

Migrational Survey and Habitat Usage of Shorebirds in the Lake Erie Marsh Region, 2010

PROGRESS REPORT-2010

BSBO-10-3

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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). 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 distant 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 analysis are needed to seek International 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 (20 March

2010) through fall (23 November 2010). 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 2010 field season was the 16th full year of data collection for shorebird migration. Eleven marshes were sampled at least once in the spring and nine in the fall. The main areas sampled were Ottawa NWR, flooded fields in Ottawa and Lucas Counties, Winous Point Marsh Conservancy, Pickerel Creek State Wildlife Area (WA), Pipe Creek WA, McClure Marsh, 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 9,785 birds of 26 species were counted during 50 trips (Table 2). Ottawa county flooded fields, Ottawa NWR, Lucas County flooded fields, and Pt. Mouillee were the most frequently surveyed wetlands. Heaviest bird concentrations were observed on Ottawa NWR and Pt. Mouillee SGA. Peak activity on these four major marshes is shown in Table 3. The most abundant species counted and their peak movements were Pectoral Sandpiper (April 1-10), Greater Yellowlegs (April 1-10 and May 1-10), Killdeer (April 21-30), Lesser Yellowlegs (May 1-10), Black-bellied Plover (May 11-20), Dunlin (May 11-20), Least Sandpiper (May 11-20), Whimbrel (May 21-31), Semipalmated Plover (May 21-31), and Semipalmated Sandpiper (June 1-10) (Table 4).

The Pectoral Sandpiper appears to be the most abundant species of early 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 along the various estuaries, such as Turtle Creek and Crane Creek, 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 2010, 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 and two units of Pt. Mouillee SGA that were being specifically managed for spring-migrating shorebirds in 2010. Overall, 2010 was one of the poorest migrations for shorebirds recorded in the marsh region. This mirrored assessments for passerines and waterfowl. Lack of suitable mudflat habitat could be a major contributing factor to the shorebird numbers but does not explain the low numbers of other bird groups, raising questions of a larger population decline issues.

Fall Migration

Thirty-two species totaling 48,665 birds were recorded on 92 trips (Table 2). Consistently productive marshes were Ottawa NWR, Winous Point Marsh Conservancy, Pipe Creek WA, Pickerel Creek WA, McClure Marsh, and Pt. Moulliee SGA. A fair amount of mudflat habitat was available throughout the fall migration. Peak activities of major sampled marshes are shown in Table 5. The most abundant species counted and their peak movements were Killdeer (Sept. 21 - Oct. 10), Short-billed Dowitcher (July 11-20), Least Sandpiper (July 11-20), Sanderling (Oct. 21 - Nov. 10), Semipalmated Sandpiper (Aug. 21-31), Lesser Yellowlegs (Sept. 21-30), Greater Yellowlegs (Sept. 21-30), Stilt Sandpiper (Sept. 21-30), Semipalmated Plover (Aug. 21-31), Pectoral Sandpiper (Sept. 21 - Oct. 10), Long-billed Dowitcher (Sept. 21-30), and Dunlin (Oct. 21-Nov. 10) (Table 6).

Fall migration is more protracted than spring, running from early July into November. The earliest species to peak were the Short-billed Dowitcher and Least Sandpiper in July. Semipalmated Plover and Semipalmated Sandpiper peaked in August. September peaks were observed in Greater Yellowlegs, Lesser Yellowlegs, hatching year Stilt Sandpiper, Pectoral Sandpiper, Killdeer, and adult Long-billed Dowitcher. Hatching year Long-billed Dowitcher peaked during early to mid-October, while Dunlin and Sanderling peaked in late October and early November.

High lake levels resulted in poor amounts of natural mud flats available for migrating shorebirds once again in 2010. The loss of natural habitats puts more importance on water level management regimes in managed marsh units. Rainfall timing also resulted in less than 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 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 usage and requirements for shorebird species. As more yearly data accumulate a better picture of habitat use will be developed.

It appears that 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 2010 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 compartmentalizing themselves into 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

Cost of this project was covered by the Black Swamp Bird Observatory through computer support, data analysis, and volunteers for data collection (1,700 hrs @ \$16.00/hr for services=\$27,200).

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Table 1. Sampling intensity of surveyed marshes and shorebird numbers, 2010.

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
Pipe Creek W/A	2	41	21	11	1,395	127	13	1,436	110
Magee Marsh W/A	2	15	8				2	15	8
Huron River	1	16	16	3	468	156	4	484	121
Ottawa NWR	14	1,409	101	27	28,826	1,068	41	30,235	737
Pickereel Crk. W/A	3	988	329	6	1,913	319	9	2,901	322
Sheldon's Marsh	2	45	23	3	119	40	5	164	33
Ottawa Co.Flooded fields	7	766	109				7	766	109
Winous Point Marsh				25	11,104	444	25	11,104	444
Lucas Co. Flooded fields	8	866	108				8	866	108
Pt. Mouillee	9	5,001	556	3	828	276	12	5,829	486
Sandusky Co. Flooded fields	1	434	434				1	434	434
Cedar Pt NWR	1	204	204	1	54	54	2	258	129
McClure Marsh				13	3,958	1,319	13	3,958	1,319
Total	50	9,785	196	92	48,665	529	142	58,450	412

Table 2. Shorebird numbers observed during spring and fall migration in the Lake Erie marshes, 2010.

Species	Spring	Fall	Total	Species	Spring	Fall	Total
Piping Plover	0	5	5	Short-billed Dowitcher	98	3,489	3,587
Semipalmated Plover	105	447	552	Long-billed Dowitcher	3	371	374
Killdeer	897	6,062	6,959	Greater Yellowlegs	172	698	870
American Golden Plover	40	31	71	Lesser Yellowlegs	724	4,974	5,698
Black-bellied Plover	125	346	471	Red Knot	0	10	10
Spotted Sandpiper	145	170	315	Wilson Phalarope	3	39	42
Solitary Sandpiper	38	125	163	Red-necked Phalarope	1	129	130
Pectoral Sandpiper	411	2,132	2,543	Upland Sandpiper	4	0	4
White-rumped Sandpiper	31	72	103	Ruddy Turnstone	62	0	62
Baird's Sandpiper	0	40	40	Willet	30	22	52
Least Sandpiper	186	3,978	4,164	American Avocet	0	9	9
Stilt Sandpiper	1	603	604	American Woodcock	2	1	3
Semipalmated Sandpiper	476	4,724	5,200	Common Snipe	18	78	96
Western Sandpiper	0	11	11	Sanderling	51	2,709	2,760
Marbled Godwit	20	47	67	Whimbrel	253	4	257
Buff-breasted Sandpiper	0	7	7	Unidentified Dowitcher	0	0	0
Dunlin	5,880	17,241	23,121	Unidentified Peep	9	0	9
Hudsonian Godwit	0	90	90	Ruff	0	0	0
Black.-necked Stilt	0	0	0	Red Phalarope	0	1	1
TOTAL birds	9,785	48,665	58,450	# Trips	50	92	142
# observer hrs.			1,600				

Table 3. Mean shorebird numbers observed by ten day periods for selected marshes during spring migration in the Lake Erie marshes, 2010.

10-day Periods	Principle Marshes Surveyed			
	Pt. Mouillee	Ottawa NWR	Ottawa Co. Fields	Lucas Co. Fields
March 1-10				
March 11-20			2	
March 21-31		4		
April 1-10	8	101		2
April 11-20		47		6
April 21-30		73	57	
May 1-10	92	27	25	26
May 11-20	477	48	140	152
May 21-31	484	76	5	47
June 1-10	335	365		
June 11-20	74			
June 21-30	161			

Table 4. Timing of spring migrating shorebirds (avg. #/trip) in the Lake Erie marsh region, 2010.*

Time Period	Semi Plov	Spot. Sand.	Killdeer	Blk.-be Plover	Pect. Sand	Semi-Sand	Dunlin	Greater Yleg	Lesser Yleg	Least Sand.	Whim
Mar 1-10											
11-20									2		
21-31			4								
Apr 1-10		<1	12		<u>64</u>		6	<u>10</u>	19		
11-20			6		31			9	12		
21-30		1	<u>48</u>	4	7		47	9	18		
May 1-10	5	7	16	3	11		197	<u>11</u>	<u>69</u>	12	
11-20	1	6	26	<u>21</u>	3	1	<u>844</u>	6	49	<u>20</u>	5
21-31	<u>13</u>	8	62	6		49	397	<1	<1	6	<u>47</u>
Jun 1-10	5	6	49			<u>228</u>	17				
11-20	2	6	63			1	2				
21-30		28	95			1	3		7	24	

*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, 2010.

10-day periods	Marshes				
	Pipe Creek WA	Ottawa NWR	Winous Point	Pickereel Creek WA	McClure Marsh
July 1-10	20			52	
July 11-20	73	73	93	236	136
July 21-31		8	46	<1	316
Aug. 1-10	17	24	22	90	99
Aug. 11-20	31	24	482		
Aug. 21-31	61	43	445		
Sept. 1-10		121	254		
Sept. 11-20		290	18		
Sept. 21-30		1,851			
Oct. 1-10		1,851			
Oct. 11-20		790			
Oct. 21-31		4,715			
Nov. 1-10		5,198			
Nov. 11-20		2,314			
Nov. 21-31		350			

Table 6. Timing of fall migrating shorebirds (avg. #/trip) in the Lake Erie marsh region, 2010.*

Time Period	Semi Plov	Kill-deer	Pect Sand	Least Sand	Semi. Sand	Great Yleg	Less Yleg	Sh-bill Dowit	Stilt Sand	Lo-bill Dowit	Dunlin	Sanderling
July 1-10		146		44	<1	5	45	32			<1	
11-20		112	4	<u>152</u>	10	12	157	<u>206</u>	7		<1	
21-31	1	103	39	67	57	8	71	41	5		<1	
Aug 1-10	4	50	30	56	53	4	38	10	<1		<1	
11-20	12	73	31	100	116	12	53	115	9	2		
21-31	<u>17</u>	51	32	84	<u>210</u>	14	65	86	5	7		
Sep. 1-10	8	65	34	34	89	19	55	47	6	2		
11-20	12	95	14	27	15	20	118	3	20	6	1	<1
21-30	12	<u>560</u>	<u>244</u>	99	56	<u>58</u>	<u>492</u>	2	<u>147</u>	<u>106</u>	4	32
Oct 1-10	6	<u>456</u>	<u>197</u>	10	6	6	273		49	51	308	400
11-20	1	38	10	1		3	18		5	11	530	140
21-31		215	28			1	115		6	6	3,700	<u>520</u>
Nov 1-10		46		1			5				<u>4,600</u>	<u>533</u>
11-20											2,300	10
21-30											350	

*numbers underlined are peaks for each species