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The co-operative Breeding Bird Survey in Canada, 1976

by Anthony J. Erskine[1]

Introduction

In 1976, the Breeding Bird Survey (BBS) began its second decade in Canada. This co-operative effort, co-ordinated by the Canadian Wildlife Service and the United States Fish and Wildlife Service in their respective countries, involves both volunteers and professional ornithologists; it is now one of our most important means of following year-to-year changes in numbers of birds (especially song birds) in settled areas of Canada. Methods of data collection remain the same, but procedures for editing and analysing data are revised as better methods are developed. A report covering the first 10 years of the BBS in Canada has been prepared and should be published during the next year. The present account includes the comparisons between 1975 and 1976, and thus is comparable to recent reports in this series (cf. Erskine 1976).

At this time, we wish to call to the attention of our co-operators the likely effects of the winter of 1976–77 on bird numbers this spring. Cold weather was prolonged across Canada east of the Rockies, but temperatures were within the range met with in some winters of every decade in these latitudes. Farther to the south, however, where the great majority of Canadian birds winter, the weather was exceptionally severe, and winter bird populations are believed to have been reduced by 50% or even more (Chandler S. Robbins, pers. comm.). We may anticipate that effects of this severe winter will be striking among many of our common summer birds, including the thrushes and fringillids; insectivorous birds such as warblers and flycatchers winter still farther south, and thus are less likely to be seriously affected. We urge our co-operators, as far as possible, to repeat in 1977 the surveys they did in 1976, so that we will be able to assess accurately the losses resulting from the past winter.

Results

Coverage

Figure 1 shows the distribution of degree-blocks in which surveys were made in 1976, compared with past coverage, and Table 1 shows the actual numbers of routes surveyed in each of the last 5 years. In the Maritimes and in southern parts of Quebec, Ontario, and British Columbia, most degree-blocks contain two routes each, so the coverage is somewhat less complete than is suggested by Figure 1.

Grouping of routes for analysis

Since the last report (Erskine 1976), a significant change in groupings has been made in the Prairie Provinces, where the boundary between the southern (prairie) and central (parkland and forest) regions was moved southward. This change affected about 12 degree-blocks in all. Removal of blocks with considerable numbers of parkland birds improved the homogeneity of the prairie region, while also increasing the sample of routes for which comparisons could be made in the central Prairie Provinces region. The species most frequently reported in each region are shown in Tables 2 to 9.

Changes observed

Analyses cover six major regions of Canada, as in recent years. Summaries of comparisons for the Maritimes, central Ontario and Quebec, southern Ontario and Quebec, southern Prairie Provinces, central Prairie Provinces, and British Columbia (west of the Rockies) between 1975 and 1976 are presented in Tables 10 to 15. Data for Newfoundland and Yukon Territory are still too few for analysis.

Discussion

Coverage

The pattern of coverage differed only in detail from past years, but the downward trend noted in the east last year became more general. Only in Ontario were more routes surveyed than in any previous year. A most unfortunate feature of the decline is that many of the gaps in coverage are near major population centres, where most competent observers are concentrated; routes not covered in both 1975 and 1976 included some within 50 miles, or even within 30 miles, of Vancouver, Calgary, Edmonton, Regina, Winnipeg, Ottawa, Montreal, and Quebec. In some cases, previous observers had planned to do these surveys, but were unable to do so. It is always preferable that the same observer continue a survey, if possible; but a survey by another observer, who may be able to continue next year, is preferable to no survey at all. An observer change means that the route cannot be included in comparisons for this year, but a survey omitted means two lost comparisons, with the year ahead as well as with the year behind. In order to document the effects of the cold winter of 1976–77 on bird numbers, we must hope that as many as possible of the routes covered in 1976 will be repeated by the same observers in 1977.

The comparability of routes covered in both 1975 and 1976 was satisfactory, with 79% of such routes having comparable coverage. Only in the central Prairie Province region (67%) were fewer than 77% of routes comparable. Of 39 routes with 1975–76 coverage considered not comparable, 22 had observer changes, 12 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), while the other five were rejected for various combinations of factors reducing comparability (date, weather, non-adherence to rules).

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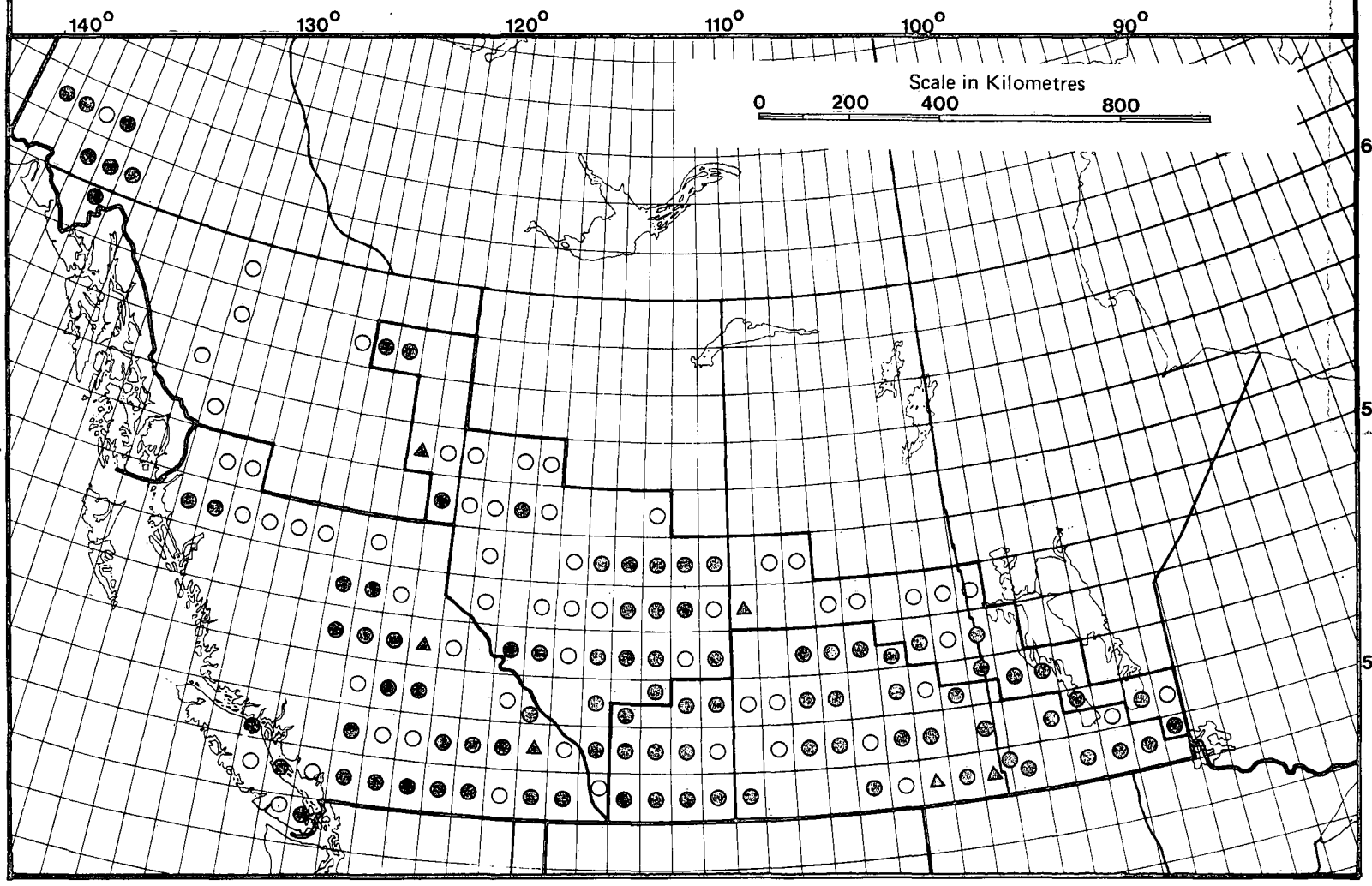
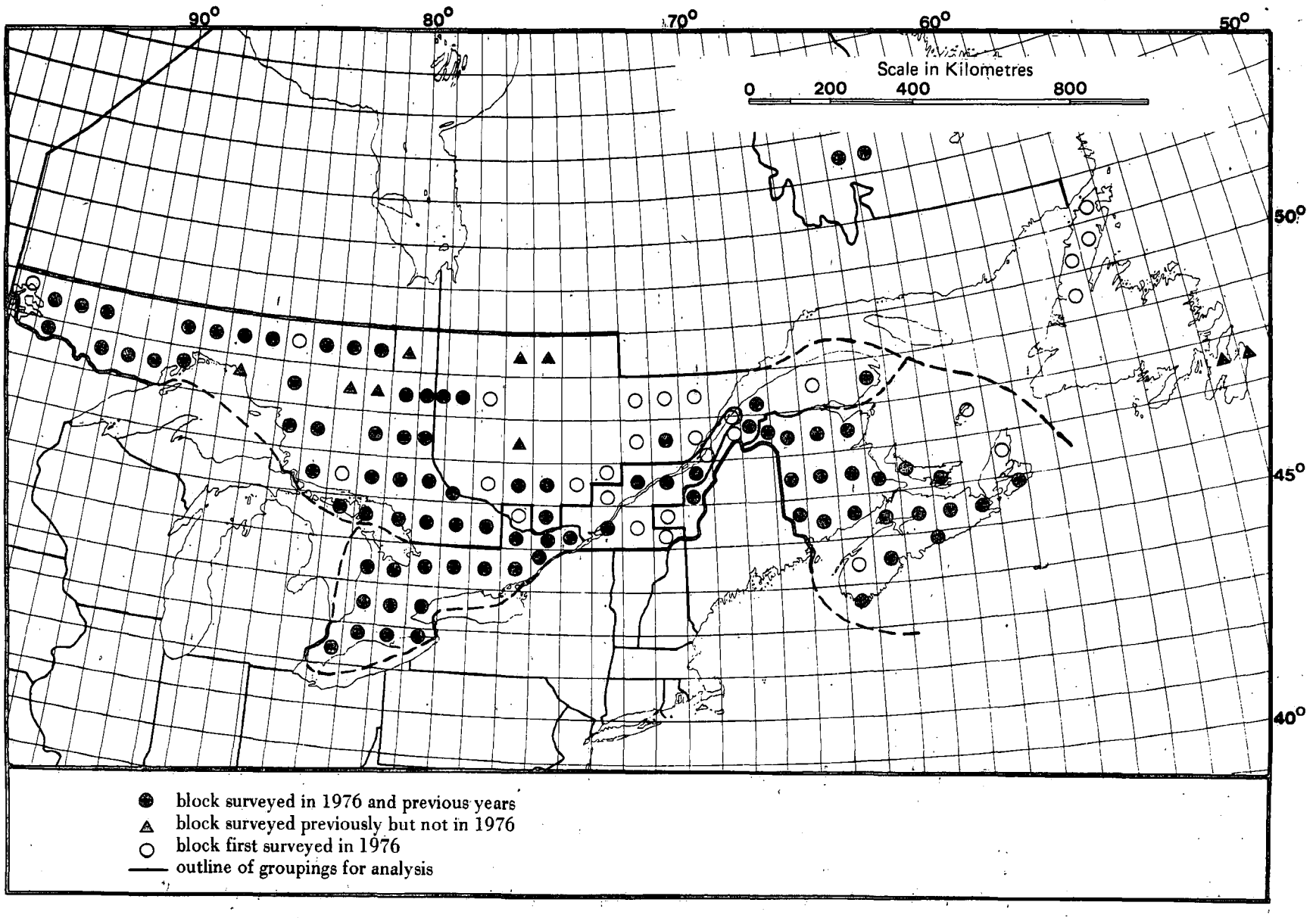
Figure 1
Extent of coverage in 1976 and additional coverage in 1966–75 Breeding Bird Survey





Grouping of routes for analysis

The one change in grouping, involving routes along the northern edge of the prairies, was desirable because of the small numbers of comparable surveys in the central Prairie Provinces in the past. However, even with this change the sample of comparable routes in this region was inadequate in 1975–76, largely owing to the many changes in observers.

Subdivision of regions has been little explored as yet. The example given last year (Erskine 1976, Table 16) of areas sprayed against spruce budworm compared to unsprayed areas in the Maritimes suggested that, where the subsamples were more homogeneous than the whole, analysis of smaller samples might be more informative. A further comparison, involving 10 species of forest birds in the Maritimes, showed that over the 10-year period 1967–76 (90 individual comparisons) 19 changes were statistically significant at the 95% level for the Maritimes as a whole; 11 of these, plus five others not significant for all the Maritimes, were significant for New Brunswick alone. Such subsamples might thus be worth analysing separately as long as they are reasonably compact. However, to do this in other regions would probably mean that more routes would have to be omitted from comparisons as being too far removed from other subsamples to be combined with them, as has been the case with routes in Newfoundland and Yukon Territory thus far. It seems probable that we will not be able to improve over the present pattern of six major regions.

Changes observed

There was no evidence of any country-wide influence on bird numbers in the 1976 results, such as followed the generally cold spring of 1974, and such as we anticipate in 1977. The Maritimes, following two successive years with general decreases, resulting from adverse weather in 1974 and a combination of chemical spraying against spruce budworm and of some unidentified (climatic?) factor in 1975, showed more species with increases than decreases from 1975 to 1976. Neither increases nor decreases were unusually frequent among birds of any particular habitat. Of the five species in which continuing downward trends had been suspected, three showed (non-significant) declines of 5 to 8% while the others increased by 21 and 22%. Of 14 species with significant changes in either or both of the last two comparisons (1975–76 and 1974–75), nine had changes in one direction one year followed by the reverse direction in the other (the usual pattern), two had (essentially) no change one year, and three showed decreases in both years. Of these last, Common Snipe and Winter Wren had showed their highest ever indices in 1974; the third, Brown-headed Cowbird, is now at the lowest level since the BBS began, and may bear watching in future.

The sprawling and heterogeneous central Ontario and central Quebec region showed no pattern of change, with nine of 13 species that had changed significantly in one or both of the last two comparisons having reversed direction between years. Interestingly, one exception was again the Brown-headed Cowbird, but here its increase in each of the last two years followed its lowest ever index in 1974.

In the southern Ontario and southern Quebec region, only four significant changes were noted in 1976, and none of these species had changed significantly the previous year. Only one of 10 species with significant changes in either year had changes in the same direction both years, this being the Red-winged Blackbird, which continued its general upward trend, though the 8% increase between 1975 and 1976 is non-significant. Of species suspected in the past of sustained declines, both Horned Lark and Vesper Sparrow showed (non-significant) declines of 16%, whereas Rock Dove indices increased.

In the southern prairies, the dramatic changes in erratic species, particularly Franklin's Gull and Lark Bunting, whose numbers fluctuate greatly between years across large parts of the region, tend to attract the most attention. Among statistically significant changes, increases greatly outnumbered decreases, and the increases were mainly in land birds. Of 10 species which changed significantly in either or both of the last 2 years, four had changes in the same direction both years, all of these being increases. Rock Dove and Mourning Dove may be recovering from earlier declines, over 4 and 3 years respectively, which had led to their lowest indices in 1974, whereas Sora and House Sparrow continue irregular but perhaps sustained increases. Rock Dove and Common Flicker, which decreased in each of the first four comparisons, have now increased in each of the last 2 years.

The Central Prairie Provinces region, which includes routes in the foothills and the boreal forest but is basically a parklands region as far as present coverage goes, showed a striking decline in water birds, with almost every species analysed showing decreases. Most of these had also declined in the preceding year, and this coincides with a growing concern over drought in the northern prairies; all these species (except Franklin's Gull) have shown lower population indices during the preceding 5 years. Among land birds, Pine Siskins re-appeared in numbers after virtual absence from most areas in 1975, while Northern Juncos increased in each of the last 3 years.

In the British Columbia region, which varies from rain forest and fertile bottomland farms on the coast to arid sagebrush plateaux, parkland, and closed sub-alpine and subboreal spruce forest in the interior, 12 of 17 species with significant changes in either of the last 2 years showed changes in one direction one year and the reverse direction in the other year. Only three of these 17 species had changes in the same direction both years, Killdeer and Common Flicker upward and Rough-winged Swallow downward. With only 4 years' data available for comparisons, we cannot make any useful comment on sustained trends in this region as yet, but we hope to be able to do so after another year or two.

This report is more than usually superficial, since most of the time available this winter has been devoted to completing the report on the first 10 years of the BBS in Canada, wherein the data through 1975 are discussed in more detail than had been possible in the annual reports. We expect to distribute copies of the 10-year report to all our co-operators, as a token of our appreciation of their efforts on this project over the years. Meanwhile, this report is probably my last public opportunity to say "Thank you" to most of you, those

whom I have met as well as those I know well. I am transferring to a new position with CWS Atlantic Region in 1977, but I expect to continue my support of the BBS there, and to co-operate with the new national co-ordinator when one is appointed. I have enjoyed and benefited from being able to work with you, and I hope that you will continue to help and encourage my successor, and also our regional co-ordinators, without whom the task would have been far more onerous and less enjoyable. I thank you all.

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: Mr. Wayne P. Neily, co-ordinated from CWS, Ottawa K1A 0E7

Reference

Erskine, A. J. 1976. The co-operative Breeding Bird Survey in Canada, 1975. Can. Wildl. Serv. Progr. Note No. 60, 15 p.

Table 1
Numbers of routes completed in the Breeding Bird Survey, Canada, 1972–76, compared to all routes surveyed in 1966 through 1976

Province	Total routes surveyed in 1966–76	No. routes surveyed in* 1972	1973	1974	1975	1976
Nfld.	9	0	2	4	**6**	4
P.E.I.	4	2	4	**4**	4	3
N.S.	24	**23**	20	19	17	14
N.B.	27	**24**	22	21	16	18
Que.	47	28	24	21	24	21
Ont.	71	47	55	58	61	**65**
Man.	16	**14**	13	**14**	13	13
Sask.	32	20	**28**	19	19	20
Alta.	46	27	**36**	31	33	29
B.C.	79	9	38	**53**	50	42
Yukon	8	1	5	7	5	6
Total	363	194	247	251	248	235

*The figures in bold type represent the greatest number of routes surveyed in one year for each province. P.E.I. also had 4 routes surveyed each year in 1967–69; N.B. also had 24 routes surveyed in 1971; Quebec had 33 routes surveyed in 1970.

Table 2
The 20 species recorded in greatest numbers in the Breeding Bird Survey, Maritime Provinces, 1976; the mean number of each per route; and the percentage of routes on which they were found. Thirty-five routes were surveyed, with a mean of 806 birds noted per route

Species	Mean no. per route	% of 35 routes
American Robin	65.7	100
Starling	52.8	94
White-throated Sparrow	50.5	100
Common Crow	34.9	94
Song Sparrow	34.8	100
Common Crackle	30.1	97
Red-winged Blackbird	29.4	100
Bobolink	24.4	83
Common Yellowthroat	21.6	100
American Redstart	19.1	94
Swainson's Thrush	19.0	97
Ruby-crowned Kinglet	18.4	94
Barn Swallow	17.8	100
Ovenbird	15.2	83
Alder Flycatcher	15.1	92
Savannah Sparrow	14.9	92
Red-eyed Vireo	14.8	89
Magnolia Warbler	14.5	83
Tree Swallow	13.9	100
House Sparrow	13.7	89

Table 3
The 20 species recorded in greatest numbers in the Breeding Bird Survey, central Ontario and central Quebec, 1976; the mean number of each per route; and the percentage of routes on which they were found. Fifty-five routes were surveyed, with a mean of 587 birds noted per route

Species	Mean no. per route	% of 55 routes
White-throated Sparrow	48.5	100
Starling	37.2	89
Red-eyed Vireo	30.7	98
American Robin	30.4	100
Common Crow	19.1	95
Ovenbird	18.8	93
Red-winged Blackbird	17.9	85
Song Sparrow	17.8	98
Veery	17.1	84
Chestnut-sided Warbler	16.3	87
Swainson's Thrush	14.3	78
Chipping Sparrow	12.9	98
Common Yellowthroat	12.8	95
Bobolink	11.8	51
Tree Swallow	11.2	93
Savannah Sparrow	10.8	69
Barn Swallow	10.3	76
Common Grackle	10.3	82
Least Flycatcher	8.6	84
Hermit Thrush	8.5	95

Table 4
The 20 species recorded in greatest numbers in the Breeding Bird Survey, southern Ontario and southern Quebec, 1976; 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 1370 birds noted per route

Species	Mean no. per route	% of 31 routes
Red-winged Blackbird	224.0	100
Starling	218.6	100
House Sparrow	84.3	100
Common Grackle	82.4	100
Savannah Sparrow	70.5	100
Bobolink	61.8	100
Bank Swallow	52.8	81
American Robin	50.8	100
Common Crow	45.0	100
Barn Swallow	41.2	100
Song Sparrow	38.8	100
Eastern Meadowlark	30.3	100
Brown-headed Cowbird	29.4	100
Killdeer	25.0	100
American Goldfinch	23.9	100
Rock Dove	23.2	97
Mourning Dove	17.5	90
Ring-billed Gull	16.0	35
Tree Swallow	13.0	100
Northern Oriole	11.7	97

Table 5
The 20 species recorded in greatest numbers in the Breeding Bird Survey, southern Prairie Provinces, 1976; 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 1051 birds noted per route

Species	Mean no. per route	% of 34 routes
Red-winged Blackbird	119.0	100
Horned Lark	90.8	100
House Sparrow	82.9	100
Western Meadowlark	61.8	100
Common Crow	40.3	100
Mallard	34.0	88
Starling	32.3	91
Yellow-headed Blackbird	32.1	82
Brown-headed Cowbird	30.3	91
Chestnut-collared Longspur	28.9	41
Clay-coloured Sparrow	27.9	100
Franklin's Gull	24.3	53
Brewer's Blackbird	23.8	100
Vesper Sparrow	23.2	94
Savannah Sparrow	20.9	94
Pintail	19.6	65
Ring-billed Gull	18.7	53
American Coot	17.4	70
Killdeer	16.8	100
Lark Bunting	14.7	26

Table 6
The 20 species recorded in greatest numbers in the Breeding Bird Survey, central Prairie Provinces region, 1976; the mean number of each per route; and the percentage of routes on which they were found. Thirty-two routes were surveyed, with a mean of 757 birds noted per route

Species	Mean no. per route	% of 32 routes
Red-winged Blackbird	58.3	88
Common Crow	42.5	94
Starling	36.6	88
Clay-coloured Sparrow	31.7	91
Brewer's Blackbird	27.9	84
Savannah Sparrow	24.0	81
Song Sparrow	23.7	75
Franklin's Gull	23.0	47
Mallard	22.6	66
Cliff Swallow	20.6	38
American Robin	20.5	100
Pine Siskin	18.4	47
Lesser Scaup	18.4	53
Brown-headed Cowbird	16.8	94
House Sparrow	16.4	84
Vesper Sparrow	15.1	88
Red-eyed Vireo	14.5	91
Barn Swallow	14.1	81
Western Meadowlark	13.3	66
Black Tern	12.9	53

Table 7
The 20 species recorded in greatest numbers in the Breeding Bird Survey, British Columbia (west of Rocky Mountains), 1976; 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 697 birds noted per route

Species	Mean no. per route	% of 37 routes
American Robin	69.7	100
Starling	55.1	76
Pine Siskin	37.5	97
Crows*	32.6	89
Swainson's Thrush	32.6	100
Barn Swallow	23.3	92
Brewer's Blackbird	20.7	70
Northern Junco	19.4	95
Chipping Sparrow	17.2	95
House Sparrow	13.0	38
Song Sparrow	12.4	97
Tree Swallow	10.1	81
Brown-headed Cowbird	9.9	73
Red-eyed Vireo	9.7	68
Yellow Warbler	9.6	87
Black Swift	9.2	24
Western Meadowlark	8.8	49
Red-winged Blackbird	8.6	65
Black-capped Chickadee	8.4	81
Yellow-rumped (Audubon's) Warbler	8.0	78

*Common Crow and Northwestern Crow combined.

Table 8
The 10 species recorded in greatest numbers in the Breeding Bird Survey, Newfoundland (including Labrador), 1976; the mean number of each per route; and the number of routes on which each was noted. Four routes were surveyed, with a mean of 369 birds noted per route

Species	Mean no. per route	No. of routes
Fox Sparrow	47.5	4
American Robin	34.8	4
Blackpoll Warbler	21.8	4
Northern Waterthrush	21.0	4
Northern Junco	20.5	4
Herring Gull	20.2	4
White-crowned Sparrow	19.2	2
Pine Grosbeak	15.8	4
Gray-cheeked Thrush	15.5	4
Yellow Warbler	10.2	3

Table 9
The 10 species recorded in greatest numbers in the Breeding Bird Survey, Yukon Territory, 1976; the mean number of each per route; and the percentage of routes on which they were found. Six routes were surveyed, with a mean of 449 birds noted per route

Species	Mean no. per route	% of 6 routes
Swainson's Thrush	58.7	100
Northern Junco	56.3	100
White-crowned Sparrow	36.0	100
Yellow-rumped (Myrtle) Warbler	33.0	100
American Robin	29.8	100
Bank Swallow	18.8	83
Cliff Swallow	17.5	83
Chipping Sparrow	17.2	100
Canada Jay	16.2	100
Mew Gull	14.5	67

Table 10
Changes in bird population samples for 25 comparable routes, Breeding Bird Survey, Maritime Provinces, 1975–76

Species	Weighted mean no. of birds per route 1975	1976	% change (bold) with 95% confidence limits		
Common Snipe*	4.80	3.94	-32	**-18**	-4
Herring Gull	18.65	11.43	-81	**-39**	+4
Common Flicker	2.97	2.79	-47	**-6**	+35
Yellow-bellied Sapsucker*	12.19	9.44	-44	**-23**	-1
Alder Flycatcher*	14.07	16.42	+1	**+17**	+32
Least Flycatcher	5.40	5.93	-16	**+10**	+36
Tree Swallow	11.04	13.39	-26	**+21**	+68
Bank Swallow*	5.05	15.00	+29	**+197**	+365
Barn Swallow	15.70	17.48	-14	**+11**	+37
Blue Jay	4.03	4.84	-19	**+20**	+60
Common Raven	8.67	8.22	-58	**-5**	+47
Common Crow	30.67	30.95	-20	**+1**	+22
Winter Wren	6.75	6.14	-45	**-9**	+27
American Robin	65.84	67.34	-5	**+2**	+10
Hermit Thrush	9.83	10.46	-23	**+6**	+36
Swainson's Thrush	21.54	23.42	-6	**+9**	+24
Veery	9.27	9.09	-23	**-2**	+19
Ruby-crowned Kinglet	18.05	22.63	-1	**+25**	+52
Starling	46.50	41.54	-31	**-11**	+9
Red-eyed Vireo	14.35	15.90	-12	**+11**	+33
Nashville Warbler	5.73	7.23	-4	**+26**	+57
Yellow Warbler*	8.81	10.95	+1	**+24**	+47
Magnolia Warbler*	15.91	19.28	+7	**+21**	+35
Black-throated Green Warbler	8.14	9.93	+16	**+22**	+60
Chestnut-sided Warbler	6.21	6.39	-37	**+3**	+43
Ovenbird	14.98	15.45	-11	**+3**	+17
Common Yellowthroat	21.09	20.81	-10	**-1**	+7
American Redstart	19.93	20.08	-13	**+1**	+15
House Sparrow	9.48	10.34	-8	**+9**	+27
Bobolink*	19.81	23.65	+3	**+19**	+35
Red-winged Blackbird	23.92	27.52	-14	**+15**	+45
Common Grackle	14.17	17.31	-3	**+22**	+47
Brown-headed Cowbird*	8.27	5.61	-56	**-32**	-8
Evening Grosbeak	18.03	11.50	-76	**-36**	+3
Purple Finch	14.39	12.23	-31	**-15**	+1
American Goldfinch	13.50	12.80	-55	**-5**	+45
Savannah Sparrow	12.22	12.84	-13	**+5**	+24
Northern Junco	16.38	14.99	-41	**-8**	+24
Chipping Sparrow	6.73	6.38	-37	**-5**	+27
White-throated Sparrow	57.66	55.76	-13	**-3**	+7
Song Sparrow	33.47	31.67	-22	**-5**	+11

*Change at least 95% significant.

Table 11
Changes in bird population samples for 33 comparable routes, Breeding Bird Survey, central Ontario and central Quebec, 1975–76

Species	Weighted mean no. of birds per route 1975	1976	% change (bold) with 95% confidence limits		
Killdeer	4.22	4.69	-36	**+11**	+58
Herring Gull	5.23	9.85	-46	**+88**	+223
Common Flicker*	4.45	2.83	-55	**-36**	-18
Yellow-bellied Sapsucker	2.41	2.28	-44	**-6**	+33
Alder Flycatcher	9.38	7.54	-50	**-20**	+11
Least Flycatcher	8.28	8.72	-24	**+5**	+34
Tree Swallow	12.60	11.26	-36	**-11**	-14
Bank Swallow	2.87	3.89	-69	**+35**	+139
Barn Swallow*	11.70	9.61	-34	**-18**	-1
Blue Jay	3.03	3.66	-21	**+21**	+63
Common Raven	7.29	8.75	-14	**+20**	+54
Common Crow	20.25	21.93	-14	**+8**	+31
Winter Wren	9.80	7.14	-56	**-27**	+1
American Robin*	27.96	33.53	0	**+20**	+40
Hermit Thrush	6.16	7.45	-14	**-21**	+56
Swainson's Thrush	15.71	15.74	-18	**0**	+18
Veery	19.13	17.90	-21	**-6**	+8
Ruby-crowned Kinglet	8.64	8.47	-25	**-2**	+21
Cedar Waxwing	4.22	3.84	-44	**-9**	+26
Starling	36.98	43.30	-11	**+17**	+45
Red-eyed Vireo	29.26	30.08	-8	**+3**	+14
Nashville Warbler	8.33	7.69	-29	**-8**	+13
Yellow Warbler	4.22	4.90	-5	**+16**	+37
Magnolia Warbler*	5.59	4.29	-43	**-23**	-4
Yellow-rumped Warbler	6.33	5.05	-46	**-20**	+5
Chestnut-sided Warbler	15.60	14.79	-16	**-5**	+6
Ovenbird	18.43	18.76	-12	**+2**	-15
Mourning Warbler*	12.34	8.75	-45	**-29**	-13
Common Yellowthroat	15.04	13.02	-32	**-13**	+5
American Redstart	7.70	6.94	-31	**-10**	+11
House Sparrow	5.21	6.00	-15	**+15**	+45
Bobolink	12.02	11.81	-26	**-2**	+22
Red-winged Blackbird	16.90	16.84	-20	**0**	+19
Common Grackle	15.59	12.27	-47	**-21**	+5
Brown-headed Cowbird*	6.02	9.99	-9	**+66**	-122
Rose-breasted Grosbeak	6.20	6.83	-13	**+10**	+34
Evening Grosbeak	7.54	7.70	-47	**+2**	+51
American Goldfinch	6.71	6.14	-32	**-9**	+15
Savannah Sparrow	15.14	14.64	-26	**-3**	+19
Northern Junco	4.49	3.76	-45	**-16**	+12
Chipping Sparrow	13.29	13.67	-13	**+3**	+19
White-throated Sparrow	51.36	48.13	-16	**-6**	+3
Song Sparrow	19.11	20.09	-10	**-5**	+21

*Change at least 95% significant.

Table 12
Changes in bird population samples for 27 comparable routes, Breeding Bird Survey, southern Ontario and southern Quebec, 1975–76

Species	Weighted mean no. of birds per route		% change (bold) with 95% confidence limits		
	1975	1976			
Killdeer	22.69	26.17	-6	**+15**	+37
Rock Dove	16.19	20.61	-28	**+27**	+83
Mourning Dove*	12.89	16.50	0	**+28**	+56
Common Flicker	5.57	5.35	-32	**-4**	+24
Eastern Kingbird	8.79	11.32	-7	**+29**	+65
Great Crested Flycatcher*	3.77	5.67	+6	**+50**	+95
Eastern Wood Pewee	3.33	3.79	-8	**+14**	+35
Horned Lark	7.56	6.34	-52	**-16**	+20
Tree Swallow	10.37	11.30	-27	**+9**	+45
Bank Swallow	30.33	52.47	-64	**+73**	+210
Barn Swallow	43.15	45.31	-17	**+5**	+27
Purple Martin	4.04	4.57	-16	**+13**	+43
Blue Jay	4.75	4.90	-37	**+3**	+44
Common Crow	45.54	49.19	-15	**+8**	+31
House Wren	7.19	7.68	-14	**+7**	+27
Gray Catbird	3.99	4.62	-29	**+16**	+60
Brown Thrasher	4.47	4.72	-20	**+6**	+31
American Robin	52.19	49.05	-15	**-6**	+3
Veery	5.03	4.61	-34	**-8**	+18
Cedar Waxwing	5.50	4.01	-65	**-27**	+11
Starling	166.81	229.95	-20	**+38**	+96
Red-eyed Vireo	6.81	6.71	-24	**-1**	+21
Warbling Vireo	3.42	4.22	-21	**+24**	+68
Yellow Warbler	8.03	9.16	-18	**+14**	+46
Common Yellowthroat	9.00	9.16	-18	**+2**	+22
House Sparrow	76.09	85.69	-3	**+13**	+28
Bobolink	49.72	64.36	-11	**+29**	+70
Eastern Meadowlark	26.35	28.18	-8	**+7**	+22
Red-winged Blackbird	200.30	215.69	-11	**+8**	+26
Northern Oriole*	8.06	11.60	+8	**+44**	+80
Common Grackle	83.17	84.79	-26	**+2**	+30
Brown-headed Cowbird	25.47	30.64	-14	**+20**	+54
Rose-breasted Grosbeak	6.50	6.56	-22	**+1**	+24
American Goldfinch	24.83	23.02	-24	**-7**	+10
Savannah Sparrow	68.16	77.85	-6	**+14**	+35
Vesper Sparrow	7.03	5.89	-48	**-16**	+16
Chipping Sparrow	12.91	11.05	-35	**-14**	+6
White-throated Sparrow*	6.75	4.97	-45	**-26**	-8
Song Sparrow	40.06	39.40	-9	**-2**	+5

*Change at least 95% significant.

Table 13
Changes in bird population samples for 21 comparable routes, Breeding Bird Survey, southern Prairie Provinces, 1975–76

Species	Weighted mean no. of birds per route		% change (bold) with 95% confidence limits		
	1975	1976			
Mallard	43.46	44.23	**-52**	**+2**	+56
Pintail	24.23	24.91	**-120**	**+3**	+126
Blue-winged Teal	15.20	14.32	**-32**	**-6**	+20
Northern Shoveler	8.93	5.97	**-72**	**-33**	+6
American Wigeon	7.15	7.03	**-60**	**-2**	+56
Lesser Scaup	7.33	13.96	**-4**	**+91**	+185
Sora	5.83	6.48	**-37**	**+11**	+60
American Coot	11.78	18.26	**-8**	**+55**	+118
Killdeer	14.70	14.43	**-25**	**-2**	+22
Ring-billed Gull	15.58	22.48	**-71**	**+44**	+160
Franklin's Gull*	8.13	26.92	**+9**	**+231**	+454
Black Tern	10.33	11.94	**-48**	**+16**	+79
Rock Dove*	4.05	9.82	**+54**	**+142**	+230
Mourning Dove*	10.39	14.27	**0**	**+37**	+75
Common Flicker	2.04	2.24	**-30**	**+10**	+49
Eastern Kingbird*	5.28	6.87	**0**	**+30**	+60
Least Flycatcher	2.72	2.14	**-64**	**-21**	+21
Horned Lark	92.70	99.39	**-18**	**+7**	+33
Tree Swallow	1.85	5.41	**-160**	**+192**	+544
Barn Swallow	15.09	15.08	**-16**	**0**	+16
Cliff Swallow*	28.30	14.20	**-71**	**-50**	-29
Black-billed Magpie*	7.86	12.37	**0**	**+57**	+114
Common Crow*	31.21	38.50	**+3**	**+23**	+43
House Wren	9.46	10.23	**-36**	**+8**	+53
American Robin	4.17	5.61	**-27**	**+35**	+97
Starling	17.89	28.21	**-11**	**+58**	+127
Warbling Vireo	2.44	2.29	**-43**	**-6**	+31
Yellow Warbler	3.87	4.20	**-18**	**+9**	+35
House Sparrow	72.79	83.43	**-16**	**+15**	+45
Bobolink	3.36	2.98	**-78**	**-11**	+55
Western Meadowlark	55.20	58.57	**-8**	**+6**	+20
Yellow-headed Blackbird	24.29	32.62	**-41**	**+34**	+110
Red-winged Blackbird	105.92	103.96	**-17**	**-2**	+13
Brewer's Blackbird	28.54	23.67	**-48**	**-17**	+14
Common Grackle	4.59	7.71	**-36**	**+68**	+172
Brown-headed Cowbird	26.74	26.13	**-36**	**-2**	+31
American Goldfinch	3.24	3.59	**-51**	**+11**	+73
Lark Bunting*	3.35	21.80	**+42**	**+552**	+1061
Savannah Sparrow	20.42	19.06	**-30**	**-7**	+17
Vesper Spartow	18.32	21.03	**-14**	**+15**	+43
Clay-coloured Sparrow	22.59	27.78	**-16**	**+23**	+62
Song Sparrow	9.22	8.92	**-30**	**-3**	+23
Chestnut-collared Longspur	21.81	29.96	**-5**	**+37**	+80

*Change at least 95% significant.

Table 14
Changes in bird population samples for 16 comparable routes, Breeding Bird Survey, central Prairie Provinces region, 1975–76

Species	Weighted mean no. of birds per route		% change (bold) with 95% confidence limits		
	1975	1976			
Mallard	27.81	33.25	-26	**+20**	+66
Pintail*	10.06	5.06	-83	**-50**	-17
Blue-winged Teal*	7.25	4.63	-59	**-36**	-13
Northern Shoveler*	4.25	1.81	-92	**-57**	-22
Lesser Scaup	8.44	6.13	-58	**-27**	+3
American Coot*	10.94	4.13	-83	**-62**	-41
Killdeer	8.56	8.00	-42	-7	+29
Common Snipe	9.88	7.56	-59	**-23**	+12
Franklin's Gull*	29.13	13.31	-96	**-54**	-13
Black Tern	10.63	13.13	-45	**+24**	+92
Common Flicker*	3.13	2.25	-49	**-28**	-7
Alder Flycatcher	7.38	5.06	-67	**-31**	+4
Least Flycatcher	7.69	5.50	-66	**-28**	+9
Western Wood Pewee	1.19	1.63	-75	**+37**	+149
Tree Swallow	2.44	3.56	-71	**+46**	+163
Barn Swallow	14.81	14.25	-22	**-4**	+14
Black-billed Magpie	12.88	14.50	-7	**+13**	+32
Common Crow	44.56	41.63	-23	**-7**	+10
House Wren	10.06	10.50	-27	**+4**	+35
American Robin	15.69	15.75	-29	**0**	+30
Starling	24.69	50.56	-6	**+105**	+215
Red-eyed Vireo	10.31	12.38	-16	**+20**	+56
Warbling Vireo	2.38	3.56	-61	**+50**	+161
Yellow Warbler*	9.13	6.88	-44	**-25**	-5
Common Yellowthroat	5.50	5.00	-40	**-9**	+22
House Sparrow	19.94	15.00	-59	**-25**	+9
Western Meadowlark	10.19	10.75	-24	**+6**	+35
Red-winged Blackbird*	65.88	55.69	-24	**-15**	-7
Northern Oriole	4.81	3.44	-60	**-29**	+3
Brewer's Blackbird	23.00	25.00	-13	**+9**	+30
Brown-headed Cowbird	11.56	11.63	-31	**+1**	+32
Pine Siskin*	2.31	15.50	+171	**+570**	+970
American Goldfinch	3.00	3.63	-44	**+21**	+86
Savannah Sparrow	19.13	23.44	-11	**+23**	+56
Vesper Sparrow	14.94	13.13	-29	**-12**	+5
Northern Junco*	2.88	4.00	0	**+39**	+78
Chipping Sparrow	7.63	6.44	-41	**-16**	+10
Clay-coloured Sparrow*	35.38	29.75	-31	**-16**	-1
White-throated Sparrow	5.50	5.25	-53	**-5**	+44
Song Sparrow	27.31	28.13	-13	**+3**	+19

*Change at least 95% significant.

Table 15
Changes in bird population samples for 24 comparable routes, Breeding Bird Survey, British Columbia (west of Rocky Mountains), 1975–76

Species	Weighted mean no. of birds per route		% change (bold) with 95% confidence limits		
	1975	1976			
Killdeer	2.65	4.02	-38	**+52**	+141
Rufous Hummingbird	2.58	2.04	-57	**-21**	+15
Common Flicker*	5.20	8.61	+22	**+66**	+110
Yellow-bellied Sapsucker	2.17	2.61	-22	**+21**	+63
Traill's Flycatcher	6.33	5.58	-39	**-12**	+15
Western Wood Pewee	4.46	6.07	-22	**+36**	+94
Violet-green Swallow	4.25	6.44	-14	**+52**	+117
Tree Swallow	7.10	9.50	-67	**+34**	+135
Rough-winged Swallow	4.22	3.37	-77	**-20**	+37
Barn Swallow	13.93	12.57	-51	**-10**	+31
Cliff Swallow	2.47	7.92	-38	**+221**	+480
Common Raven	6.42	7.48	-36	**+17**	+69
Crows†	26.50	28.70	-10	**+8**	+26
Black-capped Chickadee	8.77	7.86	-41	**-10**	+20
Chestnut-backed Chickadee*	3.24	5.02	+9	**+55**	+101
Winter Wren	3.05	4.07	-8	**+34**	+75
American Robin*	53.05	62.00	+3	**+17**	+31
Varied Thrush*	6.66	5.88	-18	**-12**	-5
Swainson's Thrush	31.04	35.26	-1	**+14**	+28
Golden-crowned Kinglet	3.40	3.20	-31	**-6**	+19
Ruby-crowned Kinglet*	5.79	4.11	-48	**-29**	-10
Cedar Waxwing	3.39	3.28	-64	**-3**	+57
Starling	51.64	37.60	-62	**-27**	+8
Red-eyed Vireo*	10.11	12.25	+4	**+21**	+39
Warbling Vireo*	3.80	5.99	+10	**+58**	+105
Orange-crowned Warbler	5.33	6.00	-21	**+13**	+46
Yellow Warbler	7.85	9.64	-7	**+23**	+53
Yellow-rumped Warbler	8.52	7.07	-67	**-17**	+33
MacGillivray's Warbler	5.98	6.29	-65	**+5**	+75
Wilson's Warbler	1.69	2.14	-38	**+27**	+91
House Sparrow	6.55	8.02	-7	**+22**	+52
Western Meadowlark	10.76	8.99	-34	**-16**	+1
Red-winged Blackbird*	14.90	6.67	-85	**-55**	-25
Brewer's Blackbird	13.88	17.61	-15	**+27**	+68
Brown-headed Cowbird	6.71	6.92	-38	**+3**	+44
Western Tanager	5.59	5.96	-31	**+7**	+44
Pine Siskin	39.29	42.62	-64	**+8**	+81
American Goldfinch	4.17	5.30	-36	**+27**	+90
Rufous-sided Towhee*	2.79	5.64	+58	**+102**	+146
Savannah Sparrow	4.96	6.04	-10	**+22**	+53
Northern Junco*	14.27	21.03	+7	**+47**	+88
Chipping Sparrow	20.38	17.40	-32	**-15**	+3
Song Sparrow	9.80	11.92	-9	**+22**	+52

*Change at least 95% significant.
†Common and Northwestern Crows combined.