

**ARIZONA GAME AND FISH DEPARTMENT  
HERITAGE DATA MANAGEMENT SYSTEM**

**Animal Abstract**

**Element Code:** AMACC01090

**Data Sensitivity:** Yes

**CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE**

**NAME:** *Myotis thysanodes*

**COMMON NAME:** Fringed Myotis

**SYNONYMS:**

**FAMILY:** Vespertilionidae

**AUTHOR, PLACE OF PUBLICATION:** Miller. 1897. N. Amer. Fauna 13:80.

**TYPE LOCALITY:** Old Fort Tejon, Tehachapi Mountains, Kern County, California

**TYPE SPECIMEN:**

**TAXONOMIC UNIQUENESS:** There are 88 species of *Myotis* worldwide and 9 species of *Myotis* in Arizona. There are four subspecies of *M. thysanodes*; *M. t. aztecus*, *M. t. thysanodes*, and *M. t. pahasapensis*, *M. t. vespertinus*.

**DESCRIPTION:** Length of head and body 80.0-99.0 mm (3.2 – 3.96 in.), length of forearm 40.0-47.0 mm (1.6-1.88 in.), wingspread 265.0-300.0 mm (10.6-12.0 in.), tail 34.0-45.0 mm (1.36-1.8 in.), ear 16.0-19.0 mm (0.64-0.76 in.). The Fringed myotis is part of the long eared myotis group. Their long ears project 3.0-5.0 mm (0.12-0.2 in.) beyond muzzle when laid forward. They weigh from 5-7 grams (0.2-0.3 oz). The fur ranges in color from yellowish brown to darker olivaceous tones, with little difference between ventral and dorsal surfaces. Color varies geographically with tendency toward darker colors in the northwestern populations. The ears and membranes are glossy black. Sexual dimorphism exists with females exhibiting significantly larger head and body as well as forearm length. The robust calcar is not distinctly keeled. The wing membranes are moderately thick and elastic, making them resistant to puncture. This is a characteristic of bats that forage by gleaning from the ground or in areas of thick or thorny vegetation and is consistent with their short and broad wings and highly maneuverable flight (O'Farrell and Studier 1980).

**AIDS TO IDENTIFICATION:** Although similar to *M. evotis* in overall appearance, this bat is larger, except in ear size. Forearm length is generally larger than 40 mm, while forearm length of *M. evotis* is typically shorter than 40 mm. They have a well developed fringe of hair on the posterior edge of the uropatagium. This feature distinguishes them from all other North American *Myotis* species, though some *M. evotis* individuals also have a relatively inconspicuous fringe. The metaloph, protoconule, and paraloph are usually absent on the first and second molars. This dental simplification is not observed in other American species of *Myotis*.

**ILLUSTRATIONS:** B&W photo (Hoffmeister 1986:81, Fig. 5.24)  
Color photo (Atlenbach *in* Wilson, 1999)  
Color photo (*In* <http://www.batcon.org/discover/species/mythysan.html>)  
Color photo (Atlenbach *in* Harvey, 1999)  
Color photo (Atlenbach *in* <http://www.sevilleta.unm.edu/data/species/mammal/sevilleta/profile/fringed-myotis.html>)

**TOTAL RANGE:** Western North America from British Columbia, Canada, to Veracruz and Chiapas in southern Mexico. A disjunct population occurs in the Black Hills of Wyoming and South Dakota.

**RANGE WITHIN ARIZONA:** Throughout much of state, although not known from northeast or southwest corner. Their winter range in Arizona shifts to the southernmost counties and Mohave County.

## **SPECIES BIOLOGY AND POPULATION TRENDS**

**BIOLOGY:** Fringed *Myotis* tend to roost in the open in tightly packed groups. They have been recorded roosting in rock crevices, caves, mines, large snags, under exfoliating bark, and in buildings. In buildings, the sides of ceiling joints are preferred, although cracks between beams may also be used. Roost trees used were large diameter snags in early to medium stages of decay and were more likely to be near water sources than random trees. Thermoregulation of *M. thysanodes* in roosts is highly variable, with individuals shifting between regulating body temperatures and conforming to ambient temperatures. Lactating females tend to maintain lower body temperatures in day roosts than do post-lactating and pregnant females. Clusters of individuals tend to shift sites within the roost periodically in response to temperature changes or disturbance. Human disturbance can cause abandonment of the roost site.

Fringed *Myotis* are known to migrate, although little is known about migration patterns or destinations. It has been suggested that fall migrations are short distances to lower elevation sites or more southern areas where bats could be periodically active in winter. Physiological studies indicate that *Myotis thysanodes* have a great deal of control over body temperature regulation and can fly at low ambient and body temperatures. Spring migration into a maternity roost is rapid, occurring from mid to late April. This migration takes place in less than a month. They are most active 1-2 hours after sunset. They fly at about 8.6 mph, and nearly vertical flight has been observed. According to Cockrum (1973), the greatest longevity recorded is 11 years, though most Fringed *Myotis* probably live for less than this.

**REPRODUCTION:** The only detailed description of reproduction is from O'Farrell and Studier (1973) for the region of northeastern New Mexico. According to this report, females do not copulate until after leaving the maternity roost in the fall. Copulation may occur at hibernacula, as in most other temperate vespertilionids. Ovulation, fertilization, and

implantation occurred between April 28 and May 15. Gestation lasted from 50 to 60 days. Parturition began June 25 and concluded by July 7. Evidence from other areas suggests similar reproductive timing throughout this species' range. Young have open eyes and erect pinnae shortly after birth and are pink in color for approximately one week, after which the skin pigmentation process commences, followed by hair growth in the pigmented areas. During lactation two to ten adults are always present in the roost to care for the young. The neonate is huge in proportion to the mother, at 22% of her body mass and 54% of her total length. Females deposit newborns in a separate roost site and only visit them to nurse or to assist young in distress. Young are capable of limited flight after 16.5 days and are indistinguishable from adults in both flight and form after 21 days. Sex ratio at birth is equal.

**FOOD HABITS:** *M. thysanodes* eat mostly small beetles (73% frequency), but moths are also taken. Observations indicated slow, highly maneuverable flight with foraging occurring in and around vegetation. These observations are consistent with their wing morphology. This bat may land to pick up prey from the ground.

**HABITAT:** Fringed *Myotis* occur primarily in middle elevation habitats ranging from deserts, grasslands, and woodlands. These bats seem to occupy the lowest elevational range of all of the long-eared *Myotis* species (*M. auriculus*, *M. evotis*, *M. keenii*, *M. milleri*, and *M. septentrionalis*). They are most frequently captured in oak-pinyon woodlands and other open, coniferous, middle-elevation forests but have also been captured in high-elevation habitats and at sea level in coastal areas. Roost sites have been found in caves, mine tunnels, in large snags, under exfoliating bark, and in buildings. These sites may be day or night roosts. It has been suggested that Fringed *Myotis* use lower elevation caves and mines as hibernation sites. All desert and steppe areas within the range of *M. thysanodes* are within an hour flight from forested or riparian areas.

**ELEVATION:** 4,000 - 8,437 feet (1,220 - 2,571 m).

**PLANT COMMUNITY:** Found from low desert scrub associations to higher elevation fir-pine associations. Oak and pinyon woodlands appear to be most commonly used vegetative association.

**POPULATION TRENDS:** Appears to be stable in Arizona, though they are rare in other areas.

## **SPECIES PROTECTION AND CONSERVATION**

**ENDANGERED SPECIES ACT STATUS:** None (USDI, FWS 1996)  
[C2 USDI, FWS 1994]

**STATE STATUS:** None

**OTHER STATUS:** [Bureau of Land Management Sensitive  
(USDI, BLM AZ 2000, 2005)]

**MANAGEMENT FACTORS:** This species greatest threat is being disturbed by humans; mostly through recreation caving, mine exploration and vandals. Other threats include: closure of abandoned mines, renewed mining at historic sites, toxic material impoundments, pesticide spraying, vegetation conversion, livestock grazing, timber harvest, destruction of buildings and bridges used as roosts and destruction or disturbance of water sources and riparian habitat. Prior to parturition, female become very secretive and virtually impossible to approach. The lack of understanding of intra-specific variation within this species compromises the effectiveness of current management policy.

**PROTECTIVE MEASURES TAKEN:** None known.

**SUGGESTED PROJECTS:** The hibernation and migratory habits of this species, as well as most *Myotis* species, are unknown. It is important to understand more about the habitat requirements of this species throughout the year. The presence of appropriate roost sites may be the most critical factor determining *M. thysanodes* presence in an area. It is important for research on roosting and foraging habits to be conducted throughout the range of this species.

**LAND MANAGEMENT/OWNERSHIP:** BLM - Arizona Strip, Kingman and Safford Field Offices; DOD - Fort Huachuca Military Reservation; NPS-Pipe Springs National Monument; USFS - Apache-Sitgreaves, Coconino, Coronado, Kaibab, and Prescott and Tonto National Forests; Private.

## **SOURCES OF FURTHER INFORMATION**

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#### **ADDITIONAL INFORMATION:**

An analysis of genetic variation within *M. thysanodes* and among the six species of long-eared *Myotis* (*M. auriculus*, *M. evotis*, *M. keenii*, *M. milleri*, *M. septentrionalis*, and *M. thysanodes*) is currently underway. This research will provide managers with the information they need to understand the identity of unique populations within *M. thysanodes* and the boundaries among the long-eared *Myotis* species.

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