

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

Animal Abstract

Element Code: AMAFH01014

Data Sensitivity: No

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Zapus hudsonius luteus* Miller

COMMON NAME: New Mexican jumping mouse, New Mexican meadow jumping mouse, meadow jumping mouse

SYNONYMS:

FAMILY: Zapodidae

AUTHOR, PLACE OF PUBLICATION: Miller, Proc. Biol. Soc. Washington, 24:253, 1911.

TYPE LOCALITY: Española, 5,000 feet, Rio Arriba County, New Mexico.

TYPE SPECIMEN: HT: USNM-133601.

TAXONOMIC UNIQUENESS: Family is holarctic in distribution and has two genera *Zapus* and *Neozapus*. Three species of *Zapus* in northern North America with one isolated population of one species in Arizona, *Z. hudsonius*. There are 12 subspecies of *Z. hudsonius* in North America, only one in Arizona. The subspecies *luteus* formerly listed under *Zapus princeps*. Wilson and Reeder (2005) considers *Z. h. luteus* a synonym of *Z. h. hudsonius*, based on Hafner et al. (1981) and Hall (1981). Recent genetic study conducted by Dr. Frey (2007) out of the Museum of Southwest Biology, University of New Mexico, indicates that *Z. h. luteus* is a distinct species from the rest of the *Zapus hudsonius* subspecies.

DESCRIPTION: A jumping mouse recognized for its extremely long tail and long hind feet. The hind legs (with 5 toes) are much longer than the delicate forelegs (with 4 toes), and the tail is attenuate, sub-cylindrical and longer than the body. For the species, the total length is 18.0-23.4 cm (7.1-9.2 in), length of tail is 10.1-13.7 cm (3.98-5.39 in), and the weight is 12-30 g (0.423-1.058 oz), which varies with the season (Wilson and Ruff, 1999). Hind feet are long, measuring 2.8-3.5 cm (1.1-1.4 in) (Whitaker 1972; Smith 1999). The general pelage is coarse with broad dorsal band of brown or yellowish brown darkened with brownish black hairs. The sides are paler, under parts white or sometimes suffused with yellowish color. The back of the forefeet and hind feet is grayish white, while the sparsely haired tail is distinctly bicolor (dark brown above and yellowish white below). They have a small, narrow, and relatively high crowned head, with a short and pointed nose. The upper lip has a median groove. Their eyes are small, located midway between ears and nose; ear dark with narrow pale edge and somewhat longer than surrounding hair. They have 8 teats: 2 pectoral, 4 abdominal, and 2 inguinal; Smith (1999) reports 4 inguinal, 1 pectoral, and 1 abdominal for

the species. The condylobasal length of the skull is less than 21 mm. Maxillary toothrow is less than 3.7 mm, incisive foramina shorter than 4.6 mm, baculum shorter than 5.1 mm (Hoffmeister 1986). They are the only mammal with eighteen teeth.

AIDS TO IDENTIFICATION: *Zapus*, with a bicolored tail and four molariform teeth, differs from *Napaeozapus* (the only other North American genus in the family) which has a white-tipped tail and only three molariform teeth. *Z. hudsonius* is smaller, has a narrower skull in proportion to its length, smaller premolars, and a shorter toothrow than other species of *Zapus*. According to Hafner et al. (1981), *Z. h. luteus* is distinguished from *Z. p. princeps* by the paler pelage of *luteus*, a less distinct dorsal band and a more ochraceous coloration. *Z. h. luteus* also lacks the white ear fringe of *Z. p. princeps*.

ILLUSTRATIONS:

Line drawing-skull (Hoffmeister 1986: Fig. 5.240)

Black and white photo (Whitaker 1972: Fig. 1)

Line drawings (Whitaker 1972: Fig. 2)

Color photos of species and tracks (*In*

http://animaldiversity.ummz.umich.edu/site/accounts/information/Zapus_hudsonius.html)

Color photos (in Frey Biological Research website accessed 2/28/2011 from

<http://freybiologicalresearch.com>)

TOTAL RANGE: *Z. h. luteus* ranges through portions of New Mexico, eastern Arizona, and southern Colorado. In New Mexico, they have been found in the San Juan Mountains, Sangre de Cristo Mountains, Jemez Mountains, Sacramento Mountains, Rio Grande Valley, and lower Rio Chama Valley. In Arizona, populations occupy the White Mountains in southern Apache County, and in northern Greenlee County.

RANGE WITHIN ARIZONA: White Mountains of eastern Arizona, in southern Apache and northern Greenlee counties.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: The New Mexico meadow jumping mouse nests in dry soils, but uses moist, streamside, riparian soils to hunt in at night, making the range long and narrow (often as long as 150 m) along permanent running water. The mouse is active only during the growing season for the grasses and forbs on which it depends. They are generally nocturnal, but occasionally diurnal. After the growing season, during which the mouse puts on a lot of fat, hibernation occurs. Preparation for hibernation (weight gain, nest building) seems to be triggered by day length. *Zapus hudsonius luteus* hibernates for as long or longer, than most other mammals. Home ranges for the species vary between 0.15 and 1.1 hectares and may overlap (Smith 1999). They are generally very quiet, however some vocalization has been recorded. The sound was something like rubbing a "cloth over a damp glass. cho...cho..." They have a keen sense of smell and probably use scent to communicate as well. They are

great swimmers and diggers, and can also climb. The longest known lifespan of this species in the wild is 3 years, with an average lifespan <1 year. Longest known lifespan in captivity was 5 years (Smith 1999).

These mice are docile creatures, seldom attempting to bite even when roughly handled. A freeze reaction is the main startle response, which is apparently their primary defense against predators. They are generally solitary animals. However, if two or more are in the same locality, they are not antagonistic toward each other, apparently offering very little defense in the face of a foe. Adults typically make jumps of about a foot at a time, but when startled, are capable of 2-3 foot leaps. Known predators include great horned owls, screech owls, red-tailed hawks, weasels, and foxes (Smith 1999).

REPRODUCTION: Females breed shortly after emerging from hibernation (about 1 to 2 weeks after the males emerge) and may give birth to 2-7 young after an average 19 day gestation. One litter is produced each year, usually between May and September. Neonates are born naked, pink, blind, clawless, and deaf, but squeak audibly at birth. Young are fully developed and weaned at four weeks (Van Pelt 1993). Female jumping mice from other parts of the country may produce two litters per year, of 2-9 (usually 5-6) young. The female provides all the care for their young, until they are weaned and independent. Females born in the spring are sexually reproductive at 2 months of age.

FOOD HABITS: Their diet consists of insects, seeds, snails, slugs, and fruits (Van Pelt 1993).

HABITAT: Moist meadows near streams with willow or alder in the Canadian and Transition life zones; moist grassland is preferred, and heavily wooded areas are avoided. Prefer habitats with permanent running water, and moist to dry soils (Van Pelt 1993). According to Whitaker (1992, in NatureServe, 2010), in New Mexico, *Z.h. luteus* select habitats in the Jemez and Sacramento mountains that included sedge-forb-willow zones along permanent streams; large wet meadows in river floodplains in the Rio Grande Valley; and on the Bosque del Apache NWR, preferred narrow riparian zones along irrigation ditches. Moist riparian zones with tall, dense sedges provides suitable habitat in many areas, while the presence of beavers is useful in maintain habitat (New Mexico Dept. Game & Fish 2008, in NatureServe 2011).

ELEVATION: Historically, they ranged from 6,500 – 9,430 ft (1983–2876 m); currently they range from 6,600 to 8,880 ft (2012-2707 m). (unpublished data, HDMS, Arizona Game and Fish Department, 2011).

PLANT COMMUNITY: Occupied plant communities are dominated by grasses and forbs, with some willow, alder and rose. Grasses include scratch grass, fescue, salt grass, red top, bluegrass, manna, etc. Forbs include clover, yarrow, field mint, sunflower, daisy, plantain, etc. (Morrison 1990).

POPULATION TRENDS: Declining throughout their limited range.

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: C (USDI, FWS 2007)
[C USDI, FWS 2008-2011]
[No status USDI, FWS 1996]
[C2 USDI, FWS 1989]

STATE STATUS: WSC (AGFD, WSCA in prep)
[LT AGFD, TNW 1989]

OTHER STATUS: Forest Service Sensitive (USDA, FS Region
3 1999, 2007)

MANAGEMENT FACTORS: Thick vegetation found along waterways in the White and Mogollon mountains should be maintained. Additional areas where suitable habitat has been lost should be restored. Educate public about beneficial role the meadow jumping mouse plays in alpine meadow ecosystems (Van Pelt 1993). Although the species is not currently threatened, local populations may be affected by changes in land use and habitat destruction.

PROTECTIVE MEASURES TAKEN:

SUGGESTED PROJECTS: Intensive distribution and monitoring surveys needed in known habitat, and historical locations. Protection of habitat from erosion and excessive grazing need to be considered, and possibly implemented as management scheme. Evaluations should be implemented on any high elevation moist riparian grass-sedge alteration, drainage, or destruction projects.

LAND MANAGEMENT/OWNERSHIP: BIA – Fort Apache Reservation (White Mountains Apache Tribe); USFS - Apache-Sitgreaves National Forest; AGFD – Black River Lands; Phelps Cabin Research Natural Area; Private.

SOURCES OF FURTHER INFORMATION

REFERENCES:

- Arizona Game and Fish Department. 1988. Threatened Native Wildlife in Arizona. Arizona Game and Fish Department Publication. Phoenix, Arizona. 32pp.
- Arizona Game and Fish Department. In prep. Wildlife of Special Concern in Arizona. Arizona Game and Fish Department Publication. Phoenix, Arizona. 32 pp.
- Berkeley Natural History Museum. Available: http://elib.cs.berkeley.edu/cgi-bin/mvz_query?CatNum_CollCde=61317Mamm.
- BISON. Available: http://fwie.fw.vt.edu/states/nmex_main/species/050410.htm.
- Cockrum, E.L. 1960. The recent mammals of Arizona: their taxonomy and distribution. The University of Arizona Press. Tucson, Arizona. P. 214.

- Colorado GAP. Available: <http://ndis1.nrel.colostate.edu/cogap...>
ENature.com. Web abstract: Meadow Jumping Mouse. Accessed 3/23/2005 at
<http://www.enature.com>.
- Frey, J.K., PhD. 2007. Morphology and Genetics of the New Mexico Jumping Mouse (*Zapus hudsonius luteus*). Annual Report, submitted to Cons. Serv. Div., New Mexico Dept. Game & Fish. Pp. 1-12.
- Frey, J.K., and J.L. Malaney. 2009. Decline of the Meadow Jumping Mouse (*Zapus hudsonius luteus*) in two mountain ranges in New Mexico. *The Southwest Naturalist*, 54(1):31-44.
- Hafner, D.J., K.E. Petersen, and T.L. Yates. 1981. Evolutionary relationships of jumping mice (genus *Zapus*) of the southwestern United States. *J. Mamm.* 62(3): 501-512.
- Hall, E.R. 1981. *The mammals of North America*, second edition. John Wiley & Sons, Inc. New York, New York. Pp. 844-845.
- Hoffmeister, D.F. 1986. *Mammals of Arizona*. The University of Arizona Press. Tucson, Arizona. P. 453.
- Integrated Taxonomic Information System (ITIS). Retrieved 3/23/2005 from ITIS, <http://www.itis.usda.gov>.
- Krutsch, P.H. 1954. North American jumping mice (genus *Zapus*). *University of Kansas Publ., Mus. Nat. Hist.* 7: 349-472.
- Morrison, J.L. 1992. Persistence of the Meadow Jumping Mouse, *Zapus hudsonius luteus* in New Mexico. *The Southwestern Naturalist*. Volume 37, Number 3. Pp: 308-311.
- Morrison, J.L. 1991. Distribution and status of the meadow jumping mouse, *Zapus hudsonius luteus* on the Apache-Sitgreaves National Forest, 1991. Unpublished report for the U.S. Forest Service, Apache-Sitgreaves National Forest.
- Morrison, J.L. 1990. "The Meadow Jumping Mouse in New Mexico: Habitat Preferences and Management recommendations." *Managing Wildlife in the Southwest*. Proceedings of the symposium. Edited by P.R. Krausman and N.S. Smith. Arizona chapter of The Wildlife Society.
- Morrison, J.L. 1989. Distribution, population status, life history and habitat affinities of the meadow jumping mouse, *Zapus hudsonius luteus* in the Sacramento Mountains, New Mexico. Unpublished report for the U.S. Forest Service, Lincoln National Forest, New Mexico.
- Morrison, J.L. 1987. A study of the active season ecology, population dynamics and habitat affinities of a known population of the meadow jumping mouse, *Zapus hudsonius luteus* in Northern New Mexico. Unpublished report for the New Mexico Department of Game and Fish.
- Morrison, J.L. 1985. The distribution of the meadow jumping mouse, *Zapus hudsonius luteus* in the Jemez Mountains, New Mexico. Unpublished report for the New Mexico Department of Game and Fish.
- NatureServe. 2005. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.2. Arlington, Virginia, USA: NatureServe. Available: <http://www.natureserve.org/explorer>. (Accessed: February 16, 2005).

- NatureServe. 2010. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: March 1, 2011).
- Smith, J. 1999. "*Zapus hudsonius*" (On-line), Animal Diversity Web. Accessed March 23, 2005 at http://animaldiversity.ummz.umich.edu/site/accounts/information/Zapus_hudsonius.html.
- USDA, Forest Service Region 3. 1999. Regional Forester's Sensitive Species List.
- USDA, Forest Service Region 3. 2007. Regional Forester's List of Sensitive Animals.
- USDI, Fish and Wildlife Service. 1989. Endangered and Threatened Wildlife and Plants; Animal Notice of Review. Federal Register 54(4): 563.
- USDI, Fish and Wildlife Service. 1996. Endangered and Threatened Wildlife and Plants: Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species. Federal Register 61(40): 7596-7613.
- USDI, Fish and Wildlife Service. 2007. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Proposed Rule. Federal Register 72(234): 69034-69106.
- USDI, Fish and Wildlife Service. 2008. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Proposed Rule. Federal Register 73(238): 75176-75244.
- USDI, Fish and Wildlife Service. 2009. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Proposed Rule. Federal Register 74(215): 57804-57878.
- USDI, Fish and Wildlife Service. 2010. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Notice of Review; Proposed Rule. Federal Register 75(217):69285.
- USDI, Fish and Wildlife Service. 2011. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Notice of Review; Proposed Rule. Federal Register 76(207):66370.
- Van Pelt, B. 1993. Meadow Jumping Mouse. Wildlife Views. November. Pp. 8.
- Whitaker, J.O., Jr. 1972. *Zapus hudsonius*. Mammalian species. No.11. The American Society of Mammalogists. Pp. 1-7.
- Wilson, D.E. and D.M. Reeder, eds. 2005. Mammal Species of the World, a taxonomic and geographic reference. Third edition, Volume 1. The Johns Hopkins University Press, Baltimore, Maryland. 892-893.
- Wilson, D.E., and S. Ruff. 1999. The Smithsonian Book of North American Mammals. Smithsonian Institution Press. Washington D.C. Pp. 666-669.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

Dr. Jennifer Frey, Dept. of Bio. and Mus. Of SW Bio., UNM, Albuquerque. E-mail:

frej_b_r@fastwave.biz

J.L. Morrison - New Mexico Department of Game and Fish, Albuquerque.

Bill Van Pelt - Arizona Game and Fish Department, Phoenix, Arizona.

ADDITIONAL INFORMATION:

Confusion as to the identity of these animals in Arizona and New Mexico existed for many years. Genetic and morphometric studies culminated in 1981 to provide a clearer understanding of the taxonomy and consequently the biogeography of the Arizona and New Mexico populations, which were formerly thought to be *Z. princeps*.

Revised: 1992-01-08 (JSP)
1993-02-19 (DBI)
1997-03-04 (SMS)
1999-07-08 (DAS)
2005-02-25 (AMS)
2005-03-24 (SMS)
2007-12-10 (TFH)

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.