winter. Bats are the only mammals with true flight. Their wings are made of the skin of the arm, hand and fingers. Mating occurs in late summer or fall with fertilization delayed until late winter or spring. Female bats form maternity colonies and bear live young. The pups feed on milk produced from their mother's mammary glands until they are able to hunt on their own. Predators of bats include cats, raccoons, hawks, owls, shrikes, opossums, skunks, snakes and weasels. See the "Conservation" section of the poster for problems bats in Illinois face.

eastern red bat (*Lasiurus borealis*)
Identifying Features: The bat has bright red fur, while the female has fur that is lighter in color, more tan or yellow. Both sexes can have fur that is tipped with white. The dorsal surface of the interfemoral (tail) membrane is covered with fur. White patches of fur are present on the wrists and shoulders. Ears are short and rounded. The wingspan is about 11.0-13.0 inches.

Illinois Range and Habitat: Found statewide, this species is associated with trees.
Natural History: Eastern red bats roost singly, except for a female and her young. They prefer large trees in forest edges, woodlots, parks and urban areas as roost sites. They also roost in leaf litter and under leaves of large plants. They emerge before darkness and mainly feed in flight, although some do glean insects from plants. They feed near forest edges, outdoor lights in urban areas and above streams and ponds. Moths are a major component of the diet. Born in June, two to four pups are common per litter, which is a high range for bats. The pups start flying about a month after birth. Red bats migrate southward in late summer and fall and return north in the spring, arriving in Illinois mainly in April. **Status:** The species is commonly found in Illinois from spring through fall. Some individuals overwinter in southern Illinois and possibly in central Illinois.

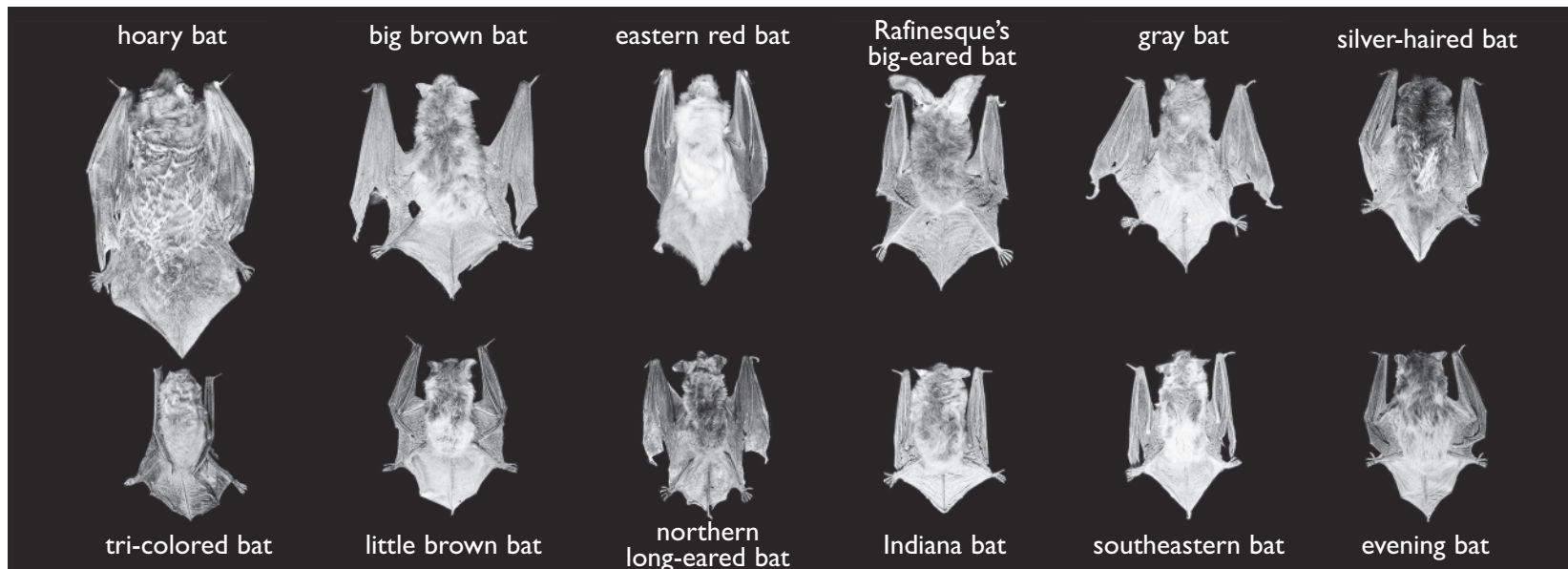
hoary bat (*Lasiurus cinereus*)
Identifying Features: The hoary bat is the largest bat in Illinois. Its fur is gray with white on the tip. It has a ring of light-brown fur around the face. The dorsal side of the tail membrane is furred. The ears are rounded, short and have black edges. The wingspan is about 13.4-16.1 inches.
Illinois Range and Habitat: Found statewide, the hoary bat is associated with trees.
Natural History: This species is solitary (except for a female and her pups) and migratory. Roost sites occur in deciduous and conifer trees. They begin foraging after dark, generally later than the other bat species in the state. Hoary bats feed around and over forests, fields, ponds, marshes, streams and streetlights. Their diet consists mainly of moths and beetles. Pups are born from mid-May through June, generally with two pups per litter. They can fly after about one month. Migration in late summer and fall occurs from August through October. It is believed that summer resident hoary bats in Illinois migrate to southern California or Mexico for the winter. They begin to return to the state in April. **Status:** Hoary bats are commonly found in Illinois in spring and fall migration. They are also present in summer, almost all of them females and young.

Rafinesque's big-eared bat (*Corynorhinus rafinesquii*)
Identifying Features: The huge ears of this species are often more than one inch in length. Sometimes the bat curls the ears in a coil shape. The fur is brown or gray-brown on the back with nearly white fur on the belly side. The fur is bicolored: dark at the base and either brown (dorsal side) or white (ventral side) at the tip. There are no hairs on the interfemoral membrane. The wingspan is about 10.0-12.0 inches.

Illinois Range and Habitat: This species is found in only a few counties in southern Illinois. It lives in swamps and forests that are located along streams.
Natural History: Small maternity colonies are formed in summer. These bats often roost in abandoned buildings, hollow trees and under bridges. They are active from after darkness until before sunrise. They can catch insects in flight, but most of their feeding is done by picking insects off of leaves and other objects. Moths are the most frequently consumed item. Pups are born in June with one pup per female. Pups can fly at three weeks of age. These ani-

mals hibernate in Illinois in caves, abandoned mines and similar underground structures.

Status: The Rafinesque's big-eared bat is endangered in Illinois. It is not commonly found anywhere in its range in the United States.



The relative sizes of 12 of the state's 13 bat species are shown in this photograph of preserved bat specimens.

tri-colored bat (eastern pipistrelle) (*Perimyotis subflavus*)
Identifying Features: The hair on the back of this species has three sections of colors: dark at the base; light brown in the center; and dark at the tip. The hair on the belly is lighter than that on the back. The forearms are pink. The tragus is short and blunt. The front half of the interfemoral membrane has fur. The calcar (hard extension from the ankle) is not keeled. The wingspan is about 8.0-10.0 inches.

Illinois Range and Habitat: This species is found statewide in forests and agricultural areas.
Natural History: Tri-colored bats begin foraging before dark and return to the roost about sunrise. They feed over water, fields and around forests and eat a variety of small insects, particularly flies, leafhoppers, beetles and moths. Females form maternity colonies in trees or buildings. Most pups are born in June and July. Two pups are typically born annually per female. The pups begin to fly about three weeks after birth. Hibernation occurs in caves, abandoned mines and other underground structures. They emerge in spring around mid-April. **Status:** This species is common in Illinois.

evening bat (*Myotis cinerascens*)
Identifying Features: The fur on the dorsal side is brown with the fur on the ventral side lighter in color. The wings, interfemoral membrane and ears are black with no hair. The muzzle is black, too. The tragus is short and curved. The wingspan is about 10.0-11.0 inches.

Illinois Range and Habitat: Evening bats are found statewide in summer. They frequent agricultural fields and woodlands.

little brown bat (*Myotis lucifugus*)
Identifying Features: The fur is bicolored with a dark base and light-brown tip. Long hairs are present on the toes of the hind feet. The wingspan is about 8.7-10.6 inches.
Illinois Range and Habitat: Found statewide, this species is associated with farm fields, forest edges and urban areas.
Natural History: Little brown bat maternity colonies are formed in dead trees, attics, old barns and other structures built by humans. One pup per female is born annually. Roost sites include cracks, crevices and under tree bark. They will roost in bat houses. Hibernation takes place in caves and abandoned mines. Beetles, moths and caddisflies compose the majority of the diet. **Status:** The little brown bat is common in Illinois.

Indiana bat (*Myotis sodalis*)
Identifying Features: The fur is brown on the dorsal side and lighter brown on the ventral side. The wings are about the same color as the dorsal fur. The calcar is keeled. The nose is pink. The wingspan is about 9.0-11.0 inches.
Illinois Range and Habitat: In the summer, the species is present in southern and central Illinois.
Natural History: About 13 percent of the entire Indiana bat population hibernates in a few caves and abandoned mines in southern Illinois. Males of this species may use the same mines/caves in summer and winter and not migrate. Females may migrate more than 300 miles. Maternity colonies are established in forests, along streams and in swamps. One pup per female is born annually. Pups can fly about three weeks after birth. The diet varies by location, with aquatic insects being favored by more northern members of the species, and moths and beetles composing the majority of the diet farther south in the state. **Status:** This species is endangered in Illinois and federally.

southeastern bat (*Myotis austroriparius*)
Identifying Features: The southeastern bat has fur that is dark at the base and light at the tip. The overall color of the bat is gray to brown on the dorsal side and white to buff-colored on the ventral side. The wingspan is about 9.5-10.5 inches. The calcar is not keeled. Long hairs are present on the toes of the hind feet.

Illinois Range and Habitat: This species has been found in the southernmost eight counties in Illinois associated with swamps, forests and streams.

Natural History: Hollow trees in swamps, caves and abandoned mines are often used for roost sites. They use the same or similar roost sites in summer and winter. In winter they enter torpor, a period of reduced body temperature and metabolic rate, for short periods. Two pups are born per female each year. They fly at five to six weeks after birth. These bats feed close to the water, eating mainly aquatic insects.

Status: Southeastern bats are endangered in Illinois.

northern long-eared bat (*Myotis septentrionalis*)
Identifying Features: This small, brown bat has dorsal fur that is dark at the base and light brown at the tip. The ears are long but shorter

than those of the Rafinesque's big-eared bat. The tragus is long and thin. The wingspan is about 9.0-10.5 inches.
Illinois Range and Habitat: Found statewide, the northern long-eared bat is associated with large, contiguous tracts of forests.
Natural History: The species hibernates in caves and abandoned mines and spends the summer in forests. Trees and old buildings/barns are important summer roost sites. The northern long-eared bat does utilize bat houses. Feeding occurs in flight as well as while gleaning on vegetation. Moths, spiders, flies and beetles are important dietary components. A single pup is born per female in late May or June. It can fly in about three weeks.

Status: Northern long-eared bats are threatened in Illinois and federally.

gray bat (*Myotis grisescens*)
Identifying Features: The fur of the gray bat is either gray or gray-brown. The wing membrane attaches to the ankle of the hind foot instead of at the base of the toes as it does in other Illinois bat species. The wingspan is about 11.0-12.0 inches.

Illinois Range and Habitat: In Illinois, this species is found in the counties along the central and lower Mississippi River, the Ohio River border counties and LaSalle County. It is associated with forests and caves.

little brown bat (*Myotis lucifugus*)
Identifying Features: The fur is bicolored with a dark base and light-brown tip. Long hairs are present on the toes of the hind feet. The wingspan is about 8.7-10.6 inches.
Illinois Range and Habitat: Found statewide, this species is associated with farm fields, forest edges and urban areas.
Natural History: Little brown bat maternity colonies are formed in dead trees, attics, old barns and other structures built by humans. One pup per female is born annually. Roost sites include cracks, crevices and under tree bark. They will roost in bat houses. Hibernation takes place in caves and abandoned mines. Beetles, moths and caddisflies compose the majority of the diet. **Status:** The little brown bat is common in Illinois.

Indiana bat (*Myotis sodalis*)
Identifying Features: The fur is brown on the dorsal side and lighter brown on the ventral side. The wings are about the same color as the dorsal fur. The calcar is keeled. The nose is pink. The wingspan is about 9.0-11.0 inches.
Illinois Range and Habitat: In the summer, the species is present in southern and central Illinois.
Natural History: About 13 percent of the entire Indiana bat population hibernates in a few caves and abandoned mines in southern Illinois. Males of this species may use the same mines/caves in summer and winter and not migrate. Females may migrate more than 300 miles. Maternity colonies are established in forests, along streams and in swamps. One pup per female is born annually. Pups can fly about three weeks after birth. The diet varies by location, with aquatic insects being favored by more northern members of the species, and moths and beetles composing the majority of the diet farther south in the state. **Status:** This species is endangered in Illinois and federally.

southeastern bat (*Myotis austroriparius*)
Identifying Features: The southeastern bat has fur that is dark at the base and light at the tip. The overall color of the bat is gray to brown on the dorsal side and white to buff-colored on the ventral side. The wingspan is about 9.5-10.5 inches. The calcar is not keeled. Long hairs are present on the toes of the hind feet.

Illinois Range and Habitat: This species has been found in the southernmost eight counties in Illinois associated with swamps, forests and streams.

Natural History: Hollow trees in swamps, caves and abandoned mines are often used for roost sites. They use the same or similar roost sites in summer and winter. In winter they enter torpor, a period of reduced body temperature and metabolic rate, for short periods. Two pups are born per female each year. They fly at five to six weeks after birth. These bats feed close to the water, eating mainly aquatic insects.

Status: Southeastern bats are endangered in Illinois.

northern long-eared bat (*Myotis septentrionalis*)
Identifying Features: This small, brown bat has dorsal fur that is dark at the base and light brown at the tip. The ears are long but shorter

Echolocation

All bats that live in Illinois have a special hearing system for locating food and navigating in the dark. The process is called echolocation. In echolocation, bats send out high-pitched squeaks that bounce off objects and return to the bat as echoes. Humans cannot usually hear these sounds although we can hear some other sounds that bats make. Bats' large, sensitive ears help to collect the returning sound waves. Echolocation allows bats to recognize the size, shape and texture of an object and determine if it is moving. It is only used on objects that are a short distance away from a bat. With this system, bats may fly accurately in total darkness.

Conservation

Bats are tremendously important ecologically and economically. They are predators of night-flying insects. They reduce insect pests of agricultural crops. They disperse plant seeds. Although none of the species that live in Illinois do so, many bat species are plant pollinators, including more than 200 plant species that provide food, lumber, fiber and medicines. They are also used in medicinal research.

Bat populations are declining worldwide. In Illinois, four of the 13 species present in the state are listed as endangered and two are threatened. Cave closures, habitat loss and/or disturbance (for roosting and feeding), accumulation of insecticides, intentional killing, wind turbines and diseases, such as white-nose syndrome, are all contributing factors to the reduction of bat populations. Human fears and misunderstandings also negatively impact bats.

What can be done to help bat populations in Illinois? All 13 species of bats are protected under the Illinois Wildlife Code. The Illinois Endangered Species Protection Act and the federal Endangered Species Act provide additional protection to the bat species listed as endangered and threatened as defined by these laws. The Illinois Cave Protection Act is designed to protect caves and the animals that live in them. Bat-friendly gates have been installed at the entrance of some caves where bats roost and/or hibernate. The gates allow bats to enter and exit but keep people out. Forest habitat and large, dead trees can be preserved. Bat houses can be constructed or purchased and installed on property. Education is a tool being used to overcome negative perceptions of bats.

White-nose Syndrome

White-nose syndrome is a disease that is devastating bat populations in North America. Caused by the fungus *Pseudogymnoascus destructans*, it has resulted in the death of millions of bats, including more than 90 percent of the bats in some hibernacula. This fungus grows in cold, moist conditions, and hibernating bats are very susceptible. It was first found in the United States in the winter of 2005-2006 in New York and spread quickly throughout the northeast, Canada and the Appalachian area. White-nose syndrome was first detected in Illinois in the winter of 2012-2013. It is also present in Europe, but does not cause such high mortality rates there. It is believed that someone from Europe may have unintentionally transported the fungus to a cave in the United States. The fungus can be transported on clothes, equipment and shoes. Bats can also carry and pass along the fungus through physical contact with other bats.

The fungus appears as a white coating on the nose and wings of infected bats. It causes infected bats to change their behavior. They may be seen flying outside of their hibernaculum in winter, even when snow and/or extreme cold temperatures are present. They hibernate closer to the cave entrance than normal, where temperatures are colder than and not as stable as deeper in the cave. Infected bats arouse more often than normal, using up fat reserves needed to survive hibernation. Infected bats usually die of freezing or starvation. The following bat species are most affected by the disease: Indiana bat; eastern small-footed bat; tri-colored bat; little brown bat; northern long-eared bat; and big brown bat. All of these species hibernate in caves.

Currently, there is no method to treat infected bats or eliminate the fungus. Caves have been closed to eliminate transport of the fungus by humans, but bat-to-bat contact and physical transport cannot be stopped.

Bats and Rabies

All mammals are susceptible to rabies, and some mammals act as a reservoir for these viruses (Family *Rhabdoviridae*, genus *Lysavirus*). The rabies virus attacks the central nervous system, resulting in swelling of the brain and sometimes the spinal cord. A rabies infection can be fatal to any mammal, including humans.

The wild mammals in the United States most commonly affected by rabies are foxes, raccoons, skunks and insect-eating bats. In Illinois, the majority of rabid animals found are insect-eating bats. Humans are more likely to come in contact with rabid bats than other rabid animals because bats tend to live in closer association with humans, especially in urban areas. Rabid bats are often slow-moving or sluggish and may be seen during the day in places that you would not expect to see a bat. Rabid bats may allow humans to pick them up. Rabies infections generally occur when saliva from the infected animal enters a wound on the victim's skin, such as from biting or scratching with claws. The main method of avoiding bat-related rabies infection is to not pick up or touch bats. You should be aware, too, that your pets may come in contact with a rabid animal without your knowledge. Dogs in Illinois must be vaccinated for rabies. Many local governments also require cats to receive rabies vaccinations. These efforts greatly reduce the spread of rabies to humans. If you see a bat that you think might be exhibiting symptoms of rabies infection, call your local animal control department, police department or natural resources biologist to report it. Do not pick up or touch the animal.

While thousands of people in the United States are treated annually for possible contact with the rabies virus, very few people are actually infected. A vaccine to combat the virus exists and is effective if administered soon after exposure to the virus. If you should be bitten by an animal suspected of having rabies, seek medical assistance immediately.

Bats perform important ecological functions. All bat species in Illinois are protected by the Wildlife Code. The incidence of rabies in wild bat populations is very low. Rabies rates in bats tested for this disease tend to be higher because many more bats that are diseased or injured, thus possibly harboring the virus, are tested than are healthy bats.

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Educational Resources

Illinois Department of Natural Resources' Division of Education

- The ENTICE (Environment and Nature Training Institute for Conservation Education) training program for teachers and other educators provides participants with background information in the topic, the opportunity to work with natural resources professionals, participation in hands-on activities and supplemental, educational resources that allow for instant implementation of the topic into the curriculum. Professional Development Hours from the Illinois State Board of Education are available at all ENTICE workshops. Workshops on Illinois bats are offered regularly. Visit <https://www.enticeworkshops.com> for the ENTICE workshop schedule.
- The *Schoolyard Habitat Action Grant* program provides funding for teachers and youth-group leaders to implement or enhance a wildlife habitat area on the school grounds or other public place. <https://www.dnr.illinois.gov/education/Pages/grants.aspx>
- The *Illinois Biodiversity Field Trip Grant* program can provide funds to allow teachers to take their students on a field trip to study native bats. <https://www.dnr.illinois.gov/education/Pages/grants.aspx>
- The *Illinois Wild Mammals* resources trunks are available for loan from locations statewide. <https://www.dnr.illinois.gov/education/Pages/ItemsForLoan.aspx>



- IDNR publications may be accessed at <https://www.dnr.illinois.gov/publications>.
- Lessons, video podcasts and other information may be found at <https://www.dnr.illinois.gov/education>.

Decatur Audubon Society

The mission of the Decatur Audubon Society (and the National Audubon Society) is to conserve and restore natural ecosystems, focusing on birds, other wildlife and their habitats for the benefit of humanity and the earth's biological diversity. They support many educational opportunities through their organization. <http://www.decatdur-audubon.org/educate.htm>

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