

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

PROGRESS REPORT-2006 BSBO-ONWR06-3

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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 (8 March) through fall (12 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 were compiled by region and marsh unit.

RESULTS AND DISCUSSION

The 2006 field season was the twelfth full year of data collection for shorebird migration. Eleven marshes were sampled at least once in the spring and ten in the fall. The main areas sampled were Ottawa NWR, Magee Marsh W/A, Ottawa county fields, Lucas county fields, and Pt. Mouillee. The number of sample dates and the total shorebirds are shown in Table 1.

Spring Migration

A total of 17,944 birds of 23 species were counted during 235 trips (Table 2). Ottawa county fields, Magee Marsh W/A, Ottawa NWR, Magee Marsh W/A, and Pt. Mouillee 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 (March 11-20), Dunlin (May 1-10); Pectoral Sandpiper (April 1-10); Least Sandpiper (May 1-10); Semipalmated Sandpiper (June 1-10); Semipalmated Plover (May 21-31), Lesser Yellowlegs (April 11-20), Ruddy Turnstone (May 21-31), Greater Yellowlegs (April 11-20), Wilson's Snipe (April 11-20), and Black-bellied Plover (May 21-31) (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, Lesser Yellowlegs, 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 27,313 birds were recorded on 168 trips (Table 2). Consistent marshes were Crane Creek estuary on Ottawa NWR and Ottawa county fields. Fair 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 (Aug. 21-31); Killdeer (Oct. 11-20); Short-billed Dowitcher (July 11-20); Semipalmated Sandpiper (Aug. 21-31); Lesser Yellowlegs (July 11-20 and again Oct. 11-20); Pectoral Sandpiper (Oct. 11-20); Greater Yellowlegs (Oct. 11-20); Stilt Sandpiper (Aug. 21-31); Black-bellied Plover (Oct. 11-31); Semipalmated Plover (Aug. 21-31); Long-billed Dowitcher (Oct. 11-20); 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 and Lesser Yellowlegs in July. Semipalmated Plover 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, Black-bellied Plover, Killdeer, Pectoral Sandpiper, Greater Yellowlegs and Lesser Yellowlegs. Dunlin peaked in early November.

Lake levels resulted in poor amounts of natural mud flats available for migrating shorebirds. This puts more importance on water level management in managed marsh units.

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, Conners 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 (240 hrs @ \$12.00/hr for services=\$2880).

LITERATURE CITED

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Table 1. Sampling intensity of surveyed marshes and shorebird numbers, 2006.

| 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 | 4 | 26 | 7 | | | | 4 | 26 | 7 |
| Magee Marsh W/A | 18 | 333 | 19 | 6 | 39 | 7 | 24 | 372 | 16 |
| Maumee Bay SP | 2 | 34 | 17 | 8 | 184 | 23 | 10 | 218 | 22 |
| Ottawa NWR | 17 | 6,397 | 376 | 15 | 17,240 | 1,149 | 32 | 23,637 | 739 |
| Pickerel Crk. W/A | 4 | 54 | 14 | 3 | 328 | 109 | 7 | 382 | 55 |
| Winous Pt SC | | | | 4 | 2714 | 679 | 4 | 2714 | 679 |
| Ottawa Co.Flooded fields | 52 | 8,154 | 157 | 23 | 3725 | 162 | 75 | 11,879 | 158 |
| Moxley | 3 | 15 | 5 | | | | 3 | 15 | 5 |
| Lucas Co. Flooded fields | 4 | 1,942 | 486 | 11 | 1261 | 114.6 | 15 | 3,203 | 214 |
| Pt. Mouillee | 8 | 968 | 121 | 9 | 1281 | 142 | 17 | 2249 | 132 |
| MI Marshes | 5 | 11 | 2 | 2 | 11 | 6 | 7 | 22 | 3 |
| South Bass Island | 6 | 10 | 2 | | | | 6 | 10 | 2 |
| Turtle Creek | | | | 4 | 530 | 133 | 4 | 530 | 133 |
| Total | 123 | 17,944 | 146 | 85 | 27,313 | 321 | 208 | 45,257 | 218 |

Table 2. Shorebird numbers observed during spring and fall migration in the Lake Erie marshes, 2006.

| Species | Spring | Fall | Total | Species | Spring | Fall | Total |
|-------------------------|--------|--------|--------|----------------------|--------|-------|-------|
| Piping Plover | 0 | 0 | 0 | Sh.-billed Dowitcher | 49 | 1,487 | 1,536 |
| Semi-palmated Plover | 70 | 414 | 484 | Lo.-billed Dowitcher | 11 | 1,152 | 1,163 |
| Killdeer | 1,042 | 3,852 | 4,894 | Greater Yellowlegs | 522 | 709 | 1,231 |
| Am. Golden Plover | 21 | 28 | 49 | Lesser Yellowlegs | 502 | 2,295 | 2,797 |
| Black-bellied Plover | 270 | 90 | 360 | Red Knot | 0 | 5 | 5 |
| Spotted Sandpiper | 68 | 119 | 187 | Wilson Phalarope | 2 | 7 | 9 |
| Solitary Sandpiper | 15 | 48 | 63 | Red-necked Phalarope | 0 | 2 | 2 |
| Pectoral Sandpiper | 1,143 | 807 | 1,950 | Upland sandpiper | 0 | 0 | 0 |
| White-rump Sandpiper | 20 | 9 | 29 | Ruddy Turnstone | 56 | 2 | 58 |
| Baird's Sandpiper | 4 | 14 | 18 | Willet | 4 | 1 | 5 |
| Least Sandpiper | 121 | 936 | 1,057 | American Avocet | 0 | 3 | 3 |
| Stilt Sandpiper | 1 | 104 | 105 | American Woodcock | 4 | 0 | 4 |
| Semi.-palm. Sandpiper | 230 | 1,342 | 1,572 | Wilson's Snipe | 326 | 113 | 439 |
| Western Sandpiper | 0 | 1 | 1 | Sanderling | 9 | 33 | 42 |
| Marbled Godwit | 0 | 2 | 2 | Whimbrel | 0 | 1 | 1 |
| Buff-breasted Sandpiper | 0 | 5 | 5 | Unident. Dowitcher | 0 | 27 | 27 |
| Dunlin | 13,454 | 13,198 | 26,652 | Unident. Peep | 0 | 503 | 503 |
| Hudsonian Godwit | 0 | 4 | 4 | Ruff | 0 | 0 | 0 |
| Black-necked Stilt | 0 | 0 | 0 | Red Phalarope | 0 | 0 | 0 |
| TOTAL birds | 17,944 | 27,313 | 45,257 | # Trips | 235 | 168 | 403 |
| # observer hrs. | | | 250.3 | | | | |

Table 3. Mean shorebird numbers observed by ten day periods for selected marshes during spring migration in the Lake Erie marshes, 2006.

| 10-day Periods | Principle Marshes Surveyed | | | | | |
|----------------|----------------------------|------------|-------------|---------------|-------------------|------------------|
| | Pt. Mouillee | Ottawa NWR | Magee Marsh | Pickrel Creek | Ottawa Co. Fields | Lucas Co. Fields |
| March 1-10 | | | 24 | | | |
| March 11-20 | 7 | 59 | 26 | | 79 | |
| March 21-31 | | 22 | 34 | | 94 | |
| April 1-10 | 38 | 204 | 54 | | 786 | |
| April 11-20 | 51 | 352 | 104 | | 371 | |
| April 21-30 | 111 | 1,379 | 30 | 17 | 1,620 | |
| May 1-10 | | 4,184 | | 22 | 1,267 | |
| May 11-20 | 240 | 76 | | 15 | 1,236 | 210 |
| May 21-31 | 244 | 40 | 49 | | 2,623 | 1,732 |
| June 1-10 | 192 | 55 | 5 | | 69 | |
| June 11-20 | 85 | 26 | 7 | | 9 | |

Table 4. Timing of spring migrating shorebirds (avg. #/trip) in the Lake Erie marsh region, 2006.*

| Time Period | Semi Plov | Snipe | Killdeer | Bl-be Plover | Pect. Sand | Semi-Sand | Dunlin | Greater Yleg | Lesser Yleg | Least Sand. | Rudy Turn. |
|-------------|-----------|----------|-----------|--------------|------------|-----------|------------|--------------|-------------|-------------|------------|
| Mar 1-10 | | | 3 | | | | | | | | |
| 11-20 | | <1 | <u>10</u> | | | | | | | | |
| 21-31 | | <1 | 6 | | 7 | | | <1 | <1 | | |
| Apr 1-10 | | 2 | 4 | | <u>15</u> | | 5 | 4 | <1 | | |
| 11-20 | | <u>8</u> | 3 | <1 | 3 | | 8 | <u>6</u> | 2 | | |
| 21-30 | <1 | <1 | 4 | | 12 | | 68 | 4 | 4 | <1 | |
| May 1-10 | 2 | <1 | 5 | <1 | <1 | <1 | <u>212</u> | 3 | <u>10</u> | <u>1</u> | |
| 11-20 | <1 | <1 | 3 | 4 | | <1 | 64 | <1 | <1 | <1 | <1 |
| 21-31 | <u>4</u> | | 4 | <u>6</u> | <1 | <1 | 152 | | <1 | 1 | <u>2</u> |
| Jun 1-10 | <1 | <1 | 4 | <1 | | <u>9</u> | 5 | | | | <1 |
| 11-20 | <1 | | 5 | <1 | | 3 | <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, 2006.

| 10-day periods | Marshes | | | | | |
|----------------|--------------|------------|-------------|----------------|-------------------|------------------|
| | Pt. Mouillee | Ottawa NWR | Magee Marsh | Pickerel Creek | Ottawa Co. Fields | Lucas Co. Fields |
| July 1-10 | 183 | 50 | | 14 | 569 | 182 |
| July 11-20 | | | | | 1,618 | 147 |
| July 21-31 | 188 | | 22 | | 560 | 580 |
| Aug. 1-10 | | 444 | 15 | 1 | 208 | 208 |
| Aug. 11-20 | 218 | 146 | 1 | | 125 | |
| Aug. 21-31 | 167 | 11 | | 313 | 4 | 3 |
| Sept. 1-10 | 282 | 779 | 1 | | 250 | |
| Sept. 11-20 | 92 | 540 | | | 104 | 2 |
| Sept. 21-30 | | 666 | | | 42 | 9 |
| Oct. 1-10 | 39 | | | | | |
| Oct. 11-20 | | 1,513 | | | | |
| Oct. 21-31 | 2 | 4,856 | | | 15 | 14 |
| Nov. 1-10 | | 8,235 | | | 230 | 115 |
| Nov. 11-20 | 110 | | | | | 1 |

Table 6. Timing of fall migrating shorebirds (avg. #/trip) in the Lake Erie marsh region, 2006.*

| Time Period | Semi Plov | Kill-deer | Pect Sand | Least Sand | Semi. Sand | Great Yleg | Less Yleg | Sh-bill Dowit | Stilt Sand | BB Plover | Dunlin | Lo-bill Dowit |
|-------------|-----------|-----------|-----------|------------|------------|------------|-----------|---------------|------------|-----------|--------------|---------------|
| July 1-10 | | 24 | <1 | 6 | <1 | <1 | 8 | 7 | <1 | | | |
| 11-20 | | 34 | <1 | 1 | 5 | 9 | <u>29</u> | <u>53</u> | <1 | | <1 | <1 |
| 21-31 | <1 | 20 | 2 | 3 | 9 | 1 | 11 | 5 | <1 | | <1 | |
| Aug 1-10 | 3 | 35 | 13 | 13 | 28 | 2 | 22 | 7 | | <1 | <1 | <1 |
| 11-20 | 2 | 9 | 1 | 5 | 5 | 1 | 8 | 1 | <1 | <1 | <1 | |
| 21-31 | <u>10</u> | 7 | 10 | <u>21</u> | <u>35</u> | 5 | 10 | 24 | <u>4</u> | 1 | <1 | 3 |
| Sep. 1-10 | 2 | 24 | 4 | 3 | 6 | 4 | 19 | <1 | <1 | <1 | | |
| 11-20 | 8 | 17 | 2 | 5 | 2 | 7 | 16 | 2 | <1 | <1 | <1 | 14 |
| 21-30 | 1 | 55 | | 1 | <1 | 10 | 11 | | | 1 | <1 | 11 |
| Oct 1-10 | 5 | 2 | | 5 | | | | | | | 8 | |
| 11-20 | | <u>40</u> | <u>73</u> | <1 | 2 | <u>12</u> | <u>41</u> | <1 | 2 | <u>5</u> | 18 | <u>114</u> |
| 21-31 | | 11 | 4 | 2 | <1 | 4 | 7 | | <1 | <u>5</u> | 646 | 22 |
| Nov 1-10 | | 29 | | | | | | | | | <u>2,111</u> | 9 |
| 11-20 | | <1 | | | | | | | | | 37 | |

*numbers underlined are peaks for each species