

NOTES ON THE FOOD HABITS OF CERTAIN RAPTORES IN
BRITISH COLUMBIA AND ALBERTA

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In view of the present interest in the food habits of the Raptores the following notes on stomach analyses, supplemented in some cases by field observations, are offered as a small contribution to the literature on the subject. Specimens from Cedar Hill, Vancouver Island, British Columbia, were collected by the officer in charge of the Government pheasant farm at that place; the majority of those from other localities were collected by the writer. To Mr. E. R. Buckell, Dominion Entomologist, Vernon, British Columbia, the writer is indebted for identification of insect remains in the stomachs of Swainson Hawks.

Circus hudsonius. Marsh Hawk. Female, immature, Okanagan Landing, B. C., April 23, 2 entire Drummond voles (*Microtus drummondii*); female, immature, Okanagan Landing, B. C., September 12, 1912, 2 Solitary Sandpipers; female, adult, Lumby, B. C., May 9, 1926, 2 Drummond voles.

The only food found beside a nest containing four young Marsh Hawks, placed in a clump of wolf willow near Sullivan Lake, Alberta, July 15, 1926, was a decapitated nestling Baird Sparrow. At Beaver Hill Lake, Alberta, on August 24, 1925, two immature Marsh Hawks harried the flocks of small waders that frequented a long sandy point. The hawks kept swooping at and flushing the waders for several hours, but only one wounded bird was captured during this time. On September 24, 1918, the writer shot an immature male Marsh Hawk as it circled over a poultry yard. This bird had been making daily visits to the vicinity and on one occasion killed and partly consumed a Rhode Island Red cockerel which weighed approximately four pounds. In the same vicinity a few weeks later an immature male made several clumsy and ineffectual attempts to capture a pullet, one of a flock that was ranging in an orchard.

Marsh Hawks have been flushed from the half-eaten carcasses of Ring-necked Pheasant, Hungarian Partridge and ducks, but whether or not the prey in these instances had previously been disabled is not known. The writer has not seen Marsh Hawks capture unwounded birds of this size. It is common to see them swoop at ducks; for example an immature bird was seen to swoop twice at a flock of Green-winged Teal on the water. On both occasions the ducks rose but soon settled again in the same place as if not much alarmed.

At times rodents appear exclusively to engage the attention of Marsh Hawks. For example, at Lake Newell, Alberta, during August, 1925, when "duck disease" had been responsible for the death of many water birds, which, dead and dying, littered some parts of the shore, Marsh Hawks, surprisingly, paid little attention to this abundance of easily secured food. An immature male was seen feeding upon the carcass of a Pintail; but apart from this instance all the other individuals noted were hunting over the bald prairie some distance back from the lake where ground squirrels and mice formed the attraction. On the other hand, numerous Prairie Falcons and a lesser number of Duck Hawks were flushed from the carcasses of ducks and waders. Whether these were birds which recently had died or whether they had been killed by the falcons is not known. An immature Prairie Falcon was seen standing close to a dying Mallard, apparently waiting until the duck finally should succumb.

Accipiter velox. Sharp-shinned Hawk. Five females, adult, June 28, 1923, one pheasant chick; July 28, 1923, feet and feathers of Oregon Junco and Oregon

Towhee; February 26, 1924, feathers and portion of tarsus of Gairdner Woodpecker and feathers of Oregon Towhee; March 1, 1924, flesh and feathers of domestic fowl; November 13, 1924, portion of tarsus and feathers of Oregon Junco, portions of Varied Thrush in crop. Male, adult, Annacis Island (near New Westminster, B. C.), January 6, 1925, tarsus and feathers of Golden-crowned Kinglet.

Greater Yellow-legs is the largest species which the writer has seen attacked by the Sharp-shinned Hawk, and this attack was unsuccessful. It is believed that more small birds are killed by Sharp-shinned Hawks than by all other Raptores combined; and, in the writer's experience, among the common hawks it is this species which is the least often killed during the now popular campaigns of control directed against predatory birds, for many hunters act on the assumption that a hawk's power for destroying bird life is in proportion to its size.

Accipiter cooperii. Cooper Hawk. Male, adult, Okanagan Landing, B. C., June 2, 1919, small quantity of mouse hair (*Microtus?*); male, immature, August 13, 1919, remains of young Robin in crop; four females, adult, Cedar Hill, B. C., May 7, 1922, parts of Fox Sparrow; July 28, 1923, foot of Ring-necked Pheasant about 6 weeks old; August 6, 1924, parts of domestic fowl; August 8, 1924, parts of young Ring-necked Pheasant.

An immature male captured near Cedar Hill on January 28, 1925, had entered a quail trap and before being detected had killed six California Quail. The stomach of this specimen contained portions of an Oregon Towhee. A second immature male Cooper Hawk was captured later in the day in the same trap.

Other Cooper Hawk stomachs examined contained bird remains only. The instance of mouse hair in the stomach, noted above, is the only evidence of a mammal being eaten that has come to the writer's attention.

Astur atricapillus. Goshawk. Female, adult, Okanagan Landing, B. C., December 29, 1918, Bonaparte weasel (*Mustela cicognanii*); male, adult, October 30, 1926, parts of Red-winged Blackbird; female, adult, November 8, 1926, crop distended with flesh of Sharp-tailed Grouse; male, immature, October 15, 1927, crop distended with flesh of European Gray Partridge; female, adult, December 20, 1928, head and feathers of domestic fowl; male, adult, crop distended with flesh and feathers of Coot.

Numerous other individuals shot in the same locality during recent years contained portions of Ring-necked Pheasant and European Gray Partridge. The recent phenomenal increase of these exotics in the Okanagan region has attracted an unusual number of Goshawks to the valleys and it is possible as a consequence that Blue Grouse and Ruffed Grouse now suffer less from the attacks of this predator.

On April 22, 1919, a Goshawk was flushed from the still warm body of a Magpie; on December 16, 1921, an adult male was seen pursuing a Kingfisher over the water; on January 30, 1929, an adult was seen carrying an Evening Grosbeak. Instances of Goshawks attacking the smaller bird species are comparatively rare in the writer's experience.

Buteo borealis calurus. Western Red-tailed Hawk. Female, adult, Shuswap Falls, B. C., May 31, 1919, remains of one Columbian ground squirrel (*Citellus columbianus*); the two nestlings of this bird contained parts of a Columbian ground squirrel; female, immature, Lumby, B. C., May 11, 1926, skull, leg bones and hair of pocket gopher (*Thomomys fuscus*); female, immature, August 17, 1926, 5 crickets (*Anabrus longipes*), 1 Drummond vole (*Microtus drummondii*); female, immature, August 17, 1926, 10 crickets, 1 Drummond vole.

Reports of the Western Red-tailed Hawk attacking birds are sometimes received more particularly from Vancouver Island and the Gulf Islands than elsewhere, which may be explained by the relative scarcity of small mammals and snakes in that region. In the interior of British Columbia, the Red-tail can be considered entirely beneficial.

Buteo swainsoni. Swainson Hawk. Three males, immature, Okanagan Landing, B. C., July 17, 1915, stomachs distended with grasshopper and cricket fragments; male, immature, July 24, 1925, 6 whole crickets, 30 grasshoppers; male, adult, May 9, 1926, 20 crickets, nymphs and adults (*Anabrus longipes*), 1 grasshopper (*Xanthippus corallipes leprosus*), parts of 2 beetles (dytiscid and carabid); male, adult, May 10, 1926, 1 whole grasshopper, parts of about 20 crickets; female, immature, May 23, 1926, 30 grasshoppers; male, immature, 50 grasshoppers; male, immature, 50 grasshoppers; female, adult, August 24, 1926, 1 grasshopper, wing of Red-winged Blackbird.

In the dry belt of British Columbia, the Swainson Hawk is common and conspicuous during the periodic outbreaks of grasshoppers and crickets and at such times appears to feed almost exclusively on these insects. In southern Alberta it still is the common hawk of the roadsides, but in recent years it has been the object of so much persecution that the species has become less numerous. Stomachs from specimens taken in Alberta have not been available for examination, but field observation in that Province indicate that this hawk feeds largely on the Richardson ground squirrel (*Citellus richardsonii*).

Buteo lagopus sancti-johannis. American Rough-legged Hawk. Male, immature, Lumby, B. C., November 4, 1925, stomach held parts of 6 Drummond voles (*Microtus drummondii*), crop contained 3 entire Drummond voles and 2 shrews (*Sorex* sp.?) ; male, immature, Lumby, B. C., November 6, 1925, stomach contained pellet composed of parts of 6 Drummond voles, crop held 3 others.

In the Okanagan Valley, B. C., this hawk is a regular transient. In the autumn it usually first appears in October during the open season for Ring-necked Pheasants. At this time many hunters are in the field, so consequently the slow-flying and generally unwary rough-leg too frequently is a victim of "vermin control". In British Columbia when a bounty was paid on eagles, a shipment of feet of this hawk, described as young Golden Eagles, was sent to the Provincial Game Warden for payment of bounty.

Falco mexicanus. Prairie Falcon. The writer has seen more Prairie Falcons in the Okanagan Valley during the past two autumn and winter seasons than in the preceding sixteen years. The present relative abundance (the species is by no means common) is perhaps due to a recent increase of European Gray Partridge which these falcons hunt persistently. When a Prairie Falcon passes along one of the open hillsides frequented by these birds, coveys rise in every direction. No better aid in estimating the partridge population of a hillside could be devised.

In Alberta, Prairie Falcons have been seen flying over the prairie and "stooping" at ground squirrels without changing their course. Sometimes one of these animals would be lifted in the air, carried for a short distance, and then dropped.

Falco columbarius suckleyi. Black Pigeon Hawk. Female, immature, Cedar Hill, B. C., March 9, 1924, bill, tarsi and feathers of Pine Siskin; female, immature, November 3, 1924, parts of Oregon Junco.

Pigeon Hawks of all subspecies appear to be winter urban dwellers more often than other small hawks and when frequenting cities live largely on House Sparrows. Red-winged Blackbirds are preyed upon to a large extent, particularly

during the autumn migration. No evidence that small mammals are included in their diet has been noted.

Falco sparverius. Sparrow Hawk. Male, adult, Okanagan Landing, B. C., June 4, 1911, parts of unidentified warbler, large carabid beetle, several spiders and remains of two grasshoppers; male, adult, Cedar Hill, B. C., April 26, 1922, brown rat (*Rattus norvegicus*); female, adult, house mouse (*Mus musculus*), unidentified insect remains; male, adult, August 23, 1924, 4 grasshoppers; male, adult, Colquitz, B. C., December 16, 1924, 5 coleopterous larvae, elytra carabid beetle, parts of 5 grasshoppers.

Sparrow Hawks occasionally have been seen attacking small birds; an adult male was observed in an unsuccessful attempt to strike a European Gray Partridge which outdistanced the falcon with ease; at the Government Pheasant Farm they have been shot while in pursuit of young pheasants. Nevertheless the greater part of evidence obtained in the field, such as their constant habit of eating grasshoppers, supports the statement that this species is beneficial to man's interests.

Asio wilsonianus. Long-eared Owl. Male, adult, Cedar Hill, B. C., March 24, 1922, pellet of mouse hair (*Microtus tetramerus?*); male, adult, Okanagan Landing, B. C., October 30, 1928, parts of Gray Vole (*Microtus nanus canescens*).

In British Columbia this beneficial species is sometimes shot, and presented for payment of bounty, in mistake for the Great Horned Owl; the "ear tufts" being mentioned as evidence to show that these birds are the young of the larger species.

Asio flammeus. Short-eared Owl. Male, adult, Cedar Hill, B. C., April 25, 1922, brown rat (*Rattus norvegicus*); male, adult, May 7, 1922, one *Zonotrichia*, sternum of unidentified warbler; male, Penticton, B. C., 1 Drummond vole (*Microtus drummondii*), head and forefeet detached.

In the West instances of this species taking birds are not common according to the writer's experience. In Ontario, the destruction of small birds by Short-eared Owls sometimes has reached serious proportions. (See Munro, Auk, xxxv, 1918, p. 223.) At Beaver Hill Lake, Alberta, feather remains of two Savannah Sparrows killed by Short-eared Owls were noted.

Cryptoglaux acadica. Saw-whet Owl. Male, adult, Okanagan Landing, B. C., June 11, 1926, skull of House Mouse (*Mus musculus*). Stomachs of 12 other specimens taken in the same locality were empty.

Otus asio. Screech Owl. On January 28, 1929, a female Macfarlane Screech Owl (*Otus asio macfarlanei*) was seen to kill and partly eat a Red-shafted Flicker. The stomach was distended with the flesh and feathers of this kill. Five other stomachs examined, belonging to specimens of this race, were empty.

A study of the stomach contents of 30 Kennicott Screech Owls, taken during nine months of the year in the Victoria region, British Columbia, indicated that locally the diet of this race is largely insectivorous. (See Munro, Canadian Field-Nat., xxxix, 1925, pp. 166-7.)

Bubo virginianus. Great Horned Owl. Female, adult, Okanagan Landing, B. C., January 1, 1923, parts of Ashcroft white-footed mouse (*Peromyscus maniculatus artemisiae*); female, adult, November 14, 1926, flesh of European Gray Partridge; female, adult, Falkland, B. C., December 1, 1926, parts of domestic fowl; Vernon, B. C., December 18, 1928, parts of domestic fowl; February 1, 1929, parts of Coot and Red-shafted Flicker.

Nyctea nyctea. Snowy Owl. Male, immature, Vernon, B. C., December 8, 1928, wing and feathers of Buffle-head.

Surnia ulula caparoch. American Hawk Owl. Male, adult, Lac La Biche, Alberta, August 9, 1922, pellet of mouse hair (*Synaptomys?*); two males, one female, Big Hay Lake, Alberta, October 17, 1924, each contained parts of short-tailed voles (*Microtus* sp.?); Penticton, B. C., December 3, 1926, pellet mouse hair (*Microtus* sp.?).

Speotyto cunicularia hypugaea. Burrowing Owl. Two adult males, Oliver, B. C., May 27, 1926, grasshoppers and crickets, 100%. The entrances to several nesting burrows in the same locality, examined on June 9, 1925, were littered with pellets composed of the hard portions of ground beetles and grasshoppers; one decapitated toad (*Bufo* sp.?) also was found.

Glaucidium gnoma. Pigmy Owl. Male, adult, Cowichan Lake, V. I., B. C., June 20, 1923, parts of nestling Russet-backed Thrush; male, adult, Okanagan Landing, B. C., October 7, 1925, 2 unidentified grasshoppers.

A large number of Pigmy Owls have been collected in the past eighteen years but in nearly every case the stomach was empty. It is well known that a whistled imitation of this owl's call will excite all the small birds in the vicinity and this seems proof that the Pigmy Owl is feared as an enemy. The writer is of the opinion that this species is destructive to small birds.

Okanagan Landing, British Columbia, March 1, 1929.