

Previous food studies have indicated that Marsh Hawks primarily prey on small rodents (McAtee, U.S.D.A. Circ. No. 370:26–28, 1935; Errington and Breckenridge, Am. Midl. Nat. 7:831–848, 1936; Bent, U.S. Natl. Mus. Bull. 167:85–87, 1937; Randall, Wilson Bull. 52:165–172, 1940; Hecht, Wilson Bull. 63:167–176, 1951; Weller et al., Wilson Bull. 67:189–193, 1955), although the diet has been known to include larger prey and carrion (Errington and Breckenridge 1936; Cruickshank, Auk 56:474–475, 1939; Randall 1940). Evidence from food studies also indicated that waterfowl eaten by Marsh Hawks were ducklings (Errington and Breckenridge 1936, Bent 1937, Hecht 1951) or crippled adults (Errington and Breckenridge 1936).

Bent (1937) described a Marsh Hawk that pirated a duck (species not included) from a Peregrine Falcon (*Falco peregrinus*). However, other workers have observed Marsh Hawks attack and, in some cases, kill adult or nearly-grown waterfowl. Griffiths et al. (Br. Birds 47:25, 1954) saw a female or immature Hen Harrier (*Circus c. cyaneus*) attack, pick up and then drop a European Wigeon (*A. penelope*) along the coast of Hampshire, England; and Paulson (pers. comm.) watched a female Marsh Hawk stoop repeatedly at an adult Blue-winged Teal in Wisconsin. The teal avoided injury by diving underwater at each approach of the hawk. Hammond (Auk 65:297–298, 1948) saw a Marsh Hawk, identified as a probable adult female, attack and kill an immature American Wigeon (*A. americana*) in North Dakota. This duck was fully feathered and thought to be capable of flight. Finally, Beske (pers. comm.) took an adult Blue-winged Teal with a trained female Marsh Hawk in Wisconsin. We feel that our observations support the notion that Marsh Hawks are capable of preying on adult waterfowl, although these instances appear to be rare.

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Detrimental effects of cecal defecation in winter roosting Willow Ptarmigan.—Willow Ptarmigan (*Lagopus lagopus*) roost in snow holes, presumably for protection from cold and predators. The following account illustrates that snow roosting can have detrimental effects that may lead to predation on Willow Ptarmigan.

On 31 January 1976, on Karlsøy Island, Troms Co., Norway (70°00'N, 19°55'E) 1 of our pointing dogs retrieved a live Willow Ptarmigan. The bird appeared to be in good health, except that the tips of 3 outer primaries of 1 wing were frozen together by a clot of frozen cecal excrement. The bird had been flushed while feeding, and being unable to fly was captured by the dog. On 27 December 1976, on an adjacent island, a second Willow Ptarmigan, with the tips of several primaries of 1 wing similarly frozen together, was captured by the dog. Both birds were autopsied and were apparently in good condition.

Both ptarmigan seemed to have contaminated their wing tips with cecal excrement while in snow roosts. Ptarmigan shift position slightly while roosting, as evidenced by the distribution of woody droppings and slightly enlarged roost chambers. If shifting occurred shortly after cecal defecation wing tips could conceivably become contaminated and eventually freeze.

Willow Ptarmigan apparently feed only during daylight hours and may spend more than 16 h in snow roosts during midwinter nights. Inclement weather may further prolong roosting times (Irving, Condor 69:69–71, 1967). Woody droppings are commonly found in evacuated

snow roosts. The question of whether or not ptarmigan normally excrete cecal contents in snow roosts was raised. In the winter of 1977, 60 recently evacuated snow roosts were examined. Each contained woody droppings. Only 3 contained cecal excrement, which in each case lay uppermost on the pile of woody droppings, presumably having been excreted last. Quite frequently cecal excrement was found lying within several meters of recently evacuated snow roosts. Krafft (Viltet, Jegerforb. Viltunders. 51-59, 1952) found cecal droppings in only 2 of 55 Willow Ptarmigan snow roosts examined, and in 2 instances, cecal droppings were found in the exit tracks within 5 m of the opening. Thus, pasty cecal droppings, as opposed to woody droppings, are seldom excreted in snow roosts.

The frequency and timing of emptying of the cecum in wild Willow Ptarmigan and the closely related Rock Ptarmigan (*L. mutus*) are poorly documented. A majority of birds shot during April in central Alaska appeared to have emptied their ceca in the early morning. Some ceca showed evidence of being emptied, possibly for a second time, during the late afternoon (Gasaway, Comp. Biochem. Physiol. 53A:115-121, 1976).

Our observations suggest that cecal excretion among wild Willow Ptarmigan during the short days of subarctic midwinter normally occurs just after snow roosts are abandoned. The length of time spent in the roost may be 1 factor influencing the timing of cecal excretion. Occasionally, Willow Ptarmigan excrete cecal droppings in snow roosts, presumably when experiencing extreme conditions of short days and winter storms. This can result in frozen wing tips and may increase susceptibility to predation.

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Observations on the life history of Willets on Long Island, New York.—Prior to 1966, Willets (*Catoptrophorus semipalmatus*) nested along the Atlantic coast north to New Jersey with an isolated population in Nova Scotia. In June 1966, 3 nests with eggs were found in salt marshes at Jones Beach State Park and at Tobay Beach, both in Nassau County on the western portion of the south shore of Long Island. These were the first known New York State nesting records (Davis, *Wilson Bull.* 80:330, 1968). The following year, the species had spread about 12 km eastward to Oak Beach, Suffolk Co., and by 1968 67 km further to Tiana Beach at Shinnecock Bay. The species is still increasing and spreading on Long Island; it is presumed that this population spread northward from the New Jersey coast. I began studying Willets at Shinnecock Bay in 1969.

General accounts of Willet behavior and nesting biology were given by Forbush (Birds of Massachusetts and Other New England States, Pt. 1. Mass. Dept. Agric., Boston, Mass., 1928), Bent (U.S. Natl. Mus. Bull. 146, Pt. 2, Washington, D.C., 1929) and Palmer (*in* Shorebirds of North America, G. D. Stout, ed., Viking Press, New York, 1967). The previously most intensive research on nesting Willets was reported by Tomkins (*Wilson Bull.* 44:46-47, 1932; 67:291-296, 1955; 77:151-167, 1965). The purpose of this paper is to report results obtained in a 10-year study of nesting Willets on Long Island.

Methods.—Willet nests were located by watching adults and searching the salt marshes. Adults were trapped on their nests with wire trip-step traps or occasionally captured with scoop nets. The average time needed to trap 23 adults on nests was 2 h and 25 min. I captured 20 adult males, 20 adult females and 1 bird of unknown sex, which included 23 new birds, 17 returns and 1 repeat. Four males and 6 females were caught with a scoop net