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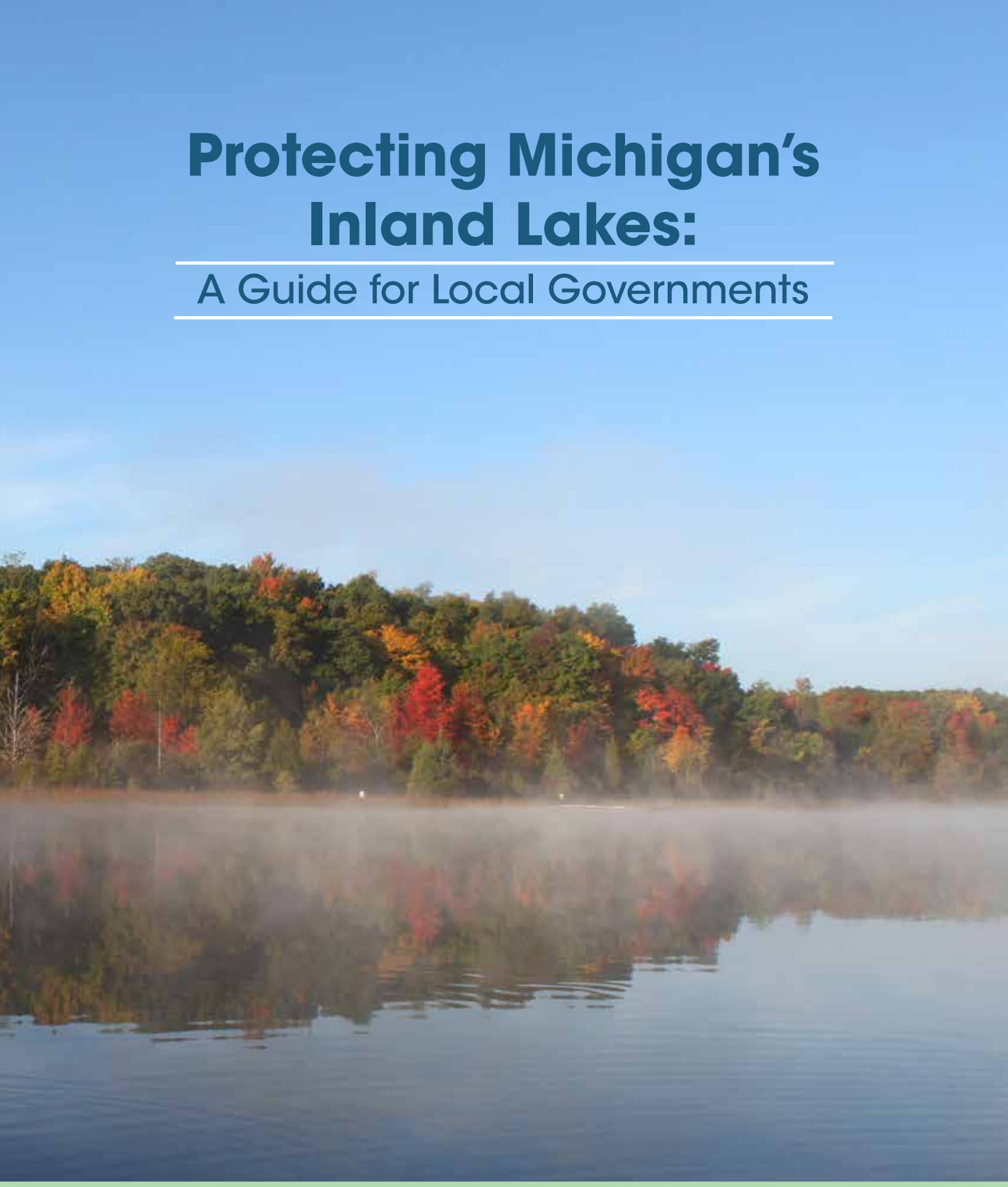
Protecting Michigan's Inland Lakes:

A Guide for Local Governments



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PROTECTING MICHIGAN'S INLAND LAKES:
A Guide for Local Governments

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Chapter 1

Local Protection of Inland Lakes

This guidebook is designed to help local officials and concerned citizens understand the benefits of inland lakes to communities, the regulations that govern inland lakes, and the opportunities for protecting them at the local level. Protecting these important resources does not always require elaborate or expensive regulations. The following chapters will outline a variety of inland lake protection techniques, from the simple enforcement of existing statutes to comprehensive ordinances.

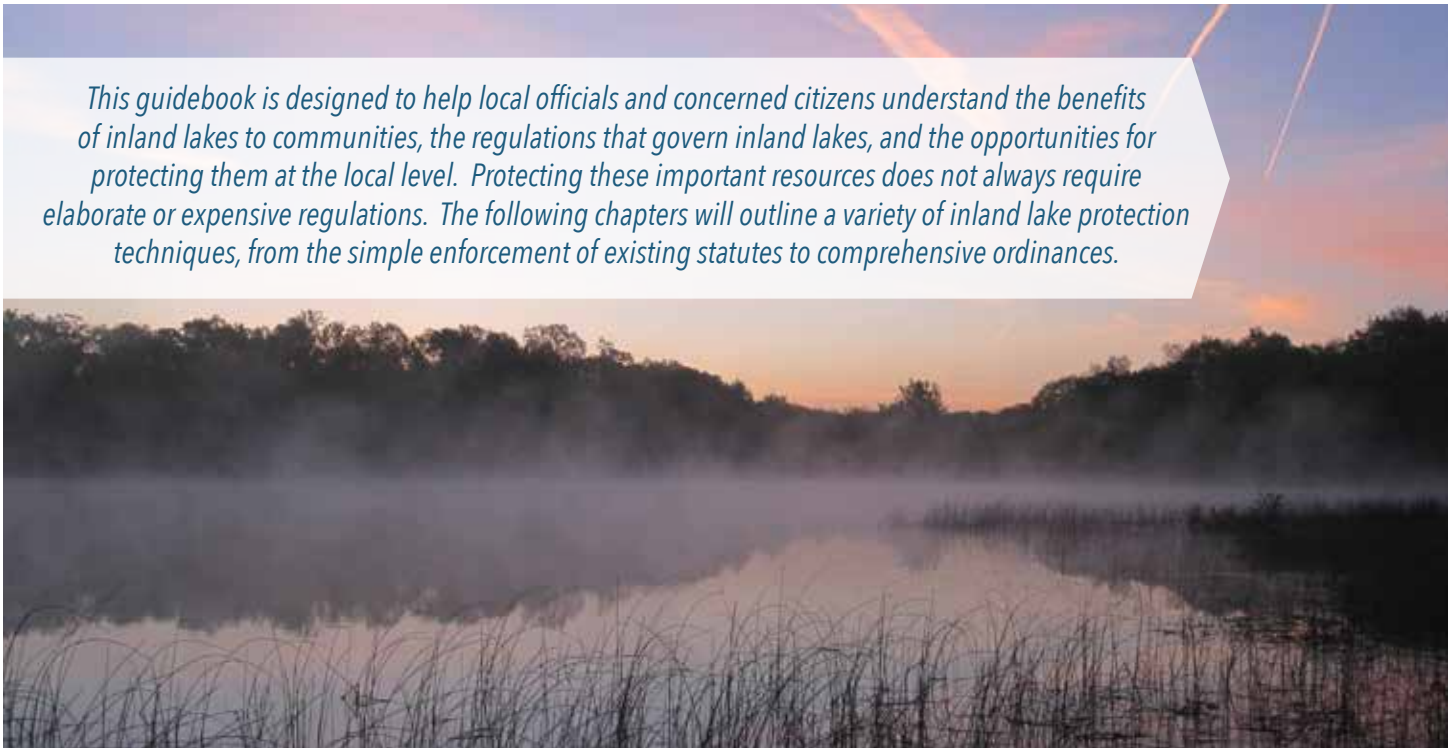


Photo: SW MI Land Conservancy

Inland lakes are places where family and friends gather to enjoy recreational opportunities such as fishing, boating, swimming or just sitting to watch the horizon or listen to the sounds. The memories that are created during these times play an important role in the reasons why citizens are interested in lake protection.

Waterfront property owners, other citizens, and our communities benefit socially and economically from healthy lake ecosystems. Michigan lakes are vast and provide significant recreational benefits, economic value, and ecological services for the citizens of the state and provide important habitat for many animals and plants.

Surveys conducted in Wisconsin of lakefront property owners and visitors consistently show clean water, wildlife, scenic beauty, and recreational opportunities as the amenities that attract them to the water (Eiswerth et al. 2005).

Inland lakes are most valuable to communities when they are clean and healthy. Clean lakes offer better recreation opportunities (and thus more tourist revenue) as well as higher tax revenue. One study estimated that inland lake properties in Michigan generate $3.4 billion in annual tax income to local governments (Kevern 2008). Other studies have shown that lake property values (and thus the tax income generated to the local community) decline as water clarity decreases (Maine DEP). This is strong incentive for local communities to pursue policies that keep lakes clean.

Why Local Government Involvement?

The power to protect inland lakes is shared among all levels of government and all people have a stake in the outcome: clean water for drinking, swimming, fishing, boating, etc. State and federal agencies have regulations to protect lakes; however, there are gaps in inland lake protection because not all aspects or features of inland lakes are regulated under state or federal laws. Local governments can fill these gaps in lake protection because they have the ability to develop future land use plans and to make land use decisions. They can also provide protection for lakes beyond statewide minimum standards and have local knowledge and on-the-ground resources.

The Michigan Zoning Enabling Act of 2006, Sec. 203: "A zoning ordinance shall be based upon a plan designed to promote the public health, safety, and general welfare, to encourage the use of lands in accordance with their character and adaptability, to limit the improper use of land, to **conserve natural resources and energy**… A zoning ordinance shall be made with reasonable consideration of the character of each district, its peculiar suitability for particular uses, the **conservation of property values and natural resources…**"

Proactive efforts by local governments to preserve the quality of life in their communities are part of the rich history of home rule in Michigan. Beginning in 1921 with the City and Village Zoning Act, local governments in Michigan have had the authority to implement local regulations that foster the health and well-being of their communities. This includes conserving natural resources.

Citizens often look to local governments for leadership when local land use conflicts arise—such as between landowners who would like to develop their property and other community residents who would like to see more natural shorelines around inland lakes. For this reason it is essential that local officials understand the importance of inland lakes in their communities and how lakes are used by residents and nonresidents, as well as understand the role they can play in keeping these lakes clean and healthy.

Wildlife-related recreation (like fishing, birdwatching, hunting, etc.) is a $22 billion industry in Great Lakes states; $3 billion in Michigan for fishing alone. In 2001, there were an estimated 16.6 and 0.6 million days of fishing and migratory bird hunting at lakes, with associated economic values of $712.3 million and $39.1 million (U.S. Department of the Interior 2002). An estimated 1.1 million people participated in wildlife viewing away from home (non-residential) and associated with a waterbody; this wildlife viewing had an estimated value of $276.4 million (O'Neal and Soulliere 2006).

Photo: Michigan DNR

Opportunities for Protection

Photo: SW MI Land Conservancy

Local decision makers have numerous options available that can effectively, and with little cost, protect sensitive landscapes valuable to their community. Building permits, zoning authority, wetland and natural feature ordinances, enforcement of the sanitary code, and soil erosion control all fall under the authority of local government. Within each of these areas exists an opportunity to protect inland lakes and their associated features. Whether it is in the form of site plan review or in the establishment of ordinances, local governments have the ability, authority, and responsibility to protect their community's character at the same time as they are protecting the overall public and environmental health for the long term.

Knowing your community's goals is the first step to understanding what your community can do to help ensure the lakes and other natural features remain healthy. Is high quality fish and wildlife habitat an important aspect of your community? Or is your community more concerned with pollutants in the water? Or do you want to make sure your inland lakes are clean enough for recreation – fishing, swimming, or boating? Or do you want to preserve your community's natural, rural character? You might answer "yes" to all of these questions but a thoughtful approach to your community's goals for ensuring healthy inland lakes will help you narrow your focus and lead to a solution that fits your community.

Table 1 shows some example planning tools that address particular community goals most effectively. These tools and others help local governments act in the public interest to protect our inland lakes. If local officials work proactively to protect these resources, future generations will be able to experience clean lakes and all their benefits.

	Fish/Wildlife Habitat	Clean water	Natural/rural character	Improved recreational opportunities
Wetland ordinance	x	x	x	x
Natural features setback	x	x	x	
Minimum lot width			x	
Dock-related ordinances	x		x	x
Stormwater/Low Impact Design		x		
Soil erosion/sediment control	x	x		x
Lake access regulations			x	x
Weed/landscape ordinances	x		x	
Aquatic invasive species ordinances	x		x	
Septic-related ordinances		x		x
Impervious surface limitations	x	x	x	

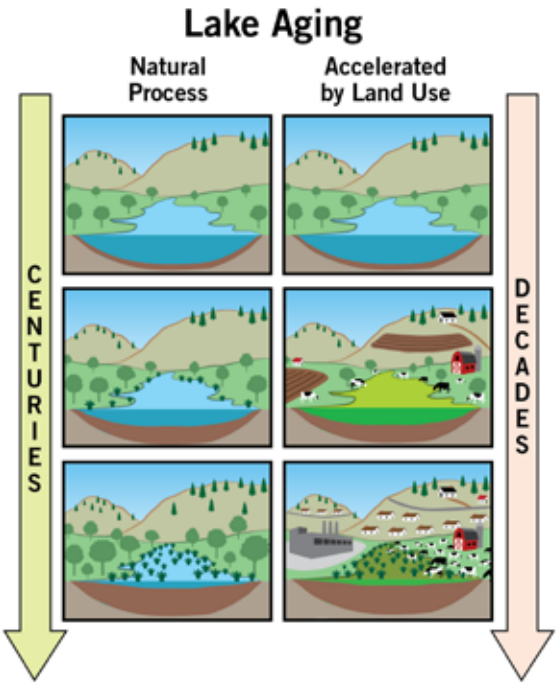
Table 1: Community goals and example planning tools

Chapter 2
Why Are Inland Lakes Important to Protect?

Michigan's 11,000 inland lakes contribute to the economy and provide residents numerous recreational opportunities. Understanding some basics of lake health is important to understanding how to protect these valuable community resources.

Lakes are often associated with wetlands along their shorelines, the health of which are closely related to how the lake functions and what values the lake provides to the community. This shallow area around the lake is called the Littoral Zone, which is at a depth where enough sunlight reaches the lake bottom to allow plant growth. The existence of this zone along with a natural upland buffer is critical to maintaining healthy lake systems.

Lakes are classified according to their trophic state. Lake trophic levels are determined by the amount of available nutrients in the lake. Three main factors influence the trophic state of a lake: amount and rate of nutrient supply, climate, and shape of the lake basin. The four trophic states are oligotrophic, mesotrophic, eutrophic and hypereutrophic.



Graphic: P.J. Chmiel

Lake drainage areas with infertile soils release relatively little nitrogen and phosphorous and tend to have oligotrophic lakes (i.e., lakes that are low in nutrients and plants and high in oxygen). Conversely, drainage areas with rich organic soils, or agricultural regions enriched with fertilizers tend to have more eutrophic lakes (i.e., lakes that have more nutrients and plants). Lakes that lie in between the two are called mesotrophic lakes. Lakes can naturally become eutrophic (high in nutrients) over time through a process called lake aging. This natural gradual process can take centuries. However, human- caused nutrient inputs from runoff and other sources can significantly speed up the process (decades vs. centuries).

Each Michigan lake is different in size, depth and surrounding land characteristics. Thus, each lake also varies in its sensitivity to sediment and nutrient pollution. Generally the more nutrients (especially phosphorus) that move from the land into the lake the more aquatic plants and algae grow throughout the lake system instead of just along the shoreline. When this occurs in a short amount of time, the system becomes unbalanced and water quality declines.

Once degraded, lakes are very difficult to restore.

Oligotrophic and mesotrophic lakes are very sensitive to phosphorus pollution and can be significantly degraded by even small amounts. Alternatively, eutrophic and hypereutrophic lakes are less sensitive to phosphorus pollution. Even major reductions in phosphorus loading to these lakes result in only minor improvements in water quality. Consequently, it is best to protect lakes while they are still of higher quality.

Functions and Values

In general, functions are the natural processes that are performed by a lake, and values are the resulting benefits as perceived by society. Examples of functions and values that lakes provide are wildlife habitat, flood protection, groundwater recharge and water supplies, clean drinking water, fishing and hunting, boating, swimming, and aesthetics. These functions and values are largely dependent on the presence of a natural shoreline and buffer around the lake. This area provides critical habitat for a large variety of wildlife.

"Ninety percent of all lake life is born, raised and fed in the area where land and water meet. The shallow water and the first 10 to 15 meters of shoreland forms a ribbon of life around lakes and rivers that is essential to the survival of many species. This rich complex habitat supports plants, micro-organisms, insects, amphibians, birds, mammals and fish" (Preserving and Restoring Natural Shorelines, Ontario Ministry of Natural Resources Extension).

The plants along the shoreline provide many functions that maintain a healthy lake:

- Stabilization of shorelines and bottom sediments which reduces erosion and sediment suspension from wave action and concentrated stormwater flows.
- Absorption of nutrients such as phosphorous and nitrogen, which protects the lake from excess fertilizer and animal waste.
- Food and cover for a variety of wildlife, especially for waterfowl brood rearing and fish spawning.
- Shading and cooling of the lake water.
- A source of dissolved oxygen, which is important for a healthy fish population.

In short, a stable lake shoreline consisting of native plants provides clearer water, quality habitat, and thus more wildlife in the lake itself, all of which provide communities with the fishing, boating, swimming, and other recreational opportunities they value most about the lake.

Michigan Lakes Support a Variety of Fish and Wildlife (O'Neal and Souilliere 2006)

Species	Number	# Threatened, Endangered Special concern
Fish	151	22
Mussels and Snails	121	9
Amphibians	24	4
Reptiles	25	8
Birds	87	29
Mammals	19	

What Are Your Lake's Characteristics?

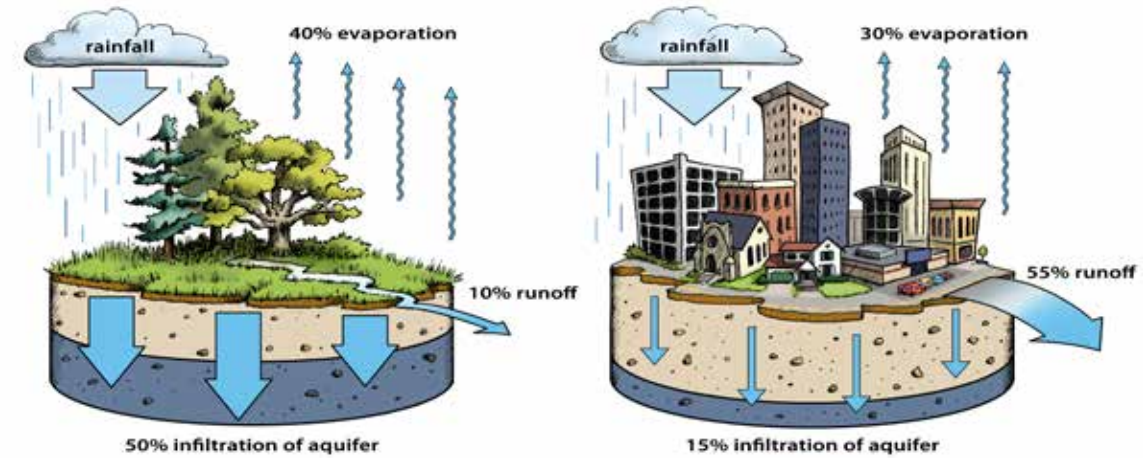
In order to determine which protections would best address the needs of the community and the lake, the existing conditions should assessed. Finding out the basic characteristics of the lakes in your community such as size, shape, and depth (also called lake morphology), trophic status and water quality data will help you understand the lake type and how sensitive it might be to nutrient pollution. Looking at characteristics such as the littoral zone (area closest to shore) and other natural features (including soils, slopes, and the extent of natural shoreline or vegetative buffers currently in place) will give you an understanding of what is there to protect. Other characteristics to review are the amount of existing impervious surfaces (lot coverage), average setbacks of structures from the water, storm drains and trends related to development.

Assessing your community's lakes and watersheds does not have to be time consuming or expensive. Easily accessible web-based tools such as Google Earth, the Natural Resources Conservation Service Web Soil Survey and the Michigan Department of Environmental Quality Surface Water Information Management System offer a lot of information at no cost. Organizations such as local watershed groups, conservation districts, local and county government planning and GIS departments, state agencies (Michigan Department of Environmental Quality, Water Resources Division and Michigan Department of Natural Resources, Fisheries Division) and regional planning agencies may also be excellent information sources. Many of these agencies and organizations may have information about important natural features or certain lakes in your community that are especially important from an ecosystem standpoint.

Photo: DEQ

Example Questions to Ask:

- What is the predominant setback of existing buildings from the shore?
- Are there trouble spots where erosion and runoff is excessive?
- How intact is the natural buffer of trees and shrubs around area lakes?
- What percent of each parcel do homes, driveways and other impervious surfaces occupy?
- What are the soils like around area lakes?
- How steep is the land surrounding area lakes?
- Are there a lot of seawalls along the lakeshore?
- What are current development trends? Are seasonal homes being replaced by larger year-round residences?
- What kinds of recreational opportunities does the lake support?
- Are there water quality and habitat issues facing the lake? If so, what are the suspected or known causes?
- Are homes surrounding lakes on septic systems and wells or served by municipal sanitary sewer and water?



Graphic: Amelia Hansen

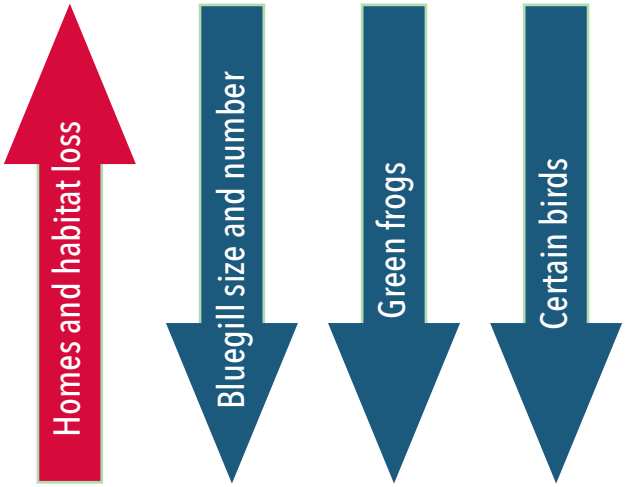
Lake Health and the Community

A healthy lake is safe for recreation and provides sufficient habitat (food, safety, spawning and nesting areas) for fish and wildlife. There are many factors in the lake ecosystem that people do not have control over – for example, the amount of rain and snow each lake receives. However, Michigan lakes face many land use-related challenges including development pressure, polluted runoff, aquatic invasive species, changes to shorelines and groundwater withdrawals. As development increases around the lake less water soaks into the ground and more water runs off into the lake. This runoff can carry pollutants such as nutrients, sediment, oils, and gas from roads, lawns, construction sites, storm sewers, and other sources.

40% of Michigan's lakes have been rated as "poor" for shoreline habitat as compared to only 3% rated as poor for nutrient pollution.
Michigan National Lake Assessment Results

Studies completed between 2001 and 2010 show that Michigan's lakes are generally healthy (with regards to nutrient pollution) with only a few lakes being severely impacted by excessive nutrients (Fuller and Taricska, 2011). However, the 2007 National Lakes Assessment results found the number one lake stressor to be the loss of physical habitat at the shoreline and the second most significant stressor was high levels of nutrients. Overall, 46% of the lakes showed moderate to high levels of lakeshore human disturbance at a level that causes harm to the lakes.

Studies have shown that as residential development increases around lakes the subsequent effects of habitat loss can change the size and productivity of fish as well as the number and diversity of fish species (Schindler et al. 2000, Jennings et al. 1999). Other studies have found that as near shore habitat is lost due to high impact developed shorelines, green frog numbers and bird diversity decreases (Woodford and Meyer 2003, Lindsay et al. 2002). These studies on the human impacts on lakeshores indicate that there are long term consequences to the overall health of lake ecosystems. Protecting lakes through land use planning can help minimize the negative impacts associated with development on inland lakes.



Chapter 3

Existing Legal Framework

Photo: DEQ

Michigan's Statutory Definition

An inland lake is a natural or artificial lake, pond, or impoundment with a surface area of 5 or more acres. They do not include the Great Lakes, Lake St. Clair, or a lake or pond that has a surface area of less than 5 acres.

Ordinary High Water Mark Characteristics often seen in Lakes and Streams
Natural line impressed on bank
Changes in character soil
Destruction of upland vegetation
Presence of litter and debris (deposited from high water)
Vegetation matted down, bent or absent
Sediment sorting
Leaf litter disturbed or washed away
Water staining
Changes in plant community

Michigan lakes and streams are regulated at the state level under the authority of Part 301, Inland Lakes and Streams, of the Natural Resources and Environmental Protection Act (Act 451 of 1994, as amended).

Under Part 301, permits are required from the Michigan Department of Environmental Quality, Water Resources Division for dredging, filling, constructing or placement of a structure on bottomlands, constructing a marina, interfering with natural flow of water or connecting a ditch or canal to an inland lake or stream. Bottomland is the area of land that lies below the ordinary high water mark (OHWM) and that may or may not be covered by water. The OHWM is the line between upland and bottomland and is identified by the presence of a distinct change in character of the land caused by successive changes in water levels. Some lakes have a court-established OHWM elevation.

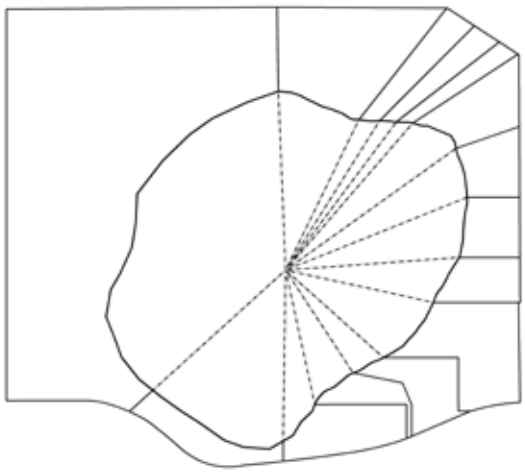
Part 301 includes several provisions:

1. It establishes a permit program regulating activities that alter inland lakes and streams.
2. It establishes a state policy to preserve the public trust through protection of inland lakes and streams against pollution, impairment, and destruction
3. It provides enforcement language and sets maximum penalties for violations.

Public Trust and Riparian Rights

The Public Trust and Riparian Rights are major considerations under Part 301 for permit application review. The nature of the Public Trust is that certain natural resources are of such importance to the public that they should not be under purely private ownership and control. The Public Trust is written into the Michigan Constitution and is referenced in various state statutes, including Part 301. Under the public trust doctrine it is the duty of the state to protect the air, water, and other natural resources of the state against pollution, impairment, or destruction. The state has a duty to enforce the Public Trust, but cannot abdicate control over property in which the whole people have an interest so as to leave them entirely under the control of private parties. Therefore, the Public Trust is still applicable on private lakes, even those held by a single owner.

Riparian Rights are also defined in Part 301 and are those rights which are associated with the ownership of the bank or shore of an inland lake or stream. Owners with property contiguous to an inland lake or stream have riparian rights. Those rights include the right to access navigable waters, dockage, usage of the water for general purposes (e.g., swimming, lawn watering, domestic use), and title to natural accretions (such as an increase of upland area due to deposition).



Riparian Interest Area boundaries on inland lakes are often wedge shaped toward the center of the lake.

Graphic: DEQ

Riparian Interest Areas are the portion of an inland lake or stream over which a riparian owner has an ownership interest. Unlike the Great Lakes, in Michigan the bottomlands (area below the ordinary high water mark) of natural inland lakes and streams are owned by the riparian property owners. However, shoreline property owners on non-natural water bodies may not own the bottomlands and likely do not have riparian rights associated with that ownership. For example, bottomlands of an impoundment may be owned by the dam owner, lakes created by gravel mining may be owned by the mining company, and some lakes have platted bottomlands.

Uses of bottomlands by the riparian property owner are limited to their stated riparian rights (i.e., access, dockage, and water use). However, these rights are subject to the Public Trust and the state has the duty to protect them from pollution, impairment, and destruction for purposes of navigation and fishing. This means that although the bottomlands are privately owned, the water, fish, wildlife, etc. in the inland lakes and streams are the property of the people of the state of Michigan and are managed and regulated by the state.

Permits

Under Part 301, Inland Lakes and Streams, a permit is required to:

- Dredge or fill bottomland.
- Construct, enlarge, extend, remove, or place a structure on bottomland.
- Construct, reconfigure, or expand a marina.

- Create, enlarge, or diminish an inland lake.
- Structurally interfere with the natural flow of an inland lake or stream.
- Construct an artificial waterway that ultimately connects to or is within 500 feet of the Ordinary High Water Mark (OHWM) of an existing inland lake or stream.
- Connect any natural or artificial water with an existing inland lake or stream

DEQ staff review permit applications for impacts, perform a site inspection, and make a decision. These decisions on inland lakes and streams permit applications are based on the DEQ's review of the proposed project in light of the criteria in Part 301 and associated administrative rules. In general, applicants must show the project will not adversely affect the public trust or riparian rights. The DEQ also considers any public comments that have been received prior to making a permit decision.

State and federal authorities overlap in coastal and certain other waters according to Section 10 of the federal Rivers and Harbors Act, and both federal and state permits are required. A joint state and federal permit process has been established between the DEQ and the U.S. Army Corps of Engineers (USACE) for proposed projects in areas which have both state and federal jurisdiction. The DEQ will determine whether a permit application requires joint state and federal review, and when appropriate, will forward these permit applications to the USACE Detroit office for federal permitting review.

Other water-related state laws that often come into play on inland lakes include:

- Public Health Code 1978 PA 368 – Aquatic Nuisance Control
- NREPA, PA 451 Part 91- Soil Erosion and Sediment Control
- NREPA, PA 451 Part 303 – Wetlands Protection

Examples of Projects Requiring a Permit
• Docks
• Boat ramps
• Bridges and culverts
• Dams and dam removals
• Dredging
• Marinas
• Fills for beaches
• Outfall structures
• Ponds and basins
• Shoreline protection
• Seawalls, rip rap, bioengineering
• Streambank stabilization

Part 301 requires the following determinations before a permit can be issued for inland lake or stream impacts:

- ▶ Adverse impacts to the public trust, riparian rights, and the environment will be minimal
- ▶ The possible effects on the inland lake or stream, and upon waters from which or into which its waters flow, and the uses of all such waters including uses for recreation, fish and wildlife, aesthetics, local government, agriculture, and commerce must be considered
- ▶ Project will not unlawfully impair or destroy any of the waters or other natural resources of the state.
- ▶ Project will not cause unlawful pollution as defined by Part 301
- ▶ That a feasible and prudent alternative is not available

Exemptions

In Part 301, specific activities are listed that are exempted from the need for obtaining an inland lake or stream permit from the state. These exempt activities include:

- A seasonal structure placed on bottomland to facilitate private noncommercial recreational use of the water. Seasonal structures are removed at the end of the boating season and include structures such as seasonal docks, boat hoists, and swimming rafts.
- Reasonable sanding of beaches to the water's edge that does not shift the OHWM.
- Water withdrawals (regulated under a separate statute, Part 327)
- Maintenance of a permitted structure identified in Part 301. Examples include seawalls, docks, boat ramps, bridges and culverts, dams, and lake level control structures.
- Maintenance of County Drains and Agricultural Drains as defined in statute.
- Construction and maintenance of minor drainage structures as identified in Part 301. Examples include culverts, roadside ditches; standard appurtenances for stormwater runoff (rip rap, manholes, catch basins, headwalls, outlets from basins).

Exempt activities often require best management practices to be implemented. To determine if a proposed activity is exempt, contact the MDEQ.

Photo: N. Fuller

Chapter 4

Natural Features Setback Ordinances

Local governments can incorporate various tools in their land use regulations to protect inland lakes from the pressures of both shoreline and watershed development. One of the most effective ways to protect inland lakes, streams, and wetlands is to require minimum setbacks with the maintenance or development of an undisturbed buffer of native vegetation within a certain distance from specified natural features.

Photo: SW MI Land Conservancy

Natural Features Setback requirements can be incorporated as part of the local zoning ordinance and can include a defined set of natural features. These defined features can be as broad as including all wetlands, lakes, streams, ponds, and other areas, or as detailed as to address a specific location, size, river, preservation area, etc. This type of ordinance can take into account the community needs, the amount of lake and other natural feature protection desired, concerns such as political climate, available funding or funding mechanisms, or administrative capacity.

There are many benefits of establishing natural features setbacks.

Benefits to the environment:

- Protection of surface water runoff and water quality for pollution prevention
- Assistance in beneficial water recharge
- Stabilization and protection of soil resources, including the prevention of erosion and prohibition of loss due to moving water.
- Protection of wildlife habitat, including preservation of threatened and endangered species habitat.

The shoreline buffer area is the **last line of defense** for inland lakes. Studies show that vegetative buffer zones are highly effective for controlling sedimentation, erosion, and pollution from runoff. Sedimentation occurs when excess soil particles accumulate in water bodies, which can suffocate organisms and reduce sunlight needed by aquatic life. Pollutants that are attached to soil particles are transported by sediment to the water. Two common pollutants, phosphorus and nitrogen, cause excessive algae growth, deteriorate water quality, and can kill fish.

Benefits to the community:

- Fosters early planning and better land use decisions
- Preserves aesthetic views
- Increases enjoyment of natural resources and recreational opportunities
- Improves water quality and reduces flood damage
- Preserves unique community features
- Contributes to a sense of place, which can benefit the local economy

Graphic: Kristin Faasse

Elements to Consider

The first step to establishing a local Natural Features Setback Ordinance is to complete a thorough assessment of the community's natural features and goals. If lakes are largely undeveloped with a natural shoreline still intact, regulations restricting the removal of natural vegetation may be sufficient to achieve the community's goals. If most lakes are already built-out with very little natural shoreline remaining, regulations will look quite different and might even require the installation of vegetative buffers with any construction activity that involves a zoning permit.

Before regulating a land use or activity, the problem should first be defined and the goals for what the regulations will achieve must be documented to help avoid legal challenges. Standards should also be supported in the community's master plan. Careful assessment, with existing setback conditions documented in the community master plan, provides the legal basis for regulation, and helps assure that standards are practical and match inland lake and shoreline protection needs. For instance, if an assessment determines that a natural tree and shrub buffer averaging 30 feet deep surrounds most of the area lakes, a standard requiring maintaining that buffer may be effective in protecting the lakes while reducing the need for other regulations. Likewise, if there are many lakes and a lot of development variability, several shoreline districts applying to different areas might better match protection goals.

Once an assessment of the existing setbacks is completed, the next step is to choose the techniques that best address inland lake protection challenges in the community. Choosing which types of natural features the setbacks will apply to is also an important part of the initial steps. Some communities apply setbacks to all wetlands, streams, lakes, and ponds in the community. Others have specific features such as identified unique rivers, drains, open water or wetlands of a certain size. Again, whichever is chosen, communities should have some legal basis for regulation, such as documentation in the master

Examples of natural features that communities could apply setbacks to:

- Wetlands regulated by state or federal law
- All wetlands greater than a specific size
- Streams
- Lakes
- Open Water areas of a specific size

Note: Specific setbacks can also be customized for each feature (e.g., 50 foot setback from a named river; and 25 foot setback from all wetlands)

plan. It can be helpful for communities to complete an inventory or map of natural features (e.g., lakes, wetlands and streams) prior to implementing a natural features setback ordinance, but it is not required.

Basic Setback Requirements

Because there is no specific standard for setbacks widths in Michigan, local planners have flexibility to establish standards that are best for their situation. Setbacks can vary anywhere between 25 to 100 feet or more. The regulation may permit some modification such as limited clearing within the buffer areas to allow for access, views or beaches. Setbacks often require an undisturbed area for a specified distance from a natural feature. "Undisturbed" means no construction; no earth-moving activities; no storage of materials; no tree, shrub, or groundcover removal; and no mowing. Some communities require the establishment of a setback that takes effect if a major change takes place on the parcel, such as when an old cottage is torn down and replaced with a new structure.

Typical building setbacks are between 25 and 100 feet or more from the shoreline. There may also be greater distance setbacks for nutrient sources such as septic drain fields. Small structures such as garden sheds or boathouses are sometimes allowed in the buffer zone, but are recommended to be at least 25 feet back from the shoreline and the number and/or square footage be limited.

The following uses and activities are items that are often restricted within the natural features setback:

- paved surfaces,
- primary structures,
- grading,
- fertilizer and pesticide application,
- mowing,
- use of motorized vehicles,
- septic tanks and drain fields
- any other activity that causes soil disturbance or contributes to pollution.

Native plant requirements

Since one of the natural features setback ordinance goals is to protect critical shoreline habitats, regulations may allow only native species to be planted. Just what "native" means should be defined within the ordinance. This restriction is especially important, since many commonly planted landscape species are not native. Even though lawns are not considered natural vegetation, sometimes un-mowed grass is allowed. The Michigan Natural Shoreline Partnership maintains a recommended native plant list for inland lakes.

Mitigation requirements

In areas where maintaining an undisturbed area is not feasible, the local government may elect to have a mitigation requirement in place in order to compensate for the loss of the Natural Features Setback. Mitigation is typically at least as large as the area of disturbance (1:1 mitigation ratio) and has exceedance limits of no more than 0.5 acres. Many ordinances further require that the mitigation be located on the same site as the disturbance.

Preservation area restrictions

Additional protection of local government preservation areas can also be incorporated into the Natural Features Setback Ordinance. The location of structures (permanent or temporary) can be prohibited within preservation areas.

Stormwater discharge restrictions

The Natural Features Setback Ordinance can restrict placement of storm water, sump water, or wastewater direct discharges within the setback area in order to protect the lake from pollution.

Seawalls, docks, or other shoreline activity restrictions

Minor alterations along the shoreline to provide reasonable access and recreational use can be allowed, such as one pier or dock on each frontage lot with total length and extension into the lake being limited (50 feet is common). Pre-existing structures are exempted, but approval is needed for significant expansions of existing structures. Additional measures can be added to the ordinance to restrict seawalls and other shoreline structures and beach sanding.

Tree and shrub trimming restrictions

Removing trees, shrubs and other vegetation along shorelines is often restricted in a natural features setback. There are usually exceptions for dead, dying or diseased plants, or for invasive species. Trimming to allow filtered views, such as limiting cutting of trees to a height of 12 feet and herbaceous vegetation to 4 feet, is also usually allowed. Some communities require that approval be obtained before removing any vegetation. Likewise, limitations with a specific provision for the amount of trimming for viewsheds could also be incorporated so long as the root systems remain intact. For example, no more than 10 percent of the area to be selectively pruned or removed to provide reasonable private access or views to water features, to remove potentially hazardous or nuisance exotic vegetation, and to improve or protect wildlife habitat. Pathways accessing water features not to exceed 10 feet in width could also be incorporated as a provision.

Shoreland area restrictions

A community may also choose a larger focus to include an entire shoreland protection area or district (sometimes referred to as a shoreline district or shoreline overlay district). For instance, the shoreland protection area could at a minimum include two lot lengths outward from the lake or at least 1,000 feet from the shoreline. This area could be expanded to account for bluffs, wetlands, steep slopes, erodible soils or other sensitive natural features around the lake.

A community may choose to limit clearing of vegetation and limit building footprint size within this district. An example is to limit clearing during construction to no more than 25% of the total lot area or 10,000 square feet, whichever is less. Another example is to require that no more than 50% of each shoreland lot or 25,000 square feet, whichever is less, be disturbed for residential or commercial construction. In this district, land uses that may be restricted include hazardous material storage, landfills, junkyards, golf courses, above or below ground storage tanks.

Impervious surfaces such as roofs, driveways, walkways and patios do not allow storm water to seep into the ground. Instead, they enable runoff to flow into the lake or stream, carrying nutrients and chemicals. Ordinances can address this issue by limiting the percent of the shoreland area that can be impervious, typically 10 to 20 percent for residential lots in this area. All impervious surfaces should be constructed such that runoff is directed away from the waterbody or to a native plant area to provide the maximum filtration of storm water as possible.

Impervious surface requirements are sometimes an issue with major re-landscaping projects that include “hardscape” – walkways and patios. Porous paving materials are commonly available that can be used for driveways, patios and walkways to comply with impervious surface limitations.

Chapter 5
Additional Options For Local Protection Of Inland Lakes

In addition to enacting a natural features setback ordinance, there are many other tools available to local governments for protecting inland lakes. Some of the most common protection options are discussed in this section, including:

- Option #1: Site Plan Review Regulations
- Option #2: Stormwater Management
- Option #3: Open Space Zoning and Conservation Design
- Option #4: Weed Ordinances
- Option #5: Watercraft and "Keyhole" Ordinances
- Option #6: Aquatic Invasive Species
- Option #7: Septic Systems Regulation

Protecting wetlands within a community can significantly contribute to lake protection. Tools for local wetland protection, including wetland protection ordinances, soil erosion and sedimentation control ordinances, and floodplain management ordinances, are available in *Protecting Michigan's Wetlands: A Guide for Local Governments at* www.mi.gov/wetlands.

Michigan townships, villages, cities and counties have broad authority to regulate land uses as authorized by the Michigan Planning Enabling Act (MCL 125.38) and Michigan Zoning Enabling Act (MCL 125.31). That authority gives local officials substantial flexibility to draft regulations that are practical, fair and enforceable for their community. State and federal regulatory authority is distinctly different than that of local governments, and local regulations are essential and work together with state and federal laws to protect inland lakes.

The Importance of Master Planning

Inland lake protection can be incorporated into existing site planning and land use procedures without adopting specific ordinances. Proactive planning on a community level can create many opportunities for protection of inland lakes. For example, park and recreation plans can target acquisition of areas adjacent to or that connect inland lakes. In addition, consideration of the location of water resources during master planning can help direct growth-inducing activities away from environmentally sensitive landscapes.

Why Plan?

- To establish a policy document that guides physical development of the community
- What does the community want to look like and be like in the future?
- Goals, objectives, and policies that express a vision about the future of the community.
- Identify and Map

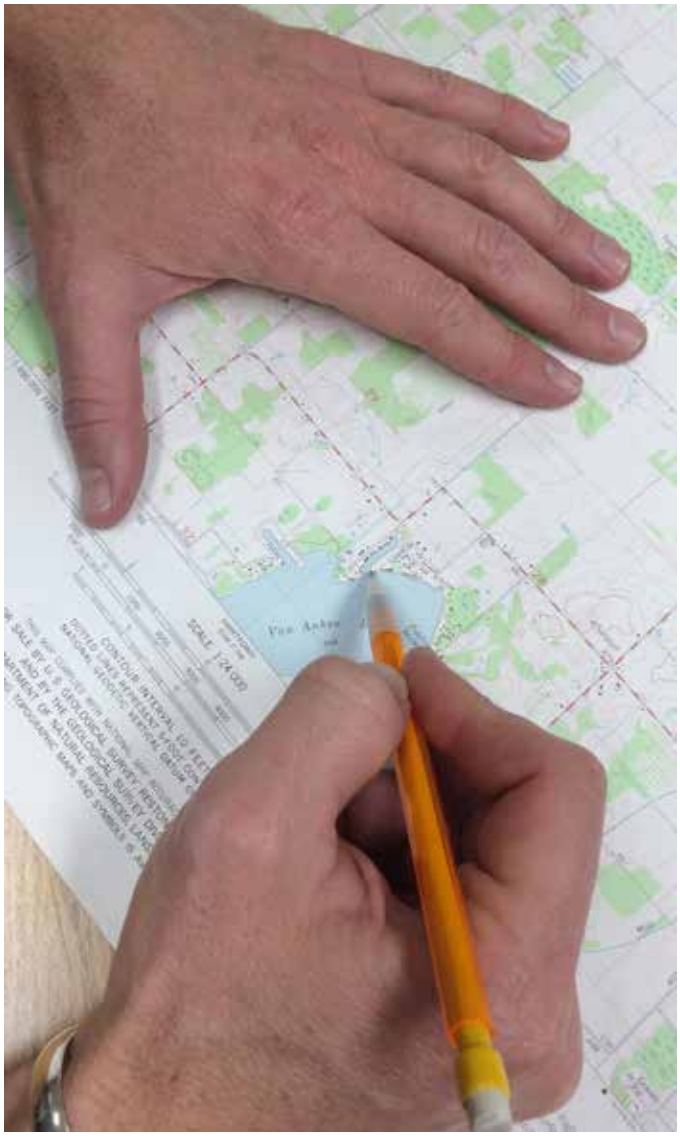
Option #1: Site Plan Review Regulations

Good development design strengthens economic activity, improves community attitudes, reduces nuisance impacts, decreases the cost of development, improves property values, and enhances public safety. For these reasons, it is in a community's interest to conduct a site plan review process. Site plans are the documents and drawings that present information showing what an applicant for zoning approval wants to achieve on a parcel of land. Because good site plans usually include information on stormwater patterns, topography, soils and wetland locations, they can help local decision makers better assess what might be necessary to protect water resources before construction begins.

Site Plan Review

Site plan review regulations are provisions in a zoning ordinance for the administrative review of the physical layout of proposed projects to assure the standards contained in the zoning ordinance are complied with as each property is developed. Many local governments already administer site plan review as part of their planning process, so adding lake protection review often does not add to the administrative work load.

Good site plans can help decision makers better assess water resource protection *before* construction begins



In addition to specifying the procedures for submission and approval of site plans, site plan review regulations also identify the land uses subject to review and the individual or body responsible for administering the review. Site plan review typically requires professional assistance and trained decision makers if it is to be used most effectively. This may require hiring outside consultants with the cost borne by fees paid by applicants. Site plan review is often applied to commercial/industrial facilities, and other uses that require a more detailed review to look at number of parking spaces, structure size, and development in sensitive natural features such as lakes. Communities can require site plan review for all construction or site modifications in shoreline districts.

The site plan submittal requirements should include that all existing natural features such as waterbodies (lakes, ponds, streams, rivers) wetland boundaries, soil types (especially hydric soils), stands of trees, and floodplains be shown on the site plan. The site plan should show how these features will be impacted with the proposed development.

Site Plan Review Standards

The inclusion of standards within site plan review regulations is essential to ensure effective and legally rooted review decisions. Site plan review standards typically used include: nondiscretionary review standards, discretionary review standards, and conditions to ensure ordinance conformance.

If development does not proceed according to an approved site plan, legal means, such as performance guarantees, can be initiated to require enforcement. Performance guarantees are a form of "insurance" to protect a community from unmarketable sites due to project abandonment or partial completion, where required public or environmental improvements have not been completed. Roads, sidewalks, lighting, utilities, and stormwater management are all common site features for which local governments can require performance guarantees in the form of surety bonds, cash, or cash equivalence. The guarantee is returned to the developer when the project improvements are completed within a specified timeline and an agreed upon project site plan.

Other Considerations

Planning at the site level can also include aspects of stormwater management that will aid in controlling the amount, quality, and timing of runoff to prevent its damaging effects on natural resources. In the early stages of site planning, the natural features should be assessed, mapped, and included on the site plan. Natural vegetation, direct stormwater discharge, impervious surfaces, curb and gutter locations, parking area requirements, stormwater control measures, and soil erosion control measures should all be elements that are evaluated during the site plan review with the perspective of how they will affect the nearby natural features. Proper management of stormwater during the design phase can provide another level of protection to inland lakes.

During the site plan review measures can be incorporated to ensure that areas around the lake are not over-developed, such as limiting the amount of structures adjacent to and on lakes. Implementing open space and conservation design principles in site plan requirements can help ensure that scenic views and natural features are retained. The buildable envelope where structures can be placed on the lot should be sited to protect the quantity and quality of open space surrounding inland lakes.

In addition, limiting the development intensity can also provide another level of protection. Many communities limit development intensity through minimum lot sizes and shoreline frontage distances. Another way to limit intensity is to limit back lot development which allows off-water lots to share a narrow strip of waterfront land that provides access to the water. This often results in over-development of the lakeshore to accommodate docks and access points for a large number of people. Many communities enact anti-keyhole ordinances to limit this activity.

Tying local government approval of site plans to the acquisition of the necessary county, state and federal permits is another tool for inland lake protection. This ensures that inland lake issues affected by the project are addressed early in the planning process, and facilitates communication between local, state, and federal agencies, both of which can help better understand the environmental aspects of a project's design. Land developers should be informed in the early stages of site planning that project approval is conditional on the project receiving the proper county, state and federal permits. A community may include a stamp on the approval stating "Approval Conditional to the Acquisition of Necessary County, State and Federal Permits."

Option #2: Stormwater Management

Stormwater management regulations are designed to address the challenges posed by flooding and nonpoint source pollution. Stormwater runoff can carry with it high concentrations of sediment (soil particles), hydrocarbons and other hazardous chemicals, pesticides, bacteria, nutrients, and heavy metals.

Nonpoint source pollution comes from diffuse sources rather than a specific point or an easily identified source (e.g., from snow melt or stormwater runoff versus an outlet pipe).

Local governments are becoming increasingly involved in the administration of stormwater management activities, particularly in rapidly urbanizing areas where the impacts of development on water quality and quantity are the highest. In many areas of Michigan, polluted runoff from lawns, roads, and agricultural areas account for as much as 70% of the water quality problems of a waterway. Proper management of stormwater during the design phase provides another level of protection to inland lakes.

Research shows that when an urbanizing watershed reaches a level of 10% impervious cover (roads, parking lots, rooftops), the water quality and fish habitat problems rapidly accelerate. By using effective site planning to manage stormwater and soil erosion, local governments can lessen the impacts of stormwater runoff to lakes, streams, and wetlands.

Planning for stormwater management can include controlling the amount, quality, and timing of runoff to prevent its damaging effects on natural resources. Curb cut-outs allow stormwater to flow into this garden and soak into the ground. This helps clean the water before soaking into the ground. The storm sewer allows for overflows to prevent flooding. Photo: DEQ

Sharing Stormwater Management

Since stormwater runoff does not respect municipal boundaries, it makes sense for local governments to coordinate with surrounding units of government on stormwater management. Cooperative agreements among local governments, known as urban cooperation agreements (UCA), are legally allowed under the Urban Cooperation Act of 1967. It has become increasingly common to manage and fund trans-boundary matters such as fire services, recreational facilities, and water and sewer services using UCAs. Stormwater management is no different. Prior to adopting a local plan, an area-wide stormwater management plan can provide the rationale and guidelines for local regulation. Once these regional guidelines have been established, it is much easier for local governments to develop their individual ordinances. UCAs can easily be applied to a public works program that would allow for construction of systems for stormwater management that might include area-wide retention basins, monitoring programs, and financing mechanisms, such as special assessments or utility fees.

Stormwater Management Best Practices

- Prohibit the discharge of stormwater to wetlands and the use of natural wetlands to treat stormwater – instead encourage low impact development, creation of rain gardens, green roofs, wet detention basins and other engineered solutions.
- Control quantity, timing, and quality of runoff.
- Set a limit for impervious areas, require pervious (porous) surfaces whenever possible, and reduce parking requirements.
- Reduce design demands for curbs and gutters, allow replacement with grassed swales where appropriate.
- Protect and restore green infrastructure, such as wetlands and other natural landscapes and drainage ways.
- Ensure proper installation and require routine maintenance of stormwater control measures.
- Treat “first flush” runoff - the runoff that occurs at the beginning of a rainstorm and generally contains a higher concentration of pollutants.
- Protect natural vegetation along shorelines and streambanks with natural features setbacks.
- Prevent filling in wetlands, floodplains, and other natural stormwater collection areas.
- Require a stormwater management plan at the site plan review stage for new, modified or expanded developments.

Option #3: Open Space Zoning and Conservation Design

Open space zoning regulations are techniques used by communities to accommodate growth while preserving lakes, streams, wetlands, other natural features and other special features (e.g., historic landmarks and scenic views) that are important to the community. Open space zoning requires a certain percentage of a site to be preserved as open space to protect these resources.

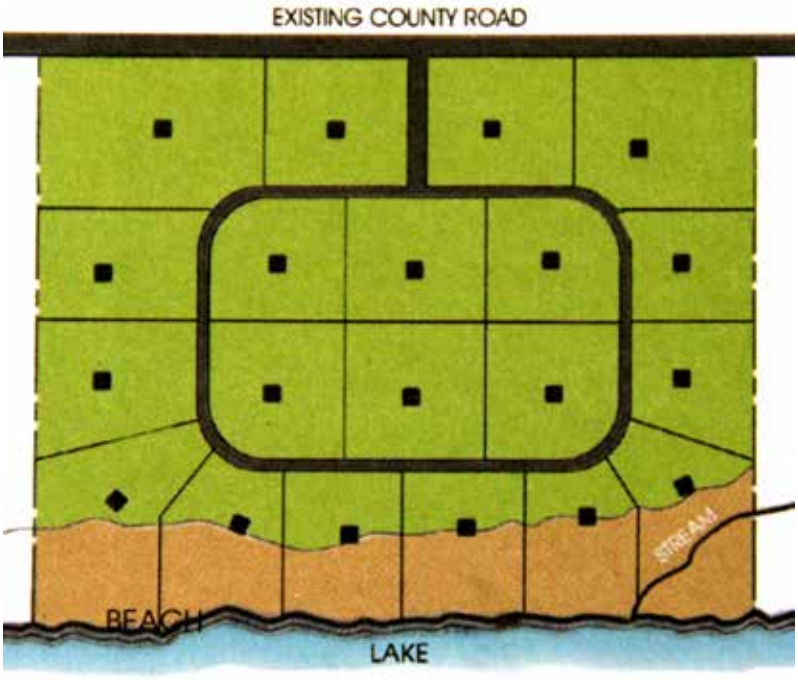
There are four fundamental components of open space zoning:

1. Special site features are inventoried and mapped
2. A significant portion of the site is protected as permanent open space.
3. Building envelopes are sited to respect special features and preserve the quantity and quality of open space on the site.
4. Viewsheds are protected by siting development to maintain a low visual impact, particularly along public roadways and waters.

When local government pursues open space zoning, the regulations should reflect the community's master plan to assure legal validity. Site development regulations should be consistent with local rural character, privacy, and open space access. Permitting should be no more difficult than for traditional subdivisions and if substantially easier, will result in more open space projects. In some cases, density bonuses for open space projects should be considered to increase financial attractiveness of open space developments.

Conservation Design

Conservation design allows for clustering of building sites to provide protection of areas that contain lakes, wetlands, steep slopes, views, agricultural lands, and other special features. Clustering building sites not only protects sensitive landscapes, it also provides more open space for recreation and can preserve scenic views that contribute to higher property values.



Graphic: Kristy Beyer

Traditional Subdivision Design

(shown at left)

Grid layout with little regard for natural and special features.

Conservation Design

(shown at right)

Trees, wetlands, scenic view, and natural views are retained. All homes have lake views. All residents have equal access to the shoreline. Single-loaded roads provide more privacy and better views. Trails make a pedestrian and recreation-friendly development.

Additionally, a more compact site design can significantly lower the costs of infrastructure, surveying, and engineering.

While conservation design may reduce lot sizes, the protected open space adjacent to and surrounding the lots is usually available for use and enjoyment of residents and gives a sense of much larger lots. Local regulations might require conservation design in certain zoning districts, or regulations might take the approach of offering incentives, such as density bonuses allowing more lots to be created than would otherwise be allowed, in order to encourage natural resources protection in this way.

Planned Unit Developments

Planned unit developments (PUD) are authorized under Michigan Zoning Enabling Act to provide opportunities for more flexible land use and site development. PUDs generally encourage site designs that integrate structures and uses with natural site characteristics to minimize impacts on the site and adjoining properties and include planned open space. PUDs can create larger areas of open space through clustering of units than lot-by-lot development. PUD projects must undergo a site plan review process, and thus these projects are administratively more complex than traditional single-site developments.

Conservation Easements

Conservation easements can be used to provide permanent land protection. The explosive growth of the land trust movements in Michigan and nationwide is allowing local governments to create public-private partnerships in land protection. Communities that have an open space preservation plan or a land protection element in their master plan can identify key lands for which they can work with landowners and conservancies to protect.

What does conservation design add up to?

Preservation of natural features +

Private lots and common areas +

Increased sense of community and social opportunities +

Shoreline use concentrated in single dock area

HIGHER PROPERTY VALUES!

Option #4: Weed and Nuisance Plant Ordinances

Many communities have weed ordinances – regulations that limit the size or type of vegetation which grows or is cultivated within the community – to prevent unsightly or poorly maintained property. However, some weed ordinances are so restrictive that they limit the ability of landowners to use natural landscaping. Natural landscaping along a lake's shoreline mimics natural conditions – often by using native plants – and provides a buffer for the lake, filtering pollutants and reducing erosion. Natural landscaping does not pose the hazards that the weed

Graphic: Kristin Faasse

Traditional Lakefront Landscaping

Manicured Landscape with Buffer Zones

Natural or Restored Buffer Zones

laws are intended to address (e.g. fire risk, vermin and mosquitos).

Communities are beginning to recognize the benefits of more natural landscaping practices, and many have amended their weed ordinances to allow for maintained native plantings. The most common ways to approach this are through setbacks, adding exceptions to the weed ordinance, or listing specific regulated plants within the ordinance:

- Setbacks: these ordinances generally require an area (such as within the front or perimeter of the lot, or from a road) in which vegetation above a certain height is not permitted. Vegetation behind the setback is unregulated, allowing landowners freedom to use native landscaping around lakes and other natural features.

Photo: Julia Kirkwood

Most Prohibitive ◄				► Least Prohibitive
All "weeds" over an arbitrary height are restricted. Native plants are not distinguished from weeds.	*Homeowner's natural landscape is approved once an application is approved by a majority of neighbors or by governing body.*	*Modifying clause in weed ordinance grants permission for native landscapes without application approval by neighborhood or governing body.*	*The use of native landscapes is actively promoted and no application is required for native plantings.*	*Native landscapes are actively promoted while non-native vegetation is restricted.*

Weed ordinance scale (adapted from "Native Landscaping Ordinances: A New Generation of Plant Ordinances", Mid-America Regional Council, June 2013)

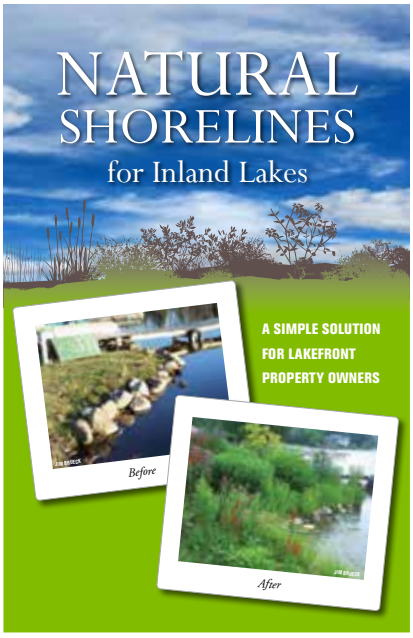
- Natural landscape exception ordinance: these types of weed ordinances contain exceptions for environmentally beneficial landscapes (such as those planted for erosion control, wildlife habitat, educational purposes, etc.)
- Listing regulated plants: these ordinances include a list of plants that are unauthorized (such as noxious and invasive plants) and those that must be kept mowed below a specified height (such as turf grasses)

Lake-friendly weed ordinances should allow for natural landscaping practices and be simple to understand, simple to enforce, and balance the interests of homeowners, their neighbors, and the community.

Mowed lawn grass extending to the water's edge has consequences for inland lakes:

Loss of fish and wildlife habitat
Nuisance animal (goose!) habitat
Shoreline erosion
Loss of shade
Polluted runoff
Excessive nuisance aquatic plant growth
Algae blooms
Oxygen loss
Recreation impacts

Natural shorelines are an alternative to lawns that can reduce erosion, filter pollutants and provide habitat.



Option #5: Watercraft and "Keyhole" Ordinances

Although the benefits of having a lake within a local community are numerous, sometimes conflicts between users of the lake can arise that need to be addressed. Local governments can address these conflicts through several tools, including establishing maximum dock length requirements, regulating road-end docks and keyhole developments, and developing local watercraft control ordinances.

Keyhole development, also called funnel development, is the development of a large parcel that has a relatively small, narrow frontage on a body of water and is used more heavily than is typical from a single family lot. These developments can include condominiums, campgrounds, or planned unit developments and often accommodate access by owners, residents and guests. The conflicts that arise from these developments include increased boating traffic, increased shoreline erosion from boat wakes, water quality impacts, noise, and navigation issues. Local governments can alleviate some of these conflicts by establishing lot width requirements for access per dwelling unit and limiting the number of watercraft per dock. Local governments can also set limits on motorized to non-motorized watercraft ratios.

Local governments can work with the Department of Natural Resources to establish a watercraft control ordinances to address conflict between high speed boaters, water skiers, swimmers, fisherman, and others. For example, an ordinance could set hours for water skiing, prohibit motorboats (entirely or in certain sensitive areas), or require no-wake speed. For more information, contact the DNR Marine Safety Program.

Photo: Michigan DNR

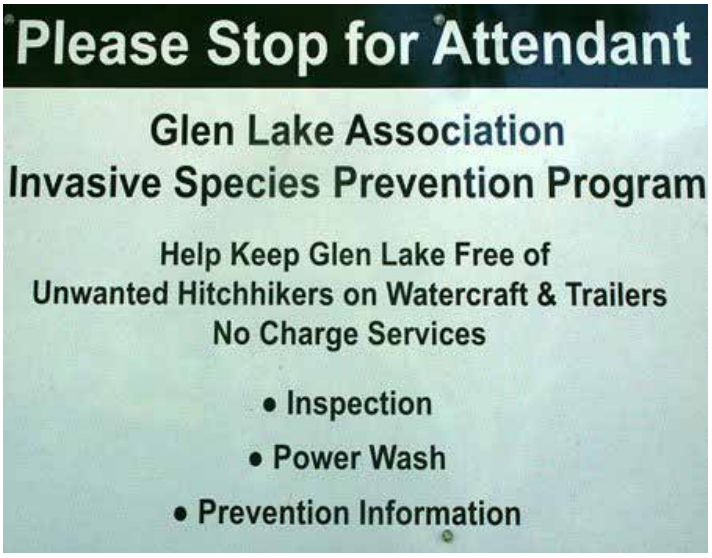
Option #6: Aquatic Invasive Species Ordinances

Aquatic invasive plants and animals like zebra mussels, Eurasian water milfoil and phragmites pose a significant threat to Michigan's inland lakes. Once introduced into a water body, they affect water quality and impact recreation. Effective and enforceable local ordinances are a key part of preventing the spread of existing aquatic invasive species or the introduction of new species. These ordinances protect public health, safety and welfare, prevent water pollution and protect habitat.

"Much of the ongoing spread of aquatic invasive species (AIS) to inland waters throughout North America can be attributed to the overland movement of small-craft boats"

- Journal of the American Fisheries Society, March 2010

Several townships in Michigan have enacted such ordinances, with provisions that require the washing of boats and trailers when they are moved from one lake to the next and prohibit emptying of bait boxes and aquariums into local waterways. Some communities also provide watercraft washing stations and signage educating boaters on how to prevent the spread of invasive species. For more information on boat washing, contact the Michigan Lake and Stream Associations Clean Boats, Clean Waters Program.



Option #7: Septic System Regulations

In Michigan, the public health code charges local health departments with developing and implementing codes regarding water wells and septic systems. Local communities around the state are beginning to pass Time of Sale/Transfer septic ordinances. Time of Sale ordinances require local inspection of well and septic systems prior to the sale of a property, identify well and septic systems that are no longer functioning as designed (or were installed without regard to the code), and require action if necessary. Older systems, which may not meet current codes, are typically grandfathered in as long as they are still functioning. However, if a system is determined to be failing then repair or replacement is required.

Septic systems require proper maintenance by the homeowner. Some homeowners, however, may not be aware of the necessary maintenance and may not realize they have a problem until a failure occurs and sewage backs up into the house. State officials estimate 10 percent of septic systems are failing across Michigan. However, communities with Time of Sale ordinances are reporting failure rates as high as 25 percent and finding some residences with no septic system at all.

Communities with Time of Sale ordinances are reporting failure rates as high as 25% and finding some residences with no septic system at all.

Failing septic systems can introduce human pathogens into the environment, contaminate home water wells, and negatively impact adjacent lakes, streams and wetlands. Failing septic systems near lakes, stream, and wetlands can leach phosphorus and nitrogen into those waters leading to excessive plant growth, depletion of dissolved oxygen, and eutrophication.

Time of Sale ordinances often share common themes:

- Well and septic inspections are required when property is sold or a title is conveyed to a new owner.
- If a system is determined to be failing then repair or replacement within a certain time is required.
- Older systems, which may not meet current codes, are grandfathered in as long as they are still functioning.
- Health Departments use certified health department staff, others use licensed third-party contractors, and some use a combination of staff and contractors for conducting inspections.
- Inspections consist of visual observations, pumping of the septic tank, evaluation of the drain field, physical inspection of the well, and water sampling.

Photo: Barry-Eaton District Health Department

Chapter 6

A Recipe for Community Success

For communities interested in protecting lakes and other natural features, there are strategies that can be helpful in successful passage and implementation of those protections. Crafting effective standards can be challenging, as local elected leaders and planning commissions seek to protect lakes and shorelines while accommodating the need to access and enjoy those environments. Local officials often have concerns about protecting inland lakes with regulations, including local opposition to additional regulations, lack of enforcement capacity, lack of resident awareness about lake issues and the need for technical assistance. Despite those challenges, many communities in Michigan have added inland lake protection standards to their zoning ordinances – an effective complement to state and federal regulations and voluntary efforts to enhance water quality.

Recipe for Success

- Local Leadership
- Public Participation
- Establish Goals
- Develop Defensible Language
- Implement and Enforce Consistently
- Education and Partnerships

The following sections describe an approach that is a recipe for success for protecting inland lakes through local planning and zoning. This approach entails having local leadership, involving the public, establishing goals, developing legally defensible language, implementing and enforcing regulations consistently, and providing on-going education. As discussed in previous sections, a community should also start by assessing existing conditions in the community and providing support for new standards in the community's master plan.

Local Leadership

Local champions and the support from a share of lakefront property owners in the community will be critical in protecting inland lakes through local regulation. Champions can be individuals

Deciding what shoreline zoning standard is best depends on a shoreline assessment. A more developed shoreline (right) requires a different approach than a lake with an existing greenbelt (left). Source: Rod Cortright.

from the local government, but ideally they are also lakefront property owners themselves that can 'walk the talk' when it comes to implementing natural shoreline strategies. It is important that their opinions are respected by a broad range of citizens. Without the existence of local champions that can assist with education and awareness, attempts to adopt regulations may be met with more opposition than support.

Community Vision - Involve the Public

As important as it is to know the unique characteristics of lakes in the jurisdiction, it is equally important to involve the public in drafting master plan goals, objectives, and strategies.

One type of involvement process can be a visioning exercise where community members have the opportunity to share comments and ideas about how best to approach an issue. Visioning is a participatory process where stakeholders and citizens develop a common view of the future of the community. The process of visioning allows for participants to express what a desired future could look like, based on emphasized community values.

Visioning allows participants to express what a desired future could look like, based on emphasized community values.

In the case of inland lake protection, it may be that a planning commission's value for inland lakes at the beginning of the planning process is different than the average lakefront property owner's. The visioning process should then start by sharing some of the information in this Guidebook and the results from the lake assessment with community members. The idea is to educate property owners on the public and private benefits of protecting inland lakes and shorelines without suggesting that local officials have already decided on how best to proceed. For any regulatory approach, to be successful there must be support from the majority of the community for the strategies being adopted.

After sharing the background information on area lakes and their value to the community, a visioning process generally consists of three steps. First, participants imagine the future. The approach to take will depend on the condition of area lakes established during the lake assessment. Oftentimes, this imagined future is an ideal world five, 10, or 20 years in the future where only the best of outcomes have benefited the community. However, it could also be the case for an environmental protection issue like natural shoreline protection, that residents are asked to imagine a future reality where unchecked shoreline development has resulted in significant declines in water quality and property values.

Next, community members share their visions with others and commonalities are noted. Lastly, using the commonalities that arise, a draft community vision is prepared and refined with subsequent opportunities for participant comments. The resulting vision statement should reflect the consensus of the participants in the process. Then the community vision is linked to the current situation with related goals, objectives and strategies that provide achievable targets for achievement.

Example Community Vision

If a community identifies that "surface water quality is threatened," the vision statement may include language such as "We envision a community where natural resources, including water quality and quantity, remain pristine and land is developed in a manner consistent with natural resource protection."

Photo: SW MI Land Conservancy

Public involvement should be continued throughout the goal, objective and strategy development described below. Further, maintaining open channels of communication between local officials and lakefront property owners is a way to ensure landowners are aware of the standards in place, the voluntary options available to them, and the economic and environmental benefits of the enacted regulations and policies. This open communication should start before or during the planning process prior to any public hearings. Continued communication after standards are adopted will benefit local officials by gaining a better understanding of any challenges with meeting the standards and opportunities for refinement. Dialogue in this way will help local officials in implementing standards over the long-term that satisfy the test of 'reasonableness.'

Establish Goals and Strategies

The community vision comprises peoples' values, wishes, fears and desires and the process has a tendency to produce an idealistic view of the future. Therefore, it is important to continue the process to link the current situation to the future vision by developing goals and strategies to achieve the vision. The community vision will have individual components that lend themselves to individual goals. For instance, goals that emerge might include "Protect water quality from nonpoint source pollution" and "Maintain natural and scenic views."

Goals express the general aim of the community, but don't directly offer solutions. The next step is to figure out what specifically the community will do (strategies) to meet that goal. Developing strategies further clarify the general goals and make them more tangible and measurable. For

instance, “Where lakefront properties are developed, they are done so in a manner to minimize runoff from impervious surfaces and maintain the natural character of the lakeshore.”

Strategies are individual policies, regulations, or incentives that are to be implemented in order to achieve the vision over time. One strategy that might emerge is to meet the above goal could be to “Protect water bodies (lakes, rivers, wetlands) by establishing a building setback and required greenbelt.” The strategy is specific enough that it recommends a specific action that, when implemented, will help in achieving the original community vision and identified goal. Some strategies could also help achieve more than one goal.

Besides being based on the community vision, goals and strategies need to be viewed as ‘reasonable’ in a court of law. One way to ensure that a regulation is reasonable is to clearly articulate exactly why the measure is necessary and to base strategies on best available science. With a better understanding of the condition of lakes, local government is better able to articulate the goals of inland lake protection in the master plan. Crafting goals and strategies unique to the community based on the lake assessment is ideal. However, related goals might also exist in neighboring jurisdictions or regional plans prepared by the state planning and development region. While governments should be careful not to copy and paste master plan goals and ordinance standards from one jurisdiction into their own documents, referencing surface water protection goals from neighboring and regional plans and taking efforts to ‘align’ the plans where feasible will provide greater evidence of the importance of protecting inland lakes and maintaining natural shorelines.

Example Goals and Strategies for Inland Lakes

- Maintain and improve fish and wildlife habitat and water quality.
  - Protect water bodies (lakes, rivers, wetlands) by establishing a building setback and required greenbelt.
  - Implement low impact development techniques and limit impervious surfaces to reduce polluted runoff.
  - Enact and enforce soil erosion and sediment control regulations.
  - Regulate shoreline construction of seawalls and docks.
  - Ensure all federal, state and county permits are coordinated with the local development process.
  - Implement a septic maintenance ordinance.
- Maintain natural and/or rural character.
  - Establish a building setback and required greenbelt around lakes and rivers.
  - Ensure existing natural features are identified on site plans and standards are developed to protect these features.
  - Support efforts of the local and county park department, land conservancies and others to protect sensitive lands through acquisition and conservation easements.
- Maintain and improve recreational opportunities that also support a healthy ecosystem.
  - Control lake access through anti-keyhole ordinance.
  - Regulate shoreline construction of docks and seawalls.
- Maintain the trophic state of the lake by reducing phosphorus inputs.
  - Require all new development to leave a shoreline buffer to filter runoff.
  - Require all new development to use stormwater treatment practices designed to remove phosphorus from stormwater runoff.
  - Adopt stormwater performance criteria that call for no increase in phosphorus loading from new development.
- Control terrestrial and aquatic invasive species
  - Enact weed/landscaping ordinances that prohibit planting of invasive species and allow/encourage or require native species.
  - Provide education and awareness to residents and visitors on how to limit the spread of aquatic invasive species.

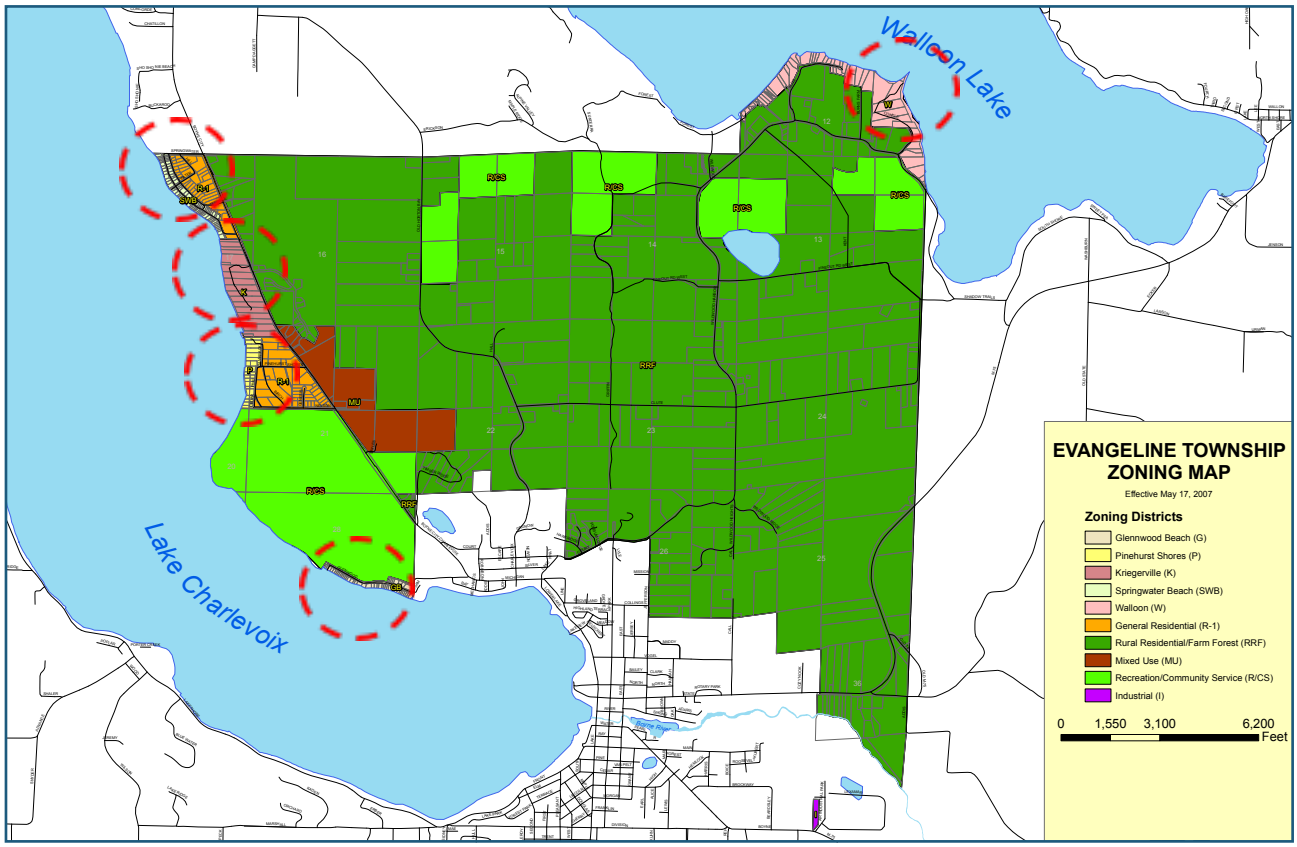
Legally Defensible Language

Following the above planning process for developing locally-tailored strategies for inland lake protection will help in building a defense if standards are challenged in court. The most legally defensible approach is having regulations based upon a plan and a local lake assessment and visioning process involving the public. Yet, that does not mean that a particular standard will not be challenged by a lakefront property owner on the grounds of substantive due process. Substantive due process protects against arbitrary governmental action by requiring that a regulation promote health, safety or general welfare by rational means.

Generally, the tests applied by courts to determine whether a zoning standard or decision violates substantive due process include:

- It fails to advance a reasonable governmental interest (for example, public health, safety or welfare).
- It results in ". . . the purely arbitrary, capricious and unfounded exclusion of other types of legitimate land use from the area in question." (Kropf v. City of Sterling Heights, 391 Mich. 139 (1974)).
- The regulation goes beyond what is minimally necessary to accomplish the public purpose.

To avoid losing a substantive due process challenge, reference research and studies that provide the public health, safety or welfare justification to show a reasonable governmental interest in inland lake protection regulations (such as O'Neal and Soulliere 2006, Radomski and Schultz 2006). In some communities zoning standards consider the characteristics of each lake and the existing development (if any) along the shores of lakes in the jurisdiction.



Evangeline Township in Charlevoix County created different shoreline zoning districts for different residential developments on Lake Charlevoix and Walloon Lake, based on the character of development.

Ensuring the protection of inland lakes often involves regulating activities and uses on private property. The approach must balance an individual's property rights to use and enjoy the land and water with the public's interest in resource protection for the benefit of the public as a whole. For example, local regulation limiting the rights of a property owner to alter or remove natural vegetation along a lake is appropriate so long as there is a legitimate public purpose to protect public health, safety, and welfare. On the other hand, ". . . while property may be regulated to a certain extent, if regulation goes too far, it will be recognized as a taking" (Pennsylvania Coal Co. v. Mahon, 260 U.S. 393 (1922)).

The Fifth Amendment of the U.S. Constitution provides in part: "nor shall private property be taken for public use, without just compensation." This is known as the 'Takings Clause'. The purpose of the Takings Clause is to prevent the government from ". . . forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole"(Armstrong v. United States, 364 U.S. 40 (1960)). The government's physical invasion of private land, whether by roadway, public park, or for the construction of a public building, entitles an owner to 'just compensation'. In our legal system, private landowners' losses are compensated by the public treasury.

Studies have shown the addition of lake buffers increased property values by $11 to $200 per foot of shoreline property (Maine DEP).

If a complete loss in property value results not from a physical invasion of the land, but rather from the enforcement of a regulation, then this is called a regulatory taking. It is important to understand that a regulation that merely reduces property values will generally not be found to be a regulatory taking. Even in extreme cases where regulations have resulted in a 93.7% diminution in value, courts have not found such regulations to amount to a taking (Armstrong v. United States, 364 U.S. 40 (1960). Palazzolo v. Rhode Island, 533 U.S. 606 (2001)). With shoreline protection regulations, property values may actually be increased through improved water quality.

If local inland lake and other environmental protection measures are carefully crafted, supported by a plan, and applied consistently, it is unlikely that a court will find a regulatory taking has occurred. On the other hand, it is likely that a court will find a regulatory taking has occurred if the following two conditions are met:

- The regulation does not substantially advance legitimate public interests.
- The regulation denies the landowner virtually all economic use of the land.

Overall, the approach to take for inland lake protection regulations (and all local regulation) is one of risk management. Risk management refers to crafting regulations and making decisions in a way that minimizes the jurisdiction's chances of being brought to court and maximizes the jurisdiction's chances of prevailing if brought to court. Following the guidance in this guidebook will help reduce any small legal risk associated with regulation.

Consistent Implementation and Enforcement

Beyond a sound master plan and rational basis for standards in an ordinance, the key to successful implementation of regulations is consistently applying those regulations. That entails basing zoning decisions on the ordinance standards and nothing more, each and every time an application is before the planning commission, legislative body, or zoning board of appeals.

With respect to inland lake protections, if a variance is sought to relax an natural feature setback

requirement along lake lot frontages based on a landowner's stated desire for a less obstructed view, the applicant's relationships, wealth, or other status in the community should have no bearing on approving or denying the request. Only the ordinance standards are to be considered, and in this example, the request falls short of proving a 'practical difficulty' to warrant a regulation variance. Granting of unwarranted variances overtime will 'weaken' the ordinance standards, making it difficult to enforce the standards and ever achieve the goals of the regulations altogether.

When regulating inland lake activities, enforcement can be a major issue that may challenge a local government's ability to consistently apply the ordinance standards. However, if a zoning standard is unenforceable because properties cannot be easily viewed or accessed, then the standard should probably not be adopted. Standards that are difficult to enforce can result in a situation of selective enforcement where some landowners are required to follow the standards, while others are not because the local government is unaware of the violations.

Selective enforcement is a legally risky approach to ordinance administration. Selective enforcement could be challenged on grounds of violating the constitutional right referred to as equal protection. Equal protection guarantees the right of similarly situated individuals to be treated in a similar manner and to bear no greater burdens than are imposed on others under like circumstances. Both the U.S. and Michigan constitutions outline this clearly.

Being able to consistently apply the ordinance standards can be made easier with the use of well-crafted applications, forms, and checklists. For instance, if a natural features setback and impervious surface maximums are established in the zoning district, site plan review should also be required with standards that require the natural feature setback and the impervious surfaces to be shown on the site plan. For consistency's sake, zoning permit applications and/or site plan review checklists should then include places on the form(s) where these features are noted and the applicant or review

Standards that must be met for a showing of a Practical Difficulty

- Strict compliance with standard would unreasonably prevent landowner from using the property for a permitted use;
- The particular request, or a lesser relaxation of ordinance standard, would provide substantial justice to landowner and neighbors;
- Plight is due to unique circumstances of property; and
- Problem was not self-created.

Tips for Enforcing Natural Feature Setbacks and Shoreline Buffers

Ordinances should specify who is responsible for enforcing and managing the setback/buffer during and after construction. Ordinances should contain provisions to notify owners and contractors about the boundaries and restrictions. Some useful techniques include marking boundaries with permanent signs that describe allowable uses; clearly delimiting the boundaries on all construction plans, maps, deeds and property surveys; and verifying that new owners are fully informed about uses/limits when waterfront property is sold.

Ordinances should contain a series of progressively tougher enforcement actions for owners and contractors who violate the provisions of the ordinance, beginning with a notice of violation with time to correct. If these administrative remedies fail, then fines, property liens, stop work orders, restoration liability and other sanctions should be available.

official(s) can 'check' that the features are included in the plan, per the ordinance standards. Many examples of applications, forms, and checklists exist, but any should be tailored to the specific standards applicable in the jurisdiction where they will be used.

Education and Partnerships

It is important to offer opportunities to increase awareness about inland lake issues not only throughout the process of developing the vision, goals and strategies, but also with implementing and enforcing the regulations and standards.

Some municipalities offer information on their websites, post information to social media pages, install signage on public property around lakes, distribute flyers, brochures and door hangers, send out newsletter articles or tax/utility bill inserts, or maybe even host events and festivals to celebrate the lake or lakes in the community. Many municipalities partner with local watershed organizations, lake associations, conservation districts, MSU Extension and other agencies to offer educational opportunities about inland lakes and their protection. Lake associations can be a key partner in education and enforcement of lake protection regulations.

Educational efforts can include information on the specific regulations that are in place to protect the lakes, but can also offer information on voluntary actions of homeowners, visitors and businesses that can help to protect inland lakes. Some communities have established lake improvement boards to address relevant lake improvement issues, including the oversight of aquatic weed control programs, nuisance control and other educational activities.

One idea for educating lake property owners about the importance of vegetative buffers is to host an annual buffer walk to check on encroachment, and provide information on how residents can become better stewards through reforestation and shoreline landscaping programs. Other educational messages could include boating or fishing regulations, septic system cleanouts and techniques to slow the spread of invasive species.

Conclusion

Michigan's inland lakes and wetlands need you – whether you're a lakefront property owner, a local government official, or just someone who loves our lakes. This guidebook offers you many different options for protecting Michigan's vast variety of lakes – from rural, unpopulated lakes to busy, well-loved lakes – but they all require action at the local level. We can all play a role in keeping our lakes clean for future generations.

References

Eiswerth, Mark, R. Kashian and M. Skidmore. 2005. What is the Value of a Clean and Healthy Lake to a Local Economy? Prepared for the Delavan Lake Improvement Association by the Fiscal and Economic Research Center at the University of Wisconsin-Whitewater.

Fuller, L.M. and C.K. Taricska. 2011. Water-Quality Characteristics of Michigan's Inland Lakes, 2001–10. US Geological Survey Scientific Investigations Report 2011–5233.

Jennings, M. J., M. A. Bozek, G. R. Hatzenbeler, E. E. Emmons and M. D. Staggs. 1999. Cumulative effects of incremental shoreline habitat modification on fish assemblages in north temperate lakes. North Am. J. Fish. Manage. 19:18-26.

Kevern, Niles. 2008. Project Report: Value of Riparian Property on Michigan's Inland Lakes. Lake Effect Newsletter, Michigan Chapter of the North American Lake Management Society.

Landowner Resource Centre (LRC). 2000. Preserving and Restoring Natural Shorelines. Ontario Ministry of Natural Resources Extension.

Lindsay, A. R., S. S. Gillam, and M. W. Meyer. 2002. Influence of lakeshore development on breeding bird communities in a mixed northern forest. Biological Conservation 107:1–11.

Maine Department of Environmental Protection (DEP) Lake Assessment Program. More on Dollars and Sense: The Economic Impact of Lake Use and Water Quality.

O'Neal, R. P., and G. J. Soulliere. 2006. Conservation guidelines for Michigan lakes and associated natural resources. Michigan Department of Natural Resources, Fisheries Special Report 38, Ann Arbor.

Radomski, P. and R. Schultz. 2006. An assessment and rationale for the alternative shoreland management standards. Minnesota Department of Natural Resources, Division of Waters.

Rothlisberger JD, Chadderton WL, McNulty J, Lodge DM. 2010. Aquatic invasive species transport via trailered boats: what is being moved, who is moving it, and what can be done. Fisheries 35:121-132

Schindler, D. E., S. I. Geib, and M. R. Williams. 2000. Patterns of fish growth along a residential development gradient in north temperate lakes. Ecosystems 3:229–237.

U.S. Department of the Interior, U.S. Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau. 2002. 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, Washington, D.C.

U.S. Environmental Protection Agency (USEPA). 2009. National Lakes Assessment: A Collaborative Survey of the Nation's Lakes. EPA 841-R-09-001. U.S. Environmental Protection Agency, Office of Water and Office of Research and Development, Washington, D.C.

Woodford, J. E., and M. W. Meyer. 2003. Impact of lakeshore development on green frog abundance. Biological Conservation 110:277–284.