

Minnesota's Lakefront Development Problem: A Critique of Current Regulation and Recommendations for a Sustainable Future

Overview

Minnesota's lakes sustain diverse ecosystems, an economically important tourism industry, and countless ecosystem services. Arguably the most critical habitat in a lake is the shallow, near-shore zone referred to as the littoral zone, which is strongly affected by the adjacent riparian land and is important at various life stages for many aquatic and semi-aquatic organisms. This habitat is becoming degraded as the pressure of lakefront development increases the number of properties and docks, the severity of erosion and runoff, and the clearing of aquatic and terrestrial vegetation. With such a critical habitat at stake, the state of Minnesota has enacted legislation which provides for the protection and rehabilitation of the shoreland and aquatic vegetation. However, the efficacy of this legislation is limited by budget constraints, unclear language, and poorly informed property owners. This paper will first situate the lakeshore habitat problem within the context of the Minnesotan culture, economy, and ecosystem. Having shown the value of this resource, it will explain in detail the current regulatory frameworks which address lakeshore issues and the process through which stakeholders influenced them. Finally, seven recommendations are made for the future management of lakeshore properties.

Minnesota: The Land of 10,000 Lakes

Minnesota is defined by its lakes, as the state's nickname would imply. In fact, the state is home to 11,842 lakes of 10 acres or more (MDNR 2007a). There are over 13 million acres of surface water, and these have been utilized for a wide variety of uses. Residents and non-residents alike place great value on the aquatic habitats for which the state is famous. While water is only valued significantly in some areas of the country for its consumption, in Minnesota the law and the citizens recognize significant ecosystem services which it provides.

Minnesota's tourism provides enormous economic support to the state, accounting for \$10 billion per year (Clean Water Initiative 2007). The state is ranked first nationally in the sales of fishing licenses per capita which the Minnesota Department of Natural Resources (MDNR) and direct expenditures on sport fishing alone account for \$1.58 billion annually (MDNR 2007b). The industry is an especially substantial source of income to rural areas of central and northern Minnesota, where the majority of lakes and rivers are located.

Over the past 70 years, Minnesota's waters have seen increasing shoreline development (Figure 1). This rise in development has been concurrent with impacts to shoreline habitats such as docks, vegetative clearing, erosion, and habitat loss (Conservation Resources Planning 2007). A representative example of this development is the town of Brainerd, MN. Three-year growth projections exceed 60 percent, and it ranks 27th nationally in growth for a micropolitan area during the past decade (North Central Lakes Collaborative 2007).

Minnesota's lakes represent a variety of ecosystems, with species of warm, cool, and coldwater habitats of most major lake types. The natural variation in the landscape, caused by glaciation, has created a patchwork of varying ecotypes throughout the state. There are 158 species of fish on record in the state (MDNR 2007b), more than any bordering state and well above the national average (Diana, 2007)

Shoreline Habitat: The Cornerstone of the Lake Ecosystem

The shoreline habitat is by definition the boundary between water and land. As such, this zone regulates the effects of the land on the water as well as the water's effects on the land. These

processes create or destroy the value which we gain from the lake through ecosystem services, and are often overlooked in favor of more shortsighted goals.

The presence of aquatic vegetation, woody debris, and other natural substrates absorb wave energy and reduce bank erosion. These elements are naturally common within the littoral zone, an ecologically defined area which is shallow enough to allow sunlight penetration to the bottom. Furthermore, they provide habitat for many aquatic species, including waterfowl, fish, and invertebrates. Studies have shown that the removal of aquatic vegetation negatively impacts the lake ecosystem (Wege and Anderson 1979).

At this interface between land and water, the land also contributes to the aquatic ecosystem. The removal of trees in the riparian zone, an area which is ecologically defined as that which affects a water body, has been correlated with lakeshore development and shown to impair spawning in fish such as the muskellunge (Zorn et al. 1998). The natural input of woody habitat has declined as property owners clear plots for a lawn and remove woody debris from the littoral zone. The clearing of native vegetation from riparian land also diminishes the land's ability to absorb and slow runoff, leading to sedimentation in lakes. Further, the shallow root systems of the lawns common in most developed locations are not strong enough to withstand wave action, and erosion damages the shoreline further. Such degraded systems provide little or no habitat for animals such as muskrats, wading birds, green frogs, or waterfowl, which rely specifically on the shoreline habitat for survival (MDNR Division of Ecological Services 2007).

Not only does the shoreline provide ecosystem function for the lake and riparian habitats, it also has aesthetic value for boaters and landowners. Current Minnesota statutes recognize this explicitly in the requirement that structures must be hidden through setback from the water's edge, vegetation, topography, color, and other means to reduce visibility (Box 1).

Current State Regulation

The increasing impacts of riparian land use and shoreline degradation as well as the collective damages from aquatic vegetation removal, dock building, and habitat removal necessitate a substantial regulatory framework. These frameworks are provided in Minnesota through two main regulatory methods: statutes and rules. Statutes are the codification of laws passed by the state legislature, and rules are created by designated agencies as interpretations of statutes, having the force and effect of law. Together, these comprise the regulatory aspect of Minnesota's shoreland management. A third more proactive approach is the Shoreland Habitat Restoration Grant Program. The following is a summary of current Minnesota shoreland policy.

Current State Regulation: Shoreland Regulation

Shoreland regulation is enforced mainly through Minnesota Statutes 103B (Lake Improvement), 103 F (Shoreland and Floodplain Management), and 103G (Public Waters and Public Wetlands). Chapter 6120 of Minnesota Rules, "Shoreland and Floodplain Management," provides additional clarification to the statutes, extending their influence even further in some places.

Minnesota Statute 103F provides the most extensive guidance on shoreland management, and is codified as Minnesota Rule 6120. The purpose of the statute is, "in the interest of the public health, safety, and welfare to:

- (1) provide guidance for the wise development of shorelands of public waters and thus preserve and enhance the quality of surface waters
- (2) preserve the economic and natural environmental value of shorelands
- (3) provide for the wise use of water and related land resources of the state." (Minnesota Office of the Revisor of Statutes 2007)

These statutes are laid out by the state, but used as guidance for policy by each county. The county is responsible for drafting, gaining approval of, and adopting ordinances which are in substantial compliance with the guidelines set out by the statutes. Therefore, the statutes themselves are to be read as minimum standards by which counties *should* be enacting and enforcing ordinances.

Zoning provisions were incorporated into Rule 6120 as explicit acknowledgements of the costs associated with high density development, including the maintenance of “natural characteristics of shorelines,” along with more traditional measures such as property value (Box 2). This is an example of language within the Rule which emphasizes not only anthropogenic concerns, but also those characteristic of a deep ecological perspective which views humans as part of an ecosystem and recognizes the inherent value of that ecosystem.

Riparian buffers have long been a tool in eliminating runoff and erosion while improving habitat. The zoning provisions utilize this tool by setting distances from the high water mark, beyond which a structure can be built (Box 3). This provision effectively prohibits new structures from being built within a buffer area, referred to in the rule as setback. These regulations are part of a package which sustains the shoreline buffer, thus reducing the need for riparian vegetation removal.

Zoning provisions are determined according to lake classification. Lakes are classified as general development, recreational development, and natural environment. The tiered system of regulation is used to protect more critical habitats (i.e. natural environment lakes) while allowing more intensive use in degraded habitats (i.e. general development lakes). This approach favors saving what is left of the “natural environment” while placing increased stress upon systems which are already in poor condition. One interpretation of this shortcoming is that it is an exacerbation of already existing problems, while a more positive approach views it as increased protection above the baseline for natural areas.

Subpart 4 of Rule 6120.3300 provides guidance on allowable vegetation clearing (Box 4). These rules specifically limit the removal or alteration of vegetation, except for in silviculture or agricultural use. Intensive vegetative clearing is not allowed within the shore and bluff impact zones, thus attempting to prevent the loss of native riparian vegetation. The shore impact zone is defined as an area within half the structure setback distance from shore [as defined by 6120.3300 Sup. 3 A (1)]. However, some low intensity clearings are allowed to provide physical and visual access to the water. These “low intensity clearing” exceptions provide leeway during permit authorization, and cloud the level of acceptable clearing.

The shoreland management regulated through Section 103F represents a comprehensive approach to managing the state’s riparian habitats. Its strength is in the permitting process as regulated by counties in siting new structures and in the protection of riparian vegetation. Other portions of the rule place a minimum size on each lot, regulate agricultural and silvicultural uses, and place restrictions upon the siting of impervious surfaces.

Section 103F is set to be reviewed and rewritten in 2008 to improve upon the most recent version. A pilot project commissioned by the governor charged five counties with creating their own Shoreland Management Standards which were to exceed the statewide standards. The process operated through the Shorelands Standards Update Advisory Committee, and gained stakeholder involvement through public meetings and hearings which included stakeholders of many varieties. Among the involved interests were real estate, development, environmental planning, lake associations, local governments, and construction. This progressive committee put forth standards which exceeded the state’s with respect to aquatic vegetation

The Alternative Shoreline Standards are significantly stronger in their support for native riparian vegetation (Box 5). Shoreline buffers must include native plants and be located within the shore impact zone. The shore impact zone is defined as an area within half the structure setback

distance from shore (as defined by 6120.3300 Sup. 3 A (1)). The explicit description of the shoreline buffer zone enables more efficient management through verifiable and clear language. While the current statewide standards and the alternative standards both provide for “limited clearing of trees and shrubs,” the alternate standards specifically delineate rule for this “recreation area” and limit it to between 150 and 450 ft².

The Alternate Shoreline Standards are in use by the five counties in the North Central Lakes Pilot Project. One of the cities included within these counties is Brainerd, a rapidly expanding city typical of many Minnesotan towns. The project has created interest amongst other counties, and currently at least fifteen states have considered or already implemented elements of the Alternate Shoreline Standards (Figure 2). These strengthened standards prioritize the shoreline buffer even further than the original standards, and implicitly place greater value the ecosystem services they provide for the lake. As the Shoreline Standards are updated in 2008, it is important that these new and progressive regulations be incorporated into statewide statutes.

Section 103B provides for the creation of Lake Improvement Districts (LID's), which operate as agents of the county and can be given the ability to create rules for the county under 103F as well as issue permits. LID's are a system by which direct input from stakeholders within a county can be obtained and within which conflict resolution is meant to occur. The LID is a watershed-based approach, focusing on watersheds within a county, and therefore must designate its own boundaries upon inception (Minnesota Office of the Revisor of Statutes, 2007). At this point, only 24 LID's have been formed out of Minnesota's 85 counties, with recent increases due to interest in protecting against invasive aquatic plants (Otterson 2007).

Aquatic plants are claimed as property of the state and regulated under MS 84.091 and MS 103G.615 (Box 6). The state turns over the regulation of aquatic plants to the MDNR, who allows for small-scale unregulated removal and large-scale regulated removal via permits. To clear submerged aquatic vegetation, the area cleared must be smaller than 2,500 ft² and must be the lesser of 50 ft. or half of the property's shoreline (MDNR 2007c). In addition, the area must not have emergent vegetation, be in a posted fish spawning area, located adjacent to an undeveloped shoreline, or in a location which does not interfere with recreation. For more extensive removal, a permit is necessary. In 2006, 4,297 permits were issued in Minnesota for aquatic plant management in almost one thousand lakes (MDNR Division of Ecological Services 2007). Over the past 15 years, the number of public waters with permits issued has doubled (Figure 3). These numbers reflect growing numbers of riparian users, increasing perceived need to clear vegetation, and ultimately the increased clearing of aquatic vegetation.

Current State Regulation: Minnesota Shoreland Habitat Restoration Program

As with many regulatory frameworks, the Minnesota Rules and Statutes were long criticized for being all “stick” and no “carrot.” The regulations limited development and riparian owner's options in renovation. These short-term costs were sacrificed for long term gains, which are realized both by the individual and the lake community in this commons. However, Minnesota has begun a program which provides strong incentive for lakeshore owners to improve their property in an ecologically sound way. The program rewards the restoration of native plant communities, ecological buffers, complex habitats, and hydrologically sound landscaping. The Shoreland Restoration Program makes over \$300,000 in grants available across the state. Property owners can seek anywhere between \$10,000 and \$75,000 in cost-sharing funds for the individual project (MDNR 2007d). Approved projects must restore at least 75% of shoreline with a buffer zone of over 25ft. This progressive legislation also places explicit value upon the ecosystem services offered by the lakeshore and aquatic vegetation.

Recommendations

Given the regulatory frameworks in place now, there are seven recommendations presented here which could improve the efficacy of current policy. The regulations address both the laws on the books and the enforcement thereof, and therefore are interdependent for success. As such these recommendations should be considered and adopted as a package.

(1) The initial recommendation is to adopt the Alternative Shoreline Standards which are already in use by the North Central Lakes Pilot Project. These standards are progressive in their approach in that they explicitly delineate the shore impact zone, and in doing so create a measurable and enforceable standard to which property owners must comply. By eliminating the unclear language of the current standards, it is much harder to bend the law.

(2) There is a necessity for the explicit valuation of woody habitat with the aquatic ecosystem. The legacy of logging through the Upper Midwest has left many formerly wooded areas denuded of fallen timber. The development of shorelines is cutting into this forested cover even further. With fewer and fewer trees in the riparian zone, there is decreased recruitment of woody cover into lakes. Wood supports invertebrate, fish, mammalian, and waterfowl communities through habitat and nutrients. It is a critical component in spawning, predation, and defense for many species. There are no specific rules which address this crucial component of the habitat, and this must be included in the regulation. A reasonable suggestion would be to add regulation which designates wood on the lake bottom as property of the state much as the vegetation of the lake bottom is today.

(3) Create a more extensive application process for the removal of submerged aquatic vegetation; one which is rigorous in accepting only the strongest claims for vegetation removal. The increasing number of vegetation clearing permits is a sign that standards are easing and that impacts are increasing. The causes for this increased demand are many. There are more riparian owners, and these owners are increasingly suburban. This removed connection from the local land and water discourages an understanding of the cause and effect relationship with aquatic vegetation and reduces the costs to an owner not present to bear them. Furthermore, a lack of knowledge on the part of riparian owners as to the function of aquatic vegetation precludes ability to make a rational choice. On top of that, plot sizes have diminished, leaving the allowable clearance with out a permit to become insufficient.

(4) The current legislation raised \$288,603.36 in funds through the aquatic vegetation removal program (MDNR Division of Ecological Services 2007). The average payment for a permit was only \$24. This removal negatively impacts the entire lake ecosystem, and a \$24 fee isn't likely to deter many property owners from deciding to remove vegetation, especially when they are paying upwards of \$3300 for a McCrarry WeedRoller (Boat Hoist Direct 2007). These mechanized weed clearing machines will clear a radius of 21 ft. automatically, encouraging vast degradation of the lakeshore vegetation. Since the lake represents a commons, costs such as shoreline degradation are borne upon the entire community. It is necessary to mitigate such damage to the extent that one user's choices don't decrease other's value obtained from the resource. Massive vegetation clearing can decrease water clarity, sportfish productivity, and create foul odors which reduce the value of property and aesthetics as well as ecosystem function.

Increased funding through the permitting system should provide the necessary rehabilitation on a given lakeshore. There are three distinct possibilities to offset reasonable use clearings, each attempting to achieve a slightly different goal. The first is similar to current wetland law administered by the Corps of Engineers. When a project is permitted to fill or otherwise destroy a

wetland, another ecologically functional wetland must be constructed. The parallel for this process would be through permits for vegetative clearings. Permit applications would include a specific project which restores native vegetation in a natural setting, and this vegetation would be functional and of the same size and type as that which was removed. Such a vegetation banking system would require the creation of habitat within the same lake or lake chain, as defined by state boundaries. A local no net loss goal would allow reasonable use while maintaining ecosystem function. It would further increase revenue and generate economic opportunities through consulting and lakescaping. A second, more traditional approach, would increase the cost of permits (currently allowed up to \$750) for the clearing of aquatic vegetation. Since it is more costly to replace vegetation than it is to protect existing vegetation, and since the ecosystem function of created habitats is often lower than that of a natural one, it makes economic and ecological sense to encourage protection. With this approach, permits would be set at cost-prohibitive levels, thereby discouraging the removal of aquatic vegetation to those unwilling to pay the fee. Finally, the third approach would be to increase the fee structure to maximize profits. Since riparian owners are frequently spending over \$3,000 on removal devices, the demand for permits near the average permit price of \$24 is likely inelastic. Increases in price would not significantly reduce demand, but would raise more funds. The state should price permits according to demand in an effort to maximize profits. These funds could be used to significantly enhance the Minnesota Shoreland Habitat Restoration Program, thus offsetting losses through other habitat gains.

(5) Enforcement of the current regulations has the most substantial and feasible gains. Current Rules and Statutes already specifically prohibit the removal of aquatic vegetation above a specified and easily regulated amount. They also regulate the non-intensive clearing of vegetation and specifically prohibit the intensive clearing of vegetation. While there is little available data on the actual amount of lots in compliance with regulation, informal surveys of dock compliance may be a good indicator. In surveys completed through the DNR on Lake Bertha and Lower Hay Lake, a total of 7.8 miles of shoreline were investigated. On Lake Bertha there were 158 docks, of which 8.2% were illegal. (Wallschlaeger et al. 2007a). On Lower Hay Lake the problem is even worse, with 12.8% of the 141 docks being out of compliance (Wallschlaeger et al. 2007b). The fact that such high percentages of illegal docks are in place is the result of local governments looking the other way. Some may argue that it is too expensive to go out and measure each dock for compliance. This doesn't make sense, though, since the funds generated from the violation tickets would surely bring in more than enough to pay the field teams. The same argument can be made for intensive riparian vegetative clearing. There are many properties which are in clear violation of the code, but have survived unscathed by the law only due to the lack of enforcement. Rules and Statutes are nothing without enforcement, and it is up to the counties to enforce them. If the counties are not able to comply, state agencies such as the DNR and the Commissioner of Natural Resources are responsible for stepping in.

(6) Education of the public also could potentially serve as a vehicle for mitigating habitat destruction. As the typical riparian owner becomes more and more likely to be of suburban origin and not residing locally, the effects and consequences of their actions become less clear to them. For example, a property owner who only visits a few times a summer and clears submerged vegetation from the adjacent littoral zone will likely not bear the foul odors produced as it decomposes, but their neighbors will. Unwittingly, such owners may destroy native riparian and aquatic vegetation through a lack of understanding and appreciation for their value to the ecosystem. The DNR needs to take a proactive stance in educating the public about the benefits provided by native vegetation and woody habitat. The most critical target audience is those who are not aware of these benefits, and are therefore not likely to seek out information on them. While the DNR has extensive information available through its website for those interested, the critical

audience is likely not going to navigate to these pages. As a steward for the lake ecosystems across the state, the DNR has the responsibility to educate all property owners about the ecosystem services of native vegetation, buffers, aquatic habitat, and functional shoreline ecosystems. One possible way to do this is to institute a mandatory lecture for those wishing to put a dock in. Attendance would be ensured through a sticker which can be displayed on the end of the dock and checked easily and yearly by a DNR official. Another less time intensive method would be to distribute fliers in mailboxes of riparian property owners. Since the state has records of all riparian owners already, it should be possible to send each one an informational packet which plainly emphasizes the value of a preserved shoreline habitat. While the costs of an action such as this would be initially high, it would be a one-time transaction which could be supported by increased permitting fees for other activities (such as wood or vegetation removal). After this, a flier could be sent in connection with riparian real estate transactions. By convincing lakeshore owners that conservation of their habitats is in everybody's self interest, there is a potential for greater self-regulation as well as reporting of violators.

(7) Since most regulations are only regulated through the permitting process, many riparian property owners find loopholes through being grandfathered in. While it would be unreasonable to expect all structures to be relocated to the required setback, there are often examples of renovations which do not require permitting, yet constitute infractions of the Rules and Statutes. These have been traditionally included in a compromise between county officials and property owners as reasonable use, which provides leeway for closer development etc. There is little inspection of landscaping and other practices which affect riparian and littoral habitats, as these typically do not require permitting or notification of activities. As such, potentially unwitting citizens could illegally clear vegetation and there wouldn't be any consequences. There exists a need for a comprehensive survey and notice of compliance, and this starts with educating the public as to when a permit is needed for clearing, building upon, or modifying riparian and littoral habitats.

The state of Minnesota faces growing concerns during this pivotal time for shoreline habitats. It is important that these recommendations be followed in order to assure that the Rules and Statutes accomplish the goals intended by the legislation for the sake of all riparian owners. Through more effective legislation, enforcement, and education, Minnesota can sustainably manage its lakeshore ecosystems into the future.

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Appendix

Figure 1.

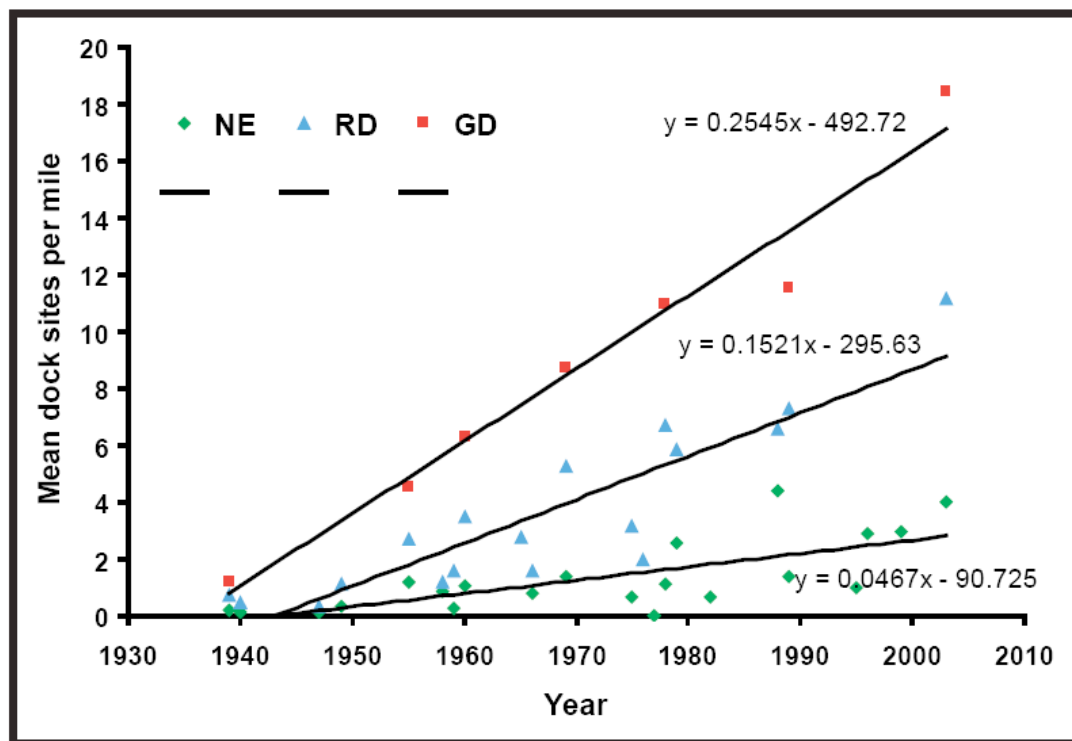


Figure 1 illustrates the dramatic increase in the density of docks over the past 70 years. Docks represent a well correlated surrogate for lakeshore development and housing density, thus evidencing the increasing pressure of development on lakeshores. Natural environment lakes (NE) experienced less growth than recreational development lakes (RD) or general development lakes (GD). Figure from Conservation Resources Planning, 2007

Figure 2. Counties Using of Considering Alternate Shoreline Standards

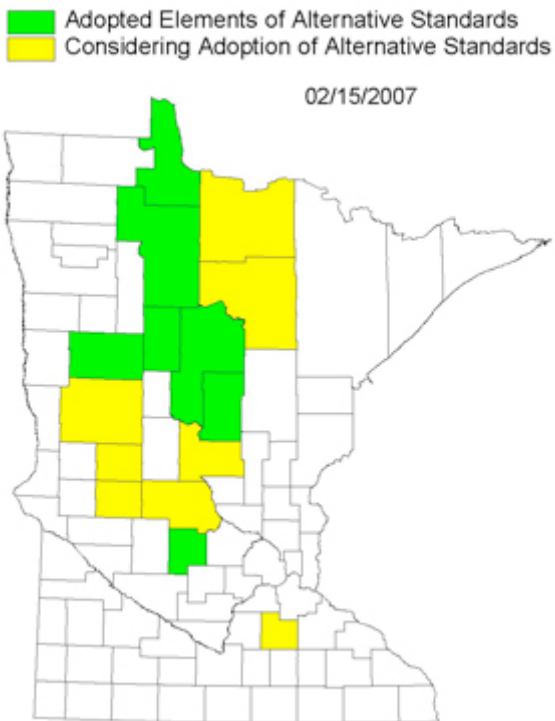


Figure 2 shows the distribution and number of counties which have adopted or considered elements of the revised and strengthened Alternate Shoreline Standards (MDNR 2007e)

Figure 3. Permits Issued for Mechanical and Chemical Control of Aquatic Vegetation.

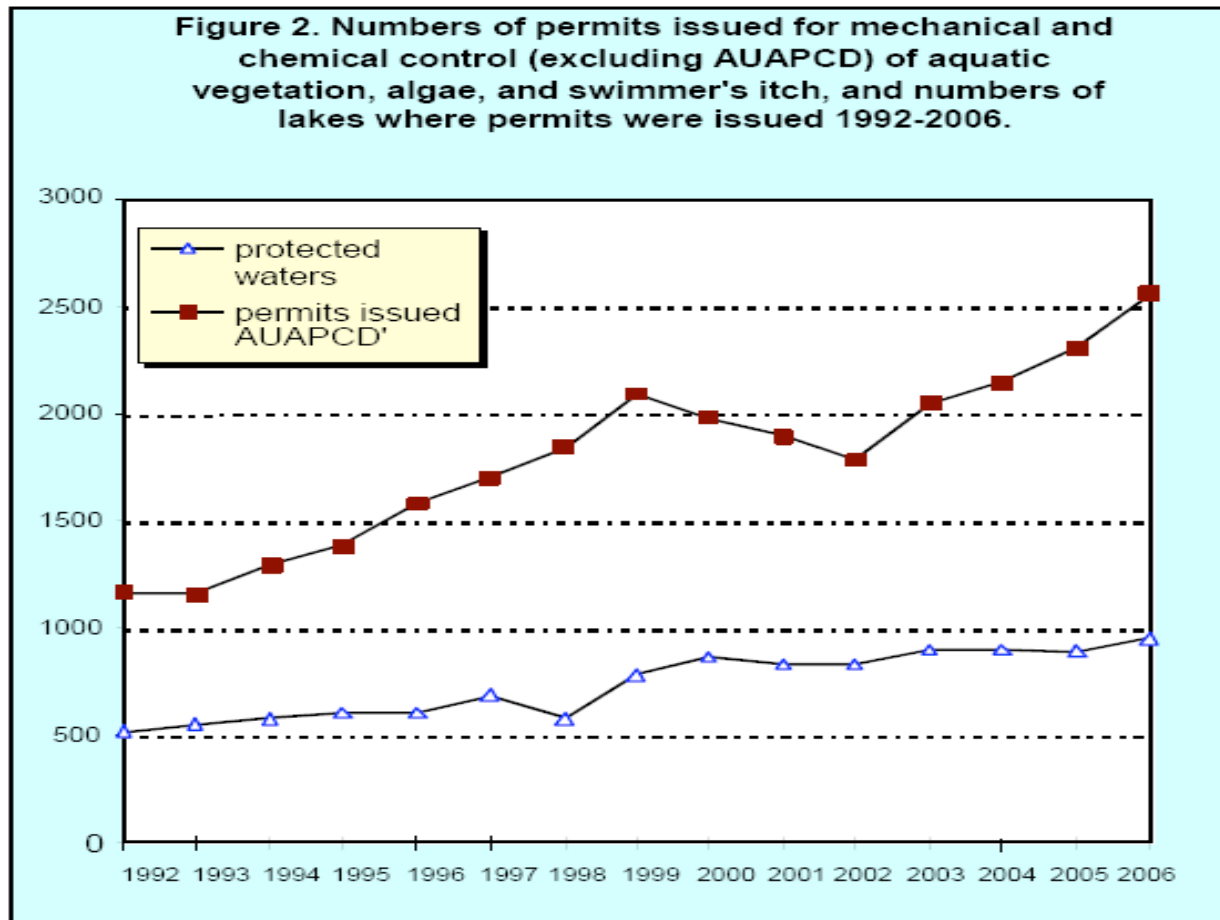


Figure 3 illustrates the number of aquatic vegetation removal permits issued since 1992, showing a dramatic rise and more than double the permits issued for the same number of water bodies.

Box 1. *Selected Minnesota Rules (Minnesota Office of the Revisor of Statutes, 2007).*

Rules Chapter 6120: 6120.3300 ZONING PROVISIONS: Subp. 3, (H), 3. The structure or facility must be treated to reduce visibility as viewed from public waters and adjacent shorelands by vegetation, topography, increased setbacks, color, or other means acceptable to the local unit of government, assuming summer, leaf-on conditions.

Box 2. *6120.3300 Zoning Provisions (Minnesota Office of the Revisor of Statutes, 2007).*

Subpart 1. Purpose. To manage the effects of shoreland and water surface crowding, to prevent pollution of surface and ground waters of the state, to provide ample space on lots for sewage treatment systems, to minimize flood damages, to maintain property values, to maintain historic values of significant historic sites, and to maintain natural characteristics of shorelands and adjacent water areas, shoreland controls must regulate lot sizes, placement of structures, and alterations of shoreland areas.

Box 3: *6120.330 Zoning Provisions, Subpart 3 (Minnesota Office of the Revisor of Statutes, 2007).*

6120.3300 ZONING PROVISIONS.

Subp. 3. Placement and height of structures and facilities on lots. When more than one setback requirement applies to a site, structures and facilities must be located to meet all setbacks. The placement of structures and other facilities on all lots must be managed by shoreland controls as follows:

A. Structure setbacks. The following minimum setbacks presented in the following table for each class of public waters apply to all structures, except water-oriented accessory structures and facilities that are managed according to item H:

(1) Structure setback standards

Class	Ordinary high water level setback (feet)		Setback from top of bluff (feet)
	Unsewered	Sewered	
Natural environment	150	150	30
Recreational development	100	75	30
General development	75	50	30
Remote river segments	200	200	30
Forested and transition river segments	150	150	30
Agricultural, urban, and tributary river segments	100	50	30

B. High water elevations. In addition to the setback requirements of item A, local shoreland controls must regulate placement of structures in relation to high water elevation. Where state-approved, local flood plain management controls exist, structures must be placed at an elevation consistent with the controls.

Box 4. *6120.330 Zoning Provisions, Subpart 4 (Minnesota Office of the Revisor of Statutes, 2007).*

6120.3300 ZONING PROVISIONS.

Subp. 4. Shoreland alterations. Vegetative alterations and excavations or grading and filling necessary for the construction of structures and sewage treatment systems under validly issued permits for these facilities are exempt from the vegetative alteration standards in this subpart and separate permit requirements for grading and filling. However, the grading and filling conditions of this subpart must be met for issuance of permits for structures and sewage treatment systems. Alterations of vegetation and topography must be controlled by local governments to prevent erosion into public waters, fix nutrients, preserve shoreland aesthetics, preserve historic values, prevent bank slumping, and protect fish and wildlife habitat. Public roads and parking areas, as regulated by subpart 5, are exempt from the provisions of this part.

A. Removal or alterations of vegetation, except for forest management or agricultural uses as provided for in subparts 7 and 8, is allowed according to the following standards:

(1) Intensive vegetation clearing within the shore and bluff impact zones and on steep slopes is not allowed. Intensive vegetation clearing outside of these areas

is allowed if the activity is consistent with the forest management standards in subpart 8.

(2) Limited clearing of trees and shrubs and cutting, pruning, and trimming of trees to accommodate the placement of stairways and landings, picnic areas, access paths, livestock watering areas, beach and watercraft access areas, and permitted water-oriented accessory structures or facilities, as well as providing a view to the water from the principal dwelling site, in shore and bluff impact zones and on steep slopes is allowed, provided that:

- (a) the screening of structures, vehicles, or other facilities as viewed from the water, assuming summer, leaf-on conditions, is not substantially reduced;
- (b) along rivers, existing shading of water surfaces is preserved; and
- (c) the above provisions are not applicable to the removal of trees, limbs, or branches that are dead, diseased, or pose safety hazards.

(3) Use of fertilizer and pesticides in the shoreland management district must be done in such a way as to minimize runoff into the shore impact zone or public water by the use of earth, vegetation, or both.

Subp. 4. Shoreline buffer standards.

Alterations of natural vegetation and topography shall be controlled by local governments to prevent erosion into public waters, fix nutrients, infiltrate rainwater runoff, preserve shoreland aesthetics and historic values, prevent bank slumping, limit direct and indirect impacts on water quality, and protect fish and wildlife habitat.

A shoreline buffer, consisting of trees, shrubs, and ground cover of native plants and understory, shall be required. Vegetation removal necessary for the construction of structures and sewage treatment systems under validly issued permits for these facilities shall be exempt from the standards in this subpart. However, the grading and filling conditions of this subpart must be met for issuance of permits for structures and sewage treatment systems. Public roads and parking areas, as regulated by subpart 5, and public swimming areas are exempt from the provisions of this part. Shoreline buffers standards shall include the following:

A. Removal or alterations of natural vegetation, except for forest management or agricultural uses as provided for in subparts 7 and 8, shall follow these standards:

- (1) A shoreline buffer shall exist within the shore impact zone, consisting of trees, shrubs, and low ground cover of native plants and understory in a natural state.
- (2) Vegetation clearing and removal of ground cover, including leaf litter and the forest floor duff layer, within the shore and bluff impact zones and on steep slopes shall not be allowed, except as follows:

(a) limited clearing of trees and shrubs, and cutting, pruning, and trimming of trees to accommodate the placement of stairways and landings, access paths, view corridors, recreation use areas, and permitted water-oriented accessory structures or facilities shall be allowed within the shore impact zone. Trees, shrubs, and a low ground cover consisting of native plants and understory shall be maintained in a natural state within this area. An access path permitted within this area shall not exceed a cleared width of 6 feet and must be oriented generally perpendicular to the shoreline. Only one shoreline recreation use area shall be allowed on each residential lot and it shall not exceed the following dimensions:

Class or District	Width (the maximum distance in feet parallel to shore)	Length (feet)
Special Protection	10	15
Sensitive Area	10	15
Natural Environment	10	15
Recreational Development	20	15

General Development	30	15
Remote River segments	10	15
Forested and transition river segments	20	15
Agricultural, urban, and tributary river segments	30	15

For conservation subdivisions, planned unit developments and new resorts, shoreline recreation use areas shall be no larger than 20 feet in width along the shoreline for each 100 feet of shoreline, not to exceed 5000 square feet in total area, with the depth of the shoreline recreational area not exceeding 25 feet landward from the ordinary high water level. A perennial ground cover shall be maintained to prevent erosion on all shoreline recreation use areas, and a tree canopy shall cover half of the area to intercept rainfall and lessen erosion potential.

(b) limited clearing of trees and shrubs, and cutting, pruning, and trimming of trees to accommodate the placement of stairways and landings, and access paths shall be allowed in bluff impact zones and on steep slopes. Trees, shrubs, and a low ground cover consisting of native grasses and plants shall be maintained in these areas.

(c) The removal of trees or branches that pose a safety hazard shall be allowed.

(3) Removal of trees and shrubs within the secondary shoreline buffer zone may be allowed, provided that a well-distributed stand of trees and shrubs are maintained. A welldistributed

stand of trees and shrubs means that a tree and shrub canopy covers over 50 percent the area. A ground layer of predominantly perennial vegetation, such as grass, flowers, forbs, or preferably native plants, shall be preserved, established or maintained in this area.

B. Use of fertilizer shall not be allowed within the shore impact zone. Use of fertilizer and pesticides elsewhere within the shoreland management district must be done in such a way as to minimize runoff into the shore impact zone or public water.

C. Vegetation within the shore impact zone shall be maintained to screen structures with trees and shrubs so that the structures are at most 50 percent visible from public waters during summer, leaf-on conditions.

D. No impervious surfaces shall be allowed within the shore impact zone, except for boat launches, stairways, lifts or landings, and, where permitted, one water-oriented accessory structure.

E. Open areas and lawns within the shore impact zone, except those allowed in part A, shall be left unmowed or replanted with native vegetation of trees and shrubs to establish and maintain a vegetative buffer, with a natural ground layer of understory plants.

The shore impact zone shall be brought into compliance with the requirements of the standards in this part by restoration to no less than 50 percent tree and shrub canopy coverage and establishment of natural ground cover within the shore impact zone upon issuance of any variance or permit, or alternatively, the local government shall implement a mitigation scoring system that includes planting or maintaining a natural vegetated buffer zone along with other measures, such as the removal of structures that do not meet structure setbacks standards from ordinary high water level, reestablishment of a shoreline berm, removal of water-oriented accessory structures, removal of impervious surfaces within the shore impact zone, reduction of impervious surface coverage on the parcel, restoration of wetlands, stormwater management, or other conservation designed actions.

Local governments may also require the shore impact zone to be brought into compliance

upon the conveyance of the lot.

F. Land disturbing activities within the shoreland management district shall be controlled by local governments. These controls must also apply for subdivision, variance, building permit, and conditional use permit reviews. Local shoreland controls shall meet or exceed the following standards:

- (1) Filling of any wetlands within the shore impact and secondary shoreline buffer zones shall be prohibited.
- (2) Natural swales, depressions, steep slopes, and topsoil shall be preserved. Alterations to these areas may only be permitted in conjunction with erosion control, stormwater management, and vegetation buffer plans that are approved by the local government and effectively implemented.
- (3) Excavation or placement of more than 5 cubic yards of material within shore impact zone may be permitted provided that erosion control, stormwater management, and vegetation buffer plans are approved by the local government and effectively implemented.
- (4) Alterations must be designed and conducted in a manner that ensures only the smallest amount of bare ground is exposed for the shortest time possible.
- (5) Mulches or similar materials must be used for erosion control, where necessary, for temporary bare soil coverage, and a permanent vegetation cover must be established as soon as possible.
- (6) Silt fences or other methods to trap sediments before they reach any surface water feature must be used.
- (7) Altered areas must be stabilized to acceptable erosion control standards consistent with the field office technical guides of the local soil and water conservation districts and the Natural Resources Conservation Service.

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 - (8) Fill or excavated material must not be placed in a manner that creates an unstable slope.
 - (9) Plans to place fill or excavated material on steep slopes, including the construction of walkout basements, shall be developed by a registered professional engineer for continued slope stability and must not create finished slopes of 30 percent or greater.
 - (10) Fill or excavated material must not be placed in bluff impact zones.
 - (11) Any alterations below the ordinary high water level of public waters shall be authorized by the commissioner under Minnesota Statutes, sections 103G.245 and 103G.405 prior to the commencement of any work.
 - (12) Alterations of topography shall only be allowed if they do not adversely affect adjacent or nearby properties.
 - (13) Placement of natural rock riprap and retaining walls, where allowed shall comply with regulations adopted pursuant to Minnesota Statutes, section 103G.245. Natural rock riprap shall only be used for the correction of an established erosion problem that cannot be controlled through the use of native vegetation, slope stabilization using mulch, biomat, or similar bioengineered means. Riprap and retaining walls used for ornamental purposes or for terracing natural slopes shall be prohibited within the shore and bluff impact zones.
- G. Excavations where the intended purpose is connection to a public water, such as boat slips, canals, lagoons, and harbors, shall be regulated by local shoreland controls. Permission for excavations may be given only after the commissioner has approved the proposed connection to public waters pursuant to Minnesota Statutes, section 103G.245. Structures setbacks and the shore impact zone shall be measured from the excavation.

Box 6. *103G.615 Permits to Harvest or Destroy Aquatic Plants (Minnesota Office of the Revisor of Statutes, 2007).*

103G.615 PERMITS TO HARVEST OR DESTROY AQUATIC PLANTS.

Subdivision 1. Authorization. (a) The commissioner may issue permits, with or without a fee, to:

- (1) gather or harvest aquatic plants, or plant parts, other than wild rice from public waters;
 - (2) transplant aquatic plants into public waters;
 - (3) destroy harmful or undesirable aquatic vegetation or organisms in public waters under prescribed conditions to protect the waters, desirable species of fish, vegetation, other forms of aquatic life, and the public.
- (b) Application for a permit must be accompanied by a permit fee, if required.