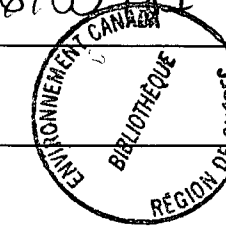


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### The co-operative Breeding Bird Survey in Canada, 1977

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#### Introduction

The Breeding Bird Survey (BBS) has been active in Canada since 1966. This co-operative effort attempts to measure year-to-year and long-term changes in populations of birds (especially smaller land birds) in settled areas of Canada. The BBS is limited mainly by the availability and distribution of qualified observers and of all-weather roads. The roadside method of surveying (Erskine 1978) precludes strictly natural habitats and incorporates an edge effect. An advantage of the BBS method, however, is that it samples larger numbers of individual birds relative to the time spent than almost any other type of ground survey. The BBS also enables detection of widespread or continuing changes in relatively common bird species, in time to take appropriate action. This report compares 1976 and 1977 data and considers the changes in bird populations over the last 5 years. It is similar in format and coverage to recent reports (cf. Erskine 1975, 1976, 1977). A report covering the first 10 years of the BBS in Canada has recently been published (Erskine 1978).

The Canadian Wildlife Service and the United States Fish and Wildlife Service co-ordinate the BBS while the surveys are done by volunteers and professional ornithologists. Methods of data collection are the same throughout, but procedures for editing and analysing data are revised as better methods are developed. The senior author directed the data analysis, in consultation with Dr. Erskine, who had been national co-ordinator until this year.

#### Results

##### Coverage

Figure 1 shows the distribution of degree-blocks in which surveys were made in 1977, compared with past coverage. Table 1 shows the actual numbers of routes surveyed in each of the last 5 years and the total number of routes surveyed since the survey began in 1966. In the Maritimes and in southern parts of Quebec, Ontario, and British Columbia, most degree-blocks contain two routes each; therefore the coverage is somewhat less complete than Figure 1 indicates.

##### Grouping of routes for analysis

The 1976 groupings were used again, with minor adjustments. The species detected in greatest numbers in each region are shown in Tables 2-8; the species most frequently detected along the route near Churchill, Manitoba, are shown in Table 9.

#### Changes observed

Analyses cover six major regions of Canada, as in recent years. Summaries of comparisons for the Maritimes, central Ontario and central Quebec, southern Ontario and southern Quebec, southern Prairie Provinces, central Prairie Provinces, and British Columbia (west of the Rockies) between 1976 and 1977 are presented in Tables 10-15. Although data for about 60 species were analysed for each region, only the comparisons made for species reported previously (cf. Erskine 1975, 1976, 1977) are presented here. Indices of relative abundance of those species are presented for the last 5 years for each region in Tables 16-21. For those analyses, 1973 estimates of abundance were fixed at an index value of 100. With 5 years of information now available for British Columbia, this is the first year that trends for this region have been seriously analysed.

#### Discussion

##### Coverage

The pattern of coverage differed only in detail from past years. The general downward trend in the number of routes surveyed continued into 1977. No routes were surveyed in the Yukon Territory or on the island of Newfoundland. Far fewer routes were surveyed in Alberta this year. More routes were surveyed than in previous years only in Manitoba, where three new routes were added in the north. Surprisingly, many of the gaps in coverage are near major population centres (e.g. Edmonton, Regina, Winnipeg, Montreal, Quebec City) where most competent observers live and where it should be easy to recruit more co-operators. While it is preferable that the same observer surveys a route each year, a survey by another observer, who may continue the following year better than no survey at all. An observer change means the route cannot be included in comparisons for the current year, but it may be comparable in the following year, which would otherwise be lost.

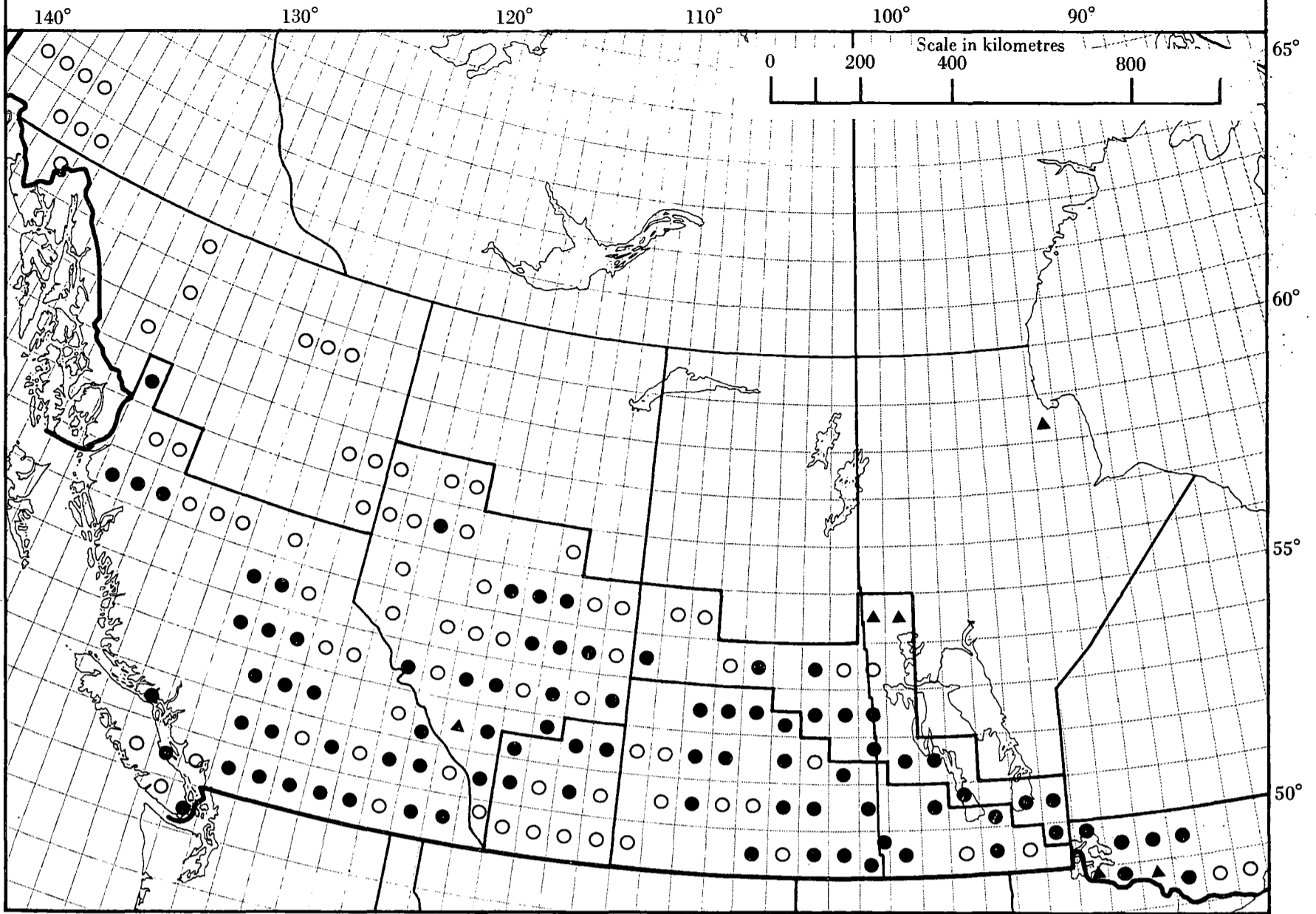
Of routes covered in both 1976 and 1977, 79% were comparable. Only in the southern Prairie Provinces (69%) were fewer than 77% of routes comparable. Of 38 routes which were surveyed in both 1976 and 1977 but which were not comparable, only 12 had observer changes while 14 had survey dates differing by 20 or more days between years or with one or both dates outside the allowable period (i.e. after 7 July). The other 12 were rejected for combinations of reasons, often including adverse weather. To ensure the collection of useful data, we emphasize the need to survey routes within the specified calendar period and as close to past survey dates as possible.

##### Grouping of routes for analysis

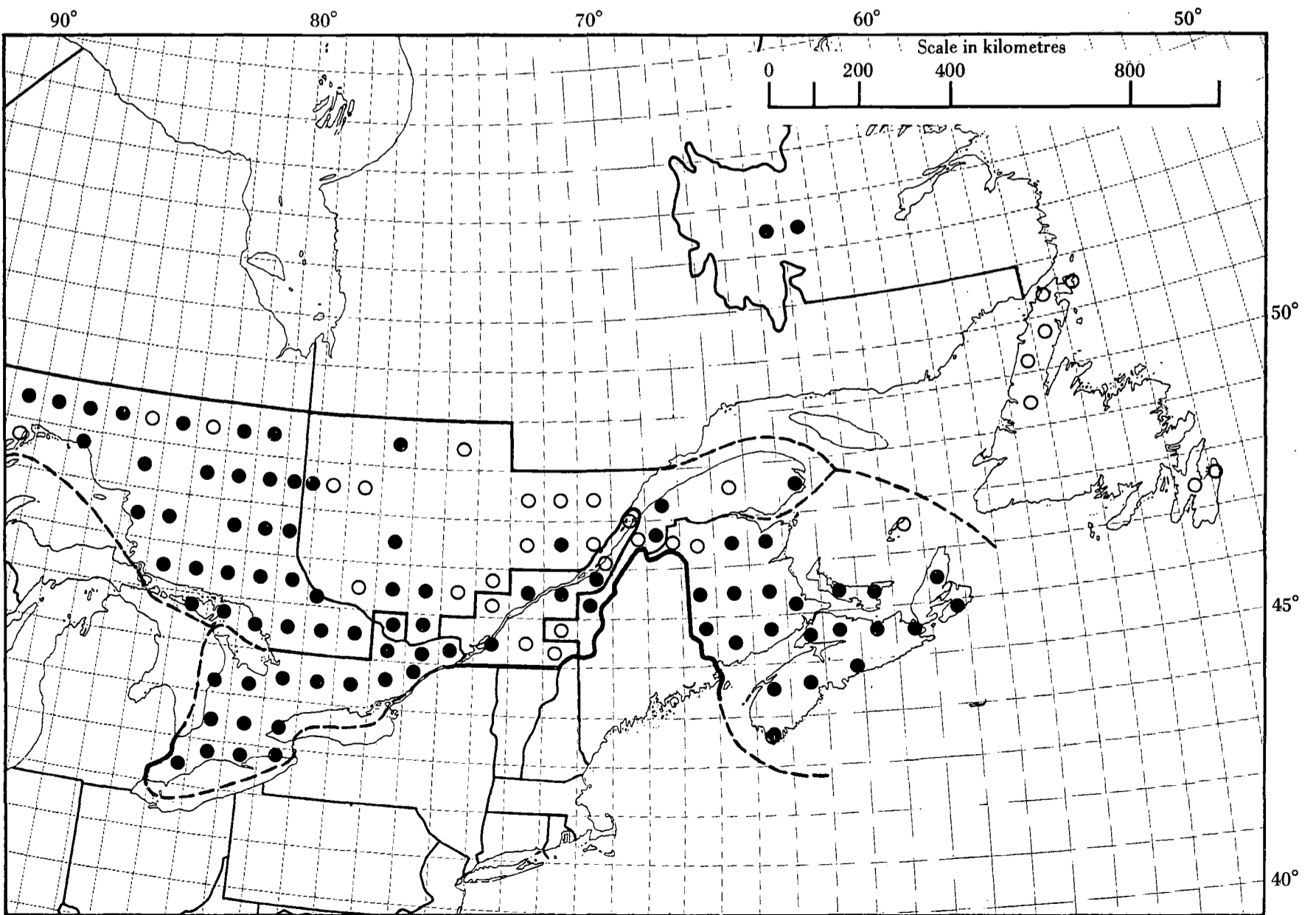
No changes were made this year, despite the marginally adequate samples again available from the Prairie Province

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Figure 1  
 Extent of coverage in 1977 and additional coverage in  
 1966-76 Breeding Bird Survey



2



3

- block surveyed in 1977 and previous years
- block surveyed previously but not in 1977
- ▲ block first surveyed in 1977
- outline of groupings for analysis

regions. The central Prairie Province region does not incorporate northeastern British Columbia, as no routes were surveyed in that area in 1977. Until the number of comparable routes is significantly increased in the current BBS coverage or the BBS coverage area is expanded, it is unlikely that the present analysis pattern of six major regions can be improved.

#### Changes observed

In 1977 more species decreased than increased significantly in numbers in all regions except the central Prairie Provinces (Tables 10 to 15). In the Maritimes, Yellow-bellied Sapsucker, Winter Wren and Ruby-crowned Kinglet all plummeted dramatically in numbers to their lowest levels since the surveys began (Tables 3 and 16; Erskine 1978), apparently in response to the severe winter in the south-eastern United States. Brown-headed Cowbird, Common Flicker, Nashville Warbler and Dark-eyed Junco, all of which seemed to be declining up to 1975 (Erskine 1978), appeared to be stable in 1977. Only House Sparrow and Common Yellowthroat increased significantly in numbers, although Red-eyed Vireo, Ovenbird and American Redstart also continued their upward trend.

Winter Wren and Ruby-crowned Kinglet declined dramatically and significantly in the central Ontario and central Quebec region; the Yellow-bellied Sapsucker population index was nearly unchanged between 1976 and 1977. The Song Sparrow population index also decreased significantly. Winter Wren was at its lowest level since 1969, the first year of the BBS in this region, and Song Sparrow and Ruby-crowned Kinglet population indices have never been lower (Tables 4 and 17; Erskine 1978). The decline for Ruby-crowned Kinglet and Winter Wren is made the more dramatic because of their previous steady increases since the BBS began in central Ontario and central Quebec (Erskine 1978). Meanwhile, population indices for both Mourning Warbler and American Redstart increased significantly. For American Redstart this renews a general upward trend noted by Erskine (1978) up to 1975, which was briefly halted in 1976. Among other species of interest, both Brown-headed Cowbird and Red-winged Blackbird showed little change, while population trends for Blue Jay, Cedar Waxwing and Rose-breasted Grosbeak remained decidedly uncertain.

In southern Ontario and southern Quebec, six species showed significant decreases while only two, Barn Swallow and Red-winged Blackbird, increased significantly. Both species have increased steadily in numbers since 1973. Gray Catbird and Rock Dove again increased between 1976 and 1977, although not as significantly as during the past five surveys. Among the species that declined was this region's representative of the genus *Troglodytes*, the House Wren, which also winters in the southeastern and southcentral United States. This decline followed successive increases since 1974. Warbling Vireo also decreased in numbers after increases in three successive years, while the decline in Northern Oriole in 1977 followed a significant increase in 1976. Blue Jay was at its lowest level (49% of 1973 level) since the surveys began in this region in 1968, perhaps also

a victim of the unusually cold and snowy eastern North American winter. Rose-breasted Grosbeak also declined, reversing a trend in evidence to 1975 (Erskine 1978). Killdeer also declined significantly between 1976 and 1977. The population indices suggest that Cedar Waxwings may be slowly declining in numbers although individual annual changes have not been significant. In southern Ontario and southern Quebec Starling continued a strong and steady increase, in evidence since 1968 (Erskine 1978).

In the southern prairie region, seven species declined significantly in numbers between 1976 and 1977, while none increased. Franklin's Gull, Starling, Yellow-headed Blackbird and Common Grackle declined to more usual levels after reaching extremely high numbers in 1976. Lark Bunting declined dramatically to its lowest level since the start of analyses of prairie birds in 1970, but this is not unexpected in light of the extreme fluctuation in population indices which is evident for this species between years. The most notable change in the southern Prairies is the decline of Sora to its lowest level during the survey period, after a strong and fairly steady increase since 1970. Among species not showing significant changes between 1976 and 1977, Rock Dove and Mourning Dove remained at their high 1976 levels, and House Wren and Red-winged Blackbird were stable. It bears repeating that, with only 18 comparable routes in 1976-77, accurate interpretation of BBS trends in the southern Prairies is quite tenuous. We hope that volunteers will come to the rescue and increase this number so that in the near future we do not have a gap in our annual data.

In the central prairie region, populations of four species declined while those of seven increased. Among waterbirds, Lesser Scaup were down while American Coot and Northern Shoveler both increased. Starling, Dark-eyed Junco and Pine Siskin all declined significantly following large increases between 1975 and 1976. Clay-coloured Sparrow and Red-winged Blackbird population indices rose significantly in 1977 following significant declines a year earlier. Compensatory changes, as were recorded for these species and several others in the southern Prairies, may reflect real population recoveries but more likely reflect local observation difficulties in one year (e.g. poor weather, unusual bird distribution or timing). Red-eyed Vireo continued to recover from a substantial decline due to a cold spring in 1974 and the increase in Black-billed Magpie completes the list of species which showed a significant change.

The most notable changes in Canada took place in British Columbia where, of 10 species changing significantly in numbers, only Starling showed an upward trend. Among those showing a significant decline, Western Wood Pewee, Black-capped Chickadee, Orange-crowned Warbler, House Sparrow and Pine Siskin reached their lowest level of the 5 years of the BBS. A consistent downward trend is suggested for Black-capped Chickadee and possibly Cedar Waxwing, which has declined in each year of the survey but never significantly. American Robin, Varied Thrush, Dark-eyed Junco and Song Sparrow all declined following large increases between 1975 and 1976. Among those species not showing a significant change in 1977, Common Flicker and

Rufous-sided Towhee are both of note as they remained at their relatively high levels of 1976.

Throughout Canada, 1977 was apparently not a very good year for birds. The winter of 1976-77 obviously took its toll on some species, notably Ruby-crowned Kinglet and Wrens in eastern Canada; but, surprisingly, thrushes and sparrows, which winter in the same general area, were not markedly affected. Changes in the Prairies may best be attributed to a dry winter and early spring followed by a wet May and June in many places. Causes for the changes in British Columbia are not known.

The continued decline in route coverage is presently our major concern. Now that the BBS has been active for at least 5 years in all provinces of Canada, real trends ought to become more evident, making the results more useful as an ecological early-warning device.

#### Acknowledgments

We wish to thank all observers and assistants plus the regional co-ordinators for their fine efforts and urge them to recruit competent observers, especially in regions where route coverage is declining.

Addresses of the co-ordinators are:

Newfoundland: co-ordinated from CWS, Ottawa K1A 0E7

New Brunswick, Nova Scotia, Prince Edward Island: Mr. David S. Christie, The New Brunswick Museum, 277 Douglas Avenue, Saint John, N.B. E2K 1E5

Quebec: Club des Ornithologues de Québec, 8191, avenue du Zoo, Orsainville G1G 4G4

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

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

Saskatchewan: Dr. J.B. Gollop, CWS, 115 Perimeter Road, Saskatoon S7N 0X4

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

British Columbia: Mr. R. Wayne Campbell, British Columbia Provincial Museum, Victoria V8W 1A1

Yukon Territory: co-ordinated from CWS, Ottawa K1A 0E7

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**Table 1**  
Number of routes completed in the Breeding Bird Survey, Canada 1973-77, compared to all routes surveyed in 1966 through 1977

Province	Total routes surveyed in 1966-77	No. routes surveyed*				
		1973	1974	1975	1976	1977
Nfld.	9	2	4	6	4	2
P.E.I.	4	4	4	4	3	4
N.S.	24	20	19	17	14	19
N.B.	27	22	21	16	18	19
Que.	47	24	21	24	21	20
Ont.	72	55	58	61	65	63
Man.	19	13	14	13	13	16
Sask.	32	28	19	19	20	21
Alta.	47	36	31	33	29	21
B.C.	79	38	53	50	42	34
Yukon	8	5	7	5	6	0
<b>Total</b>	<b>368</b>	<b>247</b>	<b>251</b>	<b>248</b>	<b>235</b>	<b>219</b>

\*The figures in bold type represent the greatest number of routes surveyed in one year for each province. PEI also had four routes surveyed each year in 1967-69; N.S. had 23 routes surveyed in 1972; N.B. had 24 routes surveyed each year in 1971-72; Quebec had 33 routes surveyed in 1970.

**Table 2**  
The 20 species recorded in greatest numbers in the Breeding Bird Survey, Maritime Provinces, 1977; the mean number of each per route; and the percentage of routes on which they were found. Forty-one routes were surveyed, with a mean of 758 birds noted per route

Species	Mean no. per route	% of 41 routes
American Robin	56.1	100
White-throated Sparrow	47.2	100
Starling	45.9	100
Common Crow	39.1	100
Song Sparrow	32.8	100
Common Yellowthroat	26.7	98
Bobolink	25.7	88
Red-winged Blackbird	25.7	95
Common Grackle	24.7	98
American Redstart	20.8	93
Herring Gull	19.5	63
Barn Swallow	18.5	100
Bank Swallow	17.3	68
House Sparrow	16.6	95
Red-eyed Vireo	16.4	98
Swainson's Thrush	15.0	95
Ovenbird	14.6	85
Savannah Sparrow	14.4	88
Alder Flycatcher	13.7	90
Tree Swallow	12.8	95

**Table 3**  
The 20 species recorded in greatest numbers in the Breeding Bird Survey, central Ontario and central Quebec, 1977; the mean number of each per route; and the percentage of routes on which they were found. Fifty-two routes were surveyed, with a mean of 624 birds noted per route

Species	Mean no. per route	% of 52 routes
White-throated Sparrow	45.2	100
Starling	35.7	83
American Robin	32.2	100
Red-eyed Vireo	32.0	98
Veery	21.9	87
Ovenbird	20.8	96
Common Crow	19.9	94
Red-winged Blackbird	18.7	87
Swainson's Thrush	17.1	85
Song Sparrow	16.7	96
Chipping Sparrow	16.4	98
Chestnut-sided Warbler	15.0	87
Common Yellowthroat	14.7	96
Common Grackle	13.4	90
Tree Swallow	11.9	92
Savannah Sparrow	11.6	71
Bobolink	11.5	52
Mourning Warbler	10.8	87
Barn Swallow	10.6	79
Herring Gull	10.0	50

**Table 4**  
The 20 species recorded in greatest numbers in the Breeding Bird Survey, southern Ontario and southern Quebec, 1977; the mean number of each per route; and the percentage of routes on which they were found. Thirty-one routes were surveyed, with a mean of 1356 birds noted per route

Species	Mean no. per route	% of 31 routes
Red-winged Blackbird	222.2	100
Starling	207.0	100
House Sparrow	87.1	100
Common Grackle	78.8	100
Savannah Sparrow	70.8	100
Bobolink	57.6	100
American Robin	53.8	100
Common Crow	46.0	100
Barn Swallow	45.9	97
Bank Swallow	45.1	90
Song Sparrow	44.7	100
Eastern Meadowlark	28.3	97
Brown-headed Cowbird	26.4	100
American Goldfinch	25.5	100
Killdeer	21.7	100
Rock Dove	19.8	97
Mourning Dove	19.1	97
Ring-billed Gull	14.3	45
Tree Swallow	12.9	90
Mallard	12.4	52

**Table 5**

The 20 species recorded in greatest numbers in the Breeding Bird Survey, southern Prairie Provinces, 1977; the mean number of each per route; and the percentage of routes on which they were found. Twenty-six routes were surveyed, with a mean of 964 birds noted per route

Species	Mean no. per route	% of 26 routes
Red-winged Blackbird	138.9	100
Horned Lark	86.2	100
House Sparrow	73.3	100
Western Meadowlark	55.6	100
Common Crow	47.2	100
Mallard	43.1	96
Brewer's Blackbird	32.9	100
Clay-coloured Sparrow	31.3	100
Yellow-headed Blackbird	27.5	81
Brown-headed Cowbird	26.7	100
Savannah Sparrow	20.8	96
Vesper Sparrow	18.3	92
Killdeer	15.8	100
Barn Swallow	15.2	100
Chestnut-collared Longspur	15.1	27
Mourning Dove	14.5	88
House Wren	14.0	81
Blue-winged Teal	13.7	77
Cliff Swallow	12.8	23
Black-billed Magpie	12.1	88

**Table 6**

The 20 species recorded in greatest numbers in the Breeding Bird Survey, central Prairie Provinces region, 1977; the mean number of each per route; and the percentage of routes on which they were found. Twenty-eight routes were surveyed, with a mean of 737 birds noted per route

Species	Mean no. per route	% of 28 routes
Red-winged Blackbird	70.8	96
Common Crow	40.3	93
Clay-coloured Sparrow	31.2	89
Mallard	30.2	64
Brewer's Blackbird	29.9	79
Song Sparrow	26.0	86
Savannah Sparrow	22.8	68
House Sparrow	21.5	75
American Robin	21.1	100
Yellow-headed Blackbird	20.6	46
Red-eyed Vireo	17.6	89
Brown-headed Cowbird	16.4	89
Starling	15.4	79
Barn Swallow	14.5	89
Franklin's Gull	14.0	46
Black-billed Magpie	13.6	79
Cliff Swallow	12.7	43
House Wren	11.9	86
Black Tern	10.8	57
Western Meadowlark	9.9	57

**Table 7**

The 20 species recorded in greatest numbers in the Breeding Bird Survey, British Columbia (west of Rocky Mountains), 1977; the mean number of each per route; and the percentage of routes on which they were found. Thirty-four routes were surveyed, with a mean of 623 birds noted per route

Species	Mean no. per route	% of 34 routes
Starling	60.3	82
American Robin	57.6	100
Crows*	36.5	88
Swainson's Thrush	29.9	100
Pine Siskin	18.8	88
Barn Swallow	15.9	88
Chipping Sparrow	14.6	85
Cliff Swallow	14.3	53
Dark-eyed Junco	14.3	94
Song Sparrow	12.5	97
Brewer's Blackbird	11.7	74
Glaucous-winged Gull	11.2	15
Violet-green Swallow	11.2	68
Red-eyed Vireo	10.6	71
Brown-headed Cowbird	9.5	85
Red-winged Blackbird	9.4	76
Yellow Warbler	8.8	94
Black-capped Chickadee	8.4	82
Western Meadowlark	7.9	53
Yellow-rumped (Audubon's) Warbler	7.7	85

\*Common Crow and Northwestern Crow combined.

**Table 8**

The 10 species recorded in greatest numbers in the Breeding Bird Survey, Labrador, 1977; the mean number per route; and the number of routes on which they were found. Two routes were surveyed with a mean of 310 birds noted per route

Species	Mean no. per route	No. of routes
White-crowned Sparrow	36.0	2
Pine Grosbeak	27.0	2
Hermit Thrush	26.5	2
Yellow-rumped Warbler	20.0	2
Dark-eyed Junco	16.0	2
American Robin	15.5	2
Northern Waterthrush	15.5	2
Blackpoll Warbler	14.5	2
Common Snipe	11.0	2
Tennessee Warbler	11.0	2

**Table 9**

The 10 species recorded in greatest numbers in the Breeding Bird Survey, Churchill, Manitoba, 1977; the number on the one route surveyed. A total of 931 birds was noted

Species	Number
Herring Gull	202
Arctic Tern	77
White-crowned Sparrow	59
Lesser Yellowlegs	55
Savannah Sparrow	53
Canada Goose	53
Arctic Loon	36
Whimbrel	33
Oldsquaw	31
Tree Sparrow	30

**Table 10**  
Changes in bird population samples for 24 comparable routes,  
Breeding Bird Survey, Maritime Provinces, 1976-77

Species	Weighted mean no. of birds per route		% change (bold) with 95% confidence limits		
	1976	1977			
Common Snipe	4.69	5.14	-20	+10	+40
Herring Gull	15.21	19.02	-48	+25	+99
Common Flicker	2.56	2.79	-45	+9	+63
*Yellow-bellied Sapsucker	5.25	3.06	-64	-42	-19
Alder Flycatcher	17.37	17.49	-14	+1	+15
Least Flycatcher	5.02	4.37	-41	-13	+15
Tree Swallow	13.37	12.95	-32	-3	+26
Bank Swallow	15.26	12.65	-68	-17	+34
Barn Swallow	15.93	18.68	-10	+17	+45
Blue Jay	4.02	3.48	-39	-14	+12
Common Raven	7.26	9.36	-12	+29	+69
Common Crow	37.64	44.82	-6	+19	+44
*Winter Wren	2.40	1.08	-80	-55	-30
American Robin	62.11	60.69	-13	-2	+8
Hermit Thrush	10.06	7.31	-59	-27	+5
Swainson's Thrush	15.32	14.74	-19	-4	+11
Veery	8.71	9.74	-10	+12	+33
*Ruby-crowned Kinglet	18.50	7.83	-66	-58	-49
Starling	54.04	43.99	-38	-19	+1
Red-eyed Vireo	14.38	16.52	-4	+15	+34
Nashville Warbler	5.89	5.88	-23	0	+22
Yellow Warbler	13.13	14.85	-9	+13	+35
Magnolia Warbler	13.39	13.58	-21	+1	+24
Black-throated Green Warbler	7.80	6.71	-33	-14	+5
Chestnut-sided Warbler	6.10	6.86	-14	+13	+39
Ovenbird	11.54	13.99	-1	+21	+43
*Common Yellowthroat	25.40	30.86	+5	+21	+38
American Redstart	20.02	22.31	-6	+11	+29
*House Sparrow	12.54	16.36	+7	+30	+54
Bobolink	24.87	25.14	-26	+1	+28
Red-winged Blackbird	25.48	24.61	-14	-3	+7
Common Grackle	28.40	23.33	-37	-18	+2
Brown-headed Cowbird	6.93	8.35	-35	+20	+75
Evening Grosbeak	2.89	2.21	-84	-23	+37
Purple Finch	6.65	7.08	-30	+6	+43
American Goldfinch	11.11	11.81	-22	+6	+34
Savannah Sparrow	16.93	14.86	-28	-12	+4
Dark-eyed Junco	9.48	10.75	-17	+13	+44
Chipping Sparrow	7.80	7.02	-32	-10	+12
White-throated Sparrow	49.87	51.06	-9	+2	+14
Song Sparrow	36.63	34.19	-19	-7	+5

\*Change greater than 95% significant.

**Table 11**  
Changes in bird population samples for 38 comparable routes,  
Breeding Bird Survey, central Ontario and central Quebec,  
1976-77

Species	Weighted mean no. of birds per route		% change (bold) with 95% confidence limits		
	1976	1977			
Killdeer	3.90	3.45	-35	-11	+12
Herring Gull	7.34	14.41	-91	+97	+284
Common Flicker	2.76	3.00	-19	+9	+37
Yellow-bellied Sapsucker	2.80	2.68	-54	-4	+45
Alder Flycatcher	7.59	7.67	-21	+1	+23
Least Flycatcher	8.93	8.24	-29	-8	+13
Tree Swallow	9.67	10.59	-13	+10	+32
Bank Swallow	3.46	3.61	-80	+4	+88
Barn Swallow	8.33	7.60	-34	-9	+16
Blue Jay	2.97	2.50	-56	-16	+25
Common Raven	7.74	9.97	-27	+29	+85
Common Crow	17.64	20.34	-16	+15	+46
*Winter Wren	7.84	4.24	-76	-46	-16
American Robin	30.82	31.95	-12	+4	+19
Hermit Thrush	8.51	8.83	-16	+4	+24
Swainson's Thrush	15.97	19.37	-9	+21	+51
Veery	15.25	18.98	-3	+24	+52
*Ruby-crowned Kinglet	10.36	2.93	-81	-72	-62
Cedar Waxwing	3.68	5.68	-15	+54	+123
Starling	36.18	32.41	-31	-10	+10
Red-eyed Vireo	32.54	33.71	-7	+4	+14
Nashville Warbler	8.42	7.58	-28	-10	+8
Yellow Warbler	4.59	3.48	-53	-24	+5
Magnolia Warbler	5.06	5.76	-18	+14	+46
Yellow-rumped Warbler	4.52	5.06	-16	+12	+40
Chestnut-sided Warbler	15.64	15.46	-18	-1	+15
Ovenbird	18.50	19.57	-7	+6	+18
*Mourning Warbler	8.73	11.31	+8	+29	+51
Common Yellowthroat	13.49	14.38	-11	+7	+24
*American Redstart	6.29	8.26	0	+31	+62
House Sparrow	5.18	4.04	-78	-22	+34
Bobolink	8.94	9.29	-19	+4	+27
Red-winged Blackbird	15.33	15.27	-26	0	+26
Common Grackle	9.34	12.22	-12	+31	+73
Brown-headed Cowbird	7.93	7.73	-46	-2	+41
Rose-breasted Grosbeak	5.57	4.64	-57	-17	+24
Evening Grosbeak	7.38	9.24	-34	+25	+84
American Goldfinch	5.23	6.11	-8	+17	+42
Savannah Sparrow	12.27	12.11	-24	-1	+21
Dark-eyed Junco	5.26	5.91	-32	+12	+56
Chipping Sparrow	11.56	12.73	-6	+10	+27
White-throated Sparrow	48.52	45.69	-15	-6	+4
*Song Sparrow	16.57	13.96	-27	-16	-4

\*Change greater than 95% significant.

**Table 12**  
Changes in bird population samples for 22 comparable routes,  
Breeding Bird Survey, southern Ontario and southern  
Quebec, 1976-77

Species	Weighted mean no. of birds per route		% change (bold) with 95% confidence limits		
	1976	1977			
*Killdeer	27.41	24.28	-22	-11	-1
Rock Dove	17.19	17.98	-48	+5	+57
Mourning Dove	17.66	17.55	-39	-1	+38
Common Flicker	5.15	5.30	-27	+3	+33
Eastern Kingbird	12.52	9.81	-43	-22	0
Great Crested Flycatcher	6.76	5.15	-48	-24	+1
Eastern Wood Pewee	4.98	4.22	-42	-15	+12
Horned Lark	8.22	8.47	-19	+3	+25
Tree Swallow	11.35	12.69	-21	+12	+44
Bank Swallow	53.17	40.18	-58	-24	+10
*Barn Swallow	43.99	55.17	+6	+25	+45
Purple Martin	4.36	3.69	-75	-16	+44
*Blue Jay	7.94	4.45	-61	-44	-27
Common Crow	49.39	42.95	-40	-13	+14
*House Wren	8.86	6.78	-40	-24	-7
Gray Catbird	5.41	5.53	-24	+2	+28
Brown Thrasher	5.35	5.72	-16	+7	+30
American Robin	51.82	51.01	-14	-2	+11
Veery	4.20	5.04	-45	+20	+85
Cedar Waxwing	8.65	7.40	-88	-14	+59
Starling	198.57	221.19	-26	+11	+49
Red-eyed Vireo	7.08	6.78	-20	-4	+11
*Warbling Vireo	5.65	3.73	-46	-34	-22
Yellow Warbler	11.43	10.09	-36	-12	+13
Common Yellowthroat	11.23	10.20	-32	-9	+13
House Sparrow	93.29	94.03	-18	+1	+19
Bobolink	69.39	63.75	-21	-8	+4
Eastern Meadowlark	29.11	30.71	-14	+5	+25
*Red-winged Blackbird	220.21	233.27	+1	+6	+11
*Northern Oriole	12.70	9.76	-39	-23	-7
Common Grackle	73.97	77.20	-11	+4	+20
Brown-headed Cowbird	30.22	26.93	-32	-11	+11
*Rose-breasted Grosbeak	7.75	6.09	-36	-21	-7
American Goldfinch	23.54	26.00	-11	+10	+32
Savannah Sparrow	82.34	85.71	-7	+4	+15
Vesper Sparrow	7.41	8.67	-3	+17	+37
Chipping Sparrow	12.97	12.73	-18	-2	+14
White-throated Sparrow	5.34	5.65	-33	+6	+44
Song Sparrow	42.91	46.47	-5	+8	+22

\*Change greater than 95% significant.

**Table 13**  
Changes in bird population samples for 18 comparable routes,  
Breeding Bird Survey, southern Prairie Provinces, 1976-77

Species	Weighted mean no. of birds per route		% change (bold) with 95% confidence limits		
	1976	1977			
Mallard	37.43	51.09	-40	+37	+113
Pintail	20.11	13.92	-133	-31	+72
Blue-winged Teal	13.63	18.13	-32	+33	+98
Northern Shoveler	6.22	5.71	-126	-8	+110
American Wigeon	4.57	3.99	-87	-13	+62
Lesser Scaup	15.62	26.38	-113	+69	+250
*Sora	8.17	2.52	-83	-69	-56
*American Coot	24.60	12.79	-84	-48	-12
Killdeer	17.93	16.39	-32	-9	+14
Ring-billed Gull	13.48	8.12	-101	-40	+22
*Franklin's Gull	16.21	4.86	-93	-70	-47
Black Tern	15.73	12.25	-88	-22	+44
Rock Dove	8.18	8.43	-75	+3	+81
Mourning Dove	14.82	14.06	-25	-5	+15
Common Flicker	3.29	2.51	-49	-24	+1
Eastern Kingbird	6.34	6.90	-19	+9	+37
Least Flycatcher	2.78	3.23	-45	+16	+78
Horned Lark	72.31	73.78	-13	+2	+17
Tree Swallow	8.05	5.12	-81	-36	+8
Barn Swallow	14.61	14.92	-23	+2	+27
Cliff Swallow	15.02	17.36	-18	+16	+49
Black-billed Magpie	12.87	12.60	-27	-2	+23
Common Crow	48.21	48.20	-20	0	+20
House Wren	14.26	14.75	-20	+3	+26
American Robin	6.35	8.02	-34	+26	+87
*Starling	22.58	11.95	-77	-47	-17
Warbling Vireo	3.20	3.77	-22	+18	+57
Yellow Warbler	4.19	5.14	-9	+23	+54
House Sparrow	62.90	78.05	-7	+24	+55
Bobolink	2.65	3.03	-55	+14	+83
Western Meadowlark	55.55	50.49	-18	-9	0
*Yellow-headed Blackbird	40.03	29.59	-49	-26	-3
Red-winged Blackbird	130.95	132.24	-15	+1	+17
Brewer's Blackbird	22.63	34.10	-29	+51	+131
*Common Grackle	7.32	4.42	-74	-40	-5
Brown-headed Cowbird	22.08	22.71	-34	+3	+40
American Goldfinch	5.18	6.03	-34	+16	+67
*Lark Bunting	7.39	0.40	-95	-94	-93
Savannah Sparrow	18.59	20.73	-9	+12	+32
Vesper Sparrow	23.10	21.02	-24	-9	+6
Clay-coloured Sparrow	32.44	34.79	-16	+7	+31
Song Sparrow	11.76	13.85	-6	+18	+42
Chestnut-collared Longspur	3.41	4.48	-27	+31	+90

\*Change greater than 95% significant.

**Table 14**

Changes in bird population samples for 16 comparable routes, Breeding Bird Survey, central Prairie Provinces region, 1976-77

Species	Weighted mean no. of birds per route		% change (bold) with 95% confidence limits		
	1976	1977			
Mallard	21.45	28.05	-43	<b>+31</b>	+104
Pintail	3.31	2.87	-115	-13	+88
Blue-winged Teal	2.33	4.67	-32	<b>+100</b>	+232
*Northern Shoveler	0.60	2.53	+44	<b>+322</b>	+600
*Lesser Scaup	26.13	7.65	-105	-71	-37
*American Coot	3.09	10.60	+71	<b>+243</b>	+413
Killdeer	9.53	9.21	-35	-3	+28
Common Snipe	8.55	8.48	-74	-1	+72
Franklin's Gull	20.68	15.19	-172	-27	+119
Black Tern	13.19	13.12	-31	-1	+30
Common Flicker	2.92	3.53	-18	<b>+21</b>	+60
Alder Flycatcher	6.27	6.44	-55	+3	+61
Least Flycatcher	8.21	8.65	-38	+5	+49
Western Wood Pewee	2.93	4.67	-150	<b>+59</b>	+268
Tree Swallow	3.84	5.76	-7	<b>+50</b>	+107
Barn Swallow	16.89	14.40	-43	-15	+14
*Black-billed Magpie	13.45	17.53	+5	<b>+30</b>	+55
Common Crow	40.09	46.13	-36	<b>+15</b>	+66
*House Wren	9.45	13.68	+11	<b>+45</b>	+78
American Robin	18.47	21.97	-16	<b>+19</b>	+54
*Starling	42.53	22.36	-79	-47	-16
*Red-eyed Vireo	13.65	16.24	+1	<b>+19</b>	+37
Warbling Vireo	4.51	4.76	-30	+6	+41
Yellow Warbler	7.53	9.67	-12	<b>+28</b>	+68
Common Yellowthroat	6.28	8.00	-7	<b>+27</b>	+62
House Sparrow	16.79	22.45	-36	<b>+34</b>	+104
Western Meadowlark	9.77	10.35	-26	+6	+37
*Red-winged Blackbird	57.79	74.45	+4	<b>+29</b>	+54
Northern Oriole	3.67	4.47	-24	<b>+22</b>	+67
Brewer's Blackbird	31.72	36.77	-13	<b>+16</b>	+45
Brown-headed Cowbird	14.20	16.24	-28	+14	+57
*Pine Siskin	11.59	5.96	-78	-49	-19
American Goldfinch	5.89	7.20	-16	<b>+22</b>	+61
Savannah Sparrow	28.12	27.80	-17	-1	+15
Vesper Sparrow	10.64	9.67	-31	-9	+13
*Dark-eyed Junco	2.13	1.07	-79	-50	-21
Chipping Sparrow	4.92	6.43	-20	<b>+31</b>	+81
*Clay-coloured Sparrow	31.75	38.97	+3	<b>+23</b>	+42
White-throated Sparrow	5.99	4.96	-76	-17	+41
Song Sparrow	33.43	29.71	-29	-11	+7

\*Change greater than 95% significant.

**Table 15**

Changes in bird population samples for 23 comparable routes, Breeding Bird Survey, British Columbia (west of Rocky Mountains), 1976-77

Species	Weighted mean no. of birds per route		% change (bold) with 95% confidence limits		
	1976	1977			
Killdeer	5.34	4.36	-44	-18	+7
Rufous Hummingbird	1.74	2.41	-30	<b>+39</b>	+108
Common Flicker	8.59	8.12	-27	-5	+16
Yellow-bellied Sapsucker	2.80	3.31	-28	+18	+65
Trail's Flycatcher	5.86	5.26	-46	-10	+25
*Western Wood Pewee	8.18	5.46	-49	-33	-18
Violet-green Swallow	6.40	9.03	-22	<b>+41</b>	+105
Tree Swallow	7.38	6.54	-51	-11	+29
Rough-winged Swallow	4.27	5.84	-16	<b>+37</b>	+89
Barn Swallow	12.64	11.20	-88	-11	+65
Cliff Swallow	9.84	13.78	-41	<b>+40</b>	+121
Common Raven	6.65	8.66	-13	<b>+30</b>	+73
Crows†	26.60	26.44	-15	-1	+14
*Black-capped Chickadee	6.48	4.91	-46	-24	-2
Chestnut-backed Chickadee	6.65	7.28	-26	+9	+45
Winter Wren	3.38	4.87	-15	<b>+44</b>	+103
*American Robin	60.09	52.71	-23	-12	-1
*Varied Thrush	5.90	5.13	-25	-13	-2
Swainson's Thrush	29.75	28.09	-19	-6	+8
Golden-crowned Kinglet	2.51	4.11	-36	<b>+64</b>	+164
Ruby-crowned Kinglet	5.25	4.66	-50	-11	+28
Cedar Waxwing	3.15	2.68	-56	-15	+27
*Starling	27.74	49.13	+14	<b>+77</b>	+140
Red-eyed Vireo	10.40	12.44	-4	<b>+20</b>	+43
Warbling Vireo	6.01	7.05	-23	<b>+17</b>	+58
*Orange-crowned Warbler	6.98	4.84	-59	-31	-2
Yellow Warbler	10.21	8.55	-33	-16	+1
Yellow-rumped Warbler	7.21	7.77	-17	+8	+33
MacGillivray's Warbler	5.13	5.74	-42	<b>+12</b>	+66
Wilson's Warbler	1.77	1.78	-35	+1	+37
*House Sparrow	9.94	4.75	-71	-52	-33
Western Meadowlark	9.99	9.20	-31	-8	+15
Red-winged Blackbird	7.53	9.16	-53	<b>+22</b>	+97
Brewer's Blackbird	12.53	11.51	-56	-8	+40
Brown-headed Cowbird	9.60	9.27	-38	-3	+31
Western Tanager	5.57	5.21	-39	-6	+26
*Pine Siskin	41.86	20.55	-82	-51	-20
American Goldfinch	4.57	3.95	-95	-14	+68
Rufous-sided Towhee	2.11	2.75	-56	<b>+30</b>	+116
Savannah Sparrow	3.71	3.81	-28	+3	+34
*Dark-eyed Junco	19.09	15.29	-37	-20	-3
Chipping Sparrow	18.98	16.29	-30	-14	+2
*Song Sparrow	11.02	9.22	-29	-16	-4

\*Change greater than 95% significant.

†Common and Northwestern Crows combined.



**Table 16**  
Index numbers of bird populations, Maritime Provinces,  
from Breeding Bird Survey, based on 1973 index of 100

Species	Annual indices				
	1973	1974	1975	1976	1977
Common Snipe	100	* 169	* 103	* 84	92
Herring Gull	100	91	82	50	63
Common Flicker	100	99	78	73	80
Yellow-bellied Sapsucker	100	125	140	* 108	* 63
Alder Flycatcher	100	* 149	* 103	* 121	122
Least Flycatcher	100	87	71	78	68
Tree Swallow	100	79	* 56	68	66
Bank Swallow	100	96	* 42	* 125	104
Barn Swallow	100	* 74	* 53	59	69
Blue Jay	100	136	116	139	120
Common Raven	100	111	91	86	111
Common Crow	100	108	* 95	96	114
Winter Wren	100	* 165	* 101	92	* 41
American Robin	100	107	102	104	102
Hermit Thrush	100	121	120	127	93
Swainson's Thrush	100	90	88	96	92
Veery	100	93	77	75	84
Ruby-crowned Kinglet	100	110	109	136	* 57
Starling	100	96	103	92	75
Red-eyed Vireo	100	* 137	115	128	147
Nashville Warbler	100	76	69	87	87
Yellow Warbler	100	* 79	72	* 89	101
Magnolia Warbler	100	* 75	77	* 93	94
Black-throated Green Warbler	100	70	65	79	68
Chesnut-sided Warbler	100	81	75	77	87
Ovenbird	100	119	* 89	92	111
Common Yellowthroat	100	* 85	78	77	* 93
American Redstart	100	108	104	105	117
House Sparrow	100	113	* 89	97	* 126
Bobolink	100	* 124	* 104	* 124	125
Red-winged Blackbird	100	104	103	118	114
Common Grackle	100	* 79	71	87	71
Brown-headed Cowbird	100	123	109	* 74	89
Evening Grosbeak	100	66	* 103	66	51
Purple Finch	100	102	106	90	95
American Goldfinch	100	110	107	102	108
Savannah Sparrow	100	93	95	100	88
Dark-eyed Junco	100	102	101	93	105
Chipping Sparrow	100	83	84	80	72
White-throated Sparrow	100	* 106	100	97	99
Song Sparrow	100	92	88	84	78
No. routes included in comparison	30	28	25	24	

\*Index change greater than 95% significant

**Table 17**  
Index numbers for bird populations, central Ontario and  
central Quebec, from Breeding Bird Survey, based on 1973  
index of 100

Species	Annual indices				
	1973	1974	1975	1976	1977
Killdeer	100	89	115	128	114
Herring Gull	100	130	* 62	117	230
Common Flicker	100	93	99	* 63	69
Yellow-bellied Sapsucker	100	77	98	92	88
Alder Flycatcher	100	128	116	93	94
Least Flycatcher	100	83	86	90	83
Tree Swallow	100	82	* 126	112	123
Bank Swallow	100	156	* 75	101	105
Barn Swallow	100	76	* 101	* 83	76
Blue Jay	100	77	82	99	83
Common Raven	100	103	106	127	164
Common Crow	100	96	* 71	77	89
Winter Wren	100	122	* 167	122	* 66
American Robin	100	107	104	* 125	130
Hermit Thrush	100	94	143	113	118
Swainson's Thrush	100	* 86	* 115	115	139
Veery	100	92	109	102	126
Ruby-crowned Kinglet	100	121	118	116	* 32
Cedar Waxwing	100	95	105	96	148
Starling	100	86	112	131	118
Red-eyed Vireo	100	88	* 107	110	114
Nashville Warbler	100	101	81	75	68
Yellow Warbler	100	66	94	109	83
Magnolia Warbler	100	100	115	* 89	101
Yellow-rumped Warbler	100	85	122	98	110
Chestnut-sided Warbler	100	91	101	96	95
Ovenbird	100	96	92	94	100
Mourning Warbler	100	106	* 142	* 101	* 130
Common Yellowthroat	100	98	112	97	104
American Redstart	100	111	122	110	* 144
House Sparrow	100	63	115	132	103
Bobolink	100	* 83	100	98	102
Red-winged Blackbird	100	100	106	106	106
Common Grackle	100	* 72	84	66	86
Brown-headed Cowbird	100	86	94	* 156	153
Rose-breasted Grosbeak	100	84	97	107	89
Evening Grosbeak	100	* 44	50	51	64
American Goldfinch	100	84	95	86	101
Savannah Sparrow	100	85	105	102	101
Dark-eyed Junco	100	77	96	81	91
Chipping Sparrow	100	112	109	112	123
White-throated Sparrow	100	107	108	102	96
Song Sparrow	100	92	101	96	* 81
No. routes included in comparison	28	28	33	38	

\*Index change greater than 95% significant.

**Table 18**  
Index numbers of bird populations, southern Ontario and southern Quebec, from Breeding Bird Survey, based on 1973 index of 100

Species	Annual indices				
	1973	1974	1975	1976	1977
Killdeer	100	89	107	123	* 109
Rock Dove	100	115	128	163	171
Mourning Dove	100	91	91	* 116	115
Common Flicker	100	101	98	94	97
Eastern Kingbird	100	96	79	102	80
Great Crested Flycatcher	100	* 69	63	* 95	72
Eastern Wood Pewee	100	89	* 62	71	60
Horned Lark	100	89	138	116	119
Tree Swallow	100	* 148	129	141	158
Bank Swallow	100	* 47	46	80	61
Barn Swallow	100	111	121	127	* 159
Purple Martin	100	110	108	122	102
Blue Jay	100	82	84	87	* 49
Common Crow	100	98	88	95	83
House Wren	100	* 120	146	156	* 119
Gray Catbird	100	* 132	130	151	154
Brown Thrasher	100	89	72	76	81
American Robin	100	105	106	100	98
Veery	100	107	139	128	154
Cedar Waxwing	100	119	102	74	64
Starling	100	104	101	139	154
Red-eyed Vireo	100	110	* 147	146	140
Warbling Vireo	100	132	143	177	* 117
Yellow Warbler	100	109	89	101	89
Common Yellowthroat	100	90	100	102	93
House Sparrow	100	97	87	98	99
Bobolink	100	118	113	146	134
Eastern Meadowlark	100	97	* 80	86	90
Red-winged Blackbird	100	107	* 138	149	* 158
Northern Oriole	100	110	102	* 147	* 113
Common Grackle	100	93	108	110	114
Brown-headed Cowbird	100	* 140	115	138	123
Rose-breasted Grosbeak	100	107	144	145	* 115
American Goldfinch	100	102	122	113	124
Savannah Sparrow	100	88	104	119	124
Vesper Sparrow	100	91	90	76	89
Chipping Sparrow	100	108	118	101	99
White-throated Sparrow	100	* 151	211	* 156	165
Song Sparrow	100	103	* 91	89	96
No. routes included in comparison	26	23	27	22	

\*Index change greater than 95% significant.

**Table 19**  
Index numbers for bird populations, southern Prairie Provinces, from Breeding Bird Survey, based on 1973 index of 100

Species	Annual indices				
	1973	1974	1975	1976	1977
Mallard	100	100	116	118	162
Pintail	100	163	233	240	166
Blue-winged Teal	100	148	171	161	214
Northern Shoveler	100	116	* 182	122	112
American Wigeon	100	111	143	140	122
Lesser Scaup	100	244	176	336	568
Sora	100	164	218	242	* 75
American Coot	100	200	206	319	* 166
Killdeer	100	114	124	122	111
Ring-billed Gull	100	* 42	47	68	41
Franklin's Gull	100	178	94	* 311	* 93
Black Tern	100	77	102	118	92
Rock Dove	100	* 67	80	* 194	200
Mourning Dove	100	103	112	* 153	145
Common Flicker	100	87	112	123	93
Eastern Kingbird	100	91	81	* 105	114
Least Flycatcher	100	129	186	147	171
Horned Lark	100	113	120	128	131
Tree Swallow	100	102	112	327	209
Barn Swallow	100	89	98	98	100
Cliff Swallow	100	140	153	* 77	89
Black-billed Magpie	100	90	82	* 129	126
Common Crow	100	89	80	* 98	98
House Wren	100	91	92	99	102
American Robin	100	96	96	130	164
Starling	100	129	144	228	* 121
Warbling Vireo	100	105	102	96	113
Yellow Warbler	100	97	75	82	101
House Sparrow	100	82	116	133	165
Bobolink	100	* 67	79	70	80
Western Meadowlark	100	106	95	101	92
Yellow-headed Blackbird	100	144	155	208	* 154
Red-winged Blackbird	100	96	107	105	106
Brewer's Blackbird	100	113	121	100	151
Common Grackle	100	* 55	86	144	* 86
Brown-headed Cowbird	100	120	116	114	117
American Goldfinch	100	89	85	94	109
Lark Bunting	100	110	* 32	* 209	* 13
Savannah Sparrow	100	118	111	103	115
Vesper Sparrow	100	109	110	127	116
Clay-coloured Sparrow	100	93	82	101	108
Song Sparrow	100	124	98	95	112
Chestnut-collared Longspur	100	90	102	140	183
No. routes included in comparison	28	23	21	18	

\*Index change greater than 95% significant.

**Table 20**  
Index numbers for bird populations, central Prairie Provinces, from Breeding Bird Survey, based on 1973 index of 100

Species	Annual indices				
	1973	1974	1975	1976	1977
Mallard	100	88	79	95	124
Pintail	100	258	178	* 89	77
Blue-winged Teal	100	166	139	* 89	178
Northern Shoveler	100	207	* 134	* 58	* 245
Lesser Scaup	100	91	83	61	* 18
American Coot	100	134	183	* 70	* 240
Killdeer	100	116	107	100	97
Common Snipe	100	108	117	90	89
Franklin's Gull	100	139	89	* 41	30
Black Tern	100	97	101	125	124
Common Flicker	100	97	143	* 103	125
Alder Flycatcher	100	139	157	108	111
Least Flycatcher	100	92	99	71	75
Western Wood Pewee	100	76	103	141	224
Tree Swallow	100	103	116	169	254
Barn Swallow	100	101	109	105	89
Black-billed Magpie	100	80	74	84	* 109
Common Crow	100	82	82	76	87
House Wren	100	92	99	103	* 149
American Robin	100	99	101	101	120
Starling	100	* 70	71	146	* 77
Red-eyed Vireo	100	* 50	66	79	* 94
Warbling Vireo	100	92	* 63	95	101
Yellow Warbler	100	116	115	* 86	110
Common Yellowthroat	100	115	116	106	135
House Sparrow	100	* 73	88	66	88
Western Meadowlark	100	101	87	92	98
Red-winged Blackbird	100	96	102	* 87	* 112
Northern Oriole	100	134	110	78	95
Brewer's Blackbird	100	137	123	134	155
Brown-headed Cowbird	100	* 145	129	130	148
Pine Siskin	100	146	* 38	* 255	* 130
American Goldfinch	100	73	65	79	96
Savannah Sparrow	100	100	91	112	111
Vesper Sparrow	100	95	100	88	80
Dark-eyed Junco	100	106	133	* 185	* 93
Chipping Sparrow	100	137	* 95	80	105
Clay-coloured Sparrow	100	103	112	* 94	* 116
White-throated Sparrow	100	115	108	103	85
Song Sparrow	100	95	93	96	85
No. routes included in comparison	23	25	16	16	

\*Index change greater than 95% significant.

**Table 21**  
Index numbers for bird populations, British Columbia (west of Rocky Mountains), from Breeding Bird Survey, based on 1973 index of 100

Species	Annual indices				
	1973	1974	1975	1976	1977
Killdeer	100	* 64	* 100	152	125
Rufous Hummingbird	100	143	123	97	135
Common Flicker	100	* 78	98	* 163	155
Yellow-bellied Sapsucker	100	149	125	151	178
Trail's Flycatcher	100	94	100	88	79
Western Wood Pewee	100	84	50	68	* 46
Violet-green Swallow	100	127	76	116	164
Tree Swallow	100	96	78	105	93
Rough-winged Swallow	100	205	* 96	77	105
Barn Swallow	100	101	141	127	113
Cliff Swallow	100	75	63	202	283
Common Raven	100	99	144	168	218
Crows†	100	89	103	111	110
Black-capped Chickadee	100	* 51	60	54	* 41
Chestnut-backed Chickadee	100	64	54	* 84	92
Winter Wren	100	113	82	110	158
American Robin	100	* 83	80	* 94	* 83
Varied Thrush	100	98	146	* 128	* 111
Swainson's Thrush	100	98	92	105	99
Golden-crowned Kinglet	100	85	72	68	112
Ruby-crowned Kinglet	100	87	130	* 92	82
Cedar Waxwing	100	79	69	67	57
Starling	100	81	103	75	* 133
Red-eyed Vireo	100	84	75	* 91	109
Warbling Vireo	100	104	92	* 145	170
Orange-crowned Warbler	100	100	85	96	* 66
Yellow Warbler	100	111	* 88	108	91
Yellow-rumped Warbler	100	117	122	101	109
MacGillivray's Warbler	100	* 66	57	60	67
Wilson's Warbler	100	177	* 81	103	104
House Sparrow	100	114	118	144	* 69
Western Meadowlark	100	87	* 129	108	99
Red-winged Blackbird	100	82	137	* 62	76
Brewer's Blackbird	100	79	66	84	77
Brown-headed Cowbird	100	116	124	128	124
Western Tanager	100	104	110	118	111
Pine Siskin	100	95	151	163	* 80
American Goldfinch	100	120	99	126	108
Rufous-sided Towhee	100	89	71	* 143	186
Savannah Sparrow	100	* 66	71	87	90
Dark-eyed Junco	100	120	114	* 168	* 134
Chipping Sparrow	100	91	123	105	90
Song Sparrow	100	114	* 107	131	* 110
No. routes included in comparison	27	26	24	23	

\*Index change greater than 95% significant.

†Common Crow and Northwestern Crow combined.

