



Spring 2011

THE TROUBLE WITH SEAWALLS

A common and seemingly harmless practice such as the removal of native shoreline vegetation and installing seawalls (bulkheads) is that the destruction or altering of shoreline and nearshore habitat. Generally, when implemented on a small scale, this type of activity has negligible impacts on lake resources as a whole. However, as residential development increases along shorelines and more and more natural shoreline is altered, the cumulative effect is the degradation of natural scenic beauty, shoreline floral and faunal communities, and water quality.

Lakefront property owners wanting a view or access to the lake have often chosen installation of seawalls (bulkheads) rather than considering shoreline landscaping (soft armor practices) or bioengineered practices. Lakefront property owners have often chosen seawalls rather than another more friendly hard armor practice; rock rip-rap.

Loss of shoreline vegetation is an increasing concern around Michigan lakes. This is true around Maple Lake as well. Converting natural shoreline vegetation to high-maintenance, shallow-rooted turfgrass, in conjunction with increased boat traffic and wave action, contributes to:

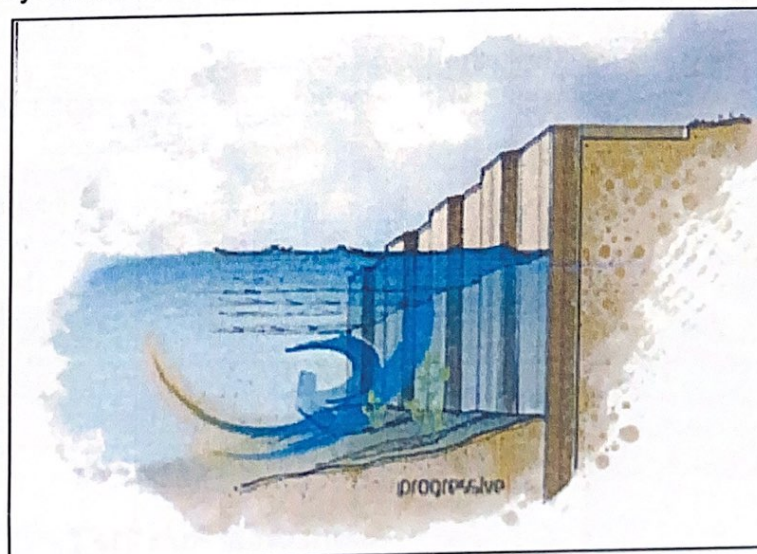
- ◆ Shoreline erosion
- ◆ Pollutant runoff
- ◆ Loss of wildlife habitat

Seawalls deflect wave energy downward which scours the bottom of the lake. The scouring action resuspends sediments and results in a loss of habitat.

When one property owner has a seawall and another doesn't, wave flanking can cause erosion on the other property; leading to more seawalls.

There are alternatives to just installing seawalls.

The choices are not as limited as they once were. More inside.



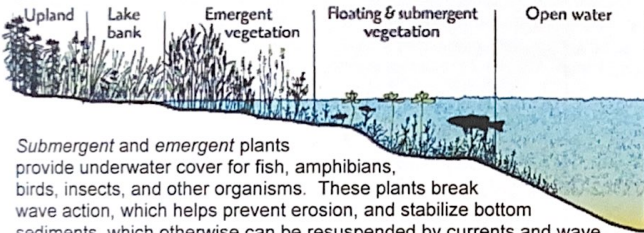
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One of the most common practices riparian owners do is to alter the shoreline. Seawalls of every type have long been used to protect shorelines, from the smallest inland lakes to the most battered coastal shores. On the inland lakes of Michigan, typical seawall applications request one of three general types: bulkhead, glacial stone, or bioengineered seawalls. Each, when properly designed, can be very effective in controlling the erosion by wave action. Each method has strengths and weaknesses that must be weighed when determining which to use on a particular shoreline.

Examples of soft and hard shoreline protection systems are on the opposite page (pg. 3) and below.

A great reference and resource for options to constructing seawalls can be found at www.mishorelinepartnership.org.

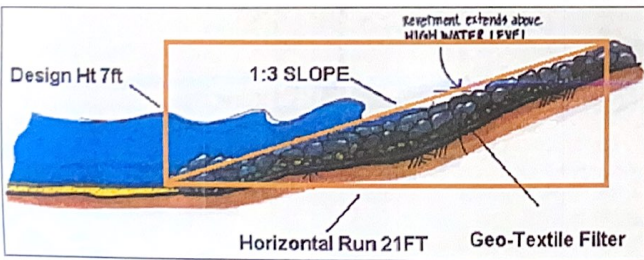
Soft Armor Shoreline



Submergent and emergent plants provide underwater cover for fish, amphibians, birds, insects, and other organisms. These plants break wave action, which helps prevent erosion, and stabilize bottom sediments, which otherwise can be resuspended by currents and wave action. Plants growing on upland slopes and lake banks help keep the lake water clean by holding sediments in place against the eroding forces of water runoff and by absorbing excess nutrients like phosphorous and nitrogen.

Hard Armor Shoreline

Protects against shoreline erosion and is more habitat friendly.

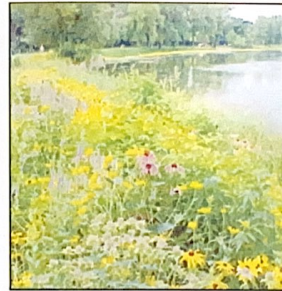


The Trouble with Seawalls

There are two types of bioengineering techniques available in lakescaping: soft-armor and hard-armor. Soft-armor bioengineering implies the use of live vegetation, whereas hard-armor requires the use of rocks, concrete or metal.



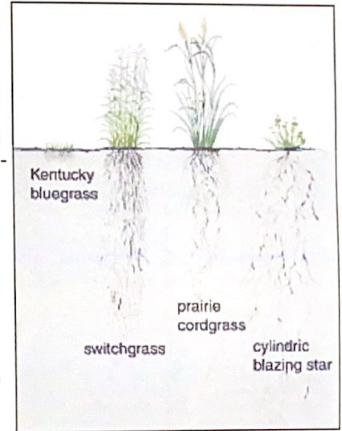
Rock Riprap – A very common hard-armor technique which consists of large rocks placed in the water and up the slope along the shoreline. Riprap should be lined with geotextile fabric to prevent wave action from sucking soils from behind rocks, causing slumpage. Glacial stone seawalls provide shoreline armoring while causing less damage to habitat and natural aesthetics.



Soft-armor bioengineering – The placement of plant materials into structures that are designed to withstand wave and ice action. Soft-armor bioengineering is appropriate anywhere there are suitable conditions for plants to grow. This means adequate soil, sunlight and water. As the plants grow, their root structures naturally stabilize the shoreline.

In the picture at the right, the 2-3 inches of roots is compared to the 3-5 foot deep root structure of other native plantings. Altering your shoreline by removing the deeper rooted plants in favor of turf lawn may lead to shoreline erosion as well as the destruction of wildlife habitat.

More acceptable shoreline landscaping can allow for the advantages of both while helping improve and protect overall water quality.



Do You Really Need a Seawall?

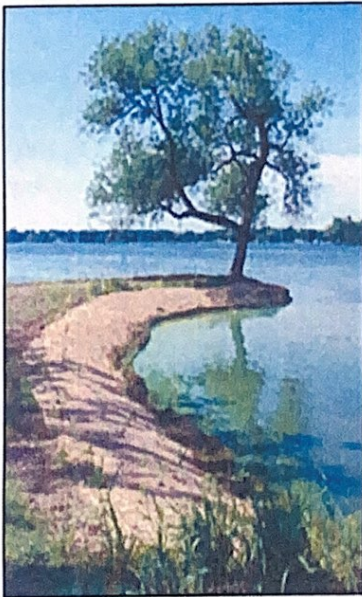
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The need for seawalls is often overstated. In most Michigan inland lakes, the wind speed lake depth and 'fetch' (the longest straight-line distance from your property to another side of the lake) are not great enough to warrant a seawall as protection from the destructive forces of waves and ice. Maple Lake is no exception. Selecting lakefront properties and using the Erosion calculator (used by Wisconsin and Michigan DNRs) indicates soft armor or rock rip-rap hard armor is more than sufficient on Maple Lake. The online Erosion Calculator can be used to find what the wave energy at any site. It requires knowing the average depth of a lake. For Maple Lake, depending upon the location the average depth is currently between 2 and 6 feet. The Michigan DNR has determined the Wisconsin calculator is valid for Michigan inland lakes. The calculator can be found online at:

http://dnr.wi.gov/waterways/shoreline_habitat/erosioncalculator.html

Michigan DNR also has many lake contour maps. These maps can be found online at:

www.michigan.gov/dnr/0,1607,7-153-30301_31431_32340---,00.html



A bioengineered seawall (erosion control fabric and plantings) such as the one at left can also control erosion while appearing natural and providing habitat.

The bottom right photo shows a natural shoreline which is great for water quality and all sorts of wildlife. This natural shoreline is bad news for geese and swans. However, other birds, butterflies, turtles, frogs and fish can thrive in a such a shoreline. The bottom left photo shows a seawall (bulkhead) that is not friendly to wildlife and, if built improperly, causes scouring of the lake bottom. It is also ideal habitat for geese! In this shoreline, habitat for birds, butterflies, turtles, frogs and fish is also eliminated.

