

CANADIAN WILDLIFE SERVICE
P. O. BOX 1590
SACKVILLE, N. B.
E0A 3C0

REPORT

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Progress Report
Black Duck Breeding Pair Survey in
Newfoundland - 1992

M.C. Bateman

Canadian Wildlife Service
Sackville, New Brunswick

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Introduction

Waterfowl management depends on surveys which monitor the status of populations and indicate where management is required. The mid-winter inventory conducted annually since 1954 in the US provides long-term information on wintering populations but comparable information on the breeding grounds is not available for any large geographical area in eastern North America. Trends in the midwinter inventory results can not be related to specific breeding grounds even if the results accurately reflect total population trends. Several attempts to establish (Black Duck) breeding ground surveys were terminated because results were thought to be of limited value relative to the resources required and because those resources were required for higher priority projects.

In the early 1980's, increased concern over the decline in the Black Duck population recorded by the mid-winter inventory led to renewed interest in breeding ground surveys. North American Waterfowl Management Plan funds administered through the Black Duck Joint Venture became available for breeding ground surveys in the Atlantic Provinces in 1985. Early helicopter surveys (1986-1989) in New Brunswick, Nova Scotia and Newfoundland were reported in Erskine et al (1990). Those early surveys were modified in 1990 to allow comparable Black Duck breeding pair surveys throughout the main breeding range of the Black Duck. There are now available three years of comparable data for the Black Duck breeding range (BDJV Progress Report, 1992). This report presents results from the 1992 survey in Newfoundland.

Methods

Statistical analyses of 1986-89 aerial survey data from New Brunswick, Nova Scotia, Newfoundland, Ontario and Quebec (B. Collins, CWS-NWRC) indicated that a sample size of 200 plots across the Black Duck breeding range was adequate to detect a change of 10% in five years with 90% power and 95% confidence. The major breeding range of the Black Duck approximates and is defined here as strata 28 and 29 of the Breeding Bird Survey. The 200 required plots were allocated to provinces and states on the basis of their area within Breeding Bird strata 28 and 29. Newfoundland was allocated 21 plots. To provide data useful for management on a smaller scale, additional plots were assigned to New Brunswick, Nova Scotia, Newfoundland and Maine to a total of 25 plots each. That sample size will permit a population change of 10% to be detected over a ten year period with 90% power. With the additional plots in the Atlantic provinces and Maine and minor modification to numbers of plots in Quebec and Ontario in 1991, the total number of plots in the 1992 survey was 229. Modifications in 1991 included reduction in the number of helicopter plots in Ontario, and the use of fixed-wing surveys in Wisconsin and Michigan instead of helicopter surveys.

In Newfoundland the plot allocation on the basis of area was 21 plots. Those plots were placed on the UTM grid to conform with methods used in Quebec and Ontario. One plot was placed in each 100 km² grid at a location randomly selected. The remaining plots were placed at locations selected from the survey described in Erskine et al (1990). Six plots were placed in Labrador and 19 on insular Newfoundland. Seven plots in central Newfoundland were on the locations of old survey plots (surveyed 1987-1989). The location of part of the sample at old plot sites was designed to allow some comparison of the new survey data (after 1990) with those of previous years.

Timing of surveys

Timing of the survey was based on results from the original helicopter

survey described in Erskine et al (1990) and prior knowledge for breeding chronology. The 1990 survey was flown between 8 May and 30 May; the 1991 survey, between 13 May and 7 June (Goudie 1990; Goudie 1991); and the 1992 survey between 16 May and 31 May. Spring breakup was later in 1991 and 1992 than in 1990.

Flying and recording

The survey was flown in a Bell 206LR (Long Ranger) with three observers as in previous years. Constant radio communication between the observers and the pilot prevented duplication of records and ensured good coverage of plots. Each water body, wetland and all coastline within the plots were flown. All wetlands were marked on colour photocopies of 1:50,000 topographical maps as they were flown to ensure complete coverage. Surveys were carried out in compliance with the standard operating procedures for the helicopter surveys prepared in March 1990. Surveys were flown at 16-50 meters (50-150 ft.) above ground level and at 60-100 km/hr (30-50 kts).

All waterfowl observed were recorded and locations were mapped on colour photocopies of 1:50,000 topographical maps. The principal observer-navigator and one observer were different from previous years; the pilot and one observer were the same as on the 1991 survey (Appendix D).

Interpretation of waterfowl data

Two Black Ducks together or a single Black Duck was considered an indicated pair and assumed to be breeding locally. The number of pairs of sexually dimorphic species was recorded even if the pairs occurred within a flock. Because breeding behaviour and chronology are less well known for species other than Black Ducks and Canada Geese, discussion of the other species is based on the number of birds only.

Results and Discussion

Twenty-five plots 100 km² in area were flown in Newfoundland in May 1992 (Figure 1). Nineteen plots were flown on insular Newfoundland between 16 May and 26 May and six plots were surveyed in Labrador between 29 May and 31 May. Detailed results are listed in Appendix II. The three most numerous waterfowl species on Insular Newfoundland were Ring-necked Duck, Canada Goose and Black Duck and on the Labrador plots were Common Goldeneye, Canada Goose and Black Duck (Table 1).

The total numbers of the most common species of waterfowl (Black Duck, Ring-necked Duck, Canada Goose, Common Goldeneye, Green-winged Teal and Common Merganser) were 1511 on the 19 insular plots and 434 on the six Labrador plots (total 1945). Black Ducks made up 16 percent of the total common waterfowl on Newfoundland and 18 percent in Labrador (17 percent of total on all plots). Ring-necks were 40 percent of the most common species on the insular plots and 18 percent of most common species in Labrador (34 percent of total on all plots). Canada Geese made up 17 percent of the common species on the 19 insular Newfoundland plots and 19 percent, on the 6 Labrador plots. Species composition in 1990 and 1991 was similar in most cases (Goudie 1990, 1991): Black Ducks made up 17 percent and 16 percent of the most common species on insular plots and Labrador plots respectively in 1990 and 16 percent and 24 percent in 1991; ring-necks made up 37 percent (insular plots) and 14 percent (Labrador plots) in 1990 and 43 percent (insular) and 15 percent (Labrador) in 1991; Canada Geese made up 13 percent (insular plots) and 18 percent (Labrador plots) in 1990 and 14 percent (insular) and 16 percent (Labrador) in 1991. The high proportion of Black Ducks on the Labrador plots in 1991 may have been caused by the very late spring that year.

The total flying time was 80 hours for the twenty-five plots. Total time on plots was 57 hours 21 minutes or an average of 2 hour 18 minutes per plot.

Black Ducks

A total of 249 Black Ducks was recorded on the 19 insular Newfoundland plots and 78 on the six Labrador plots (Table 1). Two bird groups and single Black Ducks were considered pairs even though determination of sex of Black Ducks was often not possible. The ratio of pairs of blacks to single ducks was 0.5:1 on the island and 0.9:1 in Labrador (Table 2). That ratio indicates the stage of breeding chronology and should approach 1:1 during the Black Duck survey. The low ratio for insular Newfoundland suggests that the survey may have been somewhat late despite an exceptionally late spring breakup.

The numbers of Black Ducks in groups greater than 2 was 50 (20 percent of birds) in Newfoundland and 12 (15 percent of birds) in Labrador. In previous years, the numbers in flocks were 25 (9 percent of birds) and 46 (12 percent of birds) on Newfoundland in 1990 and 1991 respectively and 13 (13 percent of birds) and 3 (2 percent of birds) in Labrador in 1990 and 1991 respectively.

Black Ducks were recorded on all 25 plots. The number of birds per plot ranged from 1 (one indicated pair) to 41 (15 indicated pairs). The mean number of indicated pairs per 100 km² was 7.7 on the insular plots and 7.5 on the Labrador plots (7.7 on all plots). The mean number of Black Ducks per 100 km² was 13.1 on the insular plots and 13.0 on the Labrador plots (13.1 on all plots).

The seven plots in central Newfoundland which have been done since 1987 show considerable year-to-year variation in the number of Black Ducks observed (Table 3, Figure 2). The 1991 counts were high (35 percent higher than the six year mean), possibly due to the unusual spring. The numbers of indicated pairs of blacks observed in 1987 and 1992 were below average.

Results of the international helicopter survey suggest a significant ($p < .05$) decline for Black Duck breeding pairs (Collins 1992). Significant declines were recorded in Maine and Quebec and significant increases in Nova Scotia and Ontario. A non-significant increase was recorded in New Brunswick and a non-significant decrease in Newfoundland. However, three years is an inadequate length of time to confirm a population trend. Year-to-year variation in surveys

and/or populations make a five-year period preferable.

Canada Goose

A total of 261 Canada Geese was recorded on the nineteen insular Newfoundland plots and 83 on the six Labrador plots in 1992 (total 344 on all plots). Those numbers compare with 220 on insular plots and 116 on Labrador plots (total 336) in 1990 and 325 on insular plots and 100 on Labrador plots (total 425) in 1991. The high numbers in 1991 may have been caused by the unusual spring that year. Twenty percent of the observed geese were in flocks in 1991 compared to 14 percent in 1992 and 15 percent in 1990.

Canada Geese were recorded on all plots in Labrador and 17 of 19 (89 percent) insular plots. The number of birds per plot ranged from 0 to 40 (21 indicated pairs). Seven plots in central Newfoundland have been surveyed for six years (1987-1992) (Goudie 1991). The mean number of indicated pairs per plot ranged from 3.8 in 1987 and 1992 to 6.4 in 1989 (Table 4, Figure 3). These data suggest a stable population.

Other Species

The Ring-necked Duck was the most numerous waterfowl species recorded on the insular Newfoundland plots. The total number of ring-necks on the nineteen insular plots was 587 (Table 1) and on the six Labrador plots was 77 (total 664). Ring-necks were recorded on all insular plots and five of the six Labrador plots. The mean density of ring-necks was 30.9 birds per 100 km² on the island and 12.8 birds per 100 km² on Labrador plots. Total numbers of ring-necks recorded were lower than on either the 1990 or 1991 survey.

Common Goldeneye was the most numerous waterfowl species on the six Labrador plots. A total 134 birds was recorded there and 160 birds on the insular plots (Table 1). Goldeneye was recorded on 13 of 19 insular plots and all Labrador plots. Mean densities were 8.4 birds per 100 km² on the island and 22.3 per 100 km² in Labrador. Total numbers of goldeneye recorded were higher in 1990 - 300

birds on the insular plots and 242 in Labrador - and in 1991, 287 birds on the island and 168 in Labrador.

A total of 133 Green-winged Teal was recorded on insular plots and 44 on the Labrador plots (total 177). The mean densities of observed birds were 7.0 per 100 km² on the island and 7.3 per 100 km² on Labrador plots. Total numbers of green-wings recorded on previous surveys were: 169 and 261 on insular plots in 1990 and 1991 respectively; 62 and 76 on Labrador plots in 1990 and 1991 respectively. Green-wings are notoriously hard to survey from the air and the number of birds observed may be affected by the abundance of more conspicuous species.

Summary

1. Twenty-five 100 km² plots were surveyed by helicopter in Newfoundland in May 1992. Nineteen plots were flown on insular Newfoundland between 16 May and 26 May and six plots were surveyed in Labrador between 29 May and 31 May. These plots were part of the international breeding Black Duck survey carried out for the third consecutive year in 1992. Black Ducks were recorded on all plots surveyed.
2. Black Ducks made up 16 percent of the total common waterfowl (Black Duck, Ring-necked Duck, Canada Goose, common Goldeneye, Green-winged Teal, and Common Merganser) on the island and 19 per cent in Labrador. Ring-necks were 40 percent of the most common species on the insular plots and 18 percent, on Labrador plots. Canada Geese made up 17 percent of the common species on the insular plots and 19 percent, on the Labrador plots.
3. Trend analysis on the three years data (1990-1992) indicated a non-significant ($p > 0.5$) decrease in the breeding Black Duck population. Central Newfoundland data for six years suggest a stable or increasing population.
4. The mean densities of Black Ducks on the insular Newfoundland and Labrador plots were 7.7 and 7.5 indicated pairs per 100 km² respectively.

References Cited

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- Goudie, R.I. 1990. Black Duck Joint Venture monitoring surveys Newfoundland and Labrador. 1990. CWS ms. report, 11 pp.
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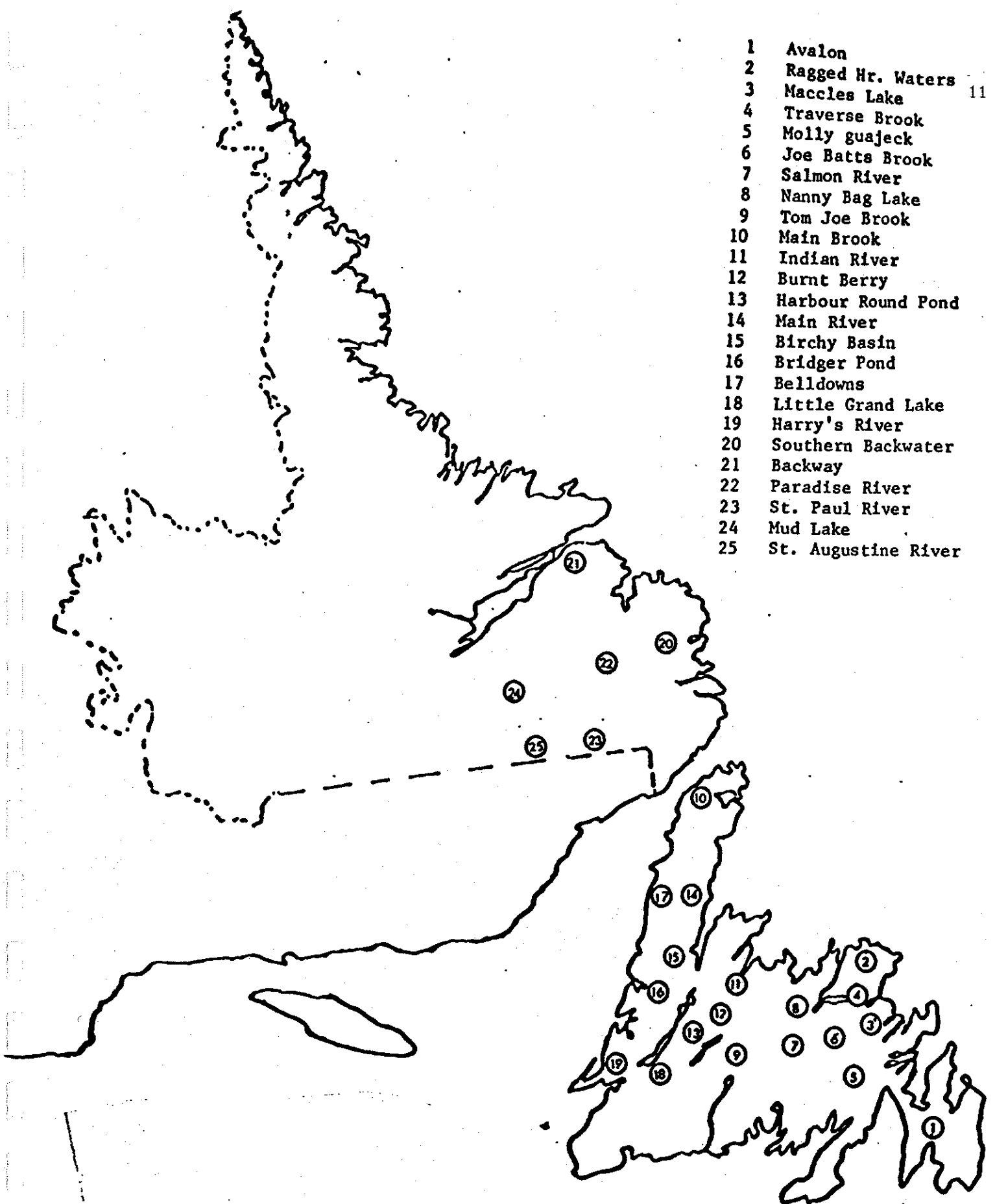


Figure 1. Approximate locations of 25 100 km² plots surveyed for breeding Black Ducks in Newfoundland in May 1992.

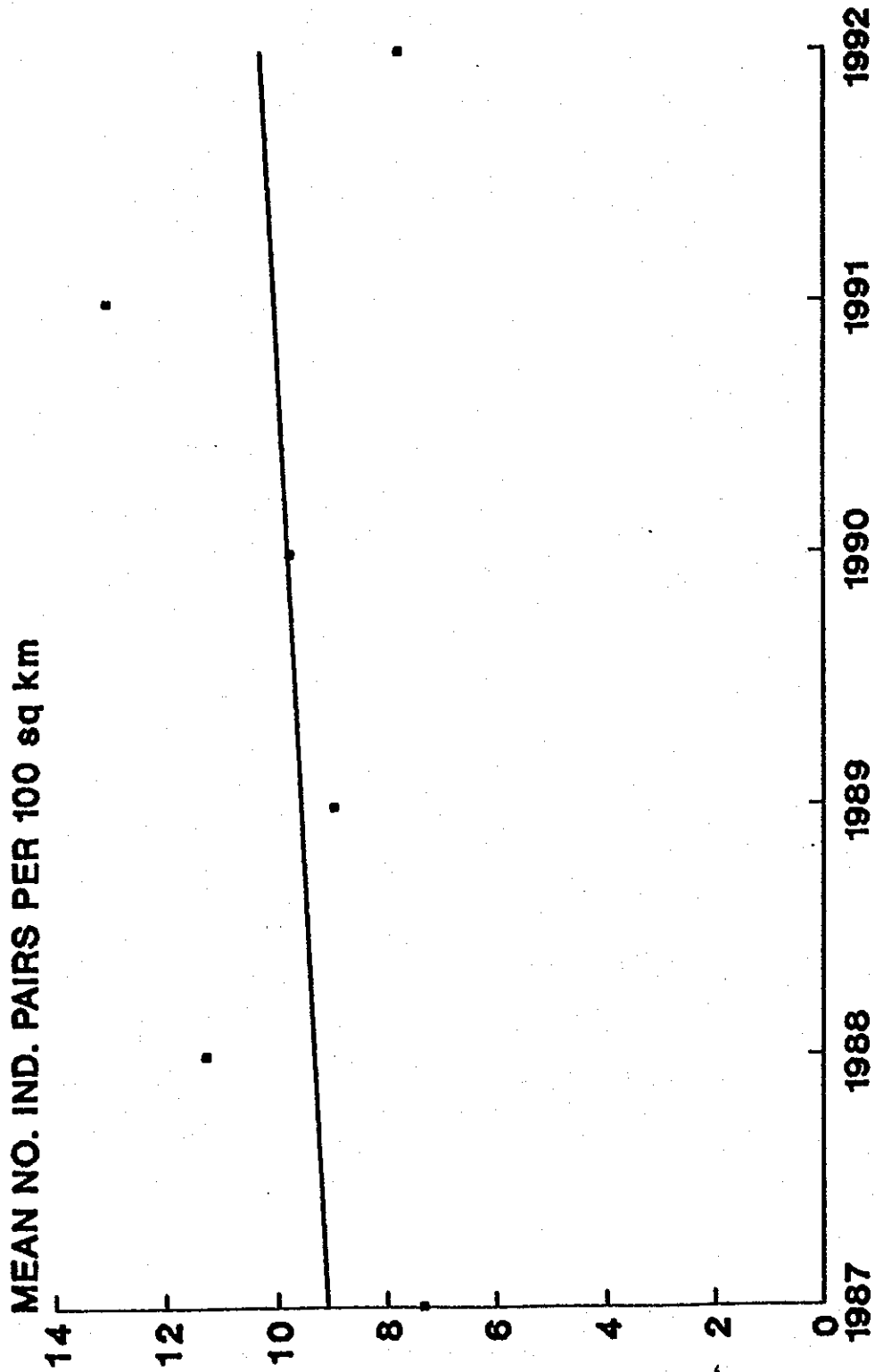


Figure 2. The mean number of indicated pairs of Black Duck recorded on seven 100 km² plots surveyed by helicopter in Central Newfoundland 1987-1992. (1987-1991 data from Goudie 1991).

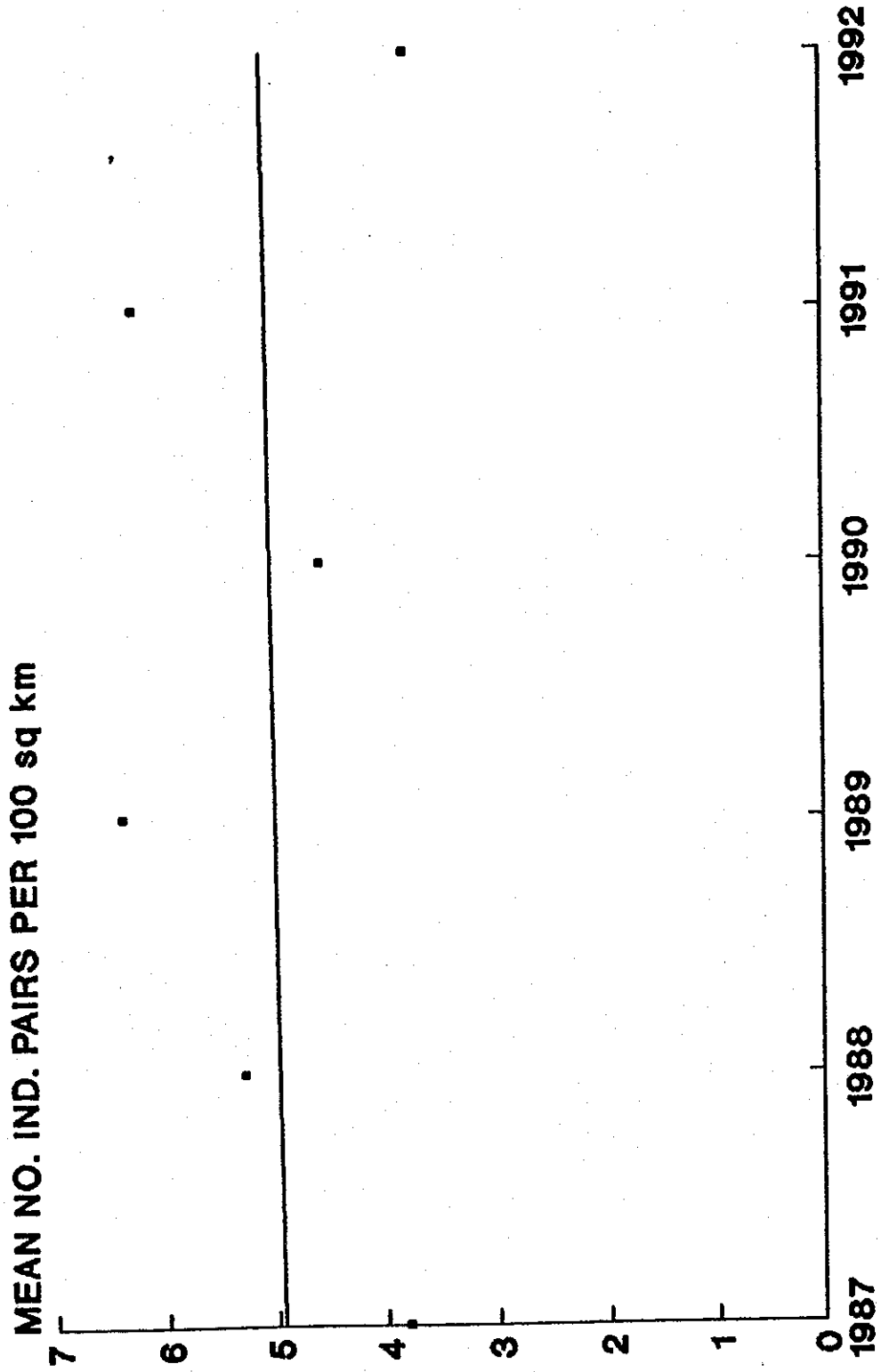


Figure 3. The mean numbers of indicated pairs of Canada Geese recorded on seven 100 km plots surveyed by helicopter in Central Newfoundland 1987-1992. (1987-1991 data from Goudie 1991).

Table 1. The number of waterfowl recorded on 100 km² plots during the Newfoundland breeding pair survey, May 1992.

Plot #	Black Duck		Ring-N Duck		Canada Goose		C. Goldeneye		Green-w Teal		C. Merganser		MISCELLANEOUS											
	P	S	P	S	P	S	P	S	P	S	P	S	P	S										
1	4	5	1	7	2	3	-	-	2	5	-	-	-	-										
2	1	10	19	66	3	1	-	-	7	2	-	-	1	1										
3	1	1	4	2	3	1	-	-	2	2	-	-	1	1										
4	4	9	6	2	7	2	-	-	-	3	-	-	1	1										
5	1	5	2	4	5	1	-	-	-	-	-	-	7	6										
6	7	7	9	4	3	1	-	-	3	3	-	-	1	2										
7	4	1	8	6	1	-	-	-	2	1	-	-	-	-										
8	1	4	7	5	3	1	-	-	3	4	-	-	-	-										
9	2	6	9	2	3	1	-	-	2	2	-	-	3	3										
10	7	10	6	3	9	3	-	-	1	1	-	-	3	9										
11	-	3	4	4	1	1	-	-	2	1	-	-	-	-										
12	2	3	14	6	7	5	-	-	2	1	-	-	3	2										
13	1	2	5	5	7	-	-	-	1	1	-	-	6	1										
14	8	8	7	4	16	5	-	-	5	3	-	-	2	9										
15	5	10	21	3	9	3	-	-	4	8	-	-	4	6										
16	7	3	1	6	2	8	-	-	1	1	-	-	1	1										
17	2	4	1	1	9	3	-	-	2	2	-	-	2	4										
18	2	2	2	2	11	3	-	-	1	1	-	-	1	1										
19	-	2	-	8	-	-	-	-	-	1	-	-	-	3										
20	2	-	1	-	2	4	-	-	1	-	-	-	2	-										
21	-	1	-	-	4	3	-	-	-	-	-	-	-	-										
22	-	2	3	-	5	2	-	-	-	-	-	-	4	1										
23	7	7	10	3	7	3	-	-	3	4	-	-	1	3										
24	3	2	2	1	1	3	-	-	5	5	-	-	-	-										
25	9	12	8	3	6	7	-	-	6	3	-	-	-	-										
Nfld Sub total	52	95	50	249	124	46	293	587	95	35	36	261	61	27	11	160	39	38	17	133	34	15	38	121
Lab. Sub total	21	24	12	78	19	8	31	77	25	22	11	83	38	15	43	134	15	7	7	44	7	4	0	18
Total	73	119	62	327	143	54	324	664	120	57	47	344	99	42	54	294	54	45	24	177	41	19	38	139

P = pairs
S = singles
Fl = flocks
Tot = total

Table 2. Results of the Black Duck counts during the Newfoundland breeding pair survey 1992.
Nineteen 100 km² plots were surveyed on insular Newfoundland and six in Labrador.

	Insular Newfoundland	Labrador	Total
Number of pairs	52	21	73
Number of singles	95	24	119
Number in flocks	50	12	62
Total number	249	78	327
Number of Indicated Pairs	147	45	192
Mean number indicated pairs per 100 km ²	7.7	7.5	7.7
Mean number of ducks per 100 km ²	13.1	13.0	13.1
Ratio of pairs: singles	0.5:1	0.9:1	0.6:1

Table 3. The number of indicated pairs of Black ducks on seven 100 km² plots surveyed by helicopter each year 1987-1992 (1987-1991 from Goudie 1991).

Plot number		1987	1988	1989	1990	1991	1992
<u>Old survey</u>	<u>New survey</u>						
A	(2)	13	14	10	11	22	11
B	(4)	11	10	10	10	25	13
C	(5)	8	9	8	12	13	6
E	(6)	3	11	6	7	5	7
F	(7)	7	7	13	10	11	5
H	(8)	6	17	6	8	3	5
J	(9)	3	11	10	11	13	8
Total indicated pairs		51	79	63	69	92	55
Mean indicated pairs/100 km ²		7.3	11.3	9.0	9.8	13.1	7.8

Table 4. The number of indicated pairs of Canada Geese observed on seven 100 km² plots surveyed each year by helicopter in Central Newfoundland 1987-1992 (1987-91 data from Goudie 1991).

Plot number		1987	1988	1989	1990	1991	1992
<u>Old survey</u>	<u>New survey</u>						
A	(2)	2	5	4	4	4	4
B	(4)	5	7	13	8	8	9
C	(5)	10	12	13	14	17	6
E	(6)	0	0	0	0	0	0
F	(7)	1	3	2	1	4	1
H	(8)	2	6	5	3	4	3
J	(9)	7	4	8	2	7	4
Total indicated pairs		27	37	45	32	44	27
Mean indicated pairs/100 km ²		3.8	5.3	6.4	4.6	6.3	3.8

Appendix I

List of observers and pilots on the helicopter surveys in Newfoundland-Labrador
1990-1992.

	1990	1991	1992
Primary observer/navigator	R.I. Goudie	R.I. Goudie	M.C. Bateman
Secondary observers		C. Baldwin W. Lidster	B. Pollard C. Baldwin
Pilot	G. Goodyear	G. Goodyear	G. Goodyear