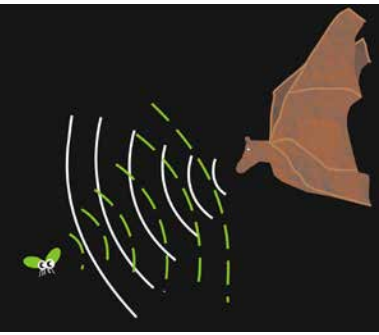


BIOLOGY

The only mammals that can sustain flight, bats comprise an order, or group of animals called *Chiroptera*, which means “hand wing.” When you look closely at a bat’s wing, you understand why. The wing is made up of two layers of skin covering the bones of the hand and arm. The thumb and four fingers make up half the wing, with the upper arm and forearm accounting for the other half.

With each finger working independently, bats have amazing flying skills. Hovering in place, swooping, diving and “turning on a dime” are just a few of their abilities. These are all necessary when in hot pursuit of evasive insect prey.



Bats use a special sensory system called echolocation to evaluate their surroundings and locate food. They emit short, high-pitched sounds that bounce off surrounding objects and return to them

as echoes, which are used to determine the size, distance, direction and movement of objects around them, including insects they catch and eat.

Of equal interest are the longevity and birth rates of bats. Most small mammals (mice, voles, rats, etc.) produce several litters of many young each year but live only one to two years. By contrast, bats typically have a single litter of only one or two offspring per year and can live in the wild for up to 30 years.



Virginia big-eared bat. Merlin D. Tuttle, BCI.

OUR OFFICIAL STATE BAT: THE VIRGINIA BIG-EARED BAT

The Virginia big-eared bat is about 4 inches long, weighs less than half an ounce and feeds mainly on moths. This bat lives exclusively in limestone caves in a few isolated populations in the mountains of western Virginia, West Virginia, Kentucky and North Carolina. The large ears are this bat’s most conspicuous feature. Human disturbance of caves used for hibernation and the raising of offspring (maternity colonies) are the biggest threats to the species. As of 2015 the Virginia big-eared bat does not appear to be affected by WNS.

HEALTH ISSUES

Two human health issues associated with bats are histoplasmosis and rabies. Histoplasmosis, a lung disease caused by a microscopic fungus found in bat guano, is typically contracted by inhaling airborne fungal spores in an enclosed area, such as an attic or barn. Hiring a professional cleaning service or wearing an appropriate respirator can reduce the risk of this disease. Though very few bats carry rabies, occasionally cases are attributed to them. Their small teeth make bite wounds difficult to detect. Anyone suspecting a bat bite should seek medical attention immediately and if possible turn the bat over to authorities for testing. Avoid rabies by leaving wild animals alone, particularly those behaving abnormally. For bats this might include daytime activity and the inability to fly.



Top, **Tricolored bat**. Phil Lucas.
Middle, **Big brown bat**. Wil Orndorff, DCR.
Bottom, **A bat-friendly cave gate**. USFWS.
Cover, **Big brown bat**. Wil Orndorff, DCR.

INFORMATION

Virginia Department of Conservation and Recreation
www.dcr.virginia.gov/natural_heritage/karst_bats.shtml

Virginia Department of Game and Inland Fisheries
www.dgif.virginia.gov/wildlife/information

U.S. Forest Service
www.fs.fed.us/biology/wildlife/bats.html

Centers for Disease Control and Prevention
www.cdc.gov/rabies/bats/index.html

White-Nose Syndrome
<https://www.whitenosesyndrome.org/>

BatsLive and Edubat education materials
<http://batslive.pwnet.org/>



BATS in Virginia





Eastern red bat with twin pups. Merlin D. Tuttle, BCI.

DIVERSITY

Bats are one of the most diverse mammal groups. There are more than 1,000 species worldwide, comprising about one-fifth of all mammal species. Forty-seven bat species are native to the United States. Situated in the mid-Atlantic region, Virginia shares the diversity of bat species found in both the Northeast and the Southeast.

For the most part, bats may be divided into two broad subgroups, fruit-eating bats and insect-eating bats. Insect-eating bats, found in both tropical and temperate climates, feed predominantly on insects. Insect-eating bats in temperate climates, such as the eastern United States, are forced to hibernate or migrate during the winter months when insects are scarce. All bat species that reside in Virginia are insectivorous.

BATS IN VIRGINIA

Seventeen species of bats have been documented in Virginia, although only 15 are likely to reside in the state.

Cave Bats

Virginia Big-eared Bat* (*Corynorhinus townsendii virginianus*)

Big Brown Bat (*Eptesicus fuscus*)

Gray Bat* (*Myotis grisescens*)

Eastern Small-footed Bat (*Myotis leibii*)

Little Brown Bat (*Myotis lucifugus*)

Northern Long-eared Bat (*Myotis septentrionalis*)

Indiana Bat* (*Myotis sodalis*)

Tricolored Bat (*Perimyotis subflavus*)

Tree Bats

Eastern Big-eared Bat* (*Corynorhinus rafinesquii macrotis*)

Silver-haired Bat (*Lasionycteris noctivagans*)

Eastern Red Bat (*Lasiurus borealis*)

Hoary Bat (*Lasiurus cinereus*)

Seminole Bat (*Lasiurus seminolus*) (likely resident)

Southeastern Bat (*Myotis austroriparius*)
(rare species in Virginia)

Evening Bat (*Nycticeius humeralis*)

Non-resident Bats

Northern Yellow Bat (*Lasiurus intermedius*)

Brazilian Free-tailed Bat (*Tadarida brasiliensis*)

* state or federal endangered species



Eastern small-footed myotis. Amelia Hulth, DCR.

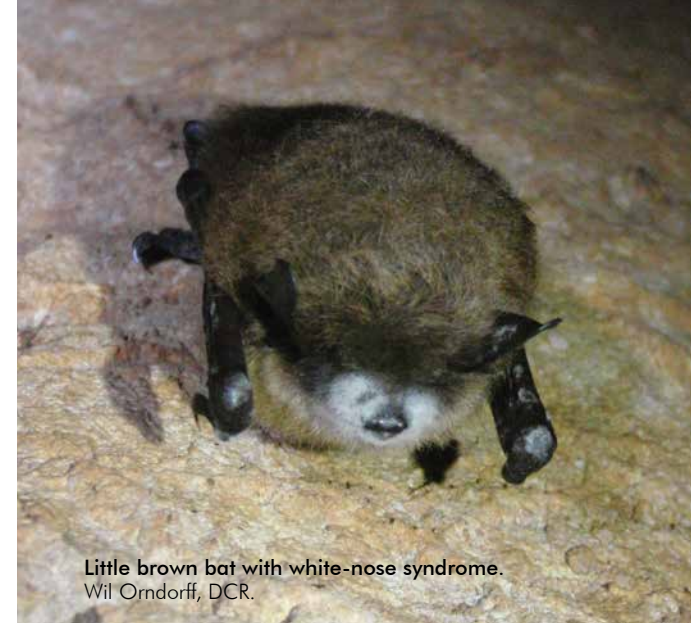
CONSERVATION

Bats are an essential and beneficial part of natural ecosystems. Consuming over half their body weight in insects each night, bats are an important natural insecticide and the only major predator of night-flying insects. Bat research has contributed to major scientific discoveries in the fields of vaccine development, artificial insemination, sonar and blood coagulation.

In Virginia, four bat species are listed as endangered. Three cave species, the gray, Indiana and Virginia big-eared bats, are federally endangered. One tree bat, the Eastern big-eared bat, is state endangered. The decline of these four species is due primarily to loss of habitat and disturbance by humans, although Indiana bats have suffered significant additional losses from white-nose syndrome (WNS). A fifth species recommended for federal listing is the Northern long-eared bat, whose numbers have dropped by 95 percent due to WNS. The low reproductive rates of most bat species make it difficult for populations to recover quickly after large declines.

Efforts to stabilize or increase populations of rare bats in Virginia include land purchases, conservation easements, education programs and construction of bat-friendly cave gates that allow bats to move freely while reducing human disturbance of hibernating bats and maternity colonies.

The Virginia Department of Conservation and Recreation's Natural Heritage Program and the Virginia Department of Game and Inland Fisheries' Non-game Wildlife Program work with public and private stakeholders to protect bats. Partners on bat conservation projects include the U.S. Fish and Wildlife Service, the U.S. Forest Service and non-governmental organizations.



Little brown bat with white-nose syndrome. Wil Orndorff, DCR.

White-nose Syndrome

In the winter of 2007, large numbers of bats in the Northeast died from white-nose syndrome, named after the appearance of the pathogenic fungus on the muzzle of many affected bats. WNS was first found in Virginia in 2009, and steep declines in summer and winter bat populations were seen across the state. By 2014 cave populations of little brown, Northern long-eared and tricolored bats had decreased by more than 90 percent. WNS has impacted Indiana bats to a lesser but still significant extent, and impact on other species such as Eastern small-footed and gray bats has been difficult to measure. Scientists continue to track the health of Virginia's bat population with banding and biometry projects and winter hibernacula counts.

Another issue is the development of wind farms, where bladed turbines sometimes kill large numbers of bats either directly or by inducing extremely rapid changes in air pressure. With cooperation between the public and private sectors, bats can continue to perform valuable pest control and other ecological functions that benefit both humans and the environment.