Part II

The Law of the Land

WETLANDS

With so much talk about the importance of wetlands in recent years, local officials are often surprised to learn that many wetlands in their communities are not protected because they fall outside the scope of state or federal law. However, Michigan law specifically provides opportunities for communities to enact greater wetland protection mechanisms locally if they so choose. The key idea for local officials to keep in mind as they consider instituting local wetland policy is where the authorization to do so comes from: NREPA and the Planning and Zoning Enabling Acts.

WHY PROTECT WETLANDS?

In addition to providing habitat, food, and breeding areas to a variety of plant and animal species, wetlands provide a number of important services to society and are crucial for sustaining and improving water quality.

What is a wetland? Wetlands are surface areas that are usually saturated with water, and the unique type of *hydric,* or moisture containing soil is the dominant factor determining the types of plants and animals living there. These areas are transitional between terrestrial and aquatic systems where the water table is at or near the surface.[11] The aquatic systems connected to wetlands may be obvious, as is the case with coastal wetlands, or not so obvious, as is the case with inland wetlands connected to ground water. [See Figure 2.1] Wetlands may be covered by water for all or part of the year. Therefore, some wetlands may appear to be dry land at times.

What do wetlands do? Wetlands essentially function like natural sponges, storing water, filtering it, and then slowly releasing it. This process helps control erosion– especially in coastal areas– recharges groundwater, and reduces flood heights. In fact, one acre of wetland can store up to 1.5 million gallons of floodwater.[2] That is enough to fill 30 Olympic size swimming pools!

Most people are familiar with the cattail or lily pad wetland found in areas with standing water, but wetlands can also be grassy meadows, shrubby fields, or mature forests. Examples of different types of wetlands found in Michigan (left to right) coastal, forested, and shrub. To see where these types of wetlands are found in the landscape, refer to Figure 2.1. Note that although these wetlands may not appear to be connected to one and other on the surface, they play a complimentary role in the watershed and are connected to the same groundwater systems. *Photos (L): D. Kenyon, DNR; (C): K. Ardizone; (R): DEQ-GLMD.*

Wetlands also remove pollutants and sediments from water. This naturally occurring filtration process is so effective that many communities are looking to wetland protection and mitigation as a means of meeting federal stormwater treatment requirements by allowing them to continue to function normally. *For more information about wetland functions, see "What are Wetlands," and "Wetlands and People" in Appendices.*

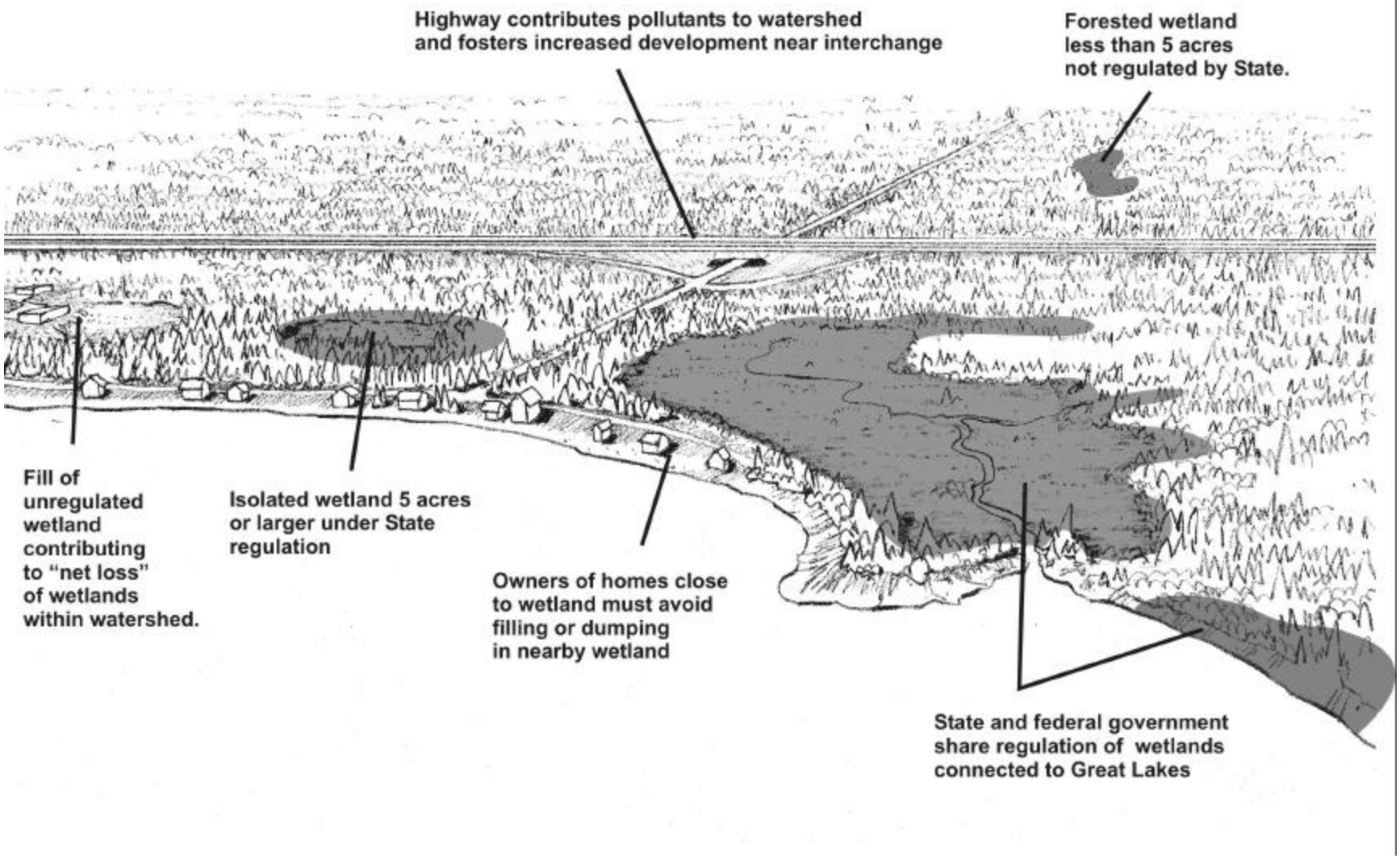
Easier to protect than to replace: In an effort to strike a balance between new development and environmental protection, the state and many communities have negotiated with developers to *mitigate*, or lessen the effects of unavoidable wetland destruction by restoring a wetland or creating a wetland in an area elsewhere that was not one previously. Although artificially constructed wetlands can provide many of the aesthetic services of a naturally occurring wetland, and can be an option for treatment of stormwater, they take many years to establish and rarely provide the same groundwater recharge functions, or plant and animal habitat in an ecosystem as naturally occurring wetlands.

Enforcing mitigation agreements between development interests and state and local governments has also been problematic. [See Case Study in this section] Therefore, it is better economically and environmentally for communities to protect the wetlands they already have, or focus efforts into wetland restoration, rather than try to build costly and less effective artificial wetlands in the future.

Coastal erosion protection: As was discussed in the first part of the book, coastal wetlands warrant special attention. One reason is because they provide the best means of defense for a community to prevent and reduce coastal erosion. Coastal wetlands absorb the energy of waves, and break up the flow of stream and river currents.[3] Michigan's coastal wetlands grow and recede in conjunction with the fluctuation of Lake levels. Even during high-water years when the plants are submerged, their dense root mats hold the soil, most of which is sandy and highly erodible. The ability of wetlands to control erosion is so valuable that some states are restoring wetlands in coastal areas to buffer storm surges and provide a more effective and permanent means of protection than shore armor.[4]

Top: Coastal wetland during high water levels.
Bottom: Coastal emergent wetland during low water levels.
Photos: Dennis Albert (Courtesy of MSU Extension)

Figure 2.1. Wetlands



Coastal wetland restoration efforts are underway along parts of Michigan's coast through programs such as federally funded coastal restoration grant projects. As with inland wetlands, it is much less expensive for taxpayers to protect coastal wetlands in the first place than to suffer the consequences and costs of repair in the future.

MICHIGAN'S REGULATORY FRAMEWORK

Wetlands are regulated under a variety of state and federal legislation. Section 404 of the Clean Water Act (CWA) of 1972 is the primary piece of federal legislation that addresses wetlands. Under this section, the U.S. Army Corps of Engineers is granted principal permitting authority, although the U.S. Environmental Protection Agency (EPA) is authorized to veto permits issued by the Corps for filling of wetlands.

Michigan is one of two states that has authority to administer section 404 of the CWA, and shares jurisdiction with the Corps in some areas. State regulations that support the provisions of section 404 of the CWA are found in Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act (NREPA), PA 451 of 1994, as amended. Before development within a regulated wetland takes place, a permit must be obtained from the Department. In order to obtain a permit, an applicant must show avoidance of wetland resources to the greatest extent possible and minimization of unavoidable wetland impacts. The Department considers any public comments that have been received prior to making a permit decision, and also encourages local governments to comment during this period.

WHAT IS REGULATED?

As defined by Michigan state statute, a wetland is, *"land characterized by the presence of water at a frequency and duration sufficient to support, and that under normal circumstances does support, wetland vegetation or aquatic life, and is commonly referred to as a bog, swamp, or marsh."*

In accordance with Part 303, wetlands are regulated if they are any of the following:

- Connected to one of the Great Lakes or Lake St. Clair.
- Located within 1,000 feet of one of the Great Lakes or Lake St. Clair.
- Connected to an inland lake, pond, river, or stream.
- Located within 500 feet of an inland lake, pond, river or stream.
- Not connected to one of the Great Lakes or Lake St. Clair, or an inland lake, pond, stream, or river, but are more than 5 acres in size and located in counties with a population of more than 100,000.
- Not connected to one of the Great Lakes or Lake St. Clair, or an inland lake, pond, stream, or river, and less than 5 acres in size, but the DEQ has determined that these wetlands are essential to the preservation of the state's natural resources and has so notified the property owner.

WHAT IS NOT REGULATED

As important to local governments as defining what wetlands are regulated is clarifying what is not regulated. NREPA leaves gaps in protecting this important resource that can be filled by local governments, such as protecting isolated, or *non-contiguous,* wetlands smaller than 5 acres.

LOCAL ROLE

A local unit of government has the authority to create wetland regulations that address wetlands not protected by the state. Part 303, section 324.30307 authorizes local units of government to adopt and administer their own wetland regulations, provided they are at least as restrictive as state regulations. The DEQ must be notified if a community adopts a wetland ordinance, but it has no review or approval authority. Complete text of §324.30307 (4) is provided in the Appendices. Ultimately, local control of wetlands can lead to

better protection of the resource because it serves as an "added layer" of regulatory protection.

The state is currently in the process of conducting wetland inventories on a county by county basis. This data can be useful to communities wanting to adopt a local wetland ordinance, as an inventory may be a required prior to implementation—depending on the population size of the county. To check the availability of a wetland map for your county, check the DEQ web site *www.michigan.gov/deq*.

Nuts and Bolts of Local Wetland Ordinances

When a community chooses to adopt its own wetland ordinance, it takes on the role of co-administrator of wetland regulation for its jurisdiction. If a community has a local wetland ordinance, a permit applicant must also request a permit from the DEQ. The local permit review process is concurrent with the state review process. Approval from both the DEQ and the local government are necessary in order to proceed with the project.

Permit fees are charged to applicants for both the state and local applications. The state fee is based on size and scale of project, the local fee is determined by the local wetland ordinance.

Using Authority from NREPA vs. the Planning & Zoning Enabling Acts

As was discussed in the first part of this book, local governments considering implementing environmental protection measures can do so either through the provisions of NREPA, or through the ability to "protect the natural environment" granted by the Planning & Zoning Enabling Acts, or both. Where local governments run into legal trouble with local wetland ordinances is when they have overstepped the bounds of what Part 303 of NREPA allows them to do.

MICHIGAN COMMUNITIES WITH WETLAND ORDINANCES
Revised March 2003

NAME
Clyde Township, Allegan Co.
Forest Home Township, Antrim Co.
Argentine Township, Genesee Co.
Fenton Township, Genesee Co.
Caseville Township/Village, Huron Co.
Meridian, Charter Township of, Ingham Co.
Williamstown, Township of, Ingham Co.
Elba Township, Lapeer Co.
Empire, Village of, Leelanau Co.
Brighton Township, Livingston Co,
Pinckney, Village of, Livingston Co.
LaSalle Township, Monroe Co.
Addison Township, Oakland Co.
Auburn Hills, City of, Oakland Co.
Bloomfield Township, Oakland Co.
Franklin, Village of, Oakland Co.
Independence, Charter Township of, Oakland Co.
Milford, Charter Township of, Oakland Co.
Novi, City of, Oakland Co.
Oakland, Charter Township of, Oakland Co.
Orchard Lake Village, Oakland Co.
Orion, Charter Township of, Oakland Co.
Oxford, Charter Township of, Oakland Co.
Rochester Hills, City of, Oakland Co.
Southfield, City of, Oakland Co.
Waterford, Charter Township of, Oakland Co.
West Bloomfield, Chtr. Township of, Oakland Co.
White Lake Township, Oakland Co.
Wixom, City of, Oakland Co.
Fabius, Township of, St. Joseph Co.
Ann Arbor, City of, Washtenaw Co.
Ann Arbor, Charter Township of, Washtenaw Co.
Pittsfield Charter Township, Washtenaw Co.
Salem Township, Washtenaw Co.
Superior, Charter Township of, Washtenaw Co.
Grosse Ile, Township of, Wayne Co.

For example, adopting a local wetland ordinance that mandates 25 foot buffer zones around wetlands, or preservation of mature trees within 100 feet of a wetland may be overstepping the authority granted under NREPA because the Act does not give explicit authority to local governments to address such provisions. As a result, a local wetland ordinance adopted under NREPA runs the risk of being invalidated if legally challenged.

However, the mandate of the Planning & Zoning Enabling Acts to "protect natural resources" authorizes local governments to enact additional "natural environment" protection provisions, such as vegetated buffer zones and mature tree preservation guidelines provided they do not conflict with Part 303 of NREPA.

NREPA: Local governments can

- ✓ Regulate isolated wetlands smaller than 5 acres
- ✓ Must conduct a wetlands inventory for some regulatory measures
- ✓ Notify the DEQ of the local ordinance

Local governments can increase wetland protection under NREPA most readily by addressing the size of the wetland to be regulated. Whereas state regulation typically only addresses wetlands adjacent to another body of water or 5 or more acres in size, local governments can require permits for drainage, construction, dredge, or fill activities on isolated wetlands much smaller. Some communities currently implementing this increased level of protection for wetlands require a permit application for the above activities down to the .25 acre size. Sample local wetland protection ordinances are found in the Appendices.

WHY PROTECT WETLANDS SMALLER THAN 5 ACRES?

The benefits of protecting small, natural, isolated wetlands are becoming increasingly clear as studies show how their unique soil characteristics reduce flooding, provide valuable habitat, treat stormwater, and recharge groundwater.[5] More communities are looking to wetland protection as a means of improving water quality, and wetland restoration to inexpensively and effectively meet stormwater treatment requirements.

Zoning Enabling Acts: Local governments can

- ✓ Protect mature trees and native vegetation in and around wetlands
- ✓ Require vegetated buffer strips around important natural features, such as wetlands
- ✓ Implement other tools that protect wetlands

Increasing wetland protection is not just beneficial to the environment. Beyond preserving aesthetics, the scenic vistas and open space they provide can positively affect property values in a community. Perhaps it is no accident that some of the highest property values in the state are found in communities that have adopted strong local wetland protection ordinances.

ALTERNATIVE APPROACHES TO LOCAL WETLAND PROTECTION

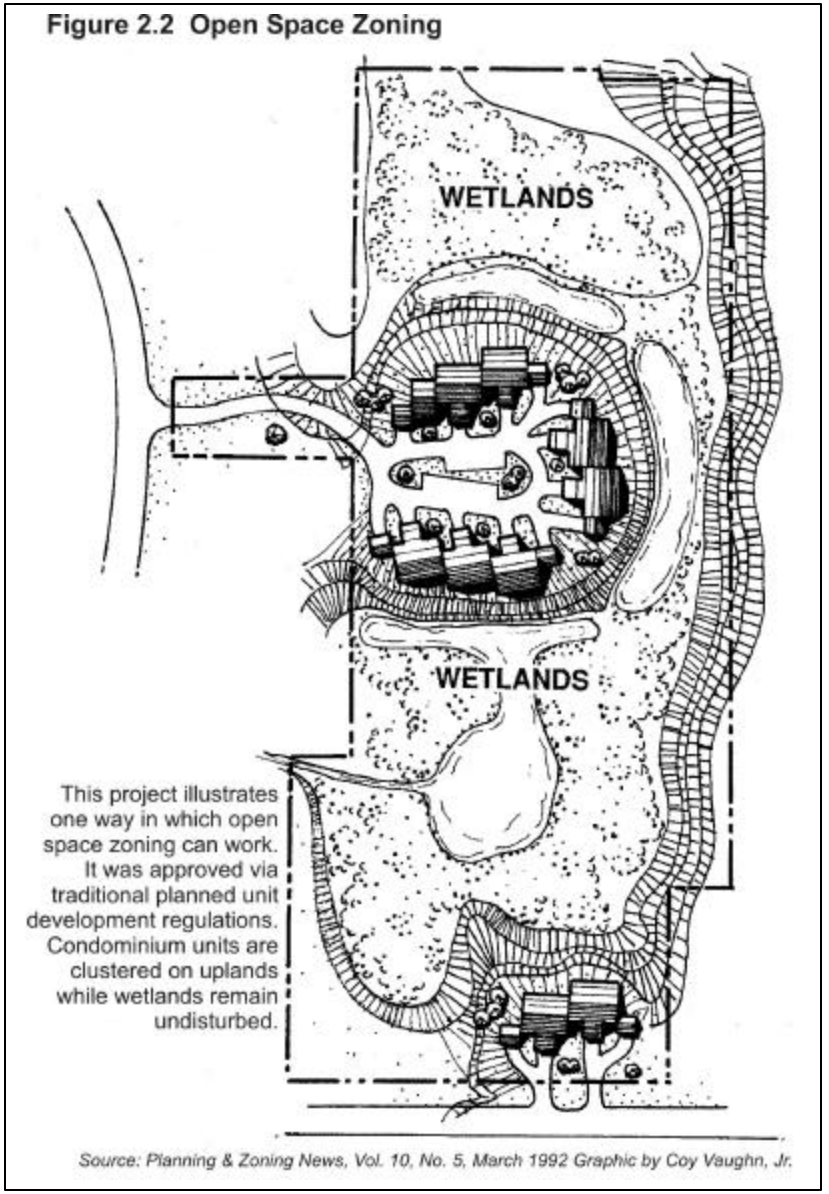
Implementing a local wetland ordinance is not the only option for communities desiring to protect wetlands. Zoning tools can also serve as a means of accomplishing conservation goals. In the case of wetlands, instituting site plan review of proposed development plans can go a long way towards protecting the resource.

Site plan review affords design oversight to local officials. Through this mechanism, a site plan (drawing) for a proposed development is reviewed to ensure it conforms to zoning requirements for maintenance of existing vegetation, provision of a natural vegetation strip around designated natural areas, planting of new vegetation in certain places, etc. Wetland protection can also be assured in new development plans. This is accomplished in large measure by requiring that state (and federal if relevant) wetland permits be obtained as a condition of local zoning approval.

While site plan review is an effective zoning tool, it is generally only applied to large development projects and therefore may not account for wetland impact from smaller-scale project sites (see also site plan review section in Part III). For this reason, and because a local wetland ordinance provides another enforcement mechanism, a local wetland ordinance is usually the best way to ensure all valuable wetland areas are protected.

However, adopting an ordinance can be challenging if there is not enough local support, or there is not adequate administrative staff to properly enforce the ordinance. If your community is considering a more immediate approach to wetland protection, instituting site plan review provisions in the zoning ordinance may be the way to go—at least until appropriate guidelines can be included within a specific wetland protection ordinance. Open space zoning (see Figure 2.2) may also achieve desired wetland protection goals for your community.

Figure 2.2 Open Space Zoning



Source: Planning & Zoning News, Vol. 10, No. 5, March 1992 Graphic by Coy Vaughn, Jr.

Case Study
Wetland Mitigation: Why Protection Pays

In 1997 the Michigan Department of Environmental Quality (DEQ) initiated a study to evaluate the state's wetland mitigation program. The study, funded by a grant from the U.S. Environmental Protection Agency (EPA), was conducted by DEQ staff who evaluated wetland permits issued between 1987 and 1998. Projects were included from all geographic regions of the state and involved the creation of at least one acre of replacement wetland, established for a minimum of two complete growing seasons.

What the study found, was that the vast majority of mitigated wetland sites did not provide the same ecological functions of the wetlands they were intended to replace. In fact, of the 159 mitigation sites that were evaluated for the study, 14% were never constructed at all. Additionally, the study concluded:

- 50% of mitigation sites contained the required wetland acreage
- 42% of mitigation sites had excessive open water
- 32 % of mitigation sites had insufficient water
- 41% of mitigation sites did not contain sufficient topsoil to facilitate plant growth
- 18% of permittees complied with all permit conditions
- 22% of the projects were determined to be successful overall

Location, location, location

Part of the reason for a high failure rate among wetland mitigation projects evaluated in the study is due in large part to the location of the mitigation site. When the state's wetland mitigation program was adopted in 1979, the concept of mitigation was in its infancy. Subsequent rules passed in 1988 required mitigation to be on site or in the immediate vicinity.[6] As a result, many wetland mitigation sites during this period were on land that was not suitable for wetland mitigation, as opposed to restoration of historic wetlands—which are much more likely to succeed. The study concluded that any wetland mitigation program should therefore require, whenever possible, the restoration of historic wetland sites instead of allowing the creation of wetlands in upland areas where they are likely to fail. These findings were incorporated in mitigation rules in 2000.[7]

A costly proposition

Because it is not always possible to protect existing natural wetlands, mitigation is an important tool in maintaining water quality and the overall health of a watershed. Done properly, mitigation can off-set the adverse impacts of some wetland alteration by compensating for it elsewhere in the same watershed. However, communities looking to implement wetland policies that emphasize mitigation over protection of existing natural wetlands should beware: even when successful, it is a costly proposition.

Although voluntary wetland restoration of historic wetland sites can be done for as little as $500 per acre, mitigated wetland restoration sites in Michigan that involve monitoring and other requirements have an average cost of $5,000 per acre.[8] This amount does not include the cost of the land itself. Created wetlands are even more expensive due to the increased amount of excavation and planting involved. The average cost of a created wetland in Michigan is a whopping $40,000 per acre, not including the cost of land.[9] Focusing on wetland protection by avoiding land alteration in and near existing wetlands is not only better for a community's environmental health, it is better for the budget as well.

ENVIRONMENTAL AREAS

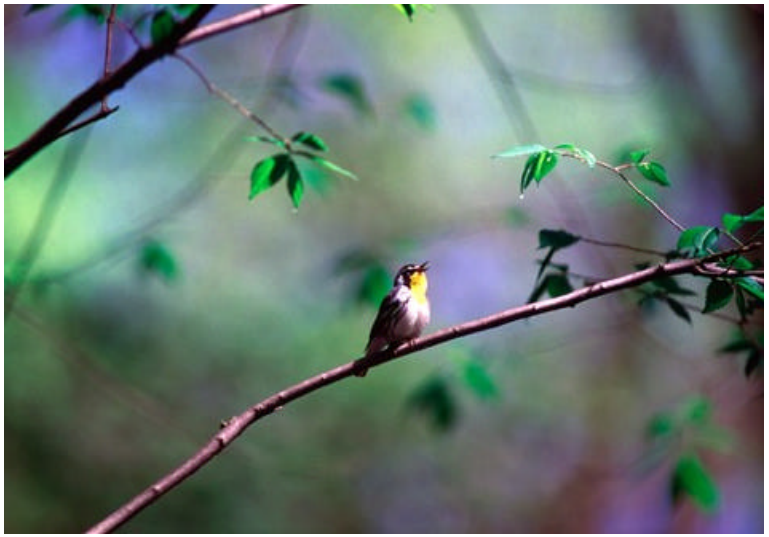
Included in the many environmental protection policies adopted during the 1970's is a Michigan state statute that has been largely overlooked—especially by local governments. Environmental areas, or EAs, were originally part of the Shorelands Protection and Management Act of 1970, and are now incorporated under the Shorelands section of NREPA, Part 323, PA 451 of 1994 as amended.

WHY PROTECT ENVIRONMENTAL AREAS?

Parts of the shoreline designated as environmental areas may most easily be thought of as the "crown jewels" in an ecosystem for priority protection. The primary reason for instituting additional regulatory protection measures in these magnificent landscapes was to safeguard their existence for the sustainability of ours.

What are environmental areas? Environmental areas are some of the most important and pristine fresh water habitat found in the state, and in the country. These shoreline places are vital for wildlife breeding and spawning. They are so crucial for the continued survival of most species of fish, water fowl, and migratory birds, that scientists and lawmakers agreed they deserve additional protection from destructive human activities. Environmental areas are defined by statute as, *"An area of the shoreland determined by the Department, on the basis of studies and surveys, to be necessary for the preservation and maintenance of fish and wildlife."*

Figure 2.3 illustrates the landscape characteristics of many designated EAs. Notice that some species require the use of the entire range of an EA to survive. When environmental areas are destroyed, fish and wildlife dependent upon these areas, if not killed, are forced to crowd into habitats elsewhere—if they can find a place to go. The end result is a smaller number of species with unstable populations that are more susceptible to disease and catastrophe.[10]

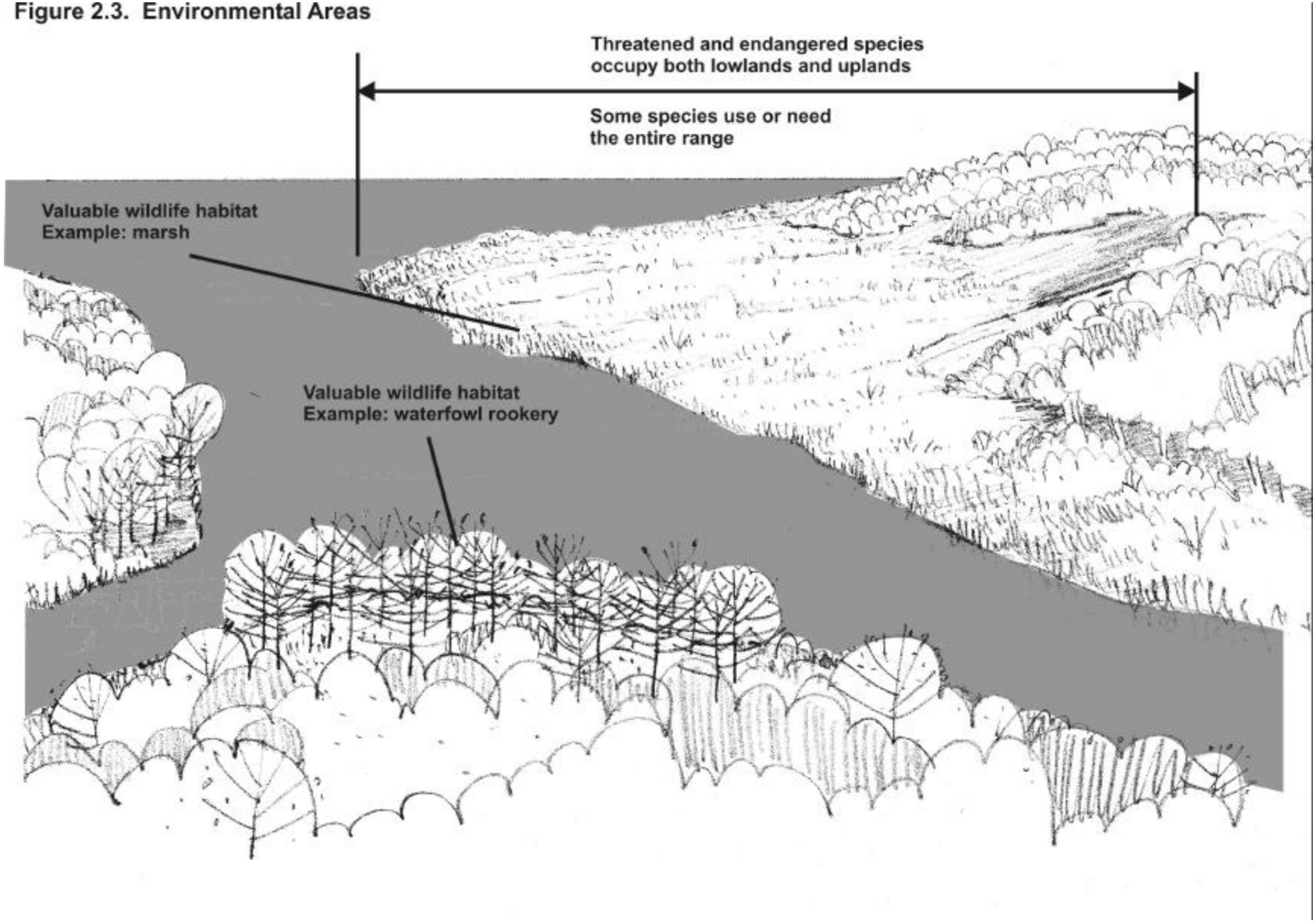


Many threatened species, like this Yellow-throated Warbler, rely on environmental areas for their migratory routes. *Photo: David Kenyon, DNR.*

What do they do? Environmental areas provide habitat, migration stopovers, food, and nursery areas to a variety of fish and wildlife. Perhaps most importantly, they flourish in the absence of human activities. As the name implies, environmental areas are places where the shoreline is kept in its most natural state.

Although EAs may contain other regulated natural features, such as wetlands or sand dunes, it is their overall importance to the ecosystem that is the reason for protection. Consequently, EA designation is designed to serve as an added layer of environmental protection for this invaluable resource. EA protection is the most ecosystem-based environmental legislation currently on the books in Michigan, as it attempts to protect the landscape as it functions as a whole.

Figure 2.3. Environmental Areas



An irreplaceable resource. Because EAs are designated based on their high-quality ecological characteristics, they are irreplaceable. Wildlife dependent on these areas cannot simply choose to go elsewhere for their breeding and habitat needs. They rely on the naturally occurring features of these areas. Therefore, there is little way to compensate for the loss of these wild places once they have been destroyed.

WHAT IS REGULATED?

Of Michigan's 3,288 miles of Great Lakes shoreline, approximately 275 linear miles are considered essential habitat. That is a mere 8.5% of the shoreline we must strive to keep devoid of human activities in order to protect the numerous fish and wildlife species that depend on it.

Currently, there are 118 designated environmental areas. They are located within the townships indicated on Map 2.1. State statute provides for the designation of environmental areas up to 1000 feet landward of the ordinary high water mark of a Great Lake or 1000 landward of the ordinary high water mark of lands adjacent to waters affected by levels of the Great Lakes. Many parcels containing environmental areas extending inland 1,000 feet are state and/or federally owned. However, if an EA encompasses an entire parcel that is privately owned, a 12,000 square foot structure zone is identified where construction can be permitted as long as it complies with local ordinances and does not adversely impact the EA or its inhabitants.

Private owners of designated environmental area lands are eligible to apply for enrollment in Part 361 of NREPA, Farmland and Open Space Preservation, PA 451 of 1994 (formerly know as PA 116 of 1974). This statute provides for property tax reduction and exemption from some types of assessments if the property owner enrolls under an open space easement.

How does an EA differ from a coastal wetland? As mentioned above, EAs usually contain natural features regulated under other statutes, such as a coastal wetland. However, wetland regulations do not regulate all methods of vegetation removal, or assert habitat protection conditions. In contrast, EAs are designed to protect the natural condition of the area, limit or prohibit human presence, and specifically do not allow the following activities without a permit from the DEQ:

- vegetation removal
- dredging, filling, or in any way altering the soil
- alteration of drainage
- timber harvest in a colonial bird nesting area
- placement of a permanent structure.

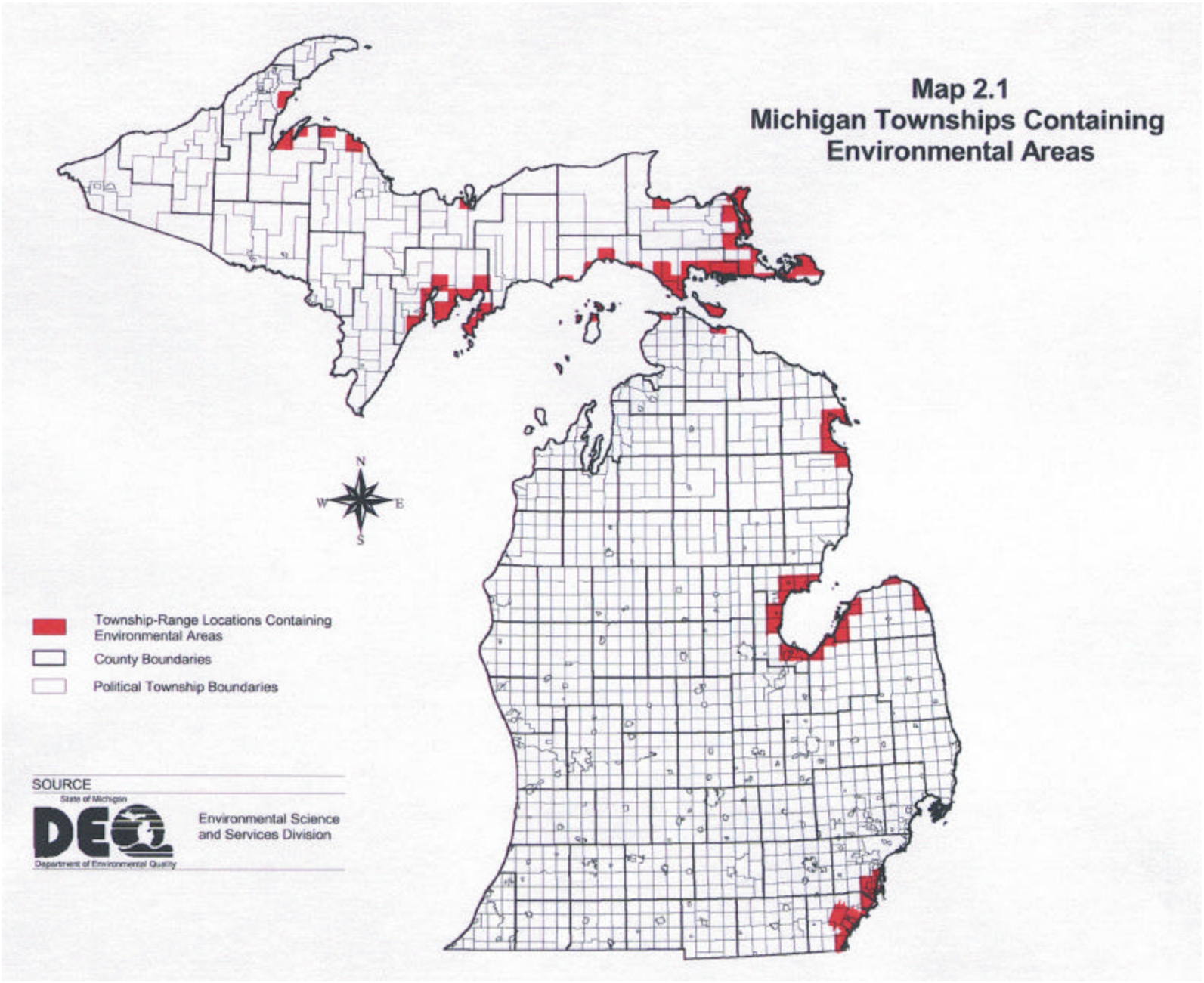
Contact the Department of Environmental Quality for an example of a complete EA management plan.

WHAT IS NOT REGULATED?

Although EAs are designed to protect the resource as a whole, the statute does not address water quality within EAs, near-shore boating activities, or land use on properties adjacent to EAs. These are important considerations, the last of which can be regulated by local zoning. EA designation does not require a deed restriction to be placed on properties within the regulated areas. Local governments can inform property owners of EAs by flagging the designation on property records which can facilitate an up-front understanding of the ecological importance of the property if it changes ownership.

LOCAL ROLE

Through the environmental area provisions, NREPA provides a county, township, city, or village with specific authority to enact shoreland zoning based on environmental factors. Like other regulated natural features, local governments can use the authority under NREPA or under the Planning and Zoning Enabling Acts. In this instance, the EA provisions in NREPA


Map 2.1
Michigan Townships Containing
Environmental Areas
N
W
E
S
Township-Range Locations Containing
Environmental Areas
County Boundaries
Political Township Boundaries
SOURCE
State of Michigan
DEQ
Department of Environmental Quality
Environmental Science
and Services Division

NREPA: Local governments can

- ✓ Adopt local ordinance subject to DEQ approval prior to implementation

require approval of a local ordinance by the Department of Environmental Quality prior to implementation.

Essentially, local governments are in a position to strengthen protection of the resource by adopting additional guidelines for use of environmentally sensitive areas within their jurisdiction and by effectively enforcing their zoning ordinances. An approved local zoning ordinance eliminates the need for a state site plan review procedure and may be enacted at any time.[11]

Local governments also have the ability to institute resource protective measures on the land surrounding EAs, and can essentially provide a large-scale buffer to these sensitive areas. To do that, community plans must recognize the importance of EAs, and then subsequent EA zoning ordinances must be adopted. Buffer requirements can be incorporated in the ordinance.

Zoning Enabling Acts: Local governments can

- ✓ Zone for low intensity or density land uses around EAs
- ✓ Require vegetated buffer areas around designated areas
- ✓ Implement native vegetation landscaping requirements on properties adjacent to EAs

Community development plans can also design open space areas around EAs, as well as provide recreational opportunities for bird watching, canoeing, kayaking, and other non-intrusive recreational activities around the perimeter.

Case Study
When Mistakes are Made, Our Environment Suffers

In 1976, an Environmental Area was designated along the coast of Lake Huron. The adjacent property, beyond the 1,000 foot inland boundary of the EA was, and still is a drained wetland area used for agricultural purposes. In the early 1990's, the farmer who had owned the property designated as EA, sold over 80 acres of his property that contained both agricultural land and a significant portion of the EA. No deed restrictions stating the existence of the designated EA were placed on the property, and few follow-up visits or letters from the DEQ reminded him over the years that his property was a designated EA .

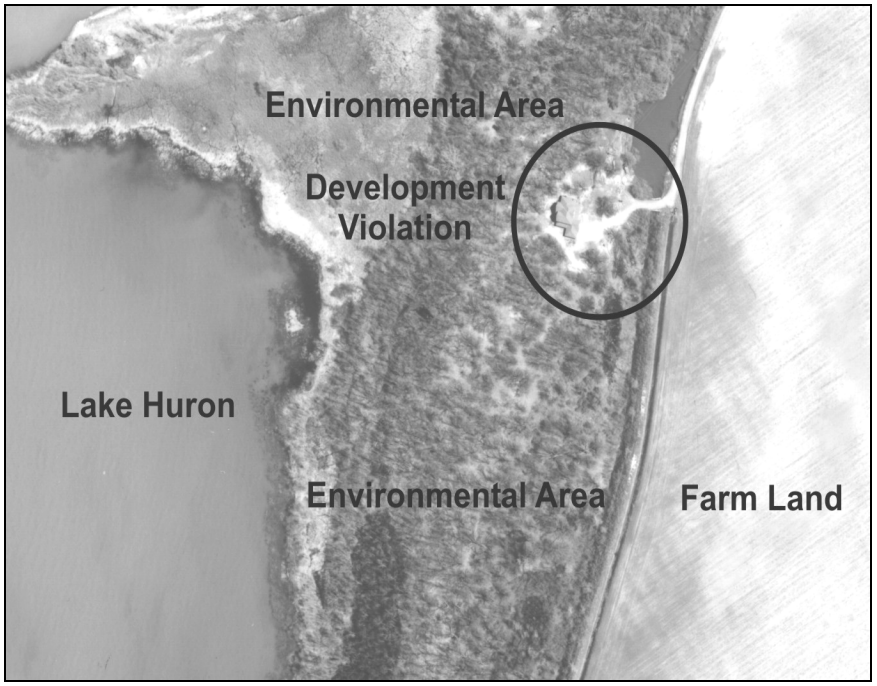
The new owner, pleased with his purchase and preparing to build his own home before building others to sell, sought to obtain building permits from the local government. The local government issued what they believed to be the necessary permits, and the property owner began construction on his new home. The DEQ was never contacted for permit review by the property owner or the local government.

Considered by the new owner as an ideal building site among his vast acreage because of the scenic views and wooded surroundings, he built his home right in the middle of the EA. This aerial photograph from the late 1990's shows where the house is in relation to the EA and surrounding agricultural land. The EA, is the wooded area on the left from the ditch line to the shoreline.

Although this one intrusion may not appear to be an environmental threat, it created a host of problems for the EA including: human disturbance to essential habitat by way of light, noise, pollution, utilities, and outdoor activity. The new resident also planted several non-native plant species—such as autumn olive trees—which are highly invasive and destructive to the native plant community. To make matters worse for this pristine habitat and coastal wetland area, neither the township nor the county had zoning ordinances, land division, or subdivision controls on the surrounding agricultural land. The lack of these land use tools essentially opens the door to destruction of the EA caused by unguided future development and infrastructure.

This situation not only created a dismal outlook from an environmental standpoint, and a lot of stress for the property owner, it also created the potential for numerous lawsuits; none of which presented an appealing scenario to any of the parties involved. Regardless of any legal action or outcomes, it is this vital piece of the ecosystem that ultimately pays the price.

Although not good news for the EA, this case exemplifies the importance of communication between the state and local governments, as well as with property owners. Coordination between the state and local government, deed restrictions, appropriate local zoning—or a combination of all of these actions could have prevented this situation in the first place. As none of these tools were employed in the beginning, the integrity of the resource has been compromised, and may be lost entirely for future generations to enjoy.



SOIL EROSION & SEDIMENTATION CONTROL

While it may be true that a little dirt never hurt anyone, the massive quantity entering our waterways each year is damaging and costly. Consequently, Michigan's Soil Erosion and Sedimentation Control Program (SESC) was implemented in an effort to limit the amount of sediment pollution entering the state's waters by improper construction site management practices. Special measures must be taken at all development sites where there will be a disruption in land cover.

"Cumulative research suggests that excessive sediment in our waterways is the planet's most prevalent contaminant. Sediment accounts for more than 2/3 of all pollutants entering U.S. waterways. Estimates indicate up to $13 billion per year are spent in the U.S. to directly mitigate the off-site impacts of erosion and sediment."

-- Marc Thiesen
Excerpt from Wetlands, Woodlands and Wildlife, the First Annual New England Natural Resources Conference Proceedings, *Land and Water*, 1996.

WHY PROTECT WATER FROM SEDIMENT?

Soil erosion in the context of ecological health is really about water quality. Figure 2.4 illustrates how sediment enters waterways because of soil disturbance. Notice also how isolated activities add up, causing problems for the watershed.

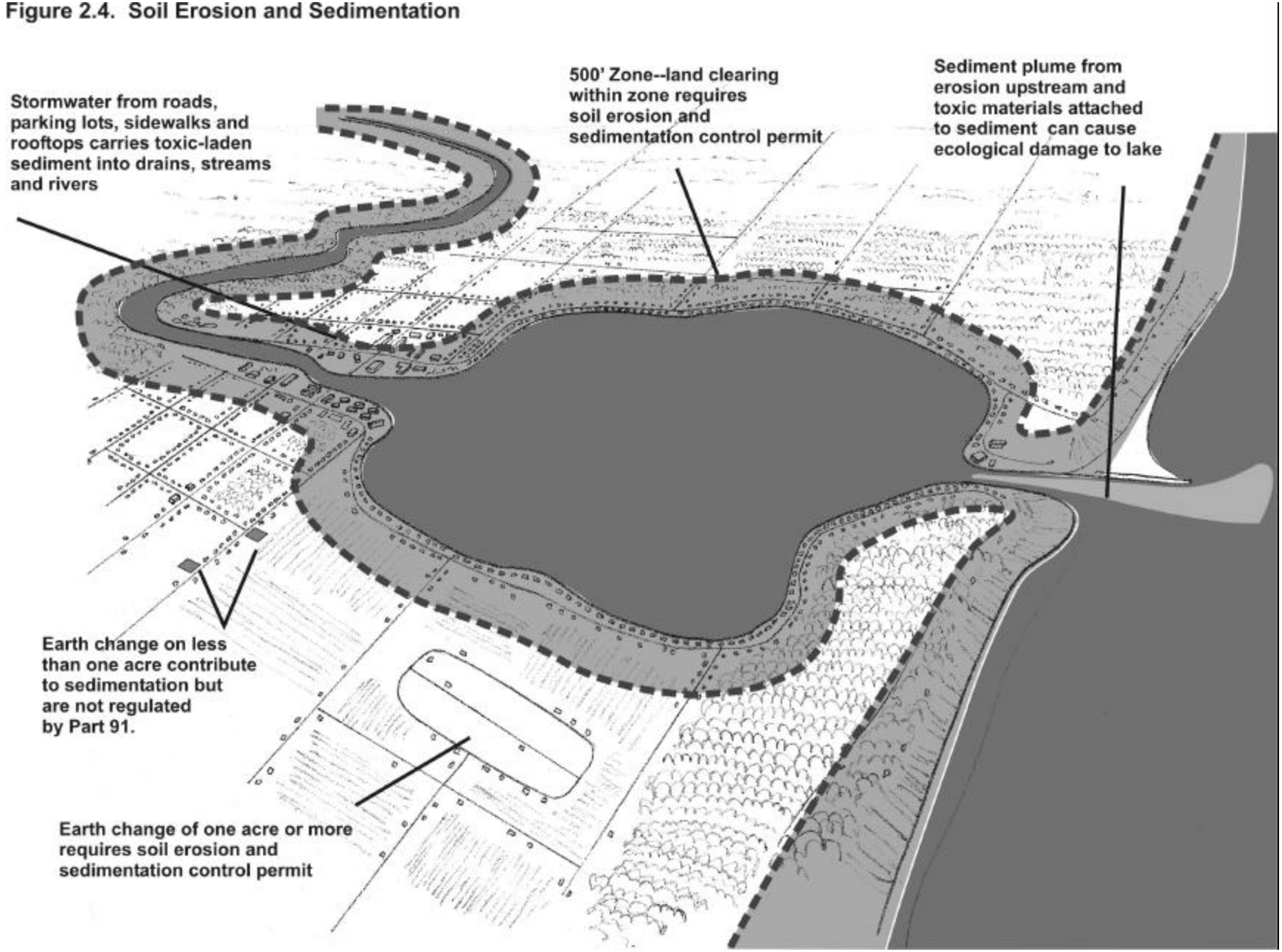
Construction is considered the most damaging phase of development projects for streams and other aquatic resources.[12] Trees, vegetation, and topsoil are usually all removed, and the exposed soil is more prone to erosion. Additionally, heavy equipment compacts underlying soils which limits the ground's natural ability to infiltrate rainfall.[13] All of these activities are detrimental to water quality, and cumulative impacts can be devastating to a watershed.

This stream has been severely degraded because of excessive soil erosion and sedimentation. How much sediment is reaching our waterways? "Four to five billion tons are being deposited in our country's streams each year." –Field & Engle, Purdue University. *Photo: NEMO Project, University of Connecticut.*

What is soil erosion and sedimentation? Soil erosion is a process that occurs when the actions of water, wind, and other factors displace surface soils.[14] In simple terms, it is the process where soil particles are dislodged or detached and put in motion. Sedimentation is the process whereby detached particles generated by erosion are deposited elsewhere. Exacerbated by construction and earth moving activities, eroded soil (sediment) and other large particulate debris that enters waterways after a storm event is problematic for many reasons.

Sedimentation decreases water clarity, degrades fish and wildlife habitat, and adversely impacts water quality. Particularly damaging to water resources are the excess nutrients and contaminants attached to eroded soil, such as fertilizers, and toxics picked up from paved areas. Sediment also decreases water depths in lakes, rivers, and streams.

Figure 2.4. Soil Erosion and Sedimentation



Once surface soil is lost to erosion it is nearly impossible to replace—except at great expense.

Sediment is defined by NREPA as, *"solid particulate matter, including both mineral and organic matter, that is in suspension in water, is being transported, or has been removed from its site of origin by the actions of wind, water, or gravity and has been deposited elsewhere."*[15] Four to five billion tons of sediment are being deposited in our country's streams each year. That amount could fill 25,000 football fields, 100 feet high![16] While at least half of this amount is attributed to agricultural practices, the remainder comes from other soil disturbances, primarily from construction activities.[17]

Development projects leave soil prone to erosion. Notice the failing silt fence near the vegetation. *Photo: Ottawa County SESC Agency.*

WHAT IS REGULATED?

Part 91, Soil Erosion and Sedimentation Control of the Natural Resources and Environmental Protection Act (NREPA), PA 451 of 1994, as amended, regulates only earth change activities. Simply put, Part 91 deals primarily with construction projects. Under current rules, Part 91 requires a permit for, *"earth changes which disturbs 1 or more acres of land or which is within 500 feet of the water's edge of a lake or stream."*[18] Exempted activities include plowing and tilling for crop production, and some logging and mining activities. Most other sources of sediment are addressed separately in Part 31, Water Resources Protection of NREPA, PA 451 of 1994, as amended. For more information, contact the DEQ Water Division or the Michigan Department of Agriculture.

WHAT IS NOT REGULATED?

Like other parts of NREPA, Part 91 does not regulate all activities that local governments may want to address in order to protect aquatic resources. For example, earth change activities near wetlands or environmental areas may not require a permit under Part 91, but still need to be protected in order to effectively protect water quality. Part 91 also does not include provisions for other pollutants contained in stormwater runoff. See page 19 for list of common pollutants.

"Municipality," as defined by NREPA, does not include every community in Michigan, only cities, villages, charter townships, and general law townships in counties with a population of 200,000 or more.[19] This limitation may oblige a community not fitting the NREPA definition of municipality to adopt local soil erosion and sedimentation control policy via the enabling legislation rather than through the provision of Part 91.[20] If this is done, however, individuals in the community must still obtain a SESC permit from the county.

As is true for almost all of Michigan's regulated natural features, local governments need to clarify the source of their regulatory authority: NREPA or the Planning and Zoning Enabling Acts.

LOCAL ROLE

Soil erosion and sedimentation control programs are administered by various county agencies. Some cities and townships have their own SESC programs. Counties can administer Part 91 via a resolution or ordinances, whereas municipalities must adopt an ordinance to administer Part 91. To find out which local agencies are responsible for administering Part 91 in your community, visit DEQ's web site: *www.deq.state.mi.us/sesca/.*

The law states that local governments may adopt ordinances that are more stringent than NREPA. Therefore, counties and municipalities can adopt soil erosion and sedimentation control ordinances that require permits for earth change activities not regulated under Part 91 such as activities adjacent to wetlands, storm drains, and other sensitive environmental features, or earth change on less than 1 acre.

Nuts and Bolts of Local Soil Erosion & Sedimentation Control Ordinances

Unlike local wetland ordinances, local soil erosion and sedimentation control ordinances and programs must be approved by the DEQ prior to implementation. District DEQ field staff work with local soil erosion control program administrators throughout the ordinance development and approval process. A map of the regional jurisdictions can be obtained from the DEQ web site: w*ww.michigan.gov/documents/deq-soils-soilsstaff_4478_7.pdf.*

Although county and municipal programs can be more restrictive than Part 91, there are limits to what can be required under Part 91. Part 91 grants the state authority to approve *only* what is authorized in the statute, and the administrative rules. Guidance from the Attorney General's office clarifies, *"The DEQ possesses no authority under Part 91 to review and approve portions of a proposed ordinance that deals with issues other than those specifically addressed by Part 91 and the rules promulgated under Part 91."* In other words, the DEQ cannot approve sections of a soil erosion and sedimentation control ordinance that pertain to aspects of stormwater management other than soil erosion control because DEQ does not have the authority to approve any provision that is outside the specific scope of state law.

Recent amendments to Part 91 require the DEQ to review all soil erosion and sedimentation control programs by January

NREPA: Local governments can

- ✓ Adopt local ordinance subject to DEQ approval prior to implementation
- ✓ Can require a permit for earth change activities adjacent to wetlands, storm drains, and other sensitive environmental features

Zoning Enabling Acts: Local governments can

- ✓ Adopt stormwater control ordinances that include requirements for on-site stormwater retention and treatment
- ✓ Institute impervious surface limitations within the jurisdiction
- ✓ Require street vacuum or sweep services on a regular basis

2004. Local programs not approved by that date will no longer be able to administer and enforce Part 91.

Relationship of Local Soil Erosion Regulations and Local Zoning

Sediment is one of many pollutants contained in stormwater runoff. Some communities have incorporated language into their soil erosion control ordinances that addresses all types of stormwater runoff, earth change activities on less than 1 acre, and/or requires a permit for earth change activities near man made watercourses as well as natural water bodies, such as a storm drain.

These progressive management practices are good from an environmental standpoint as they institute greater overall resource protection. However, making sure the ordinance is within the scope of a state law and meets all procedural requirements can be the difference between an "iron clad" policy, or one that may be defeated if legally challenged.

In light of the above technical but important distinction about what NREPA allows state and local officials to regulate, local governments wanting to implement stormwater best management practices and pollution control methods that are not addressed in Part 91 may want to consider other options — even where a county or municipal soil erosion and sedimentation control ordinance is already in place. Overall stormwater management goals can be implemented under a different ordinance, such as separate municipal stormwater ordinance, or stormwater provisions in the zoning codes.

As with other local policies that seek to "protect natural resources," the Planning and Zoning Enabling Acts give local governments the authority to do so. Within master plans, communities can recognize the relationship between stormwater management and water quality.

Pollutants in Polluted Runoff

The focus of water pollution problems has traditionally been on point sources of pollution— direct discharges from industrial facilities, sewage treatment plants and the like. Over the last 30 years, these point sources have been cleaned up considerably due to federal legislation such as the Clean Water Act and many additional state and local efforts. Yet pollution problems persist.

Today, "nonpoint source pollution" or polluted runoff, is the number one water quality problem in the U.S. (U.S. Environmental Protection Agency). Polluted runoff is created when water washes over the land, picks up all sorts of pollutants along the way, and carries them directly to lakes, rivers streams, and even groundwater.

Many officials know about sediment because there has been a lot of guidance and regulation regarding erosion control and sedimentation already. However, it's important to keep in mind that sediment is just one of several nonpoint pollutants that impairs water quality. What we do to control sediment and erosion does not necessarily control for other pollutants as well. Below is a list of some of the most damaging pollutants in runoff.

- **Nutrients** Ex: nitrogen, phosphorus.
  Sources include: pet waste, livestock waste, fertilizers, septic systems, auto emissions
- **Pathogens** Ex: harmful bacteria, viruses.
  Sources include: failing septic systems, animal waste, marine sanitation devices
- **Sediment** Ex: soil, sand.
  Sources include: road sand, construction sites, agricultural fields, disturbed surface areas
- **Toxic Contaminants** Ex: motor oil, solvents, paint, pesticides.
  Sources include: industrial, commercial, household and agricultural chemicals; auto emissions
- **Debris** Ex: trash, litter, abandoned objects.
  Sources include: illegal dumping, street litter, beach litter, boating waste, camping, hunting, and fishing waste
- **Thermal Stress** Ex: alteration in water temperature, increased sun exposure.
  Sources include: runoff from heat-absorbing impervious surfaces (roofs, roads, parking lots), removal of streamside vegetation, shallow water impoundments.

Source: NEMO, "Linking Land Use to Water Quality," University of Connecticut Cooperative Extension, 1993.

An Ounce of Prevention…

As a state certified stormwater inspector, Bob Knox knows the importance of soil erosion and sedimentation control. As the Project Superintendent for W.P.M., Inc. contractor, he knows the importance of doing a job right the first time.

That is why, he says, his crew uses silt sacks and other soil erosion control devices on every job. "At only $60.00 to $80.00 each, it is worth preventing a more costly clean-up after the fact." Preventative measures are not just better from an economic standpoint, they are the best way to protect and improve water quality.

Above: A W.P.M., Inc. employee displays a "silt sack" placed under storm drain grates on and around construction sites to trap sediment and debris. One of many ways to control soil erosion and sedimentation, "It's the first thing we do at a site," he says. On average, the reusable sacks need to be cleaned out once every 4-8 weeks. *Photo: K. Ardizone.*

Subsequent zoning ordinances can then be implemented that support maintaining and improving water quality through buffer strips, reduction in impervious surfaces, and other stormwater best management practices. Police power regulations may be another way to implement stormwater management. More information about police power regulations is found in Part III. Sample soil erosion and sedimentation control ordinances and sample stormwater management ordinances are found in the Appendices.

Case Study
Grand Traverse County

Grand Traverse County Drain Commissioner, Maureen Templeton, recognized the importance of maintaining the area's high level of water quality when she first began working for the county in 1985. Not surprisingly, the county's stormwater control program emphasizes pollution prevention.

The county's soil erosion, sedimentation and stormwater control ordinance goes above and beyond state law by incorporating stormwater regulations and requiring permits for development in environmentally sensitive areas and on slopes greater than a 10% grade. Templeton points out that there are no major storm sewer systems outside of the city limits. Therefore, the ordinance also requires every commercial development to have on-site stormwater treatment, regardless of the size of development. "Soil disturbances less than one acre and the cumulative impacts of small scale impervious surfaces can be just as damaging to water quality as larger projects," she says.

Although situated along the coast, the majority of streams running through Grand Traverse County are fed by ground water. That is why, says Templeton, her program tries to protect natural hydrology and emphasize infiltration processes as much as possible. Provisions within the ordinance discourage underground systems because they do not allow bio-filtration to occur. The ordinance also safeguards against toxics entering groundwater by requiring two-cell retention basins on projects over five acres in size.

When the county's ordinance was being developed in the late 1980's, there was a great deal of interest and support within the community. Prior to the adoption of the ordinance, developers were required to implement on-site erosion and sediment controls, but without the help of guidelines. The new ordinance provided a more comprehensive approach to water quality protection as well as clearly defined guidelines, which were welcomed by developers.

The program is administered through site plan review and site inspection. Templeton says that the vast majority of people are willing to work with county officials to comply with the ordinance. However, she would like to see greater enforcement mechanisms implemented for the few who are not willing to comply with the ordinance. Templeton believes that being tough up front with those who choose not to comply would alleviate the potential for a lengthy legal battle later on. It would also institute greater incentive for those who "do the right thing" initially.

Contrary to "cut and dry" compliance issues related to building inspections or fire codes, soil erosion and sedimentation controls lend themselves to some degree of subjectivity. This is why, says Templeton, it would be a tremendous asset for communities updating or instituting SESC and/or stormwater management ordinances to ask their county attorney's office to outline provisions and consequences for enforcement from the beginning. "There is no 'cookbook' for soil erosion and sedimentation control," explains Templeton. "Clear communic ation from the county prosecutor about enforcement is essential."

Maureen Templeton can be reached at the Grand Traverse County Drain Commission: 231-995-6042.

Earth change activities on less than one acre, like the one above, are not generally regulated by the state, yet cumulatively they can be just as damaging to water resources as large-scale projects. Local control over small project sites can lead to tremendous water quality improvements in the watershed. *Photo: K. Ardizone*.

INLAND LAKES and STREAMS

Although Minnesota is known as the "land of 10,000 lakes," it is Michigan that is home of more than 11,000 lakes and ponds. Adding that figure to our 3,288 miles of Great Lakes coastline and 36,000 miles of rivers makes the amount of shoreline in the state staggering. Although the paths of inland lakes and streams waterways lead to the Great Lakes, they are regulated differently than Great Lakes. As a result, proper management of inland lake and stream water quality is tied to the overall ecological health of the watershed, and ultimately the Great Lakes themselves.[21]

WHY PROTECT INLAND LAKES and STREAMS?

Inland lakes and streams provide a host of recreational activities as well as valuable habitat and, in some instances, drinking water. Like most of the natural features discussed in this book, naturally occurring lakes and streams are continuously moving and have cyclical input and output processes. Water enters lakes from the runoff of rain and snowmelt, streams, rivers, and creeks, and from groundwater flow. Water leaves lakes through outlet streams and rivers, groundwater flow, and evaporation.

Inland lakes and streams are often the first indicators of water quality problems within a watershed, as they provide the path for water to move towards its ultimate outlet. The continuous flow of streams and groundwater brings water and the pollution it carries from the highland part of the watershed down to the lakes.[22]

Think of the water moving through a watershed as an empty freight train that picks up garbage at every stop, so that by the time it reaches its destination there is an enormous pile of trash to be deposited. By checking the box cars at the stops along the way, you can get a good indication of the size of the mess that awaits the end of the journey if nothing is done to clean it up before it gets there. Protecting, maintaining, and improving water quality of inland lakes and streams, essentially inspecting the "box cars," is beneficial both environmentally and economically—and is the best way to check up on the overall health of the watershed.

"Each of us is personally responsible for contributing some of the pollutants that run off our lawns, streets and parking lots. (Yet) we seldom take the trouble to measure the cumulative impact of our individual behaviors on the watershed."

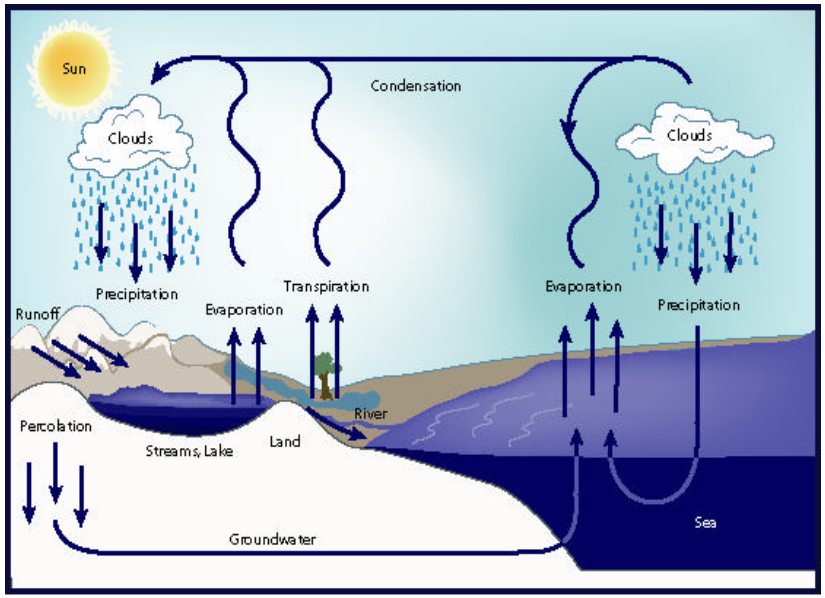
-Tom Scheuler, ***The Practice of Watershed Protection,*** *Article 126, "Understanding Watershed Behavior," 2000.*

Figure 2.5 illustrates the many surrounding land use inputs entering a lake and stream. Although high concentrations of runoff entering water bodies come from adjacent parcels, other parts of the watershed share some of the responsibility. Understanding this process makes it easy to see the link between land use and water quality. Water quality acts as the "report card" of the overall ecological health—and land use patterns–of the entire watershed. *More information about Michigan's water quality standards can be found in Part 31 of NREPA or from DEQ's Water Division.*

WHAT IS REGULATED?

Inland lakes and streams are regulated under Part 301 and of the Natural Resources and Environmental Protection Act (NREPA), PA 451 of 1994, as amended. Critics argue that protection of inland bodies of water has fallen short at the state level. At least part of the reason for this is because state law address primarily the activities on and in inland lakes and streams. The state rarely determines surrounding land uses. Without the ability to protect inland lakes and streams from

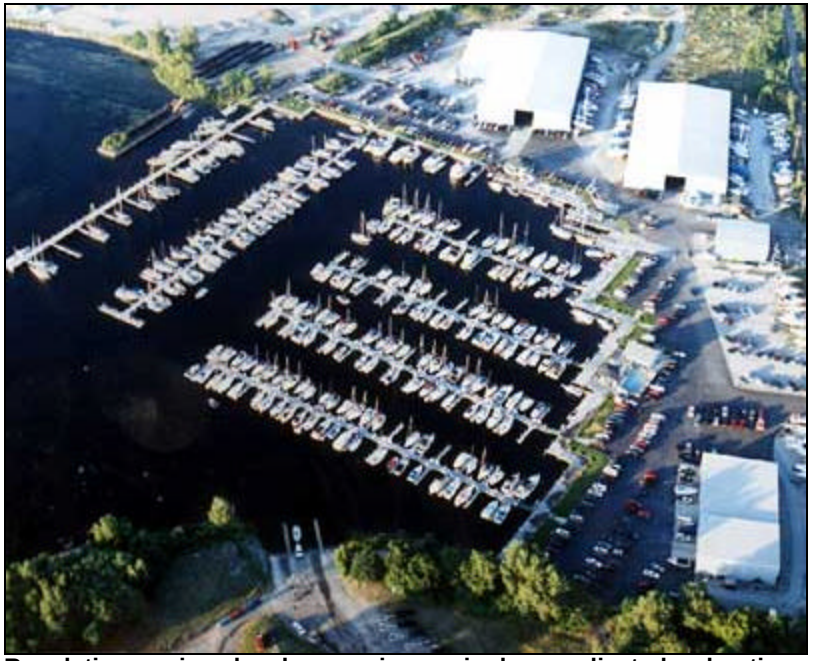
adverse uses of surrounding land, it is difficult for the state to effectively protect water quality on its own.



The Water Cycle. Notice how eventually all water moves over – and through – the land. *Source: Athens-Clarke County, GA, Stormwater Management Program.*

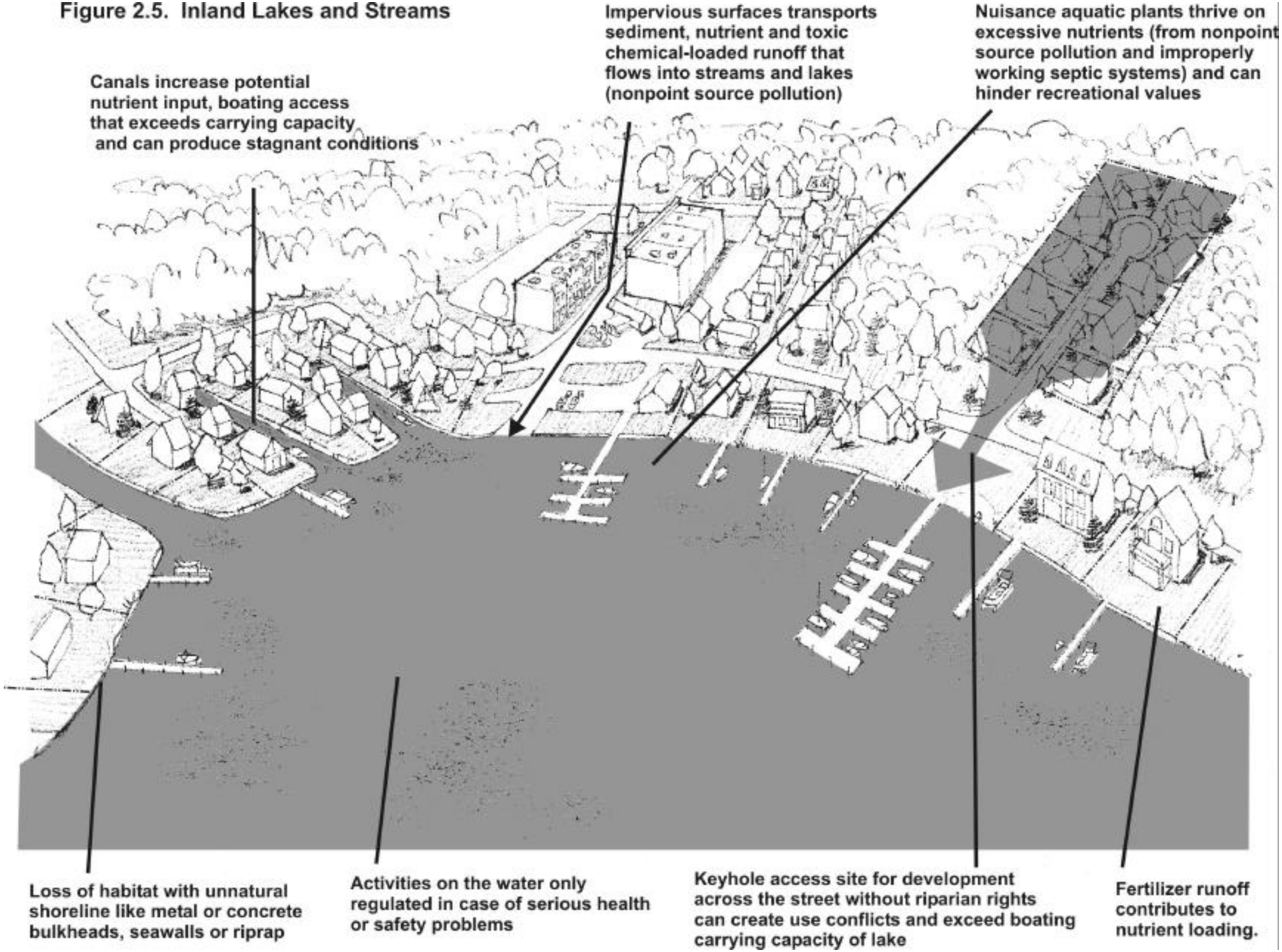
Permits are required from DEQ for activities such as construction of permanent docks, or placing fill in the water. Whether or not an activity requires a Marina Operating Permit under Part 301 of NREPA, depends on the nature of the use. In addition to commercial businesses that provide docking or mooring as part of their services, docking or mooring from riparian properties such as outlots, trailer parks, condominium and apartment developments, yacht clubs, and other commonly owned or controlled points of access may meet the definition of a marina under Part 301. More information about state marina regulation can be found on the DEQ's website at *www.michigan.gov/deq* under "Marina Operating Permits."

Although the DEQ issues permits for marina operations and monitors water quality, the state Department of Natural Resources steps in as regulator when human safety, critical habitat, or threatened and endangered species are at risk. The DNR does not restrict the type or size of watercrafts used on an inland lakes or streams unless environmental regulations have been broken, or unless human health or protected species are in harms way as a result. The DNR Director may regulate the number of boats and the size of engines at DNR access sites if he/she chooses to do so. [See also the local watercraft ordinance topic at the end of this section.]



Regulating marinas has become increasingly complicated as boating demands rise and regulatory jurisdictions are sometimes unclear. *Photo: Great Lakes Marina.*

Figure 2.5. Inland Lakes and Streams



WHAT IS NOT REGULATED?

As mentioned above, land uses surrounding inland lakes and streams are not regulated by the state. Water quality impairments caused by motorboats, stormwater runoff, and septic fields are usually regulated by county or local agencies rather than by the state. While the state does provide guidance for dock length, it does not regulate the number of slips within a marina or on a keyhole development that provides water access to a large number of people.

KEYHOLE DEVELOPMENTS

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. The small access point is intended for use by many more persons than is typical from a single family lot.[23] Keyholing occurs as a result of a "backlot" property owner purchasing a small, waterfront lot to accommodate access by owners/residents/guests.[24] Typical backlot developments include condominiums, campgrounds, or planned unit developments.

Keyhole developments can be problematic for many reasons. Chief among them is the increased water traffic from boating. Other conflicts include:

- Increase of safety hazards
- Increase in shoreline erosion can result from an increase in boating activity
- High density development around water can decrease water quality through increased run-off
- Oil and gas pollution increases from motor craft engines
- Noise[25]

Local governments can alleviate some of the conflicts created by keyhole developments by establishing lot width requirements for access per dwelling unit. Local governments can also set limits on motorized to non-motorized watercraft ratios. More information about keyhole regulations is provided in the Appendices.

LOCAL ROLE

Part 301 states that it is, "The duty of the state to protect the air, water, and other natural resources of this state against pollution, impairment, or destruction." However, all levels of government have jurisdiction and responsibility to promote clean water, which is why protecting lake water quality requires a multifaceted and interjurisdictional approach.[26] Considering that the state has limited jurisdiction on

NREPA: Local governments can

- ✓ Provide comment to DEQ for Marina Operating Permit requests and ensure compatibility with local zoning, parking, and other facility considerations

Zoning Enabling Acts: Local governments can

- ✓ Regulate keyhole developments
- ✓ Require vegetated buffers around lakes and streams
- ✓ Limit the amount of impervious surfaces near lakes and streams
- ✓ Limit lot splits and control frontage requirements for docks
- ✓ Establish maximum dock lengths

surrounding land uses, policies implemented by local governments can help–or hurt–inland lake and stream health tremendously.

Because the state does not regulate land use of the watersheds surrounding inland lakes and streams, which is a key factor in determining water quality, the responsibility lies primarily in the hands of local officials and in the personal choices of the state's residents. Stormwater and agricultural management techniques, in addition to lakefront property owner efforts and land use controls, are all essential to protect water quality of inland lakes.[27]

Although all residents in a watershed are responsible for the level of water quality within that watershed, the land use decisions of waterfront property owners are particularly important to inland lake and stream water quality due to their proximity to the water. Riparian owners also have greater control over the inland lakes they surround. Therefore, lake associations are a key player in any discussion about lake issues, and need to be involved in any management planning process.

On public lakes, lake boards can be established by a local unit of government on their own initiative, or by petition of 2/3 of the riparian property owners around the lake.[28] Whether on a public or private lake, lake boards can initiate and fund lake management planning and implementation projects. Watershed councils can also provide technical assistance for inland land and/or watershed management plans.[29]

Lakes provide numerous recreational activities for residents year round. *Photo: D. Kenyon, DNR.*

Fertilizers seep into lake; algae a problem

By Gene Schabath / **The Detroit News**
Sunday, 9/29/02

HARRISON TOWNSHIP – A blanket of mint-green algae that recently covered Campau Bay – south of the Clinton River in Lake St. Clair – is a graphic example of what happens from overuse of lawn and crop fertilizers, said biologist Carl Freeman at Wayne State University.

"The Macomb County Health Department conducts water tests in Campau Bay, and it always has nutrients in it. That's a sign of fertilizers," Freeman said.

The Clinton River also is affected.

"Fertilizers from our lawns and from farms gets washed into the Clinton River, and a lot of it ends up in the lake," said Doug Martz, head of the Macomb Water Quality Board.

Algae growth was so thick that it kept some boaters from the bay, Martz said.

That inconvenience pales in comparison to what happened to Lake Erie in the 1950s and '60s, Freeman said. The amount of phosphorous -- from fertilizers and laundry detergent -- draining into Lake Erie was so plentiful that it contributed to turning Erie into a "dead lake."

"It caused algae to grow horrifically," Freeman said. "When the algae died it used up the oxygen and that asphyxiated the fish. And the dead fish used up more oxygen. That's how Lake Erie died."

Elsewhere, nutrients are being blamed for "dead zones" in the Gulf of Mexico.

"Nutrients stimulate growth in the form of plankton blooms. And when those organisms die, they sink to the bottom and die," according to a report from Ducks Unlimited. "This decay process uses up available dissolved oxygen, causing mobile organisms like fish and shrimp to leave the area. Immobile animals like clams and oysters essentially suffocate."

An abundance of algae is usually an indication of excessive nutrients in ponds, inland lakes, and the Great Lakes. Common sources of nutrients include: fertilizers, septic systems, livestock waste, and pet waste. Homeowners can help reduce nutrient loading by cleaning up after pets, properly maintaining septic systems, and reducing – if not eliminating – use of fertilizers in their yards.
Photo: Desotelle Consulting, MN NEMO Project.

PROCEDURES - LOCAL WATERCRAFT CONTROL ORDINANCE

MICHIGAN DEPARTMENT OF NATURAL RESOURCES LAW ENFORCEMENT DIVISION

On certain bodies of water, high speed boaters, water skiers, swimmers, fishermen and others using the waters find that their varied recreational activities generate conflict situations and serious problems. Safety problems not specifically enforceable by the provisions of P.A. 451, 1994, Part 801, as amended are the only marine related issues that will be given consideration for establishing a local ordinance. **Issues concerning trespass, disorderly conduct, or damage caused to private property by the wake of vessels are not valid safety considerations for establishing a local ordinance.**

Local political subdivisions which believe that special local ordinances of the type authorized by this act are needed on waters in their jurisdiction shall inform the department and request assistance. All such requests shall be in the form of an official resolution approved by a majority of the governing body of the concerned political subdivision. Upon receipt of such resolutions the department shall proceed as required by sections 14 and 15 of Public Act 451, Part 801, Public Acts of 1994, as amended.

The department may initiate investigations and inquiries into the need for special rules for the use of vessels, water skis, water sleds, aquaplanes, surfboards, or other similar contrivances on any of the waters of this state. If controls for such activities are considered necessary, or changes or amendments to or repeal of an existing local ordinance is required. The Department may consider a local ordinance at this time. Notice of a public hearing shall be made in a newspaper of general circulation in the area in which the local ordinance is to be considered, amended, or repealed, not less than 10 calendar days before the hearing. Interested persons shall be afforded an opportunity to present their views on the proposed local ordinance either orally or in writing.

A local ordinance proposed pursuant to section 14 shall be submitted to the governing body of the political subdivision in which the controlled waters lie. Within 60 calendar days the governing body shall inform the department that it approves or disapproves of the proposed local ordinance. If the required information is not received within the time specified, the department shall consider the proposed local ordinance disapproved by the governing body. If the governing body disapproves the proposed local ordinance, or if the 60-day period has elapsed without a reply having been received from the governing body, no further action shall be taken. If the governing body approves the proposed local ordinance, the local ordinance shall be enacted identical in all respects to the local ordinance proposed by the department.

For more information contact DNR Law Enforcement Division, Marine Safety Section in Lansing.

*Photo: Andrew Shurtleff, **The Herald News**, 1998.*

NATURAL RIVERS

More than 36,000 miles of rivers and streams wind through Michigan and eventually flow into the Great Lakes. The Natural Rivers Program was adopted in 1970 to preserve, protect, and enhance portions of these wild and wooded landscapes that are home to some of the state's most treasured natural features most valued natural resources.[30] Fourteen rivers have sections designated and managed as natural rivers. At printing, natural river designation was being sought for the Pine and Upper Manistee rivers as well. The state's Natural Rivers Program is separate from the federal Wild & Scenic River Act of 1968, which applies to a few Michigan rivers on federally owned land.

WHY PROTECT RIVERS?

As discussed in the "Inland Lakes & Streams" section, rivers function as the life-blood of a watershed. The level of water quality in rivers and streams is generally the first test of land use decisions within the watershed as a whole. This is because channelization, excess runoff, soil erosion, and vegetation removal caused by poor land use decisions ultimately degrades water quality.

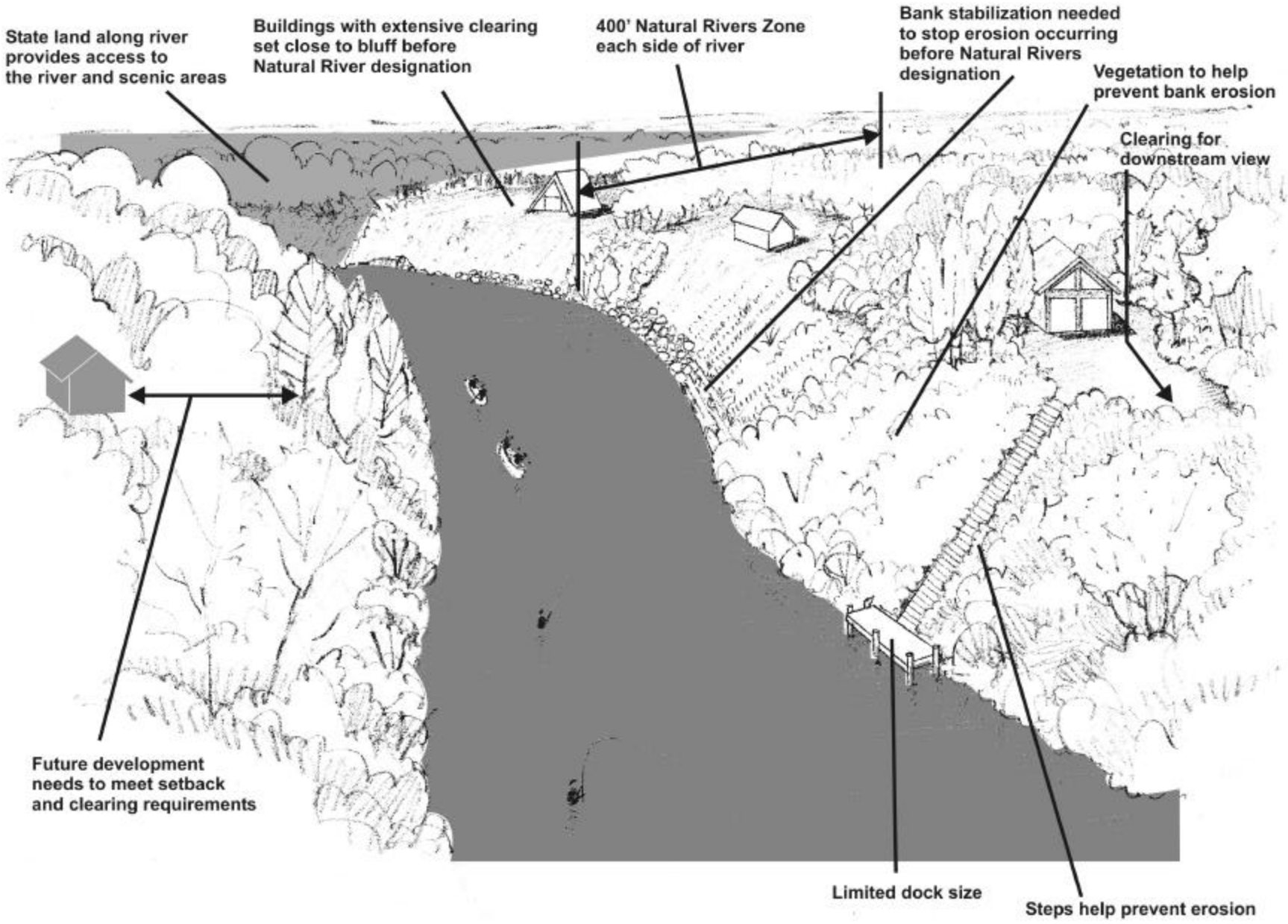
Maintaining our high quality river systems is a crucial component of maintaining the state's 1.5 billion dollar a year fishing industry.

Rivers and streams also serve as a significant source of water replenishment for the Great Lakes, and are critical habitat to numerous fish and wildlife species. Michigan is fortunate to have a number of clean, healthy rivers, and boasts an impressive 12,000 miles of cold water trout streams. But not all of the state's rivers and streams are in such good shape, which is why it is important to protect the condition of the rivers that are. The Natural Rivers Program is one way of ensuring high quality rivers and streams will continue to run through Michigan for future generations.

Beyond serving as a vital link in the water cycle and an important indicator of watershed health, properly managed rivers offer abutting property owners higher property values. Notice in Figure 2.6 how property owners are still able to maintain scenic views and have access to the river in designated areas. Studies conducted in the 1990's by Michigan State University conclude that people who live along the Boardman, Betsie, and other designated Natural Rivers overwhelmingly support the development guidelines because they ensure the quality of the river and raise property values.[31] Maintaining our high quality river systems is also a crucial component of maintaining the state's 1.5 billion dollar a year fishing industry.[32]

Channelization and improper development adjacent to rivers ultimately degrades water quality. *Photo: NEMO Project, University of Connecticut.*

Figure 2.6. Natural Rivers



WHAT IS REGULATED?

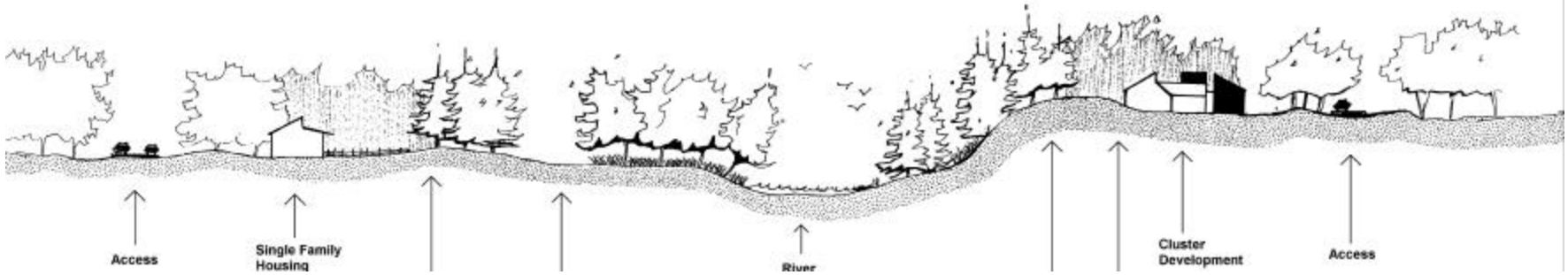
Part 305, Natural Rivers, of the Natural Resources and Environmental Protection Act, PA 451 of 1994, as amended was created, *"for the purpose of preserving and enhancing [a river or portion of a river's] values for water conservation, its free flowing condition, and its fish, wildlife, boating, scenic, aesthetic, floodplain, ecologic, historic, and recreational values and uses."*[33] The primary mechanism employed by the statute to achieve this goal is local zoning.[34] Unlike the other components of NREPA discussed in this book, the Department of Natural Resources (not the DEQ) is the administering agency of the Natural Rivers Program. [See Map 2.2 illustrating designated Natural Rivers.] Detailed maps of each designated Natural River can be found on DNR's website: *www.michigan.gov/dnr.* See sample ordinance in Appendices.

Through zoning provisions, development plans in designated Natural River areas are required to meet certain construction and septic setback distances from the water, and maintain a vegetated—typically forested—buffer strip of up to 100' wide along the water's edge. For new developments or newly created subdivisions and lot splits, there is generally a minimum lot size requirement of 200' of river frontage, and 1.5 acre lots. Existing properties that do not conform with provisions of Natural River ordinances are grandparented as a condition of the program, and therefore are allowed to remain within designated Natural River areas. Condemnation of a private property under Part 305 is specifically prohibited.[35] Ordinances are usually administered locally, but a local government may choose to allow the DNR to serve as the Natural River ordinance administrator and enforcement entity.

Similar to other local assumption provisions in NREPA, if a local government administers Part 305 it becomes fully responsible for upholding the provisions of the statute and corresponding ordinance, including potential liability if legally challenged. However, Part 305 affords communities a bit more protection for potential legal challenges because the law states, *"Any conflict shall be resolved in favor… of the local unit or the department… in such a manner as to promote the orderly preservation or enhancement of the values of the rivers and related land resources…"*[36] The potential for a regulatory "takings" judgment is also very low, as the statute does not prohibit development in designated areas. A local river protection ordinance, therefore, should not preclude all development—and cannot if it adopts a ordinance under Part 305.

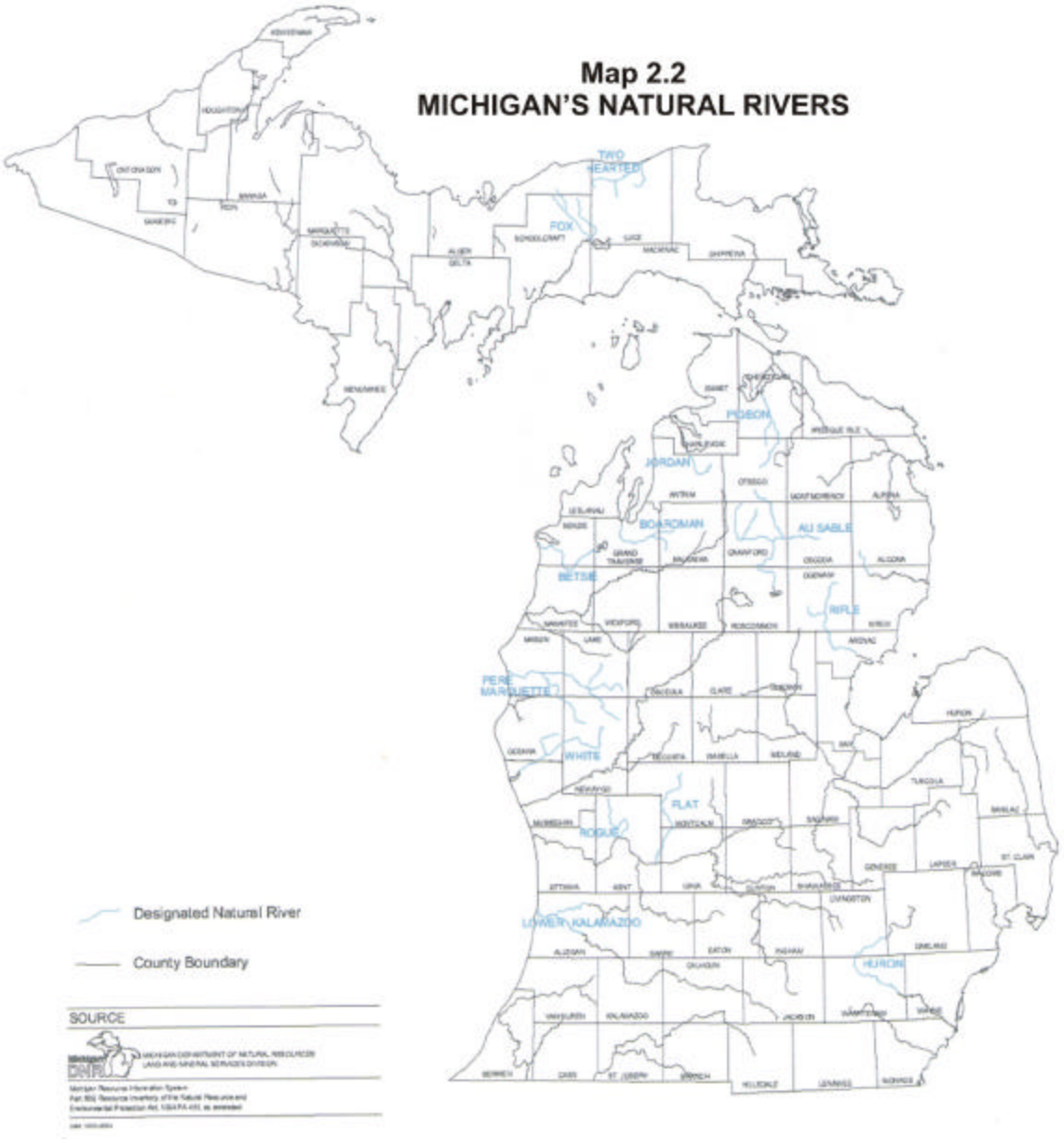
WHAT IS NOT REGULATED?

Although this nationally recognized program has been



Side view of setback distances. *Source: DNR*

Map 2.2
MICHIGAN'S NATURAL RIVERS



heralded as a workable balance between development and resource protection through local control, only 1,698 miles are designated as state Natural Rivers—a mere 4.5% of Michigan's riverine system. In many areas with forested, healthy rivers, the need for implementing river protection controls locally may not be obvious. However, as Michigan's population increases, and shifts to rural areas, the threat of damaging this resource is increasingly imminent. Because the Natural Rivers program seeks to protect rivers that are presently in good or excellent condition, the goal of the program is to create development guidelines *before* development proposals are on the table. In other words, the program does not seek to restore degraded rivers. Rather, it establishes guidelines to protect the highest quality rivers and streams to help keep them that way.

At printing, the Upper Manistee was being considered for Natural River designation which would help maintain excellent water quality and healthy fish populations. *Photo: Department of Natural Resources.*

Part 305 of NREPA allows agricultural uses of land in designated areas. The rules also permit small businesses, such as home occupations, canoe liveries, rental cabins, and campgrounds in designated areas as long as the applicable local zoning permits are obtained. The program institutes river and streambank management practices in a way the protects water quality, minimizes erosion with mature vegetation root structure, and preserves the aesthetic values of the area.

"Tax Advantages of Natural River Lots"

Natural River zoning increases the value of riverfront property because it protects the natural assets that make the land desireable. Zoning does restrict land uses, such as the number of lots into which an owner can subdivide the land. The Part 305, therefore, instructs local tax assessors to take zoning limitations into account when valuing property. The Act also provides for tax relief, under open space preservation programs, to property owners with farmland or undeveloped land in Natural River zoning districts.

Source: "Natural River Property Values," Fact Sheet 2, Michigan Land Use Institute, www.mlui.org, Benzonia, MI.

LOCAL ROLE

If an area is designated by DNR as a Natural River, local governments have, in essence "first refusal" to administer the statute. If the local government chooses not to administer the law through the adoption of corresponding zoning ordinances, then the DNR administers zoning rules that govern activities in the designated area.

ALTERNATIVE APPROACHES TO RIVER PROTECTION

Designation of a Natural River can be a lengthy process if there is not consensus among adjoining townships, or within a region about the desire to pursue river protection through designation. But local governments can often avoid the static that may arise from a highly publicized designation process, or from conflicting views within a river corridor by simply incorporating the key setback and management guidelines in their own zoning ordinances.

There are some benefits to acting locally and avoiding DNR involvement. One is a greater level of local control. Another is the speed in which policy to protect the resource can be implemented by acting autonomously. Also, what is wanted within one jurisdiction may not be welcomed in another. By implementing development standards locally, regional disputes can be avoided. The DNR is available to assist communities choosing this route by providing technical assistance if it is requested.[37]

Although from an ecological standpoint it is more effective to protect water quality on a watershed, or regional basis—every little bit helps. Just as there are negative cumulative impacts associated with poor land management, there are positive cumulative impacts associated with resource protection. Starting small, with one jurisdiction, can also motivate surrounding jurisdictions to follow suit—especially when increasing property values and cleaner water are the payoffs. Regardless of acting alone, regionally, or with the state, ultimately the issue is one of protecting natural, free-flowing rivers for current and future generations to enjoy.

Not The Typical Urban Stream
It's clean, quiet, full of fish.

By Andrew Guy: Great Lakes Bulletin News Service 3/5/2002

Rockford, MI -- Anglers eager to hook some of the Great Lakes finest steelhead will travel in the coming weeks from around the Midwest to wade in Michigan's rushing Rogue River. Sport fishing enthusiasts know the clean, cold currents of the Rogue and its spring-fed tributaries sustain a robust brown trout population and attract an exceptional fall salmon run. But the spring migration of steelhead — the silvery-sided, lake roaming relative of the rainbow trout — makes the Rogue one of Michigan's more popular fishing streams.

What's even more spectacular about the Rogue, though, is its location. The stream is born in the wind-stirred forest of the Rogue River State Game Area. From there it stretches through residential neighborhoods, past industrial factories, and into sprawling Grand Rapids — Michigan's second largest city — all the way maintaining its exceptional water quality and lively fishery.

In almost every place in Michigan and across the nation such heavy real estate development pressure has damaged rivers and run out wildlife with erosion and pollution. But west Michigan residents had the foresight nearly 30 years ago to put Michigan's Natural River Act to the test and enacted permanent safeguards that protect the Rogue's scenic and recreational value. They adopted limitations on home building, brush cutting, and other uses of land throughout the river's corridor.

Today, even as Grand Rapids' metropolitan boundary reaches further into the countryside, the Rogue River is a testament to sound public policy and courageous political decisions. It remains a wild and wooded natural attraction for visitors and residents alike and enhances the region's economy and quality of life.

"People know the Rogue is a special river," says Bernice Oosternouse, the proprietor of a one-room riverside outfitter known as O's Bait and Tackle

Shop in Rockford. "Come March everyone will start calling for a fish report. They'll rush right out here as soon as they hear the steelhead are running."

Rockford and the entire region immediately north of Grand Rapids is an increasingly urban environment. "The Rogue is unique because it's close to an urban area, yet we're still able to maintain a quality trout fishery," says Amy Harrington, a fish biologist with the Michigan Department of Natural Resources.

Ms. Harrington says the DNR artificially stocks game fish in the Rogue and that fluctuating water temperature is a serious issue, as it is for any stream. Warm storm water runs off parking lots, roof tops, and other impervious surfaces and, on occasion, can force the Rogue's various trout species to hide out in the cooler waters of upstream tributaries. But for the most part icy springs and vegetated riverbanks keep the stream shaded, clean, and cool.

The typical urban riverbank — stripped of vegetation, crowded by homes and businesses, and covered by water resistant concrete surfaces — fails to slow erosion, filter pollution, or provide shelter for wildlife.

Another once rural Grand Rapids-area community learned this costly lesson in the mid 1990's. Alpine Township's York Creek once sported 29 species of game fish. But relatively unchecked development over the past two decades ultimately choked the stream with sand and pollution. Now only the mighty minnow survives, and the cost to attempt restoration of just one mile of York Creek approached $1 million.

In 1970 the state Legislature created the Michigan Natural Rivers Program to help communities avoid these problems. The law enables local communities to work with the state DNR and maintain pristine rivers and tributaries by setting reasonable restrictions on commercial and residential development.

Citizens throughout the Rogue River system immediately embraced the visionary program and in 1973 the Rogue became the third waterway to be designated a state Natural River. Local townships coordinated their zoning and land use regulations to ensure that, among other things, buildings and septic systems would be setback 150 feet from the river's edge. Today, 132 miles of Rogue River remains locally zoned with environmentally sensitive ordinances.

"Natural River designation is not stopping any development," Harrington says. "But it has helped guide development in a way that protects the river. Beyond that the program doesn't have a whole lot of authority."

Michigan's Natural Rivers Program protects 14 of the state's world class waterways, all of which, like the Rogue, offer a piece of the region's natural heritage. The Au Sable River, designated in 1987, is considered by many the best trout fishery in the Midwest. The Pere Marquette, designated in 1978, is a nationally known blue ribbon trout stream.

"The Natural Rivers Program is not a cure all," says Amy Harrington. *"But it helps. And every little bit helps."*

Article reprinted with permission from Andrew Guy, *Great Lakes Bulletin News*.

FLOODPLAINS

Nearly all Michigan communities face challenges when safeguarding their residents from the damage that can be caused by floods. Floodplain guidance comes from both the state and federal governments and focuses on protecting people and property rather than natural resources.

WHY PROTECT FLOODPLAINS?

As most easily buildable lands have already been developed in many communities, much of the new and future construction in some parts of Michigan is moving to land areas that are not as suitable for development. Floodplains are one of these areas. This shift in development location is doubly problematic for watersheds that have lost extensive amounts of wetlands. Loss of wetlands in and outside of floodplains exacerbates flood events because it decreases the ability of the watershed as a whole to hold water. As discussed earlier in the book, wetlands can hold up to 1.5 million gallons of floodwater per acre—so when they are destroyed, the water that would have been contained within them to prevent flooding is no longer able to be absorbed effectively.

What is a floodplain? A river, stream, lake, or drain may on occasion overflow onto the surrounding banks and inundate adjacent land areas with flood water. The land that is inundated by water is defined as a floodplain. In Michigan, and nationally, the term floodplain has come to mean the land area that will be inundated by the overflow of water resulting from a 100-year flood (a flood which has a 1% chance of occurring any given year—NOT a flood which occurs once every hundred years).

WHAT IS REGULATED?

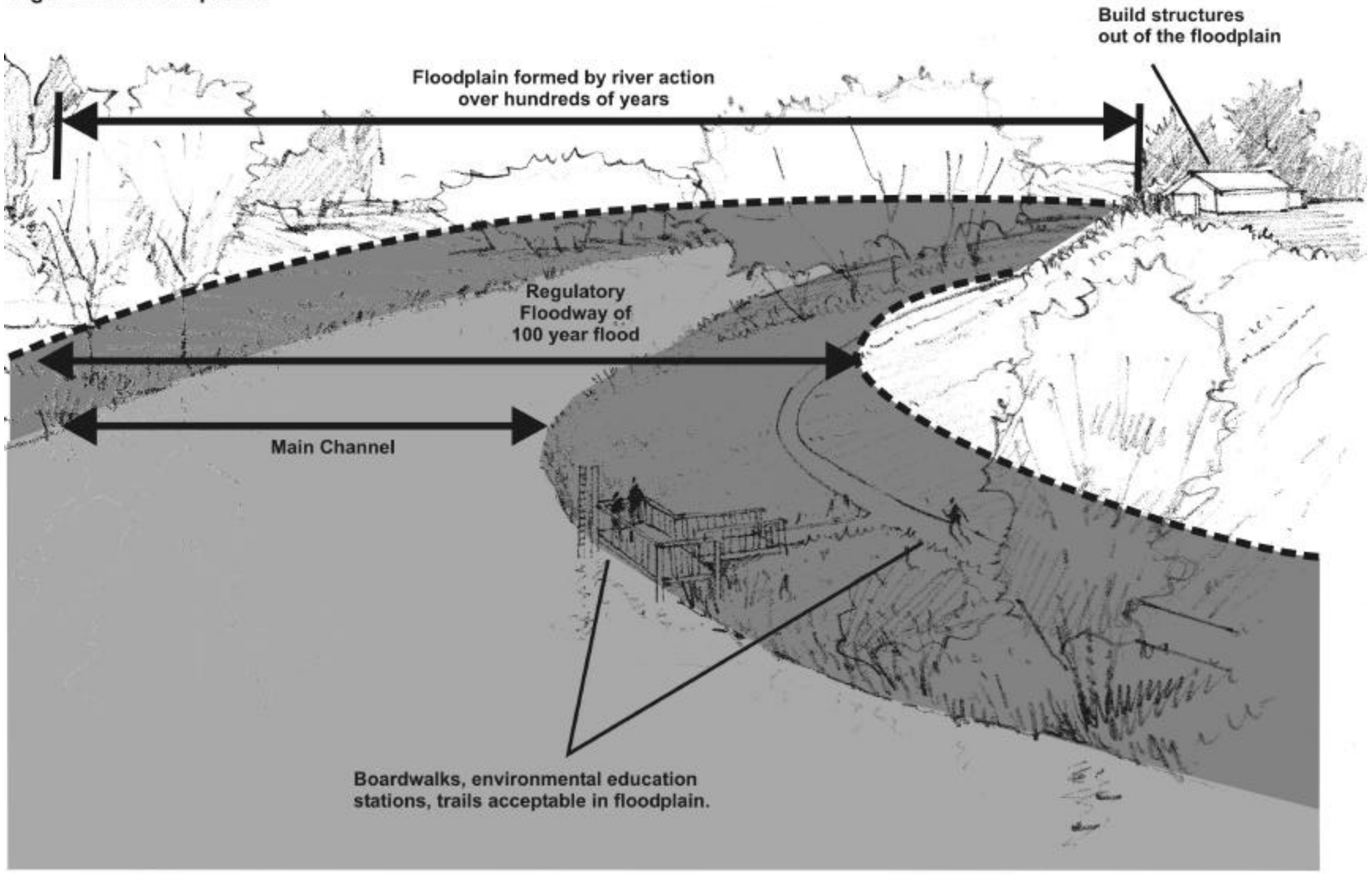
Development in floodplains is regulated under Part 31 Water Resources Protection of NREPA PA 451, 1994 as amended.

Many communities wisely choose to put parks or other low intensity land uses along floodplains so that property and financial damage is minimized. *Photo: Annette Nealey family archives.*

The purpose of Part 31 is to assure that the flow carrying capacity of a watercourse is not harmfully obstructed, and that the floodway portion of the floodplain is not used for residential construction. Flood Risk Areas, essentially coastal floodplains, are addressed in Part 323, Shorelands Protection and Management, of the same Act. Floodplains are also regulated federally through the Federal Emergency Management Agency.

Any area that is determined to be floodplain is subject to local, state, and federal regulation for development restrictions and/or requirements. The minimum standard for residential construction within the 100-year floodplain requires that the lowest floor of a structure be elevated one-foot above the 100-year flood elevation. Some communities and counties may have a higher standard relating to elevation requirements. A floor of a structure that is below grade on all sides is considered a basement and must be at or above the 100-year flood elevation. (See Figure 2.7)

Figure 2.7. Floodplains



Although all floodplains are regulated, not all floodplain areas have been mapped in Michigan. Consequently, when an area is being considered for development, the first step is to identify whether or not the property is in a floodplain.

How can communities identify floodplains? One of the biggest concerns for local officials is the dilemma of identifying where floodplains exist within their jurisdictions. Currently, there is no state map showing all floodplain locations. The reason being that most floodplain maps have been made on an "as needed" basis and are site specific. Available floodplain maps may be obtained on the DEQ's web site, *www.michigan.gov* under, "Floodplain Mapping," or refer to the *"Michigan Quick Guide,"* also available on DEQ's website.

Nearly all of Michigan's coastal communities and approximately 40% of inland communities participate in the National Flood Insurance Program administered by the federal government. Communities that participate in the National Flood Insurance Program reduce their economic liabilities in the event of a flood, and have access to maps that delineate floodplains. To be eligible, a community must either a) pass a resolution to enforce building codes that will regulate construction in floodplains, or b) pass an ordinance that regulates development in floodplains. *For more information about the National Flood Insurance Program, go to the "Floodplain Management" section of www.michigan.gov/deq.*

For communities that do not participate in the national program, there are essentially two ways to determine if an area is a floodplain. The first option, and the most accurate, is to contact a DEQ District Floodplain Engineer. (DEQ district offices contact information is provided in the Appendices.) That individual will make a site visit to assess the area in question. Typically, district engineers process requests from local governments as a priority over private property owners.

The second alternative for a community is to look at a soils map, generally available at low or no cost through the county planning office, on-line through the U.S. Geological Survey, or on the *www.michigan.gov* site. Soils maps identify where hydric soils are present, and can serve as a preliminary method of identifying potential floodplains.

WHAT IS NOT REGULATED?

Regulations pertaining to floodplains are property-based, not resource-based, in nature. Therefore, the goal of the statutes is to protect humans and their personal property from injury or destruction caused by floods. The statutes are not designed to protect the environment or natural resources, beyond maintaining the natural flow of flood waters as much as possible.

Impervious surfaces, such as pavement or compacted soils, are not regulated—yet they may affect the severity of flood impacts. Likewise, wetland protection and restoration is not specifically addressed in floodplain regulations—yet we know the benefits of wetlands in flood reduction. Therefore, communities are in a position to implement local regulatory and planning tools that alleviate many of the impacts of floods beyond building elevation requirements.

LOCAL ROLE

Fifty-one Michigan coastal communities have mapped designated flood risk areas and adopted regulations. These communities have approved zoning ordinances adopted under provisions of Part 323 of NREPA. The DEQ periodically monitors performance and provides technical assistance. As with other local ordinances adopted in accordance with NREPA, they are bound to the provisions of the statute. Communities choosing to include language in an ordinance that addresses impervious surfaces, or more stringent limitations on development plans can do so by adopting an environmentally sensitive area ordinance, site plan review for

residential developments, and by enacting greater restrictions within their building codes.

Inland communities not bound by Part 323 of NREPA are still subject to state building codes that require structures to be built at least one foot above the 100 year floodplain level.

These communities can include additional building requirements within their local building codes. For inland and coastal communities alike, local building officials are the primary enforcing agent for floodplain management.

Floodplains devoid of development can provide beautiful, scenic areas for a community to enjoy. *Photo: D. Kenyon, DNR.*

Case Study

Building a Prize-winning Floodplain Program

By Bruce Menery, DEQ

The City of Vassar is located along the Cass River in Tuscola County in the "Thumb" area of Michigan's Lower Peninsula. Since 1904, the City experienced approximately 28 floods. In 1986, Vassar experienced flood levels which exceeded 1% (100-year) frequency estimates, resulting in portions of the City being inundated by up to eight feet of water.

Following the 1986 flood, the City decided against simply rebuilding again and waiting for the next flood. Instead, the City put forth strong efforts to relocate, acquire, and flood-proof buildings within the floodplain. Immediately following the 1986 flood, the City was able to use funds from the National Food Insurance Program (NFIP) and State of Michigan Community Development Block Grants (CDBG) to purchase and remove 16 residential structures from the floodway portion of the floodplain. During times of flooding the floodway will experience moving water and flood depths which make it a hazardous area to occupy.

Due to lack of funding, the flood mitigation effort was put on hold, until 1998, when, with funding from the Federal Emergency Management Agency (FEMA), the City was able to develop a Flood Mitigation Plan. The Plan, which was adopted by the City Council, and approved by the FEMA, included 32 actions that the City could take to reduce flood damages in Vassar. The plan also included an inventory that identified 130 structures within the City as being prone to flooding. By having a plan developed, the City now has guidance to help reduce future flood losses, while also opening a funding mechanism through the FEMA to continue to mitigate flood losses, including purchasing and flood-proofing structures.

In 2001, four flood-prone homes were elevated using FEMA mitigation funding. The funding amounted to 75% of the project cost being picked up by the FEMA, 12.5 % by the City, and the remaining 12.5% coming from the homeowners. As the success of these elevation projects are demonstrated, additional property owners are expected to take advantage of the program.

For their efforts in outstanding floodplain management the City was awarded the Association of State Floodplain Managers' Sheaffer Flood-proofing Award at the Association's 2002 annual meeting in Phoenix, Arizona.

Higher ground: An example of a house that was elevated in Vassar as part of their flood program. Top photo taken prior to elevation; bottom after elevation. *Photos: DEQ.*

HIGH RISK EROSION AREAS

Although some people enjoy life on the edge, development in highly erodibe areas puts that kind of excitement in a whole different light. Many homes and other structures have been destroyed along the Great Lakes because of shore erosion processes. Although erosion is a natural process, the problems it causes for human inhabitants is often made worse by poor land use decisions.

Source unknown.

WHY PROTECT HIGH RISK EROSION AREAS?

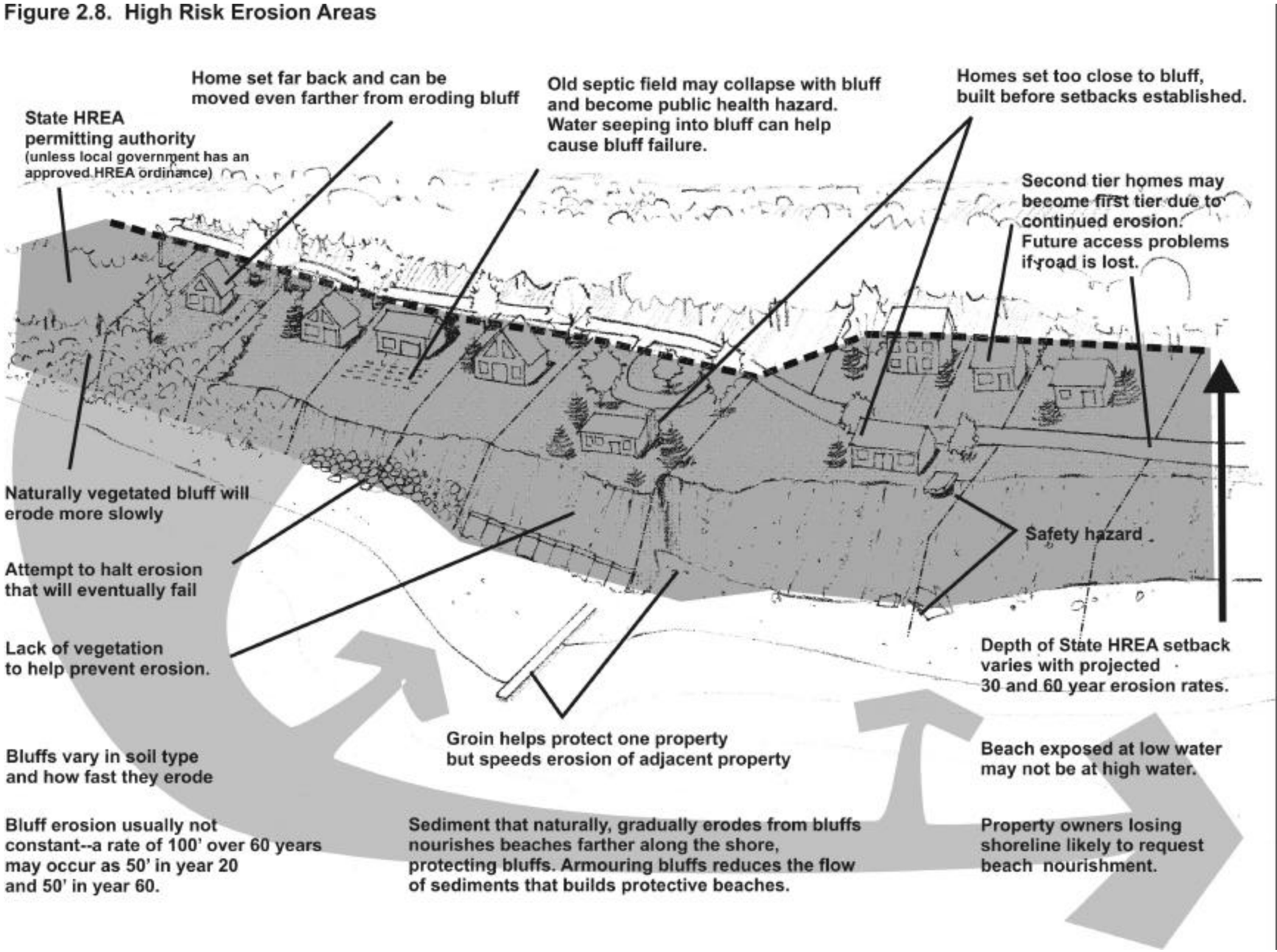
The impetus for regulating high risk erosion areas (HREA) is two-fold. First, state law is intended to reduce the amount of physical and economic damage caused by inappropriate development in these areas. Second, it serves to protect neighboring property owners' interests by curtailing development activities that will adversely affect their property. Notice in Figure 2.8 the many ways in which attempts to artificially control erosion ultimately damages the coastline. Similar to the seat belt law, HREA regulations set out to protect property owners from themselves. HREA regulation is intended to protect the greater good of the state by reducing the need for engineered shore protection structures, and preventing costly clean-up, mitigation, hazards to boats, and increased insurance rates and federal income tax casualty loss deductions for all property owners in the future.


An example of the destruction that can result from inappropriate construction in a HREA. *Photo: DEQ.*

Michigan's coastline and Great Lakes water quality have benefited as a result. Pollution caused by limited septic fields, and structure debris from homes and commercial development have been prevented from entering the Great Lakes. Development impacts on coastal ecosystems have been reduced as well.

What is a HREA? High risk erosion areas are those shorelands of the Great Lakes and connecting waters where erosion has been occurring at a long-term average rate of one foot or more per year. The erosion can be caused from one or several factors. High water levels, storms, wind, ground water seepage, surface water runoff, and frost are important factors causing erosion. While many of these factors occur naturally, surface water runoff and irresponsible development that increase erosion rates can be lessened or prevented by implementing appropriate land siting standards.

Figure 2.8. High Risk Erosion Areas



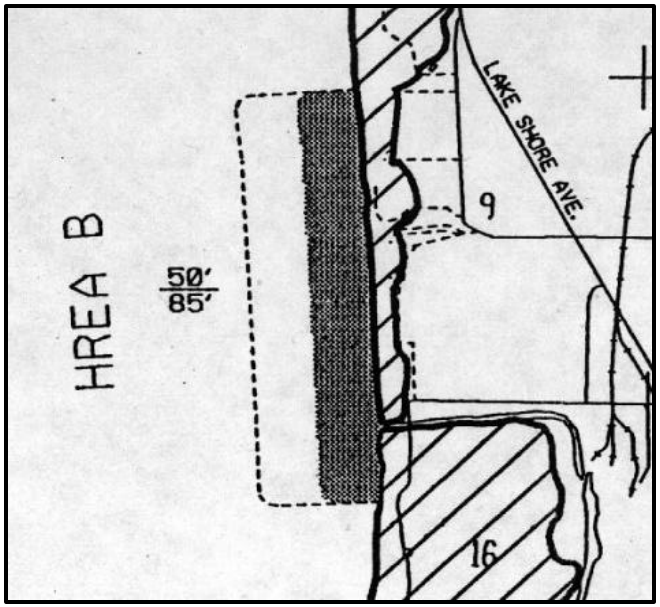
WHAT IS REGULATED?

Approximately 300 miles of Michigan Great Lakes shoreline are classified as high risk erosion areas. These eroding areas are addressed in Part 323, Shorelands Protection and Management, of the Natural Resources and Environmental Protection Act, PA 451, 1994 as amended. The law is designed to promote setbacks for construction projects that are a safe distance from the eroding shoreline in order to prolong the lifespan of the structure. Before discussing permit requirements, it is important to clarify exactly which coastal areas are affected. Map 2.3 shows which townships contain regulated HREAs.

How are HREA identified? One of the questions most frequently asked by local officials and property owners is, "How does the DEQ identify HREA?" In a nutshell, the Department compares historic aerial photographs with recent aerial photographs, and then measures the amount of shoreline that has eroded based on the difference between the two. If the amount per year over a minimum 15 year period equals one foot or more, the shoreline is considered a HREA. The standard practice is to use the longest time period available to calculate rate of erosion averages.

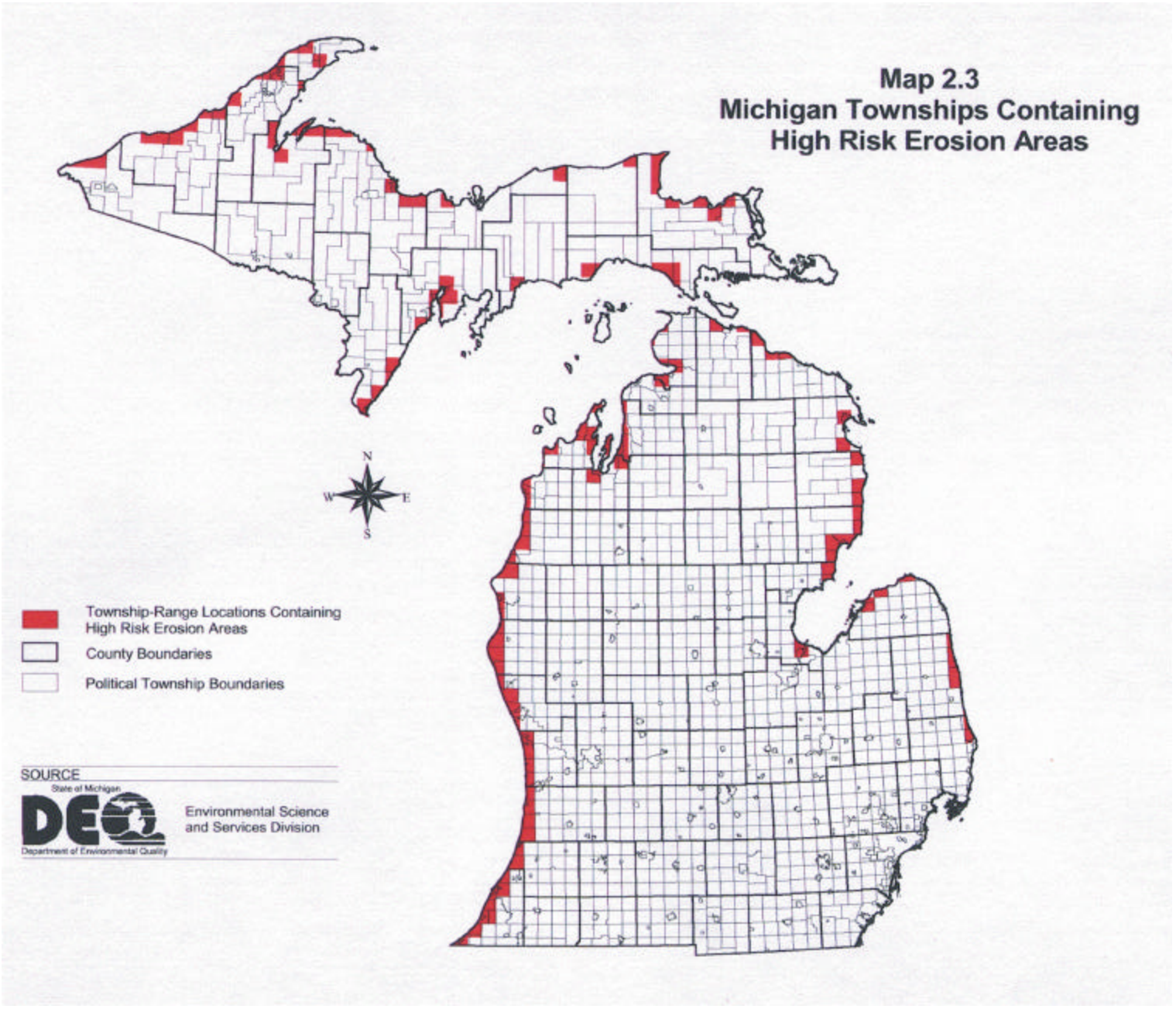
How are setback distances determined? Measurements are taken at transects (intervals) placed every 150 feet along the shoreline. Updates of the recession rate studies are scheduled on a county by county basis every ten years to reflect changing water levels and shore protection efforts. Some HREA transects have an average recession rate as high as 9 feet a year!

Once erosion rates are determined, 30 and 60 year setback distances are calculated. Setback measurements are taken from the *erosion hazard line*, which is typically the line of stable vegetation. Setback distances are <u>not</u> measured from the present day water's edge. To calculate the required setback distances, 15 feet is added to each projected recession distance to account for potential accelerated erosion due to sudden storm events. Setback distances are not necessarily the same for all HREA as they are based on the calculations of transects in the region of interest.



Example of transect and setback distance delineation. *Source: DEQ.*

What structures are allowable for each setback distance is defined within the statute's administrative rules, and is commonly at the center of disputes that arise during HREA administration. New structures must be located landward of the required setback distance. Whether it is appropriate to use the 30-year or 60-year required setback distance depends on whether the building meets the criteria for a readily-moveable structure. If a building is considered to be "readily moveable," only the 30-year setback distance is required. If not, the 60-year setback distance is required. It is important to keep in mind that the 30 and 60 year setback distances are the *minimum* distance a building must be away from the erosion


Map 2.3
Michigan Townships Containing
High Risk Erosion Areas
N
W
E
S
Township-Range Locations Containing
High Risk Erosion Areas
County Boundaries
Political Township Boundaries
SOURCE
State of Michigan
DEQ
Department of Environmental Quality
Environmental Science
and Services Division

hazard line. Additional local or even property owner imposed setbacks can help extend the life of the structure.

"What is a Readily Moveable Structure?"

Defining readily moveable structures is where HREA regulation becomes a bit confusing. It may not seem realistic for a structure with a 3500 square foot base to be "readily moveable," but according to engineers that worked with the DEQ to design the policy, they can be. Below are the criteria for a readily moveable structure according to Part 323 of NREPA:

- **First-floor foundation must be less than or equal to 3500 square feet.**
- **Foundation must be either crawl space, basement, or pilings.**
- **Above-foundation walls must be stud frame or whole log.**
- **Garage cannot exceed 676 square feet.**
- **Sufficient access for relocation.**

A permit is also required for additions or substantial improvements to existing readily moveable and non-readily moveable structures. For specific considerations, contact the DEQ HREA program.

WHAT IS NOT REGULATED?

So what does it mean for a community or property owner if an area is determined to be a HREA? It may be better to first clarify what it does not mean. It does not mean that existing buildings will have to be moved. It also does not mean that new structures cannot be built on the property except in rare instances.

A permit is required from the DEQ prior to construction or movement of a permanent structure. This includes building a new home or business as well as installation of a septic system, construction of additions to an existing structure, and substantial improvements to existing structures. It is possible to construct some structures under 225 square feet, such as open decks, storage sheds, and gazebos without first obtaining a permit. Additionally, swimming pools that are not enclosed do not require a permit. DEQ staff are available to work with property owners to determine the permit requirements for specific parcels.

Shore protection structures: not a long term solution. As is depicted in Figure 2.8 and in the case study in this section, the battle between people and nature often leads to greater erosion problems in the long run—especially when "hard," or unnatural shore protection structures (also called shore armor) are used.

Attempts to stop erosion eventually lead to bigger problems for property owners and the environment. *Photo: DEQ*.

Attempts to prevent coastal erosion never work for the long-term. In fact, many attempts to protect beachfront properties from natural sand process actually create severe erosion problems on adjacent properties. Sea walls, revetments, boulders, and even junk (such as old cars or tires) have been used to stop the natural coastal changes. All attempts eventually lead to greater erosion and ecological damage.[38]

While there exists no easy answer to coastal erosion, the best way to work with the natural system is to place houses and other buildings in a safe location that allows some of the natural erosion processes to occur. Doing so promotes beach formation which will be able to absorb much of the energy brought to the beach by waves, thereby reducing the rate of erosion. [See case study in this section.]

LOCAL ROLE

Under Part 323 of NREPA, local units of government may adopt a zoning ordinance for high risk erosion areas. If a local government chooses to do so, it must be at least as restrictive as the state statute, and the regulations must be approved by the DEQ prior to implementation. Once approved and implemented, a local ordinance replaces the need for a state high risk erosion area permit. Rather, the DEQ monitors the performance of the community and provides technical assistance as needed. A copy of the sample HREA ordinance is provided in the Appendices.

Adopting a zoning ordinance is the local tool identified by NREPA for local HREA regulation, but there are additional techniques that local governments can implement to protect their communities from these critically fragile areas. Additional measures that can be built into local zoning ordinances under the authority provided to local governments by the Zoning Enabling Acts include enacting provisions for:

- Performance standards that are designed to minimize soil and vegetative disruptions in HREA.
- Cluster development that allows structures to be sited in less vulnerable coastal areas, away from HREA.
- Subjecting all development in HREA to special use permits and site plan review requirements.
- More stringent and uniform setback requirements than those required by the Department.[39]

NREPA: Local governments can

- ✓ Adopt a DEQ approved local high risk erosion ordinance
- ✓ Increase setback distances

Zoning Enabling Acts: Local governments can

- ✓ Enact soil and vegetation performance standards
- ✓ Cluster development
- ✓ Institute site plan review for all development in HREA
- ✓ Implement land division controls (through Land Division Control Act)

Case Study:
Why Setbacks are Only Half the Battle

Like many stretches of coastline throughout Michigan, Berrien County contains high risk erosion areas along its Lake Michigan frontage. This photograph, taken in 2000 during low water levels, is a good illustration of why setbacks required by Part 323 of NREPA alone are the bare minimums needed to protect property owners and coastal resources.

Notice the land division patterns and their effect on the shoreline. In the bottom half of the picture, haphazard development has increased the amount of imperviousness near the water, and eliminated the possibility for houses to be placed further from the shore. Consequently, shore armor and revetments–which ultimately lead to greater erosion problems–have been installed in an attempt to protect these properties. Contrast that area with the lots on the top half of the picture that allow for necessary setbacks and also enjoy a beach.

Local governments, not the state, can guide development by implementing land division controls, site plan review, and adopting protective overlay zone ordinances. Local governments can also discourage tree and other mature vegetation removal through site plan review and overlay zones, which will serve to further protect the communities' coastline. Working together, state and local governments can more effectively protect the shore for future generations through a combination of state HREA setback regulations *and* other local zoning considerations. More information about local regulatory tools can be found in Part III.

Photo: MI Department of Environmental Quality.

SAND DUNES

Michigan's majestic sand dunes along the coasts of Lakes Michigan and Superior are one of the state's most defining natural features. Coveted for their beauty, recreational, and industrial benefits, dunes also serve as a crucial transition zone from Great Lakes to inland areas. Many people believe that because Michigan's dunes are such an awesome natural feature, they are protected from destruction. In fact, only one state law attempts to protect the dunes along our coast and it does not provide protection from destruction for all sand dunes.

Michigan's magnificent sand dunes are one of the state's most defining natural features. *Photo: D. Kenyon, DNR.*

WHY PROTECT SAND DUNES?

Great Lakes dunes comprise the most extensive freshwater dunes in the world.[40] While it is true that their functions, such as acting as a buffer from storm surges, are a good reason to protect dunes from destruction, it is their ecological and aesthetic uniqueness that lies at the heart of protection efforts. Similar to the rainforest protection campaigns, or save the whale sentiment, most Michigan residents want to protect dunes because of the strong emotional ties associated with them. Simply put, dunes are magnificent to look at, to walk through, to play in. They are home to federally threatened and endangered plant, bird, and insect species. They evoke deep sentiments from most people who believe we should protect them from destruction.

Dunes are continuously moving and changing natural features—not ideal for construction of permanent dwellings. But their beauty and proximity to the shore also make them highly desirable as locations for residential and resort developments. Like all coastal areas in recent years, coastal communities that have sand dunes have experienced tremendous development pressures. As these pressures for development and redevelopment continue to mount, dunes face a greater risk of destruction.

What are sand dunes? Michigan's 270 linear miles of sand dunes were created by three primary factors: sand, wind, and Great Lake water level fluctuations.[41] Dunes are prone to movement and erosion more than other geographic areas because of their formulating factors, and because sand is not a particularly stable soil type. Figure 2.9 illustrates how various types of development disturb sand dunes. Precautionary measures, such as elevated boardwalks and adequate setbacks, help minimize dune destruction.

There are different types of dunes, yet they all have distinct zones. For example, the characteristic zones of the type of dunes found along the west side of the state are the: beach, foredune, interdunal wetland (or trough), and the backdune.[42] Beach and foredune zones, as their names imply, are closest to the water. They are also the most ever-changing zones. Consequently, development in these areas is particularly damaging to coastal ecosystem processes and most at risk from damage by storms.[43]

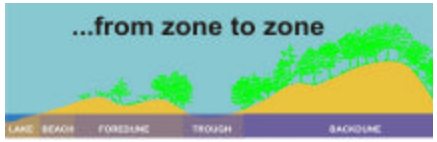
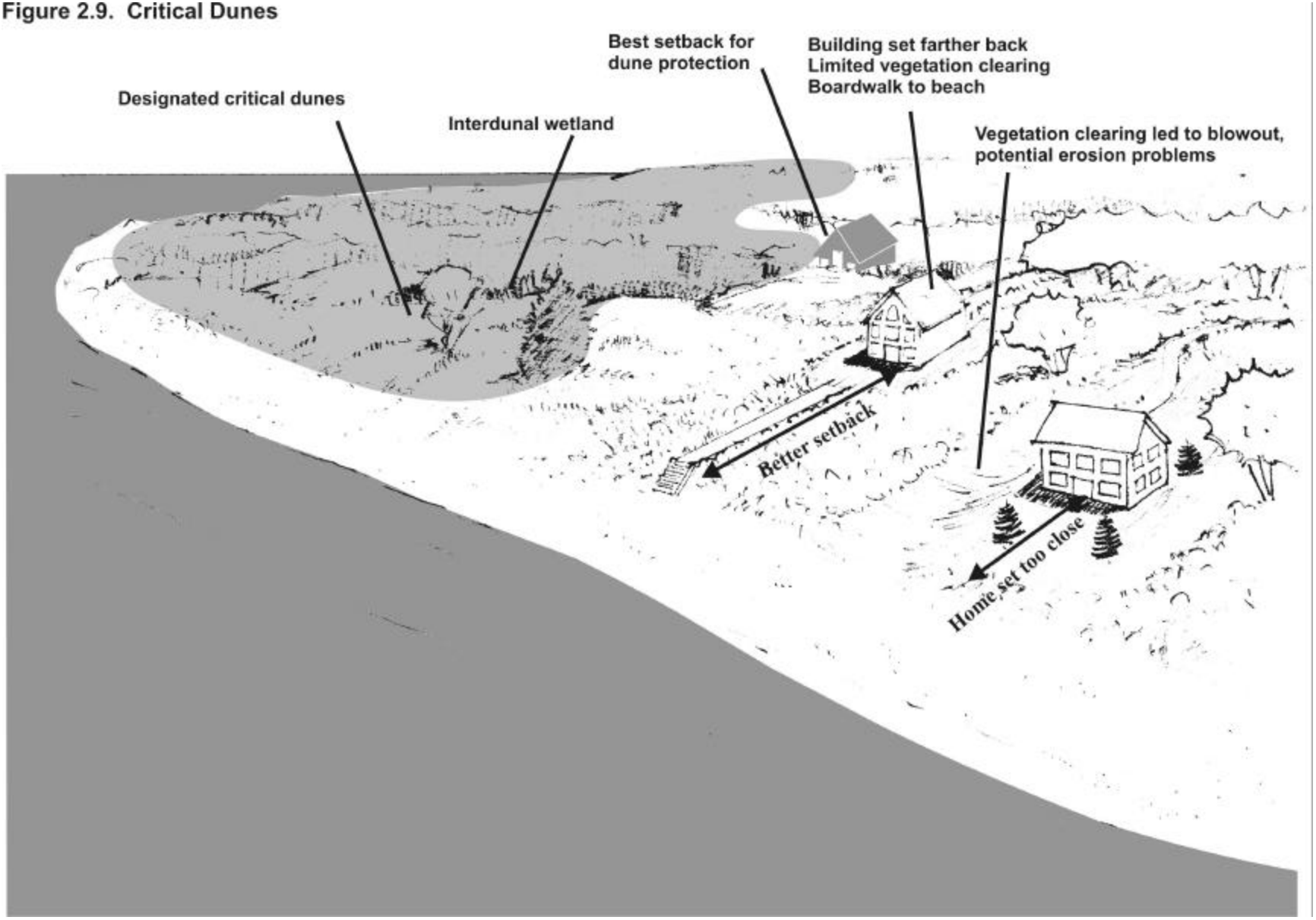


Figure 2.9. Critical Dunes



WHAT IS REGULATED?

There is no federal law pertaining to Great Lake sand dunes, so only state law and optional local regulations can protect these rare and magnificent geologic formations. The Sand Dune Management Act was initially adopted by the state in 1976 to regulate sand mining activities. In 1989, the Act was amended to address dune destruction caused by development. Sand Dune Protection and Management is now contained in Part 353 of NREPA, PA 451 of 1994, as amended. The statute calls for sand dune protection and management in areas that are designated as "Critical Dune Areas" (CDA). Any dunes not designated as CDA may or may not be protected by regulations depending on the presence or absence of local zoning provisions.

Critical dune areas represent some of the most spectacular dune formations in the state, such as Sleeping Bear Dunes. They also represent forested dunes, and other dune formations that do not have the same "high-profile" perception as do towering, shoreline bluffs. Of the nearly 250,000 acres of dunes along Michigan's coast, approximately 70,000 acres are designated as CDA. The remaining 70% of dunes are not regulated unless local governments have implemented protection measures of their own.

The Sand Dune Protection and Management provisions of NREPA require a permit in areas identified as critical dunes for activities including; development, silviculture, and recreational activities. Essentially, anything that causes contour changes or significantly alters the physical characteristic of the dunes in a CDA requires a permit.

Where are critical dunes? Perhaps the most pressing concern for local governments which have sand dunes within their jurisdiction is clarification of what areas are or are not regulated. Map 2.4 illustrates townships that have CDA designations in their boundaries. It is important to note that not necessarily all of the shoreline within a highlighted township is regulated under Part 353. This site specific delineation has created some confusion among property owners, local officials, and even DEQ staff—as distinguishing criteria for CDA designation is not always obvious to the naked eye.

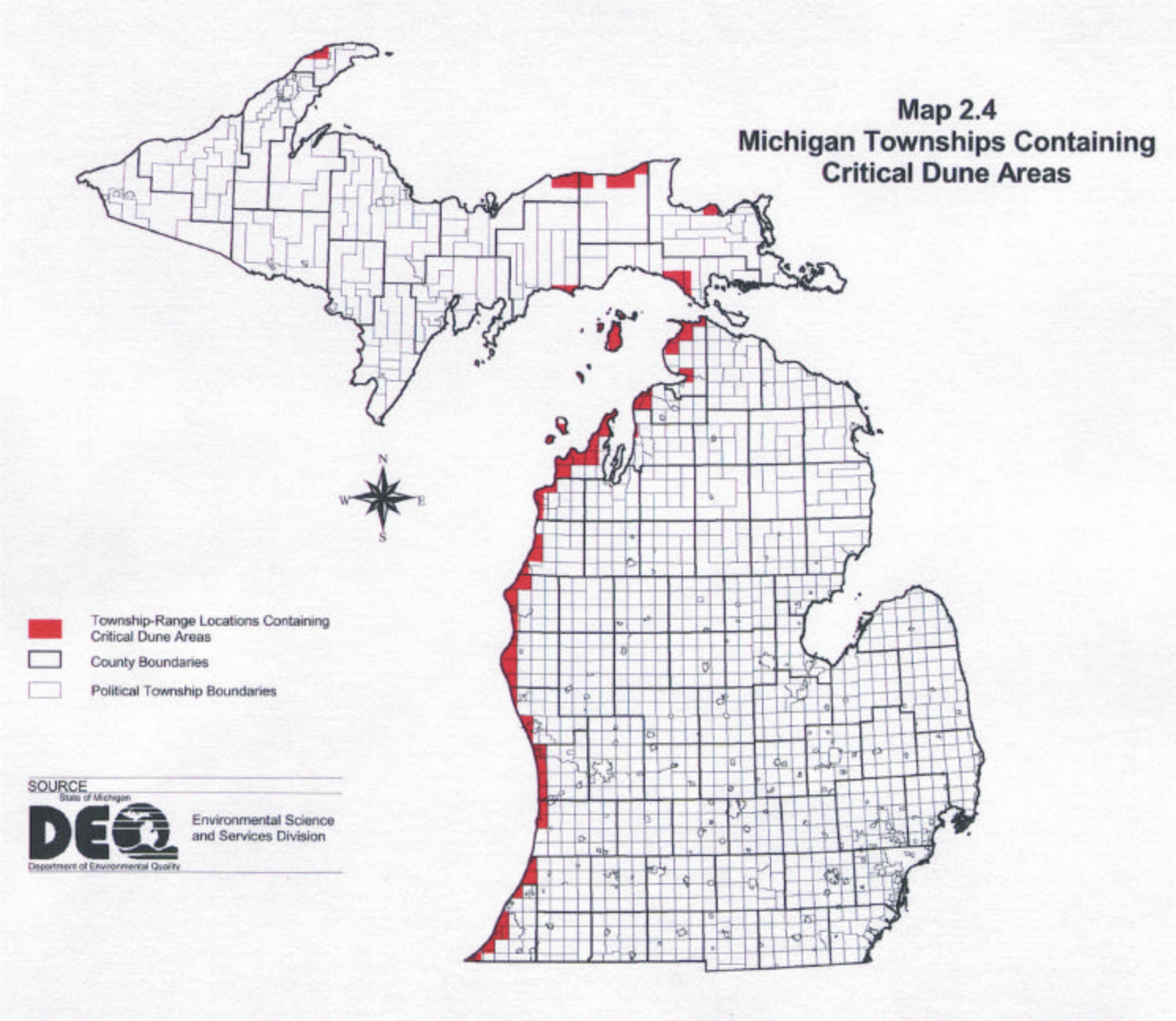
WHAT IS NOT REGULATED?

Any dune that is not designated as CDA, and is not within the jurisdiction of a local shoreline protection ordinance is not protected from the adverse impacts of poor land use plans and development. Additionally, areas that are designated CDA lack oversight of adverse cumulative impacts to a dune system in its entirety. In other words, even within regulated areas that are strictly enforced, a great deal of dune destruction still occurs because Part 353 regulates dune activities on an individual parcel basis—it does not protect the landscape as a whole.

For example, if there is a mile-long stretch of CDA in which each and every parcel measures 25-50 feet wide by 150 feet deep, and each is developed with a single family home, the dune system as a whole is still prone to severe damage by the extreme fragmentation of the resource, and the physical impacts of each of those homes and their driveways.

LOCAL ROLE

After the Sand Dune Management Act was amended in 1989, local governments were encouraged to administer the statute. However, there was, and still is, little local incentive to do this. The largest argument against local administration of Part 353 is that it means local liability if legally challenged. This situation became a reality for Port Sheldon Township, one of the original communities to adopt local administration after the law was originally passed. A sample CDA ordinance is provided in the Appendices.


Map 2.4
Michigan Townships Containing
Critical Dune Areas
N
W
E
S
Township-Range Locations Containing
Critical Dune Areas
County Boundaries
Political Township Boundaries
SOURCE
State of Michigan
DEQ
Department of Environmental Quality
Environmental Science
and Services Division

CASE STUDY
Port Sheldon Township Example

For years, southwest Michigan's Port Sheldon Township was one of the few local governments to administer Part 353 of NREPA. But in June 2001 township officials repealed the CDA ordinance in response to a takings lawsuit. This unfortunate situation forced the community to explore alternative dune protection options that would help preserve the resource and reduce the chances of the repeating their litigation ordeal. Some communities may have viewed a lawsuit as a dead-end for the program, but Port Sheldon chose to try another route rather than forgo local sand dune protection. The new zoning was adopted unanimously in January 2003.

New zoning classification moves forward

By John Charles Ribbons, ***Holland Sentinel*** Staff Writer
Web posted Thursday December 5, 2002

Port Sheldon Township's new zoning classification designed to protect the sensitive Lake Michigan shore area is one step from completion.

At a meeting Wednesday, the township planning commission unanimously recommended a map showing the exact locations for the new zoning. A large map is on its way to the township board for final approval. The text of the new zoning, called Lakeshore Residential (LSR), was adopted by the board earlier this year.

Larry Nix, township planning consultant, said the actions on the new zoning illustrate how the public hearing process is alive and well in the township. "We listened to what the public wanted," he said.

The original plan was to rezone the entire Lake Michigan shore area, and east to Lakeshore Drive. Some property owners with tiny lakefront lots objected and asked to have their land removed from the proposed zone. And that's just what Nix and the commission did, removing about 30 percent of the parcels from the targeted area.

The commission also chose not to rezone those areas to avoid creating a bunch of new non-conforming lots, Nix said. Officials feel the move is necessary to protect the special sand dune area, and prevent the shore from getting chopped up into small half-acre lots.

The new zoning is a replacement for Critical Dune rules the township repealed in June 2001 in reaction to litigation. The Lakeshore Residential zone has a minimum lot size of 40,000 square feet, just shy of one acre -- 43,560 square feet. "It lays out nice," said Chairman Ken Souter. Wayne Oosterink, zoning administrator, agreed. "It protects the vital, beautiful areas," he said.

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Regulatory Takings and Sand Dune Protection.
The provisions of Part 353 require a permit for new construction, additions to existing structures, sand removal, driveways and parking areas, contour changes, vegetation removal, and industrial and commercial projects. In most instances, projects can be designed to conform to dune protection requirements. In some cases, these requirements cannot be met. Coastal properties in particular tend to be divided by frontage measured in feet, as opposed to acreage. Many older platted subdivisions may contain lots that measure no more than 25' by 50'. Consequently, some lots may be too small to accommodate placement of a structure that will not destroy the dune. When that situation arises, the potential for a "regulatory takings," may exist.

ALTERNATIVE APPROACHES TO SAND DUNE PROTECTION

Avoiding a nasty lawsuit and still protecting Michigan's dunes for future generations may be a goal that is easier for local governments to attain utilizing alternative approaches. As with all other natural features regulated under NREPA, there is

always the option to protect resources under the Planning and Zoning Enabling Acts. Sand dune protection under Part 353 may not be the most appealing path to take for a local government. Not only because of the threat of a takings charge, but because Part 353 does not address all dunes.

There are a number of tools that can be implemented locally that potentially provide greater resource protection, do not preclude development, and a greatly reduce, if not eliminate threat of legal liability to communities that exists under provisions of Part 353. One such mechanism is land division oversight.

As mentioned above, parcelization and land division is very damaging to dune systems because it fragments the ecosystem. Local governments receive authority and are required to review any land division request on parcels less than 40 acres under the Land Division Act, PA 288, 1967. Therefore, local governments can protect dune resources through land division controls. *For more information about implementing land division controls, refer to the land division section in Part III.*

Another mechanism for protecting dunes locally is to implement special overlay zones in coastal areas. Overlays add an extra layer of land use considerations in areas that are of special environmental, historical, or cultural concern. An overlay to protect sand dunes would include:

A. Prohibition of off-road vehicles.
B. Requiring special use permits and associated site plan review for development or redevelopment.
C. Requiring specified setbacks from the ordinary high waterline.
D. Use of planned unit or cluster development sited in well-protected, vegetated areas behind the foredune. PUD's and clustering also reduce costs and impacts of development through shared driveways, parking spaces, and more compact utilities.
E. Impervious surface restrictions.
F. Design standards that allow for raised structures, which reduces problems associated with unstable sand.
G. Requirements for use of native vegetation.[44]

NREPA: Local governments can

- ✓ Assume administration of Part 353 locally, with DEQ approval

Planning & Zoning Enabling Acts: Local governments can

- ✓ Adopt overlay zoning ordinances
- ✓ Implement land division and subdivision control guidelines
- ✓ Require setbacks from crest of the foredune
- ✓ Institute site plan review for all development in near shore areas that limit imperviousness, allow for raised structures, and prohibits vegetation removal

Redevelopment

Most coastal areas with dunes have been developed, or else are protected as state or federal park properties. Consequently, many development issues faced by local governments with dunes in their jurisdictions pertain to redevelopment. Local governments have it within their power to fit, or retrofit as the case may be, various tools to help alleviate the ecological damage caused by multiple driveways, landscaping practices, and infrastructure demands associated with each parcel. This basically involves approving those projects which have the least negative impacts on the dunes and/or prohibiting those projects or parts of projects that would negatively impact the dunes. This requires great care through the site plan review process and ordinance standards that are sensitive to the natural characteristics of dunes. Sample ordinance language for each of these techniques is found in the Appendices.

Dune protection measures on a parcel-by-parcel basis generally do not protect the integrity of the resource as a whole. Local governments can help address this dilemma with appropriate planning and zoning.
Photo: MI Department of Environment Quality.

Case Study
How Chocolay Township Started Protecting Their Dunes

Prompted by some environmentally destructive development projects along their 6 mile stretch of coastline, the Upper Peninsula's Chocolay Charter Township adopted the "Lake Superior Shoreline/Dune Protection Overlay District" in the summer of 2001. A year later, Township Planning and Research Director Doug Riley said, "It's working extremely well."

When the planning commission began considering the idea in early 2000 they were leery of property owners' response to new coastal regulation. Once the Township board and the planning commission agreed upon the goals of the ordinance, they immediately solicited property owner input. "The property owners literally applauded the planning commission and thanked (the P.C.) for getting their input," Riley said.

The township set out to create local regulations through authority found in the Zoning Enabling Acts—not under Part 353 of NREPA. Implementing policy through this mechanism allowed the township to address local problems, and eliminates the potential for a "takings" judgment against the community.

Riley said that what he and other township residents found most surprising was that the dunes were not regulated. "People with (construction) project plans would ask us if they needed a permit, and were shocked when we, or the DEQ, said 'No.'"

During the initial meeting, in which all 350 property owners were personally invited and approximately 75 attended, Department of Environmental Quality field staff and representatives of the Conservation District helped guide education efforts about the dunes, and dispelled myths about what is regulated and what is not. According to Riley, once people realized the dunes were not protected, they agreed that something should be done. The common concern was over how what one neighbor did could adversely impact the neighboring property and that there should be some type of review prior to significant changes being made to the dune.

Township officials listened to property owners' concerns before drafting final ordinance language. Their goal was to keep the ordinance and the application process as simple as possible to avoid the perception of "too much bureaucracy." Working with property owners helped the township identify the most important features to include in the ordinance so the integrity of the dunes could be protected. The result: a one page ordinance with language that protects mature trees and stabilizing vegetation, implements buffer strips, requires planting dune grass plugs in affected areas, and provides assistance to property owners with development plans.

The key provision of the ordinance is the "Conditional Uses" section. Not only does this section provide clear guidance to applicants, it also requires the township to notify all property owners within 300 feet of the proposed project area and allows those owners to comment on the proposal. With parcels in Chocolay ranging in area from 800 sq. ft. to 20+ acres, Riley has been particularly pleased by how well their overlay ordinance works in the highly developed areas along the coast.

Once the formal language of the ordinance was ready for consideration, a public hearing was held to maintain the community participation that had been essential during the planning process. In total, the ordinance took about a year and a half from the first public meeting to implementation. But Chocolay's efforts have not stopped there. The township recently produced a brochure for property owners that contains information about the ordinance, environmental educational material, and additional resources.

A copy of the overlay district language can be found in the Appendices. Doug Riley can be reached at the Chocolay Township offices: 906-249-1448.

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