

## Cooperative Hunting of Canada Geese (*Branta canadensis*) by Gray Wolves (*Canis lupus*) in Northern Quebec

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Gray Wolves (*Canis lupus*) are opportunistic predators that feed mainly on ungulates across their range. Incidental to a Canada Goose (*Branta canadensis*) leg banding program in northern Quebec, I observed what appeared to be a predation attempt by three wolves on a flock of 28 Canada Geese at a time when geese were just regaining their flight capability following their annual remige moult (4 August 2003). Although I was able to observe only a short period of this presumed predation attempt, it seemed apparent from the position of the wolves and geese that this was ambushing behaviour described by other authors with other prey species.

Key Words: Gray Wolf; *Canis lupus*; *Branta canadensis*; Canada Goose; cooperative hunting; northern Quebec; predation

Gray Wolves (*Canis lupus*) are flexible and opportunistic predators, but typically prey on large ungulates (Peterson and Ciucci 2003), Caribou (*Rangifer tarandus*) being their primary prey north of the tree line (Kuyt 1972; Stephenson and James 1982). Arctic Hares (*Lepus arcticus*) and Muskoxen (*Ovibos moschatus*) can also be important foods in northern areas where and when Caribou are less abundant (Mech 2005, 2007a). In addition to relative abundance and size, physical vulnerability, defensive behaviour, and environmental conditions influence which prey species are most important in a local area at a particular time (Mech *et al.* 1998). Other prey, such as American Beaver (*Castor canadensis*) and fishes, can also be locally or seasonally important (Voigt *et al.* 1976; Darimont *et al.* 2003).

Although ungulates are Gray Wolves' primary prey, birds are also taken opportunistically. In northern Ontario, Raveling and Lumsden (1977) documented the remains of a Canada Goose that had been killed by a wolf next to a nest. In Nunavut, Wiebe *et al.* (2009) observed wolves feeding on and attempting to take geese (primarily *Chen* spp.), but did not observe any successful predation events. However, their observations occurred during spring when geese would be less vulnerable to wolf predation as they can fly at this time. Wiebe *et al.* (2009) noted that bird remains were found in older wolf scats, suggesting that wolves preyed on birds during the previous summer, presumably while they were flightless during the moult. Mech (1970) cited a letter from J. A. Hagar, reporting evidence of wolves feeding on flightless ducks during August in the James Bay region. Hagar's letter did not state whether ponds were small enough for a lone wolf to flush ducks from them or whether more than a single wolf hunted the ducks cooperatively. Further, Wiebe *et al.* (2009) observed only individual wolves feeding or preying on geese. These authors surmised that wolves might target moulting geese as an adaptive behaviour, because birds are less likely to inflict injury on the predator, compared with large mammals. Here, I report an observation of

apparent cooperative hunting of Canada Geese (*Branta canadensis*) by Gray Wolves in northern Quebec.

The study area was characterized by interspersed lichen–heath tundra, lakes, wet sedge meadows, and ponds (Cadieux *et al.* 2005). The dominant vegetation consisted of lichens, Glandular Birch (*Betula glandulosa* Michaux), willows (*Salix* spp.), Mountain Cranberry (*Vaccinium vitis-idaea* L.), Black Crowberry (*Empetrum nigrum* L.), mosses, sedges (*Carex* spp.), and Narrow-leaved Cottongrass (*Eriophorum angustifolium* Honckeney) (Cadieux *et al.* 2005).

On 4 August 2003, while cruising in a helicopter at an altitude of about 50 m above ground level at a ground speed of 150 km/h, I observed what appeared to be Gray Wolves attempting to prey on a flock of Canada Geese. The observation occurred at about 58.66°N, 69.43°W, about 13 km south of Rivière aux Feuilles and about 65 km west of Ungava Bay. The sky was heavily overcast, the temperature was 15°C, and winds were light and variable.

At 0840, I observed a lone wolf wading in an irregularly shaped pond, about 500 m by 150 m in size, toward a flock of 28 adult Canada Geese (Figure 1). The wolf was near the centre of the pond and approaching the flock from the south about 70 m from the nearest goose. The flock of geese was swimming away from the wolf. Based on the water level on the wolf's legs, most of the pond appeared to be less than 1 m deep. While flying over the pond, I detected two additional wolves about 70 m from the north edge of the pond and about 100 m from each other (Figure 1). A second pond lay about 200 m to the north of the pond with the geese and the two hidden wolves were between these ponds. The two wolves on land were facing the flock of geese and were crouched in the cover of hummocks and woody vegetation, such that they appeared to be in a position to attempt to intercept any geese that might try to move to the pond to the north. The terrain between the two ponds appeared to contain enough hummocks and low, woody cover to allow the two wolves to move

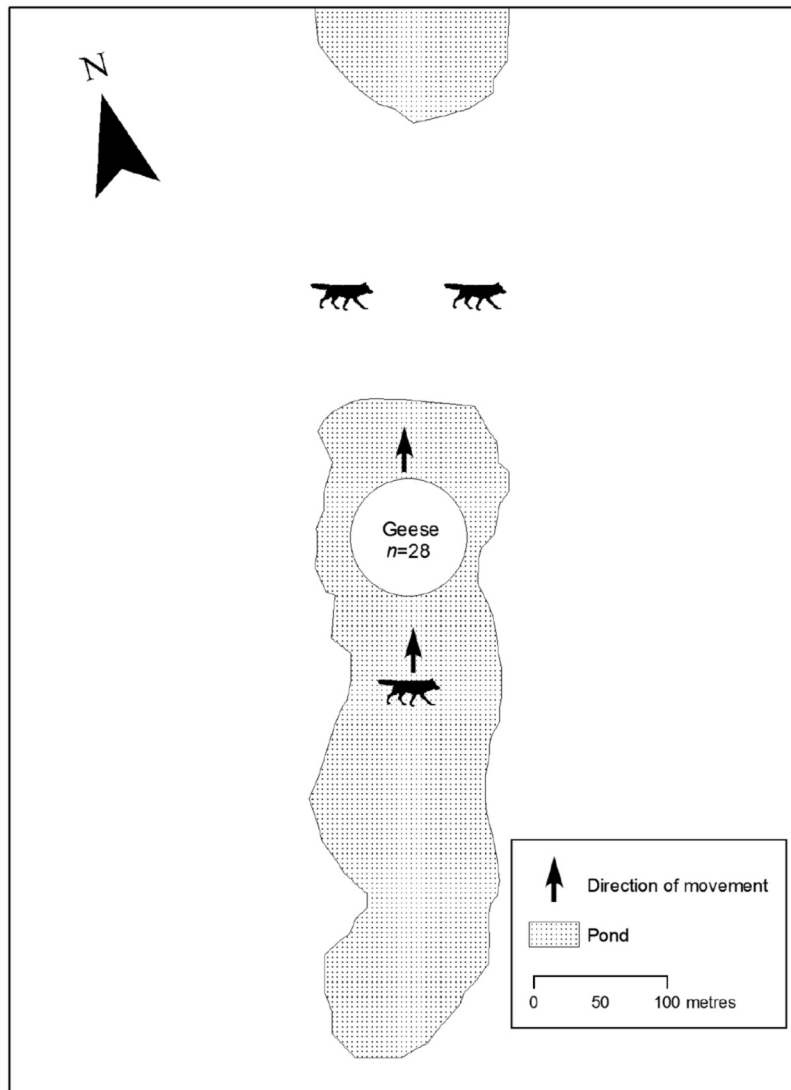


FIGURE 1. Diagram of a predation attempt by three Gray Wolves (*Canis lupus*) on a flock of Canada Geese (*Branta canadensis*) in northern Quebec, Canada, on 4 August 2003. Small arrows show the northward movement of a lone wolf and a flock of 28 Canada Geese toward two wolves crouched under cover of hummocks and woody vegetation.

into their current position without being seen by the geese.

On observing the hidden wolves, I asked the pilot to turn the helicopter and gain altitude so as to view the outcome of the presumed predation attempt. However, as we re-approached the scene from the north, all of the Canada Geese flew off to the south, likely because of the presence of the helicopter.

From 1997 to 2007, when I served on the Atlantic Population Canada Goose banding crew in the Ungava Bay region, we were in the field by helicopter for about 10 days annually between 27 July and 14 August. Our

area of coverage each year spanned about 350 km of tundra and boreal forest within a 35-km wide strip along the western and southern coasts of Ungava Bay and major tributaries between Kangirsuk and Kangisualujuaq. We typically spent about five days between our base in Kuujuaq and Rivière aux Feuilles (90 km), where the incident described above occurred, searching for Canada Geese to band or in transit to banding stations further north. When flying, we spent most of our time searching for Canada Goose brood flocks to band at an altitude of 30 m and a speed of about 60 km/h, i.e., under conditions where Caribou would be

readily observed. Although Caribou were common in this area, we never saw herds any larger than 25 individuals during any year; the number of Caribou observed annually averaged about 30 (personal observation). Given the importance of Caribou to Gray Wolf diet in the North (Kuyt 1972; Stephenson and James 1982) and the fact that Caribou were not particularly abundant in this area at this time of year, it is uncertain whether the observation of Canada Goose predation was a relatively common occurrence or an isolated incident.

In a survey described by Peterson and Ciucci (2003), the idea of "strategic cooperation," or wolves hunting as a unit, was not unanimously accepted by wolf biologists. In this same survey, wolf biologists who reported strategic cooperation had observed the prey species to be primarily large ungulates, including Caribou, Horse (*Equus caballus*), White-tailed Deer (*Odocoileus virginianus*), and Moose (*Alces americanus*). Further, Mech (2007b) described wolves using specialized strategies, including ambushing behaviour, when hunting Muskoxen. Regarding non-ungulates, Mech (1995) observed wolves chasing Arctic Hares toward other waiting wolves. I was not able to find any documentation of wolves cooperatively hunting birds.

The date of the observation (4 August) coincided with the time when nonbreeding Atlantic Population Canada Geese first begin to regain flight capability following the moult (personal observation). Therefore, it is plausible that Gray Wolves would still be hunting geese, given that these birds had been flightless for approximately four weeks (Bellrose 1980) before the observation. Although I was only able to observe a short period of this presumed predation attempt, it seemed apparent from the position of the three wolves and the geese, and the timing of the moult, that this was ambushing behaviour used by cooperatively hunting wolves, similar to that described by Mech (2007b).

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