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DISTRIBUTION NOTES OF BATS FOR WEST-CENTRAL ILLINOIS

Bryon K. Clark[1]
and
Brenda S. Clark[2]
Department of Biological Sciences
Western Illinois University
Macomb, Illinois 61455

ABSTRACT

A limited survey of bats in eastern Pike County was conducted during the summer of 1981 with 89 bats of nine species examined. Notable captures included two Indiana bats (*Myotis sodalis*) and one gray bat (*Myotis grisescens*), both endangered species. Three additional Indiana bats were found roosting on outer building walls in Macomb, McDonough County between 1980 and 1983. Suitable maternity roost habitat is present in west-central Illinois for the Indiana bat. Additionally, the southern breeding range of the silver-haired bat (*Lasionycteris noctivagans*) may extend into west-central Illinois.

INTRODUCTION

At least 11 species of bats occur in west-central Illinois, but little is known about their summer ecology (Hoffmeister and Mohr, 1957). Two species, the Indiana bat (*Myotis sodalis*) and gray bat (*M. grisescens*) possess federal endangered species status (Thom, 1981). Numerous studies have been conducted in Illinois since their endangered status to survey potentially suitable habitats and assess the impact of habitat alteration by various highway and construction projects (e.g., Brack, 1979; Gardner and Gardner, 1980; Dunstan and Warnock, 1981; Gardner and Taft, 1983; 1984). This paper summarizes bat data collected in west-central Illinois by the authors and others at Western Illinois University (WIU) between 1980 and 1983.

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[1]Current address: Division of Biology—Ackert Hall, Kansas State University, Manhattan, Kansas 66506.
[2]Current address: Oklahoma Cooperative Fish and Wildlife Research Unit, Oklahoma State University, Stillwater, Oklahoma 74078.

MATERIALS AND METHODS

Six sites in Pike County, Illinois were surveyed for bats during the summer and autumn of 1981. Limestone Mine Cave and Twin Culvert Cave were searched on 16 October 1981 between 1200 and 1600 hrs and bats were collected by hand from cave ceilings, identified, and released.

Bats were mist-netted 11 nights at four sites in eastern Pike County near the Illinois River; one night at Flint Creek (5 September), six at Napoleon Hollow (20-21 June, 3-5 July, and 19 August), two at South Border Road (17-18 July), and two at Florence (6 and 11 September). We used single and/or tiered mist nets (5.5, 9.1, or 12.8 m) erected perpendicular to flyways at least partially enclosed by vegetation. Nets were monitored at 15-minute intervals each night for a minimum of three hours past sunset or until sunrise, except during inclement weather. Data collected for each individual included sex, age, weight, and reproductive condition. Brief descriptions of mist net locations are provided below (see Henry and Henry, 1981; Ives, 1981 for details).

Incidental sightings of bats were reported to the Department of Biological Sciences (WIU) by residents of Macomb, McDonough County during 1980-1983. These bats were removed from buildings, identified, and released outside the city limits.

SITE DESCRIPTIONS

Flint Creek (SE1/4, Sec. 19, T4S, R2W).—Nets were erected on the floodplain of Flint Creek. Silver maple (*Acer saccharinum*), American elm (*Ulmus americana*), bur oak (*Quercus macrocarpa*), red oak (*Q. rubra*), and shagbark hickory (*Carya ovata*) were the prevalent overstory trees. The bottomland was heavily grazed and little understory vegetation was present. Adjacent hillsides were wooded (oak-hickory complex; see Ives, 1981) and had a brushy understory.

Napoleon Hollow (SE1/4, Sec. 29, T4S, R2W).—This site was located in the Pike County Conservation Area (PCCA). Nets were placed across an intermittent upland creek and dirt road. Dominant trees included silver maple, cottonwood (*Populus deltoides*), red oak, American elm, and black walnut (*Juglans nigra*). A dense understory of young canopy trees, dogwood (*Cornus* spp.), and aromatic sumac (*Rhus aromatica*) was present.

South Border Road (SW1/4, Sec. 33, T4S, R2W).—Nets were erected across a 7-m wide dirt road in PCCA. Shagbark hickory, American elm, red oak, and basswood were the prevalent trees and provided complete canopy coverage over the nets. Common woody understory species included dogwood, boxelder (*A. negundo*), hackberry (*Celtis occidentalis*), and small canopy trees.

Florence (NW1/4, Sec. 15, T5S, R2W).—Nets were placed across a ravine near an old section of Illinois Highway 100. The site was highly disturbed as swine and other livestock reduced the understory and herbaceous growth to bare ground. Dominant canopy species were American elm, cottonwood, red oak, and hackberry.

Limestone Mine Cave and Twin Culvert have been described in detail by Kerr (1973) and Skaggs (1973).

RESULTS

We examined 89 bats in Pike County, 50 in the two caves and 39 while mist-netting (Table 1). The eastern pipistrelle (*Pipistrellus subflavus*) was the most abundant species found in the caves (N = 31), and was the only species in Twin Culvert Cave. Three other species were found in Limestone Mine Cave: the big brown bat (*Eptesicus fuscus;* N = 17), little brown bat (*M. lucifugus;* 1), and a non-reproductive adult male (testes not descended) gray bat (1).

During 11 nights of sampling we netted 39 bats of eight species (Table 1). The red bat (*Lasiurus borealis*) was the most abundant species taken (N = 13) and was the only species captured at all net sites. Additional species netted were the big brown bat (N = 10), little brown bat (5), Keen's myotis (*M. keenii;* 3), silver-haired bat (*Lasionycteris noctivagans;* 2), hoary bat (*L. cinereus;* 2), Indiana bat (2), and eastern pipistrelle (2).

We captured 14 individuals of eight species in a single night at Flint Creek including an adult non-reproductive male Indiana bat and one adult breeding male (testes descended) silver-haired bat (Table 1). Although the floodplain was heavily grazed, surrounding wooded hillsides were less disturbed and appeared to be suitable bat habitat.

Five species (11 individuals) were captured during six nights of netting at Napoleon Hollow (Table 1). A lactating female Indiana bat was taken on 3 July. No maternity roosts were found within a 150 m radius of the nets; however, many potential sites (i.e., trees ≥ 50 cm dbh with cavities or exfoliated bark) were in the area.

All captures occurred at South Border Road on 17 July as rain during the second night inhibited bat activity. Three species were netted; however, a juvenile (as determined by unfused epiphyses) male silver-haired bat was the most notable (Table 1). In contrast to South Border Road where inclement weather probably reduced our capture success, the high degree of disturbance at Florence was probably responsible for its low diversity (Table 1). The three species netted at this site are more tolerant of disturbance than other bats and are frequently taken in anthropogenic habitats.

Between 1980 and 1983, personnel of the Department of Biological Sciences (WIU) collected 10 bats from Macomb, Illinois. Records of significance included three Indiana bats removed from the outer walls of buildings: one adult non-reproductive female (Thompson Hall, WIU campus; 8 October 1980), one adult non-reproductive male (Citizen's National Bank; 21 October 1981), and one juvenile male (Waggoner Hall, WIU campus; 15 September 1982). These bats were probably using buildings as daytime roosts during migration. Three Keen's myotis, three big brown bats, and one red bat, also were collected in Macomb.

DISCUSSION

Our study, along with those of Gardner and Gardner (1980) and Gardner and Taft (1983; 1984), indicate that both sexes of the Indiana bat occur in Pike County during summer. Furthermore, the capture of juveniles and/or reproductive females indicate the presence of nurseries. Although Gardner and Taft (1983) doubted the existence of a maternity roost in Napoleon Hollow, we urge caution. The capture of a lactating female, coupled with the limited foraging distances traveled by such individuals (see Humphrey et al., 1977), suggest the strong possibility of at least one maternity roost in the area. Additionally, reproductive females and juveniles were netted at sites in Iowa similar to Napoleon Hollow (see Clark et al., 1987).

Kerr (1973) and Skaggs (1973) reported that gray bats used Limestone Mine Cave and Twin Culvert Cave as transient roosts during spring and fall. Additionally, Smith and Parmalee (1954) collected five gray bats from Twin Culvert Cave on 1 October 1953. Although no gray bats were netted during the summer of this study, close proximity of these caves to streams provide roost sites in habitats similar to those used by *M. grisescens* during summer in Missouri (LaVal et al., 1977; LaVal and LaVal, 1980). We feel more detailed summer sampling at potential roost caves and adjacent wooded habitats is necessary before the status of the gray bat in west-central Illinois can be ascertained.

An adult breeding male and a newly volant juvenile male silver-haired bat were netted at Flint Creek and South Border Road on 5 September and 17 July 1981, respectively. These captures suggest the midwestern breeding range of this species extends further south (approximately 39°40' N Latitude) than previously thought (see Hoffmeister and Mohr, 1957; Easterla and Watkins, 1970).

SUMMARY

Lack of information about the summer ecology of the bat fauna in Illinois precludes sound management practices. Additional sampling is needed to discern habitat requirements and assess the impact of continued loss and fragmentation of remaining wooded areas on the reproductive patterns of all species. Only through concerted scientific effort, greater public awareness, and habitat preservation, will the native bat fauna be maintained.

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Table 1. Number of individuals captured by species and location at Pike County, Illinois.

Species	Flint Creek	Napoleon Hollow	South Border Road	Florence	Limestone Mine Cave	Twin Culvert Cave	Total Captures Mist Net	Total Captures Cave	Total Captures All
P. subflavus	2	—	—	—	22	9	2	31	33
E. fuscus	3	1	—	6	17	—	10	17	27
L. borealis	3	7	2	1	—	—	13	—	13
M. lucifugus	2	—	—	3	1	—	5	1	6
M. keenii	1	1	1	—	—	—	3	—	3
L. cinereus	1	1	—	—	—	—	2	—	2
L. noctivagans	1	—	1	—	—	—	2	—	2
M. sodalis	1	1	—	—	—	—	2	—	2
M. grisescens	—	—	—	—	1	—	—	1	1
Total Captures	14	11	4	10	41	9	39	50	89