ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract **Element Code:** AMACC01180
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CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Myotis evotis* (H. Allen, 1864)
COMMON NAME: Long-eared Myotis
SYNONYMS: *Vespertilio evotis* H. Allen, 1864
FAMILY: Vespertilionidae

AUTHOR, PLACE OF PUBLICATION: (H. Allen 1864). Smithson. Misc. Coll., 7(165):1-85(48). Publication under *Vespertilio evotis*.

TYPE LOCALITY: USA, California, Monterey.

TYPE SPECIMEN:

TAXONOMIC UNIQUENESS: *Myotis evotis* is one of 88 species of *Myotis* worldwide and 9 *Myotis* species within Arizona. It is composed of six subspecies based on analysis of cranial morphology and pelage characteristics. Manning (*in* Wilson and Reeder 1993) described 6 subspecies of *M. evotis*, including *M. evotis milleri*; recognized by Wilson and Reeder as a unique species, *M. milleri* (from Baja California). However, Wilson and Reeder (2005) included *milleri* in *M. evotis*. Subspecies *M. e. jonesorum* found in northern and eastern Arizona and west-central New Mexico.

Per NatureServe (2010), "van Zyll de Jong and Nagorsen (1994) provisionally interpreted the very close morphologically similarity between *M. keenii* and *M. evotis* in British Columbia and the adjacent northwestern United States as overlapping intraspecific variation rather than intergradation between the taxa; they noted the need for molecular data to resolve the situation.

A phylogenetic study based on mtDNA data, sequence divergence between *M. evotis* and the *leibii* group was small (2.9%) and within the intraspecific range. Further sampling of *M. evotis* is necessary to establish the level of divergence between *M. evotis*, as well as other long-eared *Myotis*, and the *leibii* group (Rodriguez and Ammerman 2004)."

DESCRIPTION: A large bat with significant sexual dimorphism in some characters. The total length is 8.7-10.0 cm (3.43-3.94 in), length of forearm 3.6-4.1 cm (1.42-1.61 in), wingspan 25-30 cm (9.84-11.81 in), and weight 5-8 gm (0.176-0.282 oz). They have long, glossy dark brown to black ears that are longer than 19-23 mm, longer than any other North American long-eared *Myotis*; tragus long and slender. Their contrasting pale pelage is full, soft and glossy. On the upper parts, it is light to medium brown, pale brownish to straw-colored overall. Middorsally, the pelage is 10.0 mm long with individual hairs black at the

base. They lack an often present fringe of hairs on the posterior border of uropatagium. The calcar extends about one-half way from foot to tip of tail, is not keeled or only slightly so. Cranium rises gradually from rostrum to braincase; the skull is fairly narrow.

AIDS TO IDENTIFICATION: *Myotis evotis* is distinguished from other North American long-eared *Myotis* by its larger body size, longer, glossy dark brown to black ears, and by its lack of an obvious fringe of hairs on posterior border of the uropatagium. (Wilson and Ruff, 1999). Long tooth rows with robust molars, and auditory bullae relatively large when compared to other long-eared *Myotis*. Easily confused with *M. auriculus*, which is similar in size, ear length, and color, but tends to have brownish ears and membranes, and a more dull, brownish pelage overall.

ILLUSTRATIONS:

B&W photo (Burt 1976:26, plate II)
B&W photos (Manning and Jones Jr. 1989:328,329; Fig.1, 2)
Color photo (Peterson *in* www.enature.com
Color photos (Wilson and Ruff 1999: 89)
Color photo (Harvey 1999)

TOTAL RANGE: Occurs in temperate western North America from southern British Columbia, southern Alberta, and southern Saskatchewan (Canada) to New Mexico (USA) and Baja California (Mexico). (Wilson and Reeder, 2005)

RANGE WITHIN ARIZONA: Coconino, Mogollon, and Kaibab plateaus in northern and eastern Arizona, in Coconino and Navajo (1 obs.) counties. One observation from 1993 occurred in eastern Arizona in the White Mountains SW of Hannigan Meadows, in Greenlee County.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Long-eared *Myotis* are categorized as "hovering gleaners" which feed by taking prey from the surface of foliage, tree trunks, rocks, or ground. They are fast and maneuverable in flight, have been observed hovering and are often observed foraging in dense vegetation. *M. evotis* varies the echolocation frequencies and patterns used in response to different foraging situations. They typically use lower frequency calls and passive listening in order to detect prey, making them particularly adept at capturing tympanate moths which are sensitive to the typical echolocation frequencies used by insectivorous bats. *M. evotis* seem particularly efficient at foraging in high elevation habitats, and when ambient temperatures are low. Unlike most other insectivorous bats, where females are typically restricted to lower elevations and warmer conditions during the breeding season, reproductively active *M. evotis* females do occur throughout the elevational range of this species throughout the breeding season. These bats probably migrate short distances between summer haunts and winter retreats, although very little is known about these migration patterns and nothing is known about hibernacula. Thought to roost in the winter primarily in caves and abandoned mines.

The only known hibernation site is an abandoned mine in Montana. The record longevity for this species is 22 years, but most individuals probably live for much less than this. A snake, the yellow-bellied racer, is a known predator of these bats in British Columbia.

REPRODUCTION: Mating occurs in the fall; probably around the time these bats enter their winter hibernacula. Ovulation and fertilization occur in the following spring. Earliest reported date of pregnancy for this species is May 19 in California, while the latest reported pregnancy was July 7 in British Columbia. Females give birth to one young per year in late June or July. Females form small maternity colonies in the summer, while males and barren females live singly or in small groups, occasionally occupying the same roost as the maternity colony but roosting apart from it.

FOOD HABITS: Jameson and Peeters (1988) state that *M. evotis* is "a late flying species, emerging after dark. Forages low from 4-6 ft. above ground." However, other evidence (Hoffmeister, 1986) reports two specimens taken in early evening. Foraging times probably vary with prey availability, ambient temperature, and reproductive status. These bats are often captured when air temperatures are low, but may be more active when insect activity is highest. *M. evotis* feeds on Lepidoptera, Coleoptera, Diptera, Neuroptera, Hymenoptera, Hemiptera, and Homoptera. The majority of prey taken by *M. evotis*, though, is Lepidopterans. Sexual differences in food prey upon, has been observed, with males eating primarily moths and females taking more beetles. Where *M. evotis* occurs sympatrically with *M. auriculus*, there is evidence that *M. evotis* of both sexes prey mainly on beetles, while *M. auriculus* individuals prey mainly on moths.

HABITAT: In Arizona, generally found in habitats with Ponderosa pine overstory and grassland meadow understory. They also inhabit Sub-alpine and ponderosa pine/gambel oak habitats. (unpublished data, HDMS, AZ Game and Fish Department 2011). These documented observations seem to correspond to what Hoffmeister reported in 1986. According to Hoffmeister (1986), *M. evotis* inhabits ponderosa pine or spruce-fir forests of Arizona. During the summer months these bats roost in small groups of 12 to 30 individuals in rock outcroppings, tree cavities, under peeling bark, in stumps, caves, mines, sink holes, lava tubes, or in abandoned buildings. Large diameter trees and snags seem to be the preferred tree roost sites (Rabe, 1998, Waldien et. al., 2000). During winter, it is likely that they use caves and abandoned mines as hibernacula. The availability of appropriate roost sites may more strongly influence local distribution and abundance than plant community composition. In Oregon, areas where *M. evotis* forage and roost, seem to be strongly influenced by the availability of water sources as well. Foraging areas and day roosts were more likely to be found close to a water source and were less influenced by forest composition (Waldien and Hayes, 2001).

ELEVATION: In Arizona, the elevation ranges from 6,480 – 8,800 ft (1975-2682 m).

PLANT COMMUNITY: In Arizona, generally found in habitats with Ponderosa pine overstory and grassland meadow understory. They also inhabit Sub-alpine and ponderosa pine/gambel oak habitats. (unpublished data, HDMS, AZ Game and Fish Department 2011).

Dominate plant species include Ponderosa pine (*Pinus ponderosa*), Gambel oak (*Quercus gambelii*), spruce sp., Douglas-fir (*Pseudotsuga menziesii*), and various high elevation grasses.

POPULATION TRENDS: Stable, though unique populations inhabiting relatively isolated mountain ranges may be threatened by loss of habitats. *M. evotis* is moderately common in areas of suitable habitat but may be threatened by loss of suitable roost sites throughout its range. These include mines, cave, roost trees.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: SC (USDI, FWS 1996)
[C2 USDI, FWS 1994]

STATE STATUS: None (AZGFD, AWCS 2022)
[1C (AGFD SWAP 2012)]

OTHER STATUS: Not BLM Sensitive (USDI, BLM AZ 2008)
[Bureau of Land Management Sensitive (USDI, BLM AZ 2000, 2005)]
Determined Subject to Special Protection for *M. evotis evotis* (Secretaría de Medio Ambiente 2000, 2010)
[Listed Rare for *M. evotis evotis*, Secretaría de Desarrollo Social 1994]

MANAGEMENT FACTORS: The lack of understanding of intra-specific variation within this species compromises the effectiveness of current management policy.

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS: "Variation in *Myotis evotis* has not been studied since Miller and Allen's (1928) revision of the genus. A thorough morphometric analysis of the species throughout its known range is overdue" (Manning and Jones, 1989).

LAND MANAGEMENT/OWNERSHIP: USFS – Coconino, Apache-Sitgreaves and Kaibab National Forests.

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION:

Myotis is derived from two Greek words, mys, “mouse” and otos, “ear” in reference to the fact that the ears of many common bats resemble those of mice. *Evotis* means “good ears” and pertains to the conspicuous ears of this bat and is of Greek origin.

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