

CANADIAN WILDLIFE SERVICE  
P. O. BOX 1590  
SACKVILLE, N. B.  
EOA 3CD

REPORT

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**Canada Goose Breeding Ground Survey**

**Labrador 1993**

**MC. Bateman  
Canadian Wildlife Service  
Atlantic Region**

**September 1993**

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**Funding provided by Department of National Defence Wildlife Avoidance Program.**

### Abstract

A survey for breeding Canada Geese was flown in Labrador June 1 to 15, 1993. Transects totalling 6678 km were flown with a fixed-wing aircraft. Based on this survey an estimated 27000 (SE 3532) pairs of Canada Geese breed in Labrador. Few geese breed outside the surveyed area.

Approximately 65 percent of the area sampled in 1993 was surveyed with an identical survey in 1980. Comparison of results from the 1980 survey and results from the same area in 1993 showed no change in the number of pairs but fewer total birds observed on the 1993 survey. The low number of sub-adult birds present in 1993 will reduce the ability of the population to withstand high mortality.

The areas of highest densities of observed geese were in the southeast (St. Paul and Eagle Rivers), and southwest (Atikonak Lake, Domagaya Lake).

## Introduction

The migrant portion of the Atlantic flyway Canada Goose population is declining as evidenced by a decreasing Midwinter Index in the US since the mid 1980's (Serie 1993). Although indexes from wintering birds in the Atlantic flyway states are influenced by the resident population, accumulating data suggest a significant decrease in the number of migrants wintering south from the mid-Atlantic states. To address this problem some states reduced their harvest in 1988 and changes to reduce the harvest were made in regulations of all Atlantic flyway states in 1992.

Information available for the Atlantic flyway Canada Geese include harvest estimates, age ratios in the harvest, midwinter indices, band recoveries and survival rates. Analysis of this information is complicated by the presence of different populations or subpopulations on the wintering grounds. The summer population of resident birds in the Atlantic flyway may approach 600 000 (preliminary data presented at the At. Fly. Tech. Section July 1993), and whereas the Atlantic province birds may make up 15 percent of the migrants.

Consistent breeding ground surveys to monitor the subarctic-nesting migrants are conspicuously lacking. Early surveys by Chamberlain and Kazinski (1965) and Gillespie and Wetmore (1974) provided distribution information but the data were not precise enough for monitoring purposes. In 1980 Goudie and Whitman (1987) estimated 22000 breeding pairs of Canada Geese in Labrador. As many as 5000 pairs of Canada Geese may breed on insular

Newfoundland (Goudie 1987). In 1988 Malecki and Trost (1990) estimated a breeding population of 157 000 pairs in northern Quebec.

Increasing concern about the status of the Atlantic flyway migrants resulted in two breeding ground surveys in 1993. A survey in northern Quebec comparable to the 1988 survey was flown June 11-20 by CWS Quebec Region and cooperating agencies. The Department of National Defence and the native people of Labrador have concerns about possible impacts of low level flying on breeding waterfowl populations in Labrador. The Wildlife Avoidance Programs of the Department of National Defence requires information on distribution and densities of breeding geese. A survey in Labrador comparable to the 1980 survey was flown June 1-15. This report presents the results from the 1993 survey in Labrador.

#### Acknowledgements

Financial support was provided by the Department of National Defense Wildlife Avoidance Program. Contributions of Eugene Cole (pilot) and Morgan Michelin (observer) to the success of the survey are gratefully acknowledged.

## Methods

The survey was designed to be comparable to the fixed-wing transect survey flown in southeast Labrador in 1980 (Goudie and Whitman 1987). The 1993 survey sampled all of Labrador south of 55° latitude. The north-south transects followed the 0° and 30' longitude lines from the coast or the Quebec border in the south to the coast, the Quebec border or the 55° latitude in the north (Figure 1). Twenty four transects totalling 6687 km were flown between June 1 and June 15 1993.

The survey was flown in a Cessna 206 on wheels (Labrador Travel Air) with a pilot, a navigator/observer and one observer. Locations of all observations of Canada Geese were mapped on 1:250 000 National Topographic Series maps. Navigation was assisted by the use of a Geographical Positioning System. The transects were flown at ground speeds of 120-130 km/hour and an altitude of about 30 meters agl. Aircraft struts were marked for transect widths of 200 m (100m each side) and 400 m (200 m each side). All geese recorded were within the 200 m transect width.

The data were analyzed by Ecological (biophysical) Land Units (Lands Directorate, Environmental Management Service, Canada Dept. of Fisheries & Environment 1977) (Appendix I), and for the complete survey. Transects 1 to 15 covered the area surveyed by the same methods in 1980 and were analyzed separately for comparison to results from that survey.

A single Canada Goose or two geese together were considered an indicated pair. Groups of more than two birds were considered to be nonbreeders. A lone bird in most cases would have had a mate on a nest in the immediate area.

## Results and Discussion

Timing of the survey (June 1 to 15, 1993) was judged appropriate for breeding geese. All bogs and ponds were snow and ice-free. Large bodies of water, such as the Smallwood Reservoir, had significant ice cover remaining. Although nesting chronology can vary from year to year depending on weather condition, early June generally corresponds to nest initiation for Geese.

The estimated breeding population of Canada Geese in the surveyed portion of Labrador (247 000 km<sup>2</sup>) was 13600 (SE 1768) without adjusting for visibility (Table 1). Comparison of the fixed-wing results with results from a helicopter survey in Labrador suggests that a visibility correction of 2 is conservative (based on results from nineteen 100 km<sup>2</sup> plots surveyed by helicopter in June 1992 and compared only with 1993 transects from the same region of Labrador (Appendix II)). Using a visibility correction of 2x the estimated breeding population for Labrador is 27 000 (SE 3532).

Fixed-wing transect surveys carried out in southeastern Labrador in 1980 (Goudie and Whitman 1987) covered only the area surveyed by transects 1 to 15 in 1993. Comparison of results from the 1993 transects 1 to 15 with the 1980 results indicated no change in the number of breeding pairs of geese observed (Table 2). However, the number of non-breeding geese observed in 1993 was significantly less than was observed in 1980. In 1993 the total number of geese observed was approximately double the number of indicated pairs but in 1980 the total number of geese was 4-5 times the number of indicated pairs. Data from six 10 km x 10 km Black Duck Joint



Venture blocks in southeastern Labrador in 1990 also showed a total number of geese about double the number of indicated pairs (Goudie unpub. data). As well, results from helicopter surveyed plots in western Labrador in 1992 showed total numbers approximately 2 to 3 times the number of indicated pairs (CWS unpublished data). Previous surveys in Labrador (Gillespie and Wetmore 1974) in 1970, 1971, 1972 reported totals for Canada Geese 3 to 4 times the number of pairs.

Possible reasons for these differences in number of (assumed) non-breeding birds relative to breeding pairs include fewer subadults and a different distribution of non-breeders. Gillespie and Wetmore (1974) reported an influx of non-breeding geese after the breeding pair survey in 1970. Few non-breeding birds (sub-adults) suggests that production may have been low for several years. This agrees with the age ratios from the Species Composition Survey. Managers should be aware that low representation of those age cohorts in the population may affect the number of breeding birds in future years as those age classes mature.

Canada Geese were not uniformly distributed over the survey area (Figure 2). Overall the density of geese observed inside the low level flying zones (7.1 ind. pr. per 100 km<sup>2</sup>) was higher than in the same ecoregions outside the zones (5.3 ind. pr. per 100 km<sup>2</sup>).

## Summary

- 1) Canada Goose survey was flown in Labrador June 1 to 15 1993 using fixed-wing aircraft and north-south transects.
- 2) The estimate of the breeding Canada Goose population from the results of that survey (using a visibility correction of 2x) was 27000 (SE 3532) pairs.
- 3) Comparison of the results from transects 1 to 15 in 1993 with results from fixed-wing transects in the same area in 1980 indicated no change in the number of pairs but significantly fewer total birds observed.
- 4) The low number of subadult birds observed in 1993 will reduce the population's ability to recover from high mortality.
- 5) The areas of highest densities of observed geese were in the southeast (St. Paul, Eagle Rivers) and southwest (Atikonak Lake, Domagaya Lake).

## References Cited

- Chamberlain, E.B. and C.F. Kaczynski 1965. Problems in aerial surveys of waterfowl in eastern Canada. USFWS Spec. Sci. Rep. Wildlife No. 93. 21 pp.
- Gillespie, D.I. and S.P. Wetmore 1974. Waterfowl surveys in Labrador - Ungava, 1970, 1971, 1972. Can. Wildl. Ser. Rep. Ser. No. 29. Pages 8-18.
- Goudie, R.I. 1987. Preliminary estimates of waterfowl breeding populations in Newfoundland, 1978-1979. Can. Wildl. Ser. Occ. Paper No. 60 pp 36-44.
- Goudie, R.I. and W.R. Whitman, 1987. Waterfowl populations in Labrador, 1980-1982. Can. Wildl. Ser. Occ. Paper No. 60. pp 45-64.
- Malecki, R.A. and R.E. Trost 1990. A breeding ground survey of Atlantic flyway Canada Geese, Branta Canadensis, in northern Quebec. Can. Field-Nat. 104 (4) : 575-578.
- Serie, J.R. 1993. Results of the 1993 midwinter waterfowl survey in the Atlantic Flyway States. USFWS draft report. Laurel Md. 3 pp.

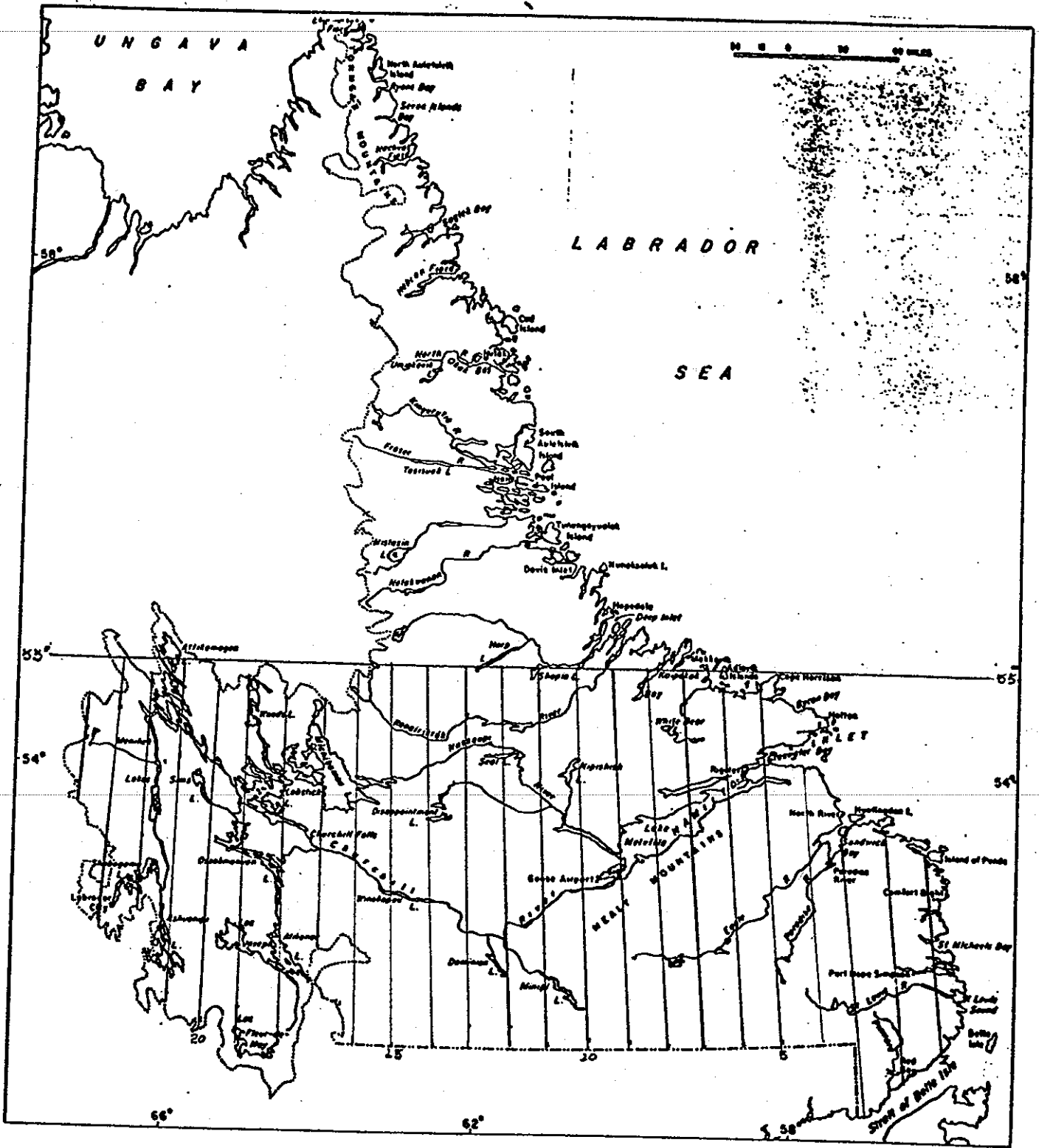
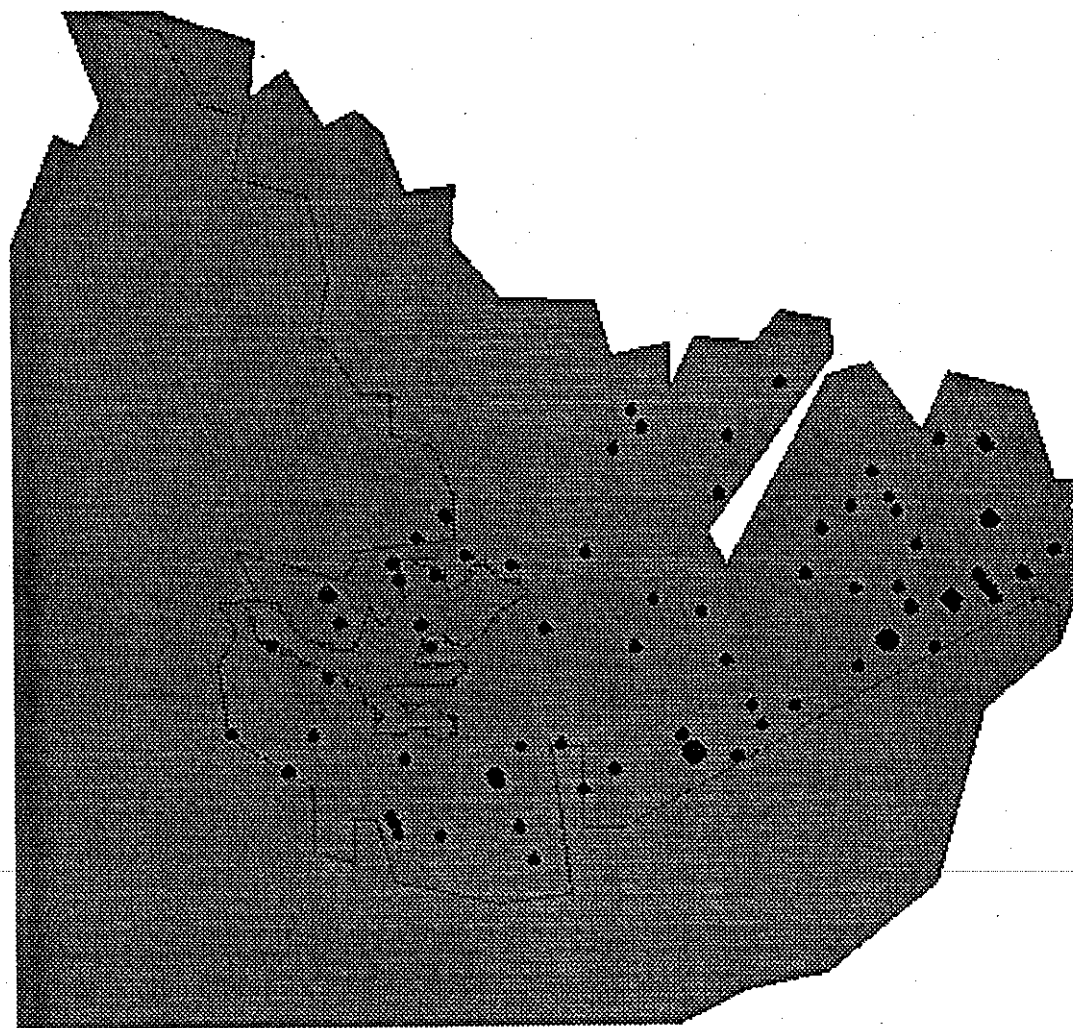


Figure 1. Approximate locations of north-south transects flown with a fixed-wing aircraft on a Canada Goose survey of Labrador June 1-15, 1993. The transects are 30' longitude apart on the degree and 30' lines.

50 0 250 km



number

- 1
- 2
- 3
- 5
- 6
- 7

Figure 2. Approximate locations of Canada Goose observations recorded on a fixed-wing survey in Labrador, June 1 to 15, 1993.

Table 1. The estimated number of Canada Geese in Labrador derived from a fixed-wing survey, June 1-15 1993.

	Uncorrected	With Visibility Correction X2
Total transect length (km)	6687	--
Total area surveyed (km <sup>2</sup> )	1337	--
Average density (indicated pairs per 100 km <sup>2</sup> )	5.5	11.0
Average density (total geese per 100 km <sup>2</sup> )	10.9	21.8
Estimated indicated pairs in area sampled (247 000 km <sup>2</sup> )	13 500 (SE 1766)	27 000 (SE 3532)
Estimated total geese in area sampled (247 000 km <sup>2</sup> )	26 900 (SE 4300)	53 800 (SE 8600)

Table 2. Comparison of the 1980 fixed-wing transect results with results from transects 1 to 15 in 1993 (uncorrected for visibility).

	1980	1993
Total transect length (km)	4252	4379
Total area surveyed (km <sup>2</sup> )	850	876
Average density (indicated pairs per 100 km <sup>2</sup> )	5.6	5.4
Average density (total geese per 100 km <sup>2</sup> )	26.8	10.9
Estimated indicated pairs in area sampled (138520 km <sup>2</sup> )	7756 (SE=?)	7480 (SE1077)
Estimated total geese in area sampled (138 520 km <sup>2</sup> )	37 100 (SE=?)	15100(SE2627)

## Appendix I

### Analysis by ecoregion of results from a fixed-wing transect Canada Goose Survey in Labrador June 1 to 15 1993.

The analysis by ecoregion resulted in no difference between estimated pairs of geese in 1980 and 1993 on comparable areas (transects 1 to 15) (Table i). However, the number of birds estimated on the area in 1980 was 2.5 times the number estimated from the 1993 survey (Table ii).

Sample size from some small ecoregions was very small and results are not reliable. This may cause the discrepancies between relative importance of ecoregions in the 1980 and 1993 surveys. For example, the density of indicated pairs in the Postville Region was 14 per 100 km<sup>2</sup> in 1980 but 3 per 100 km<sup>2</sup> in 1993 and in the St. Paul region, 4 indicated pairs per 100 km<sup>2</sup> were recorded in 1980 but 16 indicated pairs per 100 km<sup>2</sup> in 1993.



**Table i** A comparison by ecoregion of densities of Canada Geese observed (uncorrected) on fixed-wing transects (1-15 this study) in June 1993 and similar transects in the same area in June 1980.\*

Ecoregion**	1980			1993		
	Sample Size (km <sup>2</sup> )	Mean No. (Ind. Pr/ 100 km <sup>2</sup> )	Est. Ind. Pr. in Ecoregion	Sample Size (km <sup>2</sup> )	Mean No. (Ind.Pr./ 100km <sup>2</sup> )	Est.Ind.Pr. in Ecoregion
Postville	72	14	2539	99	3	544
Nipishish Lk.	98	4	756	117	6	1134
Churchill Fal	171	4	939	149	5.5	1291
Dom. Lk.	28	0	0	36	8.5	841
Lk.Melville	123	4	674	128	1	168
Eagle Plateau	121	6	1145	110	8	1527
St. Paul	111	4	490	70	16	1960
Paradise Riv	125	8	1592	119	5	995
Total	<u>849</u>		<u>8135</u>	<u>828</u>		<u>8460</u>

\*data from Goudie and Whitman (1987)

\*\* from maps by Lands Directorate, Environmental Management Service, Canada Dept. of Fisheries and Environment (1977)

**Table ii.** A comparison by ecoregion of total densities of Canada Geese observed (uncorrected) on fixed-wing transects (1 to 15 this study) in June 1993 and similar transects in the same area in June 1980.\*

Ecoregion**	1980			1993		
	Sample Size (km <sup>2</sup> )	Mean No. Birds/ 100 km <sup>2</sup>	Est. Geese in Ecoregion	Sample Size	Mean No. Birds/ 100km <sup>2</sup>	Est. Geese in Ecoregion
Postville	72	92	16688	99	5	907
Nipishish Lk.	98	40	7560	117	9	1776
Churchill Fal	171	16	3758	149	11.4	2678
Dom. Lk.	28	6	594	36	11.0	1089
Lk.Melville	123	4	674	128	1.5	252
Eagle Plateau	121	12	2290	110	14.8	2768
St. Paul	111	26	3185		45.8	5610
Paradise Riv	125	40	7960	119	10.1	1990
Total	<u>849</u>		<u>42709</u>	<u>828</u>		<u>17070</u>

\*data from Goudie and Whitman (1987)

\*\* from maps by Lands Directorate, Environmental Management Service, Canada Dept. of Fisheries and Environment (1977).

## **Appendix II**

Comparison of Canada Goose observations recorded on a helicopter survey in 1992 and on a fixed-wing survey of the same area in 1993.

Nineteen plots 10 km x 10 km were flown June 3 to 19 1992 using the standard operating procedures of Black Duck Joint Venture breeding pair surveys (CWS unpublished data collected under the Canada - NFL Comprehensive Labrador Agreement). All plots were located in the Lake Plateau of Western Labrador in the Smallwood Reservoir, Churchill Falls, Harp Lake or Seahorse Ecoregions. In 1993, 495 sq km (2475 linear km) of those four ecoregions was surveyed in this survey.

The number of Canada Geese present may have been different in 1992 and 1993. However, it is likely that most of the difference noted here is due to survey methods.

*Table iii.* A comparison of Canada Goose observations on helicopter plots and fixed-wing transects in the same area of Labrador.

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	<u>Sample Size</u>	<u>Mean No Ind. Pr./100</u> <u>km<sup>2</sup></u>	<u>Mean No. Total</u> <u>Geese/100 km<sup>2</sup></u>
<b>Helicopter Plots 1992</b>	1900 km <sup>2</sup>	15.5 (SE = 2.2)	35.9 (SE = 6.1)
<b>Fixed-Wing Transects</b> <b>1993</b>	95 km <sup>2</sup>	5.8 (SE = 0.75)	11.5 (SE = 1.8)

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