





## Plant Diversity Equals Fish Diversity

Thanks to the dynamic water levels in the Great Lakes, different types of bottom substrate (rock, clay, sand, or muck), and large lake processes including waves and seiches, there is a great diversity of wetland types and wetland vegetation found in Great Lakes coastal marshes. This diversity of wetland habitat promotes a very diverse fish population. A 1992 study found that approximately 90% of all Great Lakes fish species are dependent on coastal wetlands for some aspect of their life history. A study conducted in 2000 found that wetland fish and invertebrate communities are far more diverse than adjacent offshore communities.



Wetland plants buffer shorelines from wind and waves.

## Transferring Nutrients and Energy

Coastal wetlands, or vegetated Great Lakes bottomlands, are the interface between land and water in the Great Lakes ecosystem. As such, they provide many critical physical, chemical, and biological functions. With their diverse and abundant plant life, coastal wetlands are the most productive component of the Great Lakes ecosystem. This rich plant life translates into rich zooplankton and insect food sources for fish. The biological richness generated by the wetland vegetation as it captures nutrients and energy from the sun through photosynthesis is transported out of the wetland in many ways: by migration of young fish as they mature, predation by fish or birds that utilize wetlands for feeding, and movement of materials by wave and current action.

## Clearing the Waters

In addition to providing places for fish to feed, spawn and take cover from predators, and providing important energy and nutrients into the great Lakes system, the



shoreline vegetation also provides the beneficial service of binding the soil and reducing the erosive effects of wave action and at the same time reducing the turbidity of the water. When wetland vegetation is removed, the soils are

exposed to wave and current action, thus releasing or stirring up sediment. Turbidity (or the cloudiness of water) is an important variable in determining what fish (and how many) live in a particular area. High turbidity, because it reduces light for photosynthesis, can reduce the production of rooted plants and phytoplankton, and thus reduce the production of zooplankton, aquatic insects, forage fish, and larger fish such as pike and walleye.

## How Fish Rely on Coastal Wetlands

Many species of fish rely on Great Lakes coastal wetlands in different ways. Some species such as largemouth bass, brown bullhead, and many species of important forage fish such as the common shiner, reside in coastal wetlands throughout their life cycle feeding, spawning, and rearing young. Other fish species, including yellow perch, muskellunge, and walleye utilize both the deeper waters of the Great Lakes and coastal wetlands during some stage in their life cycle. For example, adult muskellunge will spawn in coastal wetlands and return to deeper waters, leaving the eggs to hatch and young to forage (and avoid predators) in the sedges and bulrushes. In the Great Lakes, yellow perch



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and forage fish such as spottail shiners increase their reproduction by having some of the fish in a particular population spawn in coastal wetlands early in the summer, while others spawn offshore a month or so later when the water temperatures increase to optimal levels. The third main category of fish are those that spend most of their time in deep waters, but feed on fish produced in coastal wetlands, including lake trout, chinook salmon, and Atlantic salmon.

In short, Great Lakes coastal wetlands support the reproduction of large numbers of forage fish, provide food for larger predatory species, and furnish spawning and nursery areas for many of our most beloved fish species.

## What Shoreline Property Owners Can Do

Healthy coastal wetlands mean higher fish populations in the Great Lakes. Great Lakes shoreline property owners, and all Michigan residents, benefit from a healthy fishery. As a shoreline property owner, you can work to improve the health of the Great Lakes fish stocks by allowing the Great Lakes to go through their natural cycles. This means allowing vegetation to grow in areas along the shore that will be covered when water levels rise. Other activities include avoiding the use of pesticides, herbicides, and fertilizers on shoreline property, maintaining a greenbelt of natural (un-mowed) vegetation along the shore, and directing stormwater from roofs and driveways away from coastal wetlands.



## Where to Go for More Information

With forty million people relying on the Great Lakes for drinking water, their businesses, and recreational opportunities, it's no surprise that numerous organizations and agencies exist that can help landowners make informed decisions. Visit the following websites for more information on Great Lakes coastal wetlands:

**TIP OF THE MITT WATERSHED COUNCIL**  
[www.watershedcouncil.org](http://www.watershedcouncil.org) or  
[www.michiganwetlands.org](http://www.michiganwetlands.org)

**WATERSHED CENTER GRAND TRAVERSE BAY**  
[www.gtbay.org](http://www.gtbay.org)

**MICHIGAN SEA GRANT**  
[www.miseagrant.org](http://www.miseagrant.org)

**MICHIGAN NATURAL FEATURES INVENTORY/MICHIGAN STATE UNIVERSITY EXTENSION**  
[www.msue.msu.edu/mnfi/home.cfm](http://www.msue.msu.edu/mnfi/home.cfm)

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY**  
[www.michigan.gov/deq](http://www.michigan.gov/deq)

**U.S. ARMY CORPS OF ENGINEERS**  
[www.lre.usace.army.mil](http://www.lre.usace.army.mil)

To talk with someone about stewardship of Great Lakes coastal wetlands and exposed bottomlands, contact Tip of the Mitt Watershed Council at (231) 347-1181