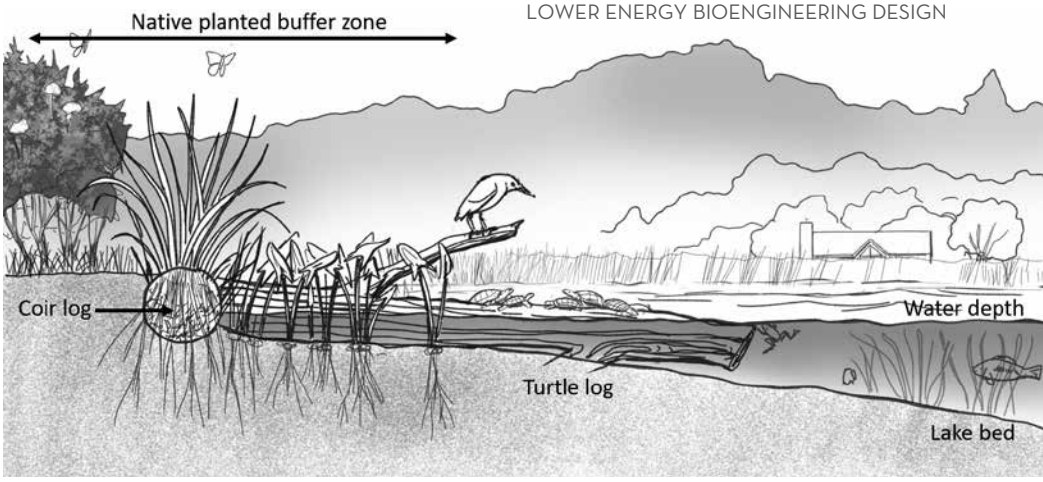
BEST MANAGEMENT PRACTICES:
MITIGATING HARMFUL IMPACTS OF SEAWALLS

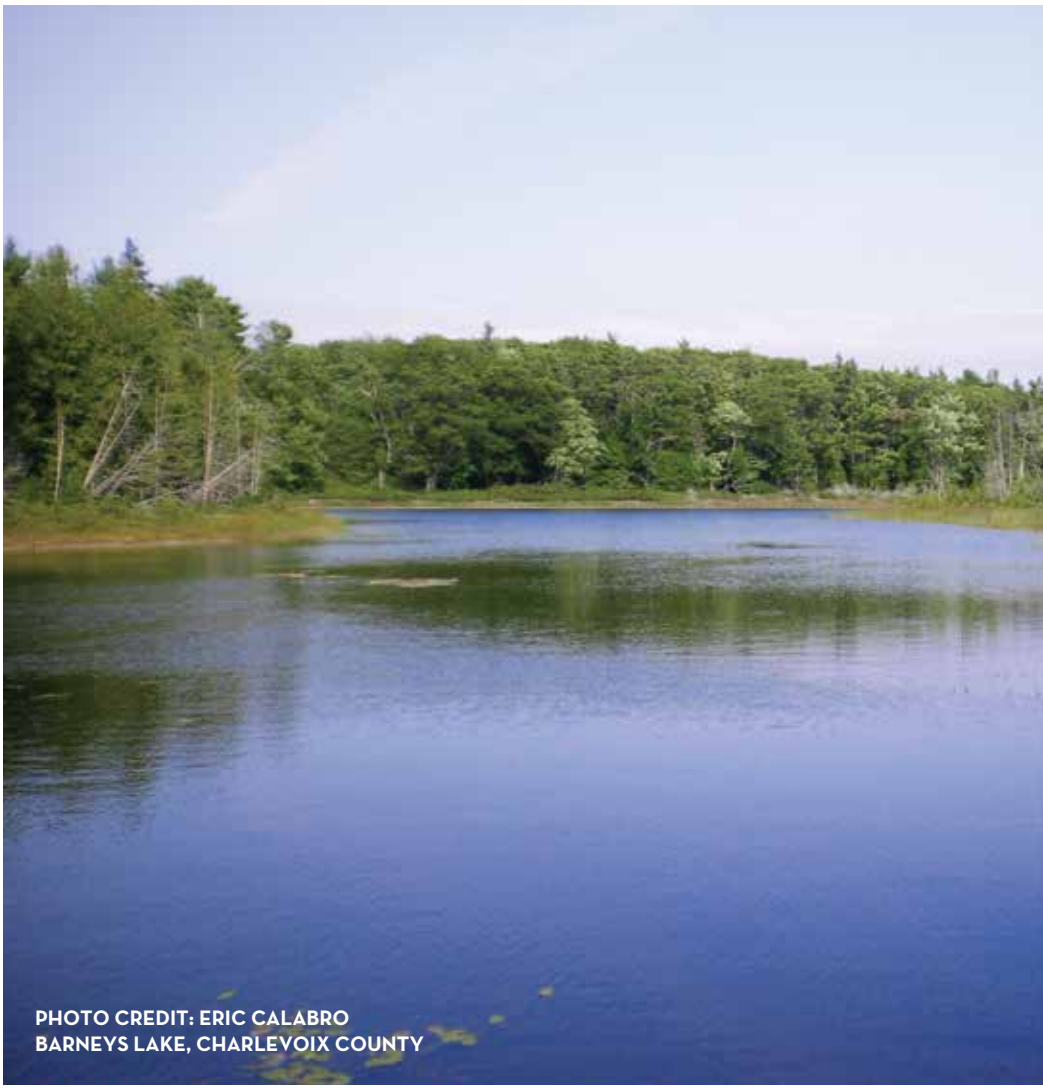
ERIC CALABRO | INLAND LAKES ANALYST, MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY; WATER RESOURCES DIVISION

ILLUSTRATION CREDIT: BRUCE KERR
LOWER ENERGY BIOENGINEERING DESIGN



Seawalls and hardened shorelines significantly degrade lakes by reflecting wave energy, eliminating shoreline habitat for fish and wildlife, promoting runoff of nutrients and pollutants, and degrading water quality. The individual and cumulative impacts of seawalls on our inland lakes have been significant, with the National Lakes Assessment indicating that over 50% of Michigan's lakes have degraded lake habitat complexity and lakeshore habitat.

Seawalls and hard armoring on inland lake shorelines don't allow for the absorption and dispersal of wave energy. Because armored shorelines reflect wave energy, they can make erosion worse in other areas. Additionally, hard armoring fragments the land-water interface and results in a loss of habitat complexity. The nearshore zone plays a critical role in the various life cycles of many invertebrates, amphibians, and fish, providing spawning and nursery areas, refuge, and foraging opportunities, as well as other functions. In addition to habitat, healthy littoral zones and shoreline plants stabilize sediment, reduce turbidity, absorb wave energy, and provide increased ecological integrity. The loss of nearshore littoral habitat has been shown to adversely affect fish and wildlife, and to negatively influence recreational fishing on lakes. The effects of individual shoreline developments on the nearshore lake environment accumulate over time, affecting fish, amphibians, birds, and other wildlife.



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BARNEYS LAKE, CHARLEVOIX COUNTY

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Bioengineered shoreline stabilization includes techniques that can prevent erosion, as well as improve water quality, and fish and wildlife habitat. Shoreline protection techniques that use deep-rooting native plants and shrubs, in addition to biological erosion control structures, natural materials, coir logs, brush bundles, and rock to protect shoreline as well as add habitat, are a best management practice on inland lakes in Michigan. These techniques can be designed in such a way to be able to handle a variety of conditions and water levels. Using plants in the littoral zone and biological materials to disperse wave energy, rather than reflect wave energy, is crucial to protect your property and your neighbor's property. In the State of Michigan, the loss of lakeshore habitat and lakeshore complexity are major stressors on our lakes. Activities that simplify the shoreline, such as eliminating aquatic and emergent vegetation, seawalls, and fills into the littoral zone, result in lower diversity as shoreline and aquatic plant and animal species are eliminated. Diverse natural ecosystems are better able to cope with stress because there are a variety of species that thrive under different conditions. Maintaining habitat complexity on our inland lakes perpetuates the functions and values we all enjoy.

EGLE recently updated the General Permit and Minor Project Categories for wetlands, lakes, and streams in Michigan. The General Permit and Minor Project Categories are expedited permits for activities which will cause only minimal adverse effects when performed separately, and will have only minimal cumulative adverse effects on the environment by incorporating current best management practices (BMP). For shoreline stabilization projects, using bioengineering techniques, including plants, rocks, and woody structures are the current best management practices. These BMPs protect shorelines from erosion while also protecting and enhancing the water quality and habitat of our inland lakes. We've reached a point in Michigan where the education, technology, and

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HIGGINS LAKE

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infrastructure has made less impactful alternatives widely available and achievable. We know that there are many owners with existing seawalls who apply for replacement of those walls every year, and the new category allows for replacement of existing seawalls if BMPs are incorporated. The category is flexible, giving applicants the ability to choose the BMP that they prefer, or to propose another measure of their choice. The choices include:

- Reduce the total length of the seawall by 25% or more, and use riprap or bioengineering on the remaining area. For example, this could include a break in the wall for bioengineering, or a shortened wall at one end, etc.

- Shoreline woody structure waterward of the replacement wall. Designs following the protocol from the Wisconsin DNR's document entitled, "Fish Sticks; Improving Lake Habitat with Woody Structure" are recommended. We will share a link to that document in *The Michigan Riparian* magazine's companion newsletter.

- Maintenance of a minimum 6 ft. wide no-mow zone or native planted buffer strip landward of the wall, for the entire length of the wall. It may include minimal breaks for riparian rights access, such as around docks or swimming areas.

- Other measures approved by staff.

HOW THE BMPS MITIGATE THE HARMFUL IMPACTS OF SEAWALLS

- Seawalls cause scouring of the lake bottom and erosion of neighboring properties, but BMPs such as shoreline woody structure, riprap, and bioengineering address this impact by absorbing and dissipating wave energy.

- Seawalls cause sediment and nutrient suspension, and cumulatively lower water quality, but BMPs such as natural buffer strips, shoreline woody structure, riprap, and bioengineering address this impact by filtering sediment from runoff and stabilizing sediment.

- Seawalls do not support aquatic and shoreline vegetation growth, but bioengineering and shoreline woody structure BMPs address this impact by dissipating wave energy and supporting plant growth.

- Seawalls have no habitat complexity or ecological value, but BMPs such as riprap, shoreline woody structure, and bioengineering address this impact by creating more complex microhabitats where organisms can thrive.

ILLUSTRATION CREDIT: BRUCE KERR
LOWER ENERGY BIOENGINEERING DESIGN

- Seawalls create a barrier for animal movement, but BMPs such as reducing seawall length and bioengineering address this impact by improving land-water connectivity.

These criteria allow a permit to be issued under an expedited category, and do not require financial assurance, easements, or detailed monitoring efforts. There are many resources available for lakefront property owners to find contractors and learn about different options for shoreline stabilization. EGLE recently gave a webinar covering BMPs for inland lake shorelines including the seawall replacement category and BMP requirements. See this issue's companion newsletter for a link to the recording.

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GULL LAKE