

## Notes on the food habits of the Short-eared Owl (*Asio flammeus*: Strigiformes: Strigidae) in Oklahoma

**William Caire**

Department of Biology, University of Central Oklahoma, Edmond, Oklahoma 73034

**Paul W. Wilson**

10004 E. 156<sup>th</sup> Street North, Collinsville, Oklahoma 74021

**Ariesha T. A. Wilbert**

Department of Biology, University of Central Oklahoma, Edmond, Oklahoma 73034

**This description of the diet of *Asio flammeus* (Short-eared Owl) in Oklahoma is based on prey remains identified in 4,281 Short-eared Owl pellets collected by Paul Wilson from 1982-2005. Also included in the list are prey items of Short-eared Owls in Oklahoma reported in the literature. The pellets contained 3 species of birds and 9 species of small mammals. Our results combined with those in the previously published reports produced a list of 22 different prey items for the Short-eared Owl in Oklahoma. © 2008 Oklahoma Academy of Science.**

### INTRODUCTION

The Short-eared Owl (*Asio flammeus*) has been documented from many counties in Oklahoma (Force 1927; Saunders 1927; Nice 1931; Sutton 1967; Johnsgard 1979; Wood & Schnell 1984; Troutt 1991; Baumgartner & Baumgartner 1992; Blaha et al. 1995; Wilson 1995). Short-eared Owls are attracted to areas with abundant food resources (Sutton 1967; Clark 1975; Baumgartner & Baumgartner 1992; Holt & Leasure 1993) and will hunt both day and at night (Nice 1931; Clark 1975; Johnsgard 1988; Howard 1994). This owl has relatively small nesting territories and home ranges and will nest in loose colonies in suitable habitat (McMahon 1989; Holt & Leasure 1993; Wilson 1995; Lewis 2005). They have been noted near or in open grassland prairie habitats in Oklahoma (Nice 1927, 1931; Baumgartner & Baumgartner 1944; Sutton 1967; McMahon 1989; Troutt 1991; Baumgartner & Baumgartner 1992; Blaha et al. 1995).

Clark (1975) summarized the food habits of the Short-eared Owl across its range in North America. In this study, Clark cited only one food habit study of Short-

eared Owls in Oklahoma, Baumgartner & Baumgartner (1944). Other reports on the Short-eared Owl in Oklahoma do contain additional notes on prey items (Nice 1931; Sutton 1967; McMahon 1989; Blaha et al. 1995; Wilson 1995). However, no single reference summarizes the food habits of Short-eared Owls from Oklahoma. Our objective is to provide an updated checklist of prey items for Short-eared Owls in Oklahoma. The list is based on identification of prey remains from Short-eared Owl pellets collected across the state and previously published information.

### METHODS

Paul W. Wilson collected 4,281 Short-eared Owl pellets from 22 counties in Oklahoma from 1982-2005. The numbers of pellets examined from the various counties were: Beckham 6; Canadian 3; Cherokee 3; Coal 49; Comanche 1; Craig 48; Custer 4; Grant 175; Harmon 9; Jackson 56; Jefferson 13; Lincoln 69; Mayes 2; Osage 39; Ottawa 347; Pawnee 4; Pontotoc 8; Rogers 117; Texas 67; Tulsa 3146; Wagoner 44; and Washington 71. Most of the pellets were recovered from

Short-eared Owl nesting sites during the winter to early spring. In a few instances, pellets were collected at other times of the year. Each visit to a location was considered one collection. Wilson identified mammalian prey species using a skull key modified from Hall & Kelson (1959) and Hall (1981). Identifications were verified by the late Everett Grisby of Northeastern Oklahoma State University, Tahlequah, as well as by comparison with reference specimens in the University of Kansas Natural History Museum and Biodiversity Center, Lawrence, Kansas. The owl pellets are deposited in the Collection of Vertebrates at the University of Central Oklahoma Natural History Museum. The majority of the pellets contained identifiable prey remains; however, a few item identifications were based on less reliable fragments (e.g., feathers, bones, fur, and partial skull fragments). These prey item fragments were identified and consolidated to the lowest taxonomic level considered reliable. Published literature (see Table 1) related to the diet items of Short-eared Owls in Oklahoma was examined and the taxa (scientific names, etc.) were reported as listed in those publications.

## RESULTS AND DISCUSSION

Twenty-two different prey items are listed in Table 1 for Short-eared Owls in Oklahoma. Of the 22 prey items listed, 12 were identified in the pellets, 17 items have been reported from other published reports and seven were common to both sources. Several prey items listed in Table 1 (e.g., bird, shrew, rodent, *Reithrodontomys sp.*) are not included in the 22 prey items listed because they were not clearly identified as a particular species or item and could have been a form already listed. Of the four birds known to be taken by Short-eared Owls in Oklahoma (Table 1), two, the Red-winged Blackbird (*Agelaius phoeniceus*) and the Eastern Meadowlark (*Sturnella magna*), are new species added in this study. Of the 12 mammals known to be

taken by Short-eared Owls (Table 1), three new species were added in this study - Elliot's short-tailed shrew (*Blarina hylophaga*), the fulvous harvest mouse (*Reithrodontomys fulvescens*) and the Norway rat (*Rattus norvegicus*).

Prey items of Short-eared owls in Oklahoma (Table 1) are similar to those reported from other areas consisting of primarily small mammals and relatively few small birds (Clark 1975; Holt & Leasure 1993). Short-eared owls have been reported in large numbers in Oklahoma during the winter when small rodents are abundant (Sutton 1967). Voles are commonly reported in the diet in other states (Clark 1975; Holt & Leasure 1993). Voles (*Microtus ochrogaster*) were also common in the pellets examined in this study (identified in 77.4 % of the collections); however, cotton rats, *Sigmodon hispidus*, were present in 94.8 % of the pellet collections. Baumgartner & Baumgartner (1944) and Sutton (1967) also noted large numbers of cotton rats in their studies in Oklahoma. They did not report any voles. Adult cotton rats are larger than adult voles (Caire et al. 1989) and provide a better unit per meal bulk contribution than voles.

Baumgartner & Baumgartner (1992) noted that in the fall and spring, Short-eared Owls consumed a few invertebrates: grasshoppers, May beetles, cutworms, and scorpions. Reptiles and amphibians usually have a low percent occurrence in the diet (Baumgartner & Baumgartner 1992; Smith & Hanebrink 1982). The pellets examined in our study were similar in that they contained neither reptile remains nor insect remains. However, most of the pellets examined in our study were collected in the winter or early spring when neither insects nor reptiles are as abundant. Relatively few bird remains were identified in the collections of pellets we examine (Table 2). Holt & Leasure (1993) reported that birds are eaten by Short-eared Owls but mainly in coastal areas. However, Smith & Hanebrink (1982) reported that birds comprised 50 % and small mammals only 44 % of Short-eared

**Table 1. Food items of Short-eared Owls (*Asio flammeus*) from Oklahoma identified in owl pellets in this study and in previous studies. Prey items are listed alphabetically under each heading.**

Short-eared Owl Prey Items	This study	Other References
<b>Invertebrates</b>		
Beetles (Carabidae or Tenebrionidae) (no species identified)		Blaha et al. (1995)
Cutworms (no species identified)		Nice 1931 Baumgartner & Baumgartner (1992)
Grasshopper (no species identified)		Nice 1931 Baumgartner & Baumgartner (1992)
<i>Phyllophaga</i> sp. (May beetle) (no species identified)		Baumgartner & Baumgartner (1992)
Scorpions (no species identified)		Nice 1931 Baumgartner & Baumgartner (1992)
<b>Amphibians</b>		
Frogs (no species identified)		Baumgartner & Baumgartner (1992)
<b>Birds</b>		
<i>Agelaius phoeniceus</i> (Red-winged Blackbird)	X	
<i>Eremophila alpestris</i> (Horned Lark)		Blaha et al. (1995)
Fringillidae (no species identified)	X	Baumgartner & Baumgartner (1944) Baumgartner & Baumgartner (1992)
Icteridae (no species identified)	X	
Passeriformes sparrow (no species identified)	X	
<i>Sturnella magna</i> (Eastern Meadowlark)	X	
Unidentified bird		Nice 1931 Baumgartner & Baumgartner (1992) Blaha et al. (1995)
<b>Mammals</b>		
Shrew*		Nice 1931 Baumgartner & Baumgartner (1992)
<i>Blarina hylophaga</i> (Elliot's short-tailed shrew)	X	
<i>Cryptotis parva</i> (least shrew)	X	Baumgartner & Baumgartner (1944) Blaha et al. (1995)
Rabbits (no species identified)		Nice 1931
Gophers (no species identified)		Nice 1931
Unidentified rodents (no species identified)	X	Nice 1931 Baumgartner & Baumgartner (1992) Blaha et al. (1995)
<i>Microtus ochrogaster</i> (prairie vole)	X	Blaha et al. (1995)
<i>Mus musculus</i> (house mouse)		Baumgartner & Baumgartner (1944)
<i>Perognathus</i> (= <i>Chaetodipus</i> ) <i>hispidus</i> (hispid pocket mouse)	X	Baumgartner & Baumgartner (1944)
<i>Peromyscus</i> (no species identified)	X	Baumgartner & Baumgartner (1944)
<i>Rattus norvegicus</i> (Norway rat)	X	
<i>Reithrodontomys</i> (no species identified)	X	Blaha et al. (1995)
<i>Reithrodontomys fulvescens</i> (fulvous harvest mouse)	X	
<i>Reithrodontomys montanus</i> (plains harvest mouse)	X	Baumgartner & Baumgartner (1944) Wilson (1995)
<i>Sigmodon hispidus</i> (cotton rat)	X	Baumgartner & Baumgartner (1944) Sutton (1967) McMahon (1989) Baumgartner & Baumgartner (1992)

**Table 2. The number of times prey items were identified in the 155 collections of Short-eared Owl pellets. Items are listed alphabetically.**

Taxa	Number of pellet collections containing the taxa	% occurrence in 155 separate pellet collections
<b>Birds</b>		
<i>Agelaius phoeniceus</i>	3	1.9 %
Fringillidae sparrow	38	24.5 %
Icteridae	9	5.8 %
Passeriformes sparrow	8	5.2 %
<i>Sturnella magna</i>	4	2.6 %
<b>Mammals</b>		
<i>Blarina hylophaga</i>	2	1.3 %
<i>Cryptotis parva</i>	89	57.4 %
<i>Microtus ochrogaster</i>	120	77.4 %
<i>Perognathus</i> (= <i>Chaetodipus</i> ) <i>hispidus</i>	1	0.6 %
<i>Peromyscus</i> sp.	61	39.4 %
<i>Rattus norvegicus</i>	2	1.3 %
<i>Reithrodontomys</i> sp.	4	2.5 %
<i>Reithrodontomys fulvescens</i>	1	0.6 %
<i>Reithrodontomys montanus</i>	94	60.6 %
<i>Sigmodon hispidus</i>	147	94.8 %

Owl diet in Arkansas. They suggested that the owls were feeding on migratory birds, which were abundant in the area at the time of their study.

The variety of prey items reported in the diet of Short-eared Owls in Oklahoma and adjacent states suggest that Short-eared Owls are probably opportunistic foragers seeking out prey that are readily abundant. Future examinations of owl pellets will add to the list of prey items for Short-eared Owls in Oklahoma. Owl pellet analysis continues to be an important tool for understanding the ecology of owls.

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