

An Updated Checklist of the Food Items of the Great Horned Owl (*Bubo virginianus*: Strigiformes: Strigidae) in Oklahoma

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This paper provides an updated checklist of prey items known to be taken by the Great Horned Owl (*Bubo virginianus*) in Oklahoma. The checklist is based on the prey remains in 17,744 Great Horned Owl pellets collected and analyzed throughout the state from 1976 to 1999 as well as those prey items listed in previously published reports. The pellets from this study contained remains from insects, crayfish, snakes, a lizard (*Phrynosoma cornutum*), 16 bird and 30 mammal species. Our results and those in other reports have produced a list of 59 different prey items for the Great Horned Owl in Oklahoma. © 2006 Oklahoma Academy of Science.

INTRODUCTION

The food habits of *Bubo virginianus* (Great Horned Owl) are documented from many areas of North America (e.g., Parmalee 1954, Craighead and Craighead 1956, Wink and Goodrich 1987, Aigner et al 1994, Marti and Kochert 1996, Zimmerman et al 1996, Woodman et al 2005). Although the Great Horned Owl is common in Oklahoma, past reports of its food habits within the state are from only seven counties: Cimarron (Schemitz and Ables 1962); Caddo (Smith 1993); Cleveland (Byre 1995); Jackson (Tyler and Jensen 1981); Major (Perry and Rogers 1964); Greer (Taylor 1964); and Payne (Baumgartner and Baumgartner 1944). None of these previous studies compile and summarize all of the prey items reported to be consumed by the Great Horned Owl in Oklahoma. Our objective is to provide an updated list of prey items for Great Horned Owls in Oklahoma. This list is compiled from owl pellets collected across Oklahoma from 44 additional counties and prey items listed in previously published reports.

METHODS

From 1976 to 1999, Paul W. Wilson collected 17,744 Great Horned Owl pellets in 49 counties throughout Oklahoma with the exception of the far southeastern corner. The pellets were primarily recovered at Great Horned Owl nesting sites on a monthly basis during the nesting season which extends from late winter into spring. In a few instances, pellets were collected at other times of the year. All the pellets per visit to a site were treated as a single collection. He identified mammalian prey species using a skull key modified from Hall and Kelson (1959) and Hall (1981). Identifications were verified by the late Everett Grisgby of Northeastern Oklahoma State University, Tahlequah, as well as by comparisons with reference specimens in the University of Kansas Natural History Museum and Biodiversity Center, Lawrence, Kansas. All the owl pellets are housed at the University of Central Oklahoma Collection of Vertebrates (UCOCV). Depending upon the quality of the animal remains present in the pellets, all prey items were identified to the lowest reli-

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able taxonomic level. Therefore, some prey identifications were consolidated and listed as insect, crayfish, fish, lizard, snake, bird, etc., depending upon the level of identification of the fragments (e.g., feathers, vertebrae, bones, exoskeletons, gizzards, skulls). Published literature related to the diet items of Great Horned Owls in Oklahoma was located through a traditional search of the literature as well as in searchable databases (e.g., BioOne™ and SORA – Searchable Ornithological Research Archive). Taxa referenced from the literature are listed in Table 1 as they were reported in the original papers.

RESULTS AND DISCUSSION

Table 1 lists 59 different prey items identified in owl pellets of this study and reported in other studies on Great Horned Owl food habits in Oklahoma. Several prey items listed in Table 1 (e.g., insect; birds; Anatidae, Ducks; *Microtus* sp., voles; *Neotoma* sp., woodrats; *Peromyscus* sp., deermice; *Reithrodontomys* sp., harvest mice; and *Sylvilagus* sp., cottontails) were not included in the 59 because they were not clearly identified to a particular species and could have been repeats of species already listed.

Several fragmented prey items that were not identifiable to genus or species in Great Horned Owl food included crayfish, insects, fish, a lizard and snakes (Table 1). Our study added one noteworthy diurnal lizard, *Phrynosoma cornutum* (Texas horned lizard), identified in a pellet from Jackson County.

Of the 21 birds known to be taken by Great Horned Owls in Oklahoma (Table 1), 11 are previously unreported taxa added in this study. They include *Cardinalis cardinalis* (Northern Cardinal), *Columba livia* (Rock Pigeon), *Egretta caerulea* (Little Blue Heron), *Geococcyx californianus* (Greater Roadrunner), *Quiscalus quiscula* (Common Grackle), *Rallus limicola* (Virginia Rail), *Sturnus vulgaris* (European Starling), and *Turdus migratorius* (American Robin). Noteworthy in the pellets

were the remains of *Tyto alba* (Barn Owl), and *Bubo virginianus* (Great Horned Owl). Sutton (1967) indicated that in Oklahoma, Great Horned Owls had not been reported to eat *Corvus brachyrhynchos* (American Crow); however, remains were identified in the pellets of this study.

Of 31 mammals known to be taken by Great Horned Owls (Table 1), 13 species previously unreported were added in this study. Mammal prey not documented in previous food habit studies of Great Horned Owls in Oklahoma include *Baiomys taylori* (northern pygmy mouse), *Cratogeomys castanops* (yellow-faced pocket gopher), *Didelphis virginiana* (Virginia opossum), *Eptesicus fuscus* (big brown bat), *Microtus pinetorum* (woodland vole), *Neotoma floridana* (eastern woodrat), *Ondatra zibethicus* (common muskrat), *Oryzomys palustris* (marsh rice rat), *Rattus norvegicus* (Norway rat), *Reithrodontomys fulvescens* (fulvous harvest mouse), *Sciurus niger* (eastern fox squirrel), *Spermophilus tridecemlineatus* (thirteen-lined ground squirrel), and *Sylvilagus audubonii* (desert cottontail).

Baiomys taylori (northern pygmy mouse) is a noteworthy species identified in the owl pellets. Only a few verified occurrences of this species have been listed for Oklahoma (Stangl and Dalquest 1986, Caire 1991). The Great Horned Owl is a predator of *Tadarida brasiliensis* (Mexican free-tailed bat) (Twente 1954, Perry and Rogers 1964, Taylor 1964, Looney 1971, Chesser and Kennedy 1976, Caire and Ports 1981). Pellets in this study (from Harmon, Major, Beckham and Grant Counties) that contained *Tadarida* remains were found near several large maternity caves of *Tadarida* where there were observations of the owl capturing bats. These maternity caves harbor large populations of bats during spring and summer and the exit flight of the bats at dusk provides a ready source of prey for the owls. The skull of *Eptesicus fuscus* (big brown bat) in an owl pellet from Ottawa County is the first confirmation of Great Horned Owl predation on a bat species other than *T. brasiliensis* in Oklahoma.

Table 1. Food items of *Bubo virginianus* (Great Horned Owl) from Oklahoma identified in owl pellets in this study and in previous studies. Prey items are listed alphabetically under each heading.

<i>Bubo virginianus</i> (Great Horned Owl) Prey Items	This study	Other References
INVERTEBRATES		
Beetle - <i>Calosoma</i> sp. (searcher beetles)*		Baumgartner and Baumgartner (1944)
Beetle - Carabidae (ground beetles)*		Baumgartner and Baumgartner (1944)
Beetle - Coleoptera (beetles)*		Schemnitz and Ables (1962)
Beetle - Trogidae (skin or hide beetles) *		Baumgartner and Baumgartner (1944)
Crayfish *	x	Sutton (1967)
Insects *	x	
FISH *		
		Sutton (1967)
AMPHIBIANS		
Frogs *		Baumgartner (1992)
REPTILES		
Lizard *		Chesser and Kennedy (1976)
<i>Phrynosoma cornutum</i> (Texas Horned Lizard)	x	
Snakes *	x	Baumgartner (1992)
BIRDS		
<i>Agelaius phoeniceus</i> (Red-winged Blackbird)	x	Schemnitz and Ables (1962)
<i>Anas discors</i> (Blue-winged Teal)		Sutton (1967)
Anatidae (Ducks, Geese, and Swans)*		Baumgartner and Baumgartner (1944)
Bird *	x	Baumgartner and Baumgartner (1944)
		Schemnitz and Ables (1962)
<i>Bubo virginianus</i> (Great Horned Owl)	x	
<i>B. lineatus</i> (Red Shouldered Hawk)		Byre (1995)
<i>B. platypterus</i> (Broad-winged Hawk)		Sutton (1967)
<i>Cardinalis cardinalis</i> (Northern Cardinal)	x	
Chickens		Baumgartner (1992)
<i>Columba livia</i> (Rock Pigeon)	x	
<i>Corvus brachyrhynchos</i> (American Crow)	x	
<i>Egretta caerulea</i> (Little Blue Heron)	x	
Emberizidae (American Sparrows, Buntings, and relatives) *		Schemnitz and Ables (1962)
Fringillidae (Finches)*	x	Baumgartner and Baumgartner (1944)
<i>Fulica americana</i> (American Coot)	x	Sutton (1967)
<i>Geococcyx californianus</i> (Greater Roadrunner)	x	
Icteridae (Blackbirds, Orioles, and relatives) *	x	Baumgartner and Baumgartner (1944)
<i>Quiscalus quiscula</i> (Common Grackle)	x	
<i>Rallus limicola</i> (Virginia Rail)	x	
<i>Sturnella</i> sp. (Meadowlark) *	x	Baumgartner and Baumgartner (1944)
		Sutton (1967)
<i>Sturnus vulgaris</i> (European Starling)	x	
<i>Tringa melanoleuca</i> (Greater Yellowlegs)		Sutton (1967)
<i>Turdus migratorius</i> (American Robin)	x	
<i>Tyto alba</i> (Barn Owl)	x	
MAMMALS		
<i>Baiomys taylori</i> (northern pygmy mouse)	x	

<i>Bubo virginianus</i> (Great Horned Owl) Prey Items	This study	Other References
<i>Blarina brevicauda</i> (short-tailed shrew)	x	Baumgartner and Baumgartner (1944)
<i>Chaetodipus hispidus</i> (hispid pocket mouse)	x	Baumgartner and Baumgartner (1944) Tyler and Jensen (1981) Smith (1993)
<i>Cratogeomys castanops</i> (yellow-faced pocket gopher)	x	
<i>Cryptotis parva</i> (least shrew)	x	Baumgartner and Baumgartner (1944) Tyler and Jensen (1981) Smith (1996)
<i>Didelphis virginiana</i> (Virginia opossum)	x	
<i>Dipodomys ordii</i> (Ord's kangaroo rat)	x	Schemnitz and Ables (1962)
<i>Eptesicus fuscus</i> (big brown bat)	x	
<i>Geomys</i> sp. (pocket gopher)*	x	Schemnitz and Ables (1962)
<i>Lepus californicus</i> (black-tailed jackrabbit)		Baumgartner and Baumgartner (1944) Schemnitz and Ables (1962)
<i>Mephitis mephitis</i> (striped skunk)	x	Schemnitz and Ables (1962)
<i>Microtus ochrogaster</i> (prairie vole)	x	Smith (1993)
<i>Microtus pinetorum</i> (woodland vole)	x	
<i>Microtus</i> sp. (vole)*		Smith (1996)
<i>Mus musculus</i> (house mouse)	x	Tyler and Jensen (1981)
<i>Neotoma floridana</i> (eastern woodrat)	x	
<i>N. micropus</i> (southern plains woodrat)	x	Tyler and Jensen (1981)
<i>Neotoma</i> sp. (woodrat)*		Schemnitz and Ables (1962)
<i>Ondatra zibethicus</i> (common muskrat)	x	
<i>Onychomys leucogaster</i> (northern grasshopper mouse)	x	Schemnitz and Ables (1962)
<i>Oryzomys palustris</i> (marsh rice rat)	x	
<i>Perognathus</i> sp. (pocket mouse)*	x	Schemnitz and Ables (1962)
<i>Peromyscus leucopus</i> (white-footed mouse)		Smith (1993)
<i>Peromyscus</i> sp. (deermouse)*	x	Baumgartner and Baumgartner (1944) Schemnitz and Ables (1962) Tyler and Jensen (1981)
<i>Rattus norvegicus</i> (Norway rat)	x	
<i>R. rattus</i> (roof rat)	x	Tyler and Jensen (1981)
<i>Reithrodontomys fulvescens</i> (fulvous harvest mouse)	x	
<i>R. montanus</i> (plains harvest mouse)	x	Baumgartner and Baumgartner (1944) Smith (1993)
<i>Reithrodontomys</i> sp. (harvest mouse)*		Schemnitz and Ables (1962) Tyler and Jensen (1981)
<i>Scalopus aquaticus</i> (eastern mole)	x	Baumgartner and Baumgartner (1944)
<i>Sciurus niger</i> (eastern fox squirrel)	x	
<i>Sigmodon hispidus</i> (hispid cotton rat)	x	Baumgartner and Baumgartner (1944) Schemnitz and Ables (1962) Tyler and Jensen (1981) Smith (1993, 1996)
Skunk *		Baumgartner and Baumgartner (1992) Sutton (1967)
<i>Spermophilus tridecemlineatus</i> (thirteen-lined ground squirrel)	x	

<i>Bubo virginianus</i> (Great Horned Owl)	
Prey Items	This study Other References
<i>Sylvilagus audubonii</i> (desert cottontail)	x
<i>S. floridanus</i> (eastern cottontail)	x Baumgartner and Baumgartner (1944) Schemnitz and Ables (1962) Sutton (1967)
<i>Sylvilagus</i> sp. (cottontail)*	Tyler and Jensen (1981) Smith (1996)
<i>Tadarida brasiliensis</i> (Mexican free-tailed bat)	x Twente (1954) Taylor (1964) Perry and Rogers (1964) Looney (1972) Chesser and Kennedy (1976) Caire and Ports (1981)

* Species not identified

The diet of the Great Horned Owl in Oklahoma is seemingly quite diverse. This study has added to the knowledge of prey items of Great Horned Owls and it further reveals the owl's opportunistic hunting behavior. Even though this study analyzed varying numbers (from a single pellet in five counties to 8,858 from Ottawa Co.) of owl pellets from 44 Oklahoma counties from which no owl pellets had previously been analyzed, future examinations of owl pellets will certainly add to the list of prey items for Great Horned Owls. Therefore, it is important that field biologists remain cognizant of the valuable ecological information present in owl pellets and preserve them for future analyses.

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