#551

Western Bat Working Group

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

EUMOPS PEROTIS WESTERN MASTIFF BAT

2005 Update by: Melissa S. Siders Original account by: Elizabeth D. Pierson

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I. DISTRIBUTION: *Eumops perotis*, a member of the Family Molossidae, has a disjunct distribution, with two subspecies confined to South America. The subspecies that occurs in North America, *E. p. californicus*, ranges from central Mexico across the southwestern United States (parts of California, southern Nevada, Arizona, southern New Mexico and western Texas). Recent surveys have extended the previously known range to the north in both Arizona (several localities near the Utah border) and California (to within a few miles of the Oregon border). Distribution in Nevada and Southern Utah is not well understood. Until recently, Nevada records were limited to a single record from Southern Nevada. A recent study in southern Nevada has acoustic records for *E. perotis* from June through October in 2004. The species has also been detected acoustically in southern Utah. Published information suggests that the species occurs only to 375 m in California, and 1,100 m in Texas. Recent surveys in California, however, have documented roosts up to 1,400 m, and foraging animals at > 2,700 m. Acoustic records of *E. perotis* in California document foraging or commuting at up to 3,050m in the southern Sierra Nevada. Recent surveys in northern Arizona have documented roosts at approx. 1,200 m, and foraging animals at >2,500 m. The distribution of *E. perotis* is likely geomorphically determined, with the species being present only where there are significant rock features offering suitable roosting habitat. It is found in a variety of habitats, from desert scrub to chaparral to oak woodland and into the ponderosa pine belt and high elevation meadows of mixed conifer forests (Figure 1).

II. STATUS: Global Rank - G5. National Rank – N3., State Ranks: AZ – S2S3; CA - S3?; NV – S2; TX - S3., former category 2 candidate species. A Species of Special Concern in California, where severe declines have been documented in the Los Angeles basin.

III. IDENTIFYING CHARACTERISTICS AND LIFE HISTORY: *E. perotis* can be distinguished from all other North American molossid (=free-tail) species based on size. With a forearm of 73-83 mm, it is North America's largest species. While it may overlap somewhat in size with the smaller *Eumops underwoodi*, the tragus is broad and square in *E. perotis*, and small and rounded in *E. underwoodi*.

E. perotis is primarily a cliff-dwelling species, where maternity colonies of 30 to several hundred (typically fewer than 100) roost generally under exfoliating rock slabs (e.g., granite, sandstone or columnar basalt). It has also been found in similar crevices in large boulders and buildings. Although maternity roosts for many bat species contain only adult females and their young, some *E. perotis* colonies contain adult males and females at all times of year. Roosts are generally high above the ground, usually allowing a clear vertical drop of at least 3 m below the entrance for flight. *E. perotis* have been estimated to forage as much as 2000 ft above the ground; regularly forage at 100 to 200 ft over the substrate; and probably forage for considerable distances from roosting sites. *E. perotis* may forage in flocks. In California, it is most frequently encountered in broad open areas. Its foraging habitat includes dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, and agricultural areas. In northern Arizona, it is also encountered in broad open areas, and captures are limited to larger bodies of water. Its foraging habitats are similar to those described for California, but it also includes high elevation meadows surrounded by mixed conifer forests. The diet consists primarily of moths (Lepidoptera), but also includes beetles, crickets and katydids. In Arizona, large Lepidoptera (up to 60 mm) pre-dominated for prey species, although a few small (about 8 mm) hymenopterous insects were consumed.

E. perotis does not have a late emergence, but may have been assumed to have late emergence due to long distances traveled from roost sites to capture locations over water. Studies in California and Arizona seem to indicate that they emerge from roosts just after dark.

Unlike vespertilionids which mate in the fall, North American molossids, including *E. perotis*, appear to mate in the late winter/early spring and give birth to a single young in the early to mid-summer. Available data suggest that, although most *E. perotis* young are born by early July, parturition dates vary extensively and births are not synchronous, even within colonies. Unlike some Molosside species (e.g., *Tadarida brasiliensis*) which undergo long distance seasonal migrations, *E. perotis* appears to move relatively short distances seasonally. It does not undergo prolonged hibernation, and appears to be periodically active all winter, and thus may seek winter refugia that are protected from prolonged freezing temperatures.

E. perotis emit an audible echolocation call, and aural detection is the best survey method. Acoustic monitoring is transforming our understanding of this species, especially foraging habitat and species distributions. These strong, fast fliers cover an extensive foraging area and can be detected flying throughout the night. The species appears to forage over open areas, and many individuals have been heard feeding over agricultural fields in the Imperial Valley and along the Lower Colorado River.

The species has been heard in open desert, at least 15 miles from the nearest possible roosting site (Vaughan, 1959). In Arizona, capture to roost distances were >30 km. Often multiple animals are detected together, and this species may travel or forage in groups. Western mastiff bats move relatively short distances seasonally. Although capable of lowering their body temperatures for short periods of time, they do not undergo prolonged hibernation, and may be periodically active throughout the winter. In California and Arizona, *E. perotis* have been detected at all seasons, although they may change roost sites.

IV. THREATS: Like most other North American species of bat, the long term persistence of *E. perotis* is threatened by: low fecundity, high juvenile mortality, long generational turnover; loss of clean, open water; loss of riparian vegetation; pesticide application. Population trends for this species are difficult to assess in many areas because of an absence of historical roost records.

Additionally, *E. perotis* in particular, are threatened by urban expansion. When colonies are within or in close proximity to human dwellings, they are vulnerable to disturbance, vandalism and the hysteria which often surrounds bat colonies, causing extermination by pest control operators and public health departments. Two colonies in buildings in the Los Angeles area (Norco and Rancho Cucamonga) were eradicated recently in the name of public health.

Any construction activities (e.g., quarry operations, highway projects, water impoundments) that impact cliffs or boulders could also affect western mastiff bat roosts. Rock climbing may also disturb roosting bats, and is a rapidly-growing recreational activity in the range of *Eumops*. Communication with avid rock climbers suggest bat encounters do occur on climbs, and that hands or temporary climbing aids inserted into a roost crevice could cause abandonment of a site.

Since *E. perotis* forage over a large area, the huge amount of pesticide applications in areas such as the Imperial and Colorado River Valleys could have far-reaching effects. Non-chemical methods, such as the lepidopteron-attacking *E. perotis*, can reduce the prey base for western mastiff bat populations, which rely heavily on moths.

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, high juvenile mortality, and long generational turnover, many bat populations may be vulnerable to human-induced pressures.

V. SURVEY METHODS: Morphologically distinct. Most roosts are in cliffs and are highly inaccessible; quite frequently in building roosts. *E. perotis* can sometimes be found by surveying for guano and listening for loud chatter along base of cliffs. Effectiveness of netting varies regionally. *E. perotis* have been netted where open flight paths are evident, or water is limiting. *E. perotis* forage at considerable heights and captured at drinking sites. *E. perotis* calls are diagnostic and in the audible range; easy to detect species acoustically (better with low frequency microphone). Flight is distinctive except in areas of overlap with *E. perotis*.

VI. GAPS IN KNOWLEDGE: More surveys are needed, using acoustic techniques, to delineate the range of this species. More information is needed on distribution of breeding colonies, seasonal movements, roosting and foraging requirements. Methods need to be developed for assessment and on going monitoring of population size.

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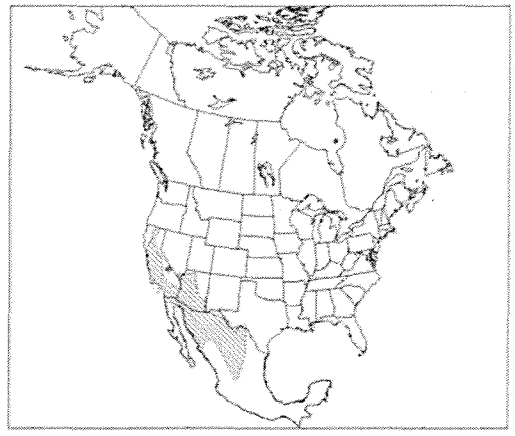

Figure 1. Range map (http://www.batcon.org/discover/species/eperotis.html).