



Bats 101

Ch'ien Lee/Minden Pictures

An Unlikely Hero With Global Impact

Bats have been on Earth for more than 50 million years. With more than 1,400 species, they are the second largest order of mammals, and are widely dispersed across six continents. Globally, bats provide vital ecosystem services in the form of insect pest consumption, plant pollination, and seed dispersal, making them essential to the health of global ecosystems.

Today, bats are under unprecedented threat from widespread habitat destruction, accelerated climate change, invasive species, and other stresses. Without concerted international action, their populations will continue to fall, driving many species to extinction.

Bats are mammals that belong to the order Chiroptera (from the Greek *cheir* – “hand” and *pteron* – “wing”).

Bats are Important

- **Pest consumption**

Who needs pesticides when we have bats?

Scientists estimate that insect-eating, or insectivorous, bats may save U.S. farmers roughly \$23 billion each year by reducing crop damage and limiting the need for pesticides. Most, on average, can eat up to half their body weight in insects, while pregnant or nursing mothers will consume up to 100 percent of their body weight each night.

Did You Know? The millions of Mexican Free-tailed Bats at our Bracken Cave in Central Texas help target an especially damaging pest called the Corn Earworm Moth (aka cotton bollworm, tomato fruitworm, etc.), that attacks a host of commercial plants from artichokes to watermelons.

- **Pollinators**

Most flowering plants cannot produce seeds and fruit without pollination – the process of moving pollen grains from the male part of the flower (the stamen) to the female part (the pistil). This process also improves the genetic diversity of cross-pollinated plants. From deserts to rainforests, nectar-feeding bats that drink the sweet nectar inside flowers pick up a dusting of pollen and move it along to other flowers as they feed.

This role as a pollinator is critical for a wide variety of plants, such as giant cacti and agave, which would not thrive without bats. Bat pollination also plays a vital role in the cultivation of a host of commercial products, including balsa wood, carob, cloves, and durian fruit.

- **Seed Dispersers**

Vast expanses of the world's rainforest are cleared every year for logging, agriculture, ranching, and other uses. And fruit-eating bats are key players in restoring those vital forests.

Regenerating clear-cut forests is a complex natural process, one that requires seed-scattering by many animals besides bats. Many fruit-eating animals drop seeds back into the ground, but these droppings typically occur within proximity to where they live. Night-foraging fruit bats, on the other hand, often cover vast distances each night, and many of these species are quite willing to cross clearings and typically defecate in flight, scattering far more seeds than animals such as birds across cleared areas. Seeds dropped by bats can account for up to 95 percent of the first new growth.

This ability to transport seeds is highly crucial — as the conditions left by forest clearings are often hot, dry, and unwelcoming to many types of plants. The seeds dropped by bats are often from hardy pioneer plants, whose first growth serves as shelter and cover for more delicate plants.

J. Scott Altenbach

8 Amazing Bat Facts

1. Bats are the only mammal capable of true flight.
2. Tequila is produced from agave plants that in the wild rely on bats as their primary pollinators.
3. The world's smallest bat is the Bumblebee Bat measuring up to 29 – 33 mm (1.1 – 3 in) in length and 2 g (0.071 oz) in mass as a full-grown adult.
4. The world's largest bat is the Giant Golden-crowned Flying Fox with a wingspan up to 6 ft!
5. The oldest known bat was a male Brandt's myotis who lived at least 41 years.
6. The fastest bat in the world is the [Mexican Free-tailed Bat](#), flying in short bursts at speeds up to 100 mph!
7. Of the 1,400+ species of bats in the world, only three are vampire bats that drink blood.
8. [Bracken Cave](#) is the world's largest bat colony. Located near San Antonio, Texas, USA, this is a summer maternity colony for up to 20 million Mexican Free-tailed Bats.

Conservation Status

Bat species are critically endangered (face imminent risk of extinction)
85

Bat species are endangered
113

Bat species are considered vulnerable
236

Bat species are considered "Data Deficient," an indicator that more conservation attention is necessary for these species

[According to the IUCN](#)





Jeroen van der Kooij-

little brown bats with visible signs of White-nose syndrome, Michael Schirmacher

A dangerous time for bats

As bat populations continue to decline worldwide, their potential for extinction only grows. While some of the challenges they face are endemic to their order, such as their **slow gestation periods** and diseases like **White-nose Syndrome**, the primary cause of their decline is human activity including:

- The **ongoing destruction** of natural habitats
- **Hunting and persecution** for sport and meat
- The growing use of **wind-turbine energy**
- The proliferation of **harmful myths**

Bats are among the slowest-reproducing mammals on earth for their size – On average, most species only give birth to one pup per year.

Bats are threatened

• Climate Change

Global climate change is a major threat to the ecological integrity of our planet. The negative forces of climate change are often most severe on species already imperiled by habitat loss and other stressors. Integral to our mission to protect global bat populations is developing science-based strategies that address threats to bats around the world to prevent extinctions and faunal collapse.

Major threats that climate change poses to global bat populations:

- Mortality from increased severity and frequency of extreme weather events
 - Flying foxes are dying in alarming numbers in Australia from extreme heat waves
 - Bats on islands are threatened by severe tropical storms, especially when coupled with extensive habitat loss and persecution on islands.
- Increased aridity and drought reduce survival and reproductive success of bats
 - Bats in arid and semi-arid landscapes have lower fitness during drought. The long-term consequences could result in range contraction of bat species and loss of bat diversity in arid and semi-arid regions of the world.
- Changes in timing of migration and potential for phenology mismatch between bats and critical food resources during critical life stages
 - Species of insectivorous and pollinating bats that undergo long-distance migrations and depend on seasonal timing of food resources to fuel migrations could be negatively impacted by shifts in phenology of available resources (e.g. flowering plants or seasonal insect abundance).

Climate change is a global problem necessitating a global solution, but local interventions and targeted actions play a critical role in protecting species from its adverse effects. Effective conservation strategies must address current and future impacts from climate change, including creating resiliency and mitigating the threats of extreme weather events, increased drought, and shifts in phenology and habitat suitability. Our work to protect bats includes strategies that promote climate adaptation, mitigation, and identifies key research needs. Specifically, Bat Conservation International takes action by:

- **Promoting Climate Adaptation for Bats**
 - Securing resilient habitats for imperiled bats threatened by climate change
 - We protect critical habitat refugia for island endemic bats vulnerable to increased severity and frequency of tropical storms (e.g. Fiji, Jamaica)
 - We provide safe roosting structures for endangered species in hurricane-prone areas (e.g. Florida bonneted bat)
 - We protect subterranean roosts to provide habitat resiliency for bat communities
 - Protecting and restoring habitat networks for migratory species experiencing shifting phenology
 - Our [Bracken Cave](#) preserve protects the largest known colony of Mexican free-tailed bats during the summer maternity season and now also protects a growing population of bats overwintering in Texas
 - We restore agave plants in desert and montane habitats across the migratory range of nectar-feeding bats in Mexico and the US-Mexico borderlands to provide climate resilient corridors for migratory pollinating bats
- **Supporting Climate Mitigation Solutions**
 - We invest in researching solutions that reduce bat fatalities at wind energy facilities; supporting renewable energy development that is sustainable and does not negatively impact biodiversity while producing carbon-free energy
- **Leading Research to Inform Conservation Priorities in a Changing Climate**
 - We partner with the [North American Bat Monitoring Program](#) to determine status and trends of bats, including range shifts, to inform local to continental conservation planning

• Habitat Destruction

The loss of natural habitats remains the most widespread peril for bats worldwide.

Forest habitat, which many bats use for roosting and foraging, are disappearing at an alarming rate — the result of timber harvests, clearings to make room for farm crops, mining operations, cattle pastures, and cities. The danger is even more significant for tropical rainforests, home to the richest diversity of bat species.

Caves and abandoned mines also serve as roosts for many species, with countless numbers of bats being driven out due to inappropriate guano mining or thoughtless tourism. This is especially prevalent during the winter months when large numbers of bats hibernate in caves and mines. If roused from hibernation, such as by human disturbance, bats can burn through the stores of fat they need to survive the winter.

• Persecution

In many parts of the world, bats are victims of casual killing, the result of harmful myths and misplaced fears. In Latin America, whole colonies of beneficial bats are routinely slaughtered, the victims of a mistaken belief that all bats are vampires. (In reality, only three of the more than 1,400 bat species feed on blood, and all are in Latin America.)

In regions such as Southeast Asia and the Pacific islands, large fruit-eating bats are hunted, both for local consumption and commercially for markets and restaurants. Some bats are also used in traditional folk medicines.

• White-nose Syndrome

White-nose Syndrome (WNS) is a fungal disease that has been continually responsible for the death of millions of bats in North America since it was first discovered in a single cave in New York in 2006. The condition is causing massive population declines for multiple hibernating bat species – resulting in one of the most significant losses to wildlife in the past century. Named for the telltale white fuzzy growth on the nose, ears, and wings of infected bats, WNS repeatedly rouses bats from hibernation, causing them to consume their winter fat stores — which often can result in starvation before spring.

Bats with the disease symptoms of WNS are found in 35 U.S. states and 7 Canadian provinces. To date, 12 North American bat species have been confirmed with WNS, including two federally endangered species, the gray bat and Indiana bat. The Northern long-eared bat was listed as federally threatened due to the rapid decline of this species from WNS. Thankfully, not all species are impacted the same way by WNS, with some appearing more resistant to the disease than others. Scientists are working to determine the conditions that contribute to a bat's susceptibility and for potential treatments.

Bats affected with WNS do not always have visible fungal growth. Sometimes, they simply display unusual behavior such as flying outside during the day in near-freezing weather. As a result, in winter, you may see dead or dying bats on the ground or in buildings or other structures. If you encounter one, do not handle it.

• Wind Energy

As the world reckons with the need to reduce carbon emissions and invest in renewable energy sources, there is rapid growth of wind energy facilities around the world to support transitions to cleaner power in our global fight against climate change. Unfortunately, wind turbines pose risk to some bat species that are vulnerable to colliding with turbine blades. Scientists estimate that hundreds of thousands of bats are killed each year in the United States alone. Migratory bats appear most vulnerable and comprise most bat casualties identified under wind turbines.

As wind energy development expands to fight climate change, the impact on bat populations from increasing build-out could be devastating unless solutions to minimize bat fatalities are implemented. A [recent study](#) by Bat Conservation International showed that the [Hoary Bat](#) (*Lasiurus cinereus*) in North America could experience a 50% decline of its population by 2028, unless measures to reduce current fatality rates are adopted rapidly.

Bat Conservation International has been a leader in working with the wind energy industry to develop solutions to support wind energy and sustain bat biodiversity. [Solutions](#) such as changing the speeds at which turbine blades are allowed to start spinning can reduce bat fatalities by nearly half, which can help sustain bat populations and the ecosystems services they provide.

Bat Facts

Thank Bats For That Margarita

Do you enjoy tequila? Without bats, we might not have any. Tequila is produced from the agave plant, which relies primarily on bats to pollinate its flowers and reproduce. So next time you raise your glass to the pollinating bats that helped to make it possible!

- [1](#)
- [2](#)
- [3](#)
- [4](#)
- [5](#)

Suzi Eszterhas/Minden Pictures

Bats, humans, and health

When simply left alone, bats are harmless and highly beneficial. Bats are fascinating creatures that are vital to the balance of nature around the world. Like most wild animals, bats prefer to avoid contact with humans. But in situations where bats and humans come into close proximity, it is important to understand how to prevent negative outcomes.

Here are several scenarios that might bring bats and humans together:

- Bats sometimes accidentally fly into a home or business through open doors or windows.
- Bats might roost in structures where humans live or work by taking advantage of existing small openings into attics, wall spaces, or chimneys.
- Sick, injured, or dead bats sometimes fall to the ground where humans live.

In each of these situations, we discourage the general public from handling bats. Learn how to safely and humanely deal with a single bat or a colony of bats [here](#).

Bats and Human Health

- **Bats and Infectious Disease**

More than 60 percent of infectious diseases are zoonotic, which means that these diseases are caused by pathogens that can spread between animals and humans. Some bat species are among many others, including domestic animals such as cats, and dogs, and wildlife like raccoons, civets, and macaques, that can be reservoirs of zoonotic pathogens.

The emergence of these pathogens is closely associated with habitat destruction, human encroachment into wildlife habitats and exploitation of wildlife, as these activities bring people, our domestic animals, and wildlife in close proximity to each other and increase the risk of pathogens “jumping” between species in what is called a spillover event.

Over the last decade and especially since the recent global [COVID-19 pandemic](#) caused by the virus SARS-CoV-2, bat health has been studied and monitored. Increased surveillance of bat health and improved techniques for disease detection have identified several bat species as potential reservoir hosts for pathogens that can affect humans and domestic animals. These pathogens include Marburg, Nipah, Hendra, SARS and MERS coronaviruses, lyssa viruses (including rabies), and possibly Ebola viruses.

Increased surveillance and research have also identified that the emergence of pathogens, such as Hendra, Nipah, and rabies, is closely linked to the degradation of ecosystems in ways that affect the distribution and abundance of bats’ food sources^{1–4}. This not only affects the health of bats but can also force bats to forage in habitats that are in close proximity to humans and domestic animals. Other pathogens like the SARS and MERS coronaviruses have been linked to the exploitation of wildlife in activities related to the [wildlife trade](#)⁵. The wildlife trade involves removing animals from their natural habitats and placing them in crowded, stressful, and unsanitary conditions with close contact with other species and humans, increasing opportunities for pathogen spillover.

The spillover of zoonotic pathogens is best prevented by maintaining ecosystem integrity, protecting wildlife health, and reducing opportunities for close interactions among humans, domestic animals, and wildlife. At Bat Conservation International we follow the One Health framework through conservation initiatives that protect bats and their habitats, for the sustainable coexistence of bats and humans with reduced risk of pathogen spillover.

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• Rabies

Rabies is a preventable viral infection of the central nervous system in mammals. Bats, like most mammals, can contract the rabies virus, but the vast majority never do. When bats do get rabies, they eventually die from the disease and do not “carry” the virus indefinitely without themselves getting sick.

The virus is typically transmitted by the bite of an infected animal – anyone bitten by a bat (or any other wild or unknown domestic animal) should seek immediate medical attention. People can, in rare instances, contract rabies if infectious material, such as saliva from a rabid animal, gets into their eyes, nose, mouth, or a wound.

The U.S. Centers for Disease Control and Prevention provides [information about Rabies here](#)

• Histoplasmosis

Histoplasmosis is a respiratory disease caused by a fungus that grows in soil enriched by animal droppings, including those from bats. Ninety percent of all reported cases in humans come from the Ohio and Mississippi River valleys and adjacent areas where warm, humid conditions favor fungal growth.

The disease is rare or nonexistent in most of Canada and in the far northern and western United States. The majority of cases are asymptomatic or involve flu-like symptoms, though some individuals become seriously ill, especially if exposed to large quantities of spore-laden dust.

To be safe, avoid breathing dust in areas where there are animal droppings; if you must clean an area of bat or bird droppings, wear a respirator that can guard against particles as small as two microns.

The U.S. Centers for Disease Control and Prevention provides [information about Histoplasmosis here](#)

Donations may be mailed to

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