

DIET OF THE GREAT HORNED OWL IN CENTRAL SASKATCHEWAN

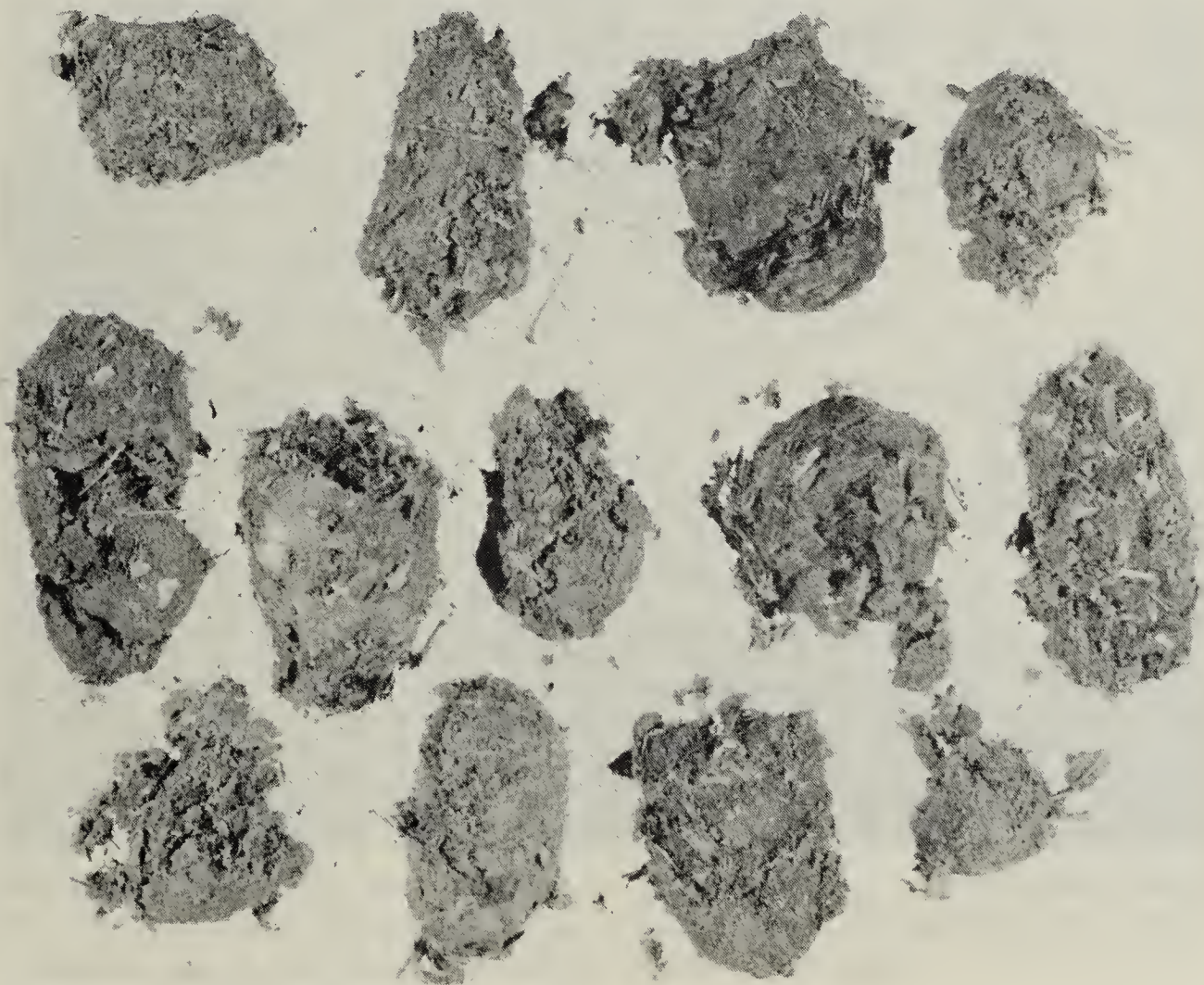
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Introduction In our Grade 12 year at Aden Bowman Collegiate, we needed a project for our science fair. Dr. Stuart Houston suggested analysing Great Horned Owl pellets that he and his climbers had collected over four years from various areas in central Saskatchewan, from Prince Albert south almost to Regina. This paper reports the results of that study.

We had four objectives: To discover (1) the overall diet of this bird;

(2) variations in prey captured for the years 1986, 1987 and 1989; (3) differences in diet between vegetation zones; and (4) the average size of an owl pellet. Because there are such great differences in the mass (size) of prey such as Deer Mice and Snowshoe Hares, we then recalculated our initial data to determine the relative importance of each prey animal in the diet.

The pellets had been bagged and labelled as to place and date found.



Great Horned Owl pellets.

C. Stuart Houston



Great Horned Owl

Gary Seib

**Table 1: DIET OF THE GREAT HORNED OWL IN SASKATCHEWAN
BY YEAR AND NUMBER OF PREY ITEMS**

	1986		1987		1989		Total	
	#	%	#	%	#	%	#	%
MAMMALS								
Deer Mouse	126	44.5	344	60.0	315	66.5	785	59.0
Northern Pocket Gopher	50	17.7	93	16.2	40	8.4	183	13.8
Meadow Vole	48	17.0	54	9.4	64	13.5	166	12.5
Snowshoe Hare	14	5.0	39	6.8	20	4.2	73	5.5
Red-backed Vole	3	1.1	4	0.7	6	1.3	13	1.0
Richardson's Ground Squirrel	0	0.0	3	0.5	2	0.4	5	0.4
Least Weasel	0	0.0	0	0.0	3	0.6	3	0.2
Muskrat	0	0.0	1	0.2	1	0.2	2	0.2
Total Mammals	241	85.3	538	93.8	451	95.1	1,230	92.6
BIRDS								
House Sparrow	9	3.2	5	0.9	8	1.7	22	1.7
Blue-winged Teal	8	2.8	7	1.2	6	1.3	21	1.6
Mallard	7	2.5	4	0.7	1	0.2	12	0.9
Ruffed Grouse	6	2.1	3	0.5	2	0.4	11	0.8
Red-necked Grebe	4	1.4	4	0.7	3	0.6	11	0.8
Gadwall	1	0.4	6	1.1	1	0.2	8	0.6
Black-billed Magpie	2	0.7	2	0.4	1	0.2	5	0.4
American Robin	1	0.4	3	0.5	0	0.0	4	0.3
American Crow	3	1.0	0	0.0	0	0.0	3	0.2
American Coot	1	0.4	0	0.0	0	0.0	1	0.1
Gray Partridge	0	0.0	0	0.0	1	0.2	1	0.1
Western Meadowlark	0	0.0	1	0.2	0	0.0	1	0.1
Total Birds	42	14.9	35	6.2	23	4.8	100	7.6
Grand Total	283	100	573	100.0	474	99.9	1,330	100.2

We borrowed skeletons of the prey species from W. Bruce McGillivray of the Provincial Museum of Alberta, Edmonton, and later, with the assistance of Dr. Nigel Mathews, photographed them because they had to be returned prior to completion of our study. Then we measured and dissected the pellets, bagging the bones and some of the fur and feathers for later identification from skeletons and photos.

Results Overall, Deer Mice made up 59% of the 1,330 prey items (Table 1). Northern Pocket Gophers comprised 14%, Meadow Voles 12% and Snowshoe Hares nearly 6%, these four mammal species comprising 90% of the prey items. Birds, ranging in size from House Sparrow to Mallard, formed only 8% of the prey items.

On an annual basis, the major

**Table 2: DIET OF THE GREAT HORNED OWL IN SASKATCHEWAN
BY DIFFERENT VEGETATION AREAS**

	# in Dry Lands	%	# in Wet Lands	%	# in Hill Lands	%	# in Plains	%
MAMMALS								
Deer Mouse	43	39.8	1	25.0	131	52.2	610	63.1
Northern Pocket Gopher	19	17.6	1	25.0	49	19.5	114	11.8
Meadow Vole	17	15.7	1	25.0	26	10.4	122	12.6
Snowshoe Hare	14	13.0	1	25.0	23	9.2	36	3.7
Red-backed Vole	2	1.9	0	0.0	2	0.8	9	0.9
Richardson's Ground Squirrel	0	0.0	0	0.0	3	1.2	2	0.2
Least Weasel	0	0.0	0	0.0	1	0.4	2	0.2
Muskrat	1	0.9	0	0.0	0	0.0	1	0.1
Total Mammals	96	88.9	3	75.0	235	93.7	896	92.6
BIRDS								
House Sparrow	1	0.9	0	0.0	3	1.2	18	1.9
Blue-winged Teal	1	0.9	0	0.0	5	2.0	15	1.6
Mallard	3	2.8	1	25.0	0	0.0	8	0.8
Ruffed Grouse	1	0.9	0	0.0	1	0.4	9	0.9
Red-necked Grebe	2	1.9	0	0.0	3	1.2	6	0.6
Gadwall	1	0.9	0	0.0	0	0.0	7	0.7
Black-billed Magpie	0	0.0	0	0.0	1	0.4	4	0.4
American Robin	1	0.9	0	0.0	1	0.4	2	0.2
American Crow	0	0.0	0	0.0	1	0.4	2	0.2
American Coot	1	0.9	0	0.0	0	0.0	0	0.0
Gray Partridge	0	0.0	0	0.0	1	0.4	0	0.0
Western Meadowlark	1	0.9	1	25.0	0	0.0	0	0.0
Total Birds	12	11.0	1	25.0	16	6.4	71	7.3
Grand Total	108	99.9	4	100.0	251	100.1	967	99.9

mammals held the same positions except for pocket gopher and vole in 1989 (Table 1). Birds varied from 5% in 1987 to 15% in 1986. However, one would expect these results to vary at different points during the ten-year population cycle of the Snowshoe Hare, which was scheduled to (but failed to) peak in 1990.

The top three mammals (Meadow

Vole, Northern Pocket Gopher, and Snowshoe Hare), continued to be the top three prey items in all vegetation areas (Table 2). However, Snowshoe Hares were absent in the southern drylands. Birds made up almost twice as many prey items in the drylands (11%) as in the hills or rangelands (6%) and agricultural plains (7%).

The foregoing calculations were

**Table 3: DIET OF THE GREAT HORNED OWL IN SASKATCHEWAN
BY MASS OF PREY**

	Number	Average Weight (grams)	Total Weight Species	% Diet by Weight
MAMMALS				
Deer Mouse	785	25.0	19,625	8.9
Northern Pocket Gopher	183	100.0	18,300	8.3
Meadow Vole	166	78.5	13,031	5.9
Snowshoe Hare	73	1,500.0	10,9500	49.5
Red-backed Vole	13	30.0	390	0.2
Richardson's Ground Squirrel	5	450.0	2,250	1.0
Least Weasel	3	70.0	210	0.1
Muskrat	2	1,200.0	2400	1.1
Total Mammals	1,230	3,453.5	165,706	75.0
BIRDS				
House Sparrow	22	26.7	587	0.3
Blue-winged Teal	21	375.6	7,888	3.6
Mallard	12	13,32.4	15,989	7.2
Ruffed Grouse	11	626.6	6,783	3.1
Red-necked Grebe	11	1,304.1	14,345	6.5
Gadwall	8	793.8	6,350	2.9
Black-billed Magpie	5	170.1	851	0.4
American Robin	4	85.0	340	0.2
American Crow	3	503.2	1,510	0.7
American Coot	1	538.6	539	0.2
Gray Partridge	1	382.7	283	0.1
Western Meadowlark	1	104.6	105	0.1
Total Birds	100	62,33.4	55,570	25.3
Grand Total	1,330	9,686.9	221,276	100.3

based on numbers of prey items identified as eaten by the owls. However, because of differences in size, they do not reflect each species' contribution to the Great Horned Owl's diet. Applying the average weight of live animals to the numbers caught, it turned out that Snowshoe Hares make up nearly 50% of the owl's diet in terms of biomass (Table 3). Deer Mice and Pocket Gophers drop to 9% and 8%, respectively, and the Meadow Vole to 6%. Birds went from

8% of the prey items to 25% of the biomass — and excepting hares, a larger proportion than all other mammals combined.

Whole pellets varied considerably in length — from 2.0 to 12.5 cm (Table 4). The average length as well as the most frequent length was 6.0 cm. A pellet which contained only Deer Mice averaged between 2.6 and 3.0 mice per pellet.

**Table 4: AVERAGE SIZE OF PELLETS
OF THE GREAT HORNED OWL IN SASKATCHEWAN**

Size (cm)	Number	Size (cm)	Number	Size (cm)	Number
2.0	2	5.5	31	7.7	1
2.2	1	5.6	2	7.8	2
2.5	1	5.7	6	7.9	1
2.6	1	5.8	6	8.0	18
3.0	12	5.9	4	8.2	3
3.5	7	6.0	62	8.5	6
3.6	2	6.1	4	8.6	2
3.9	1	6.2	6	8.9	2
4.0	27	6.3	2	9.0	8
4.2	3	6.4	7	9.2	2
4.3	1	6.5	42	9.4	1
4.4	1	6.6	4	9.5	2
4.5	27	6.7	3	9.6	1
4.6	2	6.8	2	9.7	1
4.7	3	6.9	3	9.9	1
4.8	1	7.0	36	10.0	2
4.9	3	7.1	5	10.5	1
5.0	43	7.2	6	10.8	1
5.2	6	7.3	2	11.0	1
5.3	1	7.5	18	12.0	1
5.4	3	7.6	4	12.5	1

Our display at the Saskatoon Regional Science Fair, and later at the Canadian National Science Fair in Windsor, Ontario, included a map of the landscapes of central Saskatchewan, photographs of owl pellets, and skeletons of prey animals.¹ The project won first in the Senior Life Science category and Best of Show at Aden Bowman Collegiate, first in Senior Life Science and Students' Choice at the Regional Science Fair, and a Bronze Medal at the National Science Fair.

1. ACTON, D.F. 1977. Landscapes of Southern Saskatchewan. (map) Department of Mines, Energy and Resources, Ottawa.

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