

1978

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Recommended Citation

Gardner, James E. and McDaniel, V. Rick (1978) "Distribution of Bats in the Delta Region of Northeastern Arkansas," *Journal of the Arkansas Academy of Science*: Vol. 32, Article 16.

Available at: <https://scholarworks.uark.edu/jaas/vol32/iss1/16>

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Journal of the Arkansas Academy of Science, Vol. 32 [1978], Art. 16
**Distribution of Bats in the Delta
Region of Northeastern Arkansas**

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ABSTRACT

Eight taxa of bats are reported from seven counties in northeastern Arkansas. Localities, natural history notes, sex, age and reproductive condition are reported for most species. New records are combined with previously existing ones to reveal a greater distribution of chiroptera for the state.

INTRODUCTION

The Mississippi River Delta of northeastern Arkansas is a region in which agricultural practices dominate. As a result of overcutting, burning, and clearing land for farming operations, habitat needed to support bat populations has been drastically reduced. Soil Conservation Service figures for 1975 indicate that woodlands comprise less than 15% of the total area of Craighead, Cross, Greene, Jackson, Mississippi, and Poinsett Counties.

Although bats undoubtedly occur throughout the Delta Region of northeastern Arkansas, previously published records for this area are virtually non-existent. Sealander (1956) reported records for only two species of bats for one county in this region. Baker and Ward (1967) list records for nine species of bats which occur in three counties of southeastern Arkansas. Other existing records of chiroptera for the state are concerned primarily with the Ozark Region, and caves found therein, of northwestern and northcentral Arkansas (Dellinger and Black, 1940; Sealander, 1956, 1960; McDaniel and Gardner, 1977). Graves and Harvey (1974) reported twelve species of bats occurring in all or part of 21 counties in western Tennessee.

METHODS

Localities are reported for eight species of bats collected from seven counties in northeastern Arkansas between 1973 and 1977. Although many specimens were collected by the author, a number of records existed in the Collection of Recent Mammals, Arkansas State University.

Collection was primarily by mist netting, as described by Tuttle (1976). Japanese mist nets of variable lengths (18.3, 12.8, and 5.5 m), were set in the capture position just prior to sunset, and checked at intervals of 30 minutes during the night, until sunrise. Most netting was done over water, either over creek pools or on ponds, to capture bats as they drank. However, nets were also set in flyways created by roads through woods, dry streambeds, buildings, or bridges. Each bat was removed from the net and the following data recorded for each capture: species, time of capture, sex, age, reproductive condition, and certain environmental conditions (e.g. temperature, precipitation, cloud cover, and moon phase). Other collecting techniques included the searching of abandoned houses, barns and bridges. Only voucher specimens were prepared and deposited in the Collection of Recent Mammals, Arkansas State University, the remaining individuals were recorded and released.

Assignment of bats into age classes was determined by closure of phalangeal epiphyses. Bats were designated as juveniles on the basis of small overall size, as well as incomplete ossification of the epiphyses. In some instances, sub-adult bats were determined by lack of canine wear, but more reliably by the condition of the epiphyses of the phalanges and humerus. Comparison of pelage color was helpful in separating juvenile and sub-adults from adults.

Reproductive condition of males was determined by position of the epididymides. Scrotal bats were characterized by complete descent of the epididymides into pigmented sheaths dorsolateral to the tail,

and by the presence of enlarged testes. Female bats were diagnosed as pregnant by dissection, or by examination of an obviously enlarged abdomen. Lactation was determined on the basis of teat examination and the obvious presence of lactiferous tissue.

**DISTRIBUTION AND NATURAL HISTORY NOTES
OF BATS IN NORTHEASTERN ARKANSAS**

Myotis lucifugus (LeConte). Typically a cave inhabitant, the little brown bat occurs more commonly in small numbers throughout the Ozark Region of Arkansas. The nearest existing records were from caves in Independence County (McDaniel and Gardner, 1977). On 8 October 1976 a scrotal male was netted in Craighead County over Ditch Number 60 (a tributary of the Saint Francis River), and on 15 October 1976 another scrotal male was collected from the same location. The latter specimen was a sub-adult, as its pelage was not characteristic of adult bats. These specimens represent the first records for this species in northeastern Arkansas.

Lasiurus noctivagus (LeConte). Baker and Ward (1967) reported five specimens captured in December in Bradley County. Previously, Sealander (1956) listed only two specimens from northwestern Arkansas. On 15 October 1974 an adult male was found hanging on a brick wall in the newly completed Agricultural Sciences Building, Arkansas State University. On 18 May 1977 another male was netted over Poplar Creek, Greene County. Poplar Creek cuts directly across Crowley's Ridge, and is surrounded on either side by upland deciduous hardwood forest, representing one of the few remaining habitats favorable to species of tree bats.

Pipistrellus subflavus (F. Cuvier). The eastern pipistrelle is most commonly a cave inhabitant, but females are known to regularly establish nursery colonies outside caves (Lowery, 1974), and to roost in a variety of situations, including trees (Findley, 1954). On 17 May 1973 a female was collected from a group of 10 bats found beneath a concrete bridge across the Cache River, Lawrence County. Another adult female was found hanging from the supporting rafters of a porch in Green County. On 28 April 1977 an adult female was netted during a light rain over Ditch Number 60 in Craighead County. According to Baker and Ward (1967), this species decreases in numbers during late August and September, which also seems to be the case in northeastern Arkansas since no specimens were collected during fall or winter. However, this seasonal effect is probably due to hibernation or migration on south.

Eptesicus fuscus (Rafinesque de Bevois). Sealander (1956) reported a single specimen of the big brown bat from Greenway, Clay County. Only three other specimens are presently known from northeastern Arkansas. A dead adult male was found in a parking lot near a church belfry in Jonesboro, Craighead County, on 8 February 1977. On 22 October 1977 an adult female bat was discovered dead on the theatrical stage in Wilson Hall, Arkansas State University (search of the attic revealed only a small ventilator through which a bat could enter the building, and no additional bats were found). Four days later, on 26 October, a male was collected in mid-afternoon on the west side of the First National Bank Building in Jonesboro.

Lasiurus borealis (Muller). Sealander (1956) reported only five specimens of the red bat from one locality in the extreme corner of northeastern Arkansas. This species is unquestionably the most commonly occurring in the Delta Region. From May, 1976 to October, 1977, a total of 81 red bats were captured or observed. On 26 June 1973 a female with three young attached was discovered hanging from a porch rafter in Jonesboro, Craighead County. One year later, on 25 June, a female was found in Walnut Ridge, Lawrence County, also with three young attached (one male and two females). Another female with three young attached (one male and two females), was discovered on the Arkansas State University campus on 25 June 1975. On 18 May 1977 a pregnant red bat (with one female and two male embryos, crown to rump average 15 mm), was netted over Poplar Creek, Greene County. On 13 June 1977 in Paragould, Greene County, a female with four young attached was found on the ground beneath a tree. The average weight of these young was 6.9 g while the female weighed 15.5 g. On 16 June 1977 another female red bat was discovered three km north Jonesboro, beneath a shagbark hickory (*Carya ovata* [Mill.] K. Koch). This bat had only two young attached and was discovered after observing the peculiar behavior of a pair of blue jays (*Cyanocitta cristata* [Linnaeus]). The two birds were observed molesting the female, and successfully dislodged her from the tree. Blue jays are known predators on red bats (Hoffmeister and Downes, 1964). During the night of 8 June 1977, a total of fifteen red bats were netted over a very small isolated water hole on Cooper Creek, Cross County. With the exception of one scrotal male, all specimens were females. Eight of the females were lactating, one was pregnant, one was later determined to be a sub-adult, and another was a juvenile. Cockrum and Cross (1964) stated that pregnant, and especially lactating females may require more water than males, and may not be able to maneuver and avoid a mist net as easily as males or nonpregnant females. At present there is only a single specimen of the red bat from Mississippi County—a female shot feeding around a street light four km west of Manila. An adult male red bat was captured in Jackson County, near Newport, on 27 February 1977, and a juvenile was shot at the same location on 8 April 1977.

Lasiurus borealis was collected in a variety of situations in northeastern Arkansas, including under brush piles, from the rafters of porches, and attached to the node of cane (*Arundinaria gigantea* [Walt.] Chapm.). However, they were most often collected along streams or riparian habitats. The majority of specimens was collected on or near Crowley's Ridge, in extensively wooded areas. Only one red bat (an adult female) was collected in December, near Jonesboro. However, there were several sightings of unidentified bats during December occurring in locations where red bats previously had been captured. Although no bats were captured during January or March, a male was collected on 11 February 1977 north of Jonesboro. This specimen was observed flying down a county road in mid-afternoon, and was captured after it landed on the shoulder of the road. Another bat, which appeared to be a red bat, was observed flying approximately 9 m above a road in Cross County on 26 February 1978. These data suggest at least limited winter activity of red bats during warmer days.

Lasiurus cinereus (Palisot de Beauvois). Baker and Ward (1967) reported 14 specimens of the hoary bat from southeastern Arkansas. Sealander (1956) reported a total of six specimens from the state. On 4 September 1976 an adult female was netted at 3:00 a.m. over a small pool on Poplar Creek, Greene County. On 18 May 1977 a pregnant female (containing two male embryos, crown to rump average - 19 mm), was captured at the same locality. A torpid male was discovered beneath the eave of a house in Jonesboro on 8 March 1978. Another male was collected from a low hanging branch of an oak (*Quercus* sp.), Woodruff County.

Nycticeius humeralis (Rafinesque). The evening bat appears to be more numerous in the southernmost counties of Arkansas (Baker and Ward, 1967), and farther south into Louisiana (Lowery, 1974). Only six specimens were collected from northeastern Arkansas. A scrotal male was netted on 15 October 1976 as it flew down a well-canopied stream adjacent the Saint Francis River, Craighead County. Another scrotal male was netted on 19 November 1976 over a pond north of Jonesboro. On 23 January 1977 an adult male

was discovered clinging to the side of an old chair on the back porch of a house 15 km west of Jonesboro. Another scrotal male was shot as it emerged at sunset on 4 May 1977 near the Saint Francis River, Craighead County. This bat flew considerably lower than the surrounding trees, and was the first bat observed on that particular night. A sub-adult male was netted at a different location on the Saint Francis River on 23 June 1977, Greene County. Although evening bats were not commonly encountered in northeastern Arkansas, they appear to be present in small numbers during much of the year.

Plecotus rafinesquii Lesson. Sealander (1956) lists only a single record of this bat for the state. Several specimens and a nursery colony were reported by Baker and Ward (1967). A total of six specimens were collected from the Delta Region of northeastern Arkansas. On 2 November 1973 a scrotal male was collected from a barn three km east O'Kean, Greene County. Another scrotal male was discovered hanging half way up a wall in an old house 9 km west of Tuckerman in Jackson County, on 14 June 1974. During the night of 18 September 1976 two adult females were netted as they flew down Cooper Creek, Cross County, and on 24 September 1976 a scrotal male was netted over the creek. These bats were presumably breeding in this vicinity as the testes of the males were approaching maximum development. Another scrotal male was netted on 8 October 1976 as it flew down Ditch Number 60, Craighead County. These records represent a greater distribution of the eastern bigeared bat for Arkansas than previously reported. The unusually large number of old and abandoned houses and barns, as well as other suitable roosting sites, provide excellent habitat for this species in northeastern Arkansas.

ACKNOWLEDGEMENTS

I wish to express my sincere appreciation to the many individuals who contributed both time and effort to this study. Assistance in collecting was provided by N. Childers, M. Flagg, M. Hinsen, James Huggins, John Huggins, R. Ouzts, K. Paige, R. Ramsey, B. Richards, D. Saugey, K. Sutton, and J. Wilhide. On two occasions members of the 1977 Natural History class of Arkansas State University provided valuable assistance in collecting. Additional specimens were provided by T. Allison, R. Faulkner, M. Martin, S. Modelsky, D. Parten, B. Phaup, J. Priday, K. Smith, and F. Stark. I am especially appreciative of valuable assistance from Dr. V. Rick McDaniel in collection and identification of specimens, for the use of museum records, and in critically reading this manuscript. Finally, I wish to thank my wife, Treva, for assistance in collecting specimens, and for encouragement given during preparation of this manuscript.

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