BREEDING GROUND BANDING OF ATLANTIC POPULATION CANADA GEESE IN NORTHERN QUÉBEC - 1999

More than 7,500 AP Canada geese were banded in northern Québec in 1999. Pictured here is a small brood flock in typical dry tundra habitat along the Hudson Bay coast.

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Background

This banding program is part of a larger project (AGJV Project # 59) whose overall objective is to generate new information that will allow managers to develop more effective management plans to arrest the decline of the migrant population of Atlantic Flyway Canada geese and promote its rapid recovery. The main objective of the banding program is to create a marked population of geese from representative portions of the breeding range for studies of adult and juvenile survival, harvest rate, timing and distribution of harvest and population delineation. Other benefits of capturing large numbers of breeding geese are to obtain pre-fledging immature:adult ratios, breeding ground recaptures of previously banded birds and body size measurements which may be useful in population delineation. A large number of Canada geese was banded in northern Quebec in the 1960's (13,069 geese) and a smaller number in the late 1980's (5,662). However, few (only about 200) of the birds banded in the 1980's were banded in the western portion of the breeding range. The present program of breeding ground banding, which includes both the western (Hudson Bay) and eastern (Ungava Bay) portions of the northern Quebec breeding range, was initiated in 1997.

Work conducted in 1999

We captured groups of flightless geese between 27 July and 9 August in two areas of northern Québec, one near Povungnituk along the northern Hudson Bay coast and the other near Kuujjuaq in southern Ungava Bay (Figure 1). The two areas represent the western and eastern portions, respectively, of the Ungava breeding range of Atlantic Population Canada geese. Helicopters were used to round up and drive the geese toward a funnel-shaped trap. Only flocks containing goslings were captured. Based on nesting dates (Hughes 2000), most of the goslings banded near

Povungnituk were about 5-7 weeks old and those near Kuujjuaq, 5-6 weeks old at the time of banding. All geese were banded with USFWS 1-800 leg bands. We measured the skull, culmen, tarsus, 9th primary and mass of a large sample of adult and juvenile birds. We also collected samples of growing feathers (blood quills) in the Kuujjuaq area for genetic analysis.

As in 1998, two banding crews operated simultaneously in the Povungnituk area to increase the number of geese banded. The first crew consisted of R.J. Hughes (CWS) and assistants Joël Poirier, Catherine Poussart and Stéphane Forest with Canadian Coast Guard helicopter pilot, Gaetan Gagnon. The second crew was led by Kevin Jacobs (PAGC) and included David Norris (VADGIF) with Ontario Ministry of Natural Resources helicopter crew, Rob Lamonte and Jean-Marie Kelley. The Kuujjuaq crew was led by Ted Nichols (NJFGW) and included Peter May (Makivik Corporation, Kuujjuaq), Sal Cozzolino (NY) and Stéphane Menu (Laval University, Québec). Other Makivik personnel assisted on some bandings. The helicopter was piloted by Yvan Giroux of the Canadian Coast Guard.

Results

Geese banded: In 1999, a total of 7,571 geese were banded, 5,332 in the Hudson Bay area and 2,239 in the Ungava Bay area (Table 1). We thus greatly exceeded our goals of 2,500 geese banded at Povungnituk and 1,500 at Kuujjuaq. In the Kuujjuaq area some of the birds captured were released unbanded and birds were not measured from every flock because of frequent periods of rain which threatened the safety of young geese crowded together in the banding nets. As in previous years, goose distribution at the time of banding was quite different at the two locations. Near Povungnituk, brood-rearing geese were scattered across the tundra in small groups (mostly ≤ 40 individuals), from the coast to several kilometers inland. At inland tundra sites near Kuujjuaq, the situation was similar, however some large brood flocks were encountered in coastal salt marshes on Big Island and at the mouth of the Mucalic River.

Recaptures: In addition to the more than 7,500 geese banded in 1999, we also recaptured 337 previously banded geese: 298 banded by our crews in 1997 and 1998, 25 banded in northern Quebec between 1986 and 1996 and 14 banded elsewhere.

Since 1997, we have measured more than 2400 adult Canada geese on the breeding grounds. The data will be used to develop a method of identifying the breeding affiliation of harvested birds.

Capture nets had to be set up several times per day in the Hudson Bay area where the number of geese caught per attempt was often less than 50.

Eleven of the 14 geese not banded in northern Québec, were banded in the U.S.A. in winter. Of these eleven, eight were recaptured in the Hudson Bay area: seven banded in Maryland between 1987 and 1994 and one in South Carolina in 1983. The other three, recaptured near Ungava Bay, were all banded in New Jersey between 1992 and 1995. Two of the three geese not banded in winter were moult-migrant sub-adult geese, banded as Locals in the U.S.A. in 1998. One of these, from New York, was recaptured in the Ungava Bay area and the other, from Michigan, was recaptured in the Hudson Bay area. Finally, one goose, banded as an adult on Prince Edward Island in April 1990, was recaptured in Ungava Bay.

Productivity: We examined the immature:adult (I:A) ratio in the flocks we captured. In some cases, a few birds in a flock escaped capture. When the numbers of escaped adults and goslings were known, they were included in the totals for the catch; otherwise, these flocks were excluded from the analysis. The mean (± se) I:A ratio at the time of banding was 1.45 ±0.06 for Hudson Bay flocks (n=128) and 1.15 ±0.09 Ungava Bay flocks (n=28). The mean I:A ratio was significantly greater in Hudson Bay flocks (t-test, P=0.01). Although only flocks with goslings are captured, a number of non-breeding adult geese are sometimes included within the flock. In order to correct for this potential source of bias, breeding and non-breeding birds must be differentiated. Most of the adult female geese captured were identified as being either a breeder or a non-breeder by the presence or absence of a brood patch (BP). By comparing the number of young to the number of BP-females, we can estimate mean brood size. However to do this, all of the adult female geese in a flock must be examined. Thus, flocks in which any number of adult geese escaped capture or were not examined were excluded. The mean ratio of immatures to BP-females (or brood size) was 3.15±0.17 (n=44) at Hudson Bay and 2.51±0.22 (n=22) at Ungava Bay. Mean brood size was significantly greater (t-test, P=0.03) in Hudson Bay flocks.

In the Hudson Bay area, banding was coordinated with a study of reproductive success being conducted at the Polemond River 60 km south of Povungnituk (Hughes 2000). Thus, many of the banding drives were conducted in the same area where nesting geese were studied earlier in the year. This enabled us to recapture goslings which had been marked in the nest with individually numbered web tags. This part of the operation was highly successful as we recaptured 209 of 797

(>25%) marked goslings, all of which we measured. The data from these recaptures permit us to evaluate gosling survival (see Hughes 2000) and because we know the exact age of these birds, we will be able to evaluate their growth rate. A large number of adult birds was also measured in each of the two areas. Adult geese captured near Kuujjuaq in Ungava Bay, in the eastern portion of the breeding range were larger, on average, than those captured near Povungnituk on the Hudson Bay coast (Table 2).

Band Returns

In the first three years of breeding ground banding in Ungava, 16,561 adult and juvenile geese have been banded. Some of these birds have since been shot by by Canadian and American sport hunters. Since 1997, several birds have been harvested during early resident goose seasons in September before peak migration or in zones not thought to be frequented by wintering migrant AP Canada geese. Limited regular season hunting, closed since 1995, was re-instated in the current (1999-2000) hunting season in most Atlantic Flyway jurisdictions. A large number of banded birds were harvested during this limited, regular hunting season. Finally, a small number of banded birds have been reported by Aboriginal subsistence hunters in northern Québec. Efforts have been made in recent years to encourage Aboriginal hunters to report banded birds and the use of 1-800 bands appears to have made them somewhat more likely to do so. At the time of writing this report, a total of 216 band recoveries have been reported by hunters. A summary is presented in Table 3.

Some points worth noting:

- Consistent with historic band recoveries, Ungava Bay birds tend to be harvested in Québec, New Brunswick and the New England states, whereas Hudson Bay birds tend to be harvested in Ontario and in states farther west and south.
- Several geese, known to belong to the migrant population, have been shot during early resident seasons, some as early as 10 September in NY and 24 September in MD and VA. Four of these geese were young of the year, one each shot in Ontario and Québec and two in New York. Nine others were sub-adult (one-year-old) geese.

Discussion and Plans for 2000:

The 1999 breeding season represented the third consecutive year of good productivity for Canada geese in northern Québec as evidenced by the abundance of goslings several weeks post-hatch in both the Hudson Bay and Ungava Bay banding areas. After three years of breeding ground banding, it is evident that a sufficient number of geese can be banded, at least in good production years, to provide a useful data set for studies of survival and harvest rates. The difference in goose distribution between the Hudson Bay and Ungava Bay areas is largely responsible for differences in the number of geese caught per banding drive. Although geese are abundant near Povungnituk, the lack of extensive tidal marshes anywhere along the northern Hudson Bay coast results in wide dispersal and small flocks, meaning that more effort is required to band a similar number of geese. The use of two banding crews in 1999 allowed us to again exceed our banding goal of 2,500 birds for the Hudson Bay area and to expand our geographic coverage in comparison to 1997. Although greater effort is required to band a similar number of geese in the Hudson Bay area compared to Ungava Bay, the Hudson Bay area generally accounts for a substantially greater portion of the total breeding population (Malecki and Trost 1990, Harvey and Rodrigue 1999). It is therefore important to maintain a strong banding effort in this area. Given the importance of a large banded sample of geese for survival (and other) analyses, particularly in view of the gradual re-opening of sport hunting, we plan to again have two banding crews working simultaneously in the Hudson Bay area in 2000. We will also continue to expand the geographical coverage of the bandings in both the Ungava and Hudson Bay areas.

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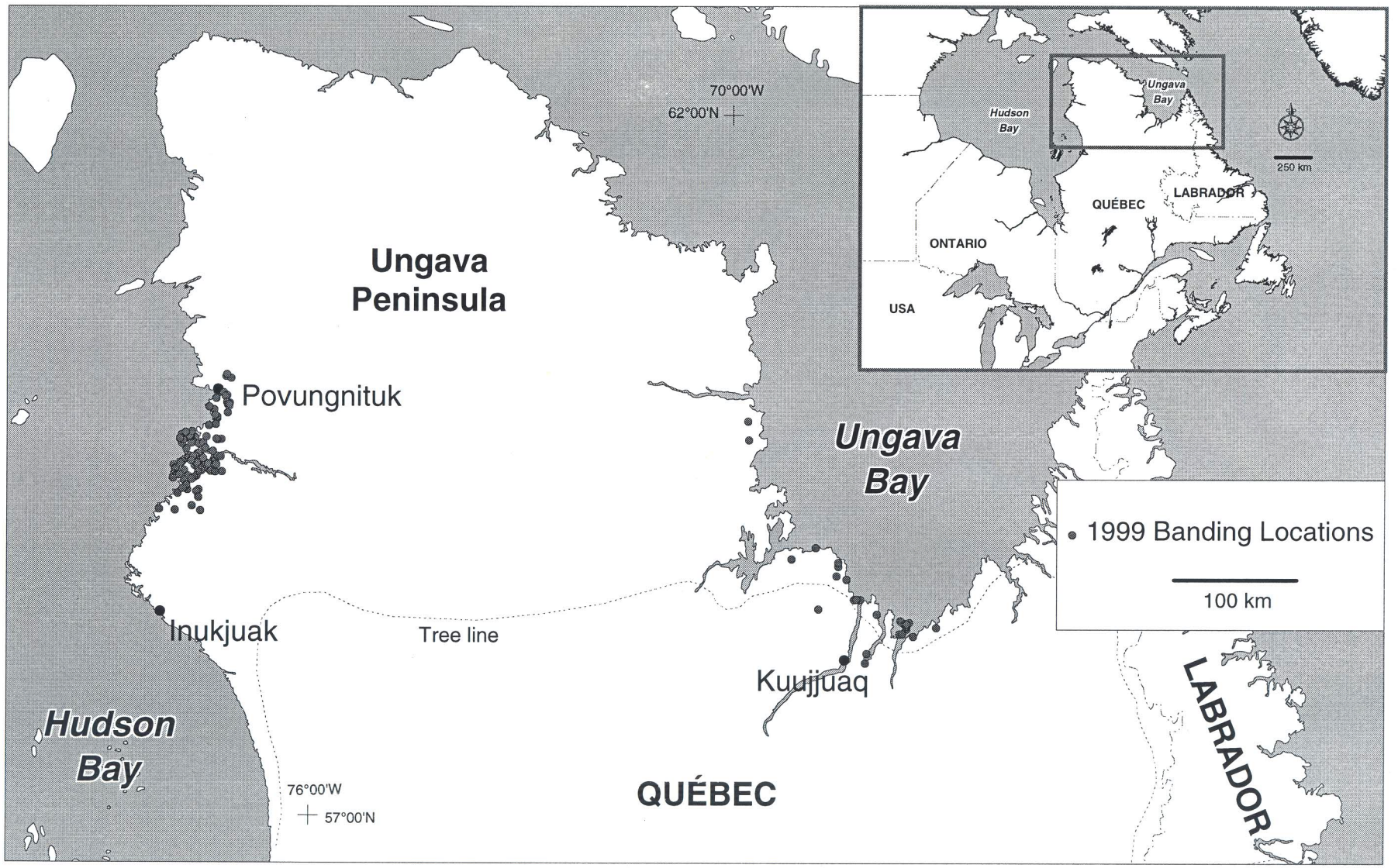

Figure 1. Ungava region of Quebec showing locations where breeding Atlantic Population Canada Geese were banded.

Table 1. Summary of banding operations of Atlantic Population Canada Geese in northern Québec, 1999.

	Hudson Bay	Ungava Bay
Dates	30 July - 9 August	27 July - 5 August
Adults Banded	2018	1039
Juveniles Banded	3314	1200
Total Geese Banded	5332	2239
Recaptures:		
Banded in 1997 or 1998, Same Area	138	160
Banded before 1997, Same Area		25
Banded outside northern Québec	10	4
Total Previously Banded Geese	148	189
No. Of Catches	133	28
Mean No. of Geese/Catch	41	88
Helicopter Hours Required	62	31

Table 2. Comparison of morphological measurements of adult Canada Geese captured during banding operations in the western (Hudson Bay) and eastern (Ungava Bay) portions of the northern Québec breeding range, 1999.

	Skull (mm)		Culmen (mm)		Tarsus (mm)		Mass (g)	
	mean	se (n)	mean	se (n)	mean	se (n)	mean	se (n)
Females								
Hudson Bay	111.7A[1]	0.2 (263)	49.0A	0.2 (263)	79.0A	0.2 (263)	3081A	16 (263)
Ungava Bay	114.6B	0.3 (213)	51.5B	0.2 (213)	81.5B	0.3 (213)	3260B	25 (188)
Males								
Hudson Bay	118.3A	0.3 (221)	52.1A	0.2 (221)	84.5A	0.4 (221)	3638A	24 (228)
Ungava Bay	121.7B	0.3 (194)	54.5B	0.2 (194)	87.8B	0.3 (194)	3806B	29 (188)

[1] Means followed by different letters for the same body measurement and sex class differed significantly (t-test, $P < 0.0001$).

Table 3. Recoveries of AP Canada geese banded in northern Québec between 1997 and 1999 and shot during early resident Canada goose seasons (September) and regular/late seasons (October-March).

	Early Season				Regular Season				Grand
State/Province	1997	1998	1999	Total	1997-98	1998-99	1999-00	Total	Total
N. Québec[1]	0	0	4	4	5	13	0	18	22
E. Québec	0	0	0	0	0	5	3	8	8
S. Québec	1	0	2	3	0	1	30	31	34
Ontario	0	1	4	5	1	0	17	18	23
New Brunswick	0	0	0	0	0	2	0	2	2
Maine	0	0	0	0	0	4	0	4	4
N. Hampshire	0	0	0	0	0	5	5	10	10
Vermont		0			1		0		1
Massachusetts	0	0	0	0	0	1	2	3	3
Connecticut	0	0	0	0	0	4	5	9	9
Rhode Island	0	0	0	0	0	1	0	1	1
New York	0	2	14	16	0	1	10	11	27
Pennsylvania	0	0	1	1	0	4	14	18	19
New Jersey	0	0	0	0	2	1	6	9	9
Delaware	0	0	0	0	0	0	0	0	0
Maryland	0	1	0	1	4	2	1	7	8
Virginia	0	0	1	1	3	8	8	19	20
West Virginia	0	0	0	0	0	0	0	0	0
North Carolina	0	0	0	0	0	0	3	3	3
Other Flyways	0	0	3	3	1	2	7	10	13
Total	1	5	29	35	16	54	111	181	216

[1] Aboriginal subsistence harvest. "Early season" is August/September. "Regular season" represents the spring hunt in April/May.