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New Records and Notes on the Ecology of the Northern Long-Eared Bat (*Myotis septentrionalis*) in Arkansas

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The northern long-eared bat (*Myotis septentrionalis*) has been a common insectivorous bat in much of eastern North America, including Arkansas, which is located near the southwestern edge of its range. While this species is expected to occur throughout the Ozarks and Ouachita Mountains, it has only been previously documented in 19 of 75 Arkansas counties (Harvey and McDaniel 1983, Saugey et al. 1989, Sealander and Heidt 1990, Saugey et al. 1993, Wilhide et al. 1998a, Tumlison et al. 2002, Sasse and Saugey 2008).

In the northeastern United States, there have been significant losses in many bat populations due to white-nose syndrome. Analyses have thus indicated declines in northern long-eared bat summer capture rates and hibernating winter cave populations (Francl et al. 2012, Ingersoll et al. 2013). In 2013, the U.S. Fish and Wildlife Service proposed listing the northern-long eared bat as an endangered species and it is now considered as such within Arkansas (U.S. Fish and Wildlife Service 2013).

We examined 1,464 known *M. septentrionalis* collection events from 1938-2014 that were collected by the Arkansas Game and Fish Commission and report on new records of this species in 16 additional counties (Figure 1).

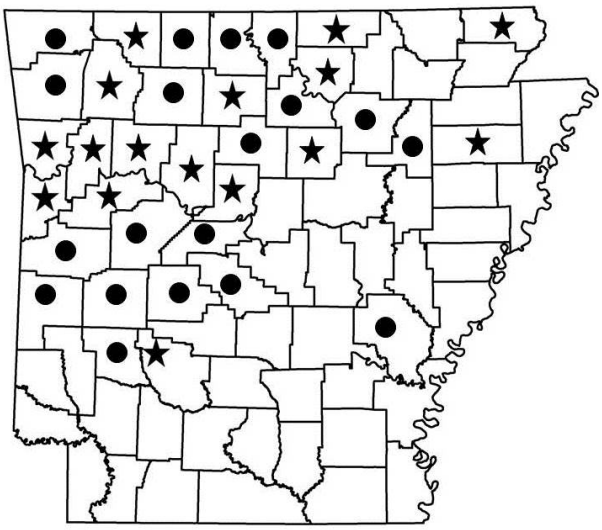

Figure 1. Distribution of the northern long-eared bat in Arkansas. "Stars" indicate new county records. "Solid circles" indicate historical records from Saugey et al (1993), Sasse and Saugey (2008), Sealander and Heidt (1990), Tumlison et al (2002).

Carroll Co.

A single male was captured by MJH inside Bennett Cave on October 27, 1979.

Clark Co.

On January 28, 1994 1 male and 1 female were found by DAS in an abandoned mine south of Amity in the northwestern part of the county.

Clay Co.

On June 19, 2006 1 male and 2 females were captured by TSR in a mist net in Sec. 12 T19N R3E.

Cleburne Co.

On July 29, 2013 a male was found alive on a homeowner's deck in the town of Tumbling Shoals

and submitted to the Arkansas Department of Health for rabies testing and was identified by DAS.

Conway Co.

On March 17, 2004 2 males were captured by DAS in a mist net set over a road in Sec. 5 T5N R18W. One male and one female were caught by DAS in this same location on July 5, 2004.

Crawford Co.

On December 31, 1997 a single bat was observed inside a crevice cave in Sec. 17 T12N R31W (Bill Puckette, personal communication).

Franklin Co.

On January 3, 1997 a single bat was seen in each of two difference crevice caves in Sec. 8 T11N R27W (Bill Puckette, personal communication).

Fulton Co.

On March 26, 2012 a female from the town of Sturkie was submitted to the Arkansas Department of Health for rabies testing and identified by DAS.

Izard Co.

On August 16, 2002 4 bats were observed in Bergren Cave (G.O. Graening, personal communication).

Johnson Co.

On July 6, 2004 4 males were captured by JLJ in a mist net set over a stream in Sec. 19 T12N R21W. Three more males were captured by JLJ at the same site on July 7, 2004.

Logan Co.

A female was captured by MLC in a mist net on August 21, 2001 on the Cold Springs Ranger District, Ozark-St. Francis National Forests.

On May 20, 2004 8 males and 9 females were captured by DAS in a mist net in Sec. 24 T6N R25W.

Madison Co.

On March 8, 1976 4 males were collected by J. Priday 22.4 km north of Fredericktown and specimens were deposited in the museum of Arkansas State University (Specimens ASU 2130, 2188-2190).

Poinsett Co.

On May 8, 2013 an adult male was captured by TSR in a mist net set over a trail in Sec. 36 T12N R1E on the Earl Buss Bayou DeView Wildlife Management Area.

Pope Co.

On June 12, 2001 2 females were captured by MLC in a mist net on the Bayou Ranger District, Ozark-St. Francis National Forests.

On June 29, 2004 one female was captured by JLJ in a mist net set over a road in Sec. 2 T9N R18W.

Searcy Co.

On July 20, 2008 4 males were captured by DBS in a mist net set over a road in Sec. 19 T15N R18W. One female was captured by DBS in a different site in that section on June 29, 2009.

Sebastian Co.

On August 3, 2005 a female was captured in a mist net set over a trail in Sec. 4 T3N R31W (Lisa Gatens, personal communication).

Examination of records maintained by the Arkansas Game and Fish Commission and the authors of this paper found other observations on the life history of this species worthy of note.

The northern long-eared bat is generally found only in the Ouachita and Ozark mountains of western and northern Arkansas. They have been found only occasionally in the Delta region in the eastern part of the state and do not seem to be common in bottomland hardwoods despite their use of this habitat in other parts of their range (Carter and Feldhamer 2005, Fokidis et al. 2005, Medlin et al. 2006). On September 4, 1986 a male bat from Stuttgart in Arkansas County was submitted to the Arkansas Department of Health for rabies testing and was identified by DAS. This species was commonly captured by TSR in mist nets set in bottomland hardwood habitat on the Dave Donaldson Black River Wildlife Management Area in Clay County during the summer of 2006 and one was captured on the Earl Buss Bayou DeView Wildlife Management Area in Poinsett County in 2013.

Caves were utilized by northern long-eared bats throughout the year. However, more than 10 hibernating bats were seen in only 11 caves and more than 100 bats in only 2 caves. Fitton Cave in Newton County is the only cave that has supported relatively large numbers of hibernating northern long-eared bats;

Arkansas Game and Fish Commission records indicate that surveys found only 1-5 hibernating bats prior to 1997, but the population has grown since to as high as 391 in 2014.

Small numbers of males used caves as roosts throughout the summer but females were found roosting inside a cave during this period only once when 2 were captured by DAS inside Spillway Mine in Garland County on May 27, 2008. At Reed Cave in Marion County, 7 males were clustered together with at least 30 Ozark big-eared bats (*Corynorhinus townsendii ingens*) on June 20, 1995 (Wilhide et al. 1998b).

Northern long-eared bats appear to leave hibernation in mid-to late March but spring records are rare. A female was submitted for rabies testing from West Fork in Washington County on March 11, 2003 and a female from Fulton County was submitted on March 26, 2012 and both were identified by DAS. Bats have been captured in mist nets set over roads and ponds as early as March 17, 2004 at a site in Conway County, and at 3 sites in Boone County from March 25-30, 2008.

Female bats were found by DAS roosting in Spillway Mine in Garland County in late April and May. Two females, one of which was pregnant, were observed there with 4 males on May 27, 2008. On April 20, 2010, 12 females that may have been in the early stages of pregnancy were found in the mine and 8 days later 10 pregnant females, and 1 female, for which reproductive status was not recorded, were captured there. On April 20, 2011, 16 pregnant females roosted in the mine.

During mist netting conducted by the authors in summer months from 1996-2013, pregnant females were captured from May 3-June 24, lactating females from May 19-July 20, and the first capture of volant juveniles occurred from June 6-July 20.

The northern long-eared bat does not commonly roost in buildings or other manmade structures (Krochmal and Sparks 2007, Henderson and Broders 2008, Timpone et al. 2010); however there were several occurrences of this in Arkansas. At least 2 male and 10 female bats were captured inside a private home in Newport on July 23, 1999 (Grippo and Massa 2000). On August 16, 2013 a male and female bat were captured by PNJ while roosting on the side of a log cabin in Newton County.

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