WILDLIFE NOTES

Spotted Bat

Photos by Merlin Tuttle

Conspicuous and distinctive, with long, silky polka dot fur and huge pink ears with pink wings to match, the Spotted Bat (*Euderma maculatum*) is the easiest American bat to identify. If it flew by day, it would surely be considered one of the state's most beautiful animals.

Euderma means "good skin", *maculatum* means "spotted". It belongs to the unique order of bats, the chiroptera (hand wing) which are unrelated to rodents.

RANGE

The patchy distribution for this rare bat has been deduced from about 100 scattered specimens. From late spring into early fall, Spotted Bats have been captured as far north as British Columbia and through most of the western states including New Mexico. They range south along the Sierra Madre into central Mexico. Winter habitat is poorly documented.

HABITAT

The rarity of this bat and the diverse habitats in which it has been seen have caused confusion about its preferences. Some have been captured in pine forests at high elevations (8000-9000 ft); others came from a pinyon pine-juniper association; and still others from desert scrub areas.

Spotted Bats are known only from about 20 locations in western and southern New Mexico. Almost all of these are sites where bats were captured in mist nets over water, so information about their roosts is speculative. However, since most capture sites had rock cliffs within 1 mile and there are almost no records of Spotted Bats roosting in caves, it is assumed that cracks and crevices in cliffs and canyons are their refuges.

Given the wide distribution of the moths on which these bats feed, the bats' distribution may be independent of elevation or plant associations, but very dependent on specific roost availability and water.

DESCRIPTION

Three highly visible white spots on its jet black back, a white belly and large-than-life ears (almost 2 inches!) make *Euderma* one of the most striking bats in the world.

The large white spots that give the bat its name are on each shoulder and on the rump; a smaller white spot is at the base of each translucent pink ear. The ears, nearly as long as the bat's body, are the largest of any American bat. They are held erect and forward during flight, but furled like a ram's horns to conserve heat and water when the bat roosts.

For New Mexico, it is a moderately large bat, weighing about ¾ of an ounce. The body is a bit over 4" long. Despite the 14" wingspan, Spotted Bats are delicate. In the hand, they are docile and seem to have no more substance than does a cottonball.

BEHAVIOR

Little is known about Spotted Bat behavior beyond what can be deduced from netting records or

generalized from related species. Because only a few (often only one) bats have been captured at any one locality, we assume they are solitary rather than colonial.

Spotted Bats may stake out feeding territories to which they faithfully return night after night. There are a few accounts of apparent territorial disputes involving vocalization and direct contact. Spotted Bats emit a loud, high-pitched (but audible to humans) click that may be an agonistic signal or an alarm sound. It is not emitted while the bats are engaged in feeding or swooping down to drink.

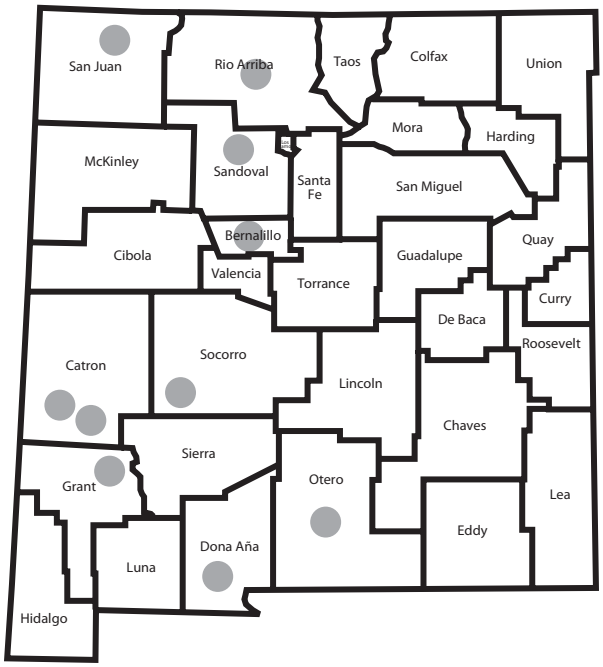
DIET/FEEDING

Foraging late at night, Spotted Bats are highly specialized feeders, subsisting almost entirely on moths over their entire range. They catch all their prey using echolocation. Compared to many other insectivorous bats, Spotted Bats use low frequencies, about 9-12 kHz. Since most humans over 30 years old don't hear sounds much above 10 kHz unless they are very loud, Spotted Bat echolocation is still at or above the upper end of human hearing. Since many moth species have evolved "ears" (tympanic membranes) that are specifically tuned to the very high frequencies (60-100 kHz) made by most bat species, it is speculated that *Euderma* are using a stealth tactic by echolocating with low frequencies that moths cannot hear.

No fans of roughage, Spotted Bats pull the tough heads and wings from moths before consuming the tender abdomens.

REPRODUCTION

As is the case with most bats, *Euderma* females bear one pup each year in the late spring or early summer. Males in reproductive condition have been found in late summer and fall, indicating that *Euderma* may mate late in the feeding season when they are fat and in peak physiological shape. If bats were "average" small mammals, the young would then be born in early winter when bugs are scarce, but many temperate zone bat species have evolved the physiological specialization of delayed fertilization. The female sequesters the sperm during hibernation so that sperm doesn't meet egg until spring and the bat pup is born and weaned during peak insect activity.



A Spotted Bat newborn is about the size of a green grape but still, at 4-5 grams, it is about ¼ of the mother's weight.

CONSERVATION

Spotted Bats have been able to hide from the efforts of science. Most likely they were never numerous; they fly at night, live in remote high crevices in widely dispersed places. They hunt alone. The dearth of information makes biologists nervous. How do we know if this species is in trouble?

Cause for cautious optimism has come from the recent research of Dr. Keith Geluso. He revisited 16 historic Spotted Bat capture sites in 2006 and found the animals at 92% of them. He also found 4 new localities. So at least some Spotted Bats have persisted for over 50 years in the areas of New Mexico where they were first discovered.

But given that bats have the formula for going extinct: "Have a bad reputation and a low birth rate", and about ¼ of the bat species in the U.S. are threatened, endangered or ranked as vulnerable, vigilance is in order for the rare Spotted Bat.

The Spotted Bat is very specialized in terms of its food habits and habitat needs. Subtle habitat disturbances in a few places could extirpate a large fraction of the known population. Land development below the roosts, quarrying or mining, or recreational activities like hiking and climbing on roost cliffs, could cause the bats to abandon these sites. Chemicals used to control crop or forest pests could also adversely affect these entirely insectivorous bats.

Recognizing the rarity and vulnerability of the Spotted Bat, NMDGF has ranked it as state-threatened.

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