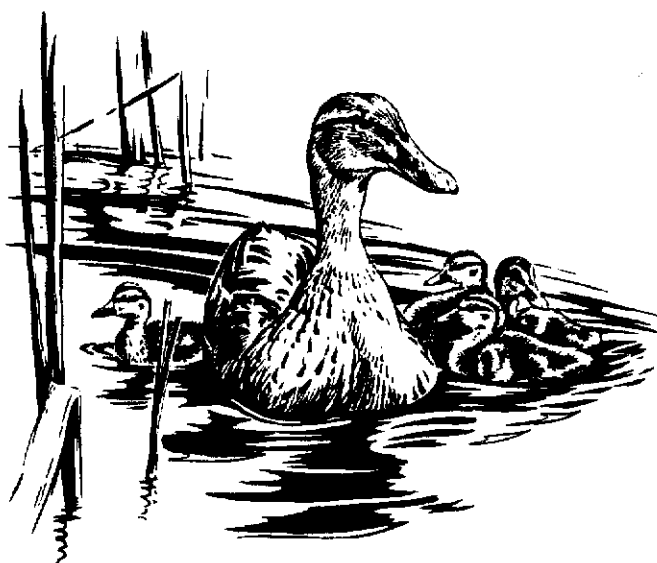


# **ILLINOIS NATURAL HISTORY SURVEY**

**CENTER FOR WILDLIFE ECOLOGY**



**1999-2000 Aerial Waterbird Inventories of Chautauqua National Wildlife  
Refuge and Peoria Lake Environmental Management Program Sites**

**Annual Report**

**by**

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## Summary

The purpose of this project was to aerially inventory waterfowl (ducks and geese), bald eagles, double-crested cormorants, and white pelicans during fall and spring, 1999-2000, at Upper Peoria Lake and Lake Chautauqua Environmental Management Program (EMP) sites. Inventories were conducted from light aircraft flying at low levels. Fall inventories were made on 1, 7, and 14 September; 4, 19, and 25 October; 3, 8, 15, 22, and 30 November; 6, 14, and 21 December; and 5 January. Spring inventories were made on 7 and 28 February; 6, 13, 23, and 29 March; and 6 April. Species of waterbirds (Table 1) and their respective numbers were recorded during each inventory.

The inventory data are summarized by site in tabular form displaying the peak (highest number counted for all inventories) population count by species for each compartment at each site and for the entire site during fall (September - January) and spring (February - April) (Tables 2 and 9). The peak number for the entire site or groups of species may not represent the sum of the peaks for all the compartments or species because the peak numbers in the various compartments and species could have occurred on different flights. Additionally, the results of each waterfowl inventory are provided by date for each site (Tables 7, 8, 16, and 17). Copies of maps delineating the areas inventoried at each site are also provided (Figures 1 and 2).

### **Upper Peoria Lake**

The Upper Peoria Lake EMP site is divided into two inventory areas, the lake segment and the 168-acre Forested Wetland Management Area (FWMA) (Figure 1). In the lake segment, construction of a barrier island extending roughly one mile and the dredging of the East River side channel were completed in December 1994. A second

island was formed during construction of the barrier island from dredged material unsuitable for use in the barrier island. The second island runs parallel to the barrier island. The fall of 1999 was the fifth waterfowl aerial censusing period (September - January) since the completion of the islands. The peak numbers for several species of waterbirds in the lake segment during fall 1999 were the highest recorded since INHS began monitoring in 1991. These species included blue-winged teals, green-winged teals, American wigeons, gadwalls, northern shovelers, ring-necked ducks, American coots and white pelicans. During the falls of 1995 through 1999 the majority of the dabbling ducks, particularly mallards, and Canada geese were observed on and around the barrier islands. Peak numbers for the lake segment, fall 1991 through 1999 and spring 1992 through 2000, are provided in tables 3 and 4, respectively.

In the beginning of this monitoring project we were unsure if the FWMA could be accurately surveyed from a fixed-wing plane. Waterfowl utilizing forested wetlands are difficult to inventory because they are concealed by vegetation and their numbers are underestimated (Geis 1966, Hawkins and Addy 1966, Conroy et al. 1988, Sherman 1990). The fall of 1999 was the fifth waterfowl aerial censusing period (September - January) of the FWMA since the levees were constructed and the area was inundated. Construction was reported as completed by July 1996. Waterfowl that could positively be identified by species and enumerated were recorded. For the 1996-1997 survey period, we began recording waterfowl that could not be identified by species as "unknowns", thereby acknowledging that there are visibility biases but still treating the observations as an index to the relative abundance of waterfowl. Peak numbers for the FWMA, fall 1991 through 1999 and spring 1992 through 2000, are provided in Tables 5 and 6, respectively.

## **Lake Chautauqua**

The Lake Chautauqua EMP site is divided into two inventory areas, Upper Pool and Lower Pool (Figure 2). High water levels on the Illinois River through late June prevented drawdown of the lower pool until mid-July. Gates in the south pool were opened 13 July and closed 19 July to achieve a water level between 432 and 432.5 feet. This water level was desirable to minimize the possibility of a botulism outbreak. Exposed mud flats were colonized by vegetation providing average waterfowl food production. Preliminary results of a moist-soil evaluation study being conducted by the INHS at Lake Chautauqua revealed teal grass and rice cutgrass as the two most abundant moist-soil plants sampled (Whetsell et al. 1999).

Peak numbers for Upper and Lower Chautauqua, fall 1999 and spring 2000, are provided in Table 9. Peak numbers for Lake Chautauqua, fall 1991 through 1999 and spring 1992 through 2000, are provided in Tables 10 and 13, respectively. Peak numbers for Upper Chautauqua, fall 1991 through 1999 and spring 1992 through 2000, are provided in Tables 11 and 14, respectively. Peak numbers for Lower Chautauqua, fall 1991 through 1999 and spring 1992 through 2000, are provided in Tables 12 and 15, respectively.

Compared with 1998, waterfowl use of Lake Chautauqua was higher for dabbling ducks, lower for diving ducks and slightly higher for total ducks observed during fall 1999. During the dry spring of 2000, waterfowl use of Lake Chautauqua was much higher for all dabbling duck species with the exception of American black ducks compared to spring 1999. Diving duck use of Lake Chautauqua during spring 2000 was comparable to spring 1999.

Table 1. Common names of waterbirds aerially inventoried and abbreviations used in the report.

| Common name                     |   | Abbreviation |
|---------------------------------|---|--------------|
| <b>Dabbling ducks</b>           |   |              |
| Mallard                         | = | MALLARD      |
| American black duck             | = | BLK          |
| Northern pintail                | = | PNT          |
| Blue-winged teal                | = | BWT          |
| Green-winged teal               | = | GWT          |
| American wigeon                 | = | WIG          |
| Gadwall                         | = | GAD          |
| Northern shoveler               | = | SH           |
| <b>Diving ducks</b>             |   |              |
| Lesser and greater scaup        | = | SCAUP        |
| Ring-necked duck                | = | RN           |
| Canvasback                      | = | CNVB         |
| Redhead                         | = | RH           |
| Ruddy duck                      | = | RDY          |
| Common goldeneye                | = | GLD          |
| Bufflehead                      | = | BH           |
| <b>Mergansers</b>               |   |              |
| Common merganser                | = | CM           |
| Red-breasted merganser          | = | RBM          |
| Hooded merganser                | = | HM           |
| <b>Unknown</b>                  | = | UNK          |
| <b>Geese</b>                    |   |              |
| Canada goose                    | = | CG           |
| Lesser snow goose               | = | SG           |
| <b>American coot</b>            | = | COOT         |
| <b>Bald eagles</b>              |   |              |
| Adult                           | = | AD           |
| Immature                        | = | IMM          |
| <b>Double-crested cormorant</b> | = | CORM         |
| <b>White pelican</b>            | = | PEL          |

## UPPER PEORIA LAKE

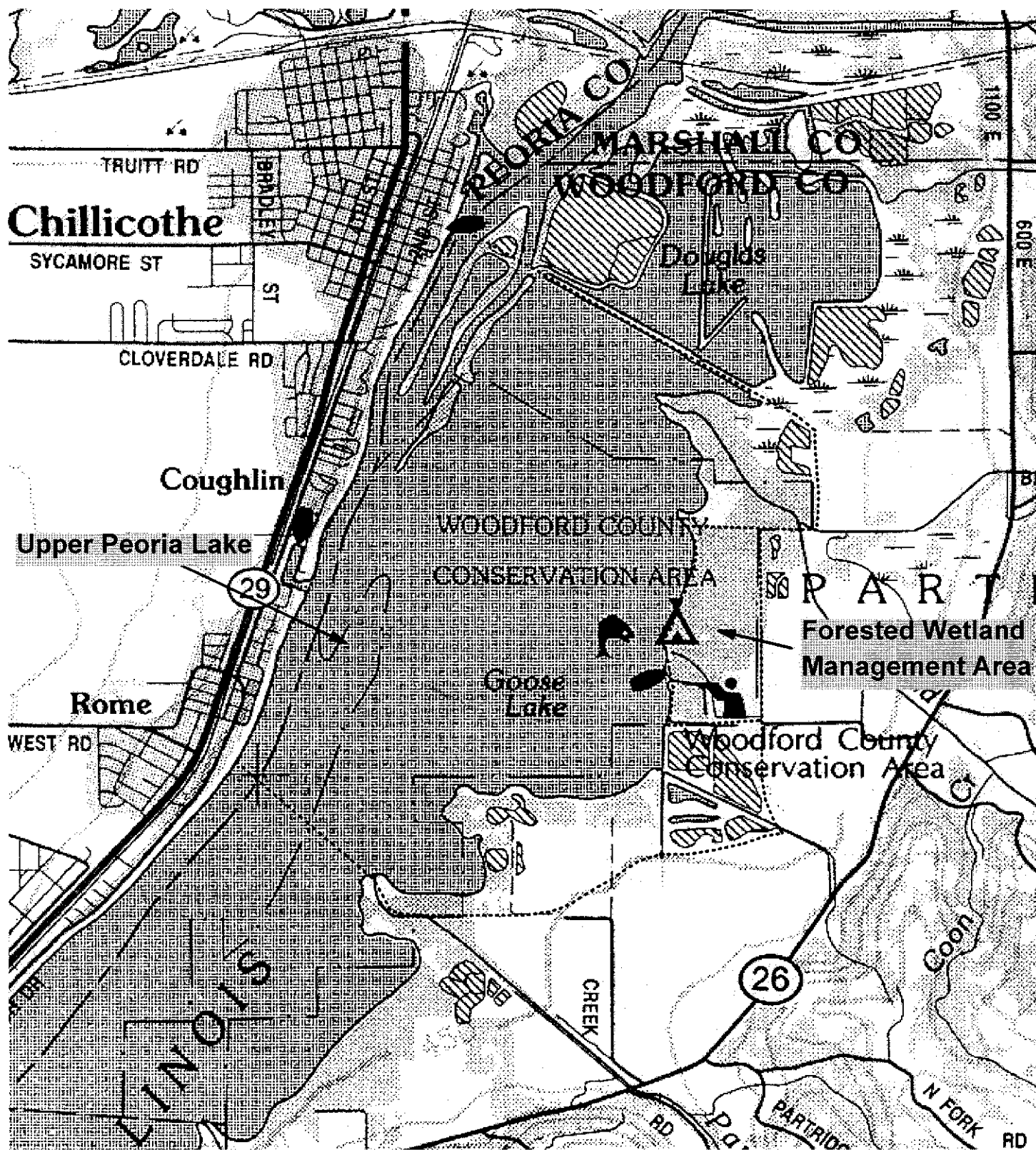


Figure 1. The Upper Peoria Lake EMP site with boundaries drawn delineating the census areas.



Table 2. Peak numbers of waterbirds aerially inventoried by the Illinois Natural History Survey at the Upper Peoria Lake EMP site, fall 1999 and spring 2000<sup>a</sup>.

| Species                         | Upper Peoria Lake |        | Forested Wetland Management Area |        | Total EMP Site |        |
|---------------------------------|-------------------|--------|----------------------------------|--------|----------------|--------|
|                                 | Fall              | Spring | Fall                             | Spring | Fall           | Spring |
| <b>Dabbling ducks</b>           |                   |        |                                  |        |                |        |
| Mallard                         | 36,000            | 750    | 500                              | 70     | 36,000         | 820    |
| American black duck             | 3,400             | 100    | 25                               | 0      | 3,400          | 100    |
| Northern pintail                | 3,000             | 0      | 50                               | 0      | 3,000          | 0      |
| Blue-winged teal                | 400               | 0      | 0                                | 0      | 400            | 0      |
| Green-winged teal               | 2,300             | 600    | 0                                | 0      | 2,300          | 600    |
| American wigeon                 | 2,000             | 0      | 0                                | 0      | 2,000          | 0      |
| Gadwall                         | 3,000             | 100    | 0                                | 0      | 3,000          | 100    |
| Northern shoveler               | 1,000             | 0      | 0                                | 0      | 1,000          | 0      |
| All dabbling ducks              | 43,000            | 850    | 500                              | 70     | 43,050         | 920    |
| <b>Diving ducks</b>             |                   |        |                                  |        |                |        |
| Lesser & greater scaup          | 800               | 0      | 0                                | 0      | 800            | 0      |
| Ring-necked duck                | 3,200             | 0      | 0                                | 0      | 3,200          | 0      |
| Canvasback                      | 200               | 0      | 0                                | 0      | 200            | 0      |
| Redhead                         | 0                 | 0      | 0                                | 0      | 0              | 0      |
| Ruddy duck                      | 0                 | 0      | 0                                | 0      | 0              | 0      |
| Common goldeneye                | 0                 | 0      | 0                                | 0      | 0              | 0      |
| Bufflehead                      | 0                 | 0      | 0                                | 0      | 0              | 0      |
| All diving ducks                | 4,000             | 0      | 0                                | 0      | 4,000          | 0      |
| <b>Mergansers</b>               |                   |        |                                  |        |                |        |
| Common merganser                | 1,000             | 0      | 0                                | 0      | 1,000          | 0      |
| Red-breasted merganser          | 0                 | 0      | 0                                | 0      | 0              | 0      |
| Hooded merganser                | 0                 | 0      | 0                                | 0      | 0              | 0      |
| All mergansers                  | 1,000             | 0      | 0                                | 0      | 1,000          | 0      |
| <b>Unknown</b>                  | 0                 | 0      | 200                              | 0      | 200            | 0      |
| <b>All ducks</b>                | 43,500            | 850    | 700                              | 70     | 43,550         | 920    |
| <b>Geese</b>                    |                   |        |                                  |        |                |        |
| Canada goose                    | 800               | 400    | 0                                | 0      | 800            | 400    |
| Lesser snow goose               | 0                 | 0      | 0                                | 0      | 0              | 0      |
| <b>American coot</b>            | 3,700             | 0      | 0                                | 0      | 3,700          | 100    |
| <b>Bald eagles</b>              |                   |        |                                  |        |                |        |
| Adult                           | 8                 | 0      | 0                                | 0      | 8              | 0      |
| Immature                        | 6                 | 0      | 0                                | 0      | 6              | 0      |
| All eagles                      | 14                | 0      | 0                                | 0      | 14             | 0      |
| <b>Double-crested cormorant</b> | 500               | 0      | 0                                | 0      | 500            | 300    |
| <b>White pelican</b>            | 200               | 300    | 0                                | 0      | 200            | 0      |

<sup>a</sup> The peak number for the entire site or groups of species may not represent the sum of the peaks for all the compartments or species because the peak numbers in the various compartments and species could have occurred on different flights.

Table 3. Peak numbers of waterbirds aerially inventoried by the Illinois Natural History Survey at the Upper Peoria Lake EMP site during fall, 1991-1999.

| Species                         | 1991         | 1992         | 1993         | 1994         | 1995         | 1996          | 1997          | 1998          | 1999          |
|---------------------------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|---------------|
| <b>Dabbling ducks</b>           |              |              |              |              |              |               |               |               |               |
| Mallard                         | 1,000        | 3,000        | 1,000        | 400          | 5,000        | 29,000        | 63,100        | 35,100        | 36,000        |
| American black duck             | 75           | 150          | 50           | 50           | 400          | 3,000         | 7,000         | 2,500         | 3,400         |
| Northern pintail                | 200          | 0            | 50           | 0            | 600          | 700           | 2,500         | 5,000         | 3,000         |
| Blue-winged teal                | 20           | 0            | 0            | 0            | 30           | 200           | 50            | 10            | 400           |
| Green-winged teal               | 0            | 0            | 50           | 300          | 50           | 500           | 200           | 1,000         | 2,300         |
| American wigeon                 | 0            | 0            | 0            | 0            | 0            | 100           | 700           | 500           | 2,000         |
| Gadwall                         | 800          | 0            | 0            | 0            | 1,000        | 2,500         | 1,500         | 2,000         | 3,000         |
| Northern shoveler               | 0            | 0            | 0            | 0            | 0            | 75            | 0             | 500           | 1,000         |
| All dabbling ducks              | 1,850        | 3,150        | 1,050        | 700          | 6,000        | 35,700        | 70,800        | 45,100        | 43,000        |
| <b>Diving ducks</b>             |              |              |              |              |              |               |               |               |               |
| Lesser and greater scaup        | 250          | 300          | 0            | 0            | 0            | 1,200         | 800           | 2,500         | 800           |
| Ring-necked duck                | 0            | 300          | 0            | 100          | 300          | 500           | 1,500         | 3,000         | 3,200         |
| Canvasback                      | 0            | 0            | 0            | 0            | 0            | 100           | 100           | 500           | 200           |
| Redhead                         | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 50            | 0             |
| Ruddy duck                      | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0             | 0             |
| Common goldeneye                | 50           | 2,000        | 3,500        | 200          | 100          | 500           | 900           | 0             | 0             |
| Bufflehead                      | 0            | 0            | 0            | 0            | 0            | 4,500         | 0             | 0             | 0             |
| All diving ducks                | 250          | 2,000        | 3,500        | 200          | 300          | 5,500         | 1,800         | 5,550         | 4,000         |
| <b>Mergansers</b>               |              |              |              |              |              |               |               |               |               |
| Common merganser                | 0            | 1,000        | 1,000        | 0            | 700          | 50            | 500           | 0             | 1,000         |
| Red-breasted merganser          | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0             | 0             |
| Hooded merganser                | 0            | 0            | 0            | 0            | 0            | 0             | 0             | 0             | 0             |
| All mergansers                  | 0            | 0            | 1,000        | 0            | 700          | 50            | 500           | 0             | 1,000         |
| <b>All ducks</b>                | <b>2,050</b> | <b>5,310</b> | <b>4,500</b> | <b>800</b>   | <b>6,000</b> | <b>41,200</b> | <b>70,800</b> | <b>50,650</b> | <b>43,500</b> |
| <b>Geese</b>                    |              |              |              |              |              |               |               |               |               |
| Canada goose                    | 100          | 0            | 50           | 100          | 2,000        | 1,500         | 1,500         | 800           | 800           |
| Lesser snow goose               | 0            | 0            | 0            | 0            | 50           | 500           | 300           | 0             | 0             |
| <b>American coot</b>            | <b>300</b>   | <b>1,000</b> | <b>0</b>     | <b>1,000</b> | <b>1,000</b> | <b>2,300</b>  | <b>3,000</b>  | <b>3,600</b>  | <b>3,700</b>  |
| <b>Bald eagles</b>              |              |              |              |              |              |               |               |               |               |
| Adult                           | 0            | 1            | 0            | 0            | 8            | 2             | 1             | 1             | 8             |
| Immature                        | 0            | 2            | 0            | 0            | 3            | 0             | 2             | 0             | 6             |
| All eagles                      | 0            | 3            | 0            | 0            | 11           | 2             | 3             | 1             | 14            |
| <b>Double-crested cormorant</b> | <b>0</b>     | <b>50</b>    | <b>25</b>    | <b>0</b>     | <b>100</b>   | <b>800</b>    | <b>300</b>    | <b>400</b>    | <b>500</b>    |
| <b>White Pelican</b>            | <b>0</b>     | <b>0</b>     | <b>0</b>     | <b>0</b>     | <b>0</b>     | <b>50</b>     | <b>20</b>     | <b>25</b>     | <b>200</b>    |

Table 4. Peak numbers of waterbirds aerially inventoried by the Illinois Natural History Survey at the Upper Peoria Lake EMP site during spring, 1992-2000.

| Species                         | 1992         | 1993       | 1994       | 1995         | 1996         | 1997         | 1998         | 1999         | 2000       |
|---------------------------------|--------------|------------|------------|--------------|--------------|--------------|--------------|--------------|------------|
| <b>Dabbling ducks</b>           |              |            |            |              |              |              |              |              |            |
| Mallard                         | 300          | 0          | 100        | 700          | 2,100        | 700          | 2,550        | 1,200        | 750        |
| American black duck             | 0            | 0          | 0          | 0            | 50           | 0            | 200          | 0            | 100        |
| Northern pintail                | 0            | 0          | 0          | 0            | 0            | 0            | 150          | 600          | 0          |
| Blue-winged teal                | 100          | 0          | 0          | 0            | 0            | 0            | 20           | 0            | 0          |
| Green-winged teal               | 100          | 0          | 0          | 0            | 0            | 0            | 0            | 50           | 600        |
| American wigeon                 | 200          | 0          | 0          | 0            | 0            | 0            | 25           | 0            | 0          |
| Gadwall                         | 0            | 0          | 0          | 0            | 0            | 0            | 100          | 0            | 100        |
| Northern shoveler               | 0            | 0          | 0          | 0            | 0            | 0            | 0            | 10           | 0          |
| All dabbling ducks              | 300          | 0          | 100        | 700          | 2,150        | 700          | 2,750        | 1,200        | 850        |
| <b>Diving ducks</b>             |              |            |            |              |              |              |              |              |            |
| Lesser and greater scaup        | 200          | 100        | 50         | 0            | 0            | 0            | 150          | 600          | 0          |
| Ring-necked duck                | 0            | 0          | 50         | 0            | 0            | 0            | 400          | 0            | 0          |
| Canvasback                      | 0            | 0          | 0          | 150          | 0            | 150          | 100          | 3,000        | 0          |
| Redhead                         | 0            | 0          | 0          | 0            | 0            | 0            | 50           | 0            | 0          |
| Ruddy duck                      | 0            | 0          | 0          | 0            | 0            | 0            | 20           | 0            | 0          |
| Common goldeneye                | 400          | 0          | 25         | 50           | 750          | 50           | 0            | 0            | 0          |
| Bufflehead                      | 0            | 0          | 0          | 0            | 0            | 0            | 0            | 0            | 0          |
| All diving ducks                | 600          | 100        | 50         | 150          | 750          | 150          | 500          | 3,000        | 0          |
| <b>Mergansers</b>               |              |            |            |              |              |              |              |              |            |
| Common merganser                | 100          | 100        | 400        | 4,000        | 1,800        | 4,000        | 0            | 900          | 0          |
| Red-breasted merganser          | 0            | 0          | 0          | 0            | 0            | 0            | 0            | 0            | 0          |
| Hooded merganser                | 0            | 0          | 0          | 0            | 0            | 0            | 0            | 0            | 0          |
| All mergansers                  | 100          | 100        | 400        | 4,000        | 1,800        | 4,000        | 0            | 900          | 0          |
| <b>All ducks</b>                | <b>1,000</b> | <b>100</b> | <b>500</b> | <b>4,350</b> | <b>2,825</b> | <b>4,350</b> | <b>2,935</b> | <b>3,450</b> | <b>850</b> |
| <b>Geese</b>                    |              |            |            |              |              |              |              |              |            |
| Canada goose                    | 50           | 300        | 0          | 500          | 40           | 500          | 200          | 800          | 400        |
| Lesser snow goose               | 0            | 0          | 0          | 0            | 0            | 0            | 0            | 0            | 0          |
| <b>American coot</b>            | <b>200</b>   | <b>0</b>   | <b>600</b> | <b>0</b>     | <b>100</b>   | <b>0</b>     | <b>500</b>   | <b>100</b>   | <b>0</b>   |
| <b>Bald eagles</b>              |              |            |            |              |              |              |              |              |            |
| Adult                           | 0            | 0          | 0          | 0            | 3            | 23           | 1            | 0            | 0          |
| Immature                        | 0            | 0          | 0          | 0            | 2            | 15           | 2            | 0            | 0          |
| All eagles                      | 0            | 0          | 0          | 0            | 5            | 38           | 2            | 0            | 0          |
| <b>Double-crested cormorant</b> | <b>0</b>     | <b>50</b>  | <b>25</b>  | <b>0</b>     | <b>100</b>   | <b>800</b>   | <b>0</b>     | <b>20</b>    | <b>0</b>   |
| <b>White pelican</b>            | <b>0</b>     | <b>0</b>   | <b>0</b>   | <b>0</b>     | <b>0</b>     | <b>50</b>    | <b>0</b>     | <b>0</b>     | <b>300</b> |

Table 5. Peak numbers of waterbirds aerially inventoried by the Illinois Natural History Survey at the Forested Wetland Management Area (FWMA) EMP site during fall 1991-1999.

| Species                         | 1991 | 1992 | 1993 | 1994 | 1995 <sup>a</sup> | 1996 <sup>b</sup> | 1997 | 1998 | 1999 |
|---------------------------------|------|------|------|------|-------------------|-------------------|------|------|------|
| <b>Dabbling ducks</b>           |      |      |      |      |                   |                   |      |      |      |
| Mallard                         | 0    | 0    | 0    | 0    | 300               | 300               | 600  | 600  | 500  |
| American black duck             | 0    | 0    | 0    | 0    | 50                | 50                | 0    | 50   | 25   |
| Northern pintail                | 0    | 0    | 0    | 0    | 0                 | 25                | 0    | 0    | 50   |
| Blue-winged teal                | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Green-winged teal               | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| American wigeon                 | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Gadwall                         | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Northern shoveler               | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| All dabbling ducks              | 0    | 0    | 0    | 0    | 350               | 300               | 600  | 600  | 500  |
| <b>Diving ducks</b>             |      |      |      |      |                   |                   |      |      |      |
| Lesser and greater scaup        | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Ring-necked duck                | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Canvasback                      | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Redhead                         | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Ruddy duck                      | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Common goldeneye                | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Bufflehead                      | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| All diving ducks                | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| <b>Mergansers</b>               |      |      |      |      |                   |                   |      |      |      |
| Common merganser                | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Red-breasted merganser          | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Hooded merganser                | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| All mergansers                  | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| <b>Unknown</b>                  |      |      |      |      |                   | 100               | 200  | 100  | 200  |
| <b>All ducks</b>                | 0    | 0    | 0    | 0    | 350               | 400               | 600  | 700  | 700  |
| <b>Geese</b>                    |      |      |      |      |                   |                   |      |      |      |
| Canada goose                    | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Lesser snow goose               | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| <b>American coot</b>            | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| <b>Bald eagles</b>              |      |      |      |      |                   |                   |      |      |      |
| Adult                           | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Immature                        | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| All eagles                      | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| <b>Double-crested cormorant</b> | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| <b>White pelican</b>            | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |

<sup>a</sup> The first fall waterfowl censusing period (September - January) for the FWMA.

<sup>b</sup> The first fall waterfowl censusing period (September - January) that unidentifiable waterfowl in the FWMA were recorded as "unknown".

Table 6. Peak numbers of waterbirds aerially inventoried by the Illinois Natural History Survey at the Forested Wetland Management (FWMA) Area EMP site during spring, 1992-2000.

| Species                         | 1992 | 1993 | 1994 | 1995 | 1996 <sup>a</sup> | 1997 <sup>b</sup> | 1998 | 1999 | 2000 |
|---------------------------------|------|------|------|------|-------------------|-------------------|------|------|------|
| <b>Dabbling ducks</b>           |      |      |      |      |                   |                   |      |      |      |
| Mallard                         | 0    | 0    | 0    | 0    | 25                | 225               | 300  | 400  | 70   |
| American black duck             | 0    | 0    | 0    | 0    | 0                 | 0                 | 10   | 0    | 0    |
| Northern pintail                | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Blue-winged teal                | 0    | 0    | 0    | 0    | 0                 | 0                 | 20   | 0    | 0    |
| Green-winged teal               | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| American wigeon                 | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Gadwall                         | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Northern shoveler               | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| All dabbling ducks              | 0    | 0    | 0    | 0    | 25                | 225               | 320  | 400  | 70   |
| <b>Diving ducks</b>             |      |      |      |      |                   |                   |      |      |      |
| Lesser and greater scaup        | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Ring-necked duck                | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Canvasback                      | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Redhead                         | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Ruddy duck                      | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Common goldeneye                | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Bufflehead                      | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| All diving ducks                | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| <b>Mergansers</b>               |      |      |      |      |                   |                   |      |      |      |
| Common merganser                | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Red-breasted merganser          | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Hooded merganser                | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| All mergansers                  | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| <b>Unknown</b>                  |      |      |      |      |                   | 0                 | 0    | 0    | 0    |
| <b>All ducks</b>                | 0    | 0    | 0    | 0    | 25                | 225               | 320  | 400  | 70   |
| <b>Geese</b>                    |      |      |      |      |                   |                   |      |      |      |
| Canada goose                    | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Lesser snow goose               | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| <b>American coot</b>            | 0    | 0    | 0    | 0    | 0                 | 0                 | 300  | 0    | 0    |
| <b>Bald eagles</b>              |      |      |      |      |                   |                   |      |      |      |
| Adult                           | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| Immature                        | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| All eagles                      | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| <b>Double-crested cormorant</b> | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |
| <b>White pelican</b>            | 0    | 0    | 0    | 0    | 0                 | 0                 | 0    | 0    | 0    |

<sup>a</sup> The first spring waterfowl censusing period (February - April) for the FWMA.

<sup>b</sup> The first spring waterfowl censusing period (February - April) that unidentifiable waterfowl in the FWMA were recorded as "unknown".

Table 7. Waterbird aerial inventory data for each individual flight for the Upper Peoria Lake EMP site, fall 1999.

| MALLARD                          | BLK    | PNT   | BWT   | GWT | WIG   | GAD   | SH    | SCAUP | RN  | CNVB  | RH  | RDY | GLD | BH | CM    | RBM | HM | UNK | DABBLERS | TOTAL  | TOTAL | TOTAL | DUCKS | CG     | SG  | COOT | BALD EAGLES |     |     |    |     |     |   |
|----------------------------------|--------|-------|-------|-----|-------|-------|-------|-------|-----|-------|-----|-----|-----|----|-------|-----|----|-----|----------|--------|-------|-------|-------|--------|-----|------|-------------|-----|-----|----|-----|-----|---|
|                                  |        |       |       |     |       |       |       |       |     |       |     |     |     |    |       |     |    |     |          |        |       |       |       |        |     |      | AD          | IMM | TOT |    |     |     |   |
| Upper Peoria Lake                |        |       |       |     |       |       |       |       |     |       |     |     |     |    |       |     |    |     |          |        |       |       |       |        |     |      |             |     |     |    |     |     |   |
| 09/01/99                         | 150    | 0     | 10    | 10  | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 170    | 0     | 0     | 0     | 170    | 320 | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 09/07/99                         | 120    | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 120    | 0     | 0     | 0     | 120    | 300 | 0    | 0           | 0   | 0   | 0  | 10  | 0   |   |
| 09/14/99                         | 300    | 0     | 0     | 400 | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 700    | 0     | 0     | 0     | 700    | 400 | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 10/04/99                         | 400    | 0     | 50    | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 450    | 0     | 0     | 0     | 450    | 200 | 0    | 0           | 0   | 0   | 0  | 500 | 40  |   |
| 10/19/99                         | 5,000  | 400   | 2,000 | 0   | 600   | 500   | 500   | 100   | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 9,100  | 0     | 0     | 0     | 9,100  | 300 | 0    | 500         | 0   | 0   | 0  | 200 | 0   |   |
| 10/25/99                         | 1,200  | 700   | 2,500 | 0   | 2,300 | 500   | 1,000 | 500   | 0   | 250   | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 8,700  | 250   | 0     | 0     | 8,950  | 500 | 0    | 2,500       | 0   | 0   | 0  | 400 | 0   |   |
| 11/03/99                         | 11,000 | 1,000 | 1,100 | 0   | 0     | 1,000 | 3,000 | 0     | 300 | 50    | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 17,100 | 350   | 0     | 0     | 17,450 | 200 | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 11/08/99                         | 22,000 | 1,850 | 2,200 | 0   | 1,850 | 2,000 | 1,450 | 0     | 800 | 3,200 | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 31,350 | 4,000 | 0     | 0     | 35,350 | 700 | 0    | 3,700       | 0   | 0   | 0  | 30  | 0   |   |
| 11/15/99                         | 32,095 | 0     | 2,000 | 0   | 1,170 | 0     | 780   | 195   | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 36,240 | 0     | 0     | 0     | 36,240 | 300 | 0    | 1,500       | 0   | 0   | 0  | 100 | 0   |   |
| 11/22/99                         | 30,000 | 3,400 | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 50    | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 33,400 | 50    | 0     | 0     | 33,450 | 300 | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 11/30/99                         | 17,000 | 2,000 | 200   | 0   | 0     | 800   | 1,000 | 0     | 300 | 700   | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 21,000 | 1,000 | 0     | 0     | 22,000 | 250 | 0    | 0           | 0   | 0   | 0  | 0   | 150 |   |
| 12/06/99                         | 32,900 | 1,600 | 3,000 | 0   | 1,500 | 1,000 | 2,000 | 1,000 | 300 | 0     | 200 | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 43,000 | 500   | 0     | 0     | 43,500 | 600 | 0    | 0           | 0   | 0   | 0  | 0   | 200 |   |
| 12/14/99                         | 36,000 | 3,000 | 1,000 | 0   | 0     | 0     | 300   | 200   | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 40,500 | 0     | 0     | 0     | 40,500 | 800 | 0    | 0           | 0   | 0   | 0  | 0   | 200 |   |
| 12/21/99                         | 0      | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 0      | 0     | 0     | 0     | 0      | 0   | 0    | 0           | 0   | 0   | 0  | 0   |     |   |
| 01/05/00                         | 0      | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 1,000 | 0   | 0  | 0   | 0        | 0      | 0     | 0     | 1,000 | 1,000  | 25  | 0    | 0           | 8   | 6   | 14 | 0   | 0   |   |
| Forested Wetland Management Area |        |       |       |     |       |       |       |       |     |       |     |     |     |    |       |     |    |     |          |        |       |       |       |        |     |      |             |     |     |    |     |     |   |
| 09/01/99                         | 0      | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 0      | 0     | 0     | 0     | 0      | 0   | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 09/07/99                         | 0      | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 0      | 0     | 0     | 0     | 0      | 0   | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 09/14/99                         | 0      | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 0      | 0     | 0     | 0     | 0      | 0   | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 10/04/99                         | 0      | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 0      | 0     | 0     | 0     | 0      | 0   | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 10/19/99                         | 40     | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 60  | 0        | 40     | 0     | 0     | 0     | 100    | 0   | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 10/25/99                         | 300    | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 300    | 0     | 0     | 0     | 300    | 0   | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 11/03/99                         | 200    | 0     | 50    | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 50  | 0        | 250    | 0     | 0     | 0     | 300    | 0   | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 11/08/99                         | 500    | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 200 | 0        | 500    | 0     | 0     | 0     | 700    | 0   | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 11/15/99                         | 275    | 25    | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 300    | 0     | 0     | 0     | 300    | 0   | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 11/22/99                         | 0      | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 0      | 0     | 0     | 0     | 0      | 0   | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 11/30/99                         | 150    | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 150      | 0      | 0     | 0     | 150   | 0      | 0   | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 12/06/99                         | 50     | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 50       | 0      | 0     | 0     | 50    | 0      | 0   | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 12/14/99                         | 0      | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 0      | 0     | 0     | 0     | 0      | 0   | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 12/21/99                         | 0      | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 0      | 0     | 0     | 0     | 0      | 0   | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 01/05/00                         | 0      | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 0      | 0     | 0     | 0     | 0      | 0   | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| Upper Peoria Lake EMP Area Total |        |       |       |     |       |       |       |       |     |       |     |     |     |    |       |     |    |     |          |        |       |       |       |        |     |      |             |     |     |    |     |     |   |
| 09/01/99                         | 150    | 0     | 10    | 10  | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 170    | 0     | 0     | 0     | 170    | 320 | 0    | 0           | 0   | 0   | 0  | 0   | 0   | 0 |
| 09/07/99                         | 120    | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 120    | 0     | 0     | 0     | 120    | 300 | 0    | 0           | 0   | 0   | 0  | 10  | 0   | 0 |
| 09/14/99                         | 300    | 0     | 0     | 400 | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 700    | 0     | 0     | 0     | 700    | 400 | 0    | 0           | 0   | 0   | 0  | 0   | 0   | 0 |
| 10/04/99                         | 400    | 0     | 50    | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 450    | 0     | 0     | 0     | 450    | 200 | 0    | 0           | 0   | 0   | 0  | 500 | 40  | 0 |
| 10/19/99                         | 5,040  | 400   | 2,000 | 0   | 600   | 500   | 500   | 100   | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 60  | 0        | 9,140  | 0     | 0     | 0     | 9,200  | 300 | 0    | 500         | 0   | 0   | 0  | 200 | 0   | 0 |
| 10/25/99                         | 1,500  | 700   | 2,500 | 0   | 2,300 | 500   | 1,000 | 500   | 0   | 250   | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 9,000  | 250   | 0     | 0     | 9,250  | 500 | 0    | 2,500       | 0   | 0   | 0  | 400 | 0   | 0 |
| 11/03/99                         | 11,200 | 1,000 | 1,150 | 0   | 0     | 1,000 | 3,000 | 0     | 300 | 50    | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 50  | 0        | 17,350 | 350   | 0     | 0     | 17,750 | 200 | 0    | 0           | 0   | 0   | 0  | 0   | 0   | 0 |
| 11/08/99                         | 22,500 | 1,850 | 2,200 | 0   | 1,850 | 2,000 | 1,450 | 0     | 800 | 3,200 | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 200 | 0        | 31,850 | 4,000 | 0     | 0     | 36,050 | 700 | 0    | 3,700       | 0   | 0   | 0  | 30  | 0   | 0 |
| 11/15/99                         | 32,370 | 25    | 2,000 | 0   | 1,170 | 0     | 780   | 195   | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 36,540 | 0     | 0     | 0     | 36,540 | 300 | 0    | 1,500       | 0   | 0   | 0  | 100 | 0   | 0 |
| 11/22/99                         | 30,000 | 3,400 | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 50    | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 33,400 | 50    | 0     | 0     | 33,450 | 300 | 0    | 0           | 0   | 0   | 0  | 0   | 0   | 0 |
| 11/30/99                         | 17,150 | 2,000 | 200   | 0   | 0     | 800   | 1,000 | 0     | 300 | 700   | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 21,150 | 1,000 | 0     | 0     | 22,150 | 250 | 0    | 0           | 0   | 0   | 0  | 0   | 150 | 0 |
| 12/06/99                         | 32,950 | 1,600 | 3,000 | 0   | 1,500 | 1,000 | 2,000 | 1,000 | 300 | 0     | 200 | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 43,050 | 500   | 0     | 0     | 43,550 | 600 | 0    | 0           | 0   | 0   | 0  | 0   | 200 | 0 |
| 12/14/99                         | 36,000 | 3,000 | 1,000 | 0   | 0     | 0     | 300   | 200   | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 40,500 | 0     | 0     | 0     | 40,500 | 800 | 0    | 0           | 0   | 0   | 0  | 0   | 200 | 0 |
| 12/21/99                         | 0      | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 0     | 0   | 0  | 0   | 0        | 0      | 0     | 0     | 0     | 0      | 0   | 0    | 0           | 0   | 0   | 0  | 0   | 0   |   |
| 01/05/00                         | 0      | 0     | 0     | 0   | 0     | 0     | 0     | 0     | 0   | 0     | 0   | 0   | 0   | 0  | 1,000 | 0   | 0  | 0   | 0        | 0      | 0     | 0     | 1,000 | 1,000  | 25  | 0    | 0           | 8   | 6   | 14 | 0   | 0   |   |

Table 8. Waterbird aerial inventory data for each individual flight for the Upper Peoria Lake EMP site, spring 2000.

|                                  |     | TOTAL   |     |     |     |     |     |       |    |      |    |     |     |    |    |     |    |     |          |       | BALD EAGLES |       |       |     |    |      |    |     |     |      |     |
|----------------------------------|-----|---|-----|-----|-----|-----|-----|-------|----|------|----|-----|-----|----|----|-----|----|-----|----------|-------|-------------|-------|-------|-----|----|------|----|-----|-----|------|-----|
|                                  |     | TOTAL TOTAL DIVERS MERG. DUCKS CG SG COOT AD IMM TOT CORM PEL |     |     |     |     |     |       |    |      |    |     |     |    |    |     |    |     |          |       |             |       |       |     |    |      |    |     |     |      |     |
| MALLARD                          | BLK | PNT   | BWT | GWT | WIG | GAD | SH  | SCAUP | RN | CNVB | RH | RDY | GLD | BH | CM | RBM | HM | UNK | DABBLERS | TOTAL | TOTAL       | TOTAL | DUCKS | CG  | SG | COOT | AD | IMM | TOT | CORM | PEL |
| Upper Peoria Lake                |     |   |     |     |     |     |     |       |    |      |    |     |     |    |    |     |    |     |          |       |             |       |       |     |    |      |    |     |     |      |     |
| 02/28/00                         | 550 | 50  | 0   | 0   | 0   | 0   | 0   | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 600   | 0           | 0     | 600   | 400 | 0  | 0    | 0  | 0   | 0   | 0    | 300 |
| 03/06/00                         | 15  | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 15    | 0           | 0     | 15    | 20  | 0  | 0    | 0  | 0   | 0   | 0    | 150 |
| 03/13/00                         | 750 | 100   | 0   | 0   | 0   | 0   | 0   | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 850   | 0           | 0     | 850   | 0   | 0  | 0    | 0  | 0   | 0   | 0    | 0   |
| 03/23/00                         | 25  | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 25    | 0           | 0     | 25    | 10  | 0  | 0    | 0  | 0   | 0   | 0    | 100 |
| 03/29/00                         | 0   | 0   | 0   | 0   | 600 | 0   | 0   | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 600   | 0           | 0     | 600   | 0   | 0  | 0    | 0  | 0   | 0   | 0    | 30  |
| 04/06/00                         | 25  | 0   | 0   | 0   | 360 | 0   | 100 | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 485   | 0           | 0     | 485   | 0   | 0  | 0    | 0  | 0   | 0   | 0    | 95  |
| Forested Wetland Management Area |     |   |     |     |     |     |     |       |    |      |    |     |     |    |    |     |    |     |          |       |             |       |       |     |    |      |    |     |     |      |     |
| 02/28/00                         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 0     | 0           | 0     | 0     | 0   | 0  | 0    | 0  | 0   | 0   | 0    | 0   |
| 03/06/00                         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 0     | 0           | 0     | 0     | 0   | 0  | 0    | 0  | 0   | 0   | 0    | 0   |
| 03/13/00                         | 70  | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 70    | 0           | 0     | 70    | 0   | 0  | 0    | 0  | 0   | 0   | 0    | 0   |
| 03/23/00                         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 0     | 0           | 0     | 0     | 0   | 0  | 0    | 0  | 0   | 0   | 0    | 0   |
| 03/29/00                         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 0     | 0           | 0     | 0     | 0   | 0  | 0    | 0  | 0   | 0   | 0    | 0   |
| 04/06/00                         | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 0     | 0           | 0     | 0     | 0   | 0  | 0    | 0  | 0   | 0   | 0    | 0   |
| Upper Peoria Lake EMP Area Total |     |   |     |     |     |     |     |       |    |      |    |     |     |    |    |     |    |     |          |       |             |       |       |     |    |      |    |     |     |      |     |
| 02/28/00                         | 550 | 50  | 0   | 0   | 0   | 0   | 0   | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 600   | 0           | 0     | 600   | 400 | 0  | 0    | 0  | 0   | 0   | 0    | 300 |
| 03/06/00                         | 15  | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 15    | 0           | 0     | 15    | 20  | 0  | 0    | 0  | 0   | 0   | 0    | 150 |
| 03/13/00                         | 820 | 100   | 0   | 0   | 0   | 0   | 0   | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 920   | 0           | 0     | 920   | 0   | 0  | 0    | 0  | 0   | 0   | 0    | 0   |
| 03/23/00                         | 25  | 0   | 0   | 0   | 0   | 0   | 0   | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 25    | 0           | 0     | 25    | 10  | 0  | 0    | 0  | 0   | 0   | 0    | 100 |
| 03/29/00                         | 0   | 0   | 0   | 0   | 600 | 0   | 0   | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 600   | 0           | 0     | 600   | 0   | 0  | 0    | 0  | 0   | 0   | 0    | 30  |
| 04/06/00                         | 25  | 0   | 0   | 0   | 360 | 0   | 100 | 0     | 0  | 0    | 0  | 0   | 0   | 0  | 0  | 0   | 0  | 0   | 0        | 485   | 0           | 0     | 485   | 0   | 0  | 0    | 0  | 0   | 0   | 0    | 95  |

# LAKE CHAUTAUQUA



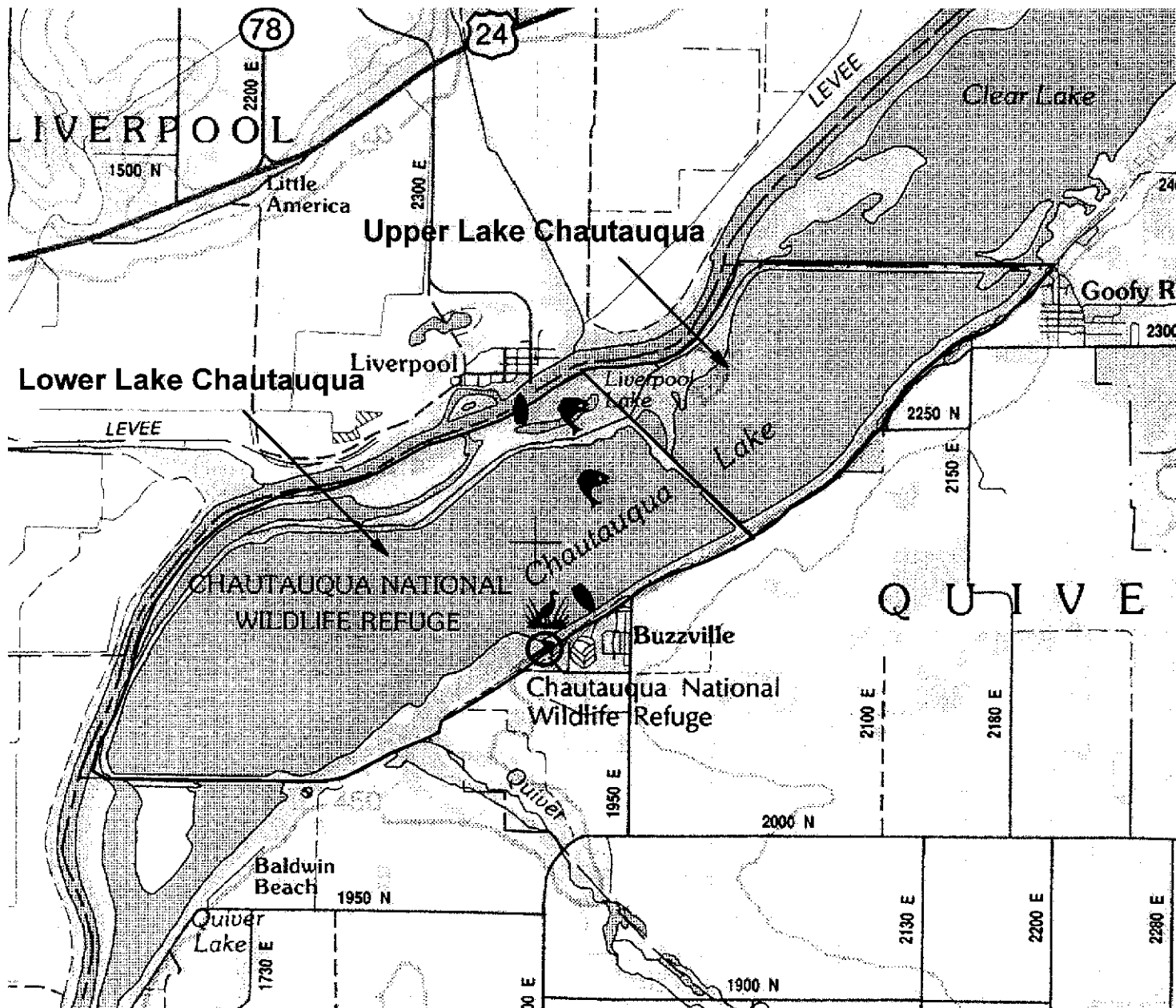


Figure 2. The Lake Chautauqua EMP site with boundaries drawn delineating the census area.

Table 9. Peak numbers of waterbirds aerially inventoried by the Illinois Natural History Survey at the Lake Chautauqua EMP site, fall 1999 and spring 2000<sup>a</sup>.

| Species                         | Upper<br>Chautauqua |              | Lower<br>Chautauqua |               | Total EMP Site |               |
|---------------------------------|---------------------|--------------|---------------------|---------------|----------------|---------------|
|                                 | Fall                | Spring       | Fall                | Spring        | Fall           | Spring        |
| <b>Dabbling ducks</b>           |                     |              |                     |               |                |               |
| Mallard                         | 1,900               | 200          | 108,900             | 49,500        | 109,320        | 49,540        |
| American black duck             | 100                 | 0            | 3,025               | 500           | 3,125          | 500           |
| Northern pintail                | 570                 | 0            | 16,100              | 6,600         | 16,100         | 6,600         |
| Blue-winged teal                | 6,650               | 400          | 6,600               | 500           | 6,650          | 600           |
| Green-winged teal               | 9,500               | 200          | 9,700               | 8,000         | 9,700          | 8,000         |
| American wigeon                 | 0                   | 0            | 1,500               | 200           | 1,500          | 200           |
| Gadwall                         | 25                  | 0            | 3,400               | 660           | 3,425          | 660           |
| Northern shoveler               | 380                 | 3,200        | 6,180               | 3,300         | 6,182          | 5,600         |
| All dabbling ducks              | 19,000              | 3,200        | 117,345             | 62,370        | 117,865        | 62,410        |
| <b>Diving ducks</b>             |                     |              |                     |               |                |               |
| Lesser & greater scaup          | 500                 | 2,500        | 500                 | 320           | 500            | 2,650         |
| Ring-necked duck                | 2,000               | 200          | 1,400               | 50            | 2,050          | 200           |
| Canvasback                      | 0                   | 200          | 600                 | 700           | 600            | 900           |
| Redhead                         | 0                   | 0            | 0                   | 0             | 0              | 0             |
| Ruddy duck                      | 600                 | 420          | 1,025               | 320           | 900            | 525           |
| Common goldeneye                | 0                   | 1,700        | 0                   | 900           | 0              | 2,600         |
| Bufflehead                      | 50                  | 0            | 255                 | 0             | 255            | 0             |
| All diving ducks                | 2,575               | 3,225        | 2,900               | 1,370         | 3,100          | 3,220         |
| <b>Mergansers</b>               |                     |              |                     |               |                |               |
| Common merganser                | 0                   | 600          | 0                   | 300           | 0              | 900           |
| Red-breasted merganser          | 0                   | 0            | 0                   | 0             | 0              | 0             |
| Hooded merganser                | 350                 | 25           | 20                  | 0             | 350            | 25            |
| All mergansers                  | 350                 | 620          | 20                  | 300           | 350            | 920           |
| <b>All ducks</b>                | <b>19,000</b>       | <b>6,100</b> | <b>120,245</b>      | <b>62,700</b> | <b>120,855</b> | <b>62,740</b> |
| <b>Geese</b>                    |                     |              |                     |               |                |               |
| Canada goose                    | 700                 | 110          | 9,700               | 750           | 9,775          | 860           |
| Snow goose                      | 0                   | 0            | 0                   | 400           | 0              | 400           |
| <b>American coot</b>            | <b>250</b>          | <b>3,500</b> | <b>8,700</b>        | <b>6,100</b>  | <b>8,730</b>   | <b>6,600</b>  |
| <b>Bald eagles</b>              |                     |              |                     |               |                |               |
| Adult                           | 9                   | 10           | 4                   | 25            | 9              | 35            |
| Immature                        | 10                  | 10           | 4                   | 24            | 12             | 34            |
| All eagles                      | 19                  | 20           | 7                   | 49            | 21             | 69            |
| <b>Double-crested cormorant</b> | <b>5,350</b>        | <b>900</b>   | <b>5</b>            | <b>320</b>    | <b>5,350</b>   | <b>1,020</b>  |
| <b>White pelican</b>            | <b>70</b>           | <b>0</b>     | <b>100</b>          | <b>50</b>     | <b>100</b>     | <b>50</b>     |

<sup>a</sup> The peak number for the entire site or groups of species may not represent the sum of the peaks for all the compartments or species because the peak numbers in the various compartments and species could have occurred on different flights.

Table 10. Peak numbers of waterbirds aerially inventoried by the Illinois Natural History Survey at the Lake Chautauqua EMP site during fall, 1991-1999.

| Species                         | 1991          | 1992          | 1993          | 1994           | 1995           | 1996          | 1997           | 1998           | 1999           |
|---------------------------------|---------------|---------------|---------------|----------------|----------------|---------------|----------------|----------------|----------------|
| <b>Dabbling ducks</b>           |               |               |               |                |                |               |                |                |                |
| Mallard                         | 17,500        | 58,000        | 12,430        | 320,300        | 165,000        | 23,000        | 199,200        | 78,000         | 109,320        |
| American black duck             | 400           | 1,000         | 300           | 2,400          | 3,000          | 900           | 6,200          | 2,400          | 3,125          |
| Northern pintail                | 1,550         | 4,000         | 500           | 20,000         | 10,500         | 3,500         | 20,700         | 11,350         | 16,100         |
| Blue-winged teal                | 320           | 3,900         | 0             | 5,800          | 9,700          | 6,100         | 9,850          | 4,820          | 6,650          |
| Green-winged teal               | 400           | 7,500         | 0             | 11,000         | 5,000          | 7,000         | 18,000         | 9,200          | 9,700          |
| American wigeon                 | 3,000         | 3,500         | 300           | 6,000          | 1,150          | 1,800         | 4,500          | 3,500          | 1,500          |
| Gadwall                         | 2,800         | 5,000         | 1,000         | 17,000         | 4,000          | 2,550         | 9,160          | 17,200         | 3,425          |
| Northern shoveler               | 0             | 0             | 0             | 15,000         | 2,100          | 2,000         | 2,000          | 5,310          | 6,182          |
| All dabbling ducks              | 21,855        | 76,840        | 14,030        | 368,800        | 180,600        | 39,900        | 225,720        | 105,660        | 117,865        |
| <b>Diving ducks</b>             |               |               |               |                |                |               |                |                |                |
| Lesser and greater scaup        | 600           | 300           | 600           | 1,000          | 0              | 900           | 1,500          | 4,850          | 500            |
| Ring-necked duck                | 100           | 2,300         | 1,200         | 5,000          | 400            | 300           | 6,200          | 5,000          | 2,050          |
| Canvasback                      | 425           | 125           | 800           | 4,000          | 500            | 0             | 3,300          | 1,600          | 600            |
| Redhead                         | 25            | 0             | 0             | 0              | 0              | 0             | 1,100          | 800            | 0              |
| Ruddy duck                      | 0             | 0             | 100           | 0              | 0              | 0             | 800            | 2,800          | 900            |
| Common goldeneye                | 4,120         | 4,200         | 450           | 0              | 100            | 0             | 25             | 0              | 0              |
| Bufflehead                      | 25            | 50            | 240           | 0              | 0              | 0             | 1,300          | 600            | 255            |
| All diving ducks                | 4,120         | 4,200         | 2,300         | 6,500          | 600            | 1,200         | 13,600         | 13,550         | 3,100          |
| <b>Mergansers</b>               |               |               |               |                |                |               |                |                |                |
| Common merganser                | 200           | 4,300         | 250           | 0              | 0              | 0             | 330            | 0              | 0              |
| Red-breasted merganser          | 0             | 0             | 0             | 0              | 0              | 0             | 0              | 0              | 0              |
| Hooded merganser                | 0             | 900           | 0             | 400            | 0              | 0             | 50             | 0              | 350            |
| All mergansers                  | 200           | 5,200         | 250           | 400            | 0              | 0             | 330            | 0              | 350            |
| <b>All ducks</b>                | <b>22,335</b> | <b>78,390</b> | <b>16,330</b> | <b>375,600</b> | <b>181,200</b> | <b>41,100</b> | <b>239,320</b> | <b>119,210</b> | <b>120,855</b> |
| <b>Geese</b>                    |               |               |               |                |                |               |                |                |                |
| Canada goose                    | 155           | 1,500         | 400           | 60,200         | 23,100         | 4,000         | 21,850         | 4,300          | 9,775          |
| Lesser snow goose               | 0             | 500           | 0             | 15,000         | 300            | 500           | 1,600          | 1,000          | 0              |
| <b>American coot</b>            | <b>4,300</b>  | <b>5,100</b>  | <b>1,225</b>  | <b>50,000</b>  | <b>6,900</b>   | <b>9,500</b>  | <b>19,000</b>  | <b>12,800</b>  | <b>8,730</b>   |
| <b>Bald eagles</b>              |               |               |               |                |                |               |                |                |                |
| Adult                           | 43            | 26            | 18            | 13             | 15             | 15            | 6              | 4              | 9              |
| Immature                        | 27            | 18            | 8             | 16             | 25             | 22            | 12             | 5              | 12             |
| All eagles                      | 70            | 44            | 26            | 29             | 40             | 37            | 17             | 7              | 21             |
| <b>Double-crested cormorant</b> | <b>810</b>    | <b>1,125</b>  | <b>590</b>    | <b>200</b>     | <b>130</b>     | <b>1,700</b>  | <b>180</b>     | <b>600</b>     | <b>5,350</b>   |
| <b>White pelican</b>            | <b>0</b>      | <b>0</b>      | <b>0</b>      | <b>0</b>       | <b>0</b>       | <b>300</b>    | <b>475</b>     | <b>200</b>     | <b>100</b>     |

Table 11. Peak numbers of waterbirds aerially inventoried by the Illinois Natural History Survey at the Upper Lake Chautauqua EMP site during fall, 1991-1999.

| Species                         | 1991  | 1992  | 1993 | 1994   | 1995  | 1996  | 1997  | 1998   | 1999   |
|---------------------------------|-------|-------|------|--------|-------|-------|-------|--------|--------|
| <b>Dabbling ducks</b>           |       |       |      |        |       |       |       |        |        |
| Mallard                         | 9,000 | 4,300 | 700  | 73,000 | 2,200 | 3,000 | 4,500 | 12,000 | 1,900  |
| American black duck             | 300   | 120   | 0    | 1,500  | 0     | 0     | 500   | 500    | 100    |
| Northern pintail                | 1,050 | 400   | 0    | 9,000  | 500   | 200   | 1,000 | 1,500  | 570    |
| Blue-winged teal                | 270   | 1,000 | 0    | 3,800  | 3,500 | 1,100 | 2,000 | 1,100  | 6,650  |
| Green-winged teal               | 400   | 5,500 | 0    | 6,000  | 2,000 | 3,000 | 5,000 | 5,000  | 9,500  |
| American wigeon                 | 500   | 200   | 50   | 5,000  | 650   | 100   | 200   | 600    | 0      |
| Gadwall                         | 1,000 | 0     | 0    | 6,000  | 0     | 200   | 300   | 9,000  | 25     |
| Northern shoveler               | 0     | 0     | 0    | 3,000  | 150   | 1,000 | 25    | 3,000  | 380    |
| All dabbling ducks              | 9,180 | 9,825 | 700  | 86,500 | 5,300 | 7,000 | 7,200 | 20,500 | 19,000 |
| <b>Diving ducks</b>             |       |       |      |        |       |       |       |        |        |
| Lesser and greater scaup        | 100   | 100   | 0    | 0      | 0     | 900   | 0     | 0      | 500    |
| Ring-necked duck                | 0     | 2,000 | 100  | 5,000  | 0     | 0     | 600   | 0      | 2000   |
| Canvasback                      | 100   | 0     | 0    | 0      | 0     | 0     | 0     | 0      | 0      |
| Redhead                         | 25    | 0     | 0    | 0      | 0     | 0     | 0     | 0      | 0      |
| Ruddy duck                      | 0     | 0     | 0    | 0      | 0     | 0     | 0     | 600    | 600    |
| Common goldeneye                | 625   | 1,300 | 50   | 0      | 0     | 0     | 0     | 0      | 0      |
| Bufflehead                      | 25    | 0     | 220  | 0      | 0     | 0     | 200   | 0      | 50     |
| All diving ducks                | 650   | 2,100 | 220  | 5,000  | 0     | 900   | 800   | 600    | 2575   |
| <b>Mergansers</b>               |       |       |      |        |       |       |       |        |        |
| Common merganser                | 50    | 500   | 150  | 0      | 0     | 0     | 30    | 0      | 0      |
| Red-breasted merganser          | 0     | 0     | 0    | 0      | 0     | 0     | 0     | 0      | 0      |
| Hooded merganser                | 0     | 0     | 0    | 200    | 0     | 0     | 0     | 0      | 350    |
| All mergansers                  | 50    | 500   | 150  |        | 0     | 0     | 30    | 0      | 350    |
| <b>All ducks</b>                | 9,180 | 9,825 | 800  | 87,500 | 5,300 | 7,900 | 7,200 | 20,500 | 19,000 |
| <b>Geese</b>                    |       |       |      |        |       |       |       |        |        |
| Canada goose                    | 130   | 300   | 300  | 5,000  | 1,000 | 1,450 | 1,150 | 1,870  | 700    |
| Lesser snow goose               | 0     | 0     | 0    | 700    | 0     | 200   | 600   | 400    | 0      |
| <b>American coot</b>            | 1,700 | 1,000 | 600  | 30,000 | 1,100 | 6,500 | 2,300 | 500    | 250    |
| <b>Bald eagles</b>              |       |       |      |        |       |       |       |        |        |
| Adult                           | 9     | 14    | 11   | 3      | 2     | 14    | 2     | 2      | 9      |
| Immature                        | 13    | 11    | 6    | 4      | 2     | 21    | 1     | 5      | 10     |
| All eagles                      | 22    | 25    | 17   | 7      | 4     | 35    | 3     | 7      | 19     |
| <b>Double-crested cormorant</b> | 710   | 105   | 425  | 200    | 130   | 1,700 | 180   | 600    | 5,350  |
| <b>White pelican</b>            | 0     | 0     | 0    | 0      | 0     | 300   | 475   | 200    | 70     |

Table 12. Peak numbers of waterbirds aerially inventoried by the Illinois Natural History Survey at the Lower Lake Chautauqua EMP site during fall, 1991-1999.

| Species                         | 1991          | 1992          | 1993          | 1994           | 1995           | 1996          | 1997           | 1998          | 1999           |
|---------------------------------|---------------|---------------|---------------|----------------|----------------|---------------|----------------|---------------|----------------|
| <b>Dabbling ducks</b>           |               |               |               |                |                |               |                |               |                |
| Mallard                         | 16,000        | 56,000        | 12,400        | 320,000        | 164,000        | 20,000        | 198,200        | 64,300        | 108,900        |
| American black duck             | 320           | 1,000         | 300           | 2,000          | 3,000          | 900           | 5,700          | 2,400         | 3,025          |
| Northern pintail                | 500           | 4,000         | 500           | 20,000         | 10,000         | 3,500         | 20,600         | 9,850         | 16,100         |
| Blue-winged teal                | 270           | 3,100         | 0             | 3,200          | 6,200          | 5,000         | 9,400          | 4,020         | 6,600          |
| Green-winged teal               | 250           | 4,800         | 0             | 8,000          | 5,000          | 4,000         | 13,000         | 5,000         | 9,700          |
| American wigeon                 | 3,000         | 3,500         | 300           | 5,000          | 700            | 1,800         | 4,500          | 3,500         | 1,500          |
| Gadwall                         | 2,400         | 5,000         | 1,000         | 11,000         | 4,000          | 2,500         | 9,160          | 8,200         | 3,400          |
| Northern shoveler               | 0             | 0             | 0             | 15,000         | 2,000          | 1,800         | 2,000          | 3,000         | 6,180          |
| All dabbling ducks              | 21,720        | 74,800        | 14,000        | 368,500        | 178,500        | 32,900        | 224,720        | 85,160        | 117,345        |
| <b>Diving ducks</b>             |               |               |               |                |                |               |                |               |                |
| Lesser and greater scaup        | 600           | 300           | 600           | 1,000          | 0              | 0             | 1,500          | 4,850         | 500            |
| Ring-necked duck                | 100           | 1,100         | 1,200         | 3,000          | 400            | 300           | 5,500          | 5,000         | 1,400          |
| Canvasback                      | 425           | 125           | 800           | 4,000          | 500            | 0             | 3,300          | 1,600         | 600            |
| Redhead                         | 0             | 0             | 0             | 0              | 0              | 0             | 1,100          | 800           | 0              |
| Ruddy duck                      | 0             | 0             | 100           | 0              | 0              | 0             | 800            | 2,800         | 1,025          |
| Common goldeneye                | 3,620         | 4,000         | 400           | 0              | 100            | 0             | 25             | 0             | 0              |
| Bufflehead                      | 0             | 50            | 20            | 0              | 0              | 0             | 1,100          | 600           | 255            |
| All diving ducks                | 3,620         | 4,000         | 2,300         | 6,500          | 600            | 300           | 12,800         | 13,550        | 2,900          |
| <b>Mergansers</b>               |               |               |               |                |                |               |                |               |                |
| Common merganser                | 200           | 4,300         | 100           | 0              | 0              | 0             | 300            | 0             | 0              |
| Red-breasted merganser          | 0             | 0             | 0             | 0              | 0              | 0             | 0              | 0             | 0              |
| Hooded merganser                | 0             | 900           | 0             | 300            | 0              | 0             | 50             | 0             | 20             |
| All mergansers                  | 200           | 5,200         | 100           | 300            | 0              | 0             | 300            | 0             | 20             |
| <b>All ducks</b>                | <b>22,420</b> | <b>75,750</b> | <b>16,300</b> | <b>375,300</b> | <b>179,100</b> | <b>33,200</b> | <b>237,520</b> | <b>98,710</b> | <b>120,245</b> |
| <b>Geese</b>                    |               |               |               |                |                |               |                |               |                |
| Canada goose                    | 100           | 1,500         | 300           | 60,000         | 23,000         | 3,900         | 21,540         | 3,500         | 9,700          |
| Lesser snow goose               | 0             | 500           | 0             | 15,000         | 300            | 500           | 1,600          | 1,000         | 0              |
| <b>American coot</b>            | <b>3,500</b>  | <b>4,500</b>  | <b>1,000</b>  | <b>45,000</b>  | <b>6,000</b>   | <b>3,000</b>  | <b>19,000</b>  | <b>12,300</b> | <b>8,700</b>   |
| <b>Bald eagles</b>              |               |               |               |                |                |               |                |               |                |
| Adult                           | 36            | 12            | 7             | 13             | 15             | 4             | 5              | 2             | 4              |
| Immature                        | 16            | 7             | 2             | 16             | 25             | 2             | 12             | 2             | 4              |
| All eagles                      | 52            | 19            | 9             | 29             | 40             | 6             | 17             | 4             | 7              |
| <b>Double-crested cormorant</b> | <b>400</b>    | <b>1,050</b>  | <b>300</b>    | <b>50</b>      | <b>0</b>       | <b>400</b>    | <b>0</b>       | <b>50</b>     | <b>5</b>       |
| <b>White pelican</b>            | <b>0</b>      | <b>0</b>      | <b>0</b>      | <b>0</b>       | <b>0</b>       | <b>0</b>      | <b>5</b>       | <b>10</b>     | <b>100</b>     |

Table 13. Peak numbers of waterbirds aerially inventoried by the Illinois Natural History Survey at the Lake Chautauqua EMP site during spring, 1992-2000.

| Species                         | 1992          | 1993         | 1994         | 1995          | 1996          | 1997         | 1998          | 1999          | 2000          |
|---------------------------------|---------------|--------------|--------------|---------------|---------------|--------------|---------------|---------------|---------------|
| <b>Dabbling ducks</b>           |               |              |              |               |               |              |               |               |               |
| Mallard                         | 10,450        | 700          | 1,400        | 12,600        | 52,000        | 1,300        | 2,000         | 14,650        | 49,540        |
| American black duck             | 30            | 0            | 0            | 200           | 100           | 0            | 40            | 800           | 500           |
| Northern pintail                | 20            | 0            | 0            | 3,200         | 10,000        | 0            | 150           | 1,500         | 6,600         |
| Blue-winged teal                | 350           | 0            | 0            | 800           | 1,700         | 0            | 0             | 0             | 600           |
| Green-winged teal               | 125           | 0            | 0            | 5,100         | 8,800         | 0            | 100           | 200           | 8,000         |
| American wigeon                 | 300           | 50           | 25           | 3,400         | 0             | 0            | 50            | 0             | 200           |
| Gadwall                         | 0             | 30           | 0            | 5,000         | 250           | 0            | 50            | 100           | 660           |
| Northern shoveler               | 300           | 0            | 0            | 6,700         | 1,000         | 0            | 50            | 1,620         | 5,600         |
| All dabbling ducks              | 10,650        | 750          | 1,400        | 25,300        | 63,900        | 1,300        | 2,110         | 16,040        | 62,410        |
| <b>Diving ducks</b>             |               |              |              |               |               |              |               |               |               |
| Lesser and greater scaup        | 6,800         | 250          | 200          | 600           | 3,000         | 1,100        | 5,500         | 1,500         | 2,650         |
| Ring-necked duck                | 2,000         | 500          | 0            | 1,500         | 1,000         | 900          | 3,600         | 2,050         | 200           |
| Canvasback                      | 4,300         | 2,400        | 300          | 1,000         | 6,500         | 200          | 3,000         | 500           | 900           |
| Redhead                         | 0             | 0            | 0            | 0             | 0             | 0            | 100           | 25            | 0             |
| Ruddy duck                      | 0             | 0            | 0            | 0             | 0             | 0            | 400           | 1,100         | 525           |
| Common goldeneye                | 250           | 2,550        | 350          | 100           | 50            | 0            | 50            | 120           | 2,600         |
| Bufflehead                      | 0             | 0            | 0            | 0             | 0             | 0            | 0             | 155           | 0             |
| All diving ducks                | 11,450        | 3,100        | 500          | 1,700         | 8,000         | 1,500        | 10,500        | 3,400         | 3,220         |
| <b>Mergansers</b>               |               |              |              |               |               |              |               |               |               |
| Common merganser                | 50            | 875          | 800          | 4,500         | 500           | 900          | 200           | 2,300         | 900           |
| Red-breasted merganser          | 0             | 0            | 0            | 0             | 0             | 0            | 0             | 0             | 0             |
| Hooded merganser                | 0             | 0            | 0            | 0             | 0             | 0            | 0             | 10            | 25            |
| All mergansers                  | 50            | 875          | 800          | 4,500         | 500           | 900          | 200           | 2,300         | 920           |
| <b>All ducks</b>                | <b>22,100</b> | <b>3,625</b> | <b>2,400</b> | <b>25,950</b> | <b>72,400</b> | <b>3,300</b> | <b>11,350</b> | <b>19,440</b> | <b>62,740</b> |
| <b>Geese</b>                    |               |              |              |               |               |              |               |               |               |
| Canada goose                    | 55            | 525          | 25           | 9,200         | 20,000        | 325          | 125           | 1,645         | 860           |
| Lesser snow goose               | 0             | 0            | 25           | 0             | 500           | 0            | 510           | 0             | 400           |
| <b>American coot</b>            | <b>4,800</b>  | <b>250</b>   | <b>350</b>   | <b>5,500</b>  | <b>0</b>      | <b>400</b>   | <b>650</b>    | <b>1,700</b>  | <b>6,600</b>  |
| <b>Bald eagles</b>              |               |              |              |               |               |              |               |               |               |
| Adult                           | 10            | 9            | 20           | 19            | 8             | 25           | 18            | 70            | 35            |
| Immature                        | 6             | 5            | 10           | 20            | 4             | 23           | 8             | 27            | 34            |
| All eagles                      | 16            | 14           | 24           | 39            | 12            | 48           | 26            | 97            | 69            |
| <b>Double-crested cormorant</b> | <b>125</b>    | <b>150</b>   | <b>545</b>   | <b>10</b>     | <b>0</b>      | <b>10</b>    | <b>35</b>     | <b>785</b>    | <b>1,020</b>  |
| <b>White pelican</b>            | <b>0</b>      | <b>0</b>     | <b>0</b>     | <b>0</b>      | <b>40</b>     | <b>60</b>    | <b>5</b>      | <b>275</b>    | <b>50</b>     |

Table 14. Peak numbers of waterbirds aerially inventoried by the Illinois Natural History Survey at the Upper Lake Chautauqua EMP site during spring, 1992-2000.

| Species                         | 1992         | 1993         | 1994       | 1995          | 1996         | 1997         | 1998         | 1999         | 2000         |
|---------------------------------|--------------|--------------|------------|---------------|--------------|--------------|--------------|--------------|--------------|
| <b>Dabbling ducks</b>           |              |              |            |               |              |              |              |              |              |
| Mallard                         | 650          | 50           | 150        | 5,200         | 2,000        | 900          | 900          | 350          | 200          |
| American black duck             | 10           | 0            | 0          | 200           | 0            | 0            | 10           | 40           | 0            |
| Northern pintail                | 0            | 0            | 0          | 2,700         | 0            | 0            | 20           | 0            | 0            |
| Blue-winged teal                | 0            | 0            | 0          | 500           | 200          | 0            | 0            | 0            | 400          |
| Green-winged teal               | 0            | 0            | 0          | 5,000         | 800          | 0            | 30           | 200          | 200          |
| American wigeon                 | 0            | 0            | 25         | 1,600         | 0            | 0            | 0            | 0            | 0            |
| Gadwall                         | 0            | 0            | 0          | 4,000         | 0            | 0            | 0            | 20           | 0            |
| Northern shoveler               | 70           | 0            | 0          | 5,000         | 50           | 0            | 50           | 1,620        | 3,200        |
| All dabbling ducks              | 650          | 50           | 150        | 15,700        | 2,000        | 900          | 1,010        | 1,620        | 3,225        |
| <b>Diving ducks</b>             |              |              |            |               |              |              |              |              |              |
| Lesser and greater scaup        | 3,000        | 150          | 0          | 100           | 0            | 50           | 300          | 900          | 2,500        |
| Ring-necked duck                | 500          | 225          | 5          | 0             | 0            | 0            | 100          | 150          | 200          |
| Canvasback                      | 500          | 200          | 0          | 0             | 0            | 30           | 0            | 0            | 200          |
| Redhead                         | 0            | 0            | 0          | 0             | 0            | 0            | 0            | 0            | 0            |
| Ruddy duck                      | 0            | 0            | 0          | 0             | 0            | 0            | 0            | 800          | 420          |
| Common goldeneye                | 200          | 2,550        | 100        | 0             | 50           | 0            | 10           | 0            | 1,700        |
| Bufflehead                      | 0            | 0            | 0          | 0             | 0            | 0            | 0            | 155          | 0            |
| All diving ducks                | 4,000        | 2,775        | 100        | 100           | 50           | 80           | 400          | 1,400        | 3,225        |
| <b>Mergansers</b>               |              |              |            |               |              |              |              |              |              |
| Common merganser                | 50           | 800          | 600        | 25            | 0            | 900          | 0            | 200          | 600          |
| Red-breasted merganser          | 0            | 0            | 0          | 0             | 0            | 0            | 0            | 0            | 0            |
| Hooded merganser                | 0            | 0            | 0          | 0             | 0            | 0            | 0            | 0            | 25           |
| All mergansers                  | 50           | 800          | 600        | 25            | 0            | 900          | 0            | 200          | 620          |
| <b>All ducks</b>                | <b>4,450</b> | <b>3,625</b> | <b>750</b> | <b>15,700</b> | <b>2,000</b> | <b>1,800</b> | <b>1,020</b> | <b>1,990</b> | <b>6,100</b> |
| <b>Geese</b>                    |              |              |            |               |              |              |              |              |              |
| Canada goose                    | 25           | 500          | 0          | 5,800         | 10           | 125          | 115          | 1,645        | 110          |
| Lesser snow goose               | 0            | 0            | 0          | 0             | 0            | 0            | 0            | 0            | 0            |
| <b>American coot</b>            | <b>1,000</b> | <b>250</b>   | <b>25</b>  | <b>1,000</b>  | <b>0</b>     | <b>100</b>   | <b>120</b>   | <b>600</b>   | <b>3,500</b> |
| <b>Bald eagles</b>              |              |              |            |               |              |              |              |              |              |
| Adult                           | 7            | 5            | 11         | 6             | 4            | 11           | 9            | 5            | 10           |
| Immature                        | 6            | 3            | 9          | 7             | 3            | 14           | 3            | 3            | 10           |
| All eagles                      | 13           | 8            | 14         | 13            | 5            | 25           | 10           | 7            | 20           |
| <b>Double-crested cormorant</b> | <b>30</b>    | <b>40</b>    | <b>200</b> | <b>10</b>     | <b>0</b>     | <b>0</b>     | <b>10</b>    | <b>750</b>   | <b>900</b>   |
| <b>White pelican</b>            | <b>0</b>     | <b>0</b>     | <b>0</b>   | <b>0</b>      | <b>0</b>     | <b>0</b>     | <b>5</b>     | <b>60</b>    | <b>0</b>     |

Table 15. Peak numbers of waterbirds aerially inventoried by the Illinois Natural History Survey at the Lower Lake Chautauqua EMP site during spring, 1992-2000.

| Species                         | 1992          | 1993         | 1994         | 1995          | 1996          | 1997         | 1998          | 1999          | 2000          |
|---------------------------------|---------------|--------------|--------------|---------------|---------------|--------------|---------------|---------------|---------------|
| <b>Dabbling ducks</b>           |               |              |              |               |               |              |               |               |               |
| Mallard                         | 10,000        | 700          | 1,400        | 7,400         | 50,000        | 400          | 1,650         | 14,650        | 49,500        |
| American black duck             | 25            | 0            | 0            | 200           | 100           | 0            | 30            | 800           | 500           |
| Northern pintail                | 20            | 0            | 0            | 1,100         | 10,000        | 0            | 150           | 1,500         | 6,600         |
| Blue-winged teal                | 350           | 0            | 0            | 800           | 1,700         | 0            | 0             | 0             | 500           |
| Green-winged teal               | 125           | 0            | 0            | 900           | 8,000         | 0            | 100           | 200           | 8,000         |
| American wigeon                 | 300           | 50           | 0            | 1,800         | 0             | 0            | 50            | 0             | 200           |
| Gadwall                         | 0             | 30           | 0            | 1,000         | 250           | 0            | 50            | 100           | 660           |
| Northern shoveler               | 300           | 0            | 0            | 1,700         | 1,000         | 0            | 30            | 1,620         | 3,300         |
| All dabbling ducks              | 10,200        | 750          | 1,400        | 9,600         | 61,900        | 400          | 1,790         | 16,040        | 62,370        |
| <b>Diving ducks</b>             |               |              |              |               |               |              |               |               |               |
| Lesser and greater scaup        | 4,000         | 200          | 200          | 600           | 3,000         | 1,100        | 5,500         | 1,500         | 320           |
| Ring-necked duck                | 1,900         | 500          | 0            | 1,500         | 1,000         | 900          | 3,500         | 2,050         | 50            |
| Canvasback                      | 4,000         | 2,400        | 300          | 1,000         | 6,500         | 200          | 3,000         | 500           | 700           |
| Redhead                         | 0             | 0            | 0            | 0             | 0             | 0            | 100           | 25            | 0             |
| Ruddy duck                      | 0             | 0            | 0            | 0             | 0             | 0            | 400           | 1,100         | 320           |
| Common goldeneye                | 50            | 200          | 250          | 100           | 0             | 0            | 50            | 120           | 900           |
| Bufflehead                      | 0             | 0            | 0            | 0             | 0             | 0            | 0             | 155           | 0             |
| All diving ducks                | 9,900         | 3,100        | 500          | 1,600         | 8,000         | 1,500        | 10,500        | 3,400         | 1,370         |
| <b>Mergansers</b>               |               |              |              |               |               |              |               |               |               |
| Common merganser                | 0             | 750          | 700          | 4,500         | 500           | 490          | 200           | 2,300         | 300           |
| Red-breasted merganser          | 0             | 0            | 0            | 0             | 0             | 0            | 0             | 0             | 0             |
| Hooded merganser                | 0             | 0            | 0            | 0             | 0             | 0            | 0             | 10            | 0             |
| All mergansers                  | 0             | 750          | 700          | 4,500         | 500           | 490          | 200           | 2,300         | 300           |
| <b>All ducks</b>                | <b>17,650</b> | <b>3,400</b> | <b>2,400</b> | <b>12,300</b> | <b>70,400</b> | <b>1,500</b> | <b>11,350</b> | <b>19,440</b> | <b>62,700</b> |
| <b>Geese</b>                    |               |              |              |               |               |              |               |               |               |
| Canada goose                    | 30            | 25           | 25           | 3,400         | 20,000        | 200          | 50            | 1,645         | 750           |
| Lesser snow goose               | 0             | 0            | 25           | 0             | 500           | 0            | 510           | 0             | 400           |
| <b>American coot</b>            | <b>3,800</b>  | <b>0</b>     | <b>325</b>   | <b>4,500</b>  | <b>0</b>      | <b>300</b>   | <b>530</b>    | <b>1,700</b>  | <b>6,100</b>  |
| <b>Bald eagles</b>              |               |              |              |               |               |              |               |               |               |
| Adult                           | 3             | 4            | 9            | 19            | 4             | 14           | 9             | 70            | 25            |
| Immature                        | 1             | 2            | 4            | 18            | 3             | 9            | 7             | 27            | 24            |
| All eagles                      | 4             | 6            | 10           | 37            | 7             | 23           | 16            | 97            | 49            |
| <b>Double-crested cormorant</b> | <b>105</b>    | <b>150</b>   | <b>400</b>   | <b>0</b>      | <b>0</b>      | <b>10</b>    | <b>25</b>     | <b>785</b>    | <b>320</b>    |
| <b>White pelican</b>            | <b>0</b>      | <b>0</b>     | <b>0</b>     | <b>0</b>      | <b>40</b>     | <b>60</b>    | <b>0</b>      | <b>275</b>    | <b>50</b>     |



Table 14. Peak numbers of waterbirds aerially inventoried by the Illinois Natural History Survey at the Upper Lake Chautauqua EMP site during spring, 1992-2000.

| Species                         | 1992         | 1993         | 1994       | 1995          | 1996         | 1997         | 1998         | 1999         | 2000         |
|---------------------------------|--------------|--------------|------------|---------------|--------------|--------------|--------------|--------------|--------------|
| <b>Dabbling ducks</b>           |              |              |            |               |              |              |              |              |              |
| Mallard                         | 650          | 50           | 150        | 5,200         | 2,000        | 900          | 900          | 350          | 200          |
| American black duck             | 10           | 0            | 0          | 200           | 0            | 0            | 10           | 40           | 0            |
| Northern pintail                | 0            | 0            | 0          | 2,700         | 0            | 0            | 20           | 0            | 0            |
| Blue-winged teal                | 0            | 0            | 0          | 500           | 200          | 0            | 0            | 0            | 400          |
| Green-winged teal               | 0            | 0            | 0          | 5,000         | 800          | 0            | 30           | 200          | 200          |
| American wigeon                 | 0            | 0            | 25         | 1,600         | 0            | 0            | 0            | 0            | 0            |
| Gadwall                         | 0            | 0            | 0          | 4,000         | 0            | 0            | 0            | 20           | 0            |
| Northern shoveler               | 70           | 0            | 0          | 5,000         | 50           | 0            | 50           | 1,620        | 3,200        |
| All dabbling ducks              | 650          | 50           | 150        | 15,700        | 2,000        | 900          | 1,010        | 1,620        | 3,225        |
| <b>Diving ducks</b>             |              |              |            |               |              |              |              |              |              |
| Lesser and greater scaup        | 3,000        | 150          | 0          | 100           | 0            | 50           | 300          | 900          | 2,500        |
| Ring-necked duck                | 500          | 225          | 5          | 0             | 0            | 0            | 100          | 150          | 200          |
| Canvasback                      | 500          | 200          | 0          | 0             | 0            | 30           | 0            | 0            | 200          |
| Redhead                         | 0            | 0            | 0          | 0             | 0            | 0            | 0            | 0            | 0            |
| Ruddy duck                      | 0            | 0            | 0          | 0             | 0            | 0            | 0            | 800          | 420          |
| Common goldeneye                | 200          | 2,550        | 100        | 0             | 50           | 0            | 10           | 0            | 1,700        |
| Bufflehead                      | 0            | 0            | 0          | 0             | 0            | 0            | 0            | 155          | 0            |
| All diving ducks                | 4,000        | 2,775        | 100        | 100           | 50           | 80           | 400          | 1,400        | 3,225        |
| <b>Mergansers</b>               |              |              |            |               |              |              |              |              |              |
| Common merganser                | 50           | 800          | 600        | 25            | 0            | 900          | 0            | 200          | 600          |
| Red-breasted merganser          | 0            | 0            | 0          | 0             | 0            | 0            | 0            | 0            | 0            |
| Hooded merganser                | 0            | 0            | 0          | 0             | 0            | 0            | 0            | 0            | 25           |
| All mergansers                  | 50           | 800          | 600        | 25            | 0            | 900          | 0            | 200          | 620          |
| <b>All ducks</b>                | <b>4,450</b> | <b>3,625</b> | <b>750</b> | <b>15,700</b> | <b>2,000</b> | <b>1,800</b> | <b>1,020</b> | <b>1,990</b> | <b>6,100</b> |
| <b>Geese</b>                    |              |              |            |               |              |              |              |              |              |
| Canada goose                    | 25           | 500          | 0          | 5,800         | 10           | 125          | 115          | 1,645        | 110          |
| Lesser snow goose               | 0            | 0            | 0          | 0             | 0            | 0            | 0            | 0            | 0            |
| <b>American coot</b>            | <b>1,000</b> | <b>250</b>   | <b>25</b>  | <b>1,000</b>  | <b>0</b>     | <b>100</b>   | <b>120</b>   | <b>600</b>   | <b>3,500</b> |
| <b>Bald eagles</b>              |              |              |            |               |              |              |              |              |              |
| Adult                           | 7            | 5            | 11         | 6             | 4            | 11           | 9            | 5            | 10           |
| Immature                        | 6            | 3            | 9          | 7             | 3            | 14           | 3            | 3            | 10           |
| All eagles                      | 13           | 8            | 14         | 13            | 5            | 25           | 10           | 7            | 20           |
| <b>Double-crested cormorant</b> | <b>30</b>    | <b>40</b>    | <b>200</b> | <b>10</b>     | <b>0</b>     | <b>0</b>     | <b>10</b>    | <b>750</b>   | <b>900</b>   |
| <b>White pelican</b>            | <b>0</b>     | <b>0</b>     | <b>0</b>   | <b>0</b>      | <b>0</b>     | <b>0</b>     | <b>5</b>     | <b>60</b>    | <b>0</b>     |

Table 16. Waterbird aerial inventory data for each individual flight for the Lake Chautauqua EMP site, fall 1999.

|                       | MALLARD | BLK   | PNT    | BWT   | GWT   | WIG   | GAD   | SH    | SCAUP | RN    | CNVB | RH | RDY   | GLD | BH  | CM | RBM | HM      | DABLERS | TOTAL  | TOTAL   | TOTAL | DUCKS  | CG    | SG | COOT | AD | BALD EAGLES |      |       |       |     |   |   |   |
|-----------------------|---------|-------|--------|-------|-------|-------|-------|-------|-------|-------|------|----|-------|-----|-----|----|-----|---------|---------|--------|---------|-------|--------|-------|----|------|----|-------------|------|-------|-------|-----|---|---|---|
|                       |         |       |        |       |       |       |       |       |       |       |      |    |       |     |     |    |     |         |         |        |         |       |        |       |    |      |    | TOT         | CORM | PEI   |       |     |   |   |   |
| Upper Lake Chautauqua |         |       |        |       |       |       |       |       |       |       |      |    |       |     |     |    |     |         |         |        |         |       |        |       |    |      |    |             |      |       |       |     |   |   |   |
| 09/01/99              | 0       | 0     | 0      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 0       | 0       | 0      | 0       | 0     | 0      | 0     | 0  | 1    | 0  | 1           | 405  | 0     |       |     |   |   |   |
| 09/07/99              | 0       | 0     | 0      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 0       | 0       | 0      | 0       | 0     | 0      | 0     | 0  | 1    | 0  | 1           | 500  | 70    |       |     |   |   |   |
| 09/14/99              | 1,900   | 0     | 570    | 6,650 | 9,500 | 0     | 0     | 380   | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 0       | 0       | 19,000 | 0       | 0     | 19,000 | 100   | 0  | 0    | 50 | 1           | 0    | 1,500 | 50    |     |   |   |   |
| 10/04/99              | 0       | 0     | 0      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 0       | 0       | 0      | 0       | 0     | 0      | 0     | 0  | 0    | 0  | 0           | 0    | 4,100 | 0     |     |   |   |   |
| 10/19/99              | 100     | 0     | 25     | 0     | 0     | 0     | 0     | 100   | 0     | 0     | 0    | 0  | 100   | 0   | 0   | 0  | 0   | 0       | 0       | 225    | 100     | 0     | 325    | 25    | 0  | 30   | 1  | 1           | 2    | 5,350 | 0     |     |   |   |   |
| 10/25/99              | 325     | 0     | 0      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0  | 600   | 0   | 0   | 0  | 0   | 0       | 0       | 325    | 600     | 0     | 925    | 425   | 0  | 200  | 0  | 0           | 0    | 50    | 10    |     |   |   |   |
| 11/03/99              | 100     | 0     | 0      | 0     | 0     | 0     | 25    | 0     | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 0       | 125     | 0      | 0       | 125   | 700    | 0     | 1  | 0    | 0  | 0           | 0    | 150   | 0     |     |   |   |   |
| 11/08/99              | 50      | 30    | 0      | 0     | 50    | 0     | 0     | 0     | 0     | 0     | 0    | 0  | 325   | 0   | 0   | 0  | 40  | 130     | 325     | 40     | 495     | 0     | 0      | 200   | 0  | 0    | 0  | 0           | 200  | 0     | 0     |     |   |   |   |
| 11/15/99              | 50      | 0     | 0      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0  | 450   | 0   | 0   | 0  | 350 | 50      | 450     | 350    | 850     | 510   | 0      | 250   | 0  | 0    | 0  | 0           | 0    | 0     | 0     |     |   |   |   |
| 11/22/99              | 100     | 0     | 0      | 0     | 0     | 0     | 0     | 25    | 500   | 2,000 | 0    | 0  | 75    | 0   | 0   | 0  | 0   | 125     | 2,575   | 0      | 2,700   | 200   | 0      | 0     | 2  | 0    | 2  | 0           | 0    | 0     | 0     | 0   |   |   |   |
| 11/30/99              | 200     | 0     | 200    | 0     | 0     | 0     | 0     | 0     | 50    | 900   | 0    | 0  | 110   | 0   | 50  | 0  | 20  | 400     | 1,110   | 20     | 1,530   | 80    | 0      | 50    | 1  | 0    | 1  | 0           | 0    | 0     | 0     | 0   |   |   |   |
| 12/06/99              | 100     | 0     | 0      | 0     | 0     | 0     | 0     | 0     | 50    | 0     | 0    | 0  | 50    | 0   | 0   | 0  | 145 | 100     | 100     | 145    | 345     | 75    | 0      | 30    | 1  | 1    | 2  | 0           | 0    | 0     | 0     | 0   |   |   |   |
| 12/14/99              | 420     | 100   | 0      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0  | 50    | 0   | 0   | 0  | 40  | 520     | 50      | 40     | 610     | 225   | 0      | 25    | 3  | 3    | 6  | 0           | 0    | 0     | 0     | 0   |   |   |   |
| 12/21/99              | 0       | 0     | 0      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 0       | 0       | 0      | 0       | 0     | 0      | 0     | 0  | 9    | 10 | 19          | 0    | 0     | 0     | 0   |   |   |   |
| 01/05/00              | 200     | 0     | 0      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 200     | 0       | 0      | 200     | 100   | 0      | 0     | 0  | 1    | 1  | 2           | 0    | 0     | 0     | 0   | 0 |   |   |
| Lower Lake Chautauqua |         |       |        |       |       |       |       |       |       |       |      |    |       |     |     |    |     |         |         |        |         |       |        |       |    |      |    |             |      |       |       |     |   |   |   |
| 09/01/99              | 730     | 0     | 0      | 6,600 | 820   | 0     | 0     | 0     | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 0       | 8,150   | 0      | 8,150   | 135   | 0      | 0     | 0  | 0    | 0  | 0           | 0    | 5     | 50    | 0   | 0 |   |   |
| 09/07/99              | 1,230   | 0     | 250    | 6,535 | 4,160 | 0     | 0     | 0     | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 0       | 12,175  | 0      | 12,175  | 250   | 0      | 0     | 0  | 0    | 0  | 0           | 0    | 0     | 25    | 0   | 0 | 0 |   |
| 09/14/99              | 0       | 0     | 0      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 0       | 0       | 0      | 0       | 0     | 0      | 0     | 0  | 0    | 0  | 0           | 0    | 0     | 0     | 0   | 0 |   |   |
| 10/04/99              | 7,025   | 0     | 6,463  | 1,000 | 7,620 | 200   | 300   | 6,182 | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 0       | 28,790  | 0      | 28,790  | 2,265 | 0      | 1,715 | 0  | 0    | 0  | 0           | 0    | 0     | 0     | 100 | 0 | 0 |   |
| 10/19/99              | 17,500  | 150   | 15,100 | 0     | 8,200 | 1,500 | 1,500 | 3,000 | 0     | 0     | 0    | 0  | 50    | 0   | 0   | 0  | 0   | 46,950  | 50      | 0      | 47,000  | 3,500 | 0      | 8,700 | 0  | 0    | 0  | 0           | 0    | 0     | 0     | 0   | 0 | 0 |   |
| 10/25/99              | 29,800  | 960   | 7,240  | 0     | 4,800 | 1,300 | 1,600 | 2,100 | 0     | 0     | 0    | 0  | 300   | 0   | 0   | 0  | 0   | 47,800  | 300     | 0      | 48,100  | 1,500 | 0      | 6,500 | 1  | 0    | 1  | 0           | 1    | 0     | 0     | 0   | 0 | 0 |   |
| 11/03/99              | 23,000  | 400   | 12,000 | 0     | 2,500 | 500   | 3,400 | 0     | 100   | 0     | 25   | 0  | 1,025 | 0   | 0   | 0  | 0   | 41,800  | 1,150   | 0      | 42,950  | 2,000 | 0      | 2     | 1  | 0    | 1  | 0           | 1    | 0     | 0     | 0   | 0 | 0 |   |
| 11/08/99              | 19,600  | 490   | 14,700 | 0     | 7,350 | 490   | 1,470 | 980   | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 45,080  | 0       | 0      | 45,080  | 1,280 | 0      | 3,000 | 0  | 1    | 1  | 0           | 0    | 0     | 0     | 0   | 0 | 0 |   |
| 11/15/99              | 42,700  | 1,830 | 5,100  | 0     | 1,500 | 0     | 2,550 | 1,020 | 500   | 1,020 | 510  | 0  | 255   | 0   | 255 | 0  | 0   | 54,700  | 2,540   | 0      | 57,240  | 1,720 | 0      | 1,530 | 4  | 2    | 6  | 0           | 0    | 0     | 0     | 0   | 0 | 0 |   |
| 11/22/99              | 24,700  | 920   | 16,100 | 0     | 4,900 | 0     | 900   | 2,300 | 0     | 50    | 350  | 0  | 125   | 0   | 0   | 0  | 20  | 49,820  | 525     | 20     | 50,365  | 1,000 | 0      | 800   | 1  | 0    | 1  | 0           | 0    | 0     | 50    | 0   | 0 | 0 |   |
| 11/30/99              | 34,500  | 920   | 6,900  | 0     | 2,300 | 0     | 600   | 800   | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 46,020  | 0       | 0      | 46,020  | 1,830 | 0      | 800   | 4  | 2    | 6  | 0           | 0    | 0     | 0     | 0   | 0 | 0 |   |
| 12/06/99              | 70,810  | 1,940 | 2,000  | 0     | 9,700 | 400   | 2,000 | 0     | 0     | 200   | 100  | 0  | 200   | 0   | 0   | 0  | 0   | 86,850  | 500     | 0      | 87,350  | 9,700 | 0      | 0     | 4  | 1    | 5  | 0           | 25   | 0     | 0     | 0   | 0 | 0 |   |
| 12/14/99              | 108,900 | 3,025 | 2,420  | 0     | 1,200 | 0     | 1,200 | 600   | 450   | 1,400 | 600  | 0  | 450   | 0   | 0   | 0  | 0   | 117,345 | 2,900   | 0      | 120,245 | 4,600 | 0      | 300   | 4  | 3    | 7  | 0           | 0    | 0     | 0     | 0   | 0 | 0 |   |
| 12/21/99              | 0       | 0     | 0      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 0       | 0       | 0      | 0       | 0     | 0      | 0     | 0  | 2    | 2  | 0           | 0    | 0     | 0     | 0   | 0 |   |   |
| 01/05/00              | 8,500   | 0     | 0      | 0     | 0     | 0     | 0     | 0     | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 8,500   | 0       | 0      | 8,500   | 2,200 | 0      | 0     | 3  | 4    | 7  | 0           | 0    | 0     | 0     | 0   | 0 | 0 |   |
| Lake Chautauqua Total |         |       |        |       |       |       |       |       |       |       |      |    |       |     |     |    |     |         |         |        |         |       |        |       |    |      |    |             |      |       |       |     |   |   |   |
| 09/01/99              | 730     | 0     | 0      | 6,600 | 820   | 0     | 0     | 0     | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 0       | 8,150   | 0      | 8,150   | 135   | 0      | 0     | 0  | 0    | 1  | 0           | 1    | 410   | 50    | 0   | 0 | 0 |   |
| 09/07/99              | 1,230   | 0     | 250    | 6,535 | 4,160 | 0     | 0     | 0     | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 0       | 12,175  | 0      | 12,175  | 250   | 0      | 0     | 0  | 0    | 1  | 0           | 1    | 500   | 95    | 0   | 0 | 0 |   |
| 09/14/99              | 1,900   | 0     | 570    | 6,650 | 9,500 | 0     | 0     | 380   | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 0       | 19,000  | 0      | 19,000  | 100   | 0      | 50    | 1  | 0    | 1  | 0           | 1    | 1,500 | 50    | 0   | 0 | 0 |   |
| 10/04/99              | 7,025   | 0     | 6,463  | 1,000 | 7,620 | 200   | 300   | 6,182 | 0     | 0     | 0    | 0  | 0     | 0   | 0   | 0  | 0   | 0       | 28,790  | 0      | 28,790  | 2,265 | 0      | 1,715 | 0  | 0    | 0  | 0           | 0    | 0     | 4,100 | 100 | 0 | 0 | 0 |
| 10/19/99              | 17,600  | 150   | 15,125 | 0     | 8,200 | 1,500 | 1,500 | 3,100 | 0     | 0     | 0    | 0  | 150   | 0   | 0   | 0  | 0   | 47,175  | 150     | 0      | 47,325  | 3,525 | 0      | 8,730 | 1  | 1    | 2  | 5,350       | 0    | 0     | 0     | 0   | 0 | 0 |   |
| 10/25/99              | 30,125  | 960   | 7,240  | 0     | 4,800 | 1,300 | 1,600 | 2,100 | 0     | 0     | 0    | 0  | 900   | 0   | 0   | 0  | 0   | 48,125  | 900     | 0      | 49,025  | 1,925 | 0      | 6,700 | 1  | 0    | 1  | 0           | 1    | 50    | 10    | 0   | 0 | 0 |   |
| 11/03/99              | 23,100  | 400   | 12,000 | 0     | 2,500 | 500   | 3,425 | 0     | 100   | 0     | 25   | 0  | 300   | 0   | 0   | 0  | 0   | 41,925  | 425     | 0      | 42,350  | 2,700 | 0      | 3     | 1  | 0    | 1  | 0           | 1    | 150   | 0     | 0   | 0 | 0 |   |
| 11/08/99              | 19,650  | 520   | 14,700 | 0     | 7,400 | 490   | 1,470 | 980   | 0     | 0     | 0    | 0  | 325   | 0   | 0   | 0  | 40  | 45,210  | 325     | 40     | 45,575  | 1,280 | 0      | 3,200 | 0  | 1    | 1  | 200         | 0    | 0     | 0     | 0   | 0 | 0 |   |
| 11/15/99              | 42,750  | 1,830 | 5,100  | 0     | 1,500 | 0     | 2,550 | 1,020 | 500   | 1,020 | 510  | 0  | 705   | 0   | 255 | 0  | 0   | 54,750  | 2,990   | 350    | 58,090  | 2,230 | 0      | 1,780 | 4  | 2    | 6  | 0           | 0    | 0     | 0     | 0   | 0 | 0 |   |
| 11/22/99              | 24,800  | 920   | 16,100 | 0     | 4,900 | 0     | 900   | 2,325 | 500   | 2,050 | 350  | 0  | 200   | 0   | 0   | 0  | 20  | 49,945  | 3,100   | 20     | 53,065  | 1,200 | 0      | 800   | 3  | 0    | 3  | 0           | 30   | 0     | 50    | 0   | 0 | 0 |   |
| 11/30/99              | 34,700  | 920   | 7,100  | 0     | 2,300 | 0     | 600   | 800   | 0     | 50    | 900  | 0  | 110   | 0   | 50  | 0  | 0   | 46,420  | 1,110   | 20     | 47,550  | 1,910 | 0      | 850   | 5  | 2    | 7  | 0           | 0    | 0     | 0     | 0   | 0 | 0 |   |
| 12/06/99              | 70,910  | 1,940 | 2,000  | 0     | 9,700 | 400   | 2,000 | 0     | 50    | 200   | 100  | 0  | 250   | 0   | 0   | 0  | 145 | 86,950  | 600     | 145    | 87,695  | 9,775 | 0      | 30    | 5  | 2    | 7  | 0           | 0    | 25    | 0     | 0   | 0 | 0 | 0 |
| 12/14/99              | 109,320 | 3,125 | 2,420  | 0     | 1,200 | 0     |       |       |       |       |      |    |       |     |     |    |     |         |         |        |         |       |        |       |    |      |    |             |      |       |       |     |   |   |   |

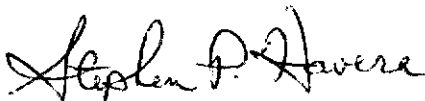
Table 17. Waterbird aerial inventory data for each individual flight for the Lake Chautauqua EMP site, spring 2000.

| MALLARD               | BLK | PNT | BWT | GWT | WIG | GAD | SH | SCAUP | RN | CNVB | RH | RDY | GLD | BH | CM | RBM | HM | DABBLERS | TOTAL |       |       |       | BALD EAGLES |    |      |    |     |     |      |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| Upper Lake Chautauqua |     |     |     |     |     |     |    |       |    |      |    |     |     |    |    |     |    |          |       |       |       |       |             |    |      |    |     |     |      |     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

### Literature Cited

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