

FOREST BIRD SURVEYS ON MT. MANSFIELD AND UNDERHILL STATE PARK

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Abstract: Censuses of breeding bird populations on two Mount Mansfield sites were conducted for a fifth year in 1995. One site in Underhill State Park at ca. 2200 ft elevation consisted of mature northern hardwoods, while the second site on the Mt. Mansfield ridgeline at ca. 3800 ft elevation consisted of subalpine spruce-fir. Ten-minute counts at each of 5 sampling points in the two habitats were conducted twice during June. Nineteen species were recorded at Underhill State Park, with a maximum of 141 individuals (101 in 1994) on 23 June and a mean of 127.5 (90.5 in 1994) for both visits. Thirteen species were recorded on Mt. Mansfield, with a maximum of 115 individuals (81 in 1994) on 9 June and a combined mean of 106.5 (68 in 1994). Species diversity and numerical abundance were significantly higher at both Underhill State Park and Mt. Mansfield in 1995 than in 1994. The reasons for these changes, whether reflecting actual changes in bird populations or an artifact of differing sampling conditions between the two years, are not entirely clear.

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1995 REPORT TO THE VERMONT MONITORING COOPERATIVE

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In 1995, breeding bird censuses were conducted for a fifth consecutive year at two permanent study sites on Mt. Mansfield, as part of a long-term Vermont Forest Bird Monitoring Program conducted by the Vermont Institute of Natural Science (VINS). This program was initiated in 1989 with the primary goal of conducting habitat-specific monitoring of forest interior breeding bird populations in Vermont and tracking long-term changes. As of 1995, VINS has selected, marked and censused 17 permanently protected sites of mature forest habitat in Vermont (Appendix 1). The specific objectives of the Mt. Mansfield study include: 1) adding a bird monitoring component to the integrated ecological research being conducted under the VMC; 2) adding two study sites to VINS' statewide monitoring program; and 3) sampling bird populations in the high elevation spruce-fir zone.

Survey methods were identical to those in previous years. Each site consists of a series of five sampling points spaced 200-300 meters apart. Preliminary site visits were made in late spring to check the condition of vinyl flagging and metal tree tags. Each site was censused twice during the height of breeding activities in June. Each census consisted of 10-minute counts of all birds seen and heard at each of the five sampling points. Field data were transcribed onto standardized forms and subsequently computerized, using Microsoft Excel 5.0. Vegetation sampling was completed at each census point on the Mt. Mansfield plot using a technique modified after the standard James and Shugart method. In 1995 this sampling technique was initiated at six other FBMP sites, and will be used at the Underhill State Park site as well as at VINS' nine other monitoring sites over the next two years.

On Mt. Mansfield, overall numerical abundance and species diversity were up from last year's four-year minimum (Table 1). Thirteen species were recorded on 22 June, with a maximum of 115 individuals (81 in 1994) on 9 June and a mean of 106.5 (68 in 1994) for both visits (Table 2). However, it should be noted that Pine Siskin and White-winged Crossbill, which are irregular breeders in this habitat and may have been non-breeders when counted, inflated the totals. By removing these two species from the 1995 totals (n=30), overall numbers were the second lowest since 1991. Of the ten species recorded in each year since 1991, six showed increases over 1994 totals, but only five were above the four-year average. Numbers of three of the five most common species, Winter Wren, Bicknell's Thrush, and White-throated Sparrow increased over 1994's totals (Table 1). Blackpoll Warbler numbers however, remained at a five-year low for the second consecutive year, and Yellow-rumped Warbler numbers dropped to equal the previous low of 1993. Purple Finch was absent from the census for the first time in 1995, while White-winged Crossbill was recorded for the first time.

Winter Wren populations rebounded slightly from a downward trend recorded between 1991-1994 on Mt. Mansfield. Similarly, at Underhill State Park, the species recovered dramatically from a two-year decline. Winter Wren numbers at VINS' other high elevation spruce-fir site on Camel's Hump however, continued on a downward trend that began in 1991. Both Blackpoll and Yellow-rumped warblers have shown steady downward trends since 1991 on Mt. Mansfield (Fig. 1). The decline for Blackpoll Warbler was significant ($P=0.01$).

At Underhill State Park, overall numerical abundance and species diversity were at a five-year high in 1995 (Table 3). Twenty species were recorded, with a maximum of 141 individuals (101 in 1994) on 23 June and a mean of 127.5 (90.5) for both visits (Table 4). Only Canada Warbler was below its 1991-1994 average, while 13 species were above their average for this period. Of the five species that have been recorded in each year since 1991, three were observed at or above their maximum counts. Populations of both Red-eyed Vireo and Ovenbird have increased significantly over the last five years (Fig. 1), $P=0.01$ and $P=0.05$, respectively. Canada Warbler, which had increased steadily since 1991, dropped to a five-year low in 1995. Winter Wren however, which had shown an average annual decline of 59% at Underhill State Park since 1992, increased significantly in 1995.

Both the declines on Mt. Mansfield and the increases at Underhill State Park must be interpreted cautiously. With only 5 years of data available, detection of meaningful population trends is not yet possible. Changes in population trends may simply reflect natural fluctuations and/or variable detection rates. Census data may be particularly susceptible to variation in detectability on Mt. Mansfield, where weather conditions are often extreme or subject to rapid change. Natural populations are also dependent on a variety of dynamic factors, such as local prey abundance, overwinter survival, and habitat change. However, the steady decline recorded among most high elevation species on Mt. Mansfield warrants concern in light of documented threats to subalpine spruce-fir forests throughout the Northeast. 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 population trends of various species at the Mansfield and Underhill sites.

Future plans include continued monitoring at both sites, as well as detailed sampling of habitat characteristics at Underhill State Park. Analysis of VINS' seven-year forest bird monitoring database was initiated in 1995 and will be completed in 1996. This should enable future comparisons among sites and habitat types, information that will be critical to evaluating the significance of results from Mt. Mansfield and Underhill State park. Funding for VINS' 1995 work at these two sites was provided in large part by the VMC. Support for monitoring at VINS' additional 15 Vermont forest bird study sites was provided by VINS' general operating budget.

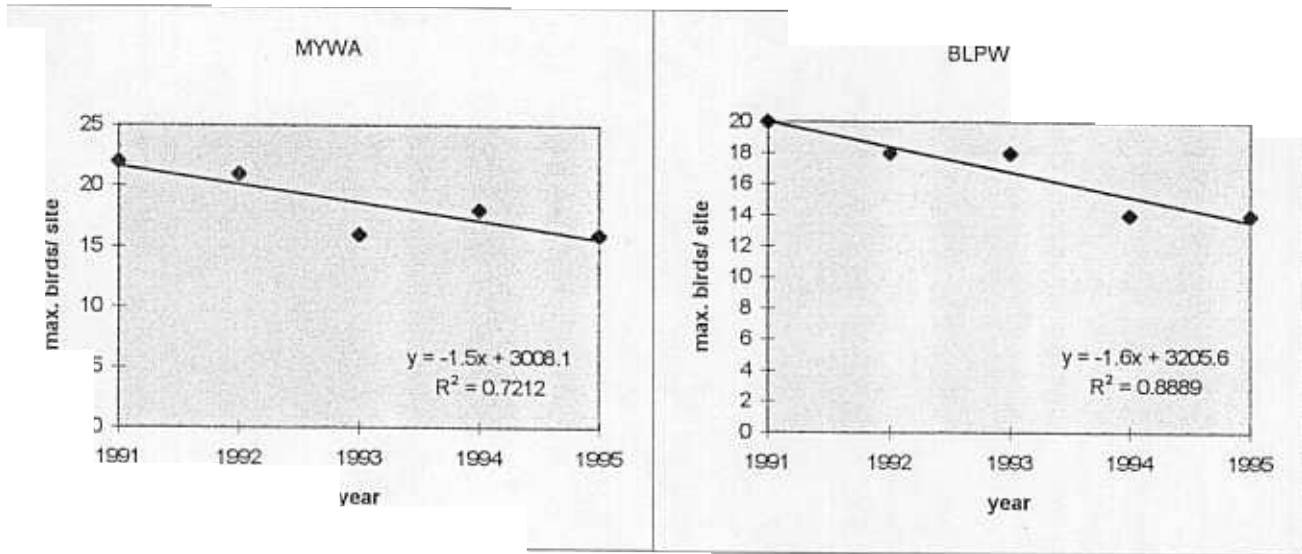
Appendix 1. Vermont Forest Bird Monitoring Sites - 1995

<u>Site</u>	<u>Town</u>	<u>Habitat</u>	<u>Observer</u>
1. Sandbar WMA	Milton	Floodplain	M. LaBarr
2. Pease Mountain	Charlotte	Oak-hickory	S. Staats
3. Cornwall Swamp	Cornwall	Maple Swamp	C. Darmstadt
4. Shaw Mountain	West Haven	Oak-hickory	S. Morrical
5. Galick Preserve	West Haven	Hemlock-pine	N. Swanberg
6. Sugar Hollow	Pittsford	N. Hardwoods	S. Faccio
7. The Cape	Chittenden	N. Hardwoods	S. Faccio
8. Dorset Bat Cave	E. Dorset	N. Hardwoods	R. Stewart
9. Roy Mountain WMA	Barnet	Cedar-spruce	C. Rimmer
10. Concord Woods	Concord	N. Hardwoods	C. Rimmer
11. May Pond Preserve	Barton	N. Hardwoods	T. Gaine
12. Wenlock/Buxton's	Ferdinand	Spruce-fir	C. Darmstadt
13. Bear Swamp	Wolcott	Spruce-fir	B. Pfeiffer
14. Underhill S.P.	Underhill	N. Hardwoods	C. Darmstadt
15. Mt. Mansfield	Stowe	Subalpine	C. Rimmer
16. Camel's Hump	Huntington	Subalpine	C. Fichtel
17. Merck Forest	Rupert	Maple-beech-oak	T. Johansson

Table 1. Maximum counts of individual birds recorded on Mt. Mansfield site, 1991-1995.

Species	Mansfield				
	91	92	93	94	95
Northern Flicker			1		
Hairy Woodpecker				1	
Yellow-bellied Flycatcher			2		1
Blue Jay		1			
Common Raven					
Red-breasted Nuthatch		2	3	1	3
Winter Wren	20	18	14	8	10
Ruby-crowned Kinglet		4			2
Bicknell's Thrush	10	23	15	9	15
Swainson's Thrush	6	16	2	2	5
American Robin	2	7	2	4	4
Cedar Waxwing		1	4		
Nashville Warbler	4				
Magnolia Warbler	2	4			
Yellow-rumped Warbler	22	21	16	18	16
Blackpoll Warbler	20	18	18	14	14
Ovenbird			2		
Lincoln's Sparrow	4				
White-throated Sparrow	14	28	26	21	24
Dark-eyed Junco	8	17	10	4	10
Purple Finch	2	8	2	4	
White-winged Crossbill					8
Pine Siskin		1			22
Evening Grosbeak		2			
Number of individuals	114	171	118	86	134
Number of species	12	16	15	11	13

Mt. Mansfield Forest Bird Monitoring Site



Underhill State Park Forest Bird Monitoring Site

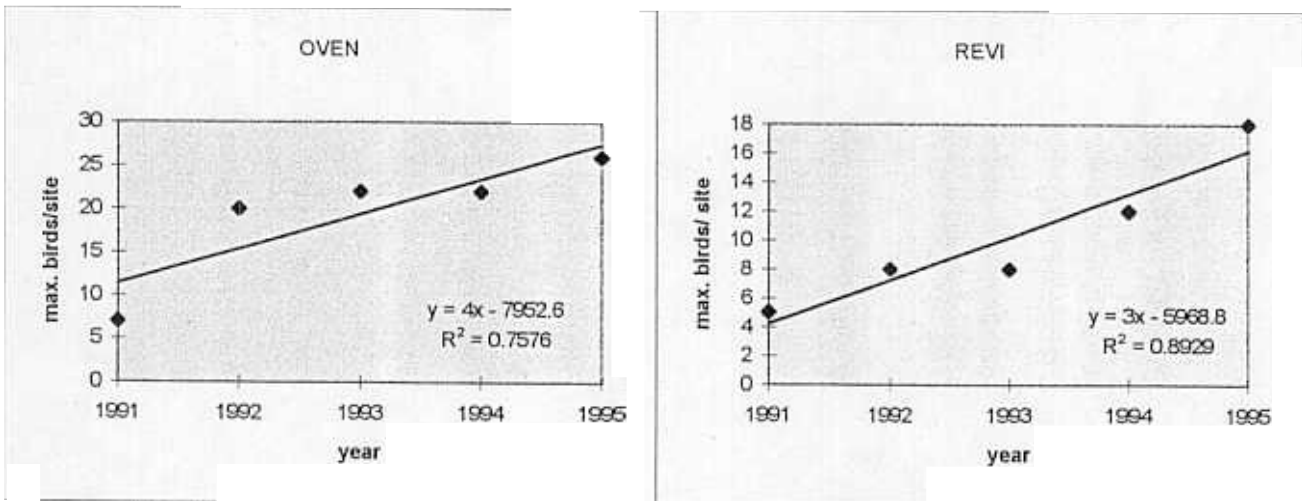


Fig. 1. Population trends of Yellow-rumped Warbler (MYWA) and Blackpoll Warbler (BLPW) on Mt. Mansfield, and Red-eyed Vireo (REVI) and Ovenbird (OVEN) at Underhill State Park, VT.

Table 2. Numbers of individual birds recorded on Mt. Mansfield in 1995. Maximum count for each species represents relative abundance index to be used in future analyses.

Species	9 June	22 June
Ruby-crowned Kinglet	2	2
Red-breasted Nuthatch	1	3
Winter Wren	6	10
Bicknell's Thrush	15	5
Swainson's Thrush	5	4
American Robin	4	
Yellow-rumped Warbler	16	16
Blackpoll Warbler	12	14
White-throated Sparrow	24	18
Dark-eyed Junco	6	10
Purple Finch	2	6
Pine Siskin	22	1
Yellow-bellied Flycatcher		1
White-winged Crossbill		8
Number of individuals	115	98
Number of species	12	13

Table 3. Maximum counts of individual birds recorded at Underhill State Park, 1991-1995.

Species	Underhill				
	91	92	93	94	95
Northern Flicker			2		
Yellow-bellied Sapsucker		2		2	2
Hairy Woodpecker				1	
Blue Jay				1	
Common Raven				4	1
Brown Creeper				1	
Black-capped Chickadee		2	1		4
Winter Wren		12	4	2	10
American Robin					5
Veery	2	2			
Swainson's Thrush		2		4	8
Hermit Thrush		7	2	11	14
Wood Thrush	1	2			
Solitary Vireo	1	4			
Red-eyed Vireo	5	8	8	12	18
Black-throated Blue Warbler	11	17	10	12	14
Yellow-rumped Warbler			4	4	
Magnolia Warbler					2
Black-throated Green Warbler	9	14	12	14	14
Black-and-white Warbler		6	4	4	8
American Redstart		6			2
Ovenbird	7	20	22	22	26
Canada Warbler	5	8	8	10	4
Rose-breasted Grosbeak	7	3		2	6
White-throated Sparrow	2		2	2	2
Dark-eyed Junco		6	2	6	8
Pine Siskin					1
Scarlet Tanager					2
Number of individuals	52	112	83	114	151
Number of species	11	18	14	18	20

Table 4. Numbers of individual birds recorded at Underhill State Park in 1995. Maximum count for each species represents relative abundance index to be used in future analyses.

Species	9 June	23 June
Yellow-bellied Sapsucker	2	
Common Raven		1
Black-capped Chickadee	4	2
Winter Wren	2	10
American Robin	2	5
Swainson's Thrush	6	8
Hermit Thrush	9	14
Red-eyed Vireo	14	18
Black-and-white Warbler	8	6
Black-throated Blue Warbler	6	14
Yellow-rumped Warbler	4	4
Magnolia Warbler	2	2
Black-throated Green Warbler	14	13
Ovenbird	26	22
American Redstart		2
Canada Warbler	4	4
Rose-breasted Grosbeak		6
White-throated Sparrow	2	2
Dark-eyed Junco	8	6
Pine Siskin	1	
Scarlet Tanager		2
Number of individuals	114	141
Number of species	17	19