WETLAND MATTERS

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WETLANDS, WATERFOWL CREATE RICHES IN THE ILLINOIS VALLEY

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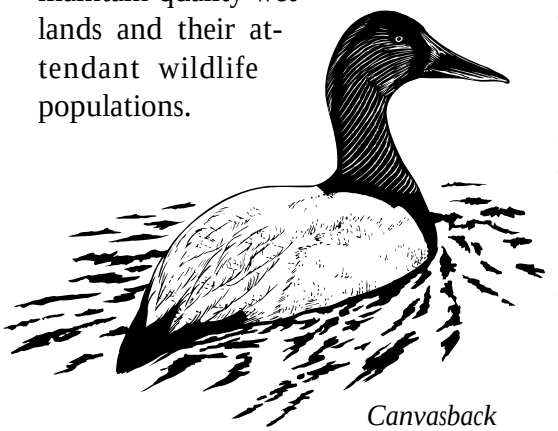
Historically, the Illinois River valley was among the most productive riverine systems in North America with respect to fish and wildlife populations. The numerous and generally shallow bottomland lakes that flanked the river hosted veritable gardens of aquatic vegetation. For the past 12,000 years or so, the Illinois River has hosted this traditional fall and spring passage of waterfowl seeking the abundance of food present in the lakes, marshes, and bottomland forests. The aquatic plants and associated invertebrate fauna were central to the biological productivity of the Illinois River system.

In the late 19th century, the Illinois River valley became renowned for the waterfowl populations frequenting its luxuriant wetlands during fall and spring migrations. As a result, a strong waterfowl tradition emerged and prospered in the valley.

A fall flight of mallards in the Illinois Valley winging its way over a bottomland lake hosting expanses of emergent aquatic vegetation in the early 1900s. (From Havera 1999)

Principally, as a result of human impacts, numbers of some waterfowl species began to decline in the valley during the 1950s. Aquatic vegetation disappeared from the lakes in the late 1950s and 1960s, mainly because of the effects of sedimentation and fluctuating water levels, and has not recovered.

Restoring selected drainage and levee districts is the most reasonable economic and ecological means to establish and maintain quality wetlands and their attendant wildlife populations.



Canvasback

Early Riches

The Illinois River occupies a valley much older than the river itself as a result of a series of unique geological events. This valley, in essence, is what was the Mississippi River valley before the Wisconsinan glaciation. Meltwaters from the receding glacier spread out into the large valley, forming bottomland lakes and a sluggish river. The bottomland lakes, ponds, and sloughs covered approximately 56,000 acres between the sites of present-day Utica and Grafton (Bellrose et al. 1983) and were the heartbeat of this unique river system.

The Illinois River was once one of the most productive rivers in North America; its fish and wildlife populations virtually unequaled. The shallow and clear bottomland lakes were filled with aquatic vegetation, including pondweeds, coontail, and water lilies (Kofoid 1903). Arrowhead, marsh smartweed, and river bulrush were abundant at the shorelines. Wild rice grew in Senachwine Lake, Rice Pond, and Rice Lake. Although some lakes were 12 to 16 ft deep, most were 4 to 6 ft, allowing sunlight to penetrate to the rich, fertile soil of their basins.

Extensive forests of pin oaks and pecans—favorite foods of mallards and wood ducks—graced the magnificent bottomlands south of Peoria (Uhler 1933). The floodplain ranged from 1.5 to 3 miles wide above Peoria, 3 to 5 miles wide near Havana, and 6 to 7 miles wide near Beardstown (Mulvihill and Cornish 1929). Below Beardstown, the lakes were smaller—due to the historically greater sedimentation of the bottomlands—and large areas of prairie occupied the floodplain beyond the forests.

The Illinois valley has a rich waterfowl tradition. Preceding the Wisconsinan glacier, legions of mallards and other species of ducks likely funneled down the ancient Mississippi River valley.

Waterfowl were a staple food of Native Americans who frequented the valley. European explorers were overwhelmed by the seemingly inexhaustible supply of waterfowl. In December 1699, St. Cosme wrote about the abundance of wildlife on the Illinois River: "[N]o one need fast on that river, so great is the quantity of game of all kinds: swans, bustards, or duck" (Kellogg 1917:354). DeLiette, who lived with the Illinois

VOICES EXPRESSING CONCERN ABOUT THE LOSS OF THE ILLINOIS RIVER FLOODPLAIN TO DRAINAGE AND LEVEE DISTRICTS COULD BE HEARD EARLY IN THE 20TH CENTURY.

Indians in the late 1600s, described waterfowl on the Illinois River as follows:

> I am now going to tell something which will perhaps not be believed, although I am not the only one who has witnessed it. The waters are sometimes low in autumn so that all the sorts of birds that I have just mentioned [bustards, swans, French ducks, musk ducks, teals and cranes, both white and gray] leave the marshes which are dry, and there is such a vast number of them in the river, especially the lake [Peoria Lake], on account of the abundance of roots in it, when, if this game remained on the water, one could not get through in a canoe without pushing them aside with the paddle. (Pease and Werner 1934:349–350)

In 1893, Strode wrote about Thompson Lake near Havana:

> The noise and fuss of the waterfowl we could plainly hear. Going out where we could have an unobstructed view we were surprised at the great numbers of waterfowl. There were simply square acres of the lake's surface, covered with ducks, geese and brant. [A disturbance by Strode] caused thousands of ducks and geese to take to the wing; the air was black in every direction with great circling flocks. (Strode 1893:88–89)

VEGETATIVE ABUNDANCE, DECLINE

The historic Illinois River was indeed a "Garden of Eden" for waterfowl. The entire area of the lower Illinois valley subject to overflow, from LaSalle to the mouth, was about 400,000 acres, including about 70,000 acres of river channel and lakes. During the 20th century, a series of events induced by humans has abused the Illinois River floodplain.

In 1900, the diversion of water from Lake Michigan increased low-water levels at Peoria by 5–6 ft (Bellrose et al. 1979) and at Havana by 3.6 ft (Forbes and Richardson 1919). The surface areas of bottomland lakes, sloughs, and marshes doubled—from about 54,000 acres to over 120,000 acres (Bellrose et al. 1979)—thus, benefitting waterfowl. The flooding of thousands of acres of bottomland forest during the growing season, however, resulted in the loss of pin oaks and pecans, species sensitive to increased water levels.

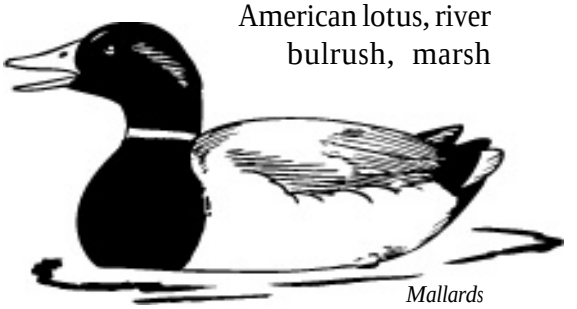
The development of drainage and levee districts in the valley from 1903 to 1926 drained many bottomland lakes. The 38 organized drainage and levee districts and three private levees incorporated

about 205,000 acres of bottomland (Mulvihill and Cornish 1929). Three drainage and levee districts—Partridge, Chautauqua, and Big Prairie, representing approximately 8,000 acres—were subsequently abandoned and reverted to a seminatural state (Bellrose et al. 1979).

Voices expressing concern about the loss of the Illinois River floodplain to drainage and levee districts could be heard early in the 20th century. In 1919 Stephen A. Forbes wrote that the reclamation and drainage of the floodplain "leaves the Illinois River much as Samson was left when shorn of his locks by the self-seeking Delilah" (Forbes 1919:13–14). "The productivity of a stream is dependent upon the extent and condition of its back-waters and the period of its overflow, a fact which makes drainage district operations on the river bottoms a menace to its productiveness." (Forbes 1912:44)

Forbes (1919:10) also remarked that "by diking and drainage operations, the Illinois River is being robbed of the haunts of its water birds, and corn will presently be growing every year on some 200,000 acres of forest, marsh, and lake...."

Forbes' assessment on the impact of drainage on plant species proved correct. The species of wetland plants found in the bottomland lakes were affected principally by fluctuating water levels, turbidity, water depth, and competition by other plants (Bellrose et al. 1979). The importance of stabilized water levels to submergent aquatic plants, such as pondweeds, in the Illinois valley was documented (Bellrose 1941). American lotus, river bulrush, marsh



Mallards

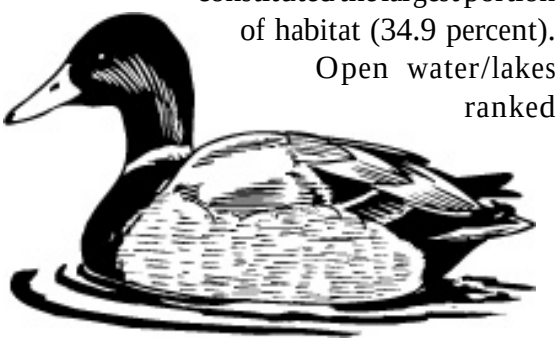
smartweed, and arrowhead were among the species most tolerant to variable environmental conditions. From 1938 to 1940, sago and longleaf pondweeds, coontail, and marsh smartweeds were abundant in those lakes with stable water levels and generally protected from the river. In lakes separated from the river at low water stages and, thus, with semistable water levels, river bulrush, American lotus, and coontail were most abundant. In lakes connected to the river at all water stages and, correspondingly, with fluctuating water levels, river bulrush, American lotus and moist-soil plants were prevalent. Until the 1950s, lakes isolated from the river, and, thus, sustaining less fluctuation in water levels, had more extensive acres of aquatic plants.

Unfortunately, after the 1950s, aquatic plants virtually disappeared, even in those lakes that were separated from the river and had minimal fluctuation of water levels. Turbidity and softness of lake beds, which resulted from sedimentation, and altered water levels were responsible for the decline in vegetation

(Bellrose et al. 1979). Turbidity readings taken in 1963 and 1964 at low-river stage were two to three times higher than benchmark values recorded in 1896 (Mills et al. 1966). By the 1970s, generally only beds of plants most tolerant to fluctuating water levels and turbidity—American lotus, river bulrush, and marsh smartweed—remained (Bellrose et al. 1979). All these species are poor duck foods.

On a broader scale, less than half of the wetlands present at the time of European settlement remain in the conterminous United States, and the long-term trends in freshwater wetlands since the 1950s indicate that freshwater emergent wetlands have declined by the greatest percentage (Dahl 2000). Wetland loss in the Midwest has been particularly extensive, hosting six of seven states with the highest wetland loss (81 percent or more) since presettlement (Dahl 1990). Sadly, Illinois has lost approximately 90 percent of its original wetland acreage (Havera 1999).

An inventory in the 1970s revealed that there were potentially 183,120 acres that could be used by waterfowl in the Illinois River floodplain and lower portions of the Des Plaines and Kankakee rivers (Havera 1999). Bottomland forest constituted the largest portion of habitat (34.9 percent). Open water/lakes ranked second in total area (21.8 percent) and included the renowned bottomland lakes. Submergent and floating aquatic plants were the least common, representing only 958 acres, or 0.5 percent, of the waterfowl habitat.



Submergent and floating aquatic plants continued to be scarce in La Grange Pool in 1990 (Peitzmeier-Romano et al. 1992) and none were recorded in 1998 (Yin et al. 2001). A total of 5,041 acres (2.8 percent) of emergent plants were inventoried. Moist-soil plants totaled 15,759 acres, or 8.6 percent of the habitat, and could conceivably colonize a large amount of the additional 15,262 acres of mud flats under suitable water conditions. Scrub-shrub habitat occurred on 6,650 acres (3.6 percent).

With sedimentation and other factors leading to the loss of aquatic plants, the integrity of the wetland systems and the quality of waterfowl habitat in the Illinois valley were significantly diminished

Mallards

(Havera and Bellrose 1985). The abundance of certain species of waterfowl is directly related to the availability of native food resources (Bellrose et al. 1979). Experimental plantings of aquatic plants in various parts of the valley have failed to

THE ILLINOIS RIVER VALLEY HISTORICALLY HAS BEEN ONE OF THE MOST IMPORTANT MIGRATION AREAS FOR MALLARDS IN THE UNITED STATES.

perpetuate the species planted (Bellrose 1941; Anonymous 1945; Roseboom et al. 1989; Peitzmeier-Romano et al. 1991). Researchers found that if environmental conditions were suitable, plants were already growing there; and, if nothing was growing on an area, it was quite evident that supplemental plantings would fail (Bellrose 1941, Anonymous 1945). The Illinois River, however, remains an important migration area for waterfowl, but it is necessary to re-establish and maintain sufficient amounts of aquatic plant and moist-soil communities to satisfy the current and future nutritional requirements of migrant waterfowl.

WATERFOWL

The waterfowl populations of the Illinois valley inspired some of the world's finest decoy carvers, call makers, and private club owners, caretakers, and members. The 100-mile stretch of the Illinois River between Beardstown and LaSalle probably had more call makers than any other place in the United States (Thomas 1988). The art of carving and painting lifelike wooden hunting decoys reached its height of perfection in Illinois, particularly in the Illinois valley, between 1870 and 1940 (Parmalee and Loomis 1969).

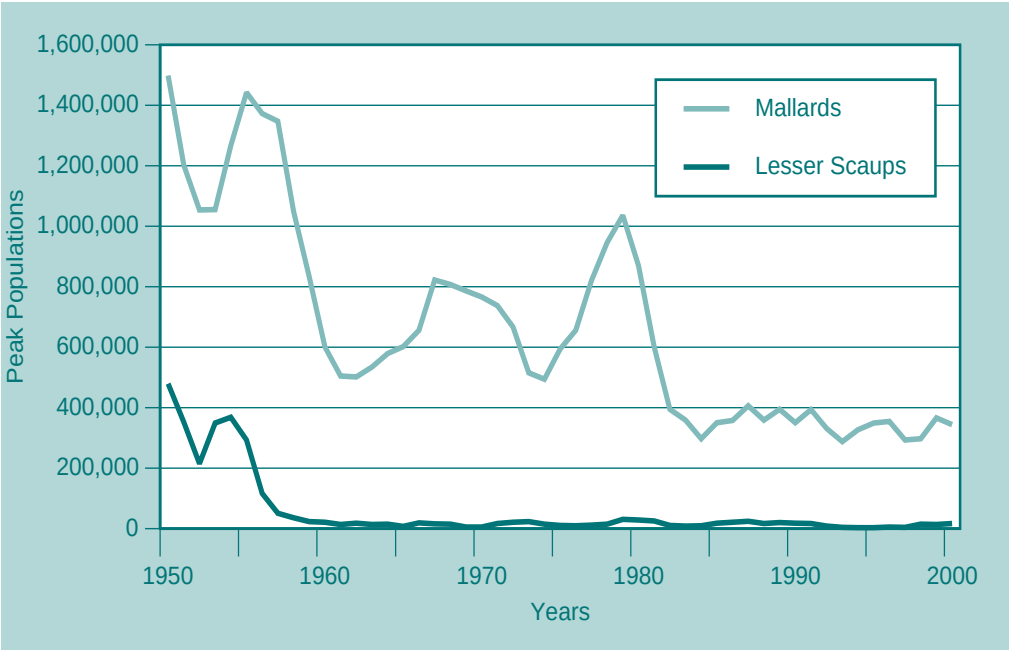
The private duck club was an institution peculiar to North America (Heilner 1943), appearing in the Illinois valley in the late 1800s. The duck clubs established their own mystique and personality. Hunters from distant locations arrived at these private clubs by rail, steamer, launch, or cabin boat before the 1920s when roads and motor vehicles became more commonplace.

The clubs contributed significantly to sport hunting and the waterfowl resource. Management practices developed over the years by the clubs, and their caretakers formed a solid base for modern waterfowl management. For example, the private clubs in the valley were among the first to initiate "rest areas" to hold ducks to improve hunter success (Uhler 1933). Almost all of the large private duck clubs (about 20) in the Illinois valley in 1938 had refuges. They were also the first to set bag limits, ban automatic shotguns, stop spring shooting, and establish shooting laws (Heilner 1943). The private clubs continue to serve critical roles in providing rest areas and food for the fall and spring passage of waterfowl through the valley and also habitat and associated benefits for many other species of wildlife.

The Illinois River valley historically has been one of the most important migration areas for mallards in the United States. Leopold (1931) reported that 3 million ducks were observed resting at both Crane Lake and Clear Lake during the late 1920s. From December 1–7, 1944, a total of 3.85 million mallard and American black ducks were documented on just seven lakes in the valley, including 1.5 million at Lake Chautauqua. Frederick Lincoln, the first to extensively band ducks in the United States, placed bands on mallards in 1922 in the Illinois valley and noted that "when all the other ducks are gone, there will still be mallards on the Illinois" (Heilner 1943:88).

Because of human actions, however, the once-magnificent habitat of the Illinois River valley has become degraded, and—along with the declining continental numbers of mallards—the number of mallards passing through the valley each fall has steadily declined. A three-year moving average of the peak number of mallards during fall on the Illinois River from 1950 to 2000 revealed a downward trend. Nonetheless, for the period of 1955–1996, 20.6 percent, on average, of all mallards wintering in the

Mallards congregating in a bottomland forest wetland in the Illinois Valley. (Photo from Havera 1999)



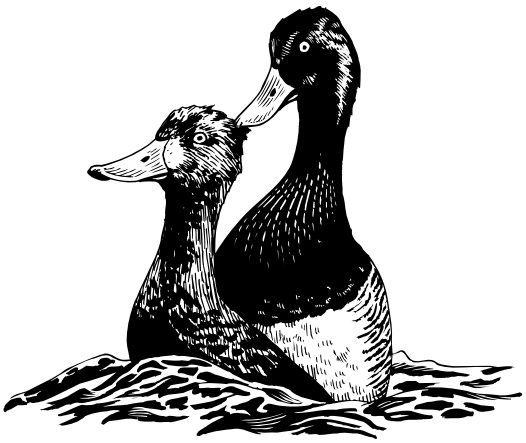
Three-year moving average of the peak numbers of mallards and lesser scaups aerially inventoried in the Illinois River valley during fall, 1950-2000, show a downward trend.

Mississippi Flyway were in the Illinois valley during one day of their fall migration (Havera 1999).

Food habit studies for mallards from the Illinois valley during 1979–1981 (Havera 1999) were compared with those from 1938–1940 (Anderson 1959). The most notable finding was that during 1979–1981 Japanese millet, buckwheat, and grain sorghum—plants intensively managed for waterfowl—were major foods representing 10.6 percent of the diet. These foods were not found in the diet of mallards in 1938–1940. Additionally, during 1979–1981 the aquatic plants of coontail, longleaf pondweed, and common arrowhead no longer constituted an important part of the mallard diet as they had in 1938–1940 (10.4 percent). Thus, in recent years, food items from domestic plants cultivated by hunting clubs and public areas had replaced the seeds of aquatic plants, which were no longer available in the valley.

The drastic declines of lesser scaups and canvasbacks in the Illinois valley are particularly noteworthy. These species were abundant in the valley before the mid-1950s. The food resources used by lesser scaups and canvasbacks began to disappear from the upper Illinois River valley in the mid-1950s and have not recovered. The largest concentration of lesser scaups observed during aerial inventories in the Illinois valley occurred on food-rich Upper Peoria Lake, where 700,000 were seen in 1949. The crash in the number of lesser scaups occurred in the 1950s (see figure above). The peak number of lesser scaups recorded in the Illinois River region north of Peoria was 585,100 in 1954; 73,650 in 1955; 34,250 in 1956; and 10,075 in 1957. The number of lesser scaups stopping in this region has never recovered.

The largest concentration of canvasbacks aerially inventoried in the Illinois River valley since 1948 occurred on Upper Peoria Lake, where 95,000 were present in November 1953. The peak number of canvasbacks recorded north of Peoria was 105,160 in 1952; in 1971, a maximum of 120 were observed there. As with the number of lesser scaups, the number of canvasbacks in the Illinois River region crashed in the mid-1950s and has not rebounded.



Lesser Scaups

Looking Ahead

How much habitat will be necessary for waterfowl in the Illinois valley in the future? The wetland and upland habitat restoration objective of the Upper Mississippi River and Great Lakes Region Joint Venture of the North American Waterfowl Management Plan identified a deficiency of 15,000 acres in Illinois (U.S. Fish and Wildlife Service 1993). The Illinois Division of Waterways (1969) concluded that to meet the potential waterfowl hunting demands in the Illinois valley, it will be necessary to utilize all bottomlands not having a higher economic use. The Division (1969) recommended that at least 100,000 acres be under public management by 2020 and that at least 50,000 acres be under private management. Thus, satisfying these requirements would place about 35 percent of the Illinois River valley bottomlands under waterfowl management.

In 1969, 11 percent of the Illinois River bottomlands were in government ownership, with the State of Illinois owning 7 percent (29,800 acres) and the United States 4 percent (17,000 acres) (Illinois Division of Waterways 1969).

About 8 percent was under the ownership or jurisdiction of private sports clubs. The largest single use of the bottomlands was for agriculture, with about 187,400 acres (44 percent of the total) under the jurisdiction of various drainage and levee districts. The remaining 120,000 acres of the bottomlands included nonprotected farmland as well as urban, industrial, and miscellaneous uses.

Several recommendations for preserving and restoring the wetlands in the Illinois valley have been made since the early 1900s (Havera 1993). Previous studies have shown that drainage and levee districts along the Illinois River raise flood heights and decrease fish and wildlife habitat (Alvord and Burdick 1919, Jenkins et al. 1950). “If drainage and levee districts could be returned to their natural conditions they would once again become paradises for hunters, fishermen, and nature lovers (Jenkins et al. 1950:58).

We believe that in today’s environment the most feasible means to reestablish high quality wetlands in the floodplain is to acquire selected drainage and levee districts in critical locations and with high restoration potential. The

levees should be retained to protect the established wetlands from the excessive sediment loads, invasive nonnative species (i.e. several species of carp), water quality concerns (i.e. nitrogen, atrazine, chemical spills) and unnaturally fluctuating levels. Successful examples of the recommended strategy include Spring Lake, Tazewell County (Fig. 2), and Banner Marsh, Fulton County in the Illinois valley, as well as Louisa Refuge, Louisa County, Iowa, and the Ted Shanks Refuge, Pike County, Missouri, in the Mississippi River floodplain.

The Hennepin & Hopper Lakes Project, developed and managed by The Wetlands Initiative, offers the only exceptional opportunity to restore clear water habitat with aquatic plants in the floodplain north of Peoria. The Thompson Lake/Emiquon area south of Peoria near Havana provides an additional unique situation. We should wisely capitalize on the multiple benefits that these areas can provide by establishing high quality wetlands within their existing levee systems.

Those who would restore the Illinois River must be cognizant of the history of this once fabulous system, but also its present limitations and historic modifications (Humburg et al. 1996, Cruikshank 1998). Ultimately it is our desire to have the river and its floodplain function as a system as in presettlement times. For this to occur, however, appropriate safeguards to control invasive nonnative species, excessive sediment, and unnaturally fluctuating water levels must be well-tested and operational.

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The Wetlands Initiative is a non-profit corporation dedicated to restoring the wetland resources of the Midwest to reduce flood damages, improve water quality, and increase wildlife habitat and biodiversity. Our mission is to promote restoration in ways that provide environmental and economic benefits to society and the landowner. Through research, education, public policy analysis, and large-scale demonstration projects, TWI aims to restore one million acres by the year 2010. While this number may seem large, it represents only 2 percent of the wetlands lost in the Midwest.

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