Pallid Bat
(*Antrozous pallidus*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)

Common throughout its range, the pallid bat occurs in arid and semi−arid regions throughout northern Mexico and the western United States. Pallid bats eat beetles, grasshoppers, and moths, and they forage for slow−moving prey, such as scorpions, flightless arthropods, and sometimes lizards, at and near ground level. They use echolocation to detect prey, but also use their large ears to listen for prey movements. Pallid bats visit flowers in their hunt for insects, and are natural pollinators of several species of cactus.

Length:
Range: 92−135 mm

Weight:
Range: 13.6−24.1 g males; 13.9−28.9 g females

FIELD NOTES

DATE: _____ LOCATION: _____

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Townsend's Big−eared Bat

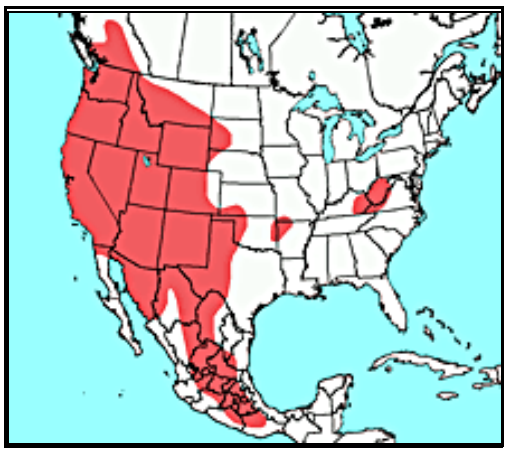
(*Corynorhinus townsendii*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

Conservation Status: Vulnerable.

Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)

Sporting prominent ears that look almost like wings, Townsend's big−eared bat largely preys on moths over open pasture and forest canopy. For females, foraging increases during pregnancy and lactation, from one or two foraging bouts per night to three, and the distance traveled also increases, from 1.0 km to more than 4.0 km per night. Females form maternity groups in the spring, in caves and shelters, where they give birth to a single pup. In addition to winter hibernation, these bats also experience daily periods of torpor during cooler weather, a sleeplike state of reduced motor and metabolic activity. Townsend's big−eared bat occurs in the western United States, northward to British Columbia, as far east as the Rocky Mountain States from Idaho to Texas, including Kansas and Oklahoma, and there are also populations in Arkansas, Missouri, Kentucky, Virginia, and West Virginia.



Also known as:
Western Long−eared Bat, Western Big−eared Bat, Western Lump−nosed Bat, Mule−eared Bat

Sexual Dimorphism:
Females are larger than males.

Length:
Range: 89−116 mm

Weight:
Range: 9−12 g

FIELD NOTES

DATE: _____ LOCATION: _____

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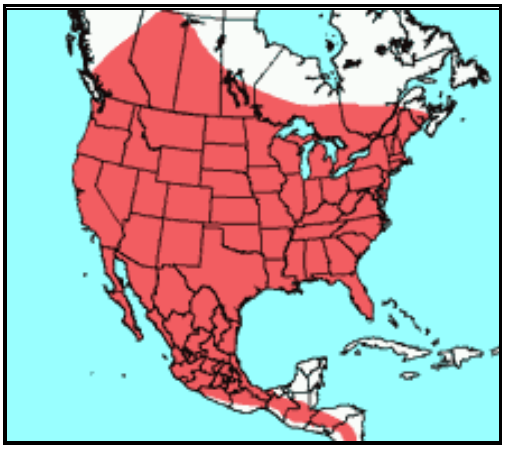
Big Brown Bat
(*Eptesicus fuscus*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)



Big brown bats make their homes in rural areas, towns, and cities, sometimes choosing barns, houses, or other buildings as roosts. Males usually live alone; females gather in maternity colonies in the spring and summer to give birth and raise their young. A maternity colony may include 20 − 75 adults and their offspring. Females in the eastern United States usually give birth to twins; those in the West usually have a single pup each year. Females may return to the same colony year after year. On warm, dry evenings, the bats leave the roost shortly after sunset to forage for insects especially flying beetles which they catch and eat in the air. When the weather is cold or wet, they may stay in the roost, dropping their body temperature and living on stored fat. In the winter, they hibernate. Many migrate a short distance (less than 80 km) to find mines or caves for hibernation, but some spend the winter in attics or walls where the temperature is cool but stays above freezing.

Also known as:
Brown Bat

Sexual Dimorphism:
Females are larger than males.

Length:
Average: 112 mm
Range: 87−138 mm

Weight:
Average: 16 g
Range: 11−23 g

FIELD NOTES

DATE: _____ LOCATION: _____

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Spotted Bat
(*Euderma maculatum*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

Conspicuous and distinctive, with three highly visible white spots on its black back, and large−than−life ears for its body size, the spotted bat would doubtless be the object of more human attention if it flew during the day. As it is, these bats are caught only rarely, and few of their roosts have been found. They inhabit coniferous forests and lowland deserts, from sea level to 3,000 m, and prey on a variety of moths and other insects. They feed on the wing, using echolocation calls that humans can hear (most bats' calls are beyond the range of human hearing).

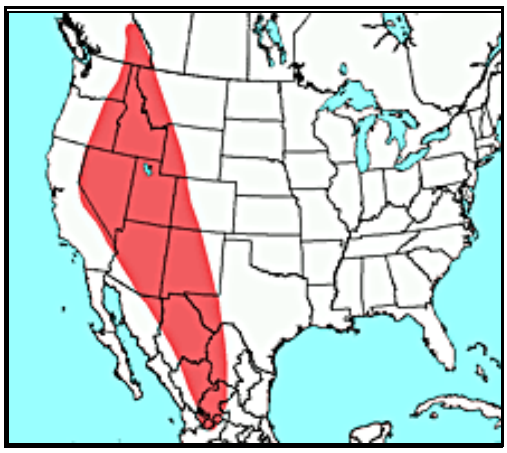
Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)

Also known as:
Pinto Bat

Sexual Dimorphism:
None

Length:
Range: 107−125 mm

Weight:
Range: 15−22 g



FIELD NOTES

DATE: _____ LOCATION: _____

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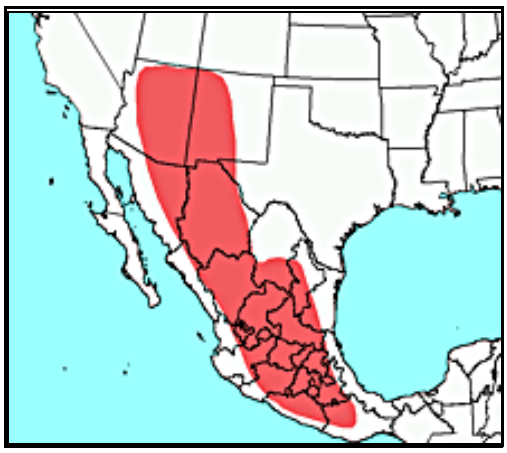
Allen's Big−eared Bat
(*Idionycteris phyllotis*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)

As with other big−eared bats, the huge ears of Allen's big−eared bat can be curled back along the sides of the neck so they resemble the horns of a ram. When its ears are tucked out of the way in this manner, one of the cartilage folds of the ear (the tragus) remains erect and may actually look like a small ear, which can make it hard to identify a roosting bat. Few have been observed in their roosts; most information about them comes from bats that were netted while they were flying. These versatile bats adapt their flight patterns and sound emissions (echolocation calls) to varying terrains. They are capable of straight, direct flight, but can also fly slowly, maneuver well, and even hover, so they can forage in and among tree branches. They mostly eat small moths but also take other insects.



Also known as:
Mexican Big−eared Bat, Lappet−browed Bat

Sexual Dimorphism:
Females may be about 5% longer than males.

Length:
Average: 110 mm
Range: 103−135 mm

Weight:
Range: 8−16 g

FIELD NOTES

DATE: _____ LOCATION: _____

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Silver−haired Bat

(*Lasionycteris noctivagans*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

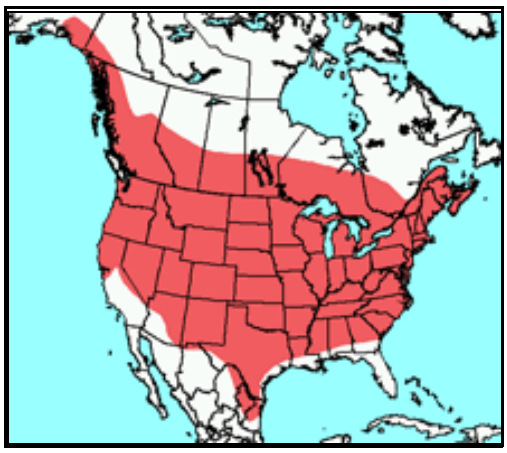
Somewhat resembling the larger hoary bat, the silver−haired bat has frosted tips on the black or dark−brown fur of its back. Silver−haired bats occur in both grassland and forest, and are abundant in old−growth forest. They feed on small flying insects, especially moths, using echolocation to navigate and hunt. They start foraging after sunset, finding their prey at treetop level or over streams and ponds. Seasonal changes in the numbers of bats have been observed: more individuals are seen farther north in the summer and farther south in winter, suggesting that the species is probably migratory. However, these bats can enter torpor for energy conservation, and some individuals may not migrate.

Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)

Sexual Dimorphism:
Females are larger than males.

Length:
Range: 90−117 mm

Weight:
Range: 9−12 g



FIELD NOTES

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Western Red Bat
(*Lasiurus blossevillii*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

This close cousin to the eastern red bat (*Lasiurus borealis*) is genetically distinct. These bats are found along the west coast and southwestern US and into Mexico where thought to hibernate in the winter. Lasiurine bats are solitary creatures that roost in broad leaved trees, especially cottonwoods and willows in the foothills and lower mountains of the southwest and in the fruit and nut orchards of the west, where they resemble dried leaves when they are curled up and asleep. They are often found near streams. Their preferred diet is moths − street lamps are the ideal cafeteria for these tasty morsels.

Length:
Range: 92−112 mm

Weight:
Range: 6−10 gm

Illustrations of *Lasiurus borealis*, (eastern red bat); *L. blossevilli* is quite similar in appearance but slightly smaller *Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)*

FIELD NOTES

DATE: _____ LOCATION: _____

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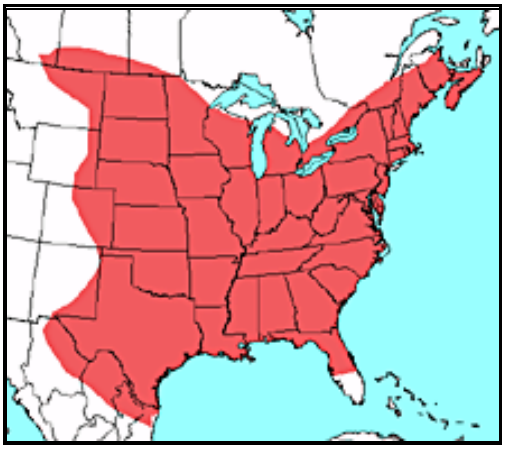
Red Bat
(*Lasiurus borealis*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

Common and widespread from far southern Canada throughout most of the United States and Mexico, and farther south through Central America and into South America, the red bat requires trees and shrubs for roosting. It is remarkable for its richly−colored reddish pelage, with the male brighter than the female. Although the red bat is solitary, it migrates in groups. Females often give birth to twins and sometimes to quadruplets. The young are born hairless, with eyes closed, and weigh only 0.5 g, but by 3−6 weeks they are covered with fur, have their eyes open, are half their mother's weight, and can fly.

Lasiurus borealis − female (left) and male (right)

Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)



Sexual Dimorphism:
Females are larger than males.

Length:
Average: 112.3 mm
Range: 95−126 mm

Weight:
Range: 7−16 g

FIELD NOTES

DATE: _____ LOCATION: _____

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Hoary Bat
(*Lasiurus cinereus*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

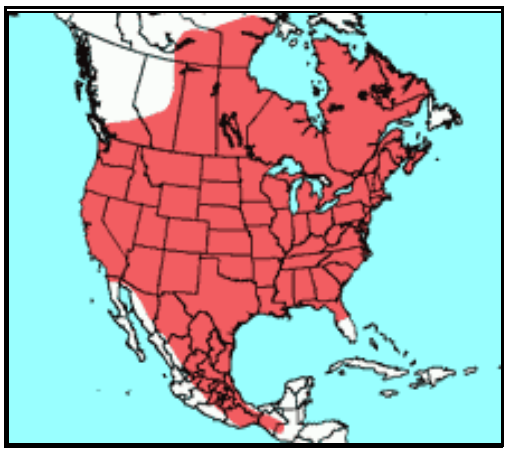
Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)

Hoary bats are found from northern Canada all the way to Guatemala, and also in South America and Hawaii. They are solitary and roost in trees. Their frosted, or hoary, look comes from a tinge of white over their grayish−brown fur. Their flight is distinctively fast and direct and can be used as an identifying trait. Hoary bats eat moths, beetles, grasshoppers, wasps, and dragonflies.

Sexual Dimorphism:
Females are larger than males.

Length:
Average: 80.5 mm males; 83.6 mm females
Range: 77−87 mm

Weight:
Range: 20−35 g



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DATE: _____ LOCATION: _____

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Southern Yellow Bat
(*Lasiurus ega*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

A strong flier with yellowish fur, the southern yellow bat is a lowland species, adapted to both dry and wet habitats. It roosts in trees, particularly palms. These bats are often seen hunting over water, including over swimming pools. Very few species of bats have more than one or two young at a time, and most have just two nipples, but some bats in the genus *Lasiurus* have four nipples and can have triplets or quadruplets. Southern yellow bats most often have triplets. The young bats nurse for about two months before they are able to fly and forage for themselves.

Lasiurus ega − inset shows white hairs on underside of wing

Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)

Also known as:
Western Yellow Bat, Tropical Yellow Bat

Sexual Dimorphism:
Females are larger than males.

Length:
Average: 115.1 mm
Range: 102−118 mm

Weight:
Average: 11.9 g
Range: 10−14 g

FIELD NOTES

DATE: _____ LOCATION: _____

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Southwestern Myotis
(*Myotis auriculus*)

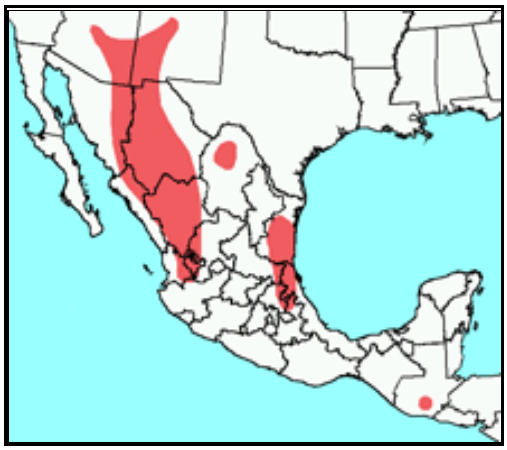
ORDER: Chiroptera
FAMILY: Vespertilionidae

Southwestern myotis live in a variety of southwestern mountain habitats, from desert grasslands up into pine and mixed coniferous forest in the United States, and in desert and grassland in Mexico. These bats and two other myotis species, the long−eared myotis and the fringed myotis, are able to hover and pluck insects from surfaces; most myotis bats catch their prey on the wing. The three species are known as hovering−gleaning bats. The southwestern myotis probably hibernates in caves, but has not yet been found in hibernation.

Length:
Range: 85−101 mm

Weight:
Range: 6−10 g

Myotis auriculus − inset shows trailing edge of tail membranes
Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)



FIELD NOTES

DATE: _____ LOCATION: _____

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California Myotis
(*Myotis californicus*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)

California myotis are found in deserts and arid basins. They drink at small waterholes, and when they forage, they fly low and slow over water and other open areas, and at forest edges. Many California myotis are active in winter, but some that live at higher elevations or farther north hibernate. Mating usually occurs in the fall, and sperm is stored in the female's uterus until spring, when ovulation and fertilization occur. A single pup is born in June or July, when food is plentiful. The young develop rapidly and can fly in about a month.

Also known as:
California Bat

Sexual Dimorphism:
Females are larger than males.

Length:
Range: 70−94 mm

Weight:
Range: 3.3−5.4 g

FIELD NOTES

DATE: _____ LOCATION: _____

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Western Small−footed Myotis

(*Myotis ciliolabrum*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)

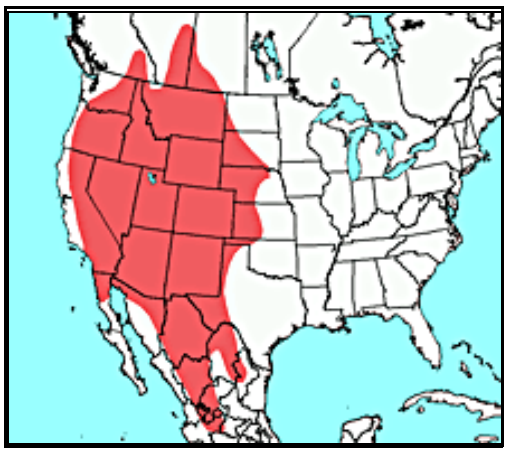
The western small−footed myotis occurs in limited areas of southwestern Canada, throughout much of the western United States, and into Mexico. It is better adapted to moist areas than to dry ones. It roosts alone or in small groups in rock crevices, mines, caves, or buildings, and even occasionally uses in an abandoned swallow's nest as a roosting site. It eats insects, including flies, beetles, moths, and ants. Like many bats, the western small−footed myotis mates in the fall and sperm is stored in the female's body over the winter, while she hibernates. In the spring, the female ovulates and fertilization occurs. A single pup is born in May, June, or July, and is ready to fly when it is about a month old.

Also known as:
Small−footed Myotis, Western Small−footed Bat

Sexual Dimorphism:
Females are larger than males.

Length:
Range: 76−90 mm

Weight:
Range: 2.8−7.1 g



FIELD NOTES

DATE: _____ LOCATION: _____

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Long−eared Myotis
(*Myotis evotis*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

With its long, luxurious fur, which can range in color from dark brown to pale yellow, and its large, coal−black ears, the long−eared myotis is a striking animal. Long−eared myotis prefer roosting in rock outcroppings and dead trees. They feed on a variety of insects, and are often seen hunting in dense vegetation or over small bodies of water. They seem to prefer moths and beetles, and it appears these bats "turn off" their echolocation to listen for insects, which they can pluck from trunks and branches by hovering momentarily. Like many bats, but unlike most other small mammals, they have a long life span. Individuals have been known to live for 22 years, although the average is much shorter.

Myotis evotis − inset shows trailing edges of tail membranes

Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)

Also known as:
Long−eared Bat, Little Big−eared Bat

Length:
Range: 87−100 mm

Weight:
Range: 5−8 g

FIELD NOTES

DATE: _____ LOCATION: _____

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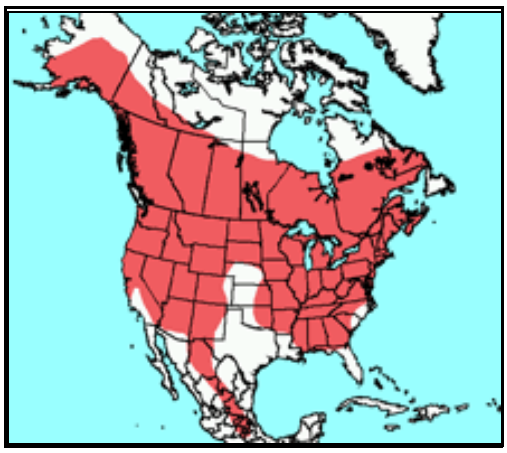
Little Brown Bat
(*Myotis lucifugus*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

Myotis lucifugus − inset shows long toe hairs

Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)

Echolocation of little brown bats has been well studied since the invention of bat detectors, electronic devices that can "hear" the ultrasonic calls bats make, which are usually beyond the range of human hearing. Little brown bats typically produce calls lasting about 4 milliseconds. While cruising, they emit echolocation calls about 20 times per second, spacing the pulses at 50 millisecond intervals. When attacking airborne prey, the pulse rates rise drastically, to 200 per second, with only 5 millisecond gaps between calls. The information the bats receive through echolocation allows them to orient themselves, and to locate, track, and evaluate their insect prey. Little brown bats feed near or over water, mainly on aquatic insects such as caddis flies, mayflies, and midges, and typically consume half their body weight in insects each night. Nursing females may eat up to 110 percent of their body weight each night.



Also known as:
Little Brown Myotis

Sexual Dimorphism:
Females are slightly larger than males.

Length:
Average: 87 mm
Range: 60−102 mm

Weight:
Average: 10 g
Range: 7−13 g

FIELD NOTES

DATE: _____ LOCATION: _____

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Fringed Myotis
(*Myotis thysanodes*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

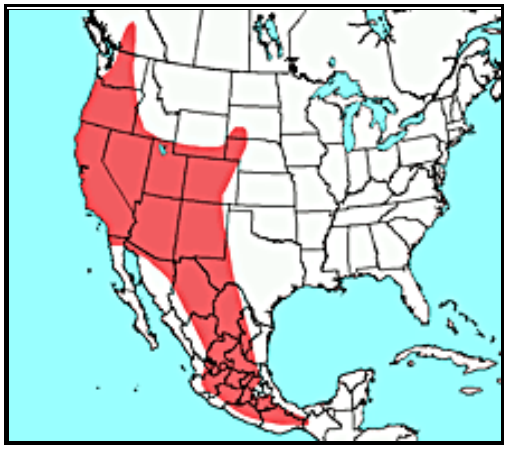
The fringed myotis belongs to the long−eared myotis group, all of which tend to be high−elevation forest bats. This species has the shortest ears and occupies the lowest elevation of the group. Its wings are short and broad, indicating maneuverable, low−speed flight, and it seems to be a specialist at gleaning small beetles from vegetation surfaces. Beetles may make up 70 percent of its diet. Fringed myotis have one baby a year, and it is huge in proportion to the mother's size. A newborn's weight is 22 percent, and its length is 54 percent, of the mother's. Newborn bats are left hanging in special roosts, where 2−10 adult females are always present to care for them. The other females fly out at dusk to forage and return at dawn, but are there as necessary to nurse their young. Before they are three weeks old, the young can fly, and by three weeks, they are as large as adults.

Myotis thysanodes − inset shows trailing edges of tail membranes
Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)

Sexual Dimorphism:
Females are larger than males.

Length:
Average: 89 mm
Range: 80−99 mm

Weight:
Average: 8.8 g
Range: 6−11.8 g



FIELD NOTES

DATE: _____ LOCATION: _____

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Cave Myotis
(*Myotis velifer*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

The cave myotis, one of the larger myotis species, has a stubby−nosed appearance. The ears reach only to the end of the short nose when bent forward. Typical of North American bats, cave myotis feed on insects, especially moths and beetles. They breed seasonally, giving birth to a single offspring of about 3 g, or 25 percent or more the weight of the mother. The young are flying and foraging for insects when they are about a month old, but nurse for about six weeks. A nursing bat hangs upside down next to its mother, nestled in her wing, sometimes hanging onto the roost with one foot and its mother with the other; the female has a nipple under each arm, near her armpits.

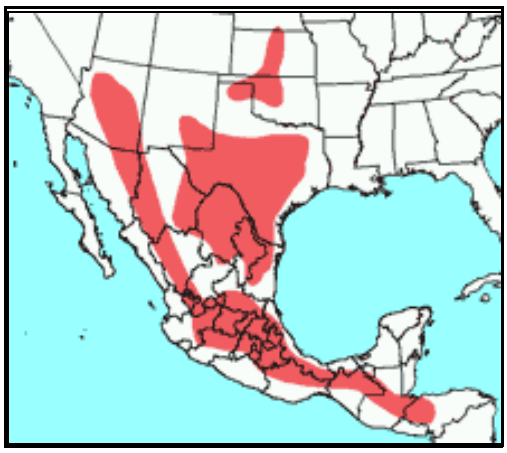
Myotis velifer − inset shows darker variation

Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)

Sexual Dimorphism:
Females have longer forearms than males.

Length:
Average: 56.7 mm
Range: 44.2−55 mm

Weight:
Average: 12 g
Range: 9−14 g



FIELD NOTES

DATE: _____ LOCATION: _____

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Long−legged Myotis
(*Myotis volans*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

Long−legged myotis typically occupy mountainous or relatively rugged areas. They often live in coniferous forest, although they are sometimes found in oak or streamside woodlands, and even deserts. They feed mostly on moths, but are opportunistic, eating whatever soft−bodied insects are most abundant. When several long−legged myotis are feeding in the same area, and two bats seem to be on a collision course, they alter their echolocation calls, adding a lower−frequency "honk."

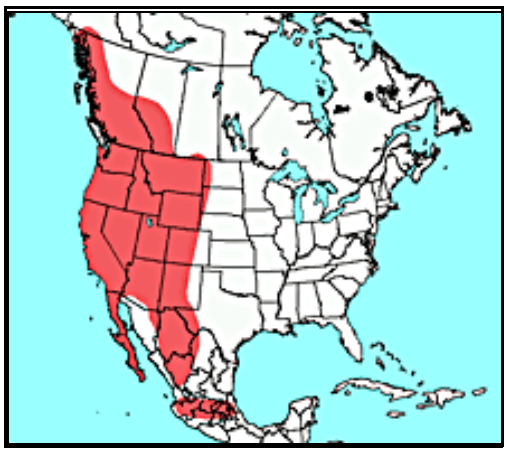
Myotis volans ssp. *interior*

Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)

Also known as:
Hairy−winged Myotis

Length:
Range: 76−106 mm

Weight:
Average: 7.5 g
Range: 5−10 g



FIELD NOTES

DATE: _____ LOCATION: _____

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Yuma Myotis
(*Myotis yumanensis*)

ORDER: Chiroptera
FAMILY: Vespertilionidae

Myotis yumanensis − light−colored desert variant is shown, with darker forest variant in inset
Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)

The skull and jaws of the Yuma myotis suggest a dependence on relatively soft insects, and the little dietary information available supports this. It fits well with the bat's habit of foraging over water, where moths and other soft−bodied insects tend to be common. The bats are often seen cruising back and forth just a few inches above the water, and have never been found living far from a pond or river. In captivity, if they do not have water, they quickly become dehydrated and die. Groups of bats roost together in the summer, under bridges, in buildings, mines, or caves, and even in mud nests made by cliff swallows. This species varies in size and coat coloration over its extensive north−south geographic distribution, sometimes making it difficult to distinguish them from the closely related little brown bat. So far, genetic studies have shown them to be two distinct species, however.

Sexual Dimorphism:
None

Length:
Average: 80.6 mm
Range: 75−89 mm

Weight:
Average: 5.9 g
Range: 4.7−7.1 g

FIELD NOTES

DATE: _____ LOCATION: _____

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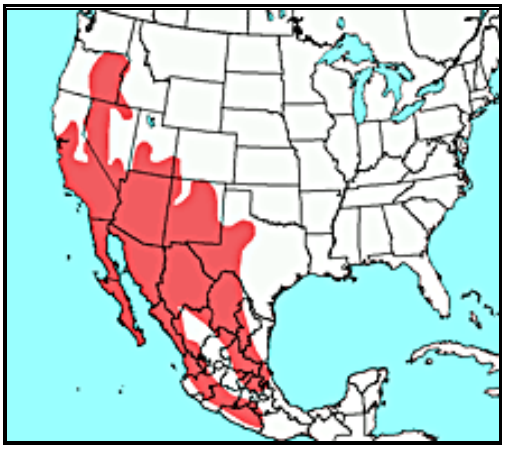
Western Pipistrelle

(*Pipistrellus hesperus*)

Credit: painting by Wendy Smith from Kays and Wilson's Mammals of North America, © Princeton University Press (2002)

ORDER: Chiroptera
FAMILY: Vespertilionidae

Western pipistrelles sometimes leave their roosts before sundown, and can be mistaken for late−flying butterflies, because they are so tiny and fly slowly and erratically, with much fluttering of their wings. Most common at low elevations in desert scrub and arid grassland habitats, they are also found in adjacent woodlands. Although they range over the arid West, western pipistrelles require a ready source of water—a lake, stream, or even a swimming pool. They—and some shrews—are the smallest mammals in North America, with weights ranging from 2—6 g. In spite of their tiny size, western pipistrelles usually give birth to twins, which are born and raised in small maternity colonies. The largest colony yet found comprised just four female bats and their eight young.



Also known as:
Canyon Bat

Sexual Dimorphism:
Females are larger than males.

Length:
Range: 60−86 mm

Weight:
Range: 2−6 g

FIELD NOTES

DATE: _____ LOCATION: _____

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