

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

## PROGRESS REPORT-2005 BSBO-ONWR05-3

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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 (21 March) through fall (13 November). 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. Data was compiled by region and marsh unit.

## RESULTS AND DISCUSSION

The 2005 field season was the eleventh full year of data collection for shorebird migration. Twelve marshes were sampled at least once in the spring and twelve in the fall. The main areas sampled were Ottawa NWR, Magee Marsh W/A, Moxley, Pipe Creek 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 42,374 birds of 22 species were counted during 62 trips (Table 2). Ottawa NWR, Magee Marsh W/A, Pipe Creek W/A, and Ottawa county fields were the most often surveyed wetlands. Heaviest bird concentrations were observed on Crane Creek of Ottawa NWR and Ottawa county fields. Peak activity on major marshes is shown in Table 3. Dominant species counted and their peak movements were Killdeer (April 11-20), Dunlin (May 11-20); Pectoral Sandpiper (April 1-10); Least Sandpiper (May 11-20); Semipalmated Sandpiper (May 21-31); Semipalmated Plover (May 11-20), Lesser Yellowlegs (May 11-20), Ruddy Turnstone (May 21-31), Greater Yellowlegs (April 1-10), American Golden Plover (April 21-30), and Black-bellied Plover (May 21-31) (Table 4).

The Pectoral Sandpiper appears to be the most abundant in 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 and in flooded agriculture fields. 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

Thirty species totaling 51,410 birds were recorded on 73 trips (Table 2). Consistent marshes were Crane Creek estuary on Ottawa NWR and Moxley marsh. 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 11-20); Killdeer (July.1-10); Short-billed Dowitcher (July 11-20); Semipalmated Sandpiper (Aug. 11-20) and again on Nov. 1-10; Lesser Yellowlegs (July 11-20); Pectoral Sandpiper (Aug 21-31); Greater Yellowlegs (Aug. 21-31); Stilt Sandpiper (Sept 1-10); Black-bellied Plover (Oct. 21-31); Semipalmated Plover (Sept. 1-10); Long-billed Dowitcher (Oct. 21-31); and Dunlin (Nov. 1-20) (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, Lesser Yellowlegs, and Least Sandpiper in July. Semipalmated Plover, Pectoral Sandpiper, Greater Yellowleg, and Semipalmated Sandpiper peaked in August. September peaks were observed in Stilt Sandpiper and Sanderling. Early to mid-October had peak species of Long-billed Dowitcher 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 2006, 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 2005 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 (230 hrs @ \$12.00/hr for services=\$2760).

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Table 1. Sampling intensity of surveyed marshes and shorebird numbers, 2005.

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	8	555	69	10	206	21	18	761	42
Little Portage W/A				1	13	13	1	13	13
Magee Marsh W/A	7	266	38	4	65	16	11	331	30
Maumee SP				2	23	12	2	23	12
Metzger Marsh	2	46	23				2	46	23
Ottawa NWR	17	36,900	2,171	28	47,777	1,706	45	84,677	1,842
Pickerel Crk. W/A	5	161	32	2	76	38	7	237	34
Darby NWR	1	2	2				1	2	2
Winous Pt SC	1	8	8				1	8	8
Sheldon's Marsh	1	25	25	9	438	49	10	463	46
Ottawa Co.Flooded fields	13	3,347	257	1	46	46	14	3,393	242
Cedar Pt NWR	1	8	8				1	8	8
Moxley				13	2,680	206	13	2,680	206
Lucas Co. Flooded fields	5	1,042	208				5	1,042	208
Navarre unit ONWR				1	36	36	1	36	36
Sandusky River				1	46	46	1	46	46
Pt Clinton Beach				1	4	4	1	4	4
Willow Pt W/A	1	14	14				1	14	14
<b>Total</b>	<b>62</b>	<b>42,374</b>	<b>683</b>	<b>73</b>	<b>51,410</b>	<b>704</b>	<b>135</b>	<b>93,784</b>	<b>695</b>

Table 2. Shorebird numbers observed during spring and fall migration in the Lake Erie marshes, 2005.

Species	Spring	Fall	Total	Species	Spring	Fall	Total
Piping Plover	0	1	1	Sh.-billed Dowitcher	44	3,094	3,138
Semi-palmated Plover	820	736	1,556	Lo.-billed Dowitcher	1	472	473
Killdeer	972	4,345	5,317	Gr. Yellowlegs	346	1,304	1,650
Golden Plover	1,148	25	1,173	Less. Yellowlegs	917	6,016	6,933
Bl.-bellied Plover	292	375	667	Red Knot	2	28	30
Spotted Sandpiper	105	170	275	Wilson Phalarope	0	50	50
Solitary Sandpiper	20	22	42	Red-necked Phal.	0	26	26
Pectoral Sandpiper	1,881	3,033	4,914	Upland Sandpiper	0	0	0
Wh.-rump Sandpiper	42	24	66	Ruddy Turnstone	151	8	159
Baird's Sandpiper	0	33	33	Willet	0	10	10
Least Sandpiper	596	3,838	4,434	Am. Avocet	0	42	42
Stilt Sandpiper	0	4,935	4,935	Am. Woodcock	1	0	1
Semi-palmated Sandpiper	600	5,766	6,366	Common Snipe	121	97	218
Western Sandpiper	0	7	7	Sanderling	5	82	87
Marbled Godwit	0	33	33	Whimbrel	0	0	0
Buff-breasted Sandpiper	0	11	11	Unident. Dowitcher	29	45	74
Dunlin	34,279	16,453	50,732	Unident. Peep	0	315	315
Hudsonian Godwit	1	14	15	Ruff	1	0	1
Black-necked Stilt	0	0	0	Red Phalarope	0	0	0
<b>TOTAL birds</b>	42,374	51,410	93,784	<b># Trips</b>	62	73	135
<b># observer hrs.</b>			141.5				

Table 3. Mean shorebird numbers observed by ten day periods for selected marshes during spring migration in the Lake Erie marshes, 2005.

10-day Periods	Principle Marshes Surveyed					
	Pipe Creek	Ottawa NWR	Magee Marsh	Pickrel Creek	Ottawa Co. Fields	Lucas Co. Fields
March 21-31		27				19
April 1-10	14	416			650	12
April 11-20	8	1,651	43		34	300
April 21-30	10	431	26		235	356
May 1-10	17	1,084	16	53	239	
May 11-20		5,068			228	
May 21-31	442	5,109	75	27	96	
June 1-10	40	74	6			
June 11-20		10				

Table 4. Timing of spring migrating shorebirds (avg. #/trip) in the Lake Erie marsh region, 2005.\*

Time Period	Semi Plov	Killdeer	Bl-be Plover	Gold. Plover	Pect. Sand	Semi-Sand	Dunlin	Greater Yleg	Lesser Yleg	Least Sand.	Rudy Turn.
Mar 21-31		13									
Apr 1-10		13			<u>205</u>		70	<u>20</u>	25		
11-20		<u>40</u>		<1	40		136	8	15		
21-30	<1	4		<u>80</u>	6		108	5	6		
May 1-10	5	13	<1	25	3	7	388	7	37	16	<1
11-20	<u>58</u>	19	4	30	1	3	<u>2870</u>	5	<u>56</u>	<u>68</u>	3
21-31	44	16	<u>24</u>			<u>47</u>	1309	<1	<1	13	<u>12</u>
Jun 1-10	4	25	1	<1	<1	5	3	1	1	<1	
11-20						7	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, 2005.

10-day periods	Principle Marshes				
	Moxley Marsh	Ottawa NWR	Magee Marsh	Pipe Creek	Sheldons Marsh
July 1-10		1,561	3		
July 11-20		3,646		24	
July 21-31		1,275			20
Aug. 1-10		1,485		30	21
Aug. 11-20	100	2,622		11	125
Aug. 21-31	67	1,643	1	2	
Sept. 1-10	273	1,644	49	25	
Sept. 11-20	264	125	12		94
Sept. 21-30	1	176			
Oct. 1-10		270			
Oct. 11-20		285			
Oct. 21-31		1,538			
Nov. 1-10		4,899			
Nov. 11-20		4,703			



Table 6. Timing of fall migrating shorebirds (avg. #/trip) in the Lake Erie marsh region, 2005.\*

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	1	<u>241</u>	2	<u>481</u>		7	204	92	1		<1	
11-20	11	176	4	<u>558</u>	2	31	<u>426</u>	<u>522</u>	96		<1	
21-31	4	141	5	24	85	21	298	251	125		<1	
Aug 1-10	4	26	32	9	80	8	47	11	46	<1		<1
11-20	19	61	102	15	<u>215</u>	15	97	21	142	1	<1	1
21-31	18	101	<u>173</u>	61	180	<u>62</u>	184	63	80	9	<1	40
Sep. 1-10	<u>29</u>	37	58	42	112	28	47	11	<u>146</u>	4	<1	2
11-20	4	21	15	7	7	5	31	2	34	1	<1	<1
21-30	1	6	5	4	2	9	16	<1	11	9		
Oct 1-10	7	44	6	17		40	30		7	37	59	20
11-20	2	139	21	9		14	5			5	8	
21-31	4	82	6	19		43	14		14	<u>75</u>	1,195	<u>81</u>
Nov 1-10		11	1		<u>250</u>	9	8		<1		<u>4,600</u>	10
11-20						2				1	2,352	

\*numbers underlined are peaks for each species