

`Migrational Survey and Habitat Usage of Shorebirds in the Lake Erie Marsh Region,2015

PROGRESS REPORT-2015 BSBO-16-2

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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 (09 March 2015) through fall (28 November 2015). 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 2015) where a complete count was made with adequate location information. Data were compiled by region and marsh unit.

RESULTS AND DISCUSSION

The 2015 field season was the 24th full year of data collection for shorebird migration. Thirty-four marshes were sampled at least once in the spring and 22 in the fall. The main areas sampled were Ottawa NWR, flooded fields in Ottawa County, Lucas County flooded fields, Magee Marsh Wildlife Area (WA), and Pointe Mouillee State Game Area (SGA). The sampling dates and the total shorebirds counted are shown in Table 1.

Spring Migration

A total of 39,339 birds of 33 species were counted during 295 trips (Table 2). Lucas County flooded fields, Ottawa NWR, Magee Marsh Wildlife Area (WA), and Pointe Mouillee SGA were the most frequently surveyed wetlands. Heaviest bird concentrations were observed on Pointe Mouillee SGA, Ottawa NWR, Magee Marsh WA, Pickerel Creek WA, and Metzger Marsh WA. Peak activity on these major areas is shown in Table 3. The most abundant species counted and their peak movements were Killdeer (May 1-20), Lesser Yellowlegs (May 1-10), Short-billed Dowitcher (May 11-20), Spotted Sandpiper (May 11-20), Semipalmated Plover (May 11-31), Black-bellied Plover (May 11-31), Least Sandpiper (May 11-20), Dunlin (May 11-20), American Golden Plover (May 1-20), Whimbrel (May 11-31), and Semipalmated Sandpiper (May 21-31) (Table 4). Data suggest migration similar to 2014 and below normal.

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 Ottawa NWR, Pointe Mouillee SGA, Pickerel Creek WA, Metzger Marsh WA, 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 2014, 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 was Pointe Mouillee SGA and Pickerel Creek Wildlife Area. Overall, 2015 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 11,993 birds were recorded on 177 trips (Table 2). Consistently productive areas were Ottawa NWR and Pt. Moulliee SGA. Shorebird habitat management is very challenging during the fall period. Early fall was extremely wet which reflooded drawdown units rapidly. July through September resulted in little shorebird habitat as heavy rains and storms affected management units. 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 (July 21-31), Lesser Yellowlegs (July 21-31), Killdeer (September 1-10), Wilson's Snipe (August 21-31), Greater Yellowlegs (August 21-31), Semipalmated Sandpiper (August 21-31), Pectoral Sandpiper (Aug. 21-31), Least Sandpiper (Aug. 11-31), Semipalmated Plover (August 21-31), Spotted Sandpiper (July 21-31 - August 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 2015. 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 2015 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.

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 (500 hrs @ \$16.00/hr for services=\$8,000).

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Table 1. Sampling intensity of surveyed marshes and shorebird numbers, 2015.

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	18	6,125	340	6	64	11	24	6,189	258
Maumee Bay State Park	11	170	15	17	462	27	28	632	23
Lucas Co. Flooded fields	35	1,662	47	25	682	27	60	2,344	39
Cedar Pt NWR	3	67	22				3	67	22
Mallard Club WA	3	47	16	1	8	8	4	55	14
Ottawa Co.Flooded fields	19	317	17	14	338	24	33	655	20
Winous Point Marsh	1	18	18				1	18	18
Magee Marsh W/A	35	1,730	49	3	35	12	38	1,765	46
Moxley Marsh	4	62	16				4	62	16
Ottawa NWR	45	3,429	76	46	3,607	78	91	7,036	77
East Harbor State Park	11	805	73	1	1	1	12	806	67
Meadowbrook Marsh				2	14	7	2	14	7
Turtle Creek	6	16	3				6	16	3
Darby Unit ONWR	1	21	21				1	21	21
Camp Perry Beach	2	11	6				2	11	6
Navarre Marsh	9	130	14	1	2	2	10	132	13
Toussaint WA	3	4	1				3	4	1
Great Egret Marsh	4	19	5				4	19	5
Pickeral Creek WA	10	6,632	663	9	364	40	19	6,996	368
Sandusky River				1	3	3	1	3	3
Green Creek	1	561	561	7	384	55	8	945	118
Willow Point WA	1	113	113				1	113	113
McClure Marsh	2	44	22				2	44	22
Bay Creek, MI	2	46	23				2	46	23
Pipe Creek WA	7	377	54	4	63	16	11	440	40
Sheldon's Marsh	4	26	7	1	18	18	5	44	9
Old Woman's WA	3	13	4	1	4	4	4	17	4
Huron Pier	2	18	9	3	34	11	5	52	10
Pt. Mouillee	24	16,172	674	20	5,392	270	44	21,564	490
Erie Marsh, MI	9	504	56				9	504	56
Sterling SP	3	13	4	7	64	9	10	77	8
East Bay	1	3	3				1	3	3
Monroe County Fields	13	146	11	4	431	108	17	577	34
South Bass Island	1	30	30				1	30	30
Sandusky County Fields				2	9	5	2	9	5
Monroe Power Plant	1	6	6				1	6	6
Erie County Fields	1	2	2	2	14	7	3	16	5
Total	93	39,339	423	100	11,993	120	193	51,332	266

Table 2. Shorebird numbers observed during spring and fall migration in the Lake Erie marshes, 2015.

Species	Spring	Fall	Total	Species	Spring	Fall	Total
Piping Plover	0	1	1	Short-billed Dowitcher	719	479	1,198
Semipalmated Plover	799	353	1,152	Long-billed Dowitcher	8	227	235
Killdeer	2,457	3,060	5,517	Greater Yellowlegs	446	582	1,028
American Golden Plover	2,124	32	2,156	Lesser Yellowlegs	891	1,486	2,377
Black-bellied Plover	980	109	1,089	Red Knot	22	12	34
Spotted Sandpiper	489	242	731	Wilson Phalarope	15	16	31
Solitary Sandpiper	257	118	375	Red-necked Phalarope	10	11	21
Pectoral Sandpiper	224	293	517	Upland Sandpiper	20	0	20
White-rumped Sandpiper	69	49	118	Ruddy Turnstone	304	12	316
Baird's Sandpiper	1	39	40	Willet	69	17	86
Least Sandpiper	811	1,065	1,876	American Avocet	133	19	152
Stilt Sandpiper	7	223	230	American Woodcock	119	7	126
Semipalmated Sandpiper	1,606	1,401	3,007	Wilson's Snipe	189	233	422
Western Sandpiper	2	8	10	Sanderling	128	140	268
Marbled Godwit	17	16	33	Whimbrel	1,125	5	1,130
Buff-breasted Sandpiper	0	17	17	Unidentified Dowitcher	4	15	19
Dunlin	25,078	1,150	26,228	Unidentified Peep	177	431	608
Hudsonian Godwit	4	122	126	Ruff	2	1	3
Black.-necked Stilt	33	0	33	Red Phalarope	0	2	2
TOTAL birds	39,339	11,993	51,332	# Trips	295	177	472

Table 3. Mean shorebird numbers observed by ten day periods for selected marshes during spring migration in the Lake Erie marshes, 2015.

10-day Periods	Principle Marshes Surveyed					
	Magee Marsh	Ottawa NWR	Metzger Marsh	Pickrel Ck	Lucas Co. Fields	Pt Moullie
March 1-10		4			9	
March 11-20	4	13			25	13
March 21-31	3	13	10		10	24
April 1-10	6	15	11		20	45
April 11-20	10	22	52		37	331
April 21-30	9	14	206		10	510
May 1-10	<u>109</u>	<u>132</u>	<u>595</u>	112	22	1,151
May 11-20	<u>113</u>	<u>198</u>	<u>810</u>	<u>1,114</u>	<u>272</u>	<u>1,405</u>
May 21-31	18	88	274	470	14	<u>2,984</u>
June 1-10		1				289
June 11-20	6	6		7	3	112
June 21-30		6	7		3	56

Table 4. Timing of spring migrating shorebirds (avg. #/day) in the Lake Erie marsh region, 2015.*

Time Period	Gold Plov	Spot. Sand.	Killdeer	SB Dow	Whim brel	Semi-Sand	Dunlin	Semi. Plover	Lesser Yleg	Least Sand.	BB Plover
Mar 1-10			7								
11-20			38						<1		
21-31			16						<1		
Apr 1-10	<1		26			<1	2		2		
11-20	<1	<1	19	<1			76		3		
21-30	<1	1	13	<1			83	<1	11	<1	<1
May 1-10	<u>144</u>	13	<u>52</u>	4		8	489	12	<u>47</u>	28	12
11-20	<u>80</u>	<u>24</u>	<u>46</u>	<u>59</u>	<u>50</u>	19	<u>1,376</u>	<u>40</u>	28	<u>44</u>	<u>44</u>
21-31	1	8	30	9	<u>67</u>	<u>110</u>	549	<u>30</u>	1	12	<u>47</u>
Jun 1-10	2	4	13	<1	3	46	72	2		1	<1
11-20		2	15		1	15	16	<1			
21-30		2	16				1		3	<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, 2015.

10-day periods	Marshes						
	Pt Moullie SGA	Ottawa NWR	Pickereel Creek	Green Creek	Maumee Bay SP	Lucas Co. Fields	Ottawa Co. Fields
July 1-10	189	5	6				7
July 11-20	122	4				59	6
July 21-31	<u>576</u>	2	6				
Aug. 1-10	<u>563</u>	9			9	15	
Aug. 11-20	347	6	<u>242</u>	<u>79</u>	4	11	
Aug. 21-31	501	<u>178</u>	16	41	27	1	20
Sept. 1-10	5	61		23	17	30	52
Sept. 11-20	4	109			23	29	
Sept. 21-30	6	56	48		<u>47</u>	<u>44</u>	6
Oct. 1-10		49	9		<u>45</u>	20	
Oct. 11-20		31			38	32	14
Oct. 21-31	36	44					<u>94</u>
Nov. 1-10	62	<u>316</u>				5	11
Nov. 11-20	61	2					
Nov. 21-30	121	17					

Table 6. Timing of fall migrating shorebirds (avg. #/day) in the Lake Erie marsh region, 2015.*

Time Period	Semi Plov	Kill-deer	Pect Sand	Least Sand	Semi. Sand	Great Yleg	Less Yleg	Sh-bill Dow	Com. Snipe	Stilt Sand	Dunlin	Spot Sand
July 1-10		33		1			24	<u>18</u>	<1			4
11-20	<1	17		4	5	1	5	7	<1			5
21-31	2	40	6	21	39	12	<u>64</u>	7	<1	<u>11</u>	<1	<u>8</u>
Aug 1-10	7	32	7	11	22	9	26	6	1	6	<1	<u>7</u>
11-20	7	36	4	<u>39</u>	29	9	27	4	4	3	<1	3
21-31	<u>13</u>	46	<u>9</u>	<u>38</u>	<u>72</u>	<u>21</u>	29	<u>17</u>	<u>10</u>	4	<1	5
Sept. 1-10	2	<u>77</u>	2	4	2	4	12	1	<1	2	<1	<1
11-20	5	34	4	9	6	7	11	3	4	3		<1
21-30	3	34	5	4	2	4	9	3	1	<1	<1	<1
Oct 1-10	4	16	<1	2	2	4	5		1	<1	5	
11-20	<1	18		<1	<1	2	<1		2		11	
21-31		25		4		3	2		<1		40	
Nov 1-10		4		4		1	1		4		<u>96</u>	
11-20		<1				<1					20	
21-30											49	

*numbers underlined are peaks for each species