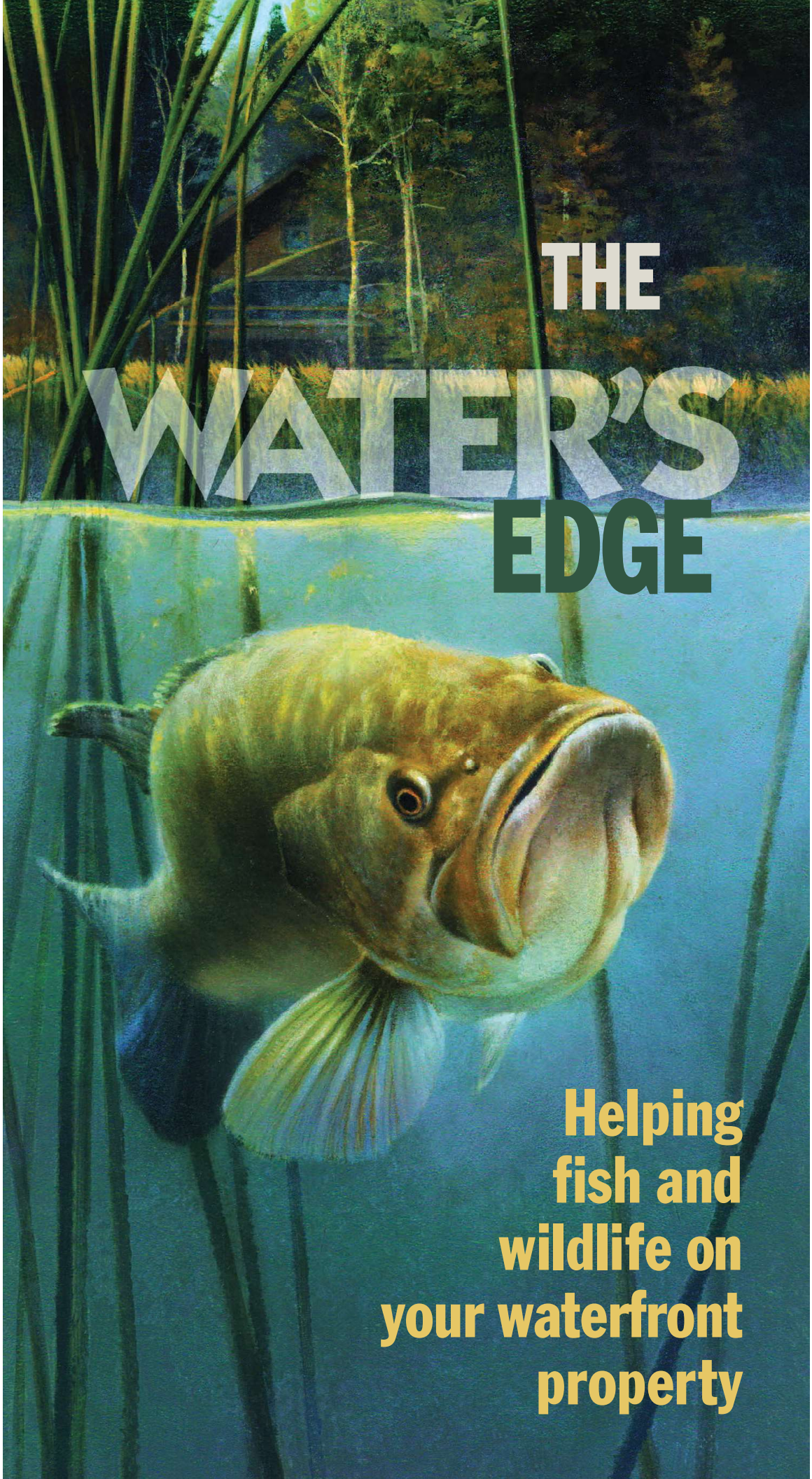


THE WATER'S EDGE

Helping fish and wildlife on your waterfront property

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 Wisconsin's lakes, rivers, and streams. Overdeveloped shorelands 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 Wisconsin waterways. The problem is poorly planned shoreland development. Bit by bit, the cumulative effects of tens of thousands of waterfront homeowners "fixing up" their property are destroying one of our state's most valuable resources – its fragile lake and stream 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.

"If you destroy the natural shoreline habitat then fishing will get worse – and we cannot fix that situation simply by stocking or changing the fishing regulations. If you want great fishing – then you have to protect the fish habitat."

Mike Staggs
DNR Fisheries Director

In-Fisherman

In-Fisherman

"Clean" lawns can make dirty water

Owners of shoreland property often bring with them the traditional landscaping ideas centered on the conventional suburban yard that strives for the "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:** Manicured lawns attract geese, which are grazers. In one week, an adult goose can produce 15 pounds of slippery, smelly droppings.

The combined effect of shoreland alterations by many property owners on a lake or river can destroy habitat and cause declines in fish and wildlife populations. It's ironic that many waterfront 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 plants ("weeds") and shoreline understory cover ("brush") that waterfront residents 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 water. The runoff carries pet waste, fertilizer, and other 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.

Make a new wish, fish

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

Chris Frieburger

The value of shoreline habitat

What can you do?

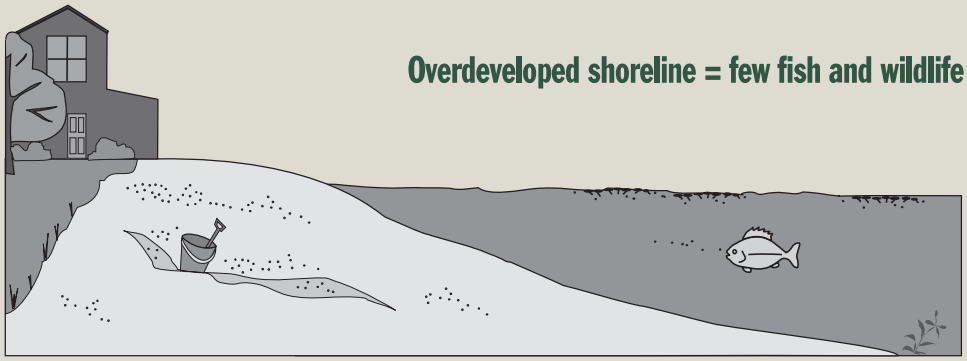
A growing number of waterfront dwellers are switching to native sedges and grasses, broadleaf groundcover plants, shrubs, subcanopy and canopy trees, instead of mowed lawns. In addition to helping wildlife, native plants require little to no maintenance, and will repel nuisance geese. That frees up more of your time to go fishing, watch wildlife, and otherwise enjoy being near the water.

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

Stephen J. Lang

Lightly developed shoreline = lots of fish and wildlife

Overdeveloped shoreline = few fish and wildlife



Amy B. Beyer

Buffer area

Nearshore 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 water, 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 area 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. A significant body of research suggests that a 35-foot shoreland buffer is inadequate for several buffer functions. The wider the buffer the more wildlife habitat it can provide, especially for less common species. On a gentle slope, having at least 35 to 50 feet of natural vegetation between the water's edge and your mowed lawn will accommodate the needs of some 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, provide increased privacy for residents, and provide nesting areas for songbirds.

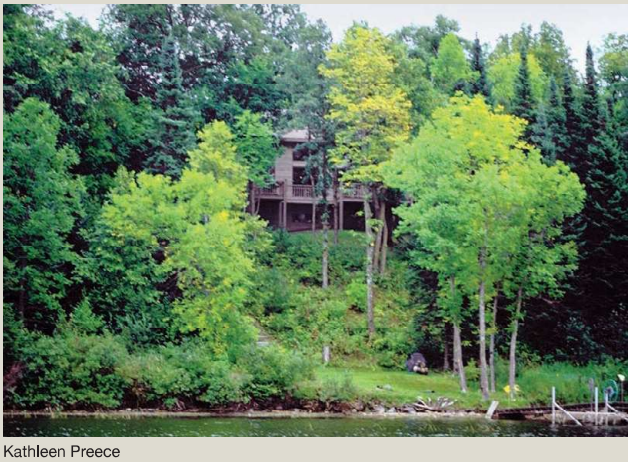
Avoid using pesticides or fertilizers in the buffer area, because harmful chemicals can leach into the water. Pesticides kill beneficial insects living in shoreline vegetation that are important foods for fish, birds, and other wildlife.

Have your lawn – and wildlife, too.

You don't need to give up your lawn and dock to create natural, wildlife-friendly shoreland. If you have 100 feet of shoreline, consider reverting at least 70 feet back to its natural condition and keeping no more than 30 feet for a view corridor, boat dock and swimming area.

Additionally, if you restore the last 35 feet or more down to the water to natural grasses and shrubs, you can still keep some lawn up near the house or cabin while helping frogs, ducks, songbirds, butterflies, and other wildlife.

Along your shoreline, try to maintain a buffer of at least a 35 to 50 feet of native grasses, wildflowers, shrubs, and trees. Healthy nearshore areas typically contain a canopy layer of trees like sugar maple, white pine, or red oak, a mid-canopy layer of smaller or younger trees such as ironwood, hazels, and willows, and a ground layer of shrubs, ferns, forbs, and grasses. Beneficial aquatic plants include bulrushes, wild rice, arrowhead, cattails, and bur reeds.



Kathleen Preece

Woody cover

What can you do?

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

Because most Wisconsin lakes and rivers are surrounded by trees and shrubs, storms and winds often blow woody "debris" (i.e., branches, limbs, and trees) into the water. This fallen wood is more than just debris, it forms critical habitat for tiny aquatic organisms that feed bluegills, turtles, crayfish and other critters. Water insects such as mayflies graze on the algae that grow on decomposing wood. Dragonfly nymphs hunt for prey among the stems and branches. Largemouth and smallmouth bass often find food, shelter, or nesting habitat among these 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 waterfront residents consider this woody cover unsightly and remove it from their shoreline. In northern Wisconsin, undeveloped lakeshores contain one log for every five feet of shoreline, while tree-falls may entirely disappear on highly developed lakes. 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 provide fish and wildlife habitat, fishing, and wildlife observation.

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

S. Nielsen

Bottom materials

Local geography and geology determine what natural materials exist on lakebeds, riverbeds and shorelines. Hard 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 bottom substrate. Yet waterfront 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 beach, waterfront owners should know that their shoreline alteration will take away fish and wildlife habitat from the entire shoreland ecosystem and will require a permit from the DNR or county zoning office.

What can you do?

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

In-Fisherman

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

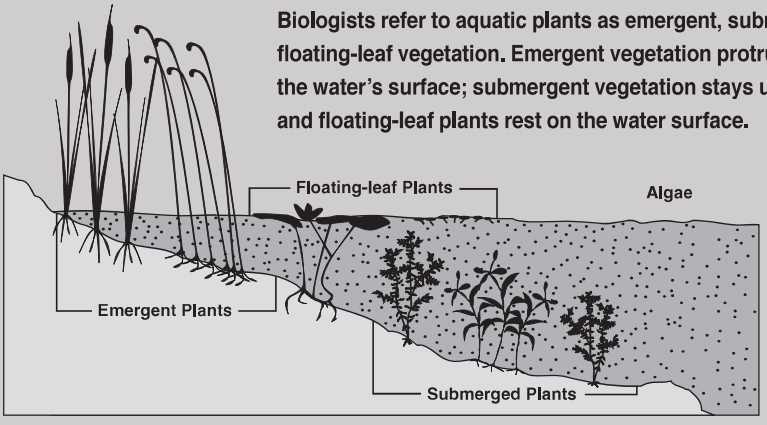
Often dismissed as "weeds" by many waterfront property owners, aquatic plants provide essential fish and wildlife habitat and help keep waters clean and healthy. Through photosynthesis, aquatic vegetation produces oxygen for the lakes and rivers. These plants also use nutrients that might otherwise fuel midsummer algae blooms. A diverse complement of aquatic plants provide food for waterfowl and are a tremendously important aspect of nearshore habitat for many fishes. Plants provide habitat for the invertebrates fish feed on. Fish such as northern pike and yellow perch lay their eggs on aquatic plants. They also 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 help trap silt carried by waves from covering bottom gravel used by bass and panfish for spawning. When bulrush beds are removed, unchecked waves begin to erode previously protected shorelines.

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

What can you do?

- Leave aquatic plants along your shoreline.
- Explore options for re-establishing aquatic plants along your shoreline.
- If you must remove plants, limit their removal to an area needed for boat access.



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.

Robert Korth

Shoreline vegetation provides critical habitat for many aquatic insects to complete their life-cycle, such as these mating damselflies.

Wetlands

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.

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

Marshes, bogs, bulrush beds, and other shoreline wetlands have been disrupted by waterfront property owners to create boat docks and swimming beaches. The loss of wetlands leads to poorer water quality, lower fish and wildlife populations, and more frequent flooding.

What can you do?

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

S. Nielsen

Healthy wetlands attract nesting and migrating waterfowl.

We're all responsible

It's up to everyone who values Wisconsin's waters to keep them healthy and productive. Many waterfront dwellers wonder what difference alterations to their single 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 waterbody. The cumulative harm from shoreline alterations by many shoreland property owners affects swimming, fishing, wildlife watching, and the overall health of our water resources.

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.

Chris Frieburger

Trees, bushes, and other native plants are often cut down to make room for houses and lawns. When multiplied around a shoreline, this destruction threatens the natural quality of Wisconsin lakes and rivers.

Protecting watersheds

A watershed is a basin that collects water from the landscape surrounding, a lake or river. A healthy lake or river depends on a healthy watershed. Logging, farming, livestock grazing, and urban development occurring in a watershed can affect water quality. Some lake and river associations map their 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 surface waters. Poor land use even several miles away can end up harming fish and wildlife habitat.

Prescription for healthy waters

More things to know:

Several state and county laws and rules protect shoreland and shallow water areas. For example, statewide, it is illegal to build most structures within 75 feet of the shore, or to place fill on lake beds.

Shoreland Management is a partnership between state and local government. Each county has its own shoreland zoning ordinance that regulates development near navigable lakes and streams, in compliance with statewide standards. Check with your local county zoning office before cutting or removing shoreland vegetation, disturbing land, or planning buildings, driveways, parking areas, sidewalks, patios or decks.

To learn which shoreline alterations are prohibited or require a permit, call your local DNR or County Zoning Office.

Healthy lakes and rivers are necessary for functioning ecosystems. 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 the watershed, land management activities are planned to minimize impacts to water quality.

A healthy lake or river does not just happen. Shoreline property owners and others living in the watershed must take steps to ensure the ecological health of lakes and rivers. Only if more waterfront owners manage their shoreline in a natural condition can fish and wildlife populations on Wisconsin lakes and rivers stay healthy and abundant.

Kathleen Preece

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

For more information

County Conservationists can help you restore shoreline wildlife habitat on your waterfront property. Give us a call, and we'll show you and your neighbors how to plan restoration projects and improve the habitat along a waterfront. Local fisheries biologists can help you if you're interested in placing trees in the water for habitat. County zoning staff will be happy to explain the rules and how property owners can design their project so that it meets personal and environmental concerns and let you know if a permit is needed.

County Conservationists wisconsinlandwater.org/files/pdf/WILandWaterDirectory.pdf

Local fisheries biologists dnr.wi.gov/topic/Fishing/people/fisheriesbiologists.html

County zoning staff wccadm.com/wcca-contacts

Healthy Lakes: Choose best practices for your property, which can include native plantings for shoreline wildlife habitat, rain gardens and more healthylakeswi.com

Fish sticks: Improving lake habitat dnr.wi.gov/topic/fishing/outreach/fishsticks.html

Other helpful publications:

The Living Shore, a 17-minute video produced by UW-Extension and University of Minnesota Extension about the importance of leaving a natural buffer zone between the lake and lake owners' dwellings and also provides information about selecting and planting shoreline plants. Available at **youtube.com/watch?v=1ZxlwPVlhm8**, or check your local library for a copy.

A Second Life for Trees in Lakes: As Useful in Water as They Were on Land. 2016. Fish use submerged trees in a variety of ways. Many species spawn on, adjacent to or under trees that provide cover that helps some species protect their incubating brood. Available at **learningstore.uwex.edu**

Protecting Our Living Shores. 2014. The authors sketch the intricate interconnection between plants, animals and water along Wisconsin shores. They discuss the grasses, flowers and trees that can be planted to restore a shore to its native state. Available at **learningstore.uwex.edu**

Water Plants: A Case for Preserving Wisconsin's Aquatic Plants is available at **uwsp.edu/cnr-ap/UWEXLakes/Documents/resources/bookstore/WaterPlants.pdf**

Impervious Surfaces: How They Impact Fish, Wildlife and Waterfront Property Values. 2013. How property owners can develop their properties with less impact on fish, wildlife and property values. Available at **learningstore.uwex.edu,** or video version at **youtube.com/watch?v=UPjPnaGNB1c&t=2s**

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The Wisconsin Department of Natural Resources acknowledges the Environmental Protection Agency's Region V (through Section 319 of the Clean Water Act) for its involvement in the partial funding of this publication. Printing of this publication was supported through a partnership between the University of Wisconsin-Stevens Point Center for Land Use Education and the State of Wisconsin Board of Commissioners of Public Lands.

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Wisconsin Department of Natural Resources
PUB-FH-428 04 revised 2018

University of Wisconsin-Extension
GWQ040

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