

# **Migrational Survey and Habitat Usage of Shorebirds in the Lake Erie Marsh Region,2013**

## **PROGRESS REPORT-2013 BSBO-14-2**

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### INTRODUCTION

The importance of studying shorebird migration and stopover habitat needs has greatly increased as wetland habitat acreage dwindles (Helmert 1992, Brown et al. 2001). The loss and degradation of migration and wintering habitat from agriculture and urban development as well as disturbance at feeding and roosting sites are creating additional pressures on these long distance migrants (Helmert 1993).

Shorebirds differ from many other Neotropical migrants because of their narrow habitat requirements. Stopover sites with abundant food sources are needed to acquire lipid reserves for continued migration and to produce eggs once they reach the breeding grounds (Eldridge and Krapu 1993, Helmert 1992). The Lake Erie marshes are the largest inland stopover habitats in the eastern United States between coastal habitats and northern breeding areas. More than 30 species of shorebirds migrate through the Lake Erie marshes each year, but different species as well as different ages within a species appear at different times of the year and choose different microhabitats. Determining habitat uses will allow establishment of management regimes that create the favored habitats, thereby increasing the value of the marsh systems to shorebirds (Skagen and Knopf 1993). Improved management of spring and fall stopover sites can increase summer reproductive success and survivorship of fledglings (Knauer 1977, Taylor 1977).

The Black Swamp Bird Observatory (BSBO) has been monitoring shorebird migration in the Lake Erie Marsh region since 1992, and was successful in acquiring Regional Site status under the Western Shorebird Hemispheric Reserve Network in September 2000. Additional data collection and analyses are needed to seek International Site status. This designation recognizes the importance of the region to shorebirds and has direct impact in assisting restoration and management projects in highly competitive granting processes. Continued data collection will also help to refine our knowledge of the specific habitat needs of migrating shorebird species and guide management efforts.

### MATERIALS AND METHODS

Units of the Ottawa National Wildlife Refuge (NWR) complex and wetlands of the Lake Erie

marsh region from south of Detroit, Michigan to Huron, Ohio were surveyed by vehicle or on foot from spring migration (04 March 2013) through fall (28 November 2013). Shorebirds were censused utilizing the International Shorebird Survey protocol (date, location, time observer, water depth, and disturbance) (Manomet 2010) plus additional information on individual management units and habitat conditions. Additional data was gleaned from the eBird Database (eBird 2014) where a complete count was made with adequate location information. Data were compiled by region and marsh unit.

## RESULTS AND DISCUSSION

The 2013 field season was the 22nd full year of data collection for shorebird migration. Twenty-five marshes were sampled at least once in the spring and 23 in the fall. The main areas sampled were Ottawa NWR, flooded fields in Ottawa County, Winous Point Marsh Conservancy, East Harbor State Park, and Pointe Mouillee SGA. The sampling dates and the total shorebirds counted are shown in Table 1.

### Spring Migration

A total of 64,836 birds of 31 species were counted during 301 trips (Table 2). Ottawa County flooded fields, Ottawa NWR, Winous Point Marsh Conservancy, and Pointe Mouillee SGA were the most frequently surveyed wetlands. Heaviest bird concentrations were observed on Ottawa NWR Winous Point Marsh Conservancy, and Pointe Mouillee SGA. Peak activity on these major areas is shown in Table 3. The most abundant species counted and their peak movements were Killdeer (March 1-10), Lesser Yellowlegs (April 11-20), Common Snipe (April 11-20), Pectoral Sandpiper (April 1-10), Greater Yellowlegs (April 11-20), Black-bellied Plover (May 11-20), Least Sandpiper (May 11-20), Dunlin (May 11-31), Semipalmated Plover (May 21-31), and Semipalmated Sandpiper (May 21-31) (Table 4).

Over the timeframe of the study the Pectoral Sandpiper appeared to be the most abundant species of April along with Greater Yellowlegs, Lesser Yellowlegs, and Wilson's Snipe. Dunlin becomes the most abundant shorebird in May, followed by Semipalmated Sandpiper, Semipalmated Plover, and Least Sandpiper.

Spring habitat was predominantly composed of mudflats in Winous Point Marsh Conservancy, Ottawa NWR, Pointe Mouillee SGA, Darby NWR, Erie Marsh, and flooded agriculture fields. Spring drawdowns of control level marshes, to increase smartweed (*Polygonum spp.*) growth for fall migration food, are well timed for species migrating in late April through early May. Drawdowns in late May for millet growth coincided with late spring migrants and some of the early fall migrants in early July. In 2013, the amount of available mudflat habitat created by drawdowns was below average, as most marsh managers chose to hold water on wetlands due to the low water levels of Lake Erie; the exceptions were one unit at the Winous Point Marsh Conservancy that were being specifically managed for spring-migrating shorebirds in 2013. Overall, 2013 was a below average spring migration for shorebirds in the marsh region.

Migration appeared to peak for most species 10 days later than last year. Weather conditions and quick vegetation maturity resulted in little available habitat and caused a presumed rapid movement north of shorebirds.

### Fall Migration

Thirty-four species totaling 37,776 birds were recorded on 283 trips (Table 2). Consistently productive areas were Ottawa NWR, Winous Point Marsh Conservancy, Pickerel Creek Wildlife Area (WA), East Harbor State Park, Ottawa County agriculture fields, Bellevue Sky Ponds, and Pt. Moulliee SGA. Shorebird habitat management is very challenging during the fall period. Early fall was extremely wet which reflooded drawdown units rapidly. August and September were wet resulting in major effects on management plans. Several prime shorebird units were just reaching desired water levels when rains inundated the region. This reduced habitat to small areas throughout the region. Peak activities of major sampled marshes are shown in Table 5. The most abundant species counted and their peak movements were Short-billed Dowitcher (July 1-10 and August 21-31), Stilt Sandpiper (August 21-31), Lesser Yellowlegs (August 11-20), Killdeer (August 1-10), Wilson's Snipe (September 21 to October 10), Greater Yellowlegs (August 21-31), Semipalmated Sandpiper (August 11-31), Pectoral Sandpiper (Aug. 1-10), Least Sandpiper (Aug. 11-31), Semipalmated Plover (August 21-31), Long-billed Dowitcher (September 21-30 and November 1-10), and Dunlin ( November 1-10) (Table 6).

Fall migration is more protracted than spring, running from early July into November. Generally the earliest species to peak are the Short-billed Dowitcher and Least Sandpiper in July. Semipalmated Plover, Lesser Yellowlegs, and Semipalmated Sandpiper peak in August. September peaks are observed in Stilt Sandpiper (hatching year), Pectoral Sandpiper, Killdeer, and adult Long-billed Dowitcher. Hatching year Long-billed Dowitcher and Greater Yellowlegs peaked during early to mid-October, while Dunlin and Sanderling peak in late October and early November. These peaks are affected by age composition of the populations passing through the region as well as well timed habitat availability.

Lake levels resulted in low availability of natural mud flats, especially at Ottawa NWR for migrating shorebirds in 2013. The loss of natural habitats puts more importance on water level management regimes in managed marsh units. Rainfall timing also resulted in sub-optimal habitat availability for birds as they arrived in the region.

### Habitat Use and Management Implications

This study continues to demonstrate the importance of the Lake Erie Marsh region to migrating shorebirds. In 2000, BSBO led a successful application for Western Shorebird Reserve Network status for the Lake Erie Marsh Region. The area now represents one of only two recognized locations in the entire Great Lakes region. This study has also provided valuable information about the timing of shorebird migration and has begun to document habitat use and requirements for shorebird species. As more yearly data accumulate a better picture of habitat use will be developed.

The habitat preferred by migrating shorebirds is typically quite transitory throughout the season. However, Turtle Creek in 1994 showed use can be spread out over an entire migration. Lower lake levels in fall 1999 through 2012 have shown the potential shorebird use of natural habitat creation in the Lake Erie Marsh region. Heaviest use appears to occur in habitats ranging from several inches of standing water to recently emerged mudflats. Habitat use varied across shorebird species, with species segregating themselves by guilds. Deeper water was used by the larger shorebirds and phalaropes, very shallow water by larger sandpipers, and wet mud flats were used by the smaller peeps and the plovers. The dry flats were utilized by the larger plovers and Baird's and Buff-breasted Sandpipers.

Information gained from this study will allow managers to make better informed decisions about wetland management as it relates to shorebird use. Shorebirds need quality habitat which can be provided by knowing what prey exists in a particular area, what prey is needed by shorebirds, and the timing of shorebird migration (Rundle and Frederickson 1981, Connors et al. 1981). Shorebird needs in wetland management plans require consideration throughout the year. Rotation of management units is necessary to provide the mudflat conditions needed to forage. Abnormal amounts of precipitation highlight the need for managers to monitor marsh levels closely to adjust unit depths to ensure proper habitat throughout the migration season. Management rotation also ensures some units in deep water condition to develop a food base and provide drawdown units that will produce substrate for invertebrate growth in following years. With the continued monitoring of shorebird numbers, species, migration timing, and habitat usage in the Lake Erie marsh region, information can be used to provide direction to resource managers for including the shorebird group into their management scheme.

Personnel overseeing this project have provided technical guidance and field assistance to the graduate project being conducted by Keith Norris of The Ohio State University entitled "Body Mass Dynamics and Foraging Ecology of Migrating Shorebirds in The Southwestern Lake Erie Basin: Autumn Versus Spring Habitat Limitation". This includes habitat needs and provided guidance on color-marking of a sample of migrating shorebirds to establish habitat use.

### COSTS

All costs associated with this project were covered by the Black Swamp Bird Observatory through computer support, data analysis, and volunteers for data collection (900 hrs @ \$16.00/hr for services=\$14,400).

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Table 1. Sampling intensity of surveyed marshes and shorebird numbers, 2013.

Marsh sampled	Spring			Fall			Total		
	# days sampled	Total birds	Birds per day	# days sampled	Total birds	Birds per day	# days sampled	Total birds	Birds per day
Metzger W/A	15	718	48	7	28	4	22	746	34
Magee Marsh W/A	11	505	46	4	53	13	15	558	37
Moxley Marsh	2	8	4	8	257	32	10	265	27
Ottawa NWR	72	25,240	351	40	3,760	94	112	29,000	259
Maumee Bay State Park	5	119	24	4	24	6	9	143	16
Ottawa Co.Flooded fields	23	934	41	27	4,121	153	50	5,055	101
Winous Point Marsh	27	21,486	796	21	2,029	97	48	23,515	490
Lucas Co. Flooded fields	11	262	24	4	171	43	15	433	29
Pt. Mouillee	22	6,624	301	42	10,631	253	64	17,255	270
Pickeral Creek WA	10	1,165	117	11	1,064	97	21	2,229	106
Cedar Pt NWR	15	1,682	112	6	175	29	21	1,857	88
Meadowbrook Marsh	4	22	6	4	59	15	8	81	10
Turtle Creek	5	131	26	6	222	37	11	353	32
Sandusky River	1	3	3				1	3	3
East Harbor State Park	11	271	25	40	9,794	245	51	10,065	197
Camp Sabroske	4	103	26				4	103	26
Green Creek	10	195	20				10	195	20
Erie Marsh, MI	19	2,428	128	4	49	12	23	2,477	108
Monroe Co. Fields	1	6	6	2	71	36	3	77	26
Cullen Park	5	100	20	2	44	22	7	144	21
Ottawa SC	2	808	404	1	86	86	3	894	298
Mallard Club WA				1	28	28	1	28	28
Willow Point WA	1	3	3	15	929	62	16	932	58
Darby Unit ONWR	9	1,917	213				9	1,917	213
Huron River	1	2	2	4	87	22	5	89	18
Pipe Creek WA	1	3	3	2	23	12	3	26	9
Bellevue Sky Ponds				10	3,782	378	10	3,782	378
Sheldon's Marsh	5	21	4	3	26	9	8	47	6
Camp Perry Beach	6	64	11	11	163	15	17	227	13
Navarre Marsh	3	16	5	1	8	8	4	24	6
<b>Total</b>	<b>301</b>	<b>64,836</b>	<b>215</b>	<b>283</b>	<b>37,776</b>	<b>133</b>	<b>584</b>	<b>102,612</b>	<b>176</b>

Table 2. Shorebird numbers observed during spring and fall migration in the Lake Erie marshes, 2013.

Species	Spring	Fall	Total	Species	Spring	Fall	Total
Piping Plover	9	2	11	Short-billed Dowitcher	127	2,108	2,235
Semipalmated Plover	1,360	2,498	3,858	Long-billed Dowitcher	2	785	787
Killdeer	2,015	7,463	9,478	Greater Yellowlegs	2,147	890	3,037
American Golden Plover	221	173	394	Lesser Yellowlegs	2,977	5,503	8,480
Black-bellied Plover	566	153	719	Red Knot	1	46	47
Spotted Sandpiper	516	474	990	Wilson Phalarope	6	154	160
Solitary Sandpiper	246	188	434	Red-necked Phalarope	7	157	164
Pectoral Sandpiper	2,638	1,834	4,472	Upland Sandpiper	37	3	40
White-rumped Sandpiper	118	71	189	Ruddy Turnstone	194	10	204
Baird's Sandpiper	0	116	116	Willet	162	13	175
Least Sandpiper	1,406	5,375	6,781	American Avocet	145	62	207
Stilt Sandpiper	1	726	727	American Woodcock	76	2	78
Semipalmated Sandpiper	2,423	6,157	8,580	Wilson's Snipe	514	772	1,286
Western Sandpiper	0	19	19	Sanderling	13	206	219
Marbled Godwit	13	18	31	Whimbrel	68	4	72
Buff-breasted Sandpiper	0	6	6	Unidentified Dowitcher	2	170	172
Dunlin	46,328	1,283	47,611	Unidentified Peep	468	324	792
Hudsonian Godwit	0	6	6	Ruff	5	0	0
Black.-necked Stilt	25	0	25	Red Phalarope	0	5	5
<b>TOTAL birds</b>	<b>64,836</b>	<b>37,776</b>	<b>102,612</b>	<b># Trips</b>	<b>301</b>	<b>283</b>	<b>584</b>



Table 3. Mean shorebird numbers observed by ten day periods for selected marshes during spring migration in the Lake Erie marshes, 2013.

10-day Periods	Principle Marshes Surveyed					
	Cedar Pt NWR	Ottawa NWR	Winous Point MC	Erie Marsh	Ottawa Co. Fields	Pt Moullie
March 1-10		34		3		
March 11-20		9		12	11	
March 21-31		13		18	11	18
April 1-10	10	87	334		30	40
April 11-20	2	134	602	15	24	
April 21-30	61	237	349	48	24	304
May 1-10	42	<u>707</u>	579	<u>285</u>	<u>53</u>	546
May 11-20	<u>211</u>	<u>949</u>	<u>1,361</u>	145	27	<u>745</u>
May 21-31	<u>268</u>	432	<u>1,550</u>	38	47	15
June 1-10	37	47	58			109
June 11-20		7				56
June 21-30						22

Table 4. Timing of spring migrating shorebirds (avg. #/trip) in the Lake Erie marsh region, 2013.\*

Time Period	Semi Plov	Spot. Sand.	Killdeer	Wilson Snipe	Pect. Sand	Semi-Sand	Dunlin	Greater Yleg	Lesser Yleg	Least Sand.	BB Plover
Mar 1-10			<u>18</u>								
11-20			7	<1					<1		
21-31			8	2	<1			<1	<1		
Apr 1-10			7	5	<u>59</u>		16	6	4	<1	
11-20		<1	4	<u>7</u>	12		56	<u>33</u>	<u>34</u>		
21-30	<1	1	5	3	9		58	11	12	<1	<1
May 1-10	3	2	7	<1	3	<1	165	5	12	6	2
11-20	12	3	8	<1	<1	2	<u>363</u>	2	8	<u>17</u>	<u>7</u>
21-31	<u>15</u>	2	5			<u>69</u>	<u>402</u>	1	2	4	4
Jun 1-10	8	<u>4</u>	9			11	9	<1	<1	1	<1
11-20		3	13			2	4	<1	<1	<1	<1
21-30		2	18							<1	

\*numbers underlined are peaks for each species

Table 5. Mean shorebird numbers observed by ten-day periods for selected marshes during fall migration in the Lake Erie marshes, 2013.

10-day periods	Marshes						
	Pt Moullie SGA	Ottawa NWR	Winous Point	East Harbor SP	Willow Pt WA	Pickrel Creek WA	Ottawa Co. Fields
July 1-10	48	8		122			46
July 11-20	58	134	34	133	46		112
July 21-31	39	58	40	85			125
Aug. 1-10	191	72	51	178		19	<u>371</u>
Aug. 11-20	<u>475</u>	10	61	<u>433</u>		14	130
Aug. 21-31	<u>520</u>	<u>148</u>	<u>199</u>	<u>408</u>	<u>108</u>	<u>180</u>	
Sept. 1-10	153	52	99	141			199
Sept. 11-20	24	84	91	105	79		22
Sept. 21-30		105	66	29	36	34	61
Oct. 1-10		23	77		36	105	
Oct. 11-20	1	2		2	20		
Oct. 21-31		25					50
Nov. 1-10	191	<u>641</u>					
Nov. 11-20	36						
Nov. 21-31							

Table 6. Timing of fall migrating shorebirds (avg. #/trip) in the Lake Erie marsh region, 2013.\*

Time Period	Semi Plov	Kill-deer	Pect Sand	Least Sand	Semi. Sand	Great Yleg	Less Yleg	Sh-bill Dow	Wil Snipe	Stilt Sand	Dunlin	Lo-Bill Dow
July 1-10		11		3	<1	<1	5	<u>21</u>			1	
11-20	<1	20	1	4	5	3	19	16	<1	2		
21-31	1	23	1	5	9	1	8	5	<1	<1		
Aug 1-10	8	<u>73</u>	<u>17</u>	21	32	2	35	3	1	<1	<1	<u>&lt;1</u>
11-20	22	33	9	<u>64</u>	<u>65</u>	3	<u>55</u>	14	1	7	<1	<1
21-31	<u>29</u>	39	13	<u>47</u>	<u>58</u>	<u>7</u>	26	<u>18</u>	3	<u>10</u>	<1	3
Sept. 1-10	5	18	2	8	9	3	14	5	5	1	<1	5
11-20	4	17	6	4	3	3	9	<1	5	<1		3
21-30	<1	16	3	2	1	3	8	<1	<u>7</u>		<1	7
Oct 1-10	1	12	6	3	1	4	7		6	<1	2	
11-20	1	4	<1	<1	<1	1	2		<1		<u>2</u>	
21-31		7				<1					31	
Nov 1-10		1		<1		1	<1				<u>137</u>	<u>38</u>
11-20		2									18	
21-30											1	

\*numbers underlined are peaks for each species