



# WETLAND MATTERS

NEWSLETTER OF THE WETLANDS INITIATIVE

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## WETLAND RESTORATION: WHY REVERSE 300 YEARS OF WETLAND LOSSES?

The Wetlands Initiative is pleased to present the first issue of *Wetland Matters*. The goal of the newsletter is to provide you, our many friends and supporters, with substantive information about the value of wetland restoration and to keep you up to date on our restoration efforts.

The Wetlands Initiative was founded as a nonprofit corporation in 1994 to demonstrate and promote the idea that wetland restoration can provide cost-effective solutions to our nation's flooding, water quality and wildlife problems, and that the restored wetlands can be economically self-sustaining.

The environmental problems we seek to address are not new ones: escalating flood damages, degrading water quality, and declining wildlife populations and diminishing biodiversity have plagued this country for 300 years. The relationship between wetland losses and these problems was dramatically illustrated by the devastation of the 1993 floods in the upper Mississippi River basin.

As a nation, we have relied on structural solutions (e.g., dams, levees, wastewater treatment plants) to address these problems. The U.S. Army Corps of Engineers has spent \$30

billion on structural flood controls in the Mississippi River watershed since 1960. In spite of these efforts, flood damages have steadily increased and now average \$3.5 billion each year.

The underlying ecological instability arose as Europeans settled the land. They clear cut vast areas of forest; plowed under the dominant prairie landscape; and drained wetlands to near extinction. The changes were continental in scale and so were the results. As problems manifested themselves, little attention was given to their origin; early solutions—as do current solutions—focused more on containing or transferring elsewhere the problems of flood damages, water pollution and habitat destruction.

Consequently, billions of dollars have been spent to erect levees to restrict the movement of water and shift it to other locations; to construct and operate hatcheries and refuges to compensate for habitat losses; to build wastewater treatment plants to replace the natural treatment capacity of landscapes such as wetlands. As forests, prairies, and wetlands were systematically destroyed, more and more water poured into the constricted artificial drainage system carrying tons of topsoil and associated chemicals, leading to a further loss of habitat and a dead zone of approximately 4.5 million acres in the Gulf of Mexico.

Structural solutions have failed to eliminate the problems; they have been unsuccessful because they have not addressed the cause—the alteration of the original landscape. Until some portion of the nation's forests and prairies are returned, wetlands

restored and the natural hydrologic, water quality and wildlife functions of these landscapes replaced, the problems will continue to plague us.

In formulating a restoration strategy, landscape solutions need not be devoid of economic benefits. Farming can continue on floodplains, although at higher risk; alternative crops, which thrive in moist conditions, can grow in periodically saturated soils; and income-producing recreation can be developed. Wastewater and polluted runoff can be cleansed in wetlands, and wildlife benefits can be secured. Above all, the federal costs of maintaining, protecting and compensating for damages can be captured and reinvested in the restoration of native landscapes.

The organizational goal of The Wetlands Initiative is to demonstrate and promote the idea that is central to this philosophy—that wetland restoration can provide cost-effective solutions to our flooding, water quality,

and wildlife habitat problems, and that the restored wetlands will be economically self-sustaining.

## HOW FLOOD DAMAGES ESCALATE AS WETLANDS DISAPPEAR

When Europeans came to North America, they began to chip away at the ecological structure of the landscape. By the early 1900s, this structure had collapsed and flooding, poor water quality, and loss of biological diversity and wildlife followed.

In 1936, immediately after two seasons of devastating floods, Congress passed the Flood Control Act, promoting the development of structural solutions on a piecemeal basis. The projects were vulnerable to congressional log rolling and indifferent to the concept of long-range planning. Despite a steady effort at controlling flooding since then,

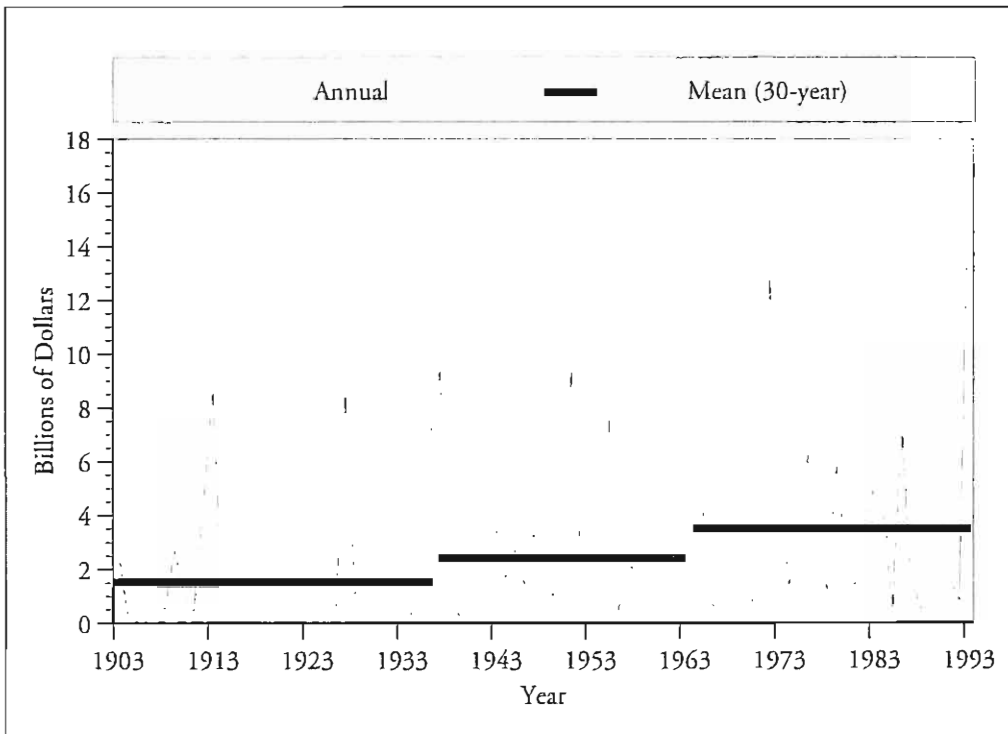


FIGURE 1. National annual and 30-year mean flood damages, adjusted to 1993 dollars. (Source: U.S. Weather Bureau)

total flood damages have continued to escalate (Figure 1). [Note that when most people talk about “flooding,” what they are really talking about is “flood damage.”]

Although the 1936 law was the first to establish a federal interest in flood control, flood control projects were nothing new. In fact, as early as the 1600s the French built levees around New Orleans. The practice extended upstream, and by the 1850s levees built by the Army Corps of Engineers had reached St. Louis, usually camouflaged as navigation projects.

Then, because of floods in the 1840s, an engineer by the name of Charles Ellet, Jr. was commissioned to study flooding on the Mississippi. He concluded that the levees were actually creating flooding. His report was promptly filed and buried in the Library of Congress and the Corps continued to build more levees.

The Corps is not entirely to blame for the ecological collapse of the Mississippi River basin. The massive reshaping of the landscape actually began with the early fur traders. Beaver, over some 10,000 years, had a tremendous impact on the landscape, building dams on our rivers in a stair-step fashion, which is still obvious today. Estimates of the beaver population before European settlement are as high as 400 million—enough beaver to put a dam every 2,000 feet on smaller streams. In the early 1600s, Europeans and Native Americans began trapping beaver and soon decimated the population.

By the early part of the 1800s, beaver were extirpated from most regions of the United States. In 1844, they were considered extinct in Illinois. Meanwhile, the beaver’s controlling works—their dams—were washed out and streamflow increased in intensity, as did flooding.

Early settlers also played a significant role in creating ecological chaos on our streams. As farmers, they began to create an agricultural industry based on land drainage. To facilitate the removal of water, 155,000 miles



*Flooding on the upper Mississippi River in 1993 caused more than \$16 billion in damages, according to the National Weather Bureau. (Photo by Linda Hascall, courtesy of the Illinois State Water Survey)*

of outlet ditches were constructed in the lower 48 states. In some areas of Illinois today, there are more miles of outlet ditch than there are miles of road. The ditches moved the water off the land and downstream, not in a matter of months, as formerly occurred, but in a matter of hours.

Drain tiles that pulled the groundwater

down 3 to 4 feet were attached to the outlet ditches. Then engineers built levees on either side of the receiving streams so water could no longer be stored on the floodplain. Between expanding levees, water was stacked up higher and higher and moved downstream more and more rapidly, causing extensive erosion and escalating flood damages.

In the Mississippi basin above Thebes, Illinois (south of St. Louis but north of the confluence of the Ohio River), the Fish and Wildlife Service has estimated that around 45 million acres (10% of the watershed) were wetlands in the 1780s. By today's estimate there are only 19 million acres. More than 25 million acres (59% of the wetlands) that could have stored floodwaters without damage have been lost. Interestingly, we know that the volume of floodwater that passed St. Louis in 1993 would have been enough to fill only 13 million acres of wetlands to a depth of 3 feet. Compare that 13 million acres to what we have lost in wetlands, and it becomes clear that about half of nature's reservoirs already lost would have provided enough storage capacity to prevent the devastation of the floods of 1993.

## TOWARD BETTER SOLUTIONS

To find solutions for our environmental problems, we must begin to change the way we view the landscape and how we live with it. We must break our past reliance on manmade structures. Obviously, we cannot take down the flood walls and levees around major population centers like St. Louis, but we can increase nature's ability to reduce flooding by rebuilding wetlands, by modifying some levees to allow overtopping during major flood events, and by reintroducing spring and fall floods to the floodplain.

Some restored wetlands would best be left as wildlife habitat, and others to support economic activity—in many cases, agriculture. Future issues of *Wetland Matters* will

explore the relationship between farming and wetlands more closely. 卍

## TWI PROJECTS: ENCOURAGING AN ECOSYSTEM APPROACH

**D**uring the past two years, The Wetlands Initiative has been working to establish four demonstration projects in the upper Mississippi River basin to illustrate the environmental and economic benefits and technical feasibility of reestablishing wetlands. This work has been supported by the McKnight, Joyce, Curtis and Edith Munson, National Fish and Wildlife, Siragusa, and Sudix foundations and the Kemper Educational and Charitable Fund.

### EMIQUON

This proposed 11,000-acre national wildlife refuge would restore the once vast marshes, bottomland forests, and backwater lakes that covered the floodplain at the confluence of the Illinois and Spoon rivers near Havana, Illinois. Most of the land has been drained, leveed, cleared, and converted to intensive row-crop agriculture. The project will show how the river and floodplain can be effectively reconnected. It will restore fish and wildlife habitat, and protect backwater lakes from sedimentation. The backwater lakes will be protected from the high sediment loads of the rivers by installing water control structures in the levee, and by a series of constructed wetlands and wooded buffers. Habitat for migratory waterfowl and other wildlife will be created. Together with the existing Chatauqua National Wildlife Refuge, across the Illinois River, and Dickson Mounds State Museum to the west, this

project provides the opportunity to re-create the entire river floodplain from bluff to bluff.

tion practices would be used in the watershed.

### GOOSE LAKE

Located on the floodplain of the Iowa River, upstream from its confluence with the Mississippi, this project will demonstrate how agriculture and wildlife can coexist in a floodplain managed to store floodwaters and how alternative crops can provide an acceptable economic return to the landowners. A sluice gate installed in the levee will restore annual flood flows to the wetlands to create corridors of wildlife habitat connecting the project with an existing downstream wildlife refuge. A notched spillway in the levee will allow water from less frequent, larger floods to spill over onto the floodplain, providing flood storage and reducing damage to the levee. Landowners will be compensated for the increased risk of flooding; easements will be purchased for land used as wetlands.

### STRAIGHT RIVER

This project, in southeastern Minnesota, is a cooperative effort between the landowners, the drainage authority, and private, state, and federal conservation organizations. As a 1,760-acre Wetlands Reserve Program (WRP) project, it is designed to restore a 1,280-acre drained marsh and 480 acres of surrounding uplands. Since the marsh was drained and farmed, the muck soils have subsided and are frequently flooded, making it difficult to farm without constant pumping. The project will reestablish marsh hydrology and demonstrate how wetlands can be managed for both wildlife habitat and floodwater storage, while still maintaining drainage of the surrounding uplands.

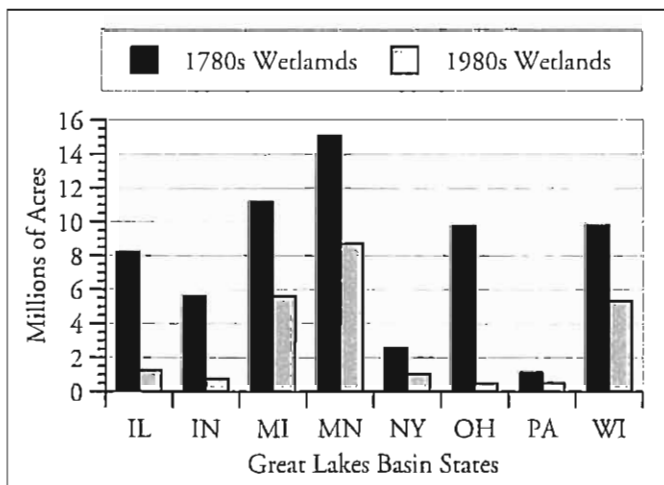
### REDWOOD RIVER

The upper Redwood River watershed is part of the prairie pothole region, one of the most important waterfowl breeding areas in North America. The project will test whether hydrologic restoration in the watershed, which includes wetland restoration and soil and water conservation practices, can effectively reduce flood peaks in the downstream town of Marshall, Minnesota. (The town sustained severe flood damages in the summer of 1993.) A combination of wetland restoration—accomplished by constructing small, beaver-like dams along the streams—and soil conserva-

tion practices would be used in the watershed.

## GREAT LAKES BASIN PLANNING

With support from the Great Lakes Protection Fund and the Charles Stewart Mott



Since the 1780s, approximately 63% of the wetlands in the Great Lakes basin states have been lost.

(Source: Dahl, T.E. 1990. Wetland Losses in the United States, 1780s to 1980s. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.)

Foundation, The Wetlands Initiative also has focused on watershed planning in the Great Lakes basin. We recently completed a two-year project to provide water resource managers with the information necessary to incorporate wetland restoration into watershed management plans.

Over the past decades numerous studies have affirmed the importance of wetlands. For example, the Great Lakes Water Quality Board wrote, "Wetlands not only form the link between aquatic and terrestrial ecosystems, but also are key in the maintenance of water quality, storage and flow." The board also found, however, that the decision-making process concerning wetlands is extremely fragmented. Institutional barriers prevent governmental agencies from forming an integrated approach to wetlands.

Fragmentation all too often results in the absence of clear guidelines for development. Different agencies may have responsibilities for dealing with wetlands and water quality issues. As a result, wetland restoration or recreation is often piecemeal and the community and the environment pay the price.

The Wetlands Initiative conducted a series of workshops in the Great Lakes basin to encourage water resource managers to consider the ecosystem management approach to water quality. Included in the presentations were results from three demonstration projects as described below.

### WAUKEGAN RIVER

The Waukegan River project serves as an example of how various government and private entities can work together to overcome the jurisdictional problems that affect a watershed. The 10-square-mile watershed is almost fully developed, except for small areas of wetlands. Within this area, however, many different groups or agencies influence or control the wetlands. As a result, permits are issued to fill the remaining wetlands one small project at a time, often with disastrous cumulative ef-

fects—a situation typical of many urban watersheds in the basin.

The Wetlands Initiative's study identifies the parameters of the problem and develops a plan to protect the wetlands, while using them to improve water quality in the watershed. The challenge is to gain consensus with the community, developers, and the regulatory agencies. The Wetlands Initiative will be working with the Conservation Fund over the next year to define a common ground from which solutions to this difficult problem can be achieved. Our goal is to develop a process that can be implemented throughout the Great Lakes basin that provides basinwide benefits.

### SAGINAW BAY

Working with Dr. William Mitsch, a research scientist at The Ohio State University, The Wetlands Initiative was able to document the improvements to water quality in Saginaw Bay made possible by wetland restoration of the Quanicasee River near Bay City, Michigan. The Wetlands Initiative study documents how protecting and restoring wetlands and riparian areas can help improve water quality by reducing pollution caused by agricultural runoff.

### SOUTHEASTERN WISCONSIN

Although it is commonly accepted that wetlands are important to the hydrology of the Great Lakes, the effects of wetlands on the hydrology of tributaries has not been clearly quantified. In this study, the presence of wetlands in nine watersheds in southeastern Wisconsin was related to watershed hydrologic characteristics to test the hypothesis that wetlands are important to protecting the water quality of Great Lakes coastal waters. The presence of wetlands in each watershed was related to the hydrologic characteristics of these basins, and hydrologic and statistical measures were used to assess the effects.



## U.S. FOREST SERVICE NAMES TWI FOR CONSERVATION EFFORT

The Wetlands Initiative has been selected to create the wetlands restoration concept plan for the recently-announced Midewin National Tallgrass Prairie (former Joliet Arsenal). This 19,000-acre project, at the confluence of the Des Plaines, Kaukahee, and Illinois rivers, is the first national tallgrass prairie east of the Mississippi River. Owned and managed by the U.S. Forest Service, it will be the largest natural area restoration project adjacent to a major metropolitan area in the country.

## ROOKERY CONSTRUCTED FOR GREAT BLUE HERON

Can heron be lured to nesting sites that are out of the way of economic development and easily protected? The Wetlands Initiative, in association with Wetlands Research, Inc., expects to find out through its research project constructing a rookery on the Des Plaines River in northeastern Illinois.

Great blue heron, black-crowned night heron, and double-crested cormorant populations are reasonably stable in Illinois. Their nesting habitat, however, is steadily giving way to the pressure of development, setting the stage for eventual conflict between economic and environmental interests. The Wetlands Initiative believes conflict can

be avoided by developing techniques to lure these birds to nesting sites that are out of the way of development and easily protected. Constructed rookeries could help to avoid a "spotted owl standoff" by getting out in front of a problem before it escalates to the front page.

Working with a wildlife biologist, we have erected 36 nesting platforms on utility poles overlooking foraging areas on the Des Plaines River floodplain on land already owned by the Lake County Forest Preserve District. The birds will be attracted by decoys and a solar-powered calling system. Nest building could start as early as this spring, with the entire project expected to last about three years.

Contributors to the project include the U.S. Fish and Wildlife Service, Wildlife Forever, Edward Hines Lumber Co., Commonwealth Edison, Aldridge Electric Co., and the Grace A. Bersted Foundation.



*Scientists hope to attract Great Blue Heron to nest in a protected area of the Lake County Forest Preserve District. The site will be the first constructed rookery in Illinois.*



## THE WETLANDS INITIATIVE

The Wetlands Initiative is a nonprofit corporation dedicated to restoring wetland resources of the Midwest to reduce flood damages, improve water quality, and increase wildlife habitat and biodiversity. Our mission is to accelerate the restoration of wetlands in ways that provide economic benefits to society and the landowner. TWI's goal is to restore one million acres by the year 2010. While this number may seem large, it represents only 2% of the wetlands lost in the Midwest. We will promote wetland restoration through research, education and public policy analysis, and by establishing demonstration projects to test the economic feasibility of large-scale wetland restoration.

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