

Progress Notes contain *interim* data and conclusions and are presented as a service to other wildlife biologists and agencies.

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No. 45, April 1975

The co-operative Breeding Bird Survey in Canada, 1974

by Anthony J. Erskine¹

Introduction

The Breeding Bird Survey (BBS) is our only coast-to-coast operation monitoring trends in numbers of birds (especially land birds). Bird numbers vary in response to weather fluctuations, habitat changes, toxic chemicals, or combinations of these and many other factors. We hope that this survey will allow us to detect widespread or continuing changes in time to take appropriate action. We have as yet found few very striking trends, but we have only examined data for the relatively common species. Further, the BBS is restricted to those parts of Canada where there is both a network of roads and a number of qualified observers. This project is carried out by the Canadian Wildlife Service and the United States Fish and Wildlife Service through the assistance of hundreds of enthusiastic volunteers. Methods of data collection and analysis used in this report are unchanged from recent reports (CWS Progress Notes Nos. 38 and 32); earlier reports (CWS Progress Notes Nos. 26, 21, and 15) used a different method of analysis and different groupings of routes.

Results

Coverage

Figure 1 shows the distribution of degree blocks in which surveys were made in 1974, and Table 1 compares the numbers of routes completed in five recent years with the totals of all routes ever surveyed.

Grouping of routes for analysis

The groupings used in 1973 were continued, with minor adjustments. The species most frequently reported in each region are shown in Tables 2 to 9.

Changes observed

For the first time, we have analysed data for all six major regions, Maritimes, central Ontario and Quebec, southern Ontario and Quebec, southern Prairie Provinces, central Prairie Provinces, and British Columbia. The central Prairie Province region, titled Alberta and Saskatchewan parklands in the 1973 Survey, includes the parkland, forest, and foothill areas of Alberta, Saskatchewan, and northeast British Columbia. The data for the parklands region again barely suffice. Data for the Newfoundland and Yukon regions, though increased compared to 1973, do not yet allow meaningful analysis. Summaries of comparisons between 1973 and 1974 are presented in Tables 10 to 15. Tables of annual index numbers for species analysed are given for the four regions with five or more years of data (Tables 16 to 19).

Discussion

Coverage

There was little change in overall coverage, except in British Columbia, and the total number of routes was only marginally above that of 1973. More of the routes previously surveyed were missed in Quebec than in other provinces (cf. Table 1), and we anticipate making a concerted effort to improve coverage there in 1975. As in past years, most observers surveyed one route only, but we are concerned about the 39 observers who collectively surveyed 93 routes (20% of the observers covered 37% of the routes). They may find it difficult to continue doing this in the future, and it would be as well to spread this effort more widely if possible.

Grouping of routes for analysis

Few people will quarrel with the division of our coverage area into six major regions, although some of their boundaries are open to question. The British Columbia and Maritimes regions are separated from the rest of Canada by the Rockies and the Appalachians respectively, and the western edge of the Canadian Shield roughly marks the boundary between the other two pairs. Each of these two pairs includes a southern agricultural zone and a northern (partly or largely) forested one separated by a transition area in which agricultural and forested lands are interspersed. Ideally, each survey route in this transition area should be assigned to one of the two zones, depending on whether the groupings of birds found along the route are similar to those found in the agricultural zone or the forested zone. However, in practice we have to assign most of these survey routes to the northern zones, so as to ensure sufficient surveys there to allow for meaningful comparisons. There is seldom any problem in securing sufficient numbers of surveys in the more densely settled southern zones. It may be necessary in the future to transfer some more of the Saskatchewan routes to the northern parklands region in order to offset the persistently low number of routes there. At the same time, by adding those British Columbia routes east of the Rockies, the region should become a workable unit.

Changes observed

Statistically significant changes from 1973 to 1974 are marked in Tables 10 to 15. The most striking feature of these was that in the three western regions all significant changes except one were downward. Only in the southern Ontario and Quebec and Maritimes regions did increases equal decreases among the significant changes. Most species increased in southern Ontario and Quebec, but in the Maritimes a number of insectivorous species decreased, especially warblers. This is thought to be a consequence of the severe snowstorm of late May, since insectivorous species that arrived later, such as the Red-eyed Vireo and Alder Flycatcher, actually increas-

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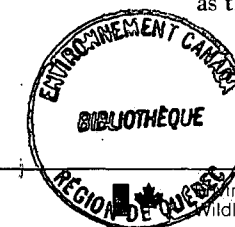
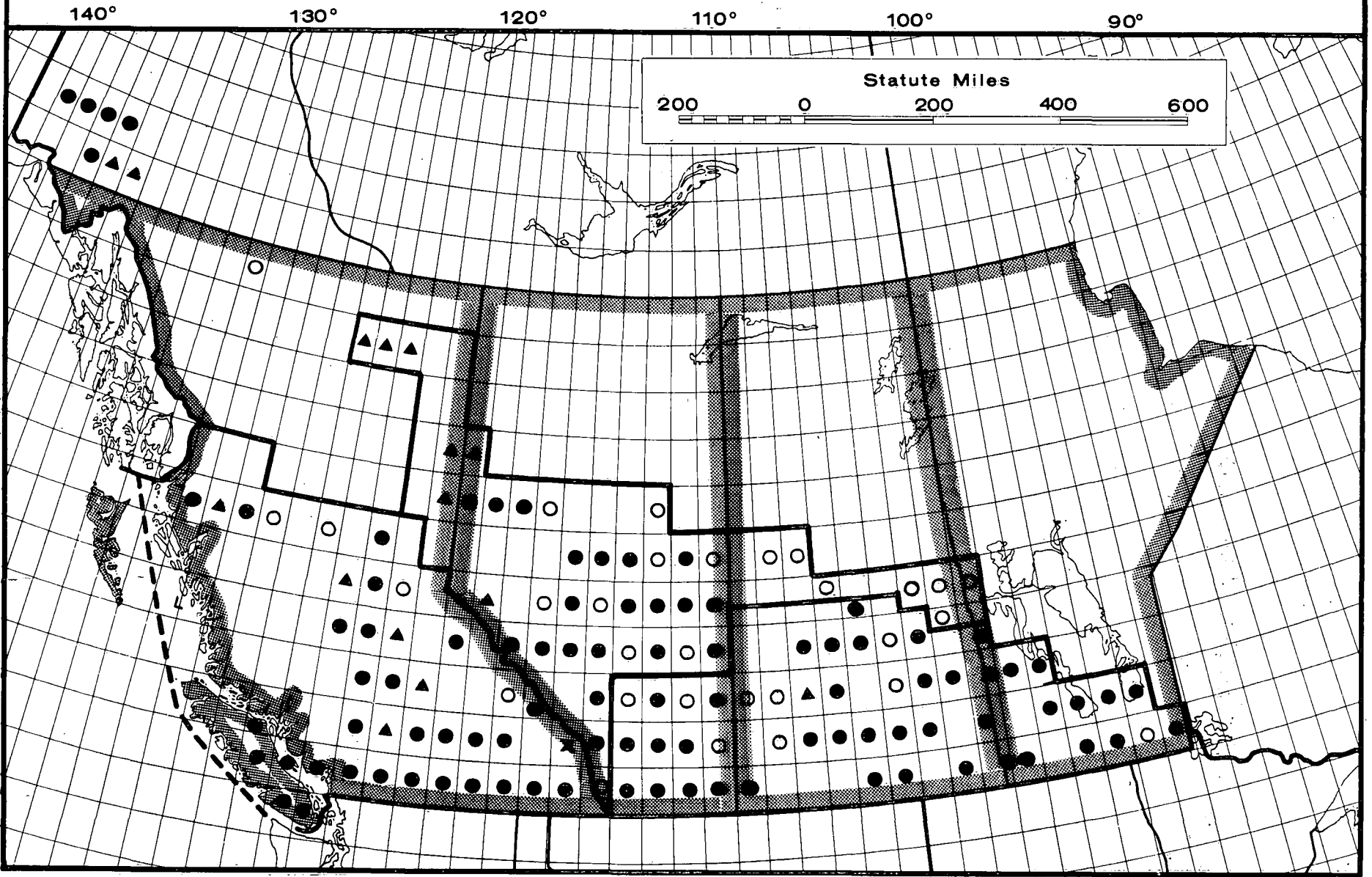
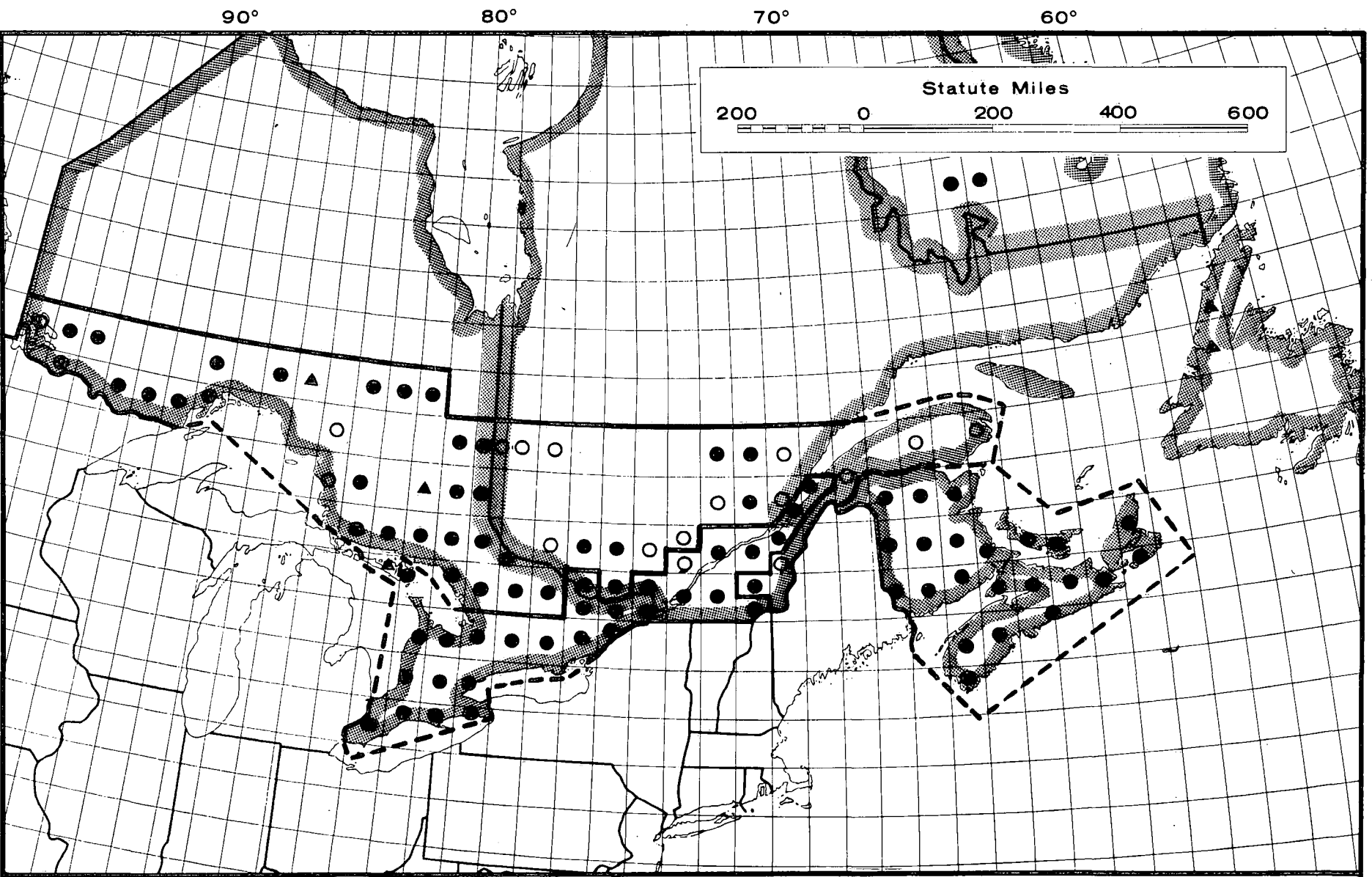
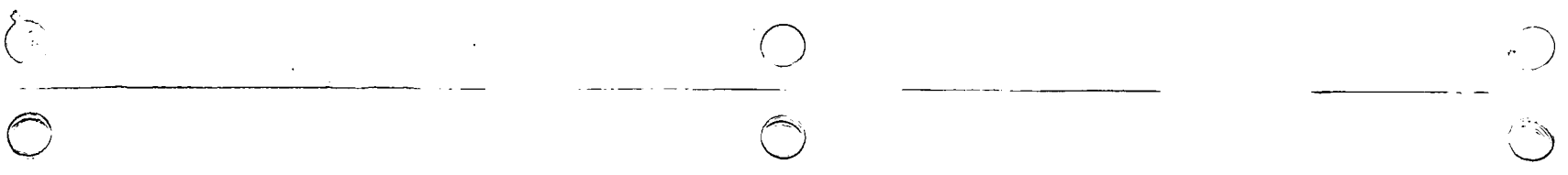


Figure 1
 Extent of coverage in 1974 and additional coverage in 1966-73
 Breeding Bird Survey



2



3

- block surveyed in 1974 and previous years
- ▲ block first surveyed in 1974
- block surveyed previously but not in 1974
- ✕ 1974 coverage incomplete
- outline of groupings for analysis

ed. Although statistically significant changes elsewhere were nearly all downward, decreases were general only in British Columbia and the central Ontario and Quebec region. In the Prairie Provinces (both regions) increases outnumbered decreases, with water birds being detected in larger numbers in most areas, probably in response to abundant melt-water after the very heavy snowfalls in the 1973-74 winter.

We have not yet devised a satisfactory mathematical method for examining long-term trends, and the following remarks are derived without further treatment from the indices in Tables 16 to 19. These indices show no overall increase of Robins in the Maritimes, even though our estimates for this very common species are more accurate (narrower confidence interval) than for most others. Concern has been expressed in the Maritimes about Robins damaging blueberry crops; however, we may conclude that any increase noted in blueberry-growing areas results from movements within the Maritimes rather than from an overall increase. Indices for Red-eyed Vireos, Ovenbirds, and Redstarts have all doubled since 1967, with increases in most years; as yet we have no explanation for these increases. These are all species most characteristic of broad-leafed and mixed forests, and all have been common since the start of this survey. Flickers continue at the same low level as in the past two years, but there is no indication of a sustained decline. Grackles and Juncos, which were earlier suggested as possibly declining, are also at or close to their all-time low.

There are no obvious trends in the central Ontario and Quebec region, where coverage has been rather irregular. But in southern Ontario and Quebec, Starlings and Red-winged Blackbirds seem to show continued increases. There is a suggestion of increases in Redwings in the other eastern regions and in the southern Prairies as well, but all of these are too slight to be convincing. There is also some suggestion of a sustained decrease in Horned Larks in southern Ontario and Quebec.

In the Prairies, apart from several long-run trends of doubtful significance, two species showed marked decreases. Few people are likely to be seriously worried about a drop in Rock Doves, though these have decreased on the average almost 30% per year since 1970. The continued decline of Flickers to barely half of the 1970 index is also striking. Whether or not such trends, established over only five years, are real, we shall certainly be watching such species very carefully in the future. It should be obvious that the value of these surveys will increase as more years of data are added to the series, so we cannot over-emphasize the need for continued comparable coverage of as many routes as possible.

The future

1975 will be the tenth successive year for many surveys in the Maritimes and several in Quebec. To mark this, we are planning a special report to sum up what we have learned so far from this widespread co-operative effort. We hope to discuss the collection of data, the analyses, the comparisons among regions as well as within a region, long-run trends, and year-to-year changes in more detail than has been done in these summary reports. If any of our readers and co-operators have ideas for subjects they would like to see included, we shall be happy to consider them.

Looking further ahead, we anticipate that these surveys can be continued for another five to ten years without appreciable change. But we do recognize that the BBS depends not only on the willingness of our volunteer assistants, but also on the availability of relatively cheap gasoline. These surveys, with their frequent and rather rapid stops and starts, use up much more fuel than ordinary driving. Hence, as pressure increases to conserve fuel, the BBS in its present form will become impossible to maintain. However, in order to make comparisons of any value the method of carrying out the survey must remain constant. We are continuing to look for a satisfactory alternative method which is not dependant on motor vehicles and which will be acceptable to the majority of competent bird enthusiasts.

Acknowledgements

Every year we are amazed at the number of people who are willing to get up in the middle of the night and drive many miles to undertake these surveys. To many, including myself, they are an exciting adventure, quite aside from being a valuable contribution to bird conservation. But there is certainly an effort required, as well as some expense, not to mention the expertise that is needed to carry out a survey effectively. So we extend our sincere thanks to all the people across Canada who have helped and continue to help in this project. Our regional co-ordinators deserve special thanks for their efforts to maintain and increase coverage. Any help you can give them will be appreciated by all of us. Their addresses are:—

Newfoundland: co-ordinated from CWS, Ottawa K1A 0H3.

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

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

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

Manitoba: Mr. H.W.R. Copland, Manitoba Museum of Man &
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: Co-ordinated from CWS, Ottawa
K1A 0H3.

Yukon Territory: Mr. Wayne P. Neily, Park Naturalist,
Kluane National Park, Haines Junction Y0B 1L0.

Table 1

Number of routes completed in the Breeding Bird Survey, Canada, 1970-74, compared to all routes surveyed in 1966 through 1974

Province	Total routes surveyed in	Number of routes surveyed in				
	1966-74	1970	1971	1972	1973	1974
Nfld.	4	0	0	0	2	4
P.E.I.	4	3	2	2	4	4
N.S.	24	20	21	23	20	19
N.B.	27	23	24	24	22	21
Que.	43	33	25	28	24	21
Ont.	62	47	53	47	55	58
Man.	16	11	11	14	13	14
Sask.	29	11	13	20	28	19
Alta.	42	11	17	27	36	31
B.C.	67	17	12	9	38	53
Yukon	7	0	0	1	5	7
Total	325	176	178	194	247	251

Table 2

The 20 species recorded in greatest numbers in the Breeding Bird Survey, Maritime Provinces, 1974; the mean number of each per route; and the percentage of routes on which they were found. Forty-four routes were surveyed, with a mean of 897 birds noted per route

Species	Mean no. per route	% of 44 routes
American Robin	69.8	100
White-throated Sparrow	58.7	100
Starling	46.7	98
Common Crow	40.6	98
Song Sparrow	37.6	100
Common Grackle	31.1	98
Red-winged Blackbird	27.4	98
Herring Gull	24.2	61
Common Yellowthroat	23.3	100
American Redstart	22.0	98
Barn Swallow	21.4	100
Bobolink	20.9	91
Bank Swallow	20.7	77
Alder Flycatcher	19.4	100
Swainson's Thrush	18.7	98
House Sparrow	18.6	84
Red-eyed Vireo	17.5	93
Ovenbird	17.1	93
Ruby-crowned Kinglet	16.0	95
Evening Grosbeak	14.7	45

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-two routes were surveyed, with a mean of 589 birds noted per route

Species	Mean no. per route	% of 42 routes
White-throated Sparrow	49.0	100
American Robin	30.4	100
Starling	28.9	86
Red-eyed Vireo	26.8	98
Common Crow	23.9	98
Ovenbird	22.1	100
Veery	19.9	91
Red-winged Blackbird	19.2	91
Song Sparrow	17.4	98
Chestnut-sided Warbler	16.8	93
Common Yellowthroat	16.1	88
Chipping Sparrow	13.3	93
Bobolink	12.2	50
Savannah Sparrow	11.2	74
Nashville Warbler	10.9	79
Barn Swallow	10.4	69
Swainson's Thrush	10.3	76
Ring-billed Gull	10.0	17
Tree Swallow	9.9	74
Mourning Warbler	9.3	91

Table 4

The 20 species recorded in greatest numbers in the Breeding Bird Survey, southern Ontario and southern Quebec, 1974; the mean number of each per route; and the percentage of routes on which they were found. Thirty-seven routes were surveyed, with a mean of 1113 birds noted per route

Species	Mean no. per route	% of 37 routes
Starling	165.1	100
Red-winged Blackbird	148.3	100
House Sparrow	73.6	100
Common Grackle	68.8	100
American Robin	53.3	100
Common Crow	48.5	100
Bobolink	46.6	100
Savannah Sparrow	46.5	97
Song Sparrow	41.7	100
Barn Swallow	38.1	100
Eastern Meadowlark	28.8	97
Brown-headed Cowbird	25.7	100
Bank Swallow	21.7	81
American Goldfinch	20.7	97
Killdeer	18.1	100
Rock Dove	16.1	81
Mourning Dove	14.7	92
Tree Swallow	12.9	89
Chipping Sparrow	12.5	100
Common Yellowthroat	11.7	86

Table 5

The 20 species recorded in greatest numbers in the Breeding Bird Survey, southern Prairie Provinces, 1974; the mean number of each per route; and the percentage of routes on which they were found. Forty-two routes were surveyed, with a mean of 884 birds noted per route

Species	Mean no. per route	% of 42 routes
Red-winged Blackbird	96.7	100
Horned Lark	78.8	95
Western Meadowlark	56.0	98
House Sparrow	53.6	100
Common Crow	37.8	100
Mallard	31.9	100
Brown-headed Cowbird	29.5	93
Brewer's Blackbird	29.0	100
Clay-coloured Sparrow	27.5	100
Savannah Sparrow	22.3	95
Starling	20.4	88
Yellow-headed Blackbird	19.6	79
Chestnut-collared Longspur	19.2	31
Franklin's Gull	19.1	43
Vesper Sparrow	16.4	95
Pintail	16.2	83
Cliff Swallow	15.4	48
Killdeer	14.5	100
Barn Swallow	14.4	100
Blue-winged Teal	12.8	81

Table 6

The 20 species recorded in greatest numbers in the Breeding Bird Survey, central Prairie Provinces region, 1974; the mean number of each per route; and the percentage of routes on which they were found. Twenty-seven routes were surveyed, with a mean of 542 birds noted per route

Species	Mean no. per route	% of 27 routes
Red-winged Blackbird	34.0	85
Franklin's Gull	25.5	33
Clay-coloured Sparrow	22.9	81
Common Crow	21.9	81
Brewer's Blackbird	21.6	67
Starling	19.5	81
Song Sparrow	17.8	59
Savannah Sparrow	17.5	81
Mallard	15.7	59
American Robin	15.2	96
Cliff Swallow	11.7	37
Chipping Sparrow	11.5	81
Brown-headed Cowbird	11.2	78
Yellow Warbler	10.5	89
White-throated Sparrow	10.5	59
Pine Siskin	10.3	70
Alder Flycatcher	9.8	52
Black-billed Magpie	9.4	70
House Sparrow	9.3	63
Least Flycatcher	9.0	74

Table 7

The 20 species recorded in greatest numbers in the Breeding Bird Survey, British Columbia (west of Rocky Mountains), 1974; the mean numbers of each per route; and the percentage of routes on which they were found. Forty-eight routes were surveyed, with a mean of 632 birds noted per route

Species	Mean no. per route	% of 48 routes
American Robin	62.8	100
Starling	59.5	88
Swainson's Thrush	33.5	94
Crows *	31.5	92
Pine Siskin	21.6	86
Brewer's Blackbird	17.3	73
Barn Swallow	16.8	90
Chipping Sparrow	13.7	83
Song Sparrow	13.6	92
Dark-eyed Junco	11.4	88
Brown-headed Cowbird	10.9	79
Glaucous-winged Gull	10.2	21
Tree Swallow	9.9	77
House Sparrow	9.9	38
Cliff Swallow	9.2	50
Yellow Warbler	9.2	81
Red-winged Blackbird	8.8	75
Violet-green Swallow	8.4	71
Orange-crowned Warbler	8.0	63
Black-capped Chickadee	7.8	69

*Common Crow and Northwestern Crow combined.

Table 8

The 10 species recorded in greatest numbers in the Breeding Bird Survey, Newfoundland (including Labrador), 1974; the mean number of each per route; and the number of routes on which each was noted (N after this number means noted only on the island of Newfoundland; L means noted only in Labrador). Four routes were surveyed, with a mean of 509 birds noted per route

Species	Mean no. per route	No. of routes
Herring Gull	79.3	3
American Robin	46.3	4
Northern Waterthrush	34.3	4
White-throated Sparrow	28.3	2 N
Blackpoll Warbler	27.8	4
Great Black-backed Gull	21.5	2 N
White-crowned Sparrow	20.0	2 L
Yellow-bellied Flycatcher	18.3	2 N
Fox Sparrow	16.0	4
Lincoln's Sparrow	16.0	4

Table 9

The 10 species recorded in greatest numbers in the Breeding Bird Survey, Yukon Territory, 1974; the mean number of each per route; and the percentage of routes on which they were found. Seven routes were surveyed, with a mean of 376 birds noted per route

Species	Mean no. per route	% of 7 routes
Swainson's Thrush	48.6	100
Dark-eyed Junco	47.5	100
White-crowned Sparrow	27.1	100
Yellow-rumped Warbler	24.7	100
American Robin	24.4	100
Greater Scaup	19.6	29
Cliff Swallow	18.8	71
Bank Swallow	18.4	86
Canada Jay	13.9	86
Chipping Sparrow	10.4	100

Table 10

Changes in bird population samples for 30 comparable routes, Breeding Bird Survey, Maritime Provinces, 1973-74

Species	Weighted mean no. of birds per route		% change (bold) with 95% confidence limits		
	1973	1974			
Common Snipe*	5.00	8.47	+21	+69	+117
Herring Gull	19.65	17.90	-55	-9	+37
Common Flicker	3.10	3.06	-36	-1	+34
Yellow-bellied Sapsucker	6.87	8.59	-11	+25	+62
Alder Flycatcher*	13.66	20.30	+19	+49	+79
Least Flycatcher	5.75	4.99	-34	-13	+8
Tree Swallow	21.10	16.76	-50	-21	+9
Bank Swallow	20.52	19.79	-31	-4	+23
Barn Swallow*	29.99	22.08	-38	-26	-14
Blue Jay	3.54	4.82	-2	+36	+75
Common Raven	11.06	12.28	-16	+11	+38
Common Crow	37.45	40.34	-10	+8	+25
Winter Wren*	4.08	6.75	+14	+65	+117
American Robin	61.23	65.33	-3	+7	+16
Hermit Thrush	9.38	11.32	-24	+21	+66
Swainson's Thrush	20.53	18.40	-28	-10	+7
Veery	10.74	9.96	-27	-7	+13
Ruby-crowned Kinglet	16.60	18.30	-11	+10	+32
Starling	51.84	49.89	-24	-4	+16
Red-eyed Vireo*	12.24	16.71	+12	+37	+61
Nashville Warbler	5.86	4.47	-53	-24	+6
Yellow Warbler*	13.07	10.39	-38	-21	-3
Magnolia Warbler*	14.52	10.84	-37	-25	-14
Black-throated Green Warbler	7.24	5.08	-60	-30	+1
Chestnut-sided Warbler	8.92	7.25	-39	-19	+2
Ovenbird	14.56	17.33	-1	+19	+39
Common Yellowthroat*	26.88	22.72	-28	-15	-3
American Redstart	19.76	21.28	-12	+8	+28
House Sparrow	16.72	18.86	-7	+13	+33
Bobolink*	18.94	23.47	+9	+24	+39
Red-winged Blackbird	26.74	27.78	-11	+4	+19
Common Grackle*	35.47	28.20	-31	-21	-10
Brown-headed Cowbird	7.53	9.24	-2	+23	+47
Evening Grosbeak	31.05	20.46	-105	-34	+37
Purple Finch	8.17	8.34	-32	+2	+36
American Goldfinch	10.81	11.84	-17	+10	+36
Savannah Sparrow	15.61	14.58	-21	-7	+7
Dark-eyed Junco	11.87	12.10	-18	+2	+22
Chipping Sparrow	10.18	8.49	-38	-17	+5
White-throated Sparrow	56.63	59.97	0	+6	+12
Song Sparrow	40.80	37.62	-20	-8	+4

*Change at least 95% significant.

Table 11
Changes in bird population samples for 28 comparable routes,
Breeding Bird Survey, central Ontario and central Quebec,
1973-74

Species	Weighted mean no. of birds per route		% change (bold) with 95% confidence limits		
	1973	1974			
Killdeer	4.68	4.15	-40	-11	+17
Herring Gull	4.64	6.03	-71	+30	+131
Common Flicker	5.18	4.80	-31	-7	+16
Yellow-bellied Sapsucker	2.57	1.97	-59	-23	+12
Alder Flycatcher	6.91	8.85	-24	+28	+80
Least Flycatcher	11.15	9.30	-42	-17	+9
Tree Swallow	11.07	9.06	-37	-18	+1
Bank Swallow	2.99	4.66	-93	+56	+205
Barn Swallow	14.31	10.87	-52	-24	+4
Blue Jay	3.21	2.48	-57	-23	+12
Common Raven	4.26	4.41	-31	+3	+38
Common Crow	27.98	26.68	-20	-4	+12
Winter Wren	5.37	6.54	-11	+22	+54
American Robin	31.16	33.46	-7	+7	+21
Hermit Thrush	8.40	7.86	-34	-6	+21
Swainson's Thrush*	16.05	13.41	-28	-16	-5
Veery	21.73	20.09	-20	-8	+5
Ruby-crowned Kinglet	7.94	9.60	-21	+21	+63
Cedar Waxwing	4.69	4.43	-52	-5	+41
Starling	42.32	36.19	-38	-14	+9
Red-eyed Vireo	30.42	26.86	-25	-12	+2
Nashville Warbler	10.93	11.03	-16	+1	+17
Yellow Warbler	5.39	3.54	-72	-34	+4
Magnolia Warbler	4.78	4.81	-44	0	+45
Yellow-rumped Warbler	5.21	4.43	-43	-15	+13
Chestnut-sided Warbler	17.07	15.55	-28	-9	+11
Ovenbird	20.89	20.06	-17	-4	+9
Mourning Warbler	9.61	10.18	-18	+6	+29
Common Yellowthroat	18.11	17.83	-15	-2	+12
American Redstart	6.83	7.60	-11	+11	+34
House Sparrow	6.80	4.26	-80	-37	+5
Bobolink	12.28	10.85	-24	-12	0
Red-winged Blackbird	15.91	15.98	-19	0	+20
Common Grackle*	10.52	7.61	-47	-28	-9
Brown-headed Cowbird	8.23	7.05	-47	-14	+18
Rose-breasted Grosbeak	7.25	6.08	-39	-16	+7
Evening Grosbeak*	10.54	4.61	-81	-56	-32
American Goldfinch	6.84	5.74	-48	-16	+15
Savannah Sparrow	15.54	13.27	-37	-15	+7
Dark-eyed Junco	4.32	3.31	-49	-23	+2
Chipping Sparrow	11.40	12.74	-4	+12	+27
White-throated Sparrow	52.34	55.81	-5	+7	+18
Song Sparrow	21.06	19.43	-21	-8	+6

*Change at least 95% significant.

Table 12
Changes in bird population samples for 26 comparable
routes, Breeding Bird Survey, southern Ontario and southern
Quebec, 1973-74

Species	Weighted mean no. of birds per route		% change (bold) with 95% confidence limits		
	1973	1974			
Killdeer	19.57	17.35	-26	-11	+4
Rock Dove	12.35	14.21	-44	+15	+74
Mourning Dove	15.37	13.98	-42	-9	+24
Common Flicker	5.45	5.48	-23	+1	+25
Eastern Kingbird	9.43	9.01	-31	-4	+22
Great Crested Flycatcher*	7.00	4.82	-53	-31	-9
Eastern Wood Pewee	3.54	3.17	-31	-11	+10
Horned Lark	5.79	5.18	-34	-11	+13
Tree Swallow*	7.97	11.81	+1	+48	+96
Bank Swallow*	32.66	15.24	-86	-53	-21
Barn Swallow	32.70	36.29	-30	+11	+52
Purple Martin	4.06	4.47	-47	+10	+67
Blue Jay	5.23	4.31	-46	-18	+11
Common Crow	52.53	51.69	-16	-2	+13
House Wren*	4.37	5.25	+2	+20	+38
Gray Catbird*	3.03	3.99	+1	+32	+62
Brown Thrasher	6.19	5.52	-31	-11	+9
American Robin	49.51	51.80	-10	+5	+19
Veery	5.59	5.96	-19	+7	+32
Cedar Waxwing	5.78	6.89	-71	+19	+109
Starling	167.29	174.27	-17	+4	+26
Red-eyed Vireo	5.53	6.07	-24	+10	+44
Warbling Vireo	2.59	3.43	-7	+32	+71
Yellow Warbler	7.97	8.72	-8	+9	+27
Common Yellowthroat	13.79	12.46	-22	-10	+3
House Sparrow	71.75	69.38	-26	-3	+19
Bobolink	44.94	52.93	-13	+18	+49
Eastern Meadowlark	31.01	30.08	-23	-3	+17
Red-winged Blackbird	143.68	153.16	-20	+7	+33
Northern Oriole	10.18	11.16	-16	+10	+35
Common Grackle	73.41	68.03	-37	-7	+23
Brown-headed Cowbird*	18.45	25.76	+1	+40	+78
Rose-breasted Grosbeak	5.47	5.83	-16	+7	+30
American Goldfinch	20.59	20.93	-28	-2	+32
Savannah Sparrow	52.84	46.73	-29	-12	+6
Vesper Sparrow	6.82	6.23	-34	-9	+16
Chipping Sparrow	11.38	12.32	-12	+8	+28
White-throated Sparrow*	6.62	10.03	+1	+51	+102
Song Sparrow	41.50	42.61	-10	+3	+16

*Change at least 95% significant.

Table 13

Changes in bird population samples for 36 comparable routes, Breeding Bird Survey, southern Prairie Provinces, 1973-74

Species	Weighted mean no. of birds per route		% change (bold) with 95% confidence limits		
	1973	1974			
Mallard	29.80	33.75	-43	+13	+70
Pintail	10.54	17.85	-58	+69	+197
Blue-winged Teal	9.22	14.43	-27	+56	+140
Northern Shoveler	6.83	7.22	-132	+6	+143
American Wigeon	5.08	5.43	-37	+7	+51
Lesser Scaup	4.56	9.82	-77	+115	+308
Sora	2.65	3.06	-45	+16	+77
American Coot	6.40	11.43	-42	+79	+199
Killdeer	11.26	13.27	-2	+18	+38
Ring-billed Gull*	27.61	11.99	-77	-57	-37
Franklin's Gull	11.68	17.43	-157	+49	+255
Black Tern	9.01	7.24	-63	-20	+24
Rock Dove*	6.65	4.10	-66	-38	-11
Mourning Dove	8.92	8.76	-19	-2	+15
Common Flicker	2.61	2.14	-58	-18	+22
Eastern Kingbird	7.14	6.80	-28	-5	+19
Least Flycatcher	2.39	2.75	-19	+15	+49
Horned Lark	77.94	88.44	-5	+13	+32
Tree Swallow	4.34	4.31	-55	-1	+54
Barn Swallow	14.98	13.56	-25	-10	+6
Cliff Swallow	14.46	18.23	-39	+26	+91
Black-billed Magpie	9.99	8.93	-28	-11	+7
Common Crow*	42.81	36.95	-24	-14	-3
House Wren	9.98	9.52	-18	-5	+9
American Robin	5.62	5.69	-22	+1	+24
Starling	17.65	22.45	-23	+27	+77
Warbling Vireo	2.81	3.30	-13	+17	+47
Yellow Warbler	5.22	5.32	-21	+2	+25
House Sparrow*	68.21	56.91	-33	-17	0
Bobolink*	2.95	1.97	-64	-33	-3
Western Meadowlark	53.28	56.49	-12	+6	+24
Yellow-headed Blackbird	13.34	17.71	-46	+33	+111
Red-winged Blackbird	99.08	93.60	-18	-6	+7
Brewer's Blackbird	25.94	30.54	-9	+18	+44
Common Grackle*	5.58	3.33	-75	-40	-6
Brown-headed Cowbird	23.92	29.31	-12	+23	+57
American Goldfinch	5.85	5.00	-37	-15	+8
Lark Bunting	12.58	14.59	-50	+16	+82
Savannah Sparrow	19.09	19.94	-9	+4	+18
Vesper Sparrow	14.85	16.98	-14	+14	+43
Clay-coloured Sparrow	28.89	27.04	-14	-6	+1
Song Sparrow	12.13	13.11	-20	+8	+36
Chestnut-collared Longspur	26.25	24.10	-49	-8	+33

Table 14

Changes in bird population samples for 15 comparable routes, Breeding Bird Survey, central Prairie Provinces region, 1973-74

Species	Weighted mean no. of birds per route		% change (bold) with 95% confidence limits		
	1973	1974			
Mallard	34.17	20.66	-98	-40	+19
Pintail*	5.40	9.36	+39	+73	+108
Blue-winged Teal	6.74	8.80	-31	+31	+92
Northern Shoveler	3.14	4.60	-64	+47	+157
Lesser Scaup	11.93	10.66	-73	-11	+52
American Coot	5.37	5.38	-75	0	+75
Killdeer	5.22	5.82	-15	+11	+38
Common Snipe	9.84	10.49	-38	+7	+51
Franklin's Gull	7.55	17.86	-402	+137	+675
Black Tern	7.30	6.98	-99	-4	+90
Common Flicker	1.48	2.22	-20	+50	+120
Alder Flycatcher	4.55	4.04	-41	-12	+18
Least Flycatcher	10.39	9.47	-31	-9	+13
Western Wood Pewee	2.85	2.15	-70	-25	+21
Tree Swallow	4.16	4.57	-41	+10	+60
Barn Swallow	7.47	8.40	-50	+12	+75
Black-billed Magpie*	15.73	11.35	-49	-28	-7
Common Crow	35.05	27.85	-52	-21	+11
House Wren*	10.97	8.81	-35	-20	-4
American Robin	22.99	21.90	-20	-5	+10
Starling*	41.20	27.58	-58	-33	-8
Red-eyed Vireo*	7.08	1.69	-88	-76	-64
Warbling Vireo*	3.06	1.61	-82	-47	-13
Yellow Warbler	7.62	8.59	-20	+13	+45
Common Yellowthroat	3.63	4.10	-29	+13	+55
House Sparrow*	18.09	13.36	-52	-26	0
Western Meadowlark	7.01	7.28	-37	+4	+44
Red-winged Blackbird	43.49	43.40	-26	0	+26
Northern Oriole	6.09	6.64	-29	+9	+47
Brewer's Blackbird	23.59	33.16	-53	+41	+134
Brown-headed Cowbird	10.60	14.94	-3	+41	+85
Pine Siskin	8.74	13.03	-66	+49	+164
American Goldfinch	2.81	2.29	-115	-18	+78
Savannah Sparrow	17.54	17.85	-36	+2	+39
Vesper Sparrow*	9.37	5.57	-67	-41	-14
Dark-eyed Junco	7.42	7.86	-59	+6	+71
Chipping Sparrow	8.49	12.40	-62	+46	+154
Clay-coloured Sparrow	21.43	24.09	-24	+12	+48
White-throated Sparrow	6.48	7.48	-18	+15	+49
Song Sparrow	21.25	21.63	-15	+2	+18

*Change at least 95% significant.

*Change at least 95% significant.

Table 15

Changes in bird population samples for 27 comparable routes, Breeding Bird Survey, British Columbia (west of Rocky Mountains), 1973-74. Note: The 1973 figures were increased by 10% for observers then new to the Survey (see text)

Species	Weighted mean no. of birds per route		% change (bold) with 95% confidence limits		
	1973	1974			
Killdeer*	4.02	2.59	-48	-36	-23
Rufous Hummingbird	2.29	3.28	-40	+43	+126
Common Flicker*	5.56	4.33	-43	-22	-1
Yellow-bellied Sapsucker	1.91	2.85	-25	+49	+124
Trail's Flycatcher‡	7.29	6.82	-34	-6	+21
Western Wood Pewee	6.62	5.59	-53	-16	+22
Violet-green Swallow	8.01	10.21	-22	+27	+77
Tree Swallow	11.26	10.85	-43	-4	+36
Rough-winged Swallow	3.45	7.08	-195	+105	+405
Barn Swallow	15.89	15.99	-36	+1	+37
Cliff Swallow	11.36	8.54	-135	-25	+85
Common Raven	4.26	4.21	-66	-1	+64
Crows‡	38.76	34.64	-24	-11	+3
Black-capped Chickadee*	13.79	7.07	-69	-49	-29
Chestnut-backed Chickadee	7.74	4.92	-81	-36	+8
Winter Wren	3.80	4.29	-16	+13	+42
American Robin*	73.94	61.55	-29	-17	-4
Varied Thrush	3.24	3.17	-45	-2	+41
Swainson's Thrush	38.06	37.22	-18	-2	+14
Golden-crowned Kinglet	5.41	4.61	-40	-15	+10
Ruby-crowned Kinglet	5.67	4.91	-50	-13	+23
Cedar Waxwing	4.33	3.43	-77	-21	+36
Starling	86.67	70.61	-65	-19	+28
Red-eyed Vireo	14.35	12.07	-42	-16	+10
Warbling Vireo	6.56	6.82	-91	+4	+99
Orange-crowned Warbler	6.65	6.64	-26	0	+26
Yellow Warbler	10.12	11.18	-22	+11	+43
Yellow-rumped Warbler	7.18	8.44	-17	+17	+52
MacGillivray's Warbler*	8.33	5.48	-61	-34	-7
Wilson's Warbler	2.08	3.67	-29	+77	+183
House Sparrow	7.57	8.63	-26	+14	+54
Western Meadowlark	9.14	7.98	-27	-13	+2
Red-winged Blackbird	12.94	10.67	-36	-18	+1
Brewer's Blackbird	20.57	16.31	-54	-21	+13
Brown-headed Cowbird	10.69	12.35	-38	+16	+69
Western Tanager	5.59	5.80	-24	+4	+31
Pine Siskin	26.60	25.17	-37	-5	+26
American Goldfinch	5.10	6.14	-30	+20	+71
Rufous-sided Towhee	4.82	4.30	-53	-11	+31
Savannah Sparrow*	8.84	5.87	-52	-34	-15

(Cont'd next page)

Table 15 (cont'd)

Changes in bird population samples for 27 comparable routes, Breeding Bird Survey, British Columbia (west of Rocky Mountains), 1973-74. Note: The 1973 figures were increased by 10% for observers then new to the Survey (see text)

Species	Weighted mean no. of birds per route		% change (bold) with 95% confidence limits		
	1973	1974			
Dark-eyed Junco	9.71	11.67	-13	+20	+53
Chipping Sparrow	21.62	19.57	-26	-9	+7
Song Sparrow	13.33	15.22	-4	+14	+32

*Change at least 95% significant.

‡Mostly Willow Flycatchers.

‡Common Crow and Northwestern Crow combined.

Table 16
Trends in index numbers for bird populations, Maritimes,
from Breeding Bird Survey, based on 1970 index of 100

Species	Index no. for									
	1966	1967	1968	1969	1970	1971	1972	1973	1974	
Common Snipe	53	97	108	* 79	100	124	114	110	* 186	
Herring Gull	48	52	41	40	100	* 46	74	* 31	28	
Common Flicker	116	100	101	91	100	86	* 42	51	50	
Yellow-bellied Sapsucker	92	103	96	* 128	* 100	149	* 101	76	95	
Alder Flycatcher	89	100	122	* 145	* 100	123	119	96	* 143	
Least Flycatcher	164	* 110	90	130	* 100	127	123	136	118	
Tree Swallow	134	118	99	109	100	131	118	93	73	
Bank Swallow	125	154	128	114	100	160	117	145	139	
Barn Swallow	85	99	84	96	100	83	92	107	* 79	
Blue Jay	68	71	* 169	* 105	100	114	89	87	118	
Common Raven	185	* 113	101	87	100	121	120	109	121	
Common Crow	123	* 96	102	116	100	101	113	99	107	
Winter Wren	102	127	122	111	100	123	127	131	* 216	
American Robin	101	101	99	98	100	100	94	90	96	
Hermit Thrush	72	88	85	76	* 100	102	103	89	108	
Swainson's Thrush	88	91	100	114	100	97	115	108	97	
Veery	132	107	91	103	100	117	130	123	114	
Ruby-crowned Kinglet	149	* 115	* 97	101	100	116	* 135	119	131	
Starling	113	88	99	94	100	96	95	101	97	
Red-eyed Vireo	99	* 78	91	115	100	109	* 134	128	* 175	
Nashville Warbler	76	65	55	* 89	100	112	117	* 88	67	
Yellow Warbler	117	97	99	115	100	104	121	140	* 111	
Magnolia Warbler	91	* 72	79	79	* 100	106	109	131	* 98	
Black-throated Green Warbler	104	* 73	88	93	100	* 77	* 93	112	78	
Chestnut-sided Warbler	88	64	66	89	100	109	132	113	92	
Ovenbird	62	67	65	78	* 100	91	* 121	120	143	
Common Yellowthroat	98	101	97	93	100	102	102	105	* 89	
American Redstart	86	72	79	86	100	113	113	132	142	
House Sparrow	68	75	71	85	100	77	70	71	80	
Bobolink	87	98	* 118	128	* 100	103	* 132	119	* 147	
Red-winged Blackbird	78	75	80	89	100	107	* 127	126	131	
Common Grackle	147	116	118	112	100	88	95	108	* 85	
Brown-headed Cowbird	71	88	98	133	100	82	75	63	77	
Evening Grosbeak	15	21	24	35	* 100	180	164	108	71	
Purple Finch	48	* 100	105	* 85	100	142	122	87	89	
American Goldfinch	120	177	* 129	115	100	113	103	* 80	88	
Savannah Sparrow	87	94	102	89	100	89	90	86	80	
Dark-eyed Junco	130	137	108	99	100	83	86	82	84	
Chipping Sparrow	96	113	106	105	100	106	109	88	73	
White-throated Sparrow	82	98	* 90	95	100	* 90	96	93	99	
Song Sparrow	149	* 97	104	108	100	100	* 86	107	99	

*The change between these years was at least 95% significant.

Table 17
Trends in index numbers for bird populations, central Ontario
and central Quebec, from Breeding Bird Survey, based on
1974 index of 100

Species	Index no. for				
	1970	1971	1972	1973	1974
Killdeer	90	88	110	112	100
Herring Gull	169	320	* 77	77	100
Common Flicker	97	95	111	108	100
Yellow-bellied Sapsucker	202	202	* 87	130	100
Alder Flycatcher	115	145	* 90	78	100
Least Flycatcher	139	122	121	121	100
Tree Swallow	126	153	142	122	100
Bank Swallow	57	74	136	64	100
Barn Swallow	112	101	109	132	100
Blue Jay	229	220	* 143	130	100
Common Raven	116	* 169	98	97	100
Common Crow	100	95	109	104	100
Winter Wren	64	70	64	82	100
American Robin	96	93	100	94	100
Hermit Thrush	114	141	124	107	100
Swainson's Thrush	108	130	134	119	* 100
Veery	107	136	136	* 109	100
Ruby-crowned Kinglet	66	78	97	83	100
Cedar Waxwing	140	223	* 136	105	100
Starling	115	108	128	116	100
Red-eyed Vireo	105	132	115	114	100
Nashville Warbler	92	113	96	99	100
Yellow Warbler	94	152	* 93	152	100
Magnolia Warbler	118	119	* 94	100	100
Yellow-rumped Warbler	159	* 116	108	118	100
Chestnut-sided Warbler	116	131	* 98	110	100
Ovenbird	89	114	104	104	100
Mourning Warbler	108	106	108	94	100
Common Yellowthroat	103	113	102	102	100
American Redstart	82	92	80	90	100
House Sparrow	134	123	* 187	159	100
Bobolink	92	* 108	101	114	100
Red-winged Blackbird	84	90	94	100	100
Common Grackle	148	157	151	139	* 100
Brown-headed Cowbird	108	142	133	116	100
Rose-breasted Grosbeak	66	* 90	81	* 119	100
Evening Grosbeak	70	* 230	* 113	227	* 100
American Goldfinch	107	* 234	* 131	119	100
Savannah Sparrow	94	96	* 142	* 118	100
Dark-eyed Junco	117	103	155	130	100
Chipping Sparrow	71	84	106	* 89	100
White-throated Sparrow	88	100	103	* 93	100
Song Sparrow	113	117	121	109	100

*The index change between these years was at least 95% significant.

Table 18
Trends in index numbers for bird populations, southern Ontario and southern Quebec, from Breeding Bird Survey, based on 1970 index of 100

Species	Index no. for						
	1968	1969	1970	1971	1972	1973	1974
Killdeer	102	93	100	105	111	114	101
Rock Dove	156	122	100	112	117	*	87
Mourning Dove	93	88	100	108	120	151	137
Common Flicker	132	98	100	104	109	106	107
Eastern Kingbird	98	95	100	94	100	110	105
Great Crested Flycatcher	91	88	100	101	99	*	146
Eastern Wood Pewee	93	83	100	87	91	85	76
Horned Lark	106	114	100	100	89	81	72
Tree Swallow	109	95	100	89	119	105	*
Bank Swallow	58	102	100	127	93	101	*
Barn Swallow	71	80	100	93	92	89	99
Purple Martin	111	93	100	146	*	92	93
Blue Jay	107	*	145	100	*	152	*
Common Crow	98	100	100	114	106	109	107
House Wren	85	63	*	100	95	115	122
Gray Catbird	69	84	100	93	81	*	59
Brown Thrasher	74	81	100	135	97	*	125
American Robin	103	102	100	112	118	*	105
Veery	91	84	100	*	80	73	74
Cedar Waxwing	48	95	100	162	*	96	115
Starling	95	100	100	102	114	137	142
Red-eyed Vireo	75	88	100	99	91	*	73
Warbling Vireo	70	76	100	143	137	*	90
Yellow Warbler	92	*	110	100	102	*	72
Common Yellowthroat	83	67	*	100	81	81	91
House Sparrow	112	*	130	*	100	96	105
Bobolink	83	96	100	*	119	114	92
Eastern Meadowlark	107	115	100	108	118	127	123
Red-winged Blackbird	83	97	100	111	154	140	150
Northern Oriole	95	93	100	115	*	89	97
Common Grackle	107	139	*	100	116	105	123
Brown-headed Cowbird	93	91	100	106	99	*	81
Rose-breasted Grosbeak	109	98	100	113	130	142	152
American Goldfinch	172	*	98	100	107	93	86
Savannah Sparrow	94	106	100	105	*	126	*
Vesper Sparrow	84	91	100	*	121	122	*
Chipping Sparrow	109	*	83	100	94	*	119
White-throated Sparrow	82	78	*	100	104	*	132
Song Sparrow	104	98	100	107	96	107	110

*The index change between these years was at least 95% significant.

Table 19
Trends in index numbers for bird populations, southern Prairie Provinces, from Breeding Bird Survey, based on 1974 index of 100

Species	Index no. for				
	1970	1971	1972	1973	1974
Mallard	112	109	101	89	100
Pintail	111	*	69	46	59
Blue-winged Teal	96	86	*	62	64
Northern Shoveler	137	*	52	131	*
American Wigeon	109	111	131	93	100
Lesser Scaup	50	60	55	*	47
Sora	66	85	116	86	100
American Coot	126	187	*	84	56
Killdeer	112	95	93	85	100
Ring-billed Gull	225	169	152	233	*
Franklin's Gull	56	66	231	*	67
Black Tern	150	139	132	125	100
Rock Dove	403	*	242	206	161
Mourning Dove	96	110	105	102	100
Common Flicker	194	155	156	122	100
Eastern Kingbird	82	83	85	105	100
Least Flycatcher	145	161	*	114	87
Horned Lark	112	85	80	89	100
Tree Swallow	38	46	*	136	101
Barn Swallow	108	*	85	*	122
Cliff Swallow	120	122	172	*	79
Black-billed Magpie	126	129	141	113	100
Common Crow	103	*	124	108	116
House Wren	108	135	127	105	100
American Robin	78	86	107	99	100
Starling	101	171	*	84	79
Warbling Vireo	73	102	97	86	100
Yellow Warbler	133	129	112	98	100
House Sparrow	77	78	*	104	121
Bobolink	137	121	118	150	*
Western Meadowlark	92	99	95	94	100
Yellow-headed Blackbird	56	*	100	*	71
Red-winged Blackbird	79	82	*	98	106
Brewer's Blackbird	84	83	90	85	100
Common Grackle	60	87	109	167	*
Brown-headed Cowbird	61	75	71	81	100
American Goldfinch	75	124	141	118	100
Lark Bunting	51	33	*	205	*
Savannah Sparrow	60	71	*	100	96
Vesper Sparrow	74	86	79	88	100
Clay-coloured Sparrow	78	86	100	106	100
Song Sparrow	116	100	105	93	100
Chestnut-collared Longspur	119	*	74	*	107

*The index change between these years was at least 95% significant.

