

BATS OF AMERICA

TEXT OF THE VISITOR CENTER SLIDE SHOW

Life in America wouldn't be the same without bats. Most people don't know they pollinate flowers or control countless insect pests. In fact, many of America's most fascinating and beneficial animals are bats.

More than 40 kinds come in a surprising variety. This spectacular spotted bat has enormous pink ears that can be rolled up during sleep. Hoary bats, with their long, silky fur, are among the most handsomely colored. Long-tongued bats have narrow heads, specially adapted for pollinating flowers, and Ghost bats, with eyes that seem to be in their ears, have very strange faces indeed!

Our 15 kinds of *myotis* bats are among those most frequently seen.

The Western mastiff is America's gentle giant, the largest North American bat, with a wingspan of nearly two feet. It weighs 22 times more than our smallest bat, the Western pipistrelle. While these two bats live in remote places where they are rarely seen ...

...these inquisitive Pallid bats are commonly found in buildings throughout the western United States and Canada.

Big brown bats live in buildings nearly everywhere. People who find such bats often panic, mistakenly assuming them to be dangerous. Like most mammals, a few, less than half of one percent, carry rabies. But even these rarely become aggressive. Authorities warn that bats should never be picked up, because sick ones are the most easily caught. Bats are wild animals and if handled may bite in self defense.

Simply left alone, bats are harmless. If it's necessary to remove a colony from a building, they can be safely evicted by use of netting hung in front of their exits. Leaving the bottom open will allow the bats to escape, yet prohibits their return. Several evenings later, when the bats are gone, their holes can be plugged.

America's largest bat colonies live in caves. Bracken Cave, in central Texas, is the summer home of 20 million Mexican free-tailed bats. Thousands of square feet of cave walls are

covered by literally 240 tons of roosting bats, up to 500 per square foot. Bats gather here to rear their young in what is known as a nursery colony.

A mother gives birth to just one pup each year and quickly learns to recognize its voice and scent. The baby's survival depends on her finding and nursing it several times a day. Amazingly, she remembers her own pup's exact location and voice even though it is packed tightly among millions of others.

Babies grow rapidly, learning to fly and navigate in about four to five weeks. This is an incredible achievement, considering what is accomplished in a traffic jam where several potential collisions must be avoided each second. Young bats that survive predators, such as snakes and owls who wait at cave entrances, may live up to 30 or more years.

Some of America's most interesting bats never use caves. Hoary bats live in trees and are found from southern South America to northern Canada.

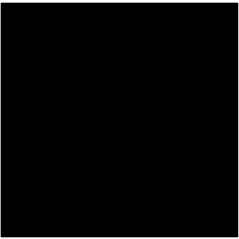
Most bats produce only one pup per year, but the foliage-roosting red bat, another wide-ranging species, usually has twins or triplets, and sometimes even quadruplets! Like all bats, the babies are nourished by their mother's milk.

In the fall, our Red and Hoary bats migrate south to milder climates, where some hibernate in tree cavities such as woodpecker holes. Silver-haired bats roost in bark crevices and small tree hollows, where their coloration provides camouflage from enemies. They, too, must travel south for winter.

Some southern species don't need to escape winter. This yellow bat lives in palm fronds or Spanish moss.

Most American bats must find shelter in a cave or abandoned mine before winter sets in. They hibernate until spring, living on stored fat reserves.

Gray bats live in caves year-round and have highly specialized roosting requirements. These



are hibernating in one of nine critically important caves that house 95% of the species population each winter.

Indiana bats also spend the winter in just a few caves, typically packed into dense clusters.

Eastern pipistrelles hibernate alone, often covered with condensed moisture droplets.

All hibernating bats are extremely vulnerable to human disturbance. Thousands die each winter when visits by amateur cave explorers force them to awaken and waste stored fat needed to keep them alive until spring.

Remote cliff faces near desert oases provide year-round homes for several of America's most spectacular bats. The Spotted bat is certainly one of the world's most unusual mammals, yet very little is known of its habits.

The Western mastiff lives in deep crevices high up on cliff faces. It has such narrow wings that it must drop some 15 feet just to gain flight.

Tiny Western pipistrelles are often the first bats seen in twilight skies.

Pallid bats are unique in that they catch grasshoppers, crickets and even scorpions directly from the ground. Most bats hunt flying prey, navigating with pulses of sound emitted through the mouth. Sensitive ears hear the echoes reflected from even tiny insects. They also can see and certainly can avoid blundering into people's hair.

This Red bat's hunting signals, before and during pursuit of an insect, can be heard using special recording equipment.

The 20 million Mexican free-tailed bats from Bracken Cave catch a half million pounds of insects each night over surrounding towns and farmland.

Prior to their widespread destruction by humans, bats often filled the evening skies. Even now, they remain the most important natural controllers of insect pests that fly at night, including corn borer and other moths whose larvae attack

crops. The loss of bats inescapably increases our reliance on chemical alternatives that already seriously threaten our health. Hundreds of insect pests are now developing immunity to agricultural pesticides, making the conservation of all nature's original controls urgently important.

In the desert Southwest, bats are vital pollinators of agaves and other plants. This agave, also known as a "century plant," is so dependent on Long-nosed bats that if its flowers aren't visited by bats, the odds of successful seed production drop to one three-thousandth of normal.

Some of the West's most famous cacti, such as organ pipe and saguaro, have flowers that open at night. Special shapes and odors attract pat pollinators. This bat's face is already covered with pollen from another saguaro flower. Cross-pollination is achieved as the bat's head enters the flower. In exchange for the pollination service, bats are rewarded with large quantities of nectar.

A flower cross-section illustrates how this virtual lock-and-key relationship works. In order to reach the nectar, the bat must first become covered with pollen that is then carried from flower to flower.

Without large numbers of Long-nosed bats, these cacti could decline, endangering numerous other plants and animals that depend on them for their own survival.

Yet Long-nosed bats are endangered, with only two nursery colonies known to remain in the United States. Dangerously late, we are now in a race against time to save these and other equally important American bats.

Loss of even a single bat colony can lead to the extinction of numerous other organisms that rely on nutrients brought into caves through bat droppings, known as guano. Guano provides the primary nutrient source for entire ecosystems of unique cave life. Bat guano is so rich in nutrients that a single tablespoon full can contain hundreds of species of bacteria of great potential value. Recent tests show that some of



these produce enzymes that can be used to detoxify industrial wastes.

The bacteria seen in these cultures came from a single Texas bat cave and may soon be used to produce detergents and even gasohol and antibiotics.

The Alabama cave fish lives under a bat roost in only one cave in the entire world. Loss of the bat colony could lead to its extinction, along with hundreds of other species of unique organisms.

Many colonies of cave-dwelling bats already have been lost due to careless human disturbance. Endangered Gray bats live in caves year-round and are therefore especially vulnerable.

Indiana bats were once abundant throughout North America. They are now endangered, and government surveys document a 55% decline in just eight years!

Eastern populations of Townsend's big-eared bats are already endangered, and recent surveys from California, Oregon and Washington indicate that the species is now endangered in the West as well.

Each kind of bat has its own unique needs for living space. Rafinesque's big-eared bats once formed colonies in the entrances of many Southeastern caves. They were thus exceptionally vulnerable to disturbance. This is the last cave-dwelling colony known to remain.

These Long-eared bats are seldom seen and may be endangered. Their population status remains unstudied, and they are therefore ineligible to receive government protection. Sadly, this is true for many bats.

Some bats moved into old wooden barns and houses when surrounding forests were cut, but such structures are now being rebuilt with metal and other bat-proof materials.

This colony of Yuma bats successfully found a new home in the spaces beneath an old wooden bridge that is now scheduled for replacement. Survival of such bats, all across America, is

seriously threatened.

Some modern bridge designs do offer hope, if builders can be persuaded to use them. The Congress Avenue bridge in Austin, Texas shelters an estimated 750,000 Mexican free-tailed bats that consume more than 15,000 pounds of insects nightly. These bats live in long vertical crevices, an inch wide by 16 inches deep.

Private corporations are also beginning to play an important role in bat conservation efforts. This entry to an abandoned mine in northern California was reopened and gated by the Homestake Mining Company to provide new bat habitat. The mine was quickly occupied by Townsend's big-eared bats. Additional protective efforts are now planned.

Other conservation initiatives include the use of artificial bat houses. This type has successfully attracted colonies of bats to state parks across the country.

Protection of essential caves is vital to bat conservation in many places. An enormous gate was built at Hubbard's Cave in Tennessee to protect its bats from human disturbance and vandalism. This permanent protection was gained through the cooperative efforts of the Nature Conservancy, the National Guard, the U.S. Fish and Wildlife Service, Bat Conservation International and professional cavers from five states. Each winter, bats from much of the southeastern United States seek shelter in Hubbard's Cave. Such sanctuaries already have helped reestablish hundreds of thousands of bats.

America's bats are a vital resource, but their survival and the health of environments we all must share are increasingly our responsibility. When we put myths and superstitions aside, bats can be appreciated as fascinating and highly beneficial animals.

Though much remains to be done, the success of recent conservation initiatives holds promise for the future. We hope you will want to join us in these efforts.