



# ILLINOIS NATURAL HISTORY SURVEY

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24 August 2007

Mr. Ray Marshalla  
Waterfowl Program Manager  
Illinois Department of Natural Resources  
One Natural Resources Way  
Springfield, IL 62702

Dear Ray:

Enclosed please find five copies of the Annual Performance Report for W-43-R-54.

Sincerely,

Joshua D. Stafford, Ph.D.  
Director, F.C. Bellrose Waterfowl Research Center

Enclosure

c: Dr. Michael Douglas



# Illinois Department of Natural Resources

One Natural Resources Way • Springfield, Illinois 62702-1271  
http://dnr.state.il.us

Rod R. Blagojevich, Governor  
Sam Flood, Acting Director

## Research Permit IDNR-Owned or Managed Site Permit # SS06-29

Dr. Joshua Stafford is authorized to conduct research at sites listed in the attachment for the purpose of estimating abundance of moist-soil plant seeds for waterfowl forage and evaluating vegetation quality for remaining managed moist-soil habitats.

Subject to any attached terms and conditions. Attachments: Yes \_\_\_ No X

By: C. S. Flood Date: 06/13/06

Permit Expires On: December 31, 2006

\*Site Superintendent: [Signature] SAST Date: 8-21-06

[Signature] Date: 9/5/06

[Signature] Date: 06 SEP 06

The holder of this permit is subject to the State Parks Act [20 ILCS 835/6] and Title 17 of the Illinois Administrative Code Part 110.70.

This permit may be modified, suspended, or revoked by the Department at any time.

The holder of this permit shall submit an annual report to the Department including the following information:\*\*

1. Names of facilities visited and dates of visits.
2. Number of specimens and species collected or handled by date and area.
3. Disposition of specimens.
4. Types, dates and locations of disturbances made on state areas.

The permit holder shall provide the Department with copies or reprints of theses or publications derived from this research.

\* Research on a DNR-owned or managed site is allowed only with the approval of the Site Superintendent. The signature of the Site Superintendent must be obtained before the initiation of research.

**\*\*New permits or renewals will not be approved until this requirement is met.**

Ed West 9/15/06 Anderson Lake FWA

Boyz Jelles 9/15/06

Mike Keselub 25 Sept 06 Donnelly

Tom W. Cobin 26/Sept 2006

Joey Shuntz 10-2-06 Horseshoe Lake  
Alex Co.

Jim Waycub 10/3/06 Cache River  
State Natural Area

Orvis J 10/3/06 Meeney Lake FWA



# ILLINOIS NATURAL HISTORY SURVEY

## T E C H N I C A L   R E P O R T

### Aerial Inventories of Waterfowl in Illinois & Estimation of Moist-soil Plant Seed Abundance for Waterfowl on Lands Managed by Illinois Department of Natural Resources

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## **Executive Summary**

### STUDY 105: AERIAL INVENTORIES OF WATERFOWL IN ILLINOIS

#### **Objectives**

- 1) Inventory waterfowl and American coots along the Illinois and central Mississippi rivers during fall migration using light aircraft.
- 2) Compute use-days and peak abundances for observed species.
- 3) Provide general inference regarding the distribution of waterfowl in space and time.
- 4) Compare these data to recent and long-term averages.
- 5) Summarize and distribute these data for parties of interest.

Job 105.1: Inventories of waterfowl along the Illinois and central Mississippi rivers during fall and winter.

We completed 12 weekly aerial inventories of the Illinois (IRV; Hennepin south to Grafton) and central Mississippi river valleys (CMRV; Grafton north to New Boston) between September 2006 and January 2007.

We considered fall 2006 habitat conditions for waterfowl in the IRV average. Waterfowl habitat conditions in the CMRV appeared above average, with abundant forage on many refuges.

Peak abundance of total ducks inventoried in the IRV and CMRV was lower in 2006 than 2005. In the IRV, total duck abundance peaked on 27 November; this estimate was 35% less than the 2005 peak, and 26% below the most recent 5-year average (2000, 2002–2005; hereafter, 5-year average). The peak abundance of total ducks in the CMRV during fall 2006 also occurred on 27 November, representing a 45% decrease from 2005 and 23% less than the 5-year average.

## STUDY 106: ESTIMATION OF MOIST-SOIL PLANT SEED ABUNDANCE FOR WATERFOWL ON PUBLIC LANDS IN ILLINOIS

### Objectives

- 1) Estimate abundance of moist-soil plant seeds in managed habitats at 8-10 sites owned by the state of Illinois.
- 2) Visually evaluate vegetation quality of managed moist-soil areas not sampled to estimate seed production at selected sites.
- 3) Summarize our findings and distribute them to site managers, biologists, and other interested parties.
- 4) Provide management recommendations to help maximize seed production.
- 5) Conduct a workshop for state employees to present concepts of moist-soil management and relate previous findings to ongoing management of public lands.
- 6) Estimate foraging carrying capacity of managed moist-soil habitats for waterfowl in Illinois.
- 7) Draw conclusions relevant to regional waterfowl conservation planning.

Job 106.1: Estimation of moist-soil plant seed abundance for waterfowl on lands managed by Illinois Department of Natural Resources.

We assembled a comprehensive list of Illinois Department of Natural Resources (IDNR) managed lands with moist-soil wetlands using literature (Havera 1999*b*, Willms and Wieda 2002) and interviews of IDNR waterfowl program staff and district wildlife habitat biologists. When possible we randomly selected 2 moist-soil wetlands at each of 10 waterfowl management areas to sample moist-soil plant seeds. At sites with >2 moist-soil areas, we visually estimated quality of vegetation in impoundments not sampled.

We sampled vegetation at 15 randomly allocated locations within each moist-soil wetland. We estimated above- and below-ground seed biomass by extracting a soil

core in standing vegetation at each sample point (Manley et al. 2004, Stafford et al. 2006). We washed core samples through a graduated series of 2-3 sieves (Penny 2003, Greer 2004, Reinecke and Hartke 2005), separated seed heads and seeds from plant debris, and dried for 24 hr at 87°C (Manley et al. 2004, Stafford et al. 2006). We classified seeds as large (i.e., wild millet) or small (i.e., pigweed) depending on retention by sieves. We separated large seeds from debris manually and weighed using an electronic balance, whereas we subsampled and weighed a portion (~2.5% by mass) of small seed samples to estimate biomass.

We used biomass data from core samples to estimate overall moist-soil plant seed abundance (lbs/ac) and foraging carrying capacity for waterfowl (duck-use days; DUD). Mean seed biomass among moist-soil areas ranged from 170.2–1,339.6 lbs/ac, and DUDs varied from 660.4–5,197.5 DUDs/ac. Our overall estimate of moist-soil plant seed biomass was relatively precise ( $484.3 \pm 85.2$  lbs/ac; CV = 17.6%), equaling 1,879.3 DUDs/ac.

We rated vegetation quality in managed wetlands average in 62% of the non-sampled wetlands. We considered 2 managed units exceptional in vegetation quality and 5 units below average, but none were ranked “poor” in quality.



## **Acknowledgements**

Project W-43-R was supported by the Federal Aid in Wildlife Restoration Act (Pittman-Robertson), with funds administered by the U.S. Fish and Wildlife Service and the Illinois Department of Natural Resources. Chuck Holzwarth and Roger Bock of C&L Holzwarth, Inc. provided aerial support for this project. Ray Marshalla, John Buhnerkempe, and Dan Holm advised the project. Drs. Matt Gray (University of Tennessee), Rick Kaminski (Mississippi State University), and Ken Reinecke (United States Geological Survey) provided information and materials for moist-soil sampling and workshop

## **Disclaimer**

Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the authors and do not necessarily reflect the views of the U.S. Fish and Wildlife Service or Illinois Department of Natural Resources.

ANNUAL REPORT – FY 2007  
Illinois Waterfowl Surveys and Investigations  
Federal Aid in Wildlife Restoration  
W-43-R-54

STUDY 105: AERIAL INVENTORIES OF WATERFOWL IN ILLINOIS

Job 105.1: Inventories of waterfowl along the Illinois and central Mississippi rivers during fall and winter.

OBJECTIVES

- 1) Inventory waterfowl and American coots along the Illinois and central Mississippi rivers during fall migration using light aircraft.
- 2) Compute use-days and peak abundances for observed species.
- 3) Provide general inference regarding the distribution of waterfowl in space and time.
- 4) Compare these data to recent and long-term averages.
- 5) Summarize and distribute these data for parties of interest.

The Illinois Natural History Survey (INHS) has conducted aerial inventories of waterfowl for the State of Illinois along the Illinois and Mississippi rivers since 1948 and for selected reservoirs and power plant cooling lakes since the 1970s. During fall 2006, we aerially inventoried 23 species of wetland birds (Table 1) at 22 locations on the Illinois River and 16 locations on the central Mississippi River (Figure 1).

We completed 12 weekly aerial inventories during fall 2006 beginning in September of the Illinois River valley (IRV; Hennepin south to Grafton) and central Mississippi River valley (CMRV; Grafton north to New Boston). Inventory dates were: 6 and 14 September; 19 and 24 October; 1, 8, 22, and 27 November; 13, 18, and 26 December; and 2 January (Appendix 1). Flights on 18 and 25 September, 13 November, and 4 December were incomplete or cancelled due to inclement weather.

One observer conducted all inventories from a single engine, fixed-wing aircraft flying at an altitude of 200–450 feet and 100–150 miles per hour.

Though not as dramatic as 2005, drought influenced the 2006 growing season, allowing some floodplain wetlands to partially or completely dewater, consolidate substrates, and grow moist-soil vegetation. Compared with previous years, waterfowl foraging habitat was average in the IRV. Illinois River water levels at Havana, IL fell below 432.0 ft. msl (7.6 ft.) by 17 June and remained below this stage until 14 September (U.S. Army Corps of Engineers 2007) allowing an 89-day growing season; similar conditions were observed in the upper Illinois River which experienced a 92-day growing season (Figure 2).

This long growing season was tempered by wetland management at many sites in the IRV. Several refuges did not completely dewater wetlands in efforts to control encroachment of woody plants or for other management practices, specifically Big Lake (Fulton County), Goose Lake (Fulton County), Chautauqua National Wildlife Refuge (NWR), and Stewart Lake. On the other hand, some sites with abundant waterfowl forage (Emiquon Preserve, Big Lake [Brown County], Spunky Bottoms) were nearly dry (< 10% inundated) throughout fall migration.

Duck abundance peaked in the IRV on 27 November (Figure 3), just prior to a record snow storm in Illinois on 30 November. Cold weather ensued, and many IRV wetlands were partially to completely frozen until 18 December. However, warmer weather in mid-December thawed many floodplain wetlands, and only trace amounts of ice were recorded in late December and early January. Despite this late-season thaw, duck abundance was <35% of the peak estimate during remaining surveys.

We considered waterfowl habitat in the central Mississippi River valley (CMRV) above average. Great amounts of forage were present on many refuges, especially the state-managed Mississippi River Area near the confluence of the Illinois and Mississippi rivers. Conversely, we observed decreased area of moist-soil vegetation on Swan Lake, part of Two Rivers NWR. Large areas of this important waterfowl refuge near the mouth of the Illinois River were not dewatered during summer 2006 in order to enhance fish populations. Consequently, the abundance of waterfowl forage was below average for this site. The area of submerged aquatic vegetation (SAV) in Pool 19 of the Mississippi River was above average, and comparison of aerial photos indicated SAV beds were 22% larger during summer 2006 than 2005. Additionally, most of the surveyed areas and refuges of the CMRV had >75% of their wetlands flooded by mid-October.

Similar to the IRV, duck abundance peaked on 27 November in the CMRV, shortly before many areas froze in early December. Warmer weather in mid-December thawed most areas, and only trace amounts of ice were observed after the 13 December survey. Nevertheless, duck abundance remained <50% of the peak estimate for the remainder of the surveys.

Peak abundance of total ducks inventoried in both river systems was less in 2006 than 2005. In 2006, peak abundance of total ducks in the IRV was 262,050 (Figure 3); this estimate was 35% less than the 2005 peak (402,535) and 26% lower than the most recent five-year average of 352,449 (2000, 2002–2005; hereafter, 5-year average; Table 2). Total duck abundance peaked in the CMRV at 298,545 (Figure 4) (45% lower than 2005; 23% less than the 5-year average; Table 2). The peak abundance estimate

of total ducks for the two river systems combined (560,595) was 39% lower than 2005 and 22% lower than the 5-year average (Table 2).

In the IRV, peak abundance estimates of all dabbling duck species inventoried in 2006 were lower than 2005, with the exceptions of blue-winged (+26%) and green-winged teal (+179%). The peak estimate of total dabbling ducks (245,385) was 35% less than the 2005 estimate (379,960) and 26% lower than the 5-year average (Table 2). Similarly, peak abundance of all dabbling duck species in the CMRV was 38% lower in 2006 (229,170) than 2005 (370,185), and 21% below the 5-year average (289,799). Peak abundance estimates of all species of dabbling ducks (excluding blue-winged [+383%] and green-winged teal [+65%]) inventoried in the CMRV were lower in 2006 than 2005 (Table 2).

Diving duck abundance in the IRV peaked on 27 November in 2006 at 16,585 (51% less than 2005; 40% below the 5-year average). Peak abundance estimates of all species of diving ducks, with the exception of canvasbacks (+100%), were lower in 2006 than 2005 (Table 2).

Excepting common goldeneyes (+12%), abundance estimates of all diving duck species inventoried in the CMRV were lower in 2006 than 2005. CMRV abundance estimates for lesser scaup and canvasbacks were both 48% lower in 2006 than 2005, and 28% and 12% lower, respectively, than the 5-year averages (Table 2).

Use-day (i.e., bird use per day extrapolated for the period 1 September – 15 December) estimates for total ducks in the IRV and CMRV were lower in 2006 than 2005 (-14% and -22%, respectively; Table 3). In the IRV, estimated use-days for 3 of 8 dabbling duck species were greater in 2006 than 2005 (northern pintail [+5%], blue-

winged teal [+4%], and green-winged teal [+58%]; Table 3). Use-day estimates for 2 of 8 dabbling duck species in the CMRV also were greater in 2006 than 2005 (blue-winged teal [+239%] and green-winged teal [+71%]; Table 3).

Estimated use-days by diving ducks decreased for all species in the IRV during 2006, excepting canvasbacks (+6%). Likewise, in the CMRV, estimated use-days in 2006 were lower than 2005 for all diving duck species except canvasbacks (+3%) and ruddy ducks (+36%) (Table 3).

## STUDY 106: ESTIMATION OF MOIST-SOIL PLANT SEED ABUNDANCE FOR WATERFOWL ON PUBLIC LANDS IN ILLINOIS

Job 106.1: Estimation of moist-soil plant seed abundance for waterfowl on lands managed by Illinois Department of Natural Resources.

### Objectives

- 1) Estimate abundance of moist-soil plant seeds in managed habitats at 8-10 sites owned by the state of Illinois.
- 2) Visually evaluate vegetation quality of managed moist-soil areas not sampled to estimate seed production at selected sites.
- 3) Summarize our findings and distribute them to site managers, biologists, and other interested parties.
- 4) Provide management recommendations to help maximize seed production.
- 5) Conduct a short course for state employees to present concepts of moist-soil management and relate previous findings to ongoing management of public lands.
- 6) Estimate foraging carrying capacity of managed moist-soil habitats for waterfowl in Illinois.
- 7) Draw conclusions relevant to regional waterfowl conservation planning.

Illinois contains critical habitats for spring- and fall-migrating and wintering waterfowl. The nearly 30 species of resident and migratory ducks, geese, and swans common to this region are ecologically important as predators and prey, and economically important to Illinois for hunting and viewing opportunities. In fact, the 2001 National Survey of Hunting, Fishing, and Wildlife Associated Recreation reported Illinois residents spend nearly \$1.1 billion annually on hunting and wildlife watching activities. Further, contemporary waterfowl management in North America requires reliable data on the status and distribution of waterfowl and their habitats throughout the annual cycle. Thus, investigations of breeding, migrating, and wintering waterfowl in Illinois are

critical to guide conservation planning and harvest management at local, regional, and continental scales.

Providing quality waterfowl foraging habitats in key migrational regions may promote good body condition prior to arrival at wintering areas (Fredrickson and Drobney 1979, Reid et al. 1989) and during spring migration (Heitmeyer 1985, LaGrange 1985). In the mid-continent region of the United States, Illinois represents a particularly important ecoregion for migrating and wintering waterfowl. Historically, much of the Illinois and Mississippi river floodplains were dominated by mast-producing bottomland hardwoods [e.g., pin oak (*Quercus palustris*)], moist-soil areas, emergent marsh, and open-water habitats (Bellrose et al. 1983, Havera et al. 1995, Havera 1999a). These bottomlands flooded seasonally, providing vast, high quality foraging habitat for spring- and fall- migrating waterfowl. Indeed, INHS personnel counted 1.5 million mallards in the IRV on November 22, 1948 (Havera et al. 1995, Havera 1999a). However, as with much of the continental U.S., a great percentage of Illinois' natural wetlands were drained for agriculture during the 20th century (Havera 1999a). Exacerbating wetland loss, many remaining wetlands have been further degraded or lack productivity due to extensive sedimentation, colonization by invasive plants (e.g., willow [*Salix* spp.] and cocklebur [*Xanthium strumarium*]) and animals (e.g., common carp [*Cyprinus carpio*]), or lack of water control to promote emergent vegetation (Bellrose et al. 1983, Havera 1999a).

Despite these landscape-scale modifications, much of Illinois remains critical habitat for migrating waterfowl annually (Upper Mississippi River and Great Lakes Region Joint Venture [UMRGLRJV] Board 1998, Havera 1999a). Specifically, peak



abundance of ducks in the IRV averaged 391,000 (range 163,000–720,000) during 1993–2003 (based on aerial inventories; M.M. Horath, INHS, pers. comm.).

Additionally, the UMRGLRJV of the North American Waterfowl Management Plan specifically relies on the IRV and other migratory focus areas in Illinois to provide energetic requirements for 227 million waterfowl use-days during a 30-day fall migration period (UMRGLRJV Board 1998).

Managed moist-soil habitats are wetlands where water conditions, vegetation, and/or seed banks are manipulated to encourage growth of seed-producing vegetation (Low and Bellrose 1944, Fredrickson and Taylor 1982). Moist-soil management is employed throughout the U.S. to provide managed habitats for waterfowl and other waterbirds that are rich in food resources. Because much of Illinois contains critical habitat for migrating waterfowl, it is not surprising that moist-soil management is a common waterfowl management practice in the state. However, manipulating water levels and seed banks requires active management, and managers may not have resources to evaluate success of their management practices. Many Illinois Department of Natural Resources (IDNR) sites practice moist-soil management, yet their combined contribution to foraging carrying capacity for waterfowl is not known. Thus, need exists to estimate moist-soil plant seed abundance and generally evaluate quality of moist-soil habitats on public lands in Illinois to guide resource management at local and regional scales.

Moist-soil management is an effective strategy to provide quality foraging habitat for migrating and wintering waterfowl (Low and Bellrose 1944, Fredrickson and Taylor 1982, Reinecke et al. 1989, Kaminski et al. 2003). For example, research in the

Mississippi Alluvial Valley (MAV) documented significantly more forage in moist-soil habitats than harvested croplands (Reinecke and Loesch 1996, Penny 2003, Reinecke and Hartke 2005). Additionally, waterfowl densities may be greater on moist-soil wetlands than flooded croplands, possibly indicating preference for these habitats (Reinecke et al. 1992, Twedt and Nelms 1999). Finally, moist-soil plant seeds provide essential amino acids not found in crop foods (Loesch and Kaminski 1989) and have average true metabolizable energy values similar to agricultural seeds (Checkett et al. 2002, Kaminski et al. 2003).

Although moist-soil wetlands are important foraging habitats for waterfowl in Illinois, we are unaware of contemporary estimates of seed production and carrying capacity for moist-soil wetlands applicable to this large region. These data are needed to evaluate moist-soil management practices in Illinois. Additionally, such information is critical to evaluate waterfowl habitat conservation and restoration success relative to goals and objectives outlined by the NAWMP (UMRGLRJV Board 1998). Therefore, we designed this study to estimate plant seed abundance in managed moist-soil areas on public managed lands in Illinois.

## **Methods**

We assembled a comprehensive list of IDNR managed lands with moist-soil wetlands using literature (Havera 1999*b*, Willms and Wieda 2002) and interviews of IDNR waterfowl program staff and district wildlife habitat biologists. We subsequently interviewed IDNR site-superintendents regarding moist-soil management practices, and at some waterfowl management areas, conducted site visits to identify moist-soil wetlands.

We randomly selected 10 waterfowl management areas from the comprehensive list using the SURVEYSELECT procedure in SAS v9.1.3 (SAS Institute 1999). We desired estimates of seed abundance and foraging carrying capacity on managed wetlands relevant at the statewide scale. We selected 2 moist-soil units (wetlands) from those available at each site, excepting Anderson Lake and Glades – 12 Mile Island State Fish and Wildlife areas (SFWA) which only had one moist-soil wetland. For sites with >2 moist-soil areas, we visually estimated the quality of vegetation in impoundments not sampled using a 5-point scale (1 = poor, 2 = below average, 3 = average, 4 = above average, 5 = excellent). We ranked vegetation quality based on estimated seed yield, species diversity, and waterfowl food quality (Bellrose 1941, Bellrose and Anderson 1943).

To allocate samples, we measured moist-soil impoundments along their greatest length using ESRI® ArcMap™ v9.1 and divided them into 6 equidistant segments allowing spacing of 5 transects (i.e., north-south or east-west lines). We designated the impoundment perimeter as the foot of the levee (ideally) or point at which plant species composition transitioned into non-woody hydrophytes. Then, we allocated 3 sampling locations along transects by selecting distances between 1–100 m from a random numbers table and alternated transect endpoints on opposite sides of the wetland perimeter. Therefore, we sampled vegetation at 15 locations (3 samples x 5 transects) per managed moist-soil wetland.

We estimated above- and below-ground seed biomass by extracting a 10-cm diameter x 5-cm depth core in standing vegetation at each sample location (Manley et al. 2004, Stafford et al. 2006). Thus, our samples included seeds in standing

vegetation, seeds that had already fallen, and below-ground seeds (i.e., seed bank). We placed core samples in individually labeled bags and froze them until processing. Prior to sorting, we thawed core samples at room temperature and soaked them in a 3% solution of hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) for 3-12 hr to dissolve clays (Bohm 1979:117).

We washed samples with water through a graduated series of 2-3 sieves (mesh sizes 18 [1.00 mm], 35 [500 µm], and 60 [250 µm]), depending on the quantity of vegetative material present (Penny 2003, Greer 2004, Reinecke and Hartke 2005). We separated seed heads and seeds from plant debris and dried for 24 hr at 87°C (Manley et al. 2004, Stafford et al. 2006). We threshed dried materials over a second series of 5 sieves (mesh sizes 14 [1.40 mm], 18 [1.00 mm], 35 [500 µm], 45 [355 µm], and 60 [250 µm]) to further separate seeds from debris (Greer 2004). We classified seeds as large if they were retained by the ≥35 sieve (e.g., largeseed smartweed [*Polygonum pennsylvanicum*], millets [*Echinochloa* spp.], and beggarticks [*Bidens* spp.]) and small if they remained in the 45 or 60 sieves (e.g., sprangletop [*Leptochloa fascicularis*], pigweed [*Amaranthus* spp.], and teal grass [*Eragrostis hypnoides*]). We separated large seeds from debris by hand. Sorting small seeds was time consuming; thus, we subsampled a portion (~2.5% by mass) of the small seed sample to estimate biomass. For example, if a sample weighed 100 g after removal of large seeds, we would hand-separate small seeds from 2.5 g of material. The percent composition of seeds and debris in the subsample was multiplied by the small-seed sample mass (e.g., 100 g) to extrapolate total small seed abundance in the core. We combined small and large seed masses to estimate total seed biomass per core. Both large and small seeds were weighed (±0.1 mg) using an electronic balance.

We used biomass data from core samples to estimate overall moist-soil plant seed abundance (lbs/ac; dry mass) using the SURVEYMEANS procedure in SAS v9.1.3 (SAS Institute 1999). This procedure accounted for different selection probabilities of sampled moist-soil areas and cores. For example, larger moist-soil areas contain more sampling points (e.g., cores or frames) and, therefore, contribute disproportionately to moist-soil abundance at a large scale. We used PROC MEANS in SAS v9.1.3 to estimate moist-soil seed abundance for different impoundments within sites weighted by impoundment size (ac).

We used seed abundance values to estimate foraging carrying capacity for waterfowl in duck-use days (DUD), defined as the number of days an area of land could support a mallard-sized duck (Reinecke et al. 1989). Our DUD calculations assumed an average true metabolizable energy of 2.5 kcal/g for moist-soil plant seeds (Kaminski et al. 2003). Average daily energy expenditure of a mallard was assumed to be 292 kcal/day (Prince 1979, Reinecke et al. 1989).

## **Results**

We compiled a list of 32 IDNR managed lands with moist-soil management capabilities (Table 4). These sites were distributed throughout the state (Region 1, 8 sites; Region 2, 3 sites; Region 3, 1 site; Region 4, 12 sites; and Region 5, 8 sites).

Our randomly selected IDNR sites (n=10) were: Anderson Lake; Donnelley; Glades – 12 Mile Island; Godar, Diamond and Hurricane Islands, and Michael's Landing; Horseshoe Lake; Marshall; Mermet; and Sanganois State Fish and Wildlife areas; Horseshoe Lake State Park; and Cache River State Natural Area. We collected and processed 270 core samples from 18 moist-soil wetlands at these sites.

Mean seed biomass at moist-soil areas ranged from  $170.2 \pm 68.2$  to  $1,339.6 \pm 238.3$  lbs/ac, and DUDs varied from  $660.4 \pm 264.4$  DUDs/ac to  $5,197.5 \pm 924.4$  DUDs/ac (Table 5). Our estimate of moist-soil plant seed biomass across all sites was relatively precise ( $484.3 \pm 85.2$  lbs/ac; CV = 17.6%), equating to 1,879.3 DUDs/ac. In contrast, our 2005 estimate of moist-soil plant seed abundance was nearly double ( $919.8 \pm 57.3$  lbs/ac) the 2006 estimate (Table 6). We attributed most of the difference between years to fewer small seeds ( $158.9 \pm 36.3$  lbs/ac) in 2006 samples, although large-seed yields were similar between years (Table 6).

We qualitatively evaluated vegetation in managed moist-soil areas not sampled at IDNR waterfowl management areas. Four of 10 (40%) sites had >2 wetland areas managed for moist-soil vegetation (Table 7). Vegetation quality in managed wetlands was variable; however, we rated wetland vegetation  $\geq 3$  of 5 (average) in 8 of 13 (62%) units (Table 7). Managed units of exceptional quality (score = 5) included the Middle Island area at Horseshoe Lake SFWA and River Swale at Sanganois SFWA. Both units had  $\geq 9$  quality plant species per impoundment in rank stands sometimes exceeding 6 ft tall and contained few undesirable species (i.e., cocklebur, bur cucumber [*Sicyos angulatus*]). We ranked 5 (38%) units below average (score = 2), and none were rated poor (score = 1) in vegetation quality. Reasons for below average ranks were generally due to undesirable or woody species invasions, low plant species diversity, dominance by perennial instead of annual vegetation, or stem densities dominated by species considered low-quality waterfowl forage.

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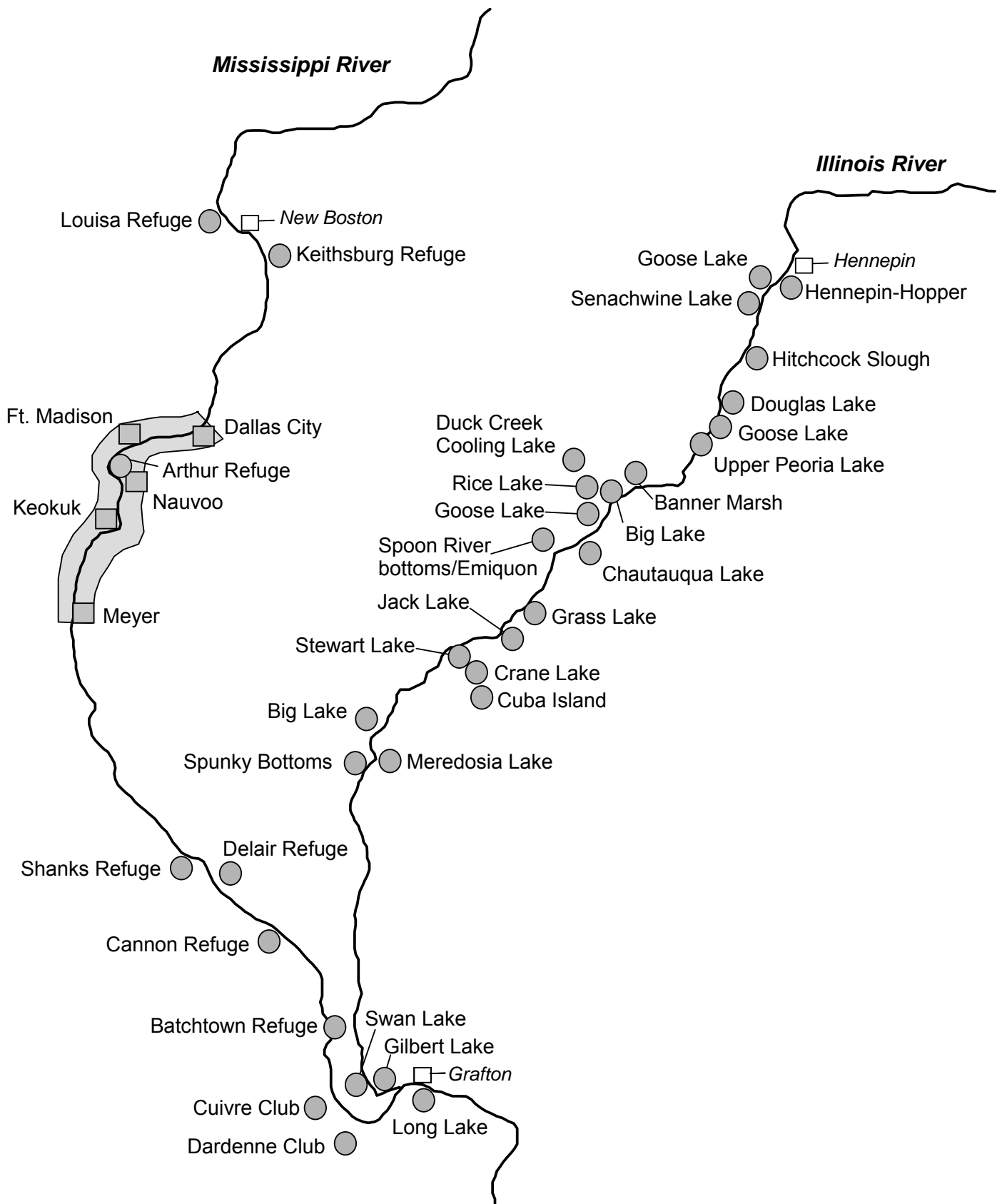


Figure 1. Specific locations within and the general areas of the Illinois and central Mississippi river valleys aerially inventoried for waterfowl by the Illinois Natural History Survey, fall 2006.

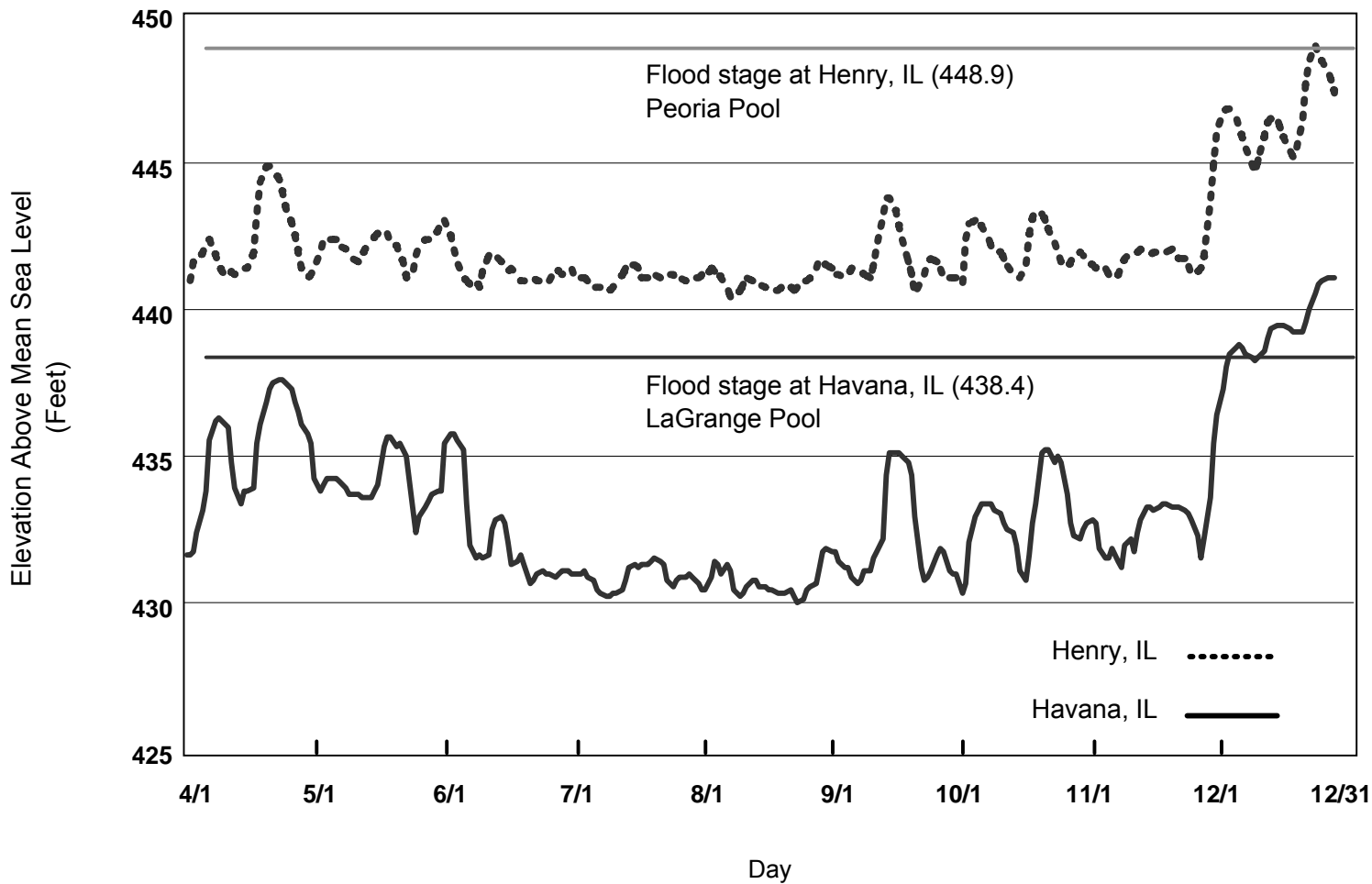


Figure 2. Daily Illinois River levels (ft-msl) recorded at gaging stations near Henry and Havana, Illinois from 1 April through 31 December 2006 (U.S. Army Corps of Engineers 2007).

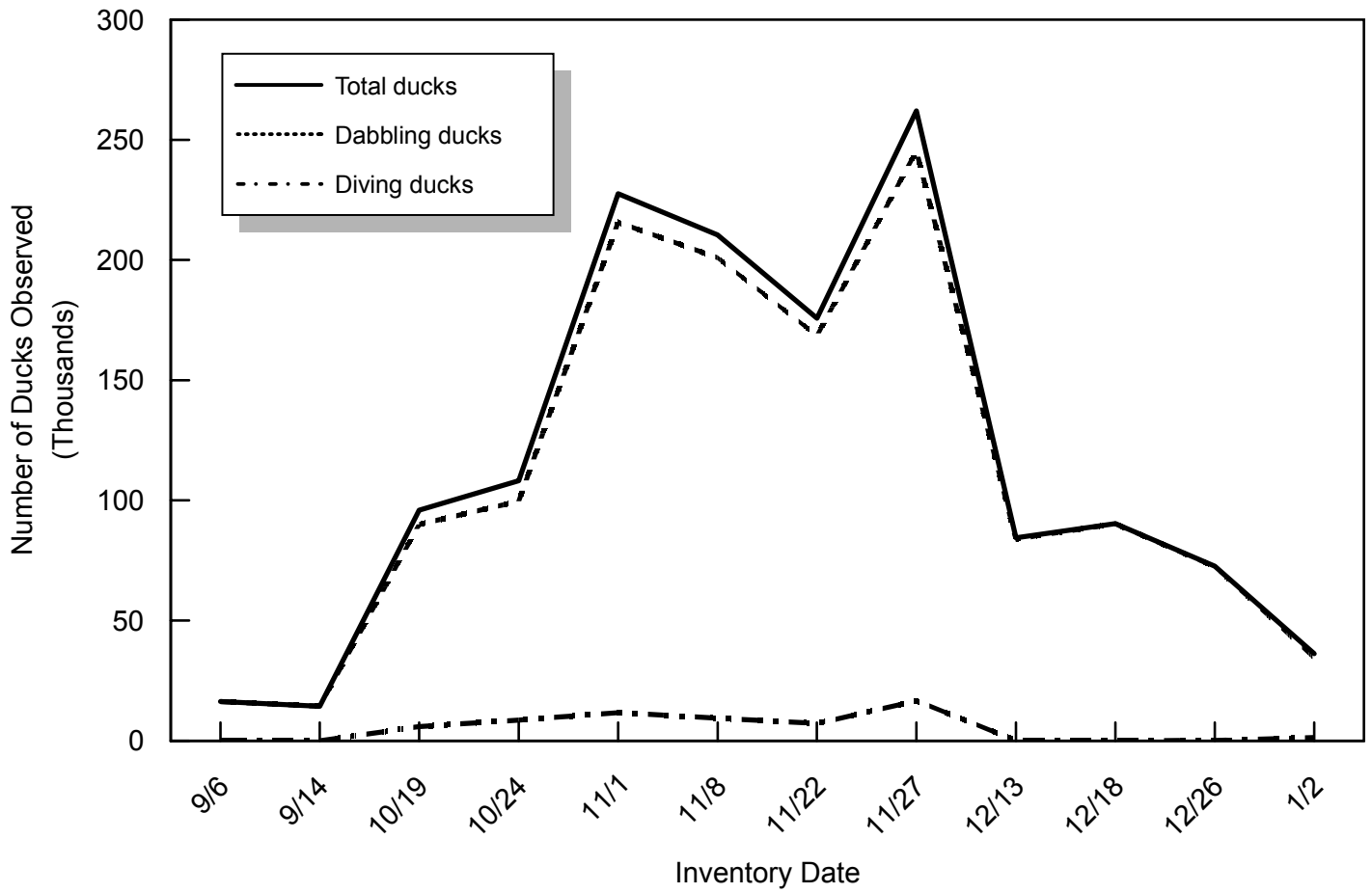


Figure 3. Estimated abundance of dabbling ducks, diving ducks, and total ducks observed during fall 2006 in the Illinois River valley.

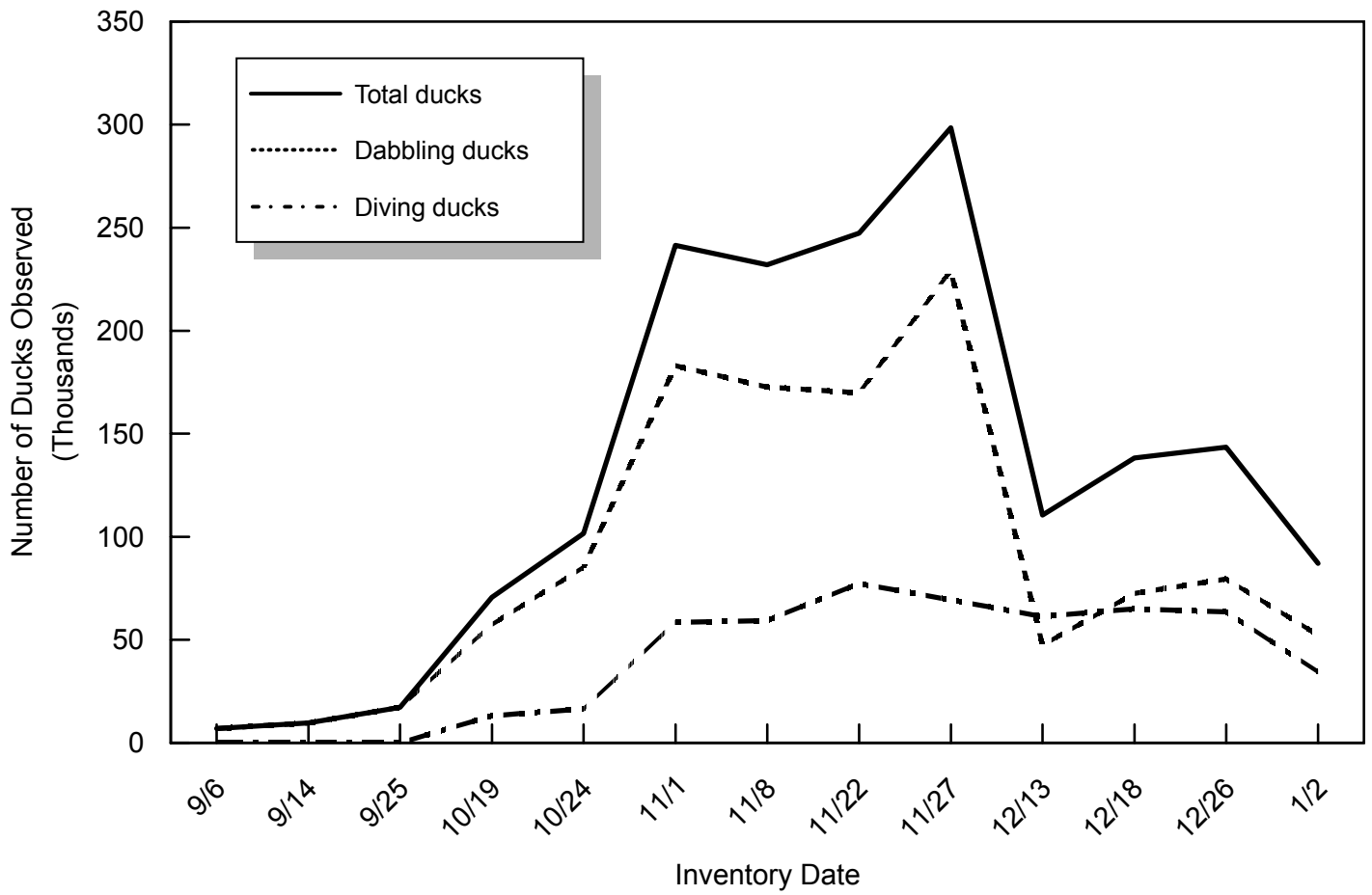


Figure 4. Estimated abundance of dabbling ducks, diving ducks, and total ducks observed during fall 2006 in the central Mississippi River valley.

Table 1. Common and scientific names and key to common name abbreviations for species aerially inventoried.

Common Name/Species Group	Scientific Name <sup>a</sup>	Abbreviation
<b>Dabbling ducks</b>		
Mallard	<i>Anas platyrhynchos</i>	MALL
American black duck	<i>Anas rubripes</i>	ABDU
Northern pintail	<i>Anas acuta</i>	NOPI
Blue-winged teal	<i>Anas discors</i>	BWTE
Green-winged teal	<i>Anas crecca</i>	AGWT
American wigeon	<i>Anas americana</i>	AMWI
Gadwall	<i>Anas strepera</i>	GADW
Northern shoveler	<i>Anas clypeata</i>	NSHO
<b>Diving ducks</b>		
Lesser scaup	<i>Aythya affinis</i>	LESC
Ring-necked duck	<i>Aythya collaris</i>	RNDU
Canvasback	<i>Aythya valisineria</i>	CANV
Redhead	<i>Aythya americana</i>	REDH
Ruddy duck	<i>Oxyura jamaicensis</i>	RUDU
Common goldeneye	<i>Bucephala clangula</i>	COGO
Bufflehead	<i>Bucephala albeola</i>	BUFF
<b>Mergansers</b>		
Common merganser	<i>Mergus merganser</i>	COME
Red-breasted merganser	<i>Mergus serrator</i>	RBME
Hooded merganser	<i>Lophodytes cucullatus</i>	HOME
<b>Geese</b>		
Greater white-fronted goose	<i>Anser albifrons</i>	WFGO
Canada goose	<i>Branta canadensis</i>	CAGO
Snow goose	<i>Chen caerulescens</i>	LSGO
<b>American coot</b>	<i>Fulica americana</i>	AMCO
<b>American white pelican</b>	<i>Pelecanus erythrorhynchos</i>	WHPE

<sup>a</sup> According to the American Ornithologists' Union Check-list, 2005.

Table 2. Peak abundance estimates of various species of waterfowl during falls 2005 and 2006, the average for 2000, 2002–2005 and the percent change between 2006 and periods of interest.

Species and Regions	2005	2006	2000, 2002–2005 Average	Percent Change from 2005	Percent Change from 2000, 2002–2005 Average
<b>Mallard</b>					
Illinois River	291,740	227,795	260,331	-22	-12
Central Mississippi River	261,030	188,805	216,573	-28	-13
Illinois & Mississippi Rivers	539,865	416,600	457,182	-23	-9
<b>American black duck</b>					
Illinois River	2,240	1,460	10,691	-35	-86
Central Mississippi River	900	520	2,603	-42	-80
Illinois & Mississippi Rivers	2,240	1,460	11,961	-35	-88
<b>Northern pintail</b>					
Illinois River	25,310	24,205	28,007	-4	-14
Central Mississippi River	49,065	21,520	49,028	-56	-56
Illinois & Mississippi Rivers	72,915	45,725	72,085	-37	-37
<b>Blue-winged teal</b>					
Illinois River	7,585	9,545	7,784	26	23
Central Mississippi River	1,070	5,170	4,348	383	19
Illinois & Mississippi Rivers	8,335	13,450	11,227	61	20
<b>Green-winged teal</b>					
Illinois River	16,965	47,400	25,328	179	87
Central Mississippi River	23,375	38,490	23,575	65	63
Illinois & Mississippi Rivers	29,110	85,890	40,780	195	111
<b>American wigeon</b>					
Illinois River	4,275	2,060	5,568	-52	-63
Central Mississippi River	4,400	1,845	7,910	-58	-77
Illinois & Mississippi Rivers	8,175	3,455	12,594	-58	-73
<b>Gadwall</b>					
Illinois River	51,925	25,830	35,453	-50	-27
Central Mississippi River	52,055	20,220	35,798	-61	-44
Illinois & Mississippi Rivers	97,365	43,530	68,065	-55	-36
<b>Northern shoveler</b>					
Illinois River	6,295	1,670	9,598	-73	-83
Central Mississippi River	3,765	785	6,762	-79	-88
Illinois & Mississippi Rivers	10,060	2,430	13,173	-76	-82
<b>Dabbling Ducks</b>					
Illinois River	379,960	245,385	331,934	-35	-26
Central Mississippi River	370,185	229,170	289,799	-38	-21
Illinois & Mississippi Rivers	750,145	474,555	616,162	-37	-23
<b>Lesser scaup</b>					
Illinois River	1,075	600	5,670	-44	-89
Central Mississippi River	38,760	20,025	27,674	-48	-28
Illinois & Mississippi Rivers	38,840	20,625	29,321	-47	-30
<b>Ring-necked duck</b>					
Illinois River	32,215	13,065	19,171	-59	-32
Central Mississippi River	42,805	21,750	26,222	-49	-17
Illinois & Mississippi Rivers	65,240	31,510	39,362	-52	-20

Table 2. Continued.

Species and Regions	2005	2006	2000, 2002–2005 Average	Percent Change from 2005	Percent Change from 2000, 2002–2005 Average
<b>Canvasback</b>					
Illinois River	400	800	2,458	100	-67
Central Mississippi River	92,520	48,250	55,127	-48	-12
Illinois & Mississippi Rivers	92,520	48,250	56,995	-48	-15
<b>Redhead</b>					
Illinois River	230	0	108	-100	-100
Central Mississippi River	710	600	1,284	-15	-53
Illinois & Mississippi Rivers	710	600	1,284	-15	-53
<b>Ruddy duck</b>					
Illinois River	9,675	4,040	5,799	-58	-30
Central Mississippi River	8,905	7,580	4,362	-15	74
Illinois & Mississippi Rivers	13,610	11,620	7,928	-15	47
<b>Common goldeneye</b>					
Illinois River	1,350	210	2,690	-84	-92
Central Mississippi River	12,380	13,890	9,415	12	48
Illinois & Mississippi Rivers	13,730	13,915	11,370	1	22
<b>Bufflehead</b>					
Illinois River	1,000	100	1,540	-90	-94
Central Mississippi River	10,670	4,380	10,167	-59	-57
Illinois & Mississippi Rivers	10,670	4,380	10,837	-59	-60
<b>Diving ducks</b>					
Illinois River	33,925	16,585	27,475	-51	-40
Central Mississippi River	178,620	77,345	106,224	-57	-27
Illinois & Mississippi Rivers	212,545	85,950	127,971	-60	-33
<b>Total mergansers</b>					
Illinois River	1,900	245	1,316	-87	-81
Central Mississippi River	11,755	1,900	7,007	-84	-73
Illinois & Mississippi Rivers	12,055	2,145	7,468	-82	-71
<b>Total ducks</b>					
Illinois River	402,535	262,050	352,449	-35	-26
Central Mississippi River	541,870	298,545	387,573	-45	-23
Illinois & Mississippi Rivers	922,380	560,595	722,444	-39	-22
<b>Greater white-fronted goose</b>					
Illinois River	2,350	10,350	534	340	1,838
Central Mississippi River	450	1,810	124	302	1,360
Illinois & Mississippi Rivers	2,700	11,350	638	320	1,679
<b>Canada goose</b>					
Illinois River	26,780	7,255	17,871	-73	-59
Central Mississippi River	17,050	10,090	13,589	-41	-26
Illinois & Mississippi Rivers	40,790	15,770	29,214	-61	-46
<b>Lesser snow goose</b>					
Illinois River	35	2,500	224	7,043	1,016
Central Mississippi River	9,000	9,005	9,530	0	-6
Illinois & Mississippi Rivers	9,000	11,505	9,530	28	21
<b>American coot</b>					
Illinois River	39,535	27,650	31,075	-30	-11
Central Mississippi River	37,495	30,015	30,036	-20	0
Illinois & Mississippi Rivers	72,545	57,665	59,031	-21	-2



Table 3. Use-day estimates of various species of waterfowl during falls 2005 and 2006, the average for 2000, 2002–2005 and the percent change between 2006 and periods of interest.

Species and Regions	2005	2006	2000, 2002–2005 Average	Percent Change from 2005	Percent Change from 2000, 2002–2005 Average
<b>Mallard</b>					
Illinois River	9,937,923	8,189,170	8,817,628	-18	-7
Central Mississippi River	9,148,503	6,299,080	6,648,645	-31	-5
Illinois & Mississippi Rivers	19,086,425	14,592,488	15,474,719	-24	-6
<b>American black duck</b>					
Illinois River	78,750	42,110	334,970	-47	-87
Central Mississippi River	4,500	970	42,122	-78	-98
Illinois & Mississippi Rivers	83,250	43,080	378,851	-48	-89
<b>Northern pintail</b>					
Illinois River	916,318	958,408	1,135,355	5	-16
Central Mississippi River	1,442,018	959,405	1,554,220	-33	-38
Illinois & Mississippi Rivers	2,358,333	1,890,785	2,644,536	-20	-29
<b>Blue-winged teal</b>					
Illinois River	184,448	192,558	225,114	4	-14
Central Mississippi River	31,678	107,465	120,510	239	-11
Illinois & Mississippi Rivers	216,125	344,763	342,725	60	1
<b>Green-winged teal</b>					
Illinois River	867,850	1,371,695	1,275,853	58	8
Central Mississippi River	755,075	1,290,493	899,539	71	43
Illinois & Mississippi Rivers	1,622,925	2,660,540	2,151,303	64	24
<b>American wigeon</b>					
Illinois River	189,523	49,250	279,871	-74	-82
Central Mississippi River	112,123	61,613	207,210	-45	-70
Illinois & Mississippi Rivers	301,645	115,135	474,366	-62	-76
<b>Gadwall</b>					
Illinois River	1,084,153	821,545	886,680	-24	-7
Central Mississippi River	1,205,123	808,210	808,302	-33	0
Illinois & Mississippi Rivers	2,289,275	1,637,013	1,720,455	-28	-5
<b>Northern shoveler</b>					
Illinois River	126,245	47,385	358,086	-62	-87
Central Mississippi River	47,615	25,738	176,055	-46	-85
Illinois & Mississippi Rivers	173,860	70,828	519,357	-59	-86
<b>Dabbling Ducks</b>					
Illinois River	13,385,205	11,672,120	13,385,205	-13	-13
Central Mississippi River	12,746,633	9,552,973	12,746,633	-25	-25
Illinois & Mississippi Rivers	26,131,838	21,354,630	26,131,838	-18	-18
<b>Lesser scaup</b>					
Illinois River	10,673	6,160	76,524	-42	-92
Central Mississippi River	779,448	661,520	544,486	-15	21
Illinois & Mississippi Rivers	790,120	667,680	621,010	-15	8
<b>Ring-necked duck</b>					
Illinois River	515,643	408,158	309,039	-21	32
Central Mississippi River	912,080	889,655	532,558	-2	67
Illinois & Mississippi Rivers	1,427,723	1,361,888	843,455	-5	61

Table 3. Continued.

Species and Regions	2005	2006	2000, 2002–2005 Average	Percent Change from 2005	Percent Change from 2000, 2002–2005 Average
<b>Canvasback</b>					
Illinois River	10,495	11,125	27,311	6	-59
Central Mississippi River	1,483,443	1,523,785	837,680	3	82
Illinois & Mississippi Rivers	1,493,938	1,534,910	864,991	3	77
<b>Redhead</b>					
Illinois River	1,725	0	589	-100	-100
Central Mississippi River	4,970	3,585	18,204	-28	-80
Illinois & Mississippi Rivers	6,695	3,585	18,793	-46	-81
<b>Ruddy duck</b>					
Illinois River	265,600	179,873	110,382	-32	63
Central Mississippi River	174,220	236,928	66,298	36	257
Illinois & Mississippi Rivers	439,820	425,050	177,253	-3	140
<b>Common goldeneye</b>					
Illinois River	18,310	2,440	18,310	-87	-87
Central Mississippi River	219,533	97,190	219,533	-56	-56
Illinois & Mississippi Rivers	237,843	99,630	237,843	-58	-58
<b>Bufflehead</b>					
Illinois River	11,295	750	11,295	-93	-93
Central Mississippi River	263,913	25,913	263,913	-90	-90
Illinois & Mississippi Rivers	275,208	26,663	275,208	-90	-90
<b>Diving ducks</b>					
Illinois River	833,740	698,720	577,865	-16	21
Central Mississippi River	3,837,605	3,446,115	2,313,510	-10	49
Illinois & Mississippi Rivers	4,671,345	4,217,160	2,893,806	-10	46
<b>Total mergansers</b>					
Illinois River	12,683	3,055	16,312	-76	-81
Central Mississippi River	176,628	18,880	63,495	-89	-70
Illinois & Mississippi Rivers	189,310	21,935	80,257	-88	-73
<b>Total ducks</b>					
Illinois River	14,231,628	12,283,680	13,907,733	-14	-12
Central Mississippi River	16,760,865	13,010,428	12,833,606	-22	1
Illinois & Mississippi Rivers	30,992,493	25,495,970	26,680,373	-18	-4
<b>Greater white-fronted goose</b>					
Illinois River	19,575	52,400	4,852	168	980
Central Mississippi River	7,675	16,475	1,837	115	797
Illinois & Mississippi Rivers	27,250	69,425	6,688	155	938
<b>Canada goose</b>					
Illinois River	795,185	259,788	632,611	-67	-59
Central Mississippi River	536,162	307,635	444,238	-43	-31
Illinois & Mississippi Rivers	1,331,347	564,580	1,073,005	-58	-47
<b>Lesser snow goose</b>					
Illinois River	175	4,725	30,436	2,600	-84
Central Mississippi River	199,713	209,695	205,044	5	2
Illinois & Mississippi Rivers	199,888	214,420	235,490	7	-9
<b>American coot</b>					
Illinois River	1,001,335	928,260	1,082,122	-7	-14
Central Mississippi River	1,338,433	1,360,443	1,036,374	2	31
Illinois & Mississippi Rivers	2,339,768	2,430,510	2,145,774	4	13

Table 4. List of state areas operated by Illinois Department of Natural Resources (IDNR) implementing moist-soil management practices.

- 
1. Anderson Lake State Fish & Wildlife Area
  2. Batchtown State Fish & Wildlife Area
  3. Cache River State Natural Area (Little Black Slough Unit)
  4. Cache River State Natural Area (Lower Cache River Unit)
  5. Calhoun Point State Fish & Wildlife Area
  6. Carlyle Lake State Fish & Wildlife Area
  7. Des Plaines State Fish & Wildlife Area
  8. Donnelley State Fish & Wildlife Area
  9. Fuller Lake State Fish & Wildlife Area
  10. Glades - 12 Mile Island State Fish & Wildlife Area
  11. Godar - Diamond & Hurricane Islands - Michael's Landing State Fish & Wildlife Area
  12. Helmbold Slough State Fish & Wildlife Area
  13. Hennepin Canal Parkway State Park
  14. Horseshoe Lake State Fish & Wildlife Area
  15. Horseshoe Lake State Park
  16. Kaskaskia River State Fish & Wildlife Area
  17. Lake Depue State Fish & Wildlife Area
  18. Lake Shelbyville State Fish & Wildlife Area
  19. Marshall State Fish & Wildlife Area
  20. Mazonia-Braidwood State Fish & Wildlife Area
  21. Mermet State Fish & Wildlife Area
  22. Moraine Hills State Recreation Area
  23. Rend Lake State Fish & Wildlife Area
  24. Rice Lake State Fish & Wildlife Area
  25. Riprap Landing State Fish & Wildlife Area
  26. Sanganois State Fish & Wildlife Area
  27. Snakeden Hollow State Fish & Wildlife Area
  28. Spring Lake State Fish & Wildlife Area
  29. Stump Lake State Fish & Wildlife Area
  30. Ten Mile Creek State Fish & Wildlife Area
  31. Triangle Lake of Pool 21 (Quincy Bay)
  32. Union County State Fish & Wildlife Area
-

Table 5. Mean biomass, standard error (SE), coefficient of variation (CV), and estimated energetic use-days per acre (DUD/ac) of moist-soil plant seeds (lbs/ac, dry mass) at 10 Illinois Department of Natural Resources (IDNR) managed lands in Illinois, fall 2006.

Site Unit	Mean	SE	CV <sup>a</sup>	DUD <sup>b</sup> /ac	DUD/ac SE
Anderson Lake SFWA <sup>c</sup>					
Total <sup>d</sup>	328.5	69.7	21.2	1,274.7	270.3
Lower Cache River SNA					
Karnak	1,290.7	256.0	19.8	5,007.6	993.4
Swale	412.3	83.6	20.3	1,599.7	324.6
Total	599.3	208.2	34.7	2,325.2	807.6
Donnelley SFWA					
Main Lake	676.5	160.5	23.7	2,624.9	622.6
Sliver	393.6	71.3	18.1	1,526.9	276.5
Total	658.3	19.7	3.0	2,554.2	76.2
Glades – 12 Mile Island SFWA					
Total	170.2	68.2	40.0	660.4	264.4
Godar - Diamond and Hurricane Islands, Michael's Landing SFWA					
Godar	274.7	75.1	27.4	1,065.8	291.4
Diamond Island	393.4	82.6	21.0	1,526.2	320.5
Total	362.4	26.4	7.3	1,406.4	102.6
Horseshoe Lake SFWA					
South Public Hunting Area	1,022.4	149.3	14.6	3,966.8	579.3
Owen Tract	1,056.3	192.7	18.2	4,098.5	747.7
Total	1,050.9	7.7	0.7	4,077.3	29.8
Horseshoe Lake SP					
Blinds 11-19	197.5	48.4	24.5	766.4	188.1
Rasky Slough	549.5	156.8	28.5	2,131.9	608.4
Total	223.4	33.9	15.2	866.5	131.3
Marshall SFWA					
Atchison Unit	215.0	46.0	21.4	834.0	178.4
Duck Ranch	1,339.6	238.3	17.8	5,197.5	924.4
Total	468.0	277.4	59.3	1,815.9	1,076.2
Mermet SFWA					
Greentree Reservoir	302.5	43.1	14.2	1,173.5	167.3
Blinds 1 – 2	417.0	128.7	30.9	1,618.0	499.3
Total	344.5	37.6	10.9	1,336.4	145.9
Sanganois SFWA					
Line Blinds	634.8	94.8	14.9	2,463.1	367.6
Barkhausen	675.1	161.1	23.9	2,619.4	625.0
Total	647.0	14.7	2.3	2,510.2	57.2
Statewide	484.3	85.2	17.6	1,879.3	330.5

<sup>a</sup> CV = (SE/mean)100

<sup>b</sup> DUD = Duck-use days, DUD/ac = (food (g/ac) \* 2.5 kcal/g) / 292 kcal/day<sub>mallard</sub>

<sup>c</sup> SFWA = State Fish & Wildlife Area; SP = State Park; SNA = State Natural Area

<sup>d</sup> Site totals were weighted by moist-soil unit area.

Table 6. Mean biomass of moist-soil plant seeds (lbs/ac, dry mass) by seed size at Illinois Department of Natural Resources (IDNR) managed lands in Illinois, falls 2005-2006.

Seed class <sup>a</sup>	2005 ( $n = 8$ sites)			2006 ( $n = 10$ sites)		
	Mean	SE	CV	Mean	SE	CV
Large	335.7	217.1	64.7	328.0	62.8	19.2
Small	584.1	170.8	29.2	158.9	36.3	22.8
Total	919.8	57.3	6.2	484.3	85.2	17.6

<sup>a</sup> Seeds were classified as large seeds if they were retained in a #35 (500  $\mu$ m) mesh sieve and small seeds were retained in the #60 (250  $\mu$ m) mesh sieve.

Table 7. Quality of moist-soil vegetation in managed areas not sampled at Illinois Department of Natural Resources (IDNR) sites, fall 2006.

Site	Management area	Rating <sup>a</sup>
Donnelley SFWA <sup>b</sup>	North Lake	2
Godar - Diamond and Hurricane Islands, Michael's Landing SFWA	Michael's Landing	2
Horseshoe Lake SFWA	Poor Farm	2
	Office Unit	3
	Lower Island	4
	Middle Island	5
	Swim-in Trap	4
Sanganois SFWA	Wood's Hole	3
	Marion	4
	Crane Lake	2
	Collis Pond	2
	River Swale	5
	Wiener Swale	4

<sup>a</sup> Scale = 1, poor; 2, below average; 3, average; 4, above average; 5, excellent.

<sup>b</sup> SFWA = State Fish & Wildlife Area.

Appendix 1:  
2006 Fall Waterfowl Inventories of the Upper and  
Lower Divisions of the Illinois and Central Mississippi  
Rivers by Date and Location

(See Table 1 for common name abbreviations)

ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

UPPER ILLINOIS RIVER VALLEY

Date: 09/06/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Hennepin/Hopper	0	0	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	80	30	0	0	0	0
Goose Lake	310	0	0	200	50	0	0	0	0	0	0	0	0	0	0	0	0	560	0	0	0	500	0
Senachwine Lake	10	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	2,225	0
Hitchcock Slough	0	0	0	75	50	0	0	0	0	0	0	0	0	0	0	0	0	125	0	0	0	5	0
Douglas Lake	100	0	50	200	100	0	0	0	0	0	0	0	0	0	0	0	0	450	0	0	0	250	0
Goose Lake	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	2,000	0
Upper Peoria	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0
TOTAL UPPER	445	0	50	595	230	0	0	0	0	0	0	0	0	0	0	0	0	1,320	30	0	0	4,980	0

LOWER ILLINOIS RIVER VALLEY

Goose Lake	100	0	0	1,500	2,000	0	0	50	0	0	0	0	0	0	0	0	0	3,650	0	0	0	0	0
Rice Lake	10	0	50	3,200	400	0	0	0	0	0	0	0	0	0	0	0	0	3,660	50	0	0	0	0
Big Lake	20	0	0	730	0	0	0	0	0	0	0	0	0	0	0	0	0	750	75	0	0	25	0
Banner Marsh	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	20	65	0	0	0	0
Duck Creek	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	0	0	0	0	0
Chautauqua	885	0	180	360	365	0	0	0	0	0	0	0	0	0	0	0	0	1,790	0	0	0	1,580	50
Spoon Btms/Emiq.	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	10	0	0	0	0
Grass Lake	35	0	10	240	0	0	0	0	0	0	0	0	0	0	0	0	0	285	20	0	0	0	100
Jack Lake	350	0	50	2,070	300	0	50	50	0	0	0	0	0	0	0	0	0	2,870	50	0	0	0	100
Stewart Lake	35	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	75	0	0	0	1,800	0
Crane Lake	400	0	0	340	210	0	0	0	0	0	0	0	0	0	0	0	0	950	0	0	0	0	25
Cuba Island	15	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	65	25	0	0	0	0
Big Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spunky Bottoms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meredosia Lake	240	0	0	400	140	0	0	0	0	0	0	0	0	0	0	0	0	780	0	0	0	500	0
TOTAL LOWER	2,180	0	290	8,950	3,415	0	50	100	0	0	0	0	0	0	0	0	0	14,985	295	0	0	3,905	275
TOTAL ILLINOIS	2,625	0	340	9,545	3,645	0	50	100	0	0	0	0	0	0	0	0	0	16,305	325	0	0	8,885	275
10 Year Ave. 1995-2000, 2002-2005	3,941	2	551	13,452	4,079	114	3	112	0	0	0	0	0	0	0	0	0	22,252	1,081	0	0	1,823	75



## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

UPPER MISSISSIPPI RIVER VALLEY

Date: 09/06/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Keokuk-Nauvoo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	145	0
Arthur Refuge	50	0	0	100	300	0	0	0	0	0	0	0	0	0	0	0	0	450	200	0	0	220	0
Nauvoo-Ft. Madison	350	0	0	1,750	650	0	0	0	0	0	0	0	0	0	0	0	0	2,750	85	0	0	550	0
Ft. Madison-Dallas	0	0	0	400	60	0	0	0	0	0	0	0	0	0	0	0	0	460	40	0	0	260	0
Keithsburg Refuge	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	50	0	0	880	0
Louisa Refuge	0	0	0	300	0	0	0	0	0	0	0	0	0	0	0	0	0	300	0	0	0	0	0
TOTAL UPPER	470	0	0	2,550	1,010	0	0	0	0	0	0	0	0	0	0	0	0	4,030	375	0	0	2,055	0

## LOWER MISSISSIPPI RIVER VALLEY

Swan Lake	340	0	0	400	250	0	0	0	0	0	0	0	0	0	0	0	0	990	20	0	0	3,160	0
Gilbert Lake	135	0	0	775	640	0	0	0	0	0	0	0	0	0	0	0	0	1,550	0	0	0	0	0
Long Lake	100	0	0	60	0	0	0	0	0	0	0	0	0	0	0	0	0	160	0	0	0	0	0
Dardenne Club	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cuivre Club	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Batchtown Refuge	0	0	0	60	0	0	0	0	0	0	0	0	0	0	0	0	0	60	0	0	0	0	0
Cannon Refuge	15	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0
Delair Refuge	50	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0
Shanks Refuge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meyer-Keokuk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	0	0	40	0
TOTAL LOWER	640	0	0	1,355	890	0	0	0	0	0	0	0	0	0	0	0	0	2,885	95	0	0	3,200	0
TOTAL MISSISSIPPI	1,110	0	0	3,905	1,900	0	0	0	0	0	0	0	0	0	0	0	0	6,915	470	0	0	5,255	0
10 Year Ave. 1995-2000, 2002-2005	378	0	29	2,259	250	11	1	11	0	0	0	0	0	0	0	0	0	2,938	355	0	0	621	0

## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

## UPPER ILLINOIS RIVER VALLEY

Date: 09/14/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Hennepin/Hopper	90	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	130	70	0	0	20	0
Goose Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	210	0
Senachwine Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	0
Hitchcock Slough	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Douglas Lake	10	0	0	120	0	0	0	0	0	0	0	0	0	0	0	0	0	130	0	0	0	400	0
Goose Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	700	0
Upper Peoria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL UPPER	100	0	20	140	0	0	0	0	0	0	0	0	0	0	0	0	0	260	70	0	0	1,375	0

## LOWER ILLINOIS RIVER VALLEY

Goose Lake	600	0	200	600	600	0	0	0	0	0	0	0	0	0	0	0	0	2,000	0	0	0	10	0
Rice Lake	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	200	0
Big Lake	150	0	50	400	100	0	0	20	0	0	0	0	0	0	0	0	0	720	0	0	0	440	0
Banner Marsh	20	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	120	20	0	0	5	0
Duck Creek	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	5	0	0	5	0
Chautauqua	385	0	250	800	100	0	0	0	0	0	0	0	0	0	0	0	0	1,535	55	0	0	2,410	0
Spoon Btms/Emiq.	50	0	0	60	0	0	0	0	0	0	0	0	0	0	0	0	0	110	0	0	0	0	0
Grass Lake	630	0	1,950	700	350	50	195	25	0	0	0	0	0	0	0	0	0	3,900	0	0	0	50	30
Jack Lake	615	0	2,300	920	460	50	230	25	0	0	0	0	0	0	0	0	0	4,600	20	0	0	400	0
Stewart Lake	10	0	0	180	0	0	25	0	0	0	0	0	0	0	0	0	0	215	0	0	0	365	0
Crane Lake	110	0	0	125	0	0	0	10	0	0	0	0	0	0	0	0	0	245	0	0	0	0	0
Cuba Island	200	0	25	160	0	0	0	0	0	0	0	0	0	0	0	0	0	385	30	0	0	0	0
Big Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spunky Bottoms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	0	0	0	0
Meredosia Lake	40	0	0	200	40	0	0	0	0	0	0	0	0	0	0	0	0	280	30	0	0	1,455	0
TOTAL LOWER	2,820	0	4,775	4,265	1,650	100	450	80	0	0	0	0	0	0	0	0	0	14,140	230	0	0	5,340	30
TOTAL ILLINOIS	2,920	0	4,795	4,405	1,650	100	450	80	0	0	0	0	0	0	0	0	0	14,400	300	0	0	6,715	30
10 Year Ave. 1995-2000, 2002-2005	5,255	2	1,012	10,323	8,061	496	73	611	0	0	0	0	0	0	0	0	0	25,833	1,096	0	0	1,949	431

ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

UPPER MISSISSIPPI RIVER VALLEY Date: 09/14/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Keokuk-Nauvoo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150	0
Arthur Refuge	50	0	50	300	0	0	0	0	0	0	0	0	0	0	0	0	0	400	70	0	0	100	0
Nauvoo-Ft. Madison	150	0	150	950	0	50	50	0	0	0	0	0	0	0	0	0	0	1,350	10	0	0	370	0
Ft. Madison-Dallas	50	0	0	225	75	0	0	0	0	0	0	0	0	0	0	0	0	350	10	0	0	320	0
Keithsburg Refuge	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5	195	0	0	0	0
Louisa Refuge	50	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	80	210	0	0	0	0
TOTAL UPPER	300	0	200	1,510	75	50	50	0	0	0	0	0	0	0	0	0	0	2,185	495	0	0	940	0

LOWER MISSISSIPPI RIVER VALLEY

Swan Lake	420	0	290	760	120	0	0	0	0	0	0	0	0	0	0	0	0	1,590	40	0	0	1,550	0
Gilbert Lake	560	0	560	2,850	1,680	0	0	0	0	0	0	0	0	0	0	0	0	5,650	70	0	0	50	0
Long Lake	120	0	50	50	0	0	0	0	0	0	0	0	0	0	0	0	0	220	0	0	0	0	0
Dardenne Club	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cuivre Club	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Batchtown Refuge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cannon Refuge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0
Delair Refuge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shanks Refuge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meyer-Keokuk	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	175	0	0	85	0
TOTAL LOWER	1,110	0	900	3,660	1,800	0	0	0	0	0	0	0	0	0	0	0	0	7,470	290	0	0	1,685	0
TOTAL MISSISSIPPI	1,410	0	1,100	5,170	1,875	50	50	0	0	0	0	0	0	0	0	0	0	9,655	785	0	0	2,625	0
10 Year Ave. 1995-2000, 2002-2005	1,359	0	335	4,306	2,135	118	8	119	0	0	0	0	0	0	0	0	0	8,381	536	0	0	909	9

ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

UPPER ILLINOIS RIVER VALLEY

Date: 09/25/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDJ	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Hennepin/Hopper	560	0	80	0	200	0	20	0	0	0	0	0	0	0	0	0	0	860	165	0	0	125	50
Goose Lake	250	20	400	0	800	0	0	0	0	0	0	0	0	0	0	0	0	1,470	0	0	0	50	0
Senachwine Lake	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	600	50
Hitchcock Slough	Weathered Out																						
Douglas Lake	↓																						
Goose Lake	↓																						
Upper Peoria	↓																						
TOTAL UPPER	810	20	480	0	1,050	0	20	0	0	0	0	0	0	0	0	0	0	2,380	165	0	0	775	100

LOWER ILLINOIS RIVER VALLEY

Goose Lake	10	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0
Rice Lake	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	15	0	0	130	25
Big Lake	15	0	25	75	0	0	0	0	0	0	0	0	0	0	0	0	0	115	20	0	0	95	0
Banner Marsh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	0	0	0	0
Duck Creek	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	70	0	0	0	0
Chautauqua	1,780	0	2,670	445	2,670	0	1,335	0	0	0	0	0	0	0	0	0	0	8,900	210	0	0	585	100
Spoon Btms/Emiq.	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	0	0	0	0	0
Grass Lake	60	0	100	90	120	0	110	0	0	0	0	0	0	0	0	0	0	480	30	0	0	0	50
Jack Lake	5	0	20	10	25	0	0	0	0	0	0	0	0	0	0	0	0	60	10	0	0	0	50
Stewart Lake	130	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150	10	0	0	600	30
Crane Lake	275	0	280	0	450	0	300	15	0	0	0	0	0	0	0	0	0	1,320	70	0	0	0	0
Cuba Island	0	0	60	10	5	0	0	25	0	0	0	0	0	0	0	0	0	100	10	0	0	0	0
Big Lake	50	0	20	25	25	0	0	0	0	0	0	0	0	0	0	0	0	120	0	0	0	0	0
Spunky Bottoms	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	120	0	0	0	0
Meredosia Lake	100	0	250	0	100	0	50	0	0	0	0	0	0	0	0	0	0	500	10	0	0	35	0
TOTAL LOWER	2,555	0	3,445	655	3,395	10	1,795	40	0	0	0	0	0	0	0	0	0	11,895	640	0	0	1,445	255
TOTAL ILLINOIS	3,365	20	3,925	655	4,445	10	1,815	40	0	0	0	0	0	0	0	0	0	14,275	805	0	0	2,220	355
10 Year Ave. 1995-2000, 2002-2005	No data																						

## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

UPPER MISSISSIPPI RIVER VALLEY

Date: 09/25/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Keokuk-Nauvoo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	70	0
Arthur Refuge	260	0	260	130	520	0	130	0	0	0	0	0	0	0	0	0	0	1,300	85	0	0	50	0
Nauvoo-Ft. Madison	10	0	0	0	200	0	0	0	0	0	0	0	0	0	0	0	0	210	55	0	0	20	1,130
Ft. Madison-Dallas	0	0	0	0	45	0	0	0	0	0	0	0	0	0	0	0	0	45	0	0	0	65	0
Keithsburg Refuge	5	0	0	0	150	0	0	0	0	0	0	0	0	0	0	0	0	155	350	0	0	15	0
Louisa Refuge	100	0	100	100	400	0	50	0	0	0	0	0	0	0	0	0	0	750	355	0	0	0	0
TOTAL UPPER	375	0	360	230	1,315	0	180	0	0	0	0	0	0	0	0	0	0	2,460	850	0	0	220	1,130

## LOWER MISSISSIPPI RIVER VALLEY

Swan Lake	1,590	0	1,625	0	1,855	0	530	0	0	0	0	0	0	0	0	0	0	5,600	215	0	0	1,855	200
Gilbert Lake	740	0	1,480	740	2,220	370	1,480	370	0	0	0	0	0	0	0	0	0	7,400	50	0	0	0	0
Long Lake	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0
Dardenne Club	0	0	1,000	0	0	0	200	0	0	0	0	0	0	0	0	0	0	1,200	0	0	0	0	0
Cuivre Club	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Batchtown Refuge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	0	0	0	0
Cannon Refuge	100	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200	0	0	0	0	0
Delair Refuge	0	0	0	50	250	0	0	0	0	0	0	0	0	0	0	0	0	300	40	0	0	0	0
Shanks Refuge	0	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	10	0
Meyer-Keokuk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	145	0	0	220	0
TOTAL LOWER	2,480	0	4,255	790	4,325	370	2,210	370	0	0	0	0	0	0	0	0	0	14,800	495	0	0	2,085	200
TOTAL MISSISSIPPI	2,855	0	4,615	1,020	5,640	370	2,390	370	0	0	0	0	0	0	0	0	0	17,260	1,345	0	0	2,305	1,330
10 Year Ave. 1995-2000, 2002-2005	No data																						

## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

UPPER ILLINOIS RIVER VALLEY

Date: 10/19/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Hennepin/Hopper	1,910	0	0	0	3,820	190	1,910	955	20	955	110	0	0	0	0	0	0	9,870	410	0	0	75	9,550
Goose Lake	2,250	10	200	0	100	0	400	0	0	0	0	0	0	0	0	0	0	2,960	0	0	0	65	1,000
Senachwine Lake	10	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	5	0
Hitchcock Slough	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	400	50	0	0	0	0
Douglas Lake	3,600	100	1,800	0	1,200	0	1,200	120	0	600	0	0	0	0	0	0	0	8,620	300	0	0	0	3,600
Goose Lake	4,300	50	100	0	0	0	100	0	0	0	0	0	0	0	0	0	0	4,550	0	0	0	5	0
Upper Peoria	3,000	50	100	0	200	0	400	0	0	0	0	0	0	0	0	0	0	3,750	0	0	0	0	0
TOTAL UPPER	15,470	210	2,205	0	5,320	190	4,010	1,075	20	1,555	110	0	0	0	0	0	0	30,165	760	0	0	150	14,150

## LOWER ILLINOIS RIVER VALLEY

Goose Lake	4,000	0	1,600	0	2,400	0	0	100	0	0	0	0	0	0	0	0	0	8,100	0	0	0	0	600
Rice Lake	3,990	0	1,330	0	0	0	1,330	0	0	1,330	25	0	2,660	0	0	0	0	10,665	0	0	0	0	2,660
Big Lake	3,480	0	870	0	2,610	0	435	100	0	0	0	0	0	0	0	0	0	7,495	200	0	0	0	1,305
Banner Marsh	2,220	0	495	0	1,975	0	245	0	0	0	0	0	0	0	0	0	0	4,935	340	0	0	0	100
Duck Creek	1,380	0	0	0	100	100	250	0	0	10	0	0	0	0	0	0	0	1,840	60	0	0	0	0
Chautauqua	2,720	0	670	0	1,675	0	670	0	0	50	0	0	0	0	0	0	0	5,785	410	0	0	120	1,415
Spoon Btms/Emiq.	240	0	0	0	300	0	200	0	0	0	0	0	0	0	0	0	0	740	185	0	0	0	100
Grass Lake	435	0	435	0	1,305	0	435	0	0	0	0	0	0	0	0	0	0	2,610	0	0	0	0	1,740
Jack Lake	1,640	0	820	0	2,460	0	820	0	0	150	0	0	0	0	0	0	0	5,890	10	0	0	500	2,460
Stewart Lake	630	0	250	0	1,010	125	250	125	0	0	0	0	0	0	0	0	0	2,390	0	0	0	5	125
Crane Lake	3,640	0	590	120	2,360	120	2,360	120	0	0	0	0	0	0	0	0	0	9,310	0	0	0	0	2,460
Cuba Island	3,230	0	0	0	300	0	0	0	0	0	0	0	0	0	0	0	0	3,530	0	0	0	0	0
Big Lake	100	0	0	0	600	0	400	0	0	0	0	0	0	0	0	0	0	1,100	0	0	0	0	0
Spunky Bottoms	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0
Meredosia Lake	550	0	0	0	350	0	300	150	0	50	0	0	0	0	0	0	0	1,400	0	0	0	0	535
TOTAL LOWER	28,265	0	7,060	120	17,445	345	7,695	595	0	1,590	25	0	2,660	0	0	0	0	65,800	1,205	0	0	625	13,500
TOTAL ILLINOIS	43,735	210	9,265	120	22,765	535	11,705	1,670	20	3,145	135	0	2,660	0	0	0	0	95,965	1,965	0	0	775	27,650
10 Year Ave. 1995-2000, 2002-2005	39,378	566	14,905	1,640	14,332	4,771	3,878	3,487	66	109	0	0	293	0	0	0	0	83,424	4,865	0	112	2,403	31,364

## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

UPPER MISSISSIPPI RIVER VALLEY

Date: 10/19/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Keokuk-Nauvoo	0	0	0	0	0	0	200	0	0	2,150	0	0	1,500	0	0	0	0	3,850	0	0	0	10	3,500
Arthur Refuge	0	0	0	0	200	0	0	0	0	0	0	0	0	0	0	0	0	200	50	0	0	10	220
Nauvoo-Ft. Madison	1,645	0	100	0	1,545	1,545	3,190	0	0	4,640	0	0	0	0	0	0	0	12,665	10	0	0	20	22,055
Ft. Madison-Dallas	485	0	0	0	50	0	50	0	0	0	0	0	0	0	0	0	0	585	0	0	0	20	700
Keithsburg Refuge	550	0	0	100	1,250	0	570	0	0	0	0	0	0	0	0	0	0	2,470	310	0	0	0	800
Louisa Refuge	5,200	0	700	0	2,100	0	300	0	0	500	0	0	0	0	0	0	0	8,800	920	100	0	0	900
TOTAL UPPER	7,880	0	800	100	5,145	1,545	4,310	0	0	7,290	0	0	1,500	0	0	0	0	28,570	1,290	100	0	60	28,175

## LOWER MISSISSIPPI RIVER VALLEY

Swan Lake	5,420	0	770	0	3,090	150	475	310	0	4,160	0	0	0	0	0	0	0	14,375	180	0	0	280	1,840
Gilbert Lake	200	0	0	0	500	0	300	50	0	0	0	0	0	0	0	0	0	1,050	60	0	0	0	0
Long Lake	2,500	0	800	0	2,400	100	2,000	400	0	200	0	0	0	0	0	0	0	8,400	50	0	0	0	0
Dardenne Club	3,150	0	2,700	0	0	0	200	0	0	0	0	0	0	0	0	0	0	6,050	0	0	0	0	0
Cuivre Club	900	0	2,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,900	0	0	0	0	0
Batchtown Refuge	1,200	0	0	0	720	0	480	0	0	0	0	0	0	0	0	0	0	2,400	100	0	0	0	0
Cannon Refuge	1,550	0	300	0	1,050	0	50	0	0	0	0	0	0	0	0	0	0	2,950	10	0	0	0	0
Delair Refuge	410	0	0	0	600	50	300	0	0	0	0	0	0	0	0	0	0	1,360	300	0	0	0	0
Shanks Refuge	1,710	0	0	0	50	0	700	0	0	0	0	0	0	0	0	0	0	2,460	0	0	0	0	0
Meyer-Keokuk	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	60	0	0	600	0
TOTAL LOWER	17,080	0	6,570	0	8,410	300	4,505	760	0	4,360	0	0	0	0	0	0	0	41,985	760	0	0	880	1,840
TOTAL MISSISSIPPI	24,960	0	7,370	100	13,555	1,845	8,815	760	0	11,650	0	0	1,500	0	0	0	0	70,555	2,050	100	0	940	30,015
10 Year Ave. 1995-2000, 2002-2005	16,315	0	13,623	891	9,578	1,684	2,159	1,981	141	163	88	0	172	0	0	0	0	46,793	2,846	0	78	1,033	21,733

## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

## UPPER ILLINOIS RIVER VALLEY

Date: 10/24/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Hennepin/Hopper	1,140	0	1,040	0	1,560	520	3,015	105	0	0	50	0	520	0	0	0	0	7,950	835	0	0	85	2,600
Goose Lake	2,380	0	405	0	480	0	480	0	0	0	0	0	0	0	0	0	0	3,745	0	0	0	0	2,380
Senachwine Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hitchcock Slough	300	0	100	0	100	0	100	0	0	0	0	0	0	0	0	0	0	600	0	0	0	0	0
Douglas Lake	4,940	150	770	0	1,540	150	2,310	150	0	770	0	0	0	0	0	0	0	10,780	300	0	0	0	4,620
Goose Lake	2,500	0	0	0	100	0	200	0	0	0	0	0	0	0	0	0	0	2,800	0	0	0	0	1,000
Upper Peoria	1,600	25	0	0	0	0	200	0	0	0	0	0	0	0	0	0	0	1,825	0	0	0	0	0
TOTAL UPPER	12,860	175	2,315	0	3,780	670	6,305	255	0	770	50	0	520	0	0	0	0	27,700	1,135	0	0	85	10,600

## LOWER ILLINOIS RIVER VALLEY

Goose Lake	2,040	0	0	0	2,720	0	2,040	0	0	0	0	0	0	0	0	0	0	6,800	0	0	0	0	0
Rice Lake	4,350	0	400	0	350	0	0	0	0	1,500	0	0	1,400	0	0	0	0	8,000	0	0	0	0	2,200
Big Lake	4,615	0	1,420	0	710	0	0	0	0	355	0	0	0	0	0	0	0	7,100	0	0	0	0	0
Banner Marsh	280	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	280	85	0	0	0	0
Duck Creek	1,145	0	100	0	150	0	300	0	0	0	0	0	0	0	0	0	0	1,695	115	0	0	0	0
Chautauqua	3,050	0	1,000	0	700	0	400	0	0	0	0	0	200	0	0	0	0	5,350	330	0	0	125	1,000
Spoon Btms/Emiq.	1,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,200	55	0	0	0	300
Grass Lake	2,400	0	4,010	0	400	0	400	0	0	0	0	0	0	0	0	0	0	7,210	0	0	0	0	800
Jack Lake	3,400	0	1,480	0	1,180	0	640	0	0	0	0	0	0	0	0	0	0	6,700	0	0	0	0	0
Stewart Lake	500	0	300	0	900	0	200	0	0	0	0	0	0	0	0	0	0	1,900	0	0	0	0	100
Crane Lake	8,780	0	960	0	2,880	0	1,920	0	0	1,920	0	0	1,920	0	0	0	0	18,380	130	0	0	0	1,920
Cuba Island	5,200	0	3,900	0	1,950	0	1,950	0	0	0	0	0	0	0	0	0	0	13,000	0	0	0	0	0
Big Lake	1,000	0	0	0	300	0	0	0	0	0	0	0	0	0	0	0	0	1,300	0	0	0	0	0
Spunky Bottoms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meredosia Lake	600	0	50	0	1,000	0	0	0	0	0	0	0	0	0	0	0	0	1,650	0	0	0	0	1,900
TOTAL LOWER	38,560	0	13,620	0	13,240	0	7,850	0	0	3,775	0	0	3,520	0	0	0	0	80,565	715	0	0	125	8,220
TOTAL ILLINOIS	51,420	175	15,935	0	17,020	670	14,155	255	0	4,545	50	0	4,040	0	0	0	0	108,265	1,850	0	0	210	18,820
10 Year Ave. 1995-2000, 2002-2005	79,551	2,400	23,646	1,268	22,848	7,372	8,264	4,064	225	844	133	0	644	0	0	0	0	151,261	5,787	0	138	1,330	38,692



## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

UPPER MISSISSIPPI RIVER VALLEY

Date: 10/24/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Keokuk-Nauvoo	700	0	0	0	0	0	200	0	2,200	1,750	500	50	5,000	0	0	0	0	10,400	0	0	0	30	4,700
Arthur Refuge	200	0	500	0	300	0	300	0	0	0	0	0	0	0	0	0	0	1,300	425	0	0	10	500
Nauvoo-Ft. Madison	2,100	0	1,700	0	1,000	160	1,800	0	100	800	700	0	1,600	0	0	0	0	9,960	0	0	0	0	20,440
Ft. Madison-Dallas	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200	0	0	0	5	405
Keithsburg Refuge	1,250	0	100	0	700	50	2,100	0	0	0	0	0	0	0	0	0	0	4,200	1,430	0	0	0	0
Louisa Refuge	750	0	150	0	400	0	100	0	0	100	0	0	0	0	0	0	0	1,500	445	50	0	0	0
TOTAL UPPER	5,200	0	2,450	0	2,400	210	4,500	0	2,300	2,650	1,200	50	6,600	0	0	0	0	27,560	2,300	50	0	45	26,045

## LOWER MISSISSIPPI RIVER VALLEY

Swan Lake	4,405	0	880	0	3,520	0	4,410	0	0	2,640	0	0	980	0	0	0	0	16,835	725	0	30	10	880
Gilbert Lake	1,430	0	220	0	330	0	220	0	0	0	0	0	0	0	0	0	0	2,200	0	0	0	0	0
Long Lake	6,875	0	3,750	0	625	0	1,250	0	0	0	0	0	0	0	0	0	0	12,500	200	0	0	0	0
Dardenne Club	4,520	0	5,650	0	0	0	1,130	0	0	0	0	0	0	0	0	0	0	11,300	0	0	0	400	0
Cuivre Club	1,540	0	1,750	0	50	0	425	0	0	0	0	0	0	0	0	0	0	3,765	0	0	0	0	0
Batchtown Refuge	1,560	0	260	0	260	100	520	0	0	0	0	0	0	0	0	0	0	2,700	350	0	0	10	0
Cannon Refuge	11,700	0	900	0	2,700	0	2,700	0	0	0	0	0	0	0	0	0	0	18,000	0	0	0	0	0
Delair Refuge	1,080	0	270	0	540	0	810	0	0	0	0	0	0	0	0	0	0	2,700	400	100	0	0	0
Shanks Refuge	3,160	0	200	0	200	40	400	0	0	0	0	0	0	0	0	0	0	4,000	0	0	0	0	0
Meyer-Keokuk	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	30	0	0	215	0
TOTAL LOWER	36,285	0	13,880	0	8,225	140	11,865	0	0	2,640	0	0	980	0	0	0	0	74,015	1,705	100	30	635	880
TOTAL MISSISSIPPI	41,485	0	16,330	0	10,625	350	16,365	0	2,300	5,290	1,200	50	7,580	0	0	0	0	101,575	4,005	150	30	680	26,925
10 Year Ave. 1995-2000, 2002-2005	38,627	94	18,036	1,041	14,237	3,373	4,082	1,659	767	1,512	2,266	0	314	0	97	0	0	86,106	3,564	0	297	1,079	22,071

## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

## UPPER ILLINOIS RIVER VALLEY

Date: 11/01/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Hennepin/Hopper	3,840	160	2,400	0	3,200	800	2,400	0	0	1,600	0	0	0	0	0	0	0	14,400	1,425	0	0	130	1,600
Goose Lake	9,680	200	4,030	0	700	0	700	0	0	640	0	0	0	0	0	0	0	15,950	0	0	0	0	1,800
Senachwine Lake	6,635	90	445	0	890	0	890	0	0	200	0	0	0	0	0	0	0	9,150	0	0	0	0	300
Hitchcock Slough	1,500	0	0	0	150	0	150	0	0	0	0	0	0	0	0	0	0	1,800	0	0	0	0	0
Douglas Lake	11,270	0	955	0	2,865	190	2,865	0	0	955	100	0	0	0	0	0	0	19,200	0	0	0	0	0
Goose Lake	8,140	110	0	0	1,100	0	1,100	0	200	550	0	0	0	0	0	0	0	11,200	0	0	0	0	1,500
Upper Peoria	1,900	0	0	0	100	0	100	0	0	0	0	0	0	0	0	0	0	2,100	0	0	0	0	200
TOTAL UPPER	42,965	560	7,830	0	9,005	990	8,205	0	200	3,945	100	0	0	0	0	0	0	73,800	1,425	0	0	130	5,400

## LOWER ILLINOIS RIVER VALLEY

Goose Lake	300	0	0	0	200	0	0	0	0	0	0	0	0	0	0	0	0	500	0	0	0	0	100
Rice Lake	3,000	0	0	0	100	0	400	0	0	0	0	0	0	0	0	0	0	3,500	0	0	0	0	3,000
Big Lake	3,840	0	640	0	640	0	1,280	0	0	0	0	0	1,800	0	0	0	0	8,200	200	0	0	0	4,200
Banner Marsh	1,430	0	0	0	25	0	100	0	0	0	0	0	0	0	0	0	0	1,555	245	0	0	0	200
Duck Creek	19,825	0	0	0	100	0	635	0	0	0	0	0	500	0	0	0	0	21,060	80	0	0	0	0
Chautauqua	8,960	0	4,380	0	11,680	0	3,220	0	0	1,560	300	0	700	0	0	0	0	30,800	800	0	0	0	1,850
Spoon Btms/Emiq.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grass Lake	1,760	0	0	0	1,420	0	880	0	0	0	0	0	0	0	0	0	0	4,060	0	0	0	0	1,280
Jack Lake	13,260	25	5,100	0	10,500	340	5,100	0	200	0	400	0	0	0	100	0	0	35,025	0	0	0	0	1,700
Stewart Lake	600	0	0	0	3,300	0	250	0	0	0	0	0	200	0	0	0	0	4,350	0	0	0	0	1,200
Crane Lake	17,100	0	870	0	7,250	580	4,350	0	0	1,450	0	0	0	0	0	0	0	31,600	300	0	0	0	0
Cuba Island	1,600	0	2,000	0	300	50	400	0	0	0	0	0	50	0	0	0	0	4,400	450	0	10	0	100
Big Lake	0	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0
Spunky Bottoms	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	5	0	0	0	0
Meredosia Lake	4,390	0	0	0	2,880	100	960	0	200	0	0	0	100	0	0	0	0	8,630	0	0	0	25	1,920
TOTAL LOWER	76,085	25	12,990	0	38,395	1,070	17,625	0	400	3,010	700	0	3,350	0	100	0	0	153,750	2,080	0	10	25	15,550
TOTAL ILLINOIS	119,050	585	20,820	0	47,400	2,060	25,830	0	600	6,955	800	0	3,350	0	100	0	0	227,550	3,505	0	10	155	20,950
10 Year Ave. 1995-2000, 2002-2005	93,361	3,291	30,225	479	23,493	6,118	15,384	4,019	1,768	1,843	300	13	2,263	0	0	0	10	182,566	4,314	0	399	1,386	35,543

## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

## UPPER MISSISSIPPI RIVER VALLEY

Date: 11/01/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Keokuk-Nauvoo	0	0	0	0	0	0	0	0	14,800	2,200	5,300	0	500	0	50	0	0	22,850	0	0	0	10	4,100
Arthur Refuge	50	0	100	0	50	0	0	0	0	0	0	0	0	0	0	0	0	200	240	0	0	10	120
Nauvoo-Ft. Madison	1,700	0	0	0	1,725	375	1,125	0	4,400	750	13,200	0	1,100	0	1,100	0	0	25,475	0	0	0	0	17,225
Ft. Madison-Dallas	250	0	0	0	200	0	200	0	0	0	0	0	0	0	0	0	0	650	20	0	0	25	100
Keithsburg Refuge	1,190	0	0	0	400	0	350	0	0	0	0	0	0	0	0	0	0	1,940	645	0	0	5	0
Louisa Refuge	1,700	0	0	0	100	0	0	0	0	0	10	0	0	0	25	0	0	1,835	445	0	0	0	0
TOTAL UPPER	4,890	0	100	0	2,475	375	1,675	0	19,200	2,950	18,510	0	1,600	0	1,175	0	0	52,950	1,350	0	0	50	21,545

## LOWER MISSISSIPPI RIVER VALLEY

Swan Lake	28,175	0	2,300	0	15,375	575	5,800	0	775	11,875	100	0	500	0	0	0	0	65,475	400	100	4,000	0	2,975
Gilbert Lake	1,100	0	0	0	800	100	400	0	0	0	0	0	0	0	0	0	0	2,400	600	0	0	0	0
Long Lake	15,300	0	900	0	900	0	900	0	0	0	0	0	0	0	0	0	0	18,000	0	0	0	0	0
Dardenne Club	15,000	0	5,000	0	3,750	0	1,250	0	0	0	0	0	0	0	0	0	0	25,000	0	0	0	0	0
Cuivre Club	9,290	0	5,160	0	2,720	175	860	0	0	0	0	0	0	0	0	0	0	18,205	0	0	0	0	0
Batchtown Refuge	8,330	0	0	0	4,250	170	2,550	0	50	1,700	0	0	0	0	0	0	0	17,050	300	0	0	20	0
Cannon Refuge	15,960	0	1,330	0	5,320	0	2,660	0	0	0	0	0	0	0	0	0	0	25,270	0	0	0	0	0
Delair Refuge	2,000	0	250	0	1,750	0	1,000	0	0	0	0	0	0	0	0	0	0	5,000	800	0	0	0	0
Shanks Refuge	9,545	0	230	0	1,150	0	575	0	0	0	0	0	0	0	0	0	0	11,500	0	0	0	0	0
Meyer-Keokuk	600	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	630	60	0	0	70	0
TOTAL LOWER	105,300	0	15,170	0	36,015	1,020	16,025	0	825	13,575	100	0	500	0	0	0	0	188,530	2,160	100	4,000	90	2,975
TOTAL MISSISSIPPI	110,190	0	15,270	0	38,490	1,395	17,700	0	20,025	16,525	18,610	0	2,100	0	1,175	0	0	241,480	3,510	100	4,000	140	24,520
10 Year Ave. 1995-2000, 2002-2005	45,174	137	22,806	264	11,824	4,774	9,989	1,681	4,811	4,118	4,493	71	1,193	0	171	0	0	111,506	3,676	0	627	641	27,091

## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

## UPPER ILLINOIS RIVER VALLEY

Date: 11/08/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Hennepin/Hopper	8,100	0	1,500	0	2,250	375	2,250	375	0	1,000	0	0	0	0	0	0	0	15,850	1,200	0	0	0	150
Goose Lake	30,750	375	850	0	0	0	0	0	0	3,750	0	0	200	0	0	0	0	35,925	0	0	0	0	1,875
Senachwine Lake	7,420	80	0	0	400	0	400	0	0	0	0	0	0	0	0	0	0	8,300	0	0	0	0	0
Hitchcock Slough	3,500	25	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	3,625	0	0	0	0	0
Douglas Lake	15,360	0	3,600	0	2,400	240	2,400	0	0	0	0	0	0	0	0	0	0	24,000	150	0	0	0	0
Goose Lake	8,900	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,000	0	0	0	50	0
Upper Peoria	2,955	45	0	0	1,000	0	500	0	0	0	0	0	0	0	0	0	0	4,500	0	0	0	0	0
TOTAL UPPER	76,985	625	5,950	0	6,150	615	5,550	375	0	4,750	0	0	200	0	0	0	0	101,200	1,350	0	0	50	2,025

## LOWER ILLINOIS RIVER VALLEY

Goose Lake	100	0	300	0	50	0	0	0	0	0	0	0	0	0	0	0	0	450	50	0	0	0	100
Rice Lake	2,200	0	0	0	200	0	200	0	0	0	0	0	0	0	0	0	0	2,600	0	0	0	0	200
Big Lake	840	0	140	0	210	0	210	0	0	0	0	0	100	0	0	0	0	1,500	0	0	0	0	0
Banner Marsh	325	0	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0	525	345	0	0	0	100
Duck Creek	21,070	0	220	0	320	0	420	0	0	220	0	0	0	50	0	0	0	22,300	380	0	0	0	0
Chautauqua	4,280	20	3,195	0	2,130	0	1,065	0	0	0	0	0	360	0	0	0	0	11,050	310	0	0	0	0
Spoon Btms/Emiq.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grass Lake	2,000	0	800	0	200	0	0	0	0	0	0	0	0	0	0	0	0	3,000	0	0	0	0	1,100
Jack Lake	13,000	0	5,800	0	4,100	0	2,600	0	0	1,300	0	0	0	0	0	0	0	26,800	0	0	0	0	0
Stewart Lake	0	0	0	0	900	0	400	100	0	0	0	0	100	0	0	0	0	1,500	0	0	0	0	0
Crane Lake	17,250	0	7,000	0	5,250	0	3,500	0	0	1,750	0	0	0	0	0	0	0	34,750	300	0	0	0	350
Cuba Island	1,100	0	300	0	100	0	100	0	0	200	0	0	25	0	0	0	0	1,825	400	0	0	0	0
Big Lake	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0
Spunky Bottoms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meredosia Lake	1,010	0	500	0	500	0	600	0	0	300	0	0	0	0	0	0	0	2,910	0	0	0	0	200
TOTAL LOWER	63,195	20	18,255	0	13,960	0	9,195	100	0	3,770	0	0	685	50	0	0	0	109,230	1,785	0	0	0	2,050
TOTAL ILLINOIS	140,180	645	24,205	0	20,110	615	14,745	475	0	8,520	0	0	885	50	0	0	0	210,430	3,135	0	0	50	4,075
10 Year Ave. 1995-2000, 2002-2005	155,656	7,337	24,299	20	21,637	8,201	19,701	6,952	1,785	6,277	787	90	2,522	0	25	0	45	255,334	6,263	17	470	912	30,565

## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

UPPER MISSISSIPPI RIVER VALLEY

Date: 11/08/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Keokuk-Nauvoo	100	0	0	0	200	0	0	0	10,400	11,600	12,970	0	5,300	0	0	0	0	40,570	0	0	0	0	4,530
Arthur Refuge	700	0	200	0	400	0	300	0	0	0	0	0	0	0	0	0	0	1,600	450	0	0	50	0
Nauvoo-Ft. Madison	400	0	50	0	0	0	0	0	6,455	0	0	0	1,400	500	100	0	0	8,905	0	0	0	50	16,245
Ft. Madison-Dallas	25	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	125	300	0	0	0	0
Keithsburg Refuge	1,135	0	0	0	100	0	100	0	0	0	0	0	0	0	0	0	0	1,335	695	0	0	0	100
Louisa Refuge	1,100	0	300	0	1,500	0	800	0	0	100	0	0	0	0	0	0	0	3,800	1,360	0	0	0	0
TOTAL UPPER	3,460	0	550	0	2,200	0	1,300	0	16,855	11,700	12,970	0	6,700	500	100	0	0	56,335	2,805	0	0	100	20,875

## LOWER MISSISSIPPI RIVER VALLEY

Swan Lake	20,435	0	5,525	0	16,570	550	11,050	550	0	8,500	0	0	500	0	0	0	0	63,680	730	100	5,000	5	550
Gilbert Lake	2,135	0	175	0	700	35	350	105	0	0	0	0	0	0	0	0	0	3,500	350	0	0	0	0
Long Lake	9,490	0	1,950	0	650	130	650	130	0	0	0	0	0	0	0	0	0	13,000	0	0	0	0	0
Dardenne Club	7,800	0	5,850	0	2,925	0	2,925	0	0	0	0	0	0	0	0	0	0	19,500	0	0	0	0	0
Cuivre Club	4,400	0	4,400	0	1,100	0	1,100	0	0	0	0	0	0	0	0	0	0	11,000	0	0	0	0	0
Batchtown Refuge	4,975	0	375	0	1,500	0	750	0	0	1,500	0	0	0	0	0	0	0	9,100	660	0	0	0	0
Cannon Refuge	36,000	0	2,000	0	1,000	0	1,000	0	0	0	0	0	0	0	0	0	0	40,000	100	0	0	0	0
Delair Refuge	2,400	0	100	0	500	0	500	0	0	0	0	0	0	0	0	0	0	3,500	500	100	0	0	0
Shanks Refuge	10,415	0	595	0	595	0	595	0	0	50	0	0	0	0	0	0	0	12,250	50	0	0	0	300
Meyer-Keokuk	50	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	150	100	0	0	40	0
TOTAL LOWER	98,100	0	20,970	0	25,640	715	18,920	785	0	10,050	0	0	500	0	0	0	0	175,680	2,490	200	5,000	45	850
TOTAL MISSISSIPPI	101,560	0	21,520	0	27,840	715	20,220	785	16,855	21,750	12,970	0	7,200	500	100	0	0	232,015	5,295	200	5,000	145	21,725
10 Year Ave. 1995-2000, 2002-2005	69,524	553	21,932	27	14,893	6,075	12,506	3,074	8,774	7,815	6,056	319	971	0	848	0	15	153,380	4,380	0	2,168	329	21,689

ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

UPPER ILLINOIS RIVER VALLEY

Date: 11/13/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Hennepin/Hopper	<b>Cancelled due to weather.</b>																						
Goose Lake																							
Senachwine Lake																							
Hitchcock Slough																							
Douglas Lake																							
Goose Lake																							
Upper Peoria																							
TOTAL UPPER																							

LOWER ILLINOIS RIVER VALLEY

Goose Lake	275	0	0	0	300	0	0	0	0	0	0	0	0	0	0	0	0	575	0	0	0	0	0
Rice Lake	4,150	0	300	0	0	0	0	0	0	0	0	0	375	0	0	0	0	4,825	0	0	0	0	1,225
Big Lake	6,860	0	435	0	435	100	435	0	0	0	0	0	0	0	0	0	0	8,265	0	0	0	0	435
Banner Marsh	1,020	0	0	0	0	0	325	0	0	0	0	0	0	0	0	0	0	1,345	60	0	0	0	100
Duck Creek	25,030	0	0	0	0	275	1,465	0	0	0	0	0	0	0	0	0	0	26,770	200	0	0	0	800
Chautauqua	10,900	300	6,000	0	9,000	300	3,100	300	0	180	0	0	270	0	0	0	50	30,400	530	0	0	0	950
Spoon Btms/Emiq.	85	0	0	0	50	0	50	0	0	50	0	0	25	0	0	0	0	260	30	0	0	0	0
Grass Lake	600	0	0	0	0	0	0	0	0	1,500	0	0	0	0	0	0	0	2,100	0	0	0	0	3,500
Jack Lake	31,185	0	0	0	4,950	495	4,950	495	0	4,950	0	0	0	0	0	0	0	47,025	0	0	0	0	2,475
Stewart Lake	300	0	0	0	2,800	100	800	0	0	200	0	0	200	0	0	0	0	4,400	0	0	0	0	0
Crane Lake	11,400	0	2,000	0	3,000	0	1,000	0	0	2,000	0	0	0	0	0	0	0	19,400	100	0	0	0	600
Cuba Island	6,910	0	3,050	0	1,000	90	550	0	0	1,500	0	0	0	0	0	0	0	13,100	300	0	0	0	100
Big Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spunky Bottoms	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0
Meredosia Lake	4,790	0	0	0	2,100	50	860	0	0	100	0	0	300	0	0	0	0	8,200	0	0	0	0	300
TOTAL LOWER	103,555	300	11,785	0	23,635	1,410	13,535	795	0	10,480	0	0	1,170	0	0	0	50	166,715	1,220	0	0	0	10,485
TOTAL ILLINOIS	103,555	300	11,785	0	23,635	1,410	13,535	795	0	10,480	0	0	1,170	0	0	0	50	166,715	1,220	0	0	0	10,485
10 Year Ave. 1995-2000, 2002-2005	219,629	9,544	22,989	0	15,623	4,901	21,619	3,964	7,378	11,363	2,106	283	1,793	8	718	6	277	322,199	10,319	17	322	394	21,924

ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

UPPER MISSISSIPPI RIVER VALLEY

Date: 11/13/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Keokuk-Nauvoo	<b>Cancelled due to weather.</b>																						
Arthur Refuge																							
Nauvoo-Ft. Madison																							
Ft. Madison-Dallas																							
Keithsburg Refuge																							
Louisa Refuge																							
TOTAL UPPER																							

LOWER MISSISSIPPI RIVER VALLEY

Swan Lake	24,210	0	16,140	0	16,140	1,615	12,105	0	0	8,270	100	0	0	0	0	0	0	78,580	0	0	4,500	70	2,620
Gilbert Lake	5,015	0	0	0	2,125	85	1,275	0	0	0	0	0	0	0	0	0	0	8,500	645	0	0	0	0
Long Lake	13,320	0	2,850	0	1,900	0	950	0	0	190	0	0	0	0	0	0	0	19,210	0	0	0	0	0
Dardenne Club	8,740	0	9,200	0	2,300	230	2,300	0	0	0	0	0	0	0	0	0	0	22,770	0	0	0	0	230
Cuivre Club	7,990	0	2,960	0	1,480	150	2,220	0	0	0	0	0	0	0	0	0	0	14,800	0	0	0	0	0
Batchtown Refuge	8,400	0	0	0	2,100	0	1,400	0	0	2,100	0	0	0	0	0	0	0	14,000	100	0	0	0	0
Cannon Refuge	30,600	0	1,700	0	850	0	850	0	0	0	0	0	0	0	0	0	0	34,000	0	0	0	0	0
Delair Refuge	5,160	0	0	0	2,020	0	1,020	0	0	0	0	0	0	0	0	0	0	8,200	700	0	0	0	0
Shanks Refuge	27,590	0	1,550	0	775	310	775	0	0	0	0	0	0	0	0	0	0	31,000	0	0	0	0	250
Meyer-Keokuk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL LOWER	131,025	0	34,400	0	29,690	2,390	22,895	0	0	10,560	100	0	0	0	0	0	0	231,060	1,445	0	4,500	70	3,100
TOTAL MISSISSIPPI	131,025	0	34,400	0	29,690	2,390	22,895	0	0	10,560	100	0	0	0	0	0	0	231,060	1,445	0	4,500	70	3,100
10 Year Ave. 1995-2000, 2002-2005	100,240	1,044	31,387	0	14,786	6,367	19,269	2,891	12,736	12,977	16,131	672	1,294	150	1,652	44	41	221,681	7,709	0	5,078	296	16,803

## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

UPPER ILLINOIS RIVER VALLEY

Date: 11/22/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Hennepin/Hopper	5,445	10	505	0	2,620	100	1,520	0	0	300	0	0	0	0	0	0	0	10,500	1,840	0	0	5	0
Goose Lake	5,400	50	400	0	850	0	750	0	0	0	0	0	0	0	0	0	0	7,450	0	0	0	0	75
Senachwine Lake	3,000	25	0	0	100	0	50	0	0	50	0	0	0	0	0	0	0	3,225	0	0	0	0	0
Hitchcock Slough	800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	800	0	0	0	0	0
Douglas Lake	13,690	185	1,850	0	925	0	925	0	0	925	0	0	0	0	0	0	0	18,500	0	0	0	0	0
Goose Lake	7,700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7,700	0	0	0	0	0
Upper Peoria	200	10	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	235	0	0	0	0	0
TOTAL UPPER	36,235	280	2,780	0	4,495	100	3,245	0	0	1,275	0	0	0	0	0	0	0	48,410	1,840	0	0	5	75

## LOWER ILLINOIS RIVER VALLEY

Goose Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rice Lake	2,800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,800	0	0	0	0	235
Big Lake	250	0	0	0	0	0	50	0	0	0	0	0	1,500	0	0	0	0	1,800	5	0	0	0	0
Banner Marsh	1,290	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,290	320	0	0	0	0
Duck Creek	32,100	0	340	0	0	0	1,710	0	0	0	0	0	0	0	0	0	0	34,150	720	0	0	0	0
Chautauqua	13,695	0	910	0	1,820	0	1,840	0	0	0	0	0	900	0	0	0	0	19,165	455	0	0	0	25
Spoon Btms/Emiq.	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	20	20	0	0	0	0
Grass Lake	1,650	0	0	0	0	0	0	0	0	700	0	0	0	0	0	0	0	2,350	0	0	0	0	500
Jack Lake	28,400	0	500	0	2,550	0	2,550	0	0	1,700	0	0	0	0	0	0	0	35,700	0	0	0	0	0
Stewart Lake	500	0	0	0	600	0	100	0	0	0	0	0	0	0	0	0	0	1,200	0	0	0	0	0
Crane Lake	7,905	0	520	0	1,040	0	520	0	0	105	0	0	310	0	0	0	0	10,400	150	0	0	0	0
Cuba Island	7,950	0	4,650	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12,600	400	100	0	0	100
Big Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0
Spunky Bottoms	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	10	5	0	0	0	0
Meredosia Lake	3,780	0	0	0	810	0	510	0	0	100	0	0	700	0	0	0	0	5,900	50	0	0	0	0
TOTAL LOWER	100,320	0	6,920	0	6,820	0	7,310	0	0	2,605	0	0	3,410	0	0	0	0	127,385	2,130	100	0	0	860
TOTAL ILLINOIS	136,555	280	9,700	0	11,315	100	10,555	0	0	3,880	0	0	3,410	0	0	0	0	175,795	3,970	100	0	5	935
10 Year Ave. 1995-2000, 2002-2005	228,477	9,886	15,488	0	13,304	2,325	19,170	4,462	2,974	8,370	840	83	3,164	185	716	12	183	309,639	10,558	38	471	229	11,727



## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

UPPER MISSISSIPPI RIVER VALLEY

Date: 11/22/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Keokuk-Nauvoo	0	0	0	0	0	0	0	0	13,440	4,200	42,900	280	660	100	280	0	0	61,860	0	0	0	0	660
Arthur Refuge	1,540	0	220	0	220	0	220	0	0	0	0	0	0	0	0	0	0	2,200	400	0	0	0	0
Nauvoo-Ft. Madison	50	0	0	0	260	0	10	0	950	0	5,350	0	200	0	200	100	0	7,120	0	0	0	10	11,650
Ft. Madison-Dallas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Keithsburg Refuge	1,420	0	100	0	200	0	250	0	0	0	0	0	0	0	0	0	0	1,970	700	0	0	0	0
Louisa Refuge	2,060	0	0	0	100	0	500	0	0	0	0	0	0	0	0	0	0	2,660	1,210	50	0	0	0
TOTAL UPPER	5,070	0	320	0	780	0	980	0	14,390	4,200	48,250	280	860	100	480	100	0	75,810	2,310	50	0	10	12,310

## LOWER MISSISSIPPI RIVER VALLEY

Swan Lake	26,235	0	3,590	0	7,180	0	1,895	0	0	7,500	0	0	25	0	0	0	0	46,425	175	250	6,000	10	200
Gilbert Lake	5,460	0	910	0	1,820	0	910	0	0	0	0	0	0	0	0	0	0	9,100	600	0	0	0	0
Long Lake	16,500	0	1,100	0	3,300	0	1,100	0	0	0	0	0	0	0	0	0	0	22,000	0	0	0	0	0
Dardenne Club	17,250	0	4,600	0	575	0	575	0	0	0	0	0	0	0	0	0	0	23,000	0	0	0	0	0
Cuivre Club	12,000	0	4,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16,000	0	0	0	0	0
Batchtown Refuge	6,890	0	530	0	1,590	0	530	0	0	1,060	0	0	0	0	0	0	0	10,600	400	0	0	0	0
Cannon Refuge	26,460	0	1,470	0	735	0	735	0	0	0	0	0	0	0	0	0	0	29,400	0	0	0	0	0
Delair Refuge	3,440	0	0	0	945	0	215	0	0	200	0	0	0	0	0	0	0	4,800	1,050	0	0	0	0
Shanks Refuge	9,210	0	100	0	100	0	495	0	0	0	0	0	0	0	0	0	0	9,905	0	0	0	0	0
Meyer-Keokuk	100	0	0	0	100	0	50	0	0	0	0	0	0	0	0	0	0	250	190	0	0	0	0
TOTAL LOWER	123,545	0	16,300	0	16,345	0	6,505	0	0	8,760	0	0	25	0	0	0	0	171,480	2,415	250	6,000	10	200
TOTAL MISSISSIPPI	128,615	0	16,620	0	17,125	0	7,485	0	14,390	12,960	48,250	280	885	100	480	100	0	247,290	4,725	300	6,000	20	12,510
10 Year Ave. 1995-2000, 2002-2005	129,885	1,378	32,609	0	10,901	3,185	16,770	2,447	13,338	12,913	20,285	455	1,208	631	2,753	25	95	248,877	6,871	13	7,208	164	10,170

## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

## UPPER ILLINOIS RIVER VALLEY

Date: 11/27/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGW	WHPE	AMCO
Hennepin/Hopper	15,450	100	185	0	915	185	550	0	0	0	0	0	0	0	0	0	50	17,435	750	100	0	0	915
Goose Lake	18,820	100	400	0	0	0	200	200	0	200	0	0	0	0	0	0	0	19,920	0	0	0	0	400
Senachwine Lake	1,980	20	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	2,100	0	0	0	0	0
Hitchcock Slough	1,400	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,450	0	0	0	0	0
Douglas Lake	24,120	270	1,355	0	815	0	540	0	0	100	0	0	200	0	0	0	0	27,400	0	0	0	0	0
Goose Lake	7,325	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7,400	0	0	0	0	0
Upper Peoria	1,300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,300	0	0	0	0	100
TOTAL UPPER	70,395	615	1,940	0	1,730	185	1,290	200	100	300	0	0	200	0	0	0	50	77,005	750	100	0	0	1,415

## LOWER ILLINOIS RIVER VALLEY

Goose Lake	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0
Rice Lake	2,700	100	0	0	0	0	100	0	0	200	0	0	170	0	0	0	0	3,270	0	0	0	0	165
Big Lake	500	0	0	0	50	0	0	0	0	100	0	0	10	0	0	0	0	660	0	0	0	0	0
Banner Marsh	1,350	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,350	110	0	0	0	0
Duck Creek	41,655	420	0	0	500	0	470	0	0	0	0	0	0	0	0	0	0	43,045	510	1,100	0	0	100
Chautauqua	21,570	100	240	0	1,200	240	480	240	20	440	0	0	1,340	0	0	0	0	25,870	140	1,000	300	0	0
Spoon Btms/Emiq.	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	120	20	0	0	0	0
Grass Lake	3,620	0	0	0	155	0	50	0	0	775	0	0	0	0	0	0	0	4,600	0	0	0	0	1,300
Jack Lake	41,150	100	0	0	500	250	500	0	0	7,500	0	0	0	0	0	0	0	50,000	25	0	0	0	800
Stewart Lake	415	0	0	0	600	0	0	0	0	10	0	0	0	0	0	0	0	1,025	0	0	0	0	0
Crane Lake	17,265	100	590	0	590	100	235	0	0	3,540	200	0	1,180	0	0	0	0	23,800	250	100	0	0	0
Cuba Island	19,700	0	3,000	0	200	100	200	0	0	0	0	0	0	0	0	0	0	23,200	1,000	800	0	0	100
Big Lake	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120	0	0	0	0	0
Spunky Bottoms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Meredosia Lake	7,230	0	0	0	160	0	60	0	0	200	0	0	300	0	0	0	0	7,950	40	300	0	0	0
TOTAL LOWER	157,400	820	3,830	0	3,955	690	2,095	240	0	12,765	200	0	3,020	0	0	0	0	185,015	2,095	3,300	300	0	2,465
TOTAL ILLINOIS	227,795	1,435	5,770	0	5,685	875	3,385	440	100	13,065	200	0	3,220	0	0	0	50	262,020	2,845	3,400	300	0	3,880
10 Year Ave. 1995-2000, 2002-2005	215,137	10,895	11,344	0	5,250	2,297	10,679	2,301	2,497	6,620	1,624	23	863	961	2,173	648	155	273,465	8,806	38	88	97	3,033

## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

## UPPER MISSISSIPPI RIVER VALLEY

Date: 11/27/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Keokuk-Nauvoo	0	0	0	0	0	0	0	0	5,750	6,050	31,600	0	5,200	0	0	0	0	48,600	0	0	0	0	7,010
Arthur Refuge	3,730	0	125	0	205	0	40	0	0	0	0	0	0	0	0	0	0	4,100	305	0	0	0	100
Nauvoo-Ft. Madison	850	0	0	0	200	0	0	0	2,100	200	4,000	0	1,000	400	200	0	0	8,950	0	0	0	0	10,500
Ft. Madison-Dallas	250	0	0	0	100	0	25	0	100	0	100	0	100	0	100	0	0	775	0	0	0	5	500
Keithsburg Refuge	2,895	0	0	0	200	0	100	0	0	0	0	0	0	0	0	0	0	3,195	325	0	0	0	0
Louisa Refuge	1,200	0	50	0	400	0	200	0	0	0	0	0	0	0	0	0	0	1,850	1,000	0	0	0	0
TOTAL UPPER	8,925	0	175	0	1,105	0	365	100	7,850	6,250	35,700	0	6,300	400	300	0	0	67,470	1,630	0	0	5	18,110

## LOWER MISSISSIPPI RIVER VALLEY

Swan Lake	31,050	0	2,250	0	6,750	450	4,500	0	90	8,730	180	0	0	0	0	0	10	54,010	475	250	6,000	200	0
Gilbert Lake	5,900	0	500	0	500	100	3,000	0	0	0	0	0	0	0	0	0	0	10,000	700	50	0	0	0
Long Lake	21,360	0	480	0	1,200	0	240	0	0	720	0	0	0	0	0	0	0	24,000	0	0	0	0	0
Dardenne Club	20,500	0	5,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25,500	0	0	0	0	0
Cuivre Club	15,200	0	3,800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19,000	0	0	0	0	0
Batchtown Refuge	12,445	0	180	0	1,830	180	915	0	0	2,745	0	0	0	0	0	0	0	18,295	300	0	0	0	0
Cannon Refuge	35,660	0	1,980	0	990	0	990	0	0	0	0	0	0	0	0	0	0	39,620	50	100	0	0	0
Delair Refuge	8,485	0	100	0	1,010	0	505	0	0	0	0	0	0	0	0	0	0	10,100	400	300	0	0	0
Shanks Refuge	28,280	0	290	0	290	0	290	0	0	0	0	0	0	0	0	0	0	29,150	100	0	0	0	350
Meyer-Keokuk	1,000	0	0	0	200	0	200	0	0	0	0	0	0	0	0	0	0	1,400	170	0	0	0	0
TOTAL LOWER	179,880	0	14,580	0	12,770	730	10,640	0	90	12,195	180	0	0	0	0	0	10	231,075	2,195	700	6,000	200	350
TOTAL MISSISSIPPI	188,805	0	14,755	0	13,875	730	11,005	100	7,940	18,445	35,880	0	6,300	400	300	0	10	298,545	3,825	700	6,000	205	18,460
10 Year Ave. 1995-2000, 2002-2005	131,128	1,336	22,214	0	8,609	2,066	16,143	2,383	13,451	7,153	33,361	763	1,329	1,443	4,186	504	9	246,077	6,079	56	8,249	88	3,079

## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

## UPPER ILLINOIS RIVER VALLEY

Date: 12/13/2006

Observer: Aaron Yetter

LOCATION	%ICE	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Hennepin/Hopper	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goose Lake	60	4,455	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,500	450	0	0	0	0
Senachwine Lake	50	1,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,200	0	0	0	0	0
Hitchcock Slough	50	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	400	175	0	0	0	0
Douglas Lake	60	6,370	130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,500	0	0	0	0	0
Goose Lake	5	18,810	190	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19,000	0	0	0	0	0
Upper Peoria	5	3,465	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,500	770	0	0	0	0
TOTAL UPPER		34,700	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35,100	1,395	0	0	0	0

## LOWER ILLINOIS RIVER VALLEY

Goose Lake	80	1,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,200	50	0	0	0	0
Rice Lake	80	2,810	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,810	200	0	0	0	0
Big Lake	90	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	25	0	0	0	0
Banner Marsh	80	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	400	230	0	0	0	0
Duck Creek	5	8,330	100	0	0	0	0	0	0	0	0	0	0	0	110	0	225	10	8,775	2,675	0	0	0	0
Chautauqua	95	8,060	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,060	470	250	0	0	0
Spoon Btms/Emiq.	95	65	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	110	0	0	0	0
Grass Lake	95	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0
Jack Lake	80	9,800	100	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	10,000	200	100	0	0	0
Stewart Lake	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crane Lake	80	9,000	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,100	50	0	0	0	0
Cuba Island	75	1,700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,700	1,500	250	0	0	0
Big Lake	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spunky Bottoms	99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0
Meredosia Lake	70	6,930	70	0	0	0	0	100	0	0	0	0	0	0	0	0	10	0	7,110	300	0	0	0	0
TOTAL LOWER		48,405	375	0	0	0	0	100	0	0	0	0	0	0	210	0	235	10	49,335	5,660	600	0	0	0
TOTAL ILLINOIS		83,105	775	0	0	0	0	100	0	0	0	0	0	0	210	0	235	10	84,435	7,055	600	0	0	0
10 Year Ave. 1995-2000, 2002-2005		170,249	9,196	3,288	0	3,002	60	2,567	305	311	1,771	446	0	1,104	2,435	308	1,216	68	196,321	13,814	28	154	64	1,307

## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

## UPPER MISSISSIPPI RIVER VALLEY

Date: 12/13/2006

Observer: Aaron Yetter

LOCATION	%ICE	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Keokuk-Nauvoo	5	0	0	0	0	0	0	0	0	5,120	810	19,970	0	0	200	0	100	0	26,200	0	0	0	0	50
Arthur Refuge	75	950	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	1,050	150	0	0	0	50
Nauvoo-Ft. Madison	10	0	0	0	0	0	0	0	0	5,100	0	20,060	0	0	7,800	440	1,800	0	35,200	50	0	0	0	150
Ft. Madison-Dallas	5	0	0	0	0	0	0	0	0	100	0	710	0	0	0	0	0	0	810	100	0	0	0	0
Keithsburg Refuge	99	2,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,100	670	0	0	0	0
Louisa Refuge	0	3,960	40	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	4,100	755	0	0	0	0
TOTAL UPPER		7,010	40	0	0	0	0	0	0	10,320	810	40,840	0	0	8,100	440	1,900	0	69,460	1,725	0	0	0	250

## LOWER MISSISSIPPI RIVER VALLEY

Swan Lake	40	750	0	0	0	0	0	0	0	0	700	50	0	0	0	0	0	0	1,500	760	0	0	5	0
Gilbert Lake	25	500	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	510	800	0	0	0	0
Long Lake	25	5,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,500	0	0	0	0	0
Dardenne Club	0	14,300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14,300	0	0	0	0	0
Cuivre Club	25	6,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,500	0	0	0	0	0
Batchtown Refuge	25	1,600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,600	310	0	0	0	0
Cannon Refuge	90	600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	600	0	0	0	0	0
Delair Refuge	75	4,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,200	350	0	0	0	0
Shanks Refuge	95	6,300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,300	0	0	0	0	0
Meyer-Keokuk	10	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	750	0	0	0	0
TOTAL LOWER		40,300	10	0	0	0	0	0	0	0	700	50	0	0	0	0	0	0	41,060	2,970	0	0	5	0
TOTAL MISSISSIPPI		47,310	50	0	0	0	0	0	0	10,320	1,510	40,890	0	0	8,100	440	1,900	0	110,520	4,695	0	0	5	250
10 Year Ave. 1995-2000, 2002-2005		109,084	1,337	11,038	0	2,454	598	4,857	465	6,311	2,893	14,096	454	447	4,131	3,837	1,494	18	163,511	7,359	8	3,105	36	823

ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

UPPER ILLINOIS RIVER VALLEY

Date: 12/18/2006

Observer: Aaron Yetter

LOCATION	%ICE	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Hennepin/Hopper	5	1,050	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,050	1,050	0	0	0	0
Goose Lake	30	8,920	180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,100	10	0	0	0	0
Senachwine Lake	5	1,760	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,800	0	0	0	0	0
Hitchcock Slough	0	210	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	210	0	0	0	0	0
Douglas Lake	50	9,505	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,600	50	0	0	0	0
Goose Lake	0	12,175	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12,300	0	0	0	0	0
Upper Peoria	0	900	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	925	0	0	0	0	0
TOTAL UPPER		34,520	465	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34,985	1,110	0	0	0	0

LOWER ILLINOIS RIVER VALLEY

Goose Lake	90	2,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,000	0	0	0	0	0
Rice Lake	25	1,600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,600	0	0	0	0	0
Big Lake	75	1,800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,800	275	0	0	0	0
Banner Marsh	40	45	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	325	50	0	0	0
Duck Creek	0	12,600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	12,610	1,445	2,600	0	0	0
Chautauqua	20	8,730	50	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	8,805	1,730	4,100	0	0	0
Spoon Btms/Emiq.	60	4,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,500	420	3,600	1,500	0	0
Grass Lake	25	3,400	0	0	0	0	0	0	0	0	50	0	0	0	0	0	0	0	3,450	0	0	0	0	0
Jack Lake	10	1,900	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,905	0	0	0	0	0
Stewart Lake	40	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0
Crane Lake	10	12,465	385	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12,850	600	0	0	0	0
Cuba Island	25	4,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,000	450	0	0	0	0
Big Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spunky Bottoms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	310	0	0	0	0
Meredosia Lake	10	1,810	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,810	10	0	0	0	0
TOTAL LOWER		54,860	445	0	0	0	0	0	0	0	50	0	0	0	25	0	10	0	55,390	5,565	10,350	1,500	0	0
TOTAL ILLINOIS		89,380	910	0	0	0	0	0	0	0	50	0	0	0	25	0	10	0	90,375	6,675	10,350	1,500	0	0
10 Year Ave. 1995-2000, 2002-2005		133,829	6,424	790	0	0	0	839	0	3	26	75	0	0	1,829	304	779	13	144,909	15,813	50	38	0	81

## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

## UPPER MISSISSIPPI RIVER VALLEY

Date: 12/18/2006

Observer: Aaron Yetter

LOCATION	%ICE	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Keokuk-Nauvoo	0	0	0	0	0	0	0	0	0	1,550	2,500	15,530	175	0	100	100	0	0	19,955	5	0	0	0	0
Arthur Refuge	0	700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	700	660	0	0	0	0
Nauvoo-Ft. Madison	0	110	0	0	0	0	0	0	0	3,850	50	21,570	425	0	13,540	4,280	725	0	44,550	200	0	0	0	0
Ft. Madison-Dallas	0	200	0	0	0	0	0	0	0	0	0	0	0	0	250	0	0	0	450	210	0	0	0	0
Keithsburg Refuge	5	950	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	950	555	0	0	0	0
Louisa Refuge	5	900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	900	1,350	0	0	0	0
TOTAL UPPER		2,860	0	0	0	0	0	0	0	5,400	2,550	37,100	600	0	13,890	4,380	725	0	67,505	2,980	0	0	0	0

## LOWER MISSISSIPPI RIVER VALLEY

Swan Lake	0	7,720	80	0	0	0	0	0	0	0	800	0	0	0	0	0	0	0	8,600	455	750	7,000	135	0
Gilbert Lake	0	1,400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,400	1,200	0	0	0	0
Long Lake	0	14,850	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15,000	0	0	0	0	0
Dardenne Club	0	14,420	160	1,620	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16,200	0	0	0	0	0
Cuivre Club	0	12,610	130	260	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13,000	0	0	0	0	0
Batchtown Refuge	0	1,900	0	0	0	0	0	0	0	0	300	0	0	0	0	0	0	0	2,200	680	0	0	0	0
Cannon Refuge	0	6,300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,300	150	100	0	0	0
Delair Refuge	0	1,700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,700	1,220	100	0	0	0
Shanks Refuge	0	6,400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,400	70	50	0	0	0
Meyer-Keokuk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200	0	0	0	0
TOTAL LOWER		67,300	520	1,880	0	0	0	0	0	0	1,100	0	0	0	0	0	0	0	70,800	3,975	1,000	7,000	135	0
TOTAL MISSISSIPPI		70,160	520	1,880	0	0	0	0	0	5,400	3,650	37,100	600	0	13,890	4,380	725	0	138,305	6,955	1,000	7,000	135	0
10 Year Ave. 1995-2000, 2002-2005		139,234	1,066	3,469	0	203	100	1,266	0	3,500	850	17,580	750	0	15,894	8,524	6,258	0	198,693	7,428	0	125	0	80

ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

UPPER ILLINOIS RIVER VALLEY

Date: 12/26/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Hennepin/Hopper	650	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	650	1,380	0	0	0	0
Goose Lake	370	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	380	75	0	0	0	0
Senachwine Lake	1,250	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,255	0	0	0	0	0
Hitchcock Slough	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0
Douglas Lake	19,950	1,050	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21,000	0	0	0	0	0
Goose Lake	8,600	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,700	0	0	0	0	0
Upper Peoria	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	400	75	0	0	0	0
TOTAL UPPER	31,320	1,155	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	32,485	1,530	0	0	0	0

LOWER ILLINOIS RIVER VALLEY

Goose Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rice Lake	1,700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	1,715	10	0	0	0	0
Big Lake	940	5	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	1,045	25	0	0	0	0
Banner Marsh	140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	140	370	0	0	0	0
Duck Creek	2,435	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	2,445	975	200	0	0	100
Chautauqua	7,150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	7,160	1,385	3,000	2,500	0	0
Spoon Btms/Emiq.	1,500	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,600	510	900	0	0	0
Grass Lake	600	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	650	0	0	0	0	0
Jack Lake	8,200	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,400	0	0	0	0	0
Stewart Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crane Lake	10,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10,100	300	0	0	0	0
Cuba Island	6,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6,100	245	0	0	0	0
Big Lake	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200	0	0	0	0	0
Spunky Bottoms	220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	220	330	200	0	0	0
Meredosia Lake	350	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	350	0	0	0	0	0
TOTAL LOWER	39,635	305	0	0	0	0	0	0	0	0	0	0	0	150	0	15	20	40,125	4,150	4,300	2,500	0	100
TOTAL ILLINOIS	70,955	1,460	0	0	0	0	0	0	0	0	0	0	0	150	0	25	20	72,610	5,680	4,300	2,500	0	100
10 Year Ave. 1995-2000, 2002-2005	80,206	2,798	38	0	13	50	88	0	150	13	675	0	0	2,156	375	841	8	87,409	19,010	588	9	25	50



## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

UPPER MISSISSIPPI RIVER VALLEY

Date: 12/26/2006

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Keokuk-Nauvoo	10	0	0	0	0	0	0	0	1,905	400	10,670	125	0	1,100	0	0	0	14,210	15	0	0	0	0
Arthur Refuge	200	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	300	470	0	0	0	0
Nauvoo-Ft. Madison	25	0	0	0	0	0	0	0	6,450	0	30,740	430	0	6,400	4,300	430	0	48,775	50	0	0	0	0
Ft. Madison-Dallas	300	0	0	0	0	0	0	0	0	0	0	0	0	400	0	0	0	700	900	0	0	0	0
Keithsburg Refuge	925	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	925	985	0	0	0	0
Louisa Refuge	3,820	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,820	3,500	0	5	0	0
TOTAL UPPER	5,280	0	0	0	0	0	0	0	8,355	400	41,410	555	0	8,000	4,300	430	0	68,730	5,920	0	5	0	0

## LOWER MISSISSIPPI RIVER VALLEY

Swan Lake	3,000	0	100	0	0	0	450	0	0	450	60	0	0	0	0	0	0	4,060	450	0	9,000	100	0	0
Gilbert Lake	1,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,500	1,260	600	0	0	0	0
Long Lake	9,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,000	0	0	0	0	0	0
Dardenne Club	18,330	0	965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19,295	0	0	0	0	0	0
Cuivre Club	14,550	0	450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15,000	0	10	0	0	0	0
Batchtown Refuge	6,860	0	365	0	0	0	75	0	0	0	0	0	0	0	0	0	0	7,300	810	100	0	0	0	0
Cannon Refuge	9,500	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,600	0	300	0	0	0	0
Delair Refuge	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,000	1,625	800	0	0	0	0
Shanks Refuge	8,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,000	0	0	0	0	0	0
Meyer-Keokuk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0
TOTAL LOWER	71,740	0	1,980	0	0	0	525	0	0	450	60	0	0	0	0	0	0	74,755	4,170	1,810	9,000	100	0	0
TOTAL MISSISSIPPI	77,020	0	1,980	0	0	0	525	0	8,355	850	41,470	555	0	8,000	4,300	430	0	143,485	10,090	1,810	9,005	100	0	0
10 Year Ave. 1995-2000, 2002-2005	124,588	1,670	4,561	0	968	5	1,005	0	2,538	1,834	17,174	0	0	7,031	1,664	3,703	0	166,739	13,780	88	3,025	0	138	0

## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

## UPPER ILLINOIS RIVER VALLEY

Date: 01/02/2007

Observer: Aaron Yetter

LOCATION	%ICE	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Hennepin/Hopper	0	2,385	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	2,390	1,155	1,350	0	0	0
Goose Lake	0	650	50	0	0	0	0	0	0	0	0	0	0	0	100	0	5	0	805	0	300	0	0	0
Senachwine Lake	0	3,700	0	0	0	0	0	0	0	0	0	0	0	0	200	0	0	0	3,900	0	0	0	0	0
Hitchcock Slough	0	300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	300	0	0	0	0	0
Douglas Lake	0	9,160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	9,180	105	50	0	0	0
Goose Lake	0	4,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,500	50	0	0	0	0
Upper Peoria	0	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150	0	350	5	0	0	0	0
TOTAL UPPER		20,895	50	0	0	0	0	0	0	0	0	0	0	0	300	5	175	0	21,425	1,315	1,700	0	0	0

## LOWER ILLINOIS RIVER VALLEY

Goose Lake	0	270	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	270	100	0	0	0	0
Rice Lake	0	2,255	0	0	0	0	0	0	0	0	0	0	0	0	300	0	0	0	2,555	2,750	500	0	0	0
Big Lake	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	60	2,500	2,510	0	0
Banner Marsh	10	40	0	0	0	0	0	75	0	0	0	0	0	0	0	0	0	0	115	325	0	0	0	0
Duck Creek	0	1,005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,005	465	0	0	0	0
Chautauqua	0	5,430	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	5,530	2,605	3,200	10,100	0	0
Spoon Btms/Emiq.	0	1,500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,500	210	1,750	1,250	0	0
Grass Lake	0	210	0	0	0	0	0	0	0	0	0	0	0	0	120	0	110	0	440	0	100	0	0	0
Jack Lake	0	600	0	0	0	0	0	0	0	0	600	0	0	0	70	0	5	0	1,275	5	0	0	0	0
Stewart Lake	0	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0	0
Crane Lake	0	600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	600	80	300	9,000	0	0
Cuba Island	0	240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	240	1,440	2,500	0	0	0
Big Lake	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	5	0	0	0	0
Spunky Bottoms	0	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	325	0	0	0	0
Meredosia Lake	0	1,110	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	1,120	100	0	0	0	0
TOTAL LOWER		13,420	0	0	0	0	0	85	0	0	600	0	0	0	490	0	215	0	14,810	8,470	10,850	22,860	0	0
TOTAL ILLINOIS		34,315	50	0	0	0	0	85	0	0	600	0	0	0	790	5	390	0	36,235	9,785	12,550	22,860	0	0
10 Year Ave. 1995-2000, 2002-2005		49,866	750	49	0	3	0	13	0	1	29	11	0	0	3,699	109	5,117	1	59,646	12,774	558	921	0	0

## ILLINOIS NATURAL HISTORY SURVEY WATERFOWL AERIAL INVENTORY DATA

UPPER MISSISSIPPI RIVER VALLEY

Date: 01/02/2007

Observer: Aaron Yetter

LOCATION	MALL	ABDU	NOPI	BWTE	AGWT	AMWI	GADW	NSHO	LESC	RNDU	CANV	REDH	RUDU	COGO	BUFF	COME	HOME	TOTAL DUCKS	CAGO	GWFG	LSGO	WHPE	AMCO
Keokuk-Nauvoo	0	0	0	0	0	0	0	0	0	1,700	100	0	0	710	0	0	0	2,510	0	0	0	0	100
Arthur Refuge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	520	50	0	0	0
Nauvoo-Ft. Madison	50	0	0	0	0	0	0	0	0	300	23,600	0	0	4,730	2,120	210	0	31,010	165	0	0	0	0
Ft. Madison-Dallas	100	0	0	0	0	0	0	0	0	0	0	50	0	100	50	0	0	300	290	0	0	0	0
Keithsburg Refuge	1,460	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,460	810	0	0	0	0
Louisa Refuge	100	0	0	0	0	0	0	0	0	0	0	0	0	10	0	10	0	120	1,080	975	0	0	0
TOTAL UPPER	1,710	0	0	0	0	0	0	0	0	2,000	23,700	50	0	5,550	2,170	220	0	35,400	2,865	1,025	0	0	100

## LOWER MISSISSIPPI RIVER VALLEY

Swan Lake	2,400	0	0	0	0	0	200	0	0	1,000	0	0	0	0	0	0	0	3,600	785	20	7,000	0	0
Gilbert Lake	510	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	510	3,600	1,400	0	0	0
Long Lake	5,200	100	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,400	0	0	0	0	0
Dardenne Club	12,025	0	375	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12,400	0	0	0	0	310
Cuivre Club	9,500	0	500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10,000	0	0	0	0	0
Batchtown Refuge	7,885	0	415	0	0	0	50	0	0	0	0	0	0	0	0	0	0	8,350	1,650	0	0	0	0
Cannon Refuge	8,350	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,350	0	1,500	900	0	0
Delair Refuge	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,000	1,350	1,500	0	0	0
Shanks Refuge	2,010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,010	160	125	0	0	0
Meyer-Keokuk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0
TOTAL LOWER	48,880	100	1,390	0	0	0	250	0	0	1,000	0	0	0	0	0	0	0	51,620	7,585	4,545	7,900	0	310
TOTAL MISSISSIPPI	50,590	100	1,390	0	0	0	250	0	0	3,000	23,700	50	0	5,550	2,170	220	0	87,020	10,450	5,570	7,900	0	410
10 Year Ave. 1995-2000, 2002-2005	43,058	75	1,025	0	75	0	254	0	34	625	2,704	0	0	10,624	3,204	6,833	0	68,511	4,921	43	1,286	1	3

Submitted by:

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Date: 24 August 2007.