FOOD HABITS OF NESTING COOPER'S HAWKS AND GOSHAWKS IN NEW YORK AND PENNSYLVANIA

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MUCH has been written about the food habits of our birds of prey. Through crop and stomach content analyses it has been shown that most hawks and owls are beneficial to man's interests and, therefore, are protected by many states. However, there is a notable exception—the accipiters. In only eight states are the accipiters fully protected. Five other states protect them except when they do damage to poultry, livestock, etc. Food habit studies always indicate that the large accipiters—the Cooper's Hawk (*Accipiter cooperii*) and the Goshawk (*Accipiter gentilis*)—feed largely on poultry and game and, therefore, are unprotected.

Accipiters are exceedingly wary, woods hawks and are seldom seen even in areas where they are abundant. Cooper's Hawks and Goshawks are fast fliers and are seldom shot by hunters. The great majority of specimens available for food habit studies, therefore, come from game farms where they are caught in pole traps. Most of these hawks are young birds which have been attracted by the concentrations of game or poultry. Occasionally accipiters (as well as buteos) are shot from "kills" which prove to have been previously crippled or wounded game birds (McDowell and Luttringer, 1948). Analyses of the crop and stomach contents of this rather select group of hawks will naturally indicate a high percentage of poultry and game birds in their diet.

Probably the best way to secure information about these hawks is to study their feeding habits during the nesting season. Nests are located early in the spring and studied throughout the breeding season. For the past ten years I have studied the food habits of nesting Cooper's Hawks and Goshawks in New York and Pennsylvania. Pellets and remains of prey found in the nests and nest areas were collected and analyzed. Data were secured from 34 Cooper's Hawk nests and 14 Goshawk nests.

During the first three years of this period (1948–1950) a study was made of the food consumed by 12 broods of Cooper's Hawks. Each nest was visited four or five times a day from the hatching date until the hawks had left the nests. All of the pellets and remains of prey were collected and analyzed. Pellets found during one day were combined with the data of quarries observed in the nest on the previous day, in order to determine not only what species were preyed upon but also how many of each. Table 1 shows the kind and number of food items consumed by 42 young Cooper's Hawks at 12 nests in the Ithaca, N.Y., region.

In the Ithaca region the food of growing Cooper's Hawks, as well as of the adults who partake of the prey brought to the young, consists of 18 per cent mammals and 82 per cent birds. The most important prey mammals are the

TABLE 1

FOOD OF YOUNG COOPER'S HAWKS AT ITHACA, NEW YORK

Species		Number
Birds		
Ring-necked Pheasant (*Phasianus colchicus*)		4
Spotted Sandpiper (*Actitis macularia*)		1
Rock Dove (*Columba livia*)		13
Mourning Dove (*Zenaidura macroura*)		5
Screech Owl (*Otus asio*)		1
Yellow-shafted Flicker (*Colaptes auratus*)		134
Pileated Woodpecker (*Dryocopus pileatus*)		1
Red-headed Woodpecker (*Melanerpes erythrocephalus*)		1
Yellow-bellied Sapsucker (*Sphyrapicus varius*)		1
Hairy Woodpecker (*Dendrocopos villosus*)		5
Blue Jay (*Cyanocitta cristata*)		11
Catbird (*Dumetella carolinensis*)		1
Robin (*Turdus migratorius*)		79
Wood Thrush (*Hylocichla mustelina*)		7
Starling (*Sturnus vulgaris*)		241
Ovenbird (*Seiurus aurocapillus*)		5
Bobolink (*Dolichonyx oryzivorus*)		1
Eastern Meadowlark (*Sturnella magna*)		118
Redwinged Blackbird (*Agelaius phoeniceus*)		3
Common Grackle (*Quiscalus quiscula*)		37
Brown-headed Cowbird (*Molothrus ater*)		17
Scarlet Tanager (*Piranga olivacea*)		9
Rose-breasted Grosbeak (*Pheucticus ludovicianus*)		1
Rufous-sided Towhee (*Pipilo erythrophthalmus*)		2
TOTALS	24	698
Mammals		
Cottontail (*Sylvilagus floridanus*)		6
Eastern Chipmunk (*Tamias striatus*)		109
Gray Squirrel (*Sciurus carolinensis*)		4
Red Squirrel (*Tamiasciurus hudsonicus*)		36
TOTALS	4	155
TOTALS	28	853

chipmunk and the red squirrel, which together make up 94 per cent of the mammalian diet during the nesting season. The Starling, Yellow-shafted Flicker, E. Meadowlark, Robin, and Common Grackle together constitute 87 per cent of the avian diet, with the Starling being by far the most frequent item on the menu.

L. L. Snyder (1937) examined 40 Cooper's Hawks killed in Ontario during 1931 and 1932 and found Starlings in 17 of them.

In a typical nest containing four young, an average of 266 prey items was brought to the nest during the first six weeks: 4 quarries per day during the first week, 5 per day during the second week, 7 per day throughout the third week, 9 per day during the fourth week, 7 each day during the fifth week and 6 per day in the sixth week. It takes an average of 66 prey items to raise a Cooper's hawk to the age of six weeks. The females are about one-third larger than the males and require more food, so this figure would be slightly higher for the females and lower for the males.

FIG. 1. Cooper's Hawk at nest with young.

Most quarries are young animals that have not yet learned to be sufficiently wary, but occasionally adult birds are also brought in. These are probably caught while protecting their young. Like most predators the Cooper's Hawk will take what is most abundant and easiest to catch. Sometimes even two-thirds-grown nestling birds are taken from their nests. On two occasions I saw a male, who does almost all of the hunting, bring two live nestling Scarlet Tanagers to its nest.

There have been a few reports of Cooper's Hawks taking young chickens during the nesting season, and if an individual male gets into this habit he may cause quite a loss to the owner. However, very few acquire this habit and most hawks tend to specialize on common wild birds or mammals that are available throughout the year. One Cooper's Hawk nest that was studied intensively was within 300 yards of a large poultry range. Thousands of chickens could be seen from the nest, and they were sufficiently small so that the male could have easily killed and brought them to the nest, but not a single one was found in the nest, nor did the owner complain of having lost any. A similar incident in the case of a Goshawk nest in Nova Scotia was reported by A. C. Bent (1937:132–133). The nest was located one-half mile from a poultry yard that produced about 300 chicks. The farmers did not complain of losing a single bird all summer, nor had they seen any "hen hawks" about their premises.

Time did not permit as intensive a study of the 14 Goshawk nests, but some rather interesting data were gathered. Nine of the nests were located in Wayne Co., Pa., three in Potter Co., Pa., and two in Chenango Co., N.Y. Each of the nests was visited several times during the nesting season, and once about a month after the young had left the nest. Pellets and remains of prey were gathered and analyzed (Table 2).

TABLE 2

ANALYSIS OF PELLETS AND PREY REMAINS AT GOSHAWK NESTS

Species		Number of times found
Birds		
Sparrow Hawk (*Falco sparverius*)		3
Ruffed Grouse (*Bonasa umbellus*)		5
Blue Jay (*Cyanocitta cristata*)		7
Common Crow (*Corvus brachyrhynchos*)		83
Blackbird (*Euphagus, Quiscalus, Agelaius*)		15
TOTALS	7	113
Mammals		
Cottontail (*Sylvilagus* sp.)		7
Eastern Chipmunk (*Tamias striatus*)		3
Gray Squirrel (*Sciurus carolinensis*)		4
Red Squirrel (*Tamiasciurus hudsonicus*)		58
TOTALS	4	72
TOTALS	11	185

As can be seen from Table 2 the red squirrel and the Common Crow were the main food items of these 14 nesting pairs of Goshawks. Under one nest 24 crow legs and 15 humeri were found, and at another nest 3 crows were brought to the young while the writer was photographing the hawks from a blind. The remains of grouse were found only five times. The wing and leg bones of large birds are generally not swallowed by the hawks, and they can be found under the nests and in the nest areas. The humeri of crows and grouse are very similar in appearance, and very probably crow humeri have been mistaken for grouse bones in the past. In the area studied, crow humeri average 64 mm. in length and are straighter than grouse humeri, which average 57 mm. in length.

FIG. 2. Goshawk at nest with young.

In all of the Goshawk nest areas studied the grouse population was high, but grouse appeared only five times in contrast to 83 crows. This suggests that the Goshawks do not select a particular area to nest in because of the high grouse population, as is often thought, but that they may even be instrumental in increasing the numbers of grouse by removing numerous crows. Red squirrels, chipmunks, and crows destroy many grouse nests by feeding

on the eggs and young, or, as in the case of the chipmunk, by pushing the eggs out of the nests.

From the above data it can be seen that the Cooper's Hawk and Goshawk are important predators of the Starling, Common Crow, red squirrel, and chipmunk. In view of these data it seems logical that these two accipiters should be protected along with the other birds of prey. Also, as long as even one species of hawk or owl remains unprotected all will continue to be shot. I feel that all birds of prey should be given protection, with the stipulation, as is found in Michigan's law, that "a farmer or landowner may destroy hawks or owls on the land which he owns or occupies, which are doing real damage to poultry or other domestic animals" (Morrison, 1955).

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State University Teachers College, New Paltz, New York, December 16, 1958