Wetland Functional Values

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Until recently, wetlands were often viewed as wastelands, useful only when drained or filled. Now, the common wisdom has changed. We know that wetlands benefit people and the natural world in remarkable ways. These characteristics are commonly called "wetland functional values."

Every wetland is unique. One wetland on the north edge of town may perform different functions than another on the south edge—even though they may appear at first glance to be very similar. A bog (type of wetland) in northern Wisconsin may be valued for different reasons than a bog in southeastern Wisconsin. Wetland functional values are determined by a variety of different parameters including physical, chemical and biological components. However, all too often we forget who is responsible for assigning value to these parameters. YOU, ultimately determine the value and fate of these wetland ecosystems in our society. The future of these wetlands and their continued existence upon this good earth is in your hands.

When Is a Wetland a Wetland?

Wetlands in Wisconsin were defined by the State Legislature in 1978. According to this definition, a wetland is:

> "an area where water is at, near, or above the land surface long enough to be capable of supporting aquatic or hydrophytic (water-loving) vegetation and which has soils indicative of wet conditions."

Apart from these essential common characteristics, wetlands—and wetland functions—vary. This brochure describes the basic functions that *can* occur in a wetland. Whether a specific wetland performs these functions depends on many variables (including wetland type, size, and previous physical influences/natural or human-induced) and *opportunity* (including the location of the wetland in the landscape and surrounding land use). Wetlands also change over time and may function differently from year to year or season to season. These are very dynamic ecosystems.

What's Inside: A Brief Description of Wetland Functional Values

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Determining Values

Standardized assessment methods are used to evaluate the extent to which a specific wetland may perform any given function. The presence or absence of specific characteristics are used to determine the importance of each functional value for the site in question.

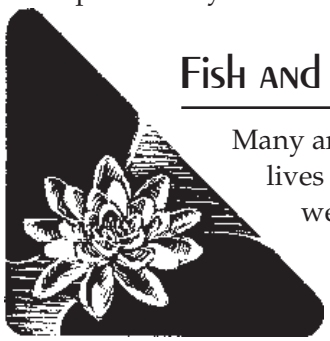
These characteristics may or may not be obvious to the casual observer. The dynamic (changing) nature of wetlands can hide many of these traits. Migratory bird use, for example, is not always obvious except in spring and fall.

And the occurrence of various wetland plants gives important, yet subtle clues about habitat, water quality and biodiversity. These types of observations help us evaluate a wetland's intrinsic value and overall importance to society.

Floral Diversity

Wetlands can support an abundance and variety of vegetation, ranging from duckweed and orchids to black ash. These plants contribute to the earth's biodiversity and provide food and shelter for many animal species at critical times during their life cycles. Many of the rare and endangered plant species in Wisconsin are found in wetlands.

The importance of floral diversity in a particular wetland is usually related to two factors. First, the more valuable wetlands usually support a greater variety of native plants (high diversity), as opposed to sites with little variety or large numbers of non-native species. Second, wetlands hosting plant communities which are regionally scarce are considered particularly valuable.



Fish and Wildlife Habitat

Many animals spend their whole lives in wetlands; for others, wetlands are critical habitat for feeding, breeding, resting, nesting, escape cover, or travel corridors. Wisconsin wetlands are spawning grounds for northern pike, nurseries for fish and ducklings, critical habitat for shorebirds and songbirds and lifelong habitat for some frogs and turtles. Wetlands are also essential habitat for smaller aquatic organisms in the food web, including crustaceans, mollusks, insects, and planktonic organisms.

Some of the most valuable wetlands for fish and wildlife provide diverse plant cover and open water within large, undeveloped tracts of land. This function may be considered particularly important if the habitat is regionally scarce, such as the last remaining wetland in an urban setting.

Flood Protection

Due to dense vegetation and location within the landscape, wetlands are important for retaining stormwater from rain and melting snow moving toward surface waters and floodwater from rising streams. Wetlands slow the movement of stormwater run-off and can provide storage areas for floods, thus minimizing adverse impacts to downstream areas.

Preservation of wetlands can prevent needless expenses for flood and stormwater control projects such as dikes, levees, concrete lined channels and detention basins.

What better more cost effective method can you think of for reducing flood damage than by having wetlands perform this function in addition to providing water quality benefits, plant and animal habitat, recreational and educational opportunities and a scenic view.

Wetlands located in the mid or lower reaches of a watershed contribute most substantially to flood control since they are in the path of more water than their upstream counterparts. When several wetland basins perform this function within a watershed, the effect may be a staggered, moderated discharge, reducing flood peaks.

Flood protection may be especially important in urban settings (where pavement contributes to run-off) and areas with steep slopes, overgrazing, or other land features which tend to increase stormwater amounts and velocity. These functional values can provide economic benefits to downstream property owners and tax payers.

Water Quality Protection

Wetland plants and soils have the capacity to store and filter pollutants ranging from pesticides to animal wastes. Calm wetland waters, with there flat surface and flow characteristics allow particles of toxins and nutrients to settle out of the water column. Plants take up certain nutrients from the water. Other substances can be stored or transformed to a less toxic state within wetlands. As a result, our lakes, rivers, and streams are cleaner and our drinking water is safer.

Larger wetlands and those which contain dense vegetation are most effective in protecting water quality. If surrounding land uses contribute to soil runoff or introduce manure or other pollutants into a watershed, the value of this function may be especially high.

Wetlands which filter or store sediments or nutrients for extended periods may undergo fundamental changes. Sediments will eventually fill in wetlands and nutrients will eventually modify the vegetation. Such changes may result in the loss of this function over time.

Shoreline Protection

Shoreland wetlands act as buffers between land and water. They protect against erosion by absorbing the force of waves and currents and by anchoring sediments. Roots of wetland plants bind lake shores and streambanks, providing further protection. Benefits include the protection of habitat and structures, as well as land which might otherwise be lost to erosion. This function is especially important in waterways where boat traffic, water current and/or wind cause substantial water movement which would otherwise damage the shore.

Trout streams and other high quality waterways often depend on shoreland wetlands to protect their characteristic clear, cold waters. Without this wetland buffer, the shoreline becomes undercut and collapses. When this happens streams often becomes wider, shallower and turbid. Water temperatures rise and habitat quality deteriorates.

A wetland which reduces erosion can also reduce sedimentation to nearby waterways. If the waterway is a navigational channel, the reduction in sedimentation can help to reduce the frequency of maintenance dredging.

Groundwater Recharge and Discharge

Groundwater recharge is the process by which surface water moves into the groundwater system. Although recharge usually occurs in the higher parts of the landscape, some wetlands can provide a valuable service of replenishing groundwater supplies. The filtering capacity of wetland plants and substrates may also help protect groundwater quality.

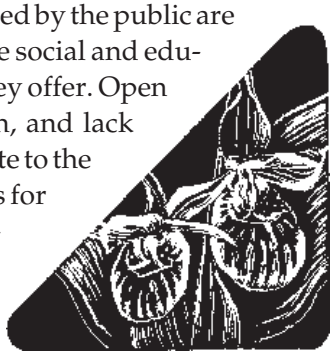
Groundwater discharge is the process by which groundwater is discharged to the surface. Groundwater discharge is a more common wetland function and can be important for stabilizing stream flows, especially during dry months. This can result in an enhancement of the aquatic life communities in the downstream areas. Groundwater discharged through wetlands can contribute toward high quality water in our lakes rivers and streams. In some cases groundwater discharge sights are obvious, through visible springs or by the presence of certain plant species.

Aesthetics, Recreation, Education and Science

Do you like to canoe? Cross country ski? Watch birds or listen to bullfrogs? Wetlands are some of our favorite places to study, hike, or just drive by. They provide peaceful open spaces in landscapes which are under development pressure and have rich potential for hunters and anglers, scientists and students.

Wetlands provide exceptional educational and scientific research opportunities because of their unique combination of terrestrial and aquatic life and physical/chemical processes. Many species of endangered and threatened plants and animals are found in wetlands.

Wetlands located within or near urban settings and those frequently visited by the public are especially valuable for the social and educational opportunities they offer. Open water, diverse vegetation, and lack of pollution also contribute to the value of specific wetlands for recreational and educational purposes and general quality of life.



Which Wetland Type?

Scientists distinguish dozens of wetland types in Wisconsin, characterized by vegetation, soil type, and degree of saturation or water cover. Some of the more prominent types include:

Aquatic Bed	Plants growing entirely on or in a water body no deeper than 6'. Plants may include pondweed, duckweed, lotus, and water-lilies.
Marshes	Characterized by standing water and dominated by cattails, bulrushes, pickerelweed, lake sedges, and/or giant bur-reed.
Sedge or "Wet" Meadows	These wetlands may have saturated soils, rather than standing water, more often than not. Sedges, grasses, and reeds are dominant, but look also for blue flag iris, marsh milkweed, sneezeweed, mint and several species of goldenrod and aster.
Scrub/Shrub	These areas, which include bogs and alder thickets, are characterized by woody shrubs and small trees such as tag alder, bog birch, willow and dogwood.
Forested	These areas which include bogs and forested floodplain complexes are characterized by trees 20 feet or more in height such as tamarack, white cedar, black spruce, elm, black ash, green ash and silver maple.

Three broad categories describe the relationship of Wisconsin wetlands to other surface waters:

- *Lacustrine* wetlands are associated with lakes.
- *Riverine* wetlands are found along shores of rivers and streams.
- *Palustrine* wetlands are not associated with lakes, rivers or streams.

The *Wisconsin Wetland Inventory*, a program of the Department of Natural Resources, classifies and maps wetlands two acres and larger throughout the state. Information about the *Inventory* is available from any DNR office.

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Illustrations by Amy Nast.