



EXTENSION

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BATS - Essential Members of the Southern Nevada Community

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INTRODUCTION

Of all the animals inhabiting the southwest, few have the undeservedly bad reputation that bats endure. Contrary to their "spooky" status, these are important members of desert ecosystems, playing a major role in the control of insects and pollination of desert plants. As human development expands further into deserts and other previously uninhabited lands, the territory and food supply available to bats changes or decreases. Roughly one half of American bat species are in decline. Six are on the Endangered Species list and the US Fish and Wildlife Service lists 26 as "Species of Concern". This reflects the situation worldwide.

ECOLOGY and BIOLOGY

With nearly one thousand species, bats dwell in most places on earth, except for extremely cold or hot climates and some remote islands. In the United States, 45 species have been recorded, of which 22 have been found in Nevada. While many species of bats reside in caves or mines, others inhabit trees, old buildings, bridges or culverts. Bat houses can provide shelter for bats in suburban areas.

Bats are not related to birds, nor are they mice. They are a unique group, and among all mammals, only bats can truly fly. Their group (order) name, Chiroptera, literally means "hand wing". Animals such as flying squirrels do not fly, but only glide from place to place.

Fossil records indicate that bats have maintained a form much like their current one for approximately 50 million years, but there is much variety among the diverse species. The differences include size, habitat, diet and appearance.

A bat can weigh (depending on its species) from less than an ounce to over 3 pounds. Flying foxes (found only in Asia) may have wingspans greater than two yards across.



As a night hunting animal, bats are the major predator of night-flying insects. Insects are the diet staple for 70% of all bats worldwide, although some bats species consume exclusively fruit, and others are carnivorous, eating insects, fish, lizards, frogs and birds. In Latin America, three species are vampire bats, living on drops of blood. Most North American bats are insectivorous, which tend to be relatively small.

Despite that small size, they are prodigious eaters. A single little brown bat (*Myotis lucifugus*) is capable of ingesting well over six hundred mosquito-sized insects in an hour. It may eat half its weight in insects in a single night. In addition to mosquitoes and small flying insects, bats prey on moths, spiders, cockroaches and other beetles. The Pallid Bat (*Antrozous pallidus*), a native of Southern Nevada, will land on the ground and eat scorpions as well as other ground dwelling insects. As a result of their insect diet, bats perform a major role in diminishing the populations of pests that injure plants and animals.

Other desert bats pollinate the century plant (agave), as well as certain columnar cacti (organ pipe and saguaro). Night blooming plants with large sturdy flowers are most likely to rely on bats for pollination.

Most bats in the desert southwest are social animals, living in colonies. Female cave-dwelling bats frequently produce their offspring nearly simultaneously, creating large nurseries of thousands, or even hundreds of thousands, of babies. The bat reproduction rate is one of the lowest among mammals, usually producing only one or two, offspring per year.

In comparison to other similar-sized mammals, bats tend to be long lived. They may live for 15 years or more and there is a record of a little brown bat having lived in the wild for 32 years.

Contrary to myth, bats are not blind. In fact, the California leaf nosed bat (*Macrotus californicus*) hunts ground dwelling insects by sight. Despite possessing the ability to see, the Microchiroptera (new world bats) navigate primarily using a kind of sonar. A bat will emit noises through its mouth or nose, and the noises are reflected back off objects. This process, called "echolocation" enables these flyers to maneuver through the dark. The bat is then able to determine the location of prey or a potential obstacle. With such an excellent navigation system, it is impossible for a bat to get tangled in someone's hair.

Bats generally do hang upside down when resting; this position permits them to take flight quickly, by simply letting go of the perch. Bats in Nevada generally survive winters either by migrating south or hibernating. During hibernation, their metabolism slows, sometimes to a rate 90% lower than their active state.

ATTRACTING BATS TO YOUR YARD

Bats are so effective at decreasing night flying insect problems that it may be desirable to attract them. The best way is to attract certain insects that provide food for bats. Among the plants that serve this purpose are: cornflower, phlox, salvia, silene, spearmint, and stock. These are generally easy to grow and provide scented flowers. Evening blooms, such as four o'clocks, moonflower, and nicotiana, are also good additions to a bat garden.



While they have not been very successful in Southern Nevada, bat houses may also be part of a

BAT HOUSES

Bats are particular about where they will reside, but they will often move into a properly built and located bat house (or bat box). These are similar to birdhouses, except that the opening is located on the bottom of the house. This is the preferred entry for bats, and reduces problems with other animals such as squirrels and birds.



Do not use pressure treated lumber for bat houses. Rather, use exterior grade plywood, ½ inch for the front and back exterior walls, cedar for the sides and ¼ inch for the inner partitions. Inner partitions create roosting chambers, which should be spaced about 1 inch apart. The house should be caulked to weatherize it. In Southern Nevada, where temperatures exceed 100° F, it should be painted white.

There are bat house kits available from many sources, and garden supply stores often sell fully assembled houses for bats.

A bat house must be mounted close to the bats' hunting area and to water. It should be placed fairly high (at least 15 feet) on a building or a wooden pole. Houses on metal poles appear to be unattractive to bats. Often a bat house will remain uninhabited for a couple of years before bats move in.

Bat conservation International (www.batcon.org) provides directions on building bat houses. This website also provides information on many other bat-related issues.

The University of Wisconsin provides detailed directions on building a successful house for big and little brown bats. The web address is <http://www.dnr.state.wi.us/org/land/er/publications/bats/assembly.htm>

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THREATS TO BATS

Across the world, many bat species are experiencing significant decreases in population. Research indicates that several factors contribute to this situation.

- **Loss of habitat** - Although many bats have adapted to life in populated areas, others reside only in undisturbed locales. As urban centers expand into previously uninhabited regions, these bats' roosting areas and food sources are destroyed. Closing caves to prevent human injury has brought about the death of many bats, as has vandalism or disturbance of roosting sites.
- **Ignorance** - Fear of bats is a common problem, particularly among people of European descent. On the other hand, in Chinese myth, a bat was considered a sign of good luck. Lack of information about the importance of bats in controlling insect pests, and in pollinating commercially important species, has caused bats to become victims of violence. Disseminating information about their necessary roles might help to correct this situation.
- **Pesticides** - Since many bats are insectivorous, they are at risk of becoming poisoned by eating insects that have been treated with insecticides. Insects that have walked on plants treated with herbicide or fungicides will not be injured by those chemicals, but the bat that eats those insects may have a toxic response. Pesticides drifting to flowers, or are carried by insects, can poison nectar-eating bats.
- **Cyanide** leaching ponds used by the precious metal mining industry have also been a problem to bats in Nevada.
- **Other chemicals** such as wood preservatives have been found to increase the metabolic rates of bats, possibly leading to their deaths.

DEALING WITH BATS IF THEY BECOME PESTS

The best method for removing bats from houses (eaves, under shingles, within walls) will depend on whether it is an entire colony or a single bat.

The only certain way to evict bats is to exclude them.

If a number of bats has taken up residence around the home, first find out what openings they are using for ingress and egress. Since bats emerge to hunt around sunset, stand outside the house at that time to observe the openings from which they are emerging. Cover each of the emergence sites with a piece of polypropylene bird netting. Let the netting extend at least a foot below and to each side of the opening. Tape the net in place so that one or two inches hangs free from the building. In this way, bats will be able to exit, but will be unable to re-enter the building.

Bat Conservation International information indicates that a single healthy bat found flying in a home is often a lost juvenile (<http://www.batcon.org/discover/unguest.html>). If a single bat is found in a home, the first and simplest method is simply to open doors and windows, turn out the lights within the house, and hope the bat will find its own way out.

Bats often appear around spotlights on streets or near buildings. They are hunting the insects that are attracted to those lights. Moving lights away from the house will result in bats being further from the house as well.



BATS AND DISEASE

Bats are wild animals, and should not be handled. They are also very shy, and try to avoid human contact. Since bats spend a good portion of their waking hours grooming, they are quite clean, and not usually vectors of diseases or insect pests.

Like any other mammal, however, bats may become infected with rabies, a fatal nerve disease that can affect humans. Less than ½ of 1% of bats are infected with this disease. It is rare for bats that live in colonies to become rabid. A rabid bat is far more likely to be a member of a species that remains solitary. Bats that become rabid invariably die.

Unlike an infected dog or other animal, a rabid bat tends not to be aggressive and will not bite unless it perceives that it is being attacked. To avoid risk of rabies, do not pick up any bat. It is more likely that a bat is sick if it can be picked up. There have been no reported cases of bats transmitting rabies to dogs, although there have been incidents of transmission to cats.

A bat that has been brought into the house by a household pet is probably sick and possibly rabid. If you find a bat that is unstable or moving erratically, do not handle it. Keep children and pets away from it. Call the local animal control office immediately.

The Clark County Health District issued these guidelines to avoid exposure to rabid bats:

- *Never approach a bat. Bats seen during the day, on the ground, flying erratically, or inside of a home are probably sick. Animal Control should be notified immediately.*
- *Do not attempt to capture, handle or kill a bat.*
- *Immunize pets against rabies.*

It further states: "*Bats leave very small bite marks, therefore, if a bat brushes against a person it should be treated as a possible exposure.*"

WHAT HAPPENS TO A WORLD WITHOUT BATS?

Bats are the most important predator of night flying insects. Without bats controlling them, their numbers will increase. The response to a population explosion of insects is most likely to be an increased need for pesticides. Rates of insect transmitted disease and insect predation of crops could increase.

Plants that require pollination by bats would experience a decline, as they would no longer be able to set seed.

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