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NOTE ON FOOD HABITS OF THE SCREECH OWL AND THE BURROWING OWL OF SOUTHEASTERN OREGON

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ABSTRACT.—Diets of the Common Screech Owl (*Otus asio*) and Burrowing Owl (*Athene cunicularia*) from the Great Basin, Malheur County, southeastern Oregon, were studied. Although there was considerable overlap in the diets of these owls, there were differences related to habitat use.

Few data are available on the food habits of owls from the Great Basin of southeastern Oregon. The Barn Owl (*Tyto alba*) is the only one whose food habits have been studied in this part of the state (Maser et al. 1980), although some data are available on food habits of owls from the rangelands of central Oregon: Barn Owl (Maser and Hammer 1972); Great Horned Owl (*Bubo virginianus*) (Brodie and Maser 1967, Maser et al. 1970); Short-eared Owl (*Asio flammeus*) (Maser et al. 1970; Maser et al. *A note on the food habits of the short-eared owl*, 1971); Long-eared Owl (*A. otus*) (Maser et al. 1970), and Burrowing Owl (*Athene cunicularia*) (Maser et al. *Food habits of the burrowing owl*, 1971).

This paper presents information on food habits of the common Screech Owl (*Otus asio*) and the Burrowing Owl in the rangelands of Malheur County, Oregon.

STUDY AREA

The study area, Malheur County, in extreme southeastern Oregon, lies within the Owyhee Upland physiographic province. The major vegetation zone is described as shrub-steppe (characterized by big sagebrush, *Artemisia tridentata*) (Franklin and Dyrness 1973). Plant communities were defined by Dealy et al. (1981), and the more restrictive habitats were described by Bohn et al. (1980) and Maser et al. *Geomorphic and edaphic habitats*, 1979; Maser et al. *Manmade habitats*, 1979).

METHODS

Castings were collected from April 1975 through July 1978. They were placed in plastic bags and were soaked in water before dissection. Prey items were identified to species whenever possible, and individuals were counted. Total counts of leaves and seeds were taken, but other plant parts, fur, and feathers were listed only as the number of pellets in which they occurred. Comparisons between vertebrate and invertebrate foods were based on total percentages. Diversity of prey was calculated for all food items as the number of items per total number of castings.

RESULTS AND DISCUSSION

Vertebrates formed 20.2% of the prey individuals in screech owl diets (Table 1); invertebrates, 79.8% (Table 2). Vertebrates comprised 14.3% of the prey items in burrowing owl diets (Table 3) and invertebrates 85.7% (Table 4).

Vertebrate Prey

Both owls fed heavily on the Ord kangaroo rat (*Dipodomys ordi*), but the kangaroo rat was more important to the Burrowing Owl than to the Screech Owl.

The northern pocket gopher (*Thomomys talpoides*) was important in the diet of the Burrowing Owl but accounted for less than 1% of the Screech Owl diet. The similarity in weight between the Ord kangaroo rat (the average weight of 32 individuals from both

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TABLE 1. Vertebrate foods of the Screech Owl (*Otus asio*) from southeastern Oregon, based on analysis of 205 castings.

Prey item		Number of individuals	Percentage of diet	Number of castings	Percent frequency
MAMMALIA					
Rodentia					
Cricetidae	*Peromyscus* sp.	16	5.2	10	4.9
	Cricetinae unidentified	69	22.6	41	20.0
	Microtinae unidentified	25	8.2	18	8.8
	Microtus sp.	2	0.6	1	0.5
	Lagurus curtatus	11	3.6	10	4.9
Geomyidae	*Thomomys talpoides*	2	0.6	2	1.0
Heteromyidae	*Dipodomys ordi*	39	12.8	32	15.6
	Perognathus parvus	1	0.3	1	0.5
Sciuridae	*Spermophilus* sp.	8	2.6	1	0.5
	Sciuridae unidentified	16	5.2	16	7.8
Lagomorpha					
Leporidae	*Lepus californicus*	1	0.3	1	0.5
	Leporidae unidentified	16	5.2	11	5.4
Mammal	Unidentified	47	15.4	46	22.4
REPTILIA					
Squamata					
Iguanidae	*Phrynosoma platyrhinos*	11	3.6	9	4.4
	Cnemidophorus tigris	1	0.3	1	0.5
Lacertilia	Unidentified	23	7.5	10	4.9
Reptile	Unidentified	11	3.6	11	5.4
AVES					
Columbiformes					
Columbidae	*Zenaida macroura*	1	0.3	1	0.5
Passeriformes	Unidentified	2	0.6	2	1.0
Bird	Unidentified	3	1.0	1	0.5
*Eggshell	Unidentified	—	—	6	
*Feathers	Unidentified	—	—	5	
*Claws	Unidentified	—	—	8	
		305	99.5		

*Not included in total count

central and southeastern Oregon was 56.8 g; Maser, unpublished data), and the northern pocket gopher in Malheur County (61.3 g) probably allowed the Burrowing Owl to exploit both species. These gophers formed only 0.02% of the Burrowing Owl diet in central Oregon (Maser et al. *Food habits of the burrowing owl*, 1971). Northern pocket gophers of the poorly drained lacustrine soils that occur in Malheur County are small (average weight of 25 individuals was 61.3 g) compared with the same subspecies (*quadratus*) from the better drained soils of the Steens Mountain, Harney County (average weight of eight individuals, 94.6 g), and from the sandy soils of central Oregon, Jefferson and Klamath counties (average weight of 47 individuals 67.4 g; Maser, unpublished data). Possibly, the weight difference (6.1 g) between the gophers of central and southeastern Oregon allowed the Burrowing Owl to exploit this prey in one area but not in the other.

Within the family Cricetidae, the Screech Owl had the following taxa available as prey: western harvest mouse (*Reithrodontomys megalotis*), deer mouse (*Peromyscus maniculatus*), canyon mouse (*P. crinitus*), northern grasshopper mouse (*Onychomys leucogaster*), desert woodrat (*Neotoma lepida*), bushy-tailed woodrat (*N. cinerea*), montane vole (*Microtus montanus*), long-tailed vole (*M. longicaudus*), and sage vole (*Lagurus curtatus*). Montane voles were by far more abundant than long-tailed voles (Maser, unpublished data). The family Cricetidae accounted for 40.2% of the vertebrate prey items. The

TABLE 2. Invertebrate foods and vegetation of the Screech Owl (*Otus asio*) from southeastern Oregon, based on analysis of 205 castings.

Prey items		Number of individuals	Percentage of diet	Number of castings	Percent frequency
INSECTA					
Coleoptera					
Carabidae	*Calosoma* sp.	90	7.5	34	16.6
	Near *Anisodactylus* sp.	6	0.5	5	2.4
	Unidentified	3	0.2	3	1.5
	Anisodactylus sp.	7	0.6	1	0.5
Curculionidae	Unidentified	6	0.5	10	4.8
Alleculidae	Unidentified	1	0.1	1	0.5
Tenebrionidae	Unidentified	61	5.1	33	16.1
Scarabaeidae					
	Cyclociphala sp.	41	3.4	30	14.6
	Rutela sp.	1	0.1	1	0.5
	Unidentified	4	0.3	4	2.0
	Paracotalpa granicollis	6	0.5	4	2.0
Silphidae	*Necrophorus* sp.	11	0.9	7	3.4
Coleoptera	Unidentified	21	1.7	20	9.8
Diptera	Unidentified	3	0.2	3	1.5
Hemiptera	Unidentified	1	0.1	1	0.5
Homoptera					
Cicadidae	Unidentified	81	6.7	21	10.2
Hymenoptera					
Formicidae	Unidentified	20	16.6	12	5.9
Lepidoptera	Larvae	3	0.2	1	0.5
Neuroptera	Unidentified	1	0.1	1	0.5
Orthoptera					
Acrididae	Unidentified (mandibles)	424	35.2	48	23.4
Gryllidae	*Gryllus veletis*	59	4.9	35	17.1
	Unidentified (mandibles)	27	2.2	8	3.9
Stenopalmatidae	*Stenopelmatus* sp. (mandibles)	117	9.7	19	9.3
Siphonaptera	Unidentified	2	0.2	1	0.5
ARACHNIDA					
Araneida	Unidentified	4	0.3	4	2.0
Scorpionida					
Vejovidae	*Vejovis boreus*	24	2.0	16	7.8
VEGETATION					
Leaves	*Erigonum*	—	—	41	
*Vegetation		—	—	11	
*Seeds	Unidentified	2	—	1	0.5
*Grass seeds		48	—	3	1.5
		1,204	99.7		

*Not included in total count

subfamily Cricetinae accounted for 27.8% and Microtinae 12.4% of the vertebrate diet.

The Burrowing Owl had the same taxa available as prey within the family Cricetidae as did the Screech Owl, except for the canyon mouse and occasionally the desert woodrat. Cricetidae formed 29.9% of the Burrowing Owl vertebrate diet. The subfamily Cricetinae composed 10.3% and the Microtinae 15.7%. As with the Screech Owl, the montane vole was far more abundant in habitat of the Burrowing Owl than was the long-tailed vole (Maser, unpublished data).

Invertebrate Prey

Although the Screech Owl ate 26 kinds of invertebrates (Table 2) and the Burrowing Owl ate 24 kinds (Table 4), there are some major differences. Beetles accounted for 21.4% of the items in the Screech Owl diet, including Scarabaeidae (4.3%) and Carabidae (8.8%). Beetles were slightly more important to the Burrowing Owl (38.6% of the diet). Although the Burrowing Owl used Carabidae about the same as the Screech Owl (7.8%), Scarabaeidae were more important to the Burrowing Owl (21.7%).

TABLE 3. Vertebrate foods of the Burrowing Owl (*Athene cunicularia*) from southeastern Oregon, based on analysis of 150 castings.

Prey item		Number of individuals	Percentage of diet	Number of castings	Percent frequency
MAMMALIA					
Rodentia					
Cricetidae	*Peromyscus maniculatus*	11	5.4	10	6.7
	Reithrodontomys meglotis	7	3.4	7	4.7
	Microtus sp.	10	4.9	8	5.3
	Lagurus curtatus	13	6.4	11	7.3
Cricetinae	Unidentified	3	1.5	3	2.0
Microtinae	Unidentified	9	4.4	8	5.3
Cricetidae	Unidentified	8	3.9	6	4.0
Geomyidae	*Thomomys talpoides*	21	10.3	21	14.0
Heteromyidae	*Dipodomys ordi*	49	24.1	47	31.3
	Perognathus parvus	11	5.4	11	7.3
	Unidentified	1	0.5	1	0.7
Sciuridae	Unidentified	14	6.9	14	9.3
Mammal	Unidentified	19	9.4	18	12.0
AMPHIBIA	Unidentified	21	10.3	14	9.3
REPTILIA					
Squamata					
Iguanidae	*Phrynosoma platyrhinos*	1	0.5	1	0.7
Reptile	Unidentified	4	2.0	4	2.7
AVES					
Columbiformes					
Columbidae	*Zenaida macroura*	1	0.5	1	0.7
*Feathers				4	
		203	99.8		

*Not included in total count

The other insect order of major importance to both owls was Orthoptera. This item was more important to the Screech Owl (52.0%) than to the Burrowing Owl (34.3%). Within Orthoptera, grasshoppers (Acrididae) were more important to the Screech Owl (35.2%) than to the Burrowing Owl (21.6%), but the Jerusalem cricket (*Stenopelmatus* sp.) was eaten more by the Burrowing Owl (12.7%) than by the Screech Owl (9.7%). The Screech Owl also consumed the cricket (*Gryllus veletis*) (4.9%), but the Burrowing Owl did not.

Prey Diversity

Total prey diversity per casting for the Screech Owl was 0.3 species and averaged 7.4 individual items. The Burrowing Owl was surprisingly close, 0.3 species per casting and averaged 9.5 individuals.

Owls

The Screech Owl generally inhabited riparian zones, abandoned homesteads, and some cliffs (Bohn et al. 1980; Dealy et al. 1981; Maser et al. *Geomorphic and edaphic habitats*, 1979; Maser et al. *Manmade habitats*, 1979; Maser, unpublished data). The Burrowing Owl, on the other hand, was associated with badger (*Taxidea taxus*) burrows, primarily in the basin big sagebrush/bunchgrass and black greasewood (*Sarcobatus vermiculatus*)/ grass communities (Dealy et al. 1981; Maser, unpublished data).

Flexibility in selection of habitat by the Screech Owl brought it into contact with a wider prey base than was available to the Burrowing Owl with its more rigid selection of habitat. For example, Screech Owls in cliffs had canyon mice and both species of woodrats available; Screech Owls in abandoned homesteads also had both species of woodrats available and were known to take the desert woodrat (Maser, unpublished data). The Burrowing Owl, however, occupied habitat that was inhospitable to canyon mice and to bushy-tailed woodrats, and the desert woodrat only occasionally inhabited the black greasewood/ grass community (Maser, unpublished data).

Both species of owl are opportunistic and catholic in diet (Gleason and Craig 1979; Maser et al. *Food habits of the burrowing*

TABLE 4. Invertebrate foods and vegetation of the Burrowing Owl (*Athene cunicularia*) from southeastern Oregon, based on analysis of 150 castings.

Prey item		Number of individuals	Percentage of diet	Number of castings	Percent frequency
INSECTA					
Coleoptera					
Carabidae	*Calosoma* sp.	51	4.2	36	24.0
	Anisodactylus sp.	31	2.5	13	8.7
	Unidentified	14	1.1	8	5.3
Curculionidae	Unidentified	19	1.6	11	7.3
Scarabaeidae	*Paracotalpa granicollis*	121	9.9	25	16.7
	Cyclocephala sp.	1	0.7	1	0.7
	Rutela sp.	88	7.2	26	17.3
	Unidentified	48	3.9	17	11.3
Tenebrionidae	Unidentified	30	2.5	22	14.7
Silphidae	*Necrophorus* sp.	49	4.0	30	20.0
Elateridae	Unidentified	11	0.9	2	1.3
Coleoptera	Unidentified	1	0.1	1	0.7
Diptera	Unidentified	28	2.3	4	2.7
Homoptera					
Cicadidae	Unidentified	13	1.1	12	8.0
Hymenoptera					
Formicidae	Unidentified	10	0.1	3	2.0
Braconidae	Unidentified	98	8.0	8	5.3
Lepidoptera	Unidentified (larvae)	7	0.6	3	2.0
Orthoptera					
Acrididae	Unidentified	263	21.6	55	36.7
Stenopelmatidae	*Stenopelmatus* sp. (mandibles)	155	12.7	9	6.0
Insect	Unidentified	2	0.2	2	1.3
	Unidentified (mandibles)	48	3.9	5	3.3
ARACHNIDA					
Scorpionida					
Vejovidae	*Vejovis boreus*	126	10.3	56	37.3
Araneida	Unidentified	3	0.25	3	2.0
Acari	Unidentified	2	0.2	2	1.3
VEGETATION					
*Leaves	*Eriogonum* sp.	103		18	
*Vegetation		17		6	
*Seeds	Grass	52		2	
Feathers	Unidentified	1		1	
		1,219	100.3		

*Not included in total count

owl, 1971; Smith and Wilson 1971; Zarn 1974), and their diets in southeastern Oregon overlapped considerably. They used totally different habitats, however, which physically isolated the owls and avoided competition.

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