



Changes in abundance of migrant warblers at Port Weller, Ontario: an update

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Introduction

Recently, Black and Crewe (2016) presented a comparison of warbler counts on the Port Weller west pier for 1993-1995 and 2013-2015, which concluded that:

Our study has nevertheless answered the simple question raised in the introduction: did the number of warblers detected using the west pier during migration change between 1993-1995 and 2013-2015? We see that the number of warblers detected using the west pier during migration increased! It will be most interesting to see if the conclusions reached here persist when the final two years, 2016 and 2017, of data are included.

In this update, I present the results for the final two years of the study and compare warbler counts for 1993-1997 and 2013-2017. The results are shown in Table 1. See Black and Crewe (2016) for details of sampling methods. For the complete study see the article *Final Port Weller West Migration Study July 2017* at <http://www.brocku.ca/tren/niagarabirds>.



Table 1: Total counts of warblers using the Port Weller west pier over 31 days of sampling in May of each year. Numbers in bold indicate statistically significant changes between periods.

Species	Annual Count										Cumulative Totals			
	1993	1994	1995	1996	1997	2013	2014	2015	2016	2017	1993 -1995	2013 -2015	1993 -1997	2013 -2017
Ovenbird <i>Seiurus aurocapilla</i>	4	5	7	33	8	4	1	2	5	0	16	7	57	12
Northern Waterthrush <i>Parkesia noveboracensis</i>	2	5	2	20	14	7	12	6	4	11	9	25	43	40
Black-and-White Warbler <i>Mniotilta varia</i>	9	3	30	57	21	10	17	14	10	17	42	41	120	68
Tennessee Warbler <i>Oreothlypis peregrine</i>	3	2	2	2	1	9	6	5	13	9	7	20	10	42
Nashville Warbler <i>Oreothlypis ruficapilla</i>	3	6	15	27	21	6	46	5	9	12	24	57	72	78
Mourning Warbler <i>Geothlypis philadelphia</i>	2	0	0	0	0	3	1	2	0	0	2	6	2	6
Common Yellowthroat <i>Geothlypis trichas</i>	40	24	33	39	21	47	59	60	27	22	97	166	157	215
American Redstart <i>Setophaga ruticilla</i>	72	37	59	36	14	40	49	65	44	26	168	154	218	224
Cape May Warbler <i>Setophaga tigrina</i>	32	31	9	15	3	2	7	9	0	4	72	18	90	22
Northern Parula <i>Setophaga americana</i>	1	11	3	10	5	6	16	20	3	20	15	42	30	65
Magnolia Warbler <i>Setophaga magnolia</i>	62	29	33	45	25	40	77	92	11	39	124	209	194	259
Bay-breasted Warbler <i>Setophaga castanea</i>	42	13	10	4	4	3	14	17	6	12	65	34	73	52
Blackburnian Warbler <i>Setophaga fusca</i>	6	1	11	20	13	3	13	20	5	4	18	36	51	45
Chestnut-sided Warbler <i>Setophaga pensylvanica</i>	38	12	33	31	5	24	29	28	10	21	83	81	119	112
Blackpoll Warbler <i>Setophaga striata</i>	22	9	7	6	0	64	17	100	21	29	38	181	44	231

Figure 1: The Port Weller west pier, May 2013. Note it is 750 m from the Coast Guard station (at left) to the light at the north end of the pier.

Photo: Kayo J. Roy



Species	Annual Count											Cumulative Totals			
	1993	1994	1995	1996	1997	2013	2014	2015	2016	2017	1993 -1995	2013 -2015	1993 -1997	2013 -2017	
Black-throated Blue Warbler <i>Setophaga caeruleascens</i>	18	26	47	53	25	11	22	27	12	23	91	60	169	95	
Palm Warbler <i>Setophaga palmarum</i>	43	44	24	82	89	60	98	84	36	33	111	242	282	311	
Black-throated Green Warbler <i>Setophaga virens</i>	8	9	13	37	2	13	8	10	5	19	30	31	69	55	
Canada Warbler <i>Cardellina canadensis</i>	5	1	3	3	0	6	1	7	0	3	9	14	12	17	
Wilson's Warbler <i>Cardellina pusilla</i>	13	3	7	16	1	12	17	11	1	3	23	40	40	44	
Totals (Exclude Yellow-rumped Warbler and Yellow Warbler)	425	271	348	536	272	370	510	584	222	307	1044	1464	1852	1993	
Yellow-rumped Warbler <i>Setophaga coronata</i>	295	276	226	1401	435	139	271	372	149	364	797	782	2633	1295	
Yellow Warbler <i>Setophaga petechia</i>	268	208	208	266	239	373	761	950	764	789	684	2084	1189	3637	
Totals (Include Yellow-rumped Warbler and Yellow Warbler)	988	755	782	2203	946	882	1542	1906	1135	1460	2525	4330	5674	6925	

The increase in Cumulative Totals (Including and Excluding Yellow-rumped and Yellow warblers) from 1993-1995 to 2013-2015 was much reduced in the five-year results. Much of this reduction can be attributed to the large number of warblers counted in 1996. For this update, a simple analysis of variance showed that increases for Tennessee, Blackpoll and Yellow warblers (bold in Table 1) are statistically significant at or below the 5% level. The decrease in Cape May Warblers is very close to statistically significant at 5.5%.

The results of the five-year study can be compared with the results of the more robust statistical analysis in the three-year study (Black and Crewe 2016):

Our analysis also supported an increase in counts between time periods for 7 of 22 species: Northern Waterthrush, Tennessee Warbler, Common Yellowthroat, Northern Parula, Blackpoll Warbler, Palm Warbler and Yellow Warbler and a decline in counts for Cape May Warbler and Ovenbird (bold in Table 1). If we consider species with a posterior probability ≥ 0.95 (increase in counts) or ≤ 0.05 (decline in counts), our results further supported an increase in count between time periods for Magnolia Warbler, Nashville Warbler, Blackburnian Warbler and Wilson's Warbler

and a decline in count for Bay-breasted and Yellow-rumped Warblers. In the case of the Yellow-rumped Warbler, the apparent decline was likely the result of a decline in extreme counts between time periods, as opposed to a decline in the median or mean count over time.

Note that the direction of changes in numbers observed from 1993-1997 to 2013-2017 is unchanged from that observed from 1993-1995 to 2013-2015 for the warblers in the above paragraph except for Northern Waterthrush and Blackburnian Warbler.

Note also that the statistical tests used differ between the Black and Crewe (2016) and this update so significance is not directly comparable.

Conclusions

Site based migration counts can fluctuate widely among years, and as a result, counts made over a small number of years can have substantial variation (e.g., the large numbers detected in just one year (1996) influenced the magnitude of the relative increase in cumulative totals for the five-year period compared to the three-year period). Nevertheless, the trend of an increase in overall warbler totals from 1993-1995 to 2013-2015 reported in Black and Crewe (2016) remains in the comparison of 2013-2017 to 1993-1997.



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Literature Cited

Black, J.E. and **T.L. Crewe.** 2016. Changes in abundance of migrant warblers at Port Weller, Ontario, from 1993-1995 to 2013-2015. *Ontario Birds* 34:178-197.

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