Protecting Hamlin lake

A Homeowner's Guide

Original Hamlin Lake dam circa 1859. Photo courtesy of the Mason County Historical Society.

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The Residents of Hamlin Lake

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Michigan Department of Natural Resources

U.S. Environmental Protection Agency

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Mason-Lake Soil Conservation District

Michigan State University Extension / Mason County

Points Betsie to Sable Conservancy, Inc.

Manistee-Mason District Health Department

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1O ways to kill Hamlin lake

1. Use lawn fertilizer that contains phosphorus.
2. Frequently spread large quantities of fertilizer. Even if the lawn doesn't need it.
3. Water the lawn often and allow nutrients and sediments to wash into the lake.
4. Feed ducks and geese near the lake.
5. Burn leaves and grass clippings near the shoreline.
6. Don't plant shrubs or ground covers that might prevent nutrients from entering the lake.
7. Don't conserve water and maintain your septic system.
8. Place fill in area wetlands.
9. Be complacent - assume someone else will solve the problem.
10. Don't read: Protecting Hamlin Lake-A Homeowners Guide

For information on how to SAVE Hamlin Lake, read this guidebook.

Contents

Introduction

You are a Partner

Protecting Hamlin Lake is an important job for many people: The Environmental Protection Agency (EPA), the Department of Natural Resources (DNR), the Hamlin lake Association, the Hamlin Lake Improvement Board, and the Mason County Walleye Association, to name just a few. But most of all, protecting Hamlin Lake important to you, the homeowner. It is critical not only to protect your property value. but to preserve a precious and unique natural resource as well. As a homeowner, you are a steward of the great treasure known as Hamlin Lake.

Preservation Begins at Home.

Protecting Hamlin Lake: A Home-owners Guide was developed to preserve the campaign to preserve the quality of Hamlin Lake. Like many lakes in the state and across the country, Hamlin is threatened by pollution from numerous sources. If no action is taken, the lake will certainly degrade - as many lakes already have. The key to reversing the trend is pollution prevention and pollution reduction. Responsibility for clean-up is shared by all, and your help is crucial. By following the recommendations contained in this guidebook, you will help ensure the success of the entire program. This guidebook contains specific information related to:

- Proper lakefront lawn care practices
- Proper lakeside landscaping techniques
- Septic system maintenance
- Wetland protection

The Big Picture

But first, the guidebook provides background on the larger efforts to properly - and proactively - manage the lake. It begins with some facts about Hamlin Lake, the watershed. and general information about lake water quality. Then, Hamlin Lake's water quality and pollution inputs are discussed as the foundation for a comprehensive protection strategy: The Hamlin Lake Management Plan.

Hamlin lake and its watershed

Hamlin Lake is a 4,990-acre lake with a shoreline length of 32 miles. The lake is larger today than it was historically. In the late 1800"s, a dam was erected at the lake's outlet to facilitate the transport of logs to area mills during the lumbering era. The dam impounded water from the inlet streams, and, in doing so. inundated low-lying areas and created many bayous along the shoreline. Submerged tree stumps in the bayous are remnants of land that was once high and dry. The dam was reconstructed several times. then finally replaced with the existing structure around 1912. Prior to the construction of the dam, Hamlin Lake was about half its present size. Today, the maximum depth in the lake is 79 feet and the average depth is approximately 17 feet. The tree stumps and aquatic plants in the shallow regions of the lake create ideal habitat and cover for fish and wildlife.

The major tributary to Hamlin Lake is the Big Sable River which empties into the lake at the northeast end of the lake. Water flows westward, through “the Narrows." then turns sharply southward. eventually to the outlet. The Narrows separates upper and lower Hamlin Lake. Water drops some 14 feet over the dam, then meanders briefly before emptying onto Lake Michigan.

The shoreline is characterized by extensive forested lands along the north shore and spectacular sand dunes along the west shore. Hamlin Lake has a volume of water equal to 85,290 acre-feet. This equates to approximately 28 billion gallons of water and would cover a 133-square-mile area to a depth of one foot. On average. the entire volume of water in Hamlin Lake is replaced by incoming water every 7 months.

The land area that drains to Hamlin Lake, i.e., the watershed, is 178 square miles. Thus, the Hamlin Lake watershed is nearly 23 times larger than the lake itself. The watershed covers all or part of 12 political jurisdic1ions. The headwaters of the Big Sable River in Lake County are 24 miles upstream and roughly 170 feet higher in elevation than Hamlin Lake.

<u>Hamlin Lake Physical Characteristics</u>

- Surface Area: 4,990 Acres
- Maximum Depth: 79 Feet
- Average Depth: 17.1 Feet
- Volume: 85,290 Acre-Feet
- Water Residence Time: 7 Months
- Shoreline Length:32 Miles
- Shoreline Development Factor:3.2
- Watershed Area: 178 Square Miles

Lake water quality

"Is my lake 'healthy'?" That is the question.

Before we embark on a strategy to combat weed growth, reduce pollution. or any other lake improvement objective, we must first know "Is my lake 'healthy'?" That is, we need to determine the lakes current water quality.

But what do we mean exactly by the term -water quality"? What is good and what is bad? You might think that only a scientist could answer these questions. In reality, there are many important aspects of water quality that no one knows better than you, the lake user. Some of these characteristics include water clarity, rooted plant growth, algae growth, and sediment composition, i.e., whether the lake bottom is sandy or mucky.

However, some questions can only be answered through scientific study. A lake scientist must investigate some of the unseen aspects of water quality, in particular, water chemistry. Information on the lake's water chemistry, along with more detailed observations of the lake's biology (e.g., type and distribution of rooted plants and algae) and physical condition (e.g., water temperature. sediment composition, flow patterns), allow the scientist to better understand why a lake Is heathy, or not.

Important measurements used to evaluate lake water quality include temperature, dissolved oxygen, total phosphorus, chlorophyll-a, and water clarity. A brief description of these water quality measurements is as follows:

Temperature

Temperature is important in determining the type of organisms which may have in a lake. For example, trout prefer temperatures below 68 F. In most deep lakes in the summer, the water separates into a warm upper layer (70 F or higher) and a cool lower layer (perhaps 60 F or lower). This process is known as thermal stratification. In the fall, during "fall turnover" the entire lake mixes. and the water is the same temperature from top to bottom. Shallow lakes, on the other hand. tend to have a uniform temperature from top to bottom during all ice-free periods because wind mixing prevents thermal layers from forming

Dissolved Oxygen

Of all the ways to measure water quality. dissolved oxygen content probably best answers the question. "Is my lake healthy?" Although many aquatic organisms can survive with little or no oxygen, most need rather high levels to have and grow. A lack of oxygen can also lead to rather unpleasant changes in water chemistry The familiar "rotten-egg" odor can occur when sediments become devoid of oxygen. And, if oxygen levels are not high enough in the water. a fish kill can result. Most warm water fish (like bass and bluegill) need at least 5 parts per million of dissolved oxygen; cold water fish (like trout and whitefish) need at least 7 parts per million.

Many deep lakes with abundant plant growth are depleted of deep-water oxygen in late summer as bacteria break down organic matter (plant and animal remains) at the lake bottom. In these lakes. oxygen is not replenished to the bottom waters until the lake mixes during fall turnover

Phosphorus

The quantity of phosphorus present in a lake is especially important since phosphorus is the nutrient that most often controls aquatic plant growth and the lake aging or eutrophication process. In general, lakes with a phosphorus concentration of 20 parts per billion or greater are able to support abundant plant growth and are considered to be nutrient-enriched. By reducing the amount of phosphorus in a lake. plant growth can be controlled

Algae Growth

Chlorophyll-a is the pigment that imparts the green color to plants and algae. As the amount of algae in a lake increases, the water wlll begin to take on a green tinge. A rough estimate of the quantity of algae present in lake water can be made by measuring the amount of chlorophyll-a in a water sample. A concentration greater than 6 parts per million is considered undesirable in that the lake will begin to appear green in color.

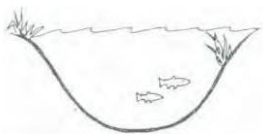
Water Clarity

A Secchi disk is often used to estimate water clarity. The measurement is made by fastening a round, black and white, 8-inch disk to a calibrated line. The disk is lowered over the deepest point of the lake until it is no longer visible. and the depth is noted. The disk is then raised until it reappears. The average between these two depths is the Secchi transparency. Water clarity can be reduced by particles in the water, such as algae and suspended sediments Secchi transparency measurements less than 7.5 feet indicate poor water clarity.

Ordinarily.as phosphorus inputs to a lake increase. the amount of algae the lake can support will also increase. Thus. The lake will exhibit increased chlorophyll-a levels and decreased water clarity.

Classifying Lakes

Lakes can be classified based on their ability to support plant and animal lite. Oligotrophic lakes are generally deep and clear with little aquatic plant growth. These lakes maintain sufficient dissolved oxygen in the cool. deep bottom waters during late summer to- support cold water fish such as trout and whitefish. By contrast, eutrophic lakes are generally shallow, turbid, and support abundant aquatic plant growth. In deep eutrophic lakes, the cool bottom waters usually contain little or no dissolved oxygen. Therefore, these lakes can only support warm water fish such as bass and pike. Lakes that fall between these two extremes are called mesotrophic lakes. A summary of lake classification criteria developed by the DNR is shown in Table 1.



Oligotrophic

Mesotrophic

Eutrophic

Table 1- Lake Classification Criteria			
Lake Classification	Total Phosphorus (µg/L)	Chlorophyll-a (µg/L)	Secchi Transparency (feet)
Oligotrophic	Less than 10	Less than 2.2	Greater than 15
Mesotrophic	10 to 20	22 to 6.0	7.5 to 15
Eutrophic	Greater than 20	Greater than 6.0	less than 7.5
µg/L = micrograms per liter = parts per billion			

Hamlin lake water quality

In 1992, a comprehensive study of Hamlin Lake and its watershed was completed as part of the Hamlin Lake study. Water samples were collected from the surface to the bottom in the upper and lower Hamlin basins, from April of 1991 to April of 1992. Samples were also collected from the major incoming streams to determine the quality of water that empties into Hamlin Lake

Temperature and Dissolved Oxygen

Somewhat surprisingly, Hamlin Lake does not exhibit summer thermal stratification in midsummer, the lake is near 70F from the surface to the bottom. Because of its depth, Hamlin Lake would be expected to be approximately 50F at the bottom throughout the summer. Although Hamlin Lake is deep, thermal layers form tor only brief periods. Strong prevailing winds from Lake Michigan cause the lake to be mixed throughout much of the summer. The summertime mixing of water in Hamlin Lake causes warm water from the surface to be mixed downward, raising the temperature of the deep water. (Not mentioned is the possibility that the cold water drains out the bottom of the lake.) Thus, Hamlin Lake is generally too warm for cold water fish like trout. However, high dissolved oxygen levels throughout most of the lake allow warm water fish to inhabit shallow and deep water alike. The lake has abundant populations of both largemouth and smallmouth bass, northern pike, yellow perch, bluegill, black crappie. rock bass. and pumpkinseed. In recent years, the Mason County Walleye Association has undertaken a program to enhance the walleye fishery In Hamlin Lake. From 1989 to 1991, over 350,000 walleye fingerlings were planted in the lake.

Phosphorus, Algae Growth, and Water Clarity

Phosphorus data indicates Hamlin Lake is at a threshold. In like fashion, chlorophyll-a and Secchi transparency data for Hamlin Lake indicate the lake is at a stage where a slight increase in phosphorus levels would increase nuisance algae growth and decrease water clarity. Study findings indicate that about half of the phosphorus entering Hamlin Lake is from the Big Sable River drainage basin, and half is from the shore land areas adjacent to the lake. Pollution from lake shore land areas results from improperly maintained septic systems. the loss of area wetlands, and runoff of fertilizers and sediment from residential development.

Hamlin Lake's Classification

Sampling data collected to date indicates Hamlin Lake Is borderline between mesotrophic and eutrophic in that it exhibits characteristics common to both nutrient enriched lakes and medium quality lakes. On a scale of 1 to 10 (with 1 being poor quality and 10 being excellent quality). Hamlin Lake would rate about a 6.

Hamlin lake management plan

Defining a Workable Strategy

The challenge in developing a management plan for Hamlin Lake was to define a strategy that would be effective, affordable, and could realistically be implemented with available resources and within an acceptable lime frame. In other words, a workable strategy had to be defined. First, however, the following questions needed to be answered:

- What is the current water quality of Hamlin Lake?
- How much pollution is entering Hamlin Lake?
- What are the current sources of pollution?
- What are the potential sources of pollution?
- What can be done to reduce pollution inputs to Hamlin Lake?

To answer these questions. a comprehensive study of Hamlin Lake and its watershed was undertaken with financial assistance from the EPA and DNR. The results of the study indicated that, at present. a moderate quantity of phosphorus pollution is entering Hamlin Lake. but the potential is very high for more pollution to enter the lake, and at much faster rates. Currently. phosphorus is being washed into the lake from sources such as septic systems. lawn fertilizers, farmland runoff. and streambank erosion. Study findings indicated that Hamlin Lake is at a threshold beyond which restoring water quality may not be possible. At present, the extensive forested land and wetland in the watershed actually protect the quality of Hamlin Lake. However, if these lands were converted to high density residential development or high intensity agricultural uses, for example. the quality of Hamlin Lake would rapidly deteriorate. Thus, the Hamlin Lake Management Plan consists of a two-pronged approach:

1. Reduce current levels of pollution input to the take
2. Protect the lake from additional sources of pollution input

To this end, the Hamlin Lake Management Plan has been designed to address pollution inputs from existing development around the lake, as well as sources of pollution from the extended watershed (i.e. the Big Sable River).

Key components of the management plan include:

Reduce Current Levels of Phosphorus Input

- Shore lands – Promote use of phosphorus-free lawn fertilizer, proper lakeside landscaping, and periodic septic system maintenance.
- Farmlands - Promote conservation practices to reduce soil erosion and fertilizer use.
- Streambanks - Repair eroded banks along streams and rivers that flow to Hamlin Lake.

Protect the Lake from Additional Phosphorus Input

- Land Use Planning and Zoning Develop zoning provisions to protect the Big Sable River corridor and Hamlin Lake shoreline areas.
- Wetland Protection -- Map the location of wetlands through· out the watershed and review applications for permits to Impact wetlands.
- Conservation Easements - Work with the Land Conservancy to protect environmentally sensitive areas

Bringing All the Tools to Bear

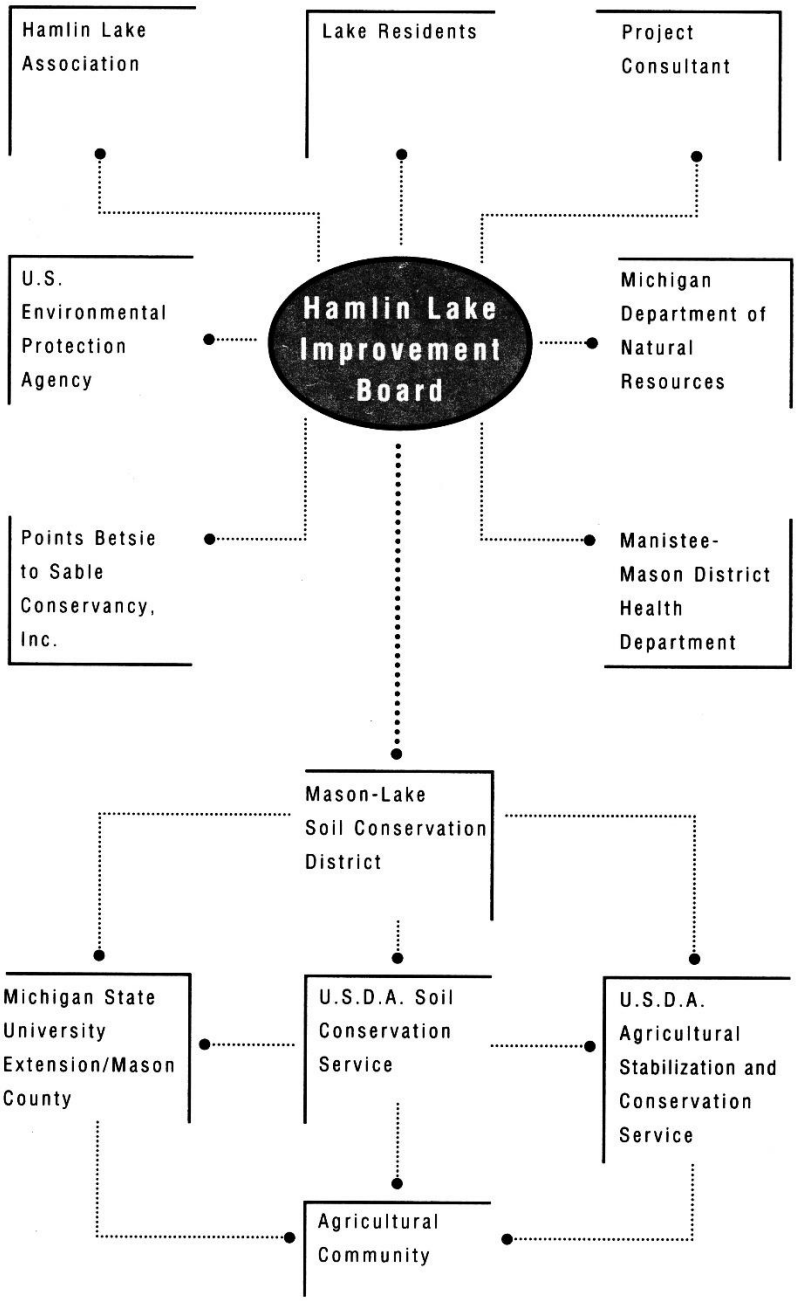
- Geographic Information System -- Combine the speed of computers with the value of maps and graphics to analyze environmental and demographic data from the watershed.
- Lake Improvements • Assist homeowners in obtaining permits to control nuisance aquatic plant growth, maintain canals. improve beach areas, and remove navigation hazards.
- Water Quality Monitoring – Gauge program effectiveness by periodic sampling of Hamlin Lake and the Big Sable River.

The Lake Board

Developing a lake management plan, putting it in place, and seeing it through to completion requires the cooperation of many partners. It also requires a certain degree of coordination to champion the process. With input from lake residents and the Hamlin Lake Association, the Hamlin Lake Improvement Board is acting in this capacity. The lake board was established in accordance with Michigan's Inland Lake Improvement Act (P.A. 345 of 1966). Under provisions of the act, the lake board is comprised of a lake resident, representatives from Hamlin and Victory Townships, a Mason County Commissioner, the Mason County Drain Commissioner and a representative from the Department of Natural Resources.

The lake board has worked closely with state and federal agencies to secure outside sources of funding and, to date, has been awarded $92.800 in grants from the EPA Clean Lakes Program and $36,810 in grants through Michigan's Recreational Improvement Fund. Additional grant funds are pending. Grants have been matched with local funds to finance the cost of the study and ongoing management efforts.

Hamlin Lake Protection Plan Project
Organizational Chart



Guidelines for property owners

As with most lakes, much of the development around Hamlin Lake has occurred in close proximity to the lake. As a result, the shore lands around Hamlin Lake have changed dramatically. Wooded areas and wetland were replaced by rooftops, roads, driveways, and lawns - all of which promote the runoff of water and pollutants to Hamlin Lake. In many areas, vital wetlands were filled to accommodate building sites and septic systems. often with little regard for the value of wetlands for water purification, wildlife habitat, and water storage.

The impact of runoff and septic seepage from shore land areas is significant in that water quality problems associated with shore land activities tend to directly impact localized areas near shore. Most often, it is the near-shore problems which most lake residents consider to be of primary concern, since excessive plant growth or elevated bacteria levels will quickly diminish the recreational and aesthetic appeal of the lake. Every year, more and more homes around Hamlin Lake are being converted from seasonal to year-round use. Given the relatively high density of development around the lake, and the limited ability of lakeside soils to adequately cleanse improperly treated septic system effluent, effective management of lake shore lands is critical to the long-term health of Hamlin Lake. Studies conducted to date have shown the lake to be at a threshold in terms of its health and quality. The management guidelines discussed in the remainder of the guidebook are designed to provide lake residents with effective tools to protect Hamlin Lake over the long term.

Lakefront Lawn Care

Lake front property owners should not apply fertilizer to lawns and shrubs unless absolutely necessary. When fertilizer is required, only fertilizers specially formulated for lakeside use should be applied, since excess fertilizer can wash into the lake and stimulate unwanted aquatic plant growth. Nutrients commonly found in commercial fertilizers are nitrogen, phosphorus, and potash. The relative content of nutrients in lawn fertilizer can be determined by examining the packaging label. For example, a fertilizer that contains 30 parts nitrogen. 15 parts phosphorus, and 10 parts potash would be labeled 30-15-10. This is not suitable for areas near the lake.

In most cases, phosphorus Is the nutrient that stimulates plant and algae growth in lakes. Generally, most soils contain sufficient phosphorus to maintain a good grass cover and applying additional phosphorus as fertilizer saturates the soil allowing phosphorus to wash into the lake. Once in the lake, phosphorus can generate several hundred times its weight in aquatic plants. In light of these considerations, lake residents should not use fertilizer containing phosphorus unless a soil test specifically indicates a need for this nutrient. Many fertilizer suppliers carry phosphorus-free fertilizers which are specially formulated to be lake safe These fertilizers will be labeled to indicate they are phosphorus-free, i.e. the second number on the label will be zero.

The following practices help reduce phosphorus losses from lake front lawns:

- When establishing a lawn, plant fescue rather than blue grass. Fescue grass requires much less fertilizer.
- Use the smallest amount of fertilizer necessary to maintain a good grass cover. To reduce the amount of undissolved fertilizer washing into the lake, fertilize in the spring or early summer when the lawn is actively growing and can utilize the fertilizer. This will reduce the amount of undissolved fertilizer washing into the lake.
- Do not use a fertilizer containing phosphorus unless a soil test shows a specific need for this nutrient. Use a fertilizer mix containing potash and a slow-release type of nitrogen, such as sulphur-coated urea,

in combination with a more soluble form of nitrogen like ammonium nitrate or ammonium sulfate. Usually, a non-phosphorus fertilizer, such as 25-0-4 or 16-0-8, will contain sufficient nutrients to maintain a healthy lawn without polluting the lake.

- Water sparingly to avoid washing or leaching nutrients into the lake.
- On lightly fertilized lawns, thatch probably will not need to be removed. It will decompose and provide part of the nutrients needed by the lawn.
- In the fall, rake and dispose of leaves away from the lake (compost if possible). Do not bum leaves near shore. Nutrients concentrate in the ash and are easily washed into the lake.
- Do not cut the lawn too close. Cutting height should be 2 to 2.5 inches so that adequate green area remains on the turf. Do not allow grass clippings to enter the lake
- Do not feed geese or ducks near the lake. Bird droppings are high in phosphorus and bacteria, and can cause swimmer's Itch.

Lakeside Landscaping

Lakeside landscaping involves planting or preserving a zone of natural vegeta- tion (i.e., a greenbelt) around the lake's edge. This vegetation acts as a buffer, trapping runoff and absorbing nutrients before they can enter the lake.

The lakefront should be landscaped to allow full recreational use of the lake and still provide water quality protection. Lawns alone do not make good greenbelts. Plant varieties should be selected that are attractive, easily maintained, and effective buffers.

To minimize the amount of leaves falling into the water, deciduous trees (i.e., trees that lose their leaves at the end of the growing season) should be planted as far from the water's edge as practical. Ideally, deciduous trees should be set back from the water's edge a distance equal to twice the mature height of the tree. Evergreens can be established closer to the lake shoreline. Some native greenbelt varieties include:

Hardy Perennials

Sweet Flag	Acorus calamus
Astilbe	Astilbe spp.
Bergenia	Bergenia cordifolia
Marsh Marigold	CaJtha palustris
Swamp Rose Mallow	Hibiscus moscheutos
Daylily	Hemerocallis spp.
Plantain Lily	Hosta spp.
Japanese Iris	Iris kaempferi
Red Iris	Iris fulva
Siberian Iris	Iris sibirica
Blue Flag	Iris versicolor
Cardinal Flower	Lobelia cardinalis
Snake Weed	Polygonum bisorta 'Superflame'
Pickerel Weed	Ponteaeria coroata
Primrose	Primula spp.
Arrowhead	Sagittaria sagittifolia 'Flore Pieno'
Lizard's Tail	Saururus cernus
Arum Lily	Zantedeschia aethiopica

Hardy Ferns

Maidenhair Fern	Adiantum pedatum
Cinnamon Fern	Osmunda cinnamomea
Royal Fern	Osmunda rega/is
Ostrich Fern	Matteuda struthiopteris

Ground Covers

Ajuga or Bugleweed	Ajuga reptans
Crown Vetch	Coronifla varia
Pachysandra	Pachysandra terminalis
Periwinkle	Vinca minor

Deciduous Shrubs

Autumn-Olive (Not anymore)	Elaeagnus umbellata
Cotoneaster	Cotoneaster spp.
Dogwood, shrub form	Cornus spp.
Forsythia	Forsythia spp.
Honeysuckle	Lonicera spp.
Lilac, shrub form	Syringa spp.
Mockorange	Phifadelphus coronarius
Ninebark	Physocarpus opulifolius
Privet	Ligustrum spp.
Rose-of-Sharon	Hibiscus syriacus
Service Berry	
Viburnum	Viburnum spp.

Evergreen Shrubs

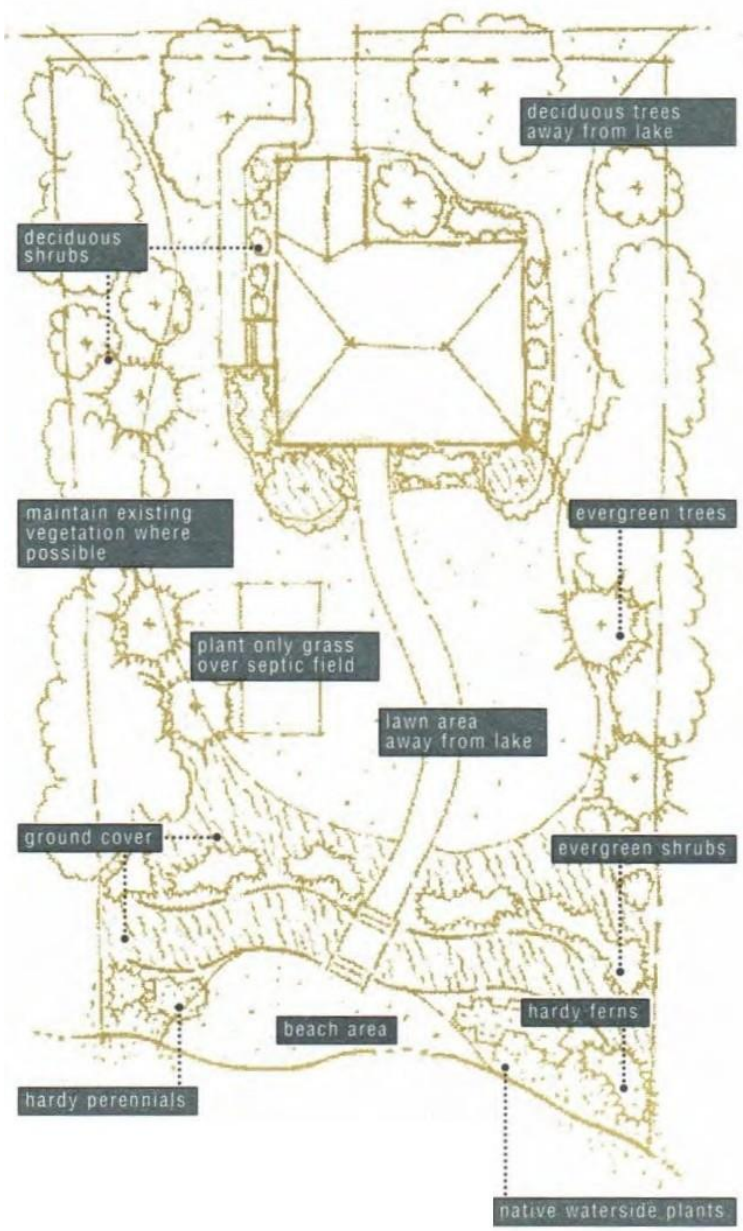
Juniper	Juniperus spp.
Sheep Laurel	Kalmia angustifolia

Deciduous Trees

Ash (Not anymore)	Fraxinus spp.
Balsam Poplar	Populus balsamifera
Basswood	Tilia americana
Beech (Not anymore)	Fagus spp.
Birch	Betula spp.
Black Locust	Robinia pseudoacacia
Crabapple	Malus spp.
Quaking Aspen	Populus tremuloides
Red Maple	Acer rubrum
Red Oak	Ouercus rubra
Redbud	Cercis canadensis
Serviceberry	Amelanchier spp.
Silver Maple	Acer saccharinum
Sugar Maple	Acer saccharum
White Oak	Quercus alba

Evergreen Trees

Baldcypress	Taxodium spp.
Canadian Hemlock	Tsuga canadensis
Cedar	Cedrus spp.
Eastern Red Cedar	Juniperus virginiana
Red Pine	Pinus resinosa
Spruce	
Tamarix	Tamarix spp.
White Pine	Pinus strobus



Septic System Maintenance

If a septic system is not properly designed and maintained, bacteria and nutrients (such as nitrogen and phosphorus) can readily pass through the soil to the water table and ultimately to the lake or a nearby well. In some instances, septic contaminants can move several hundred feet. Therefore, proper maintenance of lakeside septic systems is critical to water quality protection. This section describes how septic systems function and may be properly maintained.

Parts of a Septic System

A septic system consists of two components: a septic tank and a drain field. Wastewater flows from the house to the septic tank. In the septic tank, most of the solids settle to the bottom and form a sludge layer that is partially decomposed by bacteria. Floating solids form a scum layer on the water surface. Baffles may be positioned in the septic tank to help prevent solids from flowing into and clogging the drain field Liquids from the septic tank flow into the drain field where the wastewater is treated by filtration and microorganisms in the soil. Most commonly, the drain field consists of a series of perforated pipes that allow water from the septic tank to slowly drain to the surrounding soils.

The following practices will help to reduce septic contamination problems and will prolong the hie and efficiency of your septic system.

Septic System Maintenance Practices

Maintaining the Septic Tank

- Inspect the septic tank scum and sludge depth once a year. If the scum depth is within one inch of the outlet baffle, the tank requires cleaning. If the sludge depth is within 12 inches of the outlet baffle or within 16 inches of the outlet fitting, the tank requires cleaning.
- Pump the tank at regular intervals (usually every 2 to 3 years).
- To avoid overburdening your septic system with solids, do not use a kitchen garbage disposal unit.
- Do not use chemical agents to clean your system except on the advice of the county health department.
- Do not put harmful materials. such as fats, solvents, oils, paints, coffee grounds. paper towels. Disposable diapers. cigarettes. sanitary napkins. or tampons. into your system.
- If your system is equipped with a distribution box between the septic tank and the drain field, at one-year intervals, allow one side of your system to rest. ·
- If your system is equipped with a dosing chamber.be sure the submersible pump is operating and properly maintained for uniform discharge of effluent into the drain field. followed by drainage between doses.

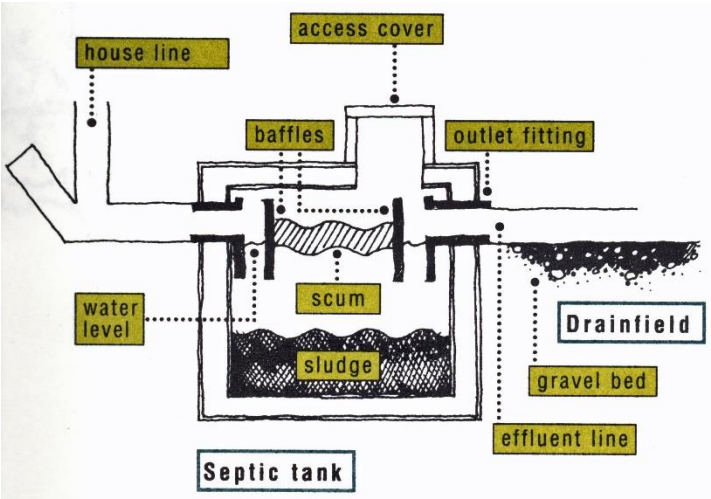
Maintaining the Drain field

- Know the location of your drain field.
- Keep automobiles and all heavy vehicles off the drain field.
- Do not allow puddles of storm- water to form over the drain field.
- Do not fertilize the soil above the drain field.
- Do not stockpile snow or soil on the drain field.
- Do not allow downspouts to drain onto or into your drain field.
- Dense grass cover and other shallow-rooted plants are beneficial over a drain field.
- Avoid planting deep-rooted trees and shrubs over the drain field. Although they promote moisture removal from the drain field, their roots may clog the drain tiles.

Water Conservation Measures

The less water you use, the better your septic system will function.

- Toilets are among the most water-consumptive appliances in a house. By installing a low-flush toilet, with a one gallon-per-flush capacity, instead of the 3.5 to 5-gallon toilets, you may reduce toilet water use by as much as 30 percent.
- Use low-flow, water-saving shower heads. This plumbing fixture can reduce shower water use by up to 50 percent but increases water velocity so the shower feels the same.
- Faucet aerators can decrease faucet water use by as much as 50 percent.
- Other simple things that can be done in the home include repairing leaky faucets and toilets; and using dish and clothes washers only with a full load.



Note: Much of the information in this section was derived from the Michigan State University. Cooperative Extension Service Publications "How to Conserve Water in Your Home and Yard" (Bulletin WQ16) and "Maintaining Your Septic System" (Bulletin E-1521).

Wetland protection

Wetlands and Water Quality

What's all the fuss over wetlands, anyway? What do wetlands have to do with Hamlin Lake? As you might suspect, wetlands are land areas that are wet! They may be wet for only a few weeks, or they may be constantly inundated. However, not all wet areas are wetlands. To be considered a wetland. the area must contain wetland plants or animals. There are many different types of wetlands such as bogs, swamps. and marshes.

Why are wetlands Important?

Historically, wetlands were dismissed as useless land that should be filled in to build homes, or drained for agriculture. Today, we see the devastating effects of these practices as severe flooding and loss of wildlife. Now we realize that wetlands perform many important functions.

Wetland Values:

- Flood control
- Erosion control
- Pollution control
- Wildlife habitat
- Recreation

Wetlands in the Hamlin Lake Watershed

One of the outstanding features of Hamlin Lake is the beauty of the wetlands along the shoreline.

Of the 178 square miles of land that drain to Hamlin Lake, about 5%. or 5.700 acres, is wetland. Most of these wetlands are forested. The wetlands along the shoreline contain cattails and other water· loving plants. Historically, much of the shoreline was wetland. However, large portions of the shore land areas were filled - and continue to be filled - to accommodate home and cottage development.

In the past, when the rains would come and the level of Hamlin Lake would rise, the shore land wetlands would be inundated. But there was very little harm done because the plants and animals inhabiting those areas were accustomed to, even depended on, the flooding. These days, the rains still come and the lake still rises. But now, there are homes where there used to be wetlands, and lake level has become a concern.

Wetlands remaining around Hamlin Lake play an important role in regulating water level, especially during heavy rains. The wetlands don't prevent flooding, but they do help to slow the rate at which the water level rises. By contrast, highly urbanized areas often experience "flash" flooding because wetlands are no longer present to absorb the onslaught of water. Thus, Hamlin Lake's shore land wetlands are crucial for protecting homes and property.

Most of the creeks that empty into Hamlin Lake pass through wetlands before reaching the lake. In doing so,

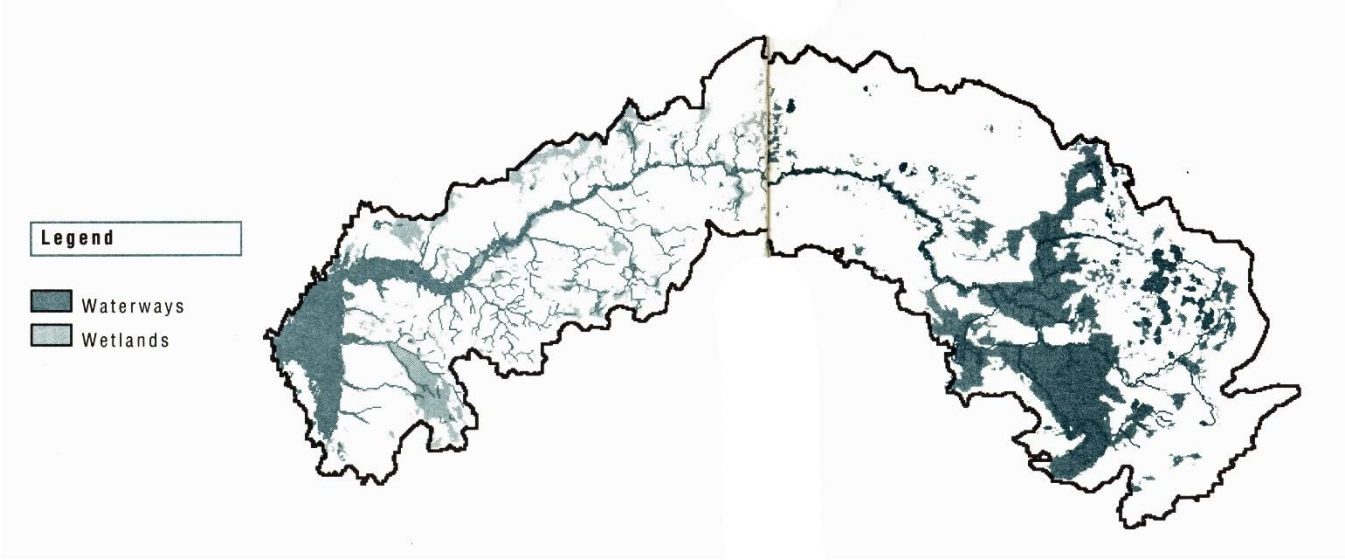
nutrients, sediments, and other pollutants are slowly filtered and removed. Thus. these streamside wetlands are vital to the protection of Hamlin Lake's water quality.

How do I know If I have wetlands on my property?

Most often, wetland conflicts arise because property owners are unaware that wetlands exist on their property. While there are no "official" wetland maps of Michigan, there are several sources of maps available which provide generalized wetland locations. Copies of these maps may be reviewed at the offices of Hamlin and Victory Townships or the Mason County Drain Commissioner during normal business hours.

What happens If I have wetlands on my property?

Congratulations! You are the owner of a very valuable natural resource. Enjoy the birds and other wildlife the wetland will attract. You should be aware, however, that certain wetlands are regulated by the Department of Natural Resources (DNR). In the Hamlin Lake watershed. all wetlands that have a permanent or intermittent surface water connection to a lake, pond, river, or stream. or are located within 500 feet of any lake, pond, river. or stream are regulated by the Department of Natural Resources. Within these wetlands. certain activities are prohibited unless a permit is acquired from the DNR.



The Wetland Permit Process

A permit must be acquired from the DNR in order to:

- Deposit fill material in a wetland
- Dredge or remove soil or minerals from a wetland
- Construct, operate, or maintain any use or development in a wetland
- Drain surface water from a wetland

A wetland permit application can be obtained by contacting the DNR. Once a complete application has been received, the DNR has 90 days to either issue or deny a permit. In some instances, the DNR may determine that a formal public hearing is required prior to issuing a permit. if a public hearing is held, the DNR must act on the permit application within 90 days of the conclusion of the public hearing.

The Nibbling Effect

One of the greatest threats to wet- lands today is "the nibbling effect." A pole barn here, a driveway there, little by little we are nibbling away at our natural wetland areas. Eventually, all that nibbling adds up to huge losses. According to the US Fish and Wildlife Service, over half (53%) of wetlands In the lower 48 states was lost between the late-1700's and mid-1970's. From the mid-1970's to mid-1980's, wetlands were lost at a rate of 290,000 acres per year. Seven states have lost more than 80% of their original wetlands: California; Indiana; Illinois; Iowa; Missouri; Kentucky; and Ohio. In Michigan, over 50 percent of our original wetlands have been lost through nibbling or wholesale destruction.

What can I do to protect wetlands?

Do

- Find out where all the wetlands are located near your home. or neighborhood, or watershed.
- Keep track of your local wetlands: Are they being left alone, or are they being nibbled?
- Acquire a permit from the DNR any time you may impact a wetland.
- Look for alternatives to nibbling: Can new construction avoid wetlands? Can a driveway be routed around the wetland? In most cases, with a slight modification, you can accomplish the same objective without harming the wetland.
- Report wetland violations to the DNR or Lake Board.

Don’t

- Place grass clippings. Leaves, sticks. etc. in wetlands. Find an area that is high and dry and compost these materials.
- Dredge, fill, or drain water from a wetland.

Information Sources

Hamlin Lake Association
Dave Kalina President
PO Box 918, Ludington, Ml 49431

Mason County Drain Commissioner 's Office
Tim Hansen
Mason County Drain Commissioner
401 E. Ludington Avenue,
Ludington, Ml 49431-2122
845-6516

Township of Hamlin Kathy Griffith Supervisor
3775 N. Jebavy Dr., Ludington, Ml 49431
845-7801

Township of Victory, Russell Andersen, Supervisor
4643 N. Anderson Rd., Ludington, Ml 49431
843-8065

Michigan Department of Natural Resources
Cadillac District Office
8015 S. Mackinaw Trail, Cadillac, Ml 49601
775-9727 / 775-9728

Manistee-Mason District Health Department
Robert Dixon, Environmental Director
1110 S. Washington Ave. Ludington, Ml 49431
845-7381

Mason-Lake Soil Conservation District
Fred J. Kirchner, District Conservationist
862 W. US 10/31, Scottville, Ml 49454
757-3708

Michigan State University Extension / Mason County
Dave Peterson, County Extension Director
102 S. Main Street, Scottville, Ml 49454-1221
757-4789

Pointe Betsie to Sable Conservancy, Inc.
Brian Allen, President
P.O. Box 705, Manistee, Ml 49660-0705
723-9911

Hamlin Lake Improvement Board

Hamlin Lake Improvement Board
401 E. Ludington Avenue Ludington, Ml 49431-2122

Dave Mahannah, Chairman

Tim Hansen, Mason County Drain Commissioner

Russell Andersen, Victory Township Representative

Frank Lenz, Hamlin Township Representative

James Pinkerton, Mason County Board of Commissioners

Howard Wandell, Department of Natural Resources

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