

Yavapai County  
Master Gardener Association



# Arizona Bats

March 2022





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# A Face that Only a Mother could Love



Allen's big-eared bat

# Bats – Description

- Fist-sized or smaller, with short fur and thin wings, many have large ears
- Brown, gray, yellow, red, some with frost-tipped fur, spots or dark eye mask
- Hang upside-down to rest in dark, secluded “roosts” during daytime
- Similar eyesight to humans



# Facts about Bats

Bats belong to the order Chiroptera (meaning hand-wing) and are the only mammals to possess the powers of true flight.

Bats make up over 20% of all living mammal species in two sub-orders

- Megachiroptera are large, Old World, fruit-eating bats which generally find their food by using their eyesight
- Microchiroptera bats tend to be smaller and feed primarily on insects by echolocation.

Bats are one of the most diverse and widespread groups of mammals on the planet today. They are found on every continent except Antarctica.

There are between 1,100-1,400 species of bats worldwide, with 40 species in the United States.



# Facts about Bats (con't)

Bats are considered mammals and are well known for their excellent ability to hear from far away distances.

Bats emit high pitched chirps (echolocation) to determine such things as the distance, speed, and direction of the surrounding objects, which help them hunt for prey.



**FLYING FOXES** - The world's largest bat that lives on islands in the South Pacific and has a wingspan of up to 6 feet.

In contrast, the world's smallest bat is the bumble bee or Kity's hod nosed bat of Thailand, which is smaller than a thumbnail, has a wingspan of about 6 inches and weighs less than a penny.

# Facts about Bats (con't)

- Many bat species are can live 30 to 40 years.
- More than half of the bat species in the United States are in severe decline or listed as endangered due to loss of habitat and the white-nose disease.
- Some bats hibernate in caves through the cold winter months. Bats can also survive freezing temperatures, even after being encased in ice.
- Bats can fly at speeds of 60 miles per hour (or more!). A study by the University of Tennessee found that the Mexican free-tailed bat could reach speeds up to 100 mph, making it the fastest mammal on Earth.
- Bats can find their food in total darkness. Not all bats are nocturnal (meaning they're awake at night).



# Facts about Bats (con't)

- Bats reproduce only once a year. Most species in Arizona have only one “pup” a year between May and July.
- Females nurse offspring and form maternity roosts that can contain hundreds or thousands of bats
- Bat mothers can find their babies among thousands or millions of other bats by their unique voices and scents. Having only one pup a year makes bats extremely vulnerable to extinction.
- Bats can consume their body weight in insects every night

## **RAFINESQUE'S BIG-EARED BAT**

Some bats can find their food in total darkness using echolocation, which is emitting an inaudible high-pitched sounds, 10-20 beeps per second and listening to echoes





# Benefits of Bats

- Are your ally against the insects that are likely eating your cherished plants.
- Are responsible for pollinating many different types of plants.
- Contribute at least \$3 billion annually to the U.S. agriculture economy through pest control and pollination.
- Are the primary dispersers of seeds in tropical habitats and play a major role in re-establishing vegetation after logging or deforestation or building roadways.
- Bat droppings, called guano, are one of the richest fertilizers. Bat guano was once Texas's largest mineral export before oil!



# What do Bats Eat

Bats feed off the flying insects such as mosquitoes, moths, beetles, and other insects

Food can include insects that congregate in areas near lights, agricultural or playing fields, ponds or other water sources.



Nectar-feeding bats may be attracted to flowering agaves and hummingbird feeders which they can drain overnight



Water sources can include any pool, pond or lake with a long flying corridor that bats can skim.

# What do Bats Eat (con't)

- Many bats eat insects in flight and can eat more than 1,000 insects in an hour.
- Some small species have been known to eat up to 12,000 mosquito-sized insects an hour. It is estimated that a single large colony of free-tailed bats in Texas eat about 200 tons of insects a night.
- There are two species of Arizona bats who are considered nectar eating bats per the AZ Dept. of Game & Fish - AZDGF):
  - The Lesser Long Nosed and the Mexican Long Tongued Arizona bats' primary source of food is the Saguaro, Pipe and Organ Cactus, and Agaves.
- Pallid bats eat scorpions and are immune to scorpion stings, even from the most venomous scorpion in North America, the Arizona bark scorpion. Up to 70% of a Pallid bat's diet can be scorpions at certain times of the year.



# Where do Bats Live

Bats in AZ are found throughout the state and represent families in all four of the state's habitats. (Grassland, Savanna, Forest and Desert)

Of the 28 AZ bat species, only 6 don't spend time within the forest habitats.



Besides caves, bats are attracted to spaces inside buildings and attics, under bridges, in culverts, behind siding on buildings, in palm trees, and under eaves and porch or patio awnings.

Shelter can include branches or any rough surface for hanging. A bump of only 1/16 inch is enough.

Bats can squeeze into holes as small as 3/8 inch



If bats are in an area, it is probably because they are finding food, water or shelter.



# Where do Bats Live (con't)

If a bat is inside a building, it's probably just lost. What to do?

- Close the interior doors to confine the animal to one room or section of the building.
- After dark, open all doors and windows to let the bat fly outside on its own.
- Turn inside lights off to help bats find open windows and doors.
- If the bat does not leave on its own after several hours, put on leather gloves, and then place a box, coffee can or glass jar over the bat when it is on a wall. Slide a lid or piece of stiff paper over the top; then release the bat outside while it is still dark.
- Hold the bat up high to allow it to fly away or place it on the edge of a tall building, fence or tree branch (it may not be able to fly up from the ground).



# Where do Bats Live (con't)

- Bat-proof your home
  - Remove bug lights and water sources and turn off outside lights at night to avoid attracting bats.
  - Find entry and exit points in the area.
  - Hang lightweight wire screening or hardware cloth over the entry and exit holes, attaching it on the top and sides, but leave the bottom loose and open so bats can crawl out but will not be able to re-enter.
  - Permanently secure the entry hole after all bats are gone and well after darkness has fallen (remember, bats can squeeze through openings as small as 3/8 inch)
- **Never exclude bats during the summer months** (May to September). This is the maternity period, when bats leave their young in the roost to forage for food.



# What Diseases Do Bats Carry

## Rabies

- Bats are one of the known rabies vector species in Arizona.
- Less than 1% of bats are likely to have rabies at any given time.
- Symptoms of a rabid bat include inability to fly, flying during daylight, lethargy and paralysis.
- Most bats, even if sick, will not attack a person, but bats may bite if handled.
- If a live bat is on or near the ground, leave it alone, and contact the local county health or animal control agency.
- If bitten by a bat, seek immediate medical attention. If possible, the bat should be captured and tested for rabies.



# Diseases (con't)

## Histoplasmosis

- This disease is caused by a fungus (*Histoplasma capsulatum*) that lives in soil enriched by bird or bat droppings.
- The fungus is rare in dry Western climates, but it has been found in AZ. It can also be present in dry, hot attics of buildings.
- Infection is caused by inhalation of airborne spores in dust enriched by animal droppings.
- The majority of histoplasmosis cases in humans is asymptomatic or results in only flu-like symptoms, though individuals may become seriously ill if exposed to large quantities of spore-laden dust.
- The disease can be avoided by not breathing dust suspected of being enriched by animal feces. (Bat Conservation International Web site.)





# Diseases (con't)

## **Pseudogymnoascus destructans (Pd)**

- A fungus that causes white-nose syndrome (WNS) in bats, was present in samples collected from multiple species in SE California and NW Arizona.
- White-nose syndrome has killed millions of bats in North America
- The disease is not known to pose a direct health risk to people, pets or wildlife other than bats.
- Sick or dying bats observed during winter may be a sign of WNS and can lead scientists to important roosting locations
- Federal and state agencies are asking the public to report any sick or dead bats found on the landscape.
- Visit <https://www.whitenosesyndrome.org> for more info.



# Diseases Connection to Covid -19

According to the Bat Conservation International website, a live wildlife market in Wuhan, China, is believed to be the source of the outbreak of the coronavirus in humans.

Bats are among the many varieties of wildlife sold at that market. Chinese researchers at Wuhan Institute of Virology have shown that the virus now known as COVID-19 shares 96% of its genome with SARS-like coronaviruses.

Horseshoe Bats in China, are the natural wildlife reservoirs for SARS-like coronaviruses.

The federal Centers for Disease Control and Prevention has an explanation of the source and spread of the virus at [cdc.gov/coronavirus](https://www.cdc.gov/coronavirus).



# Law and Polices

- All bats in Arizona are protected and cannot be collected or killed. Proper exclusions may be performed where necessary.
- It is unlawful to use pesticides or other chemicals directly on bats.
- Bat exclusions should be done only with the advice of the Arizona Game and Fish Department or a wildlife control business.
- Exclusion should not be attempted during the maternity season (generally May through September) to avoid separating mothers from their young.
- No fumigants or toxicants are registered for bat control in AZ





# Arizona Bats

- There are 28 known species of bats in Arizona, second only to Texas.
- There are nine different myotis species of bats in AZ.
- Saguaro National Park in southern Arizona has the most Arizona bat species, which is the most in any part of the US
- Arizona also has Canyon bats (Western Pipistrelle ), the smallest species in the U.S. which are about the size of butterflies.
- The Mexican free-tailed bat, which is one of the most common species in Phoenix, is also thought to be the most abundant mammal on Earth. Some colonies of this species number in the tens of millions.



# Arizona Bats (con't)

AZGFD installed a bat roost camera at the Cluff Ranch Wildlife Area near Safford, in southeastern Arizona in 2018, providing an opportunity to watch migratory Yuma myotis bats and other bat species while they roost.

- There are several species of bats using this roost including Pallid bats, Cave myotis and Yuma myotis
- Canyon bats (*Parastrellus hesperus*) have also been found in this roost and other species on occasion
- The best opportunity to view the bats is from about 8 to 10 p.m. and in the morning hours from dawn until about 10 a.m.

[View the bat cam at https://www.azgfd.com/wildlife/viewing/webcamlist/bats/bat-cam/](https://www.azgfd.com/wildlife/viewing/webcamlist/bats/bat-cam/)



# Bats that Frequent Yavapai Co.

**Cave myotis** bats are found in desert areas with creosote, palo verde, brittle bush, and cacti. They inhabit mine shafts, caves, and under bridges. They are always a few miles from a water source.

**Arizona myotis.** prefer forests of ponderosa pine and oak and have been seen in the Verde Valley and on Mingus Mountain.

**Fringed myotis** (*Myotis thysanodes*) occurs in the oak woodlands, including the Bradshaw Mountains.

**Big brown bats** are commonly found in wooded areas but are also present in the desert scrub. Although this species may hibernate during part of the winter, they can withstand cold weather well.

**Mexican free-tailed bats** are present throughout Central Arizona in the summer, inhabiting caves, mines, old buildings or bridges in the desert scrub and foothills. They are found only in the south part of Arizona in the winter.

**Big-eared bats** inhabit caves or mine-tunnels. They can be found over desert scrub, in desert mountains shelters, and oak-woodland, pinyon juniper, or coniferous forests. Recorded sightings include Camp Verde, Cordes, and Congress in Yavapai County



# Cave myotis

*(Myotis velifer)*

Are considered to be doing well and listed as a species of least concern.

Life span is approximately 10-15 yrs.

Feed upon a wide variety of insects depending what is available in the area

Are found in the southwestern U.S. from mid-Texas to Arizona and southeast CA.



A medium-sized bat with brown or black fur on its back and paler fur on its underside. Its ears are short and pointed and its eyes are small.

In summer they can be found roosting in caves in groups of 2,000-5,000 individuals. Some will stay and hibernate over winter, but most are migratory over short distances.

Are very sensitive to human activity and will abandon a roosting area if disturbed. They have been known to roost in swallow nests if other suitable roost sites are not available.





# Big Brown Bats

*(Eptesicus fuscus)*

Are abundant and listed as a species of least concern.

Are considered "large" for an American bat. They have brown to glossy copper-colored fur on their back with the belly fur being lighter.

Are reported to be one of the fastest bats reaching speeds of up to 40 mph

Are found in almost all habitats from deserts, meadows, cities, to forests, mountains and chaparral.

Are insectivorous. They prefer eating beetles over other insects, using their powerful jaws to chew through the beetles' hard exoskeleton.

Can live up to 20 years though many die during their first winter because they did not store enough fat to survive through hibernation period.



# Mexican free-tailed bat

*(Tadarida brasiliensis)*

Medium sized with reddish to dark brown or gray fur, broad, black, forward pointing ears, and wrinkled lips. Their wings are long and narrow.

Have a life span of up to 18 years.

Are not threatened or endangered.

Consume enormous amounts of moths and insects. Some roosts are known to contain millions of bats. In those colonies it is estimated that 250 tons of insects can be consumed every night.

Prefer to roost in caves, but will also choose attics, under bridges, or in abandoned buildings. They choose roosts near water.

Are found in the western United States, south into northern South America. Most migrate south to Central America and Mexico during the winter.

The densest concentrations of free-tailed bats are found living in Bracken Cave near San Antonio, Texas. Their colonies can number over 20,000,000.



# Townsend's Big-eared bats

*(Corynorhinus townsendii)*

Medium-sized with very long ears reaching a length of 38 mm. Their fur is pale gray or brown and buff colored on the underside.

Lives 4 to 10 yrs; max. recorded life is 16 yrs.

Can be found throughout the western U.S. from British Columbia down into Mexico.

Is a late flier, eating moths and other insects such as beetles, flies and wasps.

Uses a variety of habitats, near caves or other similar roosting areas and can also be found in pine forests and arid desert scrub; are generally rather sedentary. The hibernation roosts are usually abandoned mines or caves

When it's roosting or hibernating, Townsend's big-eared bat curls up its long ears so they look like ram's horns.

Are in decline and are listed as an Endangered, Sensitive or Special Concern species in in 5 western states because this species is sensitive to disturbance and will abandon roost sites after human interference.



# California Leaf-nosed Bat

*(Macrotus californicus)*

Grayish to dark brown back with paler fur below with very large ears and an erect triangle flap on the nose.

Frequents Sonoran desert scrub south of the Mogollon Plateau.

The average life-span is 20-30 years.

Wings are short and broad and not suited for long distance flight

Eats various insects such as crickets, beetles, grasshoppers, katydids; and sphinx and other types of moths. The only bat in North America known to eat caterpillars and are among very few insect-eating bats that eat cactus fruit.

Preferred habitats are caves, mines, and rock shelters, mostly in Sonoran desert scrub. Roost sites are located near foraging areas.

List as Special Concern by the Federal Species of Concern and AZGFD; and is ranked by the Western Bat Working Group (WBWG) as red/high.



# Greater Mastiff Bat

*(Eumops perotis)*

Also known as the Greater Bonneted Bat.

The largest bat in the United States, with very large ears which extend out over its heavy-snout, small eyes. It has short brown to gray-brown fur on its back and paler fur on its underside. Their wings are long and narrow.

Eats insects and roost in tree hollows, caves, and buildings. They are found worldwide in warm regions.

In the U.S. they are found from central California into most of Arizona and some areas of Texas and New Mexico and into Mexico.

Habitat must have large open area with roost sites having vertical faces with at least 20 ft of vertical drop from their roosts to gain enough speed for flight.

Considered a species of least concern but has federal special status - consider to be Threatened and Endangered as it is no longer found in many of its previously occupied areas.



# Lesser Long-nosed bats

*(Leptonycteris curasoae)*

Yellow-brown to gray above, with rusty brown fur on their belly. Tails are short, ears are large and a triangular shaped noseleaf.

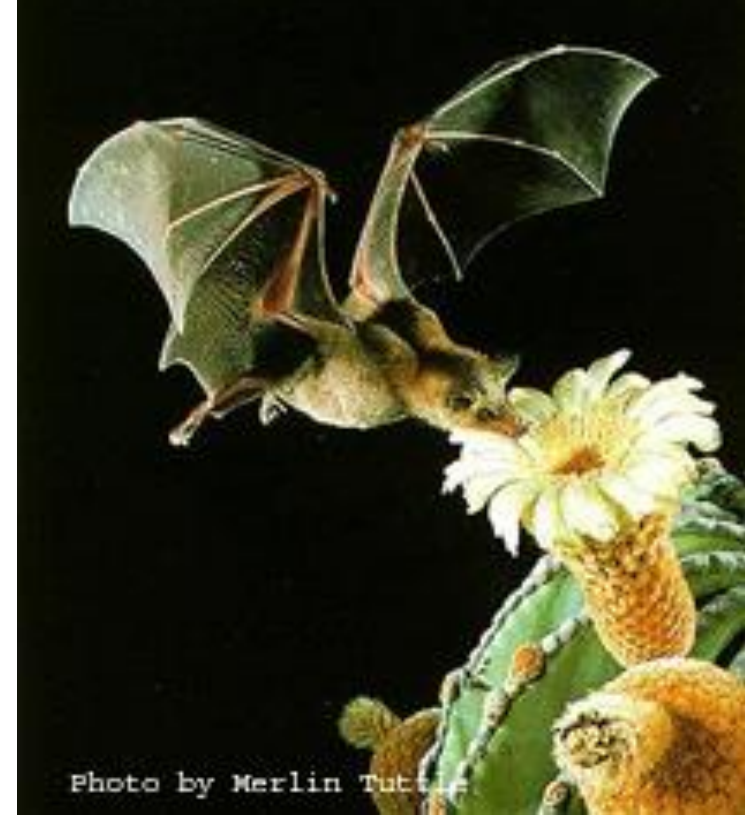
Can reach flight speeds up to 14 mph.

Found in southern Arizona and southwestern New Mexico, western Mexico, Baja California del Sur and into Central America.

Thousands will spend their day roosting in caves or mines. Their outside habitat is generally considered to be desert-scrub.

One of only a few species that undergo a long-distance migration in order to follow the flowering or fruiting cycle of their food sources; saguaro, cardon, agave and organ pipe cactus.

Listed as endangered by the U.S. Fish and Wildlife Service in 1988 due to maternity roost disturbance and habitat loss are the primary threats.



# Silvered-haired bat

*(Lasionycteris noctivagans)*

Scientific name derived from Latin words meaning "night wandering shaggy bat."

Medium-size with dark brown-black hairs tipped with silver giving it an icy look. Ears are short, rounded with no fur.

Estimated they can live up to 12 years.

One of the slowest flying bats in North America

Are insectivorous feeding on flies, midges, leafhoppers, moths, mosquitoes, beetles, caddisflies, ants, crickets.

Are among the most common bats in forested areas of the United States. and with Alaska as the northern limit and southward into Mexico.

Are a solitary, tree-roosting species hibernating in small tree hollows, under sections of tree bark, rock crevices, in wood piles, on cliff faces, or in caves.

Has no special endangered or threatened status at this time, however, deforestation may pose a threat for the bat in the not-too-distant future.



# Pallid Bat

*(Antrozous pallidus)*

Has yellowish brown to cream colored fur and white fur on its belly, large ears and eyes larger than most species of North American bats.

May live as may as 10 years

Feeds on ground-dwelling pray such as scorpions, centipedes, praying mantis, crickets, ground beetles, grasshoppers, and long-horned beetles

They occur in arid and semi-arid regions across much of the American west, up and down the coast from Canada and Mexico

Do not appear to migrate any great distance as the seasons change.

Found in arid regions with rocky outcroppings, to open, sparsely vegetated grasslands. Water must be available close by to all sites. They typically will use three different types of roosts: A day roost which can be a warm; the night roost is in the open, but with foliage nearby; and the hibernation roost.

Considered a common species with no threat with some concern they are sensitive to human encroachment.





# Western Red bat

*(Lasirurs blossevillii)*

Considered to be one of the more beautiful bat species with dense shaggy fur from brownish-yellow to an almost bright orange with white hair tips and white fur on its neck.

Life span is about 10-12 years.

Is an insectivore seeking flying insects such as moths, flying ants and beetles

Found in western Canada, United States, and Mexico and Central America.

They migrate to the southern part of their range to hibernate. They are solitary by nature but will gather in larger nursery roosts during the summer.

Prefer riparian areas dominated by walnuts, oaks, willows, cottonwoods, and sycamores where they roost in these broad-leafed trees.

They are well camouflaged in their tree roosts. When they fold their wings over their bodies' they resemble dead leaves.

Not listed as threatened or endangered, however, concerns over the loss of suitable riparian habitats



# Western Pipistrelle

*(Pipistrellus hesperus)*

Smallest bat in the United States. Its fur varies from a reddish brown to golden brown on top and a white underside. Its face and ears are black.

Life span is around 10-13 years.

Are often seen foraging for food as many as two hours before other bat species emerge from their roosts.

Are insectivores, feeding mostly on small swarming insects like moths, flies, beetles, mosquitoes, and wasps.

Can be found from southern Washington through the western United States and to southern Mexico. The wintering habits of this bat are not well known.

May occupy rodent burrows in the ground if the habitat does not provide other suitable shelter will hibernate in mines, caves, and rock crevices.

It is one of the most common bats of the desert southwest and not listed as threatened or endangered at this time.



# Spotted bat

*(Euderma maculatum)*

Is solitary and territorial and is one of the rarest bats in North America. It is a species of special concern.

One of the few bats who's echolocation sound is low enough to be heard by humans.

Has large ears which have a pinkish tone. Its body is jet-black in color with two large white spots on its back and one on its rump and snow-white fur on its belly.

The ears are rolled up around its head when it is resting and inflate with blood and unroll when the bat becomes active.

Is an insectivore with moths being its food of choice, tearing off the wings of the moth and eat only the abdomen.

Found from British Columbia, Canada southward throughout the western United States and into Mexico.

Will migrate to warmer regions in the winter and will also go into a torpor in cold weather. (body temperature will fall to that of their surroundings and its heart rate will slow)



# Large Colonies of Bats

About 1,500 bats live in a part of Kartchner Caverns in southern Arizona. A maternity colony of a species known as cave myotis lives there from approximately May through mid-September. They return to the cave each year to give birth and rear the young bats. The state park closes that part of the cave to public tours to protect that process.

The Bracken Bat Cave in Texas is home to the world's largest bat colony. Nearly 20 million of Mexican free-tailed bats roost in the Bracken Cave each year between March and October. Learn more about The Nature Conservancy's efforts to secure 1,521 acres to protect this vital species.

Austin is a seasonal home to North America's largest urban population of Mexican free-tailed bats, which live beneath the Congress Avenue Bridge. Approximately 1.5 million bats reside there!

The public can report bat colonies or observations of sick or dead bats to [bats@azgfd.gov](mailto:bats@azgfd.gov).



# Credits

Arizona's Game and Fish Department at <https://www.azgfd.com/?s=bats>

Arizona Desert Living at <https://www.my-arizona-desert-living.com/Arizona-Bats.html>

AZCentral at

<https://www.azcentral.com/story/travel/arizona/2020/03/19/bats-in-arizona-facts-myths-are-bats-dangerous-where-do-they-live/5075342002/>

[The Nature Conservancy at https://www.nature.org/en-us/about-us/where-we-work/united-states/arizona/stories-in-arizona/top-10-bat-facts/](https://www.nature.org/en-us/about-us/where-we-work/united-states/arizona/stories-in-arizona/top-10-bat-facts/)

<https://www.britannica.com/animal/free-tailed-bat>

Bat Conservation International Web site at <https://www.batcon.org>

Images credit: U.S. Fish and Wildlife Service unless otherwise noted



Questions?

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