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INCIDENCE OF BLACK-PHASE PLUMAGE IN FERRUGINOUS HAWKS NESTING IN CENTRAL NORTH DAKOTA

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Distinct plumage phases for the Ferruginous Hawk (*Buteo regalis*) include normal, black and red (Brown and Amadon 1968). During a three-yr (1977–79) study of nesting Ferruginous Hawks in central North Dakota (Gilmer and Stewart 1983), we observed only normal and black-phase plumage in adults and in nestlings with well-developed plumage.

A total of 12 (1.1%) of 1050 adult Ferruginous Hawks we observed at nest sites had black-phase plumage. The number of nest sites occupied by black-phase adults was five of 200 (3%) in 1977, five of 184 (2.7%) in 1978 and two of 245 (0.8%) in 1979 (Table 1). All black-phase adults were paired with normal-colored mates, and mixed pairings produced broods that varied from all black to all normal. Sixteen (47%) of 34 mixed-pair nestlings had black-phase plumage. In addition one black nestling was produced by a normal pair. Only 17 (1.2%) of 1407 nestlings we observed had black-phase plumage.

Observations of one mixed pair and its broods are especially noteworthy. A pair consisting of a black-phase female and a normal-colored male was observed for five consecutive yrs (1977–81) at the same nest site. During this period, five broods were produced which contained zero of four, one of four, three of three, one of two, and two of four black-phase nestlings.

Table 1. Plumage characteristics of adults and nestlings at nest sites occupied by black color phase Ferruginous Hawks in central North Dakota.

YEAR	NO. BLACK ADULTS	NO. BLACK NESTLINGS	NO. NORMAL NESTLINGS
1977	1	2	1
	1	2	3
	0[a]	1	2
	1	0	4
	1	0	1
	1	—[b]	—[b]
1978	1	1	2
	1	1	2
	1	1	3
	1	3	1
	1	—[b]	—[b]
1979	1	3	0
	1	3	1
Total	12	17	20

[a] Only normal-phase adults observed at nest site.
[b] Nesting attempt failed. No brood information.

Our data indicate that, compared with most other regions, adult black-phase Ferruginous Hawks are relatively rare breeders in central North Dakota. The incidence of Ferruginous Hawks with black plumage reported in other regions was 9.4% in southeastern Alberta (Schmutz and Schmutz 1981), 5.7% in southeastern Washington (Fitzner et al. 1977), about 4% in southern Idaho (Howard 1975; Thurow et al. 1980), 3% in northeastern Colorado (Olendorff 1973) and <1% in northcentral South Dakota (Lokemoen and Duebbert 1976).

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GREAT HORNED OWL OBSERVED "HAWKING" INSECTS

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On 20 October 1986 at 1848 H we observed a Great Horned Owl (*Bubo virginianus*) perched atop one of many snags in a flooded bog alongside a forestry fire road of the Sandilands Provincial Forest, Manitoba, Canada. A second Great Horned Owl was perched approximately 30 m distant. The "pair" maintained vocal contact intermittently, which suggested that the second owl was a male, having a lower pitched call (Austing, G. R. and J. B. Holt. The world of the Great Horned Owl. Lippincott Co., 1966).

The male made several short flights of varying heights (one to four m) over the bog and returned to the same perch or one nearby. These occurred during the first 30 of the 45 min we observed the owls. Using a 45x spotting scope we observed the male owl consuming large beetle-like insects while perched. The beetles were most likely *Dytiscus* sp. which were observed to emerge from a ditch adjacent to the fire road with an audible "plop," and the hum of their wings could be heard up to 5 m away. The male caught at least five beetles in his bill during observed "hawking" flights, but the female was not observed to do so. However, at 1918 H both birds landed on the fire road and consumed live beetles. At 1933 H there was insufficient light to continue observations.

Our observed "insect hawking" provides further evidence of the opportunistic feeding behavior of this generalist owl. Remains of at least four genera of beetles, including *Dytiscus* and other invertebrates, have been found in Great Horned Owl pellets (Hamerstrom and Mattson, *Am. Midl. Nat.* 22(3):700–702, 1939; Errington et al., *Iowa Agric. Exp. Stn. Res. Bull.* 277:758–850, 1940; Bent, A. C., Life histories of North American birds of prey, Part II. U.S. Nat. Mus. Bull. 162, Washington, DC. 1961). Errington et al. (1940) could not conclude if insects were eaten directly by owls or consumed along with the stomach contents of other prey. Where insects were undoubtedly owl prey they are considered conspicuous crawlers, carrion feeders or predators, etc., attracted to carcass fragments about feeding places (Errington et al. 1940). Errington et al. (1940) also explained insect fragments in pellets as reflecting the partial dependence of inexperienced young owls upon types of prey that are easy to catch, including invertebrates. Our observation provides evidence that direct captures of flying insects may explain the occurrence of some of the insect matter found in Great Horned Owl pellets. Insect foraging would be more economical energetically for smaller sized males with greater aerial maneuverability (Mueller, H. C., *Wilson Bull.* 98(3):387–406, 1986), although both sexes were observed consuming insects on the ground.

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