2002 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

Submitted by:

Vermont Institute of Natural Science
27023 Church Hill Road
Woodstock, VT 05091
802-457-2779
E-mail: crimmer@vinsweb.org

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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 2002. Due to funding constraints, we were unable to maintain a full-time research team on the mountain or to continue field studies on our established Octagon and Ranch Brook plots. Although the scope of our efforts was reduced from previous years', this represented our eleventh consecutive year of monitoring Bicknell's Thrush demographics on the Mt. Mansfield ridgeline. This report presents a brief summary of data collected in 2002.

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 five dates between 8 June and 2 July, and on 26 August, 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 and most individuals of the other two species 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. On adult Bicknell's Thrushes, 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 7 Bicknell's Thrushes in 2002 (Table 1). Six of these were adult birds, and five had been captured in at least one previous summer on the Mansfield ridgeline. One male was captured for a sixth consecutive year, another for a fourth. Of the two females, one had originally been banded in 1997, then was unrecorded for 3 consecutive years before being recaptured in both 2001 and 2002. One male banded in 2000 was recaptured in 2002 after having gone undetected in 2001. 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 2002 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.

Table 1. Bicknell's Thrush capture histories on Mt. Mansfield ridgeline, 1997-2002. Numbers under each year indicate number of captures in that year.

Band Number	Age[a]	Sex[b]	1997	1998	1999	2000	2001	2002	Hg Blood[c]	Hg S5[c]
122180064	ASY	M	3	2	2	1	6	1	2	2
122190051	ASY	M				1		1	2	2
122190059	ASY	M				1	1	1	2	2
124110998	ASY	F	2				1	1	2	2
135192104	ASY	M			3	2	2	1	3	3
135192256	ASY	F						2	1	1
135192268	HY	U						1	0	0

[a] age in 2002: ASY = after-second year (≥ 2 years old); HY = hatching-year (< 1 year old)

[b] M = male; F = female; U = unknown

[c] number of years in which Hg samples collected

We obtained archival blood and feather samples from all adult Bicknell's Thrushes for mercury analysis (Table 1). Four birds provided samples for a second year, while one male yielded a third 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.

We captured 9 Blackpoll Warblers in 2002 (Table 2), of which only two had been captured in a previous year. Given the abundance of this species on the Mansfield ridgeline, this was a surprisingly low number. Although our sampling intensity in 2002 does not permit adequate comparisons with previous years, our qualititative impression was that numbers of this species were reduced on the Mt. Mansfield ridgeline in 2002. Our long-term point count data clearly reflected this, with the lowest recorded index since monitoring began in 1991 (Faccio and Rimmer 2002 VMC report). We can only speculate that the decreased numbers of adult Blackpoll Warblers resulted in part from the species' poor breeding success in 2001, when the 3 of 4 nests monitored on the Mt. Mansfield ridgeline failed due to severe weather.

We collected Hg blood samples from 5 adult Blackpoll Warblers in 2002 (Table 2). These are currently being analyzed for total mercury and methymercury at Texas A&M University Trace Element Research Laboratory.

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

Band Number	Age[a]	Sex[b]	2000	2001	2002	Hg Blood[c]
175062353	ASY	F		2	1	
239049211	ASY	M	1		2	1
239049439	SY	M			1	1
239049442	SY	M			1	
239049445	AHY	M			1	1
239049447	AHY	F			1	
239049448	AHY	F			1	
239049449	SY	M			1	1
239049450	SY	F			1	1

[a] age in 2002: ASY = after-second year (≥ 2 years old); SY = second-year (1 year old); AHY = after-hatching year (≥ 1 year old)

[b] M = male; F = female

[c] number of years in which Hg samples collected

We captured 13 adult Yellow-rumped Warblers on the Mt. Mansfield ridgeline in 2002 (Table 3). Two of these had been banded in 2000, but no birds mist-netted in 2001 were captured in 2001. Again, sampling intensity was too low to permit meaningful conclusions about return rates or site fidelity, but this was a surprising result, given the generally higher return rates of 2000 birds that we obtained in 2001. Point count data showed a continuing increase in this species on the ridgeline, with the 2002 index reaching its highest level since counts began in 1991 (Faccio and Rimmer 2002 VMC report).

We collected five blood samples from Yellow-rumped Warblers in 2002 (Table 3), and these are currently being analyzed for total mercury and methylmercury content by Texas A&M Trace Element Research Laboratory.

In summary, 2002 montane forest bird research on Mt. Mansfield was characterized by a scaled-back effort that resulted in 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 is clear 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 2003 are to increase our sampling intensity from 2002 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.

Table 3. Yellow-rumped Warbler capture histories on Mt. Mansfield ridgeline, 2000-2002. Numbers under each year indicate number of captures in that year.

Band Number	Age[a]	Sex[b]	2000	2001	2002	Hg Blood[c]
239049207	ASY	M	1		2	1
239049251	AHY	M	1		1	
239049302	ASY	M			2	
239049303	SY	M			1	
239049438	AHY	F			1	1
239049440	SY	M			1	
239049441	ASY	M			1	
239049443	SY	F			1	1
239049444	ASY	M			1	
239049446	AHY	F			1	
239049451	SY	M			1	1
239049452	SY	F			1	1
239049453	AHY	M			1	

[a] age in 2002: ASY = after-second year (≥ 2 years old); SY = second-year (1 year old); AHY = after-hatching year (≥ 1 year old)

[b] M = male; F = female

[c] number of years in which Hg samples collected

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

Steven D. Faccio and Christopher C. Rimmer

In 2002, the Vermont Institute of Natural Science (VINS) conducted breeding bird censuses at 3 permanent study sites on Mt. Mansfield and 1 site at the Lye Brook Wilderness Area (LBWA) of the Green Mountain National Forest. Two of the Mt. Mansfield sites, Underhill State Park and the Ridgeline, were surveyed for the twelfth consecutive year, while the Ranch Brook site was censused for an eighth consecutive year. 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 2002, VINS had established 37 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.

Methods

Surveys were conducted by VINS staff biologists at the Mt. Mansfield Ridgeline and Ranch Brook sites, and by skilled volunteers at the Underhill State Park and Lye Brook sites. 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 3 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.

Results

A combined total of 47 avian species was detected during breeding bird surveys at three study sites on Mt. Mansfield. The two montane forest sites had similar species richness, with 30 and 29 species detected at Mt. Mansfield Ridgeline and Ranch Brook, respectively. 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 mid-elevation, northern hardwood site at Underhill State Park yielded the highest species richness, with a total of 41 species encountered since 1991 and a mean of 20.4 species per year (Table 3). The first 3 years of surveys at the mid-elevation, Lye Brook Wilderness site, were somewhat variable, probably resulting from changes in observers. However, the observer that surveyed the site in 2002, has agreed to conduct the Lye Brook census for the foreseeable future. A total of 32 species have been detected at the Lye Brook site, with a mean of 96.3 individuals of 20 species (Table 4).

Mt. Mansfield Trends

On the Mt. Mansfield Ridgeline plot in 2002, both overall numerical abundance and species richness were below the 11-year average, with 61 individuals of 12 species detected (Table 1). Of the 8 most commonly recorded species, 4 were above and 4 were below the 2001 totals. Likewise, 4 species were above and 4 below the 12-year mean. Population trends for these 8 species were relatively stable, although Yellow-rumped Warblers continued an upward trend ($r^2 = 0.309$; $P = 0.061$), and the maximum count of 3 Blackpoll Warblers was the lowest in the counts history.

At the Ranch Brook study site in 2002, the number of individuals was above the 8-year average while species richness was below average, with 82 individuals of 12 species detected (Table 2). Among the 8 most common species, 7 (87.5%) increased over 2001 counts; of these 3 were below the 8-year mean. Significant population trends were evident for 2 of these species: Yellow-rumped Warbler, which equaled its highest maximum count of the period, showed an annual increase of 0.95 (± 1.60 SE) ($r^2 = 0.71$; $P = 0.008$); and White-throated Sparrow showed a decline of 1.43 per year (± 3.69 SE) ($r^2 = 0.51$; $P = 0.046$). Unlike the Ridgeline plot, Ranch Brook showed no drop in Blackpoll Warbler numbers.

At Underhill State Park, both overall numerical abundance and species richness was below the 12-year mean, with 48 individuals of 16 species encountered (Table 3). Of the 8 most common species, 5 (62.5%) were recorded below the 1991-2002 mean. Two forest-interior species maintained positive population trends, with Red-eyed Vireo increasing at 0.41 annually (± 1.62 SE) ($r^2 = 0.48$; $P = 0.012$), and Black-throated Green Warbler increasing at 0.31 annually (± 1.31 SE) ($r^2 = 0.45$; $P = 0.017$). In addition, Canada Warbler, a species listed by Partner's in

Flight as a High Priority for the Northern New England Region (Rosenberg and Hodgman 2000), showed a decline of 0.20 annually (±1.10) ($r^2 = 0.31$; $P = 0.060$).

Discussion

Bird surveys on Mt. Mansfield are beginning to show 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.

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, 1991-2002.

Common Name	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Mean	SD	r^2	Trend	SE
Red Squirrel											1		0.08	0.29			
Sharp-shinned Hawk										1			0.08	0.29			
Hairy Woodpecker				1									0.08	0.29			
Northern Flicker			1										0.08	0.29			
Yellow-bellied Flycatcher			1		1	2	3		1	1	1	1	0.92	0.90			
Alder Flycatcher							1						0.08	0.29			
Red-eyed Vireo									1				0.08	0.29			
Blue Jay		1											0.08	0.29			
Common Raven			1			1			1	1		1	0.42	0.51			
Red-breasted Nuthatch	1	2	3	1	3	1		1	2		1		1.25	1.06	0.264	-0.150	0.95
Winter Wren	10	9	7	4	5	2	4	10	8	4	4	7	6.17	2.69	0.084	-0.217	2.70
Golden-crowned Kinglet										1			0.08	0.29			
Ruby-crowned Kinglet		2			1							1	0.33	0.65			
Bicknell's Thrush	6	15	11	8	10	11	9	9	8	7	9	9	9.33	2.31	0.087	-0.189	2.31
Swainson's Thrush	3	8	1	1	3	6	7	5	4	3	3	2	3.83	2.25	0.014	-0.070	2.34
Hermit Thrush											1		0.08	0.29			
American Robin	1	4	1	2	2	2	2	1	1	3	3	2	2.00	0.95			
Cedar Waxwing		1	4				9						1.17	2.72			
Nashville Warbler	2					2	3	1	1		1		0.83	1.03			
Magnolia Warbler	1	2				3	1	1			1		0.75	0.97			
Yellow-rumped Warbler	9	11	8	9	8	12	10	13	11	9	11	14	10.42	1.93	0.309	0.297	1.68
Blackpoll Warbler	8	9	9	7	7	15	10	10	9	8	8	3	8.58	2.75	0.069	-0.199	2.78
Ovenbird			1						1				0.17	0.39			
Canada Warbler							1						0.08	0.29			
Lincoln's Sparrow	2					1							0.25	0.62			
White-throated Sparrow	6	14	14	12	14	13	20	14	19	14	18	11	14.08	3.75	0.200	0.465*	3.52
Dark-eyed Junco	3	9	6	2	5	5	9	8	7	2	7	6	5.75	2.45	0.016	0.087	2.55
Purple Finch	2	4	1	2	3	2	2	1	4	2	3	4	2.50	1.09	0.077	0.084	1.10
White-winged Crossbill					8		1	1					0.83	2.29			
Pine Siskin		1			1		2	1			11		1.33	3.11			
Evening Grosbeak		2											0.17	0.58			
Species Richness [a]	13	16	15	11	14	15	17	14	15	13	15	12	14.17	1.70			
Number of Individuals [a]	54	94	69	49	71	78	94	76	78	56	80	61	70.42	14.21			

[a] Does not include counts of Red Squirrel

* $P = 0.061$

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, 1995-2002.

Common Name	1995	1996	1997	1998	1999	2000	2001	2002	Mean	SD	r^2	Trend	SE
Red Squirrel					4		1		0.63	1.41			
Sharp-shinned Hawk				1					0.13	0.35			
Mourning Dove						1	1		0.25	0.46			
Ruby-throated Hummingbird						1			0.13	0.35			
Hairy Woodpecker	1								0.13	0.35			
Pileated Woodpecker							2		0.25	0.71			
Yellow-bellied Flycatcher	4	4	4	3	3	4	2	4	3.50	0.76	0.149	-0.119	0.75
Red-eyed Vireo				1					0.13	0.35			
Blue Jay	1								0.13	0.35			
Common Raven		4	3	4		4	2		2.13	1.89			
Black-capped Chickadee	1								0.13	0.35			
Red-breasted Nuthatch	7		2		6		2		2.13	2.85			
Winter Wren	8	3	7	10	9	10	5	5	7.13	2.59	0.001	-0.036	2.79
Golden-crowned Kinglet				1	3	1		3	1.00	1.31			
Ruby-crowned Kinglet	3		3			3			1.13	1.55			
Bicknell's Thrush	5	6	7	5	5	6	2	8	5.50	1.77	0.001	-0.024	1.91
Swainson's Thrush	6	15	9	5	3	4	8	11	7.63	4.00	0.015	-0.202	4.28
Hermit Thrush	1		3						0.50	1.07			
American Robin		2	2	2	1	1	1	1	1.25	0.71			
Cedar Waxwing				1			1		0.25	0.46			
Nashville Warbler		1	3	2	1	3		3	1.63	1.30			
Magnolia Warbler	2	4	4	2	3	5	4	2	3.25	1.16			
Black-throated Blue Warbler	1								0.13	0.35			
Yellow-rumped Warbler	5	6	4	5	7	11	9	11	7.25	2.76	0.712	0.952*	1.60
Blackpoll Warbler	9	9	15	8	3	8	7	8	8.38	3.29	0.145	-0.512	3.29
White-throated Sparrow	22	11	12	9	8	7	7	10	10.75	4.89	0.512	-1.429*	3.69
Dark-eyed Junco	9	5	3	2	5	2	5	4	4.50	2.33	0.141	-0.357	2.33
Purple Finch	2	1	4	4	2	4	4		2.63	1.60			
White-winged Crossbill	8		2		1		6		2.13	3.14			
Pine Siskin	12		1		7				2.50	4.54			
Species Richness [a]	19	13	18	17	16	17	18	12	16.25	2.49			
Number of Individuals [a]	107	71	88	65	67	75	69	82	78.00	14.07			

[a] Does not include counts of Red Squirrel

$P < 0.05$

Table 3. Maximum counts of individual birds, and population trends from linear regression analysis for the 8 most common species (bold type) at Underhill State Park, 1991-2002.

Common Name	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	Mean	SD	r^2	Trend	SE
Eastern Chipmunk							3		5				0.67	1.61			
Red Squirrel							1		3		1		0.42	0.90			
Broad-winged Hawk							1						0.08	0.29			
Mourning Dove									1				0.08	0.29			
Yellow-bellied Sapsucker		2		1	1		1	1	1		3		0.83	0.94			
Downy Woodpecker							1						0.08	0.29			
Hairy Woodpecker				1			1	1	2				0.42	0.67			
Northern Flicker			1										0.08	0.29			
Pileated Woodpecker	2	1	1			1							0.42	0.67			
Eastern Phoebe												1	0.08	0.29			
Blue-headed Vireo	1	2				1	1			1			0.50	0.67			
Red-eyed Vireo	3	4	4	6	9	8	7	6	10	8	8	7	6.67	2.15	0.480	0.413*	1.62
Blue Jay	2	1		1		2	2		1	1	2	1	1.08	0.79			
Common Raven				4	1				1		1		0.58	1.16			
Black-capped Chickadee		1	1		2	3	3		3	1	1		1.25	1.22			
Red-breasted Nuthatch							1						0.08	0.29			
White-breasted Nuthatch							1						0.08	0.29			
Brown Creeper				1					1	1		1	0.33	0.49			
Winter Wren		6	2	1	5	3	4	6	4	4	3	3	3.42	1.83	0.072	0.136	1.85
Golden-crowned Kinglet								1					0.08	0.29			
Veery	1	1								1			0.25	0.45			
Swainson's Thrush		1		2	4	3		1	4	2	2		1.58	1.51			
Hermit Thrush		4	1	6	7	3	4	4	2		4	5	3.33	2.23	0.013	0.070	2.32
Wood Thrush	1	1											0.17	0.39			
American Robin	1				3	3	3	4	2	1	2	1	1.67	1.37			
Magnolia Warbler	1				1								0.17	0.39			
Black-throated Blue Warbler	4	9	5	6	7	8	6	5	6	5	5	5	5.92	1.44	0.083	-0.115	1.45
Yellow-rumped Warbler			2	2		2	3	3	1	1	3	2	1.58	1.16			
Black-throated Green Warbler	5	7	6	7	7	7	9	5	8	10	10	8	7.42	1.68	0.448	0.311*	1.31
Blackburnian Warbler											1	1	0.17	0.39			
Blackpoll Warbler						1	2						0.25	0.62			
Black-and-White Warbler		3	2	2	4	2	3	2	1	3	4	2	2.33	1.15			
American Redstart		4			1	1							0.50	1.17			
Ovenbird	4	10	11	11	13	12	12	10	13	10	13	6	10.42	2.81	0.037	0.150	2.89
Canada Warbler	3	4	4	6	2	4	4	2	2	3	2	2	3.17	1.27	0.310	-0.196*	1.10
Scarlet Tanager					1				1				0.17	0.39			
White-throated Sparrow	2		2	1	1		1					1	0.67	0.78			
Dark-eyed Junco		3	1	3	4	3	5	2	2	1	2	2	2.33	1.37	0.001	0.014	1.44
Rose-breasted Grosbeak	4	2		1	3	1	2		1				1.17	1.34			
Purple Finch						1		1			1		0.25	0.45			
White-winged Crossbill											2		0.17	0.58			
Pine Siskin					1						1		0.17	0.39			
American Goldfinch	1												0.08	0.29			
Species Richness [a]	15	19	14	18	20	20	23	16	21	16	20	16	20.42	7.60			
Number of Individuals [a]	35	66	43	62	77	69	77	54	67	53	70	48	60.08	13.45			

[a] Does not include counts of Red Squirrel or Eastern Chipmunk; $P < 0.060$

Table 4. Maximum counts of individual birds at Lye Brook Wilderness Area, 2000-2002.

Common Name	2000	2001	2002	Mean	SD
Eastern Chipmunk	2			0.67	1.15
Red Squirrel	1	1		0.67	0.58
Ruffed Grouse	1			0.33	0.58
Mourning Dove		1		0.33	0.58
Barred Owl	1			0.33	0.58
Chimney Swift	2			0.67	1.15
Yellow-bellied Sapsucker	5	6		3.67	3.21
Downy Woodpecker	1		1	0.67	0.58
Hairy Woodpecker	2	1	2	1.67	0.58
Unidentified Woodpecker	3			1.00	1.73
Pileated Woodpecker	1		3	1.33	1.53
Least Flycatcher	2			0.67	1.15
Blue-headed Vireo		1	4	1.67	2.08
Red-eyed Vireo	10	6	9	8.33	2.08
Blue Jay		3		1.00	1.73
Black-capped Chickadee	1	1		0.67	0.58
Brown Creeper	1			0.33	0.58
Winter Wren	7		1	2.67	3.79
Swainson's Thrush	2		1	1.00	1.00
Hermit Thrush	4	2	6	4.00	2.00
American Robin	1		1	0.67	0.58
Cedar Waxwing	1			0.33	0.58
Magnolia Warbler	1		3	1.33	1.53
Black-throated Blue Warbler	9	7	10	8.67	1.53
Yellow-rumped Warbler	2	1		1.00	1.00
Black-throated Green Warbler	8	10	4	7.33	3.06
Blackburnian Warbler	5			1.67	2.89
American Redstart	2	1	3	2.00	1.00
Ovenbird	15	13	19	15.67	3.06
Canada Warbler	1			0.33	0.58
Scarlet Tanager	1		3	1.33	1.53
White-throated Sparrow	2		2	1.33	1.15
Dark-eyed Junco	2	3	1	2.00	1.00
Rose-breasted Grosbeak	2	1		1.00	1.00
Species Richness	28	15	17	20.00	7.00
Number of Individuals	126	73	90	96.33	27.06

[a] Does not include counts of Red Squirrel or Eastern Chipmunk

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