

# NOTES ON FOODS OF GREAT HORNED OWLS (*BUBO VIRGINIANUS*) IN JACKSON COUNTY, OKLAHOMA

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Prey species were identified from 169 pellets cast by a pair of great horned owls (*Bubo virginianus*) and their young in Jackson County, southwestern Oklahoma. Pellets were collected monthly between February and August, 1977. In decreasing order of importance, prey species were: cottontails (*Sylvilagus* spp.), cotton rats (*Sigmodon hispidus*), and mice (*Perognathus hispidus*, *Peromyscus* spp., and *Reithrodontomys* spp.).

## INTRODUCTION AND METHODS

Even though great horned owl (*Bubo virginianus*) food preferences are generally known throughout much of North America (1, 2, 3, 4), no definitive work has been published concerning the food habits of this species in Oklahoma. There have been several reports of predation by this owl on free-tailed bats, *Tadarida brasiliensis* (5, 6, 7) at locations within the state. The objectives of our study were to assess the types and quantities of prey eaten and the seasonal changes in preference or availability of food consumed by a pair of great horned owls and their young. A total of 169 regurgitated owl pellets, numerous pellet fragments, and some larger prey remains were analyzed and prey items were tabulated. We collected pellets during the first few days of each month between February and August 1977 from the loft of an abandoned barn 3.2 km north and 1 km east of Duke, Jackson County, Oklahoma, where, in the spring of 1977, a pair of owls roosted and reared three young birds atop a bale of hay.

The loft was cleared of all pellets on 5 February 1977 so that pellets deposited thereafter would be of known age. Pellets were placed in a plastic bag with a collection data tag. In the laboratory, pellets were teased apart and their component skulls, bones, hair, and debris were sorted. With the aid of a mammal skull key (8) and a reference skull collection in the Cameron University Museum of Zoology, skulls were identified.

For purposes of this study, winter foods were from pellets deposited before or during the period 5 February through March, spring foods from April through May, and summer foods from June through July. Average weights for prey species were calculated from the numbers of study specimens in the Cameron Museum as parenthetically indicated in Tables 1 to 4. These values were then multiplied by the number of individuals of each species found in the pellets to obtain an estimated biomass of food consumed.

## RESULTS AND DISCUSSION

The cotton rat (*Sigmodon hispidus*) was decidedly the most important winter food (Table 1). It comprised over 66% of the total biomass, occurred in 56% of the 115 pellets, and of 153 individual prey animals identified, 42% (65) were of this species. It probably was the most abundant and easily obtainable prey in winter. *Peromyscus* was second in percent occurrence but only fourth in percent of biomass. Both *Peromyscus maniculatus* and *P. leucopus* were undoubtedly taken by the owls, but their skulls were indistinguishable. Craighead and Craighead (3) found that these were the major winter food of Michigan horned owls by percent occurrence in 1942 (49.4%) and 1948 (58.2%). *Rattus* ranked third in percent of biomass, but sixth in percent occurrence. By this latter measure, it ranked third in Michigan in 1942 and fifth in 1948 (3). Both Bent (1) and Fisher (2) mentioned that *Bubo* is an excellent ratter. In 1942 and 1948, voles (*Microtis* spp.) ranked second by percent occurrence in winter in Michigan (3). *Perognathus hispidus* and *Reithrodontomys* spp. (predominantly *R. montanus* and *R. fulvescens*) were taken often, but the former constituted over twice the percentage biomass of the latter, owing to its larger size. Numerically, the least shrew (*Cryptotis parva*) was an

TABLE 1. Winter prey remains in 115 pellets deposited before or during the period from 5 February through March 1977.

Species	Number of individuals <sup>a</sup>	Average adult weight (g)	Estimated biomass (g)	Percent occurrence	Percent of biomass
<i>Mus musculus</i> (8) <sup>a</sup>	1	18	18	0.9	0.13
<i>Cryptotis parva</i> (1)	17	5	85	15.0	0.64
<i>Reithrodontomys</i> spp. (est.)	14	19	266	12.0	2.00
<i>Perognathus hispidus</i> (2)	18	40	720	16.0	5.42
<i>Peromyscus</i> spp. (8)	31	24	744	27.0	5.60
<i>Rattus rattus</i> (1)	5	164	820	4.0	6.17
<i>Sylvilagus</i> spp. (2)	2	921	1,842	1.7	13.88
<i>Sigmodon hispidus</i> (4)	65	135	8,775	56.0	66.12
Totals	153		13,270		

<sup>a</sup>Indicates number of individuals from which average adult weight was calculated.

TABLE 2. Spring prey remains in 35 pellets deposited in April and May 1977.

Species	Number of individuals <sup>a</sup>	Estimated biomass (g)	Percent occurrence	Percent of biomass
<i>Cryptotis parva</i>	3	15	9	0.19
<i>Reithrodontomys</i> spp.	1	19	3	0.24
<i>Peromyscus</i> spp.	2	48	6	0.62
<i>Sigmodon hispidus</i>	2	270	6	3.46
<i>Rattus rattus</i>	6	984	17	12.64
<i>Sylvilagus</i> spp.	7	6,447	20	82.43
Totals	21	7,783		

<sup>a</sup>Average adult weight as in Table 1.

TABLE 3. Summer prey remains in 19 pellets deposited in June and July 1977.

Species	Number of individuals <sup>a</sup>	Estimated biomass (g)	Percent occurrence	Percent of biomass
<i>Rattus rattus</i>	1	164	5	4.09
<i>Neotoma micropus</i>	1	215	5	5.37
<i>Perognathus hispidus</i>	8	320	42	7.99
<i>Sigmodon hispidus</i>	4	540	21	13.49
<i>Sylvilagus</i> spp.	3	2,763	16	69.04
Totals	17	4,002		

<sup>a</sup>Average adult weight as in Table 1 except for *Neotoma micropus* for which such weight was calculated as 215 g on the basis of 8 individuals.

TABLE 4. Prey remains from 169 pellets collected between February and August 1977.

Species	Number of individuals <sup>a</sup>	Estimated biomass (g)	Percent occurrence	Percent of biomass
<i>Mus musculus</i>	1	18	0.6	0.07
<i>Cryptotis parva</i>	20	100	12.0	0.40
<i>Neotoma micropus</i>	1	215	0.6	0.86
<i>Reithrodontomys</i> spp.	15	285	9.0	1.15
<i>Peromyscus</i> spp.	20	480	12.0	1.93
<i>Perognathus hispidus</i>	26	1,040	15.0	4.20
<i>Rattus rattus</i>	12	1,968	7.0	7.95
<i>Sigmodon hispidus</i>	71	9,585	42.0	38.74
<i>Sylvilagus</i> spp.	12	11,052	7.0	44.67
Totals	178	24,743		

<sup>a</sup>Average adult weight as in Tables 1 and 3.

important midwinter food item, occurring in 15% of the pellets, but contributed less than 1% of total biomass. Fisher (2) listed *Blarina brevicauda* and *Sorex* spp. as shrews known to be eaten by *Bubo*. Although only five *Rattus* and two *Sylvilagus* were found during the period, these larger mammals constituted far more bulk than did the smaller prey species. Both *Sylvilagus auduboni* and *S. floridanus* occur in this part of Oklahoma. Errington (4) found that 68.5% of 4,838 winter pellets and stomachs contained lagomorph remains in the northcentral states and stated that rabbits constituted the staple winter fare of the great horned owl over most of its range. But Craighead and Craighead (3) found rabbit remains in only 20% of 539 winter pellets from Michigan, and stated that during the winters of 1942 and 1947-49, rabbits were not a staple there. This was probably attributable to the fact that rabbit populations were low then.

*Sylvilagus* was the most important food item in both percent occurrence and percent of biomass during spring, and *Rattus* was second (Table 2). *Sigmodon* ranked third in percent of biomass.

Shrew remains appeared in 9% of the spring pellets. Only two prey species occurred in May, *Sylvilagus* and *Cryptotis*. These findings agree with those of Bent (1) and Fisher (2), who indicated that rabbits were the primary prey of great horned owls throughout the year over much of the U.S.

Because of its large size, *Sylvilagus* ranked highest in percent of biomass in summer but only third in percent occurrence (Table 3). Conversely, the much smaller *Perognathus*, although first in percent occurrence, was third in percent biomass. The only *Neotoma* found in this study appeared in June.

By comparison, during the spring and summer of 1942 in Michigan, rabbits constituted but 8.1% of 99 food items and only 3.1% of 161 items in 1948 (3). Small to medium-sized birds made up 29.3% of foods in 1942 and 11.8% in 1948. Interestingly, the percent occurrence of pheasants in 1942 was 20.2% and 13% in 1948. But voles, contributing 21.2% in the former and 49.1% in the latter year, seem to have been a year-round staple. In their study, *Peromyscus* made up only 6.1% and 0.6% of spring and summer foods in 1942 and 1948, respectively. Comparable figures for rats during these two years were 5% and 6.2%.

Table 4 summarizes our findings in all 169 pellets. From these data, it is apparent that *Sigmodon hispidus* ranked highest in over-all percent occurrence and a close second to *Sylvilagus* in total percent of biomass, this despite the fact that *Sylvilagus* is approximately seven times larger than *Sigmodon*. According to numbers of individuals recovered by season, *Sigmodon* was extremely important to the owls in winter, whereas preference (or availability) shifted to *Sylvilagus* in spring when the young owls were growing rapidly. Mice constituted a stable supply of food at all seasons. Other species were probably taken opportunistically.

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