Massachusetts Wildlife

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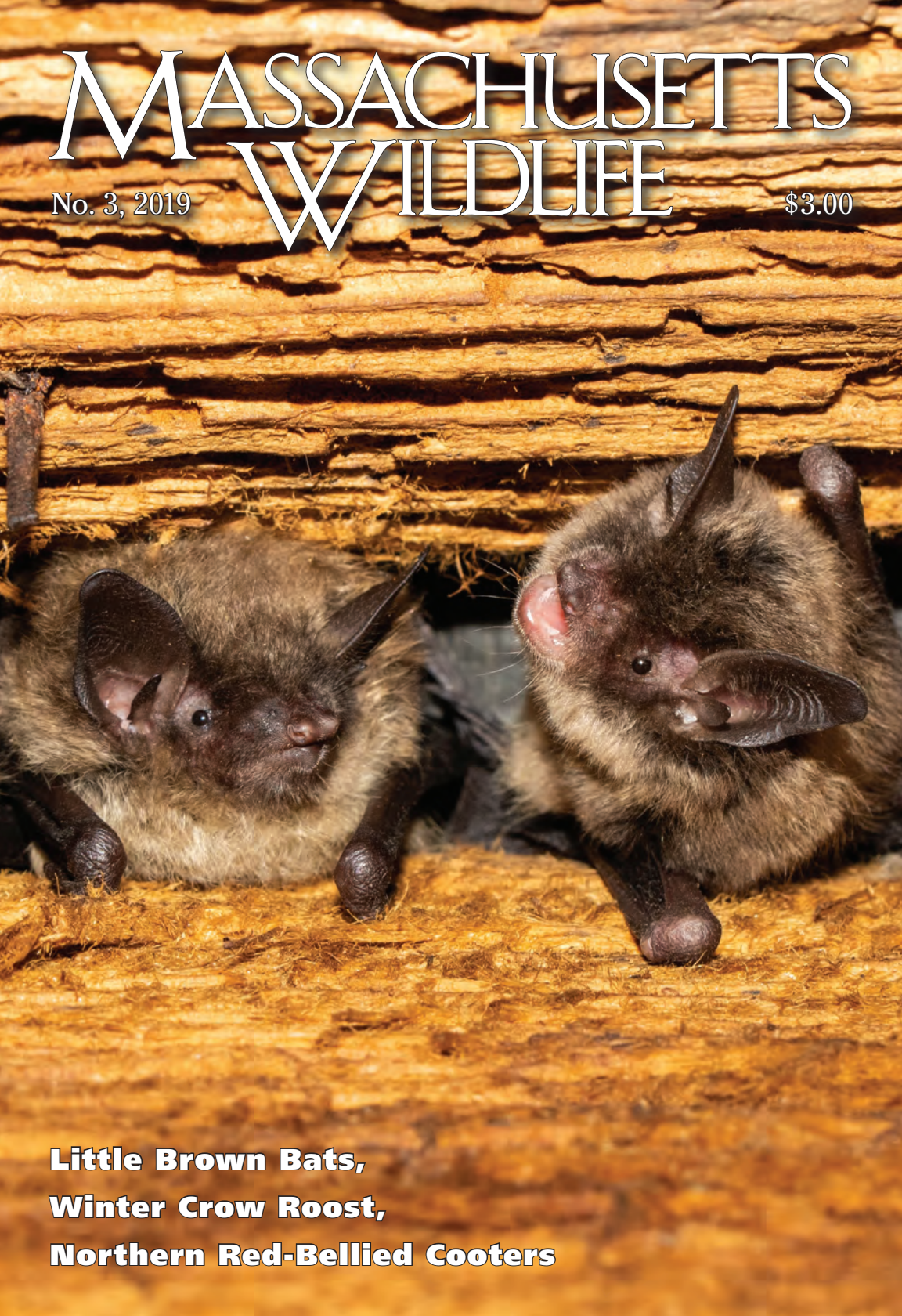
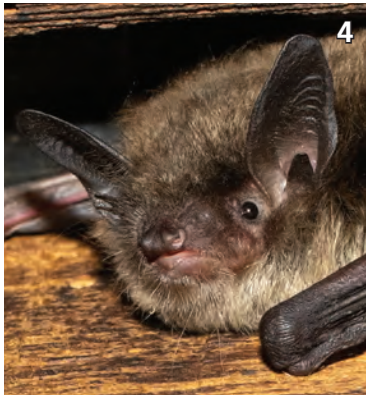


Little Brown Bats,
Winter Crow Roost,
Northern Red-Bellied Cooters



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MASSACHUSETTS WILDLIFE

Vol. 69 No. 3

FEATURES

On the Cover: Bats, such as these two little brown bats, are highly intelligent and social animals that live in groups called colonies. When bats aren't looking for food or sleeping, they're usually grooming and socializing. Roosting in large numbers provides social interaction, some protection from predators, and temperature stability. Unfortunately, bats have declined significantly over the last decade due to White-nose syndrome and human activity. Massachusetts is home to nine species of bats, five of which are protected. Learn more about bat conservation and how to properly deal with bats in your home at **mass.gov/bats**. Photo by Troy Gipps/MassWildlife.

Bat Myths Debunked

By Jennifer Longsdorf

Photo by Troy Gipps/MassWildlife

How much do you know about the world's only flying mammal? Bats have long been misunderstood, and what we think we know about these fascinating creatures is riddled with myths and misconceptions. Contrary to popular belief, bats are actually friendly, useful creatures. In fact, bats are often considered a keystone species because they play a critical role in our ecosystem and are vital to the health of our environment. Without bats, the Earth would be a very different place. Bats are the second most species-rich mammal group, outnumbered only by rodents. Approximately 1,300 species of bats around the world are valued for a variety of intrinsic, cultural, and utilitarian reasons, including the ecological and economic services they provide.

Bats use a type of natural sonar called echolocation to perform one of the most important ecosystem services of any animal: pest suppression. They are the primary predators of night-flying insects, including the disease-carrying insects we find in our backyards. They have a high metabolism so bats can eat up to 125% of their body weight in insects in a single night. Seventy percent of bat species worldwide are insectivores, and over 99% of bats found in the United States eat insects. Therefore, bats provide organic, effective, and free pest control. Bats are also important to farmers since they eat crop-damaging insects, allowing farmers to use fewer pesticides. This saves farmers money, makes our food safer, increases crop yields, and reduces the amount of chemicals released into our air and water. It is estimated that bats save farmers in the United States alone at least 3.7 billion dollars (estimates range up to $53 billion) annually in pest control services.

Bats truly are remarkable animals, and it's a shame their unwarranted reputation has prevented many people from appreciating how truly beneficial and unique they are. In other parts of the world, fruit-eating and nectar-feeding bats play a critical role in plant and crop pollination, seed dispersal, and forest regrowth.

Pest suppression, pollination, and seed dispersal are services which bats provide naturally, but there are other derived ecosystem services provided by bats including fertilizer, ecotourism, and medicine. Bat guano (excrement) is one of the richest and most concentrated natural fertilizers known and is highly valued by organic farmers as well as by homeowners for use on lawns and in gardens. Many caves around the world are ecotourism destinations that provide unique opportunities to educate the public about the myriad of ecological benefits provided by bats. Research conducted on bats has led to advancements in flight and sonar capabilities, navigational aids for the blind, drone engineering, and vaccine development, among others. Bats are literally saving our lives!

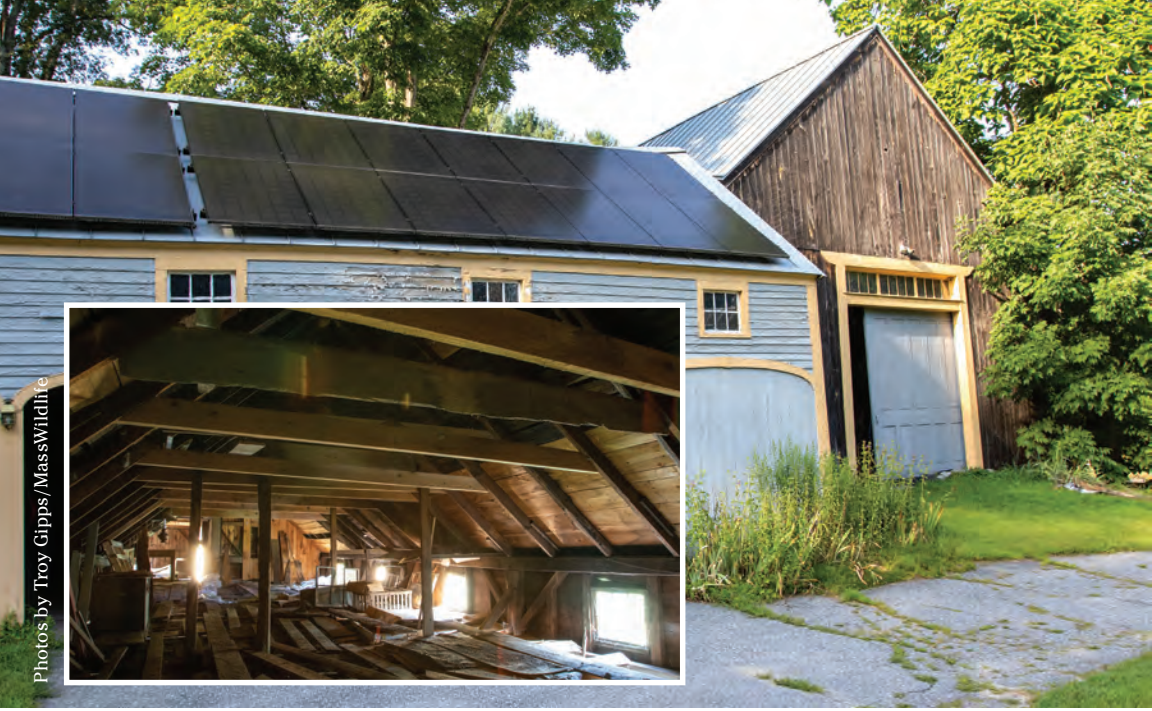
Threats to Bats

Worldwide, bat populations are in serious decline as bats are faced with a variety of threats largely the result of increasing human activity. Bats face a multitude of threats including, but not limited to, habitat loss and degradation, pesticide use, climate change, wind turbines, roost closure and destruction, fear, ignorance, bushmeat trade, unregulated guano mining, and disturbance during hibernation.

In North America, an estimated 6.7 million bats have died since 2006 from an outbreak of White-nose syndrome (WNS), a rapidly spreading disease caused by a fungus that invades and ingests the bare skin of hibernating bats while they are inactive (*Massachusetts Wildlife*, No. 3, 2011). WNS increases bat metabolism, causing bats to wake up more frequently during the winter and use up their precious fat reserves. Bats ultimately starve to death, but the fungus also compromises their immune systems and creates holes in their wings leading to dehydration.

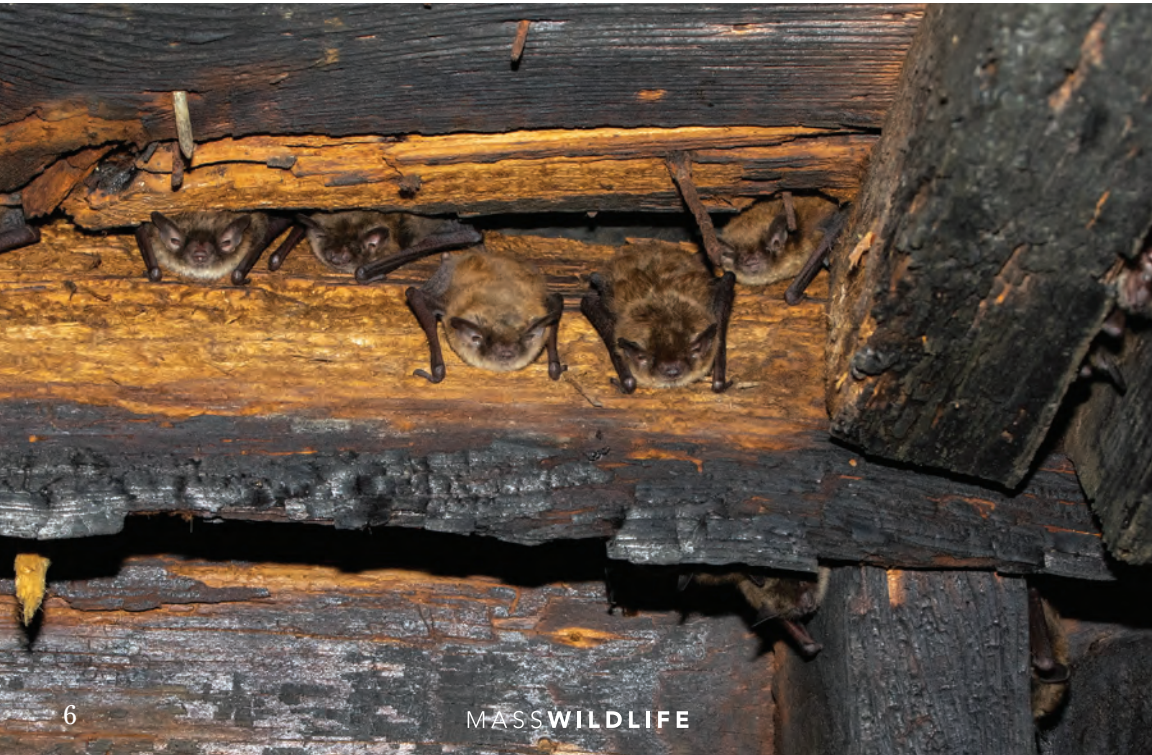
WNS was first observed in bats hibernating in a cave near Albany, New York in 2007. However, cave explorers in that area had taken a photo of bats with a white

Continued on page 8

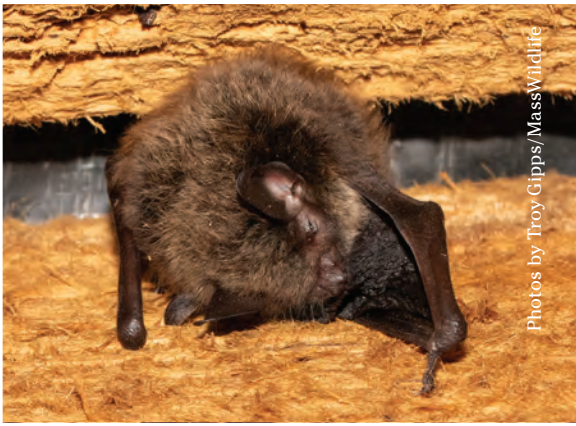


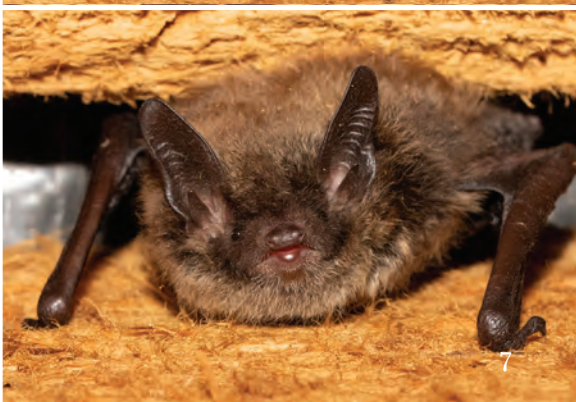
Photos by Troy Gipps/MassWildlife

A maternity colony of 200–300 little brown bats gathers each spring and summer at this private residence in Pepperell. They roost during the day in the rough and fire-scarred wood found in the garage and in the horse barn. Aside from these types of structures, bats have a variety of daytime retreats including attics, eaves, sheds, hollow trees, beneath loose tree bark, rock crevices, old buildings, window shutters, church steeples, caves, mines, bridges, and bat houses.



Bats are highly social mammals (above), especially echolocating bats as sound communication plays an important role in their social interactions. Little brown bats are a colonial species forming colonies of several hundred up to hundreds of thousands of individuals. Females form large maternity colonies to birth and raise their young. The pups profit from the extra warmth provided by this social thermoregulation. Male bats and non-reproductive females live separately from the maternity colony; A little brown bat (below) grooms its wing membranes with its tongue and teeth in preparation for the evening flight.





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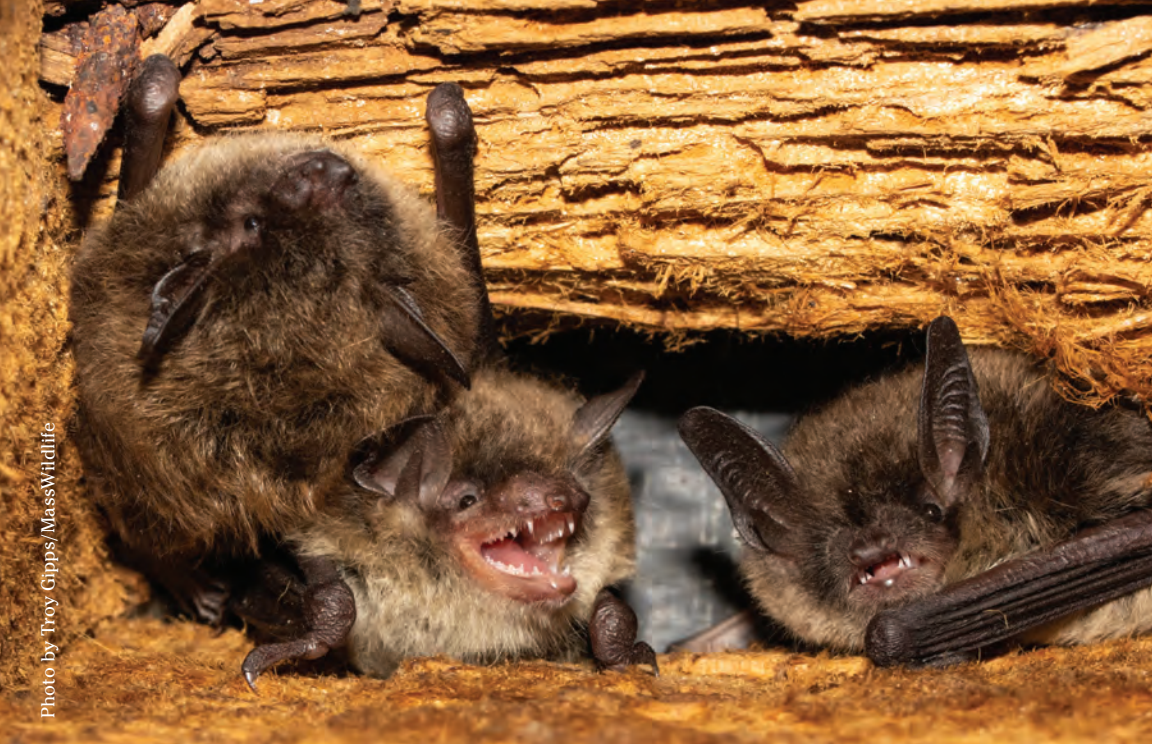

Photo by Troy Gipps/MassWildlife

Little brown bats have 38 teeth, all of which are small, relatively sharp, and prominent to enable grasping insects while in flight. Their bite marks are often mistaken for a scratch, as they are tiny and rarely ever break human skin. If you suspect a bat bite, catch the bat and submit it for rabies testing. If the bat cannot be captured, contact your healthcare provider immediately.

Continued from page 5

powdery substance on their noses the year before, so WNS has been in North America since at least 2006. WNS continues to spread rapidly and has caused a catastrophic mortality of bats that spend the winter in caves and mines. WNS is now the number one threat to bats, killing more than a million bats each year and causing mortality rates that approach 100% at some sites. As of July 2019, WNS has been confirmed in 33 states and 7 Canadian provinces, and the fungus that causes WNS has been confirmed in 5 additional states. This fungus originated from European caves and is yet another example of the harm that can be caused by the introduction of non-native species. This bat-killing fungus has triggered the most serious wildlife disease epidemic in American history.

At the largest Massachusetts bat hibernation site in an abandoned mine in Chester, there were about 10,000 little brown bats (*Myotis lucifugus*) in early winter 2007–2008. By the end of winter 2008–2009, nearly every bat had been killed by WNS … only 14 individual bats remained. The little brown bat used to be the most abundant and widespread bat species in Massachusetts. Since the onset of WNS in Massachusetts, the state's population of little brown bats has dwindled to less than 1% of what it once was. As a result of the devastating mortality that has resulted from WNS in Massachusetts, all four of our bat species that spend the winters in caves or mines have been listed as endangered on the Massachusetts Endangered Species Act list. Of the nine bat species that occur in the Commonwealth, five are now state endangered including the Indiana bat which was last recorded in 1939. See page 10 for more details.

These factors, combined with their slow

reproductive rates, result in incredibly slow recovery from population declines, making susceptible species vulnerable to extinction.

Myths Debunked

Bats certainly have an image problem, as many people think bats are aggressive or dirty animals. This is largely because movies, TV shows, and books have given bats a bad name. When many people hear the word "bat" they instantly think of blood-thirsty creatures that spread diseases like rabies.

Do you know the difference between fact and fiction when it comes to bats?

Fiction: Bats are blind.

Fact: Bats can see as well as most other mammals, and some bats can see up to three times better than humans. All bats rely on vision for daily activities, including interacting with one another, watching for predators, finding food, and navigating. Many bats don't have the sharp and colorful vision humans have, but their reduced ability to see color is compensated by their ability to detect light waves with frequencies beyond the spectrum visible to humans. The eyes of many bats are loaded with ultraviolet-sensitive photoreceptor cells called rods, which tune their vision to low-light conditions, like dawn and dusk. And although many bats have small eyes, they have the best hearing of all land mammals. At night, most bats rely on echolocation to find prey in the dark by sending out ultrasonic sound waves and listening for echoes. Therefore, bats essentially 'see' with both their eyes and ears!

Fiction: All bats have rabies.

Fact: Any mammal can contract rabies, but less than one-half of 1% of bats carry rabies. Rabies is a dreaded disease, but it is, fortunately, extremely rare in bats. With rigorous rabies vaccination programs in place in the United States, there are only about two human rabies cases per year, and these are now most often

Continued on page 11

Largest Bat Colony in the World

Bracken Cave in San Antonio, Texas is the summer home of as many as 20 million Mexican free-tailed bats. These bats are considered the world's fastest mammals and can reach speeds nearing 100 mph while flying horizontally. Bracken Cave contains the largest bat colony in the world and has one of the largest known concentrations of mammals on Earth. Every evening, as afternoons fade to darkness, millions of bats swarm out of their caves forming black clouds that darken the skies. As they head out for dinner, the skies are flooded with noise resembling radio static. Watching these bats emerge from the cave's entrance in an ancient sinkhole, and spiral into the air at dusk is a thrilling and unforgettable sight. There are so many bats that they appear on Doppler radar and nearby military flights are re-routed. An animal behavior expert, Leonard Ireland, once said this swirling cloud of bats is up to 30 miles long and 20 miles wide. This truly remarkable display is a wonder to behold.

Bat Facts

Did you know that the world's smallest mammal, the bumblebee bat, weighs less than a penny? Whereas, the world's largest bat, the giant golden-crowned flying fox, has a wingspan of about 6 feet!

Without bats, say goodbye to avocados, bananas, and mangoes. Over 300 species of fruit depend on bats for pollination.

Bats are also medical marvels. About 80 medicines come from plants that rely on bats for their survival.

The wings of bats are actually modified hands. They have 4 fingers and a thumb, and in-between the fingers are two layers of thin, flexible skin.

Bats have evolved over 60 million years to survive in nearly every type of habitat except extreme deserts and polar regions. Bats live on all continents except Antarctica.

Massachusetts Bat Species

Species of bats that occur in Massachusetts with their habitats, distribution, and status of the uncommon species noted. This list was updated in 2019. For current listing information, visit mass.gov/dfw/mesa.

Common name	Species	Range in Massachusetts	Habitat		Status
			Summer	Winter	
Big brown bat	*Eptesicus fuscus*	Statewide	Buildings, trees	Buildings, caves, mines	Common
Little brown bat	*Myotis lucifugus*	Statewide	Buildings	Caves, mines	State endangered
Northern long-eared bat	*Myotis septentrionalis*	Statewide	Trees, building exteriors, rarely inside buildings	Caves, mines	State endangered, federally threatened
Indiana bat	*Myotis sodalis*	Last recorded in 1939, Berkshire and Hampden counties	Caves, mines, hollow trees, beneath tree bark	Caves, mines	State endangered, federally endangered
Eastern small-footed bat	*Myotis leibii*	Hampden and Berkshire counties	Beneath tree bark, in rock talus and deep fissures	Caves, mines	State endangered
Tricolored bat	*Perimyotis subflavus*	Statewide	Trees, rarely in buildings	Caves, mines, rock crevices	State endangered
Silver-haired bat	*Lasionycteris noctivagans*	Probably statewide	Trees, rock crevices	Buildings, trees, migratory	Common
Eastern red bat	*Lasiurus borealis*	Statewide	Tree foliage	Migratory	Common
Hoary bat	*Lasiurus cinereus*	Statewide	Tree foliage	Migratory	Common

Continued from page 9

from exposure to wildlife. The frequency of human rabies cases associated with bats in the United States and Canada is estimated to be about one case per 143 million people per year. Far more people die from dog bites, bee stings, or lightning strikes than rabies infections caused by bats. Fewer than 40 people in the United States are known to have contracted rabies from bats during the past 40 years.

Fiction: Bats get tangled in your hair.

Fact: Bats are not interested in human hair and they do not build nests. Instead, bats find shelter inside existing structures like caves, trees, attics, and barns. Bat echolocation is highly sophisticated making bats incredibly agile and enabling them to detect obstacles as fine as human hair, and subsequently, easily avoid your head. If a bat gets close to a human, it's usually because they are curious or there are insects around due to the fact that our bodies naturally attract insects.

Fiction: Bats attack people.

Fact: Bats do not attack people and are not purposely aggressive. Bats are afraid of people and avoid them.

Fiction: All bats suck blood.

Fact: Most bats are insect-eaters and they consume large numbers of blood-sucking mosquitoes. Only three of the more than 1,300 bat species in the world are vampire bats. Vampire bats live in Mexico, Central America, and South America and lick blood from non-human animals (primarily cattle). Contrary to popular belief, they do not suck blood, but instead make an incision and lap up the draining blood, which does not clot due to anti-coagulants found in the bat's saliva.

Fiction: Bats are dirty.

Fact: Bats are very clean and groom themselves regularly like cats to keep their fur soft and silky and to control parasites. Some bats even groom each other.

Fiction: Bats are just flying mice. (The German word for bat is even "Fledermaus," which translates to flying mouse.)

Fact: Although bats are small like most rodents, they are classified as their own unique order of mammals called Chiroptera, which means "hand-wing" in Greek. Bats are more closely related to humans than they are to mice. Bats also do not nest, chew, or claw their way into structures like mice do. Also, most mice and other rodents only live for 1–3 years. One little brown bat is known to have lived in the wild for 33 years, and a Brandt's bat in Europe lived at least 41 years in the wild! Furthermore, female bats of most bat species give birth to only one pup per year, whereas mice give birth to many offspring multiple times per year.

The moral of the story: Don't let bat myths play on your fears! Bats are cute, friendly, and valuable animals once you get to know them.

How You Can Help Bats!

Bats need your help now more than ever. You can help protect these amazing animals by protecting their natural habitat, reducing pesticide use, planting night-blooming flowers (such as evening primrose, moonflowers, or night-blooming phlox), staying out of caves where bats are hibernating, dispelling myths and fears, and installing bat houses. Visit mass.gov/bats to find a complete list of bat species in Massachusetts along with their conservation status (also shown on page 10), a survey tool to report bat colonies, a Living with Wildlife: Bats in Massachusetts fact sheet, and MassWildlife's Massachusetts Homeowners' Guide to Bats. Lastly, be a bat hero and celebrate the role of bats in nature during International Bat Week from October 24–31, 2019! Learn more at batweek.org.

About the Author

Jennifer Longsdorf has worked for MassWildlife for eight years. She coordinates the Bat Conservation Program.

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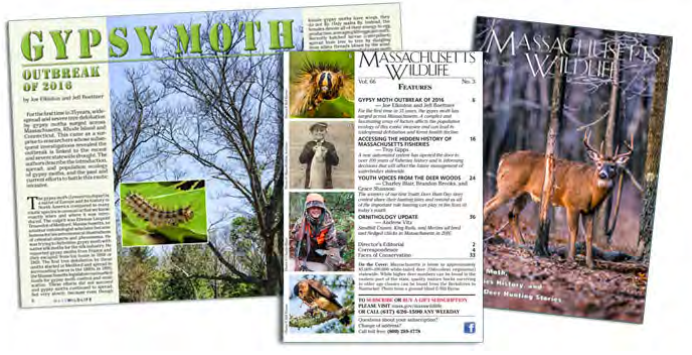
Since 1984, MassWildlife and its partners have headstarted over 4,000 northern red-bellied cooters and released them at sites in southeastern Massachusetts. Nests are protected in June, and by September the hatchlings are distributed to schools, museums, aquariums, and individuals to be raised through the winter. After a winter indoors, the young turtles are the size of 3- to 4- year old wild turtles. As a result of this work, populations of the northern red-bellied cooter have stabilized and are no longer as precipitously close to disappearing from Massachusetts as they were in 1980, when they were federally listed under the Endangered Species Act. Photo by Troy Gipps/MassWildlife

MASSACHUSETTS WILDLIFE



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