Stillwater Wildlife Management Area, P.O. Box 1236, Fallon, NV 89406 (SPT); *Hawaiian & Pacific Islands Wildlife Refuge, 300 Ala Mona Blvd., Room 5302, P.O. Box 50157, Honolulu, HI 96850* (DKM); *Nisqually National Wildlife Refuge Complex, 100 Brown Farm Road, Olympia, WA 98506* (UWW); and *University of Montana, Room 506, Aber Hall, Missoula, MT 59812* (KM). *Received 11 March 1985, accepted 27 August 1985.*

THE MURRELET 66:65–68 SUMMER 1985

COMMON BARN OWL DIET IN NORTHEASTERN OREGON

EVELYN L. BULL AND HOLLY A. AKENSON

Numerous studies of the diet of the Common Barn Owl (*Tyto alba*) reported a predominance of *Microtus* (Cowan 1942, Giger 1965, Maser and Brodie 1966, Doerksen 1969, Maser and Hammer 1972, Barrentine 1979, Roth and Powers 1979, Maser et al. 1980, Campbell 1983). Seasonal variation in the diet of Common Barn Owls has been reported in many locations. In British Columbia, Cowan (1942) reported that fewer voles were taken in the summer than during other seasons; Dawe et al. (1978) found little annual change in the frequency of *Microtus townsendii* in the diet; Campbell (1983) reported that *M. townsendii* was taken in the highest numbers in the autumn. In Pennsylvania, fewer voles were taken in the spring than at other times (Pearson and Pearson 1947). In Poland, fewer voles were taken in the spring than at other times (Goszczynski 1982). In Utah, more birds were taken in the summer than at other times (Smith et al. 1972). Our objectives were to determine differences in the diet of Common Barn Owls in northeastern Oregon throughout a year and among different nesting pairs.

METHODS

We collected over 825 regurgitated pellets in barns and rock quarries from 10 pairs of Common Barn Owls located in the Grande Ronde Valley, Union County, Oregon, in 1981–1982. The valley is at 870 m elevation, approximately 7500 km^2 in area, and is primarily agricultural land surrounded by forested mountains. Pellets from two pairs were collected bimonthly throughout the year. Pellets from another eight owls were collected whenever birds were located.

Pellets were immersed in an 8% solution of sodium hydroxide for 6 hrs to separate the material and dissolve the hair, and the skulls were counted and identified with keys (Maser and Storm 1970, Glass 1973).

We compared both the number of prey items between two pairs sampled for a year and among four pairs with adequate samples from January through March with a chi-square analysis. Shrews (*Sorex* spp.), house mice (*Mus musculus*), and birds were combined when comparing the pellets of the four pairs because of the small number of individuals found in the pellets. At one site with adequate year-round samples, a cluster analysis (Pimentel 1979) identified periods of similar diet composition. Dates of pellet collection were grouped into three seasons by the analysis based on similarities in percent of prey composition. The number of prey items per pellet of all 10 pairs were averaged for each season selected by the cluster analysis.

Percent total biomass was estimated for each prey species by season. The mean weight of each mammalian prey species was calculated from at least 20 individuals of each species trapped in Union County. Weights of *Sorex vagrans* were used for *Sorex* spp. and *Microtus montanus* for *Microtus* spp. All mean weights were within the ranges given by Burt and Grossenheider (1964). The weight of the Western Meadowlark (*Sturnella neglecta*) (Marr and Knight 1983) was used for all birds.

RESULTS AND DISCUSSION

Voles were the most frequent prey items (1620 of 2513 prey items) in over 825 pellets from the 10 pairs of owls. Most voles were *M. montanus* (80%), followed by *M. longicaudus* and unidentified *Microtus* (20%), and one individual of *M. richardsoni*. Deer mice (*Peromyscus maniculatus*) occurred in all the diets but made up from 7 to 32% of any diet. Pocket gophers (*Thomomys talpoides*) were absent in the diet of one pair, but comprised 17% of another pair's diet. Shrews, house mice, and birds comprised 10% or less of all diets. Diet differed significantly ($p < 0.05$) between two pairs on a year-round basis and among four pairs for January to March.

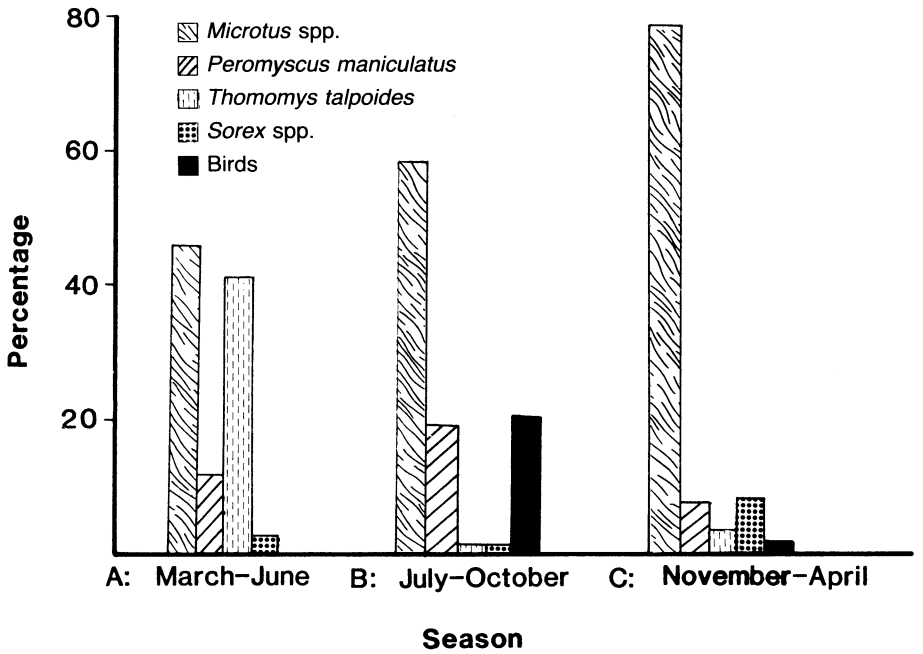

FIGURE 1. Percentage of prey composition in each of three seasons for one pair of Common Barn Owls in Union County, Oregon, 1981–1982.

We found three seasonal shifts in number of items by species in pellets from one pair (Fig. 1). In spring, pocket gophers occurred in the pellets in high numbers. On the average, 25%, 23%, and 53% of the pellets contained gophers in April, May, and June, respectively. By late summer and in autumn, Brewer's Blackbirds (*Euphagus cyanocephalus*), Western Meadowlarks, and unidentified passerines occurred frequently (21% of pellet contents). Voles predominated throughout the year but occurred most often in winter. In contrast, deer mice were eaten year-round but most often in summer.

Some of the same diet trends as in Fig. 1 were apparent when all pairs were considered (Table 1). *Microtus* spp. were most common in pellets and represented the highest percentage of biomass in winter. Birds occurred most frequently in the summer. Pocket gophers were most common in the pellets in summer but represented the greatest percentage of biomass in the spring; deer mice made up about the same percentage of biomass in all three seasons.

Acknowledgments.—Identification of some mammal skulls was verified by Chris Maser. Bird skulls were identified by Don Grayson. We are grateful to the following for permission to collect pellets in their barns: Merrell Conley, Larry Courtright, Martin Vavra, and the Oregon Department of Fish and Wildlife. Eric Forsman, Chris Maser, Timothy Max, R. McKelvey, Reed Sanderson, Jack Thomas and an anonymous referee kindly reviewed the manuscript.

Literature Cited

Barrentine, C. D. 1979. Notes on the food habits of Barn Owls at Montesano, Washington. Murrelet 60:106.

Burt, W. H., and R. P. Grossenheider. 1964. A field guide to the mammals. Houghton Mifflin Co., Boston. 284 pp.

Campbell, R. W. 1983. Feeding ecology of the Common Barn Owl in North America. M.S. thesis, Univ. Wash. 87 pp.

Cowan, I. M. 1942. Food habits of the Barn Owl in British Columbia. Murrelet 23:48–53.

Dawe, N. K., C. S. Runyan, and R. McKelvey. 1978. Seasonal food habits of the Barn Owl (*Tyto alba*) on the Alaskan National Wildlife Area, British Columbia. Can. Field-Nat. 92(2):151–155.

TABLE 1. Mean number of items per pellet, standard deviation, number of items, and biomass estimates of Common Barn Owl prey in Union County, Oregon, in 1981–1982.

Species	Estimated weight (g)	Winter (Nov.–Mar.)			Spring (Apr.–Jun.)			Summer (Jul.–Oct.)		
		$\bar{x} \pm$ SD	N	% total biomass	$\bar{x} \pm$ SD	N	% total biomass	$\bar{x} \pm$ SD	N	% total biomass
Microtus spp.	27	2.67 ± 0.50	1058	79	1.47 ± 0.74	302	28	1.5 ± 0.43	260	36
Peromyscus maniculatus	17	0.41 ± 0.23	167	8	1.64 ± 1.68	161	9	0.68 ± 0.47	102	9
Thomomys talpoides	90	0.05 ± 0.05	35	9	0.36 ± 0.47	205	63	0.46 ± 0.47	59	27
Sorex spp.	5	0.07 ± 0.11	69	1	0.16 ± 0.37	12	*	0.09 ± 0.11	11	*
Mus musculus	17	0.01 ± 0.02	4	*	*	1	*	*	1	*
Birds	96	0.01 ± 0.02	10	3	*	1	*	0.21 ± 0.27	55	27

* Mean value less than 0.01 or percentage less than 1.

DOERKSEN, G. P. 1969. An analysis of Barn Owl pellets from Pitt Meadows, British Columbia. Murrelet 50:4–8.

GIGER, R. D. 1965. Surface activity of moles as indicated by remains in Barn Owl pellets. Murrelet 46:33–36.

GLASS, B. P. 1973. Key to the skulls of North American mammals. Oklahoma State University, Stillwater. 58 pp.

GOSZCZYNSKI, J. 1982. Comparative analysis of food of owls in agrocenoses. Ekol. Pol. 29:431–440.

MARR, N. V., AND R. L. KNIGHT. 1983. Food habits of Golden Eagles in eastern Washington. Murrelet 64:73–77.

MASER, C., AND E. D. BRODIE, JR. 1966. A study of owl pellet contents from Linn, Benton, and Polk Counties, Oregon. Murrelet 47:9–14.

MASER, C., AND E. W. HAMMER. 1972. A note on the food habits of Barn Owls in Klamath County, Oregon. Murrelet 53:28.

MASER, C., E. W. HAMMER, AND S. H. ANDERSON. 1970. Comparative food habits of three owl species in central Oregon. Murrelet 51:29–33.

MASER, C., S. SHAVER, C. SHAVER, AND B. PRICE. 1980. A note on the food habits of the Barn Owl in Malheur County, Oregon. Murrelet 61:78–80.

MASER, C., AND R. M. STORM. 1970. A key to Microtinae of the Pacific Northwest (Oregon, Washington, Idaho). OSU Bookstores, Inc., Corvallis, Oregon. 162 pp.

PEARSON, O. P., AND A. K. PEARSON. 1947. Owl predation in Pennsylvania, with notes on the small mammals of Delaware County. J. Mamm. 28:137–147.

PIMENTEL, R. A. 1979. Morphometrics—the multivariate analysis of biological data. Kendall/Hunt Publ. Co., Dubuque, Iowa. 276 pp.

ROTH, D., AND L. R. POWERS. 1979. Comparative feeding and roosting habits of three sympatric owls in southwestern Idaho. Murrelet 60:12–15.

SMITH, D. G., C. R. WILSON, AND H. H. FROST. 1972. Seasonal food habits of Barn Owls in Utah. Great Basin Nat. 32:229–234.

Range and Wildlife Habitat Laboratory, Pacific Northwest Forest and Range Experiment Station, U.S. Forest Service, La Grande, OR 97850 (ELB); *and Taylor Ranch, Cascade, ID 83611* (HAK). *Received 24 February 1984, accepted 4 March 1985.*