

REPRODUCTIVE PERFORMANCE OF GREAT HORNED OWLS IN SASKATCHEWAN

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This paper reports productivity and nest occupancy for the Great Horned Owl (*Bubo virginianus*) in Saskatchewan from 1970 to 1975. I have previously reported productivity data on the same population through 1969 (Houston, 1971), but the recent data provide the first adequate sampling of a "low" period in the 10-year cycle in Saskatchewan. (In the previous "low" year of 1963, we could locate only eight Great Horned Owl nests.) Although observer efforts have varied annually, it has been possible to calculate nest occupancy for the areas most consistently visited during five of these six years.

The Great Horned Owl is a powerful and successful hunter that takes a wide range of prey species of greatly varying size (Errington et al., 1940; Seidensticker, 1968; Korschgen and Stuart, 1972). Its numbers and nesting success show less variation than those of any other common raptor in southern Saskatchewan. Yet in spite of its apparent flexibility, my data suggest that Great Horned Owl productivity follows closely the 10-year cycle of its main prey species in Saskatchewan, the Snowshoe Hare (*Lepus americanus*) (Keith, 1963, 1966). Certainly the owls do exceedingly well in years of obvious hare abundance, with almost all pairs nesting and with up to 2.5 young raised per successful nest. As hare numbers drop, there is a drop in the percentage of owl pairs nesting and also a drop in the number of young raised per successful nest (Table 1). In 1963 and again in 1973 and 1974, when such data indicated a "low" for owls and hares, there were less fresh food remains in the owl nests and fewer pellets available for collection at times of banding (C. S. Houston and H. C. Smith, unpubl. data).

Although these trends were general throughout Saskatchewan and almost synchronous, with not more than a one-year variation in "highs" and "lows" in different areas, the fluctuations of the Great Horned Owl were greatest, and its apparent dependence on hares was greatest, in the more heavily forested areas.

On about 20 square miles near Yellow Creek, including the largest residual stands of aspen of any farming area we have visited regularly, 8 pairs of owls fledged a record 25 young in 1970 when hares were literally underfoot everywhere. In 1971, with hares beginning to decline, 9 successful owl nests produced 16 young. In 1972, 3 pairs failed to nest and the remaining 6 pairs raised only 11 young. By 1973, with hares rarely seen, the resident owl population dropped to 3 pairs, none of which showed any evidence of nesting.

Near Strasbourg, 110 miles farther south, on about 30 square miles of open farming country with scattered aspen clumps, often of one acre or less, the numbers and productivity of resident owls changed less. In 1970, 13 of 17 pairs were successful and produced

TABLE 1.
Brood size of the Great Horned Owl in Saskatchewan.

Year	Percent Pairs not Nesting ^a	Number nests with:				Total nests	Total young	Mean fledging rate ^b
		4 Yg.	3 Yg.	2 Yg.	1 Yg.			
pre-1969 ^c	ID	27	221	258	70	576	1,357	2.4
1970	3%	7	56	36	14	113	282	2.5
1971	ID	1	14	39	8	62	132	2.1
1972	28%	1	24	40	11	76	167	2.2
1973	56%	0	2	18	7	27	49	1.8
1974	33%	0	3	21	14	38	65	1.7
1975	6%	0	18	40	11	69	145	2.1
Totals	ID	36	338	452	135	961	2,197	2.3

^aDetermined from areas where observer coverage was adequate to account for pairs not associated with young. ID - insufficient data available.

^bYoung fledged per successful nest, as determined at time of banding.

^cfrom Houston (1971)

29 young; in 1972, 8 nests fledged 16 young; in 1973, 8 nests yielded 15 young and in 1974, 7 of 13 pairs were successful and produced 9 young.

Owls tended to nest later in years of food scarcity. When hares are plentiful, young owls are sometimes large enough to jump from the nest as early as 8 May, whereas when prey is scarce, no owls leave the nest until early June. It is obvious to us that eggs are laid later in years of food scarcity, but there may be an element of growth suppression as well. In 1974, young from 6 of the 36 nests visited did not fledge until July, the latest group of nests in our records.

During years of food abundance, owls tended to select a wider variety of nest sites, including less suitable nests such as those built by the Common Crow (*Corvus brachyrhynchos*) and Black-billed Magpie (*Pica pica*) as well as deserted buildings (four in 1970) and even artificial nest platforms. In 1970, 32% of 100+ owl nests were visible from a travelled road, whereas in the "low" year of 1973 only 2 of the 27 nests were visible from the road. Most of the 1973 nests were in the most suitable nests built previously by Red-tailed Hawks (*Buteo jamaicensis*) deep in isolated aspen woods.

Failures first encountered at banding time totalled 25 nests during the six years, with 5, 2, 4, 1, 6 and 7 failures, respectively, in the six years from 1970 to 1975, numbers too small for meaningful trends. Six nests had *all* eggs addled (one nest each with 1 egg in 1971 and 1974 and four nests with 2, 3, 1 and 2 eggs in 1975); 5 nests had fallen down without surviving young; 4 nests had been taken over by Red-tailed Hawks; one pair had been shot;

2 pairs were present without eggs or young in the nest and 7 pairs had deserted without known cause.

Despite obvious deficiencies in these data, including the absence of any absolute measure of hare numbers (my major goal was to band large numbers of owl young) I believe the data provide useful information regarding some of the responses of Great Horned Owls to changing prey conditions. This long-term study was only possible through the cooperation of some 200 observers, most of whom were local farmers. Those providing the most consistent help and contributing to the nest occupancy estimates, were Lawrence Beckie of Kenaston, Bill Cochrance of Strasbourg, Robert Gillard of Wynyard, Wayne Harris of Raymore, Pete Hill of Duval, Fred Kochendorfer of Girvin, Ian Lochtie of Kelliher, Maurice Mareschal of Birch Hills, Rosemary Nemeth of Yellow Creek, Leif Nordal of Bulyea - Strasbourg, and Bob and Nancy Robinson of Simpson. As a by-product of these studies, there has been a positive change of attitude towards owls and other raptors in most of these districts.

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