

Ecological Notes on *Lasiurus Cinereus* (Chiroptera: Vespertilionidae) in Oklahoma

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Lasiurus cinereus, the hoary bat, is widely distributed across the United States (1); however, in Oklahoma only 19 specimens have been reported (2) during the last 59 years. From May to August of 1985, 16 additional individuals were mist netted in southeastern Oklahoma (LeFlore and Pushmataha counties, Table 1). These are noteworthy in that they nearly double the number recorded in the state and add to our knowledge of the species' ecology.

It is not readily apparent why we were able to collect almost as many *L. cinereus* in one summer as have been collected in the past 59 years in Oklahoma. One explanation may be that the mist-netting technique we used was different than that used by previous collectors in Oklahoma. In addition to the traditional size (2.1 m high x 5.5-18.3 m long) mist nets, we used a high mist net. The high net consisted of three 9.1 m long mist nets hoisted one above the other with a pulley system. When raised, the nets extended upward 7.6 m and covered a 69.3 m² area. Even though traditional single nets as well as a few double high nets were used, all the hoary bats were taken in the high net. Capture heights (Table 1) ranged from 0.6 to 6.1 m, with a median height of 2.3 m and an average of 2.8 m above the ground. These heights are slightly higher than that of a traditional set using a single net, and may in part account for our success. Even with extensive netting (a total of 189 mist nets: 52 triple high nets; 20 double high nets, and 117 single high nets) the capture rate was low, averaging 0.08 individuals per mist net for all nets and 0.31 for high mist nets. Either *L. cinereus* is not common in Oklahoma or it is not an easy species to collect. It is also possible we did not collect in the habitats most commonly used by this bat. All mist netting was above or adjacent to small creeks and streams. Except for the two nights in June (Table 1) the mist nets were monitored continuously. On those nights in June the nets were checked each hour and the time of capture was recorded as the time the bat was removed from the net. The following genera of trees were common in mist netting areas: *Pinus*, *Juniperus*, *Salix*, *Carya*, *Ostrya*, *Betula*, *Quercus*, *Ulmus*, *Celtis*, *Liquidambar*, *Cercis*, *Acer*, and *Cornus*.

This species has been described as being a late flyer (1). However, an examination of capture times (Table 1) does not support this. Times of capture varied from 2055 to 0440. Of the 16 individuals, 11 (69%) were captured prior to 2400 and 6 (38%) of these before 2200. Leaving the high mist nets up the entire night provided only a few more captures. The nightly activity pattern exhibited by *L. cinereus* seems to be similar to that of most insectivorous bats (3): a period of activity after dusk lasting until near 2400 followed by several hours of decreased activity. Just prior to dawn a second but minor period of activity seems to occur. Only 5 (31%) captures occurred after 2400: two between 2400 and 0300 and three between 0300 and 0500.

Findley and Jones (4) indicated that hoary bats exhibited a distinct seasonal and sexual geographical distribution. Males were reported as occurring primarily in the west and females in the east during the parturition season. Tyler and Scott (2), on the basis of the distribution of the 19 individuals available to them, suggested a similar pattern of segregation of the sexes in Oklahoma. They reported that 63% of the females were from central and eastern Oklahoma, and the males were predominantly from the west and Panhandle region. However, the 16 individuals we captured do not support conclusions of either of the two studies mentioned above. Of the 16 new records from eastern Oklahoma, seven are adult males, one is a subadult male, three are adult females, and

TABLE 1. Collection data for 16 *Lasiurus cinereus* captured from May to August 1985 in southeastern Oklahoma.

Date	Sex	Time	Height	Location
22 May	Male	2157	5.33 m	LeFlore Co.; 3.8 mi W Cedar Lake Rec. Area
22 May	Male	2330	2.53 m	LeFlore Co.; 3.8 mi W Cedar Lake Rec. Area
24 May	Female	0005	1.52 m	LeFlore Co.; 0.5 mi N Holson Valley Road
24 May	Male	0030	1.52 m	LeFlore Co.; 0.5 mi N Holson Valley Road
18 June	Male	2228	3.35 m	Pushmataha Co.; Pushmataha Wildl. Mgmt. Area
19 June	Female	0440	0.91 m	Pushmataha Co.; Pushmataha Wildl. Mgmt. Area
2 July	Female	0300	1.83 m	LeFlore Co.; 3.8 mi W Cedar Lake Rec. Area
8 August	?	2207	4.57 m	LeFlore Co.; Cedar Lake Rec. Area
8 August	Male	2233	0.61 m	LeFlore Co.; Cedar Lake Rec. Area
8 August	Male	2345	2.13 m	LeFlore Co.; Cedar Lake Rec. Area
8 August	Male	0332	6.10 m	LeFlore Co.; Cedar Lake Rec. Area
9 August	Female	2055	5.49 m	LeFlore Co.; 0.5 mi S Big Cedar, Kiamichi River
9 August	?	2100	2.44 m	LeFlore Co.; 0.5 mi S Big Cedar, Kiamichi River
9 August	?	2109	1.22 m	LeFlore Co.; 0.5 mi S Big Cedar, Kiamichi River
9 August	Female	2109	1.22 m	LeFlore Co.; 0.5 mi S Big Cedar, Kiamichi River
9 August	Male	2128	3.66 m	LeFlore Co.; 0.5 mi S Big Cedar, Kiamichi River

two are subadult females; the other three were not classified. Combined with Tyler and Scott's (2) data there are now as many males recorded from eastern Oklahoma during the parturition season as females.

Males captured in mid-May showed no signs of reproductive activity (no distension of the epididymides or testes). Individuals captured in early August did have partial distension of these organs, indicating that mating might occur prior to winter. Parturition probably occurs in early June because a pregnant female (containing a single well-developed embryo) was captured in late May and a lactating female was taken in mid-June. A post-lactating female was captured in early July and flying subadults were taken in early August, suggesting that the young are fledged by late July or early August.

More extensive mist netting, using high nets, in central and western regions should provide a better understanding of the distribution and ecology of the hoary bat in Oklahoma.

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