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*** START OF THE PROJECT GUTENBERG EBOOK AN ANNOTATED CHECKLIST OF
NEBRASKAN BATS ***

An Annotated Checklist of Nebraskan Bats

BY

OLIN L. WEBB and J. KNOX JONES, JR.

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HISTORY

The first mention of bats in Nebraska possibly was by Harrison Allen, in his "Monograph of the Bats of North America" (1864:14, 20, 30, 35, 42), who listed *Nycticejus crepuscularis* [= *Nycticeius humeralis*], *Lasiurus borealis*, *Scotophilus carolinensis* and *Scotophilus fuscus* [both = *Eptesicus fuscus*], and *Scotophilus noctivagans* [= *Lasionycteris noctivagans*], as collected in "Nebraska" (then Nebraska Territory) by J. G. Cooper. Henry W. Setzer (in *litt.*) reports that none of the bats collected by Cooper now exists in the United States National Museum and that no data pertaining to any of them are available except that a single specimen of *Nycticeius humeralis* was traded to the British Museum in 1866. Cooper journeyed through parts of the present state of Nebraska in the summer and autumn of 1857 and, judging from Taylor's (1919:72-80) report of Cooper's travels, this was the only time he entered any part of Nebraska Territory. The writers are of the opinion that the specimens in question probably were collected in Nebraska; but since Allen listed no exact localities or dates of collection and since the specimens and data pertaining to them are not now available, we have not included them here as Nebraskan records.

In the first comprehensive account of Nebraskan mammals, Myron H. Swenk (1908:137-139) listed six kinds of bats, *Myotis evotis*, *Myotis californicus ciliolabrum* [= *Myotis subulatus subulatus*], *Lasionycteris noctivagans*, *Eptesicus fuscus*, *Lasiurus borealis*, and *Lasiurus cinereus*, as occurring within the state. Zimmer (1913:665) recorded *Nyctinomus mexicanus* [= *Tadarida mexicana*] from Nebraska. Subsequently, Swenk (1915:854) reported *Myotis lucifugus lucifugus* in the state and three years later (1918:411) he reported *Eptesicus fuscus pallidus* for the first time. The report of *M. l. lucifugus* seemingly was not substantiated by any actual specimens. The addition of *Myotis volans interior* (Quay, 1948:181) brought to ten the number of species and subspecies of bats reported from the state.

In the present paper, *Myotis keenii septentrionalis*, *Myotis lucifugus carissima*, and *Pipistrellus subflavus subflavus* are reported from Nebraska for the first time. Also, the first authentic record of *Myotis lucifugus lucifugus* is presented, along with additional information on previously reported species. A total number of 169 specimens from Nebraska was available for the present study. This includes almost all of the known specimens preserved in all collections as well as material obtained by us in the past six years.

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Nebraska has no natural caves or caverns; however, there are two extensive man-made limestone caves near Louisville, in Cass and Sarpy counties, where four kinds of bats have been found. Two of these are here reported as new to Nebraska. The quarries, one on either side of the Platte River Valley, are in a horizontal stratum of limestone 40 feet in thickness, and are of the room and pillar type; that is to say, the stone has been quarried away leaving rooms having supporting pillars approximately every 50 feet. The average temperatures in summer and winter within these tunnels, recorded over a period of several years by the Ash Grove Lime and Portland Cement Company of Louisville, are 65° F. and 50° F. respectively. The Kiewit Stone Quarry, abandoned since 1936, is one-half mile west of Meadow, Sarpy County, and has one remaining entrance measuring approximately 30 by 30 feet. This quarry has an area of approximately one-fifth square mile and is usually flooded with several feet of water. The other man-made cave, known formerly as the National Stone Quarry, is one mile northeast of Louisville, Cass County. This quarry was abandoned in September, 1938, and until the winter of 1948-1949 had eight or nine entrances and two air shafts. It was approximately one-third square mile in area. All the openings to this quarry were covered in late 1949. Bats were first observed in the National Stone Quarry by one of us (Webb) as early as 1939, less than a year after operations in the quarry ceased.

METHODS AND ACKNOWLEDGMENTS

Records of Nebraskan bats are arranged in two categories; specimens examined and additional records. The latter refer to citations in the literature. Genera are arranged according to Simpson (1945:59, 60), and species are listed alphabetically under each genus. Specimens examined are in the personal collection of the authors unless otherwise indicated.

In connection with this study the authors acknowledge the assistance of Drs. Edson H. Fichter, Department of Biological Sciences, Idaho State College, and E. Raymond Hall and Rollin H. Baker, University of Kansas Museum of Natural History for critical assistance with the manuscript. We are indebted to Mr. Richard B. Loomis, University of Kansas, for aid in collecting specimens; to Dr. Henry W. Setzer, United States National Museum, for providing information on possible early Nebraskan records; and to Mr. Fred Brammer, Ash Grove Lime and Portland

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Cement Company, Louisville, Nebraska, for information on, and permission to collect in, the quarries of that area. For the loan of specimens we are grateful to Dr. William H. Burt, University of Michigan Museum of Zoology, Dr. C. Bertrand Schultz, University of Nebraska State Museum, Dr. Otis Wade, University of Nebraska Department of Zoology, Miss Lucille Drury, Cleveland Museum of Natural History, Mr. W. E. Eigsti, Hastings Museum, Hastings, Nebraska, and to those in charge of the collections of the Nebraska Game, Forestation and Parks Commission.

ACCOUNTS OF SPECIES

Myotis evotis evotis (H. Allen)

Long-eared Myotis

Vespertilio evotis H. Allen, Smithsonian Misc. Coll., 165:48, June, 1864 (part), type from Monterey, Monterey Co., California.

Myotis evotis, Miller, N. Amer. Fauna, 13:78, October 16, 1897.

Distribution in Nebraska.—Pine Ridge area of northwestern part of state.

Record of occurrence.—Specimen examined, 1, as follows: SIOUX Co.: Warbonnet Canyon, 1 (Univ. Nebr. State Mus.).

Remarks.—This specimen was taken by Merritt Cary on July 22, 1901.

Myotis keenii septentrionalis (Trouessart)

Eastern Long-eared Myotis

[*Vespertilio gryphus*] var. *septentrionalis* Trouessart, Catal. Mamm. viv. foss., p. 131, 1897, type from Halifax, Halifax Co., Nova Scotia.

Myotis keenii septentrionalis, Miller and Allen, Bull. U. S. Nat. Mus., 144:105, May 25, 1928.

Distribution in Nebraska.—Known from limestone quarries in Cass and Sarpy counties. Probably in other parts of extreme eastern Nebraska.

Records of occurrence.—Specimens examined, 35, as follows: CASS Co.: 1 mi. NE Louisville, 4. SARPY Co.: 1/2 mi. W Meadow, 31 (some of these specimens have been deposited in other collections as follows: Private Collection of P. H. Krutzsch, 3; Private Collection of W. G. Frum, 2; Nebr. Game, Forestation and Parks Comm., 1; Univ. Kansas Mus. Nat. Hist., 2; Univ. Nebr. State Mus., 7).

Remarks.—Although not so common as *Pipistrellus* in the limestone quarries, hibernating bats of this species frequently are found there, usually as solitary individuals either in drill holes or clinging to the walls of the quarries; occasionally, however, two or three bats have been found together in a single drill hole.

Myotis lucifugus carissima Thomas

Brown Myotis

Myotis (Leuconoe) carissima Thomas, Ann. and Mag. Nat. Hist., (ser. 7), 13:383, May, 1904, type from Yellowstone Lake, Yellowstone National Park, Wyoming.

Myotis lucifugus carissima, Cary, N. Amer. Fauna, 42:43, October 3, 1917.

Distribution in Nebraska.—Known from a single record in extreme northwestern Nebraska, but probably occurs throughout Panhandle of state.

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Record of occurrence.—Specimen examined, 1, as follows: SIOUX Co.: Agate, 1 (Univ. Mich. Mus. Zool.).

Myotis lucifugus lucifugus (Le Conte)

Brown Myotis

[*Vespertilio*]. *lucifugus* Le Conte, McMurtrie's Cuvier, Animal Kingdom, 1:431, June, 1831, type from Georgia, probably from the Le Conte Plantation, near Riceboro, Liberty County.

Myotis lucifugus [lucifugus], Miller, N. Amer. Fauna, 13:59, October 16, 1897.

Distribution in Nebraska.—Known only from the limestone quarry in Sarpy County, but probably occurs over most of eastern third of state.

Records of occurrence.—Specimens examined, 2, as follows: SARPY Co.: 1/2 mi. W Meadow, 2 (Univ. Kansas Mus. Nat. Hist., 1).

Remarks.—Two bats of this subspecies were found in the quarry in Sarpy County on December 30, 1949. None was found on subsequent visits to the quarry, although three other species of bats have been found there in large numbers. These specimens appear to be the first actual records of *M. l. lucifugus* in the state, although Swenk (1915:854, and in subsequent lists) reported it as "uncommon eastwardly".

One of these bats, a male (KU 35076), possesses a peculiar dental abnormality. Both of the second upper premolars (P3) are lacking, although the mandibular dentition is normal. This condition has been reported previously for this species by Frum (1946:176) in specimens from West Virginia.

***Myotis subulatus subulatus* (Say)**

Small-footed Myotis

Vespertilio subulatus Say, Long's Exped. to Rocky Mts., 2:65 (footnote), 1823, type from the Arkansas River near La Junta, Otero Co., Colorado.

Myotis subulatus, Warren, The Mammals of Colorado, G. P. Putnam's Sons, New York, 1910. p. 275.

Distribution in Nebraska.—Northern and western Nebraska.

Records of occurrence.—Specimens examined, 9, as follows: CHERRY Co.: Valentine, 1 (Univ. Nebr. Dept. Zool.). SHERIDAN Co.: Rushville, 1; 15 mi. N Rushville, 2. SIOUX Co.: Agate, 1 (Univ. Kansas Mus. Nat. Hist.); Monroe Canyon, 5-1/2 mi. N, 2-1/2 mi. W Harrison, 2 (Nebr. Game, Forestation and Parks Comm.); Warbonnet Canyon, 2 (Univ. Nebr. State Mus.).

Additional records: DAKOTA Co.: Crystal Lake, 1 (Stephens, 1945:92). DAWES Co.: Chadron, 1 (Miller and Allen, 1928:169). SIOUX Co.: Antelope Township, 1 (Quay, 1948:181); Sugarloaf Township, 1 (Quay, 1948:181).

Remarks.—This bat is common along the Niobrara River in the northwestern part of the state. Stephens (*loc. cit.*) reports taking a bat of this species in Dakota County in the northeastern corner of Nebraska. This specimen was sent to Swenk at the University of Nebraska for positive identification and was, according to Stephens, deposited in the Swenk collection. No trace of the specimen can be found at the present time. It is here assigned to *M. s. subulatus*.

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M. s. subulatus has been observed frequently in the Pine Ridge area, generally in association with *Eptesicus fuscus pallidus*. Two specimens were shot by us from many that were seen flying over a small clearing in the pines in northern Sioux County on August 2, 1949. Several *Eptesicus* were also obtained there. One of us (Webb) took two of these bats from their daytime retreat in a barn north of Rushville, Sheridan County, on September 5, 1951, where *Eptesicus* was also found. They are known to inhabit hay barns at the Ft. Niobrara Game Reserve, Cherry County, also in association with *Eptesicus*. Swenk (1908:137) reports finding two of these bats under a loose strip of pine bark in Sioux County.

***Myotis volans interior* Miller**

Hairy-winged Myotis

Myotis longicus interior Miller, Proc. Biol. Soc. Washington, 27:211, October 31, 1914, type from Twining, Taos Co., New Mexico.

Myotis volans interior, Miller and Allen, Bull. U. S. Nat. Mus., 144:142, May 25, 1928.

Distribution in Nebraska.—Badlands area of extreme northwestern part of state.

Records of occurrence.—Specimens examined, 2, as follows: SIOUX Co.: Warbonnet Township, 8 mi. N Harrison, 2 (Cleveland Mus. Nat. Hist.).

Remarks.—Quay (1948:181) reported finding a colony of approximately 180 of these bats in northern Sioux County in the summer of 1944. They were found in a crevice in a dry creek bed. He examined several dozen, all females, two of which were saved as specimens.

The authors, while engaged in field work in this approximate locality in the summers of 1948 and 1949, were unable to locate any of these bats.

***Lasionycteris noctivagans* (Le Conte)**

Silver-haired Bat

V[espertilio], noctivagans Le Conte, McMurtrie's Cuvier, Animal Kingdom, 1:431,

June, 1831, type from eastern United States.

Lasionycteris noctivagans, Peters, Monatsber. k. preuss. Akad. Wissensch. Berlin, p. 648, 1865.

Distribution in Nebraska.—"Entire state, fairly common during migrations but probably not breeding within our limits" (Swenk, 1908:138).

Records of occurrence.—Specimens examined, 2, as follows: CLAY Co.: Inland, 1 (Hastings Museum, Hastings, Nebraska). FRANKLIN Co.: Campbell, 1 (Hastings Museum, Hastings, Nebraska).

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Additional records (Swenk, 1908:138): CUMING Co.: West Point. DOUGLAS Co.: Omaha. LANCASTER Co.: Lincoln. County undesignated: "Platte River".

Pipistrellus subflavus subflavus (F. Cuvier)

Eastern Pipistrelle

V[espertilio]. subflavus F. Cuvier, Nouv. Ann. Mus. Hist. Nat. Paris, 1:17, 1832, type from eastern United States, probably Georgia.

Pipistrellus subflavus, Miller, N. Amer. Fauna, 13:90, October 16, 1897.

Distribution in Nebraska.—Known from limestone quarries in Cass and Sarpy counties; probably ranging throughout eastern Nebraska.

Records of occurrence.—Specimens examined, 34, as follows: CASS Co.: 1 mi. NE Louisville, 4. SARPY Co.: 1/2 mi. W Meadow, 30 (some of these specimens have been deposited in other collections as follows: Private Collection of P. H. Krutzsch, 3; Private Collection of W. G. Frum, 2; Univ. Kansas Mus. Nat. Hist., 4; Univ. Nebr. State Mus., 4).

Remarks.—This bat is the most common of the four species that are known to inhabit the quarries in Cass and Sarpy counties. Individuals have been found both in drill holes and clinging to the walls of the quarries. We have always found this bat to be solitary while in hibernation.

Eptesicus fuscus fuscus (Beauvois)

Big Brown Bat

Vespertilio fuscus Beauvois, Catal. Raisonné Mus. Peale, Philadelphia, p. 18, 1796, type from Philadelphia, Philadelphia Co., Pennsylvania.

Eptesicus fuscus, Méhely, Magyarország denevéreinek monographiája (Monographia Chiropterorum Hungariae), pp. 206, 338, 1900.

Distribution in Nebraska.—Eastern part of state.

Records of occurrence.—Specimens examined, 23, as follows: ADAMS Co.: Hastings, 1 (Hastings Museum, Hastings, Nebraska). CASS Co.: 1 mi. NE Louisville, 6; Plattsmouth, 1 (Univ. Nebr. State Mus.). SARPY Co.: 1/2 mi. W Meadow, 15 (Univ. Nebr. State Mus., 7).

Remarks.—We have observed this bat hibernating in the limestone quarries of Cass and Sarpy counties, where it was commonly found in drill holes or clinging to the ceiling or walls. We have always found this bat to be solitary while in hibernation, with one exception. On January 31, 1949, a male and female were found in the same drill hole in the Cass County quarry. The jolt of being knocked from the hole separated the two bats, and upon examination the penis of the male was noted to be extended and erected, indicating that the pair might have been in the act of copulation.

Eptesicus fuscus pallidus Young

Big Brown Bat

Eptesicus pallidus Young, Proc. Acad. Nat. Sci. Philadelphia, p. 408, October 2, 1908, type from Boulder, Boulder Co., Colorado.

Eptesicus fuscus pallidus, Miller, Bull. U. S. Nat. Mus., 79:62, December 31, 1912.

Distribution in Nebraska.—Western half of state.

Records of occurrence.—Specimens examined, 34, as follows: CHERRY Co.: Ft. Niobrara Game Reserve, 19 (Nebr. Game, Forestation and Parks Comm., 17); Valentine, 2 (Univ. Nebr. Dept. Zool.). DAWES Co.: 10 mi. S Chadron, 1 (Univ. Mich. Mus. Zool.). KNOX Co.: Niobrara, 1. SHERIDAN Co.: 15 mi. N Rushville, 2. SIOUX Co.: Glen, 1 (Univ. Nebr. State Mus.); Monroe Canyon, 5-1/2 mi. N, 2-1/2 mi. W Harrison, 1 (Nebr. Game, Forestation and Parks Comm.); Warbonnet Canyon, 7

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(Univ. Nebr. State Mus.).

Remarks.—A colony of approximately 100 of these bats was discovered in the unused portion of a barn loft at Ft. Niobrara Game Reserve on August 11, 1948. Although no temperature readings were taken, it was estimated that the temperature was more than 100° F. in the loft. The bats were congregated on rafters at the north end of the barn and when disturbed, only a few members of the colony dropped from the rafters to fly. Most of the bats crawled to new retreats between the rafters and the corrugated iron roof of the building.

Lasiurus borealis borealis (Müller)

Red Bat

Vespertilio borealis Müller, *Natursyst. Suppl.*, p. 20, 1776, type from New York.

Lasiurus borealis [*borealis*], Miller, *N. Amer. Fauna*, 13:105, October 16, 1897.

Distribution in Nebraska.—State-wide in suitable habitat.

Records of occurrence.—Specimens examined, 14, as follows: LANCASTER CO.: Lincoln, 13 (Univ. Nebr. State Mus., 11; Univ. Nebr. Dept. Zool., 1). RICHARDSON CO.: 3 mi. SE Rulo, 1 (Nebr. Game, Forestation, and Parks Comm.).

Additional records (Swenk, 1908:139): CUMING CO.: West Point. DOUGLAS CO.: Omaha. LANCASTER CO.: Lincoln. OTOE CO.: Nebraska City. RICHARDSON CO.: Humboldt.

Lasiurus cinereus cinereus (Beauvois)

Hoary Bat

Vespertilio cinereus (misspelled *linereus*) Beauvois, *Catal. Raisonné Mus. Peale*, Philadelphia, p. 18, 1796, type from Philadelphia, Philadelphia Co., Pennsylvania.

Lasiurus cinereus, H. Allen, *Smithsonian Misc. Coll.*, 17:21, June, 1864.

Distribution in Nebraska.—State-wide in suitable habitat.

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Records of occurrence.—Specimens examined, 11, as follows: CLAY CO.: Inland, 1 (Hastings Museum, Hastings, Nebraska). CUSTER CO.: Broken Bow, 2 (Univ. Mich. Mus. Zool.); Victoria Springs, 1 (Univ. Mich. Mus. Zool.). FURNAS CO.: Wilsonville, 1 (Hastings Museum, Hastings, Nebraska). LANCASTER CO.: Lincoln, 6 (Univ. Nebr. State Mus., 5; Univ. Nebr. Dept. Zool., 1).

Additional records: CUMING CO.: West Point (Swenk, 1908:139). DOUGLAS CO.: Omaha (Swenk, 1908:139). GAGE CO.: Beatrice (Swenk, 1908:139). LANCASTER CO.: Lincoln (Swenk, 1908:139). County undesignated: Loup Fork (Miller, 1897:114).

Tadarida mexicana (Saussure)

Mexican Free-tailed Bat

Molossus mexicanus Saussure, *Revue et Magasin de Zoologie*, Ser. 2, 12:283, July, 1860, type from Cofre de Perote, 13,000 feet, state of Veracruz, Mexico.

Tadarida mexicana, Miller, *Bull. U. S. Nat. Mus.*, 128:86, April 29, 1924.

Distribution in Nebraska.—Known only from Lincoln, Lancaster County.

Records of occurrence.—Specimen examined, 1, as follows: LANCASTER CO.: Lincoln, 1 (Univ. Nebr. State Mus.).

Additional record (Zimmer, 1913:665): LANCASTER CO.: Lincoln.

Remarks.—The Mexican free-tailed bat is probably rare in Nebraska. The single specimen examined by us was obtained on June 27, 1931, from a downtown business building in Lincoln. According to the label on the specimen, it died in captivity on June 29 after giving birth to one young on June 28. The bat reported by Zimmer (*loc. cit.*) was also taken in the business district of Lincoln. It was obtained on August 15, 1913.

In addition to the bats named above, six other kinds possibly occur in Nebraska. These, along with an indication of the part of the state in which each is to be looked for, are as follows:

- *Myotis grisescens* Howell, southeastern part of state.
- *Myotis sodalis* Miller and Allen, southeastern part of state.
- *Myotis thysanodes thysanodes* Miller, northwestern part of state.
- *Nycticeus humeralis humeralis* (Rafinesque), southeastern part of state.
- *Corynorhinus rafinesquii pallascens* (Miller), northwestern part of state.
- *Tadarida molossa* (Pallas), any part of state.

- ALLEN, H.
1864. Monograph of the bats of North America. Smithsonian Misc. Coll., 165:xxiii + 85, June, 1864.
- FRUM, W. G.
1946. Abnormality in dentition of *Myotis lucifugus*. Jour. Mamm., 27:176, May 14, 1946.
- MILLER, G. S., JR.
1897. Revision of the North American bats of the family Vespertilionidae. N. Amer. Fauna, 13:1-138, October 16, 1897.
- MILLER, G. S., JR., and G. M. ALLEN
1928. The American bats of the genera *Myotis* and *Pizonyx*. Bull. U. S. Nat. Mus., 144:viii + 218, May 25, 1928.
- QUAY, W. B.
1948. Notes on some bats from Nebraska and Wyoming. Jour. Mamm., 29:181-182, May 14, 1948.
- SIMPSON, G. G.
1945. The principles of classification and a classification of mammals. Bull. Amer. Mus. Nat. Hist., 85:xvi + 350, October 5, 1945.
- STEPHENS, T. C.
1945. Say's bat in Nebraska. Jour. Mamm., 26:92, February 27, 1945.
- SWENK, M. H.
1908. A preliminary review of the mammals of Nebraska. Proc. Nebr. Acad. Sci., 8:61-144, 1908.
1915. The birds and mammals of Nebraska. Nebr. Blue Book and Historical Register, pp. 851-855, 1915.
1918. The birds and mammals of Nebraska. Nebr. Blue Book and Historical Register, pp. 407-411, December, 1918.
1919. The birds and mammals of Nebraska. Univ. Nebr. Contrib. Dept. Ent., 23:1-21, March 1, 1919.
1920. The birds and mammals of Nebraska. Nebr. Blue Book and Historical Register, pp. 479-483, December, 1920.
- TAYLOR, W. P.
1919. Notes on mammals collected principally in Washington and California between the years 1853 and 1874 by Dr. James Graham Cooper. Proc. Calif. Acad. Sci., 9:69-121, July 12, 1919.
- ZIMMER, J. T.
1913. A northwardly record of the free-tailed bat. Science (NS), 38:665-666, November 7, 1913.

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