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**A preliminary catalogue of bird census plot studies in Canada, part 4.**

by Anthony J. Erskine<sup>1</sup>

**Introduction**

In the 1970's, bird census work finally began to take its place as one of the recognized tools of environmental impact assessment, although the search for short cuts still continues. In addition, the need for baseline data on breeding bird populations has become recognized as essential for many fields of research as well as in management. Despite the efforts put forth to date, many areas and habitats in Canada are still totally unsampled, and the need for more census data will continue in the future. Parts 1 to 3 of the Canadian census plot catalogue (Erskine 1971, 1972, 1976) summarized data from over 320 plots censused through 1975. Part 4 includes data for another 142 plots surveyed in recent years (Table 1). The methodology and presentation are the same as in the earlier reports. Only land and freshwater habitats are treated in this catalogue; marine birds have been catalogued by other workers (e.g., Brown *et al.* 1975, Drent and Guiguet 1961).

**Methods**

This report includes only results obtained by mapping censuses and interpreted by outlining clusters of registrations that are assumed to represent territories. Several valuable studies in which all field data had been mapped, but for which the results were expressed as mean numbers of a species per survey, were not tabulated (e.g., Lancaster 1976, Savard 1978). As such data could be re-interpreted for subsequent inclusion, these studies are listed among the references.

The five major habitat groupings introduced in part 3 of the catalogue—broad-leaved forests, conifer forests, marshes and bogs, open habitats, and urban areas—are continued herein. However, the finer subdivisions into which the census plots were grouped in parts 1 and 2 have been abandoned. With the increasing number of plots, and particularly with more studies of successional areas, the separation between the subdivisions became increasingly blurred, so that a number of plots could with equal validity be placed in either of two groupings. Along with this change, it seemed best to transfer bog plots in which most birds were associated with woody (mostly conifer) vegetation to the conifer forest grouping, and early successional areas in which most birds were associated with woody (mostly broad-leaved) vegetation to broad-leaved forests. These changes reduce the heterogeneity of the wetland

**Table 1**

Numbers of bird census plots initiated, by 5-year period; reported in Canadian census plot catalogue. Each plot listed only in first year censused, though some done in 2 or more years

Period	No. plots reported in catalogue				Mean no. plots started per yr
	Part 1	Part 2	Part 3	Part 4	
1925-29	3	—	—	—	—
1935-39	1	—	—	—	—
1945-49	13	5 (+ 3*)	—	—	4.2
1950-54	23 (+ 4*)	4	—	—	6.2
1955-59	12 (+ 2*)	—	1	—	3.0
1960-64	19	8	4	—	6.2
1965-69	54 (+ 3*)	19	9	—	17.0
1970-74	—	36 (+ 5*)	93	11	29.0
1975-79	—	—	7 (+ 1*)	131 (+ 69 + *)	41.6

\*Data for these plots (known to have been censused) are still unavailable. The number of plots censused in 1975-79 and as yet unreported is uncertain.

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**Table 2**  
Numbers of plots reported in various groups, by province or territory

Habitat group	Prov. or terr.	Plots reported in	
		Parts 1-3	Part 4
<b>I. Broad-leaved stands:</b> climax and successional	NS	5	—
	NB	1	1
	Que.	13	—
	Ont.	27	5
	Man.	2	9
	Sask.	2	—
	Alta.	1	9
BC	5	—	
<b>II. Coniferous stands:</b> spruce-fir, pines, other conifers, mixed and successional	Nfld.	—	5
	NS	4	—
	NB	18*	3
	Que.	16	69
	Ont.	42	5
	Man.	21	4
	Sask.	2	—
	Alta.	—	2
	BC	25	9
	Mackenzie	7	1
<b>III. Marsh and bog</b>	Nfld.	1	1
	NB	4	—
	Que.	2	—
	Ont.	8	3
	Man.	5	1
	Sask.	1	—
	Alta.	—	1
	BC	2	—
Mackenzie	1	—	
<b>IV. Open lands:</b> fields, dunes, and early succession; prairie; tundra	NB	—	1
	Que.	1	—
	Ont.	34	2
	Man.	1	—
	Sask.	9	—
	Alta.	12	—
	Yukon	6	—
	Mackenzie	3	—
	Keewatin	2	—
Franklin	9	—	
<b>V. Urban</b>	NB	—	1
	Que.	1	—
	Ont.	22	10
	Man.	1	—
	BC	6	—

\*Four plots counted twice, once with budworm important, and later when this food source had become unimportant.

and open habitat groupings, while increasing it for the forest types, but the latter now include almost all plots in which woody vegetation of 2 m or more in height is the dominant habitat feature.

#### Results and discussion

Table 2 summarizes the distribution of plots in the major habitat types for comparison with previous summaries. Prince Edward Island remains unsampled, but there has been increased activity in Alberta, Manitoba and Newfoundland. Early successional stages, including seral stages following fire or logging, have received more attention, but no new plots on the prairies or the tundra have been reported. It is still true that almost any census plot studied will be valuable. But in the areas and habitats that have been better sampled to date, the information contributed by using plots of less than 10 ha, or involving fewer than eight surveys or other "short cuts" in time or effort, is less likely to be worth the effort.

Various friends and colleagues have kindly made available for inclusion census plot data that have not yet been published. However, I find disturbing the increasing trend for census data to remain unreported for years, with results in some cases being lost altogether—as with most of the unreported data prior to 1970 in Table 1. Another considerable amount of census data is contained in unpublished theses and in consultants' reports, which are appreciably less available and less permanent forms of record than actual publications, but which may be consulted if their existence is publicized. Completed censuses for which data are not yet available are listed in Appendix 1, as before.

The quantity of data accumulated through bird census work in Canada has progressed to where summary and generalization covering wide areas is becoming worthwhile. "Birds in boreal Canada" (Erskine 1977) was an attempt to present a coherent picture of bird densities, communities and adaptations across Canada's largest ecological region, based primarily on the quantitative data from census plots. A brief review of urban bird communities, in winter as well as in summer, is now on the way (Erskine, in press). These syntheses were as complete as existing data permitted; as more census work is completed, more comprehensive compilations and comparisons, including regional studies, will be possible.

Bird census methodology is still being discussed. Meetings sponsored by the International Bird Census Committee, at Szymbark, Poland in October 1976 (Pinowski *et al.* eds. 1977) and at Göttingen, West Germany in September 1979 (proceedings in press) considered methods as well as results. Also, a symposium on census methodology (to be sponsored probably by the US Fish and Wildlife Service and the US Forest Service) is planned for Monterey, California in October 1980.

Concern has been expressed that the mapping method as commonly used is becoming—or has already become—a relative method, rather than an absolute

standard against which the effectiveness of other methods may be assessed (L. Tomiašojc, in press). Most experienced censurers recognize that the mapping method is not absolute, even in those habitats for which it is most suitable; but careful comparisons using nest searches, and mist-netting and colour-marking of individual birds for delineation of territories, show that mapping censuses can give reasonable approximations of absolute numbers (S. Svensson, in press). A minor modification of the mapping method, involving particularly increased effort to secure simultaneous registrations (contemporary contacts), has been recommended (L. Tomiašojc, in press). All this once again emphasizes the need to conduct censuses carefully, keeping in mind not only the prescribed procedures but also the ultimate objectives of censusing—to obtain density data that are as nearly absolute as possible, and that may be compared directly and validly with those obtained by others using the same method.

#### Acknowledgements

I wish to thank all those persons and organizations making data available to the public through these compilations. Data presented in this publication include plots studied in the course of avifaunal surveys of several national parks, by courtesy of Parks Canada and the contractors; work by the Manitoba Department of Renewable Resources and Transportation Services, Research Branch, communicated by W. H. Koonz; studies by the City of Edmonton Parks and Recreation Department, through J. C. Finlay; and a very large number of plots studied in the course of monitoring spruce budworm spray operations in Quebec by the Ministère du Tourisme, de la Chasse et de la Pêche, Direction de la Recherche Faunique, provided by R. Ouellet, and in New Brunswick by the Department of Natural Resources through P. Germain of Avifauna Ltée.

#### Appendix 1

Summary of bird census plot studies in Canada not available for this compilation (Note: plots listed in appendices of parts 1 to 3 of the catalogue are not repeated here, although some are still unreported.)

Parks Can.; Can. Wildl. Serv. West. and North Reg. 10 plots in Banff National Park and 9 in Jasper National Park, Alta. Various forest, scrub, and alpine meadow habitats, 1975-79.

Alta. Oil Sands Environ. Res. Program (AOSERP). About 10 plots in various habitats, Ft. McMurray, Alta., 1976-78.

Can. Wildl. Serv., Ont. Reg. 38 plots in various forest habitats, Chapleau and Manitowadge areas, Ont., 1978-79.

C. Norment, Washington State Univ., Pullman. 2 plots in subarctic spruce stands, Thelon River, Mackenzie, 1977.

**References**

Brown, R. G. B.; Nettleship, D. N.; Germain, P.; Tull, C. E.; Davis, T. 1975. Atlas of eastern Canadian seabirds. Can. Wildl. Serv. 220 pp.

Drent, R. H.; Guiguet, C. J. 1961. A catalogue of British Columbia sea-bird colonies. Occas. Pap. BC Prov. Mus. No. 12. 173 pp.

Erskine, A. J. 1971. A preliminary catalogue of bird census (plot) studies in Canada, (part 1). Can. Wildl. Serv. Prog. Notes No. 20. 78 pp.

Erskine, A. J. 1972. A preliminary catalogue of bird census plot studies in Canada, part 2. Can. Wildl. Serv. Prog. Notes No. 30. 42 pp.

Erskine, A. J. 1976. A preliminary catalogue of bird census plot studies in Canada, part 3. Can. Wildl. Serv. Prog. Notes No. 59. 24 pp.

Erskine, A. J. 1977. Birds in boreal Canada: Communities, densities and adaptations. Can. Wildl. Serv. Rep. Ser. No. 41. 71 pp.

Erskine, A. J. In press. Urban birds in the context of Canadian climate and settlement. Proc. XVII Int. Ornithol. Congr. (Berlin).

Lancaster, R. K. 1976. Bird communities in relation to the structure of urban habitats. Unpubl. M.Sc. Thesis. Dep. Zool. Univ. BC. Vancouver. 119 pp.

Pinowski, J.; Bogucki, Z.; Tomia/ojc, L., eds. 1977. Bird census and atlas studies. Pol. Ecol. Stud. 3(4). 334 pp.

Savard, J.-P. 1978. Birds in Metropolitan Toronto: distribution, relationships with habitat features, and nesting sites. Unpubl. M.Sc. Thesis. Dep. Zool. Univ. Toronto. 221 pp.

Svensson, S. In press. A comparison of bird census methods: territory mapping, line transects and point counts. Proc. VI Int. Conf. on bird census work and IV Meet. Eur. Ornithol. Atlas Comm.

Tomia/ojc, L. In press. The combined version of the mapping method. Proc. VI Int. Conf. on bird census work and IV Meet. Eur. Ornithol. Atlas Comm.

**Bird census plot data**

**I. Broad-leaved forest, climax and successional**

Ref. no.*	Description	Area Location	Size		Density		Commonest species with densities
			ha	acres	Males/100 ha	Year	
233	Sugar maple forest	Fundy Nat. Park, NB, 46°	10.5	25.9	467	1979	Ovenbird 105 Least Flycatcher 76 Red-eyed Vireo 71 Bl.-th. Gn. Warbler 43 E. Wood Pewee 38
270	Mixed hardwood forest	Sarnia, Ont., 43°	10.1	25	410	1976	Blue Jay 30 Song Sparrow 30 Red-hd. Woodpecker } American Robin } Wood Thrush } Ovenbird } 20 Common Grackle } each (Brown-hd. Cowbird) Rose-br. Grosbeak Rufous-s. Towhee
276	Mixed forest (mainly white and red oaks and red maple)	Port Rowan, Ont., 43°	10.1	25	435	1977	Rose-br. Grosbeak 63 E. Wood Pewee 39 Red-eyed Vireo 39 Blue Jay 34 Wood Thrush 34 Gt. Cr. Flycatcher 25
232	Hackberry-blue ash-chestnut oak savannah and old fields	Pelee I., Ont., 42°	28.3	70	161	1977	Red-w. Blackbird 35 Indigo Bunting 14 Mourning Dove 11 Amer. Goldfinch 9 Ring-n. Pheasant } Gt. Cr. Flycatcher } E. Wood Pewee } American Robin } 7 Starling } each Yellow Warbler Cardinal
254	Birch-oak savannah, and wetland	Long Point, Ont., 43°	5.85	14.46	1239	1978	Tree Swallow 256 Northern Oriole 120 House Wren 103 Red-w. Blackbird 103 Common Flicker 85 E. Wood Pewee 85 Yellowthroat 85
249	Mixed deciduous forest (being fragmented as subdivision)	Mississauga, Ont., 44°	36.4	90	306	1978	Song Sparrow 27 Catbird 25 Blue Jay 19 American Robin 19 Red-w. Blackbird 16 Amer. Goldfinch 16

\*See "References to plot data" at end-of tabulations.

I. Broad-leaved forests, climax and successional (cont'd)

Ref. no.	Description	Location	Area		Density		Commonest species with densities
			Size		Males/100 ha	Year	
			ha	acres			
257	River bottom forest	Headingley, Man., 50°	14	34.6	386 range 311-461	1977-78	Least Flycatcher 111 Northern Oriole 86 Rose-br. Grosbeak 42 American Robin 40 Gt. Cr. Flycatcher 20 Red-eyed Vireo 20 Warbling Vireo 20
247	Mixed aspen-spruce forest	Edmonton, Alta., 54° (Belgravia)	10	25	330 range 290-370	1976-77	(Bl.-billed Magpie 50) Junco 40 Bl.-cap. Chickadee 35 (Brown-hd. Cowbird 30) Red-eyed Vireo 20 American Robin 20 Chipping Sparrow 20
247	Aspen forest	Edmonton, Alta., 54° (Fort Edmonton)	10	25	427 range 415-440	1976-77	Yellow Warbler 62 Red-eyed Vireo 60 Clay-col. Sparrow 60 Least Flycatcher 35 (Brown-hd. Cowbird 30) Bl.-cap. Chickadee 25
247	Aspen forest with some spruce	Edmonton, Alta., 54° (Goldbar)	10	25	445 range 435-455	1976-77	Red-eyed Vireo 50 Northern Oriole 45 White-th. Sparrow 45 House Wren 42 Least Flycatcher 38
247	Mixed aspen-white spruce stand in ravine	Edmonton, Alta., 54° (Kennedale)	10	25	365 range 320-410	1976-77	Clay-col. Sparrow 82 House Wren 52 Red-eyed Vireo 32 (Bl.-billed Magpie 25) Bl.-cap. Chickadee 20 Mourning Warbler 20
247	Disturbed aspen forest with creek (park)	Edmonton, Alta., 54° (Mill Creek)	10	25	372 range 340-405	1976-77	Northern Oriole 55 Clay-col. Sparrow 55 American Robin 38 Red-eyed Vireo 35 White-th. Sparrow 30
247	Mixed, disturbed aspen-white spruce stand (park)	Edmonton, Alta., 54° (Skunk Hollow)	10	25	165 range 155-175	1976-77	White-th. Sparrow 30 House Sparrow 25 (Bl.-billed Magpie 25) Bl.-cap. Chickadee 15 Chipping Sparrow 13

(cont'd)

I. Broad-leaved forests, climax and successional (cont'd)

Ref. no.	Description	Location	Area		Density		Commonest species with densities
			Size		Males/100 ha	Year	
			ha	acres			
247	Aspen forest, disturbed	Edmonton, Alta., 53° (Terwillegar #1)	10	25	475 range 465-485	1976-77	Red-eyed Vireo 70 Clay-col. Sparrow 42 Least Flycatcher 40 Bl.-cap. Chickadee 35 American Robin 28 Yellow Warbler 28
247	Aspen-balsam poplar forest	Edmonton, Alta., 53° (Terwillegar #2)	10	25	642 range 530-755	1976-77	Least Flycatcher 212 Red-eyed Vireo 115 Yellow Warbler 62 (Brown-hd. Cowbird 30) American Robin 28 Bl.-cap. Chickadee 25 White-th. Sparrow 25
247	Aspen forest in creek valley	Edmonton, Alta., 53° (Whitemud)	10	25	797 range 730-865	1976-77	Least Flycatcher 245 Yellow Warbler 115 House Wren 62 Veery 60 Red-eyed Vireo 38
240	Aspen forest with green ash	Turtle Mt. Prov. Park, Man., 49°	16	39.5	271 range 231-310	1977-78	Red-eyed Vireo 67 Least Flycatcher 45 Ovenbird 45 Yellowthroat 28 American Redstart 23
236	Aspen forest	Hecla I., Man., 51°	14	34.6	146	1978	Mourning Warbler 29 Ovenbird 25 Ches.-s. Warbler 21 Red-eyed Vireo 17 Tennessee Warbler 17
239	Aspen forest	Bissett, Man., 51°	15	37.1	338 range 327-350	1977-78	Ovenbird 80 Least Flycatcher 75 Red-eyed Vireo 53 Veery 23 Mourning Warbler 18
251	Mixed forest (aspen, black spruce, balsam poplar, white spruce)	Duck Mt. Prov. Park, Man., 52°	16	39.5	328	1978	Ovenbird 156 Red-eyed Vireo 78 Ches.-s. Warbler 19 Mourning Warbler 19 Chipping Sparrow 19
260	Aspen forest	Duck Mt. Prov. For., Man., 52°	16	39.5	594	1978	Ovenbird 163 Red-eyed Vireo 119 Ches.-s. Warbler 75 American Redstart 63 Canada Warbler 38

(cont'd)

I. Broad-leaved forests, climax and successional (*cont'd*)

Ref. no.	Description	Location	Area		Density		Commonest species with densities
			Size		Males/100 ha	Year	
			ha	acres			
258	Mature aspen, sand beach	Sisipuk L., Man., 56°	8.1	20	556	1974	Tennessee Warbler 99 Magnolia Warbler 74 Red-eyed Vireo 49 Swainson's Thrush 37 Bl. & Wh. Warbler } Orange-cr. Warbler } 25 Yel-r. Warbler } each N. Waterthrush } White-th. Sparrow }
258	Immature aspen	Sisipuk L., Man., 56°	8.1	20	536	1974	Least Flycatcher 124 Bl. & Wh. Warbler 111 Tennessee Warbler 99 Ovenbird 99 Chipping Sparrow 25
278	Green ash-box elder forest	Oakland, Man., 50°	15	37.1	943	1979	Yellow Warbler 320 Least Flycatcher 157 (Mourning Dove 100) Northern Oriole 67 Warbling Vireo 50 Red-eyed Vireo 33

II. Coniferous forests, climax and successional

Ref. no.	Description	Location	Area		Density		Commonest species with densities
			Size		Males/100 ha	Year	
			ha	acres			
267	Black spruce forest	Terra Nova Nat. Park, Nfld., 49°	20.25	50.75	242	1978	Ruby-cr. Kinglet 35 Yel-r. Warbler 35 White-th. Sparrow 35 Blackpoll Warbler 30 Bl. & Wh. Warbler 20
195	Virgin balsam fir forest	Candlestick L., Nfld., 50°	18	45	537	1975	Blackpoll Warbler 143 Yel-r. Warbler 76 N. Waterthrush 65 Ruby-cr. Kinglet 56 Gray-cheek. Thrush 51
195	Second-growth balsam fir forest	Horseback Brook, Nfld., 50°	9	22.2	770	1975	Bl.-th. Gn. Warbler 162 Blackpoll Warbler 162 Yel.-b. Flycatcher 87 N. Waterthrush 50 Ruby-cr. Kinglet 42 Ovenbird 42

(*cont'd*)

II. Coniferous forests, climax and successional (*cont'd*)

Ref. no.	Description	Location	Area		Density		Commonest species with densities
			Size		Males/100 ha	Year	
			ha	acres			
261	Black spruce forest	Post I., Big Trout L., Ont., 54°	10.4	26	258	1975	Ruby-cr. Kinglet 48 Swainson's Thrush 46 Junco 45 Blackpoll Warbler 44 White-th. Sparrow 34
250	Black spruce forest	Duck Mt. Prov. Park, Man., 52°	16	39.5	219	1978	Yel.-r. Warbler 138 Gold.-cr. Kinglet 31 Chipping Sparrow 25 Swainson's Thrush 19 Ruby-cr. Kinglet 6
258	Mature black spruce forest	Sisipuk L., Man., 56°	8.1	20	227	1974	Yel-r. Warbler 86 Cape May Warbler 37 Ruby-cr. Kinglet 25 Chipping Sparrow 25 Swainson's Thrush 12 Gray Jay 12 Junco 12
234	Red spruce forest, with budworm	Fundy Nat. Park, NB, 46°	11.25	27.8	1151	1979	Bay-br. Warbler 453 Blackbur. Warbler 187 Yel.-b. Flycatcher 124 Tennessee Warbler 84 Swainson's Thrush 53
248	Fir-spruce forest (with budworm)	Green R., NB, 48° (Benedict) (Q-1)	14	35	1058	1978	Bay-br. Warbler 395 Cape May Warbler 168 Tennessee Warbler 136 Junco 57 Swainson's Thrush 42
248	Fir-spruce forest (with budworm)	Green R., NB, 48° (Mud L.) (Q-3)	9.8	24.5	803	1978	Bay-br. Warbler 354 Junco 72 Swainson's Thrush 63 Cape May Warbler 53 Blackpoll Warbler 43
248	Fir-spruce forest (with budworm)	Ruisseau Asselin, Que., 48° (Asselin-nord) (Q-4)	9.8	24.5	1195	1978	Bay-br. Warbler 486 Swainson's Thrush 140 Blackbur. Warbler 81 Yel.-r. Warbler 48 Junco 48
248	Fir-spruce-mixed forest (with budworm)	Ruisseau Asselin, Que. 48° (Asselin-sud) (Q-5)	9.8	24.5	1054	1978	Bay-br. Warbler 432 Swainson's Thrush 85 Blackbur. Warbler 82 Tennessee Warbler 68 American Redstart 67

(*cont'd*)

II. Coniferous forests, climax and successional (cont'd)

Ref. no.	Area		Size		Density		Commonest species with densities
	Description	Location	ha	acres	Males/100 ha	Year	
248	Fir-spruce forest (with budworm)	Ruisseau Asselin, Que. 48° (Asselin-centre) (Q-6)	14	35	679	1978	Bay-br. Warbler 289 Swainson's Thrush 80 Yel.-b. Flycatcher 47 Yel.-r. Warbler 34 Blackbur. Warbler 32
269	Balsam fir stand	L. de l'Est (Kamou-raska), Que., 47° (#1)	4	10	865	1977	White-th. Sparrow 99 Tennessee Warbler 74 Bay-br. Warbler 74 Nashville Warbler } Magnolia Warbler } 49 each Cape May Warbler } Bl.-th. Gn. Warbler } Blackbur. Warbler }
269	Balsam fir stand with birch	L. de l'Est (Kamou-raska), Que. 47° (#2)	4	10	865	1977	Bay-br. Warbler 99 White-th. Sparrow 99 Tennessee Warbler 74 Yel.-r. Warbler 74 Canada Warbler 74
269	Balsam fir stand with birch and aspen	L. de l'Est (Kamou-raska), Que. 47° (#4)	4	10	1458	1977	Tennessee Warbler 148 White-th. Sparrow 148 Bay-br. Warbler 124 American Robin 99 Magnolia Warbler 99
269	Fir-spruce stand with aspen regeneration	R. Manie (Kamou-raska), Que. 47° (#2)	4, 8*	10, 20*	1285 range 741-1829	1977-79	Tennessee Warbler 178 Bay-br. Warbler 143 White-th. Sparrow 124 Ovenbird 124 Magnolia Warbler 104
269	Medium-aged fir stand with birch and aspen	Carleton Centre, Que., 48° (#4)	4	10	692	1977	Bay-br. Warbler 124 Magnolia Warbler 74 American Redstart 74 American Robin } Swainson's Thrush } 49 each Bl.-th. Gn. Warbler } Blackpoll Warbler } Ovenbird } White-th. Sparrow }
269	Young fir stand with birch and aspen	R. Nouvelle, W branch, Que., 48° (#1)	4	10	593	1977	Bay-br. Warbler 99 Tennessee Warbler 74 Blackpoll Warbler 74 Swainson's Thrush 49 Yel.-r. Warbler 49 Bl.-th. Gn. Warbler 49

(cont'd)

\*Area was 4 ha in 1977, and was enlarged to 8 ha in 1978.

II. Coniferous forests, climax and successional (cont'd)

Ref. no.	Area		Size		Density		Commonest species with densities
	Description	Location	ha	acres	Males/100 ha	Year	
269	Mixed-age fir-birch stand	R. Nouvelle, W branch, Que., 48° (#3)	4	10	840	1977	Tennessee Warbler 148 White-th. Sparrow 124 Blackpoll Warbler 99 Magnolia Warbler 74 Bay-br. Warbler 74 American Redstart 74
269	Fir stand with some birch	R. Nouvelle, W branch, Que., 48° (#4)	4	10	964	1977	Tennessee Warbler 173 Bay-br. Warbler 124 Blackpoll Warbler 99 Swainson's Thrush 74 Magnolia Warbler 74 Cape May Warbler 74
269	Fir-spruce stand with aspen and birch	R. Bogan (Parc Gaspésie), Que., 49° (#1)	4	10	1260	1977	Tennessee Warbler 247 Bay-br. Warbler 173 Blackpoll Warbler 148 Swainson's Thrush } Ruby-cr. Kinglet } 74 each Magnolia Warbler } Cape May Warbler } White-th. Sparrow }
269	Fir-spruce stand with birch and aspen	R. Bogan (Parc Gaspésie), Que., 49° (#3)	4	10	1458	1977	Tennessee Warbler 198 Bay-br. Warbler 198 Swainson's Thrush 124 Bl.-th. Gn. Warbler 124 Magnolia Warbler 99 Cape May Warbler 99 White-th. Sparrow 99
269	Fir-spruce-aspen stand with birch	R. Bogan (Parc Gaspésie), Que., 49° (#4)	4	10	1433	1977	Tennessee Warbler 173 Bay-br. Warbler 148 Swainson's Thrush 124 Cape May Warbler 124 Magnolia Warbler 99 Bl.-th. Gn. Warbler 99 White-th. Sparrow 99
269	Fir stand with spruce and birch	R. Cascapedia, Que., 49° (#1)	4	10	741	1978	Tennessee Warbler 198 Bay-br. Warbler 124 Magnolia Warbler 74 Yel.-r. Warbler 74 Cape May Warbler 49 Blackpoll Warbler 49
269	Disturbed young fir stand with spruce and birch	R. Cascapedia, Que., 49° (#2)	4	10	865	1978	Tennessee Warbler 247 Bay-br. Warbler 124 Cape May Warbler 49 Yel.-r. Warbler 49 White-th. Sparrow 49

(cont'd)

II. Coniferous forests, climax and successional (cont'd)

Ref. no.	Description	Area Location	Size		Density		Commonest species with densities
			ha	acres	Males/100 ha	Year	
269	Fir stand with spruce, birch and aspen	R. Cascapedia, Que., 49° (#3)	4	10	642	1978	Bay-br. Warbler 148 Tennessee Warbler 99 Cape May Warbler 74 Magnolia Warbler 49 Yel.-r. Warbler 49 Blackpoll Warbler 49
269	Fir stand with spruce, birch and aspen	R. Cascapedia, Que., 49° (#4)	4	10	914	1978	Bay-br. Warbler 222 Tennessee Warbler 148 Magnolia Warbler } 74 Cape May Warbler } each Yel.-r. Warbler } Bl.-th. Gn. Warbler }
269	Fir stand with birch and aspen	R. Cascapedia NW, Que., 49° (#5)	4	10	568	1978	Ruby-cr. Kinglet } 49 Magnolia Warbler } each Cape May Warbler } Yel.-r. Warbler } Bl.-th. Gn. Warbler } Bay-br. Warbler }
269	Fir stand with spruce, birch and alder	R. Cascapedia NW, Que., 49° (#6)	4	10	568	1978	Winter Wren } 49 Ruby-cr. Kinglet } each Yel.-r. Warbler } Bl.-th. Gn. Warbler } Bay-br. Warbler } White-th. Sparrow }
269	Fir-spruce stand with birch	Petite R. Cascapedia, Que., 49° (#3)	4	10	593	1978	Tennessee Warbler 124 Blackpoll Warbler 124 Yel.-r. Warbler 74 Magnolia Warbler 49 Bl.-th. Gn. Warbler 49
269	Fir-spruce stand with birch and alder	Petite R. Cascapedia, Que., 49° (#4)	4	10	692	1978	Tennessee Warbler 173 Bay-br. Warbler 74 Blackpoll Warbler 74 Swainson's Thrush 49 Junco 49 White-th. Sparrow 49
269	Fir-spruce stand	L. Ste.-Anne (Gaspésie), Que., 49° (#3)	4	10	1038	1977	Tennessee Warbler 198 Blackpoll Warbler 148 Swainson's Thrush 99 Ruby-cr. Kinglet } 74 Yel.-r. Warbler } each Junco } White-th. Sparrow }

(cont'd)

II. Coniferous forests, climax and successional (cont'd)

Ref. no.	Description	Area Location	Size		Density		Commonest species with densities
			ha	acres	Males/100 ha	Year	
269	Spruce stand with fir	L. Ste.-Anne (Gaspésie), Que., 49° (#4)	4	10	890	1977	Tennessee Warbler 321 Blackpoll Warbler 148 White-th. Sparrow 74 Yel.-r. Warbler } 49 Bl.-th. Gn. Warbler } each Junco } Lincoln's Sparrow }
269	Fir stand with birch, cedar and clear-cut	Mt. Richardson, Que., 49° (#1)	4	10	766	1978	Tennessee Warbler 198 Swainson's Thrush 74 Nashville Warbler } 49 Magnolia Warbler } each Blackpoll Warbler } White-th. Sparrow }
269	Fir-spruce stand with birch	Mt. Richardson, Que., 49° (#2)	4	10	815	1978	Tennessee Warbler 148 Blackpoll Warbler 124 Bl.-th. Gn. Warbler 74 Bay-br. Warbler 74 Yel.-r. Warbler 49 Fox Sparrow 49
269	Medium-aged disturbed fir stand with birch	Mt. Richardson, Que., 49° (#3)	4	10	440	1978	Tennessee Warbler 74 Blackpoll Warbler 74 Magnolia Warbler 49 Wilson's Warbler 49 Junco 49
269	Fir-spruce stand with birch	Mt. Richardson, Que., 49° (#4)	4	10	692	1978	Blackpoll Warbler 148 Tennessee Warbler 74 Yel.-b. Flycatcher } 49 Swainson's Thrush } each Yel.-r. Warbler } Bl.-th. Gn. Warbler } White-th. Sparrow }
269	Fir-spruce stand with birch and aspen	Ste. Anne des Monts, Que., 49° (#1) (#5)	4	10	717	1977	Tennessee Warbler 99 Bay-br. Warbler 99 Swainson's Thrush 74 Winter Wren 49 Ruby-cr. Kinglet 49 White-th. Sparrow 49
269	Fir-black spruce stand	Ste. Anne des Monts, Que., 49° (#4)	4	10	914	1977	Bay-br. Warbler 124 Tennessee Warbler 99 Swainson's Thrush 74 White-th. Sparrow 74 American Robin } 49 Ruby-cr. Kinglet } each Solitary Vireo } American Redstart } Purple Finch } Fox Sparrow }

(cont'd)

II. Coniferous forests, climax and successional (cont'd)

Ref. no.	Description	Location	Area		Density		Commonest species with densities
			Size		Males/100 ha	Year	
			ha	acres			
269	Fir-spruce stand with birch	R. Ste.-Anne/Ruisseau Grand Volume, Que., 49° (#1)	4	10	741	1978	Bay-br. Warbler 124 Swainson's Thrush } Cape May Warbler } 74 Bl.-th. Gn. Warbler } each American Redstart }
269	Fir-spruce stand with birch and shrubbery	R. Ste.-Anne/Ruisseau Grand Volume, Que., 49° (#2)	4	10	568	1978	Bay-br. Warbler 148 Swainson's Thrush } Ruby-cr. Kinglet } 49 Tennessee Warbler } each Bl.-th. Gn. Warbler } American Redstart } White-th. Sparrow }
269	Fir stand with spruce and birch	R. Ste.-Anne/Ruisseau Grand Volume, Que., 49° (#4)	4	10	642	1978	Tennessee Warbler 124 Blackpoll Warbler 124 Bl.-th. Gn. Warbler 49 Bay-br. Warbler 49 American Redstart 49
269	Medium-age fir-spruce-birch stand	L. Cascapedia, Que., 49° (#1)	4	10	568	1978	Tennessee Warbler 99 Yel.-r. Warbler 74 Blackpoll Warbler 74 Winter Wren 49 Bay-br. Warbler 49 American Redstart 49
269	Disturbed fir-spruce stand with birch	L. Cascapedia, Que., 49° (#2)	4	10	568	1978	Tennessee Warbler } Magnolia Warbler } 49 Blackpoll Warbler } each Wilson's Warbler } American Redstart } White-th. Sparrow }
269	Fir-birch stand with spruce	L. Cascapedia, Que., 49° (#3)	4	10	618	1978	Tennessee Warbler 99 Swainson's Thrush } Yel.-r. Warbler } 49 Blackpoll Warbler } each Wilson's Warbler } American Redstart }
269	Fir stand with birch	R. Ste.-Anne, Que., 49° (#1 (#4))	4	10	1112	1978	Tennessee Warbler 148 American Redstart 148 Swainson's Thrush 124 Bay-br. Warbler 124 Blackpoll Warbler 99
269	Disturbed fir stand, with spruce, birch and aspen	R. Ste.-Anne, Que., 49° (#2 (#5))	4	10	914	1978	Bay-br. Warbler 173 Tennessee Warbler 148 Swainson's Thrush 99 Bl.-th. Gn. Warbler 99 White-th. Sparrow 74

(cont'd)

II. Coniferous forests, climax and successional (cont'd)

Ref. no.	Description	Location	Area		Density		Commonest species with densities
			Size		Males/100 ha	Year	
			ha	acres			
269	Young fir stand, with cedar, birch, alder and orchard	Carleton Centre, Que., 48° (#1)	4	10	420	1977	Winter Wren } Tennessee Warbler } 49 Magnolia Warbler } each Blackpoll Warbler } Chipping Sparrow } White-th. Sparrow }
269	Young fir-birch stand with aspen, alder and shrubs	Carleton Centre, Que., 48° (#3)	4	10	741	1977	American Redstart 124 White-th. Sparrow 99 Magnolia Warbler 74 Bay-br. Warbler 74 Wood Thrush 49 Red-eyed Vireo 49 Tennessee Warbler 49
269	Young birch-fir-red maple stand	R. Nouvelle, Que., 48° (#1)	4	10	1112	1977	Magnolia Warbler 99 White-th. Sparrow 99 Swainson's Thrush 74 American Redstart 74 American Robin } Veery } 49 Red-eyed Vireo } each Bl.-th. Gn. Warbler } Blackpoll Warbler } Canada Warbler }
269	Young fir stand with birch and aspen	R. Nouvelle, Que., 48° (#2)	4	10	964	1977	American Redstart 99 White-th. Sparrow 99 Swainson's Thrush } Veery } 49 Magnolia Warbler } each Bl.-th. Gn. Warbler } Ches.-s. Warbler } Mourning Warbler }
269	Disturbed fir-birch stand with aspen	R. Nouvelle, Que., 48° (#3)	4	10	890	1977	Blackpoll Warbler 124 American Redstart 99 Magnolia Warbler 74 White-th. Sparrow 74 Winter Wren } Swainson's Thrush } 49 Bl.-th. Gn. Warbler } each Fox Sparrow }
269	Young fir-birch stand, disturbed	R. Nouvelle, W Branch, Que., 48° (#2)	4	10	544	1977	Tennessee Warbler 99 Blackpoll Warbler 99 White-th. Sparrow 74 Magnolia Warbler 49 American Redstart 49

(cont'd)



II. Coniferous forests, climax and successional (cont'd)

Ref. no.	Description	Location	Area		Density		Commonest species with densities
			Size		Males/100 ha	Year	
			ha	acres			
269	Disturbed young fir stand with birch	L. Madeleine, Que., 49° (#1)	4	10	766	1978	Swainson's Thrush 99 Tennessee Warbler 99 Bay-br. Warbler 99 Nashville Warbler 74 White-th. Sparrow 74
269	Disturbed young fir stand with birch	L. Madeleine, Que., 49° (#2)	4	10	1063	1978	Tennessee Warbler 198 Blackpoll Warbler 124 Swainson's Thrush 99 Nashville Warbler 99 Ruby-cr. Kinglet 74 White-th. Sparrow 74
269	Disturbed young fir stand with birch and aspen	L. Madeleine, Que., 49° (#3)	4	10	791	1978	Tennessee Warbler 198 Swainson's Thrush 99 Nashville Warbler 74 Bl.-th. Gn. Warbler 74 Ruby-cr. Kinglet 49 Blackpoll Warbler 49
269	Fir-spruce stand with birch and regeneration	L. Ste.-Anne (Gaspésie), Que., 49° (#1)	4	10	1507	1977	Tennessee Warbler 222 Blackpoll Warbler 173 White-th. Sparrow 148 Fox Sparrow 124 Yel.-r. Warbler 99
269	Fir-spruce stand with regeneration and cut-over	L. Ste.-Anne (Gaspésie), Que., 49° (#2)	4	10	1260	1977	Tennessee Warbler 247 Blackpoll Warbler 148 Bay-br. Warbler 124 White-th. Sparrow 124 Bl.-th. Gn. Warbler 99
269	Fir-spruce-cedar stand with birch and aspen	Ste. Anne des Monts, Que., 49° (#2)	4	10	840	1977	White-th. Sparrow 148 Tennessee Warbler 99 Bay-br. Warbler 99 Swainson's Thrush 49 Solitary Vireo 49 Magnolia Warbler 49 American Redstart 49
269	Fir stand with birch and aspen, disturbed	Ste. Anne des Monts, Que., 49° (#3)	4	10	1161	1977	Tennessee Warbler 148 Bay-br. Warbler 148 White-th. Sparrow 148 Swainson's Thrush 99 Ruby-cr. Kinglet 99

(cont'd)

II. Coniferous forests, climax and successional (cont'd)

Ref. no.	Description	Location	Area		Density		Commonest species with densities
			Size		Males/100 ha	Year	
			ha	acres			
269	Disturbed spruce-fir stand with cedar and birch	R. Ste.-Anne/Ruisseau Grand Volume, Que., 49° (#3)	4	10	642	1978	Bay-br. Warbler 99 American Redstart 99 White-th. Sparrow 74 Ruby-cr. Kinglet } Philadelphia Vireo } 49 Tennessee Warbler } each Blackpoll Warbler }
269	Disturbed young birch-fir stand	L. Cascapedia, Que., 49° (#4)	4	10	544	1978	Swainson's Thrush 99 Tennessee Warbler 99 Blackpoll Warbler 74 American Redstart 49 Fox Sparrow 49
269	Disturbed red maple stand with fir and birch	R. Ste.-Anne, Que., 49° (#3 (#6))	4	10	988	1978	Bay-br. Warbler 173 American Redstart 148 Least Flycatcher 99 Swainson's Thrush 99 Solitary Vireo 99
269	Fir-spruce stand with birch	R. Manie (Kamouraska), Que., 47° (#1)	4	10	1252 range 1038-1656	1977-79	Tennessee Warbler 166 Bay-br. Warbler 124 Cape May Warbler 82 White-th. Sparrow 82 Swainson's Thrush 74
269	Red spruce-fir stand with birch	R. Manie (Kamouraska), Que., 47° (#3)	4	10	890 range 618-1236	1977-79	Tennessee Warbler 148 Cape May Warbler 106 White-th. Sparrow 91 Bay-br. Warbler 67 Magnolia Warbler 57
269	Balsam fir stand with cedar and tamarack	L. de l'Est (Kamouraska), Que., 47° (#3)	4	10	741	1977	Tennessee Warbler 148 Cape May Warbler 99 Magnolia Warbler 74 White-th. Sparrow 49 13 other species 25
269	Fir-spruce-aspen stand with birch	R. Bogan (Parc Gaspésie), Que., 49° (#2)	4	10	1211	1977	Tennessee Warbler 198 Bay-br. Warbler 99 Swainson's Thrush 74 Magnolia Warbler 74 8 other species 49
269	Fir stand with spruce	R. Cascapedia NW, Que., 49° (#7)	4	10	469	1978	White-th. Sparrow 99 Yel.-r. Warbler 74 Yellowthroat 49 10 other species 25

(cont'd)

II. Coniferous forests, climax and successional (cont'd)

Ref. no.	Area		Size		Density		Commonest species with densities
	Description	Location	ha	acres	Males/100 ha	Year	
269	Fir-spruce stand	R. Cascapedia NW, Que., 49° (#8)	4	10	346	1978	Yel.-r. Warbler 49 Bay-br. Warbler 49 White-th. Sparrow 49 8 other species 25
269	Fir-spruce stand	Petite R. Cascapedia, Que., 49° (#1)	4	10	766	1978	Tennessee Warbler 247 Bay-br. Warbler 74 Blackpoll Warbler 74 Swainson's Thrush 49 Bl.-th. Gn. Warbler 49
269	Fir-spruce stand	Petite R. Cascapedia, Que., 49° (#2)	4	10	766	1978	Tennessee Warbler 222 Bay-br. Warbler 148 Blackpoll Warbler 148 Gray-ch. Thrush 49 8 other species 25
269	Disturbed medium-age fir-spruce stand	L. Madeleine, Que., 49° (#4)	4	10	914	1978	Tennessee Warbler 346 Nashville Warbler 148 Swainson's Thrush 124 Ruby-cr. Kinglet 74 10 other species 25
269	Birch-fir stand with maple and spruce	St.-Pascal de Kamouraska, Que., 47° (#1)	4	10	1351 range 1065-1730	1977-79	White-th. Sparrow 116 Red-eyed Vireo 106 Ovenbird 99 Magnolia Warbler 67 Veery 57
269	Medium-age fir stand with birch and aspen, partly logged late 1978	St.-Pascal de Kamouraska, Que., 47° (#2)	4	10	717 range 445-939	1977-79	Ovenbird 141 White-th. Sparrow 57 Ruby-cr. Kinglet 32 Red-eyed Vireo 32 Bl.-th. Gn. Warbler 32
269	Fir-birch-aspen stand	St.-Pascal de Kamouraska, Que., 48° (#3)	4	10	1206 range 720-1754	1977-79	Ovenbird 99 White-th. Sparrow 74 Magnolia Warbler 57 Veery 49 Cape May Warbler 49
269	Birch stand with fir and aspen	St.-Pascal de Kamouraska, Que., 48° (#4)	4	10	815 range 420-1211	1977-79	Ovenbird 131 Red-eyed Vireo 91 White-th. Sparrow 57 Rose-br. Grosbeak 42 6 other species 32

(cont'd)

II. Coniferous forests, climax and successional (cont'd)

Ref. no.	Area		Size		Density		Commonest species with densities
	Description	Location	ha	acres	Males/100 ha	Year	
269	Mixed-age fir-birch stand with spruce, maple and aspen	R. Nouvelle, Que., 48° (#4)	4	10	717	1977	White-th. Sparrow 99 American Redstart 74 Swainson's Thrush 49 Magnolia Warbler 49 15 other species 25
269	Young fir-birch-aspen stand with orchard	Carleton Centre, Que., 48° (#2)	4	10	420	1977	Swainson's Thrush 49 American Redstart 49 11 other species 10
277	Red pine-white pine forest	Wasaga Beach, Ont., 44°	8.7	21.6	446	1976	Least Flycatcher 51 Chipping Sparrow 51 House Wren 46 (Brown-hd. Cowbird 34) Purple Finch 29 Com. Nighthawk } E. Kingbird } 23 Cedar Waxwing } Amer. Goldfinch } each
237	Jack pine forest	52 mi SE of Bissett, Man., 51°	16	39.5	114	1977	Ovenbird 34 Chipping Sparrow 28 Yel.-r. Warbler 19 Nashville Warbler 15 Hermit Thrush 6 Swainson's Thrush 6
195	Larch scrub in gully	Wallace Brook, Nfld., 49°	12	30	413	1975	White-th. Sparrow 57 Blackpoll Warbler 48 Lincoln's Sparrow 48 Swamp Sparrow 19 Yel.-b. Flycatcher 14 Yellow Warbler 14
275	Mixed aspen-birch over spruce-fir forest	Pukaskwa Nat. Park, Ont., 48°	12.25	30.27	482	1977	Bl.-th. Gn. Warbler 65 Bay-br. Warbler 49 Ovenbird 49 Nashville Warbler 33 Least Flycatcher 29 Red-br. Nuthatch 29
261	Black spruce/trembling aspen forest	Big Trout L., Ont., 54°	10.4	25.6	315	1975	Magnolia Warbler 29 White-th. Sparrow 29 Tennessee Warbler 28 Least Flycatcher } Boreal Chickadee } 19 Red-eyed Vireo } Junco } each

(cont'd)

II. Coniferous forests, climax and successional (cont'd)

Ref. no.	Area		Size		Density		Commonest species with densities
	Description	Location	ha	acres	Males/100 ha	Year	
253	Wet spruce woodland, with small fen (subalpine)	Banff, Alta., 51°	24	59	113	1977	Yellowthroat 19 American Robin 13 Sora } Swainson's Thrush } 8 Golden-cr. Kinglet } each Townsend's Warbler }
268	Subalpine spruce-fir forest	Vermilion Pass, BC, 51° (PL-4)	9	22	339	1975	Townsend's Warbler 67 Hermit Thrush 44 Swainson's Thrush 44 American Robin 33 Winter Wren } Golden-cr. Kinglet } 22 Yel.-r. Warbler } each Junco }
271	(Fairly) mature hemlock-cedar coast forest	Pacific Rim Nat. Park, BC, 49°	8	20	237	1972	Western Flycatcher 163 Winter Wren 37 Townsend's Warbler 37 Pine Siskin N.T.* Red Crossbill N.T.*
259	Disturbed sub-arctic scrub, bog and barren	L'Anse-aux-Meadows, Nfld., 52°	34.5	86	180	1976	Blackpoll Warbler 36 Swamp Sparrow 26 American Robin 17 Fox Sparrow 17 Savannah Sparrow 13
261	Black spruce-tamarack bog	Big Trout L., Ont., 54°	7.93	19.82	406	1975	Junco 86 White-th. Sparrow 50 Ruby-cr. Kinglet 38 Canada Jay 25 Tennessee Warbler 25 Blackpoll Warbler 25
258	Regenerating area burned off 14 yr earlier	Sisipuk L., Man., 56°	8.1	20	228	1974	White-th. Sparrow 37 Orange-cr. Warbler } Magnolia Warbler } 25 Chipping Sparrow } each Swamp Sparrow }
244	Black spruce scrub-muskeg	Chick L., NWT, 66°	100.3	247.8	55	1975	Tree Sparrow 13 Blackpoll Warbler 12.5 Junco 10 White-cr. Sparrow 9 Chipping Sparrow 5

\*N.T. = non-territorial, density not determined.

(cont'd)

II. Coniferous forests, climax and successional (cont'd)

Ref. no.	Area		Size		Density		Commonest species with densities
	Description	Location	ha	acres	Males/100 ha	Year	
268	Subalpine forest 6 yr after burn, + avalanche slopes	Vermilion Pass, BC, 51° (PL-1)	18	44	200	1975	American Robin 50 Junco 44 White-cr. Sparrow 33 Chipping Sparrow 28 Flicker 17 Mountain Bluebird 17
268	Subalpine forest 6 yr after burn	Vermilion Pass, BC, 51° (PL-2)	18	44	106	1975	Junco 22 Hermit Thrush 17 Townsend's Solitaire 17 Yel.-r. Warbler 17 Wilson's Warbler 11
268	Subalpine forest 6 yr after burn, + avalanche slopes	Vermilion Pass, BC, 51° (PL-3)	18	44	89	1975	Chipping Sparrow 22 Junco 17 Clark's Nutcracker 11 Hermit Thrush 11 Yel.-r. Warbler 11
268	Successional lodgepole pine forest (3-5 m tall)	Vermilion Pass, Alta., 51° (PL-5)	9	22	311	1975	Swainson's Thrush 56 American Robin 44 Yel.-r. Warbler 44 Junco 44 Canada Jay 22 Wilson's Warbler 22 Chipping Sparrow 22
271	Cedar-hemlock forest regenerating after logging 24 yr before	Pacific Rim Nat. Park, BC, 49°	8	20	537	1972	Rufous Hummingbird 175 Swainson's Thrush 112 Orange-cr. Warbler 100 Winter Wren 87 American Robin 37
271	Regenerating coast forest with planted Douglas fir, 12 yr after logging	Pacific Rim Nat. Park, BC, 49°	8	20	350	1972	Rufous Hummingbird 87 Orange-cr. Warbler 75 MacGilliv. Warbler 62 Winter Wren 50 Swainson's Thrush 25 Song Sparrow 25
271	Regenerating coast forest with planted Douglas fir, 8 yr after logging	Pacific Rim Nat. Park, BC, 49°	8	20	287	1972	Junco 75 Song Sparrow 62 Orange-cr. Warbler 50 MacGilliv. Warbler 37 White-cr. Sparrow 37
271	Clear-cut coast forest, 2 yr after logging.	Pacific Rim Nat. Park, BC, 49°	8	20	212	1972	Winter Wren 100 Junco 62 Song Sparrow 50 (only spp. recorded)

III. Marsh and bog

Ref. no.	Description	Area Location	Size		Density		Commonest species with densities
			ha	acres	Males/100 ha	Year	
267	Blanket bog with small ponds	Terra Nova Nat. Park, Nfld., 49°	14	35	29	1978	Savannah Sparrow 14 Greater Yellowlegs 7 Lincoln's Sparrow 7
242	Cattail marsh	Port Rowan, Ont., 43°	2.76*	6.82*	4312*	1976	Red-w. Blackbird 3659 Black Tern 290 Com. Gallinule 254 Mallard 72 Least Bittern 36
274	Mixed swamp and abandoned field	Acton, Ont., 44°	4.85	12	947	1977	Red-w. Blackbird 124 Song Sparrow 72 Flicker Great-cr. Flycatcher Bl.-cap. Chickadee E. Meadowlark Northern Oriole Com. Grackle (Br.-hd. Cowbird) } 42 each
256	Sedge-tamarack dune pond	Long Point, Ont., 43°	9.66	23.86	549	1978	Red-w. Blackbird 394 Eastern Kingbird 31 Tree Swallow 31 Yellowthroat 31 Northern Oriole 20
238	Semi-open black spruce bog	37 mi SE of Bissett, Man., 51°	36	89	35	1977	Palm Warbler 11 Savannah Sparrow 7 Connecticut Warbler 6 Lincoln's Sparrow 6 LeConte's Sparrow 3
253	Creek delta of willows and sedges	Banff, Alta., 51°	16.6	41	275	1977	Red-w. Blackbird 127 Yellowthroat 57 Sora 21 Eastern Kingbird 9 10 other species 6

\*Area too small for representative extrapolation.

IV. Open lands

Ref. no.	Description	Area Location	Size		Density		Commonest species with densities
			ha	acres	Males/100 ha	Year	
235	Landscaped park area (non-urban)	Fundy Nat. Park, NB, 46°	22.5	55.6	371	1979	(Barn Swallow 98) American Robin 37 Chipping Sparrow 36 American Redstart 31 (Cliff Swallow 22) Parula Warbler 18 Yel.-r. Warbler 18
252	Interdunal meadow	Pinery Prov. Park, Ont., 43°	6.1	15.1	990	1978	Field Sparrow 147 Rufous-s. Towhee 115 Blue Jay 98 Cedar Waxwing 65 (Br.-hd. Cowbird 65) Catbird American Robin Prairie Warbler Chipping Sparrow } 49 each
243	Old field with deciduous regrowth and young conifer plantations	Rockton, Ont., 44°	42	103.8	338	1977	Field Sparrow 49 Song Sparrow 44 Savannah Sparrow 43 Grasshopper Sparrow 39 Chipping Sparrow 23

V. Urban

Ref. no.	Description	Area Location	Size		Density		Commonest species with densities
			ha	acres	Males/100 ha	Year	
246	Small town, residential and commercial areas	Sackville, NB, 46°	50.5	124.8	285	1979	House Sparrow 135 Starling 53 American Robin 21 Common Grackle 20 American Redstart 12
245	Urban residential area	Ottawa, Ont., 45°	53	131	278	1976	House Sparrow 132 American Robin 34 Starling 29 Chipping Sparrow 14 Song Sparrow 14
273	Urban area—high-density semi-detached housing (Lansdowne)	Toronto, Ont., 44°	15.62	38.59	603	1975	House Sparrow 282 Starling 242 American Robin 40 Rock Dove 32 Common Grackle 12

(cont'd)

V. Urban (cont'd)

Ref. no.	Description	Area Location	Size		Density		Commonest species with densities
			ha	acres	Males/100 ha	Year	
273	Urban area—large houses and large trees (Rosemary)	Toronto, Ont., 44°	16.27	40.20	660	1975	House Sparrow 203 Starling 166 American Robin 148 Rock Dove 37 Common Grackle 37
273	Urban area—large houses and large trees (Rosedale II)	Toronto, Ont., 44°	13.11	32.39	763	1975	House Sparrow 405 Starling 168 American Robin 91 Rock Dove 77 Blue Jay 7
273	Urban area—landscaped bungalows and small trees (Etobicoke)	Toronto, Ont., 44°	7.57, 16.79*	18.7, 41.4*	621 range 648-595	1974-75	House Sparrow 266 Starling 124 American Robin 121 Common Grackle 42 Chipping Sparrow 14
273	Urban area—landscaped bungalows and small trees (O'Connor)	Toronto, Ont., 44°	14.49	35.80	597	1975	House Sparrow 353 American Robin 119 Starling 42 Common Grackle 35 Chipping Sparrow 27
273	Urban area—bungalows and medium-sized trees (Don Mills II)	Toronto, Ont., 44°	13.68	33.80	824	1975	House Sparrow 329 American Robin 153 Starling 138 Common Grackle 116 Cardinal 22 Chipping Sparrow 22 Song Sparrow 22
273	Urban area—low density, large houses, well-vegetated (Bayview)	Toronto, Ont., 44°	16.79	41.48	706	1975	House Sparrow 227 American Robin 215 Common Grackle 119 Starling 47 Mourning Dove 25
273	Urban area—new 2-storey houses and no trees (Windfield)	Toronto, Ont., 44°	12.91, 16.55*	32, 41*	164 range 128-200	1974-75	Starling 85 House Sparrow 64 Common Grackle 6 Rock Dove 3 Mourning Dove 2
241	Urban residential (area)	Waterloo, Ont., 43°	25.5	63	198	1977	Rock Dove 63 House Sparrow 59 Starling 43 Cardinal 14 American Robin 12

\*Area was 7.57 ha in 1974 and was enlarged to 16.79 ha in 1975.  
\*Area was 12.91 ha in 1974 and was enlarged to 16.55 ha in 1975.

References to plot data\*

158. (replacing ref. 158 in Prog. Notes No. 59). Buckner, C. H.; Erskine, A. J.; Lidstone, R.; McLeod, B. B.; Ward, M. 1975. The breeding bird community of coast forest stands on northern Vancouver Island. *Murrelet* 56 (3): 6-11.

160. (replacing ref. 160 in Prog. Notes No. 59). Campbell, C. A.; Dagg, A. I. 1976. Bird populations in downtown and suburban Kitchener-Waterloo, Ontario. *Ont. Field Biol.* 30: 1-22.

164. (partially replacing ref. 164 in Prog. Notes No. 59; see also refs. 229, 230, 231 below). Eagles, P. F. J. 1975a. Abandoned hayfields with few trees. *Am. Birds* 29: 1109-1110.

195. (replacing ref. 195 in Prog. Notes No. 59). Lamberton, R. D. 1976. Pages 121-126 in An avifaunal survey of Gros Morne National Park, Nfld. Parks Canada. Contract No. 74-46. Final rep. Vol. II. Pages 127-131, 132-137 and 138-143 report three additional plots not included in former ref. 195).

229. (partially replacing ref. 164 in Prog. Notes No. 59). Eagles, P. F. J. 1975b. Abandoned hayfields with scattered hedgerows. *Am. Birds* 29: 1110.

230. (partially replacing ref. 164 in Prog. Notes No. 59). Eagles, P. F. J. 1975c. Upland deciduous forest and abandoned fields. *Am. Birds* 29: 1111-1112.

231. (partially replacing ref. 164 in Prog. Notes No. 59). Eagles, P. F. J. 1975d. Wooded ravine, floodplain and river. *Am. Birds* 29: 1112-1113.

232. Campbell, C.; Donaldson, G. 1978. Hackberry-blue ash-chesnut (sic) oak savannah and old fields. *Am. Birds* 32: 78.

233. Christie, D. S.; Dalzell, B. In press. Sugar maple forest. *Am. Birds* 34.

234. Christie, D. S.; Dalzell, B. In press. Red spruce forest. *Am. Birds* 34.

235. Christie, D. S.; Dalzell, B. In press. Landscaped park area. *Am. Birds* 34.

236. Cuthbert, C. W. 1979a. Aspen forest. *Am. Birds* 33: 96.

237. Cuthbert, C. W. 1979b. Jack pine forest. *Am. Birds* 33: 98.

238. Cuthbert, C. W. 1979c. Semi-open black spruce bog. *Am. Birds* 33: 98.

239. Cuthbert, C. W.; Kyle, D. W. 1979. Aspen forest. *Am. Birds* 33: 97.

240. Desmet, K. D.; Smith, C. E. 1979. Aspen forest. *Am. Birds* 33: 96-97.

241. Donaldson, G. R.; Mutrie, D. F. 1978. Urban residential. *Am. Birds* 32: 124.

242. Dunn, E. H.; Nol, E. 1977. Cattail marsh. *Am. Birds* 31: 83.

243. Eagles, P. F. J.; Tobias, T. N. 1978. A replication of a breeding bird census. *Am. Birds* 32: 14-17.

244. Ebel, G. R. A. *et al.* 1975. Black spruce scrub-muskeg. *Am. Birds* 29: 1136-1137.

\*Arranged alphabetically here, but numbering continued from parts 1-3.

245. Erskine, A. J. 1977. Urban residential. *Am. Birds* 31: 90-91.

246. Erskine, A. J. In press. Small town, residential and commercial areas. *Am. Birds* 34.

247. Finlay, J. C.; Thormin, T. W. 1977. Breeding bird survey. 3rd yr rep. John Janzen Nat. Cent., Edmonton Parks and Recreation. Unpubl. typed rep. 129 pp. (Copy in CWS files).

248. Germain, P. unpubl. data (recalculated from Germain, P.; Morin, G. 1979. 1978 monitoring program in relation to aerial spray of insecticides against spruce budworm. A final report to For. Prot. Ltd. and NB. Dep. Nat. Resour. by Avifauna Ltée/Ltd., Moncton, NB. 43 pp.) (Note: includes additional data on one plot reported earlier, refs. 72, 74 in Prog. Notes No. 20).

249. Gotfryd, A. 1979. Mixed deciduous forest. *Am. Birds* 33: 63.

250. Guinan, D.; L'Arrivee, L. 1979. Black Spruce forest. *Am. Birds* 33: 97-98.

251. Guinan, D.; L'Arrivee, L. 1979. Mixed forest. *Am. Birds* 33: 98.

252. Harris, C. G. 1979. Interdunal meadow. *Am. Birds* 33: 76.

253. Holroyd, G. L. Unpubl. data (elaborated from Bow Valley Nat. 1978. Vermilion Lakes. Printed priv. 68 pp.)

254. Hurst, R. *et al.* 1979a. Birch-oak savannah and wetland. *Am. Birds* 33: 75-76.

255. Hurst, R. *et al.* 1979b. Dune grass-cottonwood beach. *Am. Birds* 33: 76. (Note: added census for ref. 202 in Prog. Notes No. 59).

256. Hurst, R. *et al.* 1979c. Sedge-tamarack dune pond. *Am. Birds* 33: 103-104.

257. Koonz, W. H. 1979. River bottom forest. *Am. Birds* 33: 64.

258. Koonz, W. H. Unpubl. data. *in Man. Wildl. Sector rep. on Churchill River study.* (Copy in CWS files).

259. Lamberton, R. D. 1976. An avifaunal survey of L'Anse-aux-Meadows National Historic Park, Newfoundland. Parks Can. Contract No. ARO 75-31, Final rep.

260. L'Arrivee, L.; Guinan, D. 1979. Aspen forest. *Am. Birds* 33: 96.

261. Lee, D.; Speirs, J. M. 1977. Breeding bird censuses at Big Trout Lake, 1975. *Ont. Field Biol.* 31: 48-54.

262. McCracken, J. D. 1975a. Tamarack-white cedar slough. *Am. Birds* 29: 1104. (Note: added census for refs. 201 & 206 in Prog. Notes No. 59).

263. McCracken, J. D. 1975b. White pine-white cedar forest. *Am. Birds* 29: 1104. (Note: added census for refs. 182 & 197 in Prog. Notes No. 59).

264. Nasmith, E.; Pace, D. 1977. Wooded city ravine. *Am. Birds* 31: 42-43. (Note: this and refs. 265 and 266 below are added data to refs. 37 in Prog. Notes No. 20; 139 in Prog. Notes No. 30; and 210 and 211 in Prog. Notes No. 59).

265. Nasmith, E.; Fairfield, G. 1978. Wooded city ravine. *Am. Birds* 32: 65.
266. Nasmith, E. 1979. Wooded city ravine. *Am. Birds* 33: 63.
267. Northland Associates Ltd. 1979. Terra Nova National Park avifaunal survey. Vol. I. Parks Can./Can. Wildl. Serv. Contract No. 07SC-KL103-003. Final rep. 192 pp.
268. O'Keeffe, M. S. 1975. 1975 Vermilion Pass avian survey. Final rep. Unpubl. typed rep. to Parks Can. West. Reg. Off. Calgary. 89 pp. (Copy in CWS files).
269. Ouellet, R. Unpubl. data from Quebec Ministère du Tourisme, de la Chasse et de la Pêche, Direction de la Recherche Faunique (Copy in CWS files).
270. Roach, T. 1977. Mixed hardwood forest. *Am. Birds* 31: 42.
271. Roe, N. A. 1974. Birds and disturbed forest succession after logging in Pacific Rim National Park, Vancouver Island, British Columbia, and A contribution towards the development of an interpretive plan for logged areas. Unpubl. M.Sc. Thesis. Comm. Resour. Environ. Plann. Univ. Calgary. 212 pp.
272. Roy, P. *et al.* 1975. Red oak-sugar maple forest. *Am. Birds* 29: 1094. (Note: added census for ref. 184 in Prog. Notes No. 59).
273. Savard, J.-P. 1978. Birds in metropolitan Toronto: distribution, relationships with habitat features, and nesting sites. Unpubl. M.Sc. Thesis. Dep. Zool. Univ. Toronto. 221 pp.
274. Sharp, M.; Tobias, T. N. 1978. Mixed swamp and abandoned field. *Am. Birds* 32: 78-79.
275. Skeel, M.; Bondrup-Nielsen, S. 1978. Avifauna survey of Pukaskwa National Park. Final rep. Parks Can. Contract No. CR 76-61. 259 pp.
276. Speirs, J. M. *et al.* 1978. Mixed forest. *Am. Birds* 32: 64-65.
277. Van Stam, P. H. 1977. Red pine-white pine forest. *Am. Birds* 31: 54-55.
278. Cuthbert, W. C. M.; Jones, R. E. In press. Green ash-box elder forest. *Am. Birds*, 34.