

## Western Bat Working Group

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### Species Accounts

Developed For the 1998 Reno Biennial Meeting

Updated at the 2005 Portland Biennial Meeting

### *Idionycteris phyllotis*

#### ALLEN'S LAPPET-BROWED BAT

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I. **DISTRIBUTION:** Allen's lappet-browed bat (*Idionycteris phyllotis*) is one of the rarest bats in North America, occurring from central Mexico north through the southwestern United States, including Arizona, New Mexico, southern Nevada and southern Utah (Figure 1). It is also known as Allen's big-eared bat, Allen's lappet-eared bat, or Mexican big-eared bat. Although it ranges close to the California and Colorado borders, it is not yet verified from those states. Recorded locations range from Mojave Desert scrub to fir forest at elevations ranging from 403-3225 meters (m) (1320 to 9800 feet (ft)), although most captures are from elevations between 1,100-2,500 m (3,500-7,500 ft) in oak-juniper woodland and ponderosa pine forest.



Figure 1. Approximate range of *I. phyllotis* (Bat Conservation International, [www.batecon.org](http://www.batecon.org)).

II. STATUS: Global Rank - G4. State Ranks: Arizona - S2, California –no ranking; Colorado - no ranking; Nevada – S1; New Mexico - S2; and Utah - S1. Lappet-browed bat is a former U.S. Fish and Wildlife Service Category 2 Candidate for listing under the Endangered Species Act and is now a Species of Concern for U.S. Fish and Wildlife Service, a Candidate for listing by Arizona Game and Fish Department, a Species of Special concern in Utah , and a Bureau of Land Management Sensitive Species.

III. IDENTIFYING CHARACTERISTICS AND LIFE HISTORY: The lappet-browed bat can be distinguished from all other species by the presence of a pair of lappets projecting over the forehead from the median bases of the large ears, hence the common name of lappet-browed or lappet-eared bat. Based on 138 cranial characters, Tumlison (1993) split *Idionycteris phyllotis* into two subspecies that appear to have different habitat requirements. The preponderance of captures is in scrub woodland and forest, often associated with cliffs and rocky slopes, suggesting a roosting relationship with caverns and rock fissures. Maternity colonies have been found within passages in a large boulder pile (Commissaris 1961), in a sandstone crevice in a natural bridge in Canyon lands (M. Bogan pers. comm.) and a cliff in Grand Escalante (M. Siders, pers. comm.), under exfoliating bark on ponderosa pine snags (Rabe *et al.* 1998; Morrell *et al.* 1999) and in abandoned mines (Cockrum and Musgrove 1964, Brown and Berry 2001). In Arizona , the only known permanent maternity roosts of lappet-browed bats are in three mines in the vicinity of Union Pass in the Black Mountains, Mojave County . Pregnant individuals have been found in June, parturition occurs in mid- to late June, and lactation extends through July and early August. A single young is produced annually. Lactating females have been captured entering a mine after dark in Utah , possibly to catch moths inside the entrance and to night roost (M. Perkins, pers. comm.). R. Sherwin (pers. comm.) has also seen night-roosting bats and individual males in abandoned uranium mines in Utah . Individuals may move from higher elevation summer ranges to low elevation winter habitats (O'Farrell, unpublished data).

Foraging lappet-browed bats emit loud human-audible echolocation calls, similar to those of spotted bats (*Euderma maculatum*). Lappet-browed bats eat primarily small moths (6-12 millimeters) that possess simple “ears” tuned to ultrasonic frequencies, which may explain the use of lower frequency echolocation signals below the range of the moths’ hearing (Simmons and O’ Farrell 1977). The bats also emit human-audible communication signals, especially near roosts.

An August 2004 telemetry study of 12 post-lactating females from a mine in the Black Mountains demonstrated high roost fidelity when the bats traveled between 70-100 km (43-62 mi) roundtrip nightly to forage in the next mountain range to the east, despite the fact that there were many abandoned mines in the foraging area (Brown and Berry, 2004). Mesquite grassland, scrub oak and pinyon/juniper woodland were present in the higher elevation areas (1500-2000 m; 4921-6562 ft) where the bats were foraging. The elevation of the roost mine is 1000 m (3280 ft) in creosote bush scrub.

IV. THREATS: The threats to the identified lappet-browed bat mine roosts are from active mining and human entry. Chalk Peak Mine is the largest known colony of lappet-browed bats. Currently, the active quarry operation protects the roost from recreational entry; however the roost sites may be eventually mined. The area is under increased recreational pressure by the growing resident and tourist population in nearby Laughlin and Bullhead City . Another colony of lappet-browed bats at the Excelsior Mine (a.k.a. OK Mine) in the White Hills was collapsed in 1999 by renewed mining, possibly burying the bats. A mine roost at Union Pass was destroyed by relocation of a nearby highway (Cockrum *et al.* 1996). The threat of recreational entry into abandoned mines may be exacerbated because preliminary information suggests this species may not accept mine gates. In 2001, three mines used by lappet-browed bats at Union Pass were gated. In 2004, these mines were not occupied and the maternity colony had moved into a nearby un-gated mine.

In the forest range of this species, specific physical requirements and the ephemeral nature of exfoliating bark on tree snag roosts may be limiting (Rabe *et al.*1998). It is critical that proper forest management provide sufficient roosts for this species. The rarity and patchy distribution of this species, as well as the apparent high degree of specialized feeding strategy, compounds the sensitivity to perturbations or

disturbance. The potential separation of roosting and foraging locations makes management decisions difficult.

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: *Idionycteris* is captured relatively infrequently in mist nets. They may be difficult to locate during initial surveys. Finding roosts may be difficult, especially in trees and rock crevices, unless radio-telemetry is used. In mines, they are easy to detect since they roost in clusters on an open surface (e.g., domes of mines). However, without disturbing the cluster they can be mistaken for *Corynorhinus townsendii*. The easiest method of detection is acoustic (with a low frequency microphone). Most sequences are diagnostic, except they may be difficult to distinguish from *Euderma maculatum*, with which they geographically overlap throughout much of their range. A very distinctive social call is used, especially near roosts.

VI. GAPS IN KNOWLEDGE: Relatively little is known of maternity roost requirements or the range of roost types used, especially during the winter. Foraging behavior and seasonal requirements in different habitats needs further research. Reproductive biology and population dynamics are poorly understood. It will be necessary to gather these data to properly evaluate potential threats and provide adequate management protocols. The current lack of knowledge of lappet-browed bats suggests the need for focused surveys throughout their geographic range.

#### VII. RELEVANT LITERATURE:

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