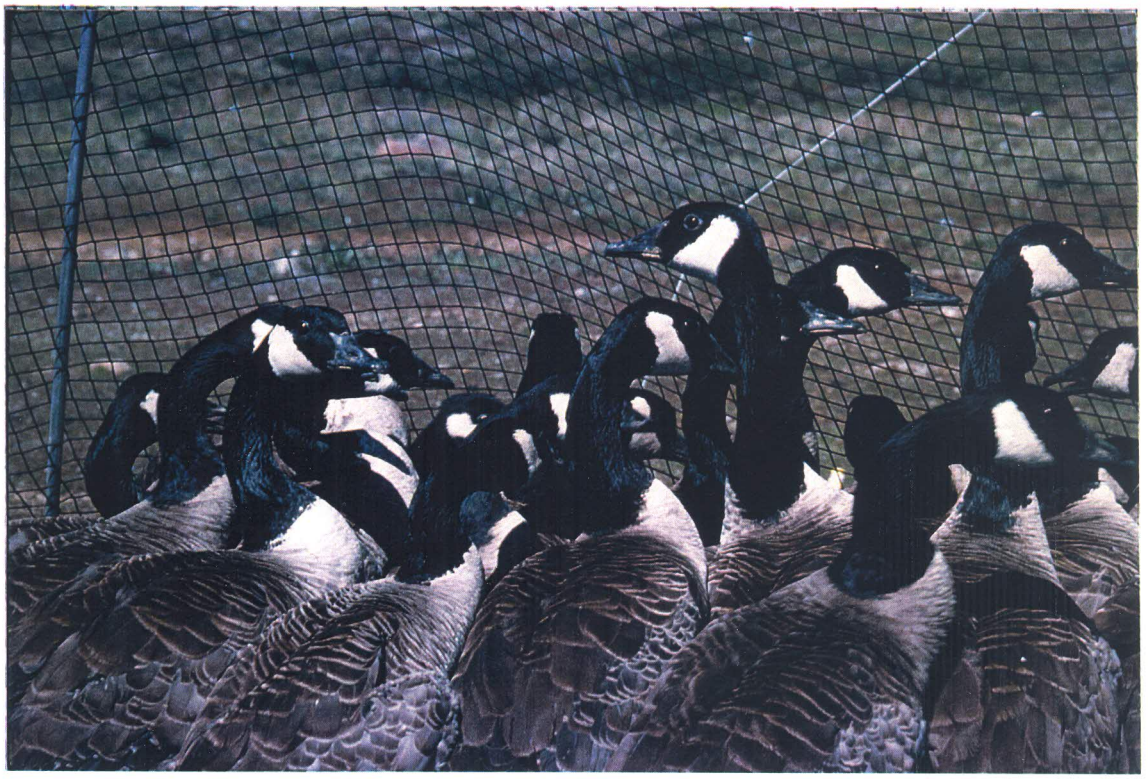
BREEDING GROUND BANDING OF ATLANTIC POPULATION CANADA GEESE IN NORTHERN QUÉBEC - 1998



Nearly 6000 Atlantic Population Canada geese were banded on the northern Québec breeding grounds in 1998.

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BREEDING GROUND BANDING OF ATLANTIC POPULATION CANADA GEESE IN NORTHERN QUÉBEC - 1998

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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 and only 103 have been banded in northern Quebec since 1989 (in 1996). 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 1998

We captured groups of flightless geese between 26 July and 8 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 sites represent the western and eastern portions, respectively, of the Ungava breeding range of Atlantic Population Canada geese. A helicopter was used to round up and drive the geese toward a funnel-shaped trap. Only flocks containing goslings were captured. Based on nesting dates (Hughes and Reed 1999), most of the goslings

banded near Povungnituk were about 5-6 weeks old and those near Kuujjuaq, 4-5 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) for genetic analysis by Dr. Kim Scribner of Michigan State University and feather samples for stable isotope analysis by Dr. Lisa Reed of Rutgers University.

Following the results and recommendations in the 1997 report (Reed and Hughes, 1998), two banding crews operated simultaneously in Povungnituk in 1998 to increase the number of geese banded. The first crew consisted of R.J. Hughes (CWS) and assistants Joel Poirier, Catherine Poussart and Anne Lagacé with Canadian Coast Guard helicopter pilot, Al Pearly. The second crew included Kevin Jacobs (PAGC) and Paul Hess (NYDEC) with Ontario Ministry of Natural Resources helicopter crew, Dale Flieler and Mark Benoit. The Kuujjuaq crew was led by Ted Nichols (NJFGW) and included wildlife technicians Gérald Picard (Laval University) and Natalie Hamel and Makivik Corporation technicians Peter May and Sandy Suppa. Other Makivik personnel and the helicopter pilot (Alain Auger, Helimax Nunavut Ltd.) assisted on some bandings.

Results

In 1998, a total of 5828 geese were banded, 3821 in the Hudson Bay area and 2007 in the Ungava Bay area (Table 1). We thus exceeded our goals of 2500 geese banded at Povungnituk and 1500 at Kuujjuaq. In the Kuujjuaq area some of the birds captured were released unbanded and birds were not measured from every flock captured because of frequent periods of rain which threatened the safety of young geese crowded together in the banding nets. As in 1997, 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 several kilometers inland from the coast. Although some small brood-rearing groups were encountered on inland tundra habitats near Kuujjuaq, most of the geese in this area had assembled in large flocks in a few coastal salt marshes on Big Island and at the mouth of the Mucalic River.

AP Canada Geese near Povungnituk share their breeding grounds with thousands of woodland caribou of the Leaf River herd.

Brood rearing habitat of AP Canada Geese in the northern Hudson Bay area consists mainly of small sedge/cottongrass meadows.

In addition to the nearly 6000 birds banded in 1998, we also recaptured 151 previously banded birds. About two thirds of them (n=107) were geese banded in northern Quebec by our crews in 1997. Of the remainder, 11 were recaptured near Povungnituk and 33 near Kuujjuaq. Ten of the birds recaptured near Povungnituk were banded in winter, eight in Maryland between 1985 and 1997 and one each in Pennsylvania (1991) and Alabama (1989). Twenty-five of the 33 geese recaptured near Kuujjuaq were banded in the Kuujjuaq area between 1986 and 1989. Five of the remaining birds were banded in winter, three in Maryland (1991-96) and two in New Jersey (1988, 1995). Two geese were banded in the U.S. in summer, one in South Carolina in 1986 and the other in New Jersey in 1995. Interestingly, the South Carolina-banded goose was an adult female with a brood patch indicating that she had nested locally (in northern Quebec) in 1998. No banding data could be obtained for two birds, one recaptured near Povungnituk and one near Kuujjuaq.

We examined the immature:adult ratio in the flocks we captured. In some cases, a few birds in a flock escaped capture. These were noted and included in totals of adults and juveniles for each flock. The mean (± se) ratio of juveniles to adults (J:A) at the time of banding was 1.87 ±0.08 for Hudson Bay flocks (n=57) and 1.67 ±0.16 Ungava Bay flocks (n=21). This gives a mean brood size of 3.74 and 3.34 for the two areas respectively. There was no significant difference between the two areas (t-test, P=0.238). The J:A ratio may be negatively biased however, if a number of non-breeding adult geese are included in the flock. One way to avoid this potential source of bias is to differentiate between breeding and non-breeding birds. Most of the adult female geese captured were identified as being either breeders or non-breeders by the presence or absence of a brood patch. By comparing the number of young to the number of brood-patch females, we can estimate mean brood size at the time of banding. However to do this, all of the adult female geese in a flock must be examined for the presence or absence of a brood patch. Thus, groups in which any number of adult geese escaped capture or were not examined, were excluded. The mean ratio of juveniles to brood-patch females (or brood size) was 4.18±0.30 (n=26) at Hudson Bay and 3.96±0.46 (n=14) at Ungava Bay. There was no significant difference (t-test, P=0.680) between the two areas. Although only a small number of the adult females captured were not breeding

geese, by using this criteria to eliminate these individuals, we determined that mean brood size was greater by about 0.5 goslings compared with using a simple J:A ratio.

In the Hudson Bay area, banding was coordinated with a study of reproductive success being conducted at a site 60 km south of Povungnituk on the Polemond River (Hughes and Reed 1999). 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 295 of 1136 (>25%) marked goslings, all of which we measured. The data from these recaptures permit us to evaluate juvenile survival(see Hughes and Reed 1999) 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 two years of breeding ground banding in Ungava, 8989 adult and juvenile geese have been banded. With regular season hunting to likely be re-instated in the upcoming (1999-2000) hunting season, many banded birds will be shot and reported by Canadian and American sport hunters. An analysis of these data will be the subject of a later report. A small number of recovered bands have already been reported; details of these returns are presented in a separate table included with this report.

Discussion and Plans for 1999:

The 1998 breeding season represented the second 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 two 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 addition of a second banding crew in 1998 allowed us to exceed our banding goal of 2500 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 1998). 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 probable re-opening of sport hunting in Fall 1999, we hope it will again be possible to have two banding crews working simultaneously in the Hudson Bay area in 1999. This will depend upon solid financial support for the project. A final decision about whether two crews can be used on an annual basis under current levels of funding will only be possible after a complete analysis of 1998 expenditures and contributions.

Acknowledgments

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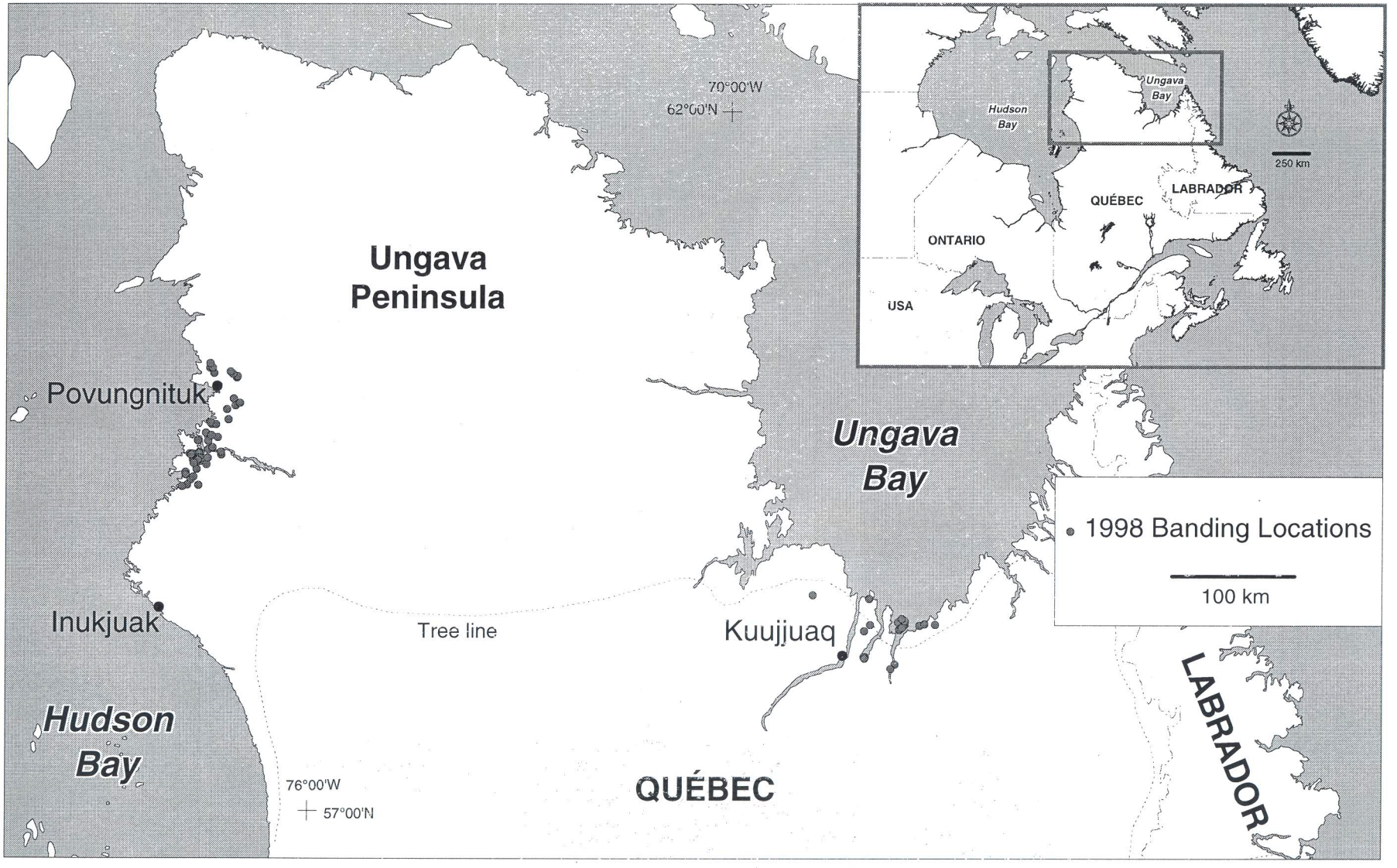

Figure 1. Ungava region of Quebec showing locations where breeding Atlantic Population Canada Geese were banded.

Table 1. Summary of banding operations of Atlantic Population Canada Geese in northern Québec[1], 1998.

	Hudson Bay	Ungava Bay
Dates	28 July - 8 August	26 July - 3 August
Total Geese Caught	3894	2093
No. Of Catches	63	23
Mean No. of Geese/Catch	62	91
Helicopter Hours Required	56	24
Total Geese Banded	3821	2007
Adults Banded	1360	675
Juveniles Banded	2461	1332
Recaptures		
Geese Banded in 1997, Same Area	56	51
Previously Banded Geese	11	33

[1] Geese from Hudson Bay were captured near Povungnituk and geese from Ungava Bay, near Kuujjuaq (Fig 1).

Table 2. Comparison of Morphological measurements of adult Canada Geese captured during banding operations in the western and eastern portions of the northern Québec[1] breeding range, 1998.

	Skull (mm)		Culmen (mm)		Tarsus (mm)		Mass (g)	
	mean	se (n)	mean	se (n)	mean	se (n)	mean	se (n)
Females								
Hudson Bay	112.0A[2]	0.2 (332)	48.5A	0.1 (332)	78.6A	0.3 (323)	3037A	13 (325)
Ungava Bay	117.8B	0.3 (209)	52.5B	0.2 (209)	82.9B	0.3 (183)	3331B	27 (183)
Males								
Hudson Bay	118.2A	0.2 (313)	51.6A	0.2 (312)	84.6A	0.4 (306)	3559A	16 (305)
Ungava Bay	124.0B	0.3 (184)	55.4B	0.2 (184)	89.0B	0.3 (166)	3930B	34 (166)

[1] Geese from Hudson Bay were captured near Povungnituk and geese from Ungava Bay, near Kuujjuaq (Fig 1).

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

Table 3. Hunting recoveries of Canada Geese banded in northern Québec[1] in 1997.

Banding Location	Age	Sex	Recovery Date	Recovery Location			
				State/Prov.	Latitude	Longitude	Locality
Ungava Bay							
	AHY	M	Apr 26 1998	PQ (north)	583	0655	George Riv
	L	M	May 1998	PQ (north)	583	0655	George Riv
	L	M	May 1998	PQ (north)	583	0681	Kuujjuaq
	L	M	Sept 1997	PQ	451	0731	
	AHY	M	Oct 6 1998	PQ	480	0650	Shigawake
	AHY	F	Oct 24 1998	NB	464	0652	Rogersville
	L	F	Oct 17 1998	CT	415	0727	Summers
	L	F	Nov 10 1998	RI	412	0713	Matunuk
	L	F	Jan 28 1998	NJ	392	0747	
Hudson Bay							
	L	M	Nov 7 1997	ON	432	0803	
	L	F	Sept 25 1998	ON	442	0784	Lindsay
	L	F	Sept 10 1998	NY	433	0760	Mexico
	L	F	Sept 19 1998	NY	432	0761	Mexico
	L	M	Jan 17 1998	NJ	392	0750	
	L	F	Jan 31 1998	MD	394	0772	
	L	F	Feb 13 1998	MD	390	0777	
	AHY	M	Feb 13 1998	MD	391	0771	
	L	M	Aug 1998	MD	393	0777	Carroll Co
	L	M	Sept 24 1998	MD	392	0770	Woodbine
	AHY	M	Dec 26 1997	VA	380	0782	
	L	M	Jan 31 1998	VA	383	0780	
	AHY	M	Jan 31 1998	VA	383	0780	
	L	F	Dec 1 1998	VA	374	0780	Cartersville

Recoveries of AP Canada Geese Banded in northern Québec, 1997-1998

(file: RECOV.xls, last update: 10/02/99)

Hunter Shot Geese

Band	Age	Sex	BandLoc	BY	How	RecReg	RM	RD	RY	RLat	RLon	RecLoc
90817438	AHY	M	Kuujjuaq	97	1	PQ	04	26	98	583	655	George Riv
90816621	L	M	Kuujjuaq	97	1	PQ	05	99	98	583	655	George Riv
90818045	L	M	Kuujjuaq	97	1	PQ	05	99	98	583	681	Kuujjuaq
90817615	AHY	M	Kuujjuaq	97	1	PQ	10	06	98	480	650	Shigawake
90825651	L	M	Kuujjuaq	98	1	PQ	10	22	98	480	652	New Carlisle
90816947	L	M	Kuujjuaq	97	1	PQ	09	99	97	451	731	St Jean (Rich)
90817867	AHY	F	Kuujjuaq	97	1	NB	10	24	98	464	652	Rogersville
90833910	L	M	Kuujjuaq	98	1	NB	10	12	98	460	673	Woodstock
90815251	L	F	Povungnituk	97	1	ON	09	25	98	442	784	Lindsay
90814669	L	M	Povungnituk	97	1	ON	11	07	97	394	772	
90825935	AHY	M	Kuujjuaq	98	1	ME	10	10	98	452	687	Corinth
90825615	L	M	Kuujjuaq	98	1	ME	10	15	98	435	694	Bath
90825207	L	F	Kuujjuaq	98	1	ME	10	10	98	434	705	Parsonfield
90833555	AHY	F	Kuujjuaq	98	1	VT	09	13	98	440	731	Addison
90825830	L	F	Kuujjuaq	98	1	NH	10	23	98	435	710	Conway
90825898	AHY	M	Kuujjuaq	98	1	NH	10	23	98	435	710	Conway
90825071	L	M	Kuujjuaq	98	1	NH	10	13	98	425	721	Keene
90825081	L	:F	Kuujjuaq	98	1	NH	10	07	98	424	713	Hollis
90814997	L	F	Povungnituk	97	1	MI	10	13	97	434	833	
90815334	L	F	Povungnituk	97	1	NY	09	10	98	433	760	Mexico
90815318	L	F	Povungnituk	97	1	NY	09	19	98	432	761	Mexico
90817858	AHY	M	Kuujjuaq	97	1	MA	01	15	99	422	712	Concord
90816823	L	F	Kuujjuaq	97	1	CT	10	17	98	415	727	Summers
90837361	AHY	M	Povungnituk	98	1	CT	10	20	98	414	727	Elington
90825508	L	M	Kuujjuaq	98	1	CT	11	20	98	414	715	Brooklyn
90816630	L	M	Kuujjuaq	97	1	CT	12	05	98	414	721	Willimantic
90818435	L	F	Kuujjuaq	97	1	RI	11	10	98	412	713	Matunuk
90814787	L	M	Povungnituk	97	1	NJ	01	17	98	392	750	
90816868	L	F	Kuujjuaq	97	1	NJ	01	28	98	392	747	
90815023	L	F	Povungnituk	97	1	MD	01	31	98	394	772	
90814999	L	M	Povungnituk	97	1	MD	08	63	98	393	777	Carroll Co
90814704	L	M	Povungnituk	97	1	MD	09	24	98	392	770	Woodbine
90835456	AHY	M	Povungnituk	98	1	MD	11	16	98	392	772	Mt Pleasant
90815085	AHY	M	Povungnituk	97	1	MD	02	13	98	391	771	
90815045	L	F	Povungnituk	97	1	MD	02	13	98	390	777	
90815229	L	M	Povungnituk	97	1	VA	01	31	98	383	780	
90815243	AHY	M	Povungnituk	97	1	VA	01	31	98	383	780	
90836479	L	F	Povungnituk	98	1	VA	12	29	98	382	775	Culpepper
90815725	L	F	Povungnituk	98	1	VA	12	05	98	381	780	Orange
90814634	AHY	M	Povungnituk	97	1	VA	12	26	97	380	782	
90814597	L	F	Povungnituk	97	1	VA	12	01	98	374	780	Cartersville

Geese Found Dead

Band	Age	Sex	BandLoc	BY	How	RecReg	RM	RD	RY	RLat	RLon	RecLoc
90814647	AHY	F	Povungnituk	97	0	PQ	05	99	98	593	773	Povungnituk
90814933	L	F	Povungnituk	97	0	PQ	05	27	98	593	773	Povungnituk
90818274	L	M	Kuujjuaq	97	0	PQ	10	16	97	464	711	Kuujjuaq
90814740	AHY	F	Povungnituk	97	0	PQ	04	30	98	454	735	Povungnituk
90833134	L	F	Kuujjuaq	98	0	CT	11	11	98	414	725	Avon
90818499	L	M	Kuujjuaq	97	0	PA	02	11	98	401	750	
90818024	L	F	Kuujjuaq	97	0	NJ	10	19	97	435	752	
90818120	L	F	Kuujjuaq	97	0	NJ	12	10	98	404	741	Union
90833365	AHY	F	Kuujjuaq	98	0	NJ	11	23	98	395	744	Mt Holly