

## The Canadian Breeding Bird Survey, 1967–1998

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### Introduction

The Breeding Bird Survey (BBS) is a cooperative effort among skilled amateur and professional ornithologists to document long-term changes in bird populations. The BBS is jointly coordinated by the U.S. Geological Survey (USGS) Patuxent Wildlife Research Center and the Canadian Wildlife Service (CWS). In Canada and the United States, the data are widely used by researchers, government agencies, nongovernmental organizations, and the public for information on changes in terrestrial bird populations in North America and as a basis for decisions on conservation and management. For most landbirds, the BBS is the only source of long-term data on population change that extends throughout the continent. The BBS began in 1966 in the eastern United States and eastern maritime Canada and has since expanded throughout the United States and Canada, including Alaska, Yukon, and a few routes in the Northwest Territories (Fig. 1).

This Progress Note presents the Canadian population trends from 1967 to 1998 for the 253 species of birds recorded on the BBS for which sample sizes are sufficient for analysis. Results are also available on the CWS website (<http://www.cws-scf.ec.gc.ca/nwrc/bbs.htm>). Results of North American analyses are available on the USGS-Patuxent BBS website (<http://www.mp2-pwrc.usgs.gov/bbs/index.htm>). Raw data can be downloaded directly from the USGS-Patuxent BBS website or are available on request to the second author.

### Methods

#### Data collection

The BBS consists of routes established along roadsides. Most BBS routes are run by skilled volunteers, who run routes by car once annually. In Canada, the acceptable dates for running a BBS route are between 28 May and 7 July, although volunteers are encouraged to run their routes after 1 June or, for the boreal regions, after 5 June. Routes are located along all-weather secondary roads. The starting point and starting direction of routes are selected randomly in order to sample a range of habitats representative of the region. Because the BBS is designed to monitor long-term changes in bird populations, volunteers are encouraged to continue to run routes in areas where the habitat conditions have changed

over time. The path of a route is changed only if the road system has been altered or if traffic has increased to the point that the noise interferes with bird identification and detection or creates conditions under which it is dangerous for a participant to stop a car. Participants are encouraged to run their routes for as many consecutive years as possible in order to reduce the effects of observer variability on data analysis (Collins and Wendt 1989; Sauer et al. 1994).

Routes consist of 50 stops spaced 0.8 km apart along a 39.4-km route. Participants record the total number of individual birds heard or seen within 0.4 km of each stop during a three-minute observation period. Data are also recorded for starting and finishing time, weather, and traffic conditions. Data can be entered by participants via the USGS-Patuxent BBS website or submitted to the CWS and USGS offices for data entry. Canadian participants submit data forms to the National Wildlife Research Centre (NWRC), CWS. Most of these data are electronically scanned into the database by the USGS Patuxent Wildlife Research Centre. A portion are entered manually by NWRC, usually because these forms are illegible to the scanner. Electronic copies of Canadian data are amalgamated into the North American BBS database housed at the USGS Patuxent Wildlife Research Center, while original data sheets are stored at the NWRC-CWS.

#### Data analysis

Several factors, in addition to changes in bird populations, contribute to variation within BBS data; these include changes in weather, date of the survey, starting and finishing time, and differences among observers. To help control these sources of variation, data are screened to determine which surveys are included in analyses and how they are subdivided. Individual routes that were run under similar conditions are grouped into "subroutes" for analytical purposes. The set of matching conditions used to define a subroute are that all surveys must have been run by the same observer, and all surveys were done within a date span of 19 or fewer days.

A particular year's survey is excluded from analysis if any of the following proves true:

- 1) winds are of force 4 (Beaufort scale) at both the beginning and end, or force 5 at either point;
- 2) rain is combined with winds equal to force 4 or greater, except on the Prairies (where high winds are frequent), where surveys are excluded only if winds are force 5 at the beginning and end of a route;
- 3) the survey was outside the allowable dates (28 May through 7 July);
- 4) the survey started more than one hour after the prescribed time or finished after 11:00 (local time).

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Analyses for a particular species include only those routes for which the species was recorded at least twice within at least one subroute. An analysis is run only if there are more than 15 routes recording the species in all years and only if a total of at least 40 individuals was recorded (across all years).

The BBS began in the Maritimes and Quebec in 1966, in Ontario and Manitoba in 1967, and in Saskatchewan, Alberta, and British Columbia in 1968; however, certain ecozones were not well covered until later years. The longest-term trend presented here for Canada as a whole is 1967–1998. The longest-term trend calculated is also 1967–1998 for the Atlantic Maritime ecozone but is 1969–1998 for all other ecozones (except for the Boreal Cordillera ecozone). Coverage in the Boreal Cordillera was insufficient for trend calculation before 1986.

#### *Analytical method*

The BBS trends for a region are a weighted average of the local trend estimates for individual routes. The current analysis assumes each route has an exponential trend over the period being studied. The local trends for each route are estimated through maximum likelihood, assuming the trend is linear in the log scale and the underlying counts have a Poisson distribution. The model incorporates partitioning of the observations into blocks of routes measured under similar conditions (subroutes) as described above. To combine the local trends into a regional trend, the routes are weighted by a factor that incorporates both the precision of the local trend estimate and the local population density.

The trend analysis for an individual route is based on Link and Sauer (1994), which uses estimating equations:

- 1) Observed counts are assumed to have a Poisson distribution.
- 2) For each individual route, the logarithm of the Poisson parameter can be written as an ANCOVA-type model with a linear trend with year and fixed effects for blocks of comparable observations.
- 3) Parameters are estimated as the maximum likelihood of the conditional likelihood. The overall trend is a weighted average of the individual route trends. Weighting factors are selected to minimize the mean squared error of the overall estimate.

Several weighting factors are used: proportion of population represented (which is a product of two subfactors: area and local population level) and a slope precision factor, as detailed below.

- 1) BBS routes are established within “degree blocks” of one degree of latitude and longitude, which are considered the basic sampling unit for the BBS. Although efforts are made to establish routes in an even pattern across the country, the distribution of the routes that are run by volunteers is uneven, with distinct concentrations of routes near major population centres (Fig. 1). Area weighting is used to reduce this potential bias. Each degree block is given an area value of 1, except that the value is reduced according to the proportion of a block occupied by major water bodies. The weight given to each route in the degree

block is equal to the total area of the block divided by the number of routes in it. The justification for assigning an area weight to a route is based on the assumption that the population trends are representative of the habitat within a degree block. However, because the BBS is a roadside survey, some habitat types (e.g., interior forest) may be underrepresented.

The area weighting described here differs from that used by the USGS-Patuxent Wildlife Research Center, which uses a biogeographic stratum as the basic sampling block. Routes are assigned an area weight equal to the area of the biogeographic region within which the route is found, divided by the number of routes in the same stratum. This method is effective in the 48 contiguous states where a higher population density and more extensive road network make it possible to achieve a more even distribution of routes. In addition, the strata and states used for the summary of the data are generally much smaller than the ecozones and provinces used for summarizing data within Canada. The degree block weighting scheme is more appropriate for the analysis of the BBS in Canada.

- 2) The population density weighting factor adjusts for differences in the number of individual birds detected on a route. The use of such a weighting factor is justified by the argument that the BBS should attempt to measure the magnitude of change in the species' population, and changes in areas with higher density will have more impact on overall population size than changes in areas with lower densities. Hence, the local population density should influence the weight given to a route in calculating overall population trend. The weighting factor used to represent density is the average count on the route.

It can be argued that density weighting is not appropriate, because the reported counts are only a good measure of local population density if the areas sampled by all routes are identical. However, routes pass through different habitats, and the distance that birds can be detected will vary among habitats as well as among observers. In the absence of a reliable index of local density, routes could perhaps be given equal weight. Although this weakness is acknowledged, we nonetheless believe that the density weighting adopted provides a more accurate measure of trend than no density weighting at all.

- 3) A slope precision factor is used to adjust for differences in the precision of the regression line. The precision of the estimate of slope depends on the number and spacing of the annual surveys done on each route. Routes with more precise estimates, generally those with a longer run of years, are given more weight.

The Canadian BBS analysis program developed by CWS is written in C++ and is available for distribution, on request to the third author, to individuals interested in running their own analyses. The program includes options to customize the analysis by changing the data screening, matching, and weighting procedures. Documentation for the program includes a more detailed description of the analytical techniques and calculation of weighting factors.

## Results

The number of routes surveyed fluctuates annually but has stayed at about 400 since 1994 (Table 1). In 1998, 411 BBS routes were run in Canada by 320 volunteers (Fig. 1).

Trend estimates were calculated for various periods and at a variety of spatial scales. Those detailed in Appendix 1 are for the full period of the survey, for the past 25 years, for the past 10 years, and for the past five years. Trends for all these periods are calculated for Canada as a whole and, where sample sizes allow, for eight ecozones: Boreal Shield, Atlantic Maritime, Mixedwood Plains, Boreal Plains, Prairies, Pacific Maritime, Montane Cordillera, and Boreal Cordillera (Fig. 1). The BBS was not established in all areas at the same time, however, so the years for "full period of the survey" vary among regions (Appendix 1).

Long-term results (32 years from 1967 to 1998) indicate that half of Canada's bird species have increased and half have decreased (Table 2, top line of data). Populations are changing all the time, and trends are almost never equal to zero, so this is the result that would be expected by chance. However, about two-thirds of all BBS trends were not statistically significant, meaning that they are indistinguishable from no change at all.

Of the significant trends, declines were nearly twice as numerous as increases (Table 2). Thus, nearly one in five Canadian species showed significant decline, while only one in 10 showed significant increase. Inclusion of species with near-significant trends ( $0.15 > P > 0.05$ ) changes these numbers only a little (14% increasing, 22% decreasing).

Table 3 shows the median change in population index for increasing and decreasing species. For species without significant trends, the median increase was 56%, while the median decrease was 40% (i.e., 40% fewer individuals were counted in 1998 than in 1967). For species with significant population trends, the overall changes in population were larger, with a median increase of more than 200% and a median decline of 62% (Table 3).

Species with statistically significant or near-significant ( $0.15 > P > 0.05$ ) declines over the entire survey period (1967–1998) are shown in Table 4, grouped according to persistence of decline over the most recent three decades. The same information is shown for significantly increasing species in Table 5.

Species were subdivided in various ways to test whether particular groups stood out as having more numerous or more severe negative trends, whether statistically significant or not. The proportion of increasing and decreasing species usually did not differ significantly from the expected 50:50 ratio according to ecozone, migratory status, or habitat type, whether comparing all trends or only those that were statistically significant (Table 2). However, birds of open country with significant trends had significantly more declines than increases. Of 97 open-country species, 23% declined significantly over the past 32 years, versus only 9% increasing significantly (see Tables 4 and 5 for listing of species).

## Discussion

The magnitude of BBS trends is presented for illustrative purposes (Table 3), but it should not be interpreted too

literally. For example, the overall magnitude of population change is affected by the method of data analysis. The route regression technique assumes a linear trend in the log scale (see Methods), which ignores nonlinear changes in population size. However, populations are known to go up and down over time (Francis and Hussell 1998), and linear models can over- or underestimate the true change over time, depending on stage of the population cycle at the start and end points of the analysis period. In addition, because BBS data are very variable, it is easier to document a statistically significant population trend when the population change is very steep. This helps to explain why median change in population index is higher among species with significant population trends than among other species (Table 3). Some of the smaller changes are certain to be real, but a larger quantity of data is required to document small changes with the level of precision required by statistical tests. Such problems become smaller as the period considered becomes longer, but users should be particularly cautious in interpreting the magnitude of shorter-term trends.

Except for the fact that open-country species showed a preponderance of declines among statistically significant trends, there were no other notable differences in direction of BBS trend among groups of species based on ecozone, migratory status, or habitat (Table 2). Other groups that appear to stand out generally involved a small number of species, which can skew results by chance (e.g., Boreal Cordillera data based on six species). As noted above, trends for the Boreal Cordillera ecozone also cover a much shorter period (1986–1998) than those for the other ecozones.

In most species with statistically significant national trends, the trends in each ecozone were similar. A few exceptions stand out, however (Appendix 1). Among declining species, the following species stood out as faring well in one ecozone (indicated in parentheses): Northern Flicker (Atlantic Maritime), Boreal Chickadee (Boreal Plains), Brown Thrasher (Prairies), and Chestnut-sided Warbler (Mixedwood Plains). Among species increasing significantly in Canada as a whole, there were notable regional declines in Red-tailed Hawk (Mixedwood Plains), Ring-billed Gull (Atlantic Maritime and, recently, Boreal Shield), Red-eyed Vireo (Montane Cordillera), and Magnolia Warbler (Mixedwood Plains).

Data in Appendix 1 indicate that several species with negative 32-year trends have shown a strong increase in the past 5–10 years, suggesting population recovery. These include waterfowl in general, as well as certain other open-water species, such as Pied-billed Grebe and American Coot. Wilson's Phalarope, while not declining earlier, has also shown a notable recent increase. These species have probably responded to increased rainfall in their breeding areas, and the increases have also been documented in waterfowl surveys (Migratory Birds Conservation Division, 1996). Black-billed Cuckoo is another species showing a strong recent recovery (Appendix 1). Chipping and White-throated sparrows show less strong signs of a turnaround, although migration count data from southern Ontario have shown notable increases (Francis and Hussell 1998).

Another group of species stands out as having positive or essentially steady long-term trends (1967–1998) but steep declines in the past five or 10 years (Appendix 1). This group includes Gray Partridge, several woodpeckers (Red-naped and Red-breasted sapsuckers, Hairy and Pileated woodpeckers), Red-breasted Nuthatch, House Wren, Ruby-crowned Kinglet, Nashville Warbler, and House Finch. The latter species expanded exponentially into eastern Canada during the past two decades, and its current decline suggests that population growth has reached (perhaps exceeded) its limits. The other species listed here deserve attention to determine whether trends are continuing or require research into causal factors.

Open-country species with significant population trends were especially likely to be decreasing (see Table 2), but several taxonomic groups also showed a preponderance of declines (Appendix 1). Of the nine species of blackbirds with Canadian trends (excluding orioles), seven (78%) showed significant long-term decline. Forty percent of finches (10 species) and 40% of flycatchers (15 species) also declined significantly. No taxonomic group showed a similar preponderance of increases. These numbers are striking and suggest that common causation may be involved. These species, and all those that have declined consistently over the past 32 years (Table 4), should be high priorities for further research.

#### Acknowledgements

We thank the many hundreds of volunteers who have participated in the BBS throughout the years and those who have served as provincial or territorial coordinators.

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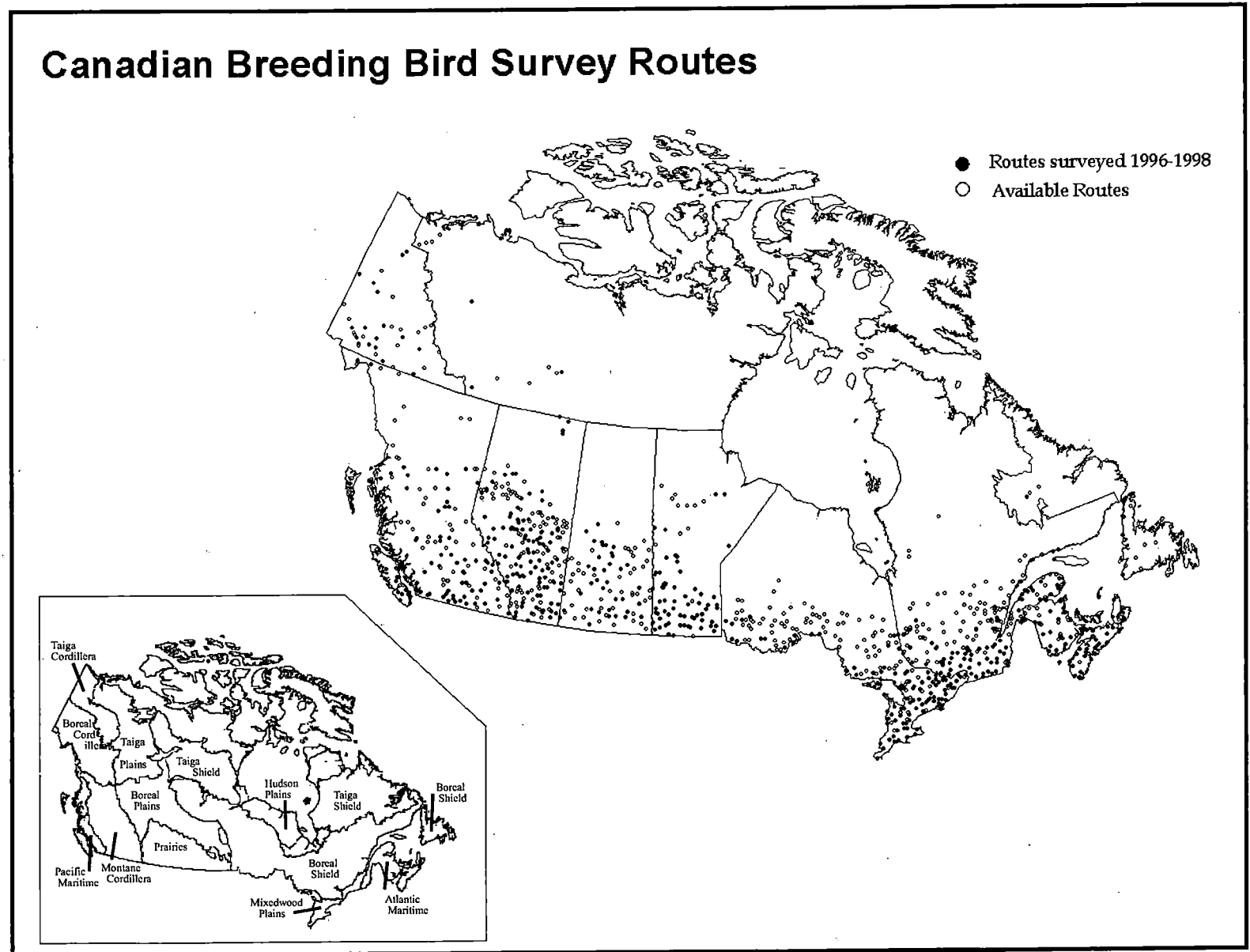
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**Figure 1**

All available BBS routes and all routes run in 1998. The inset shows Canadian terrestrial ecozones excluding the Arctic (Ecological Stratification Working Group 1995).



**Table 1**

Number of BBS routes in Canada conducted by volunteers in 1994–1998

Province/territory	1994	1995	1996	1997	1998
Newfoundland	2	7	3	4	6
Prince Edward Island	2	2	2	2	2
Nova Scotia	17	22	23	26	26
New Brunswick	13	15	14	15	15
Quebec	47	60	52	59	55
Ontario	91	96	89	79	75
Manitoba	31	40	42	44	45
Saskatchewan	29	28	23	27	27
Alberta	83	91	77	81	83
British Columbia	57	64	57	59	61
Yukon Territory	17	15	13	14	12
Northwest Territories	0	1	1	2	4
Total	389	441	396	412	411

**Table 2**

Percentage of Canada-wide trends for 1967–1998 that are positive or negative

Group	All trends		Significant trends only <sup>a</sup>		No. of species
	Positive (%)	Negative (%)	Positive (%)	Negative (%)	
<b>All species</b>	49	51	9	17	253
<b>Ecozone<sup>b</sup></b>					
Boreal Shield	41	59	9	19	138
Atlantic Maritime	45	55	10	13	117
Mixedwood Plains	48	52	12	12	103
Boreal Plains	45	55	5	11	123
Prairies	56	44	11	10	114
Pacific Maritime	44	56	5	10	61
Montane Cordillera	50	50	7	6	110
Boreal Cordillera	67	33	33	0	6
<b>Migratory status (landbirds only)</b>					
Neotropical migrant	45	55	7	18	92
Temperate migrant	46	54	13	23	79
Resident	56	44	11	15	27
<b>Habitat group<sup>c</sup></b>					
Open country	44	56	9	23	97
Wetland	50	50	8	8	64
Woodland	52	48	9	16	92

<sup>a</sup> Significance level of  $P < 0.05$ .<sup>b</sup> Trends for ecozones are for 1969–1998, except for Atlantic Maritime (1967–1998) and Boreal Cordillera (1986–1998) ecozones.<sup>c</sup> Species assigned to habitat according to Peterjohn and Sauer (1993), combining their categories of grassland and successional scrub species into the single category for "open country." Additional species not covered by that paper were classified by the authors.

**Table 3**Median percent change in population between 1967 and 1998 (Canada-wide trends),<sup>a</sup> shown separately for increasing and decreasing species

Group	Nonsignificant trends			Significant trends only <sup>b</sup>		
	Positive (%)	Negative (%)	No. of Species	Positive (%)	Negative (%)	No. of Species
<b>All species</b>	56	-40	189	235	-62	64
<b>Ecozone<sup>c</sup></b>						
Boreal Shield	52	-38	99	275	-72	39
Atlantic Maritime	107	-46	90	205	-77	27
Mixedwood Plains	76	-47	79	275	-57	24
Boreal Plains	81	-49	103	1361	-84	2
Prairies	50	-42	91	215	-87	2
Pacific Maritime	89	-63	52	384	-87	9
Montane Cordillera	87	-43	95	406	-72	15
Boreal Cordillera	12	-23	4	324		2
<b>Migratory status (landbirds only)</b>						
Neotropical migrant	27	-36	69	169	-74	23
Temperate migrant	43	-45	5	206	-52	28
Resident	84	-42	20	197	-78	7
<b>Habitat group<sup>d</sup></b>						
Open country	23	-49	66	543	-53	31
Wetland	98	-38	54	275	-92	10
Woodland	87	-34	69	71	-74	23

<sup>a</sup> Magnitude of change calculated according to the formula: Total percent change =  $[(1 + t)^n - 1]100$ , where  $t$  is the trend in Appendix 1 divided by 100, and  $n$  is the number of years over which the trend was calculated.

<sup>b</sup> Significance level of  $P < 0.05$ .

<sup>c</sup> Changes for ecozones are for 1969–1998, except for Atlantic Maritime (1967–1998) and Boreal Cordillera (1986–1998) ecozones.

<sup>d</sup> Species assigned to habitat according to Peterjohn and Sauer (1993), combining their categories of grassland and successional scrub species into the single category for "open country." Additional species not covered by that paper were classified by the authors.

**Table 4**

Species with significant or near-significant declines over entire survey period, showing trends in each of the most recent three decades (sample size allowing)<sup>a</sup>

Species	1967–1998	Decade trends		
		1969–1978	1979–1988	1989–1998
<b>Consistently negative</b>				
Lark Bunting	−15.6 *			−29.6 *
Connecticut Warbler	−9.8 +		−6.4	−3.8
Great Horned Owl	−8.3 *	−11.4	−6.2	−7.8
Lesser Yellowlegs	−7.9 *		−11.1	−6.4
Loggerhead Shrike	−7.7 *	−8.7		−8.0 *
Chimney Swift	−7.4 *	−12.0 *	−4.4	−11.4 *
Gray-cheeked Thrush	−7.2 +			
Black-crowned Night-Heron	−6.9 *			−23.2 +
Boreal Chickadee	−6.9 *	−4.9	−6.6	−0.1
Common Nighthawk	−6.3 +	−0.4	−4.1	−3.3
Olive-sided Flycatcher	−5.5 *	−7.9 *	−0.5	−7.7 *
Calliope Hummingbird	−4.8 *			−8.3
Purple Finch	−4.5 *	−3.4	−2.1	−7.5 *
Band-tailed Pigeon	−4.4 *	−1.2		
Evening Grosbeak	−4.3 +	−19.5 *	−0.2	−4.6
Eastern Wood-Pewee	−4.1 *	−6.8 *	−2.7	−4.3 *
Black Tern	−3.3 +	−5.9 +	−1.9	−1.4
Eastern Meadowlark	−2.6 *	−1.9	−3.4 *	−2.7
Northern Flicker	−2.5 *	−0.4	−1.6	−3.2 +
Herring Gull	−2.0 +	−2.0	−1.2	−7.7 +
Brown Thrasher	−1.2 *	−1.5	−4.7	1.9
<b>Declining in most recent two decades</b>				
Eastern Towhee	−6.8 +	2.9	−4.5	−4.2
Sharp-tailed Grouse	−5.9 +	6.1	−0.9	−10.8
Scarlet Tanager	−4.8 *	5.0	−5.9	−9.5 +
Blackpoll Warbler	−4.1 *	7.3	−5.3 *	−4.2
Spotted Sandpiper	−3.3 +	3.0	−3.7	−4.4 *
Barn Swallow	−2.7 *	0.1	−1.5 +	−4.6 *
Bobolink	−2.6 *	3.9 *	−3.8 *	−3.7 *
Killdeer	−2.6 *	2.8 *	−3.5 *	−1.7 *
Brown-headed Cowbird	−1.9 *	0.1	−1.3	−1.2
Chestnut-collared Longspur	−1.8 *	19.9 *	−2.7	−5.2
Chestnut-sided Warbler	−1.4 +	3.2 *	−2.6 *	−1.6
Chipping Sparrow	−1.3 *	0.7	−1.3	−0.3
Great Crested Flycatcher	−1.2 +	1.2	−1.5	−1.7
Red-winged Blackbird	−1.2 *	4.3 *	−3.4 *	−1.8
Veery	−1.2 *	0.1	−3.1 *	−1.1
<b>Declining in most recent decade</b>				
Bank Swallow	−6.2 +	−1.4	1.6	−13.0 *
Baird's Sparrow	−4.4 *	−14.2	8.1	−8.1 +
Northern Harrier	−3.7 *	−9.2 +	1.1	−6.1 *
Horned Lark	−3.1 *	0.9	0.5	−9.3 *
Gray Jay	−3.0 *	−2.0	1.3	−3.0 +
Western Wood-Pewee	−2.6 *	−6.7 +	0.9	−4.2
European Starling	−2.5 *	0.3	1.3	−2.3 *
House Sparrow	−2.2 *	−0.9	1.2	−0.9
Western Meadowlark	−2.0 *	−2.9 *	0.3	−2.6 *
Eastern Kingbird	−1.8 *	4.1 *	0.7	−5.0 *
Pine Siskin	−1.7 *	−2.3	6.1 +	−2.0
Song Sparrow	−1.0 *	−0.9	0.7	−0.3
Least Flycatcher	−0.8 +	−0.8	0.9	−2.6



**Table 4** (cont'd.)

Species with significant or near-significant declines over entire survey period, showing trends in each of the most recent three decades (sample size allowing)<sup>a</sup>

Species	1967–1998	Decade trends		
		1969–1978	1979–1988	1989–1998
<b>Apparent levelling off (positive trends in most recent decade)</b>				
Rusty Blackbird	–14.1 *	–15.7	–17.2 *	7.2
Northern Pintail	–8.5 *	–16.0+	–8.9 *	8.5
Pine Grosbeak	–5.8 *	7.5	–8.1	0.5
Yellow-bellied Sapsucker	–3.0 *	–8.8 *	2.2	0.9
Common Grackle	–2.3 *	–3.5 *	–1.8	0.2
White-throated Sparrow	–0.8 *	–1.6 *	–0.6	1.3 *

<sup>a</sup> Statistical significance: \* indicates  $P < 0.05$ ; + indicates  $0.15 > P > 0.05$ .

**Table 5**

Species with significant or near-significant increases over entire survey period, showing trends in each of the most recent three decades (sample size allowing)<sup>a</sup>

Species	1967–1998	Decade trends		
		1969–1978	1979–1988	1989–1998
<b>Consistently positive</b>				
American Crow	0.6+	0.7	0.6	1.8 *
American Robin	1.0 *	0.5	1.8 *	0.8 *
Hermit Thrush	1.5 *	0.1	4.2 *	1.4
Downy Woodpecker	2.5+	6.1+	3.9+	2.1
Mourning Dove	2.6 *	7.0 *	0.3	1.3
Black-capped Chickadee	3.1 *	2.6	1.4	2.1
Blackburnian Warbler	3.5 *	2.1	1.5	3.2+
Red-tailed Hawk	3.5 *	2.6	1.8	3.1 *
Common Raven	3.7 *	6.6 *	1.9	4.1 *
Bald Eagle	4.1 *			5.3 *
American White Pelican	4.5 *			1.3
Mew Gull	5.4+			
Yellow-billed Cuckoo	5.5+	10.0+		
Sedge Wren	6.0 *	4.8 *	8.4	8.3+
Lazuli Bunting	6.4 *		13.8 *	4.1+
House Finch	6.9 *		12.3 *	0.3
Hooded Merganser	11.9+			18.8 *
Orchard Oriole	12.8 *			
Turkey Vulture	13.0 *		25.6 *	4.1
Canada Goose	13.8 *	30.3	1.7	16.1 *
Northern Mockingbird	15.2 *			
<b>Increasing in most recent two decades</b>				
Marsh Wren	5.6 *	−8.2	3.3	5.1
Black-and-white Warbler	3.2 *	−0.4	3.5 *	3.1 *
Warbling Vireo	1.6 *	−1.9	0.3	2.9 *
Yellow Warbler	0.6+	−0.1	0.1	1.0
<b>Increasing in most recent decade</b>				
Pine Warbler	7.7+		−0.4	9.5 *
Cape May Warbler	3.4+	2.2	−2.5	4.6
Common Loon	1.7+	−1.8	−0.9	5.0 *
Lincoln's Sparrow	1.7+	13.9 *	−1.9	1.3
Red-eyed Vireo	0.8+	4.6 *	−0.4	1.2 *
<b>Apparent levelling off (negative trend in most recent decade)</b>				
Ring-billed Gull	4.0 *	4.4	2.4	−0.3
Magnolia Warbler	1.7 *	0.2	3.1 *	−1.5
Red-breasted Nuthatch	1.9 *	−3.5	5.7 *	−4.1 *
Broad-winged Hawk	2.6+	−7.2	−4.6	−5.5

<sup>a</sup> Statistical significance: \* indicates  $P < 0.05$ ; + indicates  $0.15 > P > 0.05$ .

## Appendix 1

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998			1974–1998			1989–1998			1994–1998		
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Common Loon												
Canada	1.7	+	289	1.6		275	5	*	198	3.6		145
Boreal Shield	0.3		109	−0.3		105	2.4		70	−0.5		52
Atlantic Maritime	3.3		54	4.3	+	48	10.6		34	14.6		27
Mixedwood Plains	12.6		17	13.4		16	14.7		15			
Boreal Plains	4.3		39	2.7		39	8.8	+	32	12.7		21
Pacific Maritime	13.4	*	16	14	*	16						
Montane Cordillera	3.6		41	4.2		39	3		30	4.2		24
Pied-billed Grebe												
Canada	−1		124	−2.5		118	11.9	*	81	2.1		52
Mixedwood Plains	−1		19	2.6		16						
Boreal Plains	−1		26	−0.7		26	17	*	20			
Prairies	−1.7		48	−4.4		46	11.1		31	−8		22
Horned Grebe												
Canada	−0.4		71	−6.9		66	0.3		45	1.5		29
Boreal Plains	2.4		20	2		20	−0.3		15			
Prairies	1		42	−8.6		38	4.9		24	0.2		16
Red-necked Grebe												
Canada	−1.6		56	−2		56	−0.6		47	−6.4		30
Boreal Plains	0.7		23	0.6		23	2.2		20	−0.9		15
Prairies	−3.5		15	−6		15						
Eared Grebe												
Canada	−1.8		40	−4.5		38	8.6		21			
Prairies	3.4		29	0.2		27	0.7		17			
American White Pelican												
Canada	4.5	*	29	4.6	*	27	1.3		23			
Double-crested Cormorant												
Canada	3.8		76	4.1		75	21.3	+	60	29		38
Atlantic Maritime	2.5		33	1.9		32	22	*	24	40		18
Prairies	−5.9		18	−1.9		18						
American Bittern												
Canada	−2		250	−1.6		227	5.5	+	141	0.6		103
Boreal Shield	2.1		74	2.5		69	3.8		40	−4.5		30
Atlantic Maritime	−1.8		51	−3.6		42	−5.3		25	−11.4		18
Mixedwood Plains	4.3		35	6.6		31	3		25	−1.6		21
Boreal Plains	−6.5	+	25	−6.5	*	25						
Prairies	−4.8		55	−3.4		50	20.7	*	34	4.1		22
Great Blue Heron												
Canada	−1.9		301	−2.5	*	294	−4.1		226	−10.7	*	152
Boreal Shield	2.7		87	2.9		85	−4.4	+	67	−14.1	*	51
Atlantic Maritime	−4.4		54	−5		51	1.9		34	−23.8	+	20
Mixedwood Plains	1.6		56	−0.1		56	−0.7		50	9.8		44
Boreal Plains	−2.9		33	−4.1		33	−9.4		24			
Prairies	−5.4		40	−7.7		38	−17.1	*	29			
Montane Cordillera	−4.4		18	−3.7		18						

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998		1974–1998			1989–1998			1994–1998			
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Green-backed Heron												
Canada	-3.4		44	-5.1		43	-12.3	+	24	-13.4		16
Mixedwood Plains	-3.1		34	-5.3		33	-12.6		20	-14.1		15
Black-crowned Night-Heron												
Canada	-6.9	*	33	-10.1	+	28	-23.2	+	17			
Canada Goose												
Canada	13.8	*	236	13.4	*	234	16.1	*	208	2.4		158
Boreal Shield	54.7	*	31	53.7	*	31	51.4	*	27	-5.1		20
Mixedwood Plains	10.9	*	42	11.1	*	42	8.2		40	8.9		35
Boreal Plains	16.7	*	38	16.7	*	38	13.2	*	35	3.9		23
Prairies	8.8	*	68	8.2		68	17.9		64	-1.4		48
Montane Cordillera	-6.3		31	-6.5		30	2.2		25	1.2		20
Wood Duck												
Canada	6.9		78	9.4	+	74	3.7		58	-1.2		34
Boreal Shield	13.6	*	30	12.3	*	28	3.7		22			
Mixedwood Plains	4.2		26	3.8		24	9.1		19			
Green-winged Teal												
Canada	2.3		132	-0.2		128	16.1	*	95	25.7	*	64
Boreal Plains	5.2		36	4.2		35	16.5		25	13.6		16
Prairies	4.6	*	64	5.7	*	61	24.7	*	48	35.6	*	33
American Black Duck												
Canada	-3.1		99	-2.4		87	0.7		54	19.4		30
Boreal Shield	-11.9		26	-14.5		23						
Atlantic Maritime	2.5		55	1.6		48	6.9		37	41.6	*	20
Mixedwood Plains	-4.6		15									
Mallard												
Canada	0.2		371	0		366	-3.7		309	10.3	*	252
Boreal Shield	-2.4		50	-4.1		50	-6.9		40	-3.1		32
Mixedwood Plains	0		59	1.8		59	-4.4		55	-20.4	*	50
Boreal Plains	-0.1		68	-0.1		67	-12.4		58	14		50
Prairies	0.3		115	-0.3		113	0.2		95	15.8	*	80
Pacific Maritime	2.9		16	2.9		16						
Montane Cordillera	2.9		46	3.2		44	10.4		33	8.4		21
Northern Pintail												
Canada	-8.5	*	149	-10.5	*	141	8.5		95	16.1	*	68
Boreal Plains	-12.5		30	-17.5		29						
Prairies	-9.4	*	98	-11.1	*	93	7.4		73	16.8	*	55
Blue-winged Teal												
Canada	-1.1		217	-1.7	+	206	5.3		147	24.1	*	118
Boreal Shield	1.6		16									
Mixedwood Plains	0.7		23	-1		21						
Boreal Plains	-1.2		49	-2.1		49	-6.5		38	27.1	*	31
Prairies	-0.4		105	-0.5		101	11.2	*	83	23.4	*	69
Montane Cordillera	5.3		15	5.3		15						

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998			1974–1998			1989–1998			1994–1998		
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Cinnamon Teal												
Canada	−2.2		21	−2.2		21	−13.2		17			
Northern Shoveler												
Canada	0.9		142	3.5	*	137	8.1	+	109	10		84
Boreal Plains	6.8	*	31	7.4	*	31	−3.5		26	11.3		16
Prairies	0.2		96	3.1	*	92	9.8	*	77	9.8		64
Gadwall												
Canada	1		133	0.4		128	−0.1		106	9.6	+	83
Boreal Plains	−2.8		28	−2.4		28	−10.1		21	15		15
Prairies	3.5		98	1.6		94	5		80	9.1		63
American Wigeon												
Canada	−0.1		144	1.4		140	1.6		102	17.4	*	70
Boreal Plains	7		29	7.8		29	−7.2		22	38.4	+	16
Prairies	−2.3		86	−0.5		82	4.8		60	8.2		43
Canvasback												
Canada	−0.7		67	−3.1		65	8.5		39	5.2		25
Prairies	−0.2		52	−2.3		50	6.9		31	1.9		19
Redhead												
Canada	−0.2		83	0.2		80	−7.3		60	14.2		38
Boreal Plains	−2.6		16	−3.7		16						
Prairies	−0.2		61	1.6		59	−11.8		43	11.3		26
Ring-necked Duck												
Canada	3.7		80	5.9	*	73	11.3	*	51	9.2		33
Boreal Shield	1.1		21	2.5		19						
Boreal Plains	2		18	1.7		18						
Montane Cordillera	2.1		15									
Lesser Scaup												
Canada	0.3		140	−0.9		136	0.9		107	−0.3		80
Boreal Plains	−0.1		38	0		38	−1.3		30	4.3		22
Prairies	0.5		84	−0.6		80	2.4		61	−8.3		46
Common Goldeneye												
Canada	3.3		86	3.5		79	12.3	*	43	23.2	+	28
Boreal Shield	−1.6		27	−3.3		23						
Boreal Plains	9.5	*	31	8.5	+	31	16.6	*	22			
Barrow's Goldeneye												
Canada	4.3		30	3.4		30	−1.5		25	−3.1		15
Montane Cordillera	4.8		23	4.1		23	1.2		18			
Bufflehead												
Canada	−0.7		55	−1.3		55	5.4		40	21.8		25
Boreal Plains	−0.7		28	−1		28	15.3		20			
Prairies	1.3		17	−4.4		17						

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998		1974–1998			1989–1998			1994–1998			
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Hooded Merganser												
Canada	11.9	+	26	12.2	+	25	18.8	*	18			
Common Merganser												
Canada	2.6		122	1.5		116	–2.5		76	3.7		45
Boreal Shield	–1.5		41	–2.4		41	–1.6		28	8.9		16
Atlantic Maritime	–3.5		24	–3.1		19						
Montane Cordillera	0.2		27	–0.6		27	–12	*	19			
Red-breasted Merganser												
Canada	2.7		19	3.2		17						
Ruddy Duck												
Canada	–0.1		84	2.2		79	–2.2		59	8		45
Boreal Plains	–5.4		20	–5.5		20						
Prairies	0.8		52	3		48	–5.6		37	1.7		27
Turkey Vulture												
Canada	13	*	62	13.4	*	60	4.1		52	1.7		43
Boreal Shield	14.2	*	24	11.7	*	24	8.9		20			
Mixedwood Plains	13.8	*	31	12.8	*	29	2		27	0.2		25
Osprey												
Canada	–1.1		93	–1.4		91	1.2		56	–1.8		41
Boreal Shield	18.6		17	19.4		17						
Atlantic Maritime	–6		35	–6.9		34	–5		20			
Montane Cordillera	–3.7		30	–3.7		29	0.6		16			
Bald Eagle												
Canada	4.1	*	56	2.9		54	5.3	*	46	8.2	*	27
Pacific Maritime	6.3		18	6.1		18	7.2		16			
Montane Cordillera	8.3		15									
Northern Harrier												
Canada	–3.7	*	256	–4.7	*	243	–6.1	*	175	–3.9		108
Boreal Shield	–6.9		34	–7		32	–8.6		19			
Atlantic Maritime	1.7		31	–2.2		30	–5.5		16			
Mixedwood Plains	0.7		39	0.2		37	–7.4		28	–3.3		17
Boreal Plains	–7.6	*	46	–7.6	*	43	9	+	31	33.8		21
Prairies	–5.9	*	99	–6.6	*	94	–8.9	*	77	–11.3	+	52
Sharp-shinned Hawk												
Canada	14.4		39	–7.3		33	10.8		17			
Cooper's Hawk												
Canada	–4.8		28	–0.8		25						
Red-shouldered Hawk												
Canada	6		20	9.4		17						
Broad-winged Hawk												
Canada	2.6	+	87	4.6		78	–5.5		41	1.2		19
Boreal Shield	2.7		49	4.9		46	–7.6		26			
Atlantic Maritime	7.7		22	8.4		19						

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998		1974–1998			1989–1998			1994–1998			
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Swainson's Hawk												
Canada	–3.4		117	–4.2	*	112	–9.7	*	88	–2.1		67
Prairies	–3.5		98	–4.3	*	94	–10	*	77	–2.7		61
Red-tailed Hawk												
Canada	3.5	*	321	2.8	+	315	3.1	*	260	–0.5		198
Boreal Shield	–0.3		27	–0.7		27	6.3		21			
Atlantic Maritime	7.2		21	6.8		17						
Mixedwood Plains	–5.3	+	45	–6.6	+	45	–13.1	*	33	–22.4	+	27
Boreal Plains	3		70	3		70	3.7		62	3.4		49
Prairies	5.5	*	90	4.7	+	89	5.9	*	81	–3.4		68
Montane Cordillera	2.1		47	–0.6		46	–5.3		41	–5.6		32
Ferruginous Hawk												
Canada	1.3		20	–0.6		20						
Prairies	1.3		20	–0.6		20						
American Kestrel												
Canada	–1.9		360	–1.8		340	–4.6	*	254	1.2		177
Boreal Shield	–3.3	*	77	–1.4		70	–6.4		46	–5.2		27
Atlantic Maritime	0.9		51	0.7		46	1		27	–0.3		18
Mixedwood Plains	–2.7		52	–1.5		52	–13.8		42	–15.5	+	29
Boreal Plains	0.8		66	0.5		65	–0.8		54	10.8		42
Prairies	–1.8		54	–2.8		51	–4.8		42	20.1		27
Montane Cordillera	2.4		51	0.8		48	1.7		36	–4.3		30
Merlin												
Canada	10.3		75	11.2		73	10.7		57	16.1		34
Boreal Plains	3.2		21	3.2		21	7.4		16			
Prairies	19	*	23	17.1	+	23	5.5		20			
Gray Partridge												
Canada	3.3		75	–2.3		70	–9.4		43	–11.9	+	19
Prairies	3.3		64	–2.6		60	–7.5		37	–11.9	+	19
Ring-necked Pheasant												
Canada	–1.6		114	–1.2		110	1.4		84	8.4		57
Atlantic Maritime	5.8	+	20	8.1	*	20	27.7	*	17	34.6	*	16
Mixedwood Plains	–8.8	*	24	–9.8		23	–1.5		18			
Prairies	–1.3		41	–1.7		38	–6.2		30	8.2		17
Blue Grouse												
Canada	–2.1		27	–2.4		25						
Pacific Maritime	–1.6		17	–2.2		16						
Ruffed Grouse												
Canada	–0.1		196	–4		177	5.2		105	7.4		68
Boreal Shield	8.1		59	2.8		55	10.6		36	24.1		22
Atlantic Maritime	2.5		38	–3.3		29						
Boreal Plains	–6.2		29	–12.5		28	–7.6		19			
Montane Cordillera	–3.2		34	–1		34	6.4		20			

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998			1974–1998			1989–1998			1994–1998		
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Sharp-tailed Grouse												
Canada	−5.9	+	53	−6.7	+	51	−10.8		29			
Prairies	−7	+	37	−10	*	36	−18.6	*	20			
Virginia Rail												
Canada	5.1		17	5		17						
Sora												
Canada	0.6		234	0.4		223	3.9		173	−5.5		132
Boreal Shield	−4.1		16									
Boreal Plains	−1.2		63	−0.8		62	−2.1		50	−2.5		44
Prairies	1.1		97	1.7		93	5.9	*	80	−9.6	+	63
Montane Cordillera	6.1		31	5.5		31	1.4		21			
American Coot												
Canada	−0.1		151	0.5		145	8.6	+	111	26.5	*	86
Boreal Plains	1		39	1.2		39	14.1	+	31	46.9	*	21
Prairies	−0.2		88	0.8		84	7.2		66	27.6	*	54
Montane Cordillera	3.6		19	1.5		18						
Sandhill Crane												
Canada	2.3		54	3.4		54	−0.9		42	28.8		29
Boreal Plains	1.2		24	2.2		24	−7.7		17			
Killdeer												
Canada	−2.6	*	473	−3.1	*	464	−1.7	*	380	−4.3	+	307
Boreal Shield	−2.9	*	82	−4.4	+	79	−8.6	*	53	−11.8	*	41
Atlantic Maritime	−4	*	68	−6.2	*	67	−6.7		52	−13.1	*	37
Mixedwood Plains	−1.5	*	69	−3	*	69	−3.9	*	65	−7.3	+	62
Boreal Plains	−5.4	*	71	−5.6	*	69	−3		58	−10.2		45
Prairies	−1.4	+	113	−2.2	*	111	1.4		95	3.1		80
Pacific Maritime	−3.9		15	−4.4		15						
Montane Cordillera	−0.5		51	−1.4		50	2.8		41	11.2	*	31
American Avocet												
Canada	0.2		54	−0.9		53	2.3		43	12.4		23
Prairies	−0.6		50	−1.8		49	1.8		39	11.2		21
Greater Yellowlegs												
Canada	−4.4		33	−4.7		31	1.6		16			
Lesser Yellowlegs												
Canada	−7.9	*	60	−7.8	*	58	−6.4		39	−6.5		23
Boreal Plains	−14	*	30	−14.5	*	28						
Solitary Sandpiper												
Canada	−21.1		30	−15.6		30	2		17			
Willet												
Canada	0.1		116	−0.2		114	0.3		89	−4.1		71
Prairies	0.3		92	0		90	0.2		73	−4		58



# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species Area	First year–1998			1974–1998			1989–1998			1994–1998		
	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Spotted Sandpiper												
Canada	–3.3	+	350	–3.5	*	332	–4.4	*	214	–6.1		136
Boreal Shield	–7.8	*	71	–8.1	+	65	–12.6	*	31			
Atlantic Maritime	0.5		62	0.5		56	–10.3	*	28	–10.2		16
Mixedwood Plains	–5.2		48	–6.5	+	47	0.7		36	–4.2		25
Boreal Plains	–4.4		46	–3.7		44	–10.2	+	30	–20	*	21
Prairies	0		35	–2.3		33	0		23			
Montane Cordillera	–1.4		53	–1		52	–1.5		41	1.2		33
Upland Sandpiper												
Canada	1.8		133	0.1		128	–0.9		97	0.6		66
Mixedwood Plains	–2.5		46	–4.1		45	–9.1	*	37	–13.4	+	30
Prairies	3.2		56	1.6		52	2.7		41	13.3		26
Long-billed Curlew												
Canada	1.2		35	0.6		35	0		28	0.6		21
Prairies	1.1		27	0.2		27	–0.1		23	3.7		17
Marbled Godwit												
Canada	0.5		124	1.6		122	5.4		97	2.1		74
Boreal Plains	3.2		29	3.3		29	6	+	22	–16.7		18
Prairies	–0.2		93	1.4		91	5.4		73	3.9		55
Common Snipe												
Canada	–0.8		494	–1.4		483	3.7	*	379	–1.2		307
Boreal Shield	–4		112	–5	+	109	–4.5		67	–5.1		49
Atlantic Maritime	–0.7		79	–2.9	+	75	2.2		55	–3.8		43
Mixedwood Plains	0.9		51	–0.9		50	3.1		41	–0.9		37
Boreal Plains	1.5		69	1.4		69	7.6	*	61	–1.2		56
Prairies	3.8	*	89	4	+	87	8.6	+	74	8.3	+	62
Montane Cordillera	–1.7		58	–1.5		58	1.3		51	–3.5		44
American Woodcock												
Canada	–12		33	–16.9	*	21						
Atlantic Maritime	–4.2		16									
Wilson's Phalarope												
Canada	0.9		68	0.5		64	–0.9		42	28.8	+	24
Prairies	1.1		57	0.5		54	0.5		35	26.2		21
Franklin's Gull												
Canada	3.8		108	5.3		106	14.7	+	83	2.8		57
Boreal Plains	1.9		43	0.7		42	23.8		33	7.7		24
Prairies	5.3		65	8.9		64	11.9		50	0.6		33
Bonaparte's Gull												
Canada	–11.8		26	–12		26	–13.6	+	18			
Mew Gull												
Canada	5.4	+	16	5.4	+	16	4.1	+	15			

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species Area	First year–1998			1974–1998			1989–1998			1994–1998		
	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Ring-billed Gull												
Canada	4	*	277	4.2	*	273	–0.3		224	–8.9		181
Boreal Shield	1.7		62	0.7		61	–4.9		46	–31.6	*	36
Atlantic Maritime	–2.2		20	–7		19	–23.5	*	15			
Mixedwood Plains	5.2	+	58	5.3		58	–5.3		54	–8.2		50
Boreal Plains	5.6		45	5.3		45	10.4		40	17.7		33
Prairies	5.1		80	6.4	*	78	2.3		62	7.5		49
California Gull												
Canada	5.6		48	5.9		48	4.1		33	–14.6		21
Boreal Plains	–5.7		16	–6.2		16						
Prairies	12.9	+	29	15.4	*	29	19.2	*	22			
Herring Gull												
Canada	–2	+	203	–1.8		195	–7.7	+	120	–10.6		82
Boreal Shield	–1.7		89	–1.2		87	–6.7		42	–6		33
Atlantic Maritime	–1.7		55	–1.6		52	–10.2		39	–8.7		26
Mixedwood Plains	–6.5		27	–8.9		25	–9.9		16			
Great Black-backed Gull												
Canada	–0.5		69	–0.7		68	1.2		36	–24.4		27
Boreal Shield	–0.4		17	–0.4		17						
Atlantic Maritime	–0.8		50	–1		49	–2.3		32	–4.2		23
Common Tern												
Canada	2.3		79	3.3		65	–14.8		34	–50.1		15
Boreal Shield	6.3		22	6.3		18						
Atlantic Maritime	–9.5		20									
Boreal Plains	3.4		16	4		15						
Black Tern												
Canada	–3.3	+	154	–1.8		148	–1.4		106	–5.9		74
Boreal Plains	–3.5		42	–2.9		42	–5.3		35	–25.2		22
Prairies	–4.9	+	73	–3.3		69	–0.8		53	2.9		42
Rock Dove												
Canada	0.6		339	–0.1		331	0		277	0		222
Boreal Shield	6.4	*	43	5.9	*	42	6.3		35	–13.2		27
Atlantic Maritime	7.1	+	59	4.8		57	11.9	*	46	12.7		35
Mixedwood Plains	0		65	–0.3		65	–2.2		60	–0.4		55
Boreal Plains	0.2		40	–1.3		40	–2.1		35	16.4		27
Prairies	0.1		97	–0.3		93	–1.8		75	–1.5		59
Montane Cordillera	3.2		19	2.6		19	6.9		15			
Band-tailed Pigeon												
Canada	–4.4	*	21	–6		19						
Pacific Maritime	–4.5	*	20	–6		18						

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species Area	First year–1998			1974–1998			1989–1998			1994–1998		
	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Mourning Dove												
Canada	2.6	*	385	2.1	*	382	1.3		321	4.4	*	270
Boreal Shield	6	*	69	6.3	*	68	8.9	*	60	10.2	+	49
Atlantic Maritime	17.7	*	64	18	*	63	14.2	*	56	21.7	*	47
Mixedwood Plains	3.4	*	69	3.3	*	69	1.1		66	6.4	*	62
Boreal Plains	-1.8		42	-2		42	-1		32	-0.9		27
Prairies	2.1	+	103	1.1		102	0		82	-0.1		64
Montane Cordillera	-1.9		32	-1.9		32	-7.8	+	22	-5.6		19
Black-billed Cuckoo												
Canada	-1.6		219	-4.9		210	-3.7		129	19.7	+	83
Boreal Shield	1.4		61	-4		60	-13.6	*	44	10.1		29
Atlantic Maritime	-9.9	+	40	-8.3		34						
Mixedwood Plains	-2.2		53	-4.2		51	-5.1		39	-6.9		28
Boreal Plains	-2.2		23	-2.2		23						
Prairies	-8.3	*	42	-10.3		42	-16.6	+	31	39.8		17
Yellow-billed Cuckoo												
Canada	5.5	+	29	-4.9		24						
Mixedwood Plains	-3		22	-6.5		17						
Great Horned Owl												
Canada	-8.3	*	123	-9.2	*	117	-7.8		68	-1.6		27
Boreal Plains	-17.8	*	33	-19.3	*	33	-9.3		20			
Prairies	2.5		57	2		56	-1.7		38	-6.8		16
Barred Owl												
Canada	2.3		18	11.2		17						
Short-eared Owl												
Canada	-9.8		31	-16.9	*	27						
Prairies	-7.2		21	-17.1	+	17						
Common Nighthawk												
Canada	-6.3	+	158	-6.7		142	-3.3		75	6.2		37
Boreal Shield	-0.4		29	-2.3		24						
Atlantic Maritime	-4.4		27	-1.8		23						
Boreal Plains	-23.1	*	22	-23.4	*	20						
Prairies	-14.7		16									
Montane Cordillera	-7.8	+	40	-7.7	+	39	-6.2		25	-9.1		17
Whip-poor-will												
Canada	-15		25	-18.2		23						
Boreal Shield	-22.6		15	-22.4		15						
Black Swift												
Canada	-9.9		26	-11.1		26						
Pacific Maritime	-11.5		15	-13.2		15						
Chimney Swift												
Canada	-7.4	*	133	-5.4	*	117	-11.4	*	65	-15.2	+	42
Boreal Shield	-9.6	*	34	-9.6	*	30	-9.7		21			
Atlantic Maritime	-9.5	*	56	-5.9		45	-21.1	*	17			
Mixedwood Plains	-1.7		41	-2.7		40	1.5		26	-11.9		22

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998			1974–1998			1989–1998			1994–1998		
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Vaux's Swift												
Canada	5.2		21	6		20						
Ruby-throated Hummingbird												
Canada	2.2		162	4.1	*	150	4.9		110	−3.1		80
Boreal Shield	6.8	*	57	7.4	*	54	10.8	*	43	4.1		31
Atlantic Maritime	−3.7		60	0.5		55	−3		37	−16.7	+	26
Mixedwood Plains	−1.8		34	−1.9		31	−0.7		25	−4.8		19
Calliope Hummingbird												
Canada	−4.8	*	23	−5.2	+	23	−8.3		16			
Montane Cordillera	−4.8	*	23	−5.1		23	−8.2		16			
Rufous Hummingbird												
Canada	−1.5		75	−3.3		72	−4		58	−9.4		48
Pacific Maritime	−5.2		22	−5.8		21	−6.1		19	−11.5		15
Montane Cordillera	0		52	−1		50	0		38	−6.6		32
Belted Kingfisher												
Canada	−2.5		297	−0.5		284	0.7		191	3.7		115
Boreal Shield	−2.6		97	0.2		93	−3.7		63	4.5		34
Atlantic Maritime	−3		65	−1.4		61	12.8	+	37	−7.5		24
Mixedwood Plains	−6.1	+	48	−4.8	+	46	−2.3		34	0		27
Pacific Maritime	1.3		20	1.1		20						
Montane Cordillera	−3		38	−1.8		36	−2.6		24			
Red-headed Woodpecker												
Canada	−2		30	−5.7		30	−12.1		15			
Mixedwood Plains	−5.7	+	18	−6.7		18						
Yellow-bellied Sapsucker												
Canada	−3	*	279	−3	*	268	0.9		197	4.2		147
Boreal Shield	−2		96	−2		94	4		70	6.9		56
Atlantic Maritime	−3.7	*	67	−2.6		63	−1.9		38	9.3		31
Mixedwood Plains	13.2	*	28	16.2	*	26	17.8	*	24	10.6		20
Boreal Plains	−5.5		56	−6		55	−2.3		44	−0.9		30
Prairies	−14.4	*	26	−16.7	*	24	−14.4		18			
Red-naped Sapsucker												
Canada	1.2		51	0.8		50	−5.1		43	−8.2	*	33
Montane Cordillera	2.6		50	1.3		49	−4.7		42	−7.3	+	32
Red-breasted Sapsucker												
Canada	−0.1		35	−1.3		34	−3.5		28	−21.8	*	22
Pacific Maritime	−8.2	*	18	−8.2	*	18	−7.8		16			
Montane Cordillera	5.6	+	17	0.5		16						

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998			1974–1998			1989–1998			1994–1998		
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Downy Woodpecker												
Canada	2.5	+	319	1.1		312	2.1		231	3.6		149
Boreal Shield	4.7		88	1.6		87	4.8		59	−0.2		38
Atlantic Maritime	−0.9		72	−1.7		69	−4.8		53	2.4		34
Mixedwood Plains	2.9	*	58	4.1	*	56	4.2		50	4.8		38
Boreal Plains	1.4		31	1.4		30	−0.5		21			
Prairies	5.4		18	4.4		18						
Pacific Maritime	5.2		15	−2.9		15						
Montane Cordillera	−1.8		33	−1.6		33	−4.9		23			
Hairy Woodpecker												
Canada	1		346	1.3		331	−0.7		238	−6.2	+	170
Boreal Shield	3.1		91	3.4		90	−4.2		58	−1.3		39
Atlantic Maritime	3.3	+	69	4.2	+	62	15.5	+	43	−3.2		31
Mixedwood Plains	1.6		39	−2		36	1		30	8.8		22
Boreal Plains	−6	+	46	−5.8	+	45	−5.6		33	−8.3		20
Prairies	−3.2		31	−3.5		30	0.1		25	8.8		19
Pacific Maritime	2		19	1.8		19	−0.1		17			
Montane Cordillera	−2.4		48	−2.4		46	−5.3	+	29	−10.5		25
Three-toed Woodpecker												
Canada	−8.5		22	−8		21						
Black-backed Woodpecker												
Canada	−1		38	−10.5		35	12.1		15			
Boreal Shield	−5.5		16	−6		16						
Atlantic Maritime	−8.5		17	−10.3		16						
Northern Flicker												
Canada	−2.5	*	556	−2		543	−3.1	+	444	−7.4	*	375
Boreal Shield	−3.4	*	138	−3.4	*	134	−6	*	93	−10.5	*	78
Atlantic Maritime	0.8		88	1.8		85	4.7	*	70	3.3		60
Mixedwood Plains	−4.4	*	68	−5.1	*	68	−8.9	*	65	−7.9	+	60
Boreal Plains	−1.8		76	−1		76	−1.6		67	−12	*	59
Prairies	−6.6	*	70	−1.7		67	−4.7		52	−14.7	*	39
Pacific Maritime	0.1		24	−0.6		23	−6.2	+	18	1.7		15
Montane Cordillera	−0.8		68	−1		66	−3.6		58	−8.9	*	51
Pileated Woodpecker												
Canada	2.3		225	2.5		221	1.8		164	−8.3	+	102
Boreal Shield	−1.5		69	−2.3		68	−3.4		47	−19.7	*	29
Atlantic Maritime	6.3		39	6.1		38	2.5		27	−5.9		19
Mixedwood Plains	2.5		27	4		27	8.9		20			
Boreal Plains	10.8		28	10.7		28	9.2		23			
Pacific Maritime	−5.4		16	−5.5		15						
Montane Cordillera	7.1		43	7.1		42	−1.2		35	−1.2		22
Olive-sided Flycatcher												
Canada	−5.5	*	296	−5.5	*	277	−7.7	*	188	−7.3	+	119
Boreal Shield	−6.1	*	82	−6.7	*	74	−11.7	*	42	−9.6		21
Atlantic Maritime	−4.2		68	−4.4		61	−3.3		35	−6.6		27
Boreal Plains	−3		39	−3.1		39	−13.5	+	28			
Pacific Maritime	−8.4	*	25	−9.6	*	23	−15.2	*	18			
Montane Cordillera	−2.4		56	−4.2		54	−1.6		42	−2.6		32

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998			1974–1998			1989–1998			1994–1998		
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Western Wood-Pewee												
Canada	−2.6	*	173	−2.6		169	−4.1		140	4.6		108
Boreal Plains	−2.8		53	−3.4	+	53	−11	*	40	−12.1		32
Prairies	1.5		22	0.8		22	−2.5		19			
Pacific Maritime	−10.7		17	−6.9		15						
Montane Cordillera	−1.7		62	0.5		60	−0.9		53	13.2	*	45
Eastern Wood-Pewee												
Canada	−4.1	*	223	−3.5	*	214	−4.3	*	166	−1.5		134
Boreal Shield	−7	*	65	−7.1	*	63	−6.8	*	50	−4.4		38
Atlantic Maritime	−3.1		73	−0.1		67	−6		40	−8		32
Mixedwood Plains	−3.3		67	−3.3		67	−3.2		63	0.3		53
Yellow-bellied Flycatcher												
Canada	1.4		136	1		126	−3.6		75	8		58
Boreal Shield	1.2		60	1		58	−10.2		27	−8.4		21
Atlantic Maritime	2.6		62	2.3		55	5.1		40	17.6	*	32
Willow Flycatcher												
Canada	0.4		121	0.1		120	−0.2		96	1.1		79
Mixedwood Plains	4		37	3.9		37	6.4		34	−2.7		29
Pacific Maritime	−4.8	+	23	−4.3		23	−5.6	+	19	−5.4		15
Montane Cordillera	1.1		48	0.5		47	0.9		38	3.4		32
Alder Flycatcher												
Canada	0.7		436	0.6		427	−0.1		340	0.9		285
Boreal Shield	0.8		126	1.2		123	−1.6		90	−3.1		76
Atlantic Maritime	1.6	*	89	1.3		86	3.7	*	72	2.7		62
Mixedwood Plains	1.4		50	0.6		49	2.0		39	7.3		35
Boreal Plains	−2.5		76	−2.9		75	−2.1		65	−0.2		55
Prairies	1.8		36	1.7		35	0.1		27	−1.6		20
Montane Cordillera	−1.2		34	−0.4		34	−1.6		25	−0.7		22
Least Flycatcher												
Canada	−0.8	+	490	−1	*	481	−2.5	*	394	−5.3	*	327
Boreal Shield	−1.1		120	−2		117	−6	*	87	−9.5	*	73
Atlantic Maritime	−0.5		88	−2.3		84	−2.2		62	−2.3		49
Mixedwood Plains	−2.8	*	63	−3.3	*	62	−9.1	*	59	−8.3	+	50
Boreal Plains	−0.9		75	−1.1		75	−2.5	*	65	−5		60
Prairies	3.3	*	87	3.2	*	87	2.9		76	−1.3		59
Montane Cordillera	−7.1	*	43	−6.7	*	42	−5.7		33	−4.9		31
Hammond's Flycatcher												
Canada	−1		77	−0.6		76	−1.4		68	0		54
Pacific Maritime	7		19	7		19	10.1		17			
Montane Cordillera	−2.4		53	−2.2		52	−2.3		46	−3.2		36
Dusky Flycatcher												
Canada	−1.7		69	−3.5		67	−2.4		57	−9.3	+	48
Montane Cordillera	−1.8		60	−3.2		59	−1.9		51	−8.6		44

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998		1974–1998			1989–1998			1994–1998			
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Pacific Slope Flycatcher												
Canada	4.2		59	4.4		56	1.5		47	−7.6		37
Pacific Maritime	5.4		26	4.1		26	3.3		24	−3.6		19
Montane Cordillera	0		33	1.7		30	−5.1		23	−16.6		18
Eastern Phoebe												
Canada	−1.2		281	−0.9		275	−3.5		236	−5.7		188
Boreal Shield	1		72	1.3		71	−2		64	−3.9		54
Atlantic Maritime	−5.6		35	−2.5		33	2.2		22	−5.1		16
Mixedwood Plains	−0.7		63	0.6		62	2.2		55	0.9		50
Boreal Plains	−1.7		65	−0.6		65	0		55	4		46
Prairies	−5.6		40	−7.6		38	−13.5		34	−27.5	*	22
Say's Phoebe												
Canada	−8.7		22	−9		21	−6.8		15			
Great Crested Flycatcher												
Canada	−1.2	+	200	−1.1		197	−1.7		166	−2.7		140
Boreal Shield	−2.6	+	64	−3.3	*	64	−3.7		55	−7.4	*	42
Atlantic Maritime	−5.7		20	0.1		17						
Mixedwood Plains	−0.7		67	−0.4		67	1.2		62	−1.1		57
Boreal Plains	0.3		23	0.5		23	1.5		17	1.4		16
Prairies	0.3		26	0.6		26	−2		23	−2.5		19
Western Kingbird												
Canada	0.1		120	0.3		115	−4.5		95	−5.3		69
Prairies	1.4		83	2.3		80	−3.1		65	0.5		47
Montane Cordillera	−3		23	−3.9		22	−6.7		18	−14.9	*	15
Eastern Kingbird												
Canada	−1.8	*	418	−2		409	−5	*	316	−3.3	+	253
Boreal Shield	−4	*	80	−5.9	*	76	−9.4	*	59	−10.3	*	45
Atlantic Maritime	−2.4		65	−0.6		63	−10.1	*	36	−3.7		25
Mixedwood Plains	−0.8		67	−1.8		67	−2.6		64	−0.2		58
Boreal Plains	−6.3	*	54	−6.3	*	54	−9.7	*	39	−2		33
Prairies	−0.1		112	−0.3		110	−3.4	*	92	−3.6		74
Montane Cordillera	−0.8		35	−0.1		34	−1.7		21	−9.7		17
Horned Lark												
Canada	−3.1	*	236	−3.9	*	221	−9.3	*	162	−9.2	*	127
Boreal Shield	−16.1	*	19	−5.7		15						
Atlantic Maritime	−8.2		24	−4.7		19						
Mixedwood Plains	−1.3		54	−1		52	−4.3		46	2.4		42
Boreal Plains	−10.5	+	27	−10.6	*	25	−12.2	*	19			
Prairies	−2.9	*	106	−3.8	*	104	−9.5	*	87	−9.6	*	67
Purple Martin												
Canada	−0.5		102	0.4		94	4.8		73	−3.5		49
Boreal Shield	7.5		17									
Mixedwood Plains	−5.6		35	−6.4		32	−8.9	+	24	−15.5	+	17
Boreal Plains	0.6		18	2.2		17	−1.2		15			
Prairies	14		25	20.8		25	16.6		21			

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998			1974–1998			1989–1998			1994–1998		
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Tree Swallow												
Canada	0.4		544	-0.2		529	1.9		422	5.3		361
Boreal Shield	-2.9		137	-4.3	*	134	-5.4	*	83	0.3		71
Atlantic Maritime	-2.4	*	88	-2	+	83	-3.5	+	68	-4.5		59
Mixedwood Plains	5.2		69	5.9		69	9.6		66	14.4		61
Boreal Plains	2.1		68	2.3		67	5.2	+	61	3.4		52
Prairies	3.5		84	3.6		82	5.9		72	15.2	*	60
Pacific Maritime	-0.8		23	-0.5		22						
Montane Cordillera	1.3		58	1.2		55	1		48	1.3		42
Violet-green Swallow												
Canada	0.7		71	0.4		70	0.6		59	8		50
Pacific Maritime	2.3		20	1.8		20	1.7		17			
Montane Cordillera	1.4		45	0.6		44	0.3		37	5.5		32
Northern Rough-winged Swallow												
Canada	-1.5		138	-1.6		129	-5.1	+	89	-7.9		60
Boreal Shield	-0.5		22	-0.3		20						
Mixedwood Plains	-3.8		42	-4.6		39	-9	*	30	-13.6		24
Montane Cordillera	-0.1		49	-0.7		48	-4.1		42	-7.7		29
Bank Swallow												
Canada	-6.2	+	300	-7.4	*	285	-13	*	183	0.1		115
Boreal Shield	-11.4	*	59	-20.1	*	54	-29.1	+	28			
Atlantic Maritime	-10.2	+	72	-7.9	*	69	-12.8	*	37	-5.8		22
Mixedwood Plains	-1.2		48	-3	+	47	-7		38	-5.5		30
Boreal Plains	-9.5	*	30	-7.8		29	-20.4		20			
Prairies	-4.1		47	-3.3		44	-6		28	7.8		18
Montane Cordillera	-5.1		33	-3.9		31	-3.8		23			
Cliff Swallow												
Canada	-0.2		347	-1		333	-0.6		250	-7.6		177
Boreal Shield	0.2		67	-3.1	+	63	-4.1		39	4.2		22
Atlantic Maritime	-1.9		60	-2.6		55	-6.3		36	-9.5		26
Mixedwood Plains	-3.9	*	48	-5.2	*	46	-2.4		34	-7.5		32
Boreal Plains	-2.2		42	-2.8		42	-10.5		32	-29.8		23
Prairies	3.8		66	3.8		65	10.1	+	55	3.4		37
Montane Cordillera	-3.2	+	44	-3.3	*	42	-9.4	+	35	-19.1	+	27
Barn Swallow												
Canada	-2.7	*	545	-3.4	*	529	-4.6	*	437	-4.4	*	371
Boreal Shield	-4.3	*	109	-5.7	*	103	-9.5	*	72	-3.7		61
Atlantic Maritime	-5.4	*	86	-6.2	*	82	-12.7	*	65	-6.9		53
Mixedwood Plains	-0.8		69	-1.8		69	-2	+	66	0.7		62
Boreal Plains	-2.9	*	77	-3.3	*	76	-4.7	*	63	-10.5	*	58
Prairies	0.5		115	-0.8		113	-1.4		97	1		81
Pacific Maritime	-3.2	*	21	-4.3	*	21	-4.8	+	18			
Montane Cordillera	-3.5	*	62	-3.7	*	59	-8.1	*	51	-13.9	*	42



# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998		1974–1998		1989–1998		1994–1998					
	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N			
Gray Jay												
Canada	−3	*	234	−3.4	*	221	−3	+	152	−8.3	*	105
Boreal Shield	−3.8	*	68	−3.7	*	65	−5.2	+	34	−7.7		23
Atlantic Maritime	0.5		51	−2.7		43	−2.3		26			
Boreal Plains	−4		40	−3.9		40	−5.5		34	−7.7		26
Boreal Cordillera							−1.3		15			
Montane Cordillera	−1.7		38	−1		36	−0.5		30	−6.8		24
Steller's Jay												
Canada	2.6		50	2.7		48	2.3		39	−4		31
Pacific Maritime	2.9		23	2.6		23	1.2		21	−3.6		17
Montane Cordillera	−3.9		27	−3.2		25	0.8		18			
Blue Jay												
Canada	1		319	1.8		313	3.2	*	273	5.3	*	228
Boreal Shield	−0.6		103	0.3		99	1.6		82	2.3		70
Atlantic Maritime	−0.2		85	0.4		83	3		68	0.9		61
Mixedwood Plains	4.8	*	68	5.8	*	68	6.4	*	65	10.6	*	61
Boreal Plains	−0.6		39	−0.5		39	−0.4		36	2.6		21
Prairies	3.2		23	1.9		23	1		21			
Clark's Nutcracker												
Canada	3.1		27	3.8	*	26	6.4		18			
Montane Cordillera	3		26	3.7	+	25	6.2		17			
Black-billed Magpie												
Canada	0.7		219	0.9	+	214	1.2		184	1.7		160
Boreal Plains	0.3		66	0.6		65	0		58	−0.3		52
Prairies	0.8		113	1.4	+	110	3.6	*	95	4.9	+	80
Montane Cordillera	−0.1		32	−0.8		31	−3.9		24	−9.9		22
American Crow												
Canada	0.6	+	556	0.7	*	545	1.8	*	447	3.1	*	389
Boreal Shield	0.1		140	0.3		137	0.4		93	2.8		80
Atlantic Maritime	1.1	*	91	1.3	*	88	3.1	*	73	0		62
Mixedwood Plains	1.8	*	69	2.1	*	69	2.7	+	66	3.4		62
Boreal Plains	−0.4		68	−0.5		67	2.2		59	7.1	*	55
Prairies	−1.1		116	−0.5		114	0.4		97	3.3		81
Montane Cordillera	0.3		64	−0.2		62	2.1		53	2.7		45
Northwestern Crow												
Canada	0.3		24	−0.1		24	−0.7		21	−4.2		17
Pacific Maritime	0.1		24	−0.1		24	−0.9		21	−4.4		17
Common Raven												
Canada	3.7	*	444	3.4	*	436	4.1	*	357	6.4	*	297
Boreal Shield	4.5	*	134	4.7	*	131	1		88	4.5		72
Atlantic Maritime	2.6		87	1.9		84	0.3		71	8.4		60
Boreal Plains	9.2	*	66	8.9	*	66	9.6	*	61	5.8		54
Prairies	9.7		22	9.1		22	1		20	17.7		17
Pacific Maritime	−1.3		26	−1.6		26	−3.6		23	−7.2		19
Montane Cordillera	2.2		69	1.9		68	5.1		61	1.8		52

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998		1974–1998			1989–1998			1994–1998			
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Black-capped Chickadee												
Canada	3.1	*	489	2.8	+	479	2.1		400	1.5		341
Boreal Shield	4.2	*	130	4.8		128	4.6		92	1.6		80
Atlantic Maritime	4.8	*	87	4.9	*	84	3.8		73	–7.8	+	64
Mixedwood Plains	5.9	+	68	5	+	67	4.9	*	65	8.2	*	60
Boreal Plains	–1.6		67	–1.7		66	7.3		56	13		46
Prairies	7	*	43	6.4	*	42	24.1	*	37	51.9	*	30
Montane Cordillera	–0.6		65	–1.3		63	–4.4		54	–1		48
Mountain Chickadee												
Canada	1.8		54	2.1		53	–1.6		46	–1.2		35
Montane Cordillera	2.1		51	2.2		50	–1.4		43	–1		33
Boreal Chickadee												
Canada	–6.9	*	164	–7.1	+	150	–0.1		90	9.3		63
Boreal Shield	–8.9		49	–9.2		44						
Atlantic Maritime	–7.6	*	64	–7.2	*	55	–4.2		37	–1.3		31
Boreal Plains	5.4		19	1.5		19	4.9		16			
Chestnut-backed Chickadee												
Canada	–0.7		39	–0.6		38	–1.5		30	–10.1		23
Pacific Maritime	–0.3		28	–0.2		27	–1.5		24	–10.9		18
Red-breasted Nuthatch												
Canada	1.9	*	350	2.2	*	343	–4.1	*	284	–10.5	*	220
Boreal Shield	2.9	*	108	2.1		104	3.3		78	2.3		55
Atlantic Maritime	6		73	5.7		70	–8.2		56	–10		43
Mixedwood Plains	8.6	+	24	7.9	+	24	5.7		23	–0.5		18
Boreal Plains	1.7		38	1.5		38	0.1		35	–6.8		28
Pacific Maritime	–5.1		20	–5.4		20	–11.8		17			
Montane Cordillera	0.7		68	0.8		68	–7.1	*	61	–16.6	*	55
White-breasted Nuthatch												
Canada	–2		134	–3	*	129	–1.1		107	0		75
Boreal Shield	–3.1		43	–4.4		43	–11.9	+	38	–5.7		27
Mixedwood Plains	–2.1		48	–4.4		46	–5.1		40	–9.8		30
Brown Creeper												
Canada	3.3		83	1.9		77	2.8		51	5.5		33
Boreal Shield	9.7		31	9.7		28	24		16			
Pacific Maritime	5.9		18	–1.8		18	–4.9		15			
Montane Cordillera	–7.4		16	–7.4		16						
Bewick's Wren												
Canada	–1.3		16	–3.5		15						
Pacific Maritime	–1.6		16	–3.6		15						
House Wren												
Canada	1.3		316	1.3		310	0.9		261	–3.3	+	218
Boreal Shield	–1		48	0		47	3.1		35	0.5		26
Mixedwood Plains	–0.9		62	–2.4	+	61	0.3		54	–4.5		50
Boreal Plains	1.1		63	1.3		62	–0.8		54	–3.1		48
Prairies	2.2	*	106	2.6	*	104	2.5		90	–3.9		71
Montane Cordillera	0.3		24	0.8		23	–2		21	–3.9		18

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998			1974–1998			1989–1998			1994–1998		
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Winter Wren												
Canada	1		319	1.1		306	1.7		246	2.9		202
Boreal Shield	−0.2		122	1.3		117	1.2		87	0.1		72
Atlantic Maritime	−0.1		86	0.5		81	−1.6		65	1.6		52
Mixedwood Plains	5.4		29	4.2		27	5.2		23	13.7		18
Pacific Maritime	2.9		28	3.1		28	1.4		25	5.5		21
Montane Cordillera	4.1	*	42	4	*	41	9.6	*	35	25.5	*	32
Sedge Wren												
Canada	6	*	70	7.4	*	68	8.3	+	53	9.6		39
Boreal Shield	0.8		17	3.8		16						
Boreal Plains	10.7	*	23	10.7	*	23	14.8	*	17			
Prairies	3.7		26	4		26	6.6		22	25.4		19
Marsh Wren												
Canada	5.6	*	82	5.2	*	81	5.1		60	0.8		42
Boreal Plains	−0.1		18	−0.3		18						
Prairies	3.9		30	4.4		30	3.6		25	−6.9		19
Montane Cordillera	9		18	8		18						
Golden-crowned Kinglet												
Canada	3.3		221	1.2		214	−0.6		174	1.6		138
Boreal Shield	4.6		59	4.9		55	−3.3		37	5.6		27
Atlantic Maritime	3.6		61	−0.9		58	−15.2	*	50	−5.8		38
Pacific Maritime	−1.5		29	−3.4		29	4.6		25	−8		19
Montane Cordillera	1.8	+	56	2	+	56	1.3		49	3.8		44
Ruby-crowned Kinglet												
Canada	0.4		363	−0.8		353	0.3		252	−7.2	*	199
Boreal Shield	−0.1		121	−0.6		118	−0.5		62	−3.5		47
Atlantic Maritime	−1.4		86	−2.2		83	−0.7		64	−4.8		53
Boreal Plains	2		45	0.6		45	−2		36	−15.9	*	32
Boreal Cordillera							21.4	*	15			
Montane Cordillera	−2.1	+	60	−2.6	*	59	−0.9		51	−8.3	*	42
Eastern Bluebird												
Canada	4.1		92	7.4		87	0.3		79	3.2		59
Boreal Shield	5.4		31	9.3	+	31	−7.4		25	−12.6		19
Mixedwood Plains	5.8		43	11.9	+	39	9		37	22.2	+	31
Mountain Bluebird												
Canada	2.3		107	2.1		105	4.3		85	2		61
Boreal Plains	7.3		19	7.6		18	11.9		15			
Prairies	3.8		45	4.1		45	−2.3		43	−11.4	*	31
Montane Cordillera	0.1		39	−0.4		38	5.6		24	20.8	+	15
Townsend's Solitaire												
Canada	2.2		51	1.5		51	2.2		41	−8.3		30
Montane Cordillera	1.3		42	0.5		42	−1		32	−7.5		21

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998			1974–1998			1989–1998			1994–1998		
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Veery												
Canada	−1.2	*	335	−1.8	*	329	−1.1	*	256	0.7		207
Boreal Shield	−1.5	*	114	−1.8	*	112	−2		89	2.3		75
Atlantic Maritime	−1.1		79	−1.8	+	77	−3.9	*	57	−5.1		47
Mixedwood Plains	−2.1		58	−1.7		56	−0.8		50	6.3	+	46
Boreal Plains	−7.2		23	−7.1		23						
Prairies	−0.8		21	−1.7		21	0.8		16			
Montane Cordillera	0.3		37	0.1		37	4.5	*	28	−3.7		20
Gray-cheeked Thrush												
Canada	−7.2	+	26	−7.3	+	26						
Swainson's Thrush												
Canada	−0.3		406	−0.5		397	0.7		299	0.5		240
Boreal Shield	0.2		123	−0.4		119	−2.2		70	−0.6		54
Atlantic Maritime	−0.7		88	−2	*	84	−2.2		66	0.7		56
Boreal Plains	0.7		54	1		54	−0.6		43	2.3		31
Boreal Cordillera							4.5		15			
Pacific Maritime	0.5		30	1		30	1.9		27	2.1		22
Montane Cordillera	−0.2		71	0.2		70	0.7		63	0.2		56
Hermit Thrush												
Canada	1.5	*	382	0.9		372	1.4		283	5.2	*	225
Boreal Shield	−0.2		138	−0.8		135	−1.3		93	7.8	+	77
Atlantic Maritime	0.3		82	−0.4		79	−0.1		64	−0.1		55
Mixedwood Plains	−2		23	−0.6		21	−4.6		19	−9.5		18
Boreal Plains	2		48	2.2		48	7.6		37	16.6		24
Montane Cordillera	3		49	2.9		47	−1.7		36	−4.3		29
Wood Thrush												
Canada	−0.8		147	−3.5		143	−0.8		112	4.4		85
Boreal Shield	−2.6		52	−5.6		51	−2.1		44	5.1		31
Atlantic Maritime	−3.1		34	−4.1	*	32						
Mixedwood Plains	3.2		61	2.1		60	6.8		56	6.7		47
American Robin												
Canada	1	*	627	1	*	617	0.8	*	515	0.7		448
Boreal Shield	1.3	*	149	1.2	*	146	−2.1	*	98	1.2		83
Atlantic Maritime	−0.3		91	−0.4		88	−0.7		73	−1.1		64
Mixedwood Plains	2	*	69	2.4	*	69	3.5	*	66	2.4		62
Boreal Plains	0.5		79	0.7		78	1.7		69	−4.9	+	64
Prairies	3	*	108	2.7	*	107	2.2		95	−1.8		79
Pacific Maritime	0.6		30	0.5		30	0.6		27	0.5		23
Montane Cordillera	1		72	1.4	*	70	2.8	*	63	3.2		56
Varied Thrush												
Canada	1.2		101	0.9		100	3.1	*	83	3.4		65
Pacific Maritime	−1.7		24	−1.9		24	3	+	19	8.3		15
Montane Cordillera	2.9		49	2.6		48	1.4		39	0.9		32

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998			1974–1998			1989–1998			1994–1998		
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Gray Catbird												
Canada	−0.1		307	−0.9	+	304	1		250	3.7		194
Boreal Shield	−2.9		58	−1.6		57	−0.7		46	4		35
Atlantic Maritime	−0.1		71	−1.9	*	69	−0.2		51	10.3		36
Mixedwood Plains	−2		63	−2.6		63	−1.9		60	−7.1		55
Boreal Plains	2.5		28	2.6		28	2.5		22	8.8		17
Prairies	1.3		58	0.9		58	2.8		47	4.9		34
Montane Cordillera	1.7		28	1		28	16.7	+	23	16.5		16
Northern Mockingbird												
Canada	15.2	*	19	10.4		18						
Brown Thrasher												
Canada	−1.2	*	214	−1.3	+	207	1.9		162	3		134
Boreal Shield	−4.6		58	−4.1		56	−3.3		42	−11.6	+	35
Mixedwood Plains	−2.1		59	−4.1		59	−2.5		52	0		46
Prairies	1.5		72	3.6	*	68	5.1	*	52	3.5		38
Sprague's Pipit												
Canada	−5.7		77	−3.9		73	−5.4		53	1.4		33
Boreal Plains	−9.4	*	17	−9.6	*	16						
Prairies	−5.5		60	−3.7		57	−3.1		45	0.8		30
Bohemian Waxwing												
Canada	−6.4		24	−6.7		24	−8.2		22			
Cedar Waxwing												
Canada	2.4		472	2.5	*	462	−0.8		391	−3.9		326
Boreal Shield	0.9		120	0.4		116	1.2		91	7.2	+	77
Atlantic Maritime	4.1	*	85	4.3	*	83	2.6		69	−12.8	*	57
Mixedwood Plains	1.7		67	1.7		67	−0.3		62	−4.2		60
Boreal Plains	4.3		62	4.2		62	−1.5		52	−13.1		41
Prairies	0.3		58	1		56	−5.6		49	−9.8		38
Pacific Maritime	−1.9		21	−1.4		20	0.7		17			
Montane Cordillera	4		58	4.2		57	−1.3		51	8.8		39
Loggerhead Shrike												
Canada	−7.7	*	58	−8	*	52	−8	*	34	−9.6		21
Prairies	−7.8	*	49	−7.8	*	47	−8.3	*	33	−11.2		20
European Starling												
Canada	−2.5	*	507	−2.8	*	495	−2.2	*	408	−3.6		343
Boreal Shield	−3.2	*	104	−3.2	*	101	−2.5		71	−0.6		57
Atlantic Maritime	−1.8	+	85	−1.7	+	82	−0.7		67	−1.8		57
Mixedwood Plains	−1.3		69	−1.7	*	69	−1.4		66	−6		62
Boreal Plains	−4.7	*	59	−5.1	*	58	−9.6	*	48	−10.3		42
Prairies	−0.4		106	−0.1		104	−0.2		89	−10	*	69
Pacific Maritime	−4.5		26	−4.9		26	−1.7		22	13.4		16
Montane Cordillera	−4.2	*	55	−4.2	*	52	−1.8		44	−7.3		39
Solitary Vireo												
Canada	3.4		200	1.8		191	0		144	1		109
Boreal Shield	0		86	−3.9		79	−5.6		52	0.5		39
Atlantic Maritime	3.2	*	72	3.8		70	3.3		57	−1.5		47
Boreal Plains	4.7		28	4.6		28	1.5		25	7.1		18

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species Area	First year–1998			1974–1998			1989–1998			1994–1998		
	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Yellow-throated Vireo												
Canada	–5.1		26	–3.4		22	–8.7		15			
Warbling Vireo												
Canada	1.6 *		363	2.9 *		360	2.9 *		308	2.5 *		263
Boreal Shield	–0.6		44	–0.7		43	–1.1		38	–8.7		29
Atlantic Maritime	3.2		17	2.2		17						
Mixedwood Plains	1.7 +		66	0.8		66	1.7		60	–4.1		57
Boreal Plains	–2.4		60	–1.5		59	–0.7		48	–4.6		43
Prairies	3.7 +		73	4.1 *		73	2.8		62	3.1		49
Pacific Maritime	3.8 +		27	2		27	4.1 +		23	4.3		20
Montane Cordillera	1		68	3.9 *		67	2.6 *		59	6.4 *		52
Philadelphia Vireo												
Canada	4		119	7.4		111	8.4 *		75	8		55
Boreal Shield	5.9 +		66	9.2 *		60	8 +		34	9		25
Atlantic Maritime	6.2		23	8.9		22	11		20	5.1		16
Boreal Plains	0.9		22	7.5		21	11.3		16			
Red-eyed Vireo												
Canada	0.8 +		497	0.8		484	1.2 *		403	3.9 *		340
Boreal Shield	0.5		124	0.7		121	0.7		91	4.2 *		79
Atlantic Maritime	1.9 *		88	1.3		85	4.7 *		71	5.8 +		60
Mixedwood Plains	2.6		69	3.3 +		68	3.1 *		66	5.1		62
Boreal Plains	1.7		74	1.6 +		73	2.2		64	4.6 *		57
Prairies	–0.5		64	–0.9		61	2.7		54	8.5		42
Pacific Maritime	5.2 *		19	5.4 *		18						
Montane Cordillera	–2.9 *		51	–3.1 *		50	–4.1 *		39	–6.4		29
Golden-winged Warbler												
Canada	0.4		27	0.2		27	–0.3		24	–12.9		20
Boreal Shield	5.4		19	5.3		19	3.8		17			
Tennessee Warbler												
Canada	0.7		276	–0.5		264	0.1		166	–0.8		121
Boreal Shield	2.8		93	2.1		90	1.6		45	–7.3		32
Atlantic Maritime	0.2		77	–2.7		70	–5.1		52	–3.9		40
Boreal Plains	5.5		51	4.7		51	8.8 *		40	1.7		32
Montane Cordillera	–7.6		22	–5		20						
Orange-crowned Warbler												
Canada	–1.6		169	–1.8		168	–3.5		138	–4.8		114
Boreal Plains	6.5		36	5.2		36	0.6		28	–8.6		24
Pacific Maritime	–5.4 *		29	–5.7 *		29	–6.9 *		26	–2.4		21
Montane Cordillera	–1.7		63	–2.7 *		62	–5.7 *		52	–9 *		46
Nashville Warbler												
Canada	0.2		289	0.6		281	1.8		216	–4.3 *		178
Boreal Shield	1.4		120	2.2 *		116	4.2 *		86	–1.6		72
Atlantic Maritime	–2.4 *		87	–2.3 +		83	–3.7		60	–11.4		47
Mixedwood Plains	–1.5		38	–0.3		38	–0.7		34	–14.6 *		29
Montane Cordillera	1.9		30	1.2		30	–2.7		26	–11.5		23

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998			1974–1998			1989–1998			1994–1998		
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Northern Parula												
Canada	1.3		115	1.2		110	2		78	−3		64
Boreal Shield	−1.9		36	−2.8		36	−1.7		21	0.8		15
Atlantic Maritime	1.8 *		77	1.2		72	2.6		56	−3.3		48
Yellow Warbler												
Canada	0.6 +		568	0.7 +		555	1		453	3 *		381
Boreal Shield	−2 +		125	−2 +		120	1		80	3.1		64
Atlantic Maritime	1.3		85	0.2		81	−2.6		67	−2.2		58
Mixedwood Plains	1.5 +		68	1.7 +		68	0.4		64	−2		59
Boreal Plains	0.9 +		76	0.8		76	2.2		66	3.9		59
Prairies	2.3 *		101	3.4 *		100	3.6 +		83	5.4 +		67
Pacific Maritime	−3.2		24	−3.1		24	1.3		20	6.7		17
Montane Cordillera	−3.8 *		65	−3.7 *		62	−2.7		55	4.3		45
Chestnut-sided Warbler												
Canada	−1.4 +		262	−1.7		253	−1.6		198	−3 +		169
Boreal Shield	−1.5 *		117	−1.9 *		113	−1.9 +		87	−2.4		75
Atlantic Maritime	−1.1		82	−2.1		79	0.4		59	−3.1		48
Mixedwood Plains	5.3		47	4.2		45	1.1		42	0.4		37
Magnolia Warbler												
Canada	1.7 *		287	1.6 *		278	−1.5		195	0.3		159
Boreal Shield	2.3 *		134	2.1		130	−3.6 +		84	−1.9		71
Atlantic Maritime	1.9 *		88	2 *		85	1.3		63	2.7		54
Mixedwood Plains	−10 +		20	−10.6 +		19	−5.4		15			
Boreal Plains	3.8		22	3.6		22	2.3		16			
Cape May Warbler												
Canada	3.4 +		121	2.8		116	4.6		67	13.4		49
Boreal Shield	4.8 +		51	3.9		49	3.9		31	0.1		23
Atlantic Maritime	0		60	−1.2		57	−10.2		30	13.3		20
Black-throated Blue Warbler												
Canada	0.3		138	1.7		128	5		94	7.5		73
Boreal Shield	0.9		67	2.2		65	4.7		47	4.1		37
Atlantic Maritime	0.7		55	2.5		48	8.4		34	26.1 *		26
Mixedwood Plains	−5.6		16	−6		15						
Yellow-rumped Warbler												
Canada	0.3		445	−0.1		433	0.2		340	−2.1		282
Boreal Shield	−0.6		144	−0.6		140	0.9		92	2.1		74
Atlantic Maritime	4.6 +		87	3.4 *		83	2.6		68	3.3		57
Mixedwood Plains	1.7		24	2		23	−1.6		21	−1.7		18
Boreal Plains	−0.9		54	−0.9		53	2.6		44	−1.6		38
Boreal Cordillera							6.3		15			
Pacific Maritime	−2.9		26	−3.6		26	−7.6 +		21	−4.3		16
Montane Cordillera	0.1		71	0.1		69	−3.8 +		61	−8.3 *		55
Black-throated Gray Warbler												
Canada	−3.8		18	−4		18	−9.9 +		16			
Pacific Maritime	−3.4		15	−3.5		15						

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998		1974–1998			1989–1998			1994–1998			
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Townsend's Warbler												
Canada	0.2		62	0.2		61	0.3		53	−0.8		42
Pacific Maritime	1		23	0.7		23	−0.2		20	−1.8		17
Montane Cordillera	−1.1		36	−0.9		35	0.1		30	−1.1		23
Black-throated Green Warbler												
Canada	−0.7		229	−0.9		220	−0.2		174	−1		143
Boreal Shield	−0.6		113	0.4		109	3.9		81	4.5		63
Atlantic Maritime	0.8		86	0.3		82	−0.9		66	−4.3		58
Mixedwood Plains	1.9		22	4.5		21	2.8		19	5.6		17
Blackburnian Warbler												
Canada	3.5 *		184	3.2 *		179	3.2 +		129	2.3		90
Boreal Shield	4 *		96	5.1 *		94	6 *		70	0.3		51
Atlantic Maritime	4.8 *		70	2.5 +		67	1.4		47	11.9		32
Pine Warbler												
Canada	7.7 +		49	7.3		48	9.5 *		38	7.8		32
Boreal Shield	3.1		32	2.6		32	6.5		24	5.2		18
Mixedwood Plains	24 *		16	26.8 *		15						
Palm Warbler												
Canada	2.5		57	1.9		55	0		35	2.9		22
Boreal Shield	5.1		16	5		15						
Atlantic Maritime	2.7		23	1		23	1.3		15			
Bay-breasted Warbler												
Canada	0.5		123	−1.5		109	1.5		64	−6.5		42
Boreal Shield	−0.8		48	−2.9		43	12.9		25	−15.9		18
Atlantic Maritime	1.2		70	−0.4		61	−6.6		38	2.1		24
Blackpoll Warbler												
Canada	−4.1 *		110	−5.5 *		102	−4.2		59	−0.7		39
Boreal Shield	−3.3		34	−5.1 *		31						
Atlantic Maritime	−6 +		34	−8.7 *		30	−11.3		18	−10.2		15
Black-and-white Warbler												
Canada	3.2 *		287	3.1 *		280	3.1 *		214	−2.7		177
Boreal Shield	3.8 *		131	4 *		129	2.3		89	−1.9		74
Atlantic Maritime	0.6		80	0.9		77	5		60	−1.7		47
Mixedwood Plains	1.6		45	1.8		43	2.7		40	−0.6		38
Boreal Plains	0.5		26	0.5		26	0.8		20	−1		16
American Redstart												
Canada	0.4		371	−0.4		360	−2.2		269	−2.7		223
Boreal Shield	1		134	0.8		130	−0.6		89	−4.4		71
Atlantic Maritime	0.6		90	−1.3 +		87	−3.6		72	−7.4 *		63
Mixedwood Plains	5.1 *		48	4.4		46	9.7 *		39	8.3		34
Boreal Plains	−0.7		37	−0.6		37	1.8		26	6.4		19
Montane Cordillera	−0.9		46	−2.1		45	−1.8		29	−1.9		27



# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species Area	First year–1998			1974–1998			1989–1998			1994–1998		
	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
<b>Ovenbird</b>												
Canada	0.6		358	0.1		348	–1		271	–2.8		230
Boreal Shield	0.6		134	0.3		131	–2.1	*	91	–2.9		78
Atlantic Maritime	0.4		85	–1.1	*	81	0		65	–3.9		56
Mixedwood Plains	–0.3		60	–0.1		59	–1.8		56	–7.4	*	51
Boreal Plains	–1.4		56	–1.5		55	2.8		42	3.3		33
Prairies	–2		15									
<b>Northern Waterthrush</b>												
Canada	–0.4		332	–1.2		316	0.9		219	4.3		172
Boreal Shield	–1.8		119	–2.4		112	–8		65	14.5		51
Atlantic Maritime	0.7		70	–0.9		67	–5.7		47	–20.5	*	37
Mixedwood Plains	5.2		36	10.1	+	32	11.8	+	27	9.9	+	22
Boreal Plains	5.7		27	4		26	–7.6		17			
Montane Cordillera	2.3	+	46	4.3	*	45	5.1	+	36	6.7	*	33
<b>Connecticut Warbler</b>												
Canada	–9.8	+	65	–5.8		59	–3.8		37	–14.6	+	29
Boreal Shield	–17.2		22	–7.3	*	17						
Boreal Plains	–5.4		37	–6.2		36	–1.9		24	–17.6		18
<b>Mourning Warbler</b>												
Canada	0.2		297	–0.6		286	–2.7	*	200	–1.9		161
Boreal Shield	–1		139	–0.8		134	–4.5	*	89	–3.4	+	73
Atlantic Maritime	2.3		70	1		66	12.2	*	47	7.8		36
Mixedwood Plains	4.6		39	3.3		38	3.7		32	–2.4		26
Boreal Plains	–5.7		44	–5.9		43	–5.6	*	28	–7.8		23
<b>MacGillivray's Warbler</b>												
Canada	0.3		87	0.6		86	1.4		73	1.9		62
Pacific Maritime	0.2		24	0.1		24	–0.1		19	–4		16
Montane Cordillera	1.4		59	2.2	*	58	2.4		52	3		45
<b>Common Yellowthroat</b>												
Canada	0.4		548	0		537	2.4	*	435	1.8	+	367
Boreal Shield	–0.7		143	–0.9		140	–1.3		97	–0.8		83
Atlantic Maritime	0.6		90	0.2		87	3.9	*	72	6.2	*	63
Mixedwood Plains	2.2	*	69	1.9		69	3		66	3.5		62
Boreal Plains	–0.6		73	–0.2		72	2.8		61	–0.4		51
Prairies	0.2		82	0.3		80	0.2		64	–0.2		50
Pacific Maritime	5.8		20	5.9		19	6.2	*	17			
Montane Cordillera	5.5	*	54	5.2	*	53	12.9	*	43	8.1	*	37
<b>Wilson's Warbler</b>												
Canada	–1.2		228	–2.6		214	3.1		135	3.2		94
Boreal Shield	–0.8		61	–4.5		54	4.6		22			
Atlantic Maritime	5.5	*	47	4.6	+	42	21.3	*	22			
Pacific Maritime	1.5		23	3.2		23	7.6		17			
Montane Cordillera	–4		60	–1.6		58	–8.8		46	–4.4		34
<b>Canada Warbler</b>												
Canada	–6.5	+	177	–5.4		165	–4.8	+	105	–5.5		68
Boreal Shield	–2		87	–0.2		79	–0.6		52	–2.4		32
Atlantic Maritime	–5	+	70	–5	*	67	–3.5		40	–5.9		25

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species Area	First year–1998			1974–1998			1989–1998			1994–1998		
	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Scarlet Tanager												
Canada	–4.8	*	136	–5.6	*	128	–9.5	+	83	1.7		55
Boreal Shield	–7.4	*	63	–9	*	60	–10.4	*	43	3.2		26
Atlantic Maritime	1.9		22	1.7		20						
Mixedwood Plains	–3.7		50	–2.7		47	–4		33	–2.7		26
Western Tanager												
Canada	1.7		108	3	*	106	4.6	*	89	5.9	*	75
Boreal Plains	–10.6		21	–8		20	–6.1		16			
Pacific Maritime	1		23	1		23	4.7		19	9.3		15
Montane Cordillera	1.5		61	2.9	*	60	4.5	*	52	4.4		47
Northern Cardinal												
Canada	0.8		52	1.6		51	4.9	*	49	7.7		42
Mixedwood Plains	0.5		47	1.4		46	4.9	*	45	7.6		39
Rose-breasted Grosbeak												
Canada	–1.4		327	–3		321	–4	*	252	–3		201
Boreal Shield	–3.6	*	100	–5	*	98	–5.5	*	75	–1.8		55
Atlantic Maritime	–1.4		76	–3.8	*	73	–3.8		49	5.5		40
Mixedwood Plains	2.1	+	66	0.2		66	0.9		61	–1.2		55
Boreal Plains	1.2		57	1		56	–3		42	–0.5		34
Prairies	–2		26	–1.8		26	–9		23	–13		16
Black-headed Grosbeak												
Canada	2		37	1.8		37	2.7		31	6.5	+	23
Pacific Maritime	–0.4		17	–0.5		17						
Montane Cordillera	10.3	*	20	10.5	*	20	11.2	*	18			
Lazuli Bunting												
Canada	6.4	*	33	6.9	*	32	4.1	+	28	0.9		25
Montane Cordillera	5.6	*	29	6.1	*	29	4	+	25	1.8		22
Indigo Bunting												
Canada	1.6		122	1.6		117	–0.1		101	6.5	*	81
Boreal Shield	–0.8		52	0.6		51	–2.8		45	9.8	*	31
Mixedwood Plains	4.2	*	60	2.8		58	2.8		50	3.5		45
Rufous-sided Towhee												
Canada	–6.8	+	61	–4.9	+	56	–4.2		36	–7.9		28
Boreal Shield	–1.6		18	0.7		17						
Mixedwood Plains	–0.2		33	5		30	7.3		19	4.4		17
Spotted Towhee												
Canada	2.2		60	2.6		59	0.9		52	–2.1		44
Pacific Maritime	2.7		21	3		21	2.5		18	3.5		15
Montane Cordillera	1.9	*	24	2.1	*	24	–3.9	+	21	–8.7	*	20

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998			1974–1998			1989–1998			1994–1998		
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Chipping Sparrow												
Canada	−1.3	*	540	−1	*	526	−0.3		440	0.8		368
Boreal Shield	0.5		124	0.4		121	−0.7		90	5.3	*	77
Atlantic Maritime	−2.1	+	87	−0.4		84	−2.8		64	−3.5		51
Mixedwood Plains	1.7		69	1.9		69	2	+	66	6.1	*	62
Boreal Plains	−4.8	*	76	−4.9	*	75	−2.2		68	1.3		60
Prairies	2.6		67	3.8		64	0.5		56	11.1	+	41
Boreal Cordillera							2.2		15			
Pacific Maritime	−5.4		19	−11.4	*	17						
Montane Cordillera	−1.2		72	−1		70	−0.9		63	−0.9		56
Clay-colored Sparrow												
Canada	−0.2		244	−0.8		240	0.9		202	−0.4		172
Boreal Shield	2.5		20	0.8		20						
Boreal Plains	−1.6		76	−1.7		74	−0.4		66	−0.4		60
Prairies	0.6		114	0.1		113	3.7	*	97	0.3		81
Montane Cordillera	−5.7		24	−5.7		24	−9.4	+	22	−16.3	*	19
Field Sparrow												
Canada	−3.1		75	−4.9	*	71	−10.1	*	60	−8.5	*	46
Boreal Shield	−9.6	*	24	−9.3	*	21	−16.1	*	17			
Mixedwood Plains	−2.7		49	−3.8	+	49	−8.6	*	43	−10	*	36
Vesper Sparrow												
Canada	−0.3		338	−0.4		322	−1.7	+	254	−2.8		200
Boreal Shield	−9.2		48	−19.6		43	−7		30	−7.2		21
Atlantic Maritime	−8.1	*	24	−3.5		17						
Mixedwood Plains	−4.8	*	52	−5.3	*	51	−15.7	*	42	−10.4		37
Boreal Plains	−2.9	+	60	−2.8		59	−2.2		50	−8.3	*	37
Prairies	1.2		111	1.4	*	109	−0.3		95	−0.9		77
Montane Cordillera	2.3		42	2.2		42	0.3		33	−1.3		25
Lark Sparrow												
Canada	6.5		18	5.7		18	−9.2		16			
Prairies	0.4		15	−1.2		15						
Lark Bunting												
Canada	−15.6	*	32	−13.4	*	29	−29.6	*	21			
Prairies	−15.6	*	32	−13.4	*	29	−29.6	*	21			
Savannah Sparrow												
Canada	−0.2		518	−0.4		507	2.3	*	419	0.4		361
Boreal Shield	−2.6		96	−3.1		94	−0.5		65	3.3		54
Atlantic Maritime	−1.1		82	−1.7		80	2.8		64	7.1		55
Mixedwood Plains	−1.3	*	69	−1.9	*	69	0.9		66	−1.1		62
Boreal Plains	1.9	*	70	1.2	*	69	2.7		62	0.8		55
Prairies	2.6	*	115	3	*	111	4.8	*	97	1.3		81
Pacific Maritime	−6.3		16	−4.7		16						
Montane Cordillera	−0.5		52	−1.3		50	−0.8		40	−10.6	+	37
Baird's Sparrow												
Canada	−4.4	*	67	−4.6	*	62	−8.1	+	44	−10.4		29
Prairies	−4.5	*	65	−4.6	*	60	−8.2	+	43	−10.6		28

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998		1974–1998			1989–1998			1994–1998			
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Grasshopper Sparrow												
Canada	0		79	–2.3		73	–11.1	*	47	–10.1		27
Mixedwood Plains	–1		32	–2		31	–8.7		22	–18.9	+	16
Prairies	3.2		32	4.3		27	–7.7		19			
Le Conte’s Sparrow												
Canada	2.5		133	2.1		129	5.4		108	5.8		82
Boreal Plains	2.3		63	1.2		61	2.5		49	2.6		39
Prairies	–1.4		57	–0.1		56	5.2		49	–5.2		36
Nelson’s Sharp-tailed Sparrow												
Canada	–2.5		42	3.6		41	10.4		34	2.4		21
Prairies	–4.1		19	–3.1		19	7.6		17			
Fox Sparrow												
Canada	0		106	–0.1		104	1.2		65	15.6	*	53
Boreal Shield	–0.1		29	–0.1		29						
Atlantic Maritime	3.9	*	25	3.8		24	–8.7		16	5.5		15
Montane Cordillera	17.9	*	16	17.8	*	16						
Song Sparrow												
Canada	–1	*	524	–0.8	*	512	–0.3		431	–0.8		374
Boreal Shield	–2.6	*	124	–2.1	*	121	–1.4		91	–1.3		76
Atlantic Maritime	–0.5		87	–0.4		84	1.2		69	1.3		60
Mixedwood Plains	–0.1		69	0.3		69	–0.6		66	–0.4		62
Boreal Plains	–2.3	*	70	–2.1	*	69	0.2		60	–2.9		56
Prairies	–1.5		84	1.4		81	3.4		68	–3.7		54
Pacific Maritime	0.2		29	0.2		29	1		26	–0.2		22
Montane Cordillera	–0.8		60	–2.1		58	–1.9		50	–0.1		44
Lincoln’s Sparrow												
Canada	1.7	+	282	–0.1		276	1.3		194	0.3		146
Boreal Shield	–0.6		70	–3.8		66	–7.8		31	6.5	+	23
Atlantic Maritime	2.3		65	0.1		63	0.6		42	1.1		32
Boreal Plains	2.8		57	2.3		57	2.6		47	–3.4		38
Montane Cordillera	9.3	*	47	8.9	*	47	1.5		41	3.4		35
Swamp Sparrow												
Canada	0.9		292	1		281	0.2		201	2.6		158
Boreal Shield	1.1		125	1.3		120	0.4		78	5.9	+	60
Atlantic Maritime	–0.7		64	–1.7		59	9.4	*	42	0.1		30
Mixedwood Plains	1.6		46	2.5		45	0.4		38	3		37
Boreal Plains	1.3		45	1.3		45	0.2		34	2.3		28
White-throated Sparrow												
Canada	–0.8	*	407	–0.8		400	1.3	*	312	3.1	+	268
Boreal Shield	0.2		149	–0.2		146	1.2		98	7.2	*	83
Atlantic Maritime	–3.1	*	91	–3.7	*	88	–0.4		73	0.7		63
Mixedwood Plains	0.3		54	–0.2		54	–0.8		48	0.6		45
Boreal Plains	–0.6		75	–0.5		74	0.7		63	–2.4		55
Prairies	1.3		17	0.2		17						

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species Area	First year–1998			1974–1998			1989–1998			1994–1998		
	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
<b>White-crowned Sparrow</b>												
Canada	0.8		98	1.1		94	1.4		80	3.7		62
Pacific Maritime	-1.1		24	-0.5		23	4		21	11.4		17
Montane Cordillera	4.2 *		39	4.3 *		37	1.9		30	9.7 +		23
<b>Dark-eyed Junco</b>												
Canada	0.1		304	0		294	-1.8 +		206	-3.4		161
Boreal Shield	-2.1		109	-3		105	-6.7 *		54	0.9		40
Atlantic Maritime	-1.6 +		85	-0.5		81	-3.3		60	0.8		51
Boreal Plains	3.4 +		49	2.9		49	0.1		44	-2.4		35
Boreal Cordillera							-0.6		15			
Montane Cordillera	3.2		17	3.5		17	-7.5		16			
<b>McCown's Longspur</b>												
Canada	-10.6		19	-14.2 *		17	-5.2		15			
Prairies	-10.6		19	-14.2 *		17	-5.2		15			
<b>Chestnut-collared Longspur</b>												
Canada	-1.8 *		42	-2		40	-5.2		27	-10.8 *		21
Prairies	-1.8 *		42	-2.1		40	-5.2		27	-10.8 *		21
<b>Bobolink</b>												
Canada	-2.6 *		298	-3.6 *		290	-3.7 *		225	-6.6 *		191
Boreal Shield	-3.2 *		70	-4.4 *		69	-9.5 *		56	-3.8		47
Atlantic Maritime	-2.9 *		78	-5.3 *		75	-7.5 *		52	-9.3 *		42
Mixedwood Plains	-2.2 *		69	-2.7 *		69	-0.7		66	-8.1 *		62
Boreal Plains	0.4		18	0.8		18						
Prairies	-3.6 +		51	-3.3		48	-2.2		36	-1.7		28
<b>Red-winged Blackbird</b>												
Canada	-1.2 *		548	-2.1 *		533	-1.8 *		443	-2.2 *		375
Boreal Shield	-2.8 *		119	-4.4 *		114	-3 +		85	-1.9		70
Atlantic Maritime	-1.7		86	-3.2 *		82	-1.9		63	-9.2 *		49
Mixedwood Plains	-0.7		69	-2.1 *		69	0.4		66	-1.3		62
Boreal Plains	-1.3		76	-1.9 +		75	-7.3 *		65	-3.7		59
Prairies	-1.1		116	-1.7 *		114	-0.6		98	-2.1		82
Pacific Maritime	0.9		17	-0.6		17						
Montane Cordillera	2		54	0.5		51	-5.7		44	6.8		40
<b>Eastern Meadowlark</b>												
Canada	-2.6 *		130	-2.2 *		126	-2.7		114	-1.5		100
Boreal Shield	-0.7		44	0.1		43	-3.1		39	-5.4 +		32
Atlantic Maritime	-1.8		17									
Mixedwood Plains	-2.8 *		69	-2.7 *		69	-2.5		65	-1		60
<b>Western Meadowlark</b>												
Canada	-2 *		217	-1.6 *		208	-2.6 *		164	-1.3		133
Boreal Plains	-4 *		43	-3.4 *		42	-6.5 *		35	-9.1 *		29
Prairies	-1.9 *		112	-1.3 *		110	-1.8		93	-0.8		76
Montane Cordillera	-0.1		42	-0.4		41	-0.4		31	-1.7		24

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year–1998			1974–1998			1989–1998			1994–1998		
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Yellow-headed Blackbird												
Canada	−0.3		165	−1.6		160	−11	*	126	−7.1	+	101
Boreal Plains	−1.4		37	−2.5		37	−13.2	*	28	−4.7		23
Prairies	0.8		106	−0.2		104	−10	*	85	−5.9		68
Montane Cordillera	−4.8		20	−4.7		18						
Rusty Blackbird												
Canada	−14.1	*	97	−9.8	*	81	7.2		30			
Boreal Shield	−15.3	*	33	−15.5	*	31						
Atlantic Maritime	−6.9		38	5.2		28						
Brewer's Blackbird												
Canada	−0.7		260	−1		255	1.4		212	−0.1		179
Boreal Shield	−0.8		16	−1.2		16						
Boreal Plains	−2.1		66	−3.6	*	65	−5.7	*	57	−8.1	+	50
Prairies	0.7		114	0.1		112	5.8	*	96	6.3	+	80
Montane Cordillera	−0.9		47	−1.6		45	−3.3		36	−6.8		30
Common Grackle												
Canada	−2.3	*	382	−0.8		369	0.2		293	0.7		246
Boreal Shield	−2.6	*	119	−4.5	+	115	0.9		86	6.4	+	71
Atlantic Maritime	−1.8	*	88	−0.4		84	0.3		67	−3.6		58
Mixedwood Plains	−2.7	*	69	−0.5		69	1.8		66	2.8		62
Boreal Plains	−8		33	−3.7		31	−6		24	−9.9	+	19
Prairies	−0.4		72	0		69	−4.1		49	−1.4		36
Brown-headed Cowbird												
Canada	−1.9	*	491	−2.3	*	476	−1.2		385	−1.7		317
Boreal Shield	−7.4	*	87	−8.5	*	84	−6.4	+	62	−5.3		49
Atlantic Maritime	−6.2	*	75	−7.7	*	70	−10.8		41	−15.8	+	30
Mixedwood Plains	−2.8		69	−3.1		69	−1.1		66	2.9		62
Boreal Plains	−0.8		68	−1		66	−1		56	4		46
Prairies	0.4		114	0.1		111	0.9		96	−2.2		78
Pacific Maritime	−4.1	+	17	−3.9		17	−9.1	*	15			
Montane Cordillera	−0.1		60	0.1		58	−2.5		49	−5.5		41
Orchard Oriole												
Canada	12.8	*	19	12.9	*	19						
Northern Oriole												
Canada	−0.1		295	−0.9		284	−1.2		231	0.2		185
Boreal Shield	−6.1	*	48	−6.7	*	44	−0.3		32	−9.1		25
Atlantic Maritime	5		27	4		22						
Mixedwood Plains	−2.2	*	66	−3.4	*	66	−0.2		62	1		59
Boreal Plains	−1.1		59	−1.5		58	−6.6	*	51	1.6		40
Prairies	2.6	+	94	2.4	+	93	−0.3		74	0.7		55
Bullock's Oriole												
Canada	−1.4		27	−1.6		27	−6.5	+	23	−13.8	+	19
Montane Cordillera	−1.9		22	−2.3		22	−8.5	*	20	−17.3	*	16
Pine Grosbeak												
Canada	−5.8	*	79	−8.6	*	68	0.5		36	2.1		25
Boreal Shield	0.1		21	0.5		21						
Atlantic Maritime	−17.7	*	26	−13.6	*	16						

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974–1998), the most recent 10 years (1989–1998), and the most recent five years (1994–1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species Area	First year–1998			1974–1998			1989–1998			1994–1998		
	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
<b>Purple Finch</b>												
Canada	-4.5	*	321	-7	*	304	-7.5	*	215	-10.5	*	165
Boreal Shield	-0.9		118	-7.1		113	-6.6		73	-8.1		52
Atlantic Maritime	-4.9	*	89	-6.5	*	85	-9.1	*	65	-10.1	+	56
Mixedwood Plains	-1.9		32	-3.1		30	3.7		25	-1.5		22
Boreal Plains	-11	+	26	-11.6	+	25	-22.4	*	17			
Pacific Maritime	-1.9		21	0.1		20	-14.3		15			
Montane Cordillera	-9.6		25	-8.2		23						
<b>Cassin's Finch</b>												
Canada	0.3		29	0.5		29	-2.3		20	1.8		16
Montane Cordillera	-0.3		28	0		28	-2.5		20	1.8		16
<b>House Finch</b>												
Canada	6.9	*	92	6.2	*	92	0.3		86	-9.2	+	80
Mixedwood Plains	12.2		48	10.4		48	-1.3		48	-17.2	*	45
Pacific Maritime	5.4	*	17	5.3	*	17						
<b>Red Crossbill</b>												
Canada	-0.8		105	-1.3		101	-1.3		70	-1.9		49
Atlantic Maritime	6.8		16									
Pacific Maritime	-4.8		21	-4.9		21	-12		17			
Montane Cordillera	0.7		46	0		46	2.5		37	-2.4		28
<b>White-winged Crossbill</b>												
Canada	-5.5		122	8.7	*	114	9.2		91	18.4		63
Boreal Shield	-19		32	9.6	*	28	14.3		21	9.5		15
Atlantic Maritime	0.3		35	1.9		31	-16.7		24	-38.3	*	15
Boreal Plains	8.4		20	8.4		20	2.1		17			
<b>Common Redpoll</b>												
Canada	-13.3		20	-15.1		20						
<b>Pine Siskin</b>												
Canada	-1.7	*	335	-2.1	*	318	-1.9		231	-15.8	*	182
Boreal Shield	-1.5		77	-1.1		70	-2.8		34	-26.4	*	22
Atlantic Maritime	-1.6		76	-5.3	*	72	-19.6	*	51	-41.1	*	38
Boreal Plains	-1.8		58	-2.1		58	2		44	-7.4		38
Pacific Maritime	-7.6	*	21	-8.2	*	20	-6.6	*	19			
Montane Cordillera	-1.9	+	72	-2.2	*	70	-1.8		62	-15.7	*	55
<b>American Goldfinch</b>												
Canada	0.3		456	0.8		447	1.6	+	376	-0.5		322
Boreal Shield	0.2		106	0.3		102	2.8		83	4.9		70
Atlantic Maritime	-1.1		86	0.5		83	1.3		68	-6.7		59
Mixedwood Plains	1.7		69	2.6		69	4.6	+	66	6		62
Boreal Plains	-0.5		51	-0.6		51	0.2		45	-4.9		39
Prairies	4	*	98	4.3	*	96	3.9	+	81	-3.3		65
Pacific Maritime	-4.2		17	-3.5		17						
Montane Cordillera	-6.9	*	29	-7.5	*	29	-11.5	*	21	-15.1	*	18

# Appendix 1 (cont'd.)

Summary of trends from the Canadian Breeding Bird Survey. "Trend" is the mean annual percent change in bird populations. "N" is the total number of routes used to calculate the trend. The first data column shows trends for the whole period of coverage, while the other columns show trends for the most recent 25 years (1974-1998), the most recent 10 years (1989-1998), and the most recent five years (1994-1998). For the full period of coverage, the first year is 1967 for Canada as a whole and for the Atlantic Maritime ecozone, and 1969 for all other ecozones except the Boreal Cordillera ecozone. Coverage was not complete enough for trend calculation in the latter ecozone until 1989, so Boreal Cordillera trends are shown only for the most recent five- and 10-year periods.

Species	First year-1998			1974-1998			1989-1998			1994-1998		
Area	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N	Trend	P <sup>a</sup>	N
Evening Grosbeak												
Canada	-4.3	+	266	-3.6	+	252	-4.6		181	-9.1		145
Boreal Shield	0.2		102	-0.8		96	9.3		66	6.7		51
Atlantic Maritime	-6.5		85	-5.1		80	-8.5		57	-15.9	+	51
Montane Cordillera	0.6		49	-0.1		47	-13.7	*	39	-26.6	*	31
House Sparrow												
Canada	-2.2	*	404	-2.4	*	391	-0.9		304	2.9		250
Boreal Shield	-8.5	*	64	-7.1	*	59	-8.5	*	32	-4.4		23
Atlantic Maritime	-4.5	*	73	-7.8	*	69	-5.3		44	-1.9		35
Mixedwood Plains	-1.6	*	67	-1.2	+	67	-3.1	*	64	-6.5	*	60
Boreal Plains	-4.9	*	53	-5.4	*	52	-8.4	*	45	0.7		36
Prairies	-0.1		110	-0.4		108	1.4		92	8		75
Pacific Maritime	-2.7		16	0.8		15						
Montane Cordillera	-4.4		21	-5.2		21						

<sup>a</sup> Statistical significance: \* indicates  $P < 0.05$ ; + indicates  $0.15 > P > 0.05$ .

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