*Wilson Bull.*, 98(4), 1986, pp. 602–603

**Eastern Bluebird responses to nocturnal black rat snake nest predation.**—Rat snakes are well-known predators of cavity-nesting birds, and are known to kill incubating females and eat bird eggs and nestlings (e.g., Nolan 1959; Jackson 1970, 1977; Fendley 1980; Haggerty 1981). Rat snakes are reported to be major predators at Eastern Bluebird (*Sialia sialis*) nests (Fitch 1963, White and Woolfenden 1973). Studies of black rat snakes (e.g., Weatherhead and Charland 1985) have focused on diurnal activity patterns, and it is believed that diurnal observations alone accurately reflect rat snake densities (see Stickel et al. 1980). All accounts of nest predation by rat snakes concern diurnal or crepuscular observations. Here we document that black rat snakes (*Elaphe o. obsoleta*) are active after dark in the Ozarks and that they prey upon bluebird nests then.

We placed super 8-mm movie cameras with flash attachments on the backs of 6 Eastern Bluebird nest boxes during spring and summer 1985. Boxes were mounted at 1.5 m on fence posts along hayfields adjacent to a forested hillside near Durham, Washington County, Arkansas. A single frame picture of the inside of the entrance hole was taken when an infrared light beam was interrupted. Date and time of feedings were recorded for each visit by positioning a digital watch inside the box. Although designed to monitor parental feeding of nestlings, this technique also monitored predation events, and we filmed nocturnal predation by black rat snakes at 2 nest boxes.

On 26 May, a male bluebird made the last visit at 20:12 to a nest box that contained 1 11-day-old and 3 10-day-old nestlings. This was a west-facing box, and a faint trace of light could be seen behind the male in the picture. At 20:49, in complete darkness, a black rat snake was photographed entering the box. No additional information concerning this event was recorded; the snake must have remained in the infrared beam (i.e., in the entrance hole). The nest contained no nestlings the next morning at 06:47. The male bluebird continued to visit the empty nest box periodically until 15:28 on 27 May. The female was not recorded at the nest box after the nestlings disappeared.

On 9 August, a male bluebird made the last visit at 20:00 to a second nest box. We had removed the female from this box at noon that day to examine feeding rates of the male in the absence of the female. This nest contained 1 14-day-old and 3 15-day-old nestlings. A black rat snake was photographed entering the nest box at 01:44 on 10 August. At least one nestling greeted the snake at the entrance, in the manner that nestlings typically greet a parent bird (e.g., Thomas 1946). A series of pictures was taken. The snake, having consumed the nestlings, left the box 56 min after entering. At 06:36, the male bluebird returned to the empty nest box with a lepidopteran larva. He returned again at 07:49, 08:25, and 08:50, each time with a different grasshopper, after which he did not visit the box again.

When birds are breeding, rat snakes concentrate their foraging activity along habitat edges, such as fence lines (Weatherhead and Charland 1985). Of the 20 bluebird nests we studied in 1985 along fence lines, 12 nests, 11 of which contained nestlings, were preyed upon. At least 2 sets of nestlings were killed by House Sparrows (*Passer domesticus*) and at least 3 sets were eaten by black rat snakes. Due to the lack of disturbance at the other 7 nests, we suspect the eggs or nestlings were eaten by snakes. Six additional bluebird nests in boxes placed in fields away from fence lines suffered no nest predation.

Our results demonstrate that rat snake predation is possible at any time during day or night. The report of a radio-equipped fledgling Mourning Dove (*Zenaida macroura*) in a rat snake early in the morning (Mirarchi and Hitchcock 1982) also suggests nocturnal snake predation. Bluebirds may succeed at deterring rat snakes from preying upon nests during the day (Thomas 1946, Fitch 1963). Nocturnal attacks apparently go unchallenged by adults,

which do not spend the night in the nest cavity. The report by Fendley (1980) of dead ducks with broken necks in nest boxes associated with rat snake nest predation would suggest that it might be advantageous for adults to be absent during nocturnal snake visits.

*Acknowledgments.*—L. Mellott electronically synchronized cameras, flash units, and infrared beams on the nest boxes. M. Cassidy graciously allowed us use of his hayfields. P. Gowaty, T. Haggerty, J. Jackson, D. James, J. Neal, D. Petit, and C. Riley made helpful suggestions on the manuscript. Our research was funded by a National Science Foundation grant BSR-8408090 to KGS (principal investigator).

## LITERATURE CITED

FENDLEY, T. T. 1980. Incubating Wood Duck and Hooded Merganser hens killed by black rat snakes. Wilson Bull. 92:526–527.

FITCH, H. S. 1963. Natural history of the black rat snake (*Elaphe o. obsoleta*) in Kansas. Copeia 1963:649–658.

HAGGERTY, T. M. 1981. Rat snake preys on nestlings of Rough-winged Swallow and Common Grackle. Chat 45:77.

JACKSON, J. A. 1970. Predation of a black rat snake on Yellow-shafted Flicker nestlings. Wilson Bull. 82:329–330.

———. 1977. Notes on the behavior of the gray rat snake [*Elaphe obsoleta spiloides*]. J. Mississippi Acad. Sci. 22:94–96.

MIRARCHI, R. E. AND R. R. HITCHCOCK. 1982. Radio-instrumented Mourning Dove preyed upon by gray rat snake. Auk 99:583.

NOLAN, V., JR. 1959. Pileated Woodpecker attacks pilot black snake at tree cavity. Wilson Bull. 71:381–382.

STICKEL, L. F., W. H. STICKEL, AND F. C. SCHMID. 1980. Ecology of a Maryland population of black rat snakes (*Elaphe o. obsoleta*). Am. Midl. Nat. 103:1–14.

THOMAS, R. H. 1946. A study of Eastern Bluebirds in Arkansas. Wilson Bull. 58:143–183.

WEATHERHEAD, P. J. AND M. B. CHARLAND. 1985. Habitat selection in an Ontario population of the snake, *Elaphe obsoleta*. J. Herpetol. 19:12–19.

WHITE, S. C. AND G. E. WOOLFENDEN. 1973. Breeding of the Eastern Bluebird in central Florida. Bird-Banding 44:110–123.

R. CRAIG HENSLEY AND KIMBERLY G. SMITH, *Dept. Zoology, Univ. Arkansas, Fayetteville, Arkansas 72701.* *Received 14 Jan. 1986, accepted 7 Apr. 1986.*

*Wilson Bull.*, 98(4), 1986, pp. 603–605

**Destruction of heterospecific eggs by the Gray Catbird.**—Destruction of eggs by passerines is a relatively rare phenomenon that has been observed mainly in members of 2 closely related families: Troglodytidae (Belles-Isles and Picman 1986) and Mimidae (Bowman and Carter 1971, Temple 1978). Among North American mimids, 4 cases of egg destruction by the Gray Catbird (*Dumetella carolinensis*) have been reported (Pearson 1936, Bent 1948). Because egg destruction by this species was rarely observed, Bent (1948) concluded that such behavior was aberrant. Here we provide evidence showing that the behavior is more common than previously suggested.

The study was conducted in the summers of 1984 and 1985 at 2 sites in southern Ontario: