

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

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INTRODUCTION

The importance of studying shorebird migration and stopover habitat needs have 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 pressures on these long distant migrants (Helmert 1993).

Shorebirds differ from other neotropical migrants by narrow habitat requirements. Abundant food producing stopover sites 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 make up the largest stopover habitats in the eastern United States between coastal habitats and northern breeding areas. Over 30 species of shorebirds migrate through the Lake Erie marshes each year with differential age migration peaks and habitat uses. Determining habitat uses and management regimes that create the favored habitats will be beneficial for increasing the value of the marsh systems to shorebirds (Skagen and Knopf 1993). Improved management of spring through fall stopover sites can increase summer reproduction success and survivorship of fledglings (Knauer 1977, Taylor 1977). BSBO was successful in acquiring the status of Regional Site under the Western Shorebird Hemispheric Reserve Network in September 2000.

MATERIALS AND METHODS

Units of Ottawa NWR complex and surrounding wetlands of the Lake Erie marsh region were surveyed by vehicle or on foot from spring migration (4 March) through fall (21 November) (Fig. 1). Bird numbers were censused utilizing the International Shorebird Survey protocol (date, location, time observer, water depth, and disturbance) plus additional information on individual management units and habitat conditions (Fig. 2). Data was compiled by region and marsh unit.

RESULTS AND DISCUSSION

The 2003 field season was the ninth full year of data collection for shorebird migration. Fourteen marshes were sampled at least once in the spring and thirteen in the fall. The main areas sampled were Ottawa NWR, Magee Marsh W/A, Turtle Creek, Point Mouillee State Game Area, Pipe Creek W/A, Toussaint W/A, and Ottawa county fields. The number of sample dates and the total shorebirds are shown in Table 1.

Spring Migration

A total of 49,478 birds of 28 species were counted during 102 trips (Table 2). Ottawa NWR, Magee Marsh W/A, and Ottawa county fields were the most often surveyed wetlands. Heaviest bird concentrations were observed on Crane Creek of Ottawa NWR, Point Mouillee SGA, and Magee Marsh W/A. Peak activity on major marshes is shown in Table 3. Dominant species counted and their peak movements were Killdeer (March 11-20), Dunlin (May 11-31); Pectoral Sandpiper (April 11-20); Least Sandpiper (June 1-10); Semipalmated Sandpiper (June 1-10); Semipalmated Plover (May 21-31), Lesser Yellowlegs (May 1-10), Ruddy Turnstone (May 11-20), Greater Yellowlegs (April 1-10), American Golden Plover (April 21 - May 10), and Black-bellied Plover (May 11-20) (Table 4).

The Pectoral Sandpiper appears to be the dominant of early April along with Greater Yellowlegs and Common Snipe. Dunlin become the dominate shorebird in May with sub-dominants of Semipalmated Sandpiper, Semipalmated Plover, American Golden Plover, and Least Sandpiper.

Spring habitat was predominantly composed of mudflats along the various estuaries such as Turtle Creek and Crane Creek. The normal habitat created by drawdowns of the control level marshes was below normal levels as most marsh managers chose to hold water on wetlands with the low water levels of Lake Erie. Spring drawdowns geared for smartweed growth for fall migration food is well timed for species migrating in late April through early May. Drawdowns in late May for millet growth coincides with late spring migrants and some of the early fall migrants in early July.

Fall Migration

Twenty-nine species totaling 88,525 birds were recorded on 82 trips (Table 2). Consistent marshes were Point Mouillee SGA, Turtle Creek, Toussaint W/A, and Crane Creek estuary on Ottawa NWR. These estuary values were a result of the lowest levels of Lake Erie in over 30 years. Extensive mudflats were provided throughout the fall migration. Peak activities of major sampled marshes are shown in Table 5. Dominant species counted and their peak movements were Least Sandpiper (July 1-20); Killdeer (Sept. 11-20); Short-billed Dowitcher (July 11-20); Semipalmated Sandpiper (Aug. 11-20); Lesser Yellowlegs (Aug. 11-20); Pectoral Sandpiper (Oct. 1-10); Greater Yellowlegs (Oct. 1-10); Stilt Sandpiper (July 11-20); Black-bellied Plover (Oct. 1-10); Sanderling (Sept. 21-30); Semipalmated Plover (Aug. 21-31); Long-billed

Dowitcher (Oct. 1-10); and Dunlin (Nov. 1-10) (Table 6).

Fall migration is more drawn out than spring, running from early July into November. The earliest species to peak were the Short-billed Dowitcher, Stilt Sandpiper, and Least Sandpiper in July. Lesser Yellowlegs, Semipalmated Plover, and Semipalmated Sandpiper peaked in August. September peaks were observed in Killdeer and Sanderling. Early to mid-October had peak species of Long-billed Dowitcher, Greater Yellowlegs, and Black-bellied Plover. Dunlin peaked in early November.

The abundant mudflats on all rivers and streams provided a volume of habitat similar to the previous several falls. If lake levels remain the same in the year 2004, they are expected to be excellent for both spring and fall migrations. However, many areas began showing increased vegetative growth which will reduce habitat availability to shorebirds.

Habitat Use

As yearly data builds a better picture of habitat use will be developed. It appears preferred habitat typically is quite transitory. However, Turtle Creek in 1994 showed use can be spread out over an entire migration. Lower lake levels in fall 1999 through 2003 have shown the potential shorebird use of natural habitat creation in the Lake Erie Marsh region. Heaviest use occurred in habitat of several inches of water to recently emerged mudflats. Species use varied with habitat compartmentalizing themselves. Deeper water was used by the larger shorebirds and phalaropes; very shallow water by larger sandpipers; wet mud flats by the smaller peeps and the plovers. The dry flats were utilized by the larger plovers and Baird's and Buff-breasted Sandpipers.

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 shorebirds (Rundle and Frederickson 1981, Connors et. al. 1981). With the continued monitoring of shorebird numbers, species, migration timing, and habitat usage in the Lake Erie marsh region, information can be gathered to provide direction to resource managers for including the shorebird group into their management scheme.

Shorebird needs in wetland management plans require year around consideration. Rotation of management units is necessary to provide the mudflat conditions needed to forage but also to ensure units in deep water condition developing a food base and drawdown units that will provide substrate for invertebrate growth in following years.

The Observatory lead a successful application for Western Shorebird Reserve Network status for the Lake Erie Marsh Region. The area now represents one of two locations in the entire Great Lakes region.

COSTS

Cost of this project was covered by the Black Swamp Bird Observatory through computer support, data analysis, and volunteers for data collection (450 hrs @ \$12.00/hr for services=\$5400).

LITERATURE CITED

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Table 1. Sampling intensity of surveyed marshes and shorebird numbers, 2003.

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	142	71	4	346	87	6	488	81.3
Little Portage W/A	2	690	345				2	690	345
Magee Marsh W/A	28	7,252	259	7	493	70	35	7,745	221
Maumee SP	7	786	112				7	786	112
Metzger Marsh	3	46	15				3	46	15
Ottawa NWR	16	28,178	1761	28	46,569	1663	44	74,747	1699
Pickrel Crk. W/A				3	130	43	3	130	43
Toussaint W/A	3	692	231	6	3,751	625	9	4,443	494
Portage River estuary	2	13	7				2	13	7
Sheldon's Marsh	1	35	35	4	320	80	5	355	71
Ottawa Co.Flooded fields	14	1,560	111				14	1,560	111
Lucas Co. Flooded fields	5	3,573	715				5	3,573	715
Willow Pt. W/A				3	2,128	709	3	2,128	709
Huron River				1	290	290	1	290	290
Turtle Creek	10	977	98	7	1,217	174	17	2,194	129
Point Mouillee SGA	7	5,283	755	17	33,144	1950	24	38,427	1601
East Harbor SP				1	5	5	1	5	
Sandusky River									
Meadowbrook	2	216	108	1	132	132	3	348	116
Muddy Creek									
Total	102	49,478	485	82	88,525	1,080	184	138,003	750

Table 2. Shorebird numbers observed during spring and fall migration in the Lake Erie marshes, 2003.

Species	Spring	Fall	Total	Species	Spring	Fall	Total
Piping Plover	0	0	0	Sh.-billed Dowitcher	52	2,618	2,670
Semi-palmated Plover	316	795	1,111	Lo.-billed Dowitcher	0	1,926	1,926
Killdeer	1,492	4,788	6,280	Gr. Yellowlegs	284	984	1,268
Golden Plover	2,239	75	2,314	Less. Yellowlegs	620	11,120	11,740
Bl.-bellied Plover	842	537	1,379	Red Knot	9	90	99
Spotted Sandpiper	105	439	544	Wilson Phalarope	4	78	82
Solitary Sandpiper	33	19	52	Red-necked Phal.	4	4	8
Pectoral Sandpiper	3,525	4,242	7,767	Upland sandpiper	1	2	3
Wh.-rump Sandpiper	79	68	147	Ruddy Turnstone	889	0	889
Baird's Sandpiper	0	33	33	Willet	5	6	11
Least Sandpiper	481	5,249	5,730	Am. Avocet	2	7	9
Stilt Sandpiper	1	999	1,000	Am. Woodcock	4	3	7
Semi.-palm. Sandpiper	1,732	13,879	15,611	Common Snipe	24	118	142
Western Sandpiper	0	11	11	Sanderling	16	57	73
Marbled Godwit	0	0	0	Whimbrel	75	0	75
Buff-breasted Sandpiper	0	0	0	Unident. Dowitcher	0	342	342
Dunlin	36,612	39,871	76,483	Unident. Peep	0	60	60
Hudsonian godwit	1	18	19	Ruff	0	0	0
Blk.-neck Stilt	31	87	118				
TOTAL birds	49,478	88,525	138,003	# Trips	102	82	184
# observer hrs.			330.7				

Table 3. Mean shorebird numbers observed by ten day periods for selected marshes during spring migration in the Lake Erie marshes, 2003.

10-day Periods	Principle Marshes Surveyed					
	Turtle Creek	Ottawa NWR	Magee Marsh	Pt. Mouillee SGA	Ottawa Co. Fields	Lucas Co. Fields
March 1-10			8			
March 11-20			18			
March 21-31	90	1	51		45	
April 1-10		10			33	
April 11-20	87	221	65		112	
April 21-30			237			
May 1-10	30	1,262	44		39	804
May 11-20		2,833	319	1,067	215	504
May 21-31		1,402	642	60		452
June 1-10		8		557		
June 11-20			6			
June 21-30				430		

Table 4. Timing of spring migrating shorebirds (avg. #/trip) in the Lake Erie marsh region, 2003.*

Time Period	Semi Plov	Killdeer	B-b Plov.	Gold. Plover	Pect. Sand	Semi-Sand	Dunlin	Greater Yleg	Lesser Yleg	Least Sand.	Rudy Turn.
Mar 1-10		6									
Mar 11-20		<u>47</u>									
21-31		9			67			1	<1	<1	
Apr 1-10		3			64		11	<u>7</u>	2		
11-20		4		3	<u>71</u>		24	5	9	<1	
21-30		0		<u>96</u>	11		104	<1	1		
May 1-10	<1	3	2	<u>92</u>	3		324	<1	<u>9</u>	4	
11-20	7	4	<u>38</u>	2	<1	20	<u>865</u>	<1	2	5	<u>39</u>
21-31	<u>10</u>	3	<1			33	<u>718</u>			<1	5
Jun 1-10	2	4			<1	<u>130</u>	192		1	<u>29</u>	
11-20		5									
21-30	3	135	<1	1	30	33	11	45	81	63	

*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, 2003.

10-day periods	Principle Marshes						
	Pt. Mouillee SGA	Turtle Creek	Ottawa NWR	Magee Marsh	Pipe Creek	Sheldons Marsh	Toussaint W/A
July 1-10	1,754		133		155	44	
July 11-20	1,071	98	188	13	94		
July 21-31	569		12				
Aug. 1-10	393		2				
Aug. 11-20	1,976			19			
Aug. 21-31	712				49		
Sept. 1-10			102			2	
Sept. 11-20		66	909				
Sept. 21-30			1,127				
Oct. 1-10		37	1,492				62
Oct. 11-20		98	5,702	41			
Oct. 21-31			2,044			137	
Nov. 1-10		841	2,140				1,357
Nov. 11-20		11	586	1			325

Table 6. Timing of fall migrating shorebirds (avg. #/trip) in the Lake Erie marsh region, 2003.*

Time Period	Semi Plov	Killdeer	Pect Sand.	Least Sand.	Semi. Sand.	Great Yleg	Less Yleg	Sh-bill Dowit	Stilt Sand.	BB Plover	Dunlin	Lo-bill. Dowit
July 1-10		53	<1	<u>171</u>		5	99	55	<1		<1	
11-20	<1	38	1	<u>188</u>	58	3	31	<u>81</u>	<u>19</u>		<1	
21-31	<1	10	4	9	48	4	27	35	10			
Aug 1-10	1	2	1	1	141	1	23	1	3	<1		
11-20	14	10	21	29	<u>571</u>	14	<u>184</u>	15	14	<1		<1
21-31	<u>18</u>	5	56	28	105	4	154	15	12	<1		
Sep. 1-10	<1	23	4	<1	2	1	8	1	<1			23
11-20	14	<u>228</u>	24	9	65	23	66	<1	1	3		40
21-30	3	116	65	5	30	20	130	<1	2	8	1	29
Oct 1-10	2	141	<u>164</u>	7	15	<u>39</u>	114		1	<u>44</u>	371	<u>95</u>
11-20	2	109	107	6	2	8	37	2	<1	25	1,574	48
21-31		3	<1	<1		2	69			1	873	5
Nov 1-10		5	<1			3	3				<u>1,785</u>	54
11-20		1	<1			<1					305	
21-30		3									170	

*numbers underlined are peaks for each species