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**The co-operative Breeding Bird Survey in Canada, 1973**by Anthony J. Erskine<sup>1</sup>**Introduction**

The Breeding Bird Survey (BBS) is a co-operative attempt to detect and measure year-to-year changes in numbers of birds (chiefly land birds). Bird numbers fluctuate in response to environmental changes, both natural and those caused by man. By documenting the fluctuations which result from natural causes, chiefly weather, we hope to be able to detect any future changes caused by man's pollution and alteration of the environment in time to undertake remedial action. As yet, we have no evidence from this project that man's actions have affected bird populations, although we suspect that changes occurred in some species before the surveys began. The BBS, organized by the United States Fish and Wildlife Service and the Canadian Wildlife Service, depends on the co-operation of volunteer observers throughout these countries. The methods of data collection have remained the same since the start of the project, but we are gradually refining the analysis of data.

**Results****Coverage**

The distribution of degree blocks in which surveys were made in 1973 and the areas where former coverage was not repeated are shown in Figure 1. Table 1 gives the number of routes surveyed each year by province or territory.

**Grouping of routes for analysis**

The groupings used in past years have been maintained (Fig. 1) with one exception. Greatly increased coverage in the Prairie Provinces over the past two years led to the division of this region in 1973 into two parts, each more nearly homogeneous than the whole. There now are six regions: Maritimes, central Ontario and Quebec, southern Ontario and Quebec, southern Prairie Provinces, Alberta and Saskatchewan parklands, and British Columbia. The 20 species most frequently reported on surveys in these regions are listed in Tables 2 to 7. The small numbers of surveys in Labrador and Yukon Territory do not fit into any of the major regions; the 10 species most frequently reported in these areas are listed in Tables 8 and 9.

**Changes observed**

Analyses were continued for the first four regions, and those for the Alberta and Saskatchewan parklands (referred to as "parklands" hereafter) are presented for the first time, though the number of comparable surveys is small. Summaries of comparisons between 1972 and 1973 are given in Tables 10 to 14. Tables of annual index numbers are not included; they will be repeated in alternate years, beginning

after the 1974 season when five years' data will be available for the central Ontario and Quebec and the southern Prairies regions.

**Discussion****Coverage**

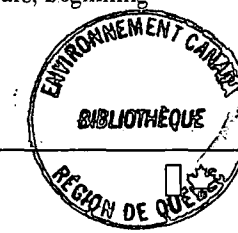
The increased coverage in 1973 was most encouraging (Table 1). The numbers of surveys completed were the highest yet in Ontario, Saskatchewan, Alberta, and British Columbia, the last area more than doubling its previous high. All routes in Prince Edward Island were surveyed. Although the numbers in Quebec, New Brunswick, and Nova Scotia dropped slightly, the coverage was generally adequate. However, lest this rosy picture arouse complacency, one should note that coverage was maintained in New Brunswick and Manitoba only by the regional co-ordinators, each surveying five routes. If these devoted individuals were incapacitated or moved elsewhere, the effect would be very marked. The national co-ordinator covered six routes, three repeated from 1972, in Saskatchewan, but as he will be working in British Columbia in 1974, most of these routes will not be continued. Spreading the effort to as many people as possible will help to minimize the effect of any one person dropping out.

**Grouping of routes for analysis**

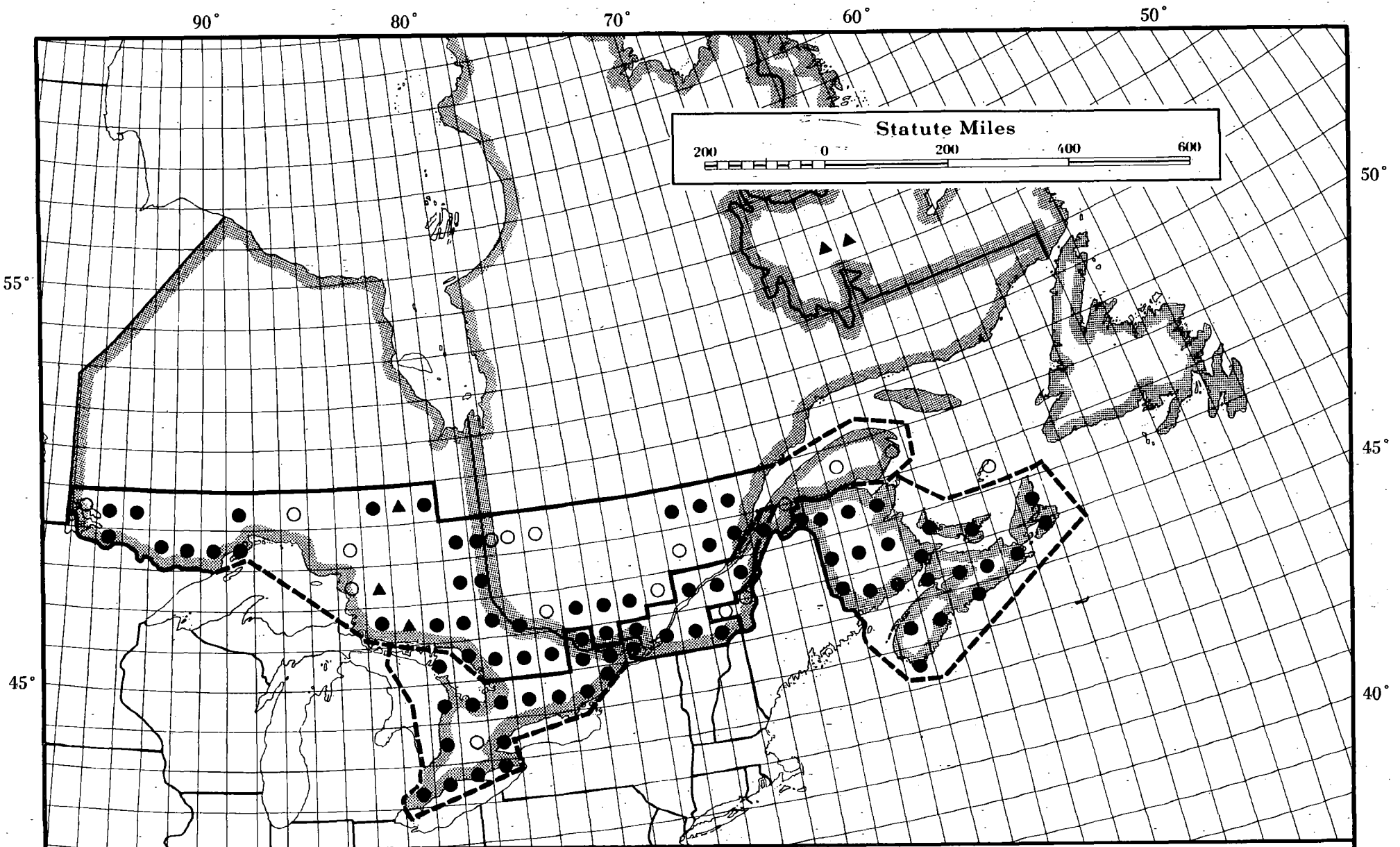
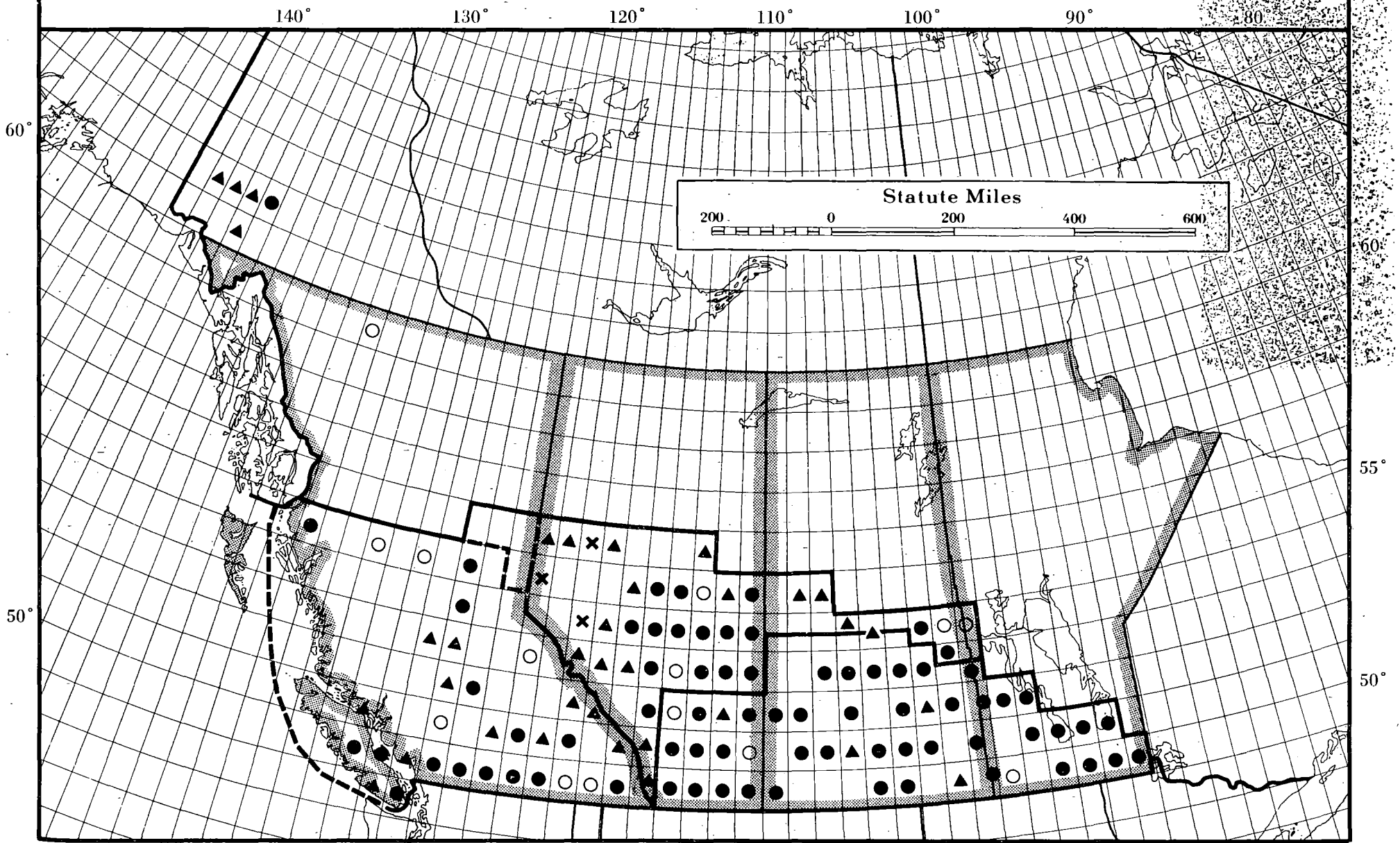
The six major regions were each represented in 1973 by from 30 to 46 routes. The homogeneity of these regions is suggested by a comparison of the frequencies with which the major species in each were noted (Table 15). The southern Ontario and Quebec region has by far the most homogeneous bird fauna, but all of the four eastern regions had 13 or more of the top 20 species noted on at least 90 per cent of the surveys. The lower frequency found in the parklands and British Columbia regions is partly a consequence of varied habitats (mountains, forests, farmland, etc.) and partly of new and inexperienced observers. Table 15 also shows that at least two-thirds of all the birds noted on these surveys belong to the most common species. Observers should ensure that they recognize all the common birds in their area, even if some less frequent ones are missed.

**Changes observed**

The numbers of statistically significant changes from 1972 to 1973 differed greatly between regions: Maritimes, 5 (4-, 1+); central Ontario and Quebec, 5 (4-, 1+); southern Ontario and Quebec, 11 (9-, 2+); southern Prairie Provinces, 5 (5-); Alberta and Saskatchewan parklands, 10 (3-, 7+). At the 95 per cent level of significance, 2 out of 40 species compared in each region might be expected to show such significant changes by chance. Nevertheless, all five regions showed markedly more changes in one direction than the other and these changes parallel changes in the weather experienced on surveys in the two years. Surveys in all provinces from the Maritimes to Saskatchewan experienced generally warmer conditions in

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**Figure 1**  
 Extent of coverage in 1973, and additional coverage in  
 1966-72 Breeding Bird Survey, with outlines of groupings  
 used in analysis



- block surveyed in 1973 and previous years
- ▲ block first surveyed in 1973
- block surveyed previously but not in 1973
- × 1973 coverage incomplete
- outline of groupings for analysis

1973, whereas those in Alberta were generally cooler. Winds were somewhat stronger and rain showers or drizzle more frequent than usual on surveys in the Maritimes, central Ontario and Quebec and in the parklands; in the other regions, winds and precipitation reported were similar in both years. These comparisons are based only on the days when surveys were made, regardless of their date. The general impression was that June had been unusually wet in 1973 and cooler than average in the parklands.

As usual, we rejected few routes from comparisons on account of weather, as routes are seldom completed under adverse conditions. However, we rejected an unusual number mainly or in part owing to divergent dates; surveys made on dates differing by 20 or more days in the two years are not used in comparisons, and those differing by 10 to 19 days may be rejected if other factors also reduce comparability. Probably many surveys had to be postponed by a week or more on account of the frequent and often heavy rains in June 1973; at least three surveys in Alberta were cut short by rain and never completed. In all four western provinces and central Ontario and Quebec, the majority of surveys were carried out after June 10.

The warmer temperatures reported on 1973 survey dates may be largely because these were late in the month. However, most of the comparable parkland routes, which experienced generally cooler temperatures in 1973, were surveyed early in June, whereas the many new parkland routes were all surveyed later. Counts made late in June tend to produce lower numbers of birds, because birds sing less often and for shorter periods later in the breeding season; birds also sing less on warm days, whatever the stage in the breeding cycle. The decreased numbers suggested by most of the significant changes may be correlated with late survey dates, higher temperatures, or both. In the parklands, where most significant changes were increases, surveys used in comparisons were generally early and cool. Furthermore, three increases in the parklands involved water birds, which could be more easily detected on the sheet water on fields after heavy rains than in the marshes they otherwise frequent. Three others which increased were blackbirds (Icteridae), all flocking species; possibly many lost their nests in the wet weather so had fledged earlier than usual, and thus were more visible.

Four of five significant changes in the Maritimes were towards the arbitrary index of 100, the fifth species having had an index of 103 in 1972. Of these four, Herring Gull is a flocking species that is poorly sampled by these surveys and most of the recorded change was noted on only four routes, while another, American Goldfinch, is an erratic species that breeds very late in the season.

Three of four significant changes in central Ontario and Quebec were towards the 100 index. The fourth, Rose-breasted Grosbeak, showed substantial increases on about six routes in the Algonquin Park - Laurentians area, and these outweighed other changes since the species was unrecorded in 1972 and 1973 on nearly one-third of the comparable routes.

In the southern Ontario and Quebec region, 6 of 11 significant changes were towards the 100 index, while three others were already at this level (97 to 99). Only Gray Catbird (1972 index 81) and Red-eyed Vireo (index 91) showed changes away from the "normal level." Changes in the indica-

ted direction were common to most routes in most of these species; however, massive changes on three routes accounted for nearly all the change in Rock Dove, a flocking species. Three of the four routes showing the largest counts of Savannah Sparrows in 1972 reported large decreases (averaging 50 birds per route), which accounted for about one-half of the indicated change.

Three of five significant changes in the southern Prairie region were towards the normal index, whereas Shoveler (1972 index 81) and Lesser Scaup (index 92) sustained further decreases. Most routes which noted these two ducks showed changes in the indicated direction, but large changes on a few routes accounted for most of the indicated change with the other three, all flocking species. Franklin's Gulls in particular were almost unrecorded in Manitoba and eastern Saskatchewan, where five routes in 1972 reported from 150 to over 600 birds; numbers of this species were up where noted in central Saskatchewan and Alberta. Two routes in southern Alberta accounted for most of the decrease found in Cliff Swallows, for which more routes actually showed increases than decreases. Most of the indicated decrease in Lark Buntings occurred on three routes in southern Saskatchewan.

With so few routes involved, there seems to be no point in discussing the changes noted in the parklands region and no trends are yet apparent here.

The trends discussed above suggest that most species show fluctuations around some intermediate level. Species having indices above that level tend to decrease, and vice versa, much as if their populations were regulated by density-dependent factors. Whatever the regulatory factors, we are probably safe in assuming that the common species discussed in this report are neither increasing nor decreasing in the long run through natural causes. Accordingly, any sustained decreases are the more likely to have been caused by man's actions. The absence of such decreases to date is encouraging for the country as a whole, but is hardly likely to reassure persons concerned about trends in bird numbers within, for example, a restricted area around an expanding urban centre.

#### Acknowledgements

This project depends on the co-operation of many people, whose only rewards are the enjoyment of a day in the country and the feeling of taking part in a worthwhile study. To most of us, an environment with no birds is desolate, regardless of how much money man has spent on it or extracted from it. We thank everyone who has contributed to this effort on behalf of a healthy environment for birds and men. The regional co-ordinators deserve extra thanks for their efforts to maintain and increase coverage. We hope to have a new co-ordinator from British Columbia in 1974. Addresses of co-ordinators are given below.

Newfoundland  
Dr. L.M. Tuck  
Canadian Wildlife Service  
Rm. 611, Sir Humphrey Gilbert Bldg.  
St. John's

New Brunswick, Nova Scotia, Prince Edward Island  
Mr. David Christie  
Curator, Natural Science  
The New Brunswick Museum  
277 Douglas Avenue  
Saint John, New Brunswick

Quebec  
Club des Ornithologues de Québec  
8191, avenue du Zoo  
Orsainville, Québec 7

Ontario  
Dr. J. Murray Speirs  
1815 Altona Road  
Pickering, L1V 1M6

Manitoba  
Mr. H.W. Copland  
Manitoba Museum of Man and Nature  
190 Rupert Avenue  
Winnipeg, R3B 0N2

Saskatchewan  
Mr. Frank Brazier  
2657 Cameron Street  
Regina, S4T 2W5

Alberta  
Mr. Jack L. Park  
10236 - 70 Street  
Edmonton, T6A 2T4

British Columbia  
(temporarily)  
Dr. A.J. Erskine  
Ottawa, Ontario, K1A 0H3

Yukon Territory  
Mr. Wayne P. Neily  
Park Naturalist  
Kluane National Park  
Haines Junction

**Table 1**  
Number of Breeding Bird Survey routes completed in each province or territory, 1966-73, excluding duplicate coverages and non-random routes

Province or territory	Number of routes surveyed in							
	1966	1967	1968	1969	1970	1971	1972	1973
Nfld. (Labr.)								2
P.E.I.	2	4	4	4	3	2	2	4
N.S.	16	20	20	20	20	21	23	19
N.B.	15	19	22	23	23	24	24	22
Que.	3	7	17	20	33	25	28	24
Ont.	0	4	41	40	47	53	47	55
Man.		11	11	12	11	11	14	13
Sask.			3	6	11	13	20	28
Alta.			5	7	11	17	27	36
B.C.			16	16	17	12	9	38
Yukon Territory							1	5
<b>Total</b>	<b>36</b>	<b>65</b>	<b>139</b>	<b>148</b>	<b>176</b>	<b>178</b>	<b>194</b>	<b>246</b>

**Table 2**  
The 20 species recorded in greatest numbers in the Breeding Bird Survey, Maritime Provinces, 1973; the mean number of each per route; and the percentage of routes on which they were found. Forty-five routes were surveyed, with a mean of 905 birds noted per route

Species	Mean number per route	% of 45 routes
American Robin	67.4	100
White-throated Sparrow	59.4	100
Starling	50.0	100
Song Sparrow	40.2	100
Common Crow	36.2	98
Common Grackle	36.0	96
Herring Gull	31.6	60
Barn Swallow	30.2	98
Common Yellowthroat	28.7	100
Red-winged Blackbird	25.2	98
American Redstart	23.3	98
Bank Swallow	23.0	71
Swainson's Thrush	19.6	100
Tree Swallow	19.3	100
Bobolink	18.8	87
Evening Grosbeak	18.7	62
Alder Flycatcher	17.5	98
House Sparrow	17.4	76
Ovenbird	15.5	89
Savannah Sparrow	15.5	93

**Table 3**  
The 20 species recorded in greatest numbers in the Breeding Bird Survey, central Ontario and central Quebec, 1973; the mean number of each per route; and the percentage of routes on which they were found. Forty routes were surveyed, with a mean of 640 birds noted per route

Species	Mean number per route	% of 40 routes
White-throated Sparrow	52.7	100
Starling	36.0	90
American Robin	31.0	100
Red-eyed Vireo	30.2	98
Common Crow	25.2	100
Ovenbird	23.4	98
Song Sparrow	21.0	98
Chestnut-sided Warbler	19.8	92
Veery	19.2	77
Common Yellowthroat	16.8	95
Red-winged Blackbird	15.5	85
Evening Grosbeak	15.0	60
Barn Swallow	13.8	90
Swainson's Thrush	13.4	72
Chipping Sparrow	13.3	98
Savannah Sparrow	12.1	67
Tree Swallow	11.0	95
Nashville Warbler	10.8	85
Least Flycatcher	10.4	95
Bobolink	10.2	55

**Table 4**  
The 20 species recorded in greatest numbers in the Breeding Bird Survey, southern Ontario and southern Quebec, 1973; the mean number of each per route; and the percentage of routes on which they were found. Thirty-nine routes were surveyed, with a mean of 1110 birds noted per route

Species	Mean number per route	% of 39 routes
Starling	161.9	100
Red-winged Blackbird	147.9	100
Common Grackle	96.8	100
House Sparrow	65.2	100
American Robin	51.5	100
Common Crow	48.3	100
Savannah Sparrow	45.0	97
Bobolink	42.2	100
Song Sparrow	41.9	100
Barn Swallow	34.5	100
Eastern Meadowlark	29.0	97
Bank Swallow	25.6	72
Brown-headed Cowbird	20.6	100
American Goldfinch	19.3	100
Ring-billed Gull	18.7	28
Killdeer	18.6	100
Mourning Dove	15.8	95
Common Yellowthroat	11.8	92
Chipping Sparrow	11.4	95
Rock Dove	11.3	79

**Table 5**  
The 20 species recorded in greatest numbers in the Breeding Bird Survey, southern Prairie Provinces, 1973; the mean number of each per route; and the percentage of routes on which they were found. Forty-six routes were surveyed, with a mean of 922 birds noted per route

Species	Mean number per route	% of 46 routes
Red-winged Blackbird	106.7	100
Horned Lark	82.1	98
House Sparrow	77.2	98
Western Meadowlark	58.1	98
Common Crow	46.7	96
Mallard	32.5	91
Brewer's Blackbird	29.8	98
Clay-coloured Sparrow	27.3	96
Brown-headed Cowbird	23.8	98
Chestnut-collared Longspur	21.1	37
Savannah Sparrow	20.8	98
Ring-billed Gull	19.9	52
Starling	18.3	83
Vesper Sparrow	18.2	96
Barn Swallow	15.7	100
Yellow-headed Blackbird	14.8	63
Killdeer	14.3	100
McCown's Longspur	12.6	20
Cliff Swallow	12.0	48
Pintail	11.9	63

**Table 6**

The 20 species recorded in greatest numbers in the Breeding Bird Survey, Alberta and Saskatchewan parklands and forests, 1973; the mean number of each per route; and the percentage of routes on which they were found. Thirty routes were surveyed, with a mean of 586 birds noted per route

Species	Mean number per route	% of 30 routes
Starling	37.4	87
Red-winged Blackbird	34.9	93
Common Crow	33.1	93
Mallard	30.7	57
Clay-coloured Sparrow	24.1	87
Brewer's Blackbird	21.8	77
Song Sparrow	19.7	87
American Robin	18.4	100
Savannah Sparrow	16.4	77
House Sparrow	16.2	73
Black-billed Magpie	14.6	73
Vesper Sparrow	14.2	73
Pintail	12.5	43
Franklin's Gull	11.1	37
Red-eyed Vireo	10.9	73
Western Meadowlark	10.7	57
Pine Siskin	10.6	47
House Wren	9.3	73
Barn Swallow	9.1	87
Brown-headed Cowbird	8.8	80

**Table 7**

The 20 species recorded in greatest numbers in the Breeding Bird Survey, British Columbia, 1973; the mean numbers of each per route; and the percentage of routes on which they were found. Thirty-eight routes were surveyed, with a mean of 661 birds noted per route

Species	Mean number per route	% of 38 routes
Starling	71.3	87
American Robin	71.0	100
Crows*	34.8	97
Swainson's Thrush	30.8	89
Brewer's Blackbird	23.2	71
Pine Siskin	21.0	87
Barn Swallow	18.9	89
Song Sparrow	15.3	97
Chipping Sparrow	13.7	84
Black-capped Chickadee	13.1	79
Bank Swallow	12.3	24
Cliff Swallow	11.9	47
Brown-headed Cowbird	10.6	76
Chestnut-backed Chickadee	9.5	34
Western Meadowlark	9.4	58
Red-winged Blackbird	9.3	71
Violet-green Swallow	9.2	76
Dark-eyed Junco †	8.6	81
Tree Swallow	8.4	87
House Sparrow	8.4	37

\* Common Crow and North-western Crow combined.

† Slate-coloured Junco and Oregon Junco now combined under this name (A.O.U. Check-list, 32nd Supplement, 1973).

**Table 8**

The 10 species recorded in greatest numbers in the Breeding Bird Survey, Newfoundland (Labrador), 1973; and the mean number of each per route. Two routes were surveyed, with a mean of 305 birds noted per route. All species listed were seen on both routes

Species	Mean number per route
White-crowned Sparrow	50.0
Rusty Blackbird	30.5
American Robin	29.0
Solitary Sandpiper	20.5
Dark-eyed Junco	17.5
Savannah Sparrow	14.5
Hermit Thrush	14.0
Boreal Chickadee	11.5
Tennessee Warbler	11.0
Canada Jay	9.5

**Table 9**

The 10 species recorded in greatest numbers in the Breeding Bird Survey, Yukon Territory, 1973; and the mean number of each per route. Five routes were surveyed, with a mean of 443 birds noted per route. All species listed were seen on all routes, except Lesser Yellowlegs (4 routes)

Species	Mean number per route
Dark-eyed Junco	86.4
Swainson's Thrush	49.4
White-crowned Sparrow	41.0
American Robin	31.2
Canada Jay	25.6
White-winged Crossbill	22.8
Pine Siskin	21.8
Yellow-rumped Warbler*	18.8
Lesser Yellowlegs	11.0
Boreal Chickadee	8.8

\* Myrtle Warbler and Audubon's Warbler now combined under this name (A.O.U. 1973).

**Table 10**  
Changes in bird population samples for 32 comparable routes,  
Breeding Bird Survey, Maritime Provinces, 1972-73

Species	Weighted mean number of birds per route		% change (bold) with 95% confidence limits		
	1972	1973			
Common Snipe	5.09	4.95	-48	-3	+42
Herring Gull*	45.68	19.23	-115	-58	-1
Common Flicker	2.56	3.13	-24	+22	+68
Yellow-bellied Sapsucker	10.73	8.10	-51	-25	+2
Alder Flycatcher*	16.67	13.45	-37	-19	-2
Least Flycatcher	6.53	7.25	-17	+11	+39
Tree Swallow	20.45	16.22	-54	-21	+13
Bank Swallow	15.54	19.23	-21	+24	+68
Barn Swallow	23.69	27.37	-7	+16	+38
Blue Jay	4.47	4.40	-38	-2	+35
Common Raven	9.63	8.79	-32	-9	+15
Common Crow	41.68	36.74	-28	-12	+4
Winter Wren	5.90	6.05	-15	+3	+21
American Robin	62.91	60.38	-13	-4	+5
Hermit Thrush	8.60	7.42	-41	-14	+13
Swainson's Thrush	21.43	20.16	-16	-6	+4
Veery	11.52	10.88	-22	-5	+11
Ruby-crowned Kinglet	15.56	13.69	-28	-12	+4
Starling	47.35	50.03	-15	+6	+26
Red-eyed Vireo	13.39	12.79	-17	-5	+8
Nashville Warbler*	6.92	5.16	-46	-25	-5
Yellow Warbler	9.60	11.11	-4	+16	+36
Magnolia Warbler	13.41	16.09	-7	+20	+47
Black-throated Green Warbler	6.17	7.38	-5	+20	+45
Chestnut-sided Warbler	8.02	6.90	-31	-14	+4
Ovenbird	15.69	15.47	-15	-1	+13
Common Yellowthroat	21.87	22.62	-11	+3	+18
American Redstart	18.24	21.40	-1	+17	+36
House Sparrow	18.31	18.71	-24	+2	+29
Bobolink	19.49	17.60	-21	-10	+2
Red-winged Blackbird	24.32	24.09	-22	-1	+20
Common Grackle	29.72	34.03	-5	+14	+34
Brown-headed Cowbird	7.80	6.55	-35	-16	+3
Evening Grosbeak	31.72	20.93	-91	-34	+23
Purple Finch	13.72	9.72	-75	-29	+17
American Goldfinch*	12.67	9.90	-37	-22	-7
Savannah Sparrow	17.85	17.13	-18	-4	+10
Dark-eyed Junco	14.38	13.67	-20	-5	+10
Chipping Sparrow	10.09	8.14	-43	-19	+4
White-throated Sparrow	56.46	54.52	-9	-3	+2
Song Sparrow*	30.37	37.66	+8	+24	+40

\* Change at least 95 per cent significant.

**Table 11**  
Changes in bird population samples for 28 comparable routes,  
Breeding Bird Survey, central Ontario and central Quebec,  
1972-73

Species	Weighted mean number of birds per route		% change (bold) with 95% confidence limits		
	1972	1973			
Killdeer	4.63	4.74	-34	+2	+39
Herring Gull	4.66	4.65	-56	0	+56
Common Flicker	4.86	4.71	-36	-3	+30
Yellow-bellied Sapsucker	1.50	2.25	-7	+50	+107
Alder Flycatcher	7.59	6.60	-31	-13	+4
Least Flycatcher	10.26	10.27	-23	0	+23
Tree Swallow	12.10	10.36	-44	-14	+16
Bank Swallow	8.80	4.14	-117	-53	+11
Barn Swallow	10.39	12.59	-22	+21	+64
Blue Jay	3.89	3.54	-50	-9	+33
Common Raven	5.05	5.02	-35	-1	+34
Common Crow	27.73	26.43	-30	-5	+21
Winter Wren	4.82	6.18	-10	+28	+67
American Robin	29.69	27.87	-23	-6	+11
Hermit Thrush	11.22	9.63	-41	-14	+13
Swainson's Thrush	16.52	14.77	-33	-11	+12
Veery*	23.69	18.91	-35	-20	-6
Ruby-crowned Kinglet	8.52	7.25	-39	-15	+9
Cedar Waxwing	4.18	3.23	-60	-23	+15
Starling	43.29	39.23	-34	-9	+15
Red-eyed Vireo	30.38	30.00	-15	-1	+13
Nashville Warbler	12.16	12.48	-19	+3	+24
Yellow Warbler	2.53	4.13	-49	+63	+176
Magnolia Warbler	6.11	6.57	-18	+7	+33
Yellow-rumped Warbler	3.55	3.89	-50	+9	+69
Chestnut-sided Warbler	14.68	16.51	-4	+12	+29
Ovenbird	21.63	21.59	-16	0	+16
Mourning Warbler	11.64	10.11	-35	-13	+9
Common Yellowthroat	16.85	16.80	-15	0	+15
American Redstart	6.83	7.76	-20	+13	+47
House Sparrow	9.30	7.93	-46	-15	+17
Bobolink	10.21	11.58	-32	+13	+59
Red-winged Blackbird	10.61	11.39	-16	+7	+31
Common Grackle	9.19	8.46	-40	-8	+24
Brown-headed Cowbird	6.63	5.78	-51	-13	+25
Rose-breasted Grosbeak*	4.21	6.16	+2	+46	+91
Evening Grosbeak	5.98	11.97	-49	+100	+249
American Goldfinch	6.18	5.60	-38	-9	+20
Savannah Sparrow*	17.76	14.72	-32	-17	-2
Dark-eyed Junco	5.02	4.21	-45	-16	+13
Chipping Sparrow*	12.92	10.86	-32	-16	0
White-throated Sparrow*	59.04	53.34	-15	-10	-4
Song Sparrow	19.80	17.74	-21	-10	+1

\* Change at least 95 per cent significant.

**Table 12**  
Changes in bird population samples for 30 comparable routes,  
Breeding Bird Survey, southern Ontario and southern Quebec,  
1972-73

Species	Weighted mean number of birds per route		% change (bold) with 95% confidence limits		
	1972	1973			
Killdeer	18.98	19.63	-21	+3	+28
Rock Dove*	16.93	12.58	-47	-26	-5
Mourning Dove	13.14	16.51	-3	+26	+54
Common Flicker	6.25	6.05	-30	-3	+24
Eastern Kingbird	7.77	8.56	-16	+10	+36
Great Crested Flycatcher*	4.84	7.18	+6	+48	+91
Eastern Wood Pewee	4.34	4.03	-36	-7	+21
Horned Lark	5.66	5.17	-33	-9	+15
Tree Swallow	10.49	9.19	-35	-12	+10
Bank Swallow	25.53	27.55	-57	+8	+73
Barn Swallow	39.55	38.27	-22	-3	+15
Purple Martin	3.83	3.89	-40	+1	+42
Blue Jay	4.66	4.76	-33	+2	+38
Common Crow	54.64	56.15	-15	+3	+20
House Wren	3.08	3.28	-13	+6	+26
Gray Catbird*	4.41	3.23	-52	-27	-1
Brown Thrasher*	4.89	6.29	0	+29	+58
American Robin*	55.09	49.08	-19	-11	-3
Veery	4.97	5.05	-33	+2	+36
Cedar Waxwing	4.22	5.06	-28	+20	+68
Starling	152.22	183.07	-14	+20	+54
Red-eyed Vireo*	7.69	6.12	-37	-20	-4
Warbling Vireo*	4.03	2.67	-58	-34	-9
Yellow Warbler	6.47	7.53	-9	+16	+42
Common Yellowthroat	9.78	10.95	-11	+12	+35
House Sparrow	72.07	76.21	-23	+6	+34
Bobolink	54.42	44.11	-40	-19	+3
Eastern Meadowlark	27.67	29.84	-10	+8	+25
Red-winged Blackbird	167.73	151.87	-21	-9	+3
Northern Oriole†	7.87	8.56	-13	+9	+31
Common Grackle	87.83	102.34	-21	+17	+54
Brown-headed Cowbird*	26.12	21.35	-36	-18	-1
Rose-breasted Grosbeak	4.60	5.01	-12	+9	+30
American Goldfinch	21.38	19.76	-24	-8	+9
Savannah Sparrow*	59.58	49.22	-24	-17	-11
Vesper Sparrow*	7.90	5.33	-48	-32	-17
Chipping Sparrow*	15.41	11.01	-39	-29	-18
White-throated Sparrow	8.21	6.77	-45	-18	+10
Song Sparrow	40.18	44.47	-1	+11	+22

\* Change at least 95 per cent significant.

† Baltimore Oriole and Bullock's Oriole now combined under  
this name (A.O.U. 1973).

**Table 13**  
Changes in bird population samples for 31 comparable routes,  
Breeding Bird Survey, southern Prairie Provinces, 1972-73

Species	Weighted mean number of birds per route		% change (bold) with 95% confidence limits		
	1972	1973			
Mallard	41.90	36.90	-51	-12	+28
Pintail	13.98	17.86	-53	+28	+108
Blue-winged Teal	11.18	11.68	-46	+4	+54
Shoveler*	11.81	8.46	-49	-28	-7
American Wigeon	7.60	5.41	-81	-29	+24
Lesser Scaup*	8.92	7.58	-29	-15	-1
Sora	4.09	3.03	-54	-26	+3
American Coot	9.11	6.15	-78	-33	+13
Killdeer	12.37	11.31	-26	-9	+9
Ring-billed Gull	16.53	25.52	-38	+54	+147
Franklin's Gull*	47.85	14.11	-99	-71	-42
Black Tern	11.86	11.22	-54	-5	+43
Rock Dove	8.06	6.28	-54	-22	+10
Mourning Dove	8.74	8.49	-39	-3	+33
Common Flicker	3.05	2.37	-51	-22	+6
Eastern Kingbird	6.00	7.40	-9	+23	+56
Least Flycatcher	2.61	2.00	-49	-24	+2
Horned Lark	72.31	80.49	-12	+11	+35
Tree Swallow	5.63	4.15	-55	-26	+3
Barn Swallow	17.00	15.43	-26	-9	+8
Cliff Swallow*	30.20	13.83	-83	-54	-25
Black-billed Magpie	10.22	8.20	-52	-20	+13
Common Crow	38.66	41.22	-9	+7	+22
House Wren	10.31	8.56	-38	-17	+4
American Robin	6.42	5.96	-36	-7	+21
Starling	17.32	16.32	-42	-6	+31
Warbling Vireo	3.09	2.77	-51	-11	+29
Yellow Warbler	5.40	4.72	-31	-13	+6
House Sparrow	56.00	65.22	-15	+16	+48
Bobolink	2.53	3.22	-19	+27	+73
Western Meadowlark	54.72	54.16	-14	-1	+12
Yellow-headed Blackbird	12.93	13.54	-50	+5	+59
Red-winged Blackbird	93.73	101.10	-2	+8	+17
Brewer's Blackbird	29.37	27.88	-24	-5	+14
Common Grackle	3.72	5.70	-52	+53	+158
Brown-headed Cowbird	20.44	23.31	-32	+14	+60
American Goldfinch	6.38	5.34	-41	-16	+8
Lark Bunting*	25.64	10.84	-85	-58	-30
Savannah Sparrow	18.15	17.44	-27	-4	+19
Vesper Sparrow	15.45	17.16	-21	+11	+43
Clay-coloured Sparrow	25.62	27.19	-9	+6	+21
Song Sparrow	11.03	9.78	-36	-11	+13
Chestnut-collared Longspur	14.35	14.69	-33	+2	+38

\* Change at least 95 per cent significant.

**Table 14**  
Changes in bird population samples for 13 comparable routes,  
Breeding Bird Survey, Alberta and Saskatchewan parklands,  
1972-73

Species	Weighted mean number of birds per route		% change (bold) with 95% confidence limits		
	1972	1973			
Mallard*	18.16	50.61	+12	<b>+178</b>	+345
Pintail	1.43	7.60	-101	<b>+431</b>	+964
Blue-winged Teal	3.45	7.08	-8	<b>+105</b>	+218
Shoveler	1.66	3.23	-68	<b>+94</b>	+256
Lesser Scaup*	2.99	6.87	+25	<b>+130</b>	+235
American Coot	2.41	3.16	-124	<b>+31</b>	+185
Killdeer	7.34	6.89	-42	<b>-6</b>	+30
Common Snipe*	4.03	12.10	+46	<b>+200</b>	+355
Franklin's Gull	14.34	12.59	-196	<b>-12</b>	+171
Black Tern*	7.11	4.11	-73	<b>-42</b>	-11
Common Flicker*	2.25	1.59	-51	<b>-29</b>	-8
Alder Flycatcher	9.48	7.01	-59	<b>-26</b>	+7
Least Flycatcher	8.17	10.64	-28	<b>+30</b>	+89
Western Wood Pewee	3.43	3.87	-53	<b>+13</b>	+79
Tree Swallow	6.35	5.19	-64	<b>-18</b>	+27
Barn Swallow	11.73	11.78	-62	<b>0</b>	+63
Black-billed Magpie	24.14	21.68	-47	<b>-10</b>	+27
Common Crow	44.72	51.80	-35	<b>+16</b>	+66
House Wren	14.46	14.69	-43	<b>+2</b>	+46
American Robin	24.50	22.00	-25	<b>-10</b>	+5
Starling	46.22	57.90	-90	<b>+25</b>	+141
Red-eyed Vireo	14.24	14.21	-52	<b>0</b>	+52
Warbling Vireo	1.75	1.76	-41	<b>+1</b>	+42
Yellow Warbler	7.30	11.12	-21	<b>+52</b>	+125
Common Yellowthroat*	6.35	4.06	-61	<b>-36</b>	-11
House Sparrow	14.98	20.05	-2	<b>+34</b>	+70
Western Meadowlark	13.34	15.02	-38	<b>+13</b>	+63
Red-winged Blackbird*	37.92	47.19	+6	<b>+24</b>	+43
Northern Oriole*	5.80	8.63	+12	<b>+49</b>	+85
Brewer's Blackbird*	28.15	40.50	+1	<b>+44</b>	+87
Brown-headed Cowbird*	7.89	11.46	+8	<b>+45</b>	+82
Pine Siskin	0.87	2.26	-214	<b>+159</b>	+533
American Goldfinch	4.00	4.41	-117	<b>+10</b>	+137
Savannah Sparrow	24.18	23.26	-24	<b>-4</b>	+16
Vesper Sparrow	18.70	17.71	-45	<b>-5</b>	+35
Dark-eyed Junco	1.86	0.99	-101	<b>-47</b>	+8
Chipping Sparrow	6.92	5.52	-64	<b>-20</b>	+23
Clay-coloured Sparrow	36.24	32.53	-29	<b>-10</b>	+9
White-throated Sparrow	8.78	6.35	-57	<b>-28</b>	+2
Song Sparrow	27.55	27.86	-10	<b>+1</b>	+12

\* Change at least 95 per cent significant.

**Table 15**  
Frequencies with which the 20 major species in each region  
were noted, and the proportion these species made up of all  
birds observed there, Breeding Bird Survey, Canada, 1973.  
Data from Tables 2 to 7 of this report.

Region	No. of top 20 species noted on					Sum of top 20 species as % of total for all species
	100% of routes	90-99% of routes	80-89% of routes	70-79% of routes	less than 70% of routes	
Maritimes	7	7	2	2	2	66
Central Ontario and Quebec	3	10	2	2	3	63
Southern Ontario and Quebec	12	5		2	1	83
Southern Prairie Provinces	3	10	1		6	72
Alta. and Sask. parklands	1	2	5	7	5	62
British Columbia	1	2	7	5	5	62



