ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract **Element Code:** AMACC05060
Data Sensitivity: Yes

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Lasiurus frantzii* (W. Peters, 1870)
COMMON NAME: Desert Red Bat; Western Red Bat (in North America) otherwise Red Bat
SYNONYMS: *Lasiurus blossevillii frantzii* Peters, 1871
Lasiurus blossevillii teliotis H. Allen 1891
Lasiurus borealis Elliot
Lasiurus borealis frantzii Peters, 1871
Lasiurus borealis teliotis Allen, 1891
Lasiurus bonariensis Lesson, 1926
Lasiurus enslenii Lima, 1926
Lasiurus brachyotis J. A. Allen, 1882
Lasiurus tetiotis H. Allen, 1891
Lasiurus ornatus Hall, 1951
Atalapha borealis Allen
FAMILY: Vespertilionidae

AUTHOR, PLACE OF PUBLICATION: (Lesson and Garnot, 1826). Ferussac's Bull. Sci. Nat. Geol., 8:95.

TYPE LOCALITY: Uruguay, Montevideo.

TYPE SPECIMEN:

TAXONOMIC UNIQUENESS: Formerly included in *Lasiurs blossevillii*. Baird et al. (2015) raised *Lasiurus blossevillii frantzii* (including specimens of the formerly recognized *L. b. teliotis*) to a species separate from *L. blossevillii*. This places the mostly North American forms into a single species, *L. frantzii*, while the strictly South American forms would be in a separate species, *L. blossevillii*. This change has been accepted by ASM (2023) and Simmons and Cirranello (2023).

Lasiurus blossevillii formerly was included in *Lasiurus borealis* (Jones 1973, Shump and Shump 1982, Banks et al. 1987), with *L. borealis teliotis* occurring in Arizona (Handley 1960, Hoffmeister 1986). Baker et al. (1988) divided *L. borealis* into multiple species: *L. borealis* (corresponding with subspecies *borealis*), *L. blossevillii* (combining former *L. borealis* subspecies *teliotus* and *frantzii*; western United States, Mexico, Central America, and South America), *L. degelidus* (Jamaica), and others on Caribbean islands. Morales and Bickham's (1995) analysis using MtDNA data support the recognition of *L. borealis* and *L. blossevillii* as distinct species. MtDNA data also indicate no distinction between *L. blossevillii frantzii* from Central America and *L. blossevillii teliotus* from Mexico and the western United States so

Morales and Bickham (1995) synonymized *teliotus* with *frantzii*, and suggested that *L. b. blossevillii* of South America and *L. b. frantzii* of North and Central America may be separate species, but further range-wide genetic studies were needed to resolve the question. Most subsequent authors have treated *L. blossevilllii* and *L. borealis* as separate species (Jones 1992, 1997; Baker et al. 2003; Wilson and Reeder 2005; Schmidly and Bradley 2016). However, Koopman and McCracken (1998) (based on morphological examinations) and Shump (in Wilson and Ruff 1999) retained *L. blossevillii* in *L. borealis*.

New World *Lasiurus* were placed in the genus *Nycteris* by Hall (1981), who based the change on nomenclatural (rather than biological) concerns; few if any other authors have followed this change.

DESCRIPTION: A medium-sized bat, forearm 3.8-4.3 cm (1.5-1.7 in), weight 7-15 g (0.25-0.5 oz); wings long, narrow and pointed, wingspan 29.0-33.2 cm (11.4-13.0 in). Ears short and rounded, 1.1-1.3 cm (0.43-0.51 in) in length; interfemoral membrane (uropatagium) completely furred on the dorsal surface. Pelage color ranges from bright orange to yellow-brown with white-tipped hairs, and whitish patches near the shoulder; wing membranes black. Males are usually more brightly colored than females. Distinct white bib under neck is in spectacular contrast to jet-black wing membrane.

AIDS TO IDENTIFICATION: Lasiurine bats distinguished from other bats in Arizona (except *Lasionycteris noctivagans*, the Silver-haired bat), by their short round ears and their long tail membrane with at least the anterior portion well furred. *L. blossevillii* distinguished from *Lasionycteris* by hair color, which in *Lasionycteris* is black with silver tips. The hair of *Lasiurus* is never black, although some hairs may be silver-tipped. Compared to *L. blossevillii*, *L. cinereus* (Hoary bat) is larger (forearm 5.0-5.4 cm [2.0-2.13 in]), has an edging of black fur around the ears, and is grayish in color. *L. xanthinus* (Western Yellow bat) is larger (forearm 4.5-5.0 cm [1.8-2.0]), yellowish in color, and only the anterior half of the uropatagium is furred.

ILLUSTRATIONS:

Black and white photo (Barbour and Davis 1969: 131, 134, 135)
Color photo (Barbour and Davis 1969: plate XIV)
Black and white photo (Hoffmeister 1986: 100)
Color photo (Whitaker 1980: plate 157)
Color photo (Harvey 1999)

TOTAL RANGE: Their distribution includes Bolivia, N Argentia, Uruguay, and Brazil to W North America (but not North America). Also found in Trinidad and Tobago, and the Galapagos of Ecuador.

Per Williams (2001), in the Moapa Valley of southern Nevada, routine monthly sampling since May 1999 has produced six captures, all from July to September. Intensive acoustic sampling in the region identifies slightly longer seasonal presence, but in low abundance.

RANGE WITHIN ARIZONA: Generally distributed in south central to southern and southeastern Arizona, with a few observations along the Colorado River near Bill Williams, and occasionally in The Grand Canyon. Historic records include observations from the Grand Canyon, Sierra Ancha, Queen Creek, San Pedro Valley, Santa Rita Mountains, Canelo Hills, Huachuca and Peloncillo mountains, and San Bernardino Ranch. Hoffmeister (1986), reported that this is a summer resident only, with collections recorded from June 12 to August 21. E.L. Cockrum (pers. comm. 1992) reviewed 61 records for Arizona and found they ranged in date from May 30 to September 30.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: Generally solitary though seems to migrate in groups and forage in close association with others. Males and females migrate at different times and have different summer ranges. Migrates to southern part of range and/or hibernates in winter, sometimes emerging to feed on warm days (air temperatures 55°-65° F). Winter roost sites found in dense foliage.

L. blossevillii responds to subfreezing temperatures by raising their metabolism to maintain their body temperature above the critical low limit of -5° C. The interfemoral membrane is wrapped over the body to provide 15% additional insulation. Migratory and winter status in Arizona is unknown. In the southern part of their range ,they are thought to migrate altitudinally (E.L. Cockrum pers. comm. 1992).

Day roosts are among dense foliage, the hanging bat resembling a dead leaf. Roost sites are from a few feet to more than 40 feet high; and heavily shaded from above but open below to allow the bat to drop into flight.

Predators include birds of prey and opossums. Humans and human construction have also taken their toll on red bats in general. There have been documented cases of these bats impaled by barbed wire, entrapped on road surface oil, flying into lighthouses and the radiator grills of automobiles (Myers, undated).

REPRODUCTION: Copulates between August and October. General observations suggest that copulation may be initiated in flight. Females store the sperm until spring when fertilization occurs. Gestation period is on average, 60-70 days. In late May to mid-June, females give birth to one litter of 1-5 young (average 2.3; higher than any other bat). Lactation lasts about 38 days (5-6 weeks); a lactating female was netted in early August in the Santa Rita Mountains. Like other species of *Lasiurus*, females of this species have two pairs of mammae instead of the single pair found in most other species of bats. It is estimated, that young fledge between their third and fourth week.

FOOD HABITS: *L. blossivillii* emerges to forage 1 to 2 hours after dark and may forage well into the morning. They may hunt 600-1000 yards from their roosting site. Foraging flight pattern begins with slow, fluttering, erratic flight high in the air. After 15 to 30 minutes,

they may begin flying in straight lines or wide circles over the same ground between tree top level and a few feet above ground level.

It is unclear whether they feed mainly on certain groups of insects or on any insect within a certain size class. Moths seem to be one of the more important prey items, however, they do take flies, bugs, beetles, cicadas, ground dwelling crickets and hymenopterans. They are commonly drawn to feed around city streetlights and floodlights on barns. Insects are caught using wing membranes, less often in interfemoral membrane. Occasionally they will land on vegetation to capture prey. There is a distinct body and head posturing change in this bat when in pursuit of prey. It has been said that if you observe a rural street light and see a bat dipping and diving, that you are most likely viewing a Red Bat.

Red Bats use echolocation to locate prey. They use both broadband and narrow band calls. Search phases of calls use long calls with low pulse repetition of narrow band frequencies. Red Bats make one pass through a concentration of potential prey, fixing on a target within 5 to 10 m. They attack insects on average, every thirty seconds and are successful forty percent of the time. If a bat is stalking a moth using echolocation, the moth can hear this and will try to flee the attack by diving. The bat will follow the moth into a steep dive and often pull away within inches of the ground. Humans observing the predator-prey interaction only see a bat and not the fleeing moth and may believe that the bat is acting aggressively towards them.

HABITAT: Preferred habitat includes riparian and wooded areas. They roost during the day in trees. Summer roosts usually in tree foliage, sometimes in leafy shrubs or herbs. Often found in trees of fruit orchards. They may also roost in saguaro boots, and occasionally in cave-like situations (E.L. Cockrum pers. comm. 1992); although they generally avoid caves and buildings during both summer/winter. Solitary females roost with young in tree foliage.

Many biologists who study this species feel that it is much less common in the southwest in recent decades. This species primarily roosts in cottonwood trees, and its notable decline in abundance is suspected to be attributable to the 70-98% loss of cottonwood habitat in North America. The Western Bat Working Group released a resolution in 2002 stating the concern of cottonwood loss and the perceived related decrease in abundance of *L. blossevillii*. Restoration in riparian corridors where cottonwoods historically existed thought to be necessary for the continued existence of this species. Cottonwood distribution throughout the range of this species is thought to determine this species ability to complete its annual migration.

ELEVATION: Observed at elevations from 1,900 - 7,200 ft. (580 - 2,196 m).

PLANT COMMUNITY: Broad-leaf deciduous riparian forests and woodlands.

POPULATION TRENDS: Unknown in Arizona.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: None

STATE STATUS: 2, as *L. blossevillii* (AZGFD, AWCS 2022)
[1B, as *L. blossevillii* (AGFD SWAP 2012)]
[WSC, as *L. borealis* (AGFD, WSCA 1996 in prep)]
[Candidate, as *L. borealis* (AGFD, TNW 1988)]

OTHER STATUS: Not BLM Sensitive (USDI, BLM AZ 2010, 2017)
[Bureau of Land Management Sensitive, as *L. blossevillii* (USDI, BLM 2008)]
Forest Service Sensitive, as *L. blossevilli* (USDA, FS Region 3 2007, 2013)
[Not Forest Service Sensitive (USDA, FS Region 3, 1999)]
[Forest Service Sensitive, as *L. borealis* (USDA, FS Region 3, 1988)]
LC (IUCN, Gonzalez et al. 2016)

MANAGEMENT FACTORS: Low numbers. The current loss of dense, mature cottonwood tree habitat throughout the western United States, is believed to be a key factor in the seemingly declining abundance of *L. blossevillii* across its range. In September 2001, the Western Bat Working Group produced a Cottonwood/Sycamore Resolution identifying this concern.

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS: Status surveys and life history information, especially roost site selection, are needed. For proper status surveys to be conducted, efficient survey methods need to be developed.

LAND MANAGEMENT/OWNERSHIP: BLM - Phoenix, Safford and Tucson Field Offices; DOD - Fort Huachuca Military Reservation; FWS - Buenos Aires National Wildlife Refuge; NPS - Grand Canyon National Park, and Montezuma Castle National Monument; USFS - Coronado National Forest; BIA - Hualapai Reservation; State Land Department; AMNH Southwestern Research Station; Johnson Historical Museum; TNC - Aravaipa Canyon Preserve, and Ramsey Canyon; Private.

SOURCES OF FURTHER INFORMATION

REFERENCES:

American Society of Mammalogists. 2023. Mammal diversity database, v1.11, released 15 April 2023. Available at https://www.mammaldiversity.org/index.html (accessed 14 June 2023)

Arizona Game and Fish Department. 1988. Threatened native wildlife in Arizona. Arizona Game and Fish Department Publication, Phoenix, Arizona. p. 26.

Arizona Game and Fish Department. 1996. Mammal diversity review notes. Arizona Game and Fish Department, Phoenix, Arizona.

Arizona Game and Fish Department. 1996, in prep. Wildlife of special concern in Arizona. Arizona Game and Fish Department Publication. Phoenix, Arizona. p.26.

Arizona Game and Fish Department. 2012. Arizona's State Wildlife Action Plan 2012-2022. Arizona Game and Fish Department, Phoenix, Arizona. 233 pages.

Arizona Game and Fish Department. 2022. Arizona Wildlife Conservation Strategy: 2022-2032. Arizona Game and Fish Department, Phoenix, Arizona. 378 pages.

Baird, A.B., J.K. Braun, M.A. Mares, J.C. Morales, J.C. Patton, C.Q. Tran and J.W. Bickham. 2015. Molecular systematic revision of tree bats (Lasiurini): doubling the native mammals of the Hawaiian Islands. Journal of Mammalogy 96(6):1255-1274. https://doi.org/10.1093/jmammal/gyv135

Baker, R.J., J.C. Patton, H.H. Genoways, and J.W. Bickham. 1988. Genic studies of *Lasiurus* (Chiroptera: Vespertilionidae). Occasional Papers, Museum of Texas Tech University 117:1-15.

Baker, R.J., L.C. Bradley, R.D. Bradley, J.W. Dragoo, M.D. Engstrom, R.S. Hoffman, C.A. Jones, F. Reid, D.W. Rice, and C. Jones. 2003. Revised checklist of North American mammals north of Mexico, 2003. Museum of Texas Tech University Occasional Papers 229:1-24.

Baker, R.W., J.C. Patton, H.H. Genoways, and J.W. Pickham. 1988. Genetic studies of *Lasiurus* (Chiroptera: Vespertilionidae). Occasional Papers, Museum of Texas Tech University 117:1-15.

Banks, R.C., R.W. McDiarmid, and A.L. Gardner. 1987. Checklist of vertebrates of the United States, the U.S. territories, and Canada. Resource Publication 166. USDI, Fish and Wildlife Service, Washington, D.C. 79 pages.

Barbour, R.W. and W.H. Davis. 1969. Bats of America. The University Press of Kentucky. pp. 131-139.

Cockrum, E.L. 1960. The recent mammals of Arizona: their taxonomy and distribution. The University of Arizona Press, Tucson, Arizona. pp. 53-34.

Findley, J.S., A.H. Harris, D.E. Wilson, and C. Jones. 1975. Mammals of New Mexico. University of New Mexico Press, Albuquerque, New Mexico. pp. 54-55.

Gonzalez, E., R. Barquez, and B. Miller. 2016. *Lasiurus blossevillii*. The IUCN Red List of Threatened Species 2016: e.T88151055A22120040. http://dx.doi.org/10.2305/IUCN.UK.2016-1.RLTS.T88151055A22120040.en

Hall, E.R. 1981. The mammals of North America. Second edition, volume 2. John Wiley and Sons, New York, New York. 1,181 pages.

Harvey, M.J., J.S. Altenbach, and T.L. Best. 1999. Bats of the United States. Arkansas Game and Fish Commission in cooperation with Ashville Field Office, U.S. Fish and Wildlife Service. p. 29.

Hickey, M.B.C. and M.B. Fenton. 1990. Foraging red bats (*Lasiurus borealis*): do intraspecific chases mean territoriality? Canadian Journal of Zoology 68:2477-2482. https://doi.org/10.1139/z90-346

Hoffmeister, D.F. 1956. Mammals of the Graham (Pinaleno) Mountains, Arizona. American Midland Naturalist 55:267. https://www.jstor.org/stable/2422591

Hoffmeister, D.F. 1971. Mammals of Grand Canyon. University of Illinois Press, Chicago, Illinois. pp. 57-59.

Hoffmeister, D.F. 1986. Mammals of Arizona. University of Arizona Press. Tucson, Arizona and The Arizona Game and Fish Department, Phoenix, Arizona. pp. 97-100.

Humphrey, S.R. 1982. Bats. Pages 52-70 *In:* J.A. Chapman and G.A. Feldhamer, editors. Wild mammals of North America: biology, management and economics. Johns Hopkins University Press. Baltimore, Maryland.

Jones, C, R.S. Hoffman, D.W. Rice, M.D. Engstrom, R.D. Bradley, D.J. Schmidly, C.A. Jones, and R.J. Baker . 1997. Revised checklist of North American mammals north of Mexico, 1997. Occasional Papers, Museum of Texas Tech University, 173:1-19.

Jones, J.K., Jr., R.S. Hoffman, D.W. Rice, C. Jones, R.J. Baker, and M.D. Engstrom. 1992. Revised checklist of North American mammals north of Mexico, 1991. Occasional Papers, Museum of Texas Tech University, 146:1-23.

Koopman, K.F., and G.F. McCracken. 1998. The taxonomic status of *Lasiurus* (Chiroptera: Vespertilionidae) in the Galapagos Islands. American Museum Novitates 3243:1-6. http://hdl.handle.net/2246/3174

Morales, J.C., and J.W. Bickham. 1995. Molecular systematics of the genus *Lasiurus* (Chiroptera: Vespertilionidae) based on restriction-site maps of the mitochondrial ribosomal genes. Journal of Mammalogy 76:730-749. https://doi.org/10.2307/1382744

NatureServe Explorer: An online encyclopedia of life [web application]. 2001. Version 1.6. Arlington, Virginia, USA: NatureServe. Available: https://explorer.natureserve.org/ (Accessed: 14 November 2002).

Schmidly, D.J. 1991. The bats of Texas. Texas A & M Univ. Press, College Station, Texas. 188 pp.

Schmidly, D.J. and R.D. Bradley. 2016. The mammals of Texas, seventh edition, online edition. Courtesy of the University of Texas Press, copyright © 1994, 2004, 2016. 720 pages. Online at: https://www.depts.ttu.edu/nsrl/mammals-of-texas-online-edition/index.php

Shump, K.A. Jr. and A.U. Shump. 1982. *Lasiurus borealis*. Mammalian Species 183:1-6. https://doi.org/10.2307/3503843

Simmons, N.B. and A.L. Cirranello. 2023. Bat Species of the world: A taxonomic and geographic database. Version 1.3. Online at https://batnames.org/

Snow, T. 1996. Arizona Wildlife Views. Arizona Game and Fish Department. 8-1996, p 5.

USDA, Forest Service Region 3. 1988. Regional Forester's sensitive species, Region 3, August 1988. U.S. Forest Service. 41 pages.

USDA, Forest Service Region 3. 1999. Regional Forester's list of sensitive animals - 7/21/1999. U.S. Forest Service. 7 pages.

USDA, Forest Service Region 3. 2000. Regional Forester's sensitive species list (7/21/99 as corrected 2/23/00). U.S. Forest Service. 13 pages.

USDA, Forest Service Region 3. 2007. Regional Forester's list of sensitive animals. U.S. Forest Service. 39 pages.

USDA, Forest Service Region 3. 2013. Regional Forester's sensitive species: animals - 2013. U.S. Forest Service. 5 pages.

USDI, Bureau of Land Management Region 2. 2008. Arizona BLM sensitive species list. Bureau of Land Management, Arizona State Office, Phoenix, Arizona.

USDI, Bureau of Land Management Region 2. 2010. Arizona BLM sensitive species list. Instruction memorandum No. AZ-IM-2011-005. Bureau of Land Management, Arizona State Office, Phoenix, Arizona.

USDI, Bureau of Land Management. 2017. Arizona BLM sensitive species list. Instruction memorandum No. AZ-IM-2017-009. Bureau of Land Management, Arizona State Office, Phoenix, Arizona. 6 pages.

Whitaker, J.O. 1980. The Audubon society field guide to North American mammals. Alfred A. Knopf, New York. pp. 323, Plate 157.

Williams, J.A. 2001. Community structure and habitat use by bats in the upper Moapa Valley, Clark County, Nevada. Unpublished M.A.S. thesis. University of Nevada, Las Vegas.

Wilson, D. E., and D. M. Reeder, editors. 2005. Mammal species of the world: a taxonomic and geographic reference. Third edition. The Johns Hopkins University Press, Baltimore, Maryland. Two volumes. 2,142 pages. Available online at: https://www.departments.bucknell.edu/biology/resources/msw3/

Wilson, D.E. and S. Ruff, editors. 1999. The Smithsonian book of North American mammals. Smithsonian Institution Press, Washington, D.C. 750 pages.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

J. A. Williams, Las Vegas, Nevada.

ADDITIONAL INFORMATION:

Has been timed in flight at 40 mph.

Ronnie Sidner has netted a juvenile in the Buenos Aires Wildlife Refuge, and several others in the Huachuca Mountains; mainly in Riparian Broad-Leaf habitat (AGFD 1996).

The genus epithet derived from the Greek *lasios* meaning shaggy and *oura* meaning having a tail. Derivation of the Latin specific epithet is unclear.

Revised: 1991-08-09 (RBS)
1992-05-02 (BKP)
1992-09-30 (RBS)
1994-03-25 (DCN)
1995-06-08 (DBI)
1996-06-19 (SMS)
2002-06-10 (JAW)
2002-11-15 (AMS)
2003-01-19 (AMS)
2011-01-13 (SMS)

2023-03-06 (MBL)
2023-06-14 (MSB)

To the user of this abstract: you may use the entire abstract or any part of it. We do request, however, that if you make use of this abstract in plans, reports, publications, etc. that you credit the Arizona Game and Fish Department. Please use the following citation:

Arizona Game and Fish Department. 20XX **(= year of last revision as indicated at end of abstract)**. X...X **(= taxon of animal or plant)**. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. X pp.