

# THE WATER'S EDGE

**Helping  
fish and  
wildlife on  
your lakeshore  
property**



# Shoreline habitat

**T**he water's edge is a busy place. Northern pike, bluegills, bass, and other fish spawn in the shallow water along the shore. Loons, ducks, sandhill cranes, and other water birds nest along the banks. Wildlife such as frogs, otters, and mink live there, too. Shoreline areas—on land and into the shallow water— provide essential habitat for fish and wildlife that live in or near Michigan's lakes. Overdeveloped shorelines can't support the fish, wildlife, and clean water that are so appealing to the people attracted to the water's edge.

Unfortunately, that's exactly what's happening to many Michigan lakes. The problem is poorly planned lakeshore development. Bit by bit, the cumulative effects of tens of thousands of lakeshore homeowners "fixing up" their property are destroying one of the state's valuable resources - its fragile lake habitats. Some examples:

**Sand trucked in for swimming beaches covers underwater gravel or silt used by:**

- fish for spawning
- mayflies for burrows
- frogs for laying eggs

**Aquatic vegetation removed to create swimming and boating areas eliminates shoreline-stabilizing plants that are also habitat for:**

- bass and other fish that hide among the plants and spawn in areas protected from waves
- loons that nest on floating vegetation
- waterfowl that feed on underwater plants
- insects that live among underwater vegetation

**Shoreline shrubs and "unsightly" fallen trees are removed to create golf course-type lawns, thus eliminating habitat for wildlife such as:**

- songbirds that use these shrubs for nesting
- ducks that lay eggs in native shoreline grasses
- turtles that sun on fallen logs
- bass and panfish that hide in the shade under toppled trees.

**"Recent studies have shown how critical shoreline habitats are to the health of the entire lake. If you want great fishing you need to protect the shoreline."**

**Rebecca A. Humphries**  
DNRE Director



In-Fisherman



Roger Darden



In-Fisherman

# “Clean” lawns can make dirty lakes

**O**wners of shoreland property often bring with them traditional landscaping ideas that strive for the conventional, suburban “clean” look of a golf course or a beach. Yet, besides eliminating fish and wildlife habitat, this type of landscaping also creates problems for homeowners such as:

- **Green water:** A mowed lawn sends rain runoff carrying fertilizers, pet waste, and lawn clippings to the water where they fuel algae blooms that make swimming less enjoyable.
- **More erosion:** Water plants such as bulrushes, cattails, and coontail soften the erosive effects of waves along shores. Removing these plants increases erosion.
- **Nuisance wildlife problems:** Traditional lawns attract geese, which are grazers. In one week, an adult goose can produce 15 pounds of slippery, smelly droppings.

The combined effect of shoreline alterations by many property owners on a lake destroys habitat and causes declines in fish and wildlife populations. It’s ironic that many lakeshore property owners buy their lots because they enjoy nature and then unknowingly harm habitat by altering the natural landscape. Most species of fish and wildlife don’t thrive along sandy swimming beaches or on mowed lawns. They do best within the tangles of aquatic (“weeds”) and shoreline cover (“brush”) that lakeshore owners frequently remove.

## Landscaping that’s unfriendly to fish and wildlife

### Rocky future

Rain that would seep into the soil flows more quickly off rocks and lawns straight into the lake. The runoff carries pet waste, fertilizer, and other lake pollutants.

### Sorry, songbirds

All natural vegetation along the water’s edge has been eliminated—and with it has gone the shrubs and grasses needed by birds, butterflies, and other wildlife.

### Big Fish come from Small Fish

With all the aquatic vegetation gone, fish have no place to live. Waves will stir up sediment and destroy spawning areas.

# The value of shoreline habitat

## What can you do?

A growing number of lakeshore owners are switching from traditional mowed lawns to native grasses and wildflowers. In addition to helping wildlife, native plants require little to no maintenance. That frees up more of your time to go fishing, watch wildlife, and otherwise enjoy being at the lake.

**S**horeline habitat consists of many natural elements woven into the lake ecosystem to form a web of life. Native vegetation, bottom materials, and natural debris play essential roles in the life cycles of a lake's fish and wildlife. Nearshore alterations that damage or destroy these habitat components sever essential strands in the web. As a result, the lake ecosystem is weakened, wildlife and fish numbers decline.



Jane Herbert

## Lightly developed shoreline = lots of fish and wildlife



## Overdeveloped shoreline = few fish and wildlife



Amy B. Beyer

# Shoreline buffers

**N**earshore vegetation provides habitat for many wildlife species. Waterfowl nest in shoreline grasses, while songbirds build their nests in trees and shrubs. Natural shorelines are wildlife highways, or travel corridors, for animals such as mink grasshoppers, ants, and other insects that live in shoreline vegetation are blown into the lake, where they are eaten by bluegills and other fish.

A tidy lawn and a sandy beach make great spots for sunbathing and swimming, but they provide little habitat for fish and wildlife. By leaving a buffer of natural vegetation along the shoreline, property owners can reduce erosion, help maintain water quality, and provide habitat and travel corridors for wildlife.

The width of the buffer strip depends upon the terrain. On a gentle slope, having a 35 to 50 foot strip of natural vegetation between the water's edge and the lawn will accommodate the needs of many shoreline wildlife. On steeper grades, leaving even more natural vegetation in place will stabilize soils and reduce the need for retaining walls or other erosion prevention. Trees and shrubs in the buffer strip can muffle noise from watercraft while providing nesting areas for songbirds.

Avoid using pesticides or fertilizers in the buffer strip because harmful chemicals can leach into the lake. Pesticides kill beneficial insects living in shoreline vegetation that are important foods for fish, birds, and other wildlife.

**Along your shoreline, try to maintain a buffer of native grasses, wildflowers, shrubs, and trees. Native plants especially good for wildlife are sugar maples, bur oaks, cranberries, dogwoods, native grasses, and wildflowers. Beneficial aquatic plants include bulrushes, wild rice, arrowhead, cattails, and bur reeds.**



## Have your lawn—and wildlife, too.

**You don't need to give up a lawn and beach to create a natural, wildlife-friendly lakeshore.**

**If you have 100 feet of shoreline, consider reverting 75 feet back to its natural condition and keeping 25 feet for a boat dock and swimming area. Additionally, if you restore the area near the lake to natural grasses and shrubs, you can still keep plenty of lawn up near the house or cabin while helping ducks, songbirds, butterflies, and other wildlife.**

# Woody cover

## What can you do?

**Leave fallen trees in the water to provide habitat for fish and wildlife.**

**B**ecause most Michigan lakes are surrounded by trees and shrubs, storms and winds often blow dead or dying branches, limbs, and trees into the water. This woody debris is important to lake ecosystems. Beneath the water's surface, woody material is critical habitat for tiny aquatic organisms that feed bluegills, turtles, crayfish, and other critters. Water insects such as mayflies graze on the algae that grows on decomposing wood. Dragonfly nymphs hunt for prey among the stems and branches. Bass find food and shelter, and nesting sites among fallen trees.

Above water, a fallen tree is like a dock for wildlife. Ducks and turtles loaf and sun themselves on the trunk. Muskrats use the tree as a feeding platform. Predators such as mink and otter hunt for prey in the vicinity of the tree. Dead trees that remain along the shoreline are used as perches by belted kingfishers, ospreys, and songbirds.

Many lakeshore owners consider this woody debris unsightly and remove it from their shoreline. Yet this takes away hiding and feeding areas for many fish and wildlife species. Unless the fallen tree is a hazard to navigation or swimming, consider leaving it in the water to improve fish and wildlife habitat, fishing, and wildlife observation.

Waterfowl, turtles, and other wildlife use fallen trees as loafing sites.



# Bottom materials

**L**ocal geography and geology determine what natural materials exist on lake bottoms and shorelines. Hard lake bottoms and beaches made up of sand or gravel are usually in open areas exposed to waves. Soft bottoms composed of muck are usually in shallow, sheltered bays. Areas with lots of rocks and boulders were left by receding glaciers 10,000 years ago.

Bottom material, called substrate, is used by fish and other aquatic life. Walleyes spawn on the clean gravel of wave-swept shorelines. Mucky bottoms support insects and other invertebrates that provide food for fish and wildlife. Crayfish, smallmouth bass, and other species hide and forage among rocks.

Pure sand is the least ecologically productive lake bottom substrate. Yet lakeshore dwellers frequently buy property and then alter the shore and bottom by dumping sand to improve a swimming area. Creating sand beaches on soft bottoms is expensive, and covering rock-rubble bottoms with sand destroys fish spawning areas.

Before creating a large beach, lakeshore owners should know that their shoreline alteration will take away fish and wildlife habitat from the entire lake ecosystem and may require permits from the DNRE.

## What can you do?

- **Minimize the size of your sandy beach to allow for more natural shoreland and underwater vegetation.**
- **If buying property, look for shoreline and lake bottom that match your desires. Don't expect to change it into something it isn't.**

Rock and gravel bottoms are important spawning areas for game fish such as walleyes and forage species such as suckers, darters, and some minnows.



# Aquatic vegetation

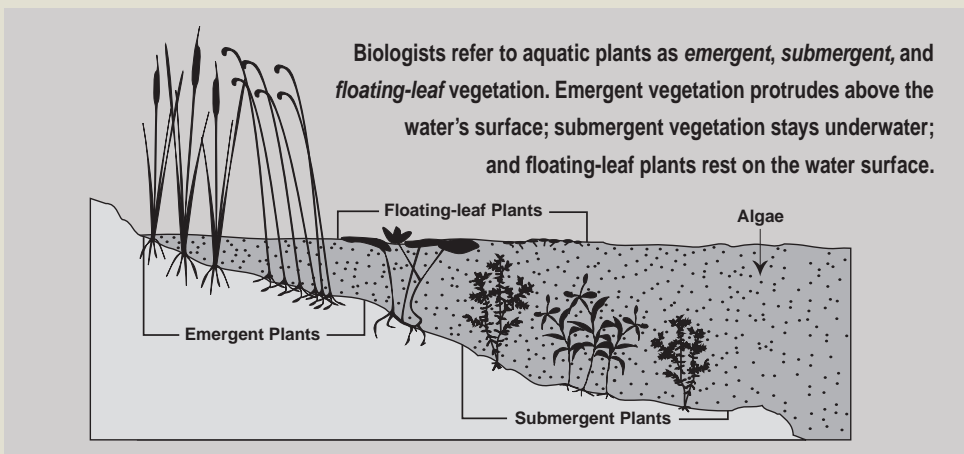
**O**ften dismissed as “weeds” by many lakeshore property owners, aquatic plants provide essential fish and wildlife habitat and help keep lakes clean and healthy. Through photosynthesis, aquatic vegetation produces oxygen for the lake. These plants also use nutrients that can otherwise fuel midsummer algae blooms and they provide food, shelter, and nesting areas for fish, invertebrates, and wildlife.

Removing aquatic vegetation to improve boating or swimming eliminates fish habitat and damages the root network that holds bottom sediments in place. For example, bulrushes keep silt carried by waves from covering bottom gravel used by bass and panfish for spawning. When bulrush beds are removed, waves also begin to erode the shoreline.

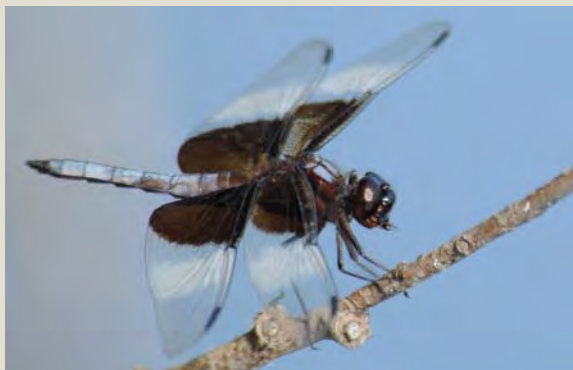
Wave action and boat wakes also stir up sediment, causing the lake water to become murky. If sunlight cannot penetrate the cloudy water, many healthy and vibrant lakes can eventually turn into a green soup, devoid of most desirable fish and wildlife species.

## What can you do?

- **Leave aquatic plants along the shoreline.**
- **Consider re-establishing aquatic plants along the lakeshore.**
- **Utilize docks & swim platforms rather than removing vegetation for access.**



Shoreline vegetation provides critical habitat for beneficial insects, such as this mosquito-eating dragonfly.



# Wetlands

**W**etlands help keep lakes clean by filtering sediments and excess nutrients. Acting like natural sponges, wetlands slow down water. This function reduces flooding, stabilizes lake levels, and provides recharge for groundwater.

Shoreline wetlands are habitat for a diverse community of plants and animals such as northern pike, which spawn among aquatic vegetation. Nutrient-rich sediments and soils in wetlands support insects, frogs, and other small animals eaten by fish and wildlife. Wetland vegetation provides food and cover for waterfowl, muskrats, and other wildlife.

Marshes, bogs, bulrush beds, and other shoreline wetlands have been disrupted by lakeshore property owners to create boat docks and swimming beaches. The loss of a lake's wetland areas leads to poorer water quality, lower game fish populations, and flooding.

## What can you do?

- **Don't fill or alter wetlands, even if they are only wet in the spring.**
- **Consider restoring drained or filled wetlands.**

Amy Peterson

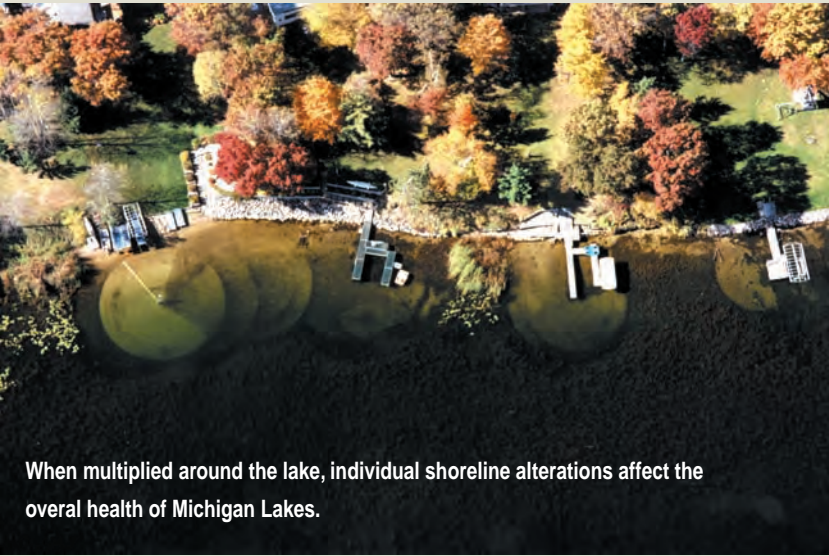


Healthy wetlands attract nesting and migrating waterfowl.

# We're all responsible

It's up to everyone who values lakes to keep them healthy and productive. Many lakeshore owners wonder what difference alterations to their one lake lot could possibly make. But when the actions of dozens or hundreds of individual property owners are added up, the sum effect can alter the habitat and water quality on that lake. The cumulative harm from shoreline alterations by many lakeshore property owners affects swimming, fishing, wildlife watching, and the overall health of the lake.

It's like walking in a garden. If a neighbor kid came through once, that would be no big deal but if the whole neighborhood came through, the garden would be trampled.

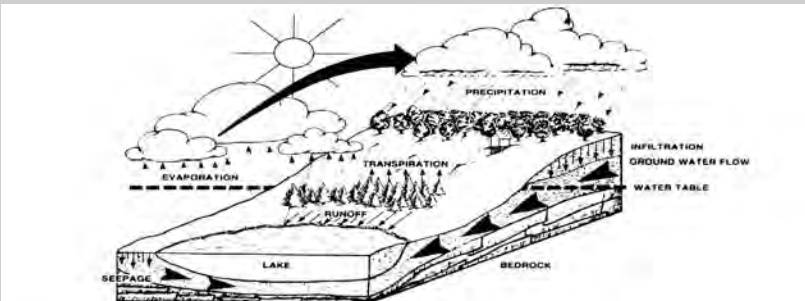


When multiplied around the lake, individual shoreline alterations affect the overall health of Michigan Lakes.

Dick Stoltman

## Protecting watersheds

A watershed is a basin that collects water from the surrounding landscape. A healthy lake depends on a healthy watershed. Logging, farming, livestock grazing, and urban development occurring in a watershed can affect a lake's water quality. Some lake associations map the lake's watershed to inventory and evaluate activities taking place. When activities that degrade water quality are discovered, people living in the watershed work together to find a solution.



Lakes & Reservoir Restoration Guidance Manual; U.S. EPA

Pollutants and eroding soil within the entire watershed can easily end up in the lake. Poor land use even several miles away can end up harming fish and wildlife habitat in a lake.

# Prescription for a healthy lake

**A** healthy lake is a functioning ecosystem. The water is safe for swimming and fishing. The aquatic habitat supplies food, cover, and spawning areas for fish. Natural shoreline vegetation supports songbirds, small mammals, and other wildlife. Throughout this lake's watershed, land management activities are planned to improve water quality.

A healthy lake doesn't just happen. It comes about when shoreline property owners and others living in the watershed take steps to ensure the lake's ecological health. Only if more lakeshore owners manage their shoreline in a natural condition can fish and wildlife populations on Michigan lakes stay healthy and abundant.

## More things to know:

**Several state laws and rules protect shorelines, wetlands, and floodplains. For example, it is illegal to construct seawalls and beaches without a permit. To learn which shoreline alterations are prohibited without a permit, call your local DNRE office.**



Steve Largent



John Gregor, Coldsnap Photography

Good fishing doesn't just happen. It's the result of clean water and abundant spawning habitat found in lakes that still have plenty of natural shoreline.

# For more information

**T**he DNRE is responsible for the protection of the natural resources and public trust of inland lakes. You can get information on permits and laws from the DNRE through their Environmental Assistance Center, the DNRE's web site [www.michigan.gov/dnreinlandlakes](http://www.michigan.gov/dnreinlandlakes), or by contacting your local DNRE office. The DNRE staff are happy to discuss your project so that it meets both personal and environmental concerns.

The Michigan Natural Shoreline Partnership (MNSP) is an organization made up of experts from the DNRE, universities, resource conservation groups, and industry designed to assist lakefront property owners who wish to restore natural shoreline habitat along their waterfront. The MNSP educates contractors and landscape professionals on natural shoreline methods, and provides workshops for landowners. Visit [www.mishorelinepartnership.org](http://www.mishorelinepartnership.org) for more information.



**Michigan DNRE**  
**Questions About Permit Applications?**  
**Call**  
**ENVIRONMENTAL ASSISTANCE CENTER**  
**800-662-9278**  
**DNRE Internet: [www.michigan.gov/dnre](http://www.michigan.gov/dnre)**  
**Email: [dnre-env-assist@michigan.gov](mailto:dnre-env-assist@michigan.gov)**

© 2010, State of Michigan Department of Natural Resources and Environment. Material adapted with permission from Minnesota DNR, Section of Fisheries publication: *The Water's Edge*

The Michigan Department of Natural Resources and Environment acknowledges the US Environmental Protection Agency's Wetlands Program for their financial support of this publication.

The Michigan Department of Natural Resources and Environment (DNRE) will not discriminate against any individual or group on the basis of race, sex, religion, age, national origin, color, marital status, disability, or political belief. Questions or concerns should be directed to the DNRE Office of Human Resources, P.O. Box 30473, Lansing, MI 48909-7973. This publication and future versions of this publication may be quoted or reproduced in part without permission, as long as such reproduction is for noncommercial or nonprofit educational purposes, and the authors are credited with any use.

Cover art by Larry Tople. Used with permission.

Printed in the United States.

AUTHORITY: PA 451 OF 1994, AS AMENDED  
TOTAL COPIES: 13,000  
TOTAL COST: \$6,941.36 COST PER COPY: \$.53



Jennifer M. Granholm, Governor  
Rebecca A. Humphries, Director  
Michigan Department of Natural Resources and Environment