2003 Report to the Vermont Monitoring Cooperative

# Part I. Demographic Monitoring of Montane Forest Birds on Mt. Mansfield

Part II. Forest Bird Surveys on Mt. Mansfield and Lye Brook Wilderness Area

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# Part I. Demographic Monitoring of Montane Forest Birds on Mt. Mansfield

### **Christopher C. Rimmer and Kent P. McFarland**

We continued demographic monitoring and mercury sampling of Bicknell's Thrush (*Catharus bicknelli*), Blackpoll Warbler (*Dendroica strriata*), and Yellow-rumped (Myrtle) Warbler (*Dendroica coronata*) on the Mt. Mansfield ridgeline in 2003. Due to continued funding constraints, we were unable to field a full-time research team on the mountain or to conduct field studies on our established Octagon and Ranch Brook plots. Although the scope of our efforts was reduced from previous years', this represented our twelfth consecutive year of monitoring Bicknell's Thrush demographics on the Mt. Mansfield ridgeline. This report presents a brief summary of data collected in 2003.

#### **METHODS**

We used mist-netting and banding to sample breeding populations of Bicknell's Thrush, Blackpoll Warbler, and Yellow-rumped Warbler on an established study plot on the Mt. Mansfield ridgeline between c. 1155-1190 m (3800-3900 ft) elevation. On six dates between 4 June and 3 July, 12-18 nylon mist nets (12 x 2.5-m and 6 x 2.5-m, 36 mm mesh) were placed at sites that have been used annually since 1992, primarily on the Amherst, Lakeview, and Long trails. Nets were generally opened from late afternoon until dusk and from dawn until early afternoon on the following morning. Bicknell's Thrushes were captured both passively and through the use of vocal lures (tape recorded playbacks), while all warblers were passively captured. Each individual was fitted with an aluminum U.S. Fish and Wildlife Service numbered band and a unique combination of 3 plastic colored leg bands. We recorded data on age, sex, breeding condition, fat class, flight feather wear, and net site of capture. Standard morphometrics included wing chord, tail length, weight, tarsal length, culmen length, bill length from mid-nares, bill width, and bill depth. We collected a small blood sample (c. 50 µl) from the brachial vein of all adult Bicknell's Thrushes for mercury analysis. Each sample was stored in a heparinized capillary tube, refrigerated in a vaccutainer in the field, and frozen within 12-48 hours. The fifth secondaries on both wings were clipped just above the follicle and stored in plasticine envelopes for mercury analysis. We also collected the fifth tail feather on both sides for stable isotope and trace element analysis.

### **RESULTS AND DISCUSSION**

We captured 9 Bicknell's Thrushes in 2003 (Table 1). Six of these were two years or older, and 5 had been captured in at least one previous summer on the Mansfield ridgeline. One male was captured for a fourth consecutive year since 2000, while a female originally banded in 1997 but unrecorded in 1998-2000 was recaptured for a third consecutive year. Two males banded in 2001 were recaptured in 2003 after having gone undetected in 2002. These results highlight both the high survivorship and strong breeding site fidelity of adult Bicknell's Thrushes, as well as the difficulty of obtaining complete population samples in a given year. Although we have not yet performed mark-recapture analyses on these 2003 data, it is clear that multiple-year sampling is necessary to obtain accurate demographic data for individual birds. The difficulty of intensively

sampling all montane forest habitat on this study plot, due to constraints of terrain, accessibility and weather, undoubtedly causes a significant portion of the breeding population to go unsampled each year. This may be particularly true for females, with their smaller home ranges and more limited movements than males.

Band	Age <sup>a</sup>	Sex <sup>b</sup>	1997	1998	1999	2000	2001	2002	2003	Hg	Hg
Number										Blood <sup>c</sup>	S5 <sup>c</sup>
122190057	ASY	Μ				Х	X		Х	3	3
122190059	ASY	Μ				Х	Х	Х	Х	4	4
124110998	ASY	F	Х				Х	Х	Х	3	3
135192242	ASY	Μ					Х		Х	2	2
135192273	ASY	Μ						Х	Х	1	1
135192274	ASY	F							Х	1	1
135192275	SY	Μ							Х	1	1
135192286	ASY	Μ							Х	1	1
135192289	SY	Μ							Х	1	1

Table 1. Bicknell's Thrush capture histories on Mt. Mansfield ridgeline, 1997-2003.

<sup>a</sup> age in 2003: ASY = after-second year ( $\geq 2$  years old); HY = hatching-year (< 1 year old)

<sup>b</sup> M = male; F = female

<sup>c</sup> number of years in which Hg samples collected

We obtained archival blood and feather samples from all 9 Bicknell's Thrushes for mercury analysis (Table 1). Two birds provided samples for a third year, another for a second, and one male yielded a fourth consecutive year of samples. These will be invaluable for examining within-year variability in blood mercury levels (a reflection of short-term dietary uptake) and chronic systemic mercury sequestering through feather growth. These data will be reported in a paper to be submitted to Ecotoxicology in May of 2004.

We captured 25 Blackpoll Warblers in 2003 (Table 2), a dramatic increase from the 9 birds captured in 2002. Six of these had been captured in a previous year. One male was originally banded in 1999, two birds in 2000, two in 2001. Of the 6 recaptured birds, 5 had gone undetected in at least one year subsequent to their original capture year. This suggests that some individuals moved home ranges outside our netting areas between years, or that our sampling intensity is inadequate to ensure high recapture probabilities between years. Our qualititative impression was that numbers of Blackpoll Warblers were higher on the Mt. Mansfield ridgeline in 2003 than in 2002, which was an exceptionally low year. However, our long-term point count data did not reflect this, as the 2003 population index matched that of 2002, the lowest recorded since monitoring began in 1991 (Faccio and Rimmer 2003 VMC report). We can only speculate that the increased numbers of banded Blackpoll Warblers in 2003, 7 of which were yearling birds, may have reflected in part unmated, nonterritorial birds that were not detected during point counts. The long-term demographics of this species on the Mansfield ridgeline warrant further close study.

Band	Age <sup>a</sup>	Sex <sup>b</sup>	1999	2000	2001	2002	2003
Number	U						
175062366	ASY	М			1		2
175062383	ASY	F			1		1
178001040	SY	F					1
239048423	ASY	Μ	2	1			1
239048483	ÁSY	F		1			1
239049211	ASY	Μ		1		2	2
239049445	ASY	Μ				1	1
239049456	ASY	F					1
239049457	SY	Μ					1
239049459	AHY	F					1
239049460	AHY	F					2
239049462	AHY	F					2
239049463	AHY	F					1
239049469	AHY	F					1
239049470	SY	Μ					3
239049472	SY	F					1
239049473	SY	F					1
239049474	ASY	Μ					1
239049478	ASY	Μ					1
239049479	SY	Μ					1
239049480	SY	Μ					1
239049484	ASY	Μ					1
239049486	SY	Μ					1
239049487	SY	Μ					1
239049488	AHY	М					1

Table 2. Blackpoll Warbler capture histories on Mt. Mansfield ridgeline, 2000-2002. Numbers under each year indicate number of captures in that year.

<sup>a</sup> age in 2003: ASY = after-second year ( $\geq 2$  years old); SY = second-year (1 year old); AHY = after-hatching year ( $\geq 1$  year old)

<sup>b</sup> M = male; F = female

We captured 13 adult Yellow-rumped Warblers on the Mt. Mansfield ridgeline in 2003 (Table 3). None had been banded in a previous year, and 6 of the 11 known-aged birds were yearlings. Sampling intensity was too low to permit meaningful conclusions about return rates or site fidelity, but this was a very surprising result, given the incidence of returning adults in both 2001 and 2002. Point count data showed a decline from 2003's record high index, but this species continues to show an increase on the Mansfield ridgeline (Faccio and Rimmer 2003 VMC report).

Band	Age <sup>a</sup>	Sex <sup>b</sup>	2003 <sup>c</sup>
Number			
239049454	SY	F	1
239049455	ASY	Μ	2
239049458	SY	Μ	1
239049461	AHY	F	1
239049464	AHY	F	2
239049465	ASY	Μ	2
239049466	ASY	Μ	1
239049467	ASY	Μ	2
239049468	SY	Μ	1
239049471	SY	F	1
239049475	SY	F	1
239049476	SY	F	1
239049477	ASY	Μ	1

Table 3. Yellow-rumped Warbler capture histories on Mt. Mansfield ridgeline, 2003.

- <sup>a</sup> age in 2002: ASY = after-second year (≥ 2 years old); SY = second-year (1 year old); AHY = after-hatching year (≥ 1 year old)
- <sup>b</sup> M = male; F = female
- <sup>c</sup> number of captures in 2003

In summary, 2003 montane forest bird research on Mt. Mansfield was characterized by the continuation of scaled-back efforts from those conducted in 1992-2002. This resulted in relatively small sample sizes of marked individuals. Although constant-effort mist-netting and banding may be an effective and valid means to monitor avian population dynamics on Mt. Mansfield, it appears that at least 6-8 annual visits will be necessary to obtain adequate data for robust metrics of survivorship, population turnover, and site fidelity via mark-recapture analyses. Our plans for 2004 are to increase our sampling intensity from 2002-2003 levels and to continue collection of blood and feather samples for mercury analysis. We will especially target known-identity individuals for which we have data on mercury levels from previous years. These present an opportunity to obtain data that are virtually unique among free-ranging wildlife and are especially important to understand patterns of mercury burdens in montane forest birds.

### Forest Bird Surveys on Mt. Mansfield and Lye Brook Wilderness Area

## Steven D. Faccio and Christopher C. Rimmer

In 2003, the Vermont Institute of Natural Science (VINS) conducted breeding bird censuses at 2 permanent study sites on Mt. Mansfield and on 1 site at the Lye Brook Wilderness Area (LBWA) of the Green Mountain National Forest. The Mt. Mansfield Ridgeline was surveyed for the 13<sup>th</sup> consecutive year, while the Ranch Brook site was censused for the 9<sup>th</sup> consecutive year. Our permanent study site at Underhill State Park was not surveyed during 2003 due to observer time constraints. A new observer has been enlisted to conduct future surveys at Underhill beginning in 2004. The Underhill State Park site consisted of mature northern hardwoods at an elevation of 671 m (2200 ft), while the Ridgeline site, at 1158 m (3800 ft), consisted of montane fir-spruce. The Ranch Brook site ranged between 975 and 1097 m (3200 and 3600 ft), and was dominated by a paper birch-fir canopy. The LBWA study site, located in Winhall, Vermont just north of Little Mud Pond, was characterized by mature northern hardwoods at an elevation of 701 m (2300 ft). The LBWA was first surveyed in 2000.

These four study sites are part of VINS' long-term Forest Bird Monitoring Program (FBMP). This program was initiated in 1989 with the primary goals of conducting habitat-specific monitoring of forest interior breeding bird populations in Vermont and tracking long-term changes (Faccio et al. 1998). As of 2003, VINS had established 38 monitoring sites in 9 different forested habitats in Vermont, with additional sites in New York, Maine, and Massachusetts. A complementary, volunteer-based, long-term monitoring program, called Mountain Birdwatch, was initiated in 2000 to collect census data on five common montane forest bird species throughout the Northeast. In addition to collecting data on bird populations at each site, baseline habitat measurements have been collected at 25 "low elevation" FBMP sites (< 2500 feet elevation) including Underhill State Park and Lye Brook Wilderness.

### Methods

# **Bird Surveys**

Surveys were conducted by VINS staff biologists at the Mt. Mansfield Ridgeline and Ranch Brook sites, and by a skilled volunteer at the Lye Brook site. Survey methods consisted of unlimited distance point counts, based on the approach described by Blondel et al. (1981) and used in Ontario (Welsh 1995). The count procedure was as follows:

- 1) Counts began shortly after dawn on days where weather conditions were unlikely to reduce count numbers (i.e., calm winds and very light or no rain). Censusing began shortly (<1min.) after arriving at a station.
- 2) Observers recorded all birds seen and heard during a 10-min sampling period, which was divided into 3 time intervals: 3, 2, and 5 mins. Observers noted in which time interval each bird was first encountered and were careful to record individuals only once. To reduce duplicate records, individual birds were mapped on standardized field cards and known or presumed movements noted. Different symbols were used to record the status of birds encountered (i.e., singing male, pair observed, calling bird, etc.).
- 3) Each site, consisting of 5 point count stations, was sampled twice during the breeding season; once during early June (ca. 2-12 June) and once during late June (ca. 14-25 June). Observers were encouraged to space their visits 7-10 days apart. For each site visit, all stations were censused in a single morning and in the same sequence.

In summarizing data for analysis, the maximum count for each species was used as the station estimate for each year. All birds seen or heard were each counted as 1 individual unless a family group or

active nest was encountered, in which case they were scored as a breeding pair, or 2 individuals. Population trends were calculated for the 8 most commonly encountered species at each of the 2 Mt. Mansfield study sites using simple linear regression. For each species, the slope of the regression line was used as the annual change in population. Regression analyses were done using SYSTAT 10.2.

#### **Baseline Habitat Measurements**

Baseline habitat metrics were collected during 2002 for 25 FBMP sites located at elevations below 2,500 feet. Both the Underhill State Park and Lye Brook Wilderness study sites were included in this data set. We characterized the vegetation at each site through measurements at four 11.3 m radius plots within 50 m of each census point location (4 vegetation plots per census point; 500 plots total). Within each vegetation plot we quantified the forest canopy, understory, and ground cover in 30 measurements, and tabulated plant species richness and abundance by age class following the BBIRD protocol (Martin et al. 1997). These data provide a baseline of forest characterization that can be used to compare forest attributes between study sites, correlate to bird abundances, and periodically measured at the same locations to monitor forest change over time.

## **Results and Discussion**

#### **Bird Surveys**

A combined total of 47 avian species was detected during breeding bird surveys at three study sites on Mt. Mansfield since 1991. Species richness was the same at both of the montane forest sites, with 30 species detected. Surveys at Ranch Brook averaged a greater number of individuals and species per year than the higher elevation and more exposed montane Ridgeline site (Tables 1 and 2). The first 4 years of surveys at the mid-elevation, Lye Brook Wilderness site, show a similar species composition to that of other northern hardwood sites, including Underhill State Park. A total of 34 species have been detected at the Lye Brook site, with a mean of 71.5 individuals of 19 species (Table 3).

On the Mt. Mansfield Ridgeline plot in 2003, species richness was above the 12-year average, while numerical abundance was below average, with 61 individuals of 15 species detected (Table 1). Of the 8 most commonly recorded species, all but Purple Finch were below the 12-year average. Population trends for these 8 species were relatively stable, although the maximum counts of 3 Blackpoll Warblers and 6 Bicknell's Thrush matched the lowest in the count's history.

At the Ranch Brook study site in 2003, both the number of individuals and species richness were below the 9-year average, with 82 individuals of 15 species detected (Table 2). Among the 8 most common species, half were below the 9-year mean. Significant population trends were evident for 2 of these species: Yellow-rumped Warbler showed an annual increase of 0.72 ( $\pm$  1.82 SE) ( $r^2 = 0.571$ ; P = 0.019); and White-throated Sparrow showed a decline of 1.05 per year ( $\pm$  3.81 SE) ( $r^2 = 0.394$ ; P = 0.070). Unlike the Ridgeline plot, Blackpoll Warbler numbers remained stable at Ranch Brook, although the count of 1 Bicknell's Thrush was the lowest ever recorded at the site.

At Lye Brook, both the number of individuals and species richness were below the 4-year average, with 57 individuals of 17 species detected (Table 3). The total number of individuals was considerably lower than the previous 3 years, and is reflected by single counts for 7 species, and zero counts for 2 of the 8 most common species; Yellow-bellied Sapsucker and Winter Wren. Among the 8 most common species, three were above the 4-year average (Hermit Thrush, Black-throated Blue Warbler, and White-throated Sparrow). Trend analyses were not conducted for Lye Brook, as 4 years is too short a period over which to assess meaningful trends.

#### **Baseline Habitat Measurements**

A comparison of vegetation measurements from the northern hardwood sites located at Underhill State Park and the Lye Brook Wilderness revealed a striking difference in the amount of herbaceous ground cover present (Figure 1). Compared to Lye Brook, Underhill had a higher percentage of forbs, ferns, mosses, shrubs, and total green vegetated cover. This difference may be due to the gentle "washing" of nutrients and organic matter from the upper slopes of Mt. Mansfield enriching the midelevation Underhill site. Such downslope movement cannot occur at Lye Brook which is located along a plateau of the Southern Green Mountains. As expected, both study sites had a high degree of canopy closure (> 90%), and well-developed layers of leaf litter.

### Conclusions

Bird surveys on Mt. Mansfield are beginning to show some interesting patterns, and the population fluctuations evident for some species underscore the need for continued monitoring and development of a long-term database. However, population trend estimates must be interpreted carefully. The site-specific trends presented for Mt. Mansfield are preliminary, short-term trends from a limited geographic sample. Changes in survey counts may simply reflect natural fluctuations, variable detection rates, and/or a variety of dynamic factors, such as prey abundance, overwinter survival, and habitat change. Several years of additional data collection, their correlation with other VMC data, and comparison with census data from other ecologically similar sites will be necessary to elucidate meaningful population trends of various species at these sites.

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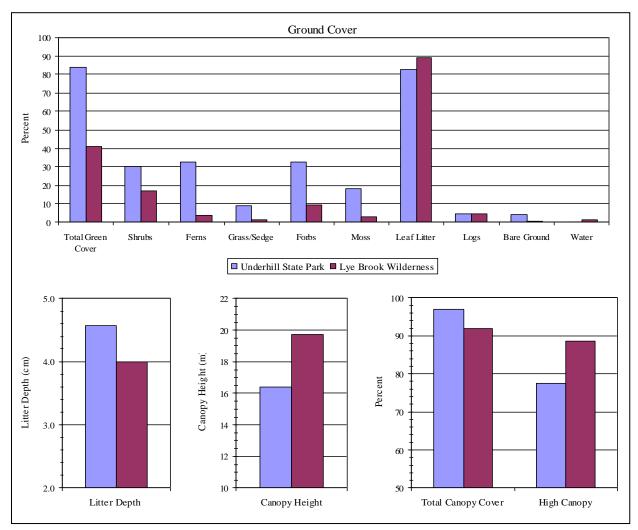


Fig. 1. Comparison of habitat measurements at Underhill State Park and Lye Brook

Common Name	<b>'91</b>	<b>'92</b>	<b>'93</b>	<b>'94</b>	<b>'</b> 95	<b>'96</b>	<b>'97</b>	<b>'98</b>	<b>'99</b>	<b>'00</b>	<b>'01</b>	<b>'02</b>	<b>'03</b>	Mean	SD	$\mathbf{r}^2$	Trend	SE
Red Squirrel											1			0.08	0.28			
Sharp-shinned Hawk										1				0.08	0.28			
Hairy Woodpecker				1										0.08	0.28			
Northern Flicker			1		••••••		••••••						••••••	0.08	0.28			
Yellow-bellied Flycatcher			1		1	2	3		1	1	1	1	2	1.00	0.91	-		
Alder Flycatcher							1							0.08	0.28			
Red-eyed Vireo			••••••		••••••		••••••		1		••••••		••••••	0.08	0.28	-		
Blue Jay		1												0.08	0.28	-		
Common Raven			1		••••••	1	••••••		1	1		1	1	0.46	0.52			
Red-breasted Nuthatch	1	2	3	1	3	1	••••••	1	2		1		••••••	1.15	1.07			
Winter Wren	10	9	7	4	5	2	4	10	8	4	4	7	3	5.92	2.72	0.154	-0.275	2.61
Golden-crowned Kinglet										1				0.08	0.28			
Ruby-crowned Kinglet		2			1		••••••					1	1	0.38	0.65			
Bicknell's Thrush	6	15	11	8	10	11	9	9	8	7	9	9	6	9.08	2.40	0.176	-0.258	2.272
Swainson's Thrush	3	8	1	1	3	6	7	5	4	3	3	2	2	3.69	2.21	0.009	-0.115	2.263
Hermit Thrush			••••••		••••••		••••••				1		1	0.15	0.38			
American Robin	1	4	1	2	2	2	2	1	1	3	3	2	6	2.31	1.44			
Cedar Waxwing		1	4				9							1.08	2.63			
Nashville Warbler	2		••••••		••••••	2	3	1	1		1		1	0.85	0.99			
Magnolia Warbler	1	2				3	1	1			1		3	0.92	1.12			
Yellow-rumped Warbler	9	11	8	9	8	12	10	13	11	9	11	14	10	10.38	1.85	0.214	0.220	1.713
Blackpoll Warbler	8	9	9	7	7	15	10	10	9	8	8	3	3	8.15	3.05	0.189	-0.341	2.869
Ovenbird			1						1					0.15	0.38	-		
Canada Warbler							1							0.08	0.28			
Lincoln's Sparrow	2		••••••		••••••	1	••••••		••••••		••••••		••••••	0.23	0.60	-		
White-throated Sparrow	6	14	14	12	14	13	20	14	19	14	18	11	13	14.00	3.61	0.127	0.330	3.519
Dark-eyed Junco	3	9	6	2	5	5	9	8	7	2	7	6	5	5.69	2.36	0.005	0.044	2.457
Purple Finch	2	4	1	2	3	2	2	1	4	2	3	4	4	2.62	1.12	0.161	0.115	1.073
White-winged Crossbill			••••••		8		1	1	•••••		••••••		••••••	0.77	2.20	-		
Pine Siskin		1			1		2	1			11			1.23	3.00			
Evening Grosbeak		2												0.15	0.55			
Species Richness <sup>a</sup>	13	16	15	11	14	15	17	14	15	13	15	12	15	14.23	1.64			
Number of Individuals <sup>a</sup>	54	94	69	49	71	78	94	76	78	56	80	61	61	69.69	13.85			
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Table 1. Maximum counts of individual birds, and population trends from linear regression analysis for the 8 most common species (bold type) at Mt. Mansfield Ridgeline, 1991-2003.

<sup>a</sup> Does not include counts of Red Squirrel

analysis for the 8 most Common Name	<b>'95</b>	<b>'96</b>	<b>'97</b>	·98	·99	• <u>00</u>	<b>'01</b>	<b>'02</b>	·03	Mean	SD	r <sup>2</sup>	Trend	SE
Red Squirrel					4		1		7	1.33	2.50			
Sharp-shinned Hawk				1						0.11	0.33			
Mourning Dove						1	1			0.22	0.44			
Ruby-throated Hummingbird			•••••			1				0.11	0.33			
Hairy Woodpecker	1		•••••							0.11	0.33			
Pileated Woodpecker							2			0.22	0.67			
Yellow-bellied Flycatcher	4	4	4	3	3	4	2	4	4	3.56	0.73	0.036	-0.050	0.763
Red-eyed Vireo			•••••	1						0.11	0.33			
Blue Jay	1									0.11	0.33			
Common Raven		4	3	4		4	2			1.89	1.90			
Black-capped Chickadee	1		•••••							0.11	0.33			
Red-breasted Nuthatch	7		2		6		2		2	2.11	2.67			
Winter Wren	8	3	7	10	9	10	5	5	9	7.33	2.50	0.012	0.100	2.657
Golden-crowned Kinglet			••••••	1	3	1		3		0.89	1.27			
Ruby-crowned Kinglet	3		3			3			1	1.11	1.45			
Bicknell's Thrush	5	6	7	5	5	6	2	8	1	5.00	2.24	0.150	-0.317	2.203
Swainson's Thrush	6	15	9	5	3	4	8	11	10	7.89	3.82	0.000	0.017	4.086
Hermit Thrush	1		3							0.44	1.01			
American Robin		2	2	2	1	1	1	1	3	1.44	0.88			
Cedar Waxwing				1			1			0.22	0.44			
Nashville Warbler		1	3	2	1	3		3	4	1.89	1.45			
Northern Parula									1	0.11	0.33			
Magnolia Warbler	2	4	4	2	3	5	4	2	4	3.33	1.12			
Black-throated Blue Warbler	1									0.11	0.33			
Yellow-rumped Warbler	5	6	4	5	7	11	9	11	8	7.33	2.60	0.571	0.717**	1.820
Blackpoll Warbler	9	9	15	8	3	8	7	8	8	8.33	3.08	0.116	-0.383	3.098
White-throated Sparrow	22	11	12	9	8	7	7	10	10	10.67	4.58	0.394	-1.050*	3.814
Dark-eyed Junco	9	5	3	2	5	2	5	4	4	4.44	2.19	0.126	-0.283	2.185
Purple Finch	2	1	4	4	2	4	4		6	3.00	1.87			
White-winged Crossbill	8		2		1		6			1.89	3.02			
Pine Siskin	12		1		7					2.22	4.32			
Species Richness <sup>a</sup>	19	13	18	17	16	17	18	12	15	16.11	2.37			
Number of Individuals <sup>a</sup>	107	71	88	65	67	75	69	82	82	78.44	13.23			

Table 2. Maximum counts of individual birds, and population trends from linear regression analysis for the 8 most common species (bold type) at Ranch Brook 1995-2003

<sup>a</sup> Does not include counts of Red Squirrel \*\* P = 0.019

\* P = 0.070

Common Name	2000	2001	2002	2003	Mean	SD
Eastern Chipmunk	2			1	0.75	0.96
Red Squirrel	1	1			0.50	0.58
Ruffed Grouse	1				0.25	0.50
Mourning Dove		1			0.25	0.50
Barred Owl	1				0.25	0.50
Chimney Swift	2				0.50	1.00
Yellow-bellied Sapsucker	5	6			2.75	3.20
Downy Woodpecker	1		1		0.50	0.58
Hairy Woodpecker	2	1	2		1.25	0.96
Unidentified Woodpecker	3				0.75	1.50
Pileated Woodpecker	1		3	1	1.25	1.26
Eastern Wood-Pewee				1	0.25	0.50
Least Flycatcher	2				0.50	1.00
Great Crested Flycatcher				1	0.25	0.50
Blue-headed Vireo		1	4	1	1.50	1.73
Red-eyed Vireo	10	6	9	4	7.25	2.75
Blue Jay		3		1	1.00	1.41
Black-capped Chickadee	1	1		2	1.00	0.82
Brown Creeper	1				0.25	0.50
Winter Wren	7		1		2.00	3.37
Swainson's Thrush	2		1	3	1.50	1.29
Hermit Thrush	4	2	6	5	4.25	1.71
American Robin	1		1		0.50	0.58
Cedar Waxwing	1				0.25	0.50
Northern Parula				3	0.75	1.50
Magnolia Warbler	1		3		1.00	1.41
Black-throated Blue Warbler	9	7	10	9	8.75	1.26
Yellow-rumped Warbler	2	1			0.75	0.96
Black-throated Green Warbler	8	10	4	6	7.00	2.58
Blackburnian Warbler	5				1.25	2.50
American Redstart	2	1	3	1	1.75	0.96
Ovenbird	15	13	19	11	14.50	3.42
Canada Warbler	1				0.25	0.50
Scarlet Tanager	1		3	2	1.50	1.29
White-throated Sparrow	2		2	4	2.00	1.63
Dark-eyed Junco	2	3	1	1	1.75	0.96
Rose-breasted Grosbeak	2	1			0.75	0.96
Species Richness <sup>a</sup>	28	15	17	17	19.25	5.91
Number of Individuals <sup>a</sup>	126	73	90	57	71.50	19.12

Table 3. Maximum counts of individual birds at Lye Brook Wilderness Area, 2000-2003. The eight most common species are listed in bold type.

<sup>a</sup> Does not include counts of Red Squirrel or Eastern Chipmunk