

THE MICHIGAN  
**RIPARIAN**



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DEVOTED TO THE MANAGEMENT AND WISE USE OF MICHIGAN'S LAKES AND STREAMS

Published Quarterly – February, May, August and November



Volunteers construct a vegetated geogrid for a demonstration project at MSU's Kellogg Biological Station on Gull Lake

In this issue:

**Solving Lakeshore Problems with a Buffer Strip**

**Outdoor Lighting: What Can We Do About Wasteful, Annoying Fixtures**

**New DEQ Rules for Permits to Chemically Treat Aquatic Nuisances**

**U.P. Owner Fined, Jailed for Illegal Wetland and Lakeshore Filling**

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## An Editorial

### It's Time To Start Thinking Differently About Lakeshore Lawns and Lighting

By William Hokanson

Two articles in this issue of *The Riparian* should stimulate many riparian owners to start thinking differently about their lakeshore lawns and outdoor lighting.

The first, on lakeshore buffer zones beginning on the opposite page, clearly explains the benefits of returning a lakeshore to a more natural state. That such landscaping can be attractive as well as environmentally beneficial is beautifully illustrated in the examples depicted.

Establishing such buffer strips need not be as extensive or as expensive as some of the more elaborate plans depicted. I have found that merely leaving an unmowed strip 15 to 25 feet wide along the shoreline can make an important difference in both protecting the lake and discouraging unwanted visitors, such as geese. Of course avoiding fertilizing is another simple way to protect the water quality of our lakes.

The second article on outdoor lighting, beginning on page 17, discusses another form of environmental pollution that is of concern to many riparians. Owners who have installed outdoor lighting "to protect their property" are often oblivious to the annoyance they are causing their neighbors who are subjected to light shining in their bedrooms. They also fail to realize that they are depriving many of us from enjoying the night sky. Experts point out that the widely used unshielded security lights are expensive to operate and wasteful of electricity. They observe that if you had a water pipe that lost 40% of its water every time you turned on the faucet, you'd be upset. Yet, they note, we throw away that much light with many of the outdoor light fixtures we use.

There are a number of ways to achieve sensible and effective outdoor lighting at little cost and long-run savings. *The Riparian* did not have space to illustrate the many different types of fixtures and shields available, but information is available from the websites listed in the article.

The Michigan Riparian welcomes letters to the editor on topics of concern to riparians. Letters must avoid partisan politics and may be edited. Articles for publication, article ideas, and suggestions are invited. Please contact William Hokanson at 269-244-5477 or Whok242@aol.com



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# Solving Lakeshore Problems with a Buffer Zone

By Carrol L. Henderson  
Carolyn J. Dindorf  
Fred J. Rozumalski

Photo by Fred Rozumalski

Many significant ecological and property management problems encountered in a lakeshore setting stem from landscape management practices. Many owners have brought these practices from traditional backyards to lakeshore yards. This article describes some of these problems and the practices that create them and suggests creating a lakeshore buffer zone as a solution.

Shoreline erosion is one of the most common problems experienced by lakeshore property owners. The main cause of shoreline erosion is wave action. Waves, either natural or created by boat wakes, wash against the shoreline and eventually wear away unprotected soils. This problem is usually minimal along natural shorelines because aquatic

plants, like stands of cattails or bulrushes, underwater plants, and fibrous rooted native plants on the bank reduce the energy of waves, decreasing their erosive force on the shore.

Because of human misconceptions about “weeds” however, many lakeshore owners remove aquatic plants in front of their properties. In doing so, landowners aggravate their erosion problems. Frequent running of motorboats and personal watercraft through aquatic vegetation may also destroy beds of aquatic plants through the action of the boat’s propeller, the propulsion of the water against the lake bottom, and the wake of the boat.

The erosive action of waves against the shore is accelerated when bluegrass lawns replace the native plant species on the bank. Bluegrass is a shallow-rooted species that cannot protect soil as well as deeper-rooted native shrubs and perennials.

Erosion of soil into the lake causes the water to become turbid or cloudy. The loss of water clarity makes feeding difficult for fish and wildlife species that rely on sight for pursuing their prey. The eventual settling of suspended particles of soil and organic debris onto the lake bottom, called sedimentation, also changes the lake’s ecosystem. Sediment covers plants and bottom habitat required for invertebrates and pollutes the waters by releasing nutrients and other pollutants attached to the soil.

Runoff from yards may also result in erosion of upland soils and sedimentation in the lake. The presence of hard surfaces, such as building roofs, drive-

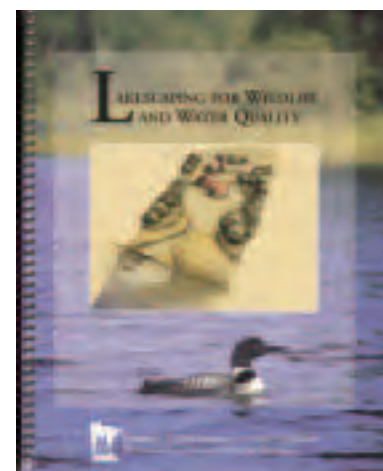
ways, patios, and walkways significantly increases runoff from adjacent upland areas because the water is prevented from soaking into the soil. Heavily used trails will destroy vegetation and create a place where erosion can begin.

## Sandy Beach Maintenance

Sand beaches are popular on developed lakeshore lots. They are natural in some places but homeowners often create them where they did not occur naturally. In those locations the sand rarely stays in place and requires a lot of plant control through hand pulling or herbicide use. Once a sand beach has been created, wave action and surface runoff may erode the sand. Additional loads of sand then need to be deposited on the beach. When the sand washes into the

*(Continued on next page)*

**Editor’s Note:** This article is an edited version of Chapter 3, Solving Lakeshore Problems with a Buffer Zone, from *Lakescaping for Wildlife and Water Quality*, by the three authors listed above. Mr. Henderson is a noted author and wildlife expert with the Minnesota DNR; Ms. Dindorf is a limnologist and water quality expert; and Mr. Rozumalski is a landscape ecologist and designer. Their book is published and copyrighted by Minnesota’s Bookstore. Material from it is used by permission. This chapter is one of the best explanations available of the benefits and advisability of returning a lakeshore to a more natural state. To show what the authors are advocating, illustrations of landscaping examples, taken from Chapter 4, Designing Lakeshore Landscapes, are also included, but in a revised layout.



This highly regarded, well illustrated guide is available from Minnesota’s Bookstore at 1-800-657-3757 or [www.comm.media.state.mn.us/bookstore](http://www.comm.media.state.mn.us/bookstore) for \$19.95. An interactive CD ROM version titled “Restore Your Shore” is also available at \$29.95. See Page 19 for system requirements.

## Design Examples Typical Lakeshore Sites Transformed by Lakescaping



- 1) In an open prairie landscape, mowed lawn is the standard landscape treatment. Few wildlife species are able to make this site their home because of the lack of food and cover. Water quality declines as debris and fertilizer wash into the lake.



- 2) Lakescaping can begin by planting a buffer zone along the lake, both in and out of the water. Planting the native grasses and wildflowers that grow best in this environment create a “filter” that catches blowing debris and also provides habitat for birds, butterflies, mammals, and fish.



- 3) Eventually, additional native vegetation can be planted to maximize habitat and concentrate lawn to those areas actively used. The beach can be reduced in size and lake vegetation planted to protect soil from washing into the lake due to wave action.

water, it may also cover aquatic plant beds and degrade fish and wildlife habitat. Some state laws limit placement of sand on lakeshores. In Michigan, a permit is required from the Department of Environmental Quality Engineering for placement of sand in the lake. If a sand beach is a high priority, look for lakeshore property where sand beaches occur naturally, when shopping for lakeshore property.

### Excessive Plant Growth and Algal Blooms

Plant growth and decomposition in lakes are natural processes. But submergent plant growth is a nuisance when it becomes so extensive that it interferes with recreation. The growth of aquatic plants and algae depends on the nutrient supply in the water. The primary nutrient that stimulates excessive growth in plants in lakes is phosphorus. It is also a major component of lawn fertilizer. One pound of phosphorus can produce up to 500 pounds of aquatic plants or algae growth once it washes into a lake! Thus, the way a lawn is managed or mismanaged frequently contributes to widespread lakeshore problems: too much plant growth and nuisance algal blooms.

When phosphorus levels in lakes are high, algae growth dramatically increases. These “algal blooms” create a floating green, slimy mat on the water surface, or turn the water the color of blue-green paint. The frequency and severity of algal blooms increase with the lake phosphorus concentration. In some cases, algal growth may be so severe that it blocks the sun from penetrating the water and shades out beneficial rooted aquatic plants. Fewer aquatic plants are available to produce oxygen. When the algae die, oxygen is consumed in the decomposition process, depriving fish and other aquatic life of this essential element. On rare occasions, a fish kill may result. And blue-green algal blooms can become toxic to wildlife and domestic animals that drink the water.

Since aquatic organisms are dependent on submergent and emergent plants for oxygen and habitat, loss of plants will result in loss of additional aquatic life. For example, rooted plants provide food and shelter for macro-invertebrates that in turn are a food supply for game fish. Whether due to low light penetration through murky water or to physical removal by lakeshore property owners, the loss of native plants is detrimental to the entire lake ecosystem.

Poor water quality, as indicated by algal blooms, is a result of a combination of many sources of pollutants to a lake. Fertilizers applied anywhere in a lake’s watershed, including fields and lawns, may eventually drain into a lake. Fertilizer accidentally spread onto driveways and sidewalks also washes directly into storm drains and lake basins. Recent studies have shown that phosphorus drains off lawns and may be a significant contributor to degraded lake water quality.

Fertilizing should be limited to once a year in the fall, and organic fertilizers should be used. Use of phosphate-free fertilizers is also a very inexpensive and cost effective strategy to reduce phosphorus in lakes. Other pollutants that overfertilize lakes include cat and dog waste, grass clippings, and soap used to bathe or wash cars. Most of what enters storm sewers ends up in lakes and rivers.

Use of herbicides and algicides to control aquatic plants and algae in lakes is a common practice. Most of these treatments are very short-lived and are an inadequate approach to the larger problem of nutrient enrichment of the lake. This approach treats a symptom, not the cause of the problem. Removal of aquatic vegetation destroys fish habitat, removes protection from waves, and opens the area to infestation by non-native plants.

Maintaining a bluegrass lawn often involves applying herbicides to control dandelions, crabgrass, creeping charlie,

and dozens of other lawn weeds. These chemicals can also wash into lakes and are harmful to aquatic wildlife. This problem is amplified where the lawn extends to the water's edge. When herbicides are necessary, the herbicide appropriate for the problem should be used, and it should be applied at the time when it will be most effective. (Ed. Note: Environmentally friendly lawn practices are discussed in detail in Chapter 8 of the book.)

**Loss of Wildlife Habitat**

Many homeowners report they enjoy viewing wildlife from their homes, yet the landscape design and maintenance methods traditionally used for lawns destroy or seriously degrade an area's value as wildlife habitat. It is estimated that 20 million acres in the United States have been converted to residential lawns.

Conversion of native forest and lake-edge vegetation is especially detrimental in lakeshore settings. A bluegrass lawn does not provide the basic habitat needs of food and shelter for most woodland and aquatic wildlife species. Pesticides also degrade the surrounding habitat and eliminate invertebrates that are needed by many creatures for food. When a native landscape is cleared, some trees may be saved, but the understory is often removed. With the loss of the understory, many important food sources and nesting areas for a variety of species are lost. In addition, land clearing eliminates connections between the lake and other habitats that many species require when moving between these habitats to complete their life cycles. Animal species need to move in the cover of native vegetation, be it lakeshore, forest, or prairie; some species need to move along the lake to different parts of the shore, and others need to move between the lake and uplands.

**Nuisance Animals**

Among the wildlife species most commonly considered as nuisances on

lakeshore lawns are Canada geese, mallard ducks, and muskrats. Well-manicured lakeshore lawns are ideal food sources for Canada geese, which are attracted to the continual supply of new green growth. A family of mallards or Canada geese is enjoyable to watch – at a distance – or on someone else's lawn. But when they show up in your backyard with several dozen of their "friends" the appreciation quickly turns to frustration. Hundreds of duck and goose droppings on a dock or lawn reduce the usefulness of the area for family and friends. That waste also provides another source of nutrients that wash into the water.

Muskrats are not a lakeshore problem or a threat to children or pets, but their burrows can interfere with lawn mowing. Most burrows do not extend more than about 10 feet from the water's edge, but if the lawn extends to the water's edge, the tires of the mower collapse into the burrows and disfigure the neat lawn.

**Loss of Leisure Time**

Traditional lawn maintenance is time consuming. Americans spend an average of 40 hours or more per year mowing their lawns. Additional hours are spent applying fertilizers and pesticides, patching and reseeding areas, watering the lawn, and disposing of grass clippings. In a Minnesota survey, researchers found that 90% of the residents spent at least two hours per week doing yard work, and 60% reported that they spent at least four hours per week. People with large lawns at a lakeshore home find themselves obligated to spend valuable weekend recreational time mowing and maintaining lawns. When they bought the lakeshore home, they probably had visions of spending their leisure time fishing, relaxing, or enjoying nature.

*(Continued on next page)*

**Landscape Designs**  
**By Fred Rozumalski**  
**Renderings**  
**By Roxanna Esparza**



1) In this eastern deciduous forest scenario, the lot has been cleared to create a panoramic view of the lake. Privacy from the lake has been sacrificed and seasonal interest and change within the yard is limited.



2) Lakescaping here began by planting the difficult-to-mow slope and by establishing a buffer on half of the lake front. Planting the slope with trees and native wildflowers and ferns creates a "framed" view with added depth, color, and seasonal interest. Reducing the beach and lake-front lawn by half still allows for a very usable lakeshore.



3) Ultimately, a double buffer zone can be created to protect the lake. Besides protecting the lake, this creates distinct outdoor relaxation and recreation "rooms" that function for both people and wildlife. If appropriate for your lifestyle, the lake shore can be completely protected by planting within the water and on the entire lake bank.

## Design Examples Typical Lakeshore Sites Transformed by Lakescaping



1) Occasionally people re-create the landscape they leave behind at their permanent residence. In this northern mixed forest landscape, mowing the large lawn is one of the prime weekend activities.



2) Reducing lawn size reduces landscape maintenance needs and allows more leisure time. A greater diversity of plants will provide food and shelter for a great variety of wildlife species. Emergent lake vegetation planted in the water absorbs wave energy, thereby reducing beach erosion.



3) Adding trees, shrubs, wildflowers, and grasses builds the vertical structure of habitat and increases the lot's usefulness for wildlife. This vegetation also helps to prevent soil erosion by breaking the energy of raindrops hitting the ground and by holding soil in extensive root systems. Water quality is not compromised by soil washing from the lot.

## Solving Lakeshore Problems With a Buffer Zone

Many of the lakeshore problems just described can be solved by creating a buffer zone along the shoreline. This is the main component of lakescaping for wildlife and water quality. Lakescaping is evolving among lakeshore owners as a strategy for managing sustainable lakeshore landscapes. The process is simple and biologically sound. First, identify the improvements needed on your homesite: a dock, swimming area, or small open lawn area. Second, design a natural buffer zone along at least three-fourths of your lake frontage. Third, eliminate "unnecessary" lawn from the upper reaches of the lakeshore property and restore native plants to as much of that area as possible.

The focal point of this process is creation of a buffer zone. It should contain native trees, shrubs, wildflowers (forbs), grasses, sedges, and emergent and submergent aquatic plants. The buffer zone restores ecological functions and structural benefits that are important in the lakeshore environment. These benefits resolve many of the problems detailed previously in this article.

A buffer zone is an area that may extend from 25 to 100 or more feet from the water's edge onto the land and 25 to

50 feet into the lake, depending on the circumstances of a given site. The zone should include at least 50% and preferably up to 75% of the shoreline frontage. Deep buffer zones create better protection than narrow ones. The illustration below (Figure 3.1) shows where such a buffer zone could be created on a lakeshore property. The buffer zone is composed of native plants that are either preserved or reestablished on the land and in the water. The type of native vegetation planted in the buffer zone depends on the ecological region as well as the slope, drainage, and soil type for the site. (Ed. Note: Extensive information about appropriate plant selection is available in Appendix A to the book *Lakescaping for Wildlife and Water Quality*, as well as in the CD ROM "Restore Your Shore.")

The buffer zone has two components: aquatic plants in the water and moist-soil, and upland plants above the water line. It could consist of moist-soil wild flowers and sedges at the water's edge and dry-soil flowers, grasses, and shrubs farther up the slope. The restoration and management of the buffer zone should address the vegetation in both locations. In some situations, however, such as where the lake bottom drops off steeply near the shore there

(Continued on Page 19)



## DEQ Announces New Rules For Permits To Chemically Treat Aquatic Nuisances

Requirements Clarified,  
Process Streamlined  
To Benefit Applicants, DEQ Says

The Water Division of the Michigan Department of Environmental Quality (DEQ) has announced that new rules providing regulatory direction to any person proposing to chemically control aquatic nuisances in waters of the state, such as aquatic plants and algae, are in effect as of March 13, 2003. They are revised administrative rules under the authority of the Public Health Code, 1978 PA 368 as amended.

The rules were revised to reduce permit application backlogs and uncertainty over what activities required permits. The DEQ expects that the new rules, which clarify notification requirements and simplify application and posting requirements, will reduce the number of public complaints. They place existing fluridone policies and practices, as well as other policies, into documented rules. The new rules also explain permit application review criteria so that applicants will find it easier to understand the factors used by the DEQ in making permit decisions.

The new rules also authorize the DEQ to issue general permits that the agency expects will cover about a third of all anticipated applications, thus simplifying and speeding the permitting process.

The rules were revised by a committee composed of representatives of other state agencies, resource managers, environmental groups, and the chemical industry which began meeting in November 2000. Public hearings were held in January 2002.

A copy of the new administrative rules can be obtained at [www.michigan.gov/deq](http://www.michigan.gov/deq). Questions may be sent by e-mail to [DEQ-LWM-ANC@michigan.gov](mailto:DEQ-LWM-ANC@michigan.gov) or by telephone to the Inland Lakes and Remedial Action Unit at 517-241-1300.

## Walloon, Crystal, Higgins Lakes Promote Natural Lakeshores Through Contests, Awards & Grants

During the summer of 2002, the **Walloon Lake Association**, in Emmet and Charlevoix counties, conducted its first annual "Restore the Shore" contest to encourage property owners to establish greenbelts of natural landscaping along the lake shore. An article in a recent issue of *The Wallooner* reported there were 10 fine entries with so many different landscaping styles and types of shorelines that it was difficult to pick a winner. Photos and write-ups on seven of the entries were to be published, beginning with the October 2002 issue of the magazine.

The **Higgins Lake Property Owners Association** in Roscommon County has been encouraging the maintenance or restoration of natural shoreline buffer strips/greenbelts by recognizing property owners with "Margaret Gilbert Greenbelt Awards." The award is named in honor of the late Margaret Gilbert, a member of one of the earliest families to have a log cabin on Higgins Lake, a longtime member of the Higgins Lake Advisory Committee, chair of its Greenbelt Committee, and concerned environmentalist.

According to Elizabeth Wade, current chair of the Greenbelt Committee, the award, in the form of a plaque, is given to riparian owners who have allowed their shorelines to remain wild or to those who have created a natural shoreline with native plants and use no fertilizers nor herbicides.

The first award was given in 2000 to Ms. Gilbert, shortly before she died. Four property owners were given the award in 2001 and three in 2002.

The **Crystal Lake Association** in Benzie County has been advising on erosion control measures as well as encouraging lake quality and shoreline protection through the use of greenbelt/buffer strips by means of articles in its newsletter *Crystal Facets* and by focusing on the Crystal Lake Protection Plan, which includes water quality, shoreline and watershed management, and safety. It recommends a guidebook prepared by the Tip of the Mitt Watershed Council entitled *Understanding, Living With, and Controlling Shoreline Erosion*. The Association also has a matching grant program to reimburse property owners up to \$150 when returning their waterfront to natural vegetation.

## Burnett County Wisconsin Pays Property Owners To Restore Their Shorelines

Burnett County in northwest Wisconsin, midway between Minneapolis and Duluth, Minnesota, has begun an innovative shoreline protection program that provides incentives to landowners to restore and maintain well-vegetated lakeshore buffers. A property owner who voluntarily participates in the program is rewarded with a one-time payment of \$250 and an annual tax credit of \$50 for installing and maintaining a 35-foot shoreline buffer. The buffer strip must be entered into a recorded deed restriction for the property.

For properties requiring extensive restoration work, Burnett County will cover up to 70% of the cost, up to \$1,200 per project. The program is being financed by a lake protection grant as well as county funds.



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# Michigan Waterfront Alliance News & Legislative Update

## Road-End Legislation Re-introduced as HB 4141 by Rep Stakoe; House Committee Expected To Hold Public Hearing in May; MWA Urges Riparians to Again Write Legislators in Support

Legislation that will convert 121 years of case law into statute was re-introduced into the Michigan Legislature by Rep. John Stakoe, Highland, as HB 4141. It has been referred to the Conservation and Outdoor Recreation Committee, which is expected to hold one more public hearing on the matter sometime in May. Riparians should monitor the website [www.michiganlegislature.org](http://www.michiganlegislature.org) for information on hearing dates or call the office of Rep. Stakoe (866-334-0010) or Scofes, Kindsvatter (517-485-5960/2021). Meanwhile MWA President Bob Frye is urging riparians to write their legislators as well as members of the Conservation committee to support HB 4141. He reports "As of April 10, members of the house committee are getting more pressure (mail, e-mail, and phone calls) from backlotterers than from riparians. This may cause the committee to postpone the hearings. If ever there was a time for **all** riparians to defend their property rights and property values it is **now!**" As detailed in the November 2002 issue of *The Riparian* and in MWA newsletters, the legislation will protect where public roads end at a lake shore as public access for ingress and egress, but not for the overnight mooring of boats, installation of boat hoists, construction of docks, or use for picnicking, sunbathing, or lounging, unless stated differently in the property dedication. Text is available at the legislature's website.

Members of the Conservation and Outdoor Recreation Committee include Reps. Susan Tabor, chair; Matt Milosch, Ken Bradstreet, Stephen Ehardt, Neil Nitz, Sal Rocca, Matthew Gillard, Frank Accavitti, Barbara Farrah, and Dale Sheltroun. All may be sent mail at House of Representatives, P.O. Box 30014, Lansing, MI 48909. (Copies of letters should also be sent to MWA c/o Scofes, Kindsvatter & Associates at 416 W. Ionia St. Lansing, MI 48993.)

**Beach Grooming Bill Approved by House 64-43.** HB 4257 that would allow owners of beachfront property on the Great Lakes to maintain their shorelines "by manual or mechanized leveling of sand, mowing, and removal of vegetation and grooming of the top 4 inches of soil" between the water's edge and the ordinary high-water mark without obtaining permits was approved 64-43 on April 10 by the House. Similar legislation in the senate (SB244) is sponsored by Sen. Jim Barcia, Bay City. Low lake levels for several years have exposed far more beach area than normal. Environmental groups have been worried that the legislation would adversely affect the beach environment by hindering native vegetation and normal sand movement. A substitute bill proposed by the DEQ failed. The Granholm administration opposes the bill.

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Group Rates Available. See Page 3

# MICHIGAN LAKE AND STREAM ASSOCIATIONS, Inc.

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## New ML&SA Member Associations

### Hagerman Lake Property Owners Association

Iron County Peter Jupe, President

### Island Lake Property Owners Association

Ogenaw/Oscoda Counties Bill May, President

### Michigamme River Basin Association

Marquette County Wulf McNeil, President

### Sawyer Lake Association

Dickinson County Jan Sirovy, President

## Highlights of 2002 Cooperative Lakes Monitoring Program

### Secchi Disk Transparency Measured in 179 Lakes

During 2002, Secchi Disk transparency data were reported for 179 lakes (235 basins). More than 3,500 transparency measurements were reported, ranging from 1.6 to 50 feet. For the lakes with 8 or more readings, the overall mean Secchi Disk transparency was 12.6 feet. The median value was 11.0 feet. The Carlson Trophic Status value ranged from 28 to 59 with a mean value of 42. This number is generally indicative of a good quality mesotrophic lake.

Citizen volunteers measure Secchi Disk transparency from late spring to the end of summer. Ideally, 18 weekly measurements are made from mid-May through mid-September. As a minimum, eight equally spaced measurements from the end of May to the beginning of September are accepted to provide a good summer transparency mean (average for the lake). Frequent measurements are necessary since algal species composition in lakes can change significantly during the spring and summer months.

### Total Phosphorus Measured in 166 Lakes

During 2002, samples for total phosphorus measurements were collected on 166 lakes. The spring overturn total phosphorus results ranged from 5 to 92 parts per billion. The average parts per billion was 15 and the median was 12. The Carlson Trophic Status index ranged from 27 to 80 with a mean value of 37. A TSI value of 37 is generally indicative of a very good quality oligotrophic/mesotrophic lake. Readers wishing more information about their lakes should contact their lake samplers.

Phosphorus is one of several essential nutrients that plants need to grow and reproduce. For most lakes in Michigan, phosphorus is the most important nutrient – the limiting factor for plant growth. The total amount of phosphorus in the water is typically used to predict the level of productivity in a lake. An increase of phosphorus over time is a measure of nutrient enrichment in a lake.

## **Plea Agreement Reached by DEQ, Mackinac County Prosecutor and Garfield Township Property Owners in Wetlands Permit Violation**

According to a news release from the Michigan DEQ dated March 28, 2003, a plea agreement was reached on March 4, 2003 between the DEQ, Mackinac County Prosecutor W. Clayton Graham, and Victor and Marianne Bruce of Garfield Township.

“Victor Bruce was charged with a Part 301 Inland Lakes and Streams Permit Violation and two counts of Part 303-Wetlands Protection, Filling/Dredging/Draining without a permit and a second count of Willful-Reckless Permit Violation. His wife Marianne was also charged with a Part 301-Inland Lakes and Streams Permit Violation and a Part 303-Wetlands Protection-Willful-Reckless Permit Violation.”

“Before the Honorable Judge Steven E. Ford of the 92nd Judicial District, Mackinac County, Mr. Bruce pled no contest to the charge of Part 303-Wetland Protection-Willful-Reckless Permit Violation, a one year misdemeanor. Judge Ford sentenced Mr. Bruce to serve 20 consecutive days in Mackinac County Jail, pay \$1,000 in fines, \$1,000 in costs, and \$6,000 in restitution to the DEQ. In addition, by September 1, 2003, Mr. Bruce must restore the wetland and shoreline area to the satisfaction of the DEQ or face additional sanctions from the Court.”

If you want a copy of the DEQ press release, you can download it from the Department’s Internet Home Page at [www.michigan.gov/deq](http://www.michigan.gov/deq).

Included in the release was a statement from Steve Chester, Director of DEQ that, “**The DEQ will vigorously enforce the laws that protect Michigan’s wetlands and shoreline areas.**”

## **Teachers, Lake Association Representatives Meet for Water Test Training at Higgins Lake**

About 25 high school science teachers and lake and stream association representatives met March 7 and 8 at Higgins Lake for training and orientation sessions on water quality testing and monitoring. The meetings, held at the R.A. McMullan Conference Center, were the first opportunity for all members of the ML&SA sponsored collaborative project between schools and lake and stream associations to get together. The conference was made possible by a grant from the Wege Foundation.

The conference included calibration and training techniques using the graphing calculator and other special equipment taught by Project Director Randy Cook of Tri County High School in Howard City, MI. Instruction on aquatic plant identification was given by Howard Wandell of MSU. Jeff Kalember, biology teacher at Gaylord High School, taught a session on identifying freshwater invertebrates. Kathleen Straus, President of the Michigan State Board of Education, was the keynote speaker on Saturday evening.

## **DEQ Denies Dredging Permit For Proposed Marina on Missaukee Lake Northeast of Cadillac**

In October 2002, the Michigan Department of Natural Resources denied a permit requested by a developer, who had proposed dredging 1,900 cubic yards of material from a wetland and lake area in order to install a dock for 12 boats on Missaukee Lake. Missaukee Lake is located about six miles northeast of Cadillac.

The request was to remove material from a wetland and lake area 130 feet by 90 feet plus a 30-foot-wide channel 270 feet to open water. The dredge spoils were to be placed in an upland area on the site.

In addition, a marina operating permit was requested for the site, since the developer also proposed to install a docking system with a main pier six feet wide and 103 feet long with six finger piers on each side, providing docking space for 12 boats.

The DEQ conducted a public hearing on the request on August 22, 2002, at the Missaukee County Office. The hearing was held open for 10 days after this date for written comments to be submitted for the hearing record.

The DEQ’s decision was sent via certified mail to the developer on October 7, 2002. It stated:

“The Department of Environmental Quality (DEQ) has reached a decision on your application for permit submitted under the regulatory authority of Part 301, Inland Lakes and Streams, and Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. The DEQ cannot permit your proposed project and your application is hereby denied.”

Some of the reasons given for the denial were:

- The proposed project will have significant adverse impacts on the natural resources associated with Lake Missaukee.
- The area provides breeding, nesting, feeding or cover for wildlife, especially amphibious animals, and macroinvertebrates which are a vital part of the food web, and marsh/shore birds and water fowl. Loons and eagles are also known to occur in this area. Dredging, construction, and increased boat traffic may cause harm to these animals.
- This area provides spawning, nursery, food, or cover for fish and also aquatic invertebrates on which they feed, and which are an important part of the aquatic ecosystem.

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The collaborative school/lake project began about two years ago with grants obtained from the Irwin Andrew Porter Foundation, the RGK Foundation, the Wege Foundation, and the Vernier Software and Technology Company of Beaverton, Oregon.

# Our Attorney Writes On Riparian Rights and other legal matters of concern

By  
Clifford H. Bloom  
Law, Weathers & Richardson P.C.  
Bridgewater Place  
333 Bridge Street N.W. Suite 800  
Grand Rapids, Michigan 49504



There has been a flurry of Michigan appellate court proceedings recently which could impact riparian rights, and not all of the news is good for riparian property owners. This issue's column will concentrate on pending and recently-decided Michigan court cases of interest to riparians.

Last year, the Michigan Court of Appeals issued its decision in *Little v Kin*, 249 Mich App 502 (2002). *Little* involved a backlot easement which read "a permanent easement for access to and use of the riparian rights to Pine Lake ..." The trial court summarily held that the easement was for ingress and egress only, and the backlot property owner could not use the easement for a dock or permanent boat moorage. On appeal, the Michigan Court of Appeals held that the trial court decided the case prematurely without a trial and remanded the case back to the lower court for a trial on the merits. Among other matters, the Court of Appeals indicated that the trial court should look closely at the intent of the original grantor based on the language used and the circumstances existing at the time the easement was created. Late last fall, the Michigan Supreme Court agreed to hear the case and oral arguments were heard last month. It is highly likely that the Michigan Supreme Court will render its decision in the *Little* case within the next month or two. The ultimate decision by the Michigan Supreme Court could have a profound impact upon future cases involving lake access easements, road ends, and riparian issues in general. Michigan Lake & Stream Associations, Inc. submitted an *amicus curiae* brief to the Michigan Supreme Court in support of the riparian property owner.

In *Higgins Lake Property Owners Ass'n v Gerrish Township, et al*, \_\_\_ Mich App \_\_\_ (2003), the Michigan Court of Appeals wrote a new chapter in the history of the misuse of public road ends at Higgins Lake. As many riparians know, the Court of Appeals in *Jacobs v Lyon Twp, after remand*, 199 Mich App 667 (1993), held that a public road end can normally be utilized for one public dock under certain circumstances, and that there can be no permanent boat mooring, shorestations, lounging, sunbathing, etc. In *Higgins Lake*, a riparian property owners association and several riparians attempted to enforce *Jacobs* for several road ends at Higgins Lake which were being misused. Backlot owners have fought a fierce litigation battle in this case and it has bobbed up and down between the trial court and the Court of Appeals on more than one occasion. The Court of Appeals' decision in this matter is a "mixed bag"—it generally upheld *Jacobs*, but did cut away at that decision slightly. The Court held that where a conventional public road dedication is involved, *Jacobs* normally applies. The Court did, however, leave the door open a little for backlot owners to argue that additional activities may be allowed at a particular road end if they can show that such activities occurred at or close to the time when the road was first created. The more troublesome aspect of the case involves the remedy available for violations of *Jacobs*. Even though there was significant evidence of activities occurring in violation of *Jacobs*, the Court of Appeals held that no court order (i.e., injunction) would be issued to stop misbehavior unless more significant evidence of public or other harm

could be shown. This will present a problem where a riparian property owner, lake association, or other person or group wins a trial court determination that someone is improperly using a road end but the trial court refuses to order the violating party to stop. In its opinion, the Court of Appeals invited the Michigan Legislature to seek a statutory remedy for infractions at road ends. In fact, the Michigan Waterfront Alliance is presently urging the legislature to adopt statewide legislation to govern public road end activities.

In *Dyball v Lennox*, the Genesee County Circuit Court permitted a backlot owner to continue to maintain a dock and permanent boat mooring at the end of a 16-foot-wide lake access easement. According to the backlot owner, such usage had occurred for many years back to the time the easement was originally created. This case is presently pending before the Michigan Court of Appeals, and ML&SA has filed an *amicus curiae* brief in support of the riparian property owner.

Even in townships which have no anti-funneling regulations, there has been a widespread assumption that "keyhole" developments and similar devices cannot be created where the property around a lake is zoned for single-family use only under the local zoning regulations. In essence, "funneling" could be considered a prohibited multi-family use. In *City of Au Gres v Walker* (decided February 11, 1993, Case No. 140101), the Court of Appeals essentially held that granting an access easement to a river for two backlot owners constituted a prohibited multi-family use of the riparian property under single-family zoning regulations.

(continued on page 16)

## 37 Killed in Boat Accidents In Michigan During 2002; Highest Toll Since 1994

The Law Enforcement Division of the Michigan DNR recorded 36 fatal boating accidents during 2002 and a total of 37 persons killed. This is the highest number of fatalities since 1994, which saw a record 42 boating deaths, and nine more than in 2001. Only two of the fatalities were the result of Personal Watercraft (PWC) accidents.

The total number of reported boating accidents was 229, a marked decline from the 348 reported in 2001, owing to a change in reporting requirements. Last year Michigan adopted the criteria used nationally, which requires reports on accidents involving \$2,000 or more in damages. Previously, Michigan required reports on any damages over \$100, although officials believe many accidents under \$500 went unreported.


## Our Attorney Writes:

(continued from page 15)

Since *Au Gres* is an unpublished case, it is not binding upon trial courts. Nevertheless, unpublished opinions are often considered by trial courts, particularly if they are persuasive. On February 28, 2003, the Court of Appeals issued its opinion in *Soupal, et al v Shady View, Inc.* (unpublished, Case No. 231443). In *Shady View, Inc.*, a group of backlot owners at Higgins Lake formed a nonprofit association which owned and controlled a vacant lake lot on Higgins Lake. Extensive dockage was installed and members of that association moored their boats at such dockage. Riparian property owners sued and claimed that the dockage was both a marina (which required state approval) and constituted a prohibited commercial or multi-family use on property zoned single-family residential. The Court of Appeals held that the lakefront lot commonly used

by the backlot owners and their association did not constitute a prohibited commercial or multi-family use under the single-family zoning for the property. Two points should be made regarding this case, however. First, like *Au Gres*, it too is an unpublished case and is not binding precedent. Second, there was some unusual wording in the local zoning ordinance which may have allowed uses normally not permitted in single-family residential zones under other zoning ordinances.

In *Yankee Springs Twp v Veloso, et al*, the Barry County Circuit Court upheld the township's anti-funneling regulations. The trial court upheld the ordinance provision against claims that it did not apply, was overbroad, was unconstitutional, was invalid since it could only apply to part of the lake (i.e., parts of the lake are located in four different townships), and the township waited too long to enforce its ordinance.



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# Outdoor Lighting:

Poorly Designed Fixtures Are Wasteful, Intrude on Privacy,  
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## What Can We Do? Dark Skies Advocates Advise:

- Light the ground, not the sky
- Use a uniform lighting pattern and avoid sharp contrasts
- Choose fixtures that have a full cutoff (shielded) design
- Place fixtures only where light is needed
- Use bulbs with appropriate wattage
- Use motion detectors or time controls to turn off automatically when not needed

Skyglow Over Petoskey, Michigan, Population 6,000

By William Hokanson

(Photo by Mary Lou Tanton, courtesy of Outdoor Lighting Forum, Emmet County)

Many riparians are disturbed by the proliferation of unshielded or misdirected exterior security lights on lakeshore properties that turn the beautiful natural surroundings of their rural homes and vacation cottages into city-like scenes at night. Besides the annoying glare that is often multiplied by reflections on the water, such lighting interferes with the enjoyment of observing the stars and planets that dapple the night sky.

Those who install such lighting argue that it is needed for security and safety. Owners who only use their lake properties on summer weekends are understandably concerned about their security when they are absent. And neighborhood watch programs sponsored by local law enforcement agencies often encourage exterior lighting to discourage break ins and other crimes.

While recognizing that outdoor lighting is sometimes needed for safety and security, a number of organizations have pointed out that excessive and poorly designed lighting causes problems, including sky glow, light trespass, glare, clutter

and confusion as well as energy and financial waste. They also say that poorly designed lighting can compromise safety and security rather than enhancing it, pointing out that misdirected bright lights produce shadowed areas where intruders cannot be seen because the human eye reacts to the bright light and is unable to discern objects in the shadows.

The International Dark-Sky Association (IDA), a non-profit organization headquartered in Tucson, Arizona, is a leading advocate of controlling light pollution while providing safety and security through good lighting practices. It was founded more than 15 years ago by a group of professional astronomers concerned about the adverse impact of sky glow from outdoor lighting on their research as well as on the public's enjoyment of the beauty of the night sky.

The organization notes that dark skies are vanishing in the United States and that two thirds of the people in the U.S. are unable to see the Milky Way on clear nights

because of sky glow from poorly designed outdoor lighting fixtures. Of course, most of these people are urban dwellers, but sky glow is also becoming a problem in rural areas too.

In addition to the adverse affect on astronomical observation, poorly designed lights cause light trespass on neighboring properties, annoying glare that is unsafe for traffic or interferes with the ability to observe intruders, and are extremely wasteful of electrical energy.

IDA reports that about 40% of the light from widely used dusk-to-dawn mercury vapor "security lights" is wasted, going up or sideways. Such lights, which cost about \$30 at home-improvement stores, use about \$70 worth of power a year, or more than twice the purchase price. IDA has estimated that about \$700 million is spent operating these lights each year and that misdirected outdoor lighting from all sources throughout the U.S. costs about \$1.5 billion each year. About six million tons of coal must be burned annually to produce this wasted light.

*(Continued on Page 18)*

Yet, there are many ways to correct this problem and reduce the waste. More efficient but effective lighting fixtures are available, and dark sky advocates are promoting their use through education, persuasion, and regulation.

One of the most active groups in Michigan is the Outdoor Lighting Forum of Emmet County, organized in May 2001, primarily through the efforts of Mary Lou Tanton, chairperson of the Sign and Lighting Committee of Emmet County and Bear Creek Township, and Emily Meyerson, former Planning Director for Bear Creek Township, who were concerned about the detrimental effects of poor outdoor lighting. Gathering together a group of volunteers interested in the subject they adopted the mission “to research and disseminate information on good outdoor lighting practices, to promote lighting that is efficient, offers safety to the public, improves community appearance, and protects the night sky environment.”

The Forum sponsored a series of seminars for contractors, building professionals, and public officials featuring a noted professional engineer who specializes in lighting technology. It also produced an informational brochure summarizing lighting problems and lighting solutions. (Call 231-348-1731 for copies.)

The Forum also supported a comprehensive outdoor lighting ordinance for Emmet County, although it applies only to commercial and industrial zones. The Forum distributes a flyer pointing out key requirements to building contractors and electricians. Other communities in Michigan with exemplary outdoor lighting ordinances are Kentwood, a suburb of Grand Rapids, and Brighton Township in Livingston County.

Such ordinances usually specify the maximum amount of light, measured in foot candles, that is permitted at the property line, as well as other control measures such as the height of light poles and shielding requirements. Most street lighting provides about 1.0 foot candles, while big box retail parking lots typically measure 10.0 foot candles—the maximum level permitted by some ordinances. Excessively lighted gasoline service stations often measure 100 foot candles, ten times what is needed for good visibility.

A great deal of information on lighting issues can be obtained from the IDA web site: [www.darksky.org](http://www.darksky.org), including listings of good lighting fixtures and where to get them. One such source is Outdoor Lighting Associates, Inc. in Ames, Iowa, which has a web site at <http://members.aol.com/outdoorlgt/ola.html>.

## Examples of Good and Bad Lighting Fixtures



**BAD:** Typical barnyard head style fixtures are very inefficient. They send about 20% of light upward and another 20% horizontally, creating glare.



**GOOD:** Many existing dusk-dawn security lights can be retrofitted with the Hubbell Sky cap costing about \$30. At a height of 25 ft. it lights a circle 200 feet in diameter. A Lite Blocker shield that covers one side (180°) of a light is also available for about \$23.

**As a result of the efforts of the Outdoor Lighting Forum, Hubbell Skycaps can be installed in Charlevoix or Emmet Counties by requesting them from the cities of Petoskey, Harbor Springs, or Charlevoix or from Consumers Energy or Great Lakes Energy. They are also available for sale at All-Phase Electric in Petoskey at 231-347-1050 or at Reed City Power 800-632-7237.**



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## Lakeshore Buffer Zones

*Continued from Page 8*

may never have been emergent vegetation in the water along the shoreline. In these cases, restoration should be limited to the water's edge and adjacent upland habitat. Aquatic plants, like bulrushes, cattails, sedges, and sweet flag, reduce the energy contained in waves and lower their potential for eroding the shoreline. Broad-leaved cattail is especially beneficial because its persistent dead stems provide protection of the water's edge late into the fall and again early in the spring before new growth provides shoreline protection. Submerged and floating aquatic plants also provide protection from wave action. Another benefit of these aquatic plants is that their root systems help stabilize the lake bottom and prevent the sediments on the bottom from being resuspended in the water.

A buffer zone significantly reduces the amount of soil erosion from the land, which can result in serious pollution of a lake. The roots of plants stabilize the soil and take up water from the lower soil layers. Water passes through the plant and evaporates from the leaves through a process called transpiration. When soil moisture is removed in this manner, the deeper rooted plants, like dogwood, help stabilize the soil. A canopy of trees and shrubs intercepts raindrops and reduces their erosive force. Once rainwater reaches the ground level, the complex structure of grasses and wildflowers slows the flow of the water and allows more of it to soak into the ground. The buffer zone also traps fertilizers, chemicals, and other potential pollutants, like pet waste, that would otherwise wash directly into the lake from a lawn that extended to the water's edge.

Maintenance of a sandy beach can be reduced if a portion of the frontage is planted in native plants. If a swimming beach is maintained, it can be adjacent to the dock area and can be partially screened from the lake by emergent vegetation in the lake. The vegeta-

tion will help prevent the sand in the swimming area from becoming suspended by wave action, thus lengthening the life span of the sand deposit.

Creating a buffer zone can reduce the size of a lakeshore lawn, often by as much as 30% to 40%. Reducing the amount of lawn reduces the amount of lawn fertilizer that can reach the lake and thereby reduces excessive weed growth and algal blooms. And less time is spent applying fertilizers and herbicides and mowing.

A buffer zone replaces shoreline wildlife habitat that may have been previously lost. Once again, the lakeshore becomes an area for wildlife nesting, feeding, brood rearing, perching and sunning, and travel.

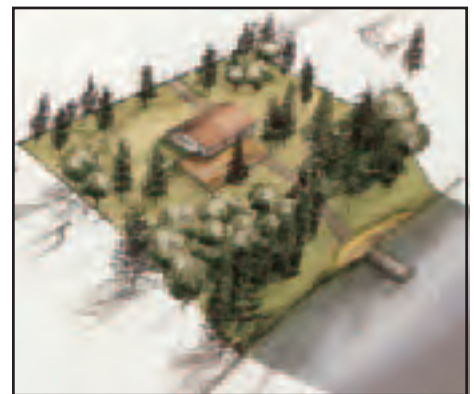
Nuisance animals, like Canada geese and mallards, will not usually cross a buffer zone to a lawn because they are reluctant to walk through tall grass that provides good camouflage for predators. Muskrats cease to be a problem if a homeowner is not mowing within 25 feet of the water's edge, because their burrows do not extend far enough into the bank to create a problem for lawn mowers.

Creation of a buffer zone is the essence of the lakescaping concept. It can return many desirable features to your shoreline and present you with a seasonal array of natural beauty: colors, textures, aromas, and continual wildlife activity. It will re-create those features that originally attracted you to life on the lake.

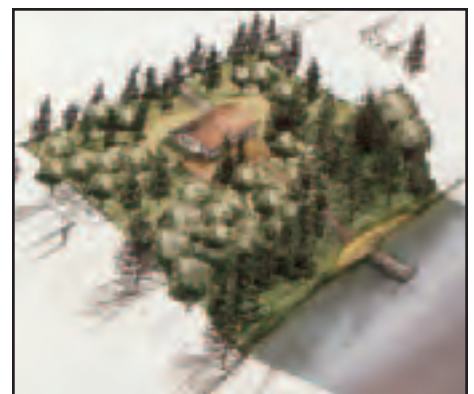
**Restore Your Shore** is an expanded version of the book *Lakescaping for Wildlife and Water Quality* in compact disc format. It is a multimedia program with interactive exercises, worksheets, plant lists, and video accounts of four actual projects. System Requirements include: Pentium 200 Mhz processor or faster; 32MB RAM for Windows 95/98/ME or 64MB for Windows 2000; 800x600 or higher resolution; 16-bit color; 8xCD-ROM; sound card and speakers; MS Internet Explorer 5.01SP2 or later; Window Media Player 6.4 or later.



1) Steep slopes often encircle midwestern lakes. When cleared, these slopes are susceptible to erosion without the protection of canopy trees and understory plants. Slopes are also dangerous to mow and are too steep to be used for most recreational activities.



2) Buffer zone planting in this situation can begin with the planting of the slope. Native plantings will protect the soil from erosion and eliminate the need to mow. The lake view is "filtered" through the trees, not obscured. The lake is visible through a beautiful foreground of trees, which create the opportunity for wildlife observation.



3) Ideally, the entire slope is planted and just a small area for socializing created at the lake. This allows for maximum protection of the slopes. In some situations, such as at this site, it is not possible to establish plants within the water due to the steep drop-off of the lake bottom.

Landscape Designs  
By Fred Rozumalski  
Renderings  
By Roxanna Esparza



# News & Activities of Lake Associations Around the State

Selected and edited from reports in recent lake association newsletters to provide an exchange of information and ideas

## Derby Lake Cottage Owners Association, Inc.

Montcalm County  
Steve Ries, President

The association served 100 persons at its annual Labor Day breakfast. It has 123 members, 82% of potential, and annual dues of \$20. About 52% of Derby Lake homes are year-round and the number is increasing. Derby Lake has completed its second year in the Cooperative Lakes Monitoring Program. It has treated eurasian water milfoil with granular 2,4-D and concludes it was about 70% effective where applied. It plans to increase treatment next year and has already applied for the permit. Don McKeague has retired after 18 years as Secretary/Treasurer of the association and editor of its newsletter but will remain as the association's resident agent. Outgoing president is Woody Ely.

## Lake Margrethe Property Owners Association

Crawford County  
Joe Porter, President

At its Oct. 12 general meeting the association made plans to attack some 10-12 acres of eurasian water milfoil that has been found in the lake with both 2-4,D and weed-eating weevils. The plan is to apply 2-4,D at six parts per billion and to introduce weevils in two or three locations. The cost of an application survey and the weevils will be \$11,000 to \$14,000. The association's newsletter, *The Ripples*, reported the source of the milfoil to be transient boaters. It also reported the presence of zebra mussels, suspected to have come from the same source. The association has a web site at: <http://lakemargrethe.homestead.com>

## White Lake Association

Muskegon County  
Tom Thompson, President

*The White Lake Viewpoint* reports that White River Township has adopted a keyhold ordinance almost identical to one adopted in Fruitlands Township. It requires a parcel with 40 feet of frontage for each back lot to have access to White Lake or lake Michigan. The association had urged the township to adopt the ordinance and will now ask Montague Township and the city of Whitehall to adopt similar ordinances.

Dredging to remove about 85,000 cubic yards of burgundy sediments contaminated with chromium, arsenic, scrap animal hides, and high levels of nitrogen from Tannery Bay in White Lake was expected to be completed by the end of December. The cleanup is being done by a Georgia firm under a \$5.1 million contract with the DEQ. Another project dredged 15,000 yards of sediment contaminated with PCBs years ago by discharges from a now closed chemical plant.

## Portage, Base and Whitewood Owners Association

Livingston & Washtenau Counties  
David Spielman, President

A membership drive resulted in an increase of members from 284 to 381 in 2002 – a 34% increase. The association studied tax maps in four townships to identify properties bordering on its five lakes and identified 960 households that should belong. Board members have been assigned to areas of concern including Environmental and Safety, Strategic Planning and Governmental, Community and Social, and Internal Development. The association promotes weed harvesting over chemicals, noting that herbicides add back nutrients that nurture more weeds. After contacting various weed harvesting companies, the association is considering purchasing its own weed harvesting machine. An historical committee meets monthly and is collecting materials for inclusion in a history book for the association.

## Big Star Lake Association

Lake County  
Owen Bieber, President

Winners in the association's annual Independence Day decorated boat parade are selected in four categories: Most Original, Most Patriotic, Best Smallcraft, and Best of Show. The 2002 parade theme was "Survivor." Next year's will be "Patriotic Movies." The association sponsored a gala fireworks display that lasted 25 minutes and cost \$5,600. In the Big Star Lake newsletter, *The Party Line*, the president reported 470 property owners had paid the \$45 annual dues and 330 other "freeloaders" who he said are not bearing their share of the financial burden. The association also sponsors a Water Skiing Show annually at a cost of \$1,350. Last year it spent \$5,700 treating eurasian water milfoil. The association has a web site at [www.bigstarlake.org](http://www.bigstarlake.org).

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## Zebra Mussels Found in 11 More Lakes in Michigan During 2002

Zebra mussels were found in 11 more inland lakes in Michigan last year, according to Michigan Sea Grant, which monitors the spread of this invasive species. The lakes and counties affected included: Big Lake in Osceola County; Hutchins Lake in Allegan County; Beaver Lake in Alpena County; Big Fish Lake in Cass County; Crooked Lake in Clare County; Pratt Lake in Gladwin County; Van Ettan Lake in Iosco County; Big Wolf Lake in Jackson County; Lower Pettibone Lake in Oakland County; and Ford and Half Moon Lakes in Washtenaw County.

The discovery of the mussels in Big Lake was the first such finding in Osceola County. It increases the number of Michigan counties affected to 44 and brings the total number of infested lakes to 177. All of the findings were made by property owners or DNR or DEQ offi-

cialists who found adult colonies clinging to boats, docks, rocks, dams, or water pumps.

A listing of all infested lakes prior to the 2002 report above was published in the May 2002 issue of *The Michigan Riparian*. For more information about lake monitoring and confirmed infested lakes visit [www.miseagrant.umich.edu/ans/lakes.html](http://www.miseagrant.umich.edu/ans/lakes.html).

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