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The First Record of the Eastern Small-footed Myotis (*Myotis leibii*) in Illinois

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ABSTRACT

The eastern small-footed myotis (*Myotis leibii*) is one of the least known bats in eastern North America. We document the first record of the species in Illinois, and discuss possible reasons it has not been reported in the state until now.

INTRODUCTION

The eastern small-footed myotis (*Myotis leibii*) is one of the smallest, least common, and more elusive species of bat in North America (Best and Jennings, 1997; Bogan, 1999). Its geographic range extends from Quebec, Ontario, and Maine south through the Appalachian Mountains and west to Arkansas and Oklahoma (Best and Jennings, 1997). The species is generally associated with mountainous regions (Best and Jennings, 1997; Whitaker and Hamilton, 1998) and eastern hardwood and coniferous forests (Bogan, 1999), although information on specific summer habitat requirements is limited. It enters hibernation later than its congeners – in November or early December – and leaves earlier in the spring (Bogan 1999). The rarity of *Myotis leibii* is suggested by its listing as endangered, threatened, or a species of special concern in 8 of the 21 states where it is thought to occur. Neither Whitaker and Hamilton (1998) nor Bogan (1999) included Illinois within the geographic range of the species. There is only one historical record of *M. leibii* within 160 km of Illinois, a specimen taken in southeastern Missouri in 1949 (Hoffmiester, 1989). The nearest record from Kentucky is from near Fort Knox, Breckinridge County (J. MacGregor, personal communication), approximately 200 km from the Illinois border.

RESULTS AND DISCUSSION

On 4 November 2005, we found a male and a female *M. leibii* in torpor at Fink Sandstone Barrens Natural Area, Pope County, Illinois (T12S, R4E, Sec 1 NE ¼; elevation 188 m). The bats were roosting together under a relatively smooth rock approximately 0.5 m in diameter that was among other scattered rocks on exposed sandstone bedrock. We retained the male for a voucher specimen (skin and skull No. 4317 Mammal Museum, SIUC Department of Zoology). The female was released because we felt one voucher specimen was sufficient. She flew a few meters away from the original spot and crawled under another rock. These specimens represent the first verified records of *M. leibii* in Illinois. Body weight of the male was 5.8 g and there was extensive subcutaneous fat deposited in the abdominal region and lower back, suggesting the animal was about to enter hibernation. Standard body measurements (mm) were: total length 72; tail length 25; hind foot length 7; ear length 13; forearm length 30; and tragus length 9. The greatest length of the skull was 13 mm; there was no sagittal crest. There were 2 upper incisors in each quadrant, with 2 small premolars posterior to the upper canine. Maxillary and mandibular premolars and molars were 6/6 in each quadrant. Body measurements, skull and dental characteristics of the specimen are consistent with those of *M. leibii* and confirm our initial identification.

There are several possible reasons why *M leibii* has never been documented previously in Illinois, despite often extensive surveys of bats by previous investigators (Whitaker and Winter, 1977; Hofmann et al., 1999; Carroll et al. 2002). It may be that relatively little work has been conducted in habitats occupied by *M. leibii*. While there is ample potential summer and winter habitat in southern Illinois, many of the investigators working with bats have concentrated their efforts on the federally endangered Indiana bat (*M. sodalis*), a species found in bottomland hardwood forests (Gardner et al. 1996; Carter and Feldhamer 2005). Thus, researchers are less likely to encounter the small-footed myotis. In addition, *M. leibii* may be difficult to detect in cave or mine hibernacula because they often occur alone or in small groups under rocks and in fissures in the floor, roof, and walls (Best and Jennings, 1997; Bogan, 1999). They are much more likely to be overlooked than *M. sodalis* for example, which generally occur in easily recognized clusters on the walls or ceilings. Also, if seen, they may be misidentified because researchers in Illinois do not expect to find them.

We suspect that *M. leibii* is more widely distributed in suitable habitat in southern Illinois beyond the single location we report here. The species is very distinctive in the way that it roosts. Whereas most bats hibernate with their wings parallel to the axis of the body, *M. leibii* may extend its wings at a 30° angle (Whitaker and Hamilton, 1998). Mohr (1936) considered this characteristic "a very definite means of identification at a distance." While conducting hibernacula surveys on the eastern side of the state during the winters of 2003 and 2004, we observed several bats hibernating in this fashion. One of these individuals also had a dark facemask, characteristic of *M. leibii*. The bats could not be retrieved from the ceiling of the mine, and because small-footed myotis had not been documented from the state, we did not consider the taxon as a viable option. Also, during surveys of bats at Mermet Lake State Forest and Conservation Area, Massac County, during the summers of 2004 and 2005 using Anabat acoustic detectors, the echolocation signature of *M. leibii* was recorded three times at three separate locations (J. Wolff,

unpublished data). Although we do not consider this definitive evidence of the occurrence of the species there, it is suggestive of wider distribution of the species in Illinois.

As with many chiropterans, there are limited data on the natural history and status of *M. leibii*. Further studies are warranted to determine the distribution, habitat requirements, and population status of the small-footed myotis in southern Illinois and many other states throughout its range where it currently is listed.

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