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• A GUIDE FOR •
BUYING & MANAGING
SHORELAND



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MINNESOTA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATERS

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MINNESOTA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATERS

INTRODUCTION

Water is one of Minnesota's most valuable resources. Lakes, rivers, and wetlands are important assets to Minnesotans. The "Land of 10,000 Lakes" actually has 12,034 lakes over ten acres in size and over 92,000 miles of streams and rivers. An adequate supply of clear fresh water is vital to life, agriculture, commerce and industry. Recreational use of waters provides enjoyment and contributes to the state's economy.

Water provides many benefits to Minnesotans and it is important to protect and manage it. High quality water is essential for a healthy state economy. Managing public waters and adjacent shorelands helps maintain and improve water quality. Careful management also protects and improves visual and scenic values -- qualities not easily measured until they are lost.

Education, legislation and good environmental practices by Minnesotans are important to maintaining and improving water quality and scenic resources in Minnesota.

WATERSHED MANAGEMENT

Shoreland management is important. The consequences of uncontrolled and unplanned development can be disastrous to our land and water resources. Overbuilt and poorly designed shoreland areas degrade the value of the entire water body. Increasing demand for shoreline building sites has led to skyrocketing land costs. Without controls, land with water frontage tends to be divided into smaller parcels. Scattered cottages, homes and resorts merge to form a continuous ribbon of buildings and structures along the shores of lakes and rivers, resulting in the destruction of natural vegetation and scenic beauty. A first row of crowded structures may be followed by a second and third until the entire watershed is overbuilt. Marginal lands with high water tables, severe flooding hazards or steep slopes fall under increasing development pressure after suitable lands are taken.

The consequences of overdevelopment are increased risks of flooding, pollution and scenic degradation. Nutrients like nitrogen and phosphorus, other pollutants, and improperly designed sewage treatment systems can contaminate wells and surface waters. Development in or near floodplains can reduce the natural storage capacity of the watershed, causing increased flooding threats to life and property.

Degraded property values, polluted lakes and wells, flood damages, and increased public service costs result when short-sighted thinking places immediate profits above long-term impacts and goals.

The Minnesota Legislature has long recognized the important value of the state's water resources and has taken action to preserve and protect these waters and their adjacent lands. In 1969, it enacted the Shoreland and Flood Plain Management Acts, and in 1973, the Minnesota Wild and Scenic Rivers Act. These statutes enabled the Minnesota Department of Natural Resources (DNR) to establish standards and criteria that are periodically reviewed and amended. On July 3, 1989, the revised statewide standards for shoreland management were adopted. The revised standards are included in this guide. Other programs such as Local Water Planning and the Pollution Control Agency's Clean Water Partnership also help to address the challenge of watershed management at the local government level.

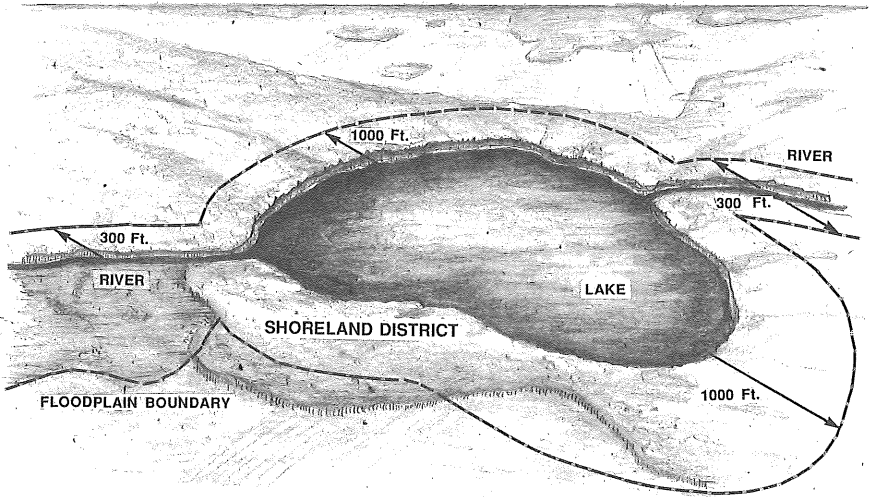
DNR WATER RESOURCE MANAGEMENT PROGRAMS

“What laws affect shoreland development and how do they work?” Shoreland Management, Floodplain Management, and Wild and Scenic Rivers are all “land use” or “zoning” programs. They require that the Commissioner of Natural Resources prepare minimum statewide development standards for shoreland, floodplain and wild and scenic river areas. Local units of government then adopt these or stricter standards in the form of local zoning or land use ordinances. For unique water resources like Lake Superior, the State has authorized special studies and plans. Local units of government formed the North Shore Management Board to deal specifically with Lake Superior.

“Why are there separate laws & programs, & how do they work?” Our lakes and rivers are unique and offer a wide variety of opportunities and challenges which these programs address.

- *The Shoreland Management Program* provides orderly development of the shoreland and protects lakes and rivers from pollution by individual sewage treatment systems and other non-point sources. The intent of this program is to encourage development of our shorelands in such a way that the water quality is enhanced and the scenic resources are preserved.
 - *The Floodplain Management Program* is intended to minimize the threat to life and property resulting from flooding. This program restricts development in floodplains by preventing structures from being built at too low an elevation in areas that have a high risk of flooding. It also controls encroachment so that the floodplain's capacity to hold flood water will not be reduced, causing flooding to properly located structures.
 - *The Wild and Scenic Rivers Program* is a program to preserve and protect rivers with outstanding scenic, recreational, natural, historical and scientific values. The program is designed to prevent damage to these exceptional rivers caused by intensive development and recreational overuse.
 - *The Protected Waters Permits Program* is the oldest regulatory program in the Division of Waters. Since 1937, work in the beds of protected waters has been controlled for the benefit of all. This permits program is administered through the Minnesota Department of Natural Resources, Division of Waters, unlike the other programs which are administered through local zoning.
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SHORELAND MANAGEMENT PROGRAM



STATEWIDE STANDARDS

The Minnesota Department of Natural Resources Statewide Standards affect all lakes greater than 25 acres (10 acres in municipalities) and rivers with a drainage area two square miles or greater. These standards set guidelines for the use and development of shoreland property including: a sanitary code, minimum lot size, minimum water frontage, building setbacks, building heights and subdivision regulations. The Shoreland Management Act regulates all land within 1,000 feet of a lake and 300 feet of a river and the designated floodplain. Local units of government with priority shorelands are required to adopt these or stricter standards into their zoning ordinance. It is always best to check with the local zoning administrator about specific regulations.

LAKE AND RIVER CLASSIFICATIONS

Minnesota's lakes range from the sterile, rock basin lakes of the Arrowhead region to the naturally fertile, shallow lakes of the southwest prairie region. Rivers vary from the urbanized Mississippi in the Twin Cities to remote streams trickling into Lake Superior. These different types of lakes and rivers require different development standards. A classification system was developed so that the appropriate development standards could be applied. Lakes and rivers are divided into the following classes based on a combination of factors.

LAKES

- 1) *Natural Environment Lakes* usually have less than 150 total acres and less than 60 acres per mile of shoreline, less than 3 dwellings per mile of shoreline, may have some winter kill of fish, may have shallow, swampy shoreline, and are less than 15 feet deep.
- 2) *Recreational Development Lakes* usually have between 60 and 225 acres of water per mile of shoreline, between 3 and 25 dwellings per mile of shoreline, and are over 15 feet deep.
- 3) *General Development Lakes* usually have greater than 225 acres of water per mile of shoreline, over 25 dwellings per mile of shoreline, and are over 15 feet deep.

RIVERS

- 1) *Remote Rivers* are primarily in roadless, forested, sparsely-populated areas in the Northeast.
- 2) *Forested Rivers* are in forested, sparsely to moderately populated areas with some roads. Northeast, Southwest and North Central.
- 3) *Transition Rivers* are in a mixture of cultivated, pasture, and forested lands.
- 4) *Agriculture Rivers* are in intensively cultivated areas, mainly southern and western areas of the state.
- 5) *Urban Rivers* are in high density residential, commercial and industrial development areas.
- 6) *Tributary Rivers* are all other rivers in the Protected Waters Inventory not classified above.

Some rivers have special classifications other than those listed above. They include designation as a State or Federal Wild and Scenic River, a trout stream or special river management district.

STATEWIDE SHORELAND MINIMUM STANDARDS

LAKES - (Sewered)

Table 1

Lake Class	Lakeshore				Non-Lakeshore	
	Lot Width (feet)	Lot Area (sq. feet)	Structure Setback (ft.)	Impact Zone (ft.)	Lot Width (feet)	Lot Area (sq. feet)
Natural Environment	125	40,000	150	75	125	20,000
Recreational Development	75	20,000	75	37.5	75	15,000
General Development	75	15,000	50	25	75	10,000

LAKES - (Unsewered)

Table 2

Lake Class	Lakeshore				Non-Lakeshore	
	Lot Width (feet)	Lot Area (sq. feet)	Struc./Sewer Setback (ft.)	Impact Zone (ft.)	Lot Width (feet)	Lot Area (sq. feet)
Natural Environment	200	80,000	150 / 150	75	200	80,000
Recreational Development	150	40,000	100 / 75	50	150	40,000
General Development	100	20,000	75 / 50	37.5	150	40,000

RIVERS

Table 3

River Class	River Shoreland			
	Lot Width (feet)	Structure Setback (ft.)	Impact Zone (feet)	Sewage Setback (ft.)
Remote	300	200	100	150
Forested	200	150	75	100
Transition	250	150	75	100
Agricultural	150	50/100*	25/50*	75
Urban & Tributary	75/100*	50/100*	25/50*	75

* Sewered / Unsewered

Note: Setbacks and the Shore Impact Zone are measured from the Ordinary High Water Level (OHWL).

STANDARDS

Development Standards - The standards specified in Tables 1, 2 and 3 have been adopted by most counties and many cities in their local zoning ordinances. Before you build a structure, install or replace a sewage treatment system, or substantially alter the shoreland landscape, you must obtain the appropriate permit. Permits are available from the local zoning administrator, usually located in the county courthouse or city hall.

Impact Zones - The areas immediately adjacent to lakes, rivers, and bluffs are critical in maintaining good water and visual qualities of these resources. Shore and Bluff Impact Zones have been created to protect these areas.

ALWAYS CHECK WITH LOCAL ZONING OFFICIALS TO VERIFY THE EXACT LOCAL REQUIREMENTS SINCE THEY MAY BE STRICTER THAN THE STATEWIDE MINIMUMS.

• **Structure Setback From:**

- Top of the bluff 30 feet
- Unplatted cemetery 50 feet
- Right-of-way line of federal, state or county highway 50 feet
- Right-of-way line of town road, public street, or other unclassified road 20 feet

- **Shore Impact Zone** - Is one-half the distance of the building setback; for agricultural land uses, the zone is 50 feet.
 - **Bluff Impact Zone** - Includes the bluff and land within 20 feet from the top. Structures and accessory facilities, except stairways & landings, must not be placed within bluff impact zones.
 - **Building Elevation** - Must be a minimum of 3 feet above the highest known water elevation.
 - **Sewage System Elevation** - Must be a minimum of 3 feet above the highest groundwater level or bedrock for all lake and river classes. A conforming sewage treatment system is required for all future development and any site improvements.
 - **Building Height** - Height limit is 25 feet in city residential districts.
 - **Impervious Surfaces** - Are not permitted to cover more than 25% of the total lot.
 - **Water-Oriented Structures** - Must be set back at least 10 feet from the OHWL and limited to one structure, i.e. a boathouse.
-

EVALUATING SHORELAND PROPERTY

“What issues should I consider when purchasing shoreland ? ”

The first and most important consideration is to ask yourself what you want from the shoreland property -- a wilderness retreat to get away from people or a friendly rural neighborhood to enjoy nature and water-related activities. Before you decide on a particular piece of shoreland, it is a good idea to spend some time in the area and to gather some information about the water body and surrounding resources. Various governmental agencies have this type of information: local government units, the DNR (Division of Fish and Wildlife has extensive data on most water bodies), county extension offices of the University of Minnesota, and the district offices of the U.S. Soil Conservation Service.

“How do local zoning ordinances affect shoreland property?”

In addition to establishing minimum lot size, building setbacks, and sewage treatment requirements, local zoning ordinances also establish “land use” or “zoning districts”. These are the same types of zoning districts that are common in cities, such as residential, commercial and industrial districts. Before you purchase shoreland property you need to confirm that your intended use (i.e. seasonal cabin, year-around home, resort, marina, etc.) is compatible with the zoning ordinance.

“What physical characteristics should be considered ?

- **Lot Size** - The lot should be large enough to accommodate your intended use, as well as comply with the local zoning requirements. Those lots which have been created since the statewide shoreland management standards took effect are large enough for most residential uses and comply with local zoning requirements. However, there are many lots which were created prior to the shoreland rules that may be substantially smaller than the new lot size requirements. These substandard lots may still be bought and sold, but they may be too small to accommodate a structure or a sewage treatment system. If you are considering buying such a lot, you should carefully review your intended use and the limitations of the property.

- **Lot Shape** - Although the size of the lot may meet zoning requirements, the shape can restrict the use and location of structures. Long, narrow lots or pie-shape lots may make it impossible to meet some of the requirements for setbacks, lot widths and sewage treatment systems. Carefully consider the compatibility of a lot shape with your intended use.

• *Topography* - Land surface elevations are important for several reasons. First, the lot should be high enough so that the dwelling will not be flooded by water level fluctuations. The site should be able to accommodate the lowest portion of the building, including the basement, at least three feet above the highest known water level.

In nonsewered areas the site must also accommodate an on-site sewage treatment system if the structure includes running water. The bottom of the sewage treatment system must be at least 3 feet above the highest known water level or bedrock. Drainfield-type sewage systems usually require an additional 2 $\frac{1}{2}$ feet of soil above the 3 foot minimum. It is necessary to have a qualified professional determine if a site can accommodate a standard sewage system. Improperly located or designed systems result in frustration and added expense to the landowner.

Erosion on steep slopes can cause problems. Many communities have specific restrictions on placement of structures and sewage systems on steep slopes, and require permits for grading, filling or vegetation removal.

• *Soil Conditions* - The soils should be suitable for your intended use. Both structures and sewage treatment systems have specific requirements. Wet soils, shallow bedrock or clay soils are generally unsuitable for soil absorption sewage treatment systems and can also make building construction difficult. A filled wetland may appear to be stable, but compaction of the mucky subsoil may cause structural failure. Even if a local permit can be obtained, it is best to avoid development in these areas.

• *Vegetation* - It is a part of the aesthetic and ecological value of shoreland property. Large trees and wooded landscapes are attractive and help to visually screen structures from the lake. Local zoning ordinances regulate the amount of vegetation that can be removed. In most communities you can remove enough vegetation to obtain a view of the lake, as long as structures and vehicles are screened. Stricter controls on vegetation removal apply within the Shore and Bluff Impact Zones. These zones must be kept in permanent vegetation. If farmed, mowed crops and pasture are allowed. Tilling is not allowed unless under an approved conservation plan.

The natural vegetation gives you clues as to the suitability of your intended use. If you want a sandy swimming beach, you should look for a lot that has one. Any alterations at or below the water's edge will require DNR approval. Fill added to wetlands is also regulated by the U.S. Corps of Engineers 404 permit program. The cost and questionable outcome of trying to develop in these areas may not be worth the effort.

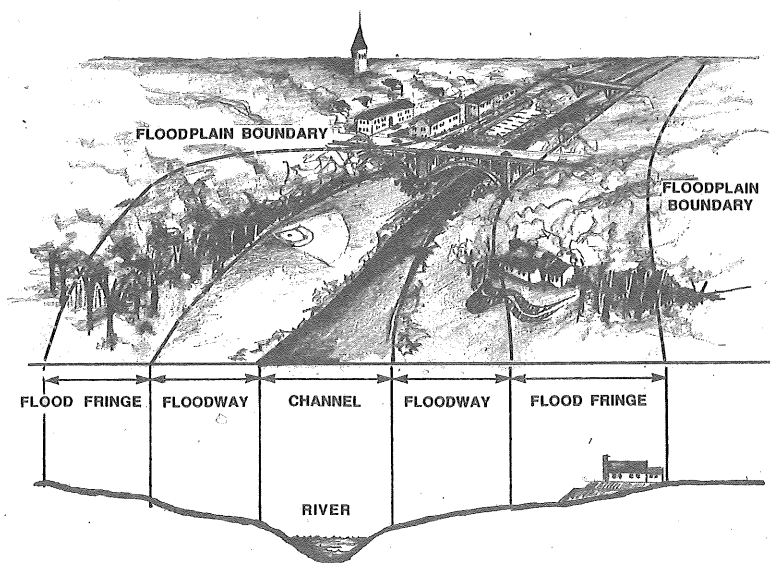
FLOODPLAIN MANAGEMENT PROGRAM

“What is a floodplain and what should I know about buying property within it?”

Under state law the floodplain is considered to be the land adjoining lakes and rivers which is covered by the “100-year” or “regional” flood. This flood is considered to be a flood that has a one percent chance of occurring in any given year. Floods of this magnitude occurred throughout the state in 1965 and 1969, and in various parts of the state in 1972, 1975, 1978, 1979, and 1987. Using sophisticated engineering and meteorological techniques, it is possible to calculate the magnitude of such a flood along those rivers where long-term flood records have been kept. Various government agencies conduct these studies and, as they become available, local communities are required by state law to adopt floodplain zoning ordinances.

The natural floodplain is an important part of our water system. It affects storm runoff, water quality, vegetative diversity, wildlife habitat and aesthetic qualities of our rivers and lakes. Any alteration of the floodplain should be carefully evaluated. Your intended use should be appropriate to the site you select. The following information about floodplains and local zoning codes deals with restrictions on developing in or near floodplains. However, remember that the least amount of alteration to the natural system is usually the most ecologically sound development decision.

If you are buying or own property on a river in a community that has adopted floodplain zoning you should consider the following points: floodway location, flood fringe location, flood protection elevation, floodproofing and flood insurance.



• *The Floodway* is the land immediately adjoining the river channel that is the natural conduit for flood waters. The floodway must remain open in order to allow flood waters to pass. When the floodway is obstructed by buildings, structures or debris, flood waters will be dammed up and will flood even greater areas upstream. Large portions of the floodplain store and later release flood waters, which reduce river flood stages. Development of these areas can result in increased flooding. Under the statewide floodplain management standards, local communities cannot allow development in the floodplain which would cumulatively cause more than a 1/2-foot increase in the height of the 100-year flood. Many communities have delineated the boundary of the floodway on zoning maps based on this 1/2-foot increase in flooding. If the property you own or are interested in buying lies within this mapped floodway, you will not be permitted to construct a dwelling or other enclosed structure, place fill material, or in any other way obstruct flood flows. Since this area must be left open to pass flood waters, only open space uses, such as farm land, residential yards or gardens, golf courses, parks, playgrounds, or parking areas, are normally allowed in the floodway.

• *The Flood Fringe* is the remainder of the floodplain lying outside of the floodway. This area is generally covered by shallow, slow moving flood waters. Development is normally allowed in the flood fringe provided that residential buildings are placed on fill so that the lowest floor, including the basement, is above the 100-year flood level. In communities that have not delineated a separate floodway and flood fringe areas on their zoning map, you will likely be asked to provide certain engineering information before you can place a structure in the floodplain. An engineer or surveyor will have to evaluate the proposed building site and furnish local officials with the necessary data to determine your property's flood protection elevation and whether your proposed building is in the floodway. Professional services and special construction methods can be a substantial expense so you should always check with the local zoning official before you buy property in a floodplain.

• *Flood Protection Elevation* refers to an elevation one-foot above the 100-year flood. The elevation of the lowest floor of a dwelling must be at or above the flood protection level. Local regulations will also require your access road elevation to be within 2-feet of the flood protection elevation.

• *Floodproofing* includes a variety of construction methods, such as watertight doors, windows, walls and bulkheads, which can be used to prevent flood waters from entering a structure. This method of flood protection is not a sure deterrent to flooding and is used only in very special circumstances where it may not be possible to place your building or accessory structure on fill. Furthermore, the State Building Code requires all floodproofed structures to be designed by a registered architect or engineer.

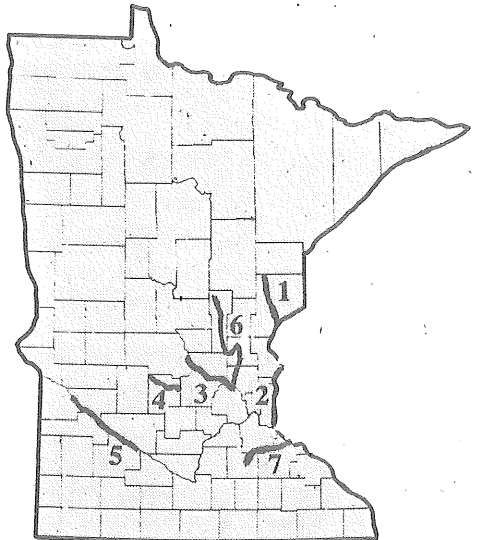
• *Flood Insurance* is important when buying floodplain property. You should be aware of the National Flood Insurance Program (NFIP), which provides flood insurance coverage for structures and their contents in communities participating in the NFIP. Under this program, federally insured or regulated institutions must require flood insurance policies on all new loans for structures in mapped floodplain areas recognized by the Federal Emergency Management Agency (FEMA). You can find out if a piece of property is located in the floodplain by checking with the local building or zoning officials (ask for the "Flood Hazard Boundary Map" or "Flood Insurance Rate Map" furnished by FEMA). If you are considering the purchase or development of floodplain property, your insurance agent can provide information on the cost and availability of flood insurance. It should be noted that flood insurance is available for structures in communities participating in the NFIP. The structure does not have to be located in the floodplain in order to obtain insurance.

WILD, SCENIC AND RECREATIONAL RIVERS PROGRAM

“What rivers and adjacent lands are preserved and protected under the Wild, Scenic and Recreational Rivers Program?”

Since 1973, the following rivers have been designated:

- 1) *Kettle River*
 - in Pine County
- 2) *Lower St. Croix*
 - from Taylors Falls to the Mississippi River (also a Federal Wild & Scenic River)
- 3) *Mississippi River*
 - from St. Cloud to Anoka
- 4) *North Fork Crow River*
 - in Meeker County
- 5) *Minnesota River*
 - from Lac Qui Parle dam to Franklin
- 6) *Rum River*
 - in Mille Lacs, Sherburne, Isanti & Anoka Counties
- 7) *Cannon River*
 - from Faribault to the Mississippi River



The protected Wild, Scenic, and Recreational Land Use District cannot include more than 320 acres of land per river mile on both sides of the river. This generally follows the road or property line nearest to an imaginary "line of sight", the approximate distance that a person can see back from the river. Check with your local zoning official on whether your property is included within this land use district.

Portions of a designated river may be managed under three different classifications. The Wild River classification is applied to those portions that exist in a free-flowing state (i.e. without significant artificial modification) with excellent water quality and adjacent lands which are essentially primitive. Scenic Rivers are those rivers that exist in a free flowing state with adjacent lands which are largely undeveloped. Recreational Rivers are those rivers that may have undergone some impoundment or diversion and that have considerably developed adjacent lands, but are still capable of being protected and preserved.

"What zoning controls affect my property?"

The local unit of government adopts zoning controls which specify allowable land uses (i.e. residences, campgrounds, temporary docks etc.), regulate subdivisions, and require special permits for alterations of the natural landscape, such as grading, filling and vegetation removal. The local county zoning ordinance will also include dimensional standards at least as restrictive as those in Tables 4 and 5. Most municipalities on rivers other than the St. Croix will have less restrictive standards. If you cannot meet the dimensional standards for your property, you must apply for a variance from the local zoning authority. Variances are granted only under certain conditions and must be approved by both the local unit of government and the DNR.

ALWAYS REMEMBER TO CHECK WITH THE LOCAL ZONING AUTHORITY TO SEE WHAT SPECIFIC ORDINANCE PROVISIONS APPLY TO YOUR PROPERTY.

"Can improvements be made to an existing home?"

Existing structures that do not meet wild and scenic zoning standards are allowed to remain as they are. However, no additions or alterations to an existing house can be made that would increase its substandard dimensions, unless a variance is approved. Ordinances for the Lower St. Croix River have additional conditions for alterations. Replacement of substandard structures are controlled by local ordinances.

"What other management programs affect river property?"

There are special management programs for the Mississippi River Headwaters Area, the Mississippi River Critical Area in the metropolitan area, portions of the central Minnesota River, and portions of the Big Fork River. Information on the programs is available from local zoning officials.

**WILD, SCENIC & RECREATIONAL RIVERS
MINIMUM STANDARDS**

Table 4

	Wild	Scenic	Recreational
Lot Size (acres)	6	4	2
Lot Width at Water Line and Building Line (feet)	300	250	200
Structure Setback From: (feet)			
• Ordinary High Water Level (OHWL)	200	150	100
• Designated Tributary	100	100	100
• Bluffline	40	20	20
Sewage Treatment System Setback From: (feet)			
• OHWL	150	100	75
• Designated Tributary	75	75	75

**LOWER ST. CROIX NATIONAL SCENIC RIVERWAY
MINIMUM STANDARDS**

Table 5

	Districts		
	Rural	Urban	
		Unsewered	Sewered
Lot Size (acres)	2 1/2	1	20,000 sq.ft.
Lot Width at Water Line and Building Line (feet)	200	150	100
Structure Setback From: (feet)			
• Ordinary High Water Level (OHWL)	200	100	100
• Bluffline	100	40	40
Sewage Treatment System Setback From: (feet)			
• OHWL	200	100	NA
• Bluffline	40	40	NA

PROTECTED WATERS PERMITS PROGRAM

"When do I need a protected waters permit?"

Under Minnesota Statutes Chapter 103G, you must obtain a protected waters permit from the Minnesota Department of Natural Resources, Division of Waters before you can begin any project which affects the bed of a protected water or wetland. This includes projects such as fill, excavation or dredging, permanent docks, wharves, harbors, boat slips, marinas and retaining walls. The reason for this law is that, although your shoreland is private property, the waters in lakes and rivers are used by the public. Before you undertake any work which might affect this public resource, the Department of Natural Resources wants to be sure that the project will not adversely affect the biological or physical condition of the lake or river. Questions regarding the procedures for obtaining these permits should be directed to one of the six regional offices listed at the back of this pamphlet.

WETLANDS

Wetlands are an important part of the shoreland which merit preservation and protection. Wetlands act as biological and mechanical filters which prevent pollutants from entering lakes, rivers and groundwater. They provide important habitat for birds, animals and plants. Wetlands are also important in controlling stormwater. Their flexible storage capacity allows flood waters to be released slowly, reducing flood damage. Federal, state and local restrictions help control the destruction of wetlands. These include the U.S. Corp of Engineers 404 Permit Program, which controls the filling of wetlands, and the DNR Waters Permit Program, which controls work in protected waters. More comprehensive measures are still needed if no net loss of wetlands is to be achieved. It is especially important that people who own or control wetlands understand their value, preserve them and use good management practices to protect them.

WATER QUALITY & SCENIC VALUE ISSUES

WATER QUALITY

High quality water is a valuable resource. The quality of water used for drinking, cooking and agriculture directly affects public health, safety and welfare. Water quality is also important for fish and wildlife habitat, recreation, transportation, and industry. The natural water system stores and cleanses water but there are limits to its effectiveness.

Water is available in surface waters, groundwater and in rain and other precipitation. It is vital to control the substances added to any of these systems in order to preserve the highest water quality.

• *Water Pollution* is the introduction of any foreign material into water, or other impact upon water, which produces undesirable changes in the physical, biological or chemical characteristics of water. Air pollution needs to be controlled because it can contaminate our water through rainfall. Both groundwater and surface waters are affected by our land use practices. Vegetation and soil are natural filters of water and help prevent foreign material from entering the water system. Wetlands also serve as filters and can actually break down some chemicals and toxins to make them less harmful.

In addition to toxic pollutants, excessive nutrients like nitrates and phosphates can degrade water quality. They are the primary cause of excessive algae and bacteria in lakes. Nutrients are introduced into the system by excessive or improper application of fertilizers in agricultural, lawn and garden uses; faulty sewage treatment systems; and concentrated storm water runoff. There are two types of pollution sources:

- *Point source pollution* comes from a specific point like a pipe.
- *Nonpoint source pollution* results from improper land management, overfertilization, erosion, and sedimentation. The amount from one source may be small, but cumulative amounts can cause severe water quality problems.

BEST MANAGEMENT PRACTICES

“What can I do to improve water quality and shorelands?”

The way land is managed has a large impact on the quality of water and ecology of lakes, rivers and shorelands. The DNR has adopted management guidelines called Best Management Practices (BMP's) that help maintain and improve quality shoreland environments.

The following are basic principles that property owners can observe to help improve water quality and shorelands. More details are available in the Best Management Practices Guides that have been prepared for agriculture, forestry management and urban areas.

• *Filter Strips* - These are areas adjacent to the shores of water bodies that help prevent contaminants from entering the water. The best filter strip is mature woodland with full ground level, mid-story and upper-story growth. The filter's effectiveness drops off as the amount of vegetation decreases. Full-height native prairie grasses along the shore are more effective as filters than short mowed lawns. The width of the filter strip also affects its filtering capability. For agricultural lands, a minimum width of 50 feet is required. Maintain or plant native vegetation over as much of the property as possible to provide the best filtration.

• *Sewage Treatment* - Maintaining a proper sewage system will prevent contaminants from leaking into the groundwater and surface waters.

• *Erosion and Sediment* - Soil erosion and sediment contain nutrients that promote excessive algae and bacteria in lakes. Stabilize and correct erosion problems as they occur by using mulch, sod and other methods to minimize soil exposure and loss.

• *Lawns and Gardens* - Carefully evaluate the need for lawn area. Watering can waste valuable groundwater. Lawns are poor at filtering out contaminants in runoff water before it enters the lake. Lawn fertilizers, pesticides and herbicides have a tendency to reach the water systems and degrade them. Plant gardens away from the water's edge, use only safe additives, and control erosion.

• *Toxic Chemicals* - Avoid using toxic chemicals as much as possible. Use biodegradable soaps and household products, and carefully handle gasoline and motor oils, especially when on or near water. Dispose of used oil, paint products and other toxins properly.

• *Storm Water Runoff* - Natural stormwater runoff can usually be handled by the natural landscape. Increased runoff can be caused by buildings, roads, driveways and patios. These changes add "hard" surfaces which are impermeable to water. Concentrations of stormwater can cause flooding, erosion and loss of valuable water which otherwise would infiltrate and recharge groundwater systems. Building sizes and hard surfaces should be minimized to help reduce the amount of runoff.

• *Species and Habitat Diversity* - Diversity applies to both the plant and animal communities. Diversity makes plant communities more interesting and stimulating to humans as well as being more ecologically sound. Diverse and balanced species populations are healthier because

they are more resistant to disease and other changes in the environment. Shoreland areas provide a unique ecological zone that is required for certain plant and animal species. Destroying this to replace it with lawn and unnecessary structures robs the community of this diversity. Once this type of landscape is destroyed, it is difficult to replace. Maintain as much of the natural landscape as possible to promote a diverse, interesting and healthy environment for plants, animals and yourself!

• *Eutrophication* - This is the process where lakes change because of an overabundant supply of nutrients. Excess phosphorus, nitrogen, and other materials in the lake cause rapid growth of aquatic weeds and algae. This growth leads to the buildup of muck on the bottom, and the replacement of sport fish, such as bass and walleyes, by rough fish like carp. No wonder eutrophic lakes are said to "age". The natural process can be slowed or even reversed by proper land use management practices and the maintenance of properly designed sewage treatment systems. It is important to remember that once a lake has become severely degraded, even the most costly methods may not be able to bring it back. Full and active participation in your local lake property owners association is the best way to see that everyone cooperates in protecting the lake from overenrichment of nutrients (eutrophication).

SCENIC VALUES AND VISUAL QUALITIES

Most people value natural river and lakeshore. Visual quality comes from a sense of the untouched "natural" look. Shoreland management recognizes this value and tries to achieve it by setting minimum standards. Shoreland property owners have the privilege and the responsibility to preserve and develop their land in harmony with the natural environment. Voluntary compliance in the following areas, in addition to the setbacks, lot sizes and other requirements mandated by local zoning, will help achieve this goal.

• *Vegetative Screening* - Native vegetation along the shore presents the most natural edge to water bodies. Preserving the natural vegetation protects the integrity of the shore. Plant additional native vegetation and replace diseased trees to improve the visual quality and screening effect.

• *Structures* usually make the most dramatic change to the appearance of the shore so they should be designed as sensitively as possible.

• *Size* - Minimize the overall size of the structure and the profile facing the water. Face appropriate rooms towards the view of the water. Don't have bathrooms, storage rooms, closets and garages or other windowless or small windowed rooms face the water. Minimize building height and excessive roofs.

- ***Building Materials*** - Select materials that are natural or have a natural appearance that blend in with the surroundings. This is important for siding as well as roofing materials.
- ***Color*** - Color adds to our environment. However, too much or inappropriately bright colors in the landscape can appear harsh. Carefully select your structure's color to blend in with the surroundings. Use accents to add color. Flowers and vegetation provide good natural accent colors.
- ***Accessory Structures*** - If an accessory structure is needed, limit it to one. Excess structures add visual clutter to the shoreland. Incorporating storage and other uses into the main structure can eliminate the need for additional structures. If required, the structures must be built according to the local shoreland zoning ordinance. Use the same design principles as above and locate the structures away from the view of the lake and public roads.
- ***Docks and Boat Storage*** - If these structures are necessary, limit their impact by keeping the size to a minimum and designing them to blend in with the shoreline.
- ***Shore Alteration*** - Maintaining natural filter strips should limit the need to alter the shore. Erosion control devices such as retaining walls can have a negative visual impact. The DNR discourages the construction of retaining walls because of their unnatural appearance and high failure rate. Shoreline alterations should be designed as sensitively as possible, using natural materials such as rock riprap and vegetative screening. A DNR WATERS PERMIT MAY BE REQUIRED.

SUMMARY

“What can I do to protect and improve water resources?”

Water resources are one of the most valuable assets of Minnesota. These natural resources along with the rest of our natural environment provide many benefits to people and wildlife. In addition to actively practicing “Best Management Practices”, you can get involved in learning more about water quality and land use issues. Your lakeshore association and local government are good places to begin. Through programs, such as local water management or voluntary lake monitoring, you can help to educate yourself and others to the principles of sound water management. You can become an active participant in preserving, protecting, and enhancing land and water resources.
