

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

## PROGRESS REPORT-2007 BSBO-ONWR07-3

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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 2007 field season was the thirteenth full year of data collection for shorebird migration. Six marshes were sampled at least once in the spring and 12 in the fall. The main areas sampled were Ottawa NWR, Magee Marsh W/A, Ottawa county fields, Metzger Marsh WA, and Pt. Moulliee. The number of sample dates and the total shorebirds are shown in Table 1.

### Spring Migration

A total of 44,145 birds of 24 species were counted during 44 trips (Table 2). Ottawa county fields, Magee Marsh W/A, Ottawa NWR, Metzger Marsh W/A, and Pt. Moulliee were the most often surveyed wetlands. Heaviest bird concentrations were observed on Metzger Marsh and Pt. Moulliee. Peak activity on major marshes is shown in Table 3. Dominant species counted and their peak movements were Killdeer (May 1-10), Dunlin (May 1-10); Pectoral Sandpiper (April 1-10); Least Sandpiper (May 1-10); Semipalmated Sandpiper (June 1-10); Semipalmated Plover (May 1-10), Lesser Yellowlegs (April 21-30), Ruddy Turnstone (May 1-10), Greater Yellowlegs (April 21-30), Common 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. The major exception here was the drawdown of Metzger Marsh that resulted in considerable shorebird use. 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 30,492 birds were recorded on 54 trips (Table 2). Consistent marshes were Crane Creek estuary on Ottawa NWR and Pt. Moulliee. 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 (July 11-20 & Oct. 21-31); Killdeer (Oct. 21-31); Short-billed Dowitcher (July 11-20); Semipalmated Sandpiper (Sept. 21-31); Lesser Yellowlegs (Aug. 1-10); Pectoral Sandpiper (Oct. 11-10); Greater Yellowlegs (Sept. 1-10); Stilt Sandpiper (Sept. 11-20); Semipalmated Plover (Aug. 11-20 & Oct. 1-10); and Dunlin (Oct. 21-31) (Table 6).

Fall migration is more drawn out then 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 Lesser Yellowlegs peaked in August. September peaks were observed in Greater Yellowlegs, Stilt Sandpiper and Semipalmated Sandpiper. Early to mid-October had peak species of Black-bellied Plover, Killdeer, Pectoral Sandpiper, and Lesser Yellowlegs. Dunlin peaked in late October.

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 2007 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 (200 hrs @ \$12.00/hr for services=\$2400).

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Table 1. Sampling intensity of surveyed marshes and shorebird numbers, 2007.

| 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              | 74          | 37            | 2              | 74          | 37            |
| Magee Marsh W/A          | 5              | 183         | 37            | 8              | 63          | 8             | 13             | 246         | 19            |
| Metzger Marsh W/A        | 10             | 33,382      | 3,382         | 4              | 406         | 101           | 14             | 33,788      | 2,413         |
| Ottawa NWR               | 6              | 530         | 88            | 24             | 23,169      | 965           | 30             | 23,699      | 790           |
| Pickereel Crk. W/A       |                |             |               | 2              | 656         | 328           | 2              | 656         | 328           |
| Navarre Unit ONWR        |                |             |               | 1              | 35          | 35            | 1              | 35          | 35            |
| Ottawa Co.Flooded fields | 12             | 1,218       | 102           | 1              | 173         | 173           | 13             | 1,391       | 107           |
| Sheldon's Marsh NP       |                |             |               | 2              | 607         | 303           | 2              | 607         | 303           |
| Lucas Co. Flooded fields | 3              | 3,311       | 1,104         |                |             |               | 3              | 3,311       | 1,104         |
| Pt. Mouillee             | 11             | 5,521       | 502           | 4              | 4,940       | 1,235         | 15             | 10,461      | 697           |
| Sandusky River           |                |             |               | 1              | 3           | 3             | 1              | 3           | 3             |
| Portage River            |                |             |               | 1              | 122         | 122           | 1              | 122         | 122           |
| Turtle Creek             |                |             |               | 1              | 244         | 244           | 1              | 244         | 244           |
| <b>Total</b>             | 44             | 44,145      | 1,003         | 54             | 30,492      | 565           | 98             | 74,637      | 762           |

Table 2. Shorebird numbers observed during spring and fall migration in the Lake Erie marshes, 2007.

| Species                 | Spring        | Fall          | Total         | Species              | Spring    | Fall      | Total     |
|-------------------------|---------------|---------------|---------------|----------------------|-----------|-----------|-----------|
| Piping Plover           | 1             | 0             | 0             | Sh.-billed Dowitcher | 128       | 844       | 972       |
| Semi-palmated Plover    | 531           | 197           | 728           | Lo.-billed Dowitcher | 0         | 286       | 286       |
| Killdeer                | 760           | 6,054         | 6,814         | Greater Yellowlegs   | 629       | 524       | 1,153     |
| Golden Plover           | 336           | 231           | 567           | Lesser Yellowlegs    | 2,250     | 4,124     | 6,374     |
| Black-bellied Plover    | 42            | 118           | 160           | Red Knot             | 1         | 7         | 8         |
| Spotted Sandpiper       | 89            | 296           | 385           | Wilson Phalarope     | 0         | 7         | 7         |
| Solitary Sandpiper      | 11            | 60            | 71            | Red-necked Phalarope | 0         | 23        | 23        |
| Pectoral Sandpiper      | 571           | 1,900         | 2,471         | Upland sandpiper     | 2         | 0         | 2         |
| Wh.-rumped Sandpiper    | 36            | 13            | 49            | Ruddy Turnstone      | 70        | 1         | 71        |
| Baird's Sandpiper       | 0             | 16            | 16            | Willet               | 53        | 0         | 53        |
| Least Sandpiper         | 637           | 1,797         | 2,434         | American Avocet      | 0         | 8         | 8         |
| Stilt Sandpiper         | 1             | 248           | 249           | American Woodcock    | 3         | 1         | 4         |
| Semi.-palm. Sandpiper   | 341           | 1,616         | 1,957         | Common Snipe         | 32        | 201       | 233       |
| Western Sandpiper       | 1             | 2             | 3             | Sanderling           | 0         | 37        | 37        |
| Marbled Godwit          | 0             | 1             | 1             | Whimbrel             | 0         | 0         | 0         |
| Buff-breasted sandpiper | 0             | 0             | 0             | Unident. Dowitcher   | 0         | 0         | 0         |
| Dunlin                  | 37,620        | 11,119        | 48,739        | Unident. Peep        | 0         | 751       | 751       |
| Hudsonian godwit        | 24            | 8             | 32            | Ruff                 | 0         | 2         | 2         |
| Black.-necked Stilt     | 0             | 0             | 0             | Red Phalarope        | 0         | 0         | 0         |
| <b>TOTAL birds</b>      | <b>44,145</b> | <b>30,492</b> | <b>74,637</b> | <b># Trips</b>       | <b>44</b> | <b>54</b> | <b>98</b> |
| <b># observer hrs.</b>  |               |               | <b>64</b>     |                      |           |           |           |

Table 3. Mean shorebird numbers observed by ten day periods for selected marshes during spring migration in the Lake Erie marshes, 2007.

| 10-day Periods | Principle Marshes Surveyed |            |             |               |                   |                  |
|----------------|----------------------------|------------|-------------|---------------|-------------------|------------------|
|                | Pt. Moullee                | Ottawa NWR | Magee Marsh | Metzger Marsh | Ottawa Co. Fields | Lucas Co. Fields |
| March 1-10     |                            |            |             |               |                   |                  |
| March 11-20    | 1                          |            |             |               |                   |                  |
| March 21-31    | 24                         |            |             |               | 25                |                  |
| April 1-10     | 52                         | 4          |             |               | 175               | 6                |
| April 11-20    |                            | 85         | 64          |               | 46                |                  |
| April 21-30    | 192                        | 17         | 42          | 2,368         | 69                | 3,305            |
| May 1-10       |                            | 58         |             | 7,970         |                   |                  |
| May 11-20      | 2,285                      | 349        | 34          | 3,415         | 144               |                  |
| May 21-31      |                            |            |             | 68            | 58                |                  |
| June 1-10      | 229                        |            |             |               |                   |                  |
| June 11-20     | 118                        |            |             | 26            |                   |                  |
| June 21-30     | 214                        |            |             |               |                   |                  |

Table 4. Timing of spring migrating shorebirds (avg. #/trip) in the Lake Erie marsh region, 2007.\*

| 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         |              |            |           |              |              |             |             |            |
| 21-31       |           | <1       | 13        |              | 2          |           | 2            | 5            | 3           |             |            |
| Apr 1-10    |           | 2        | 9         |              | <u>60</u>  |           | 3            | 5            | 3           |             |            |
| 11-20       |           | <u>4</u> | 8         |              | 5          |           | 37           | 6            | 6           | 1           |            |
| 21-30       |           | <1       | 9         |              | 13         |           | 758          | <u>42</u>    | <u>158</u>  | 11          |            |
| May 1-10    | <u>42</u> |          | <u>28</u> | 1            | 35         |           | <u>5,012</u> | 25           | 88          | <u>167</u>  | 4          |
| 11-20       | <u>34</u> |          | 16        | 2            |            | 3         | 1,273        | 2            | 14          |             | 4          |
| 21-31       | 1         |          | 22        | <u>4</u>     |            | <u>55</u> | 35           |              |             | 1           | <u>8</u>   |
| Jun 1-10    | 10        |          | 31        | <1           |            | <u>83</u> | 18           |              | 1           | 1           | 1          |
| 11-20       |           |          | 78        | <u>10</u>    |            | 9         | 18           | 1            | 2           | 4           | 1          |
| 21-30       | 1         |          | 139       | 1            |            |           | 1            | 5            | 47          | 6           |            |

\*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, 2007.

| 10-day periods | Marshes      |            |             |               |
|----------------|--------------|------------|-------------|---------------|
|                | Pt. Mouillee | Ottawa NWR | Magee Marsh | Metzger Marsh |
| July 1-10      | 461          | 312        |             | 18            |
| July 11-20     | 1,077        | 342        | 18          | 91            |
| July 21-31     | 1,329        | 522        | 22          | 149           |
| Aug. 1-10      | 2,073        | 250        | 6           |               |
| Aug. 11-20     |              | 220        | 12          |               |
| Aug. 21-31     |              | 26         | 5           |               |
| Sept. 1-10     |              | 298        |             |               |
| Sept. 11-20    |              | 342        |             |               |
| Sept. 21-30    |              |            |             |               |
| Oct. 1-10      |              | 905        | 6           |               |
| Oct. 11-20     |              | 1,325      |             |               |
| Oct. 21-31     |              | 3,477      |             |               |
| Nov. 1-10      |              | 323        |             |               |
| Nov. 11-20     |              | 58         |             |               |

Table 6. Timing of fall migrating shorebirds (avg. #/trip) in the Lake Erie marsh region, 2007.\*

| Time Period | Semi Plov | Kill-deer  | Pect Sand  | Least Sand | Semi. Sand | Great Yleg | Less Yleg  | Sh-bill Dowit | Stilt Sand | Spot Sand | Dunlin       | Solit. Sand |
|-------------|-----------|------------|------------|------------|------------|------------|------------|---------------|------------|-----------|--------------|-------------|
| July 1-10   | 2         | 134        | 1          | 41         |            | 7          | 51         | 14            | 1          | <u>22</u> |              | <u>5</u>    |
| 11-20       |           | 66         | 7          | 44         | 2          | 16         | 134        | <u>70</u>     | 2          | 15        | 2            | 1           |
| 21-31       | 1         | 96         | 25         | 40         | 52         | 9          | 110        | 44            | 9          | 8         | 3            | 2           |
| Aug 1-10    | 3         | 78         | 27         | 23         | 52         | 12         | <u>152</u> | 9             | 4          | 10        | 2            | 1           |
| 11-20       | 9         | 59         | 17         | 1          |            | 5          | 5          | 3             |            | 1         |              | 2           |
| 21-31       | 1         |            | 2          |            |            | 1          | 3          |               |            | 3         |              |             |
| Sept. 1-10  |           | 96         |            | 5          |            | <u>67</u>  | 50         | 2             |            |           |              | 2           |
| 11-20       | 5         | 75         | 60         | 25         | 28         | 13         | 75         | 2             | <u>18</u>  | 2         | 1            | 3           |
| 21-30       | 2         | 10         | 20         | 5          | <u>74</u>  | 5          | 37         | 1             | 15         |           |              |             |
| Oct 1-10    | <u>13</u> | 125        | <u>151</u> | 3          | 1          | 10         | 60         |               | 1          |           | 44           |             |
| 11-20       | 2         | 160        | 106        | 2          |            | 27         | <u>179</u> |               |            |           | 775          |             |
| 21-31       | 8         | <u>381</u> | 33         | <u>124</u> | <u>85</u>  | 7          | 18         |               |            |           | <u>4,540</u> |             |
| Nov 1-10    |           | 11         | 1          |            |            |            |            |               |            |           | 300          |             |
| 11-20       |           | 9          | 1          |            |            |            |            |               |            |           |              |             |

\*numbers underlined are peaks for each species