7-1997

Nebraska's Flying Mammals

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Nebraska's Flying

They flit around at dusk in crazy patterns. They fly around street lights and dive at rocks thrown in the air. They have high-pitched squeaks and turn up in unexpected places. They have strange, little faces and bizarre ears. They have soft fur and a thin rubbery membrane across their long fingers. They are bats, Nebraska's only flying mammals.

Bats are mysterious. Is it because they come out at night and we come out in the daytime? Maybe it is because we associate flying with birds, not mammals. Bats are dark and foreboding, not brightly colored. At first, these mysterious mammals can be frightening, maybe even repulsive, but they are also fascinating, and there is nothing else like them on earth.

Bats can fly because their fingers are long, thin and support a wing membrane. The membrane is soft and elastic, something like the rubber of a balloon that has been blown up for several days then deflated. It stretches across the fingers of the wing and works the way an umbrella does. When the struts, or fingers, stretch out, the membrane becomes a taut surface, an airfoil that makes flight possible. When the wing closes, the membranous airfoil collapses. The membrane also joins arms to legs and legs to legs. In all species of bats in Nebraska, the tail is either incorporated in the membrane between the legs or is free of the membrane and extends beyond it.

There are differences between bat flight and bird flight, but in general, bats fly quite well and maneuver better than birds. Bats take over for birds after dark, and they need special equipment to help them find their way.

Nearly all bats in the United States and Canada eat insects on the wing. Although they can see, they also have developed a sophisticated echolocation system, like sonar, for navigating in the dark. Most bats emit high-frequency sounds and hear the echoes as they bounce back from objects in front of them. With echolocation, bats can navigate in the dark, eat insects, dodge trees, find roosts and, probably, communicate with each other. The bat hears the echo with its marvelous, bizarre ears and can respond instantly by eating or dodging or both.

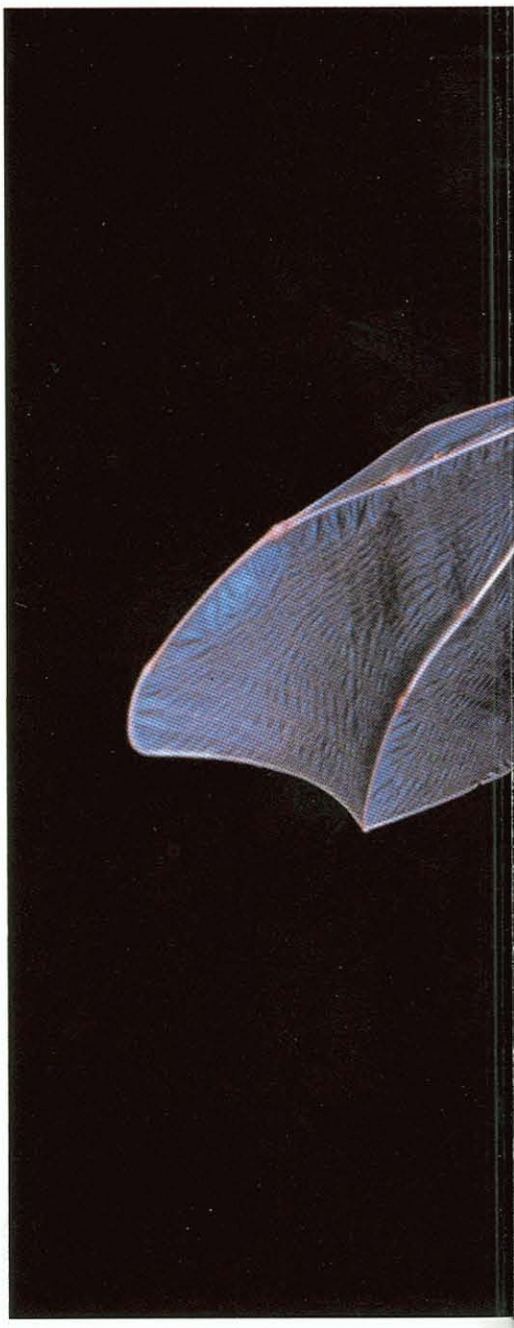
Insect-eating bats play an important role in controlling insect populations. Big brown bats *(Eptesicus fuscus),* for example, are common throughout Nebraska and prey on major agricultural pests. Cucumber beetles (the adult form of the corn rootworm), June beetles, stinkbugs and leafhoppers are the favorite prey of big brown bats and comprise almost 40 percent of the food eaten by an average colony in a season. At times they are the only insects eaten.

Bats need a lot of food because flying uses energy at a rapid rate. Big brown bats — and all bats in Nebraska — eat vast quantities of insects each night. It would be hard to imagine what spring, summer and fall nights would be like without bats patrolling the skies looking for food.

Geographically, Nebraska is in the northern temperate zone where plants do not thrive and bloom in all seasons nor are insects always available. Because bats must be able to escape the cold winter season with its low supply of insects, they use two strategies of escape that most humans only can hope for: They migrate south or sleep through the barren period.

The migrators leave in fall and time their return in spring to coincide with the emergence of insects. Hibernators go to sleep in fall and become active when warmer temperatures trigger insect activity. Different species of Nebraska's bats use one or the other strategy, but no species is active during winter, the season of no food.

Thirteen species of bats occur in Nebraska. The two smallest, the eastern pipistrelle *(Pipistrellus subflavus)* and the small-footed myotis *(Myotis ciliolabrum),* weigh about five grams, about the same as two dimes, and have a wingspan of about eight inches. The largest species, the hoary bat *(Lasiurus cinereus)* weighs about 25 grams, about the same as four and a



Mammals

By Patricia W. Freeman,
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Photos by J. Scott Altenbach

Townsend's big-eared bat

half quarters, and has a wingspan of about 16 inches.

Not all 13 species occur in any one part of the state. As habitats change across Nebraska, so does the diversity of bats. Some species in eastern Nebraska are restricted to habitats along the Missouri River; others are restricted to the west, particularly to the ponderosa pine forests of the Pine Ridge. Others are widespread, and with the increase in forests along the state's rivers, some species might have increased in abundance. Bats that temporarily roost in houses in the warm season also might be increasing as the number of houses increases.

Few people will tolerate bats in their

Big brown bat

Hoary bat

houses, although many people set up bat houses to attract bats, a natural "pesticide" for their property. Homeowners can keep bats from sharing their houses by caulking cracks and openings and using hardware cloth to protect vents. Some bats can enter openings as narrow as one-quarter inch.

Because bats can carry rabies, their reputation has suffered. Millions of dollars are spent annually on rabies prevention in the United States. Pet-transmitted rabies almost has been eliminated, and since 1990 there have been only 17 cases of rabies transmitted to humans by bats. The odds of getting rabies from bats are small, but recent data show that about 8.5 percent of the bats tested in Nebraska were positive for rabies.

Avoid handling bats if possible. Instead, call the appropriate authorities. If contact with bats — or any other wildlife — cannot be avoided, wear heavy gloves. Seek medical attention if bitten or if exposure to rabies is suspected. Pets, which often find bats first, should be immunized.

Big Brown Bat

(Eptesicus fuscus)

Big brown bats are year-round residents of Nebraska. In summer, females form nursery colonies averaging about 100 animals, but colonies can range from fewer than 10 to as many as 700 individuals. In Nebraska, females give birth to one or two young at a time. Hollow trees, rock crevices and buildings serve as maternity roosts.

Attics are popular roosts and, to a bat, are just large hollow trees. In residential areas where dead, hollow trees are removed regularly, local bats have no choice but to start nursery colonies in the large, man-made varieties. Because big brown bats often roost in buildings and are found statewide, they are encountered more often than any other species in the state.

In colder months, typically from early November to sometime in April, big brown bats hibernate. However, we have netted this species in mid-March during periods of unseasonably mild temperatures. Winter roosts include

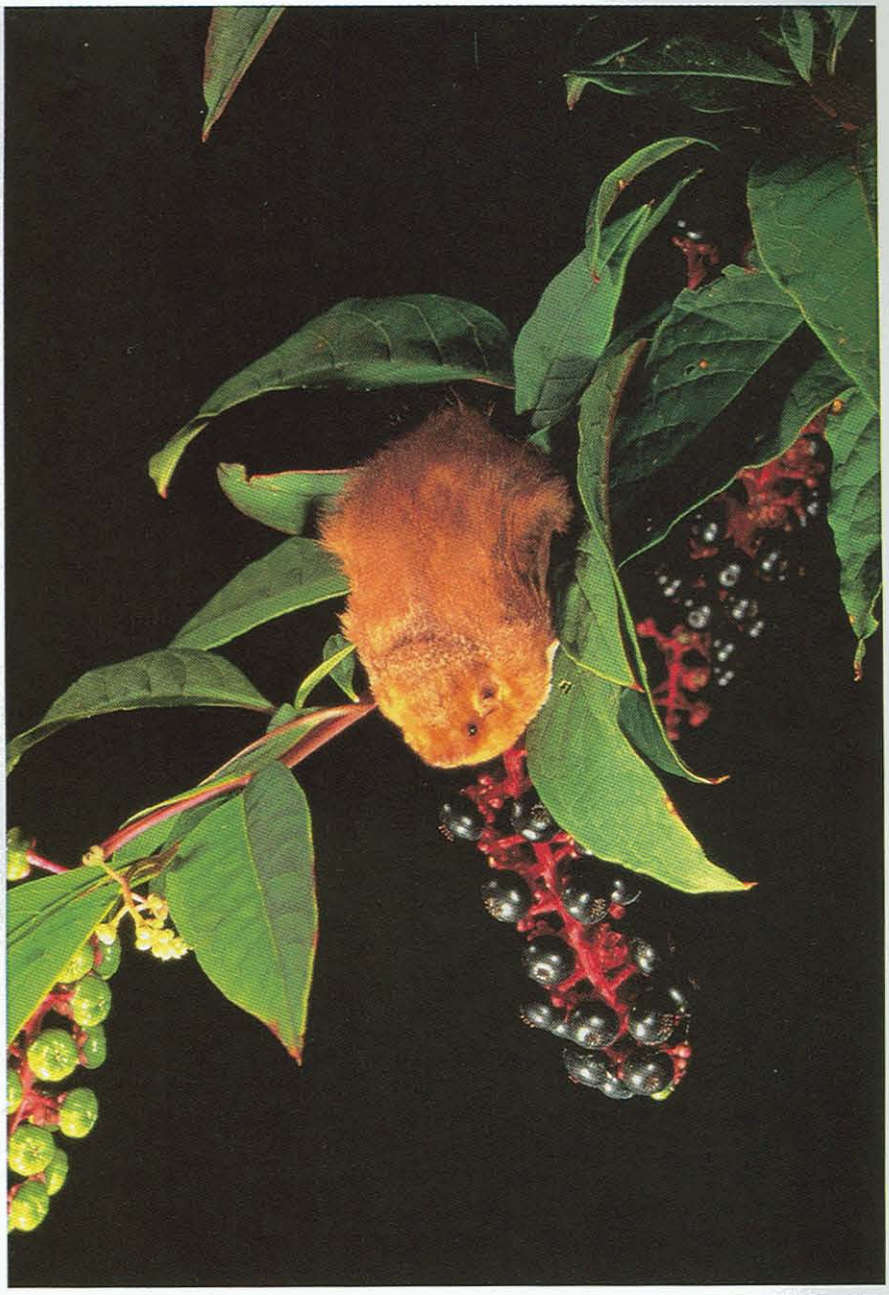
caves and their man-made equivalents such as mines, cellars and storm sewers. They occasionally hibernate in buildings that contain insulated chambers where the temperature remains above freezing.

In eastern Nebraska, big brown bats and three other species regularly use rock quarries as winter refuges. Big brown bats also hibernate in hollow trees.

Hoary Bat
(Lasiurus cinereus)

The hoary bat occurs statewide and is one of the most beautiful bats in the United States. Its mahogany brown fur is tipped with white or silver, giving the bat its distinctive frosted appearance. The hoary bat's coloration helps to conceal them when they hang among leaves of trees and other vegetation. The frosted hairs resemble bark and leaves glistening in the sun. Hoary bats are solitary animals, hanging singly or in family groups consisting of mother and young.

Hoary bats are migratory and begin arriving in Nebraska as early as May. They remain as late as October, giving females time to bear and raise their young, usually twins, before they migrate again. Like all bats in Nebraska, hoary bats produce only one litter per year. In late summer and early autumn, young hoary bats are able to fly south with the adults.



Eastern red bat

Eastern Red Bat
(Lasiurus borealis)

Red bats also roost in the foliage of trees and other vegetation. They vary in color from orange red to rusty red, and when roosting they can look like dead leaves. Red bats even have been mistaken for fruit — to the surprise of the person picking the "fruit." The upper surface of the tail membrane of red bats and hoary bats is densely furred, and the tail can be used as a blanket to help them conserve body heat.

Red bats are found in a variety of wooded habitats, from small patches of deciduous trees in residential areas to densely forested areas along rivers. They are more common in the eastern half of the state, but they also occur along wooded waterways and in towns in other parts of Nebraska.

Eastern red bats are migratory and begin to arrive in spring from unknown wintering areas. The earliest date of capture in Nebraska is April 26. Females give birth in late May and June and have two to five babies. The usual number of babies for the latitude of Nebraska is four. Most of information on litter size in Nebraska is from females and young dislodged from trees and found on the ground after storms. Once on the ground, females cannot get airborne because of the additional weight of attached youngsters. Red bats have been found in Nebraska as late as November 1. Although they are migratory, some populations of the eastern red bat are known to hibernate on a regular basis. Some hibernate as far north as the Ohio River valley.

Northern Long-eared Myotis
(Myotis septentrionalis)

The northern long-eared myotis occurs in eastern Nebraska and westward along the Niobrara and Republican rivers. Most information

Northern long-eared myotis

Eastern pipistrelle

Evening bat

about the species in Nebraska comes from bats netted in Fontenelle Forest, a wildlife preserve on the bluffs of the Missouri River in Bellevue. There we capture long-eared myotis regularly along a stream passing through a floodplain forest dominated by hackberry, cottonwood, sycamore, dogwood, box elder and white mulberry.

Pregnant females have been taken in May and nursing females in June and July. Mothers give birth to only one baby. Numbers of individuals in the nursery colonies are small and range from a few individuals to around 50. The young-of-the-year begin flying in late July.

During the day in summer, long-eared myotis squeeze under loose tree bark and behind shutters and wooden shingles. They typically hibernate in caves and mines from October to March. Many winter in limestone quarries in Cass and Sarpy counties.

Eastern Pipistrelle

(Pipistrellus subflavus)

Except for two individuals captured at Fontenelle Forest in Bellevue, all records of eastern pipistrelles in Nebraska are from the Cass and Sarpy county limestone quarries. Pipistrelles are common winter residents there, hanging singly in the slightly warmer and more humid areas.

Few pipistrelles live in the quarries during the summer, and most probably live in the foliage of trees or other vegetation. Eastern pipistrelles bear twins in late spring or early summer, but little is known about the species in Nebraska.

Evening Bat

(Nycticeius humeralis)

The evening bat occurs throughout most of the eastern United States and reaches the northwestern limit of its range in Nebraska. It is found only in the southeastern part of the state, and the distribution is based solely on adult females and flying young-of-the-year. Although there are many records of evening bats, no adult males have been captured in Nebraska. They either do

not occur here or are very rare.

Elsewhere, evening bats form nursery colonies in hollow trees and buildings, and they surely do the same in Nebraska. Hundreds can be in a colony, but smaller colonies can occur behind loose bark or in small tree cavities. Females usually have twins. In Nebraska, nursing females have been captured in June and July, and young are flying on the last day of June. Experiments have shown that adult females and young can find their way home from 100 miles away.

Evening bats do not hibernate in Nebraska, and no individuals have been captured in winter in Nebraska or in neighboring states. Their absence in winter suggests that evening bats leave the northern parts of their range and migrate to unknown southern locations. The period of hibernation in the species is unknown. Evening bats are present in Nebraska from mid-May to the end of September.

Little Brown Myotis

(Myotis lucifugus)

Little brown myotis occur in two areas in Nebraska, the eastern quarter and the northwestern corner. There are no records in between. They are common in the Pine Ridge, where breeding colonies have been found in buildings. Females have one baby a year, born between May and early July.

Nursery colonies contain hundreds and, sometimes, thousands of bats. Hibernating individuals have not been found in the Pine Ridge area, but in eastern Nebraska both sexes are common and hibernate in rock quarries along the Platte River.

Silver-haired Bat

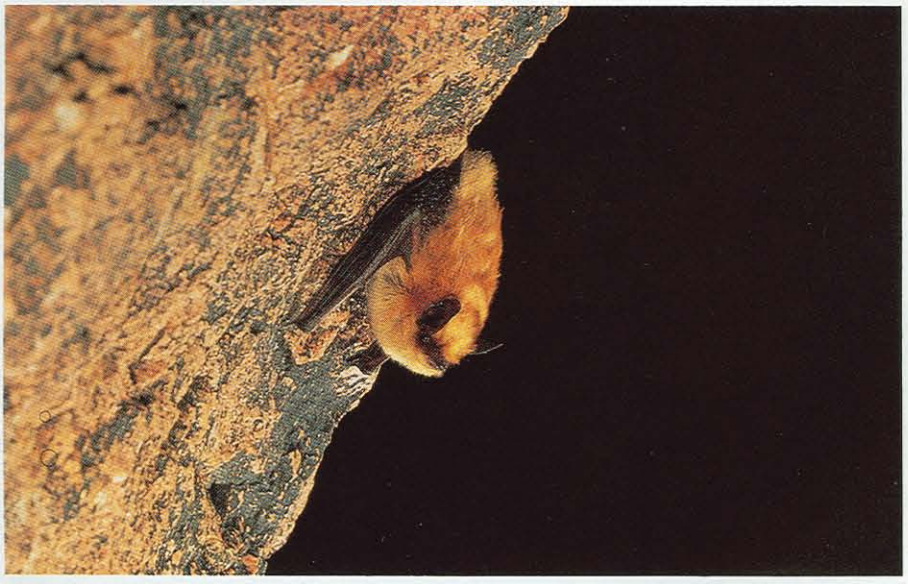
(Lasionycteris noctivagans)

Silver-haired bats are migratory and, until recently, the only sightings from Nebraska were recorded during their northward migrations in spring and southward migrations in late summer and early autumn. However, nursing females netted at Fontenelle Forest in the late 1980s and early 1990s confirm that in eastern Nebraska, at least, some

Little brown myotis

Silver-haired bat

Fringed myotis



Western small-footed myotis

silver-haired bats remain to bear and raise twins.

In warm weather, silver-haired bats strongly prefer the shelter of trees, commonly roosting behind loose bark and in small cavities. Some even have been discovered in bird nests. They also inhabit man-made shelters including open sheds, garages and outbuildings. Some have been found in piles of lumber, railroad ties and fenceposts.

Silver-haired bats also hibernate at latitudes north of Nebraska where they use trees, buildings, rock crevices, mines and caves as winter shelters. Although there are no winter records of silver-haired bats from Nebraska, winter residents are a possibility.

Townsend's Big-eared Bat

(Corynorhinus townsendii)

Townsend's big-eared bat is known only from one location in the northwestern corner of Nebraska. In 1972, a male was discovered hanging on the screen door of a ranch house below rugged Pine Ridge cliffs in Sheridan County. The species is common in the Black Hills of South Dakota where it is known to hibernate and breed.

Townsend's big-eared bats are cavernicolous, which means they prefer caves and mine shafts to other roosts. They commonly use caves and mines as shelters and maternity roosts in the warm months and hibernate there in cold months. Long-range migration is not known in the species; Townsend's big-eared bats make only short seasonal movements from their summer homes to their winter hibernation sites.

Mating begins in autumn before hibernation, typical of Nebraska's hibernating bats. Sperm is stored in the female's reproductive tract and remains viable throughout winter dormancy. When females emerge from hibernation, eggs are shed, fertilization takes place and embryos develop. A single young is born in June or July and has plenty of time to mature, learn to fly and store fat for winter.

Fringed Myotis

(Myotis thysanodes)

The fringed myotis is a western bat that can be found in the ponderosa pine forests of the Pine Ridge and in the Wildcat Hills south of the North Platte River. In Nebraska, they breed in the Pine Ridge and give birth to one young, usually in caves, mines or buildings. Fringed myotis hibernate in caves, abandoned mines and, perhaps, buildings. They typically inhabit montane and upland forest habitat, but they also occur in desert lowlands and other habitats. At dusk, they are often seen foraging for insects over ponds and the open water of rivers.

A female fringed myotis is known to have lived for 11 years. The common name refers to a fringe of straw-colored hairs extending for about a millimeter beyond the tail membrane.

Western Small-footed Myotis

(Myotis ciliolabrum)

The small-footed myotis is a handsome western species with golden-brown fur and contrasting blackish ears and flight membranes. It has been found primarily in northwestern Nebraska along the Niobrara and White rivers.

In the summer, it prefers living under strips of bark and in rocky cliffs, outcroppings, crevices and buildings. It hibernates in caves and mines. Small-footed myotis breed in northwestern Nebraska and typically have one baby a year.

Long-legged myotis

Long-legged Myotis
(Myotis volans)

Long-legged myotis occur only in the Pine Ridge area in northwestern Nebraska. No specimens have been collected farther south. They breed in the Pine Ridge, and only one young is born annually. Nursery colonies have been found in tree cavities, under loose bark, in buildings and in rock crevices. They hibernate in caves and mines.

Brazilian Free-tailed Bat
(Tadarida brasiliensis)

The Brazilian free-tailed bat is a colonial species that normally lives in the southern United States and most of Mexico. Each spring, populations in the Southwest migrate north from Mexico and usually roost in caves. Millions congregate there in relatively few roosts where females bear and raise their single young.

The best known nursery colony inhabits Carlsbad Caverns National Park, New Mexico, where visitors gather to watch free-tails emerge from the cavern to forage for insects each night. Populations in the Southeast and on the West Coast do not migrate and prefer roosting in buildings.

Brazilian free-tailed bat

Fewer than 10 Brazilian free-tailed bats have been found in Nebraska in Lancaster, Buffalo, Keya Paha and Furnas counties. Most were young-of-the-year and probably lost their way during migration. Brazilian free-tailed bats are fast fliers and are distinctive because the tail extends beyond the membrane between the hind legs. ■

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