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# Western Bat Working Group

## Species Accounts Developed For the 1998 Reno Biennial Meeting Updated at the 2005 Portland Biennial Meeting

## *EUDERMA MACULATUM* SPOTTED BAT

**2005 Update by: Carol Chambers and Michael Herder**
**Original account by: Bob Luce**

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***EUDERMA MACULATUM***
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I. DISTRIBUTION: *Euderma maculatum*, a member of the Family Vespertilionidae, occurs throughout western North America, from British Columbia as far south as Jalisco, Mexico. In the United Sates, it is known from all the states west of and including Montana, Wyoming, Colorado, New Mexico and Texas. Although broadly distributed, this species is rarely common, but may be locally abundant in southern British Columbia, northern Arizona, Arizona/Utah border, and west Texas. Spotted bats have been found from below sea level to 2700 m elevation, occurring from arid, low desert habitats to high elevation conifer forests. Prominent rock features appear to be a necessary feature for roosting. Winter range and hibernacula are unknown for most its range, though the species has been captured year-round in the southern part of its range and is may be year-round in central Oregon with the exception of December and January.

II. STATUS: Global Rank: G4. IUCN Red List Category: LR – Lower risk. Natural Heritage State Ranks: AZ – S1S2; CA – S2S3; CO – S2; ID – S2; MT – S1; NM – S3; NV – S1S2; OR – S1; TX – S2; UT – S2S3; WA – S3; WY – S3. Canada Ranks: BC – S3S4. USFWS: No status. BLM and FS: Sensitive species in several states and regions.

III. The spotted bat has been listed as a species of concern because of limited information available, and uncertainty as to life history and population trends. States with specific ranking include: AZ – Wildlife of Special Concern Candidate; CA – Species of Special Concern; ID – Species of Concern; MT – S2; NM – Threatened; NV – Threatened; TX – State Threatened Species; UT – Wildlife Species of Concern; WA – State Monitor Species; WY – NSS2. Canada Ranks: BC – Special Concern Species.

IV. IDENTIFYING CHARACTERISTICS AND LIFE HISTORY: The spotted bat is easily identifiable because of its unique coloration: dorsal black fur with three white spots, white ventral surface, and long, pink ears (37-47 mm). Weight ranges from 13-20 g; wingspan is 34-38 cm. It is the only species in its genus. Genetically, *Euderma maculatum* is closely related to *Idionycteris phyllotis* (Allen's lappet-eared bat).

Spotted bats likely breed in late summer with females giving birth to a single pup in early summer (May or June). Postpartum females have been captured from June to late August. They appear to be solitary animals but occasionally roost or hibernate in small groups. Roost sites are cracks, crevices, and caves, usually high in fractured rock cliffs. In British Columbia and Arizona, bats showed high roost fidelity, using the same roosts nightly.

This species has been found in vegetation types that range from desert to sub-alpine meadows, including desert-scrub, pinyon-juniper woodland, ponderosa pine, mixed conifer forest, canyon bottoms, rims of cliffs, riparian areas, fields, and open pasture. During summer, bats may travel from roosts in desert-scrub to forage in high elevation meadows, returning to roosts within an hour of dawn. Males and females are capable of long distance (20 km in British Columbia, 80 km in Arizona) and rapid (50 kph) flight, thus foraging ranges can be large. Spotted bats avoided conspecifics when foraging in British Columbia, probably to reduce competition for food resources. In Arizona and Oregon, conspecifics did overlap when foraging. In British Columbia, bats foraged within 6-10 km of day roosts, maintaining exclusive foraging

areas. In Arizona, spotted bats traveled up to 40 km from roosts, and night roosted for 1 to 3 hrs in or away from their day roost. Bats in Oregon and Arizona did not appear to be as predictable in their foraging locations as in British Columbia, but predictability of foraging may change over seasons. Early in summer, foraging patterns may be restricted to a few locations with abundant prey. As prey become more plentiful later in summer, spotted bats may be able to acquire food in shorter foraging periods across more locations.

When foraging, spotted bats fly alone from 2 to 50 m above ground, often within 10 m. They echolocate at a pitch (12 to 6 kHz) audible to humans but often not audible to prey until bats are too close (1 m) for prey to evade them. Spotted bats forage primarily on moths, but do not appear to select particular moth species. They likely feed on any moth they encounter that is appropriate handling size (8-12 mm in length), particularly Noctuids. In Arizona, they also fed on Lasiocampid and Geometrid moths. They avoided some moths such as those in the family Arctiidae (wooly bears), probably because the dense hairs of these moths make them distasteful.

Many new records of spotted bats have been added so this species may be more common than previously suspected. They are infrequently captured; spotted bat captures are often <0.5% of total bat captures in an area. They may be sensitive to light and noise, or fly high enough that tall net sets (e.g., 4.5 m) are needed to capture bats in some areas. In the southwest, spotted bats have been most often captured over water, but occasionally along dry canyon rims. It is probably easier to capture them because water is so limiting.

It is unknown whether spotted bats migrate or hibernate locally. At lower elevations, they do not appear to migrate, but in British Columbia, they are present at least May though August. In Arizona, spotted bats have been reported to be active year-round, although activity during winter months is generally on warmer nights with favorable weather conditions. Specimens taken in September and October may indicate post-breeding wandering but could be elevational movement towards winter range.

IV. THREATS: Little is known about possible threats to spotted bats because of lack of knowledge of this species. Because the spotted bat roosts in remote locations, threats to roosts seem unlikely. However, recreational rock climbing may cause impacts in some areas. Dam construction that inundates high cliffs and canyons may remove roost locations. Urbanization in some areas (for example, mesas in the Sierra foothills in California, areas around Bend and Redmond, Oregon) may affect roosting habitat since spotted bats appear to roost in some of these areas. Collection of spotted bats by humans and use of pesticides that may bioaccumulate in bats or kill prey may also be threats. In Montana, coal bed methane development creates toxic ponds that may harm animals. Loss of foraging habitat (grazing of meadows and desert-scrub, conversion of desert wash vegetation, or conversion of native grasslands to cheatgrass or other invasive species) may reduce food availability. In the southwest, loss of accessible, open water that has been introduced in many areas for grazing livestock may impact bats because of the bats' high rates of evaporative water loss. As with most bat species, threats include habitat destruction or alteration, disturbance, sensitivity to pesticides and other pollutants, and overexploitation.

In general, the long term persistence of North American bat species is threatened by the loss of clean, open water; modification or destruction of roosting and foraging habitat; and, for hibernating species, disturbance or destruction of hibernacula. Chemicals in the environment that affect bats or their prey are also a threat. Because of low fecundity and long generational turnover, many bat populations may be vulnerable to human-induced pressures.

V. SURVEY METHODS: Netting can be effective where water is a limiting factor in xeric conditions, although netting is not effective in many portions of range. This species is easy to detect acoustically (with microphones sensitive to audible frequencies). Calls are audible to many people. Identification in hand is easy as the species is morphologically distinct. *Euderma maculatum* is difficult to distinguish in flight from *I. phyllotis*; but is otherwise distinctive. Cliff roosts are very difficult to locate and are generally inaccessible.

VI. GAPS IN KNOWLEDGE: More information is needed on life history, ecology, reproduction, habitat use, patterns of movement, distribution and abundance.

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Inferred geographic range map for spotted bat. Used with permission from Bat Conservation International (http://www.batcon.org/). This map is only an estimation of distribution and may not reflect up-to-date capture data.