

Big free-tailed bat, *Nyctinomops macrotis**Elizabeth D. Pierson & William E. Rainey*

Description: *Nyctinomops macrotis*, like all molossids, has a free tail tip which extends beyond the edge of the interfemoral membrane. It can be distinguished from the other three molossids which occur in California based on its size or forearm length. This species, with a forearm length of 58-64 mm, is larger than *Nyctinomops femorosaccus* (forearm 45-49 mm) or *Tadarida brasiliensis* (forearm 36-46 mm), and smaller than *Eumops perotis* (forearm 75-83 mm) (Barbour and Davis 1969, Milner et al. 1990). It has large, broad ears which are joined at the midline of the forehead, and extend beyond the tip of the nose when laid forward (Schmidly 1991). It weighs 22-30 g (Schmidly 1991).

Taxonomic Remarks: *N. macrotis* is in the family Molossidae. *N. macrotis* was first described from a specimen found in a tree hollow in Cuba (Gray 1839). The California form was described by Allen (1893). Although in the past it has been called *Tadarida macrotis* or *Tadarida molossa*, the currently accepted nomenclature is *Nyctinomops macrotis* (Freeman 1981, Koopman 1993). It is a monotypic species.

Distribution: *N. macrotis* is distributed from Uruguay and northern Argentina, northward through South America, mostly east of the Andes, through central America and Mexico into the southwestern United States, with records also from the Greater Antilles (Milner et al. 1990). In temperate North America, there are also individual records from eastern Kansas, Iowa, South Carolina and British Columbia (Hall 1981, Di Salvo et al. 1992, Nagorsen and Brigham 1993). Records are more common for Texas, Arizona, New Mexico, and Utah than for California.

There are very few records for this species in California. The type specimen for a form originally described as *Nyctinomops macrotis nevadensis* was most likely collected in California, although the exact locality is not known (Allen 1893, Allen 1894). There are several records from San Diego County (Huey 1932, 1954, August and Dingman 1973), one from Alameda County (Museum of Vertebrate Zoology, UC Berkeley, 1916), and a number from scattered locations in California, with a concentration in southern California (D. Constantine pers. comm.).

Surveys conducted in 1993-1995 (Pierson and Rainey 1996b, c) identified two possible localities for this species. A moribund specimen was found below a cliff face in San Diego County in April, 1991 (P. Brown pers. comm.). Acoustic and visual observations in November 1994 and May 1995 suggested that other individuals of *N. macrotis* were roosting at this locality (Pierson and Rainey 1996b, c). Recordings of echolocation calls possibly attributable to *N. macrotis* were also made at Barker Dam in Joshua Tree National Park on August 30, 1992 (Pierson and Rainey 1996b, c).

Recent records collected by the California Department of Health Services, although all of isolated and dead individuals, suggest that, though this species is rare, it has a scattered distribution throughout much of the state, and could be expected almost anywhere (D. Constantine pers. comm.).

Life History: Available information on the population biology of this species, although limited, suggests that adult females form nursery colonies, and give birth to a single young in June or July, with lactating females having been taken as late as mid-September (Barbour and Davis 1969, Constantine 1961).

Very little is known about the foraging ecology of *N. macrotis*. Ross (1967) found only macrolepidoperans (probably hawk moths) in the stomach of one individual. Easterla and Whitaker

(1972) examined 60 stomachs, and found that the most important food was large moths. Also occasionally included in the diet were crickets (Gryllidae), grasshoppers (Tettigoniidae), and flying ants (Formicidae).

Habitat: In the southwestern U.S., *N. macrotis* is primarily associated with arid, high relief landscapes, i.e., Big Bend National Monument in Texas or the canyonlands of southern Utah (Barbour and Davis 1969, Easterla 1973, Milner et al. 1990, D. Rogers pers. comm.). Easterla (1973) documented it in four plant communities -- arroyo, shrub desert, woodland, and moist Chisos woodland -- although the majority of animals were in the floodplain-arroyo association. Although it has been found at about 2,440 m elevation in New Mexico (Jones 1965), it is more typically detected below 1,800 m (Milner et al. 1990).

Relatively few roosts of *N. macrotis* are known. A colony of about 130 was discovered by Borell (1939) in the Chisos Mountains of Texas. The animals were in a horizontal rock crevice (ca. 15 cm wide and 6 m long), located about 12 m above a talus slope in a narrow, rocky canyon. Although animals have been detected in buildings and caves (Milner et al. 1990) -- two specimens from San Diego County were in buildings (Huey 1932, 1954b) -- the few colonies of this species that have been located in the southwestern U.S. have been in rock crevices in canyon settings (Milner et al. 1990). In Cuba, the species appears to roost in small groups and has been found in tree hollows (Silva Taboada 1979).

Status: Class II. Acoustic surveys were conducted from 1993-1995 at a number of localities throughout California (Pierson and Rainey 1996b, c). These yielded possible records of *N. macrotis* at one site in San Diego County and at Joshua Tree National Park, Riverside County. Thus, although this species may occur almost anywhere in the state, it is likely very rare. Also, since no reproductive females or juveniles have been identified in any of the published records, it still is not known whether this species breeds in California.

Alterations or disturbance of cliff habitat (i.e., water impoundment projects, highway projects, and recreational climbing) could potentially affect this species. Not enough is known regarding the habitat requirements of this species to identify other potential threats.

Management Recommendations: Additional surveys for this species (which could be conducted in the context of surveys for other species) are urgently needed, especially in the canyon areas of southern California (San Diego, Imperial, and Riverside counties). Acoustic sampling may be the most efficient and effective method detecting the presence of this species in an area. While molossidids are generally readily detectable acoustically, they also display a large variability in their echolocation calls (Simmons et al. 1978). This interpretation of acoustic data should be undertaken with caution until the range of variation within potentially similar species is adequately characterized.

BIG FREE-TAILED BAT

Nyctinomops macrotis



Locations verified by authors
(captures, observations, museum records)

- Post - 1978
- 1978 and before

- ▲ Constantine 1998
- CNDDDB 1979 -1998
- CNDDDB 1978 and before