

Migrational Survey and Habitat Usage of Shorebirds in the Lake Erie Marsh Region,2011

PROGRESS REPORT-2011

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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). 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 surrounding wetlands of the

Lake Erie marsh region were surveyed by vehicle or on foot from spring migration (16 March 2011) through fall (25 November 2011). 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. Data were compiled by region and marsh unit.

RESULTS AND DISCUSSION

The 2011 field season was the 17th full year of data collection for shorebird migration. Six marshes were sampled at least once in the spring and seven in the fall. The main areas sampled were Ottawa NWR, flooded fields in Ottawa and Lucas Counties, Winous Point Marsh Conservancy, and Pt. Mouillee State Game Area (SGA). The sampling dates and the total shorebirds counted are shown in Table 1.

Spring Migration

A total of 7,615 birds of 19 species were counted during 27 trips (Table 2). Ottawa County flooded fields, Ottawa NWR, Lucas County flooded fields, and Pt. Mouillee SGA were the most frequently surveyed wetlands. Heaviest bird concentrations were observed on Ottawa NWR and Lucas County fields. Peak activity on these five major areas is shown in Table 3. The most abundant species counted and their peak movements were Killdeer (March 11-20 and May 21-31, young recruitment), Pectoral Sandpiper (April 21-30), Greater Yellowlegs (April 21-30), Lesser Yellowlegs (April 21-30), American Golden Plover (April 11-20), Black-bellied Plover (May 11-20), Dunlin (May 11-20), Least Sandpiper (May 21-31), Semipalmated Plover (May 21-31), and Semipalmated Sandpiper (June 1-10) (Table 4).

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

Spring habitat was predominantly composed of mudflats in Ottawa NWR and Pt. Mouillee SGA 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 2011, the amount of available mudflat habitat created by drawdowns was below normal, as most marsh managers chose to hold water on wetlands due to the low water levels of Lake Erie; the exceptions were one unit of Ottawa NWR, two units of Pt. Mouillee SGA, and one unit at the Winous Point Marsh Conservancy that were being specifically managed for spring-migrating shorebirds in 2011. Overall, 2011 was one of the poorest spring migrations for shorebirds recorded in the marsh region. Weather conditions and quick vegetation maturity resulted in little available habitat and a presumed rapid movement north of shorebirds.

Fall Migration

Thirty-one species totaling 26,503 birds were recorded on 78 trips (Table 2). Consistently productive areas were Ottawa NWR, Winous Point Marsh Conservancy, Lucas County fields, and Pt. Moulliee SGA. Shorebird habitat management was very challenging during the fall period. Early fall was extremely dry which transitioned drawdown units through preferred habitat stages rapidly. August and September were extremely wet resulting in major effects on management plans. Several prime shorebird units were just reaching desired water levels when heavy 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 Greater Yellowlegs (July 21-31 and Oct. 11-20), Short-billed Dowitcher (Aug. 1-10), Pectoral Sandpiper (Aug. 1-10), Lesser Yellowlegs (Aug. 1-10), Semipalmated Sandpiper (Aug. 1-20), Semipalmated Plover (Aug. 11-20), Least Sandpiper (Aug. 11-20), Killdeer (Oct. 1-10), American Golden Plover (Oct. 1-10), Black-bellied Plover (Oct. 1-20), Long-billed Dowitcher (Oct. 1-20), and Dunlin (Nov. 1-20) (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 and Semipalmated Sandpiper peak in August. September peaks are observed in Lesser Yellowlegs, hatching year Stilt Sandpiper, 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.

High lake levels resulted in few natural mud flats available for migrating shorebirds in 2011, similar to previous years. 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 2011 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 provides 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 (420 hrs @ \$16.00/hr for services=\$6,720).

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Table 1. Sampling intensity of surveyed marshes and shorebird numbers, 2011.

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
Old Woman's Creek W/A	1	42	42				1	42	42
Magee Marsh W/A				1	22	22	1	22	22
Moxley Marsh				1	108	108	1	108	108
Ottawa NWR	6	3,075	513	38	12,995	342	44	16,070	365
Maumee Bay State Park				1	30	30	1	30	30
Ottawa Co.Flooded fields	6	2,721	454				6	2,721	454
Winous Point Marsh	2	162	81	17	10,561	621	19	10,723	564
Lucas Co. Flooded fields	6	1,059	177	8	331	41	14	1,390	99
Pt. Mouillee	5	556	111	12	2,451	204	17	2,007	177
Sandusky Co. Flooded fields									
Cedar Pt NWR									
McClure Marsh									
Total	27	7,615	282	78	26,503	340	105	34,118	325

Table 2. Shorebird numbers observed during spring and fall migration in the Lake Erie marshes, 2011.

Species	Spring	Fall	Total	Species	Spring	Fall	Total
Piping Plover	0	0	0	Short-billed Dowitcher	2	2,621	2,623
Semipalmated Plover	36	801	837	Long-billed Dowitcher	0	750	750
Killdeer	515	2,961	3,476	Greater Yellowlegs	88	863	951
American Golden Plover	57	1,477	1,534	Lesser Yellowlegs	397	3,073	3,470
Black-bellied Plover	20	431	451	Red Knot	0	11	11
Spotted Sandpiper	43	287	330	Wilson Phalarope	0	6	6
Solitary Sandpiper	1	99	100	Red-necked Phalarope	3	42	45
Pectoral Sandpiper	69	586	655	Upland Sandpiper	0	2	2
White-rumped Sandpiper	7	212	219	Ruddy Turnstone	23	17	40
Baird's Sandpiper	0	63	63	Willet	1	3	4
Least Sandpiper	58	2,583	2,641	American Avocet	0	2	2
Stilt Sandpiper	0	284	284	American Woodcock	0	0	0
Semipalmated Sandpiper	123	4,095	4,218	Common Snipe	10	81	91
Western Sandpiper	0	17	17	Sanderling	0	117	117
Marbled Godwit	0	9	9	Whimbrel	0	2	2
Buff-breasted Sandpiper	0	5	5	Unidentified Dowitcher	0	193	193
Dunlin	6,161	4,652	10,813	Unidentified Peep	0	10	10
Hudsonian Godwit	0	218	218	Ruff	0	0	0
Black.-necked Stilt	1	0	1	Red Phalarope	0	0	0
TOTAL birds	7,615	26,503	34,118	# Trips	27	78	105
# observer hrs.			302				

Table 3. Mean shorebird numbers observed by ten day periods for selected marshes during spring migration in the Lake Erie marshes, 2011.

10-day Periods	Principle Marshes Surveyed				
	Pt. Mouillee	Ottawa NWR	Winous Point MC	Ottawa Co. Fields	Lucas Co. Fields
March 1-10					
March 11-20	31				
March 21-31					
April 1-10	73	18		4	
April 11-20				57	
April 21-30	72	30		712	82
May 1-10		16		14	91
May 11-20		1061		5	245
May 21-31		889		479	306
June 1-10	195				
June 11-20	237		49		
June 21-30			113		

Table 4. Timing of spring migrating shorebirds (avg. #/trip) in the Lake Erie marsh region, 2011.*

Time Period	Semi Plov	Spot. Sand.	Killdeer	Blk.-be Plover	Pect. Sand	Semi-Sand	Dunlin	Greater Yleg	Lesser Yleg	Least Sand.	AG Plover
Mar 1-10											
11-20			<u>29</u>		1						
21-31											
Apr 1-10			17		2		4	6	5	1	
11-20											<u>57</u>
21-30		1	17		<u>20</u>		634	<u>23</u>	<u>90</u>		
May 1-10		2	12		2		37	3	<u>54</u>	5	
11-20	3	<1	5	<u>7</u>			<u>847</u>	<1	2	4	
21-31	<u>21</u>	1	40				<u>1600</u>			<u>12</u>	
Jun 1-10	5	<u>14</u>	34			<u>123</u>	11		2		
11-20	1	<u>10</u>	<u>111</u>				15	1		4	
21-30		8	85						3	17	

*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, 2011.

10-day periods	Marshes			
	Pt Moullie SGA	Ottawa NWR	Winous Point	Lucas County fields
July 1-10	140			21
July 11-20	314		486	28
July 21-31	211	45	728	
Aug. 1-10		137	696	
Aug. 11-20	358	218	633	
Aug. 21-31		142	65	
Sept. 1-10	569	128		23
Sept. 11-20	238	122		
Sept. 21-30		126		101
Oct. 1-10	208	722		59
Oct. 11-20		917		27
Oct. 21-31	88	169		14
Nov. 1-10	4	707		
Nov. 11-20		1556		
Nov. 21-31		257		

Table 6. Timing of fall migrating shorebirds (avg. #/trip) in the Lake Erie marsh region, 2011.*

Time Period	Semi Plov	Kill-deer	Pect Sand	Least Sand	Semi. Sand	Great Yleg	Less Yleg	Sh-bill Dowit	B-B Plov.	Lo-bill Dowit	Dunlin	A-G Plover
July 1-10		53		5			9				<1	
11-20	<1	<u>116</u>	<1	<u>88</u>		9	79	52			<1	
21-31	16	63	<u>18</u>	55	105	<u>42</u>	<u>104</u>	66	<1	1	<1	
Aug 1-10	20	49	<u>20</u>	53	<u>172</u>	23	<u>149</u>	<u>151</u>	<1	10		
11-20	<u>36</u>	65	<u>16</u>	<u>99</u>	<u>150</u>	9	73	72	<1	5		
21-31	7	14	9	31	21	7	16	13		<1		<1
Sep. 1-10	6	16	7	22	25	7	13	9	1	2		<1
11-20	11	24	10	20	37	9	8	7	4	15	<1	3
21-30	2	71		3	4	6	9	18	6		4	
Oct 1-10	11	<u>103</u>	9	16	63	<u>29</u>	43	31	<u>46</u>	<u>55</u>	73	<u>122</u>
11-20	9	75	14	47	75	12	42		<u>48</u>	<u>47</u>	197	<u>283</u>
21-31	<1	5	<1	<1	<1	4			2	16	99	
Nov 1-10		4			2	13	2		2	28	<u>418</u>	
11-20		1				18	5				<u>1532</u>	
21-30		4				1					251	

*numbers underlined are peaks for each species