

# Aitkin County Shoreland Homeowner's Guide to Lake Stewardship

2007



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# Shoreland Homeowner's Guide to Lake Stewardship

**Congratulations on owning shoreland property in Aitkin County. Whether you are a full time or seasonal resident, living by the water provides a special opportunity to participate in water-related recreation, such as boating, swimming, or fishing; to observe wildlife in its natural habitat; or simply enjoy the beauty of watching a sunset over the lake and experience the serenity and sense of well-being experienced around water and nature.**

When you own shoreland you do have certain riparian (near the water) rights and privileges, such as the right to put a dock out to a navigable depth; to take water for domestic and agricultural purposes; and to fish, boat, hunt and swim. But, these rights must be exercised in compliance with the rules and regulations of Aitkin County and the State of Minnesota. For example, there are limits on the size of docks; regulations about construction and disturbing land in the shoreland zone (within 1,000 feet of a lake or 300 feet from a river); removal of aquatic plants; placement of wells; and maintenance of septic systems. These rules are in place for the benefit of your health and safety and the health of the adjacent lake or stream.

Along with those rights also comes the responsibility to protect, improve, and enhance the quality of the water for your enjoyment and that of future generations to come, keeping in mind that the water itself is a public resource for everyone to enjoy. **That's called stewardship: the individual responsibility to manage one's life and property with regard for the rights of others.** The lake is a living ecosystem and part of the larger ecosystem of all living plants and animals to which we also belong.

This Guide will provide you with basic information on good lake stewardship, which if practiced by you and collectively by others around the lake, will keep the lake healthy to protect your investment in shoreland property (healthy waters=higher property values), your enjoyment of the lake, and also preserve its ecological integrity.

## What We Do On the Land Matters

Water quality is primarily dependent on what happens on the land around the lake or along the river. It's the runoff from the land, and the pollution that is carried with it, that can determine the quality of the water. While the land activity in the watershed—the land area that drains to a lake or stream—contributes pollution to the lake, the shoreland zone where you live is the lake's first line of defense. What you and your neighbors do—or don't do—on your shoreland property can have a significant impact on the quality of the lake. Managing water quality means appropriately managing the land use around the lake to reduce the amount of pollution that enters the lake.

In this Guide, we'll look at two primary ways you, the shoreland homeowner, can manage your property to protect water quality. They are:

- 1. Curbing pollution at the source; and**
- 2. Reducing, capturing, and cleansing runoff.**

Proper lawn care, pet waste disposal, and use of household products; shoreline erosion control; and septic system maintenance can help curb pollution. Runoff that can pick up pollution and carry it to the lake can be reduced by minimizing hard surfaces on your property and limiting clearing and grading. It can also be captured and cleansed so it doesn't reach the lake by using shoreland vegetative buffers and by redirecting it to rain barrels and rain gardens. Let's learn more.

*C*onservation is a state of harmony between men and land...

A land ethic reflects the existence of an ecological conscience, and this in turn reflects a conviction of individual responsibility for the health of the land. Health is the capacity of the land for self-renewal. Conservation is our effort to understand and preserve this capacity...

We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect."

Aldo Leopold, *A Sand County Almanac*, 1949

*A*lake is the landscape's most beautiful and expressive feature. It is earth's eye; looking into which the beholder measures the depth of his own nature."

Henry David Thoreau  
in *Walden*

# Curb Pollution: Reduce Phosphorus and Other Pollutants

The shoreland zone where you live is the lake's first line of defense.

Nitrogen, potash, and phosphorus are the nutrients necessary for plant growth. Phosphorus is the key nutrient needed for aquatic plant and algae growth. When excessive phosphorus reaches the lake, it fuels the overgrowth of aquatic plants and algae, those microscopic organisms that give water a greenish tinge and can cause blue-green, toxic scums along the shore. Excessive plant and algae growth decreases water clarity, interferes with the recreational use of the lake, and diminishes oxygen for fish in the water, generally causing declining water quality.

Natural rainfall contains high amounts of phosphorus, which we can't control, but we can control our own shoreland practices that can contribute phosphorus to the lake. Excessive phosphorus can get into lakes from shoreland properties in a number of ways, including:

- excessive application to and runoff from lawns;
- decomposition of leaves and other plant material;
- erosion of soil, which has phosphorus particles attached to it;
- improper human and pet waste management, both of which contain high amounts of phosphorus; and the
- use of household products high in phosphorus.



One pound of phosphorus can feed the growth of over 500 pounds of algae.

## Apply Fertilizer Sparingly and Use Zero-Phosphorus Lawn Fertilizer—It's the Law in Minnesota

By law since 2005, Minnesota homeowners cannot use fertilizers containing phosphorus, except for exemptions for new lawns or when a soil test indicates a need for phosphorus. In Aitkin County, soils are naturally high in phosphorus so lawns generally don't need extra phosphorus.

When shopping for fertilizer, buy a brand that has a middle number of zero i.e. 22-0-15. The law did not prohibit retailers from selling phosphorous fertilizers, and even though most retailers are carrying more zero phosphorus fertilizers, it's up to you to make sure you comply with the law.

If you have left over phosphorus fertilizer, using it on the garden is a good way to dispose of it.

Other herbicide and pesticide cautions to follow:

- Eliminate the use of fertilizers near water or wetlands.
- Before you consider fertilizing your lawn, aerate it first and see if that improves its health.
- Use the minimum amount needed to replenish the soil and apply at the right time of year, usually spring and early fall. Water lightly after fertilizing to ensure absorption by the roots before a heavy rainfall.
- Sweep fertilizer that has spilled on hard surfaces back onto the lawn to prevent runoff.



Managing water quality means appropriately managing the land use around the lake to reduce the amount of pollution that enters the lake.

- Keep lawn healthy to avoid the need for herbicide applications. When necessary, use the least toxic and most degradable herbicide and follow directions carefully. Never use near the lake.
- Remove dandelions and other unwanted plants from your lawn using hand-tools instead of chemical applications. If you feel you must use a herbicide for control, do not apply it to the whole lawn. Instead, use an applicator which allows you to direct a small spray towards each unwanted plant.

## Keep Grass Clippings, Leaves, and Washed Up Aquatic Plant Material Out of the Lake

Grass clipping, leaves, and aquatic plant material that wash up on shore all contain phosphorus, which is released when the plant material decomposes. To prevent phosphorus from getting into the lake:

- Use a mulching lawn mower and leave grass clippings on the lawn as natural fertilizer.
- Collect and compost leaves and clippings, or haul them away from the lake to a disposal site.
- Rake up aquatic plants, leaves, and other organic matter on the shoreland and dispose away from the lake. *Hint:* It makes great mulch on the garden, which can later be worked in as a soil amendment.
- Do not burn leaves near the lake; it destroys the organic matter releasing the phosphorus, which could be washed into the lake.

## Locate Fire Pits Away from the Shoreland and Dispose of Ash

The leftover ash from burning wood is very high in phosphorus. If the fire pit is located near the lake, rain can wash the ashes into the lake.

- Locate the fire pit away at least 50 feet away from the lake; and,
- Remove ashes from the fire pit to prevent the nutrient-loaded ashes from being blown or washed into the lake.

## Properly Dispose of Pet Waste

Improper disposal of pet waste not only jeopardizes water quality, but your health as well. Pet waste contains phosphorus and may contain disease causing organisms, which, if washed into the water, can make it unsafe for swimming.

- Pick up pet waste in the yard or near the shore and dispose of it properly.

## Use Phosphorus-free Household Products

Read labels carefully and select bio-degradable, non-phosphorus dishwashing detergents, and reduce the use of commercial cleaners. Learn about and use natural, non-toxic household alternatives.

## Practice Low-Impact Boating

To reduce the pollution impact of motorized watercraft on the lake:

- When fueling the boat, take precautions not to overfill the fuel tank. If you do spill, wipe it up with a rag, do not hose into the water.
- Boat slowly; motors stir up sediments releasing nutrients that can lead to deterioration of water quality—a 50-horsepower motor operated full throttle can stir the water column to a depth of 15 feet.
- Keep your motor well-tuned; use four-cycle motors.
- Inspect your boat and trailer to avoid transporting aquatic invasive species, like Eurasian watermilfoil, Curlyleaf pondweed, or zebra mussels into the lake if you've had your boat in another waterbody.

### Caution:

Broadleaf herbicides will also affect all non-grass species, including trees and shrubs. Use carefully, or not at all, on shoreland areas.



# Curb Pollution: Inspect and Maintain Your Septic System

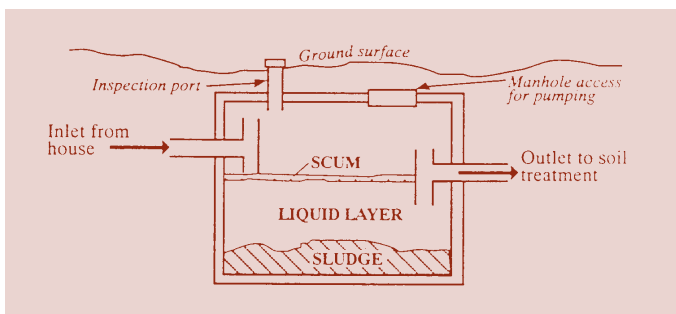
Most homes in shoreland areas rely on Individual Sewage Treatment Systems (ISTS), commonly known as the septic system. Your septic system, if designed, installed, and maintained properly, will effectively treat wastewater before it is returned to the environment to protect public health and prevent pollution of a nearby lake or river.

## Understand How Your Septic System Works

Understanding your system is essential to proper operation and maintenance. The basic components of most systems are the:

→ **Septic tank** receives the wastewater from the household plumbing. In the tank, the solids are separated from the liquid. Here, naturally occurring bacteria decomposes food particles and human waste and the remaining solids settle to the bottom until they are pumped out on a regular basis. The tank will have an inspection pipe for monitoring of the tank and a manhole for access when pumped. The size of the tank is based on the home's potential water use and types of appliances installed. When the capacity of the tank is reached the excess liquid flows, or is pumped, over into the drainfield.

→ **Soil treatment system (drainfield)**, which is typically a network of perforated pipes surrounded by small rock and soil. The liquid, which contains pathogens (disease-causing organisms), nutrients such as phosphorus, and fine solids, is cleansed naturally by bacteria as it percolates down through the soil. The design of the treatment system (trench, mound, etc.) is based on the soil conditions on your property, which must allow for at least three feet of unsaturated soil for the wastewater to percolate through for proper treatment. The correct type of system needed for your property will be determined by a state-licensed septic designer. Where gravity flow is not enough to move the liquids from the tank to the soil treatment system, pumps or lift stations are common—this is typical with mound systems.



Source: University of MN Extension Protecting Our Waters Series, #2

## What Causes a Septic System to Fail?

Septic system failure is most commonly the result of:

- Improper design or installation of the system;
- Overuse of water in the home; and/or
- Improper maintenance.

When your system, or a neighbor's system fails, untreated wastewater could come in contact with people, causing a public health hazard, or enter the groundwater and eventually the lake, adding pollution that can contribute to increased algae and aquatic plant growth and declining water quality.

## What are the signs of a failing system?

- Sewage backup into the house or slow toilet flushing,
- Frozen pipes or soil treatment areas,
- System alarms sounding,
- Wet and/or black areas around a septic mound,
- Algal blooms and excessive plant growth in the water near shore,
- Sewage odors indoors or outdoors,
- Water or sewage surfacing in the yard or a nearby low spot, or
- High levels of nitrates or coliform bacteria in well water tests.

## If you have a problem:

- Contact the Aitkin County Planning & Zoning office for advice and/or licensed septic inspector.
- If the drainfield or household pipes are not clogged, have the system pumped for both solids and liquids as a temporary measure.
- If there is surface pooling of wastewater, fence off the area to prevent contact with humans or pets.

## Properly Operate and Maintain Your System

Proper operation and maintenance will extend the life of your system for many years and prevent costly repairs.

### ✓ Pump the Tank Regularly

Have a licensed professional pump the solids (floating scum and sludge) that have accumulated from the septic tank every one to three years—the more use, the more often pumping is needed. While garbage disposal use is not recommended with septic systems, pump annually if you are using one. Failure to remove the solids can cause them to enter the drainfield, which can result in expensive repair or replacement. For licensed and certified septic system maintenance services, refer to the yellow pages under septic tanks and systems-cleaning, or contact Aitkin County Planning & Zoning.

### ✓ Practice Water Conservation

Too much water flowing into the tank will cause the tank to back up and lead to ineffective treatment of wastewater. To prevent this:

- Repair all leaky faucets, fixtures, and appliances.
- Install low water-use fixtures and appliances (especially toilets and shower heads).
- Do not empty roof drains and sump pump water into the septic system.
- Wash only full loads of clothing and dishes, and spread out water use, such as laundry, throughout the day and week. Consider front loading machines; they use less water.
- Reduce the length of showers and the number of toilet flushings, especially during high use periods.
- Reroute water softener discharge water out of the septic system.
- Do not hook floor drains or drain tile into the septic system.

### ✓ Limit What Goes Down the Drain

- Do not put household cleaners, paint, solvents, medications, and other chemicals down the drain.
- Limit the use of antibacterial products. As the name suggests, they can reduce the amount of working bacteria in the septic tank.
- Use only the recommended amounts of liquid non-phosphorus detergents and cleaners.
- Prevent food particles, grease, lint, coffee grounds, plastics, and other non-degradable solids from getting into the system.
- Use single-ply toilet paper for the best decomposition.

### ✓ Do Not Use System Additives

It is not necessary to use starters, feeders, cleaners, or other septic additives to enhance the performance of your system. If your system is properly maintained and operated, it will operate at maximum performance with the use of naturally occurring bacteria.

### ✓ Protect Your Drainfield

Compacting or obstructing the soil over the treatment area can cause malfunctioning of the drain field. To protect it:

- Keep heavy vehicles off the drainfield.
- Maintain vegetative cover, but do not plant trees or shrubs on the drainfield because the roots may penetrate and clog the distribution system.
- Mow the area, but do not fertilize or water.
- Reroute roof drains and drain tile away from the drainfield.

## Protect Your System from Freezing in the Winter

Common causes of septic system freezing during the winter can be lack of snow cover, extreme cold, compacted snow, irregular use of the system, leaking plumbing fixtures, pipes not draining properly, or a water-logged system.

**What to do if the system freezes?** Unplug your pump and call a septic system professional. Do not add antifreeze, additives, or continuously run water to try to unthaw the system.

To prevent freezing, follow these general guidelines:

- Fix any leaking plumbing or appliances prior to winter.
- In the fall, leave the grass longer over the tank and drainfield for better insulation.
- Add a layer of hay or straw mulch (8-12 inches) over the pipes, tank, and soil treatment area.
- Keep ATVs and snowmobiles off the drainfield.
- Spread hot water use (laundry, showers, dishwasher) out over the day and week. If you'll be gone for extended periods, consider having someone stop by to run hot water regularly.
- High efficiency furnaces, water softeners, and iron filters have the potential to cause problems in the winter because of slow and/or periodic discharges of water. For suggested precautions, see: <http://septic.umn.edu/homeowner/factsheets/furnaces-softenersironfilters.html>
- Talk with a professional before installing heat tapes or tank heaters.

## Aitkin County Requirements

**Who regulates?** The design, inspection, and installation of septic systems are regulated by Aitkin County and must be done by professionals licensed by the state. Lists of licensed professionals and permits for septic system installation can be obtained from the Planning & Zoning office.

**What records are required?** All septic systems must have a Certificate of Compliance indicating they meet the Aitkin County ISTS and Wastewater Ordinance, sometimes referred to as being "up-to-code." A Certificate is good for five years from the date of original installation, and must be renewed every three years thereafter.

**When are inspections required?** If you are applying for a building permit for new construction, a compliant septic system is required. A building permit for any addition to current buildings, including a deck or garage—attached or non-attached, requires a current Certificate of Compliance for the septic system. If one is not on record or it is not current, an inspection of the septic system will be required and, if the system is found to be noncompliant, modification or replacement of the system may be necessary before a building permit is issued.

**What about property transfers?** A Certificate of Compliance is required before a title transfer can occur on any shoreland property with a septic system. If the system is not compliant, it must be brought into compliance, or an agreement must be filed to update/escrow for later compliance before occupancy and title transfer to new owner.

*Call the Aitkin County Planning & Zoning Office for questions about septic system requirements, including setbacks from property lines, wells, lakes, rivers, and streams.*

Managing stormwater on your property is the best way to reduce runoff and pollutants before they reach the lake.

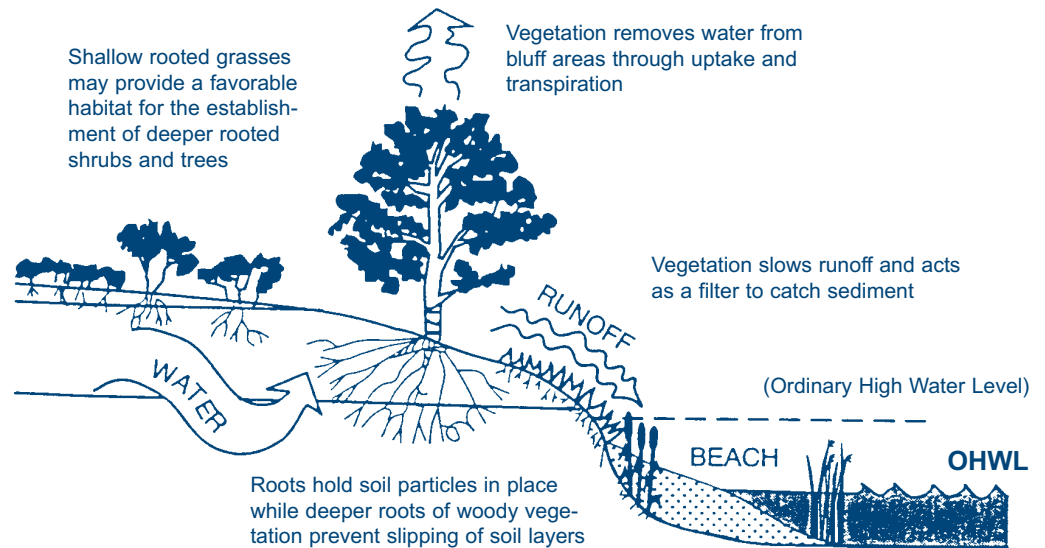
# Reduce Runoff

## What is runoff?

Snow melt or rainwater that does not soak into the ground and instead runs off hard surfaces such as roofs, driveways, sidewalks, and compacted soils or washes off lawns and steep slopes is called runoff. It is also referred to as stormwater. When runoff reaches the lake, it can carry with it nutrients, eroded soil sediments, toxic materials, bacteria and other pollutants that can all be detrimental to water quality and fish and wildlife habitat.

**Reducing runoff decreases the pollutants that can eventually reach the lake.**

Managing stormwater on your property so it soaks into the ground (infiltrates), rather than running off is the best way to reduce runoff and filter out pollutants before they reach the lake. Hard or paved-over surfaces do not allow the absorption of water. Any green space, including gardens, trees, shrubs or landscaping allows water to permeate slowly down into the soil and roots.



*Shoreland Best Management Practices Fact Sheet #5, University of Minnesota Extension.*

## Practice Good Lawn Management

### Reduce the Amount of Lawn

Bringing the suburban lawn mentality to the lake has also brought more opportunities to degrade the quality of our lakes. Limit the amount of lawn and keep as much natural vegetation as possible, or replant natural vegetation—especially near the lake. Not only will you reduce runoff, you'll reduce the amount of yard work, freeing you up to recreate instead.

### Maintain a Healthy Lawn to Absorb More Water

- Mow to a height of two to three inches; mow when dry to prevent clumping. Taller grass provides shade for better root growth, which helps with water absorption.
- Consider replacing some of the grass in your lawn area with clover, native grasses, or other groundcovers that don't need watering.
- If watering is necessary, water deeply, but infrequently, to encourage deep root growth. Water with lake water. (*Hint:* use the nutrients in the lake to make a healthy lawn instead of frequent fertilizer applications.) Water in the morning, not mid-day or evening.
- In hot weather, allow lawn grasses to go into a state of dormancy so that they require less water and nutrient intake for survival. Water 1/4 to 1/2 inch every two or three weeks to keep crowns from dehydrating beyond the point of recovery.

If we love our lakes we have to change our ideas about what is a good lawn at the lake.

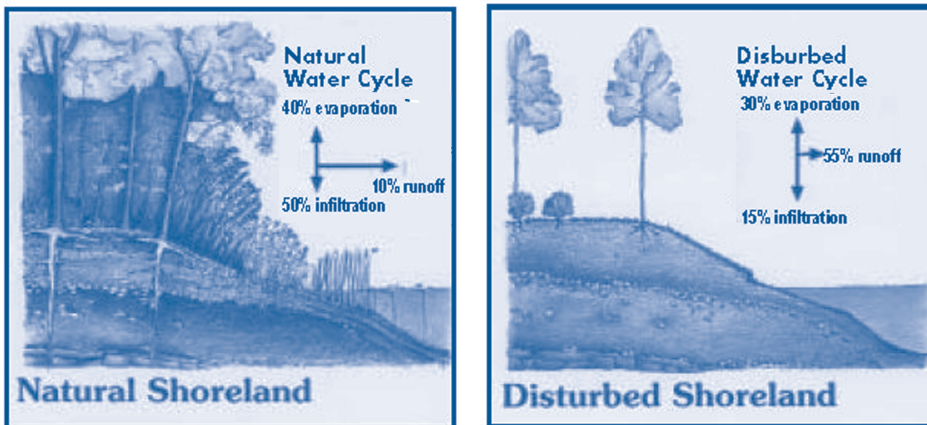
That beautiful manicured lawn takes more chemicals and more work to maintain and does not provide good habitat for the wildlife that share the shoreland with us.



## Maintain Natural Vegetation

Natural vegetation will naturally reduce runoff by holding back the water to provide time for it to soak into the ground.

- When clearing your lot, minimize the removal of wooded areas, trees and low growing shrubs. Their removal causes more rain to fall to the ground instead of landing on leaves and branches. In addition, those shrubs are most likely the next generation of tree growth.
- Grading large areas of land removes the natural depressions of land where water can pond and soak in.
- Carefully landscape your yard near roads, driveways, and along the shorelines to direct runoff away from the lake.



**When there is precipitation, water will evaporate, run off the land, or soak (infiltrate) into the ground. The amount of vegetative cover on the ground will significantly impact the amount of runoff and infiltration. Natural vegetation will hold back the runoff providing time for it to soak into the ground.**

## Reduce Hard Surfaces, Like Roofs and Driveways

Since hard surfaces cannot absorb water, reducing the amount of hard surfaces on your lot will reduce the volume of runoff.

- When considering additions, decide if the extra space is really necessary. Could you build up instead of out to reduce the roof size?
- Minimize the amount of paved surfaces, such as driveways and sidewalks. Locate driveways, sidewalks, stairways, and footpaths away from steep slopes.
- If you're installing a new patio or rebuilding a sidewalk or walkway, use bricks, interlocking pavers or flat stones set in sand instead of concrete. Consider using pervious pavers, where water runs through it, and pervious asphalt for driveways.
- Cover well worn paths, that may be compacted and act like asphalt, with mulch to absorb water; when compacted, they act like asphalt.

Aitkin County limits the amount of hard (impervious) surfaces on shoreland parcels; contact Planning & Zoning for more information.

The Wisconsin DNR calculated runoff volume from an undeveloped shoreland lot compared to a large lake home (approximately 4,000 square feet of impervious surfaces) on a lot entirely converted to lawn. They found up to a:

- 500% increase in runoff volume,
- a 700% increase in phosphorus washing into the lake, and
- a 900% increase in sediment flowing to the lake on the large home lot.<sup>2</sup>

# Reduce Runoff: Curb Erosion

Any exposed soil can be washed away with stormwater. When soil washes into the lake, it carries with it phosphorus—the desired nutrient for weed and algae growth—and debris and other toxic materials that may be on the land. It causes sediment build up in the lake; increases turbidity after rain events, which interferes with normal lake functions; and impacts fish and wildlife habitat. Degradation to water quality is a result. Curbing the erosion of soil will reduce pollutants to the lake.

## Monitor Construction or Renovation Projects

Have an erosion control plan and carefully monitor all construction or renovation projects to ensure that soil and construction materials do not runoff the exposed soils.

- Properly dispose of all construction materials each day.
- Use nontoxic, biodegradable or recycled materials.
- Wash or clean any liquid materials in-doors or directly into a container.
- Install silt fences along the shoreland to capture any sediment runoff that might occur.
- After construction, establish vegetation right away.
- Minimize land alteration around your construction projects to take advantage of existing soil stability.

## Stabilize the Soil in Steep Areas

The erosion potential on steep slopes and bluffs can be reduced by:

- Diverting water away from steep slopes by rerouting drainpipes and gutters. If diverting water away from the bluff is impractical, it should be routed through a non-perforated plastic drain pipe that outlets at the very bottom of the bluff into rock drainage.
- If you need a walkway to the shore, follow the natural contours of the slope to go across or around the slope, or use steps when a walkway must go directly up and down a slope, but minimize destruction of natural vegetation during construction.
- Keep the moisture- and nutrient-absorbing natural vegetation on steep slopes by limiting clearing and grading.
- Replant vegetation on barren slopes.
- Create a view corridor through the trees with selective pruning for an excellent view while maintaining the natural trees and shrubs.



Source: *Lakescaping for Wildlife and Water Quality*<sup>3</sup>

## Reduce Shoreland Erosion

If your shoreland is eroding away, stabilizing the shoreland will be necessary to reduce erosion. Possible causes may include:

- fluctuating water levels,
- increased wave or wake action, ice pushes in the spring, or
- loss of natural vegetation to hold the soil in place.

Each shoreland situation is different, and consulting shoreland landscaping professionals, the DNR area hydrologist, or the Aitkin Soil and Water Conservation District is encouraged to determine the best solution for your shoreline erosion situation.

Rip rap and retaining walls are usually not the best choice for stabilization. They are expensive and can negatively impact the lake by creating an unnatural barrier between upland areas and the shoreline environment. Rip rap should only be used if deemed necessary after consultation, and never to replace a stable, naturally vegetated shoreline. If rip rap is used, it is most effectively used in combination with natural vegetation to stabilize the soil between the rock material.

**Naturalizing your shoreline or maintaining the natural shoreland vegetation is the most important way to reduce shoreland erosion.**

Naturalizing your shoreline or maintaining the natural shoreland vegetation is the most important and effective way to reduce shoreland erosion in addition to enhancing water quality, maintaining good fishery resources, and provide wildlife habitat. (See pages 10 & 11.)

## Slow the Boat Down

Boat wakes can cause tremendous shoreland erosion, so boat slower. In shallow areas (less than 15 feet), motor at slow-no-wake speeds (5 mph or less) to reduce the boat wake and the consequent wave action that can erode your shoreline and other's around the lake. Observe all posted "no-wake" and low-speed zones. For personal watercraft, running at slow, no-wake speed within 150 feet of the shore is the law.

Boating slowly makes less wake, less noise, reduces pollution and is less disruptive to wildlife and other people—plus you'll see more and enjoy the lake longer. When running at higher speeds, keep the motor properly trimmed to reduce noise and boat wake.



On steep bluffs, selective pruning of trees to create a view corridor of the lake, while keeping the vegetative undergrowth, will stabilize the soil.

## Shoreland Alternations are Regulated

Be aware that any type of shoreland or bluff alteration in the impact zone,\* including grading, filling, or removal of vegetation other than dead or diseased trees, limbs, or branches, is regulated and will require a permit from either the Aitkin County Soil and Water Conservation District or Minnesota DNR. Violators will be issued fines and required to restore the alteration.

\* The *shore impact zone* is the area adjacent to the water for a distance equal to one half of the required structure setback.

\* The *bluff impact zone* includes the bluff itself and the area within 20 feet from the top of the bluff.



Preserving or restoring a natural shoreline is the best way to reduce shoreland erosion.

#### Additional benefits of shoreland buffers:

- Less time spent mowing; more time enjoying the lake.
- Attracts birds and butterflies.
- Enhances your view of the lake by adding interest, texture and color.
- Provides more privacy from people using the lake or neighboring properties.
- Protecting water quality is protecting your real estate value.
- Taller native plants create a biological barrier that will deter Canada geese from loitering on the lawn.
- Well-established emergent aquatic plants discourage the establishment of non-native species.

## Reduce Runoff: Maintain a Natural Shoreline

Preserving or restoring a native shoreline is the best way to reduce shoreland erosion, protect water quality, and improve the health and diversity of shoreland and upland birds, wildlife, and aquatic plants.

Native vegetation acts as a buffer zone between the shoreland and the water intercepting nutrients and reducing runoff, erosion, and sedimentation.

If your shoreland is already natural, congratulations—please keep it that way. If you have lawn to the water's edge, or very little native vegetation near the shore, consider a natural landscaping—"Lakescaping"—project to restore your shore by creating a shoreland buffer.

**A mostly natural landscape has only 10% runoff.**

Creating and maintaining a natural buffer zone along your shore does not mean your property has to look messy, but it may mean you have to re-think what lake shoreland should really look like. Even if your neighbors are not restoring their shoreland, it is important for you to proceed because it helps improve your property and protect water quality, and you can serve as a good model for others to follow. The individual choices by many can have cumulative impacts on the lake and its ecosystem. Ultimately, keeping the water clean can be far less costly than cleaning up a damaged lake, and clean waters framed by natural vegetation often have the highest property values.

### What is a Buffer Zone?

The buffer zone consists of:

- The shallow *aquatic zone* of the emergent, submerged, and floating leaf aquatic plants that provide food and shelter for ducks, songbirds, fish, and reduce problems caused by Canada geese. The taller plants, like bulrush, sedges, and cattails can reduce the energy of wave and wake action to minimize erosion and help maintain water quality.
- The *upland zone* of native trees, shrubs, grasses and wildflowers that hold the soil on the bank in place, slow rainwater runoff, absorb water and nutrients, and break down pollutants.



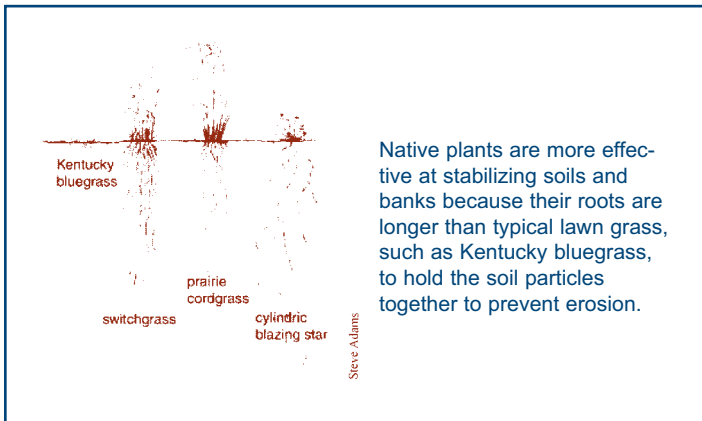
Source: *Lakescaping for Wildlife and Water Quality*<sup>3</sup>



**A natural shoreline is a bridge between two worlds—the land and water.**

**Studies show that there can be as much as 500% more diversity of plant and animal species along a natural shoreline compared to upland areas.**

Current recommendations are a minimum of a 35-foot shoreland buffer of native plants landward from the shore, but even adding a buffer as narrow as 10-15 feet (from the water's edge) will help reduce runoff. When it comes to shoreline buffers, wider is better for more benefits.



- **Consult resources and natural landscaping professionals.** Before proceeding with an extensive planting project, you'll likely need to consult with professionals for help with designing your project to ensure your project goals are met. Consult with natural landscaping specialists at local nurseries, take a class in shoreland restoration offered through the University of Minnesota Extension Service, talk with extension educators, or contact the Aitkin Soil and Water Conservation District for resources and fact sheets on designing your project, selecting plants, preparing the site, and planting.

The book *Lakescaping for Wildlife and Water Quality* and the CD *Restore Your Shore* are two highly recommended resources to get you started. Financial assistance for your project may be available; check with the Aitkin County Soil and Water District.

## Getting Started Creating a Shoreland Buffer

- **Don't mow.** A simple, no-cost way to get started in restoring your shoreland is to stop mowing for the width of the desired buffer strip. Seeds in the soil will germinate and valuable native plants will begin to appear. You can note the types of native plants and wildflowers growing on natural shorelines around the lake to get an idea of what is likely to appear or will be suitable for growing in your area. You may later need to weed out nuisance species or add native plants for diversity, but it will get you started.
- **To be more thoughtful about a restoration project, assess the shoreline and your needs.** Do you have erosion problems to correct? Problems with geese? What kind of wildlife would you like to attract? How much area is needed for lake access for boats and swimming? Limiting the beach and dock area to 15-20 feet and leaving the rest of the shoreland natural is ideal to have both the benefits of the buffer zone while having recreational access to the lake.

**Building a home and establishing a lawn to the water's edge can cause seven times the amount of phosphorus and 18 times the amount of sediment to enter the water compared to a natural shoreline.** <sup>4</sup>



## Protect Aquatic Habitats

The aquatic zone is a vital part of the shoreland buffer system. Aquatic vegetation helps purify the lake by removing contaminants and calming the water, which allows suspended soil particles to settle to the lake bottom. If submerged aquatic plants are interfering with swimming, clear by hand only what is needed to provide a small swimming area. Leave other submerged plants in place. Chemical treatment or any destruction of cattails, bulrushes, or wild rice will require a permit from the DNR Area Fisheries office.

## Leave Fallen Trees and Branches in the Water

Unless they are interfering with your recreational access, leave trees and branches that have fallen into the water alone. They form critical habitat for aquatic organisms that fish and other aquatic life feed on, and serve as a dock for turtles, kingfishers and other interesting wildlife. The fish and wildlife will appreciate you.

# Capture and Cleanse Runoff

## When It Rains, It Pollutes

Rain naturally contains pollutants, including phosphorus and mercury. You cannot do much about this source of the pollution, but you can **capture** some rainwater and allow it to be **cleansed** through natural soil processes to prevent it from running off into the lake, where it can be detrimental to water quality.

The best way to do this is to: divert rainwater off roofs, driveways, and other hard surfaces into rain barrels or the lawn, or create a special garden—rain garden—designed to capture and clean the rainwater naturally.

## Divert Rainwater Off Roofs and Driveways

Roofs of houses and other buildings, especially larger houses, and driveways comprise most of the impervious (impermeable) surfaces on a shoreland lot. Redirect rainway flow from drain spouts, roof gutters, and driveways onto vegetated areas and away from the lake, steep slopes, and bluffs. There it can be captured and have time to infiltrate naturally into the soil, or be used later for watering, instead of getting to the lake.

## Install a Rain Barrel

A rain barrel is any type of container used to catch water flowing from a downspout and store it for later use.

The rain barrel is placed underneath a shortened downspout diverting the roof runoff into the barrel. The rain barrel has a spigot to collect the stored water for use in watering flower gardens, house plants and lawns—it's a natural way to fertilize.

Due to lack of research at this time, water collected in a rain barrel is not recommended for watering vegetable gardens. Humans and pets should not drink the stored water. Non-toxic mosquito dunks are available at garden supply stores and mail order catalogs to prevent the breeding of mosquitoes in rain barrels.

Rain barrels need to be cleaned routinely during spring and summer months to reduce algae growth. During winter months, take your barrel out of operation by simply turning upside down at the same location or storing elsewhere.

Rain barrels can be purchased at garden centers, ordered online from garden catalogs, or you can make your own (see resources).



**Garden with water quality in mind!**

*How much rain do I need to fill a 50-gallon barrel?*

For every inch of rain that falls on one square foot of your roof, you can collect just over half a gallon of rainwater (0.6 gallons).

For example, if you have a shed that is 10' x 10' and you collect roof runoff from all 100 square feet of your roof, you can collect 60 gallons of rainwater during a 1-inch rain event.<sup>6</sup>



## Plant a Rain Garden

A rain garden is just what it sounds like—a garden to soak up rain water. It is a recessed planting bed, shaped like a saucer or shallow bowl, designed to collect runoff from driveways, roofs, and other hard surface or sheet flow of rain from lawns. The collected water is then infiltrated into the ground instead of running off to the lake.

Rain gardens are planted with hardy, water-loving native perennial plants that have deep roots, which along with the soil, work to provide a filter system to catch pollutants such as phosphorus, oil, mercury and other heavy metals in rainwater that run into the garden area. Rain gardens allow sediments that are carried with runoff to settle and plants to absorb the nutrients. During a rainfall, the highest concentration of pollutants is during the first inch, or first flush of a storm, which is retained in the rain garden.

A typical rain garden should be located at least 10 feet from the house and will range from 100 to 300 square feet in size with a depth of 4 inches to 10 inches. As a rule of thumb, one garden will handle the runoff from a hard surface that is about three times their size. For larger surfaces, more than one rain garden may be needed to handle the runoff, perhaps one rain garden near each down spout. Rain collected will recede into the ground within several days, sometimes even hours depending on your soil type.

To be effective, rain gardens must be properly designed for the right shape and size to accommodate the amount of roof, driveway, and other hard surfaces on your property as well as your soil conditions. Plants must be used that are appropriate for your soil type and will also tolerate standing water for up to 48 hours.

For proper design, it is recommended to consult resources to help you determine the proper plants and dimensions. Talk with the local extension agent or a landscaping professional knowledgeable about rain gardens. See the “How-To” resource on the back cover or do an internet search for amazing resources.

**Use rain gardens in combination with natural shoreland landscaping for optimal runoff control on your shoreland property.**



### Rain Garden Tips:

- Don't worry about mosquitoes. Most rain gardens will not hold water long enough for mosquitoes to reproduce.
- When first planted, hand weed biweekly until native plants are established.
- Don't fertilize near the rain garden, it will stimulate weed competition without benefiting the native plants.
- During heavy rains, your rain garden may fill up and overflow. Make sure the overflow drainage follows the drainage designed for your lot.

*Source: Taylor Creek Restoration Nurseries*

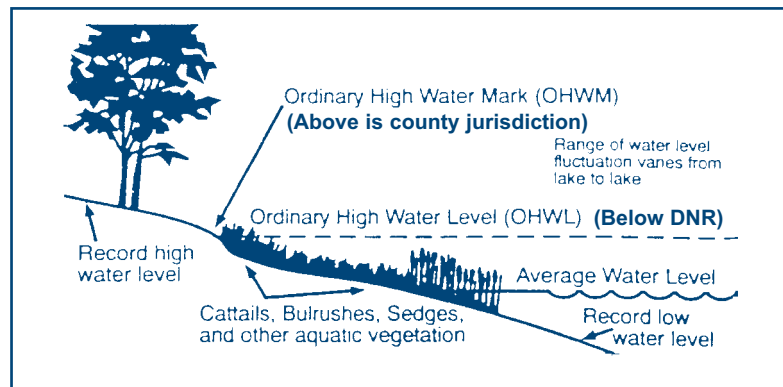
**Locate utilities before you dig—  
call Gopher One State,  
Minnesota toll free 800-252-1166**

# What Can I Do On My Shoreland Property? What Permits are Required?

## Who Has Regulatory Authority in the Shoreland Zone?

The shoreland zone is defined as the land within 1,000 feet of a lake and 300 feet of a river or stream plus the near shore waters.

- For any actions in the water or on the land **below** the ordinary high water level (OHWL) of a public water (lakes, rivers, streams, wetlands), check with the appropriate Minnesota Department of Natural Resources (DNR) office for permits that may be required.
- For any actions on the land **above** the OHWL (the upland areas of your property) and within the shoreland zone, contact the appropriate Aitkin County office. If located within the boundaries of a city, contact city offices.



See the Shoreland Homeowners Checklist for the appropriate authority in various situations.

Knowing what you can and cannot do in the water and on the adjacent shoreland area, and following the regulations that apply, is an important stewardship practice.

Any activity that disturbs land, plant or animal life or chemicals applied in the water is a regulated activity to ensure that the quality of the environment is not compromised by the activity.

**How do I know where the ordinary high water level (OHWL) is?** For lakes and wetlands, the OHWL is the highest water level that has been maintained for a sufficient period of time to leave evidence on the landscape; it is not necessarily the highest place the water has been. It is commonly that point where the natural vegetation changes from predominately aquatic to predominantly terrestrial.

The OHWL is a reference elevation that defines the DNR's regulatory authority, and it is used by Aitkin County to determine their regulatory zone and appropriate setbacks for buildings.

If there is a question about the OHWL on your property, contact the DNR Area Hydrologist for Aitkin County or check with the Aitkin County Soil and Water Conservation District (SWCD).

## Commonly Asked Questions about Shoreland Activities:

**What are the requirements for installing a retaining wall or rip rap for erosion control?** A DNR public waters work permit is required to build a retaining wall along your shoreline if the structure is proposed below the OHWL. Retaining walls are discouraged, particularly on relatively undeveloped lakes. Planting vegetation for erosion control is preferred; rip rap (coarse stones, boulders, or rock placed against the bank or shore) may be allowed without requiring a DNR permit if specific conditions are followed in installation. For either a retaining wall or rip rap installation, you will need technical advice for the best success. Contact both the DNR Hydrologist and the Aitkin County SWCD for assistance. Refer to the DNR Shoreland Alteration fact sheet.

**Do I need a permit for a sand blanket or beach development?** Everyone wants a nice sandy beach area, but trying to create a sandy beach where it has not existed naturally may not always be successful. Before making your decision, be aware that wave action can erode the beach and sand will migrate down shore, possibly damaging fish and wildlife habitat. If the lake bottom is soft, the sand will only sink into the muck and disappear. Sand blankets cannot be applied over bulrush and cattails, and vegetation will constantly emerge.

Before installing a sand blanket, contact the Area DNR Waters office for installation and possible permit requirements. Refer to the DNR Shoreland Alteration fact sheet for specifications.

**What rules apply to docks?** Docks are privately owned structures, which are allowed to be placed in public waters of the state to provide access to the use of the water. Dock rules are established by the DNR to prevent the deterioration of the lake's ecosystem from excessive or inappropriate dock placement. Local governments have the authority to regulate docks; Aitkin County currently defers to state rules.

In choosing the right dock and boat lift configuration for your property, it is important to keep in mind that a dock is private property placed on a public resource and they can have detrimental impacts on the lake. They may shade out important aquatic plants and cause fragmentation and destruction of important emergent and submerged aquatic vegetation that provides habitat where fish spawn, feed, grow, and find shelter from predators.

Keep dockage appropriately balanced between reasonable access and resource protection. Minimize the use of docks for activities that are better intended for land, such as barbecues and screened structures.

In shoreland areas where there are large bulrush and other emergent aquatic vegetation beds, consider consolidating docking with your neighbors to minimize the destruction of bulrushes, which serve as nutrient filters for the lake.

A DNR permit is not required for a dock if it meets current dock rules which allow:

- Docks, not including the watercraft lift, that are not wider than 8 feet wide and not combined with other structures to create a larger structure.
- Docks that are no longer than is necessary to reach navigable water depth, are not a navigational or safety hazard to others, and do not close off access for others to part of the lake.

#### **Can I control aquatic plants in front of my shoreline?**

The removal or destruction of aquatic plants is a regulated activity under the DNR's Aquatic Plant Management Program. Aquatic plants are a valuable part of the lake

system. They stabilize bottom sediments, protect water clarity, prevent shoreline erosion, and are important fish habitat.

You are encouraged to keep destruction of aquatic plants at a minimum. Unless aquatic plants are interfering with lake access, swimming, or other water recreation activities, they should be left alone. If you are seeing unusually high plant growth where it has not previously occurred, look for possible sources of phosphorus getting into the lake from your property that might be fueling this growth, such as excessive runoff, improperly operating septic system, or shoreland erosion.

If management is desired, consider managing plants only in the swimming area; it is not necessary to have the entire shoreline devoid of submerged aquatic plants. For management, you need to know:

- ✦ No emergent plants can be destroyed (bulrushes, cattails, wild rice) unless authorized by a DNR permit.
- ✦ Submerged vegetation can be manually controlled (hand cutting or pulling) in an area not exceeding 2,500 square feet or wider than 50 feet along the shore or half the width of your property, whichever is smaller; more than that requires a permit.
- ✦ Cut or pulled vegetation must be removed from the water and the cleared area must remain in the same place from year to year.
- ✦ A permit from DNR Fisheries is needed to:
  - Use any chemicals or automated mechanical devices (such as the Crary WeedRoller, Beachgroomer or Lake Sweeper).
  - Use copper sulfate for swimmers itch control.
  - Remove floating leaf vegetation in an area larger than a channel 15 feet wide to open water.
  - Remove or relocate a bog of any size that is free floating or lodged elsewhere than its original location.
  - Plant aquatic plants below the OHWL as part of a shoreline restoration project. This activity is encouraged and there is no permit charge.

These activities are not allowed in any circumstances:

- Excavating the lake bottom for aquatic plant control, using lake-bottom barriers to destroy or prevent the growth of aquatic plants,
- Removing vegetation within posted fish-spawning areas,
- Removing aquatic plants from an undeveloped shoreline, and
- Removing aquatic plants where they do not interfere with swimming, boating or other recreation.

**If you see violations of these permit requirements,** or any other permit requirements, contact your Conservation Officer immediately. Photo documentation is appreciated.



## Aitkin County Permit Requirements

**For shoreland properties within municipal boundaries, check with the City or Aitkin County Planning & Zoning.**

**Building Permits for New Construction, Remodeling or Adding on Decks, Garages, etc:**

**Contact Aitkin County Planning & Zoning** ~ Any new building or structure will need a permit. Onsite inspection will be required in most cases before issuing a permit. Obtain the permit before starting any construction.

**Variances for Building Permits:**

**Contact Aitkin County Planning & Zoning** ~ For projects that do not conform to Aitkin County regulations, a variance to the regulations will be needed from the Board of Adjustment, and mitigation of the development plan will need to be completed as determined by a shoreland performance worksheet before the variance is issued. The amount of mitigation needed will vary by property and may include such actions as planting or retaining native vegetative buffers along the shoreland, diverting runoff away from structures, installing a rain garden, removal of accessory structures or unnecessary impervious surfaces. Contact Planning & Zoning first, and then you will be referred to the SWCD for completion of the worksheet. Mitigation is required to ensure that exceeding the ordinance limits will not cause environmental damage.

**Accessory Structures e.g. boat houses:**

**Contact Aitkin County Planning & Zoning** ~ Boat houses are allowable in some circumstances if they are no larger than 120 square feet and are located a minimum of 10 feet from the OHW; a permit is required.

**Dirt Moving in the Shoreland Zone (such as ice ridges, shoreland landscaping, etc):**

**Contact Aitkin SWCD** ~ Any dirt moving, including ice ridge manipulation, in the shoreland zone requires a permit from Aitkin County.

**Wetland Filling in the Shoreland Zone:**

**Contact either Aitkin County Planning & Zoning or SWCD** ~ In most cases, no wetland filling is allowed in the shoreland zone. For exceptions, a permit will be required.

**Vegetation Removal in the Shoreland Zone:**

**Contact Aitkin County SWCD** ~ A plan must be approved by the SWCD before any vegetation is removed in the shoreland impact zone (half the setback distance from the lake). Removal of emergent aquatic vegetation (cattails,

wild rice, and bulrush) will require a permit from the DNR Fisheries office. For removal of submerged aquatic plants, see the Aquatic Plant Management section for requirements.

**Placement of Wells:**

**Contact Aitkin County Planning & Zoning** ~ Check on minimum setback requirements from septic systems, building, etc. for wells before proceeding with a licensed well drilling company. The well driller will obtain the required permits needed from the Minnesota Department of Health to drill a well.

**Septic Systems:**

**Contact Aitkin County Planning & Zoning** ~ To obtain a building permit in Aitkin County, a septic system on the property must be in compliance with the Aitkin County ordinance at the time of permit application. A compliant septic system is also required for property transfer. Check with the Aitkin P&Z office before installing a septic system to make sure all requirements are being met.

**New Construction and Lot Development:**

**Contact Aitkin County Planning & Zoning** ~ Before purchasing or building on a new shoreland property, check with Aitkin County Planning & Zoning to make sure the lot is suitable for building in compliance with County regulations. Allowable setback from the lake, impervious surface coverage, and lot width will vary depending on the classification of the lake. Additional setbacks and vegetation protection may apply to build on a bluff in the shoreland zone. Check with Planning & Zoning for specific requirements for your lot.

**Commercial Business in Shoreland Areas:**

**Contact Aitkin County Planning & Zoning** ~ Home-based or commercial business conducted in the shoreland zone will likely require a permit.

**Before purchasing a shoreland property, ask these questions and/or check with Aitkin Planning & Zoning:**

- ❖ Are all structures and the lot conforming to the Aitkin County ordinances—is it legal?
- ❖ Is the septic system and well properly located?
- ❖ Is the septic system in compliance with County regulations?

It is better to ask first than to find out later you will not be able to build what you planned.

## ✓ Aitkin County Shoreland Property Owner's Checklist:

### Contact Aitkin County Planning & Zoning or Aitkin SWCD before:

- Buying, clearing, or developing shoreland property.
- Building a new structure or remodeling an existing structure.
- Installing a well and/or septic system.
- Draining, mowing, or filling a wetland.
- Building a boardwalk or raised path to the lake.
- Changing the appearance of your building setback zone (shoreland impact zone) or near shore area by clearing, cutting, planting, grading, or filling.
- Building or repairing any accessory structure near the shore (boat house, gazebo, storage locker).

**If in doubt or you need clarification about any activity in the shoreland zone, contact the Aitkin County Planning & Zoning office.**

### Contact the Minnesota Department of Natural Resources before:

- Removing emergent vegetation (cattails, bulrushes, wild rice).
- Removing or applying chemical to underwater (submerged) vegetation.
- Installing any form of riprap or installing a retaining wall.
- Any land disturbance below the ordinary high water level.

### References:

- <sup>1</sup> *Protecting Your Waterfront Investment*, Center for Land Use Education, UW Extension; 2005.
- <sup>2</sup> *Shoreland Property: a guide to environmentally sound ownership*; 2002; Southeast Wisconsin Fox River Basin Partnership Team, University of Wisconsin-Extension and Wisconsin Department of Natural Resources.
- <sup>3</sup> *Lakescaping for Wildlife and Water Quality*, State of Minnesota, Department of Natural Resources; Henderson C; Dindorf C; Rozumalski, F.
- <sup>4</sup> Minnesota DNR Shoreline Alternations Fact Sheets: Natural Buffers, Lakescaping; Riprap, Sand Blankets.
- <sup>5</sup> *The Shoreland Stewardship Series: A fresh look at shoreland restoration*; DNR FH-430-00; RP-03-10M-50-S; University of Wisconsin-Extension, Wisconsin Lakes Partnership, Wisconsin Department of Natural Resources and the GMU Teams, and the Wisconsin Association of Lakes.
- <sup>6</sup> Rain Barrel Fact Sheet, Crow Wing County Extension, 2007.

## Frequently Called Contact Information:

### Aitkin County Planning & Zoning (P & Z)

209 Second Street NW  
Aitkin, MN 56431  
218-927-7342  
Email: [aitkinpz@co.aitkin.mn.us](mailto:aitkinpz@co.aitkin.mn.us)

### Aitkin County Soil and Water Conservation District (SWCD)

130 Southgate Drive  
Aitkin, MN 56431  
218-927-6565  
Email: [swcd@mlecmn.net](mailto:swcd@mlecmn.net)

See **Aitkin County website, Department/Environmental Services** for more information on the Aitkin County Shoreland Ordinance, building permits, variances, lake classifications, and ISTS professionals. Contact information for county commissioners is also listed.  
[www.co.aitkin.mn.us](http://www.co.aitkin.mn.us)

### Aitkin County Offices:

**Assessor:** 218-927-7327;  
[assessor@co.aitkin.mn.us](mailto:assessor@co.aitkin.mn.us)  
**Attorney:** 218-927-7347  
**Highway Department:** 218-927-3741  
**Land Survey:** 218-927-7326  
**License Center:** 218-927-7057  
**Sheriff:** 1-888-900-2138; 218-927-7435  
For emergency, dial 911.  
[sheriff2@co.aitkin.mn.us](mailto:sheriff2@co.aitkin.mn.us)  
**University of Minnesota Extension:**  
218-927-2538; [mnext-aitkin@umn.ed](mailto:mnext-aitkin@umn.ed)

### Minnesota DNR

**DNR Waters/Area Hydrologist**  
1601 Minnesota Drive  
Brainerd, MN 56401  
218-828-2605

### DNR Fisheries/Aquatic Plant Management Permits

1601 Minnesota Avenue  
Brainerd, MN 56401  
218-833-8614

### DNR Conservation Officers for Aitkin County

McGregor area: 218-768-2258  
Rest of Aitkin County: 218-768-3274  
Toll Free: 888-646-6367  
Turn In Poachers: 800-652-9093

### Additional Resources:

**Aquatic Plant Management:** <http://www.dnr.state.mn.us/shorelandmgmt/apg/permits.html>  
**DNR Water Permits Requirements:** <http://www.dnr.state.mn.us/permits/water/answers.html#ohwl>  
**Dock Rules:** <http://www.dnr.state.mn.us/waters/index.html> under "Recent Developments"  
**Erosion Control for Home Builders:** <http://clean-water.uwex.edu/pubs/storm.htm#erosion>  
**General Shoreland Homeowner Information:** [www.shorelandmanagement.org](http://www.shorelandmanagement.org)  
**Non-Toxic Household Product Alternatives:** <http://www.reduce.org/toxics/index.html>  
**Rain Barrels/Gardens:**

Constructing a rain barrel:

[http://www.shorelandmanagement.org/quick/easypdf/rain\\_barrel\\_const.pdf](http://www.shorelandmanagement.org/quick/easypdf/rain_barrel_const.pdf)

Rain Garden: A How-To Manual: <http://clean-water.uwex.edu/pubs/pdf/home.rgmanual.pdf>

Rain Garden Design Fact Sheets: <http://www.appliedeco.com/NLD.cfm>

Septic System Design and Maintenance: <http://septic.umn.edu/homeowner/index.html>  
or call 800-322-8642.

### Shoreland Alterations Fact Sheets

(Docks, Rip Rap, Sand Blankets, Ice Ridges, Lakescaping)

<http://www.dnr.state.mn.us/waters/index.html>; see shoreland management

### Shoreland Landscaping:

The Water's Edge:

<http://files.dnr.state.mn.us/assistance/backyard/shorelandmgmt/savewateredge.pdf>

*Lakescaping for Wildlife and Water Quality:* Available in bookstores or from Minnesota Bookstore, 800-657-3757,

<http://www.comm.media.state.mn.us/bookstore/bookstore.asp>

*Restore Your Shore CD:* [www.dnr.state.mn.us/restoreyourshore/index.html](http://www.dnr.state.mn.us/restoreyourshore/index.html)

*Living Shore Video/DVD:* A 17-minute video showing the importance of leaving a natural buffer zone on the shore; check with the Aitkin County Extension office for a loaner copy.

