Water Column

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Sustainable Lake Shorelines

I recently attended the 22nd Annual National Conference on Enhancing the States' Lake Management Programs. The theme this year was "On the Edge: Enhancing Ecological Integrity of Shorelines." I was asked to present a talk on shoreline abuse, the anti-management side of the conference's theme. I've seen way too much shoreline abuse in my 30 years here in Indiana, so it wasn't difficult to put together my talk.

Most of the conference presentations, however, described techniques and policies for improving shoreline management. This is such an important topic that I have decided to share with you things that I learned at the conference.

The Value of a Natural Shoreline

Lake shorelines covered with a rich layer of native vegetation provide a multitude of benefits for the lake. Deep-rooted native woody plants and grasses hold soil in place to prevent shoreline erosion. Kentucky bluegrass and other turf grasses have shallow roots that do not help stabilize shoreline soils (Figure 1). Furthermore, shoreline edge plants intercept runoff from lakefront properties that could contain nutrients and chemicals that would otherwise flow into the lake (Figure 2). Un-mowed native grasses and herbaceous plants along the shoreline discourage Canada geese from moving onto lakefront properties – and we all know what a mess these geese can make!

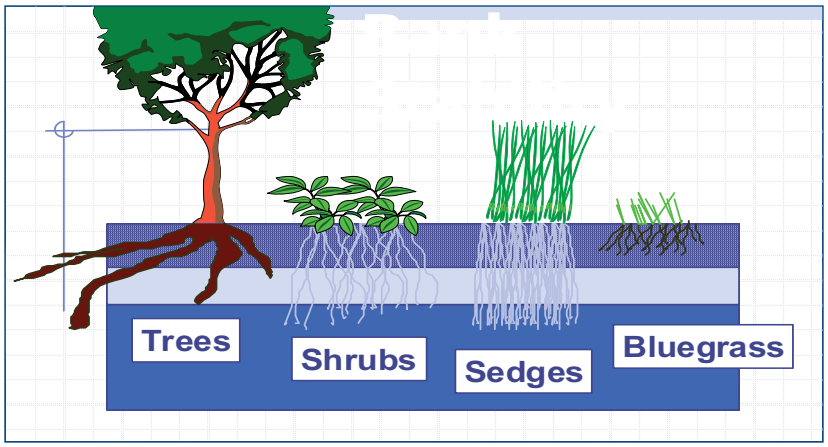

Figure 1. Native grasses, shrubs, and trees have deep roots that help stabilize lake shorelines. Turf grasses do not. Source: Mary Blickenderfer.

Maintaining trees along the lakefront provides shade for your property and for the near-shore waters. This shade is an important fish attractor. Recent doctoral research in Washington by Tessa Francis has shown that shoreline trees can provide an important source of food for fish. Terrestrial insects are very abundant in shoreline trees and a substantial number of these insects fall into the water, where they are eaten by fish. Terrestrial

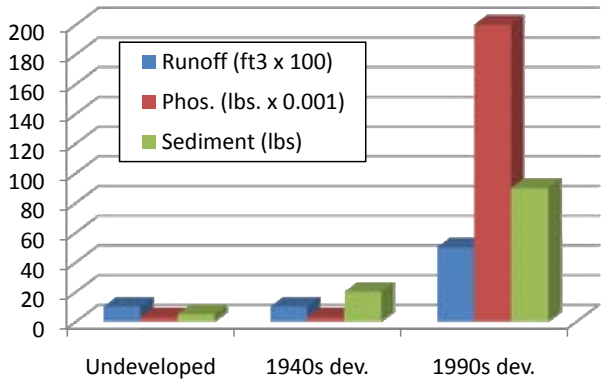

Figure 2. A modern, developed lakefront property contributes a significant amount of runoff, sediments, and nutrients to the lake. Adapted from: WI Lakes Partnership.

Figure 3. This home's sterile shoreline provides virtually no habitat value.

insects actually have more energy content than comparable aquatic insects. On lakes with intact shorelines, terrestrial insects accounted for up to 16 percent of the fishes' annual diet mass and 30 percent of the annual energy content. As a result, fish living in lakes having undisturbed trees along the shoreline grew faster and bigger than fish in lakes where homeowners had removed shoreline trees. Francis concludes that lakes with intact riparian habitats are more likely to support healthy fish populations than lakes that have been deforested by shoreline urbanization (Figure 3).

Lakefront trees also provide privacy for you and your family . . . in your yard and in your home. Remember, views go both ways. When you clear out vegetation to provide an unobstructed lake view from your home, you also create an unobstructed home view from anyone on the lake. I've noticed many Indiana lake homes with unobstructed views and loads of large windows with the blinds drawn to achieve privacy.

In summary, native shoreline plants and trees provide the following attributes:

1. Control shoreline erosion
2. Filter nutrient and chemical runoff
3. Discourage Canada geese
4. Provide shade that attracts fish
5. Provide insects to grow bigger fish
6. Provide privacy for you and your family

With all of these benefits, it sounds like a "no-brainer" for lakefront homeowners to keep and maintain a natural shoreline habit rich with trees (Figure 4).

Why People Clear the Shore

We know that lakes aren't immaculate – they are diverse. They function ecologically because they have a diverse variety of plants, insects, birds, wildlife, and fish that interact to form a functioning and sustainable ecosystem.

Yet the goal of many lakefront homeowners is to create an immaculate lakeshore – trimmed shrubs, trimmed fertilized lawns with no weeds, seawalls. Why?

Fred Rozumalski, a landscape architect/ecologist from Minnesota, explained that people create clean, immaculate yards because they think it shows that they care. If neighbors all keep clean, immaculate yards and you go "natural," it looks like you don't care. People want to show they care, so they succumb to what

Figure 4. A natural lake shoreline doesn't have to be dull or ugly. This shoreline provides many attributes and it is more sustainable. Source: Fred Rozumalski.

amounts to peer pressure . . . to blend in.

I've learned from my own conversations with lakefront homeowners and with colleagues that the reasons most often given for *not* maintaining a natural, sustainable shoreline are:

1. They like the neat, clean appearance (just as Fred Rozumalski stated).
2. They see shoreline erosion problems and conclude that only a bulkhead seawall can correct it.
3. They want to match what their neighbor has.
4. They are afraid of snakes in a natural shoreline

What Can Be Done?

Ask yourself why you were attracted to living on a lake in the first place? Was it the natural beauty? The serenity? The joy of watching birds and wildlife? The thrill of catching fish from your back yard? All of these are valuable benefits of living on the lake.

Why, then, do so many people who move to the lake take actions that destroy the very attributes that attracted them in the first place? They often re-create the landscape they had at their "city" home. But city landscapes are not suitable for the lakeshore.

The word "sustainability" is now common in our language as we try to find more sustainable sources of energy, sustainable agriculture, sustainable forests, etc. A sustainable shoreline should also be a societal goal. Natural shorelines are an important part of a sustainable lake ecosystem. They provide many benefits to keep lakes healthy and clean.

Turf grass lawns aren't sustainable without significant work and money. Wouldn't you rather spend time relaxing at your lakefront home rather than mowing the lawn? If the only time you use your lawn is to mow it – you don't need it!

If your lakefront yard is all turf grass, you can gradually reduce the size of the lawn by adding shrubs and trees, and by planting native grasses along the lakeshore. These initial steps will reduce mowing needs and will begin to provide the positive attributes discussed previously. With time, more native plantings and less lawn will complete the transition (Figure 5).

The key here is using native plants. Be careful to avoid planting non-native species that can become invasive. Unfortunately, potentially invasive plants are available at many local nurseries and greenhouses.

If native plantings look too "messy" for your individual tastes, frame them with neatness elements such as a low retaining wall, some mowed lawn, a fence, or a stone walkway.

Jeff Schloss of the University of New Hampshire identifies ten design principles to protect and improve shoreland property. Consider these principles as you make plans to create an ecologically sustainable shoreland zone at your lake home (Figure 6).

1. Protect and improve soil quality
2. Include as many vegetative layers as possible
3. Select the right plant for the right place for the right reason
4. Use plants to reduce the force and slow the flow of water
5. Maximize the amount of vegetative buffers
6. Minimize areas of impermeable surface
7. Rethink the size (and location) of your lawn
8. Design for low input

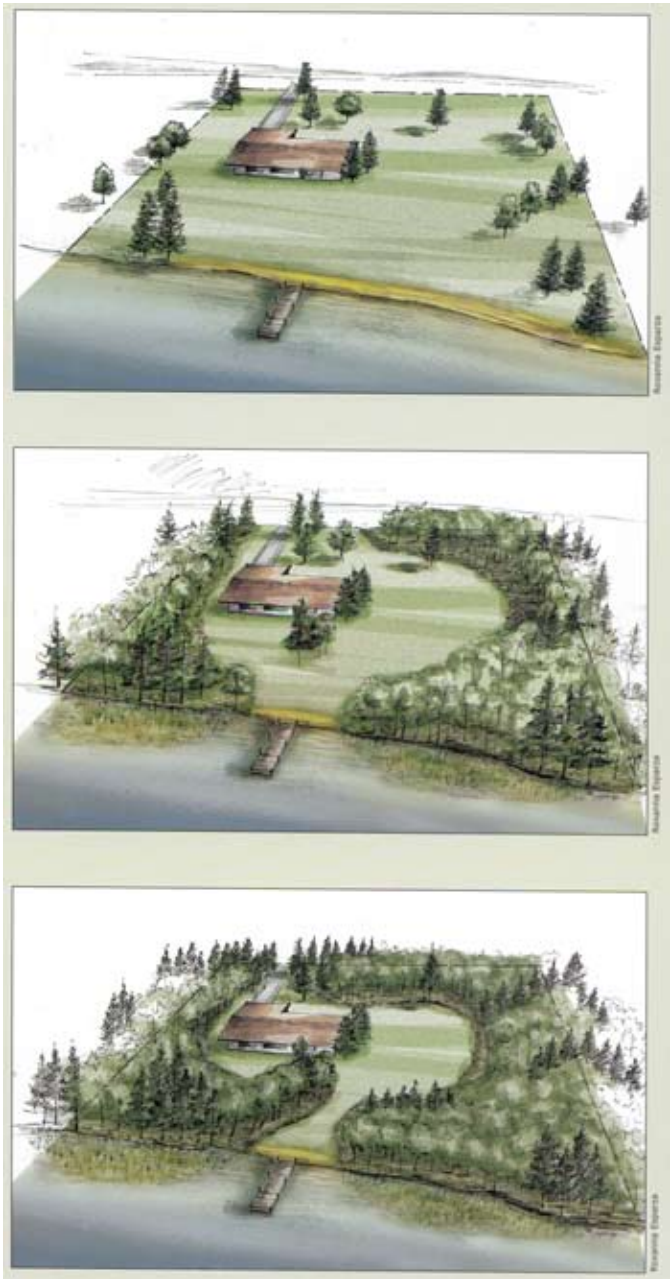

Figure 5. A turf grass lawn with little habitat value can be transformed in stages to a more ecologically valuable and sustainable shoreline. Source: *Lakescaping for Wildlife and Water Quality.*

Figure 6. A shoreline restoration buffer site on Found Lake, WI with newly planted woody material. Source: Patrick Goggin, WI Lakes Partnership.

9. Design a low-maintenance landscape
10. Remember your actions on land directly affect the water body.

Resources

There are many resources available to help homeowners transform their lakefronts into ecologically sustainable areas that can help improve their lake's quality. More are on the way.

- The book *Lakescaping for Wildlife and Water Quality*, published by the Minnesota Department of Natural Resources, is well-illustrated and contains a wealth of useful information. It is available online at: **http://www.dnr.state.mn.us/eco/pubs_restoration.html**.
- The Indiana DNR Lake and River Enhancement Program is working to create an Indiana Addendum to this Minnesota book. This addendum will contain shoreland restoration plant lists specific to Indiana. It should be completed in fall 2009. IDNR will conduct a workshop on August 1 at the Merry Lea Environmental Learning Center of Goshen College in Noble County. Contact Angela Sturdevant of IDNR at: (317) 234-4906 or e-mail her at: **asturdevant@dnr.IN.gov**.
- The Wisconsin DNR has several useful publications specific to Wisconsin but they can be a good place to start. The *Wisconsin Biology Technical Note 1* gives information about making a plan, example plants to use, and maintenance tips. See: **ftp://ftp-fc.sc.egov.usda.gov/WI/technotes/biology-tn1.pdf.**

Federal Funds Coming to DNR Fish and Wildlife

The Indiana Department of Natural Resources will receive more than $11 million from two federal programs that help states fund fish and wildlife conservation, boater access to public waters, and hunter and aquatic education.

Indiana will get $5,836,724 from the Wildlife Restoration Program, otherwise known as the Pittman-Robertson Fund, and $5,235,357 from the Sport Fish Restoration Program, otherwise known as the Dingell-Johnson Fund. Both funds are administered by the U.S. Fish and Wildlife Service.

In recent years, the DNR has used allotted funds to stock fish; develop and maintain public boating and fishing access sites; provide hunter education programs; purchase land for public hunting, fishing, and wildlife watching; provide aquatic education for youth at its State Fair fishing pond; develop and maintain shooting ranges on fish and wildlife areas for recreational shooting participants; and complete many more fish-and-wildlife-related projects.

The funds are part of the $740.9 million that Department of the Interior Secretary Ken Salazar recently announced will be distributed to the fish and wildlife agencies of the 50 states, commonwealths, the District of Columbia, and territories. Funding is based on a formula consisting of land area, including inland waters, and the number of paid hunting license-holders in each state, commonwealth, and territory.

These funds come from excise taxes and import duties on sporting firearms, ammunition, archery equipment, sport fishing equipment, electric outboard motors, and fuel taxes attributable to motorboats and small engines. [*Source*: Indiana DNR Press Release]

EPA Launches "Healthy Watersheds Initiative" and Website

Our nation has made significant progress in cleaning up polluted waters. Yet, while we devote substantial resources to restoring impaired waters, we continue to experience the loss of some of our remaining healthy aquatic

ecosystems. Some key statistics provide clear evidence of both recent and ongoing declines in our aquatic resources. For example, over the last 50 years, coastal and freshwater wetlands have declined; surface water and groundwater withdrawals have increased by 46 percent; and non-native fish have established themselves in many watersheds. A recent national water quality survey of the nation's "wadeable" streams showed that 42 percent of the nation's stream length is in poor biological condition and 25 percent is in fair biological condition. Nearly 40 percent of fish in North American freshwater streams, rivers, and lakes are found to be vulnerable, threatened, or endangered – nearly twice as many as were included on the imperiled list from a similar survey conducted in 1989. To help create a better awareness of these issues, EPA has launched a new initiative called "Healthy Watersheds" that emphasizes protection and conservation of aquatic ecosystems.

The "Healthy Watersheds Initiative" augments the watershed approach with proactive, holistic aquatic ecosystem conservation and protection. It includes both assessment and management approaches that encourage states, local governments, watershed organizations, and others to strategically conserve healthy components of watersheds and avoid additional water quality impairments in the future. The Initiative is being introduced through a new Website filled with tools and resources. Individuals interested in this additional resource can check out the Website at **www.epa.gov/healthywatersheds**.

The objective of the federal Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." While other EPA programs focus on restoring impaired waters, The Healthy Watersheds Initiative includes both assessment and management approaches that encourage communities to take a systems approach to conserve healthy components of watersheds, and therefore, avoid additional water quality impairments in the future. Anyone with an interest in maintaining existing and improving water quality in their local community is encouraged to visit the Website.

In Memoriam

RALPH E. TAYLOR, 61, passed away Monday, May 11, 2009, at Parkview Hospital, Fort Wayne. Born in Fort Wayne, Ralph was a retired Conservation Lieutenant serving from 1973 to 2003. He was Area Commander for the Indiana Department of Natural Resources, Law Enforcement Division from 1985 to 2003. Ralph was an outstanding Conservation Officer and served with distinction. He had an excellent sense of humor and was a superb storyteller. Ralph was passionate about protecting Indiana's public lakes and ensuring that all Hoosiers have the right to enjoy them. He was appointed as an original member of the Indiana Lakes Management Workgroup in the 1990s and served as a committee chairperson throughout its existence. Ralph actively led discussions that eventually resulted in hallmark legislation to adopt standards for managing piers and other structures in lakes. His legal skills also helped clarify laws dealing with state authority to manage public lakes and lake users.

Property Owners, Anglers Can Help Spot Aquatic Invaders

Lakefront property owners and anglers are being called upon to help stop the spread of invasive, non-native aquatic plants into lakes by being on the lookout for them.

Identifying and reporting these plants to local lake associations, conservation organizations, and appropriate state officials may help stop them from spreading further and causing more damage to lakes.

Non-native aquatic plants damage lakes by spreading more rapidly than native plants, disrupting lake ecology, creating nuisance conditions, and interfering with recreational use of lakes.

Doug Keller, aquatic invasive species coordinator with the DNR Division of Fish and Wildlife, said that organizations like the Indiana Lakes Management Society (ILMS) can help greatly with this effort.

"If detected early, efforts to stop the spread of invasive plants can be less costly and more effective," said Ed Spanopoulos, ILMS president. "We can serve as a source of people who locate new invaders and help participate in early responses to control them."

We do not know how many non-native plants are in Indiana lakes, nor everywhere they are spreading. Costs to control invasive species could be staggering.

The recent appearance of hydrilla in Lake Manitou in Rochester has already cost the state more than $700,000 in control efforts and forced closings of public boat ramps to prevent its spread to other waters. The total cost at Manitou to eradicate the plant is expected to approach $1.5 million.

Since 2006, DFW biologists have stepped up efforts to inspect lakes at risk of hydrilla, but they can't be everywhere, so they need help from private citizens.

"We don't have an official early detection program in place,"

WATER COLUMN
School of Public and Environmental Affairs
Room 347
1315 E. Tenth Street
Indiana University
Bloomington, IN 47405-1701

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Have you checked out the Indiana Clean Lakes Program Web page lately? Take a look at http://www.indiana.edu/~clp/ and see what's new and happening with the program and with Indiana lakes!

Keller said. "As you can imagine, not every puddle of water can be inspected. That's how local folks can help."

Keller said the most important thing that can be done in advance of new invasive plants showing up in a lake is to identify and organize people who should be involved and make sure that they know what to look for.

"That's where our ILMS members can help," Spanopoulos said. "We have folks who live at the lakes, are on the water all the time, and are trained to spot non-native species."

Spanopoulos says ILMS plans to research other organizations to determine what role their members may play in assisting with the early detection and prevention programs. [*Source*: Indiana DNR Press Release]

Perspectives

"We think of land as a civil liberty, instead of as a social resource."

– *Robert Korth*, Wisconsin Lake Partnership

WATER COLUMN

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Address all correspondence to:
William W. Jones, Editor
SPEA 347, 1315 E. Tenth Street
Indiana University
Bloomington, IN 47405-1701

E-mail: joneswi@indiana.edu
Phone: (812) 855-4556
FAX: (812) 855-7802