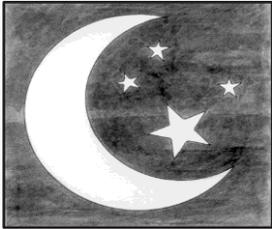


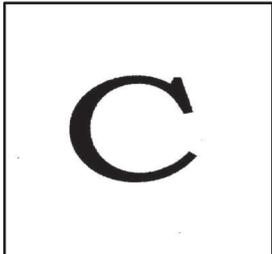


## Bats

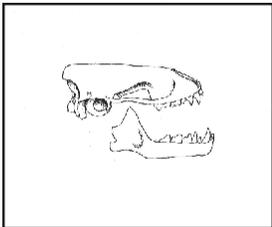
### Order Chiroptera



**First, the myths.** I know what you're thinking. Flying mice. Wrong! If ever an animal suffered from superstitions and misconceptions, it is the bat. First of all, **bats are not rodents.** Being small mammals is about the only thing bats and rodents have in common. Bats are more closely related to humans when you look at their skeletal structure. The Order of bats, called Chiroptera, literally means "hand-wing." It is a physical feature that aids them in flight and has a bone structure very similar to human fingers.



**Bats do not breed like rodents either.** Instead of having numerous litters a year, many bats only have one pup per year. Some have twins or a few more. This low reproduction rate makes it very difficult for bats to recover if they are killed by misinformed or frightened people.

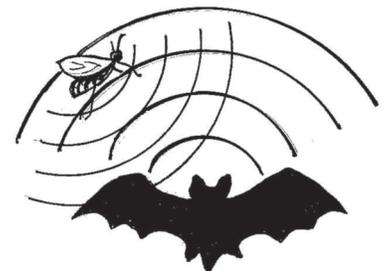


**Bats are not blind.** They can see just fine during the day and even better at night. However, they maneuver and hunt by a technique known as echolocation rather than relying on only their eyesight. (see box)

Bats can carry rabies, like any mammal. But **the incidence of rabies among bats is usually greatly exaggerated,** and too many bats are needlessly killed by individuals overly concerned about the disease.

**No bats in Pennsylvania** or North America **feed on blood.** Vampire bats are real, but they are only found in South and Central America. Vampire bats are small bats that feed on blood by making a small incision through the skin of livestock or birds and lapping (*not sucking*) up small amounts of blood through that cut. On occasion, they may even make a small incision on the toe or finger of a sleeping person. **But all bats in our country feed on insects or fruit.** In Pennsylvania, all of our bats are insectivores.

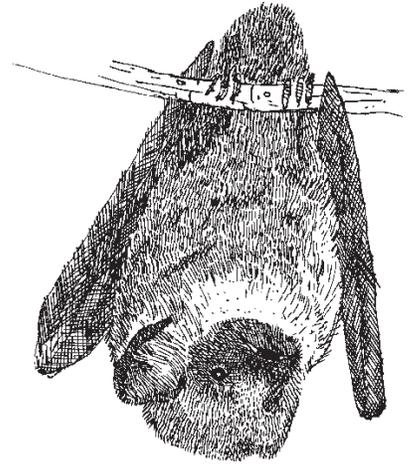
**Echolocation** is how bats locate their tiny, flying prey and avoid colliding with objects like trees and wires as they climb or dive through the air. Bats send out high-pitched sounds that bounce off objects around them. As the sounds return to them, they quickly adjust their flight pattern. **And bats don't get tangled in your hair, either.** Think about it. If they can find a tiny mosquito in pitch blackness, they can certainly avoid your head and your hair. That's just a silly myth, too.





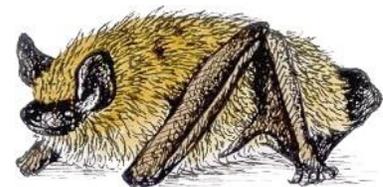
**Mosquitoes bug you?** Get a bat. Nothing puts a dent in the mosquito population better than a colony of bats. Just one little brown bat can eat up to 500 mosquitoes in one hour—that's thousands of mosquitoes in one night. Try that with your bug spray! Imagine how many mosquitoes an entire bat colony can eat in one night. Unfortunately, when you spray pesticides to kill mosquitoes, you are also poisoning the bats, which are already trying to kill the mosquitoes you want to destroy. Let the bats do the job for you.

**Hoary Bats (*Lasiurus cinereus*) are Pennsylvania's largest bats.** About six inches long with an impressive 14–16 inch wingspread, the hoary still weighs less than two ounces. They have dark brown fur tinged with white and are **uncommon**. Hoary bats do migrate, returning in spring to raise a litter of two pups in mid-May or early June. The female gives birth while hanging in a tree, grabbing the pup with her cupped wing so the pup doesn't drop to the ground. She will nurse the pups for over a month until they start fending for themselves. These bats roost or rest in trees preferring conifers (cone-bearing trees) in woods, forest edges, and farmland. They are swift fliers that prey mostly on insects, but **the hoary bat will occasionally capture and kill the much smaller pipistrelle bat—very unusual behavior in a bat.**



**Silver-Haired Bats (*Lasionycteris noctivagans*) also migrate south in winter.** It is believed that a few breed in the cooler, mountainous regions of the state, but not much is known about their breeding behavior. Smaller than the hoary at three to five inches in length with a wingspread up to 12 inches, **they have blackish-brown long fur that looks frosted.** The silver-haired bat seeks out wooded areas bordering lakes and streams to roost in dense foliage, behind loose bark, or in a hollow tree. They rarely use caves. They are early feeders, starting their hunting flights often before sunset.

**Small-Footed Bats (*Myotis leibii*) are classified in Pennsylvania as a **threatened species** and continue to decline.** Very small with just a nine-inch wingspan, they have a golden hue to their fur. They also have unusually small feet and forearms and a **distinctive black "raccoon mask."** Their feeding and breeding habits are similar to other small, closely related bats. They **hibernate** late (November) in caves preferring narrow cracks in the wall or roof, close to entrances or anywhere else the temperature is just above freezing.



**Little Brown Bats** (*Myotis lucifugus*) are our most common bat found statewide. Medium sized with a 10 inch wingspread, they weigh about a quarter of an ounce, and are heaviest in autumn before they **hibernate**. Their brownish-bronze fur, like all bats, is soft and glossy with black, hair-less wing membranes. **Females are slightly larger than males.**

Little browns eat nocturnal bugs like moths, beetles, flies, and mosquitoes, **catching insects with their wing or tail membrane**, and then lifting the food to their mouth. At dusk, when first emerging from their roost, the bats search for a body of water, where they skim the surface drinking before they start to hunt.

Little browns leave their summer roosts in autumn to search for tunnels, mine shafts or caves in which to hibernate. There they will cluster together on the ceilings, huddled against one another for warmth (below). **They return to the same hibernation sites year after year**, usually to the same exact spot in the cave or mine. The bats emerge from hibernation in April or May.

**Females gather in summer nursery colonies of 10 to 1,000 individuals** in dark, warm places like attics or barns. Males remain solitary, preferring to roost in hollow trees, under loose bark, behind shingles or the like. Only **one pup is born to each female** in June or early July. After four weeks, the young bat is fully grown, and ready to leave the colony. Little brown bats may live up to 25 years, an exceptional lifespan for such a tiny mammal.



**Hung up about babysitting?** In a nesting colony, when the adult females need to go out and hunt for food, they simply hang their baby bat up on a wall and let one of the 'babysitters' stay behind to watch over the entire nursery.



**Big Brown Bats** (*Eptesicus fuscus*) are our second largest bats. **Only the hoary bat is larger.** Their wingspan is a little more than a foot. Similar in markings to the little brown bat, they are commonly found in attics, barns, hollow trees or beneath siding or shutters.

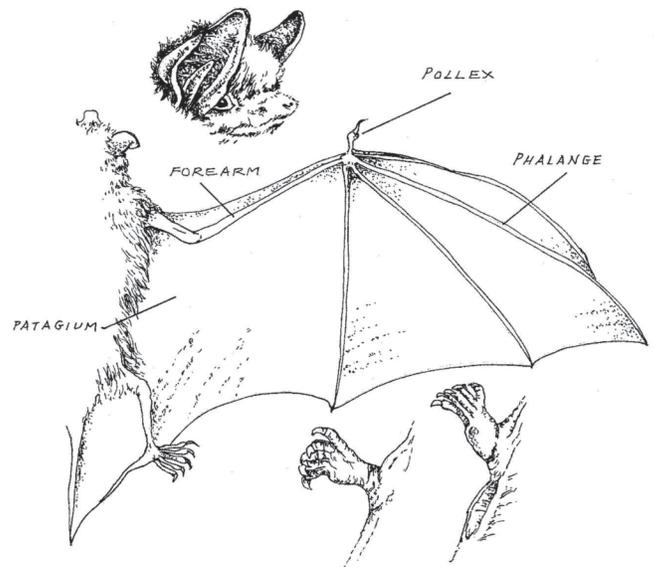
**Big brown bats can be heard chattering when they fly** at dusk, unlike most bats which emit sounds at such high decibels that the human ear cannot detect them. They are among the last bats to enter hibernation (sometimes as late as December) in caves, buildings, mines, and even storm sewers. Big Browns **prefer hibernating close to the mouth of a cave.** Females bear young, usually twins, in June. As the young mature and leave the nursery colony, adult males enter and take up residence in the previously all female colony. Big brown bats have lived up to 19 years in the wild.

**Now that's loud!** Humans are surrounded by sounds that we cannot hear, which might be a good thing. It's been said that bats communicate at decibels so loud and so high, if we could hear them calling out, it would sound as loud and intolerable as standing next to a jet plane as it takes off.



Okay, we know most birds can fly, but **bats are the only mammals that can fly**. Their unique wings are made of a very thin, double-layered skin membrane called the **patagium**. That membrane is stretched over extremely elongated finger bones or **phalanges**. It connects the bat's forearm, hand, finger bones, and its hind legs and tail.

The short, clawed thumb is called a **pollex**. The thumb remains clear of the membraned wing and is used for grasping. **Baby bats are often "hung-up" by their thumbs** when the mother bats need to go out and hunt. Bats hang upside down by their toes. When they need to take off, they simply spread their wings, release their toe-hold and fly.



**Eastern Pipistrelles (*Pipistrellus subflavus*)** are our smallest bats (right), only three inches long with a wingspan less than 10 inches. Their beautiful fur is tan on the back and pale yellow on the belly. They take flight early in the evening, making short, elliptical flights at treetop level. Their early hibernation begins in September and can last until early May. They sleep soundly, often dangling in the same spot for months, completely covered with water condensation (left).



Pipistrelles breed in November but don't give birth to twins until the following summer. They can live up to 15 years and are found throughout PA, except the south-eastern corner.

**Red Bats (*Lasiurus borealis*)** have a bright rusty coat (right) and long, pointed wings. Red bats often roost along forest edges and are especially fond of elm trees. They rarely seek shelter in caves or buildings. They prey in the evening on insects, which they take from air, foliage, and even off the ground. **It is believed red bats are migratory**, flying south at night in September and October, but little is known about their seasonal habits.

**Females may give birth to as many as 5 pups** (usually 2–3) in their treetop roosts. For the first few days, the young remain clinging to their mother when she flies out on hunts. They are able to fly at about four weeks of age. The red bat ranges across Pennsylvania.



The **Indiana Bat** (*Myotis sodalis*) is the **only bat in Pennsylvania currently on the federal endangered species list**. They are especially vulnerable to disturbances during hibernation where they cluster in groups of about 250 bats per square foot on the walls and ceilings of caves (below left). When people exploring caves unknowingly awake a bat on the edge of this cluster, it can disturb the entire colony. Continued disturbances will cause the bats to burn reserves of body fat, causing them to run out of energy before spring. This makes them too weak to hunt for insects when they emerge from hibernation. **Even a subtle disturbance within the cave can wreak havoc on the population inside—they are that sensitive.**

Closely resembling the little brown bat in size, **Indiana bats have a pinkish cast to their fur and face**, giving them a light purple-brown coloration. They have distinctly curled toes and a slight bulge in the tail membrane.

Indiana bats roost under the loose bark of trees in summer and occasionally in buildings, roosting with the much more common little browns. **In winter, almost all Indiana bats hibernate in certain large caves in Missouri, Kentucky, Indiana, and Illinois.** Pennsylvania is just barely within the Indiana bats range, and only a few have been found hibernating here.

**It is believed the Indiana bat females bear just a single pup in late June.** This slow breeding behavior makes it extremely difficult for the Indiana bat to recover from its endangered species status if large numbers of adults die during hibernation. Feeding habits are probably similar to those of the little brown bat.



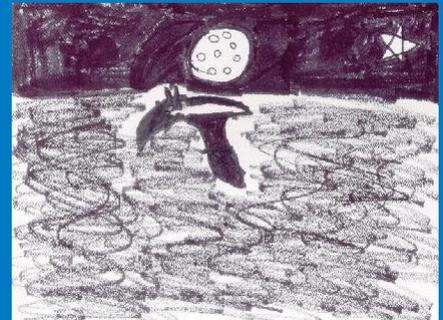
The **Northern Long-Eared Bat** (*Myotis septentrionalis*), above right, is also similar to the little brown bat but is easily identified by a longer tail and noticeably narrower and longer ears. It is less common than the little brown, but its range is state-wide.

**Biologists are still learning about the Northern long-eared bat.** We know they roost both individually or in small colonies in caves, behind window shutters, under loose tree bark or in cliff crevices. Females gather in nursery colonies in attics, barns, and tree cavities. Probably a single young is born in July. Long-eareds return to caves in fall, and will share space with other bat species.

**Sadly, hibernating bats across the country are now suffering from an alarming new disease called *White-nose Syndrome*.** Its cause is unknown and bats are dying in startling numbers, but biologists have not yet figured out how to fight it. When bats are infected with this disease, they develop a cold-loving white fungus on their nose and upper body. Those affected bats seem to have very low body fat and behave erratically. Identifying the reasons for the appearance of white-nose syndrome, preventing its spread and ***trying to find a cure for the disease is one of the most urgent wildlife issues occurring in our country today.*** Pennsylvania's bats are unfortunately among those populations that have been affected.



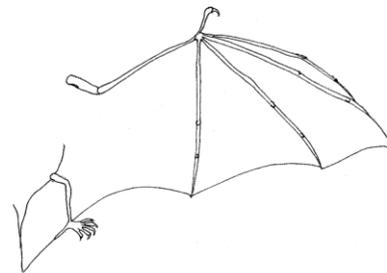
## A Simple Review of Bats



Bats belong to the **order Chiroptera**, meaning “hand-wing” and the **family Vespertilionidae**. That means “plain-nosed” bats. ***Bats are the only mammals that can fly.***

Bats are really cool, but sadly they are misunderstood. Some people think they like to fly into your hair or bite you. That's not really true. **Bats are very helpful to humans.** All of Pennsylvania's bats are insect eaters. Some bats can eat hundreds of mosquitoes and other insects every night!

**Bats have bones in their wings that are very similar to our hands.** Look at a bat wing. Look at your hand with your fingers spread out. If your fingers were really long and you had a soft stretchy skin pulled across them, you would have a bat wing.



**The body of a bat is covered with fur.** But their wings have a double layer of skin stretched over their arm and finger bones. That skin is really soft, like your eyelid.

Some bats roost alone in hollow trees or behind a window shutter. Other bats live in groups or colonies in caves, mines or old buildings. Males attract females by making sounds and flapping their wings. **Most bats have only one baby a year called a pup.** Female bats live in nursery colonies. When the mothers need to hunt or get water, they leave their babies behind with a “babysitter.” Even if there are lots of babies clinging to the cave wall, the mother can find her own baby using scent and sounds

Bats are **nocturnal**. They hunt when the air is cooler and the humidity higher. Bats are actually pretty chubby little animals, so flying takes lots of energy. Remember, birds are much lighter since they have hollow bones and feathers. If bats flew during the day, they might overheat. Hunting at night also helps protect them from predators.

**Bats are very clean animals.** At rest, they lick their fur and comb it with their feet to keep clean, like a house cat. They also keep their wings ready for flight by grooming the skin with oil from special glands.

**Bats have built-in air-conditioners.** If a bat gets too hot, it can cool down by licking its fur and wings. They fan themselves, too. If they get too cool, they can warm themselves up by wrapping their wings around their body. Yep, just like Dracula!



**We have always thought people were the biggest threat to bats** because we have destroyed their habitats, their hibernation and maternity roosts. And we have killed so many bats simply because we did not understand them.

**But now bats all across the state and the country are dying from a mysterious disease called White-nose Syndrome.** Bats infected with this illness have a white fungus covering their noses.

**Some biologists call white-nose syndrome the worst wildlife crisis in the country today.** If we cannot find out what is causing this disease, we might lose our best defense against insect pests!

**Many people hang “bat boxes”** on trees near their homes. Wooden bat boxes are easy to build and have narrow spaces where the bats can sleep.

Make sure you put a bat box up near a source of fresh water. Bats will control insect pests around your house.

Check the Pennsylvania Game Commission or Bat Conservation International for more information.

