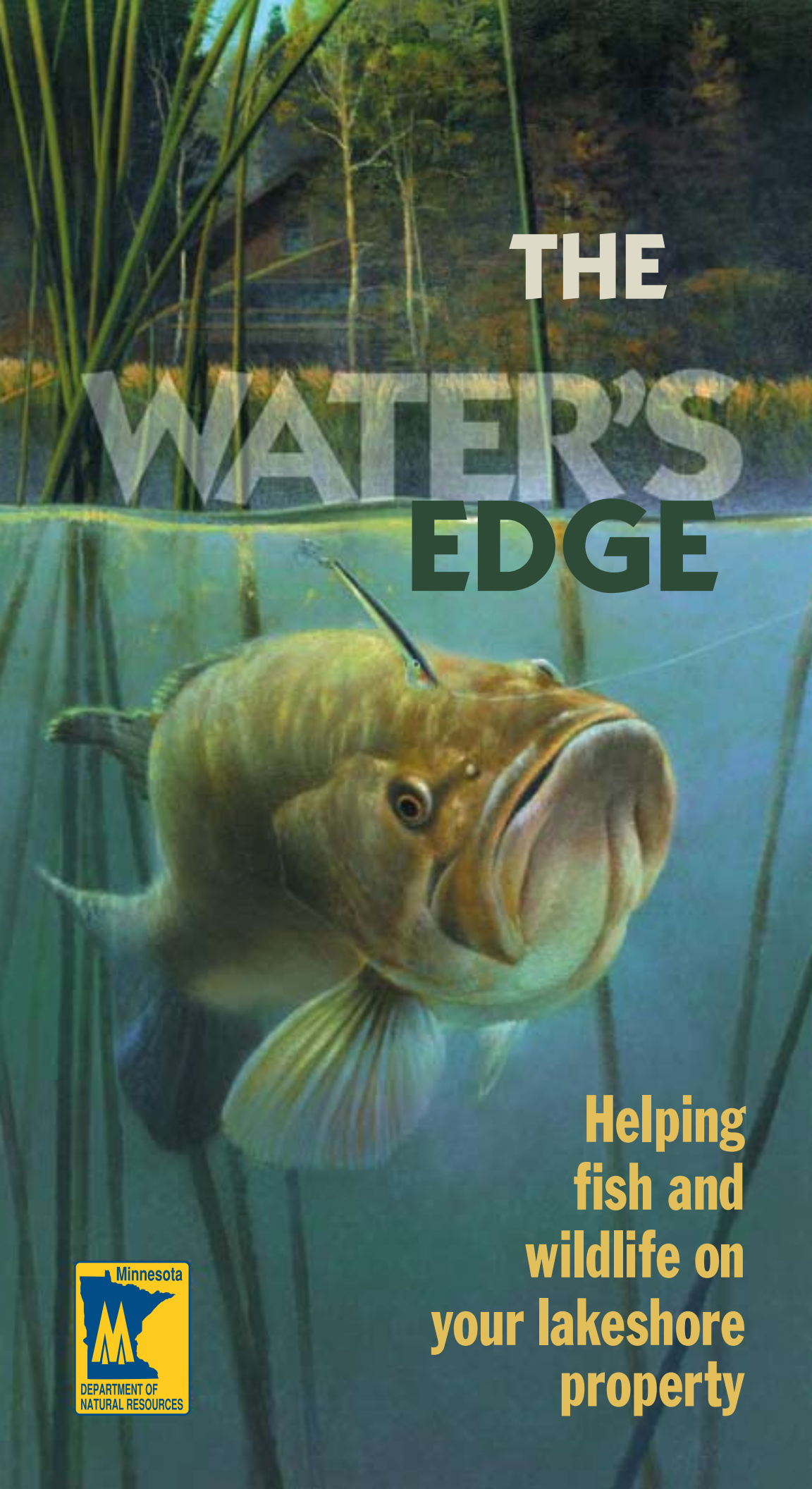


THE WATER'S EDGE

Helping fish and wildlife on your lakeshore property

Minnesota
DEPARTMENT OF NATURAL RESOURCES

Shoreline habitat

The water's edge is a busy place. Northern pike, bluegills, bass, and other fish spawn in the shallow water along the shore. Loons, ducks, geese, 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 Minnesota's lakes and streams. 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 Minnesota 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 the state's valuable lakeshores. 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.

"I believe that one of the primary reasons that fishing has declined on many lakes is because of alterations to lakeshore habitat by shoreline property owners."

Jack Skrypek
DNR Fisheries chief, retired

In-Fisherman

Bill Marchel

In-Fisherman

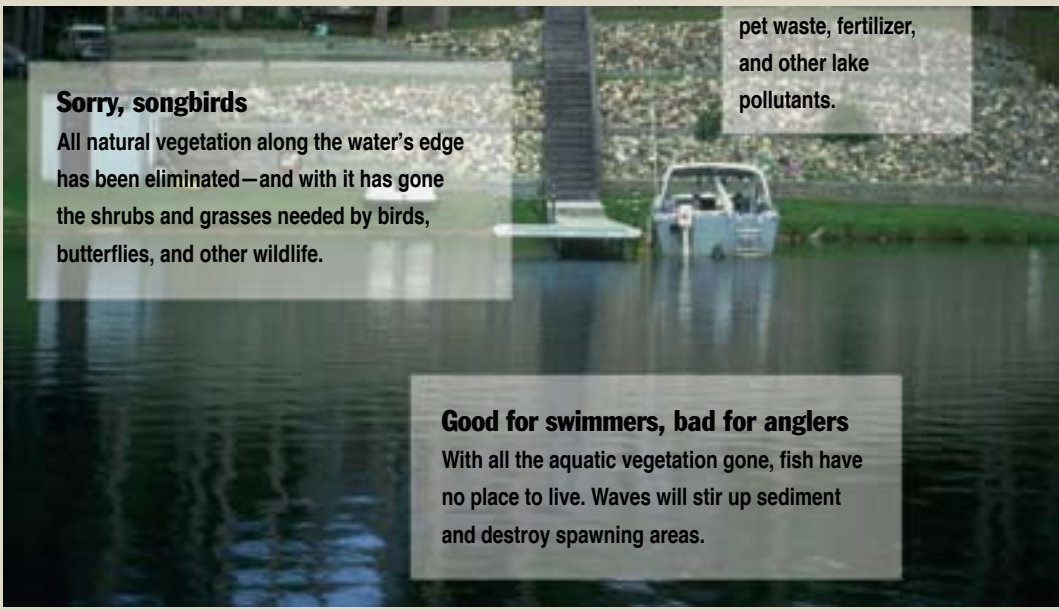
"Clean" lawns can make dirty lakes

Traditional lakeshore landscaping methods strive for the "clean" look of a golf course or a Hawaiian 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 brush that lakeshore owners frequently remove.

Lake landscaping that's unfriendly to fish and wildlife



Chris Frieburger

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.

Shoreline 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. Shoreline alterations that damage or destroy these habitat components sever essential strands in the web. As a result, the lake ecosystem is weakened, wildlife moves elsewhere, and fish numbers decline.

Lightly developed shoreline = lots of fish and wildlife

Overdeveloped shoreline = few fish and wildlife

Amy B. Beyer

Buffer strip

Lakeshore 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 strip 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, at least a 30-foot strip of natural vegetation between the beach and your lawn will accommodate the needs of 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. Besides, insects living in shoreline vegetation are important foods for fish, birds, and other wildlife.

Have your lawn—and wildlife, too.

You don't need to give up a green lawn and sandy 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. Same with your lawn. If you restore the last 30 feet or so down to 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.

Along your shoreline, try to maintain at least a 30-foot-wide buffer of native grasses, broad-leaf plants, 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.

Kathleen Preece

Woody debris

Because most Minnesota 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 debris is habitat for tiny aquatic organisms that feed bluegills and other fish. Water insects such as mayflies graze on the algae that grows on decomposing wood. Dragonfly nymphs hunt for prey among the stems and branches. Largemouth bass find food and shelter 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.

What can you do?

Consider leaving fallen trees in the water to provide habitat for fish and wildlife.

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

Bill Marchel

Bottom materials

Local 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 lake 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 city, county, or DNR.

What can you do?

- **Reduce 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.

In-Fisherman

Aquatic vegetation

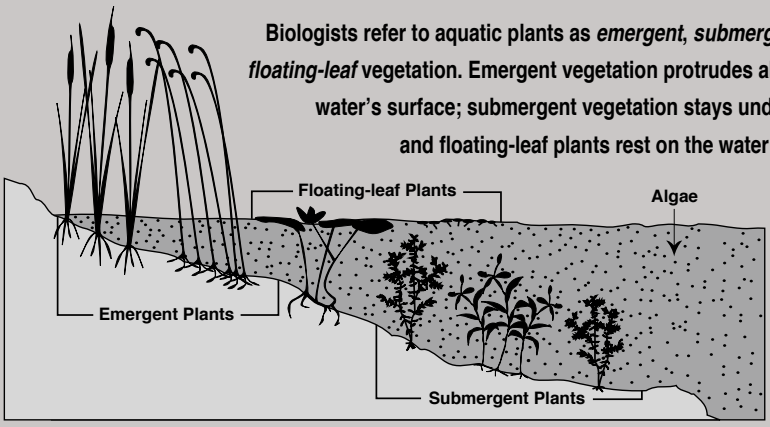
Often dismissed as "weeds" by many lakeshore property owners, aquatic plants provide essential fish and wildlife habitat and help keep lakes clean and healthy. Through photosynthesis, aquatic vegetation produces oxygen for the lake. These plants also filter nutrients that can fuel midsummer algae blooms. 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 eat away at banks.

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?

- **Call the DNR before removing aquatic plants.**
- **Consider re-establishing aquatic plants along the lakeshore. To learn how, call the DNR for advice.**



Biologists refer to aquatic plants as *emergent*, *submergent,* and *floating-leaf* vegetation. Emergent vegetation protrudes above the water's surface; submergent vegetation stays underwater; and floating-leaf plants rest on the water surface.

John Weber, Jr.

Shoreline vegetation provides many species, such as this mosquito-eating dragonfly, with a place to live.

Wetlands

Wetlands 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 worse water quality, lower game fish populations, and higher water levels.

What can you do?

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

Bill Marchel

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 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 though once, that would be no big deal. But if the whole neighborhood came through, your garden would be trampled.

The cumulative harm from shoreline alterations affects the overall health of Minnesota Lakes.

Dick Stoltman

Protecting watersheds

A lake is a basin that collects water from the surrounding landscape, which is called the watershed. 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 there. When activities that degrade water quality are discovered, people living in the watershed work together to find a solution.

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 do as little harm as possible to 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 Minnesota lakes stay healthy and abundant.

More things to know:

Several state and county laws and rules protect shoreline and shallow water areas. For example, it is illegal to remove aquatic plants from an undeveloped shoreline. To learn which shoreline alterations are prohibited or require a permit, call your local DNR office.

Bill Marchel

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

The DNR can help you restore natural aquatic and shoreline wildlife habitat on your lake front property. Give us a call (number below) and we'll show you and your neighbors how to develop management strategies that improve fish and wildlife habitat and keep your lake's water clean.

You can also get the DNR's free brochure, *Aquatic Plant Management*, which explains laws governing the removal of water vegetation and the benefits of various water plants. For a copy, call the DNR Division of Ecological Resources at 651-259-5100.

DNR Information Center

500 Lafayette Road St. Paul, MN 55155-4040

Phone: 651-296-6157

Toll Free: 1-888-MINNDNR (646-6367)

Telecommunication Device for the Deaf/TTY: 651-296-5484
Toll Free TTY: 1-800-657-3929

Internet: mndnr.gov

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