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Why Wetlands are Important!

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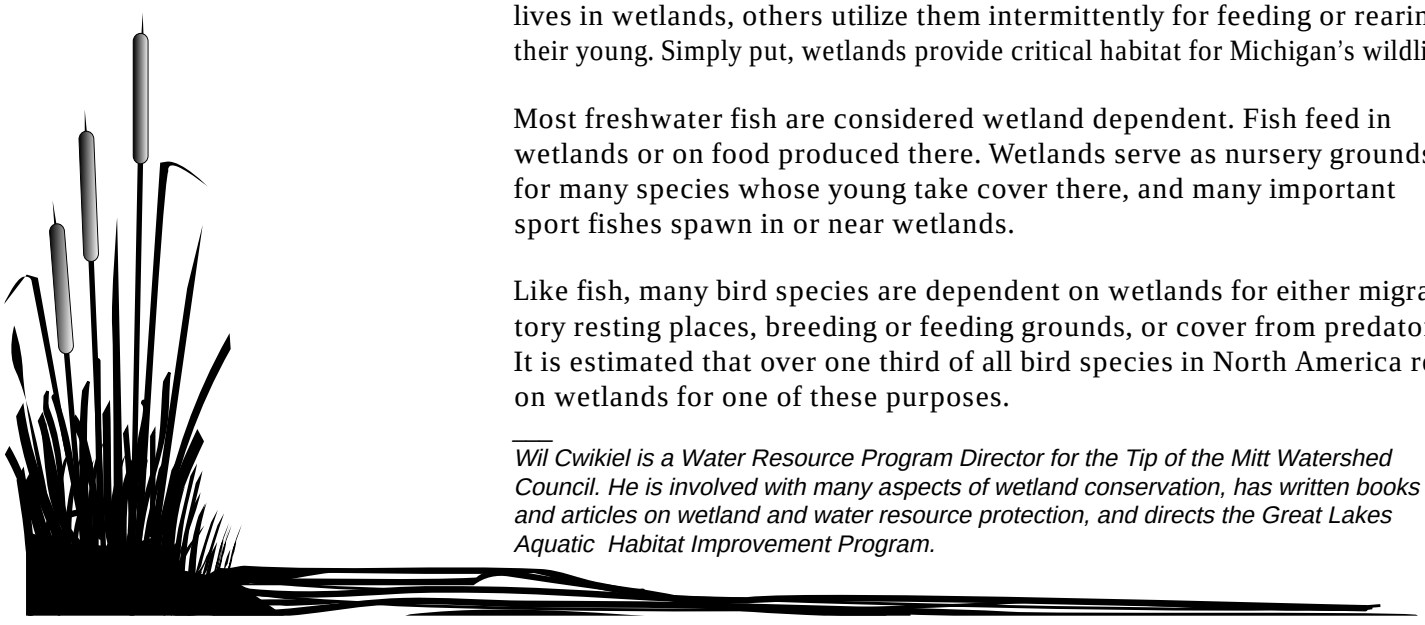
by Wil Cwikiel

Wetlands are complex ecosystems that provide many ecological functions that are valued by society. In Michigan, these functions become increasingly significant as we continue to lose wetlands. The valuable ecological functions of wetlands and the aesthetically pleasing open space they provide help to enhance the quality of life for Michigan residents and visitors. When discussing the importance of wetlands, the terms "wetland functions" and "wetland values" are often used. Wetland functions, such as sediment control and flood storage, are natural processes that continue regardless of their perceived value. Society does not necessarily attach value to all wetland functions. Value is usually associated with goods and services that wetlands provide. For this reason, wetland values, such as water quality maintenance and flood protection, are the goods and services that wetlands provide. Some common wetland functions and values are listed below.

Wetlands are known to be the most biological productive ecosystems in the temperate regions of the earth. Their biological productivity rivals that of tropical rain forests and involves complex nutrient and energy cycles. Many of the functions below are a direct result of the biological activity that occurs in wetlands.

Fish and Wildlife Habitat



Fish and wildlife habitat is the most widely celebrated and actively enjoyed wetland function. Many landowners own their wetlands solely for the benefits derived from this function. Some species spend their entire lives in wetlands, others utilize them intermittently for feeding or rearing their young. Simply put, wetlands provide critical habitat for Michigan's wildlife.

Most freshwater fish are considered wetland dependent. Fish feed in wetlands or on food produced there. Wetlands serve as nursery grounds for many species whose young take cover there, and many important sport fishes spawn in or near wetlands.

Like fish, many bird species are dependent on wetlands for either migratory resting places, breeding or feeding grounds, or cover from predators. It is estimated that over one third of all bird species in North America rely on wetlands for one of these purposes.

Wil Cwikiel is a Water Resource Program Director for the Tip of the Mitt Watershed Council. He is involved with many aspects of wetland conservation, has written books and articles on wetland and water resource protection, and directs the Great Lakes Aquatic Habitat Improvement Program.

Nearly all of Michigan's amphibians are wetland dependent, at least for breeding. Amphibians are sensitive to changes in wetland quality and quantity. Many scientists correlate declines in-amphibian populations with wetland degradation worldwide.

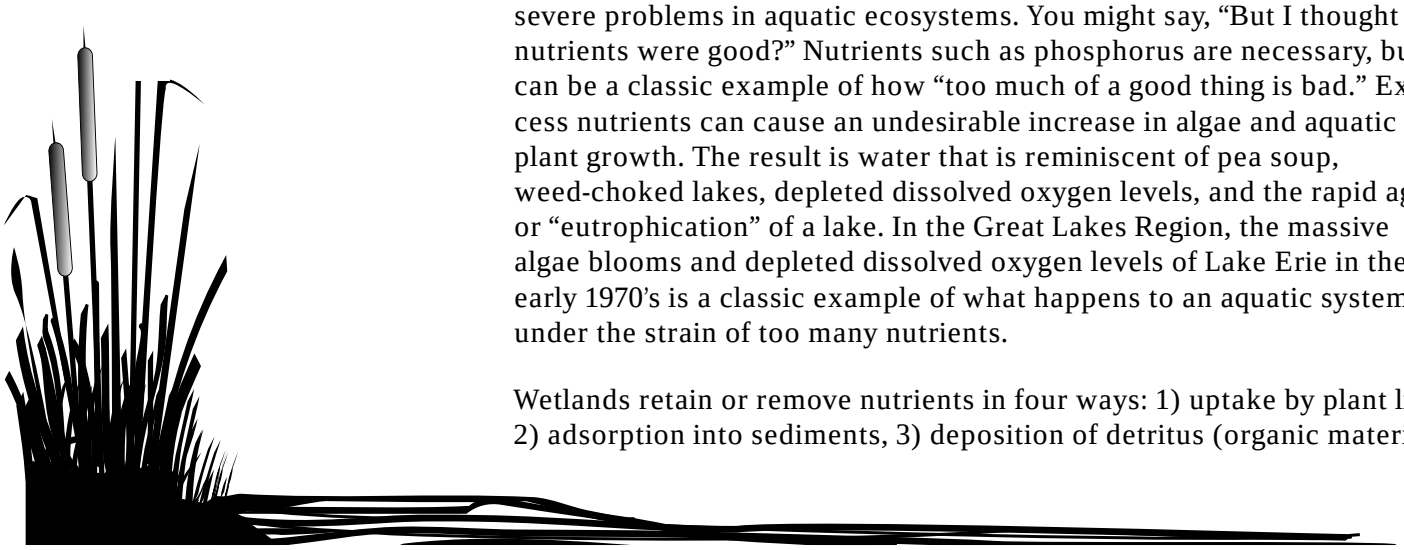
Wetlands serve as the preferred habitat for many fur-bearing animals such as muskrat, beaver, otter, mink, and raccoon. In northern Michigan, cedar swamps are critical to whitetailed deer for many reasons, including winter browse (northern white cedar sustains deer in the absence of other foods) and important thermal cover during harsh winters.

Threatened and Endangered Species Habitat

Not surprisingly, wetland habitats are critical for the survival of threatened or endangered species. Endangered species are those that are in danger of becoming extinct. Threatened species are those that are in danger of becoming endangered. These species represent a unique element of Michigan's valuable natural heritage. More than one-third of all threatened or endangered animal species in the United States are either located in wetland areas or depend on them. This is especially critical considering that wetlands comprise only about five percent of the lower 48 United States. Examples of Michigan's threatened or endangered animals that rely on wetlands include the Bald Eagle, Osprey, Common Loon, and King Rail. Of Michigan's total 395 threatened, endangered, rare, and special concern plant species, 194 of them are found in wetland habitats. Thus, nearly 50% of Michigan's plants of management concern reside in less than 15% percent of Michigan's surface area.

A major function of wetlands is the preservation of water quality. In a sense, wetlands function like living filters by removing polluting nutrients and sediments from surface and ground water. Although less well-known than providing fish and wildlife habitat, this wetland function is important to landowners and their communities.

Water Pollution Control



Excess inputs of nutrients such as phosphorus and nitrogen can cause severe problems in aquatic ecosystems. You might say, "But I thought nutrients were good?" Nutrients such as phosphorus are necessary, but can be a classic example of how "too much of a good thing is bad." Excess nutrients can cause an undesirable increase in algae and aquatic plant growth. The result is water that is reminiscent of pea soup, weed-choked lakes, depleted dissolved oxygen levels, and the rapid aging or "eutrophication" of a lake. In the Great Lakes Region, the massive algae blooms and depleted dissolved oxygen levels of Lake Erie in the early 1970's is a classic example of what happens to an aquatic system under the strain of too many nutrients.

Wetlands retain or remove nutrients in four ways: 1) uptake by plant life, 2) adsorption into sediments, 3) deposition of detritus (organic materi-

als), and 4) chemical precipitation. The most significant of these are the uptake of nutrients by plants (which occurs primarily during the growing season, the same time that lakes and streams are most sensitive to nutrient inputs) and adsorption into sediments.

Sediment Control

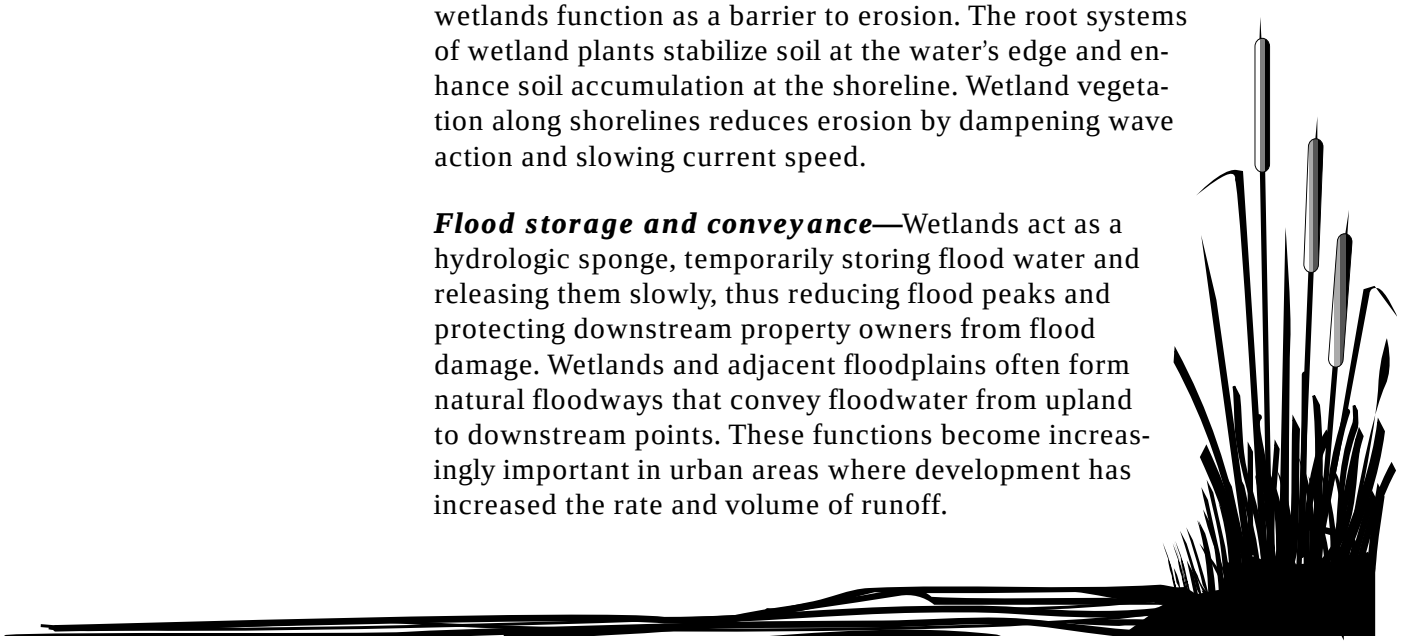
As sediment-laden water flows through a wetland from the surrounding watershed, the sediments are deposited in the wetland. This reduces siltation into lakes, rivers, and streams. A combination of wetland vegetation and generally flat topography serves to slow water flow and increase deposition of silt and organic matter (carbon compounds). Because of the soil chemistry in wetlands, carbon compounds that are deposited in wetlands decompose very slowly. In this manner, wetlands serve as a relatively permanent resting place for carbon compounds. This function of wetlands can help to trap carbon that would otherwise accumulate in the upper atmosphere and contribute to global climate change. Furthermore, there is a strong tendency for heavy metals and other toxic chemicals to attach to the sediment particles found in surface water runoff. Wetlands can trap these human induced pollutants and remove them from the water column. However, when the natural ability of wetlands to function as filters is overstressed from human inputs, the wetland and its functions can be destroyed. In fact, when overloaded, wetlands can actually become sources of pollutants, exporting materials that have been filtered and stored for centuries.

Water Supply

Wetlands are usually found where the ground water table intersects or is close to the land surface. They are usually sites of ground water discharge and are important for providing high quality water for our lakes and streams. However, some wetlands are found where ground water recharge occurs. The recharge potential of a wetland varies according to a variety of factors, including wetland type, geographic location, subsurface geology, soil type, and precipitation.

***Barrier to waves and erosion*—**In their natural condition, wetlands function as a barrier to erosion. The root systems of wetland plants stabilize soil at the water's edge and enhance soil accumulation at the shoreline. Wetland vegetation along shorelines reduces erosion by dampening wave action and slowing current speed.

***Flood storage and conveyance*—**Wetlands act as a hydrologic sponge, temporarily storing flood water and releasing them slowly, thus reducing flood peaks and protecting downstream property owners from flood damage. Wetlands and adjacent floodplains often form natural floodways that convey floodwater from upland to downstream points. These functions become increasingly important in urban areas where development has increased the rate and volume of runoff.



Water Values

Since practically every wetland function has some value to individuals and society, wetland values closely correspond to wetland functions.

Hunting, Fishing and Trapping

Nationwide, over $10 billion is spent annually by an estimated 50 million people on fishing, hunting, and trapping. Since nearly all sport fish, many popular game animals, and most fur-bearing animals depend on wetlands for their survival, healthy and functioning wet land ecosystems are a necessity to maintain the resource base for this economy.

Water Quality Maintenance

Whether it is used for recreation, drinking water, or industrial processes, everyone needs clean water. On the delivery side of the water equation, clean water resulting from the water quality maintenance function of wetlands helps to keep water treatment costs low. Ground water is vulnerable to contamination at many recharge areas. The filtering capacity of wetlands and the absence of pollution-generating uses in wetlands serve to protect vulnerable aquifers. On the treatment side of the water use equation, the pollution treatment functions of natural wetlands have been mimicked in artificial wetlands constructed to serve as wastewater treatment systems and to reclaim areas degraded by strip mining. As alternatives to typical engineered systems, created wet lands provide a cost-effective way to meet human needs.

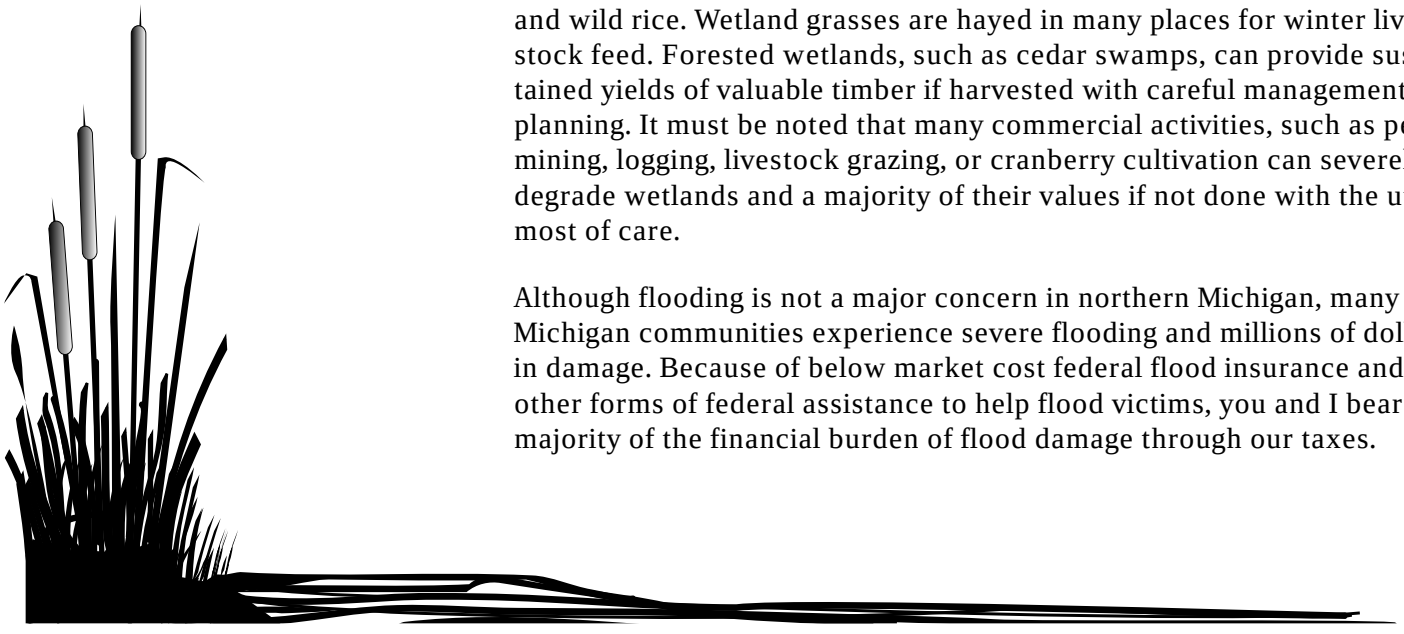
Water Supply

Because wetlands store water and slowly release it, they are often important for maintaining base flow in streams. Wetlands are also important for water storage during drought conditions. In severe drought years, the only vegetation lush enough to cut for hay may be from wetland areas.

Food and Fiber Production

Wetlands support many commercial activities. In addition to the revenue generated by hunting, fishing, and trapping wetland species, wet lands provide a variety of natural products including blueberries, cranberries, and wild rice. Wetland grasses are hayed in many places for winter livestock feed. Forested wetlands, such as cedar swamps, can provide sustained yields of valuable timber if harvested with careful management and planning. It must be noted that many commercial activities, such as peat mining, logging, livestock grazing, or cranberry cultivation can severely degrade wetlands and a majority of their values if not done with the utmost of care.

Although flooding is not a major concern in northern Michigan, many Michigan communities experience severe flooding and millions of dollars in damage. Because of below market cost federal flood insurance and other forms of federal assistance to help flood victims, you and I bear the majority of the financial burden of flood damage through our taxes.



Flood Protection

The flood storage and conveyance functions of wetlands can help to prevent flooding, resulting in substantial saving to the taxpayer. In the late I970's, the New England District of the U.S. Army Corps of Engineers concluded that natural wetlands protection was the most cost effective means of floodwater control for the Charles River near Boston. As a result, they have acquired 8,500 acres of wetlands in the Charles River watershed.

Erosion Control

Many riparian landowners experience erosion along the shore of their lake or stream. Often, this is a result of activities by the landowner that results in making the shoreline more susceptible to erosion (e.g., vegetation removal) or other human caused circumstances (e.g., excessive boat waves). Vegetative erosion control, such as the establishment of wetland vegetation in the water and on the shoreline, adjacent to the water can help to protect the property from erosion. Given the high market value of shoreline property, this wetland function is important to riparian wetland property landowners.

Historic and Archeological Values

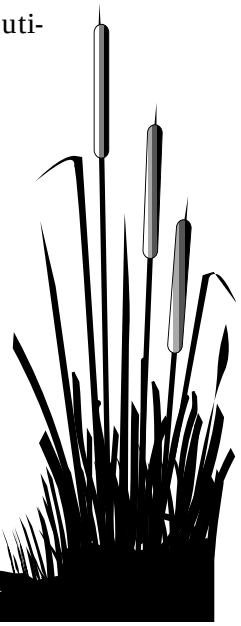
Some wetlands are important for historic, archeological, or paleontological reasons. Because wetlands served as a good source of food, early Native American settlements were often located in or near wetlands. Native American artifacts and well-preserved remains of prehistoric mammals have been found in Michigan's wetlands.

Education and Research

Wetlands serve as wonderful outdoor classrooms, providing excellent living examples of nearly all components of ecology. Boardwalks and observation platforms have been constructed in many wetlands across the state to facilitate educational activities.

Recreation and Aesthetic Values

The richness of the plant and animal communities found in wetlands make them some of Michigan's most beautiful natural environments. Rare, threatened, and endangered plant and animal species provide added interest for naturalists. Wetlands provide valuable open space for visual and recreational enjoyment. In many cases throughout the state, protected wetlands have been shown to enhance the value of neighboring properties due to these factors. Perhaps the most valued func~ of wetlands is the space they provide for introspection and quiet reflection. The stresses of a busy day seem to fade away when you are watching a Great Blue Heron fishing in the marsh.



Conclusion

Wetlands provide many ecological functions that are valuable to our quality of life, including recreational opportunities, flood storage, erosion control, and water quality maintenance. As we continue to lose wetlands in northern Michigan, the functions that they provide will continue to increase in value. If we are able to protect and wisely manage our wetlands, future generations will be able to experience (and surely find value in) the leap of a largemouth bass on the end of their line, abundant game in marshes and swamps, and high quality water resources for a variety of uses. There are many organizations working to protect wetlands in northern Michigan. Give them a call to find out what you can do to help protect wetlands. You'll be happy you got involved.