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REPORT

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1994

Update on Canada Goose Band Recoveries
as They Relate to the Atlantic Region

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March 1994

Table of Contents

	Page Number
Introduction -----	3
Methods -----	4
Results and Discussion -----	5
Atlantic Region Recoveries of US-banded Canada Geese -----	5
Recoveries of Atlantic Region - banded Canada Geese -----	6
Recovery Rates -----	7
Summary -----	9
References cited -----	10

Introduction

The most recent management plan for the Atlantic Flyway population of Canada Geese (1989) prepared by the Atlantic Flyway Technical Section, makes no distinction between the birds breeding in Newfoundland-Labrador and migrating through the Maritimes and the more numerous migrants which breed in Quebec and migrate through eastern Ontario and Quebec. Earlier work considered those two groups of birds separate sub-populations (Hine and Schoenfeld, 1968). The existence of separate sub-populations has not been definitively shown, and mixing on the wintering areas makes such evidence difficult to obtain. It is however, reasonable to consider different management strategies for birds affiliated with the Atlantic Provinces if they do have different harvest distribution, harvest rates, breeding areas and migration corridors. This update of relevant band recoveries will provide additional evidence supporting the existence of two distinct sub-populations.

The neck-collar study coordinated by R. Malecki (1983-1987) provided some information pertinent to the Atlantic Province birds (Bateman, 1991). The present study coordinated by J. Hestbeck (1990-1995) will be more valuable because emphasis is being placed on collecting data in New England and the Atlantic Provinces as well as information on resident birds in the Atlantic flyway (Figure 1).

The most recent compilation and analysis of Canada Goose band recoveries relevant to the Atlantic Provinces was done in 1986 (Bateman and Barrow, 1986). Since that time Canada Goose banding has continued, primarily on Prince Edward Island, and an update is required. Many of the geese banded after 1984 were neck-collared and banding data from those birds are included here. This report is a compilation and summary of Canada Goose banding and recoveries as they relate to the Atlantic Provinces.

Methods

The band recovery files obtained from the Canadian Wildlife Service Banding Office contained all recoveries prior to and including 1989. The recoveries from 1990 and 1991 which were available at the time of analysis (1993) were included as indicated on the tables.

Band recoveries were included if they were from Canada Geese banded as normal wild birds (code 300, 304, 370) or neck-collared (code 302). Birds banded using alpha chloralose (code 688) were not included. Birds banded in New Brunswick in the 1940's were excluded because they were semi-tame birds and the recovery pattern was thought to be unrepresentative of the wild population. A direct recovery was any band returned from a bird shot in the hunting season following banding.

The data were compiled and sorted using the D-base data processing program and maps were prepared using MAPINFO geographical information system.

Results and Discussion

The total number of Canada Geese banded in the Atlantic Provinces between 1920 and 1991 was 1437. Most of those (875 or 61 percent) were banded on Prince Edward Island ; 72 (5 percent) were banded in New Brunswick; 244 (17 percent) in Nova Scotia; 24 (2 percent) on Insular Newfoundland and 222 (15 percent) in Labrador. By 1991 209 bands (14 percent) were recovered from geese banded in the Atlantic Provinces (Figure 2). Atlantic Region recoveries of geese banded in the US totalled 582.

Ninety percent of total band recoveries in the Atlantic Provinces were from birds banded in the US (Table 1). This is expected because comparatively few birds were banded in the Atlantic Provinces. Sixty-four percent of the total recoveries were from birds banded in the states of Maryland, Delaware and south; 12 percent in New York, Pennsylvania or New Jersey; and 13 percent in Maine, Massachusetts, Connecticut or Vermont.

Atlantic Region recoveries of US - Banded Canada Geese

For purposes of analyses the states were grouped into three units: New England, (Maine, New Hampshire, Vermont, Mass., Connecticut, Rhode Island), Mid-Atlantic (New York, Pennsylvania, New Jersey, West Virginia), Chesapeake and south (Maryland, Delaware, Virginia, North Carolina, South Carolina, Georgia, Florida). Most geese banded in the Atlantic Flyway states were banded in the Chesapeake and south states. As expected, only a small proportion of the birds banded in the US were recovered in the Atlantic Provinces. The New England states had the highest proportion of birds recovered in the Atlantic Provinces (0.4 percent).

Seventy-one percent of the US- banded geese recovered in the Atlantic Provinces were banded in the Chesapeake and south states (Table 2) (Figure 3). Birds banded in New England and the mid-Atlantic states made up approximately equal proportions of the Atlantic Region recoveries (15 percent and 14 percent respectively) (Figures 4, 5). The number of Canada Geese banded in the mid-Atlantic states (without West Virginia) was higher (83958) than the number banded (18768) in New England (Table 3). The state with the highest proportion of recoveries in the Atlantic Provinces was Maine with 1.2 percent of the birds banded there recovered in the Atlantic Region.

The distribution of Atlantic Region recoveries of geese banded in the Atlantic Flyway States was closely related to Canada Goose harvest. Fourteen percent of the

recoveries and 17 percent of the Atlantic Province harvest were in Nova Scotia; 22 percent of recoveries and 15 percent of harvest, in New Brunswick; 44 percent of recoveries and 50 percent of harvest, in Prince Edward Island; 20 percent of recoveries, and 18 percent of harvest, in Newfoundland. However, a disproportionately low fraction of Atlantic Region recoveries of New England-banded birds were from Prince Edward Island (only 18 percent), and a disproportionately low fraction of mid-Atlantic-banded birds were recovered from Nova Scotia (6 percent) (Table 4). Only 1 percent of the recoveries from Chesapeake and south states was from Insular Newfoundland but 16 percent of New England-banded goose recoveries were from Insular Newfoundland.

Over half of the US-banded birds recovered on Insular Newfoundland were banded in New England (Table 2). This suggests that Insular Newfoundland birds winter further north because most US banding is done in winter. Most (77 percent) of the Labrador recoveries of US-banded birds were from birds banded in the Chesapeake and south states.

Recoveries of Atlantic Region-banded Canada Geese

A total of 209 band recoveries was recorded from the 1437 Canada Geese banded in the Atlantic Provinces 1920-1991 (Figure 2). Forty-four percent of those recoveries were from the Atlantic Provinces, 25 percent from the Chesapeake and south states, 12 percent from the mid-Atlantic states and 15 percent from New England (Table 5). Nine recoveries (4 percent) were from Quebec; seven from east of 70° longitude, the other two at 71°. Four were banded in Prince Edward Island and 5 in Labrador.

Seventy-two birds were banded in New Brunswick and only 6 recoveries of New Brunswick-banded birds were recorded. Over half (54 percent) of the recoveries of the 244 Nova Scotia-banded birds were from the Chesapeake and south states; 39 percent was from the Atlantic provinces; 6 percent from New England and 2 percent from the mid-Atlantic states.

Recoveries from the 222 Labrador-banded birds were from the Chesapeake and south states (32 percent), New England (26 percent), Quebec (26 percent), mid-Atlantic states (10 percent) and the Atlantic Provinces (5 percent) (Figure 6). The sample size is small - only 19 recoveries were recorded. Three recoveries of the 24 Insular Nfld-banded birds were recorded - one in New York, one in Massachusetts and one in PEI (Figure 7).

The largest sample of recoveries (127) is from the 875 birds banded on Prince Edward Island. Fifty-one percent of the recovered PEI bands were from the Atlantic

Provinces (34 percent were from Prince Edward Island). Thirteen percent of the recoveries were from the Chesapeake and south states; 17 percent from the mid-Atlantic states and 16 percent from New England. Four recoveries (3 percent) were from Quebec east of 70° longitude.

Differences in harvest patterns will change the distribution of band recoveries. Changes in distribution of US- wintering geese combined with reduced harvest in the Chesapeake and south States was also expected to affect the distribution of band recoveries from Atlantic Region-banded birds. An additional variable in recent banding is a change in banding location. Most of the recent banding has been on Prince Edward Island. Earlier banding was largely in Nova Scotia (Table 6).

Direct recoveries of Canada Geese banded in the Atlantic Provinces show a distribution similar to total recoveries (Tables 5, 7) (Figure 3) if time of banding and small sample sizes are considered .

Recoveries from Atlantic Region-banded birds showed a difference in distribution before and after 1985 (Table 8). Prior to 1985, 49 percent of recoveries were from Chesapeake and south states whereas only 13 percent of recoveries were from that location after 1985. An increase in proportion of recoveries from New England (8 percent to 18 percent), the mid-Atlantic States (2 to 21 percent) and the Atlantic Provinces (16 to 23 percent) was recorded. The harvest of Atlantic Province birds was most likely reduced by the changes in regulations in the Chesapeake states in the mid-1980's.

A total of 19,098 Canada Geese have been banded in Quebec north of 55° latitude and west of 70 degrees longitude. From those birds 2,538 (13 percent) recoveries have been reported (Figure 8). Only one bird was recovered in the Atlantic Provinces - a goose banded on the NE coast of Hudson Bay was recovered in New Brunswick. Twelve recoveries (0.5 percent) were reported from New England.

A total of 8,295 Canada Geese has been banded in Quebec north of 55° latitude and east of 70° longitude (Ungava birds). Two of 1,264 recoveries (0.2 percent) are from the Atlantic Provinces: a bird banded in 1986 was shot in Labrador in 1988, and a bird banded in 1988 was shot in Prince Edward Island in 1989 (Figure 9). This strongly suggests that Ungava- breeding birds do not migrate through the Atlantic Provinces either from the breeding grounds or in years

following banding.

Recovery Rates

Direct band recovery rates provide an index to harvest rates of migratory waterfowl. Anything that affects the reporting rate will affect the calculated recovery rate. It was anticipated that a recovery rate from neck-collared geese would be higher than that from leg-banded geese by at least 1.5 times (Samuel et al. 1990). The direct recovery rate 1985-1991 was 7.4, 1.4 times the rate prior to 1985 (Table 9) when most birds were only leg-banded. Location of banding may have affected the recovery rates but the sample size is inadequate to determine that.

Summary

- 1) A total of 1437 Canada Geese was banded in the Atlantic Provinces between 1920 and 1991. Two hundred and nine bands were recovered from those birds by 1991. Geese banded in the Atlantic Flyway states and recovered in the Atlantic Provinces totalled 582.
- 2) A small part (0.3 percent) of the Canada Geese banded in the Atlantic Flyway states was recovered in the Atlantic Provinces. The proportions of birds banded in New England, Mid-Atlantic and Chesapeake and south states that were recovered in the Atlantic Provinces were 0.4 percent, 0.1 percent and 0.3 percent respectively.
- 3) Over half of the recoveries of US-banded birds on Insular Newfoundland were from birds banded in New England. Seventy-seven percent of the Labrador recoveries of US-banded birds was banded in the Chesapeake and south states.
- 4) Of the 209 recoveries of Atlantic Region-banded geese, 44 percent were from the Atlantic Provinces, 25 percent from the Chesapeake and south states, 12 percent from the mid-Atlantic states and 15 percent from New England. Nine recoveries were from Quebec.
- 5) Three recoveries of Insular Newfoundland-banded birds were reported - one from PEI, one from NY and one from Mass. Nineteen recoveries of Labrador-banded birds were from Chesapeake and south states (32 percent), New England (26 percent), Quebec (26 percent), mid-Atlantic states (10 percent) and the Atlantic Provinces (5 percent).
- 6) Over half the recoveries of Nova Scotia-banded birds were from the Chesapeake and south states; 39 percent, from the Atlantic Provinces; 6 percent, from New England and 2 percent, from the mid-Atlantic states.
- 7) Prior to 1985, 49 percent of Atlantic Region-banded bird recoveries were from the Chesapeake and south states. Only 13 percent of recoveries were from those states 1985-1991. The proportion of recoveries from New England increased from 8 percent to 18 percent, and from the mid-Atlantic increased from 2 to 21 percent during these time periods. These changes were most likely

caused by a reduction in harvest in the Chesapeake states in the mid-1980's.

- 8) A total of 8,295 Canada Geese has been banded in Quebec north of 55 latitude and east of 70 longitude (Ungava birds). Two of 1,264 recoveries (0.2 percent) are from the Atlantic Provinces. This strongly suggests that the Ungava breeding birds do not mix with the Atlantic Province birds during migration or on the breeding grounds.
- 9) A total of 19,098 Canada Geese have been banded in Quebec north of 55 latitude and west of 70 longitude. Only one of 2,538 recoveries was from the Atlantic Provinces.

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Table 1. Location and number of Canada geese recovered in the Atlantic Region and banded anywhere (1931-1989).

Location of Banding	Recovery Area									
	Nova Scotia		New Brunswick		Prince Edward Island		Newfoundland		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Connecticut							2		2	
Maine	2		13		4		6		25	
Mass.	19		11		10		14		54	
Vermont	1				1		2		4	
Subtotal	22	22.9	24	18.0	15	5.1	24	19.2	85	13.2
New York	2		4		21		9		36	
Penn.					5		1		6	
New Jersey	3		8		22		6		39	
Subtotal	5	5.2	12	9.0	48	16.4	16	12.8	81	12.5
Delaware	13		28		45		28		114	
Maryland	17		15		46		13		91	
N. Carolina	22		42		99		31		194	
S. Carolina	1				1				2	
Virginia	1		5		3		5		14	
Georgia							1		1	
Subtotal	54	56.2	90	67.7	194	66.4	78	62.4	416	64.4
Nova Scotia	7		2		11		1		21	
New Brunswick			2						2	
PEI	8		2		23		5		38	
Newfoundland										
P. Quebec			1		1		1		3	
Subtotal	15	15.6	7	5.3	35	12.0	7	5.6	64	9.9
Total	96	100	133	100	292	100	125	100	646	100

Table 2. Atlantic Region recoveries of Canada Geese banded in the Atlantic Flyway states (1931-1989).

Location of Banding	Recovery Area											
	Nova Scotia		New Brunswick		Prince Edward Island		Ins. Nfld		Labrador		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Connecticut							2				2	
Maine	2		13		4				6		25	
Mass.	19		11		10		12		2		54	
Vermont	1				1				2		4	
Subtotal	22	27.2	24	19.0	15	5.8	14	58.3	10	10.6	85	14.6
New York	2		4		21		4*		5		36	
Penn.					5				1		6	
New Jersey	3		8		22				6		39	
Subtotal	5	6.2	12	9.5	48	18.7	4	16.7	12	12.8	81	13.9
Delaware	13		28		45		2		26		114	
Maryland	17		15		46		2		11		91	
N. Carolina	22		42		99		1		30		194	
S. Carolina	1				1						2	
Virginia	1		5		3		1		4		14	
Georgia									1		1	
Subtotal	54	66.7	90	71.4	194	75.5	6	25.0	72	76.6	416	71.5
Grand Total	81	100	126	100	257	100	24	100	94	100	582	100

* 1 shot in Newfoundland (Province) but exact location not reported.

Table 3. The numbers of Canada Geese banded in the Atlantic Flyway states and recovered in the Atlantic provinces (up to 1989).

Province/state	Total Geese banded	Atlantic Region Recoveries	% of birds banded	% of Atlantic Region Recoveries from US-banded geese
Connecticut	3629	2	0.06	0.3
Maine	2059	25	1.2	4.3
Mass.	9355	54	0.6	9.3
Vermont	2603	4	0.2	0.7
New Hampshire	284	0	0	0
Rhode Island	838	0	0	0
Subtotal	18768	85	0.4	14.6
New York	43642	36	0.1	6.2
Pennsylvania	19259	6	0.03	1.0
New Jersey	21057	39	0.2	6.7
Subtotal	83958	81	0.1	13.9
Delaware	15569	114	0.7	19.6
Maryland	54679	91	0.2	15.6
N. Carolina	28049	194	0.7	33.3
S. Carolina	6468	2	0.03	0.3
Virginia	10577	14	0.1	2.4
Georgia	3471	1	0.03	0.2
Florida	2219	0	0	0
Subtotal	121 032	416	0.3	71.5
Grand Total	223 758	582	0.3	100

Table 4. Distribution among the Atlantic Provinces of recoveries from Canada Geese banded in the Atlantic Flyway states (1931-1989).

Birds banded in US and recovered in AR which were recovered in												
Location of Banding	Nova Scotia		New Brunswick		Prince Edward Island		Ins. Nfld		Labrador		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Connecticut							2				2	
Maine	2		13		4				6		25	
Mass.	19		11		10		12		2		54	
Vermont	1				1				2		4	
Subtotal	22	25.9	24	28.2	15	17.6	14	16.5	10	11.8	85	100
New York	2		4		21		4*		5		36	
Penn.					5				1		6	
New Jersey	3		8		22				6		39	
Subtotal	5	6.2	12	14.8	48	59.2	4	4.9	12	14.8	81	100
Delaware	13		28		45		2**		26		114	
Maryland	17		15		46		2		11		91	
N. Carolina	22		42		99		1		30		194	
S. Carolina	1				1						2	
Virginia	1		5		3		1		4		14	
Georgia									1		1	
Subtotal	54	13.0	90	21.6	194	46.6	6	1.4	72	17.3	416	100
Grant Total	81	13.9	126	21.6	257	44.2	24	8.2	94	16.1	582	100
Fraction of Harvest	NS		NB		PEI		Ins. Nfld		Lab.			
	17%		15%		50%		10%		8%			

* 1 shot in Newfoundland (Province) but exact location not reported.

** both shot in Newfoundland (Province) but exact location not reported.

Table 5. Location and number of bands recovered from Canada Geese banded in the Atlantic Provinces and recovered anywhere (Up to -1991).

Recovery Location	Banding Locations											
	Nova Scotia		New Brunswick		Prince Edward Island		Ins. Nfld		Labrador		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Connecticut	1				6						7	
Maine			1		1				1		3	
Mass.	2		1		8		1		2		14	
New Hampshire									1		1	
Rhode Island					5				1		6	
Subtotals	3	5.6	2	33.3	20	15.7	1	33.3	5	26.3	31	14.8
New York	1				17		1		2		21	
New Jersey					5						5	
Penn.												
Subtotals	1	1.9			22	17.3	1	33.3	2	10.5	26	12.4
Delaware	4				7				1		12	
Maryland	15				4				3		22	
N. Carolina	8		1		4				1		14	
Virginia	2				1				1		4	
Subtotals	29	53.7	1	16.7	16	12.6			6	31.6	52	24.9
Nova Scotia	7				11						18	
New Brunswick	2		2		4				1		9	
PEI	11		1		43		1				56	
Ins. Nfld	1				2						3	
Labrador					5						5	
Subtotals	21	38.9	3	50.0	65	51.2	1	33.3	1	5.3	91	43.5
Quebec		0.0		0.0	4	3.1		0.0	5	26.3	9	4.3
Grand Totals	54	100	6	100	127	100	3	100	19	100	209	100

Table 6. The numbers of Canada Geese banded in the Atlantic Provinces by time period (1920-1991).

Banding Period	New Brunswick	Nova Scotia	Prince Edward Island	I. Nfld	Lab.	Total
1920-29	13	1	-	-	-	14
1930-39	-	1	-	-	-	1
1940-49	-	-	-	-	-	-
1950-59	10	10	22	10	-	52
1960-69	-	108	6	2	-	116
1970-79	10	113	1	-	-	124
1980-84	3	10	45	-	49	107
1985-91	36	1	801	12	173	1023
Total	72	244	875	24	222	1437

Table 7. Location and number of direct band recoveries from Canada Geese banded in the Atlantic Provinces (up to 1991).

Recovery Location	Banding Locations											
	Nova Scotia		New Brunswick		Prince Edward Island		Nfld		Labrador		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Connecticut			1		4						5	
Maine			1								1	
Mass.					4		2		1		7	
New Hampshire									1		1	
Rhode Island					2						2	
Subtotal			2	66.7	10	15.6	2	50.0	2	33.3	16	17.2
New York			1		12		2		1		16	
New Jersey					3						3	
Penn.												
Subtotal			1	33.3	15	23.4	2	50.0	1	16.7	19	20.4
Delaware	2				3				1		6	
Maryland	6				2				1		9	
N. Carolina	5				1						6	
Virginia												
Subtotal	13	81.2			6	9.4			2	33.3	21	22.6
Nova Scotia	2				5						7	
New Brunswick					2						2	
PEI	1				24						25	
In. Nfld												
Labrador					2						2	
Subtotal	3	18.8			33	51.6					36	38.7
Quebec									1	16.7	1	1.1
Grand Total	16	100	3	100	64	100	4	100	6	100	93	100

Table 8. Number and location of bands recovered from Canada Geese banded in the Atlantic Provinces and recovered anywhere, 1923-1984 and 1985-1991.

No. (%) of Total Bands Recovered - Location of recovery									
Location of Banding	Time Period	Atlantic Region*	Same Province	Quebec	Chesapeake	Mid Atlantic	New England	Total	
NB	1923-84	-	1(33.3)	-	1(33.3)	-	1(33.3)	3	
	1985-91	1(33.3)	1(33.3)	-	-	-	1(33.3)	3	
	Total	1(16.7)	2(33.3)	-	1(16.7)	-	2(33.3)	6	
NS	1923-84	14(25.9)	7(13.0)	-	29(53.7)	1(1.9)	3(5.6)	54	
	1985-91	-	-	-	-	1(1.9)	3(5.6)	54	
	Total	14(25.9)	7(13.0)	-	29(53.7)	1(1.9)	3(5.6)	54	
PEI	1923-84	2(22.2)	2(22.2)	1(11.1)	3(33.3)	-	1(11.1)	9	
	1985-91	20(16.9)	41(34.7)	3(2.5)	13(11.0)	22(18.6)	19(16.1)	118	
	Total	22(17.3)	43(33.9)	4(3.1)	16(12.6)	22(17.3)	20(15.7)	127	
Nfld (insular)	1923-84	-	-	-	-	-	-	-	
	1985-91	1(33.3)	-	-	-	1(33.3)	1(33.3)	3	
	Total	1(33.3)	-	-	-	1(33.3)	1(33.3)	3	
Labrador	1923-84	-	-	1(100.0)	-	-	-	1	
	1985-91	1(5.6)	-	4(22.2)	6(33.3)	2(11.1)	5(27.8)	18	
	Total	1(5.3)	-	5(26.3)	6(31.6)	2(10.5)	5(26.3)	19	
Region Total	1923-84	16(23.9)	10(14.9)	2(3.0)	33(49.3)	1(1.5)	5(7.5)	67	
	1985-91	23(16.2)	42(29.6)	7(4.9)	19(13.4)	25(17.6)	26(18.3)	142	
	Total	39(18.7)	52(24.9)	9(4.3)	52(24.9)	26(12.4)	31(14.8)	209	

* Exclude same province recoveries.

Table 9. The number of recoveries and direct recovery rates for Canada Geese banded in the Atlantic Provinces 1920-1984, 1985-1991.

Banding Location	Time Period	No. Banded	No. of Direct Recoveries (rate)
New Brunswick	1920-1984	36	1(2.8)
	1985-1991	36	2(5.6)
	Total	72	3(4.2)
Nova Scotia	1920-1984	243	16(6.6)
	1985-1991	1	0
	Total	244	16(6.6)
Prince Edward Island	1920-1984	74	2(2.7)
	1985-1991	801	63(7.9)
	Total	875	65(7.4)
Newfoundland	1920-1984	61	2(3.3)
	1985-1991	185	16(5.4)
	Total	246	12(4.9)
Region Total	1920-1984	414	20(4.8)
	1985-1991	1023	76(7.4)
	Total	1437	96(6.7)

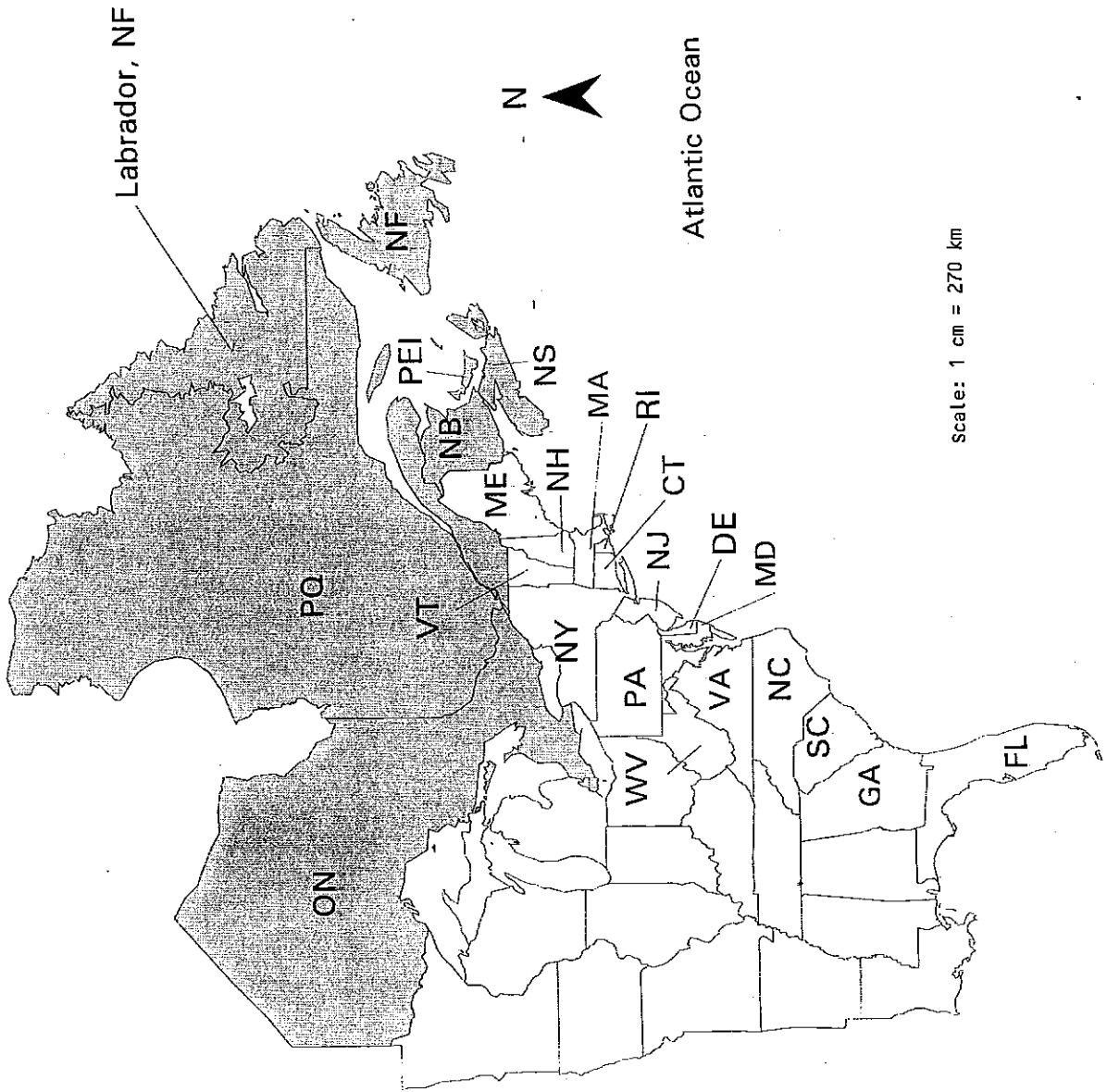


Figure 1. Provinces and states comprising the Atlantic Flyway.

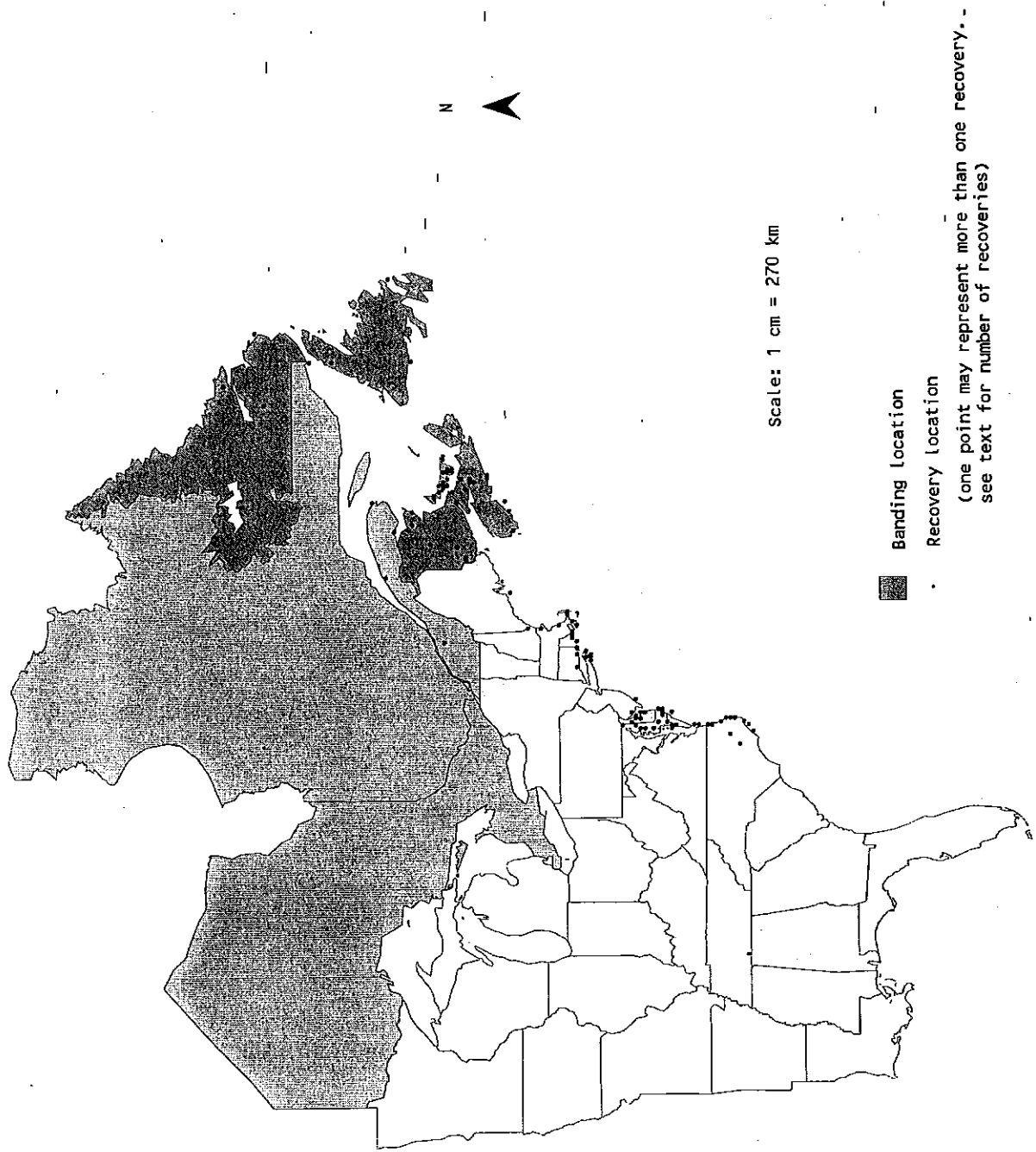


Figure 2. Locations of Canada Goose band recoveries from geese banded in the Atlantic Region (1959 - 1989).

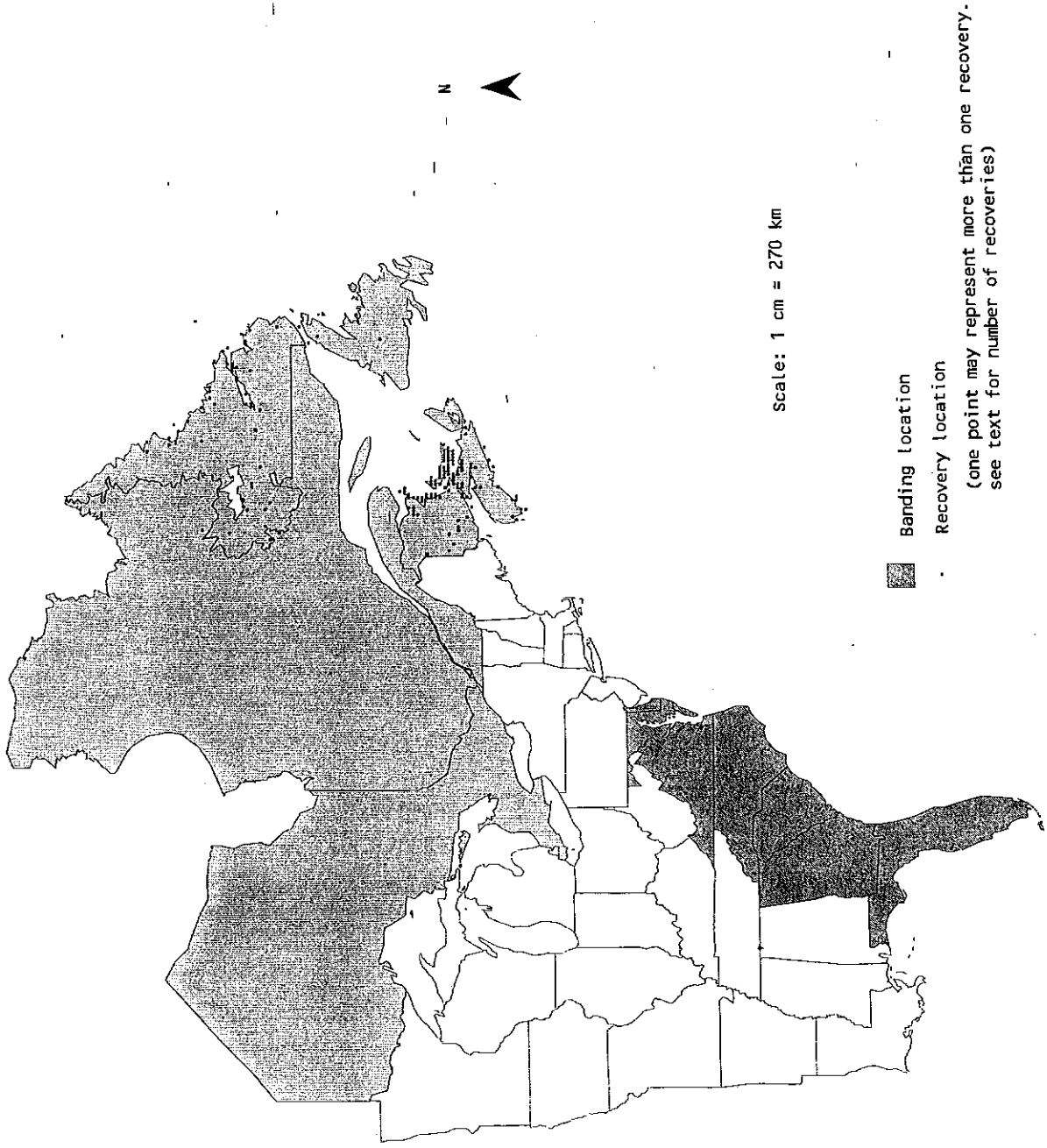


Figure 3. Locations of Canada Goose band recoveries in the Atlantic Region from geese banded in the Chesapeake states (1931 - 1989).

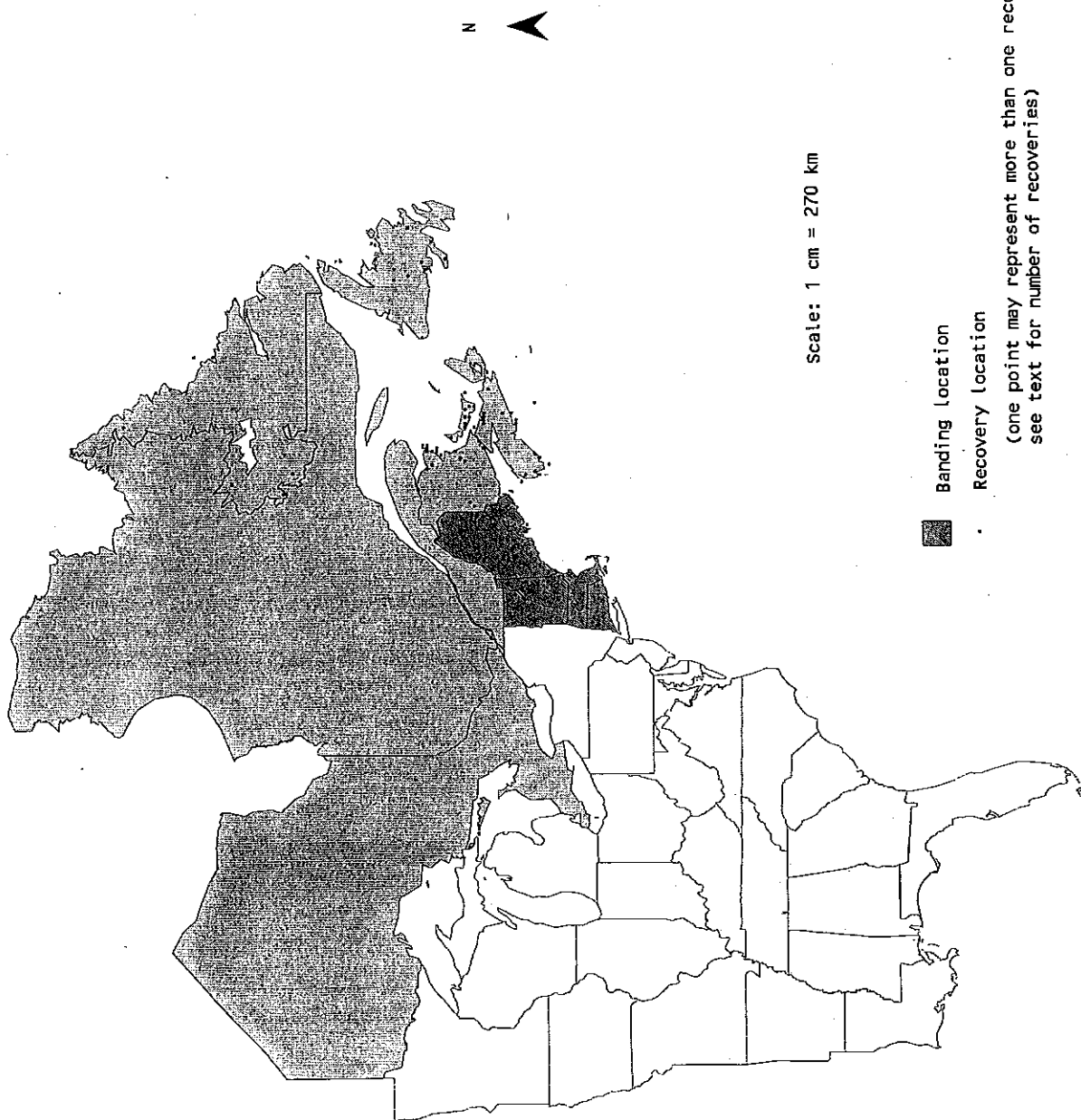


Figure 4. Locations of Canada Goose band recoveries in the Atlantic Region from geese banded in the New England states (1931 - 1989)

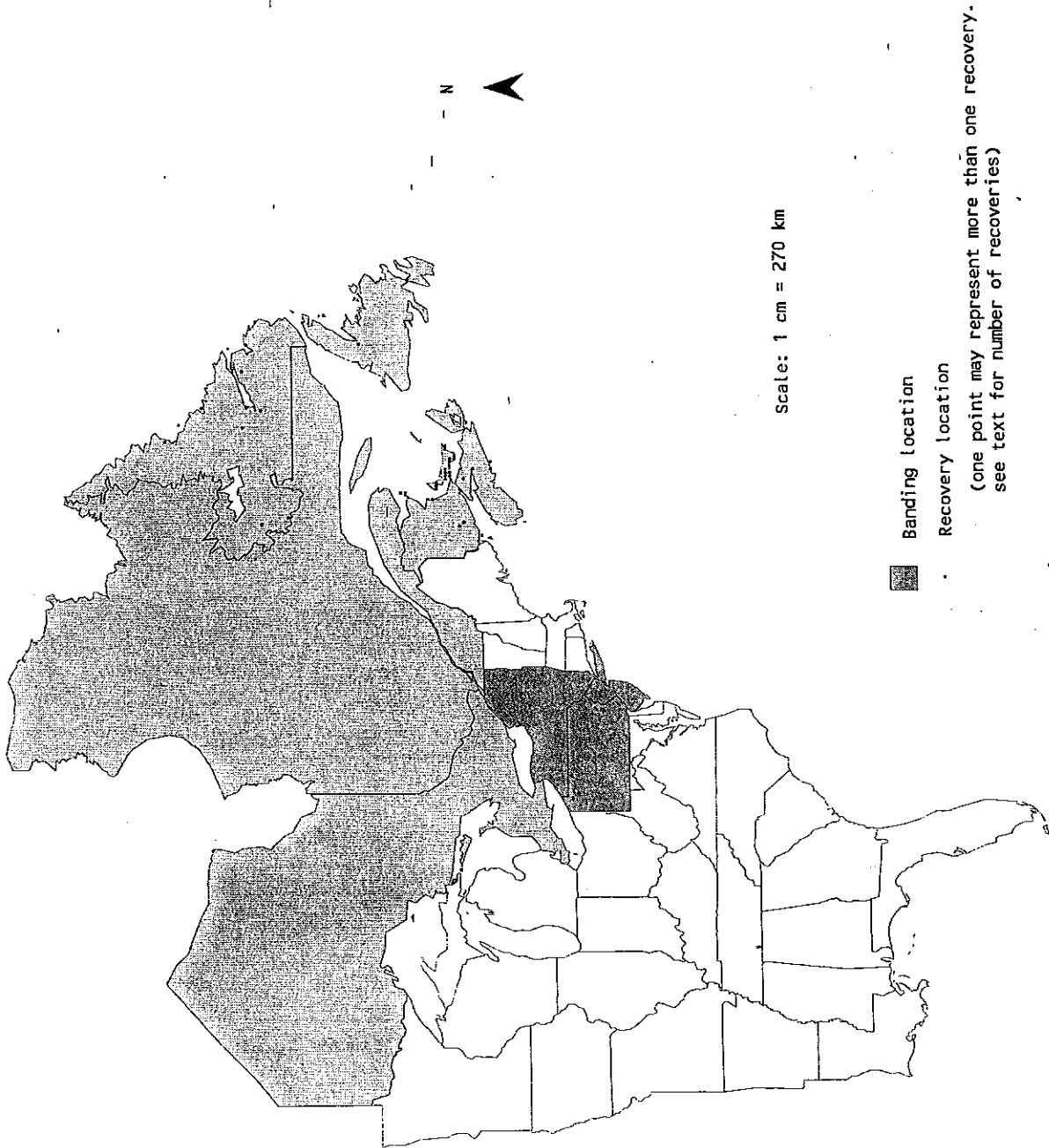


Figure 5. Locations of Canada Goose band recoveries in the Atlantic Region from geese banded in the Mid - Atlantic states (1931 - 1989).

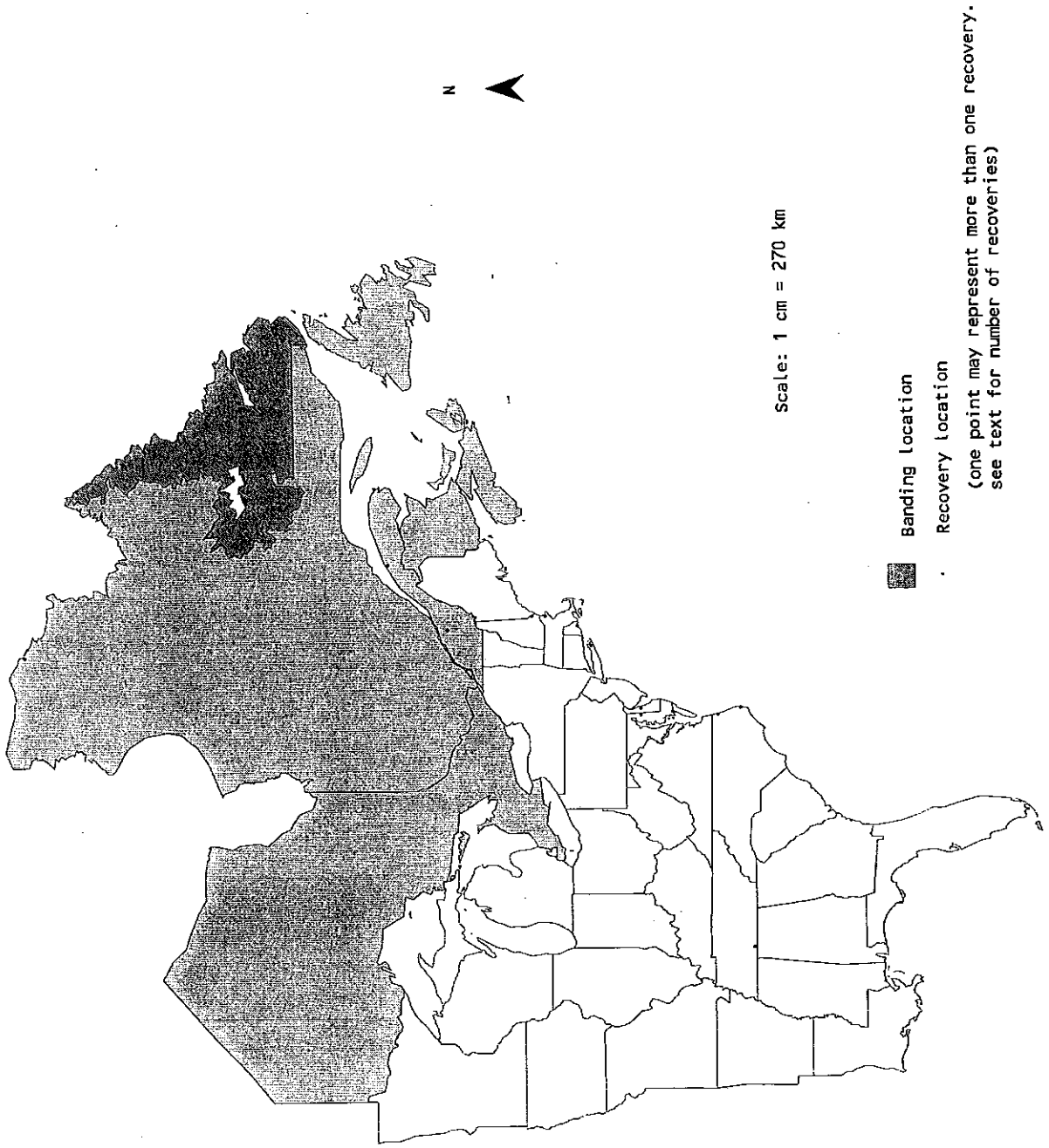


Figure 6. Locations of Canada Goose band recoveries from geese banded in Labrador, Newfoundland (1936 - 1989).

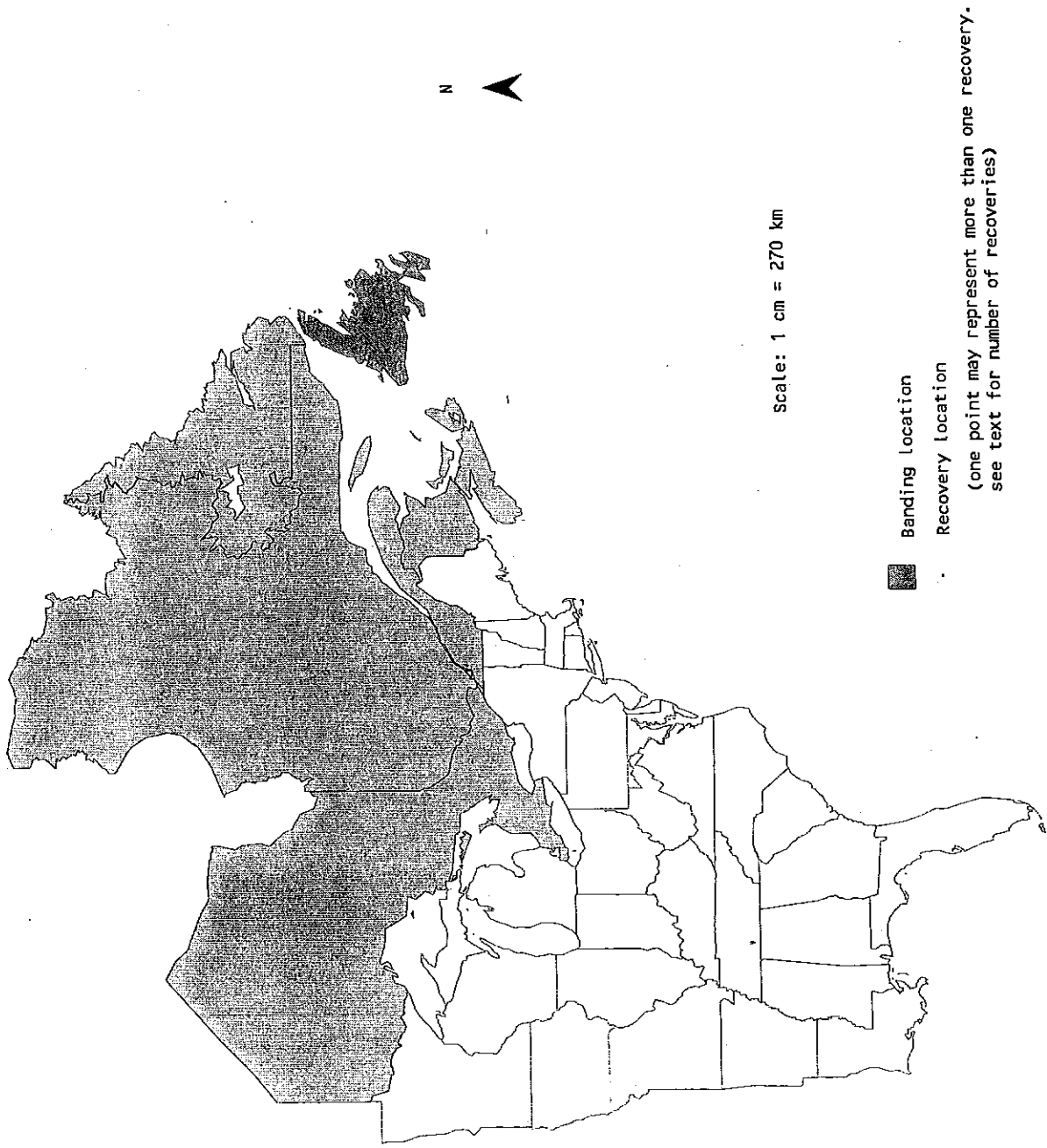


Figure 7. Locations of Canada Goose band recoveries from geese banded on insular Newfoundland (1989).

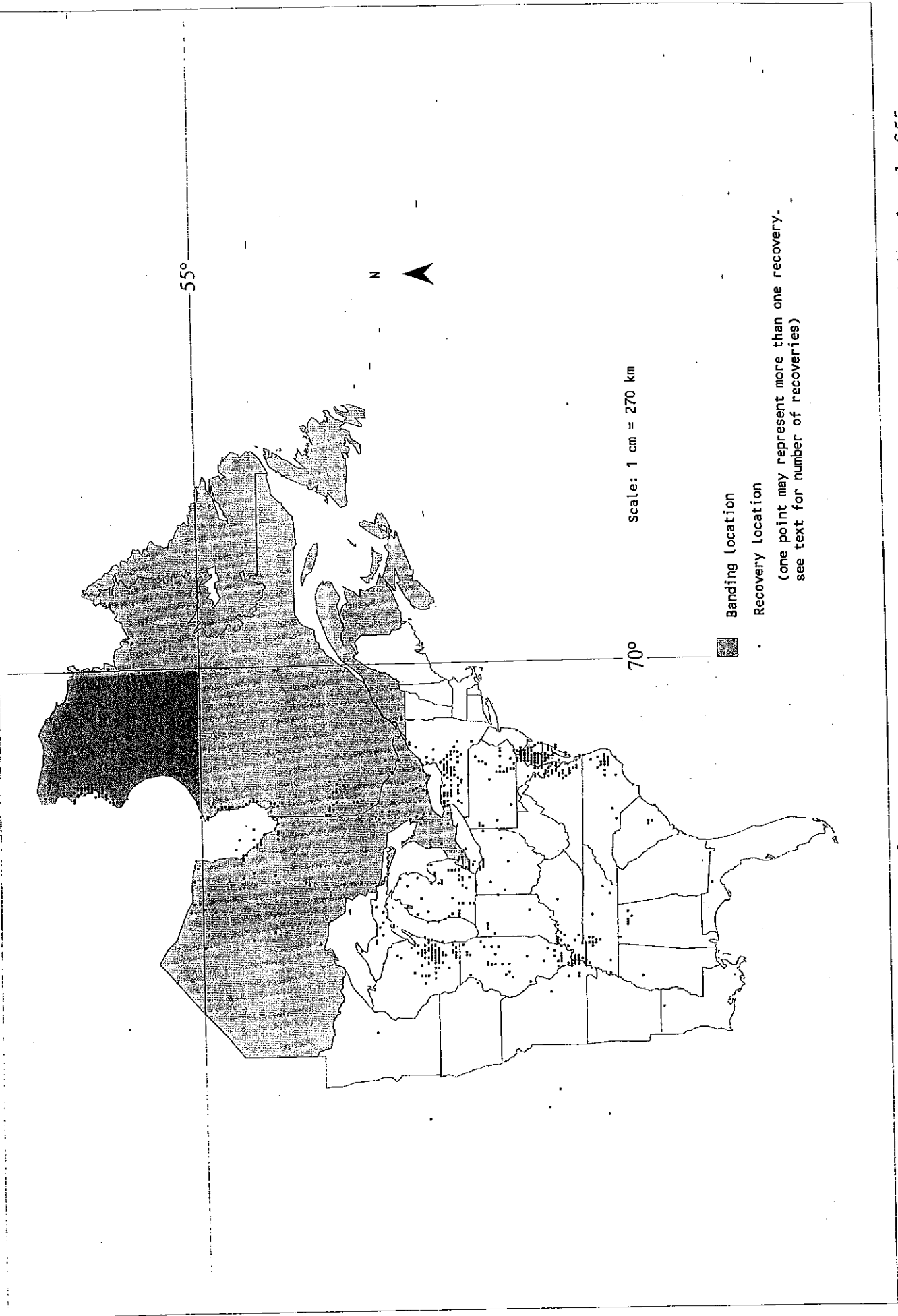


Figure 8. Locations of Canada Goose band recoveries from geese banded in Quebec, west of 70 degrees longitude and north of 55 degrees latitude (1965 - 1989). One of 2538 recoveries is in the Atlantic Provinces.

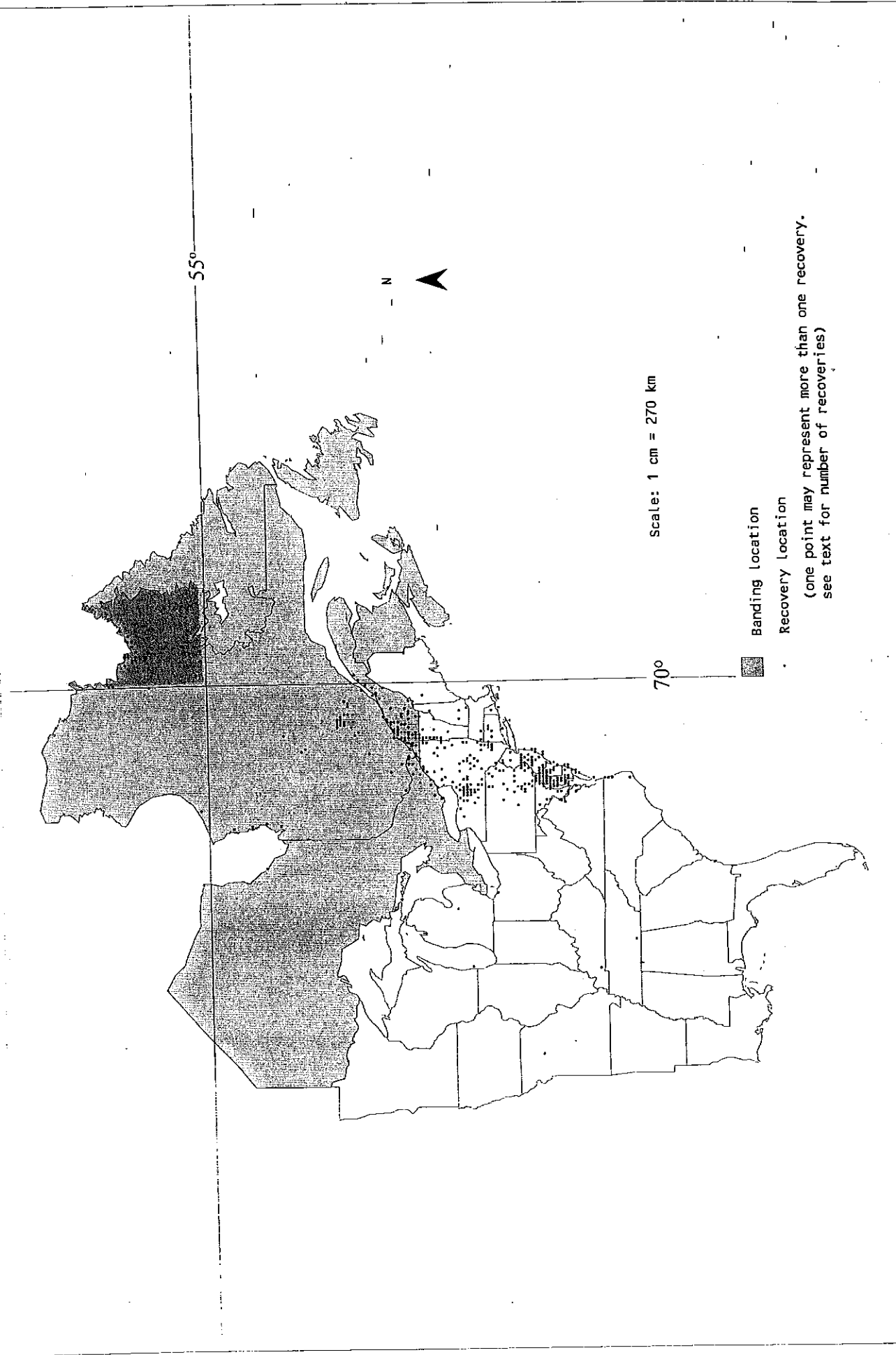


Figure 9. Locations of Canada Goose band recoveries from geese banded in Quebec, east of 70 degrees longitude and north of 55 degrees latitude (1964 - 1989). Two of 1264 recoveries are in the Atlantic Provinces.