

## OBSERVATIONS ON BEHAVIOR OF SANDHILL CRANES

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THE Sandhill Crane (*Grus canadensis*) nests on the low, wet coastal tundra near the mouth of the McConnell River (60° 50' N, 94° 25' W), on the western shore of Hudson Bay. During studies of geese and jaegers we have made many casual observations of cranes. Although adult cranes are conspicuous due to their large size and loud calls, the nests and young are very difficult to locate. Since the young are also mobile, it is difficult to make any estimate of nesting density. However, in 1966, we located eight crane nests within four square kilometers of a surveyed study area. This is probably the maximum density of nests in the region.

### PREDATION

The most unexpected aspect of crane biology was the species' role as a predator of other birds. There is a large Blue Goose (*Chen caerulescens*) colony at the mouth of the McConnell River. Cranes frequently fed in the colony, but until 1967 we had not observed them eating goose eggs. In fact, the only reference of predatory activity by Sandhill Cranes was by T. S. Roberts (*in* Walkinshaw, 1949. *The Sandhill Cranes*. Cranbrook Institute of Sci. Bull. 29, Bloomfield Hills, Mich.) who included "small mammals and at times young birds and eggs" in the diet of the species.

On 12 June 1967, Prevett observed a single crane eating the eggs from a Blue Goose nest. The adult geese watched from about twenty meters distance but made no attempt to defend the nest. Within five minutes the crane left the nest, moving to a nearby pool where it spent 20 minutes bathing and preening egg remains from its face. Both adult geese returned to the nest. The female alternately settled on the nest and stood up to peck the contents. The nest contained only the fragments of four eggs.

On 18 June Harvey saw a crane attack an unprotected nest after the adult geese had left the area due to his approach. The crane showed little concern for the observer. It pulled some grass and down from the goose nest, then broke an egg with a hard jab of its bill. It ate the eggs one by one, drinking the contents and scattering the shell fragments of each before attacking the next. Upon finishing the first nest, it immediately approached a second. Before it could break an egg, however, an adult Blue Goose landed beside the nest, and stood over the eggs with its head held low, in a threat position. The crane jumped back a meter. The goose then extended its wings, with the wrists high and the tips of the primaries touching the ground, thus presenting the typical high intensity threat display of the Blue Goose. The crane responded with a similar display, and was immediately attacked. The

goose may have struck the crane in the upper breast. The crane jumped back, then walked slowly away, leaving the goose near its nest.

On 6 July Prevett saw two adult cranes pecking at the contents of a goose nest located in a clump of dwarf birch (*Betula glandulosa*). Approaching the nest, he found a very young crane, probably not more than two days old, in the birch beside the nest. The down of its face and throat was covered with sticky egg contents. There was one unbroken egg beside the nest. A wet gosling, with the yolk sac incompletely resorbed, lay in the nest. The yolk sac was broken, the skin was torn on the thigh and breast, and the nearby shell was bloody. The adult cranes had probably opened a pipped egg, and removed the embryo. They may have been dismembering the embryo for the young when Prevett approached. In any case, the young crane had been eating the contents of the yolk sac. No adult geese were seen in the vicinity.

In view of Harvey's observation, it seems unlikely that cranes succeed in obtaining many goose eggs when the geese are not disturbed, although we have observed great individual variation in the intensity with which geese defend their nests. However, when a human moved through the colony, gulls (*Larus* spp.) and jaegers (*Stercorarius* spp.) frequently attacked nests vacated by geese fleeing from the observer. Probably at least two of the incidents described involved a crane taking a similar approach. In fact, the first two encounters occurred less than one kilometer from each other, in an area where a single adult crane was frequently seen. The same individual was possibly involved each time.

Cooch (1958). The breeding biology and management of the Blue Goose (*Chen caerulescens*). Unpubl. Ph.D. thesis. Cornell University, Ithaca, N.Y.) did not list the Sandhill Crane as a predator of goose nests. However, he described (Cooch, 1953. A preliminary study of Blue and Lesser Snow Geese on Southampton Island. M.S. thesis (Unpubl.), Cornell University.) the aerial mobbing of cranes by several hundred Blue Geese whenever cranes flew over the goose colony at Boas River, on Southampton Island. MacInnes made similar observations at Boas River, but never in seven years of study at the McConnell River. On Southampton Island cranes were rare. Only three sightings were made during the five weeks of goose incubation in June and July 1961. In each case, the cranes were followed by large numbers of geese as they flew over the goose colony. At the McConnell River, on the other hand, cranes were abundant, and up to a hundred flights over the goose colony were observed each day. The McConnell River geese apparently ignored the cranes.

Cranes were also effective predators on other birds. On 29 July 1967, Liefv watched, from a blind, while three adult cranes ate several Willow

Ptarmigan (*Lagopus lagopus*) chicks in a four hour period. When first seen, the cranes were walking stiffly and rapidly through low willows (*Salix* spp.) and dwarf birch on an island in the McConnell River delta. Occasionally, a crane would stop to probe the vegetation with its bill. A pair of adult ptarmigan were alternately attacking the cranes, or trying to distract them by feigning injury. Neither action was more than momentarily successful, and one or more cranes were invariably left undisturbed. The cranes caught and ate six small ptarmigan chicks in five minutes. In each case, the ptarmigan attacked the crane vigorously, without success. The crane retreated from the immediate area with the struggling chick in its bill. The crane held the chick in the bill until it hung limp, swallowed it whole, and returned to hunt for more.

The ptarmigan continued to harass the cranes for eight minutes after the last chick was eaten, although the male was absent for three minutes of this time. The cranes then sat down and rested. The pair of ptarmigan walked away, apparently without any chicks.

The cranes rested for 15 minutes, then moved slowly down the island, feeding on vegetation. Ten minutes later, one of the cranes was observed holding a starling-sized ptarmigan chick in its bill. A pair of ptarmigan tried vigorously to distract the crane, while it put the chick on the ground and stabbed it to death. For 15 minutes, the other two cranes pursued the successful one, accompanied by the adult ptarmigan. Each time the crane put the chick down, it was immediately forced to pick it up and retreat by the other cranes or the adult ptarmigan. The chick was eventually dismembered and eaten.

Fifteen minutes after the chick was eaten, another crane of the trio caught a similar chick. In this case, the crane which ate the first chick made little attempt to steal the second from its captor. The second large chick was eaten 10 minutes after capture. The three cranes then rested for 30 minutes. Within minutes after they resumed feeding, a third ptarmigan chick was captured. This was eaten after 15 minutes distraction by the adult ptarmigan, although the other cranes paid little attention. The cranes then rested on the edge of the island for 70 minutes. During this period the adult ptarmigan could not be seen, but were apparently hiding in the bushes where the chicks were captured.

When they resumed activity, the cranes flew to another island. Within 10 minutes one crane flapped after a half-grown ptarmigan which ran from cover. The crane caught the chick by one leg, but had difficulty holding it because the chick flapped its wings. A male ptarmigan flew into the face of the crane and the chick escaped by flying. The adult ptarmigan followed the young, but the crane made no attempt to recapture its prey.

Ptarmigan clearly recognized cranes as predators from a distance. On two occasions a brood of ptarmigan was directly in front of the observation tower when cranes flew low over an island about 30 meters away. On one occasion the female ptarmigan gave a warning call and ran between two hummocks, where all the chicks bunched tightly around her. The male sneaked away and hid in the lee of a hummock about 7 meters from the covey. On the second occasion the male hid with the covey behind a hummock. On neither occasion did the cranes change their flight direction. Ptarmigan did not react in this way to flying geese.

We have little other information on the food habits of cranes at the McConnell River. Of two stomachs, one contained only the corms of sedge (*Carex*) or cottongrass while the other contained goose egg remains and a large collared lemming (*Dicrostonyx torquatus*). The lemming was in one piece, but had been crushed before ingestion. Considering the great abundance of lemmings during years of high population, these may constitute an important food supply when available. It is evident from our observations that the cranes are opportunistic feeders, for goose eggs and ptarmigan chicks are available for only short periods during the time that cranes are present at the McConnell River. However, their role as predators, and the importance of vertebrate prey in their diet cannot be assessed from information available. Judged from the apparent skill with which the cranes were observed to catch young ptarmigan, however, it is evident either that predatory activity must be common in the species, or that cranes rapidly learn and perfect new feeding behavior.

#### CARE OF YOUNG

It appears (Walkinshaw, op. cit., and Novakowski, 1967. Whooping crane population dynamics on the nesting grounds, Wood Buffalo National Park, Northwest Territories, Canada. Canadian Wildlife Service Report Series—Number 1. Queens Printer, Ottawa) that, although cranes usually lay two eggs, they most frequently raise only one young. Lynch (pers. comm.) reported that incubator-hatched Sandhill Cranes are highly aggressive toward their siblings, and frequently the stronger or older individual kills the other within hours of hatching.

We have observed at least four crane broods out of ten with two young at the McConnell River. However, the adult cranes called alarm when a human was more than a kilometer from the young, and frequently staged their distraction displays some distance from the spot where the young were hidden in the vegetation. Thus, the incidence of broods with two young may be higher than indicated.

Two broods observed within four days of hatching indicated how this

high incidence of survival of two young may occur. In each case, the observer's attention was drawn by a single adult crane calling loudly. Within a short time, a second crane stood up and called from a spot about 150 meters from the first. When the first adult was approached, it increased the frequency of calls, and walked slowly away, allowing the observer to approach within 20 meters. The second adult joined the first, but, every two or three minutes it would fly back to the place where it was first observed, only to return within a minute or less. It took 15 to 30 minutes to find each crane chick, during which period both adults concentrated on the area near the human. However, in both instances, only one chick was found where the first adult crane was observed. The second chick was discovered in the area where the second adult crane was first disturbed, at least 100 meters from the first chick. When the search for the second chick was in progress, both adults again concentrated their alarm activity near the observer. However, the adult attending the first chick again made frequent visits back to its charge. In both cases it was possible to find the young only because they became cold and began to call. We have frequently observed adults behaving in the manner described, but were unable to find the young. It is therefore impossible to estimate how long this behavior may persist as the young develop.

It was quite clear in both cases that the young were well separated when first disturbed, yet evidently the adults were still able to communicate. If this behavior occurs frequently the Sandhill Crane may often raise two young.

#### SUMMARY

Sandhill Cranes were observed eating eggs and hatching young of Blue Geese. They also hunted young ptarmigan with skill and success. One crane stomach was found to contain a collared lemming. The two young of a brood were apparently cared for separately, one by each adult, although the adults maintained contact and both defended any threatened young.

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