

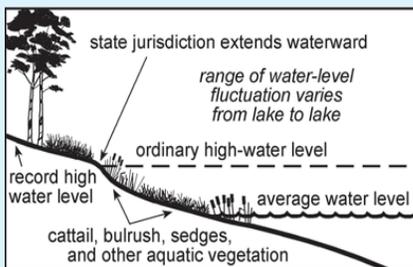
Shoreline Alterations: Riprap



Is an individual permit required?

For most projects constructed *below* the ordinary high-water level* (OHWL) of public waters, an individual Public Waters Work Permit is required by the Minnesota Department of Natural Resources (DNR).

Riprap exception: An individual permit from the DNR is not required for riprap placement if the conditions outlined in this information sheet are followed.



Shoreline cross section.

If you have questions concerning the contents of this information sheet, contact your local DNR Area Hydrologist. See contact information on reverse side.

Please note that local units of government and other agencies may require a permit for this project.

*For lakes and wetlands, the OHWL is the highest elevation that has been maintained as to leave evidence on the landscape. It is commonly that point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. For watercourses, the OHWL is the top of the bank of the channel. For reservoirs and flowages, the OHWL is the operating elevation of the normal summer pool.

What can I do to keep my shoreline from washing away?

If your shoreline is eroding, any of the following events may be destabilizing your soil, resulting in erosion: fluctuating water levels, increased wave or wake action, ice pushes, loss of natural vegetation, and human activity. Protecting your shoreline from erosion may not require you to replace natural shoreline with a high-cost, highly engineered retaining wall or riprap.

There are affordable, low-impact methods to stabilize your shoreline and still protect property values, water quality, and habitat. The Minnesota Department of Natural Resources (DNR) encourages you to consider planting native vegetation to control shoreline erosion, enhance aesthetic values, and contribute to better water quality in your lake (see Lakescaping information sheet).

Both riprap and retaining walls can reduce erosion, but they can be expensive and negatively affect lakes by creating a barrier between upland areas and the shoreline environment. Riprap should only be used where necessary and never to replace a stable, naturally vegetated shoreline. Additionally, installing riprap on a stream or river bank is a special condition that may require professional advice to ensure that the structure will stand up to the fluctuations in water levels and flowing conditions.

Natural rock riprap consists of coarse stones randomly and loosely placed along the shoreline. You should consult your DNR Area Hydrologist to determine whether your shoreline needs riprap to stop erosion. If there is a demonstrated need, such as on steep slopes, you may want to consider placing riprap or a combination of riprap and vegetation. In most cases, vegetation planted in the rocks will stabilize the riprap and improve the appearance of your shoreline. Naturalizing your shoreline is the most important contribution you can make to enhance water quality, maintain fishery resources, and provide wildlife habitat.

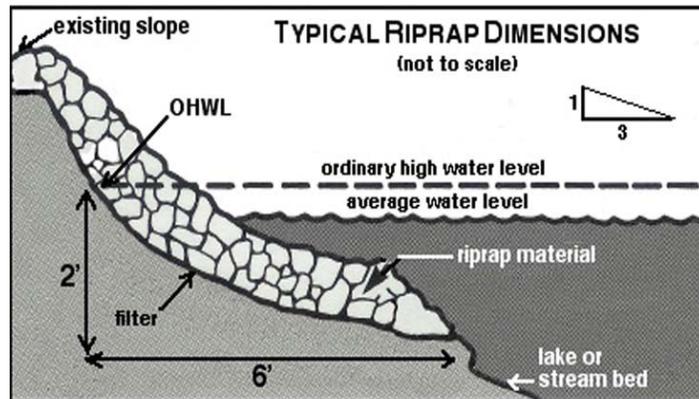


Shoreline stabilized with riprap and enhanced with a vegetative buffer.

Shoreline Alterations: Riprap

Installation of riprap is allowed only where there is a demonstrated need to stop existing erosion or to restore an eroded shoreline. An individual DNR Public Waters Work Permit is *not* required if the installation meets all of the following conditions:

- The riprap must not cover emergent aquatic vegetation, unless authorized by an aquatic plant management permit from the DNR's Division of Fisheries.
- Only natural rock (cannot average less than 6 inches or more than 30 inches in diameter) may be used that is free of debris that may cause pollution or siltation. Concrete is not allowed.
- A filter of crushed rock, gravel, or filter fabric material must be placed underneath the rock.
- The riprap must be no more than 6 feet waterward of the ordinary high-water level (OHWL; see sidebar on page 1).
- The riprap must conform to the natural alignment of shore and must not obstruct navigation or the flow of water.
- The minimum finished slope waterward of the OHWL must be no steeper than 3 to 1 (horizontal to vertical).
- The riprapped area must be no more than 200 linear feet of shoreline along lakes and wetlands or, along shorelines of streams, must be less than five times the average width of the affected watercourse.
- The site must not be a posted fish spawning area, designated trout stream, or along the shore of Lake Superior.



What are some other issues to consider?

A row of boulders at the water's edge is not considered natural rock riprap. Rows of stacked boulders function as a retaining wall, and installation would *require* an individual permit from the DNR. Retaining walls are very damaging to the near-shore environment. Retaining walls cause wave action that scours the lakebed, displacing bottom sediment and creating an extremely sterile environment. The cumulative effect of numerous wall structures on a lake reduces critical habitat for fish and wildlife resources and much of the food chain they depend on. Retaining walls require structural maintenance and are frequently damaged by ice action and undermined by wave action.

Riprap is not maintenance free and does not eliminate ice heaving, but it is easier to return the rocks to their original positions than to repair a wall. Consider planting within the riprap to add color, interest, and diversity. Live cuttings and plant plugs can be planted within riprap to provide additional slope stability and give your shoreline a more natural appearance.

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DNR Contact Information



DNR Ecological and Water Resources website and a listing of Area Hydrologists: <http://mndnr.gov/waters>

DNR Ecological and Water Resources
500 Lafayette Road, Box 32
St. Paul, MN 55155
(651) 259-5100

DNR Information Center

Twin Cities: (651) 296-6157
Minnesota toll free: 1-888-646-6367
Telecommunication device for the deaf (TDD): (651) 296-5484
TDD toll free: 1-800-657-3929

This information is available in an alternative format on request.

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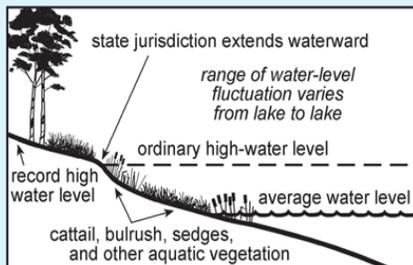
Shoreline Alterations: Ice Ridges



Is an individual permit required?

For most projects constructed *below* the ordinary high-water level* (OHWL) of public waters, an individual Public Waters Work Permit is required from the Minnesota Department of Natural Resources (DNR).

Ice ridges exception: An individual permit from the DNR is not required for the grading or removal of an ice ridge if the conditions outlined on this information sheet are followed.



Shoreline cross section

If you have questions concerning the contents of this information sheet, contact your local DNR Area Hydrologist. See contact information on reverse side.

Please note that local units of government and other agencies may require a permit for this project.

*For lakes and wetlands, the OHWL is the highest elevation that has been maintained as to leave evidence on the landscape. It is commonly that point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. For watercourses, the OHWL is the top of the bank of the channel. For reservoirs and flowages, the OHWL is the operating elevation of the normal summer pool.

What causes ice ridges and what can I do about them?

Property owners occasionally return to their cabins in the spring only to discover they are dealing with property damage caused by a phenomenon called “ice heaving” or “ice jacking”. This powerful natural force forms a feature along the shoreline known as an “ice ridge”. The result may include significant damage to retaining walls, docks and boat lifts, and sometimes even to the cabin itself.



Ice ridge formed along the shore of Shamineau Lake in Morrison County.

How do ice ridges form? Ice ridges are caused by the pushing action of a lake’s ice sheet against the shore. Cracks form in the ice because of different contraction rates at the top and bottom of the ice sheet. This is especially true in years that the ice sheet lacks an insulating snow cover. Ice cracks also develop because the edges of the ice sheet are sometimes firmly attached to the shore. When water rises in the cracks and freezes, the ice sheet expands slightly. Rising air temperatures warm the ice, leading to additional expansion, which exerts a tremendous thrust against the shore. Alternate warming and cooling of the ice sheet leads to additional pushing action, causing the ice to creep shoreward and scrape, gouge, and push soil and rock into mounds (called “ice ridges”, “ice pushes”, or “ramparts”).

What can be done about ice ridges *after* they form? Because ice ridges do provide ecological benefits (described below), the ideal reaction to the formation of an ice ridge would be to do nothing other than remove personal property from its zone of influence. However, this is often impractical. Ice ridges can impede use of the lake by a property owner or the users of public lakeshore facilities. Therefore, action may be taken to remedy the results of ice activity.

Shoreline Alterations: Ice Ridges

Lake access can be obtained by ramping over or cutting through the ice ridge. There are circumstances, however, when it may be necessary to remove or grade an ice ridge. An individual Public Waters Work Permit is *not* required from the DNR to remove or grade an ice ridge if the work meets the following conditions:

- The ice ridge resulted from ice action within the last year.
- The project is either exempt from local permits or is authorized by issuance of a local government permit.
- Not more than 200 feet of shoreline is affected.
- All ice ridge material that is composed of muck, clay, or organic sediment is deposited and stabilized at an upland site above the ordinary high-water level (OHWL; see sidebar on page 1).
- All ice ridge material that is composed of sand or gravel is removed as provided above or graded to conform to the original cross section and alignment of the lakebed, with a finished surface at or below the OHWL.
- No additional excavation or replacement fill material occurs on the site.
- All exposed areas are immediately stabilized as needed to prevent erosion and sedimentation (see Lakescaping information sheet).
- Local zoning officials, the watershed district (if applicable) and the soil and water conservation district are given at least 7 days' notice before beginning the project.

Removal or grading of an ice ridge must not disturb emergent aquatic vegetation, unless authorized by an aquatic plant management permit from the DNR's Division of Fisheries.

What can be done about ice ridges *before* they form? The simplest means of avoiding ice-related damage to shoreline property is to ensure that personal property is out of wrath's path. State and local shoreland regulations requiring setback limits not only lead to improved aesthetics but also help to minimize personal property damage from ice action and wave-induced erosion. Engineering solutions are sometimes pursued to remedy ice ridge problems, but they can be expensive and ineffective. If an engineering solution is pursued, property owners should seek the advice of a professional.

What are the benefits of ice ridges? Ice ridges are natural berms that have formed around Minnesota's lakes over thousands of years. These mounds of material provide the lake with ecological benefits by creating a barrier to nutrient loading. Nutrients collect on the landward side of the mound, producing fertile soil where plants and trees thrive. The root systems of this near-shore plant community help to protect the shore from erosion and soak up additional nutrients. Shade and habitat offered by near-shore plants benefit organisms along the shore and in the lake, thus supporting nesting and spawning fish.

Ice ridges also work to protect the shore from the lake itself. For example, a small ice ridge formed one year is followed by additional pushes in ensuing years. The ridge is fortified by jamming rocks into it. The roots of the near-shore plant community bind together the soil and rock to form natural shoreline protection.

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Shoreline Alterations: Natural Buffers and Lakescaping

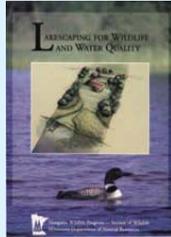


Where can I find additional information?

Book and Online Resources

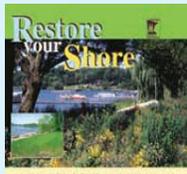
Lakescaping for Wildlife and Water Quality

(C.L. Henderson, C.J. Dindorf, F.J. Rozumalski, 1999, Department of Natural Resources*) is a book showing techniques to prevent shoreline erosion and restore wildlife habitat, wildflowers, and clean water.



Restore Your Shore

(2002, Department of Natural Resources) is a sequel to the lakescaping book. This on-line tool presents ideas to use in protecting and restoring natural shorelands. Visit the *Restore Your Shore* website at: mndnr.gov/restoreyourshore



Score Your Shore is a tool for landowners to evaluate the habitat on their developed lake lots. Visit the *Score Your Shore* website at: mndnr.gov/scoreyourshore

Information about native plants and suppliers is available through the DNR, University of Minnesota Extension Service, and Wild Ones:

- mndnr.gov/gardens/nativeplants/suppliers.html
- extension.umn.edu/distribution/horticulture/DG7447.html
- extension.umn.edu/shoreland
- wildones.org/landscap

Technical assistance is available from local watershed districts and soil and water conservation districts:

- bwsr.state.mn.us/directories

*Available through Minnesota's Bookstore: minnesotasbookstore.com

What can I do to create a more natural shoreline?

A natural shoreline is a complex ecosystem that sustains fish and wildlife and protects the entire lake. Native vegetation along the shore acts as a buffer zone, intercepting nutrients and reducing runoff, erosion, and sedimentation. Aquatic plants provide food and shelter for ducks, songbirds, and other animals while reducing problems caused by Canada geese and burrowing muskrats. Plants growing in and near the water are critical for wildlife and fish habitat and a healthy lakeshore. Tall plants like bulrush, lake sedge, and cattail can reduce the energy of wave action to minimize erosion and help maintain water quality.

Creation of a buffer zone is the essence of the lakescaping concept. A buffer zone is an unmowed strip of native vegetation that extends both lakeward and landward from the water's edge. A buffer zone that extends 25-50 feet from shore is preferable, but even 10-15 feet provides benefits. Installing a buffer zone can restore many functions critical to the health of the lake that may have been eliminated previously by sod, hard structures, or mowing. Planting grasses and flowering plants that are native to your area will diversify and enhance your shoreline and provide a seasonal show of color.



A buffer zone of vegetation provides a natural appearance to your shoreline and protects wildlife habitat, water quality, and fish.

Creating and maintaining natural buffer zones along the shore does not mean your property has to look unkempt. Buffers and upland islands of trees, shrubs, and flowers can bring natural beauty to your yard. Additionally, tall native plants typically have deep root systems. They will slow erosion, decrease ice damage, increase rain infiltration, and act as a barrier to discourage geese from walking on your shoreline property.

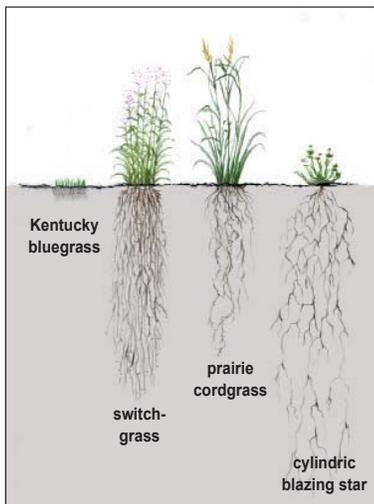
Your shoreline is part of a larger community and ecosystem. Individual choices by many have cumulative impacts on a lake and its ecosystem. Your actions can restore or degrade the quality of the ecosystem. Restoring your lakeshore to a more natural condition is important, even if your neighbors are not restoring theirs, because it can help wildlife habitat, water quality, and fish.

Shoreline Alterations: Natural Buffers and Lakescaping

Lakescaping and Erosion Control

Vegetation is extremely important for controlling erosion. Native trees, shrubs, and grasses dissipate the energy of raindrops, slow the water, and allow it to infiltrate the soil. The DNR and your county soil and water conservation district can help you select the right plants for your project. Listed below are some other erosion-control recommendations.

- Prevent erosion. Preventing erosion by maintaining native vegetation is less costly than fixing an eroded area. Think “root systems.” Native plants typically have greater rooting depth and root density. For example, the roots of the little bluestem (*Schizachyrium scoparium*) are about 2-3 feet long and have a great capacity to hold soil. In contrast, the roots of lawn grass are only 2-3 inches long.
- Identify and address the cause of erosion. Causes may include excessive foot traffic on fragile soils, vegetation clearing (both upland and in the lake), yard waste on the bank that kills vegetation, wave action from boat traffic and prevailing winds (especially when water is high), ice heaves, overland runoff down slopes, stairways that channel water, and runoff from impervious surfaces.
- Choose erosion-control methods that are “light” on the landscape. For example, use biodegradable erosion control materials that contain biodegradable netting, not photodegradable plastic netting which can trap wildlife. If wave action is eroding the bottom (toe) of the bank, consider reinforcing only the toe of the bank and planting native vegetation on the remainder.
- Plant aquatic vegetation. In-lake vegetation can help prevent erosion. Native aquatic vegetation disperses wave energy, anchors soil, limits ice heaves, and provides excellent fish and wildlife habitat.



The picture contrasts the shallow (2-3 inches) roots of Kentucky bluegrass to the deep (3-5 feet) and dense roots of native grasses. The root systems of native grasses may be effective for preventing erosion.



Contrast the eroded shoreline lacking vegetation (foreground) with the well-vegetated, uneroded shoreline in the distance.

Lakescaping Design Factors to Consider

Look around your lake and note how nature works to minimize erosion on healthy, more natural shorelines. What types of wildflowers, grasses, trees, and shrubs do you see in your area? Then determine how much of your lakeshore to naturalize, keeping in mind how much you need for lake access, swimming areas, docks, and dock storage areas. Talk to your neighbors, share ideas, and coordinate efforts to increase habitat and natural shorelines. Natural shorelines are gaining acceptance as people understand the important role shorelines play in protecting their lake and a diverse ecosystem. Many lake associations are developing demonstration projects on area lakes.

Steps for Creating a Buffer Zone

Describe your shoreline area, including the following elements:

- Natural features, including existing vegetation and woody debris, fish and wildlife use, and opportunities for links to neighboring habitat;
 - Removal of structures or construction debris, such as retaining walls or concrete, respectively;
 - Location of the house, views, trees, pathways or stairways, docks, and swimming areas;
 - Sun, including amount and number of hours of direct sunlight;
 - Topography, including ice ridges and slopes (facing directions and steepness);
 - Soil characteristics, including type, drainage, texture, and fertility;
 - Water, such as natural seeps, wet areas during high water, drainage, wave action, and runoff; and
 - Fetch (miles of open water/waves), prevailing winds and ice push.
- These elements will help determine what types of erosion control measures (biologs, brush bundles, erosion control fabric) might be needed in order to get vegetation established on the site.

Shoreline Alterations: Natural Buffers and Lakescaping

Think about your preferences. How will the site be used (viewing, swimming, boating, fishing)? What kinds of native trees, shrubs, flowers, and grasses do you like? Consider their color, height, and appearances at different times of the year. The type of vegetation you select may affect the shoreline's ability to withstand erosion.

Develop a design and management plan based on your lakeshore and preferences. Consult references such as the *Lakescaping for Wildlife and Water Quality* book or the on-line program *Restore Your Shore* (see front page) for assistance on designing your restoration project. You can also look at the DNR Fisheries lake surveys for information. Visit nearby natural areas or other shorelines to get ideas. Obtain any necessary permits from your local unit of government or the DNR. Be realistic about the size of your shoreline project. Start small, if necessary, and add to it in phases.



Planting

Identify the areas for planting native vegetation and prepare the site for planting. It may be necessary to control non-native, invasive species and turf grass first. Upland plants should be spaced from 1 foot to 3 feet apart; trees and shrubs should be 6 feet to 14 feet apart. If you decide to use an erosion-control blanket, the supplier can help you determine which type to use. After installing the blanket, simply cut a hole in it for each plant. As an alternative to the blanket, mulch could be used to control erosion, retain moisture, and suppress weeds.

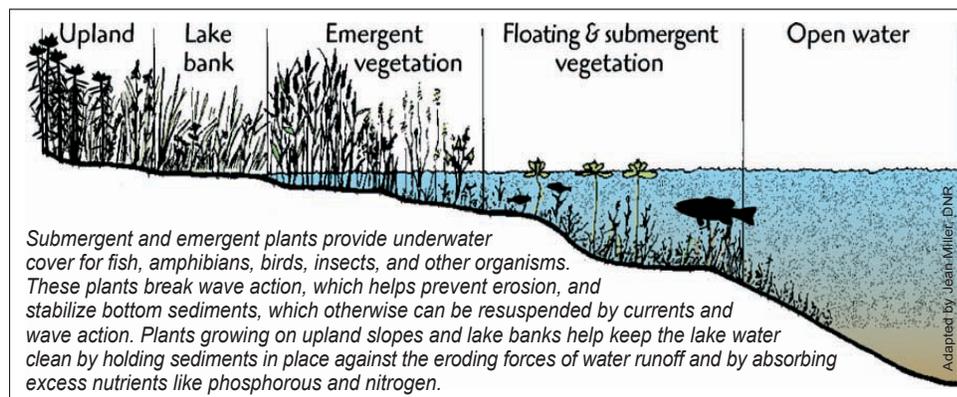


(TOP) Lakefront of home on Lake Marion, Dakota County. (BOTTOM) Closer view of the same lakefront after revegetation.

If you add aquatic plants, a temporary barrier in the water may be needed to protect new plants until they are established. For guidance on aquatic plantings, please refer to the *Restore Your Shore* on-line program or your local Soil and Water Conservation District.

Maintenance

Your new plantings require some maintenance in the first few years as they become established. Provide from 1 inch to 2 inches of water per week the first season and during dry periods in the second season. Weeding during the first few years helps the plants become established and gives them an edge. Replace vegetation that did not survive by replanting species that were most successful at your site. By the third year, watering is no longer necessary, but you should continue to remove weeds.



Shoreline Alterations: Natural Buffers and Lakescaping



(ABOVE) In 2000, start of restoration along Lake Phalen in St. Paul. (RIGHT) View of the same site in 2002.



photos by Bill Bartodziej

Permit Requirements

For most projects constructed *below* the ordinary high-water level* (OHWL) of public waters as determined by the DNR, an individual Public Waters Work Permit is required, but an individual permit is not required for planting buffer zones. Collecting, transplanting, spraying, or removing aquatic vegetation below the OHWL, however, may require a permit from the DNR Fisheries Aquatic Plant Management (APM) Program. Please go to: mndnr.gov/shorelandmgmt/apg/regulations.html for more information on APM Permits.

If you have questions concerning the contents of this information sheet, contact your local DNR Area Hydrologist. Other governmental units (federal, state, city, county, township, and watershed authority) may require a permit for that portion of the project within their jurisdiction, which usually involves work above the OHWL. It is advisable to contact them.

*For lakes and wetlands, the OHWL is the highest elevation that has been maintained as to leave evidence on the landscape. It is commonly that point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. For watercourses, the OHWL is the top of the bank of the channel. For reservoirs and flowages, the OHWL is the operating elevation of the normal summer pool.

Summary

Maintaining a healthy lake is far less costly than trying to fix a degraded one. If you are fortunate enough to have a natural shoreline, maintain or enhance it as a buffer zone and minimize erosion on the areas used for access or recreation. If your property lacks natural areas, plant native vegetation or let areas grow naturally. You will be surprised at the aesthetic appeal, as well as the energy and time you save, of helping your lake help itself.



DNR Contact Information



DNR Ecological and Water Resources website and a listing of Area Hydrologists: mndnr.gov/contact/ewr.html
DNR Ecological and Water Resources
500 Lafayette Road, Box 32
St. Paul, MN 55155
(651) 259-5100

DNR Shoreland Habitat Coordinator in St. Paul:
500 Lafayette Road, Box 12, St. Paul, MN 55155, (651) 259-5212

DNR Information Center

Twin Cities: (651) 296-6157
Minnesota toll free: 1-888-646-6367
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This information is available in an alternative format on request.

Docks and Access in Public Waters



Do I need a permit for my dock?*

No permit is needed to install, construct, or reconstruct your dock on shoreline property you own if you comply with the following:

- A dock is a narrow platform or structure extending toward the water from the shoreline. A dock may provide access to moored watercraft or deeper water for swimming, fishing, and other recreation.
- The structure, other than a watercraft lift or watercraft canopy, is **not more than 8 feet wide** and is not combined with other similar structures so as to create a larger structure.
- The dock is no longer than needed to achieve its intended use, including reaching navigable water depth.
- The structure is not a hazard to navigation, health, or safety.
- The structure will allow the free flow of water beneath it.
- The structure is not used or intended as a marina.
- The structure is consistent with the guidelines of the local unit of government.
- Docks placed on rock-filled cribs are located only on waters where the bed is predominantly bedrock.

Restrictions on docks and other structures

You may not place a dock or other structure in public waters if the structure:

- obstructs navigation or creates a hazard;
- is detrimental to fish or wildlife habitat or is placed in a posted fish spawning area;
- is intended to be used for human habitation;
- includes walls, a roof, or sewage facilities; or
- is located on property you do not own or have rights to use.

If you have questions concerning the contents of this brochure, contact your DNR Area Hydrologist. See contact information on reverse side.

*Based on Minnesota Rules, Chapter 6115.0210 and 6115.0211.

What you should know about docks and other water access structures

Docks and watercraft lifts are commonly used access structures on Minnesota lakes and rivers. If you own waterfront property, a temporary structure that provides access to a lake or river is preferred to a permanent structure. Permanent structures are more likely to sustain ice damage, and a snow-covered structure over the ice poses a hazard to recreational vehicle users.



The blue box to the left lists installation guidelines for docks and access structures like boat lifts. These guidelines are intended to minimize impacts on water resources and shoreline habitat. If you follow these guidelines, no permit is needed from the Department of Natural Resources (DNR). Local units of government may have additional dock rules related to public safety and other local issues and should be contacted.

A shoreline owner may request a permit to install a dock wider than 8 feet. The permit applicant must show a specific need and show that the wider dock represents the minimal impact solution to that need. Docks serving single-family homes or residential planned unit developments generally will not need a dock wider than 8 feet. Public docks and mooring structures that are otherwise not serving as a marina may need to be a wider structure and will be reviewed individually. Docks that have no permit and that exceed the 8-foot-wide limit are subject to enforcement action, including a citation, an order to remove the dock, and fines for both the landowner and the dock installer.

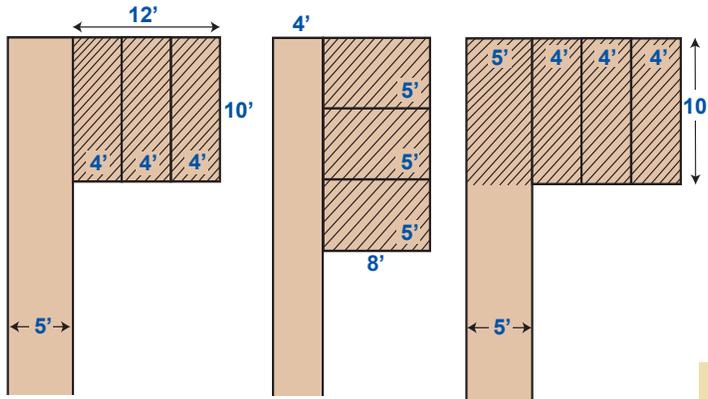
Design and locate your dock and boat lift to avoid interfering with your neighbor's use of the water. Docks and boat lifts should be placed so that mooring and maneuvering of watercraft can normally be confined within the property lines if they were extended into the water.

General Permit 2008-0401

A general permit was issued in 2008 to allow a modest platform at the lake end of a dock under certain conditions. This general permit allows a single, temporary platform up to 120 square feet measured separately from the access dock, or 170 square feet including the area of the adjacent access dock, if the following conditions exist: the access dock must be 5 feet or less in width and the dock must be on a lake with a shoreland classification of General Development or Recreational Development. See typical dock configurations on the next page. Refer to General Permit 2008-0401 at: http://www.dnr.state.mn.us/waters/watermgmt_section/pwpermits/docks.html for more details.

Docks and Access in Public Waters

Authorized by General Permit 2008-0401



Platform area (not including walkway) up to 120 square feet.

Platform area (including walkway) up to 170 square feet.

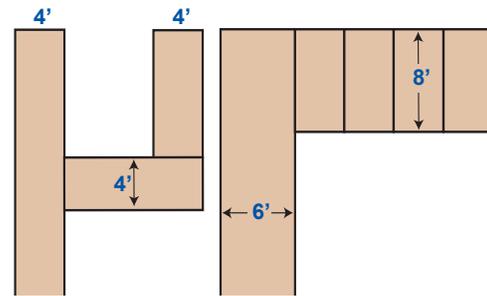
Purpose of the dock rules

Intensive shoreland development causes deterioration of a lake's ecosystem. Dock installations and their associated uses are factors in this deterioration. Studies of lakes in the Midwest show that docks and boat lifts may shade out important aquatic plants and eliminate critical habitat where fish spawn, feed, grow, and find shelter from predators. Shoreline views may also suffer when large dock systems are installed. Also, there is a growing concern about the private use of the water surface if docks and associated structures extend too far, cover too much surface area, or span the entire owned frontage. The proliferation of dock configurations and dimensions is a concern to the DNR, lake associations, anglers, lakehome owners, and others. Finding the appropriate balance between reasonable access and resource protection requires collaboration by all interests.

Another issue of concern is any attempt to control access to a lake bed or water surface. Even when land ownership extends into the lake bed, all who own land abutting the water or gain legal access have the right to use the entire surface of the water. For this reason, a dock configuration should never close off part of the lake to other users.

If the dock is designed and used for access to navigable water depth, a DNR permit will rarely be needed. A dock does not need a permit if it is no more than 8 feet wide, is designed to simply meet the need of reaching navigable depths, and follows the other guidelines on the front of this brochure.

No Permit Required



No area of the dock is wider than 8 feet.

If buying, selling or moving a dock from one body of water to another, owners should make sure all zebra mussels, vegetation or other invasive species are removed and let dry for a minimum of 3 weeks before placing in another water. When using a business to place or remove your dock, make sure that they have a valid Lake Service Provider permit and the staff have an aquatic invasive species training certificate. For more information see: mndnr.gov/invasives



The removal or destruction of aquatic plants is a regulated activity under the DNR Aquatic Plant Management Program. If your shoreline plans include removal of aquatic vegetation, please contact a regional DNR Fisheries office because a permit may be required. Removal of native plants may provide open space for invasive species to take hold.

DNR Contact Information



DNR Ecological and Water Resources website and a listing of Area Hydrologists: mndnr.gov/contact/ewr.html
DNR Ecological and Water Resources
500 Lafayette Road, Box 32
St. Paul, MN 55155
(651) 259-5100

For information about aquatic plant management permits: mndnr.gov/eco/apm

DNR Information Center

Twin Cities: (651) 296-6157
Minnesota toll free: 1-888-646-6367
Telecommunication device for the deaf (TDD): (651) 296-5484
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This information is available in an alternative format on request.

Shoreline Alterations: Beach Blanket



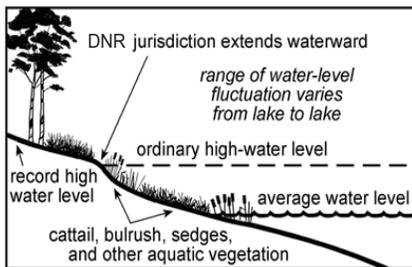
Will a sand beach work on my shoreline?

IS AN INDIVIDUAL PERMIT REQUIRED?

For most projects constructed *below* the ordinary high-water level* (OHWL) of public waters as determined by the Minnesota Department of Natural Resources (DNR), an individual permit is required from the DNR.

Beach blanket exception: An individual permit from the DNR is not required for beach sand or gravel placement if the conditions outlined in this information sheet are followed.

If you have questions concerning the contents of this information sheet, contact your local DNR Area Hydrologist. See contact information on reverse side.



Shoreline cross section

ARE OTHER PERMITS REQUIRED?

Other governmental units (federal, state, city, county, township, and watershed authority) may require a permit for that portion of the project within their jurisdiction, which usually involves work above the OHWL. It is advisable to contact them.

*For lakes and wetlands, the OHWL is the highest elevation that has been maintained as to leave evidence on the landscape. It is commonly that point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. For watercourses, the OHWL is the top of the bank of the channel. For reservoirs and flowages, the OHWL is the operating elevation of the normal summer pool.

One goal of DNR Ecological and Waters Resources is to limit unnecessary and potentially damaging alterations to shorelines. Specifically, use of beach sand and other types of fill is limited in order to prevent damage to fish spawning areas, aquatic habitat, and water quality of Minnesota's lakes.

Although natural sand beaches can be found on many Minnesota lakeshores, landowners often attempt to create them on shores where they do not naturally occur (i.e., a muddy-bottom lake). If you are considering adding a beach blanket, you should know a few important things before investing your money.

- Beach material that erodes into the lake may coat aquatic plant beds and fish spawning grounds, degrading fish and wildlife habitat and damaging the water quality of your lake.
- Beach material must be clean and washed free of fine particles and must be of the appropriate grain size (coarse sand or larger) to stay in place under wave action. Placed material that migrates from your site may constitute a violation of water quality standards. To further minimize the risk of your beach migrating away from the site, maintain aquatic vegetation on both sides of your beach, like in the diagram on page two.
- The lakebed must be capable of holding beach material in place. If the lake bottom is soft, the sand or gravel will only sink into the muck and disappear.
- You are only allowed to install sand or gravel twice in the same location without a permit.
- Vegetation will constantly emerge through the beach material, and additional plant control will be needed on the beach. If you plan to weed by hand or apply herbicide, an aquatic plant management permit may be required from the DNR Division of Fisheries.
- Beach blankets may not be placed over emergent vegetation such as bulrush or cattails unless you obtain a permit from the Division of Fisheries.

Keep in mind that you are *not* allowed to install any plant barrier or liner (e.g., filter fabric or plastic) underneath your constructed beach. If owning lakeshore property with a sandy beach is a high priority for you, look for lakeshore property where sandy beaches occur naturally before you make that important purchase.



Beach blanket at shoreline.

Shoreline Alterations: Beach Blanket

If you have considered all of the conditions above and you think adding beach sand or gravel will work for your shoreline, you may install a beach blanket without an individual permit if the installation meets all of the following conditions:

- The sand or gravel layer may be up to 6 inches thick; up to 50 feet wide along the shoreline or one-half the width of the lot, whichever is less; and up to 10 feet waterward of the ordinary high-water level (OHWL; see sidebar on page 1).
- The beach blanket does not cover emergent aquatic vegetation, unless authorized by an aquatic plant management permit (contact your local DNR Fisheries office).
- The sand or gravel is clean and washed so that it is free of fine particles.
- Local watershed district and local zoning officials are given at least 7 days' notice by the landowner.
- No plant barrier or liner (i.e., filter fabric or plastic) is installed underneath your beach sand.

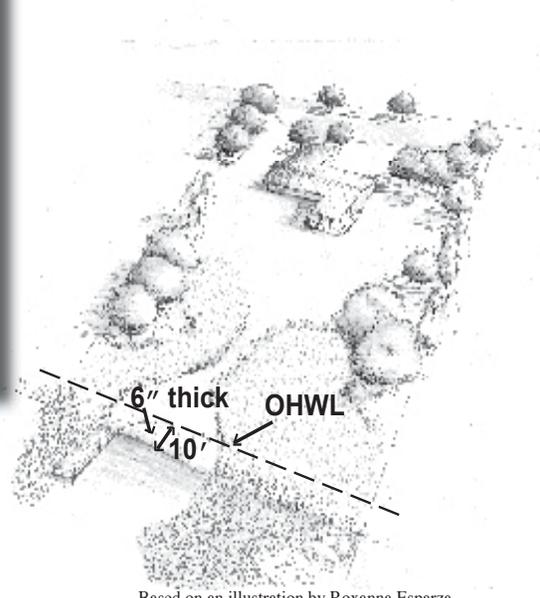
Installation of sand and gravel may be repeated *once* at the same location but may not exceed the amount of sand and dimensions of the original sand blanket.

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Another example of a beach blanket is pictured above.

The plan view of a diagram (right) shows dimensions of a beach blanket surrounded by vegetation with a path to the sand area.



Based on an illustration by Roxanna Esparza.

DNR Contact Information



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<http://mndnr.gov/shorelandmgmt/apg/regulations.html>

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Water Laws in Minnesota



Questions and Answers about Minnesota Water Laws

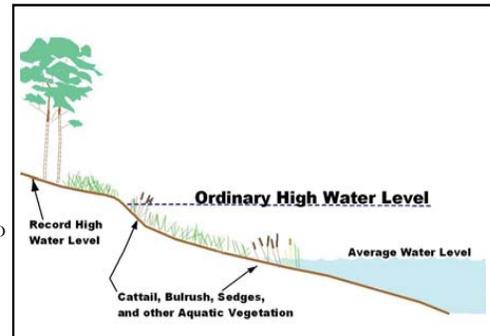
Basic Water Laws

Who owns the bed of a lake, marsh, or watercourse?

When a waterbasin or watercourse is *navigable* under the federal test, the State of Minnesota owns the bed below the natural ordinary low water level [see Minnesota Statute 84-032; *Lamprey v. State*, 52 Minn. 1981, 53 N.W. 1139 (1983) and *United States v. Holt State Bank*, 270 U.S. 49 (1926)]. The federal test used for navigability is “when they are used, or are susceptible of being used, in their natural and ordinary condition, as highways for commerce, over which trade or travel are or may be conducted.” [See *State v. Longyear Holding Co.*, 224 Minn. 451, 29 N.W. 2d 657 (1947).] If a court has found that a lake is non-navigable and meandered, the shoreland owners own the bed of the lake in severalty. [See *Schmidt v. Marsobel*, 211 Minn. 543, 2d 121 (1942).] If a stream is non-navigable but has been meandered, the shoreland owners own to the thread (centerline) of the stream. If a lake or stream is non-navigable and not meandered, ownership of the bed is as indicated on individual property deeds.

What is the ordinary high water level?

The ordinary high water level is an elevation that marks a regulatory boundary of a Public Water lake, wetland, or stream. It is the highest level at which the water has remained long enough to leave its mark upon the landscape. [See *Lake Minnetonka Improvement*, 56 Minn. 513, 58 N.W. 295 (1894), and Minnesota Statutes, Section 103G.005, subd. 14.] Generally, for basins, it is the point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. On streams and rivers, it is the top of the bank of the channel.



What are riparian rights?

Riparian rights are property rights arising from owning property abutting water. They include the right to wharf out to a navigable depth; to take water for domestic and agricultural purposes; to use land added by accretion or exposed by reliction; to take ice; to fish, boat, hunt, swim; and to such other uses as water bodies are normally put [see *Sanborn v. People's Ice Co.*, 82 Minn. 43, 84 N.W. 641 (1900) and *Lamprey v. State*, 52 Minn. 181, 53 N.W. 1139 (1893)]. The riparian owner has the right to use the water over its entire surface [see *Johnson v. Seifert*, 257 Minn. 159, 100 N.W. 2d 689 (1960)].

What are riparian duties?

It is the duty of the riparian owners to exercise their rights reasonably, so as not to unreasonably harm the ecosystem nor interfere with the riparian rights of others [see *Petraborg v. Zontelli*, 217 Minn. 536, 15 N.W. 2d 174 (1944)]. They cannot dike off and drain, or fence off, their part of the waterbody [see *Johnson v. Seifert*, 257 Minn. 159, 100 N.W. 2d 689 (1960)]. It is a public nuisance and a misdemeanor to “interfere with, obstruct, or render dangerous for passage waters used by the public” [see Public Nuisance Law, Minnesota Statutes 609.74].

What are public rights?

Where the public is a riparian landowner, such as where there is a public access site, the public has riparian rights. [See *Flynn v. Beisel*, 257 Minn. 531, 102 N.W. 2d 284 (1960).]

What is considered trespassing when the public seeks access to a water body?

The belief that the state owns a strip of land around all Minnesota lakes for public use is false. Riparian property (property abutting a lake, river, or wetland) is either privately or publicly owned. The general public can access water bodies or watercourses via public property, but not through private property. Individuals entering private property without permission from the landowner are trespassing and may be prosecuted under the state trespass laws. A person who has legally gained access to a water body may use its entire surface for recreation, such as boating, swimming, or fishing; and any “incidental use” of the bed or bottom, such as anchoring a boat or decoys, wading to fish or swim, and poling a boat, is allowed.

Water Laws in Minnesota

Regulation and Water Use

What are waters of the state?

Waters of the state are *any* surface waters or underground waters, except those surface waters that are not confined but are spread and diffused over the land [see Minnesota Statutes, Section 103G.005, subd. 17]. This includes *all* lakes, ponds, wetlands, rivers, streams, ditches, springs, and waters from underground aquifers regardless of their size or location.

When is a DNR permit needed to appropriate or use water?

A water appropriation permit from the Minnesota Department of Natural Resources (DNR) is needed to appropriate or use waters of the state for any use that exceeds 10,000 gallons in any one day or 1,000,000 gallons in a year except for domestic use serving less than 25 persons. [See Minnesota Statutes, Section 103A.201 and Section 103G.271, subd. 1, and Minnesota Rules, Part 6115.0600.]

What priorities are set for water use?

If there is not enough water for everyone, Minnesota law sets general priorities for which users can appropriate waters of the state. [See Minnesota Statutes, Section 103G.261.] These priorities, from highest priority to lowest priority, are as follows:

1. Domestic water supplies and power producers who have DNR-approved contingency plans
2. Uses of water consuming less than 10,000 gallons per day
3. Agricultural irrigation and processing of agricultural products (consuming in excess of 10,000 gallons per day)
4. Power production, without approved contingency plans
5. Other uses that consume over 10,000 gallons per day
6. Nonessential uses of water



What are the limitations on the use of ground water?

DNR is responsible for protecting ground water supplies and has authority to establish water appropriation limits through its water use permitting program. Applications for water appropriation proposals must show that the use will be sustainable now and into the future; and that the proposed use will not harm ecosystems, degrade water quality, or reduce water levels beyond the reach of public water supply and private domestic wells. [See Minnesota Statutes, Section 103G.287.]

What are the limitations on the use of surface water?

Minnesota law sets water use limits for waterbasins and watercourses and discourages taking water from waterbasins of less than 500 acres. [See Minnesota Statutes, Section 103G.285 and 103G.261.] On any waterbasin, the total of all withdrawals cannot be more than one-half acre-foot per acre per year (6 inches of water taken off the surface of the waterbasin). The DNR also establishes minimum *protection elevations* for waterbasins and *protected flows* for watercourses. Surface water withdrawals within a watershed may be suspended when water levels fall below minimum protection levels at indicator sites. *[See Minnesota Statutes, Section 103G.285, subs. 2 and 3.]

Regulation of Public Waters and Public Waters Wetlands

What are public waters and public waters wetlands?

Public waters are all waterbasins, wetlands, and watercourses that meet the criteria set forth in Minnesota Statutes, Section 103G.005, subd. 15, and are designated on the DNR's public waters inventory maps. *Public waters wetlands* include all type 3, 4, and 5 wetlands (as defined in U.S. Fish and Wildlife Service Circular No. 39, 1971 ed.) that, at the time of designation, were 10 or more acres in rural areas and 2½ or more acres within cities and are designated on the DNR's public waters inventory. [See Minnesota Statutes, Section 103G.005, subd. 18.]

Water Laws in Minnesota

When is a DNR permit needed?

A DNR *public waters work permit* may be needed to do any work that will change or diminish the course, current, or cross section of any lake, wetland, or watercourse that is designated as a public water or *public waters wetland* on the DNR's public waters inventory maps. Any work done below the ordinary high water level of public waters or public waters wetlands may require a permit. Examples of such work include draining; filling; dredging; channelizing; constructing dams, harbors, or permanent offshore structures; and placement of bridges and culverts. [See Minnesota Statutes, Section 103G.245, subd. 1, and Minnesota Rules, Part 6115.0150.] Certain projects are exempt from needing a permit provided they are done in accordance with conditions spelled out in Minnesota Rule (Part 6115).

What is the Public Waters Inventory (PWI)?

This is a map prepared by the DNR showing all public waters and public waters wetlands for each county in the State. [See Minnesota Statutes, Section 103G.201.] These maps are available for viewing on the DNR web site (mndnr.gov/waters/watermgmt_section/pwi/maps.html). The DNR is in the process of converting the original paper and scanned PWI maps to more accurate GIS-based maps. Until the GIS-based maps are completed for every county, the paper maps will continue to be available from the Minnesota Bookstore located at 660 Olive Street, St. Paul, MN 55155, telephone 651-297-3000 (metro area) or 1-800-657-3757 (statewide). The GIS-based maps available on the website should be used where available as they more accurately depict the basin and stream locations and they contain corrections to errors discovered on the original paper maps.

Is the state's regulation of public waters and public waters wetlands constitutional?

The Minnesota Supreme Court has held that DNR's inventory of public waters and public waters wetlands, and the DNR's regulation of work that changes the course, current, or cross section of public waters and public water wetlands are clearly constitutional. [See *State v. Kulwar*, 266 Minn. 408, 418, 123 N.W. 2d 699, 706-707 (1963); *State v. Olsen*, 275 N.W. 2d 585 (Minn. 1979); and Minnesota Supreme Court file number C5-86-332, decided on December 24, 1987.]

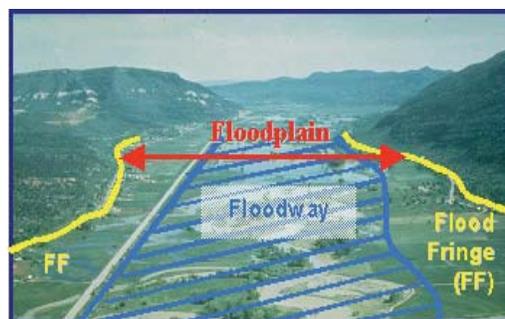
Regulation of Lands Adjoining Public Waters

What types of Land Use Regulations do we have in Minnesota?

Land use regulations guide development and land management activity on lands adjacent to public waters through city and county zoning ordinances. These regulations seek the wise development of shoreland areas to preserve their economic and natural environmental values and to protect surface water quality. Most of Minnesota's water-related land use regulations are authorized in Minnesota Statutes, Chapter 103F. These land use regulations generally fall into two categories: floodplain and shoreland. Floodplain regulations work to minimize damage to property and human life. Shoreland regulations work to maintain the ecological and hydrological services of shoreland areas, and to protect the wild, scenic and recreational values of designated river segments. Minnesota's floodplain regulations address the Federal Emergency Management Agency (FEMA) floodplain and flood insurance requirements, as well as Minnesota standards. Minnesota has a variety of shoreland programs covering different bodies of water, including select rivers and river segments. The DNR establishes the minimum statewide standards and criteria for all floodplain and shoreland programs, and local governments implement the programs through land use ordinances. Always check with your local zoning authority for specific ordinance requirements.

What is floodplain zoning?

Floodplain zoning ordinances apply to the land around lakes, rivers, and streams inundated by the 100-year flood (the flood having a 1-percent chance of being equaled or exceeded in any single year). This land is known as the floodplain and is divided into two zones. Local ordinances specify the uses and construction activity permitted in each zone. The floodway is that part of the floodplain where floodwaters are likely to be deepest and fastest. This area needs to be kept free of obstructions to allow floodwaters to move downstream. The area of the floodplain outside the floodway is called the flood fringe. Development is generally allowed in the flood fringe, but it must be placed on fill or floodproofed high enough to keep it dry during a 100-year flood. The emphasis of the program is to minimize flood damage by promoting nonstructural remedies instead of construction of costly levees, dikes, or dams. [See Minnesota Statutes, Section 103F.101-103F.155, and Minnesota Rules, Parts 6120.5000-6120.6200.]



Water Laws in Minnesota

How do the shoreland regulations apply to local zoning?



Minnesota's shoreland programs originated in the 1970s with public concern over poor shoreland development in general and with specific high valued rivers in particular. All programs described here are implemented through local government zoning ordinances. Zoning provisions typically include minimum lot size and width, structure height, structure and septic system setbacks from the water, bluff and vegetation protections, stormwater management, and impervious surface limits. Following is a brief description of the shoreland management regulations in Minnesota.

Shorelands

This regulatory program covers land adjacent to most public waters in Minnesota. Shoreland protection is extended to land within 1,000 feet of the ordinary high water level of a lake, pond, or flowage, and within 300 feet of a river or stream or to the landward extent of a designated floodplain on a river or stream, if it is wider than 300 feet. Waterbodies vary greatly in their size, depth, use and type of habit and are classified to reflect these characteristics. Minimum lot size and width and structure and septic system setbacks vary depending on the waterbody classification. These dimensional standards are intended to manage development impacts appropriate to the waterbody classification. Eighty-five Minnesota counties and about 160 cities have shoreland ordinances. Many of these communities are also covered by other program regulations (description of these other programs follows). In some cases performance standards for the different programs may overlap and conflict. In these situations, the stricter standard applies. [See Minnesota Statutes, Section 103F.201-103F.227, and Minnesota Rules, Parts 6120.2500-6120.3900.]

Wild and Scenic Rivers

This program applies to all or portions of seven rivers including the St. Croix (the only federal-designated river), the Mississippi, the Kettle, the Minnesota, the Rum, the Cannon, and the North Fork of the Crow. The boundary generally follows a land survey line or road and includes areas that are visible from the river. Locally administered ordinance standards vary for each river and are based on the management plan specific to each river and river classification. Segments of these rivers are classified as wild, scenic, or recreational. Note that the river management plans have been promulgated into Minnesota State Rules pertaining to each river. [See Minnesota Statutes, Section 103F.301-103F.345, and Minnesota Rules, Parts 6105.0010-6105.1700.]

Mississippi River Critical Area

The Mississippi River Critical Area includes designated land adjacent to the 72-mile section of the Mississippi River that runs through the 7-county metro area. This area was originally designated in 1976, and the designation was extended in 1979 by Executive Order 79-19 and made permanent by resolution of the Metropolitan Council in Minnesota Statute 116G. The Critical Area boundary coincides with the boundary of the Mississippi National River and Recreation Area, a unit of the National Park Service. All cities containing land within the boundary are required to develop a management plan and adopt zoning ordinances that implement the plan. The DNR and the Metropolitan Council review and approve community land use plans and ordinances. [See Minnesota Statutes, Section 116G.15 and Minnesota Rules, Parts 4410.8100-4410.9910.]

Other River-Related Land Use Regulations

A number of river segments are protected through local management plans and regulations that are jointly administered by local governments. These include:

Upper Mississippi River Headwaters: The upper 400 miles of the Mississippi River and seven headwater lakes are covered by land use regulations developed by the Mississippi Headwaters Board (MHB) in its management plan. All of the eight counties from the headwaters to Little Falls have adopted zoning ordinances that implement land use standards of the MHB. The district includes land within 500 feet of the river for the scenic portion of the river and 1000 feet of the river for the wild portion of the river. Land use applications are reviewed and approved by the county and then sent to the MHB for final review and certification. [See Minnesota Statutes, Section 103F.361-103F.377 and <http://www.mississippiheadwaters.org/>]

Minnesota River: Shoreland along the Minnesota River between the City of Franklin in Renville County and the City of Le Sueur in Le Sueur County is protected by the zoning ordinances of Renville, Redwood, Brown, Nicollet, Blue Earth, and Le Sueur counties. These ordinances implement the policies developed in the 1981 Project Riverbend Comprehensive Plan. [See Minnesota Statutes, Section 103F.381-103F.393.]

DNR Contact Information



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