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ALL ABOUT BATS!



There are more than 1100 species of bats in the world and all are nocturnal. The majority provide valuable insect control to our cities and natural areas through predation of night-time flying insects, such as adult mosquitoes. Arizona has 28 species of bats, with populations in desert, chaparral, forest, and urban habitats. Arizona's bats range from 2.5 inches (the Western Pipistrelle Bat) up to 7.5 inches long (the Greater Western Mastiff Bat). For a comprehensive list and species-specific information on Arizona's bats, see the Arizona Game and Fish Department's bat website:

http://www.azgfd.gov/w_c/bat_conservation.shtml.

Can Bats See?

Contrary to popular belief, bats are not blind. Most bats, however, do employ "echolocation" abilities, which help them find prey, shelter, etc., during their night-time activities. Echolocation involves emitting a sound and listening to the echo of that sound as it "bounces" off objects. This ultrasonic ability helps bats interpret their surroundings, including the distance, size, speed, and even texture of an object. Echolocation is particularly useful to bats for locating small, flying insect prey at night.

Most species of bats also have an advanced sense of smell, which is helpful for some species that must identify their offspring amidst millions of other bats in a maternity colony.

What do Bats Eat?

70% of the world's bats feed on insects; the remainder feed on fruit, nectar, meat, and fish. A very small percentage of bats feed on blood ("sanguivores"). None of these so-called vampire bats occur in the United States. The majority of Arizona's bats feed on a variety of insects ("insectivores") and other arthropods, and a smaller number feed on pollen and nectar ("nectivores").

"A colony of 150 Big Brown Bats (*Eptesicus fuscus*) can protect local farmers from 33 million root worms in a single summer."

– Bat Conservation International
<http://www.batcon.org>

Aerial insectivorous bats begin their feeding at dusk and are often seen flying over open areas, such as parks. They

capture a variety of flying insects, including mosquitoes and gnats. One bat can capture *hundreds* of mosquito-sized insects in just one hour! Aerial insectivorous bats may also be drawn to insects flying around lights, such as moths.

Other insectivorous bats are gleaners, and hunt by gleaning insects from vegetation or the ground; prey includes crawling arthropods (centipedes, scorpions, beetles, etc.), grasshoppers, katydids and the like. Regardless of their feeding style, there can be no understating the fact that insectivorous bats benefit pest management!

Nectivorous bats feed on pollen and nectar, and as they move from one plant to the next they provide valuable pollination

(similar to bees). Three species of nectivorous bats live in the United States; Arizona is host to two of them. Nectivorous bats are critical to the pollination of columnar cacti and agave in Arizona. Columnar cacti include the saguaro and organ pipe. Pollination of agave and various cacti would drop approximately 97% without our nectivorous bats!



The endangered Lesser Long-nosed Bat is a primary pollinator of the flowering Saguaro, the Arizona state flower. Photo by Merlin D. Tuttle.

Nectivores also aid seed dispersal of the plants they pollinate. In some areas of Arizona, the Lesser Long-nosed Bat, an endangered species, and the Mexican Long-tongued Bat play an important role in pollination and seed-dispersal of columnar cacti and agave.

How do Bats Live?

Like most small mammals, bats have babies in the late spring and summer. The females of many species form maternity colonies April through August in caves, cavities in trees or Saguaros, attics, bridges, and even palm fronds. Maternity colonies in Arizona may contain tens of thousands of individual bats.

Bats give birth to just one live off-spring per year. The young are fed mother's milk (bats are mammals, after all), and are typically flight-ready by one month of age. For their size, bats are the slowest reproducing mammal in the world, making their populations vulnerable to decline.



Arizona Children's Environmental Health Coalition

After the maternity colonies disperse – late summer to early fall – bats may be found roosting on protected or quiet exterior walls of buildings. These are migratory or transient bats, and their presence does not necessarily indicate a permanent colony. The presence of these bats is usually short-term, and as the season progresses they will move on. Similar sightings of bats on building walls may also occur following disorientation due to inclement weather (i.e., rain and wind).

Bats that do not migrate will hibernate, particularly in the northern and higher elevation areas of Arizona. In the lower elevations of the state, it remains warm enough that most bat species will be active year-round.

Bats and their various behaviors vary widely from one area of the state to the next, between seasons, between species, and among habitats. But often they are found in urban areas, seeking refuge and providing valuable insect-eating benefits to our neighborhoods and cities. In school and child care facility environments, bats provide learning opportunities for children and staff. **Their presence in these settings also requires education about the rabies virus and appropriate behavior around wild animals.**

*You would not approach a skunk in a school yard and touch it, would you?
...The same should hold true for bats.*

A few preventative tips on bats and rabies include:

1. Fall is the best time of year to begin exclusion maintenance on suspected roosts in structures. Bats have a very high fidelity to their maternity roost and will return to the same roost (like pigeons and doves) each spring so physical exclusion is required in these cases.
2. Bats are protected by state law. Specific guidelines are recommended for exclusion practices (see “Batty About Bats”, University of Arizona).
3. Exposure of a bat’s internal tissues or body fluids (including saliva) to a person’s skin or mucous membranes requires immediate washing with soap and water. The bat should be caught and submitted to the State Department of Health Services for rabies testing.
4. Cases involving suspected exposure include a wild bat in the room with an unsupervised child, a sleeping or incoherent person, or a person with sensory impairment; submit the bat for rabies testing.
5. On average, less 0.5% of bats are infected with the rabies virus. Lack of caution around sick bats results in a higher risk of rabies exposure. Staff and students should be aware of rabies as well as the benefits of bats.

Contact your district IPM Specialist or the University of Arizona Urban IPM for the comprehensive bulletin “Batty About Bats”.

Upcoming Coalition meeting: Bees and Bats!

RSVP your spot with Dawn or Jennifer today!!

- ◆ Thursday Nov. 8th, 10 am – 4 pm
- ◆ Maricopa County Extension Facility (Phoenix)
- ◆ Five CEU's (ALL)
- ◆ Bee remediation techniques
- ◆ Arizona Game & Fish bat biologist, Nancy Renison, will lead bat presentation followed by a mock-inspection for bats
- ◆ Beverages & snacks provided (lunch on your own)

Iron mad in our midst...

Coalition member Paul Cardosi competed in the Olympic Distance Iron man race in Tempe, AZ on 10.28.07. Paul completed a 1000-meter swim, 30-mile bike and 6.2-mile run in one of the fastest times of the day. Congrats Paul!!



Do you have school IPM contacts along the border?

The UA school IPM implementation team is taking the program to border schools. Both Arizona and Sonora, Mexico, border schools will be introduced to sIPM in the coming months... We are flushing out IPM contacts in that region – let us know if you have any!

Information sources:

1. “Got Bats?” Fact sheet. Arizona Game & Fish Department.
2. “About Bats, Caves & Deserts.” Carlsbad Caverns and National Park. <http://www.nps.gov/archive/cave/home.htm>.
3. Arizona Department of Health Services.
4. Oakland Museum of California. http://www.museumca.org/caves/onli_echo.html

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For information on Arizona’s IPM in Schools program contact Dr. Gouge, 520-568-2273, dhgouge@ag.arizona.edu



Few bugs are bad! More than 95% of all insect species are beneficial to humans