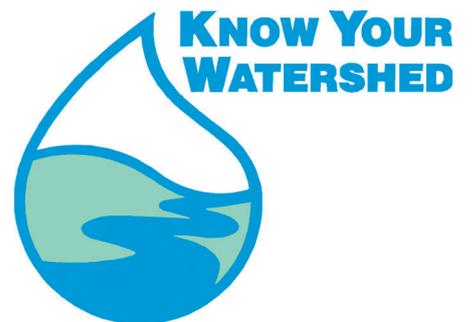


WETLANDS: A KEY LINK IN WATERSHED MANAGEMENT

A GUIDE FOR WATERSHED PARTNERSHIPS



HOW YOUR WATERSHED CAN BENEFIT WITH WETLANDS.

Wetlands are a key link in watershed management. The role that they play in our watersheds is critical to protecting water quality and moderating water quantity.

Wetland habitat serves as home for many plants and animals. Even the national—and in many areas the local—economy has a significant connection to wetlands.

Essentially wetlands are the transition between dry land and water (streams, rivers, lakes, and coastlines), wetlands take many forms including the familiar marshes, swamps and bogs. Yet, not all wetlands are “wet” year round. These “drier end” wetlands also perform significant wetland functions. Yet, these are often the target for many uses including agricultural and urban/suburban uses.

WHY CONSIDER WETLANDS IN YOUR WATERSHED?

Without wetlands, we can expect an increase in flooding, decrease of animal, plant and bird species, increase in

erosion, decrease in water quality, and lost revenue.

Vegetated riparian wetlands in agricultural areas have proven to remove high percentages of phosphorus and nitrogen from runoff water. Without these wetlands,

increased nutrient loading to rivers, streams and lakes could result in algal blooms and over-abundant aquatic plant growth. When these algae and plants die, oxygen in the water is used during the decomposition process. This can result in oxygen deprivation which may lead to fish kills.

When agriculture and development practices impact wetlands, the water storage and flood control capacity of the land decreases, increasing the likelihood of costly flood damage downstream.

WETLAND BENEFITS.

Wetlands are valuable systems that provide many benefits to your watershed including:

Reduced water treatment costs

Wetlands can help improve water quality by removing or retaining nutrients, organics, and sediment carried by runoff. The flow of water slows as it enters a wetland, which causes sediment in the water to settle out. Many chemicals — fertilizers, human and household wastes, toxic compounds — are tied to sediment and trapped in wetlands. Plants and the biological processes present in a wetland breakdown and convert these pollutants into less harmful substances. By restoring and utilizing wetland functions, we can reduce the costs of constructing, operating and maintaining drinking water treatment plants.

Increased groundwater availability

Wetlands “soak up” water during and after a rainy spell. While wetlands “hold” most of the water, some water makes its way to the groundwater supply. Thus wetlands often fill the vital job of recharging groundwater so it’s available for use at a later date.

7 WAYS YOUR WATERSHED CAN BENEFIT

1. Improve water quality by breaking down, removing, using or retaining nutrients, organic waste and sediment carried to the wetland with runoff from the watershed.
2. Reduce severity of floods downstream by retaining water and releasing it during drier periods.
3. Protect stream banks and shore lines from erosion.
4. Recharge groundwater, potentially reducing water shortages during dry spells.
5. Provide food and other products—such as commercial fish and shellfish—for human use.
6. Provide fish and wildlife—including numerous rare and endangered species—food habitat, breeding grounds, and resting areas.
7. Increase opportunities for recreation—bird watching, waterfowl hunting, photography—and outdoor education.

Reduced flood damage

Another way wetlands are valuable to humans is their influence on the flow and quality of water. Wetlands often act like giant sponges, soaking up water that runs off the land. This feature can help slow floodwaters, lower flood heights and reduce shoreline and stream bank erosion. Preserving natural wetlands can reduce or eliminate the need for expensive flood control structures.

Food and related industries

The vast majority of our nation's fishing and shellfishing industries harvest wetland-dependent species. This catch is valued at \$15 billion a year. Commercial fishermen harvested nearly ten billion pounds of fish in 1996.

EPA estimates suggest that 98% of the Gulf of Mexico fishing industry harvest comes from fish and shellfish that are dependent on in-shore wetlands. The US Department of Commerce reports that 438 million pounds of brown, white and pink shrimp were harvested in 1995 and 1996 (combined). This was worth more than \$838 million dockside.

Other wetland-reliant products include cranberries, blueberries, wild rice, medicines, pelts and timber.

Diverse plants & animals

Wetlands contribute to diversity by providing food and habitat that supports a wide variety of plants and animals. Detritus—enriched organic material formed by the decay of plant and animal material in water—is food for insects, shellfish and forage fish. In turn, fish (such as striped bass and bluefish), mammals, reptiles and amphibians feed off of the insects and forage fish. The growth of wetland plants and algae is also nourished by nutrients the provided in the detritus.

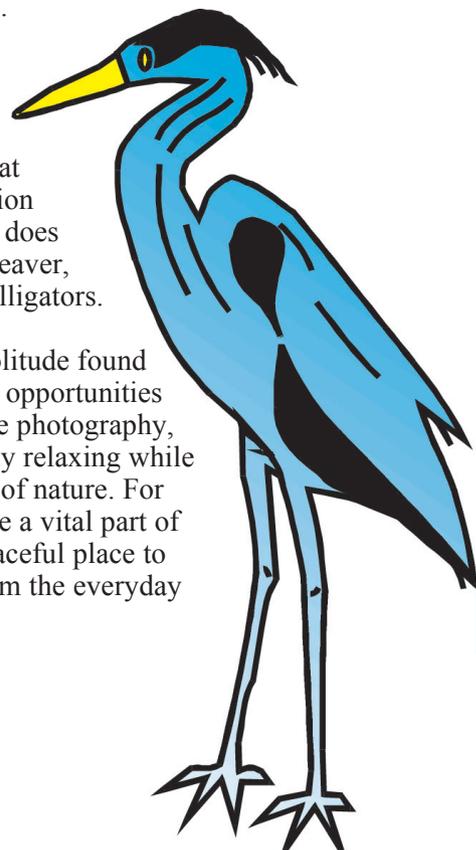
Wetland plants provide food and shelter for fish and animals. Wetland-dependent mammals include: muskrat, beaver, moose, raccoon, bobcat, swamp rabbit, and white-tailed deer. Bald eagles, ospreys, hawks, egrets, herons and kingfishers are just a few of the birds that thrive in wetlands. The high biological productivity of wetlands makes them vital ecosystems not only to the plants and animals that directly depend on them for food and shelter, but to humans as well.

Recreation

Revenue is also generated from waterfowl hunters in search of wetland-dependent birds. The 1996 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation reported 3.1 million adult Americans hunt migratory birds. This includes hunting for geese, ducks, doves, and other game birds. They spend about \$1.3 billion on travel, equipment and other associated expenses.

Another recreational outlet is trapping. An EPA report puts the nation's harvest of muskrat pelts worth over \$70 million annually. This, of course, does not include the value of beaver, mink or reptiles such as alligators.

The natural beauty and solitude found in wetland areas provides opportunities for bird watching, wildlife photography, painters, hikers and simply relaxing while appreciating the wonders of nature. For many people, wetlands are a vital part of their lives providing a peaceful place to reflect while escaping from the everyday stress and strains.



UNDERSTANDING WETLANDS.

HOW WETLANDS FORM.

The formation and role of a wetland is driven by its location in the watershed, the presence of water during significant periods, soil quality and, ultimately, plants and animals. In fact, soils and plants act as “identifiers” for each wetland.

As sediment is deposited along river corridors, opportunistic plants and animals seek out the new habitat and flourish. As these areas mature, the soils change which impact the variety of plant and animal species. Thus new species may colonize. This process is called succession.

At the mouths of rivers (where a river meets the ocean) sediments are often deposited forming alluvial plains. Marsh grasses find these areas desirable. In addition, other plants and many animals are then attracted to these deltas.

Other wetlands are formed by aging lakes that fill-in with sediments. This area supports shrubs and trees adaptable to life in a wet environment.

TYPES OF WETLANDS.

The diversity of wetland habitat makes the identification and classification of wetlands challenging. Wetlands are identified and classified according to the types of plants, soils, hydrology or patterns of water, and fish and/or wildlife communities present.

Swamps, marshes and bogs are easily recognizable types of wetlands. Other types of wetlands may be less well known because the amount of water present will vary seasonally, with specific rainfall events or with snowmelt.

The plants that live in wetlands are particularly adapted to soils that are saturated with water and, at times, contain little oxygen. These plants, such as marsh grasses, are called hydrophytes (literally water plants) and the soils where they thrive are referred to as “hydric soils.” Some basic types of wetlands are:

Riverine Bottomlands/Hardwood Forests: Found along the river corridors, these provide water storage during times of peak precipitation, reducing flood water and then slowly releasing the stored water. Silver maple and cottonwood are common in northern regions. Bald cypress and tupelo dominate southern regions.

Northern Bogs: Saturated areas with mossy carpets and shrubs, grasses and stunted spruce trees. These cool wetland areas produce wild cranberries, harvested in autumn. Bogs effect the climate by storing carbon dioxide in decaying plant materials (peat), thereby reducing its release into the air.

Cypress Swamps: Also known as domes, these are characterized by tall cypress trees growing in the center of the swamp. The trees filter pollutants like nitrates and phosphates that reach the swamp via water runoff.

Coastal Marshes: Influenced by the tides, these highly productive ecosystems support the majority of fish and shellfish harvested. These wetlands provide feeding, spawning and nursing areas for a multitude of invertebrates, birds and fish.

Prairie Potholes: Formed by receding glaciers that produced shallow depressions which seasonally fill with water, these are a favorite breeding and feeding area for North American ducks. These wetlands also play an important role in recharging freshwater aquifers.

SUSTAINABLE WETLANDS DEPEND ON...

- ◆ Understanding how the parts integrate into the whole system.
- ◆ Treating the root of existing problems, not just manifestations.
- ◆ Understanding nature’s boundaries.
- ◆ Learning to live in balance with natural systems.
- ◆ You!!

RUNOFF THREATS.

While wetlands can reduce the impact of some pollutants, too much pollution will negatively impact the wetland. Thus, the quality of a wetland is dependent on the water flowing into them ... and the pollutants that the water carries with it from activities in the watershed.

Runoff, originating with rain fall or snow melt, that contains pollutants—oil, grease, fertilizers or pesticides—is called nonpoint source pollution. In addition to the potential of runoff polluting wetlands, it also can pollute other surface waters such as lakes, rivers, and oceans. Eventually it can reach groundwater, which is often used for drinking water.

The best way to protect the quality of wetlands is for every person in the watershed to prevent potential pollutants from being carried by runoff or infiltration.

OTHER WETLAND THREATS.

The loss of the values provided by wetlands impacts watershed residents, plants, and animals. Filling in one acre of wetland

may not seem devastating. Yet, the cumulative affect threatens the value of remaining wetlands and impacts the entire watershed...residents, plants, animals, water quality and quantity. Already more than half the wetlands in the lower 48 states have been destroyed. Some of the causes are listed below:

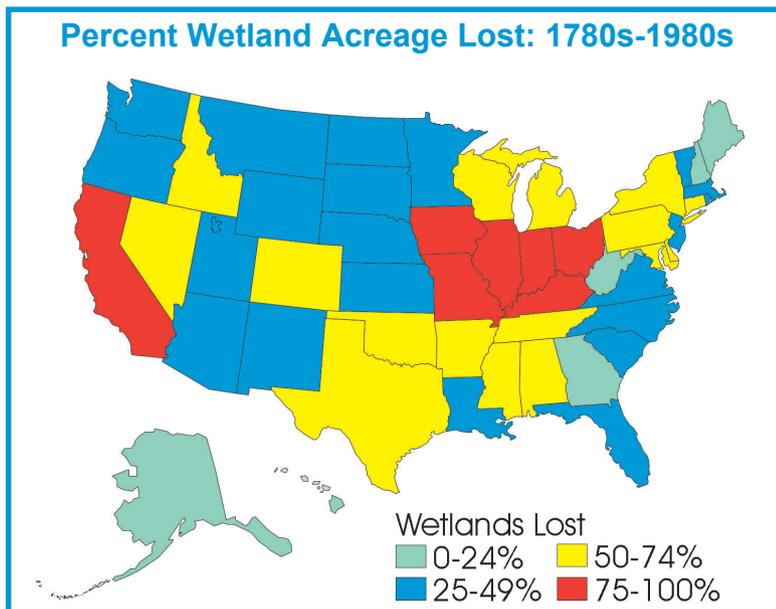
Naturally occurring events—hurricanes, droughts, erosion, drops in groundwater levels—destroyed or severely threatened some wetlands.

Agriculture production is responsible for many drained wetlands.

Marinas, housing, roads and other urban structures were built on filled wetlands.

Dams and dredging nearly always affect the flow of rivers and lakes, destroying some wetlands and threatening others.

There are numerous other threats, however those listed above are the most common.



Twenty-two states have lost at least 50% of their original wetlands since the 1780s. Seven states—Indiana, Illinois, Missouri, Kentucky, Iowa, California and Ohio—have lost over 80%. Since the 1970s states with the most losses are Louisiana, Mississippi, Arkansas, Florida, South Carolina and North Carolina. Wetlands drained for agricultural purposes has been reduced while development continues to account for a larger percent.

Source Mitch and Gosselink. Wetlands, 2nd Edition, Van Nostrand Reinhold, 1993

MANAGING & RESTORING WETLANDS.

Preservation and protection is the most economical way to “manage” wetlands. Of course, this isn’t an option for the millions of altered wetland acres. In these areas, restoration is often the best solution to meet a watershed partnership’s goals.

10 GOOD REASONS TO RESTORE WETLANDS.

1. Re-establish native vegetation...a sustainable food source for wildlife.
2. Provide breeding grounds for waterfowl.
3. Connect wildlife corridors for ease of movement and healthy interactions.
4. Reduce downstream flooding.
5. Reduce streambank and shoreline erosion.
6. Protect fish and shellfish harvests.
7. Restore natural biological diversity.
8. Improve water quality.
9. Enhance threatened and endangered species.
10. Provide recreational and educational sites.

WHAT IS RESTORATION?

“Restoration” is the process of returning the wetland system to an approximation of its predisturbed condition.

This does not mean returning all altered wetlands to their unaltered state. It simply means replacing the lost values with newly created or “restored” wetlands. In other words, the goal is to restore the value rather than restore a particular site with a self-sustaining system that requires little human “management.”

Considerable advances have been made in large-scale wetland restoration. Yet, restoring wetlands to their original condition—replicating the complex and diverse physical, chemical, and biological interactions—hasn’t been well-documented.

THE RESTORATION GOAL.

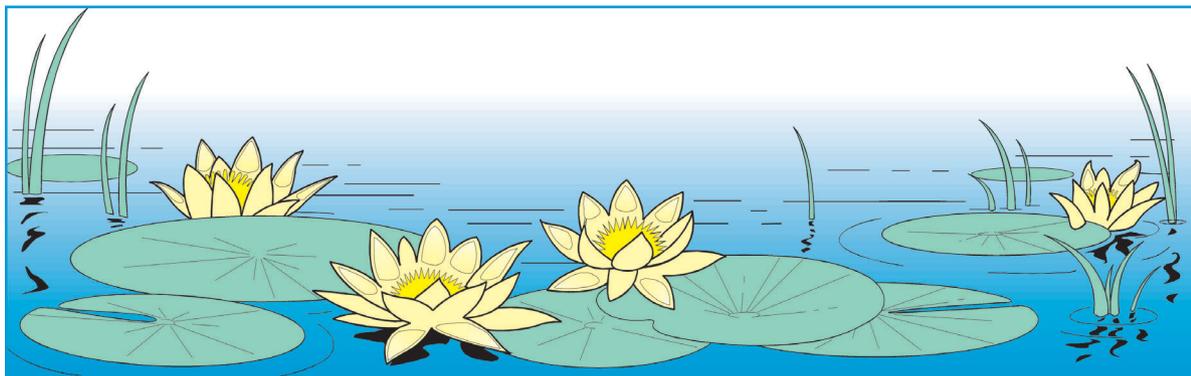
The major challenge of restoration is the replacement of the structural and functional aspects of a naturally formed wetland. A “restored” wetland should look naturally formed. It should also support values—the array of biological, chemical and physical processes and interactions—found in the naturally created wetland.

The intensity of restoration techniques will depend on the level of disturbance to the values of the original wetland.

Restore water flow. The first step in the process is to restore the hydrology (flow of water) to support conditions favorable for the return of wetland plant communities. The approach used is dependent on what caused the initial disturbance.

- ◆ Altered flow:
 - Re-establish flow of a river back into a wetland area.
 - Remove dams or other structures that cause flooding of a wetland.
- ◆ Filled or dredged:
 - Re-establish original landscape.

Re-establish plants. The next step is planting appropriate native plants. If the soil has been contaminated by toxic chemicals, it will likely need to be removed. If successful, a diverse and balanced plant community will establish itself. Then wildlife will colonize.



WHAT YOU CAN DO.

IF YOU OWN A WETLAND...

Before clearing, draining or manipulating wetland areas—including areas which you're unsure about—contact one of these government agencies. If the wetland area is used as cropland, contact your local USDA Natural Resources Conservation Service (NRCS) office. In non-cropland areas, check with your U.S. Army Corps of Engineers district. (Look under U.S. Government in the Yellow Pages.)

HOW TO GET STARTED.

Successful restoration of wetlands is possible by implementing comprehensive conservation plans along with watershed protection strategies developed by a partnership of public and private sectors. In addition to NRCS and the Army Corps of Engineers, the U.S. Environmental Protection Agency and the U.S. Dept. of Interior are also involved in protecting and restoring wetlands. Other agencies that often participate include state, tribal, regional, and local government agencies.

Government and watershed residents must work together to determine how wetlands fit into their watershed, the values (roles) of wetlands, and how to best protect and restore these values. Then each public and private partner needs to do their part in making it happen.

SOME ACTIVITIES.*

- ❑ Locate wetlands and study how they interact with the watershed.
- ❑ Bring together people concerned with wetlands in your watershed.
- ❑ Improve understanding of the systems and current and future pressures.
- ❑ Promote values of wetlands and be aware of potential threats.
- ❑ Coordinate wetland protection plans at all levels: local, state, regional, and federal.
- ❑ Build nest structures to increase nesting of Canadian geese, mallards, wood ducks, and other birds.
- ❑ Plant food plots to increase survival of pheasants and other wildlife.
- ❑ Plant native wildflowers to add color and habitat for songbirds, mammals, butterflies, and other insects.
- ❑ “Adopt A Wetland.” Call 800-832-7828.
- ❑ Help local schools adopt a wetland, maintain it and learn about it.

*Source: League of Women Voters.

FOR MORE INFORMATION...

Wetlands Information Hotline
Contractor operated for EPA.
Tel: 800-832-7828 between
9:00 a.m. and 5:00 p.m. ET
Email: wetlands-hotline
@epamail.epa.gov

America's Wetlands: Our Vital Link Between Land and Water
Tel: 800-832-7828
Email: wetlands-hotline
@epamail.epa.gov

Better Wetlands: More than a dozen ideas to improve restored wetlands for wildlife and personal enjoyment.
Tel: 765-494-9555
Email: kyw@ctic.purdue.edu

ABOUT THIS GUIDE...

Because the characteristics of each watershed are unique; you may wish to select and use the portions of this guide that are applicable to your particular situation.

This guide is one of a series of guides for people who want to organize a local partnership to protect their watershed. The series is designed to provide guidance for going through the process of building a voluntary partnership, developing a watershed management plan and implementing that plan.

The series of guides will not solve all your problems and will not replace the collective

minds of partners who, together, represent of those with a stake in your watershed and the technical advice available through local government agencies.

Although this series is written for watershed-based planning, the ideas and process can be used for developing other types of plans (such as wildlife areas) to match the concerns of the partnership. Regardless of the area, remember a long-term, integrated perspective — based on a systematic, scientific assessment — can be used to address more than one concern at a time.

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The Know Your Watershed campaign is coordinated by the Conservation Technology Information Center (CTIC), a nonprofit public/private partnership dedicated to the advancement of environmentally beneficial and economically viable natural resource systems. It provides information and data about agricultural and natural resource management systems, practices and technologies. The center was established in 1982 under the charter of the National Association of Conservation Districts.

