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SUMMER FEEDING HABITS OF BARN OWLS (*TYTO ALBA*) FROM WHITE COUNTY, ILLINOIS

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ABSTRACT

Prey remains are described from a 4-month accumulation of pellets from a nesting pair of barn owls. Of 233 individual prey items, 163 (73.1%) were microtines, primarily prairie voles and pine voles. The minimum estimated daily mean biomass consumed by each owl was 49.8 g per day.

INTRODUCTION

Population densities of the barn owl (*Tyto alba*) are declining, and the species is classified as endangered in Illinois. The only breeding records of the barn owl in the state are pre-1975 for Jefferson, Wayne and Hamilton counties (Natural Land Institute, 1981). Information on the feeding habits of this species in Illinois is minimal; the only previous data were those of Cahn and Kemp (1930). This paper describes prey remains found in cast pellets deposited from approximately May through August 1984 by a breeding pair of barn owls. The nest was found in April 1984. Five owlets subsequently fledged; the last died of inanition (A. Woolf, pers. commun.).

METHODS

All pellets were collected on 27 August 1984 from a farm silo near Norris City, White County, Illinois. The total number of pellets was not estimated, as many were broken, poorly formed or pieces were clumped together. All pellets were separated by hand and skeletal remains extracted. Differentiation of prairie voles (*Microtus ochrogaster*) and pine voles (*M. pinetorum*) was based on characteristics of the anterior enamel border of the fourth triangle of the first lower molar (see Martin, 1974; Martin and Webb, 1974). Frequency of each prey species was based on the

largest number of one identifiable part, either the skull, right or left mandible. An average weight for each prey species was estimated from Marti (1974), Steenhof (1983) and specimens in the Southern Illinois University-Carbondale mammal collection. An estimated mean body weight for undetermined shrews, mice and voles was calculated as a weighted average of the known percentage of each species in each taxon. For example, *M. ochrogaster* (mean body weight = 30g) comprised 62.2% of identifiable *Microtus*, and *M. pinetorum* ($\bar{x}$ = 24g) comprised 37.8%. Thus, the estimated mean weight of the undetermined *Microtus* (n = 56) was calculated as: (56 × .622) 30 + (56 × .378) 24/56 = 27.7 g. A similar procedure was used for the undetermined shrews and mice. No adjustment was made for differences in mean body weight due to age or sex. Thus, biomass calculations, if biased, are probably slightly high.

RESULTS AND DISCUSSION

A total of 223 bird and mammal prey remains was found (Table 1). Mammals comprised 96.0% of the remains by frequency and 91.8% of the biomass. Birds made up the remaining food items. No invertebrate, fish, amphibian or reptile remains were found. The majority of mammalian prey consisted of microtines, specifically prairie voles and pine voles, (69.1%), with the bog lemming (*Synaptomys cooperi*) contributing an additional 4%. Together, microtines comprised 76.0% of the total biomass consumed by the owls. *Microtus* sp. are generally abundant in southern Illinois. Although the frequency of microtines in barn owls diets probably fluctuates relative to their cyclic availability, many other studies of barn owl feeding habits have found *Microtus* as the primary prey item (Smith et al., 1972; Marti, 1974; Smith and Marti, 1976; Dawe et al., 1978). Mice (*Peromyscus* sp. and *Mus musculus*) were relatively intermediate in frequency, comprising 12.6% of prey items. Much less common in pellet remains was the eastern mole (*Scalopus aquaticus*), which comprised 0.9% of the food items by frequency, and 2.5% by biomass. Although moles (*Talpa europaea*) are abundant in Britain, Glue (1974) found they comprise less than 1% of the biomass of barn owl prey. In Poland, Ruprecht (1979:499) considered moles a "chance component" of barn owl diets. Moles preyed upon by barn owls are usually taken in summer months (Bunn et al., 1982), and probably are dispersing subadults (Giger, 1965). One skull of a rice rat (*Oryzomys palustris*) was found comprising just 0.4% of the prey items. This species, uncommon in southern Illinois (McLaughlin and Robertson, 1951; Klimstra and Scott, 1956), is considered threatened (Natural Land Institute, 1981). These findings suggest the owls were not foraging selectively, but took prey opportunistically, probably in proportion to availability. Several previous studies also have concluded that barn owls do not forage selectively (Ticehurst, 1935; Bunn et al., 1982).

The estimated biomass of prey consumed by the pair of barn owls during the approximate 120-day period was 5,971 g (Table 1). This probably represents only about one-half the total intake during this period. Barn owls generally cast two pellets per 24-hour period (Guerin, 1928 from Evans and Emlen, 1947; Marti, 1973); one pellet is dropped somewhere in the foraging area, the other at the roost site (Evans and Emlen, 1947). Because only about one-half the cast pellets were available for analysis, it is probable that approximately (5,971 × 2) = 11,942 g in prey biomass

was consumed by the two owls over 120 days, an average of 49.8 g/bird/day. Even allowing for possibly reduced metabolic demands during the warmer summer months, this is substantially less than the "normal" daily intake of barn owls of 100-150 g (Marti, 1970; Bunn et al., 1982). The calculated mean daily intake of biomass may have been too low if: 1) all pellets cast at the nest site from May through August were not found, or 2) some cast pellets had decomposed. Neither of these possibilities seems likely, however (K.A. West, pers. commun.). Lower estimated mean intake also may have been due to the hen not foraging during part of the 30-day incubation period (Wallace, 1948; Nice, 1954), both owls not remaining on the site throughout the 4-month period, or less than one-half the pellets being dropped at the nest site. Mean prey intake may have been less than 49.8g/bird/day if the owls were in the silo prior to May, which may have been the case (K.A. West, pers. commun.).

With the exception of *Peromyscus*, none of the small mammal species documented in Table 1 have been reported previously from White County (Hoffmeister and Mohr, 1957; Hoffmeister, manuscript in preparation).

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Table 1. Prey species of a nesting pair of barn owls in White County, Illinois, from May through August 1984.

Prey Item	Frequency	%	Estimated Mean weight (g)	Prey Biomass (g) (Frequency × mean wt.)
Mammals				
Insectivores				
Short-tailed shrew (*Blarina* sp.)	11	4.9	12.0	132
Least shrew (*Cryptotis parva*)	4	1.8	5.0	20
Undetermined shrew	5	2.3	10.0	50
Eastern mole (*Scalopus aquaticus*)	2	0.9	75.0	150
Rodents				
Prairie vole (*Microtus ochrogaster*)	61	27.4	30.0	1,830
Pine vole (*Microtus pinetorum*)	37	16.6	24.0	888
Undetermined vole	56	25.1	27.7	1,553
Deer mice (*Peromyscus* sp.)	14	6.3	20.0	280
Bog lemming (*Synaptomys cooperi*)	9	4.0	30.0	270
House mouse (*Mus musculus*)	9	4.0	18.0	162
Undetermined mice	5	2.3	19.2	96
Rice rat (*Oryzomys palustris*)	1	0.4	50.0	50
SUBTOTAL MAMMALS	214	96.0		5,481
Birds				
Red-winged Blackbird (*Agelaius phoeniceus*)	7	3.1	55.0	385
Grosbeak (?)(Fringillidae)	1	0.4	75.0	75
Small passerine	1	0.4	30.0	30
SUBTOTAL BIRDS	9	3.9		490
TOTALS	223	99.9		5,971