

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

PROGRESS REPORT-2012

BSBO-13-2

Mark C. Shieldcastle, Research Director
Black Swamp Bird Observatory
13551 West State Route 2
Oak Harbor, Ohio 43449
markshieldcastle@bsbo.org

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 (07 March 2012) through fall (27 November 2012). 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 2013) where a complete count was made with adequate location information. Data were compiled by region and marsh unit.

RESULTS AND DISCUSSION

The 2012 field season was the 21st full year of data collection for shorebird migration. Fourteen marshes were sampled at least once in the spring and 21 in the fall. The main areas sampled were Ottawa NWR, flooded fields in Ottawa and Lucas Counties, Winous Point Marsh Conservancy, Metzger Marsh Wildlife Area (WA), and Pipe Creek WA. The sampling dates and the total shorebirds counted are shown in Table 1.

Spring Migration

A total of 38,011 birds of 25 species were counted during 186 trips (Table 2). Ottawa County flooded fields, Ottawa NWR, Lucas County flooded fields, and Metzger Marsh WA were the most frequently surveyed wetlands. Heaviest bird concentrations were observed on Ottawa NWR Winous Point Marsh Conservancy, 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 (March 1-10), Lesser Yellowlegs (March 21-31), Common Snipe (April 1-10), Pectoral Sandpiper (April 1-10), Greater Yellowlegs (April 11-20), American Golden Plover (April 11-20), Least Sandpiper (May 1-10), Dunlin (May 11-20), Semipalmated Plover (May 11-20), Short-billed Dowitcher (May 11-20), and Semipalmated Sandpiper (June 1-10) (Table 4).

Over the timeframe of the study the Pectoral Sandpiper appeared 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 Winous Point Marsh Conservancy, Ottawa NWR, Metzger Marsh WA, Camp Sabroske, 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 2012, the amount of available mudflat habitat created by drawdowns was 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 of Ottawa NWR and a unit at the Winous Point Marsh Conservancy that were being specifically managed for spring-migrating shorebirds in 2012. Overall, 2012 was an average spring migration for shorebirds in the marsh region.

Migration appeared to peak for most species 10 days earlier 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-two species totaling 40,223 birds were recorded on 231 trips (Table 2). Consistently productive areas were Ottawa NWR, Winous Point Marsh Conservancy, McClure Marsh, Pipe Creek WA, Turtle Creek, and Pt. Moulliee SGA. Shorebird habitat management is very challenging during the fall period. Early fall was extremely dry which transitioned drawdown units through preferred habitat stages 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 21-31), Stilt Sandpiper (July 21-31), Lesser Yellowlegs (July 21 to August 10), Killdeer (July 21 to August 10), Spotted Sandpiper (July 21 to August 10), Greater Yellowlegs (August 1 to September 10), Semipalmated Sandpiper (August 1-10 and 21-31), Pectoral Sandpiper (Aug. 1-31 and October 11-20), Least Sandpiper (Aug. 21-31), Semipalmated Plover (August 21 to September 10), Black-bellied Plover (Oct. 11-20), and Dunlin (October 21 to November 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 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. 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 variable availability of natural mud flats, especially at Ottawa NWR for migrating shorebirds in 2012, quite 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 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 over seeing 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 (800 hrs @ \$16.00/hr for services=\$12,800).

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It is with deep sadness that BSBO recognizes the passing of John Szanto following this past field season. John has spent untold hours in field documenting shorebird numbers since the beginning of this study. His knowledge, friendly attitude, volunteer training, and effort will be greatly missed.

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Table 1. Sampling intensity of surveyed marshes and shorebird numbers, 2012.

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	39	8,434	216	11	250	23	50	8,684	174
Magee Marsh W/A	12	421	35	7	202	29	19	623	33
Moxley Marsh				5	1,414	283	5	1,414	283
Ottawa NWR	49	18,777	383	58	13,477	232	107	32,254	301
Maumee Bay State Park	14	409	29	7	82	12	21	491	23
Ottawa Co.Flooded fields	17	1,056	62	1	15	15	18	1,071	60
Winous Point Marsh	14	5,012	358	29	6,141	212	43	11,153	259
Lucas Co. Flooded fields	17	521	31				17	521	31
Pt. Mouillee				4	1,453	363	4	1,453	363
Pickeral Creek WA	4	164	41	4	361	90	8	525	66
Cedar Pt NWR	2	107	54	1	31	31	3	138	46
Meadowbrook Marsh				3	140	47	3	140	47
Turtle Creek	1	10	10	23	3,283	143	24	3,293	137
Sandusky River	1	2	2	3	46	15	4	48	12
East Harbor State Park	3	20	7	4	83	21	7	103	15
Camp Sabroske	12	2,989	249				12	2,989	249
Green Creek	1	54	54				1	54	54
Willow Point WA				3	200	67	3	200	67
Toussaint WA				1	9	9	1	9	9
Huron River				2	217	109	2	217	109
Pipe Creek WA				21	3,627	173	21	3,627	173
Sheldon's Marsh				10	640	64	10	640	64
Camp Perry Beach				7	248	35	7	248	35
McClure Marsh				27	8,304	308	27	8,304	308
Total	186	38,011	204	231	40,223	174	417	78,234	188

Table 2. Shorebird numbers observed during spring and fall migration in the Lake Erie marshes, 2012.

Species	Spring	Fall	Total	Species	Spring	Fall	Total
Piping Plover	0	0	0	Short-billed Dowitcher	406	2,502	2,906
Semipalmated Plover	684	1,279	1,963	Long-billed Dowitcher	12	301	313
Killdeer	1,579	7,567	9,146	Greater Yellowlegs	791	1,009	1,800
American Golden Plover	300	89	389	Lesser Yellowlegs	2,196	5,940	8,136
Black-bellied Plover	186	531	717	Red Knot	0	34	34
Spotted Sandpiper	143	480	623	Wilson Phalarope	3	55	58
Solitary Sandpiper	274	275	549	Red-necked Phalarope	0	66	66
Pectoral Sandpiper	2,785	5,711	8,496	Upland Sandpiper	11	7	18
White-rumped Sandpiper	58	59	117	Ruddy Turnstone	139	24	163
Baird's Sandpiper	0	58	58	Willet	27	6	33
Least Sandpiper	471	4,689	5,160	American Avocet	7	23	30
Stilt Sandpiper	0	434	434	American Woodcock	23	6	29
Semipalmated Sandpiper	253	5,703	5,956	Wilson's Snipe	308	162	470
Western Sandpiper	0	52	52	Sanderling	22	81	103
Marbled Godwit	1	58	59	Whimbrel	3	14	17
Buff-breasted Sandpiper	0	44	44	Unidentified Dowitcher	0	87	87
Dunlin	27,313	2,683	29,996	Unidentified Peep	16	146	162
Hudsonian Godwit	0	48	48	Ruff	0	0	0
Black.-necked Stilt	0	0	0	Red Phalarope	0	0	0
TOTAL birds	38,011	40,223	78,234	# Trips	186	231	417

Table 3. Mean shorebird numbers observed by ten day periods for selected marshes during spring migration in the Lake Erie marshes, 2012.

10-day Periods	Principle Marshes Surveyed				
	Camp Sabroske	Ottawa NWR	Winous Point MC	Ottawa Co. Fields	Metzger Marsh
March 1-10				12	
March 11-20		4		<1	<1
March 21-31		58		7	<1
April 1-10		<u>222</u>			<1
April 11-20		120	39	7	<1
April 21-30	6	<u>205</u>	<u>46</u>	2	26
May 1-10	<u>36</u>	48	<u>55</u>	4	57
May 11-20	<u>31</u>	174	7	<u>15</u>	<u>140</u>
May 21-31	8			1	24
June 1-10			21	1	8
June 11-20					
June 21-30		2			4

Table 4. Timing of spring migrating shorebirds (avg. #/trip) in the Lake Erie marsh region, 2012.*

Time Period	Semi Plov	S.b. Dow	Killdeer	Wilson Snipe	Pect. Sand	Semi-Sand	Dunlin	Greater Yleg	Lesser Yleg	Least Sand.	AG Plover
Mar 1-10			<u>70</u>								
11-20			5	1				<1	2		
21-31			7	2	21		1	5	<u>34</u>	<1	
Apr 1-10			15	<u>7</u>	<u>114</u>		58	9	27		<1
11-20		<1	8	5	34		87	<u>11</u>	18	<1	<u>8</u>
21-30	<1	<1	7	2	4		256	6	12	<1	3
May 1-10	1	<1	7	<1	8	<1	163	3	12	<u>6</u>	<1
11-20	<u>16</u>	<u>11</u>	10		<1	3	<u>317</u>	1	4	4	<1
21-31	5	<1	6		<1	4	21	<1	<1	2	
Jun 1-10	1		7			<u>12</u>	4	<1	<1	1	
11-20											
21-30			6					<1	<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, 2012.

10-day periods	Marshes					
	Pt Moullie SGA	Ottawa NWR	Winous Point	Turtle Creek	McClure Marsh	Pipe Creek WA
July 1-10			43			
July 11-20		30	37	13		6
July 21-31		94	<u>106</u>	8		12
Aug. 1-10	31	72	80	8	46	<u>56</u>
Aug. 11-20		48	11	18	62	23
Aug. 21-31		44	3	<u>30</u>	<u>131</u>	41
Sept. 1-10	11	61	2	<u>32</u>	26	
Sept. 11-20		22	5	7	26	
Sept. 21-30	25	42		9	7	
Oct. 1-10		24	<1	4	6	
Oct. 11-20		<u>284</u>			10	
Oct. 21-31		186	<1	1	10	
Nov. 1-10		101	43	2	<1	
Nov. 11-20		<1				
Nov. 21-31						

Table 6. Timing of fall migrating shorebirds (avg. #/trip) in the Lake Erie marsh region, 2012.*

Time Period	Semi Plov	Kill-deer	Pect Sand	Least Sand	Semi. Sand	Great Yleg	Less Yleg	Sh-bill Dowit	B-B Plov.	Stilt Sand	Dunlin	Spot Sand
July 1-10	<1	25	<1	14	<1	2	6	2			3	1
11-20	<1	44	2	24	6	1	15	21	<1	<1		4
21-31	2	<u>59</u>	23	31	46	5	<u>57</u>	<u>46</u>		<u>4</u>		<u>5</u>
Aug 1-10	7	<u>64</u>	<u>53</u>	23	<u>60</u>	<u>7</u>	<u>59</u>	10	<1	3	<1	<u>5</u>
11-20	8	26	35	22	19	<u>6</u>	29	17	1	2		2
21-31	<u>10</u>	34	<u>50</u>	<u>40</u>	<u>60</u>	<u>7</u>	32	6	1	1	<1	1
Sept. 1-10	<u>12</u>	26	14	19	23	<u>6</u>	26	3	2	3		1
11-20	8	18	7	13	4	3	10	<1	<1	2		<1
21-30	3	25	19	7	4	3	11	<1	9	1	2	<1
Oct 1-10	1	20	6	1	<1	2	3		2		4	
11-20	<1	21	<u>50</u>	12	3	5	6		<u>27</u>	2	<u>146</u>	
21-31	<1	9	28	3	<1	3	2		3	<1	<u>140</u>	
Nov 1-10	<1	3	1	5		<1					<u>140</u>	
11-20		<1				1					3	
21-30											1	

*numbers underlined are peaks for each species