ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract **Element Code:** AMACC01020
Data Sensitivity: Yes

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Myotis yumanensis* (H. Allen, 1864)
COMMON NAME: Yuma Myotis
SYNONYMS: *Vespertilio yumanensis*
FAMILY: Vespertilionidae

AUTHOR, PLACE OF PUBLICATION: *Vespertilio yumanensis* H. Allen, 1864. Smithson. Misc. Coll., 7(165):58. *Myotis yumanensis* G. S. Miller, Jr., 1897. N. Amer. Fauna, 13:66.

TYPE LOCALITY: Old Fort Yuma, Imperial County, California, USA.

TYPE SPECIMEN:

TAXONOMIC UNIQUENESS: There are 88 species of *Myotis* worldwide, 9 in Arizona. Six subspecies of *Myotis yumanensis* are recognized including *M. y. yumanensis* (southwestern desert); *M. y. lambi* Benson, 1947(San Ignacio, Baja California); *M. y. sociabilis* H. W. Grinnell, 1974 (California to Canada); *M. y. oxalis* Dalquest, 1947 (Central Valley); *M. y. saturatus* Miller, 1897 (western Coast from Mexico to BC); and *M. y. lutosus* Miller and G. H. Allen, 1928 (Mexico).

According to NatureServe (2001), "*M. yumanensis* specimens are often confused with *M. lucifugus*. These species appear to be closely related. See Harris (1974) for the most recent taxonomic revision of this species." So far, genetic studies have shown the closely related *M. yumanensis and M. lucifugus* to be two distinct species (Smithsonian Institution, 2011). According to Wilson and Reeder (2005), "An older name for this species may be *subulatus* Say, 1823; see Glass and Baker (1968). Those authors recommended that *subulatus* should be suppressed, but see Hall (1981), who used *subulatus* for the species we recognize as *leibii*."…. "Apparently closely related to *velifer*; see Ruedi and Mayer (2001)."

DESCRIPTION: One of the smallest *Myotis* species, with no sexual dimorphism. Total length 7.5-8.9 cm (2.95-3.50 in), forearm length 3.04-3.79 cm (1.20-1.49 in), tail length 29-43 mm, hind foot 8-10 mm, ear length 14-15 mm, wingspan 24-26 cm (9.5-10.2 in), and weight 4.7-7.1 g (0.166-0.250 oz). The fur is dull, lacking the brassy sheen typical of other myotis such as *M. lucifugus*. Upper parts are tawny, buffy or even brown, while under parts are paler, buffy to yellowish white. Hairs on the dorsum not tipped with a brighter brown. They have large feet with a lobed calcar (no keel on calcar), and a tail that barely extends beyond the membrane. Their short ears are usually light or pale (same color as back), and have a pointed tragus. The braincase is broad and high, lacking a saggital crest.

AIDS TO IDENTIFICATION: It can be difficult to distinguish *M. yumanensis* and *M. lucifigus* (little brown bat) from one another. They both have no obvious keel on the calcar, nor pronounced saggital crest on the skull, and the ears of both species are shorter than 16 mm and extend less than 2 mm beyond the nose if held forward. This combination of traits alone, separate these two species from other *Myotis*. However, *M. yumanensis* usually is lightly smaller, usually lacks burnished tips on the dorsal hairs, and its ears are pale, compare to dark brown or black in *M. lucifigus*. In addition, the skull of *M. yumanensis* has a relatively abrupt increase in forehead height, not a gradually ascending forehead as in *M. lucifugus*. (Wilson and Ruff, 1999). With this said, many individuals of these two species exhibit intermediate morphological characteristics and in areas of sympatry can be hard to identify (Barbour and Davis 1969, Harris 1974, Parkenson 1979, Herd and Fenton 1983, Verts and Carraway 1998). (Rodhouse et al., 2008). "Characterisitcs such as dorsal pelage sheen and ear color can be difficult to determine at night or in poor lighting typical of conditions in the field, and are open to subjective judgement. Forehead slope, typically evaluated from prepared museum specimens….can be difficult to discern in live specimens (Nagorsen and Brigham 1993, Verts and Carraway 1998)." The use of recorded echolocation calls as a diagnostic tool, along with new genetic techniques, have greatly improved the ability to identify *M. lucifugus* and *M. yumanensis* without sacrificing individuals. (Rodhouse et al., 2008).

M. yumanensis is distinguished from *M. ciliolabrum* (Western Small-footed Myotis) and *M. californicus* (California Myotis) by their larger feet, lighter fur and ear color, short ears, lack of a keeled calcar, and abrupt increase in the forehead height. The interfemoral membrane is haired nearly to knee.

This species shows a high amount of geographic variation. Their fur color tends to be light in the arid portion of its range, and darker in forested areas such as the Northwest Coast. They also show size variations from small in northern Mexico to larger in northern Utah and Colorado. (Wilson and Ruff, 1999).

ILLUSTRATIONS:

B&W drawing (Ingles 1954:74)
Color photo (Tuttle *in* http://www.enature.com/fieldguide/)
Color photo (Harvey 1999)
Color photo (Wilson and Ruff, 1999)
Color photo (Bat Conservation International, http://www.batcon.org 2011)
Color drawing and photo (*in* Smithsonian NMNH North American Mammals, http://www.mnh.si.edu/mna/ accessed 2011)
Color photo (USDI, BLM Idaho, *in* http://www.blm.gov/id/st/en/prog/ Accessed 1/21/2011)

TOTAL RANGE: Hidalgo, Morelos and Baja California (Mexico) north to British Columbia (Canada), east to Montana and W Texas (USA). (Wilson and Reeder, 2005).

RANGE WITHIN ARIZONA: Throughout most of state but not found in northeastern corner nor southeastern part of state. Generally inhabits Gila, Graham, La Paz, Maricopa,

Mohave, Pinal, and Yuma counties. Probably absent in higher, boreal areas. Winters in the Lower Colorado River area.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: In Arizona in the summer months, *M. yumanensis* found near water over which it forages for food, usually flying low to the water (about 6 feet). They are more closely associated with water than any other North American species of bat (Barbour and Davis 1969). They are found roosting in caves, mines, attics, buildings, underneath bridges, and other similar structures. In the summer, males tend to roost singly or in small groups away from nursery colonies. This nocturnal species probably makes local or short migrations to suitable hibernacula for the winter. For example, individuals that spend the summer at high elevations probably move downslope. In Arizona, some individuals may overwinter in the southwest part of the state, but the rest probably migrate to Mexico. This species tends to be lunar phobic due to a preference for lunar phobic insects, or to avoid predators such as owls. They emerge soon after sunset in many areas but their peak activity is 1-2.5 hours after sunset. Yuma Myotis are found feeding and roosting with other bat species, such as *Tadarida brasiliensis* (Mexican Free-tail Bat) and *Antrozous pallidus* (Pallid Bat).

REPRODUCTION: Breeding occurs predominantly in fall. After copulation, sperm is retained within the female reproductive tract until spring when fertilization occurs. One offspring is born between late May and June (early July), depending largely on local climate. Females give birth for the first time in the summer following their own birth. By early July, most young are able to fly, but a few may be still be nursing. Maternity colonies in the state consist of approximately 35 individuals; larger numbers reported elsewhere. At three Oregon mines, maternity colony numbers ranged from 50-60 adults to 500-750 adults (Betts 1997, in NatureServe 2010). In British Columbia, one of the largest known maternity colonies was observed, with numbers of 1,500-2,000 adult females found (Nagorsen and Brigham 1993, in NatureServe 2010). Maternal colony sites sometimes shared with *M. lucifugus*; males scatter to live as solitary bachelors, though at times associated with other species of bats.

FOOD HABITS: The skull and jaws of Yuma myotis suggest a dependence on relatively soft insects, and the lack of dietary information supports this. This fits well with the bats habit of foraging over calm water, where moths and other soft-bodied insects are common. (Smithsonian Institution, 2011). They often live near and feed along, forested edges of streams, ponds and lakes where the insect diversity is greater. They eat a variety of insects that includes moths (good portion of diet), froghoppers, leafhoppers, June beetles, ground beetles, midges, mosquitoes, muscid flies, caddisflies, and crane flies. (Bat Conserv. Intl., 2011). They can consume up to half of their weight every night, flying low to the water (about 6 feet) to capture prey. They catch insects in their mouths or they use their tail membrane as a pouch in which to snare larger prey. This species is an efficient forager, sometimes returning to the roost with a full stomach 15 minutes after dusk. They respond to temporary patches of prey, such as ant swarms, though many authors report that regular

foraging routes are followed. *M. yumanensis* have a relatively poor urine concentrating ability, and frequently are observed drinking water.

HABITAT: Found in a wide variety of upland and lowland habitats, including riparian, desertscrub, moist woodlands and forests. They prefer cliffs and rocky walls near water. They are a colonial species, hanging in closely grouped clumps, utilizing caves, mines, cliff crevices, attics, buildings, underneath bridges, and similar structures. Nursery colonies, sometimes numbering in the thousands, usually roost in buildings, caves, and mines or under bridges.

ELEVATION: In Arizona, elevation ranges from 180 – 4,940 ft (55-1506 m) (unpublished data, HDMS, AZ Game & Fish Department 2011). For their total distribution, elevation ranges from sea level to 11,000 ft (0-3353 m).

PLANT COMMUNITY: Riparian, desertscrub, moist woodlands (juniper-pinyon) and forests.

POPULATION TRENDS: Unknown.

SPECIES PROTECTION AND CONSERVATION

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

MANAGEMENT FACTORS: Myotis yumanensis is threatened by the loss of riparian habitat, and the decline in permanent water sources in the southwest (Bat Conserv. Intl., 2011). Other threats to this species include disturbance of maternity colonies (highly susceptible to disturbance; females known to abandoning site), closure of abandoned mines, and pest control activities in buildings.

PROTECTIVE MEASURES TAKEN: Unknown whether any occurrences are appropriately protected and managed.

SUGGESTED PROJECTS: Determine distribution of roosts and maternity colonies, and abundance. Monitor to determine population trends and extent and degree of threats. Survey for to determine migration routes.

LAND MANAGEMENT/OWNERSHIP: BIA – Kaibab Paiute Tribe (Indian Reservation) and San Carlos Indian Tribe (Reservation); BLM – Arizona Strip, Lake Havasu and Safford Field Offices; FWS - Imperial National Wildlife Refuge; NPS – Lake Mead National Recreation Area and Pipe Spring National Monument; USFS - Tonto National Forest; Boyce Thompson Southwestern Arboretum State Park; TNC Aravaipa Canyon Preserve; Private.

SOURCES OF FURTHER INFORMATION

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MAJOR KNOWLEDGEABLE INDIVIDUALS:

James Findley - University of New Mexico

Tom Rodhouse – NPS Upper Columbia Basin Network, Central Oregon Community College, Bend, OR. E-mail: tom_rodhouse@nps.gov.

ADDITIONAL INFORMATION:

May be difficult to identify, if in doubt, specimens should be sent to an authority for identification.

This bat was observed on the Navajo Reservation (AGFD 1996).

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1994-04-04 (DBI)
1994-04-07 (DCN)
1996-06-19 (SMS)
1997-03-04 (SMS)
2003-04-04 (AMS)
2011-01-23 (SMS)

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