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SEASONAL VARIATION IN PREY OF THE BARN OWL (*TYTO ALBA*) IN TENNESSEE

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ABSTRACT

A series of regurgitated pellets from two nest and four roost sites of the Barn Owl (*Tyto alba*) was examined in an effort to ascertain prey species that comprised the diet of this owl in Tennessee, and to determine possible seasonal differences in prey selection. A total of 787 pellets, in addition to pellet debris, was analyzed from two sites in Shelby County, three in Knox County, and one in Sullivan County. Remains of 16 species of mammals and 18 species of birds were identified from the six sites. At those sites containing the largest number of complete pellets and pellet debris (Bartlett, Shelby County; two Knox County sites), voles (*Microtus* spp.) comprised between 60% and 70% of all mammalian prey individuals, while individuals of the short-tailed shrew (*Blarina* spp.) and hispid cotton rat (*Sigmodon hispidus*) each averaged about 11%. Although the number of avian taxa exceeded that of mammals, 13 of the bird species identified from all six sites were represented by three or fewer individuals each. Approximately 97% of all prey species were mammals. Pellets were collected monthly for 33 months at the Knoxville, Knox County roost and data are presented relative to differences in seasonal prey selection at that site.

INTRODUCTION

Examination and analyses of regurgitated pellets from owls and other raptors can provide significant data on the food habits of the predator in question as well as on local distribution and abundance of the prey animals represented in the pellets. Because of its nearly cosmopolitan range and the fact that it often uses buildings and other man-made structures as roost and nest sites, numerous life history studies have been undertaken on the Barn Owl throughout its range (e.g., Bunn et al. 1982; Johnsgard 1988). Most North American studies have emphasized the food habits and bioenergetics of this species (Hamilton and Neill 1981, Feldhamer 1985, Calvin and McLean 1986). Although there are a few reports dealing with food habits of the Barn Owl in the Southeast (Dusi 1957 [Alabama], Burchfield 1984 [Mississippi], Adams et al. 1986 [North Carolina], Brown 1989 [Kentucky], Marra et al. 1989 [Louisiana]), the only comparable study from Tennessee is that of Copeland and Caldwell (1991).

In addition to our interest in the basic food habits of owls in Tennessee (Klippel and Parmalee 1982, Parmalee and Klippel 1987), we believed an analysis of prey (taxa and size) taken by various species of owls might provide evidence for the taphonomy of small-vertebrate assemblages encountered in certain cave and rock shelter sites (see Klippel et al. 1987), and might make possible the identification of the species of raptor(s) contributing to such deposits.

This paper reports on the animal remains identified from a series of 787 pellets, and quantities of pellet debris, from two nest and four roost sites of the Barn Owl in West and East Tennessee. By collecting pellets monthly at a roost site in Knoxville, Knox County—a site occupied more or less continuously for a period of at least three years (1983-1985)—certain seasonal differences in prey selection were determined.

METHODS

We located Barn Owl roost and nest sites through personal contact with members of the Tennessee Ornithological Society and other colleagues involved in avian or related wildlife studies. We also placed an advertisement in *Timely Tips*, a quarterly newsletter distributed to interested parties by the Department of Forestry, Wildlife and Fisheries of the University of Tennessee at Knoxville, in cooperation with the Agricultural Extension Service. When a collection of pellets (and typically a quantity of pellet debris) was received, the complete pellets were measured, and picked apart dry with forceps. Remains of the prey animals were then removed and placed in separate vials with appropriate data labels. A list of species represented in each pellet (plus a combined listing of all prey animals removed from pellet debris) was prepared. Pellets from the Knoxville roost, collected by us once or twice each month during the period April 1983–December 1985, were processed in the same manner.

With the exception of the eastern cottontail (*Sylvilagus floridanus*), the number of individuals of all mammalian prey taxa from each series of pellets was based on skulls and/or lower jaws. All cottontail remains (mostly postcranial) from each series of pellets (each site) were evaluated together in order to determine an accurate total of individuals. The same method was applied to birds, since, for example, a meadowlark (*Sturnella* sp.) might be represented by a skull in one pellet, a wing in another, the legs in a third pellet, and so on; theoretically, they could all be elements of the same individual. Except for small passerines, which the owls normally swallowed whole and whose total remains typically comprised a single pellet, avian prey species were dismembered by the owls, and body sections of individual prey animals (wings, legs, synsacrum, sternum, skull) typically occurred in separate pellets.

RESULTS AND DISCUSSION

Bartlett, Shelby County

In July 1983 a pair of barn owls successfully fledged four young that had been reared in a hose drying tower at the Bartlett fire station. The area near the fire station consisted of isolated timber stands, homes, and large open expanses of pastureland and brushy fields. After the nest site was abandoned, 39 complete pellets and a considerable amount of pellet debris were removed by fire department personnel and given to Mrs. Martha Waldron who in turn sent the collection to us. We identified the remains of at least 14 species and 189 individual prey animals from this sample (Tables 1 and 2). Of all individual mammalian prey items, approximately 69% were voles (*Microtus* sp.), 12% hispid cotton rats (*Sigmodon hispidus*), 7% southern short-tailed shrews (*Blarina carolinensis*), and 7% house mice (*Mus musculus*) Abandoned cropland, pasture, and orchards ("rather open terrain": Johnsgard 1988) have often been reported in the literature as the type of habitat hunted most frequently by the Barn Owl. Though most prey species identified from this site attest to this, the owls must have at least occasionally hunted over or along timbered areas, as is suggested by the occurrence of the southern flying squirrel (*Glaucomys volans*) and Cedar Waxwing (*Bombycilla cedrorum*) in the pellet sample.

Table 1. Summary data for six Barn Owl sites in Tennessee.

Location	Type	Placement	Period of occupancy	No. of pellets	No. of prey species	No. of prey individuals
11.2 km ESE Bristol Sullivan Co., Tenn.	roost	loft in farm storage shed	winter 1983-1984	36	9	171
Knoxville Knox Co., Tenn.	roost	hemlock stand in abandoned nursery	1983-1985	575	25	2717
Powell Knox Co., Tenn.	roost	pine wood lot behind house	Jan.-Feb. 1981	22	8	43
Clinch River ca. CRM 42.8 Knox Co., Tenn.	nest	crevice in west-facing river bluff	June-July 1987	107	15	503
Bartlett Shelby Co., Tenn.	nest	hose drying tower, fire station	June-July 1983	39	14	189
Memphis Shelby Co., Tenn.	roost	beneath bridge	June 1986	8	8	27

Table 2. Species and number of individual prey animals identified from a barn owl nest site, June/July 1983, Bartlett, Shelby County, Tennessee.

Species	Number of individuals	Percent of individuals
MAMMALS:		
Vole, *Microtus* sp.	80	44.69
Prairie vole, *Microtus ochrogaster*	39	21.79
Hispid cotton rat, *Sigmodon hispidus*	22	12.29
Southern short-tailed shrew, *Blarina carolinensis*	13	7.26
House mouse, *Mus musculus*	13	7.26
Pine vole, *Microtus pinetorum*	5	2.79
Eastern harvest mouse, *Reithrodontomys humulis*	3	1.67
Deer/White-footed mouse, *Peromyscus* sp.	2	1.12
Southern Flying Squirrel, *Glaucomys volans*	1	.56
Marsh rice rat, *Oryzomys palustris*	1	.56
Totals	179	99.99
BIRDS:		
Red-winged Blackbird, *Agelaius phoeniceus*	2	
Northern Bobwhite, *Colinus virginianus*	1	
Cedar Waxwing, *Bombycilla cedrorum*	1	
Meadowlark, *Sturnella* sp.	1	
cf. Dickcissel, *Spiza americana*	1	
Passerine, gen. & spp. indet.	4	
Total	10	

Table 3. Species and number of individual prey animals identified from a Barn Owl roost, June 1986, Memphis, Shelby County, Tennessee.

Species	Number of individuals	Percent of individuals
MAMMALS:		
Prairie Vole, *Microtus ochrogaster*	8	33.33
House Mouse, *Mus musculus*	8	33.33
Hispid Cotton Rat, *Sigmodon hispidus*	3	12.50
Least Shrew, *Cryptotis parva*	3	12.50
Southern Short-tailed Shrew, *Blarina carolinensis*	1	4.17
Marsh Rice Rat, *Oryzomys palustris*	1	4.17
Totals	24	100.00
BIRDS:		
Meadowlark, *Sturnella* sp.	1	
Amphibians:		
Frog, *Rana* sp.	2	

Memphis, Shelby County

Eight pellets collected from a temporary roost beneath a bridge in southwestern Memphis contained remains of 27 prey individuals (Table 3). Though eight pellets is a small sample for quantitatively evaluating owl food habits, some interesting qualitative data were revealed by this sample. For example, in addition to prey such as shrews, voles, and the hispid cotton rat—all species most often found in upland "old fields"—these pellets contained remains of one marsh rice rat (*Oryzomys palustris*) and two frogs (*Rana* sp.)—both characteristic of aquatic or semi-aquatic habitats. The marsh rice rat has been reported as a significant prey species in the diet of the Barn Owl in areas where the rat occurs (Raun 1960, Adams et al. 1986, Jemison and Chabreck 1962). In their study of winter food habits of the Barn Owl in a Louisiana coastal marsh, Jemison and Chabreck (1962) collected 804 pellets; of the 1008 vertebrate animals represented, 984 (97.5%) were marsh rice rats. Although barn owls, like all owl species, tend to take prey opportunistically, the presence of

remains of two frogs in one pellet is of particular interest because predation on amphibians by barn owls is rare. Boyd and Shriner (1954) recorded "unidentified amphibians" from a Barn Owl nest site in Hampshire County, Massachusetts, and in summarizing food habits data of this owl, Johnsgard (1988) includes frogs. Bent (1938), in a general discussion of the barn owl's diet, ends by commenting that "an occasional frog, should be added to the list." Nonetheless, predation on frogs by the Barn Owl, even in bottomlands and marshy grasslands where these amphibians are numerous, appears to be of rare occurrence.

Clinch River, Knox County

A pair of barn owls was discovered nesting in a crevice of the limestone bluff of the Clinch River (ca. CRM 42.8) approximately 1.2 km west of Solway, Knox County, in the spring of 1987. Several hundred ha of pasture, brush, and ecotone in the bottomlands immediately across the river (west and southwest) from the nest site was probably the primary area hunted by the parent owls. Four young were fledged early in July, after which pellets and pellet debris were collected by Mr. John Byrd. Some of the pellets were used by students in Mr. Byrd's Clinton Jr. High School class as a biology project. At the completion of the class project, the entire collection of pellet material (107 complete pellets and considerable pellet debris) was given to us by Mr. Byrd.

From that sample we identified 503 prey individuals representing 15 species (Table 4). Sixty-eight percent of mammalian prey individuals were pine voles (*Microtus pinetorum*), nearly 13% were northern short-tailed shrews (*Blarina brevicauda*), and about 7% were hispid cotton rats. Least shrews (*Cryptotis parva*) and eastern harvest mice (*Reithrodontomys humulis*), creatures of open grasslands interspersed with other herbaceous vegetation and brush, are both taken consistently by barn owls in this area, but seldom if ever in numbers comparable to voles. The same appears to be true for deer mice (*Peromyscus maniculatus*), white-footed mice (*Peromyscus leucopus*), and the southeastern shrew (*Sorex longirostris*). The southeastern shrew, because of its preference for thick, brushy areas and overgrown hedge or fence rows, may be less susceptible to owl predation than are those species such as voles, short-tailed shrews, and the hispid cotton rat that inhabit more open grasslands. The three eastern cottontails (*Sylvilagus floridanus*) from this nest site, as well as the 12 individuals recorded from the Knoxville roost, were all very young juveniles. All of the six species of birds identified are inhabitants of open fields, grasslands, and/or brushy thickets.

Table 4. Species and number of individual prey animals identified from a Barn Owl nest, June/July 1987, along the Clinch River, ca. River Mile 42.6, Knox County, Tennessee.

Species	Number of individuals	Percent of individuals
MAMMALS:		
Pine vole, *Microtus pinetorum*	326	68.06
Northern short-tailed shrew, *Blarina brevicauda*	62	12.94
Hispid cotton rat, *Sigmodon hispidus*	32	6.68
Least shrew, *Cryptotis parva*	20	4.17
Deer/White-footed mouse, *Peromyscus* sp.	18	3.76
Eastern harvest mouse, *Reithrodontomys humulis*	14	2.92
Southeastern shrew, *Sorex longirostris*	3	.63
Eastern cottontail, *Sylvilagus floridanus*	3	.63
House mouse, *Mus musculus*	1	.21
Totals	479	100.00
BIRDS:		
Meadowlark, *Sturnella* sp.	5	
Brown-headed Cowbird, *Molothrus ater*		3
Northern Cardinal, *Cardinalis cardinalis*		1
Song Sparrow, *Melospiza melodia*	1	
cf. Swamp Sparrow, *Melospiza georgiana*		1
Red-winged Blackbird, *Agelaius phoeniceus*		1
Passerine, gen. and spp. indet.	12	
Total	24	

Powell, Knox County

A 0.5 ha, dense stand of ca. 6 m tall pines, within the city limits of Powell, served as a roost site for a Barn Owl during January and February 1981. Although city streets lined with private dwellings bordered the pine stand on three sides, a large, fallow field (ca. 8-10 ha) and several vacant lots near the roost site appear to have produced enough prey animals to maintain the owl during this late-winter period. Approximately 68% (41 individuals) of the prey animals identified from 22 pellets were hispid cotton rats (Table 5). Only four pine voles were encountered in the pellet sample. Although the number of pellets recovered is small, the presence of six least shrews, a meadowlark, and 41 hispid cotton rats—all species of fairly open habitats—suggests this Barn Owl was hunting primarily in open fields with heavy grass cover.

Table 5. Species and number of individual prey animals identified from a Barn Owl roost, January/February 1981, Powell, Knox County, Tennessee.

Species	Number of individuals	Percent of individuals
MAMMALS:		
Pine vole, *Microtus pinetorum*	28	68.29
Least shrew, *Cryptotis parva*	6	14.63
Northern short-tailed shrew, *Blarina brevicauda*	1	2.44
Southeastern shrew, *Sorex longirostris*	1	2.44
House mouse, *Mus musculus*	1	2.44
Hispid cotton rat, *Sigmodon hispidus*	1	2.44
Totals	41	100.00
BIRDS:		
Meadowlark, *Sturnella* sp.	1	
cf. Slate-colored Junco, *Junco hyemalis*	1	
Total	2	

Knoxville, Knox County

Marcella Cranford and Larry Burch discovered a Barn Owl roosting in a stand of hemlock (*Tsuga canadensis*) in December 1982. The site was at about the 10,000 block on west Kingston Pike, Knoxville, and consisted of ca. 58 ha that had been used as a nursery (Tennessee Rose and Azalea Farm) from April 1951 through December 1966. The hemlock trees were in three rows, the rows ca. 45 m long, 9 m apart, and with the individual trees in each row spaced at about 4 m intervals. These trees were 12-15 m tall when the Barn Owl was discovered roosting in them. Several hundred

ha immediately east and south of the abandoned nursery property consisted of pasture, hay fields, abandoned fields, and brushy thickets, and provided ideal hunting territory for the owl.

For 33 months, beginning in April 1983, pellets and pellet debris were collected on or about the last day of each month; occasionally two collections were made in one month. The years 1983-1985 were unusually wet at the site, and that, plus the fragmentation of pellets caused by their hitting the tightly interlaced hemlock branches as the pellets fell to the ground, and the feeding activities of skin beetles (Family Scarabaeidae, Subfamily Troginae, *Trox* cf. *tuberculatus*), caused many of the pellets to break up quickly. Nevertheless 575 complete pellets were recovered; from these and the pellet debris, 2717 prey individuals, representing 25 species, were identified (Table 6).

Ten species of birds, representing 10 genera, were identified from complete pellets, pellet debris, and isolated bones recovered from the Knoxville roost site. Additionally, parts of a warbler, a presumed chickadee, and two species of sparrows brought the total number of avian prey species to 14. Most individuals recorded in Table 6 as Passerine, gen. and spp. indet., were birds within the size range of the Common Grackle (*Quiscalus quiscula*) to the European starling (*Sturnus vulgaris*). Because many of the bones were incomplete, lacked diagnostic characteristics, were eroded from the digestive process, or were from immature individuals, identifications could often not be carried beyond the ordinal level. Feathers from a Cedar Waxwing (*Bombycilla cedrorum*), and from one or two Mourning Doves (*Zenaida macroura*), were recovered beneath the roost trees, but remains of these two species were not found in pellets. One pellet contained the only remains of crayfish (two individuals: *Cambarus* spp.) encountered during our study.

In an effort to determine whether selection of prey animals varied significantly through the year, we pooled the 1984–85 data by season, as follows: spring (March through May); summer (June through August); fall (September through November); and winter (December through February). Data from prey animals whose date of capture by the owls could be assigned unequivocally to specific seasons are presented in Table 7. Only data from mammals identified on the basis of their skulls are included. Birds, on the other hand, were identified on the basis of a wide variety of skeletal elements, and thus may be slightly over-represented compared to the mammals listed in Table 7.

Table 6. Species and number of individual prey animals identified from a Barn Owl roost, 1983-1985, Knoxville, Knox County, Tennessee.

Species	Number of individuals	Percent of individuals
MAMMALS:		
Pine vole, *Microtus pinetorum*	1584	60.07
Hispid cotton rat, *Sigmodon hispidus*	425	16.12
Northern short-tailed shrew, *Blarina brevicauda*	344	13.04
Deer/White-footed mouse, *Peromyscus* sp.	79	2.99
Least shrew, *Cryptotis parva*	78	2.96
Eastern harvest mouse, *Reithrodontomys humulis*	54	2.05
House mouse, *Mus musculus*	54	2.05
Eastern cottontail, *Silvilagus floridanus*	12	.45
cf. Norway rat, *Rattus norvegicus*	5	.19
opossum, *Didelphis virginianus*	1	.04
southeastern shrew, *Sorex longirostris*	1	.04
Totals	2637	100.00
BIRDS:		
Common Grackle, *Quiscalus quiscula*	14	17.50
Starling, *Sturnus vulgaris*	9	11.25
Meadowlark, *Sturnella* sp.	8	10.00
Brown-headed Cowbird, *Molothrus ater*	3	3.75
Rufous-sided Towhee, *Pipilo erythrophthalmus*	3	2.75
Song Sparrow, *Melospiza melodia*	3	3.75
American Robin, *Turdus migratorius*	3	3.75
Northern Bobwhite, *Colinus virginianus*	2	2.50
cf. White-throated Sparrow, *Zonotrichia albicollis*	2	2.50
Chickadee, *Parus* sp.	1	1.25
Mockingbird, *Mimus polyglottos*	1	1.25
Northern Cardinal, *Cardinalis cardinalis*	1	1.25
cf. Field Sparrow, *Spizella pusilla*	1	1.25
Warbler, gen. and sp. indet.	1	1.25
Passerine, gen. and spp. indet.	28	35.00
Totals	80	99.00

Table 7. Prey animals collected from the barn owl roost in Knoxville during 1984 and 1985. Includes only animals whose season of capture by the owl is known: spring (March-May), summer (June-August), fall (September-November), and winter (December-February).

Taxa	SEASONS Spring	Summer	Fall	Winter	Total
Pine vole, *Microtus pinetorum*	371	218	45	144	778
Hispid cotton rat, *Sigmodon hispidus*	41	58	11	111	221
N. short-tailed shrew, *Blarina brevicauda*	74	57	5	6	152
Other mammals	75	32	7	19	133
Total mammals	561	365	68	290	1284
Total birds	15	14	0	6	35
Total vertebrates	576	379	68	296	1319

The rate of deposition of prey animals (N = 1319) at the Knoxville roost varied seasonally. The greatest number by far were deposited during the spring (44%), while very few were deposited in the fall (5%); summer and winter deposition rates (29% and 22%, respectively) were less disparate. Birds occurred much less frequently than mammals (< 3% vs. > 97%), and when compared to mammals were found to be fairly evenly distributed from season to season. A chi-square test conducted on birds and mammals, by season, (i.e., totals in Table 7) indicates that the distribution of birds is not significantly different from mammals at a 0.10 level of probability.

Ninety percent of the mammal remains recovered from the Knoxville roost were from three species: *Microtus pinetorum, Sigmodon hispidus,* and *Blarina brevicauda* (Table 7). There are considerable differences in the distribution of these taxa from season to season. A chi-square test

conducted on the four categories of mammals in Table 7, by season, indicates that differences are highly significant (chi-square = 142, df = 9, $p < 0.001$). Much of the seasonal variation results from the relatively low rate of occurrence of *S. hispidus* in the spring and its high numbers in the winter. At the same time *M. pinetorum* is over–represented in the spring and slightly under–represented during the winter. Both species are fairly evenly represented in both the summer and fall samples. The third most abundant species, *B. brevicauda*, occurred in somewhat greater than expected frequencies during summer, but as in the case of *M. pinetorum*, in fewer numbers than expected during winter.

Many authors have suggested that the Barn Owl takes prey species in relation to both the prey's abundance and availability in open areas (Andrews 1990, Bunn et al. 1982, Glue 1974). Regarding characteristics affecting susceptibility to Barn Owl predation, there are several possibly relevant differences between the hispid cotton rat and both the pine vole and northern short-tailed shrew. The latter two species are semi-fossorial and occur in a wide variety of habitats, including woodlands (Burt and Grossenheider 1964). Hispid cotton rats are usually found in grasslands and weedy thickets (Barbour and Davis 1974), and have been characterized as "among the most prolific of mammals," with a breeding season that lasts most of the year, and as many as nine litters per year possible (Barbour and Davis 1974). The breeding season for pine voles and northern short-tailed shrews extends from late winter to early fall and they usually have but two to four litters per year (Burt and Grossenheider 1964, Barbour and Davis 1974). In addition, adult hispid cotton rats may have body masses more than twice that of either pine voles or northern short-tailed shrews.

The quantitative differences we found in the representation of the hispid cotton rat on the one hand and the pine vole and northern short-tailed shrew on the other is probably due to some complex interplay between the aforementioned and other factors. Low and/or dead herbaceous vegetation in early spring and the periodic removal of hay from fields near the roost during late spring and summer could increase the exposure of even the smaller of the prey animals, while the larger hispid cotton rat might be more visible in denser vegetation at any time of year. But we suspect that the over-representation of hispid cotton rats during the winter months reflects primarily its extended breeding season, which results in the production of a steady supply of this prey animal when other prey populations are declining.

Bristol, Sullivan County

A loft in a farm storage shed on the property of Richard Lewis, 11.2 km ESE of Bristol, served as a 1983-1984 winter roost for a Barn Owl. The area surrounding the roost site is reported to have been about equally divided between woods and open grassy fields interspersed with thickets. From 36 complete pellets and a small amount of pellet debris collected at the roost site, we identified 169 prey animals of nine species (Table 8). Meadow voles (*Microtus pennsylvanicus*) comprised nearly 58% of the prey taken by this owl, northern short-tailed shrews nearly 18%, and least shrews 9.5%. Six southern bog lemmings (*Synaptomys cooperi*), a rodent typical of low-lying, dense, grassy areas, provided a noteworthy local distribution record for this species. In their study of 126 Barn Owl pellets from two roosts in Claiborne County, Copeland and Caldwell (1991) reported the southern bog lemming as the most common prey species at both sites (average from both roosts = 36.8%).

Of special interest were the remains of a hairy-tailed mole (*Parascalops breweri*) in one of the pellets. It was the only mole of any species represented in all the pellets and pellet debris that we analyzed for this study (a total of six Barn Owl nest and roost sites). In their study of the mammals of northeastern Tennessee, Smith et al. (1974) recorded one star-nosed mole (*Condylura cristata*) from a collection of Barn Owl pellets from Shady Valley, Johnson County, and a hairy-tailed mole in a series of pellets from Washington County. These two talpids tend to surface and travel above ground more frequently than does the eastern mole (*Scalopus aquaticus*), and are thus more susceptible to avian predators.

Table 8. Species and number of individual prey animals identified from a Barn Owl roost, winter 1984, 7 miles ESE of Bristol, Sullivan County, Tennessee.

Species	Number of individuals	Percent of individuals
MAMMALS:		
Meadow vole, *Microtus pennsylvanicus*	97	57.74
Northern short-tailed shrew, *Blarina brevicauda*	30	17.86
Least shrew, *Cryptotis parva*	16	9.52
Deer/White-footed mouse, *Peromyscus* sp.	8	4.76
Eastern harvest mouse, *Reithrodontomys humulis*	7	4.17
Southern bog lemming, *Synaptomys cooperi*	6	3.57
House mouse, *Mus musculus*	3	1.78
Hairy-tailed mole, *Parascalops breweri*	1	.06
Totals	168	99.46
Birds:		
cf. Slate-colored Junco, *Junco hyemalis*	1	
Passerine, gen. and spp. indet.	2	
Total	3	

SUMMARY AND CONCLUSIONS

Barn owls prey mostly on small (< 200g) mammals that inhabit relatively open areas such as pastures, abandoned cropland, and orchards (Johnsgard 1988). Within such areas they are said to take prey species in relative proportion to their abundance and/or availability (Andrews 1990, Bunn et al. 1982, Marra et al. 1989, Smith et al. 1974). Roughly half or more of Barn Owl prey is usually composed of a single species. In Europe the most abundant prey species of the Barn Owl is usually a microtine (Microtinae), with Soricidae and Murinae also occurring in high frequencies (Andrews 1990).

In the present study, of over 3500 prey animals identified in pellet remains collected from six nest and roost sites in Tennessee, 60% were microtines (Microtinae), 20% cricetids (Cricetinae), 16% soricids (Soricidae) and 2% murids (Murinae). The remaining 2% consisted of other mammal taxa, birds, and frogs. At all but one of the six sites, a single species made up over 50% of the prey; the single exception was at Memphis where a small sample that yielded only 27 individual prey animals included no more than 30% of any single prey species.

One roost (Knoxville) was used more or less continuously between 1983 and 1985, thus allowing us to evaluate seasonal variations in Barn Owl predation at that site. Statistically significant seasonal differences were noted for the three most commonly occurring taxa; *Sigmodon hispidus* was found to be highly over-represented during the winter months, *Microtus pinetorum* occurred in moderately greater numbers than expected during the spring, and *Blarina brevicauda* was more common than expected during the summer. We suggest that the obvious over–representation of the hispid cotton rat during the winter months may reflect that species' extended breeding season, which results in the production of a relatively steady number of individuals during periods when populations of other prey species are low.

The roost at Powell (Knox County) was used only during January and

February. At that roost *Sigmodon hispidus* constituted 65% of the prey animals, suggesting that *Sigmodon* may replace *Microtus* in importance during the winter in some parts of Tennessee.

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