

UNUSUAL MIGRATORY BEHAVIOR BY AN INDIANA BAT (*MYOTIS SODALIS*)

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ABSTRACT. The movement of bats is a subject requiring greater understanding among conservationists and wildlife managers. Close spatial movements as well as longer spatial movements, such as migration, can impact species mitigation efforts, dictate acquisition of protected lands, and alter structural engineering projects. A female federally-endangered Indiana bat (*Myotis sodalis*) was captured on 16 May 2004 along the East Fork of White Lick Creek near the Indianapolis International Airport. It was radio-tracked to a roost tree the next day. The next night, the bat foraged normally at first, remaining in known foraging areas in the boundaries of the study area, but departed southwesterly from the study area at about 2100 h. It was not found on subsequent nights.

Keywords: Indiana bat, *Myotis sodalis*, endangered species, nocturnal movement

Studies at the Indianapolis International Airport have successfully used radio-telemetry to obtain fine-scaled data on the nocturnal behavior of a variety of bats (Sparks et al. 2005a, 2005b; Walters et al. 2007) as well as following the departure of migrating eastern red bats, *Lasiurus borealis* (Walters et al. 2006). In 2004 a female Indiana bat (*Myotis sodalis*) left the study area without following linear landscape elements such as streams. The bat was captured on 16 May 2004 along the East Fork of White Lick Creek near the Indianapolis International Airport during an annual mist-net survey (Whitaker et al. 2005). The bat was banded with a lipped aluminum band (Lambourne's Ltd., Birmingham, United Kingdom) and radio-tagged with a 0.47 g transmitter (Holohill Ltd., Carp, Ontario, Canada). Using the techniques outlined in Sparks et al. (2005a) the bat was radio-tracked that night beginning when it emerged at 1952 h. Six crews equipped with radio receivers and three element Yagi antennas (Wildlife Materials Ltd., Murphysboro, Illinois) obtained multi-azimuth triangulations on the radioed bat every three minutes until signal was lost.

The radio-tagged Indiana bat roosted in a silver maple (*Acer saccharinum*; height = 14 m,

diameter = 27 cm) approximately 12.5 km S and 7 km W (8.53 km direct; Fig. 1) of its initial point of capture. For the first hour after emergence the bat foraged in a 0.221 km² area near the roost tree. At 2059 h, the bat began moving rapidly to the southwest with a final multi-azimuth triangulation occurring 4.91 km S and 2.87 km W (5.69 km direct) of its roost. Occasional contact with the bat continued until 2211 h with the bat moving in a southwesterly direction from a point in Gasburg approximately 14.39 km SW of the initial capture point. The total distance traveled is substantially longer than the maximum distance of 8.4 km flown by a resident Indiana bat at this site (Sparks et al. 2005b). We never again detected this bat at the study site despite repeated efforts.

DISCUSSION

The behavior of this bat is unique among the more than 70 Indiana bats tracked at the Indianapolis International Airport since 1997. It was clear this bat was leaving the study area. Movement was consistently in a southwestward direction, and this directionality was consistent both between the point of initial capture and

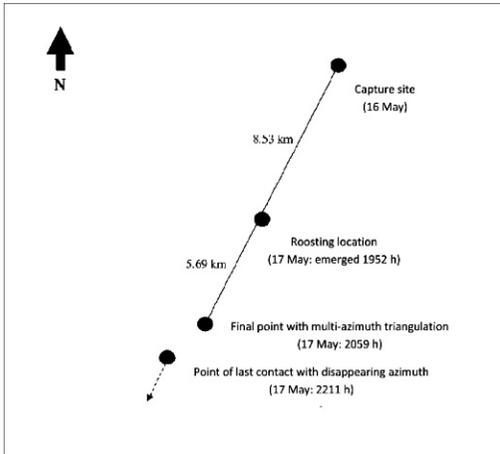


Figure 1.—Path of movement by an Indiana bat (*Myotis sodalis*).

the day roost and between that roost and the last point of contact on the second night (Fig. 1). This bat flew directly across country despite the availability of linear landscape elements such as the East Fork of White Lick Creek (where the bat was first captured) and many roadways, fence lines, and utility corridors.

Sampling efforts aimed at determining the presence of maternity colonies of Indiana bats are allowed by the US Fish and Wildlife Service beginning on 15 May and ending on 15 August of each year in the assumption that this corresponds with the time bats are at their summer roosts. The observation of this Indiana bat indicates this is not concrete and more intensive studies are needed to investigate the nocturnal behavior and movement of Indiana bats as they directly impact the conservation plans and management of this federally-endangered species.

Finally, based on banding records Gardner & Cook (2002) noted that most Indiana bats move north from their hibernacula. This bat, conversely, moved southwest. However, the

pattern of movement closely resembled that of migrating red bats tracked in the same study area (Walters et al. 2006). Regardless, it is clear that this bat was making a large landscape scale movement beyond that observed during typical foraging behavior.

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