

# **RAPTORS AND WATERBIRDS ON THE GREAT EGG HARBOR RIVER**

**ATLANTIC COUNTY, NJ**

**WINTER, 2009 - 2010**

*The Seventh Field Season of a Systematic Study  
of an Important Avian Wintering Area*

*including Key Comparisons to the MULLICA RIVER*

*and an update on continuing investigation of  
SPRING and FALL MIGRATION and the BREEDING BIRDS  
of the Great Egg Harbor River Watershed*

**Submitted to: The Great Egg Harbor River Council and Watershed Association**



**by Clay Sutton and James Dowdell  
August, 2010**

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***On the cover and above:*** Winter 2009-2010 saw an unprecedented push of Common Eiders into the South Jersey region. Up to 30 were present in Great Egg Harbor Bay. Here are **13 Common Eiders at the Longport Sod Banks (Malibu Beach WMA)** on 19 February 2010.

– Photo by Clay Sutton, 19 February 2010

***Top:*** Winter 2009-2010 presented major obstacles to birds and bird counters. Record snowfall in the region blanketed fields, forests, and roads. It covered the Great Egg marshes on several survey dates; here is a **snowy scene near English Creek Landing on 19 February 2010**. Note the obvious “muskrat house.”

– Photo by Clay Sutton, 19 February 2010

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# RAPTORS AND WATERBIRDS ON THE GREAT EGG HARBOR RIVER

## The Seventh Field Season of a Systematic Study

Spring 2009 through Spring 2010

### INTRODUCTION AND OVERVIEW

Beginning in Spring 2009, ongoing through summer and fall of 2009, then through the core winter study period, and finally through spring of 2010, raptor and waterbird counts were conducted on the Great Egg Harbor River in Atlantic County, New Jersey. This marked the seventh consecutive field season for these studies carried out for the Great Egg Harbor Watershed Association.

Survey locations and methodology remained the same as in the first six seasons of study (see: *Wintering Raptors and Waterbirds of the Great Egg Harbor River, Atlantic County, NJ – A Summary of the First Five Years of Study, 2003-2008*). **Map 1** (page 5) shows the nine bird census sites (point counts locations) on the Great Egg Harbor River and Bay. Eight core program winter surveys were conducted between the second week of December 2009 and the third week of March 2010. The results of these counts are shown in **Table 1** (page 6). **Peak winter season counts** are shown in **Bold Face**. Also shown are seasonal averages for key winter species. As in the first six seasons of study, rare, threatened, and endangered species mapping for all survey dates are included at the end of this report.

While the core winter segment of this survey was carried out with the exact same methodology as the prior six seasons of survey efforts, in 2009-2010 the survey scope was expanded to include the full seasonal cycle, that is: fall, winter, spring, and summer. Survey efforts are now conducted year round in order to assess and document spring and fall migration, breeding species, and the all-important winter concentrations of raptors and waterbirds.

Accordingly, Table 1 also shows the findings of systematic counts conducted from spring through fall 2009, as well as spring counts (and an early summer count) conducted in 2010.

Core winter studies were carried out for the seventh consecutive winter season, and were complemented by surveys carried out during the “shoulder seasons” of fall and spring. Waterfowl and raptors use the Great Egg Harbor River at all seasons; numbers build in fall and the extent of the fall migration in part determines wintering numbers.

Many birds, particularly waterfowl (ducks and Brant) linger and remain well into the spring season, and other birds stage or concentrate in large numbers as they journey north. Finally, good numbers and a wide variety of breeding birds nest in the Great Egg watershed during spring and summer. Migratory shorebird use was a particular focus of these expanded spring and fall efforts and **peak migratory shorebird counts** are shown in **Bold Face** in Table 1.1 through Table 1.5

For all these reasons, it was determined that while core winter studies would remain a major focus, expanded survey efforts in spring, summer, and fall were envisioned and carried out in an effort to document the avian ecovalues of the Great Egg at all seasons of the year.



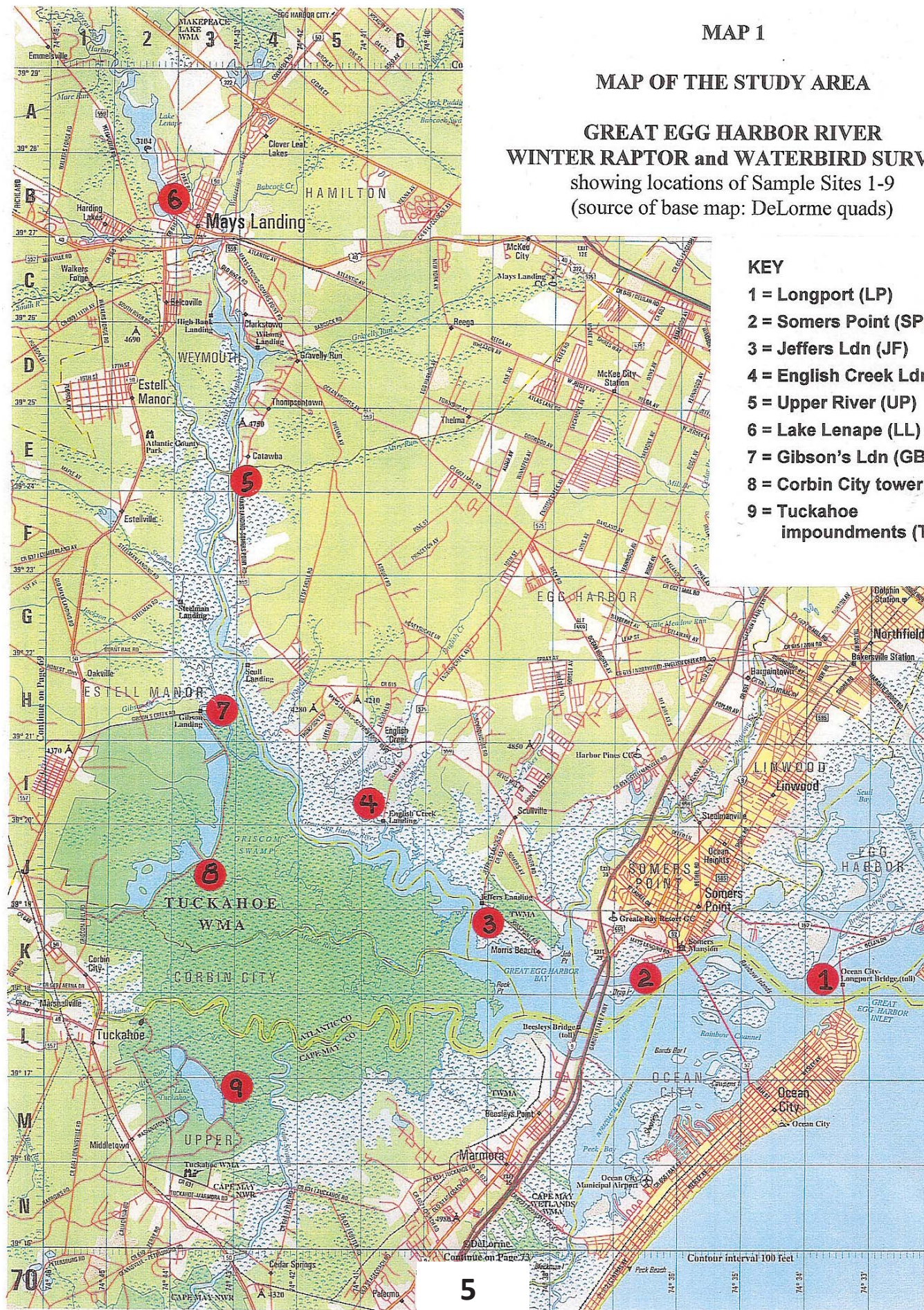
# MAP 1

## MAP OF THE STUDY AREA

### GREAT EGG HARBOR RIVER WINTER RAPTOR and WATERBIRD SURVEY showing locations of Sample Sites 1-9 (source of base map: DeLorme quads)

#### KEY

- 1 = Longport (LP)
- 2 = Somers Point (SP)
- 3 = Jeffers Ldn (JF)
- 4 = English Creek Ldn (EC)
- 5 = Upper River (UP)
- 6 = Lake Lenape (LL)
- 7 = Gibson's Ldn (GB)
- 8 = Corbin City tower (CC)
- 9 = Tuckahoe impoundments (TK)





**TABLE 1.1**  
**Great Egg Harbor River**  
**Raptor and Waterbird Survey**  
**April 2009 through July 2010**

|                             | SPRING thru FALL 2009 |      |      |     |      |      |       | CORE WINTER PERIOD 2009-2010 |       |           |           |     |      |            |            |     | SPRING thru SUMMER 2010 |      |      |      |
|-----------------------------|-----------------------|------|------|-----|------|------|-------|------------------------------|-------|-----------|-----------|-----|------|------------|------------|-----|-------------------------|------|------|------|
| DATE                        | 4/9                   | 5/19 | 6/10 | 8/7 | 8/27 | 9/18 | 11/17 | 12/11                        | 12/28 | 1/6       | 1/20      | 2/4 | 2/19 | 3/9        | 3/23       | AVG | 4/22                    | 5/25 | 6/23 | 7/16 |
| <b>LOONS to CORMORANTS</b>  |                       |      |      |     |      |      |       |                              |       |           |           |     |      |            |            |     |                         |      |      |      |
| Red-throated Loon           | 4                     | 1    |      |     |      |      | 4     | 1                            | 5     | <b>12</b> | <b>12</b> | 8   | 2    | 8          | 3          |     |                         |      |      |      |
| Common Loon                 | 34                    | 2    |      |     |      |      | 9     | 3                            | 21    | 15        | <b>32</b> | 7   | 1    | 26         | 33         |     | 24                      |      |      |      |
| Pied-billed Grebe           |                       |      |      |     | 1    |      | 5     | 1                            |       | 1         |           |     |      |            |            |     |                         |      |      |      |
| Horned Grebe                | 22                    |      |      |     |      |      |       |                              |       | 3         |           |     | 4    | 9          | <b>13</b>  |     |                         |      |      |      |
| Northern Gannet             | 10                    | 1    |      |     |      |      | 11    |                              |       |           |           |     |      |            |            |     | 12                      |      |      |      |
| Brown Pelican               |                       |      |      |     | 2    | 26   |       |                              |       |           |           |     |      |            |            |     |                         |      |      |      |
| Dbl-cr Cormorant            | 130                   | 74   | 22   | 157 | 113  | 131  | 84    | 13                           | 59    | 96        | 44        | 55  | 105  | 94         | <b>129</b> |     | 571                     | 95   | 38   | 61   |
| <b>BITTERNS to VULTURES</b> |                       |      |      |     |      |      |       |                              |       |           |           |     |      |            |            |     |                         |      |      |      |
| Heron / Egret sp.           |                       |      |      | 100 | 50   |      |       |                              |       |           |           |     |      |            |            |     |                         |      |      |      |
| Least Bittern               |                       |      | 1    |     |      |      |       |                              |       |           |           |     |      |            |            |     |                         |      |      | 5    |
| Great Blue Heron            | 4                     | 6    | 2    | 14  | 11   | 9    | 12    | 14                           | 9     | 16        | <b>22</b> | 16  | 7    | 20         | 5          |     | 3                       | 4    | 2    | 6    |
| Great Egret                 | 30                    | 70   | 58   | 143 | 47   | 106  | 8     | 2                            | 2     |           | 1         |     |      |            | <b>5</b>   |     | 39                      | 74   | 66   | 34   |
| Snowy Egret                 | 47                    | 137  | 27   | 81  | 73   | 209  |       |                              |       |           |           |     |      |            |            |     | 62                      | 100  | 39   | 57   |
| Little Blue Heron           | 3                     | 3    | 2    | 7   | 1    | 3    |       |                              |       |           |           |     |      |            |            |     | 1                       | 3    | 2    | 3    |
| Tricolored Heron            | 1                     | 1    | 1    | 2   | 2    | 1    |       |                              |       |           |           |     |      |            |            |     | 1                       | 3    | 1    | 1    |
| Cattle Egret                |                       |      |      |     |      |      |       |                              |       |           |           |     |      |            |            |     |                         | 1    |      |      |
| Green Heron                 |                       |      |      |     | 1    |      |       |                              |       |           |           |     |      |            |            |     |                         |      |      |      |
| Black-cr Nt-Heron           |                       | 2    | 4    | 15  |      |      |       |                              |       |           |           |     |      |            |            |     | 2                       | 1    | 1    | 6    |
| Yellow-cr Nt-Heron          |                       | 1    | 11   | 4   | 5    | 1    |       |                              |       |           |           |     |      |            |            |     |                         | 7    | 10   | 15   |
| Glossy Ibis                 | 6                     | 6    | 26   | 121 | 35   | 16   |       |                              |       |           |           |     |      |            |            |     | 69                      | 162  | 79   | 27   |
| Black Vulture               | 1                     | 9    | 1    | 1   | 3    | 10   | 9     |                              | 3     | 5         | 6         | 11  | 4    | <b>16</b>  | 3          | 6   | 4                       | 5    | 2    |      |
| Turkey Vulture              | 80                    | 79   | 32   | 69  | 72   | 73   | 92    | 37                           | 88    | 83        | 80        | 77  | 90   | <b>128</b> | 71         | 82  | 80                      | 80   | 36   | 29   |

**Peak winter counts shown in Bold Face**

**TABLE 1.2**  
**Great Egg Harbor River**  
**Raptor and Waterbird Survey**  
**April 2009 through July 2010**

|                     | SPRING thru FALL 2009 |      |      |     |      |      |       | CORE WINTER PERIOD 2009-2010 |             |            |            |             |      |             |            |     | SPRING thru SUMMER 2010 |      |      |      |
|---------------------|-----------------------|------|------|-----|------|------|-------|------------------------------|-------------|------------|------------|-------------|------|-------------|------------|-----|-------------------------|------|------|------|
| DATE                | 4/9                   | 5/19 | 6/10 | 8/7 | 8/27 | 9/18 | 11/17 | 12/11                        | 12/28       | 1/6        | 1/20       | 2/4         | 2/19 | 3/9         | 3/23       | AVG | 4/22                    | 5/25 | 6/23 | 7/16 |
| <b>WATERFOWL</b>    |                       |      |      |     |      |      |       |                              |             |            |            |             |      |             |            |     |                         |      |      |      |
| Snow Goose          |                       |      |      |     |      | 9    |       |                              |             |            |            |             |      |             |            |     |                         |      |      |      |
| Canada Goose        | 29                    | 88   | 61   | 113 | 16   | 130  | 5     | 275                          | 197         | 270        | 242        | 381         | 277  | <b>388</b>  | 129        | 270 | 83                      | 64   | 57   | 54   |
| Brant               | 1256                  | 422  |      |     |      |      | 1760  | 545                          | <b>1761</b> | 875        | 700        | 651         | 837  | 1205        | 1254       | 979 | 1252                    | 5    |      |      |
| "Black Brant"       |                       |      |      |     |      |      |       |                              |             |            | 1          |             |      |             |            |     |                         |      |      |      |
| Mute Swan           | 55                    | 45   | 40   | 35  | 37   | 54   | 43    | 79                           | 70          | 52         | 59         | 60          |      | 60          | <b>68</b>  |     | 35                      | 38   | 67   | 86   |
| Tundra Swan         |                       |      |      |     |      |      |       | 17                           | 3           | 8          | 15         | <b>21</b>   |      | 6           |            |     |                         |      |      |      |
| Wood Duck           |                       |      | 1    |     |      |      |       |                              |             |            |            |             |      |             |            |     |                         |      | 1    |      |
| Gadwall             | 18                    |      |      |     |      |      |       |                              |             |            | 7          |             | 12   | <b>40</b>   |            |     |                         |      |      |      |
| American Wigeon     | 5                     |      |      |     |      |      | 2     |                              |             | 1          | 11         |             |      | <b>111</b>  |            |     |                         |      |      |      |
| Am Black Duck       | 205                   | 19   | 14   | 11  | 11   | 46   | 144   | 314                          | 709         | 557        | 381        | 416         | 328  | <b>941</b>  | 393        | 505 | 11                      | 11   | 17   | 17   |
| Mallard             | 23                    | 24   | 64   | 69  | 96   | 17   | 18    | 21                           | 49          | 36         | 45         | 31          | 48   | <b>244</b>  | 25         | 62  | 11                      | 19   | 54   | 75   |
| Blue-winged Teal    | 3                     |      |      |     |      |      |       |                              |             |            |            |             |      |             |            |     |                         |      |      |      |
| Northern Shoveler   |                       |      |      |     |      |      |       |                              |             |            |            |             |      |             | 1          |     |                         |      |      |      |
| Northern Pintail    | 16                    |      |      |     | 1    |      |       | 1                            | 4           | 3          | 187        | 96          |      | <b>372</b>  | 5          |     |                         |      |      |      |
| Green-winged Teal   | 1223                  |      |      |     | 26   | 7    | 1     | 44                           | 15          |            | 52         | 3           |      | <b>1002</b> | 350        |     | 126                     |      |      |      |
| Ring-necked Duck    |                       |      |      |     |      |      |       |                              | 6           |            |            |             |      | <b>17</b>   |            |     |                         |      |      |      |
| Greater Scaup       |                       |      |      |     |      |      |       |                              |             | √          | √          | √           |      | √           |            |     |                         |      |      |      |
| Lesser Scaup        |                       |      |      |     |      |      |       |                              |             | √          | √          | √           |      | √           |            |     |                         |      |      |      |
| Scaup (sp.)         | 451                   |      |      |     |      |      | 3     | 25                           |             | 1602       | 2001       | <b>2140</b> | 72   | 1840        | 530        |     | 12                      |      |      |      |
| Common Eider        |                       |      |      |     |      |      | 7     | 15                           | 13          | 9          | 1          | 20          | 16   | 20          | <b>30</b>  |     | 1                       |      |      |      |
| Harlequin Duck      |                       |      |      |     |      |      |       |                              |             |            |            |             |      |             | 2          |     |                         |      |      |      |
| Surf Scoter         |                       |      |      |     |      |      | 15    |                              | 24          | 5          | 250        | 40          | 100  | 120         | <b>405</b> |     |                         |      |      |      |
| White-winged Scoter |                       |      |      |     |      |      | 1     |                              |             |            |            |             |      |             |            |     |                         |      |      |      |
| Black Scoter        |                       |      |      |     |      |      | 14    |                              | 22          | 12         | <b>150</b> | 15          | 21   | 35          | 125        |     |                         |      |      |      |
| Scoter (sp.)        |                       |      |      |     |      |      |       |                              |             | <b>120</b> |            |             |      | 100         |            |     |                         |      |      |      |

Peak winter counts shown in **Bold Face**

**TABLE 1.3**  
**Great Egg Harbor River**  
**Raptor and Waterbird Survey**  
**April 2009 through July 2010**

|                         | SPRING thru FALL 2009 |      |      |     |      |      |       | CORE WINTER PERIOD 2009-2010 |           |          |            |           |      |             |            |       | SPRING thru SUMMER 2010 |      |      |      |
|-------------------------|-----------------------|------|------|-----|------|------|-------|------------------------------|-----------|----------|------------|-----------|------|-------------|------------|-------|-------------------------|------|------|------|
| DATE                    | 4/9                   | 5/19 | 6/10 | 8/7 | 8/27 | 9/18 | 11/17 | 12/11                        | 12/28     | 1/6      | 1/20       | 2/4       | 2/19 | 3/9         | 3/23       | AVG   | 4/22                    | 5/25 | 6/23 | 7/16 |
| <b>WATERFOWL Cont.</b>  |                       |      |      |     |      |      |       |                              |           |          |            |           |      |             |            |       |                         |      |      |      |
| Long-tailed Duck        | 45                    |      |      |     |      |      |       |                              | 66        | 83       | 180        | 234       | 314  | <b>365</b>  | 249        |       | 1                       |      |      |      |
| Bufflehead              | 556                   |      |      |     |      |      | 139   | 78                           | 170       | 159      | 652        | 505       | 305  | <b>1079</b> | 181        | 391   | 1                       | 1    |      |      |
| Com. Goldeneye          |                       |      |      |     |      |      |       |                              | <b>20</b> | 10       | 18         | 15        | 11   | 4           |            |       |                         |      |      |      |
| Hooded Merganser        | 3                     |      |      |     |      |      | 6     | 3                            | 78        | 35       | <b>146</b> | 8         | 6    | 32          |            |       |                         |      |      |      |
| Com. Merganser          |                       |      |      |     |      |      |       |                              | 2         | 9        | <b>122</b> | 51        | 80   | 33          | 8          |       |                         |      |      |      |
| Red-br Merganser        | 146                   |      |      |     |      |      | 5     | 3                            | 67        | 36       | 95         | 44        | 85   | 85          | <b>124</b> | 67    | 16                      |      |      |      |
| <b>DIURNAL RAPTORS</b>  |                       |      |      |     |      |      |       |                              |           |          |            |           |      |             |            |       |                         |      |      |      |
| Osprey                  | 61                    | 66   | 56   | 101 | 53   | 18   |       |                              |           |          |            |           |      |             | 23         |       | 46                      | 79   | 66   | 47   |
| Mississippi Kite        |                       |      |      |     |      |      |       |                              |           |          |            |           |      |             |            |       |                         | 2    |      |      |
| Bald Eagle              | 10                    | 10   | 4    | 4   | 5    | 8    | 7     | 13                           | 11        | 16       | 14         | <b>24</b> | 19   | 14          | 6          | 14.63 | 7                       | 4    | 2    | 1    |
| Northern Harrier        | 12                    | 6    | 2    |     | 6    | 16   | 28    | 22                           | 26        | 26       | 29         | 20        | 14   | <b>34</b>   | 9          | 23    | 3                       | 2    | 1    | 2    |
| Sharp-sh Hawk           | 1                     |      |      |     |      |      | 5     | <b>2</b>                     | <b>2</b>  | 1        | <b>2</b>   | 1         | 1    |             |            | 1.13  |                         |      |      |      |
| Cooper's Hawk           | 4                     | 3    | 1    |     |      | 3    | 3     | 3                            | 4         | 1        | <b>5</b>   | 1         | 3    | 3           | 1          | 2.63  | 5                       |      |      | 1    |
| Red-sh Hawk             |                       |      |      |     |      |      | 1     |                              |           |          |            | 1         |      |             |            | 0.13  |                         |      |      |      |
| Broad-winged Hawk       |                       | 1    | 1    |     |      |      |       |                              |           |          |            |           |      |             |            |       |                         | 1    |      |      |
| Red-tailed Hawk         | 30                    | 28   | 10   | 17  | 14   | 12   | 30    | 24                           | 23        | 27       | 35         | <b>52</b> | 41   | 51          | 12         | 33    | 26                      | 30   | 12   | 1    |
| Rough-leg. Hawk         |                       |      |      |     |      |      | 1     | 1                            |           | <b>3</b> | 1          | 1         |      | 1           |            | 0.87  |                         |      |      |      |
| Golden Eagle            |                       |      |      |     |      |      |       |                              |           |          |            | 1         |      |             |            | 0.13  |                         |      |      |      |
| American Kestrel        | 2                     |      |      | 1   |      | 1    |       | 1                            |           |          |            |           |      |             | 1          | 0.25  |                         |      |      |      |
| Merlin                  | 1                     |      |      |     |      | 2    |       |                              |           |          |            |           |      |             |            |       | 1                       |      |      |      |
| Peregrine Falcon        | 4                     | 1    |      | 3   | 3    | 3    | 2     | 3                            | <b>4</b>  | <b>4</b> | <b>4</b>   | 2         | 1    | 2           | 2          | 2.75  | 3                       | 1    |      |      |
| <b>GROUSE to CRANES</b> |                       |      |      |     |      |      |       |                              |           |          |            |           |      |             |            |       |                         |      |      |      |
| Ring-nk Pheasant        |                       |      | 1    |     |      |      | 1     |                              |           |          |            |           |      |             |            |       |                         |      |      |      |
| Wild Turkey             |                       |      | 3    |     | 20   |      |       |                              |           |          |            |           |      |             |            |       |                         |      |      |      |
| Clapper Rail            |                       | 15   | 3    | 8   | 13   | 9    | 1     |                              |           |          |            |           |      |             |            |       | 4                       | 22   | 17   | 29   |

Peak winter counts shown in **Bold Face**



**TABLE 1.4**  
**Great Egg Harbor River**  
**Raptor and Waterbird Survey**  
**April 2009 through July 2010**

|                         | SPRING thru FALL 2009 |             |      |           |             |           |            | CORE WINTER PERIOD 2009-2010 |       |      |           |     |          |     |      |     | SPRING thru SUMMER 2010 |             |            |           |
|-------------------------|-----------------------|-------------|------|-----------|-------------|-----------|------------|------------------------------|-------|------|-----------|-----|----------|-----|------|-----|-------------------------|-------------|------------|-----------|
| DATE                    | 4/9                   | 5/19        | 6/10 | 8/7       | 8/27        | 9/18      | 11/17      | 12/11                        | 12/28 | 1/6  | 1/20      | 2/4 | 2/19     | 3/9 | 3/23 | AVG | 4/22                    | 5/25        | 6/23       | 7/16      |
| <b>SHOREBIRDS</b>       |                       |             |      |           |             |           |            |                              |       |      |           |     |          |     |      |     |                         |             |            |           |
| Black-bellied Plover    |                       | <b>196</b>  |      | 4         | 57          | 1         | 86         |                              |       | 26   | 16        | 1   |          |     | 10   |     | 14                      | 111         | 1          |           |
| Semipalmated Plover     |                       | <b>194</b>  |      | 22        | 33          | 32        |            |                              |       |      |           |     |          |     |      |     |                         | 92          |            | 1         |
| Killdeer                |                       | 1           | 1    | 1         | 4           | 4         |            | 2                            |       | 1    |           | 1   |          |     | 2    |     |                         | 1           |            | <b>5</b>  |
| Am Oystercatcher        | 14                    | 36          | 12   | 4         | 52          | 101       | <b>107</b> | 3                            | 10    | 10   | 16        | 32  | 43       | 38  | 26   |     | 37                      | 30          | 14         | 5         |
| Greater Yellowlegs      | 34                    | 6           |      | <b>48</b> | 12          | 8         | 20         |                              |       | 2    | 2         |     |          | 6   | 17   |     | 33                      | 2           |            | 10        |
| Lesser Yellowlegs       | 7                     |             |      | 11        | 1           | 3         |            |                              |       |      |           |     |          |     |      |     |                         |             |            | <b>14</b> |
| Solitary Sandpiper      |                       |             |      |           | 1           |           |            |                              |       |      |           |     |          |     |      |     |                         |             |            |           |
| Willet                  |                       | 81          | 32   |           |             |           |            |                              |       |      |           |     |          |     |      |     | 56                      | 86          | <b>120</b> | 13        |
| Spotted Sandpiper       |                       |             |      | <b>3</b>  | 2           |           |            |                              |       |      |           |     |          |     |      |     |                         |             |            |           |
| Whimbrel                |                       | 2           |      |           |             |           |            |                              |       |      |           |     |          |     |      |     | 1                       | <b>44</b>   |            |           |
| Ruddy Turnstone         |                       | <b>90</b>   |      | 3         | 22          | 12        | 34         |                              |       | 4    | 2         |     |          |     | 40   |     |                         | 85          |            | 1         |
| Red Knot                |                       | <b>412</b>  |      | 9         |             |           | 1          |                              |       |      |           |     |          |     |      |     |                         | 356         | 1          |           |
| Sanderling              |                       | 375         |      | 920       | <b>1200</b> | 126       | 196        | 12                           | 19    | 205  | 60        |     | 60       | 32  |      |     |                         | 185         |            |           |
| Semipalmated Sdp        |                       | 848         |      | 469       | 83          | 37        |            |                              |       |      |           |     |          |     |      |     |                         | <b>1191</b> |            | 208       |
| Western Sandpiper       |                       |             |      |           |             | <b>15</b> |            |                              |       |      |           |     |          |     |      |     |                         |             |            |           |
| Least Sandpiper         |                       | <b>239</b>  |      | 111       | 101         | 9         |            |                              |       |      |           |     |          |     |      |     |                         | 48          |            | 28        |
| Pectoral Sandpiper      |                       |             |      |           | 1           |           |            |                              |       |      |           |     |          |     |      |     |                         |             |            |           |
| Purple Sandpiper        |                       |             |      |           |             |           |            |                              |       |      | <b>80</b> |     |          |     | 1    |     |                         | 1           |            |           |
| Dunlin                  | <b>1355</b>           | 1014        |      |           |             |           | 1110       | 40                           | 7     | 1171 | 270       |     | 85       | 550 |      |     | 95                      | 1075        |            |           |
| Stilt Sandpiper         |                       |             |      | <b>3</b>  |             |           |            |                              |       |      |           |     |          |     |      |     |                         |             |            |           |
| Sh-billed Dowitcher     |                       | 335         |      | 23        | 4           |           |            |                              |       |      |           |     |          |     |      |     |                         | <b>647</b>  |            | 43        |
| Wilson's Snipe          |                       |             |      |           | 1           |           | 1          |                              |       |      |           |     |          |     | 1    |     |                         |             |            |           |
| Am. Woodcock            |                       |             |      |           |             |           |            |                              |       |      |           |     | <b>4</b> |     |      |     |                         |             |            |           |
| unid. Shorebird         |                       | <b>540</b>  |      |           | 200         |           |            |                              |       |      |           |     |          |     |      |     |                         |             |            |           |
| <b>TOTAL SHOREBIRDS</b> | 1410                  | <b>4369</b> | 45   | 1631      | 1774        | 348       | 1555       |                              |       |      |           |     |          |     |      |     | 236                     | 3954        | 136        | 328       |

Peak winter counts shown in **Bold Face**

**TABLE 1.5**  
**Great Egg Harbor River**  
**Raptor and Waterbird Survey**  
**April 2009 through July 2010**

|                               | SPRING thru FALL 2009 |      |      |      |      |      |       | CORE WINTER PERIOD 2009-2010 |       |     |      |     |      |     |      |     | SPRING thru SUMMER 2010 |      |      |      |
|-------------------------------|-----------------------|------|------|------|------|------|-------|------------------------------|-------|-----|------|-----|------|-----|------|-----|-------------------------|------|------|------|
| DATE                          | 4/9                   | 5/19 | 6/10 | 8/7  | 8/27 | 9/18 | 11/17 | 12/11                        | 12/28 | 1/6 | 1/20 | 2/4 | 2/19 | 3/9 | 3/23 | AVG | 4/22                    | 5/25 | 6/23 | 7/16 |
| <b>JAEGERS to ALCIDS</b>      |                       |      |      |      |      |      |       |                              |       |     |      |     |      |     |      |     |                         |      |      |      |
| Laughing Gull                 | 330                   | √    | √    | √    | √    | √    |       |                              |       |     |      |     |      |     | 27   |     | √                       | √    | √    | √    |
| Bonaparte's Gull              |                       |      |      |      |      |      |       | 1                            |       | 1   |      |     |      |     |      |     |                         |      |      |      |
| Ring-billed Gull              | √                     | √    |      |      | √    |      | √     | √                            | √     | √   | √    | √   | √    | √   | √    |     | √                       | √    |      | 2    |
| Herring Gull                  | √                     | √    | √    | √    | √    | √    | √     | √                            | √     | √   | √    | √   | √    | √   | √    |     | √                       | √    | √    | √    |
| Gt BI-backed Gull             | √                     | √    | √    | √    | √    | √    | √     | √                            | √     | √   | √    | √   | √    | √   | √    |     | √                       | √    | √    | √    |
| Gull-billed Tern              |                       | 3    | 2    | 3    |      |      |       |                              |       |     |      |     |      |     |      |     |                         | 4    | 3    | 4    |
| Caspian Tern                  |                       | 1    |      | 3    |      |      |       |                              |       |     |      |     |      |     |      |     |                         | 2    |      | 2    |
| Royal Tern                    |                       |      |      | 1    | 6    | 1    | 2     |                              |       |     |      |     |      |     |      |     |                         |      |      |      |
| Common Tern                   |                       | 46   | 50   | 198  | 99   | 5    |       |                              |       |     |      |     |      |     |      |     |                         | 95   | 100  | 142  |
| Forster's Tern                | 36                    | 184  | 62   | 82   | 42   | 52   |       |                              |       |     |      |     |      |     |      |     | 178                     | 147  | 72   | 84   |
| Least Tern                    |                       | 34   | 8    | 105  | 24   |      |       |                              |       |     |      |     |      |     |      |     |                         | 25   | 100  | 196  |
| Black Skimmer                 |                       | 42   | 254  | 1545 | 1252 | 750  | 5     |                              | 1     |     |      |     |      |     |      |     |                         | 226  | 800  | 1300 |
|                               |                       |      |      |      |      |      |       |                              |       |     |      |     |      |     |      |     |                         |      |      |      |
| <b>PIGEONS to WOODPECKERS</b> |                       |      |      |      |      |      |       |                              |       |     |      |     |      |     |      |     |                         |      |      |      |
| Great Horned Owl              |                       |      | 1    |      |      |      |       |                              |       |     |      | 1   |      |     |      |     |                         |      |      |      |
| Belted Kingfisher             | 3                     |      |      |      | 3    | 5    | 2     |                              |       |     | 4    | 3   |      | 1   | 2    |     |                         |      |      |      |

**Peak winter counts shown in Bold Face**



## WINTER RAPTORS AND WATERBIRDS – CORE WINTER STUDIES

Because the ongoing and long-term winter studies were extensively summarized and discussed at the five-year milestone, (see: *Wintering Raptors and Waterbirds of the Great Egg Harbor River, Atlantic County, NJ – A Summary of the First Five Years of Study, 2003-2008*). And because all previous reports dating back to 2003 are archived on the Great Egg Harbor Watershed Association website ( [www.gehwa.org/newsletter](http://www.gehwa.org/newsletter) ), we will not present an in-depth review of goals and objectives or methodologies here. Methods for core winter studies remained the same in winter 2009-2010 as in the first six seasons of study (See Appendix 2, page 46). Nine point counts were conducted by Sutton and Dowdell for a period of 45 minutes per site (See Map 1, page 5).

In 2009-2010, eight surveys were conducted between 11 December 2009 and 23 March 2010. On one count (19 February 2010), out of necessity protocol was changed when the wildlife drive (dikes) at both the Corbin City Unit (of Tuckahoe WMA) and Tuckahoe WMA were inaccessible due to deep snow and unplowed roads.

The findings of winter 2009-2010 compared highly favorably with the previous six seasons of study, again confirming and corroborating the known high ecovalues of the Great Egg Harbor River. Red-throated Loons and Common Loons were abundant in the lower estuary, and Great Blue Herons were common throughout the winter (and abundant in spring and fall counts). American Oystercatcher and Sanderling wintered on the lower rivers, mudflats, and beaches in good numbers, and a very high count of 80 Purple Sandpipers was achieved at Longport on 20 January 2010. Dunlin were scattered yet present in good numbers – 1,171 were tallied on 6 January 2010.

Waterfowl numbers, particularly for key Great Egg species such as Brant, American Black Duck, and Green-winged Teal were consistent with recent years, although with the warm spring, few lingered as late as normally expected – keeping seasonal averages down for many ducks. Scaup were abundant in the lower bay (a peak count of 2,140 was tallied on 4 February 2010) but below the high counts of many previous winters.

A major highlight of winter 2009-2010 was the major incursion of Common Eider into the South Jersey and Mid-Atlantic region. An eider was only recorded once in the previous six seasons of study (an unidentified eider on 29 January 2009), but in winter 2009-2010 Common Eiders were recorded on all eight winter surveys (and in fall and spring), peaking at 30 individuals on 23 March 2010. The eider flight of the fall and winter was unprecedented and occurred throughout southern New Jersey. It is unknown whether it was linked to known strong increases in breeding numbers in New England and the Canadian Maritimes, or whether possibly linked to a shortage of food in their normal winter range (to our north). But whatever the reason, Common Eiders were a pleasant treat for birders on the lower Great Egg in winter 2009-2010 (see cover photo).

Winter raptor populations were again exceptional on the Great Egg Harbor River in 2009-2010. Species and numbers were either at or near recent averages for most species. Black Vulture, Cooper's Hawk, and Peregrine Falcon continued their upward trends, and only Sharp-shinned Hawk was down in winter 2009-2010. A Golden Eagle, a subadult, was recorded near Gibson's Landing on 4 February 2010, and a second Golden Eagle, an immature, was seen by veteran observer Brian Johnson at the Corbin City Unit of Tuckahoe WMA on 9 January 2010. Two Golden Eagles present harkens back to the earlier years of this long-term study and to historical records as well.

A comparison of winter 2009-2010 raptor and waterbird numbers to the previous year's survey (winter 2008-2009) and to the five-year segment of this survey from 2003-2004 through 2007-2008 is shown in **Table 2**. Peaks and averages are shown for key Great Egg Harbor River species of raptors and waterbirds.

Once again, adjunct comparative studies were carried out on the Mullica River in winter 2009-2010. For the sixth consecutive year, counts were undertaken on the nearby Mullica River in order to compare and contrast raptor and waterfowl numbers and thereby gain perspective on Great Egg bird populations. Count locations on the Mullica River are shown on **Map 2** (page 13).

The findings for the Mullica River are shown in **Table 3** (page15). **Peak numbers** are shown in **Bold Face** and averages are shown for key species. A comparison of key winter raptor and waterfowl species for both the Great Egg Harbor River and the Mullica River is shown in **Table 4** (page 17). Peaks and averages are shown for each river. While the Great Egg was sampled eight times over the season, the Mullica was sampled four times – a frequency deemed acceptable for most comparative purposes (the observers attempted to sample the Mullica at key dates and in as good weather conditions as possible – and mostly in mid-winter – to try to make the comparisons as valid as possible).

As in past winters, the rivers were again found to be remarkably comparable for many or even most species. In many ways they are similar, companion rivers in South Jersey. Peaks and averages for most waterfowl and raptor species again compared very favorably, putting each river into regional perspective and bolstering recent findings that both rivers and estuaries are highly important bird areas in winter (for further discussion see: *Wintering Raptors and Waterbirds of the Great Egg Harbor River, Atlantic County, NJ – A Summary of the First Five Years of Study, 2003-2008*).

Mullica River comparative studies should continue in the winter as an adjunct to the Great Egg Harbor River core studies. The projected average of 4 times per winter allows for a continued comparison to the Great Egg for the core winter period and for key wintering species. The perspectives provided by the comparisons, and contrast, of the Mullica River are important to evaluating Great Egg Harbor avian resources in both a single season and over time.



**TABLE 2**  
**Comparison of 2009-2010 Great Egg Harbor River Winter Raptor and Waterfowl Totals**  
**to Previous Seasons of Study**

|   | 2003-2004 thru 2007-2008 |                |               |           |       |           |       |  |
|---|--------------------------|----------------|---------------|-----------|-------|-----------|-------|--|
|   | HIGH<br>COUNT            | 5-Year Average |               | 2008-2009 |       | 2009-2010 |       |  |
|   |                          | of<br>Peak     | of<br>Average | PEAK      | AVG.  | PEAK      | AVG.  |  |
|   |                          |                |               | (N = 8)   |       | (N = 8)   |       |  |
| <b>WATERFOWL:</b>                             |                          |                |               |           |       |           |       |  |
| Canada Goose                                  | 906                      | 630            | 280           | 573       | 213   | 388       | 270   |  |
| Brant   | 5,440                    | 3,150          | 1669          | 3,505     | 1,920 | 1,761     | 979   |  |
| Am. Black Duck                                | 1,238                    | 983            | 513           | 904       | 582   | 941       | 505   |  |
| Mallard                                       | 263                      | 192            | 78            | 130       | 63    | 244       | 62    |  |
| Northern Pintail                              | 783                      | 570            | 190           | 761       | 339   | 372       | 95    |  |
| Green-winged Teal                             | 2,510                    | 1,298          | 374           | 1,763     | 650   | 1,002     | 209   |  |
| Bufflehead                                    | 1,168                    | 875            | 399           | 1,280     | 474   | 1,079     | 391   |  |
| Red-breasted Merganser                        | 180                      | 167            | 87            | 144       | 68    | 124       | 67    |  |
|   |                          |                |               |           |       |           |       |  |
| <b>RAPTORS:</b>                               |                          |                |               |           |       |           |       |  |
| Black Vulture                                 | 16                       | 9.80           | 3.80          | 12        | 4.50  | 16        | 6.00  |  |
| Turkey Vulture                                | 132                      | 115.00         | 82.00         | 116       | 87.00 | 128       | 82.00 |  |
| Bald Eagle                                    | 18                       | 15.40          | 8.35          | 22        | 12.75 | 24        | 14.63 |  |
| Northern Harrier                              | 47                       | 42.00          | 31.00         | 37        | 31.00 | 34        | 23.00 |  |
| Sharp-shinned Hawk                            | 7                        | 4.60           | 1.53          | 17        | 4.38  | 2         | 1.13  |  |
| Cooper's Hawk                                 | 5                        | 3.60           | 1.47          | 3         | 1.88  | 5         | 2.63  |  |
| Northern Goshawk                              | 1                        | 0.40           | 0.05          | 1         | 0.13  | 0         | 0.00  |  |
| Red-shouldered Hawk                           | 4                        | 2.20           | 0.52          | 1         | 0.50  | 1         | 0.13  |  |
| Red-tailed Hawk                               | 59                       | 56.00          | 41.00         | 49        | 35.00 | 52        | 33.00 |  |
| Rough-legged Hawk                             | 10                       | 6.00           | 2.61          | 3         | 1.25  | 3         | 0.88  |  |
| Golden Eagle                                  | 2                        | 1.20           | 0.37          | 1         | 0.25  | 1         | 0.13  |  |
| Am. Kestrel                                   | 4                        | 1.60           | 0.22          | 0         | 0.00  | 1         | 0.25  |  |
| Merlin  | 2                        | 1.00           | 0.13          | 0         | 0.00  | 0         | 0.00  |  |
| Peregrine Falcon                              | 6                        | 4.00           | 1.89          | 4         | 2.63  | 4         | 2.75  |  |
| <b>N - number of surveys per field season</b> |                          |                |               |           |       |           |       |  |





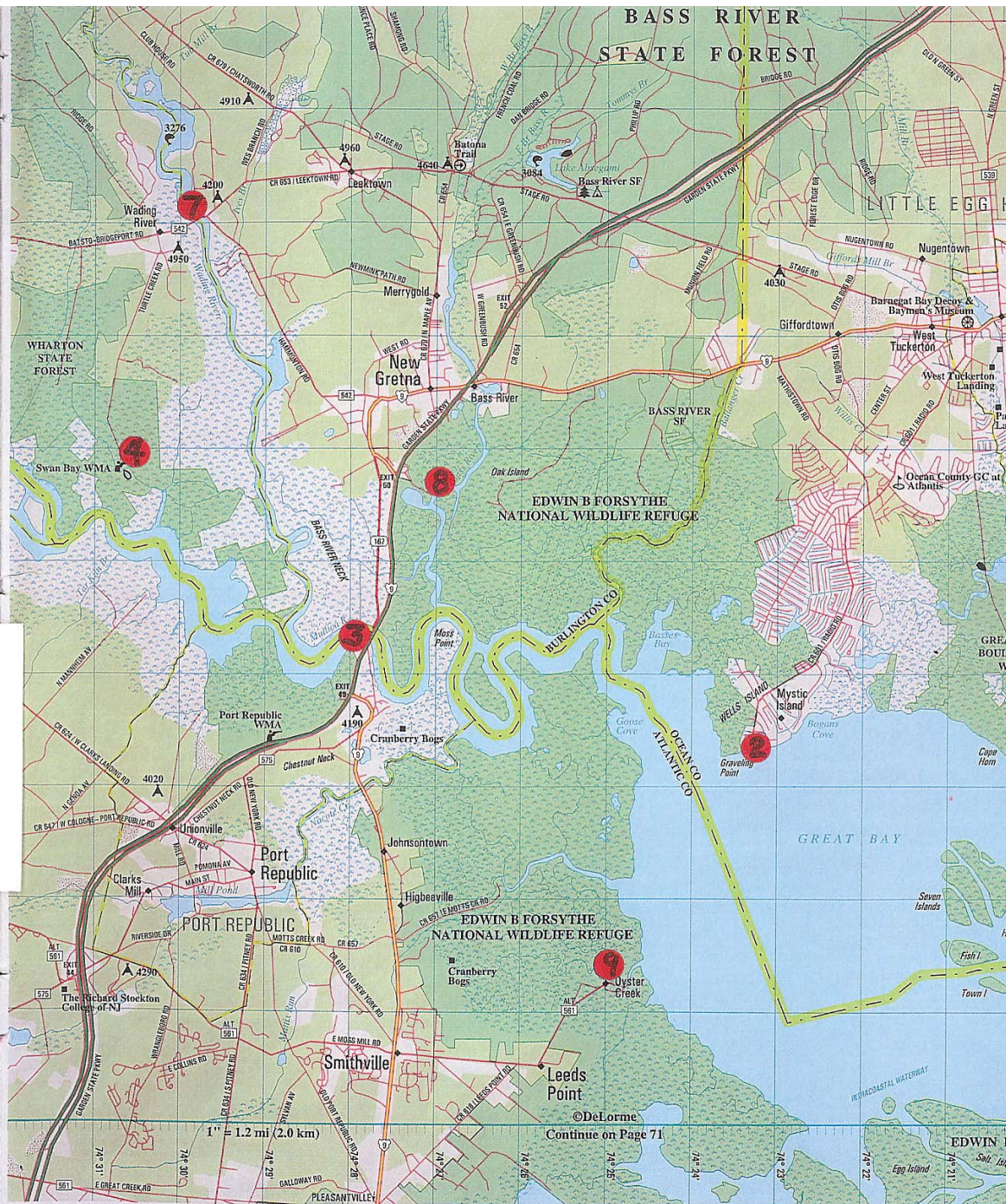
14



# **MAP 2** **MAP OF THE STUDY AREA** **MULLICA RIVER** **WINTER RAPTOR and WATERBIRD SURVEY** showing locations of Sample Sites 1-9 (source of base map: DeLorme quads)

## **KEY**

- 1 = Great Bay Blvd WMA (Seven Bridges Road)
- 2 = Graveling Point (GP)
- 3 = Gdn St Pkwy Bridge (BR)
- 4 = Swan Bay WMA (SW)
- 5 = Lower Bank (LB)
- 6 = Green Bank (GB)
- 7 = Wading River Bridge (WD)
- 8 = Amassas Landing (AM)
- 9 = Leeds Point (LD)





**TABLE 3.1**  
**Mullica River Raptor and Waterbird Survey**  
**Winter 2009-2010**

Peak Counts  
shown in **Bold**  
Face.

|                            |            |             |             |            | WINTER  |
|----------------------------|------------|-------------|-------------|------------|---------|
| DATE                       | 12/16      | 1/14        | 2/20        | 3/18       | AVG.    |
|                            |            |             |             |            | (N = 4) |
| <b>LOONS to CORMORANTS</b> |            |             |             |            |         |
| Red-throated Loon          | 18         |             | 6           | <b>26</b>  |         |
| Common Loon                | 9          | 9           |             | <b>26</b>  |         |
| Pied-billed Grebe          | 1          |             | <b>3</b>    | 1          |         |
| Horned Grebe               | 1          |             | 1           | <b>63</b>  |         |
| Double-cr Cormorant        | 2          |             |             | <b>22</b>  |         |
| <b>HERONS to VULTURES</b>  |            |             |             |            |         |
| Great Blue Heron           | <b>23</b>  | 22          | 10          | 5          |         |
| Great Egret                | 7          |             |             |            |         |
| Black Vulture              | 4          | 3           | <b>10</b>   | 3          | 5       |
| Turkey Vulture             | 84         | 39          | 89          | <b>103</b> | 79      |
| <b>WATERFOWL</b>           |            |             |             |            |         |
| Snow Goose                 | 665        |             | <b>1240</b> |            | 476     |
| Canada Goose               | <b>795</b> | 526         | 369         | 200        | 473     |
| Cackling Goose             | 1          |             |             |            |         |
| Brant                      | 895        | <b>1010</b> | 850         | 752        | 877     |
| Mute Swan                  | 5          | <b>8</b>    | 4           | 4          |         |
| Tundra Swan                |            | 5           | <b>6</b>    |            |         |
| Gadwall                    | 2          |             |             | <b>3</b>   |         |
| American Wigeon            |            |             | 2           |            |         |
| Am Black Duck              | <b>814</b> | 175         | 879         | 157        | 506     |
| Mallard                    | <b>631</b> | 168         | 277         | 70         | 287     |
| Northern Shoveler          |            | 2           |             |            |         |
| Northern Pintail           | 2          |             | <b>4</b>    |            |         |
| Green-winged Teal          | 6          |             | <b>8</b>    | 6          |         |
| Canvasback                 |            |             | 3           | <b>5</b>   |         |
| Ring-necked Duck           | <b>32</b>  | 2           | 4           |            |         |
| Greater Scaup              | 17         |             |             |            |         |
| Lesser Scaup               | 1          |             | <b>36</b>   |            |         |
| Scaup (sp.)                | 25         | <b>700</b>  | 390         | 95         | 303     |
| Common Eider               |            |             | 1           |            |         |
| Surf Scoter                | <b>6</b>   |             |             | 5          |         |
| Long-tailed Duck           | 19         | 40          | 79          | <b>82</b>  | 55      |
| Bufflehead                 | 269        | <b>860</b>  | 317         | 494        | 485     |
| Com. Goldeneye             | 3          | <b>25</b>   | 6           | 2          |         |
| Hooded Merganser           | <b>93</b>  | 92          | 85          | 35         | 76      |
| Com. Merganser             |            | 3           | <b>16</b>   |            |         |
| Red-br Merganser           | 5          | 80          | 76          | <b>274</b> | 109     |

**TABLE 3.2**  
**Mullica River Raptor and Waterbird Survey**  
**Winter 2009-2010**

Peak Counts  
shown in **Bold**  
Face.

|                               |           |            |           |           |       |
|-------------------------------|-----------|------------|-----------|-----------|-------|
| <b>DIURNAL RAPTORS</b>        |           |            |           |           |       |
| Osprey                        |           |            |           | 1         |       |
| Bald Eagle                    | <b>18</b> | 15         | 16        | 4         | 13.25 |
| Northern Harrier              | <b>32</b> | 31         | 27        | 24        | 29.00 |
| Sharp-sh Hawk                 | <b>3</b>  | 1          | 2         |           | 1.50  |
| Cooper's Hawk                 | 2         | 3          | <b>4</b>  |           | 2.25  |
| Red-sh Hawk                   |           | 1          | 1         |           | 0.50  |
| Red-tailed Hawk               | 28        | 26         | <b>48</b> | 40        | 36.00 |
| Rough-leg. Hawk               | 1         | 1          | 1         |           | 0.75  |
| Golden Eagle                  | 1         | 1          |           |           | 0.50  |
| American Kestrel              | 0         | 0          | 0         | 0         | 0.00  |
| Merlin                        | 1         |            |           |           | 0.25  |
| Peregrine Falcon              | <b>6</b>  | 3          | 1         | 1         | 2.75  |
| <b>GROUSE to CRANES</b>       |           |            |           |           |       |
| Virginia Rail                 |           |            |           | 1         |       |
| <b>SHOREBIRDS</b>             |           |            |           |           |       |
| Killdeer                      |           |            |           | 3         |       |
| Am. Oystercatcher             | 3         |            |           | <b>15</b> |       |
| Sanderling                    |           |            | 8         |           |       |
| Dunlin                        | 28        | <b>300</b> | 32        | 30        |       |
| <b>GULLS to ALCIDS</b>        |           |            |           |           |       |
| Laughing Gull                 |           |            |           | 5         |       |
| Ring-billed Gull              | √         | √          | √         | √         |       |
| Herring Gull                  | √         | √          | √         | √         |       |
| Gt BI-backed Gull             | √         | √          | √         | √         |       |
| <b>PIGEONS to WOODPECKERS</b> |           |            |           |           |       |
| Short-eared Owl               |           |            | 3         |           |       |
| Belted Kingfisher             | <b>3</b>  | 1          |           |           |       |

**TABLE 4**  
**Comparison of Winter Raptor and Waterfowl Totals**  
**Great Egg Harbor River and Mullica River**  
**2009-2010**

|                        | Great Egg Harbor River |       | Mullica River |       |
|------------------------|------------------------|-------|---------------|-------|
|                        | PEAK                   | AVG.  | PEAK          | AVG.  |
|                        | (N = 8)                |       | (N = 4)       |       |
| WATERFOWL:             |                        |       |               |       |
| Canada Goose           | 388                    | 270   | 795           | 473   |
| Brant                  | 1,761                  | 979   | 1,010         | 877   |
| Am. Black Duck         | 941                    | 505   | 814           | 506   |
| Mallard                | 244                    | 62    | 631           | 287   |
| Northern Pintail       | 372                    | 95    | 4             |       |
| Green-winged Teal      | 1,002                  | 209   | 8             |       |
| Bufflehead             | 1,079                  | 391   | 860           | 485   |
| Red-breasted Merganser | 124                    | 67    | 274           | 108   |
|                        |                        |       |               |       |
| RAPTORS:               |                        |       |               |       |
| Black Vulture          | 16                     | 6.00  | 10            | 5.00  |
| Turkey Vulture         | 128                    | 82.00 | 103           | 79.00 |
| Bald Eagle             | 24                     | 14.63 | 18            | 13.25 |
| Northern Harrier       | 34                     | 23.00 | 32            | 29.00 |
| Sharp-shinned Hawk     | 2                      | 1.13  | 3             | 1.50  |
| Cooper's Hawk          | 5                      | 2.63  | 4             | 2.25  |
| Northern Goshawk       | 0                      | 0.00  | 0             | 0.00  |
| Red-shouldered Hawk    | 1                      | 0.13  | 1             | 0.50  |
| Red-tailed Hawk        | 52                     | 33.00 | 48            | 36.00 |
| Rough-legged Hawk      | 3                      | 0.88  | 1             | 0.75  |
| Golden Eagle           | 1                      | 0.13  | 1             | 0.50  |
| Am. Kestrel            | 1                      | 0.25  | 0             | 0.00  |
| Merlin                 | 0                      | 0.00  | 1             | 0.25  |
| Peregrine Falcon       | 4                      | 2.75  | 6             | 2.75  |

**N = number of surveys per field season.**



## DISCUSSION

The particular value of ongoing long-term studies is that each field season can be reviewed in relation to long-term knowledge and findings, and this becomes particularly important when a field season presents very different or abnormal circumstances.

Fall, winter, and spring of 2009-2010 constituted such a year, when meteorological conditions presented many obstacles to both birds and bird survey efforts. A relatively warm fall was followed by a winter that was slightly above average in temperature. December was 0.1 degrees above normal; January was 0.9 degrees above normal; February was 2 degrees below normal; and 1-18 March was 5 degrees above normal in southern New Jersey (source: National Weather Service). In addition, May 2010 was 4 degrees above normal, and as this report is written, it appears that summer 2010 will be the hottest ever recorded in New Jersey.

More importantly, record rainfall and record snowfall occurred in winter (and spring) 2009-2010. Winter 2009-2010 produced more snowfall in southern New Jersey than any winter since records have been kept. February 2010 was the snowiest month on record ever (source: National Weather Service – data for Atlantic City International Airport). Over the winter, 58.1 inches of snow fell at Atlantic City International Airport, by far eclipsing the previous record of 46.9 inches set in winter 1966-1967. February alone had 36.6 inches of snow.

Snow melt, followed by heavy rainfall in March, combined to create the wettest spring on record in southern New Jersey. At Atlantic City International Airport, February precipitation measured 6.5 inches compared to the average of 2.85. In March 8.62 inches of rain fell, compared to the average of 3.93 (source: National Weather Service). Both officials and South Jersey residents readily agreed that it was easily the wettest spring in 100 years, with many area streets, roads, and homes flooded.

One aspect of the winter and spring was that our winter raptor and waterfowl surveys were regularly impeded by weather conditions. While we managed to carry out the Great Egg River surveys on a regular basis (only 2 or 3 surveys were cancelled / postponed), our route was on occasion blocked and regular survey sites often inaccessible. As a result, protocol had to be altered on several survey dates when many roads were unplowed. This occurred most notably on 19 February 2010, when the Corbin City Unit and Tuckahoe WMA were inaccessible. (Note: Because these sites are key areas for several waterfowl species, the averages for these species have been adjusted to reflect no coverage on that day).

More importantly, the aberrant weather conditions of 2009-2010 had many resultant impacts on wildlife and birds. In some cases, and for a few species, conditions were beneficial. We joked in March that, “Most of South Jersey is Wood Duck habitat” and indeed Wood Duck habitat was increased many hundreds of percent over normal as woodlands and swamps flooded. The snow cover impacted many birds severely (see the attached article from the *Press of Atlantic City*, dated 15 February 2010).

The combination of cold weather to the north, as well as heavy snow cover, sent record numbers of Bald Eagles south in January and February. A new record (previous peak count was 22), 24 Bald Eagles were carefully counted on the Great Egg on 4 February 2010 and good counts for the entire winter led to a new high average of 14.63 Bald Eagles per survey.

Of interest, and documenting the value of long-term studies, we can compare 2009-2010's peak of 24 Bald Eagles and average of 14.63 to 2000-2005's peak of 11 Bald Eagles and average of 7.3. The 2009-2010 average is double that of six years ago and another example of the Bald Eagle comeback.

Highlighting the amazing recovery of the Bald Eagle, in February Sutton surveyed all five major South Jersey rivers in five successive days. On the Great Egg Harbor River he tallied 19; and on the Mullica River 16 were found. On the Delaware Bayshore's Maurice River he counted 44 Bald Eagles; on the Cohansey River he counted 38; on the Salem River he counted 38, for a five-day total of 155 Bald Eagles in South Jersey!

Because temperatures were slightly above normal (despite the snow), South Jersey rivers never experienced severe icing in winter 2009-2010. Waterfowl were never really concentrated, nor did they linger. Late February saw major migration as American Black Ducks, Mallards, and Northern Pintails left the region heading north (and Green-winged Teal came in). This relatively short stay in New Jersey meant that expected build ups never occurred, and kept averages for many key species of waterfowl low.

As always, there were many highlights on the Great Egg Harbor River in winter 2009-2010 for those who seek the visions of abundant raptors and waterbirds. 2009-2010 findings again confirmed, corroborated, and bolstered previous long-term findings that the Great Egg continues to host highly significant concentrations of raptors and waterbirds in winter – numbers significant for South Jersey, all of coastal New Jersey, and the Mid-Atlantic Region.

# Blizzards wreck habitat for birds braving winter

Press of AC

2/15/10

Frozen ground, broken trees limit food, shelter

By RICHARD DEGENER  
Staff Writer

You think you've got it bad? Try finding a worm right about now.

As bad as the dual blizzards of 2010 were for people in southern New Jersey, it's a lot worse for the American woodcock. The rusty brown bird, a rare inland shorebird, has to eat its weight each day in earthworms.

While people struggle with power outages, dead cell phones and impassible streets, woodcocks are trying to find dinner under several feet of snow. The birds can be seen probing with their long bills on the few bare spots uncovered by snowplows on the side of the road.

The woodcocks that stay this far north in the winter gamble that the weather will not be that bad and that they will have the habitat to themselves, experts say — and this year the gamble did not pay off.

"A lot of birds are dying. It's a tradeoff, and a lot of times it works," said Don Freiday, a naturalist at the Cape May Bird Observatory.

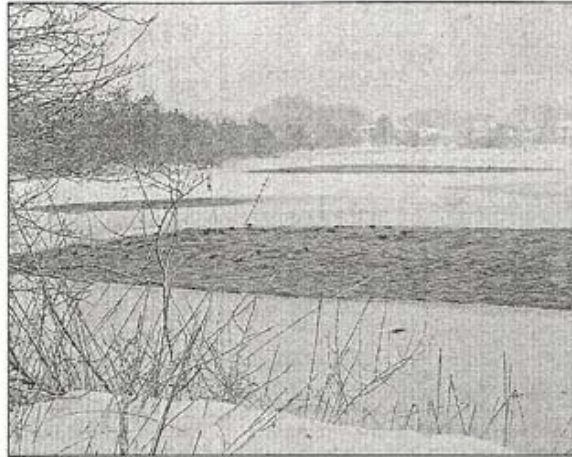
It isn't just the woodcocks dying. Freiday said the frozen salt marshes are killing the birds, such as rails, that winter there — and there isn't one in sight.

"I look out at the marshes of Cape May County and I don't see a sign of life," Freiday said.

Birds that rely on evergreens, such as the Eastern red cedar, also are affected. The wet snow Friday stuck to the foliage of the evergreens, and high winds sheared the tops off or stripped their branches. Cedars tend to be very brittle.

"I hate to lose them because they're habitat for tree birds in the winter," said Jay Schatz, who chairs the Cape May Shade Tree Commission.

The red cedar is arguably the single most important tree in this region during the winter for birds. The blue berries on the female trees provide food. The green awl-shaped



Press photo by Richard Degener

Waterfowl swim in Lake Lily in Cape May Point during Wednesday's snowstorm. The birds stayed in the open water, hugging the side of the lake where the wind was less severe.

leaves, or needles, provide cover. A dense cedar can even prevent snow from getting to the ground under it, giving birds that eat worms a chance at dinner.

"A lot of cedars got killed and that impact is strong and bad. It will affect roosting of owls that like that cover in front of them. Yellow-rumped warbler is a main winter eater of cedars. Cedar waxwings and robins also eat the berries," Freiday said.

The good news is the berries produced last summer are still on the broken trees and they will continue feeding birds. The cedars that survived may take on a more bush-like appearance this year.

Cedars, actually members of the juniper family, are an old tree found all over the world. The Eastern United States is one of its major strongholds and Freiday expects the trees to bounce back. Tree experts in the region give the red cedar the tree version of a four-star rating, which includes D (drought tolerant), S (salt tolerant), N (native) and W (flood tolerant). It's one of the few trees at the shore to be rated at D, S, N and W.

"I don't think it will affect berry production. I think we'll have the same number of

trees, but they'll be shaped differently," Freiday said.

The weather has also led to some strange animal behavior. A bat, which probably decided to migrate too late, came down the chimney into a Lower Township home. Field mice are moving into houses. People with bird feeders are seeing unusual visitors.

"I'm hearing people have meadowlarks at their bird feeder, which is crazy," said Freiday.

Schatz said deciduous trees are faring better than cedars and pines unless they are covered in vines. Trees along New England Road in Lower Township were devastated for this reason.

"The vines held the snow," Schatz said.

Bushes in Cape May, many planted to benefit birds and butterflies, were also flattened by the snow load.

The state Department of Environmental Protection is not worried about the impact of the blizzards on wildlife because nature always bounces back.

"It's all part of nature's cycle, as devastating as it seems," DEP spokeswoman Elaine Makatura said.

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## EXPANDED SPRING THROUGH FALL STUDIES

For the second fall season (following studies during Autumn 2008) and for the first time in spring (Spring 2009 and Spring 2010) and into the Summers of 2009 and 2010, expanded seasonal studies sought to document the value of the Great Egg Harbor River Watershed throughout the year. During the spring migration period, the breeding season (which mostly coincides with the spring migration season) and the all-important fall migration for which South Jersey is so aptly known, monthly counts were conducted for all raptor and waterbird species, and data was indeed kept for all birds encountered, including passerines (songbirds).

Accordingly, Table 1, in addition to showing core winter studies findings, also presents the results of expanded seasonal studies, from April 2009 through 16 July 2010.

In-depth analysis can only be offered at the conclusion of several years of expanded seasonal studies; it will take several spring and fall seasons to fully discover the status, patterns, and extent of seasonal bird use. Ongoing seasonal studies are planned through 2010 and 2011 and possibly beyond, additional coverage that will yield perspective on 2008 and 2009 spring and fall efforts as well as possible trends in bird use.

Seasonal methods and protocol differ for spring and fall surveys, an approach necessary to discover the full picture of breeding birds for example. The watershed is large and habitats are varied. While the core study area remains the same and key spots such as Tuckahoe WMA, the Corbin City Unit of Tuckahoe WMA, the Longport Sod Banks (Malibu Beach WMA) are covered each survey date (due to their demonstrated value at all seasons) breeding season survey routes on the Upper River have varied to sample various likely habitats for birds as well as butterflies, odonates, and herptiles, thereby maximizing the time and budget available.

For example, Makepeace Lake WMA has been surveyed in the past season and future visits are planned for the upcoming season. Winslow WMA and White Oak Branch WMA, as well as many places in the Elwood Corridor, will be checked as time and budget allow. In this we can gain a full understanding and the “big picture” of breeding birds in the Great Egg Harbor Watershed. Likewise, migratory season surveys have and will continue to focus on key habitats – particularly mud flats for shorebirds and leading lines and diversion lines for raptor migration.

While Table 1 only shows raptors and waterbirds (loons through gulls), full bird lists are being compiled each survey for all birds (as well as butterflies, odonates, and herptiles), and confirmed breeding species will be presented and highlighted in a future comprehensive summary report.

Even though a full seasonal analysis will follow, it is important to note that the first two years of spring, fall, and breeding season surveys have been extremely successful. As Table 1 attests, waterbirds use the Great Egg Harbor River and estuary at all seasons. Loons are present in good numbers in spring and fall. Wading birds – herons, egrets, and ibis – abound in the warmer months, and both 2009 and 2010 findings have documented major rookeries in the Ocean City and Longport areas (see Rare, Threatened, and Endangered Species mapping found at the end of this report).

We will eventually consult with the Division of Fish and Wildlife, Endangered and Nongame Species Program for actual numbers of nesting birds present, but these rookeries contain many Yellow-crowned Night Heron (Endangered) nests. Seen in both 2009 and 2010, the numbers are far higher than the peak 15 we counted, due to the fact that nests are hidden in dense foliage. On 27 August 2009, the 5 Yellow-crowned Night Heron tallied (near Ocean City) were all recently fledged young.

Surveys in early Fall 2008 and Spring 2009 and 2010 have documented a major beach nesting bird colony at the Longport Sod Banks (Malibu Beach WMA). Up to 1,545 Black Skimmers were present in Summer 2009 and up to 1,300 in July 2010, making this by far the largest Black Skimmer colony in the state. Least Terns and Common Terns nest there as well (and even a few pairs of Gull-billed Terns and American Oystercatchers); up to 196 Least Terns and 142 Common Terns were present in 2010 (data from New Jersey Division of Fish and Wildlife, Endangered and Nongame Species Program – state counts are used herein because the numbers are so hard to estimate from a distance as birds are hunkered down on nests in dune grass). See the attached article from the *Press of Atlantic City*, dated 9 August 2010, that chronicles this important beach nesting bird colony.

The tern and skimmer colony on the Great Egg Estuary is a major ecovalue of the region. It is currently unique – the largest and most successful colony in New Jersey. We will continue to monitor and report on this important beach-nesting colony, a gem of the Great Egg Estuary.

Expanded seasonal coverage has also confirmed uncommon raptor nesting activity on the Great Egg. On 19 May 2009, two adult male Northern Harriers were watched performing courtship display flights over the Great Egg, and additional Northern Harriers were repeatedly seen during the breeding season. On 10 June 2009, an adult Cooper's Hawk was seen near Patcong Creek, undoubtedly a breeding bird; a Cooper's Hawk was seen near Marmora on 16 July 2010 (a "safe date" for breeding under NJ Audubon Society's Breeding Bird Atlas protocol). Also a confirmed breeder under this protocol, an adult Broad-winged Hawk was seen carrying prey (to young in a nest) at the west end of the Corbin City Unit impoundments 25 May 2010.

A highlight of the season was the two adult Mississippi Kites seen together near Gibson's Landing on 25 May 2010 (a first record for the Great Egg to our knowledge). As this southern species rapidly expands its range to the north, the Great Egg would be a highly likely spot for this hawk to nest. To date, no Mississippi Kite nests have yet been found in New Jersey.

Of particular note were the shorebird counts achieved during the spring and fall migration periods. (Note the “total shorebirds” shown in Table 1). 4,369 shorebirds were recorded on 19 May 2009 and 3,954 on 25 May 2010, proof that the Great Egg mudflats fill with shorebirds in season. Notable counts included up to 196 Black-bellied Plover, 107 American Oystercatchers, 120 Willet, 1,200 Sanderling, and 1,355 Dunlin. Of great note is the excellent count of 412 Red Knot on 19 May 2009 and the 356 on 25 May 2010 – all on the sod banks west of the Longport Bridge. Counts such as these of the imperiled Red Knot are highly significant, particularly away from the Delaware Bayshore beaches. Also of note is the 44 Whimbrel seen near Jeffers Landing on 25 May 2010, an excellent spring count of this species of special concern.

As usual, there were a number of special sightings during the 2009-2010 studies. A Lark Sparrow was a very good find by Dowdell migrating at Longport on the early date of 7 August 2009. A very late Brown Pelican was reported to us by Mike Fritz – seen at the Longport Sod Banks on 19 December 2009.

Several good waterbird species were found. On our surveys, a “Black Brant” was found at Longport on 20 January 2010, a rare record (less than annual in New Jersey) of this western race and a first record for the Great Egg. On 28 January 2010, Brian Johnson found a Greater White-fronted Goose at Tuckahoe WMA, and on 16 March 2010 Karen Johnson saw a male Eurasian Wigeon at Corbin City WMA, both excellent watershed records.

Eight Harbor Porpoise were seen just off Great Egg Inlet from the Ocean City side of Great Egg Harbor Bay on 9 April 2010, always a good find, and Harbor Seals were seen at Longport on 17 November 2009, 6 January 2010, and 9 March 2010.

Noteworthy Mullica River sightings included one Harbor Seal on 14 January 2010, and an amazing 14 Harbor Seals on 18 March 2010. A River Otter was seen at Lower Bank on 18 March 2010. Seven Lapland Longspurs were seen at Scott’s Landing on 20 February 2010, and two “Ipswich Sparrows” were at Seven Bridges Road on 18 March 2010. A Cackling Goose was seen migrating with Snow Geese over the Rutgers Marine Lab at Seven Bridges Road (Great Bay Boulevard) on 16 December 2009, always an unusual and good find.



# Skimmers settle near busy marina in EHT

■ N.J. biologists worry about the rare birds' winter home along the Gulf that's fouled by the oil spill.

Press of A.C. - 8/9/10  
By MICHAEL MILLER  
Staff Writer

## EGG HARBOR TOWNSHIP

— Andrew Mack pedaled up to the marsh pond and pulled out his camera.

The consultant from Washington, D.C., has done lots of cycling while vacationing this week in Ocean

City. When he saw dozens of tropical-looking birds gathered just off Somers Point-Longport Boulevard, he returned with a camera.

The menagerie that caught his attention was a flock of black skimmers loafing on a mud flat.

These birds can be found deep in the Amazon rainforest, where they nest on river sandbars far from human civilization. But New Jersey's

□ See Skimmer, A6



Staff photo by Edward Lea

New Jersey's endangered black skimmers are rebounding, but biologists worry about what might happen when they migrate to the Gulf of Mexico.

## Skimmer

(Continued from A1)

birds have chosen to settle down this year in one of the most congested, noisy places they could find — a beach next to a bustling marina along a loud causeway crammed with shorebound traffic.

Skimmers are protected as endangered species in New Jersey, where they number about 2,100 — or 2 percent of the American population. About 1,500 are nesting in a single colony on a private beach at Seaview Harbor Marina in Egg Harbor Township.

Despite their scarcity in New Jersey, their choice of nesting grounds this summer makes them easy to spot along the busy causeway between the two towering bridges leading to Ocean City and Somers Point. The fancy fliers quickly caught Mack's attention.

"They're really interesting. You don't find them very many places," Mack said. "I like the way they fly. They don't soar. It's more of a half-flap."

### Susceptible to oil spill

Black skimmers are holding their ground in New Jersey, but biologists are concerned about what might happen this fall when they migrate south to their wintering grounds along the Gulf of Mexico fouled by the BP oil spill.

The state Department of

Environmental Protection earlier this year created a committee to monitor the spill and its effects on New Jersey's wildlife.

"We really don't know," said Chris Kiesel, a senior environmental specialist with the state Division of Fish and Wildlife.

She has studied skimmers for the past decade. These tern-like birds are especially susceptible to oil spills because they feed on the water's surface.

"Now it sounds like the (surface oil) might not be the biggest problem because everything is dispersed," she said. "I don't know if the impacts will be immediately obvious."

Conservation groups will be following the plight of migratory birds this fall, said Daniel Lebbin, conservation biologist with the American Bird Conservancy in Washington.

"There is certainly the potential for many migratory birds to go to the Gulf of Mexico and encounter oiled habitats," he said. "If New Jersey skimmers stick to the Atlantic coast, they should be at much lower risk of danger from the oil spill's aftermath. The impact this will have is still a big question mark."

### Fickle fliers

Black skimmers are an iconic species in New Jersey. The state goes to great lengths each year to protect the birds, even cordoning off some

favorite beaches in the spring in anticipation of their arrival as if they were VIP guests.

Skimmers even get their own bodyguards in the form of conservation officers who regularly monitor the nesting beaches and keep beachgoers and their dogs away from the skittish flocks.

The fickle birds are hard to predict. This year most of them nested on a single beach off the causeway. Dozens of other pairs are nesting from Cape May Point to Long Beach Island.

They spend the summer on New Jersey beaches where they raise their young before heading south to Florida and the Gulf of Mexico for the winter.

The black skimmer is an evolutionary oddball. It honks like a goose but flies like a storybook fairy. Its disproportionately long, sleek wings give it extra lift so it can glide effortlessly over the water with minimal wing beats.

It has the contrasting black and white coloring of a penguin and a tropical orange bill that is longer at the bottom than the top — unique among North American birds and all the better to scoop up minnows. When the lower bill feels a fish, the bird snatches it up with a reflexive bob of its head. This strategy enables them to feed at all hours of the day or night, according to the National Audubon Society.

Skimmers often hunt for fish in groups, flying in formation like fighter planes.

"They're awesome to



## Skimmer (CONTINUED)

watch," said Capt. Ginny Powell, who runs Skimmer Salt Marsh Safari in Lower Township.

She admires the birds so much that she named her charter boat, the Skimmer, after them. The birds fish near the docks behind Wildwood Crest every evening.

"They have a sleek design. When they skim, they're very graceful, leaving little wakes behind them," she said. "We listen for their calls."

### Always on the move

Powell eagerly awaits the arrival of skimmers every summer. Most young have hatched by now and will stick around through mid-September.

Kisiel said black skimmers once occupied 20 colonies along the New Jersey coast. Having one big colony makes it easier to monitor but literally puts all the eggs in one beach basket. An isolated coastal storm could spell disaster for the birds' young.

"What draws them to a particular beach is a mystery. They love dynamic systems — a state of flux. They're constantly moving around," she said.

Over the years, the birds have found a home in North Wildwood, Stone Harbor, Champagne Island and Corsons Inlet State Park, among other places.

"We'd prefer to see them more evenly distributed," she said.

### Black skimmer facts

- Social, crow-sized birds found on the East, West and Gulf coasts.
- Listed as endangered in New Jersey, threatened in New York and other states.
- They number 102,000 in North America and 165,000 worldwide.
- They hunt minnows by skimming the water's surface with their longer lower bills. This fish-by-feel technique lets them hunt at night when baitfish come to the surface.
- Chicks start life with normal-sized beaks to eat food provided by both parents.

Source: National Audubon Society

Kisiel said the Atlantic County beach the birds have chosen this year has certain advantages for the birds and their admirers. The private beach is more secluded than others in the area. And it gives the public a fantastic view of these unusual summer visitors.

Beachgoers who park at the Ocean City-Longport Bridge fishing pier only have to walk 50 feet to see the birds' aerial ballet in the nearby ponds.

"At Stone Harbor Point, we had that whole area fenced off so people couldn't really observe them," Kisiel said. "Here, they've gotten so habituated to the traffic, they don't mind the cars that drive by."

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## SUMMARY AND ACKNOWLEDGMENTS

In summary, expanded seasonal scope and coverage in spring and fall continued to discover the extent and depth of the avian resources of the Great Egg Harbor River. Expanded monitoring efforts provided important information on breeding species and migration through the Great Egg Harbor River system, and increased our understanding of the temporal aspects of Great Egg Harbor migrants and wintering birds. Core winter season studies confirmed, corroborated, and expanded upon previous findings, and continued to document and support the Great Egg's status as an important wintering area for raptors, waterfowl, and waterbirds in both southern New Jersey and the entire New Jersey coast.

We thank all those friends and members of the Great Egg Harbor River Council and Watershed Association for their encouragement and support during this project. We thank Pat Sutton for her generous assistance with data charts and report writing. We heartily thank Karen and Brian Johnson for sharing so many Great Egg sightings with us, and for showing such great interest in the study. Paul Kosten shared many interesting sightings and offered considerable insight and knowledge of both the Great Egg Harbor River and Mullica River avian resources. Thank you all; your enthusiasm and love of the rivers and their birds are infectious.

We sincerely thank *all* of the officers and members of Great Egg Harbor River Council and the Great Egg Harbor Watershed Association for their interest, support, and great enthusiasm for this winter study. We particularly thank Fred and Julie Akers for the advocacy for the study, and for their knowledge and assistance in the planning and preparation for the field work. Thanks, Fred, for nurturing a tiny idea into a landmark and ongoing long-term study, and thanks for your always friendly encouragement and optimistic outlook.

Finally, we thank the U.S. Department of the Interior's National Park Service, Wild and Scenic Rivers Program for their assistance to the Great Egg Harbor River Council and Watershed Association. The award of a Wild and Scenic River Partnership Grant enabled this survey to be conducted and the report compiled. Thank you for your visions of a wild and scenic Great Egg and Southern New Jersey.

It was a pleasure and privilege working with all of you, named and unnamed, on this important study aimed at keeping the Great Egg healthy, protected, and available to the myriad of birds and other wildlife so dependent upon it.

– Clay Sutton



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Over 25 bird species listed as Rare, Threatened, Endangered, and of Special Concern were observed and counted during the 2009-2010 Great Egg Harbor field survey. Table 5 lists the highest daily counts and the number of days these species were observed and counted.

**TABLE 5**

**Threatened, Endangered, and Special Concern Bird Species Observed and Counted in the Great Egg Harbor River 2009-2010**

| <b>2009-2010 Bird Survey Endangered, Threatened, Priority, and Special Concern Species Counts</b>        |                        |                            |                   |                 |
|--|------------------------|----------------------------|-------------------|-----------------|
| <b>Listed Bird Species</b>   | <b>Breeding Status</b> | <b>Non-breeding Status</b> | <b>High Count</b> | <b>No. Days</b> |
| American Kestrel ( <i>Falco sparverius</i> )   | Special Concern +      | Special Concern +          | 2                 | 5               |
| American Oystercatcher ( <i>Haematopus palliatus</i> )   | Special Concern        | Special Concern            | 107               | 19              |
| Bald Eagle ( <i>Haliaeetus leucocephalus</i> )   | Endangered             | Threatened                 | 24                | 19              |
| Black-crowned Night-heron ( <i>Nycticorax nycticorax</i> )   | Threatened             | Special Concern            | 15                | 7               |
| Black Skimmer ( <i>Rynchops niger</i> )  | Endangered             | Threatened                 | 1,545             | 10              |
| Broad-winged Hawk ( <i>Buteo platypterus</i> )   | Special Concern        | Regional Priority          | 1                 | 3               |
| Cattle Egret ( <i>Bubulcus ibis</i> )  | Special Concern +      | Special Concern            | 1                 | 1               |
| Coopers Hawk ( <i>Accipiter cooperii</i> )   | Threatened             | Threatened                 | 5                 | 15              |
| Glossy Ibis ( <i>Plegadis falcinellus</i> )  | Special Concern        | Regional Priority          | 162               | 10              |
| Great Blue Heron ( <i>Ardea herodias</i> )   | Special Concern        | Stable                     | 22                | 19              |
| Least Bittern ( <i>Ixobrychus exilis</i> )   | Special Concern        | Special Concern            | 5                 | 1               |
| Least Tern ( <i>Sterna antillarum</i> )  | Endangered             | Endangered                 | 196               | 7               |
| Northern Harrier ( <i>Circus cyaneus</i> )   | Endangered             | Special Concern            | 34                | 19              |
| Osprey ( <i>Pandion haliaetus</i> )  | Threatened             | N/A                        | 101               | 11              |
| Peregrine Falcon ( <i>Falco peregrinus</i> )   | Endangered             | Endangered                 | 4                 | 16              |
| Pied-billed Grebe ( <i>Podilymbus podiceps</i> )   | Endangered             | Special Concern            | 5                 | 4               |
| Red Knot ( <i>Calidris canutus</i> )   | Endangered             | Special Concern            | 412               | 5               |
| Red-shouldered Hawk ( <i>Buteo lineatus</i> )  | Endangered             | Special Concern            | 1                 | 2               |
| Sanderling ( <i>Calidris alba</i> )  | N/A                    | Special Concern            | 1200              | 12              |
| Semipalmated Sandpiper ( <i>Calidris pusilla</i> )   | N/A                    | Special Concern            | 1191              | 6               |
| Sharp-shinned Hawk ( <i>Accipiter striatus</i> )   | Special Concern        | Special Concern            | 5                 | 8               |
| Spotted Sandpiper ( <i>Actitis macularia</i> )   | Special Concern        | Regional Priority          | 3                 | 2               |
| Tricolored Heron ( <i>Egretta tricolor</i> )   | Special Concern        | Special Concern            | 3                 | 10              |
| Whimbrel ( <i>Numenius phaeopus</i> )  | N/A                    | Special Concern            | 44                | 3               |
| Yellow-crowned Night Heron ( <i>Nyctanassa violaceus</i> )   | N/A                    | Threatened                 | 15                | 8               |
| Note: + = Recommended Threatened status listing by the Endangered and Nongame Species Advisory Committee |                        |                            |                   |                 |

# **Appendix I:**

## **Rare, Threatened, and Endangered Species**

### **Field Mapping**

#### **2009 – 2010**

The following Sixteen field maps, created to provide a spatial representation of rare, threatened and endangered species observed during the survey, are marked according to the following key:

**BE = Bald Eagle**  
**Broadwing = Broad-winged Hawk**  
**BLSK = Black Skimmer**  
**GBTE = Gull-billed Tern**  
**CP = Coop = COHA = Cooper's Hawk**  
**COTE = Common Tern**  
**LETE = Least Tern**  
**NH = NOHA = Northern Harrier**  
**PBGR = Pied-billed Grebe**  
**PF = Peregrine Falcon**  
**YCNH = Yellow-crowned Night Heron**  
**a = Adult**  
**i = Immature**





# -MAP OF THE STUDY AREA-

**GREAT EGG HARBOR RIVER  
WINTER RAPTOR and WATERBIRD SURVEY**  
showing locations of Sample Sites 1-9  
(Source of base map: DeLorme quads)

**4/09/09**

KEY

LP = Longport

SP = Somers Point

JF = Jeffers Landing

EC = English Creek Ldn

UP = Upper River

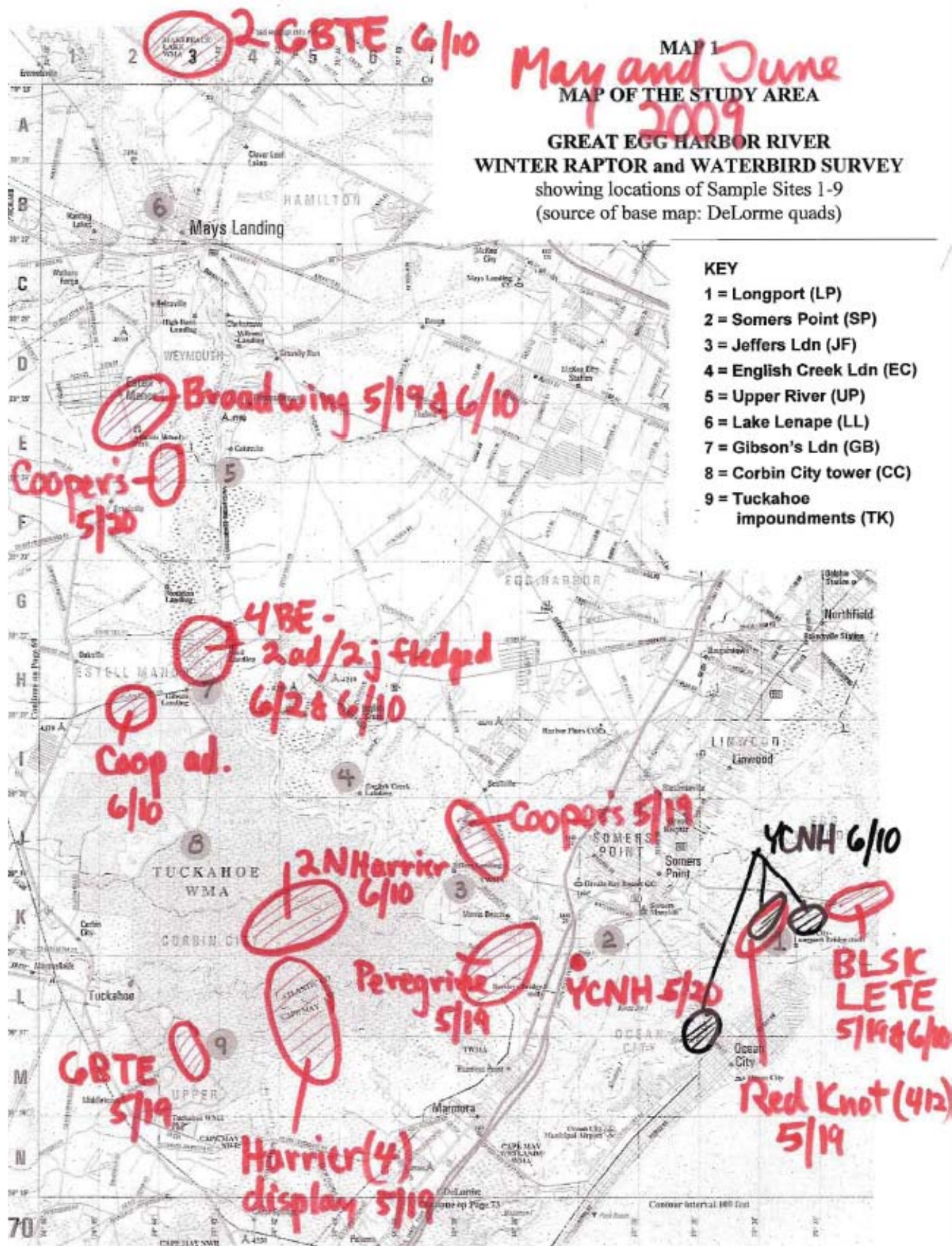
LL = Lake Lenape

GB = Gibson's Ldn

CC = Corbin City tower

TK = Tuckahoe impoundments







# MAP 1

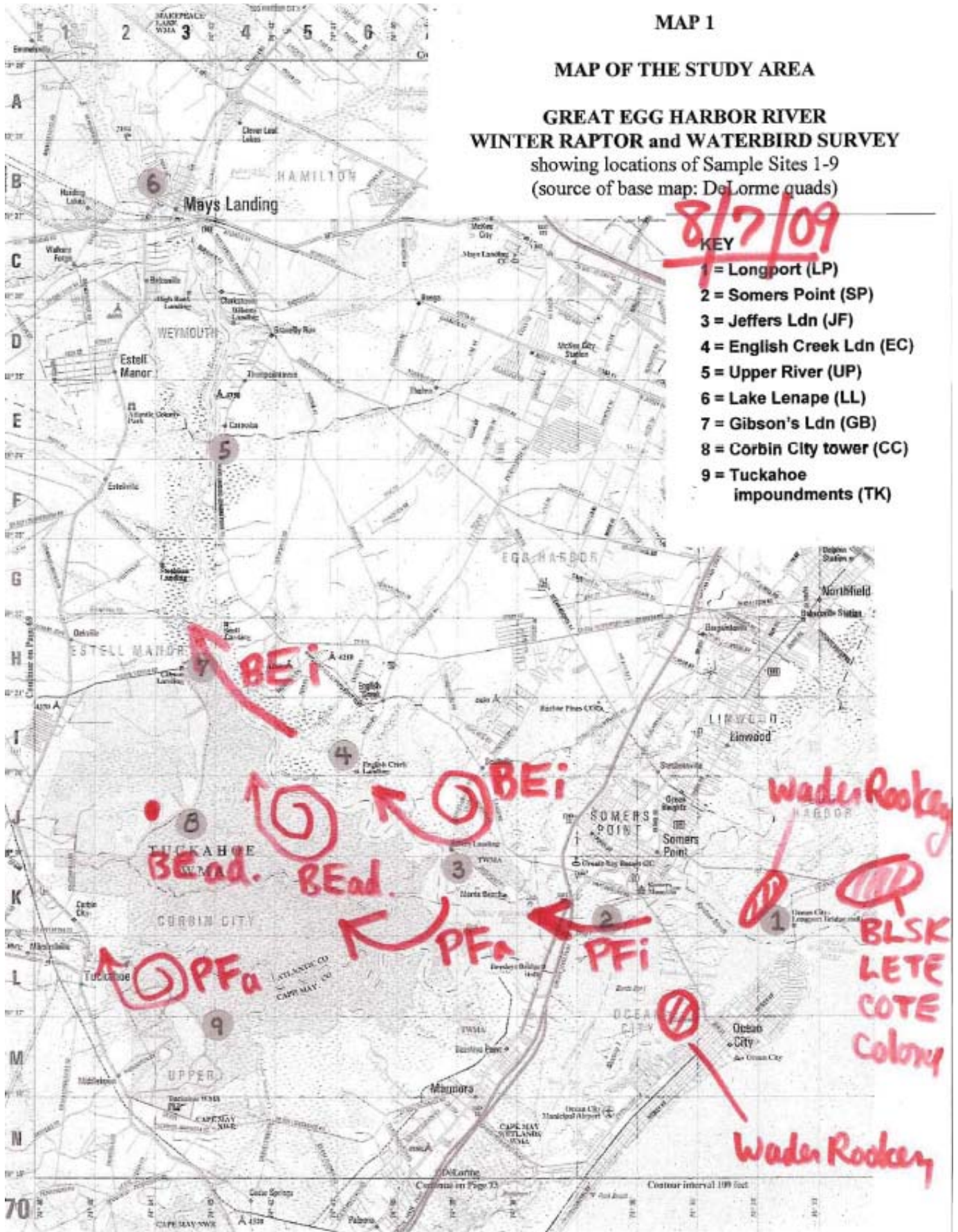
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**GREAT EGG HARBOR RIVER  
WINTER RAPTOR and WATERBIRD SURVEY**  
showing locations of Sample Sites 1-9  
(source of base map: DeLorme quads)

**8/7/09**

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A detailed map of the Cape May area, New Jersey, showing various towns and landmarks. Handwritten red annotations are overlaid on the map, including:

- Numbered circles 1 through 9, likely indicating specific bird sightings or locations of interest.
- Red arrows pointing to specific locations, such as one pointing to Tuckahoe and another pointing towards the bottom right.
- Red text annotations: "BE ad.", "BE 2ad.", "PBGR", and "Peregrine falcon".
- Other labels on the map include "Mays Landing", "Weymouth", "Estell Manor", "Tuckahoe", "Cape May", "Upper", "Middle", and "Lower".

### MAP OF THE STUDY AREA

**GREAT EGG HARBOR RIVER  
WINTER RAPTOR and WATERBIRD SURVEY**

## WINTER RAPTOR and WATERBIRD SURVEY

showing locations of Sample Sites 1-9  
(source of base map: DeLorme quads)

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# MAP 1

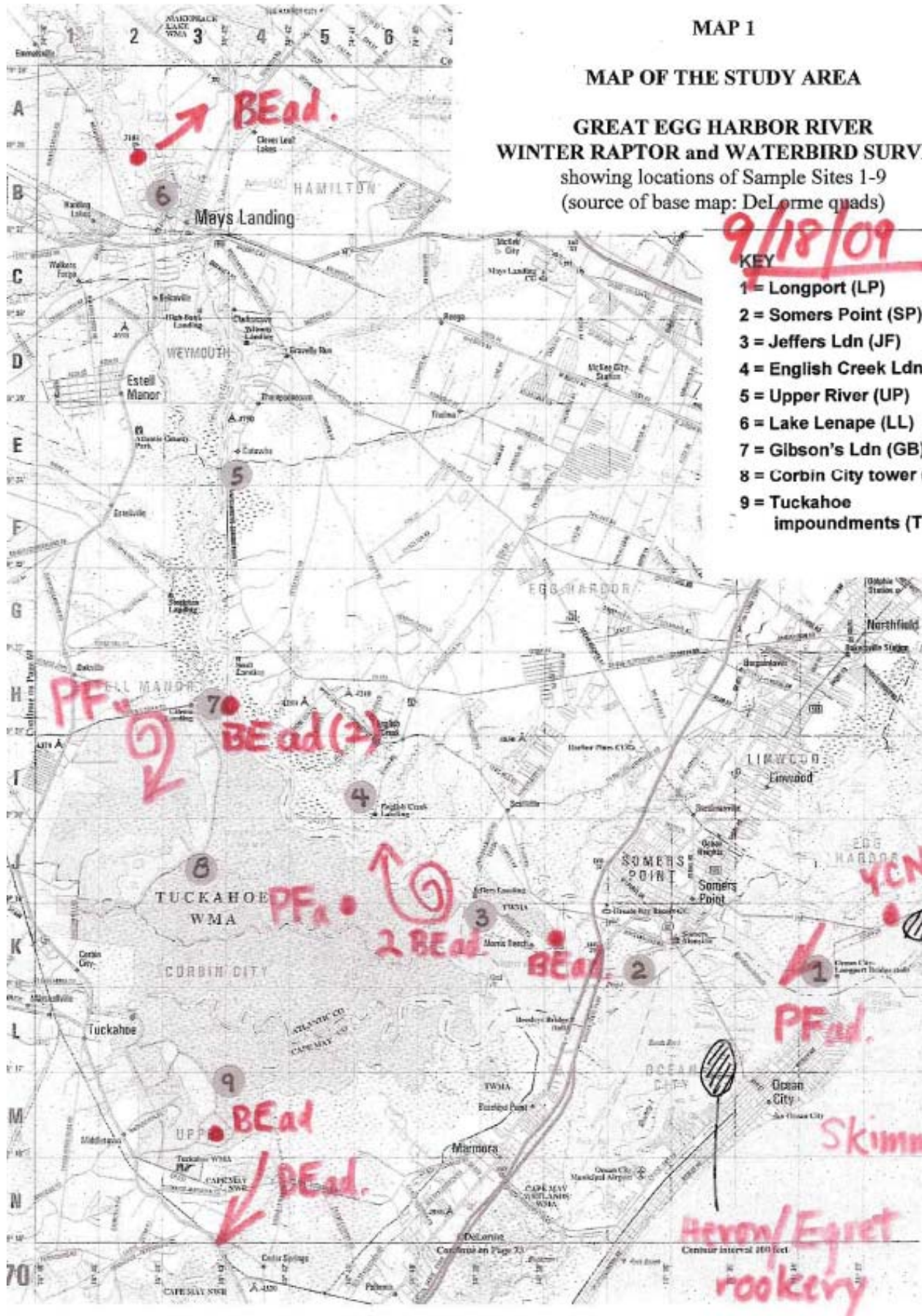
## MAP OF THE STUDY AREA

**GREAT EGG HARBOR RIVER  
WINTER RAPTOR and WATERBIRD SURVEY**  
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**9/18/09**

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MAP 1

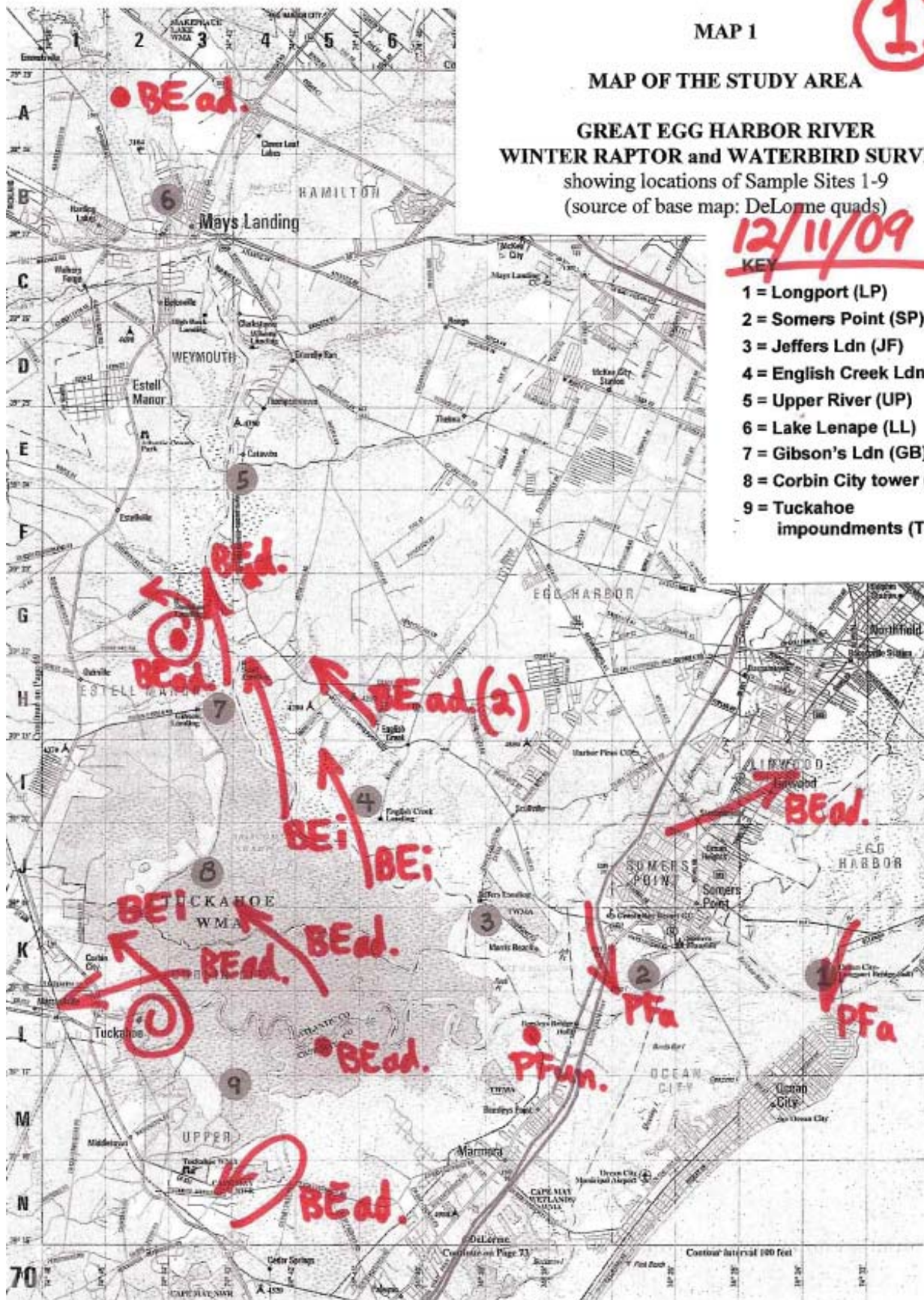
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**GREAT EGG HARBOR RIVER**  
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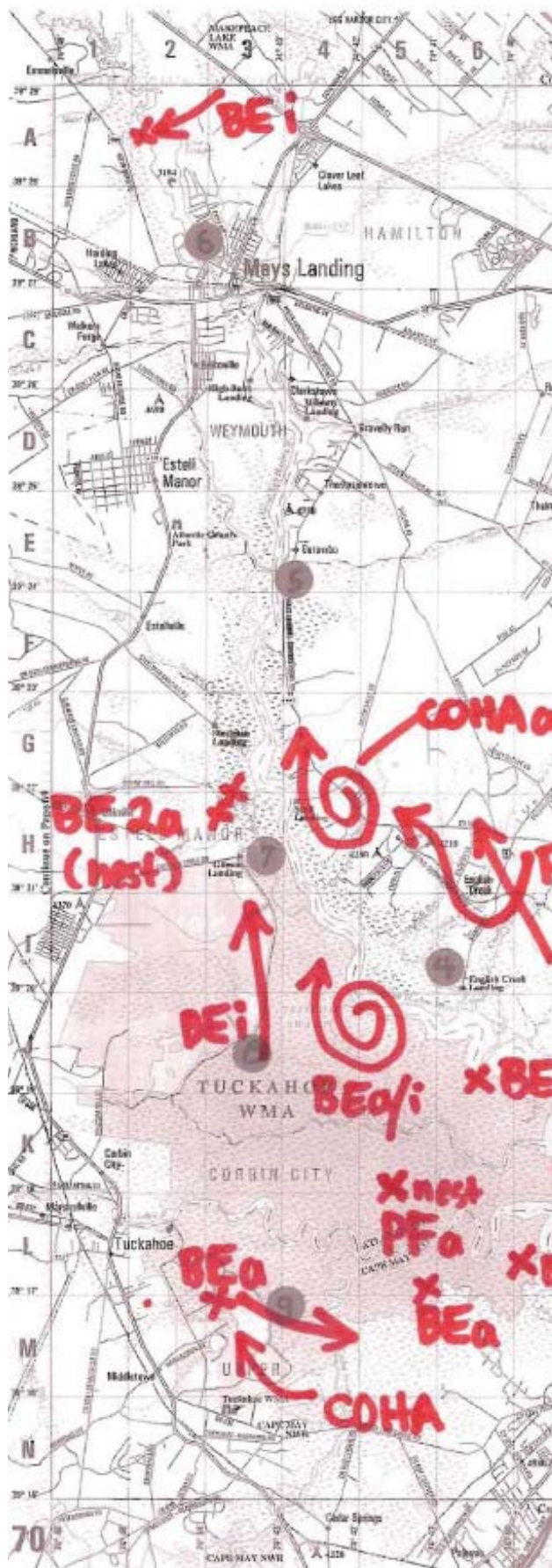
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MAP 1

MAP OF THE STUDY AREA

2

GREAT EGG HARBOR RIVER  
WINTER RAPTOR and WATERBIRD SURVEY  
showing locations of Sample Sites 1-9  
(source of base map: DeLorme quads)

12/28/09

KEY

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3.

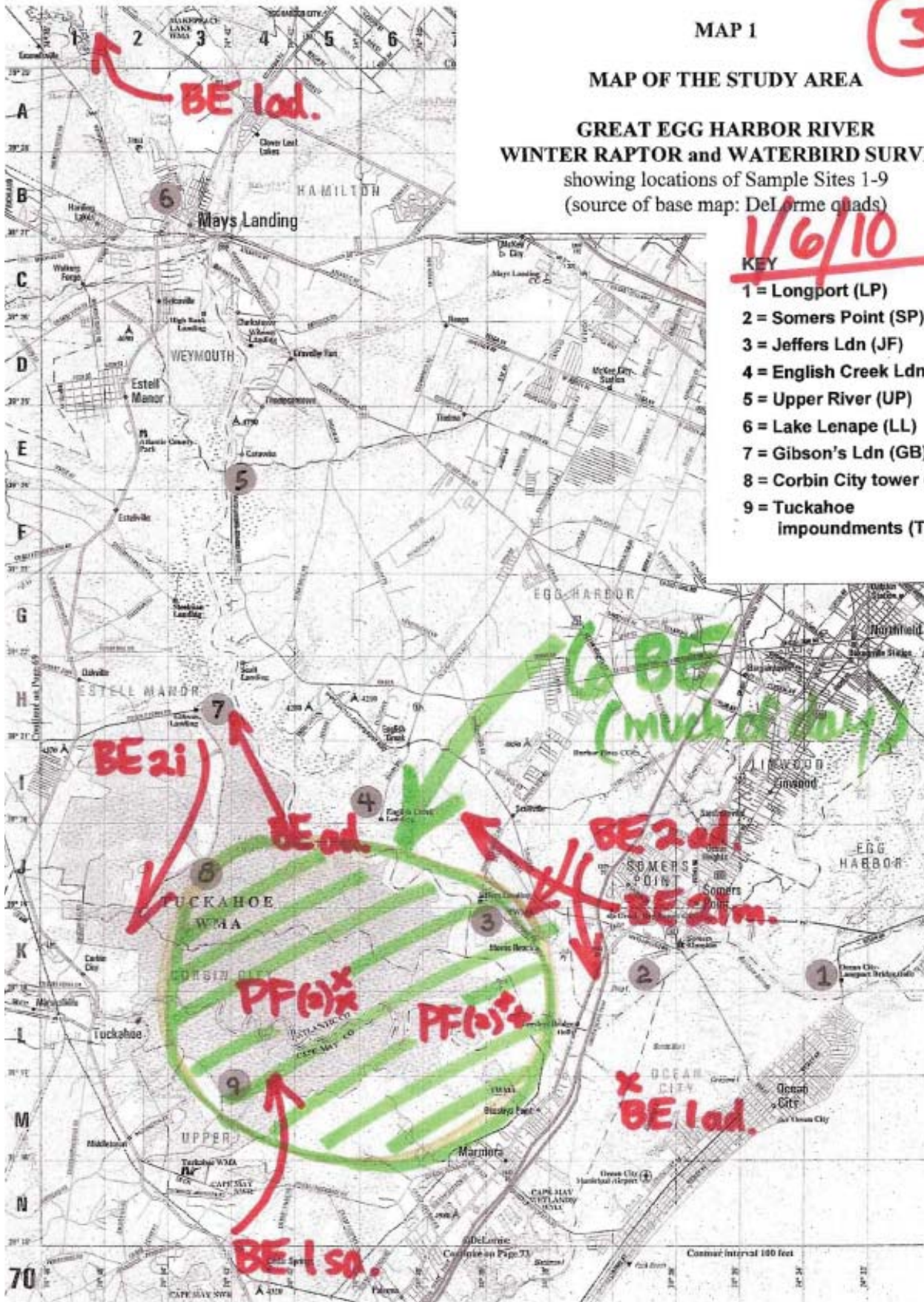
MAP 1

MAP OF THE STUDY AREA

GREAT EGG HARBOR RIVER  
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### MAP 1

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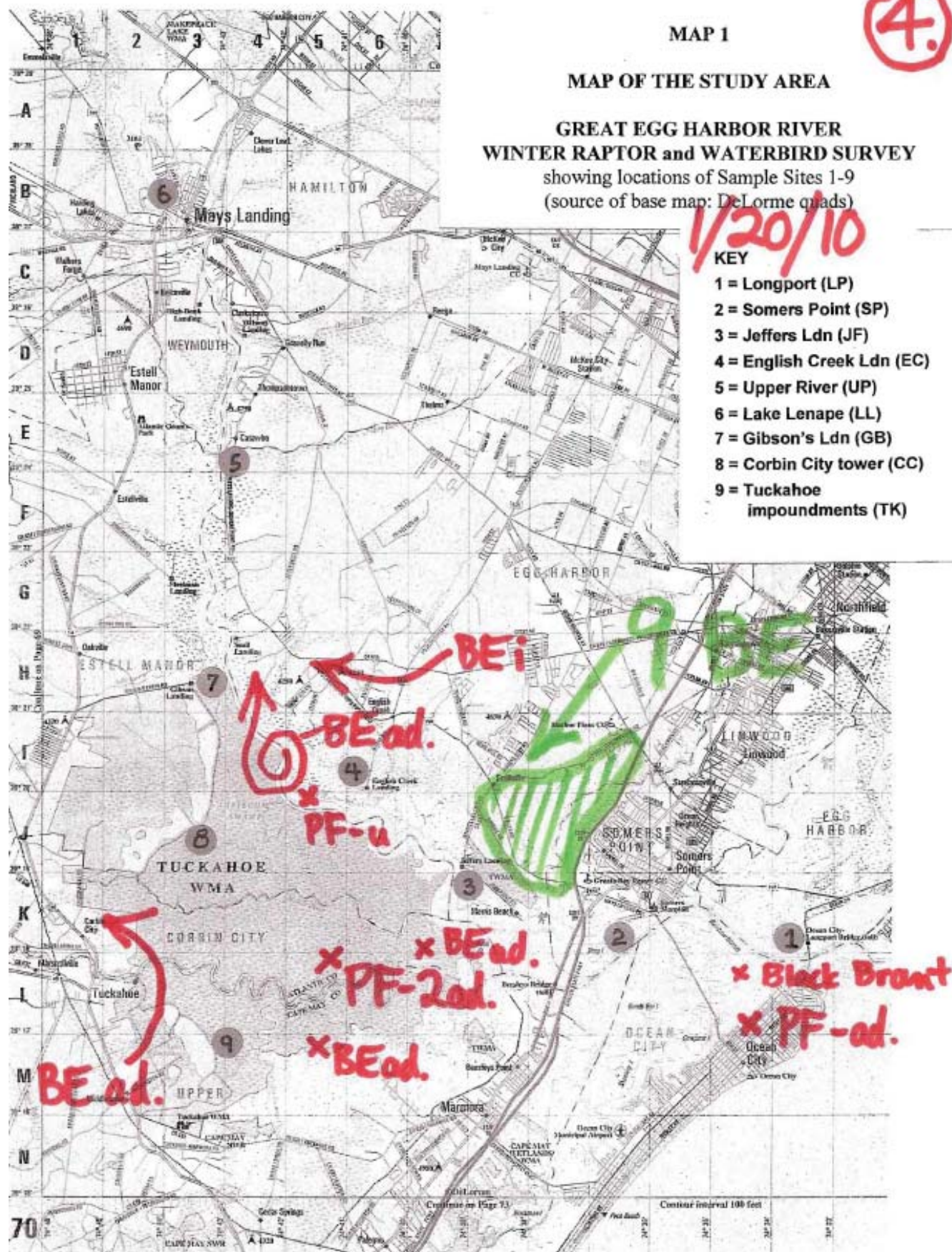
**GREAT EGG HARBOR RIVER  
WINTER RAPTOR and WATERBIRD SURVEY**

showing locations of Sample Sites 1-9  
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5.

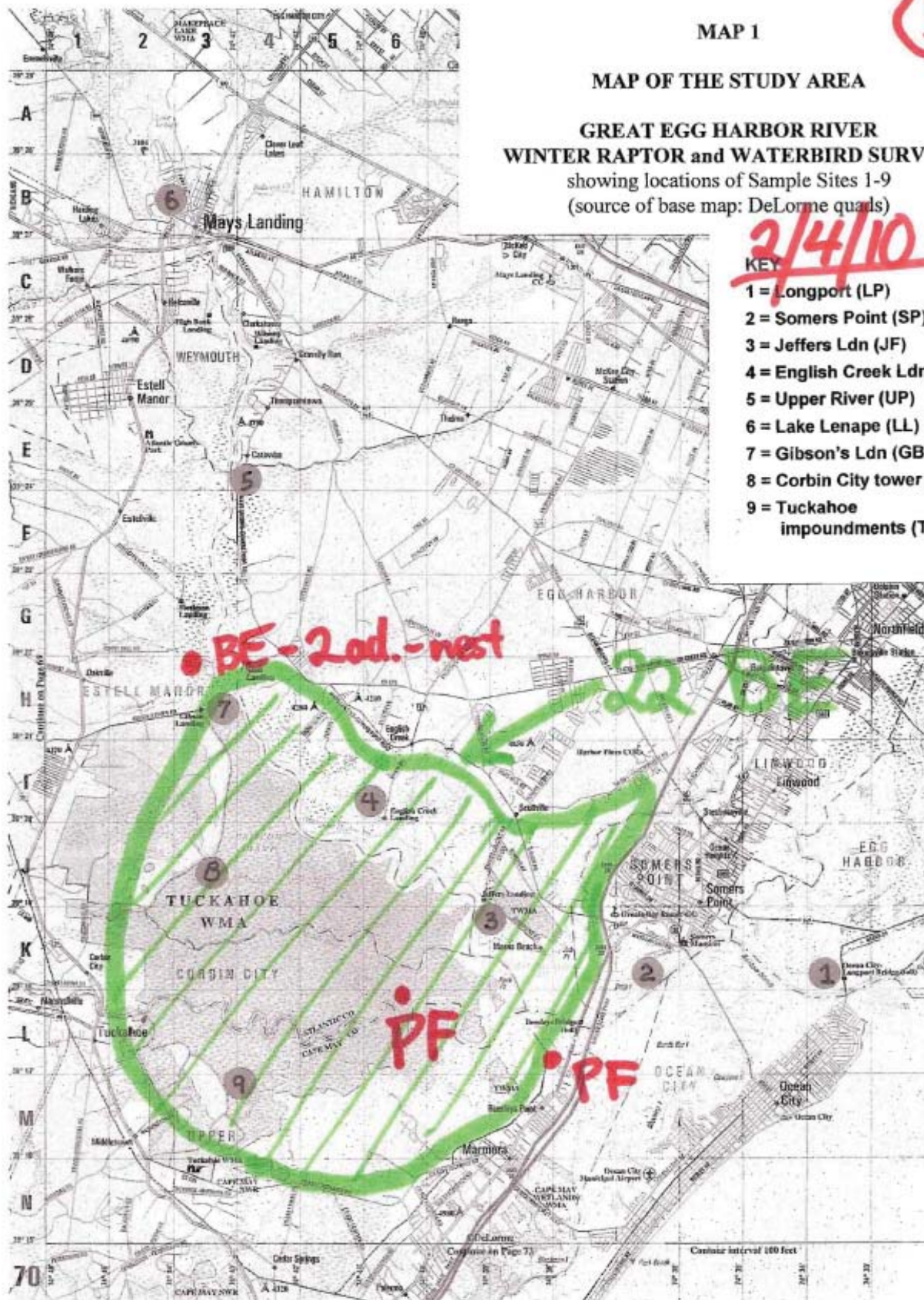
# MAP 1

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GREAT EGG HARBOR RIVER  
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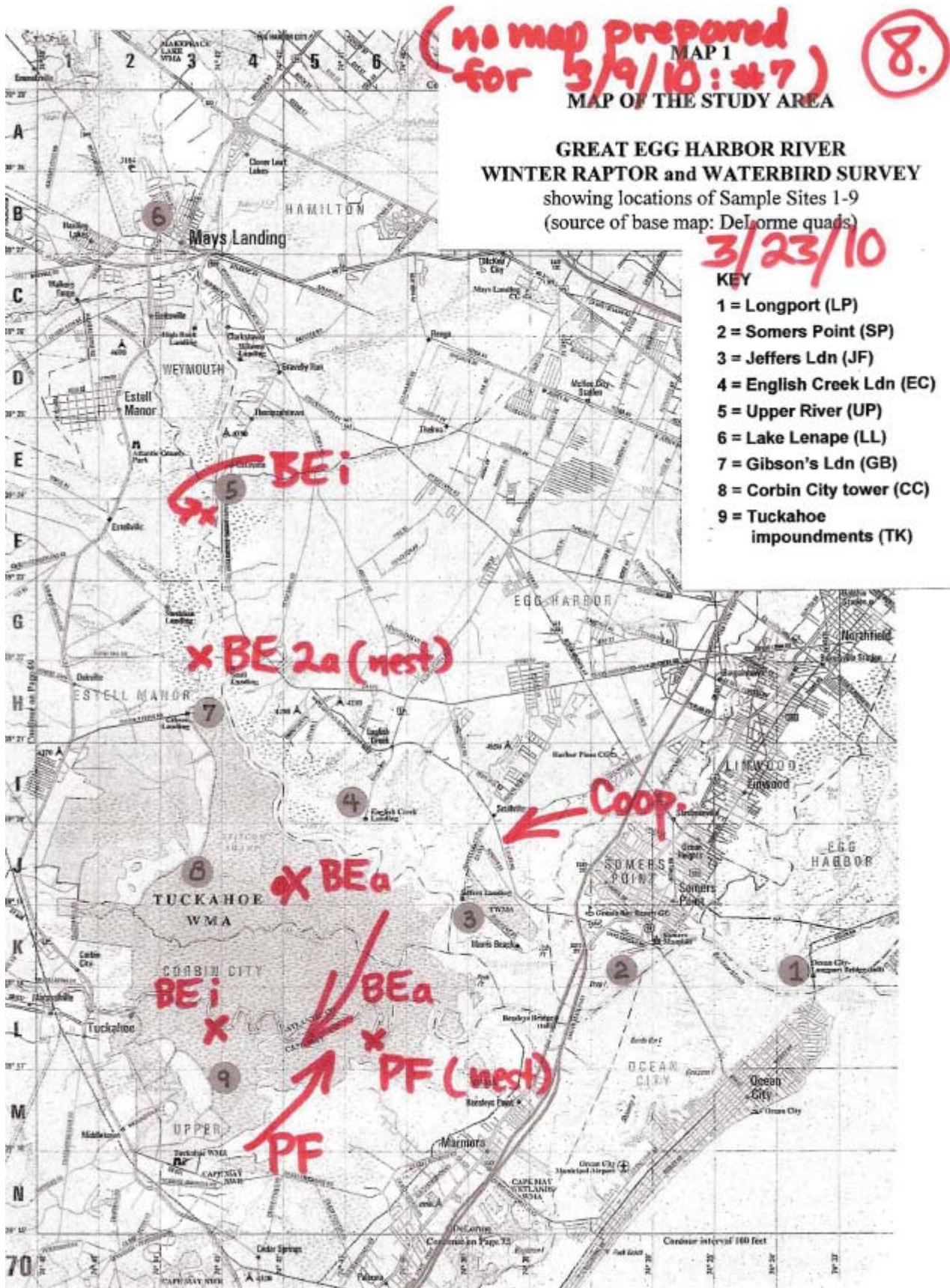
MAP OF THE STUDY AREA

GREAT EGG HARBOR RIVER  
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showing locations of Sample Sites 1-9  
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KEY

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- 1 = Longport (LP)
  - 2 = Somers Point (SP)
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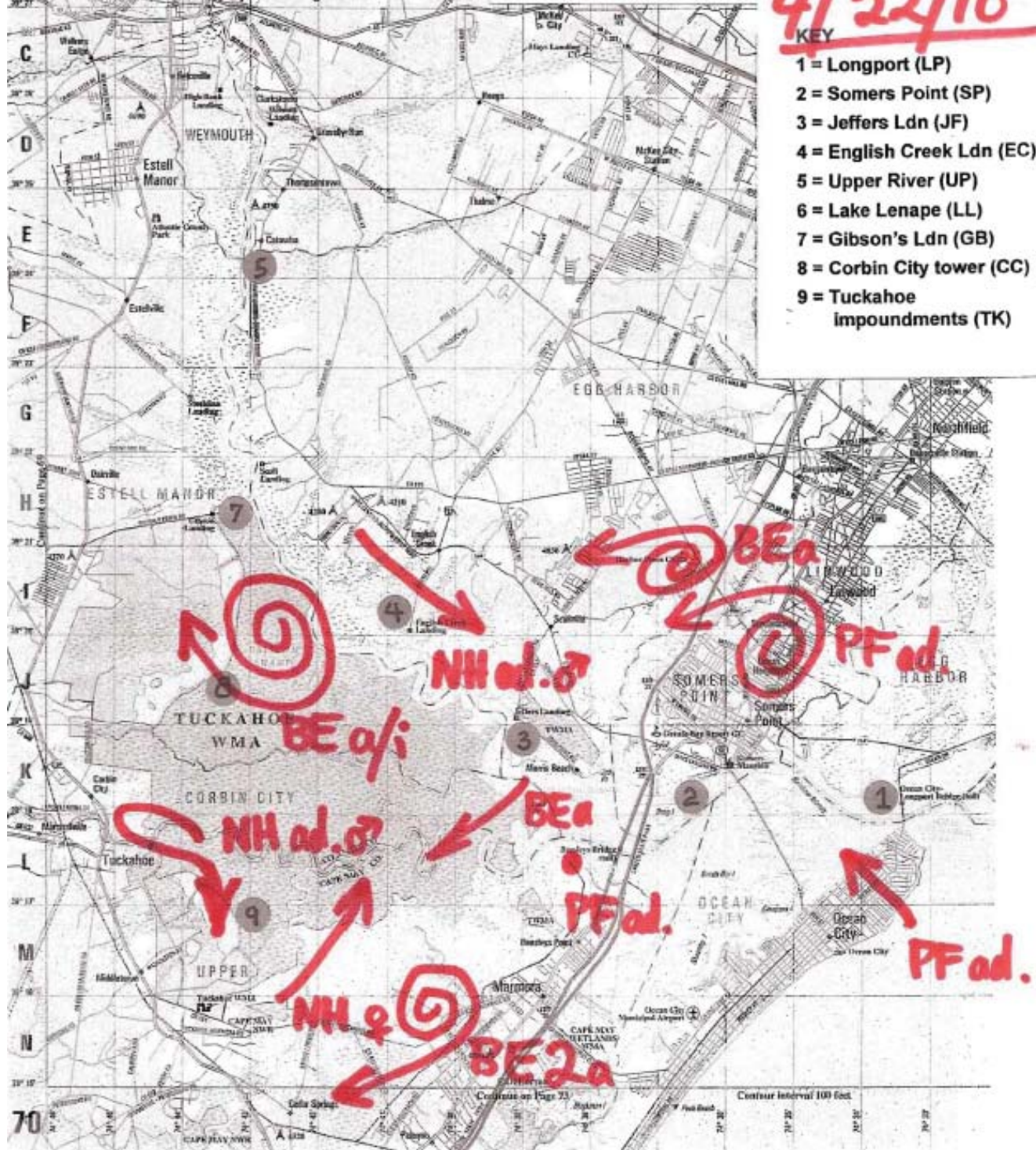
MAP 1

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GREAT EGG HARBOR RIVER  
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4/22/10  
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MAP 1

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## GREAT EGG HARBOR RIVER WINTER RAPTOR and WATERBIRD SURVEY

showing locations of Sample Sites 1-9  
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6/23/10





MAP 1

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**2/16/10**

## **APPENDIX 2.**

### **Methodology and Sampling Site Maps**

## GREAT EGG HARBOR RIVER METHODOLOGY:

Two observers, Sutton and Dowdell, spent 45 minutes apiece at each of nine sampling sites. All raptors and waterbirds were tallied at each site, whether in flight or sitting (perched or on the water). All hawks and eagles were searched for in accordance with Sutton and Sutton (1996). Raptors were identified, aged, and sexed in accordance with Dunne, Sibley, and Sutton (1986), Clark and Wheeler (1987), and Wheeler and Clark (1995). Waterbirds were found and identified in accordance with Sibley (2000), Sutton, *et al.*, (2004), and, of course, the two authors' many years of extensive experience in Southern New Jersey and elsewhere.

Additional birds, most often raptors, observed *between* official count sites were recorded if and only if the observers were confident it had not been previously counted. For example, a low-flying Cooper's Hawk dashing across the road would be added to the count if it had not been observed at the previous site. While the nine sampling sites were generally far enough apart to preclude "double-counting," the observers used extreme care to avoid recounting the same bird or birds. For example, eagles range widely up and down the river; a Bald Eagle roosting at Lake Lenape may range east to Tuckahoe WMA or farther. A "new" eagle would only be counted when direction of flight, age, plumage, or circumstance would allow the observers to confidently assess that it could not possibly have been already counted. Due to such constraints, counts of raptors, particularly eagles, are thought to be conservative. As discussed below, the Great Egg basin is a very large area, extremely wide in the lower portions.

The nine count locations, the official sampling sites, are shown on **Map 1**. Some sites did have supplemental count locations (labeled A, B, and C on our field maps, but not on Map 1) to allow for all areas to be seen and thereby all birds counted. For example, the Tuckahoe WMA site, Site 9, southeast of Tuckahoe has three impoundment pools, and not all pools can be viewed or counted from the same location. Therefore, the Site 9 count is a composite of tallies taken at three separate locations, but only one final tally is given for the site on the daily and summary data sheets. In this case, the 45 minutes are expended at the three stops put together. Only by using such alternate viewing locations could all birds, particularly waterbirds, be reasonably and reliably tallied.



In order to avoid bias in the sampling technique, the route was reversed each subsequent sampling date, run “upriver” and then “downriver” on alternate sampling days. The nine sites ultimately settled upon as a reasonable and doable sampling route are as follows, (starting on the lower estuary and working upriver):

- (1) Longport Bridge Fishing Pier. This site allowed counting of the lower portion of Great Egg Harbor Bay and the Rainbow Channel/Rainbow Island area.
- (2) John F. Kennedy park in Somers Point. Allowed counting of the bay east of the Garden State parkway Bridge. An alternate site was employed here; the foot of the Route 9 Bridge over Great Egg Harbor bay (north end) allowed the bay west of the bridges to be seen and censused.
- (3) Jeffers Landing, including alternate sites on Job’s Point Road and Jeffers Landing Road.
- (4) English Creek Landing, at Wharf Road.
- (5) The “Upper” tidal river. The principal count location was from the Shady River Marina on Route 559. A supplemental site used was “the bulkhead” in Mays Landing just south of Route 40.
- (6) Lake Lenape. Observations were conducted from the spillway in Mays Landing.
- (7) Gibson Landing, at the end of Gibson’s Creek Road in the Corbin City unit of Tuckahoe WMA.
- (8) The observation tower on the dikes of the Corbin City unit of the Tuckahoe WMA. Here supplemental observation points were used in order to observe all of the various nooks and crannies of the several impoundments.
- (9) The Tuckahoe unit of the Tuckahoe WMA, including three supplemental stops which allowed all three impoundments to be viewed and counted. Particularly Site 9 allowed those raptors and waterfowl using the lower Tuckahoe River tributary to the Lower Great Egg Harbor River basin area to be included in survey results. This site was in Cape May County; all others were in Atlantic County.

To the greatest extent practicable, all counts were conducted in good weather. The observers carefully selected sampling days which were sunny and breezy, conditions which readily facilitate raptor hunting and movement along the river. Such conditions particularly allow for the best raptor counts (on cloudy, windless days raptors often spend much of their time perched, and therefore often are out of sight).



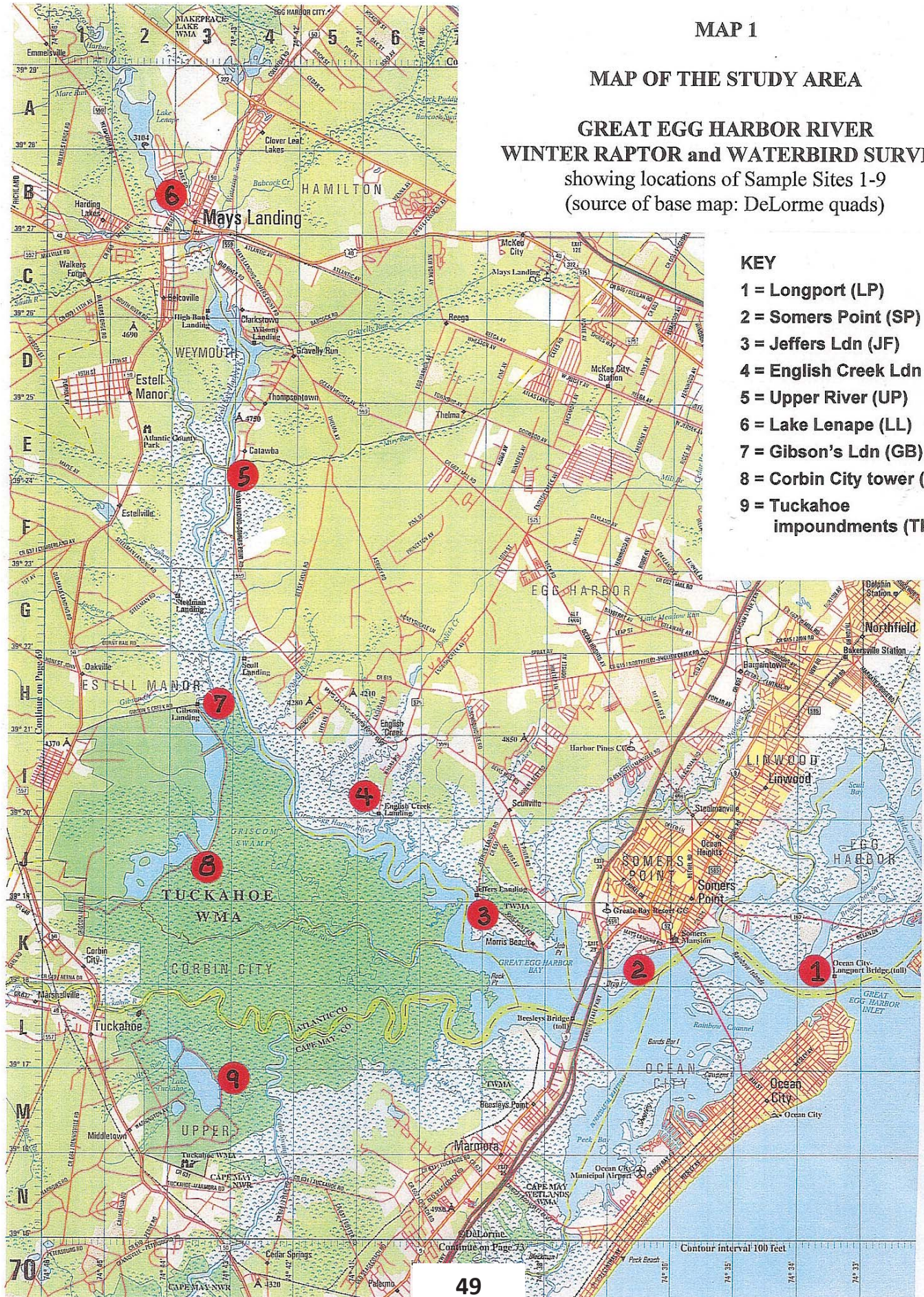
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## MAP OF THE STUDY AREA

**GREAT EGG HARBOR RIVER  
WINTER RAPTOR and WATERBIRD SURVEY**  
showing locations of Sample Sites 1-9  
(source of base map: DeLorme quads)

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## MULLICA RIVER METHODOLOGY:

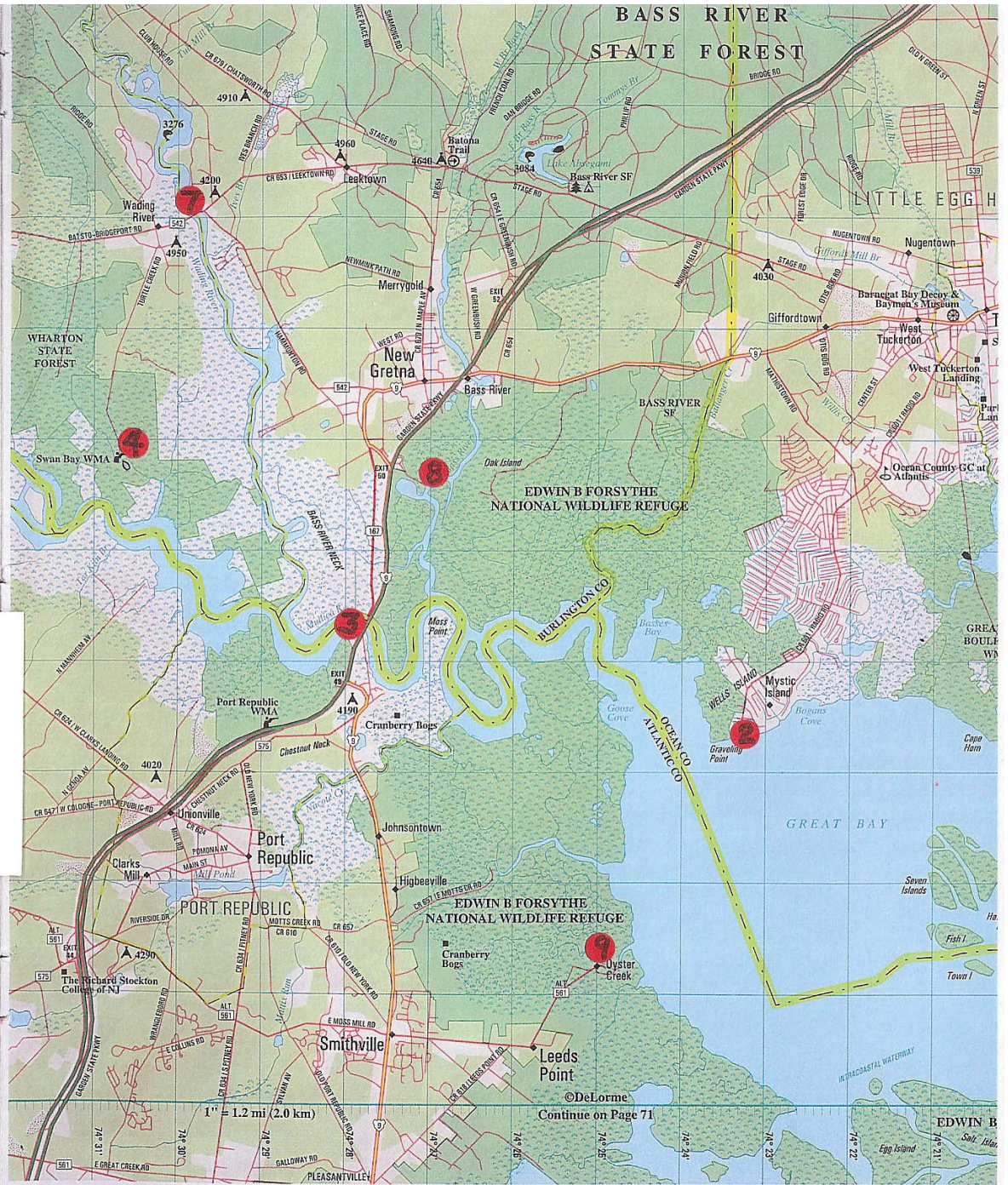
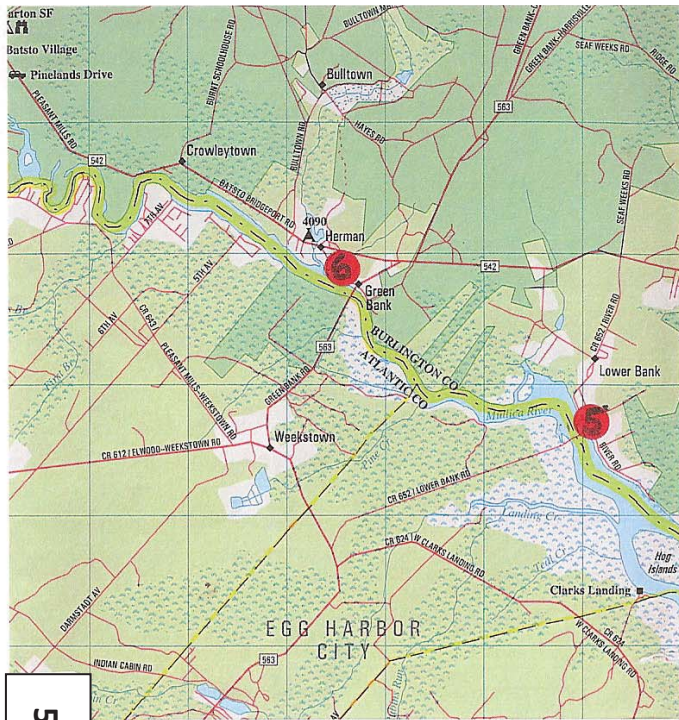
The Mullica River study area and sample locations are shown on **Map 2**. The methodology used on the Mullica was designed to be identical to that used on the Great Egg: Nine sample locations were established on the Mullica between Green Bank in the west and on downriver to Great Bay Boulevard near Little Egg Inlet. Each site was visited for approximately 45 minutes each during a given survey. Sampling direction was reversed every other survey to avoid time-of-day bias. There is some difference in the geographical scope of the study areas. The Great Egg River, from Lake Lenape east to the Longport Bridge constitutes about 12 linear miles (direct miles, not accounting for turns on the river). The Mullica River, on the other hand, is about 15.6 linear miles in length from Green Bank east to the landing at the foot of Great Bay Boulevard (Seven Bridges Road). While it bears noting that the study area on the Mullica is longer, no attempt has been made (as yet) to compare width or acreage (or habitat types) of the comparative study areas. This can be carried out in future years as part of future in-depth comparisons.

Any avian discussion of the Mullica River complex and Great Bay must include discussion of Forsythe National Wildlife Refuge, a.k.a. “Brigantine.” While not technically/geographically in the study area, it exerts a tremendous influence on the birds of the region - particularly waterfowl. Just as the quality impoundments at Corbin City and Tuckahoe WMAs attract and concentrate ducks and geese (and as the Bivalve EEP does on the Maurice River), Brigantine by its sheer size and quality of habitat (vast impoundments) attracts and concentrates vast numbers of Mullica River region waterfowl. But where Corbin/Tuckahoe can be counted because they are “within” the study area, the impoundments at Brig are adjacent to Reeds Bay, Little Bay, and Brigantine Inlet - and are not really a part of Great Bay or the Mullica River system.

None-the-less, Forsythe exerts a massive influence on Mullica waterfowl. Because of the size and high quality of the impoundments, as well as the relative safety from hunting pressure, the NWR clearly pulls in birds from the Mullica. As one person aptly put it, “Brigantine simply ‘sucks in’ most of the area’s waterfowl.” And while many return to the nearby Mullica River to feed at night, by day they are safely back at the refuge, sanctuary, and feeding station that is Forsythe NWR.

While one could make a case to include this site and its birds in a Mullica count, to do so would bias the count to such a degree that comparisons to the Great Egg and/or other rivers would be moot and meaningless. For example, few Green-winged Teal and virtually no Pintails were counted on Mullica surveys, but at the same time, just two miles away, perhaps 10,000 teal and 10,000 pintails were known present. It is a dilemma with no real answer - to count Brig birds would be to bias the count beyond comparability (plus it would take 6-8 hours each survey to truly census the Refuge...) But, at the same time, to not count Brigantine waterfowl will forever undercount (and so bias) any Mullica survey efforts. Such are the issues with Forsythe NWR, one of the premier refuges in the country, and the implications when attempting hard comparisons to the Great Egg Harbor River.





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## MAP 2

### MAP OF THE STUDY AREA

**MULLICA RIVER  
WINTER RAPTOR and WATERBIRD SURVEY**  
showing locations of Sample Sites 1-9  
(source of base map: DeLorme quads)

#### KEY

- 1 = Great Bay Blvd WMA  
(Seven Bridges Road)
- 2 = Graveling Point (GP)
- 3 = Gdn St Pkwy Bridge (BR)
- 4 = Swan Bay WMA (SW)
- 5 = Lower Bank (LB)
- 6 = Green Bank (GB)
- 7 = Wading River Bridge (WD)
- 8 = Amassas Landing (AM)
- 9 = Leeds Point (LD)



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COOPERATIVE AGREEMENT  
OF THE GREAT EGG HARBOR  
WATERSHED ASSOCIATION  
WITH THE U.S. DEPARTMENT OF THE  
INTERIOR, NATIONAL PARK SERVICE:**

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