ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract **Element Code:** AMACB03030
Data Sensitivity: YES

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Leptonycteris yerbabuenae* Martinez and Villa-R, 1940
COMMON NAME: Lesser Long-nosed Bat
Sanborn's Long-nosed Bat; Little Long-nosed Bat
SYNONYMS: *Leptonycteris curasoae yerbabuenae* Arita and Humphrey
Leptonycteris sanborni Hoffmeister 1957
Leptonycteris nivalis sanborni
Leptonycteris curasoae Miller 1900
FAMILY: Phyllostomidae (= Phyllostomatidae)

AUTHOR, PLACE OF PUBLICATION: *Leptonycteris yerbabuenae* Martinez and Villa-R., Anal. Inst. Biol. Univ. Nac. Autó. México, 11:313, August 1940. *L. curasoae yerbabuenae* Arita and Humphrey, Acta Zool. Mexicana (n.s.) 29:1-60. 1988.

TYPE LOCALITY: *L. c. yerbabuenae*: Mouth of Miller Canyon, Huachuca Mountains, 10 mi SSE Fort Huachuca, Cochise County, Arizona. Collected August 18, 1950. *L. yerbabuenae*: Mexico, Guerrero, Yerbabuena.

TYPE SPECIMEN:

TAXONOMIC UNIQUENESS: The taxonomy and nomenclatural history for species in this genus has been rather confusing over the years. This species has been treated as *Leptonycteris yerbabuenae* (Hall 1981, Wilson and Reeder 2005, Bradley et al. 2014), *L. sanborni* (Watkins et al 1972; Jones et al. 1973, 1986; Jones and Carter 1976; Banks et al 1987, USFWS 1988), and *L. curosoae* (Fleming 1991; Jones et al. 1992; Koopman, in Wilson and Reeder 1993, Baker et al. 2003) or *L. curosoae yerbabuenae* (Cockrum and Petryszyn 1991, USFWS 2007). Davis and Carter (1962) recognized *L. nivalis* from Arizona south to Oaaca, east to Hidalgo and Veracruz and *L. sanborni* from Texas and Coahuila, south in winter to Morelos and Veracruz. The currently accepted taxonomy for the Lesser Long-nosed bat is *Leptonycteris yerbabuenae* (ASM 2023, Simmons and Cirranello 2023). See Baker et al. (1989) for a classification of the higher categories of New World Phyllostomidae. See Van Den Bussche (1992) for an analysis of phylogenetic relationships of phyllostomid bats based on restriction-site variation in the ribosomal-DNA gene complex.

A considerable amount of literature devoted to this species can be found under the junior synonym *L. sanborni* (Cole and Wilson 2006). Arita and Humphrey (1988) determined that *sanborni* is a junior synonym of *yerbabuenae* and argued for including *yerbabuenae* in the synonymy of *L. curasoae* as subspecies *L. curosoae yerbabuenae*. However, subsequent authors, including Koopman (1994, in Cole and Wilson 2006) and Simmons and Wetterer (2002), separated *yerbabuenae* and *curasoae*, returning to the prior arrangement of 3 species (*curasoae, nivalis*, and *yerbabuenae*).

Leptonycteris is 1 of 10 genera in the Subfamily Glossophaginae. The other two species of *Leptonycteris* are *L. curasoae* (Curaçaoan Long-nosed Bat) and the Listed Endangered (ESA) *L. nivalis* (Mexican Long-nosed Bat) (ASM 2023, Simmons and Cirranello 2023). Wilson and Reeder (2005) report the range of *L. nivalis* in the U.S. as SE Arizona, S New Mexico and W Texas; however, Arizona currently does not have records for this species. It potentially occurs in SE Arizona and is tracked as such.

DESCRIPTION: A medium-sized bat with total length of 7.5-8.5 cm (2.95-3.35 in), forearm 5.1-5.6 cm (2.0-2.2 in), wingspan of 36-40 cm (14-16 in), and weight between 15-25g (0.53-0.88 oz). The short, dense fur is yellowish-brown or pale brown above and cinnamon-brown below. They have an elongated snout, with a nose-leaf, an erect triangular flap of skin at the tip of the snout. There is no tail, and the interfemoral membrane is reduced to a narrow band along each hind leg. These bats have large eyes and reduced ears compared to other bats in Arizona. There are two molars above and below, molariform teeth in contact with one another, zygomatic arch complete, and 4 lower incisors; sometimes these are lost. The loss of incisors might enable the bat to protrude the tongue more easily, to collect nectar.

AIDS TO IDENTIFICATION: The Lesser Long-nosed Bat is identified as a member of the Phyllostomidae family by the nose-leaf. It is distinguished from the other two Arizona Phyllostomids, by the lack of a conspicuous external tail. Its tail consists of three vertebrae that are not externally visible. Additionally, *L. yerbabuenae* is distinguished by its much smaller ears than *Macrotus californicus*, and by its shorter snout than *Choeronycteris mexicana*. This species is generally smaller in length of head and body, forearm, skull, and upper tooth row than its closely related relative *L. nivalis*. It is more brownish below and more reddish above than *L. nivalis*. *L. nivalis* is larger, with grayish pelage, longer wings, and a narrower uropatagium (tail). (Wilson and Ruff, 1999).

Spatters of thin yellow material on the floor or walls of a cave or mine likely indicate the recent presence of this bat or *Choeronycteris* (the other of the 2 nectar/pollen eating bats in Arizona). The yellow material is guano colored yellow by pollen, which the bats have ingested from plants visited for nectar.

The skull is distinguished from other Arizona bat skulls (except *Choeronycteris*) by the elongated rostrum. The presence of a complete zygomatic arch, lower incisors (usually), and 2 instead of 3 lower molars in *Leptonycteris* distinguish it from *Choeronycteris*.

ILLUSTRATIONS:

B&W photo (Barbour and Davis 1969:39)
Color photo (Barbour and Davis 1969: plate III)
B&W photo (Hoffmeister 1986:65)
Plate 180 (Whitaker 1980)
Color photo (Harvey 1999)
Color photo (Wilson 1999)
Color photo (Cole and Wilson 2006)

TOTAL RANGE: Range extends from Honduras, Guatemala, and El Salvador, north through the drier parts of Mexico, and into southern Arizona, California, and New Mexico.

RANGE WITHIN ARIZONA: Southern Arizona from the Picacho Mountains southwesterly to the Agua Dulce Mountains and southeasterly to the Galiuro and Chiricahua mountains and then southerly into Mexico and beyond. Also 2 late-summer records of immature individuals from the Phoenix area and 1 from the Pinaleno Mountains. Not present in Arizona during winter months.

There appear to be both sexual and seasonal differences in their Arizona range. The early migration consists mostly of pregnant females, who arrive in Arizona beginning in early April. The bats arriving during the spring migration travel along the western coast of Mexico. Pregnant females congregate at traditional roost sites, give birth, and raise their young at lower elevations within the range of columnar cacti. Male bats (and perhaps nonpregnant females) arrive in July, and travel along the foothills of the Sierra Madre Mountains (Wilkinson and Fleming 1996). Females and young begin leaving the maternity roost by mid-July, and many individuals move to nearby transient roost sites before migrating south (Fleming and Nassar 2002). Males live in small groups during the summer in Arizona (Cockrum 1991). Both transient roosts and maternity colonies are typically empty due to fall migration by mid-September.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: The lesser long-nosed bat is a migratory bat characterized by a resident subpopulation that remains year-round in central and southern Mexico to mate and give birth, and a migratory subpopulation that winters and mates in southern Mexico, but migrates north along a "nectar trail" in the spring to northern Mexico and the southwestern United States to give birth (USFWS 2016).

These bats can survive temperatures up to 41° C (106° F), due to a low basal metabolic rate, and do not hibernate or enter torpor. They cannot withstand prolonged exposure to temperatures below 10° C (50° F) (Carpenter and Graham 1967). They migrate in September/October to Mexico and further south, where they breed and spend the winter. They return to Arizona in the spring to bear young.

The tongue is long and tipped with brush-like papillae that help mop up nectar. Like most nectar feeders, the teeth are much modified, having lost the cutting and crushing cusps of the insect feeding species of bats.

Unlike most other bats and rodents found in arid and semiarid areas, the kidneys of *Leptonycteris* are not adapted for water conservation and salt excretion. Maximum concentrations of urea and salts in the urine are the lowest reported for any mammal including an aquatic mammal such as the beaver (Carpenter 1969). This is related to *Leptonycteris* feeding on nectar with its high water and low salt content and the need to get rid of large amounts of water rapidly while retaining salts. Even still, its diet of nectar enables this bat to

be essentially independent of free water. *L. yerbabuenae* maintains a positive nitrogen balance by ingesting pollen during the grooming process (Howell 1974). Guano examined at roosting sites indicated that fruit of columnar cactus species may be an important food source, and that these bats could be important dispersers of columnar cactus (Rojas-Martinez et al. 2012).

The Lesser Long-nosed bat is considered an important pollinator of various agave species, columnar cacti and other Mexican plant species. Pollen collects on their heads and shoulders (sometimes making them look yellow) when they stick their head into a flower to get nectar. As they go from plant to plant, pollen is rubbed off on the pistils at each flower thus pollinating them. It is not yet clear just how important this bat is as a pollinator of saguaro and the agave species with which it is associated in Arizona, since some populations of these plants also exist well outside the known range of this bat.

These bats are strong flyers capable of flight speeds of up to about 14 mph. They are highly maneuverable which allows them to hover at flowers and often to evade both hand and mist nets. In roosting areas, they can be identified by distinctive roaring sound made by their wings as they fly. They hang with their feet so close together they can turn nearly 360 degrees to watch for predators. When launching into flight, it gives several strong wing beats, bringing the body into a horizontal position before releasing its grip. It is an agile flier and can fly nearly straight up while maintaining a horizontal body position. At the local scale, individuals can travel up to great distances. In Mexico, these bats fly up to 30km each night from their roosts on Isla Tiburon in the Sea of Cortez to their feeding grounds in mainland Sonora.

REPRODUCTION: Females arrive in Arizona pregnant and as early as the second week in April. They join other females in maternity colonies late in pregnancy, sometime in April or early May. Maternity colonies may number in the hundreds to thousands, and in a few places, in the tens of thousands. Males form separate, smaller colonies. One young per year is born during May. Young can fly by the end of June. Maternity colonies break up by the end of July. In the non-migratory population, birth occurs in winter, and maternity colonies tend to be smaller (Ceballos et al. 1997, Medellin, 2005).

Immature *Leptonycteris* are dark grayish on the forehead and back whereas adults are browner. Neither maximum nor mean lifespan is known, however, one banded individual when recaptured was a minimum of 4 years old.

FOOD HABITS: In Arizona, they feed on nectar and pollen from flowers of saguaro and organ pipe cactus in early summer and agave later in the summer and early fall. TheyF feed on ripe cactus fruits at the end of the flowering season. They may also take a few insects incidentally when taking nectar. Lesser Long-nosed bats are known to feed on sugar water from hummingbird feeders at night, in Ramsey Canyon in the Huachuca Mountains, in Portal in the Chiricahua Mountains, and in Madera Canyon in the Santa Rita Mountains. During the winter period in Mexico, primary food plants, as identified by their pollen, appear to be *Ceiba, Bombax*, and *Ipomoea*. Their spring migration from central Mexico northward is thought to follow the sequential blooming of certain flowers from south to north.

They leave daytime roosts to feed about an hour after sunset. After filling their stomachs, sometimes to the point of appearing pregnant, they go to night roosts, which may be different from day roosts, to rest and groom. As they groom themselves, they remove the pollen sticking to their fur with their claws and then lick it off their claws. This ingested pollen provides proteins and other nutrients not obtainable from nectar. Observations by Howell (1979) indicate they spend about 6 hours a night foraging, alternating about 20 minutes of flying and feeding with about 20 minutes of roosting on plants or rocks and grooming. Additional observations indicate that feeding at agave flowers may often be done in groups. Individual bats may land on a panicle of flowers to feed or they may bury their snout in a flower and rapidly lap up nectar while hovering in front of it.

Although *Leptonycteris* and the other nectar/pollen feeder found in Arizona, *Choeronycteris*, feed on the same plants there are seasonal differences. *Choeronycteris* apparently prefers to feed on *Agave* flowers as it migrates northward and arrives in Arizona later than *Leptonycteris* and not until *Agave* has started blooming here. At this time and into the fall both bats feed primarily on *Agave*. During the winter in Mexico, *Choeronycteris* apparently prefers the columnar cacti flowers in contrast to *Leptonycteris*.

HABITAT: Desert grassland and shrubland up to the oak transition. They roost in caves, mine tunnels, and occasionally in old buildings; reported once in a culvert (M. Gilbert, USFS, pers comm September 1992) in Madera Canyon, Santa Rita Mountains. They forage in areas of saguaro, ocotillo, paloverde, prickly pear and organ pipe cactus and later in the summer among agaves. There appear to be seasonal differences in when certain habitats are occupied.

ELEVATION: They inhabit lower elevations below about 3,500 feet (1,068 m) from April to at least July. Range expands to include areas up to about 5,500 feet (1,678 m) from about July to late September or October. Based on records in the Heritage Data Management System, elevation ranges from 1,190 - 7,320 ft. (363 - 2,233 m) (AGFD, unpublished data accessed 2003).

PLANT COMMUNITY: Palo Verde/Saguaro, Semidesert Grassland, and Oak Woodland.

POPULATION TRENDS: At the time of listing in 1988, population numbers and trends of *L. yerbabuenae* showed low numbers and a declining trend (Wilson 1985). However, information gathered since listing show higher population numbers than assumed and a stable to increasing trend (Cockrum and Petrysyzn 1991, AGFD 2005, AGFD 2016). The species became the first bat species to be removed from the Federal List of Endangered and Threatened Wildlife in 2018.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS:
None (USDI, FWS 2018, removed from ESA) as *L. curasoae yerbabuenae*
[PDL (USDI, FWS 2017) as *L. curasoae yerbabuenae*]
[UR (USDI, FWS 2013) as *L. curasoae yerbabuenae*]
[PTN to reclassify as threatened, Pacific Legal Foundation 2012)]
[LE (USDI, FWS 1988) as *L. sanborni* (reclassified as *L. curasoae yerbabuenae* for 5-year review in 2005]
[PE (USDI, FWS 1987) as *L. sanborni*]
[C2 (USDI, FWS 1985) as *L. sanborni*]

STATE STATUS:
1 (AZGFD, AWCS 2022)
[1A (AGFD SWAP 2012)]
[WSC (AGFD, WSCA 1996 in prep) as *L. sanborni*]
[Endangered (AGFD, TNW 1988) as *L. sanborni*]

OTHER STATUS:
Bureau of Land Management Sensitive (USDI, BLM Arizona 2017)
Not Forest Service Sensitive (USDA FS Region 3, 2013, 2007)
[Forest Service Sensitive (USDA FS Region 3, 1999) as *L. curasoae yerbabuenae*]
[Forest Service Sensitive (USDA, FS Region 3, 1988) as *L. sanborni*]
Determined Threatened (Secretaria de Medio Ambiente 2000, 2010)
[Listed Threatened, Secretaria de Desarrollo Social 1994]
NT (IUCN, Medellín 2016)

MANAGEMENT FACTORS: Extreme northern edge of distribution, possible over-harvesting of native (as opposed to cultivated) agaves in northern Mexico, exclusion from some roost sites and disturbance at others. Easily disturbed at roost sites. Livestock grazing in areas with agaves may affect them, particularly if overgrazing is allowed (trampling of young agaves, feeding on the flowering stalks). Impacts from border activities can result in impacts to bats and their roosting habitats. Fire is a threat to roost sites and food availability. Vampire bat control in Mexico and Latin America may be indiscriminate and result in killing of lesser long-nosed bats and destruction of roost sites (Johnson et al. 2014). Mine closures may result in a loss of roost habitat. Invasive plants are a threat to food availability.

PROTECTIVE MEASURES TAKEN: *L. yerbabuenae* is protected from take by Arizona Game and Fish Commission Order. Protection measures have been implemented at over half the roosts in both the United States and Mexico (gating, road closures, fencing, management

plans, education, limiting access, and monitoring). More than 75% of the range of this species in the United States occurs on federally managed lands. Roosts on federal lands benefit from monitoring by agency personnel and protection from law enforcement. Gating of roosts on federal lands is being evaluated and implemented (USFWS 2018). The Coronado National Forest, the Bureau of Land Management, Organ Pipe Cactus National Monument, and Cabeza Prieta National Wildlife Refuge protect hundreds of square miles of bat foraging habitat, and follow avoidance measures to protect saguaros and agaves. Several caves and mine adits in southeastern Arizona have been gated with interpretive signs placed nearby by the Coronado National Forest and are monitored by forest, state and private bat biologists. At Colossal Cave (developed for tourism), located at the base of the Rincon Mountains, some obstacles have been removed and attempts have been made to return parts of the cave to pre-disturbance conditions in hope of attracting *Leptonycteris* to use it as a maternity roost as it did until the 1960s. In Mexico, a "Bat-friendly" certification for tequila brands has increased available agave flowers on tequila farms for bat food resources.

SUGGESTED PROJECTS: The USFWS is working with the Department of Defense to create an agreement to continue with lesser long-nosed bat conservation activities on Fort Huachuca and the Barry M. Goldwater Range. Studies have been initiated of agave ecology, including fire relationships, on the Fort Huachuca military reservation; of foraging ecology in Sonora by researchers from Bat Conservation International; and of the effects of low-flying supersonic aircraft on the Barry M. Goldwater Air Force Range. Additional information is needed on dates of occurrence at specific localities and roosts, the variety and relative importance of food plants, the bat's migration routes, plant species and phenology along such routes, winter roost sites, and abundance of these bats at winter roosts.

LAND MANAGEMENT/OWNERSHIP: BIA - Tohono O'odham Nation; BLM - Safford and Tucson Field Offices; DOD - Fort Huachuca Military Reservation; FWS - Cabeza Prieta and San Bernardino National Wildlife Refuges; NPS - Chiricahua and Organ Pipe Cactus National Monuments, Saguaro National Park, Coronado National Memorial, and Fort Bowie National Historic Site; USFS - Coronado National Forest; State Land Department; Picacho Peak State Park; AMNH Southwestern Research Station; TNC - Muleshoe Ranch, Portal, and Ramsey Canyon Preserves; Private.

SOURCES OF FURTHER INFORMATION

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ADDITIONAL INFORMATION:

Because dates of presence and roost occupation can vary with season, with elevation and habitat, and with locale, surveying for this bat must be carefully planned. Population trend and presence surveys should coincide with known dates of occupation for particular roosts or localities. Although times of occupation or presence are known for some sites, they may be only partially known or remain to be determined for others.

Leptonycteris is from the Greek *lepto* for slender (referring to snout) and *nycteris* meaning bat.

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