HOUGHTON LAKE

A GUIDEBOOK FOR HOMEOWNERS

Houghton Lake is Michigan's largest inland lake. It is an extraordinary resource that provides fishing, boating, swimming, and other recreational opportunities to thousands of people who use and enjoy it. Houghton Lake is an important part of the local economy.

Recognizing the need to effectively manage Houghton Lake, the Houghton Lake Improvement Board (HLIB)was established in 2000 under provisions of Michigan's Natural Resources and Environmental Protection Act. In accordance with state law, the lake board is composed of a representative of each of the four townships that border the lake, a county commissioner, the county drain commissioner, and a lakefront property owner. Several members of the HLIB are lake residents. The HLIB has made the coordinated management of Houghton Lake possible.

Lake management is an ongoing process and sound information must be available to make decisions. This guidebook has been prepared to provide you with information about various issues that affect the management of the lake. We are all stewards of the lake. By working together, we can protect Houghton Lake for future generations to enjoy.

Houghton Lake Improvement Board (HLIB)

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A Historical Perspective

Glacial activity left Michigan with over 11,000 inland lakes, and Houghton Lake is the largest. Houghton Lake is named after Dr. Douglas Houghton, Michigan's first state geologist. Dr. Houghton also had the distinction of having a city and a county named after him.

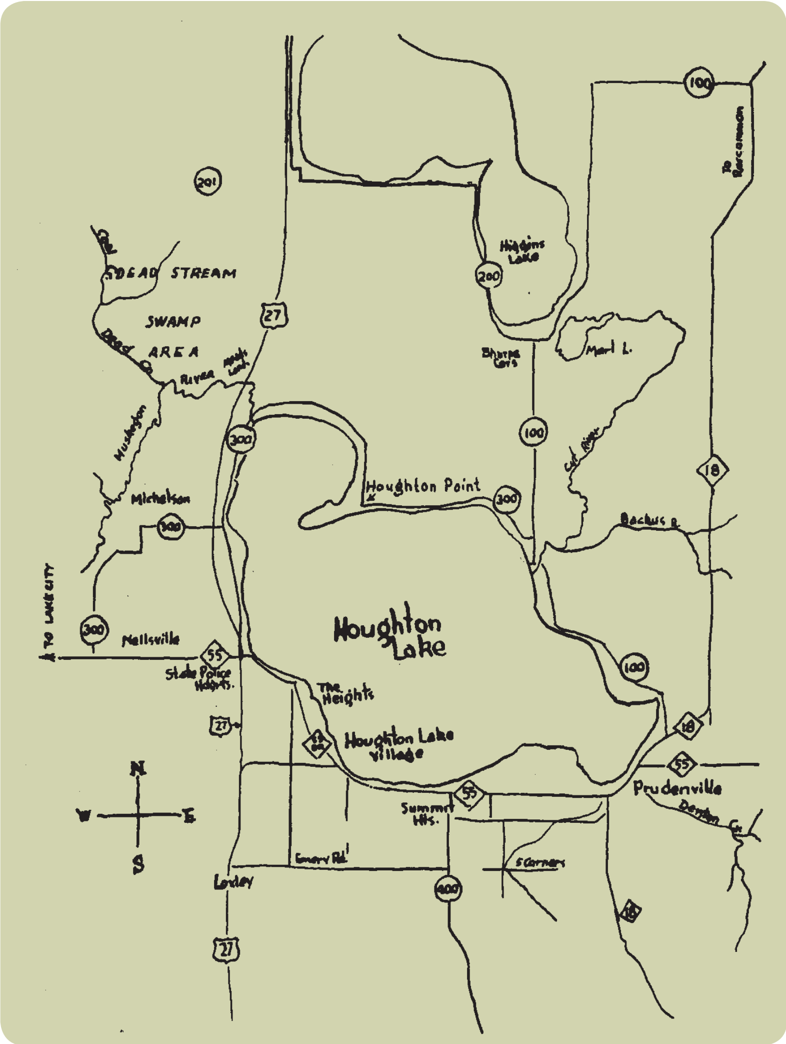
Lumbering had a profound impact on the early development of the Houghton Lake area. In the mid-1800's, lumber camps in the area were abundant, and roads, towns, and railways were established to support the lumber trade. Logs were floated from Houghton Lake down the Muskegon River to sawmills and shipping facilities in Muskegon. It has been estimated that in 1860 alone, mills on the Muskegon River produced 75,000,000 board-feet of lumber.

With the decline of the lumbering industry in the early 1900's, railways that had been used to transport lumber were transformed to passenger lines to bring outdoorsmen to fish, hunt, and experience the beauty of the "north country." The Houghton Lake fishery became legendary and attracted visitors from far and wide.

A legal lake level for Houghton Lake was first set by the Roscommon County Circuit Court in 1926. At that time, the lake level was controlled by a timber dam located on the Muskegon River about three-fourths of a mile downstream of Houghton Lake. This dam did not have sufficient spillway capacity and periodic high and low water levels were experienced on the lake. The county authorized construction of a new concrete dam in 1938 in close proximity to the old dam.

By the mid-1900's, Houghton Lake had become known as a prime resort area. Today, thousands of seasonal cottages, year-round homes, and businesses border the lake. Houghton Lake remains one of Michigan's top resort and vacation destinations and attracts thousands of visitors to its shores each year.

Michigan has many Long Lakes, Little Lakes, Big Lakes, Round Lakes, Bass Lakes, Mud Lakes, Crooked Lakes, and Silver Lakes—but only one Houghton Lake.

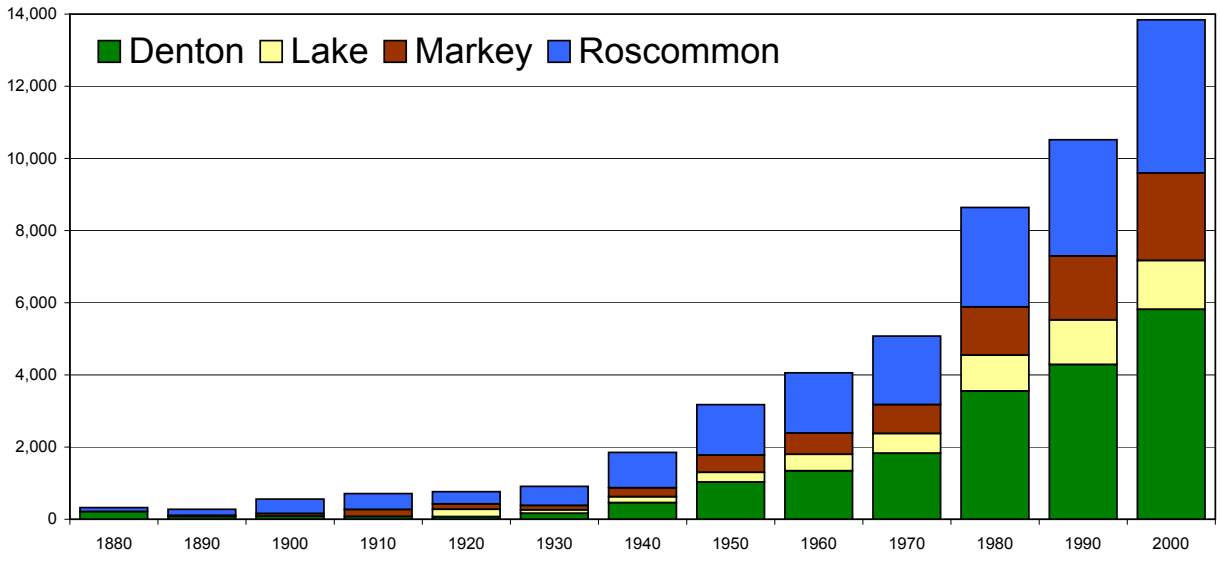


Map by Jerry Oswalt from Capsules of Time: A Saga of Houghton Lake by Beulah Carmen, 1987, Bankov Printing.

Houghton Lake's Tip Up Town in the days of old. Source: Houghton Lake Historical Society.

Logging in the Houghton Lake area. Source: Houghton Lake Historical Society.

Source: Houghton Lake Historical Society.



Population in the four townships around Houghton Lake, 1880 - 2000.

Lake Facts

With a surface area of 20,044 acres, Houghton Lake is Michigan'slargest inland lake. It covers about one-quarter of Lake Township and sizable portions of Denton, Markey, and Roscommon Townships as well. However, despite its vast size, the lake is relatively shallow. Houghton Lake has a maximum depth of 21 feet and an average depth of less than nine feet. Thus, Houghton Lake contains extensive shallow-water areas suitable for rooted plant growth.

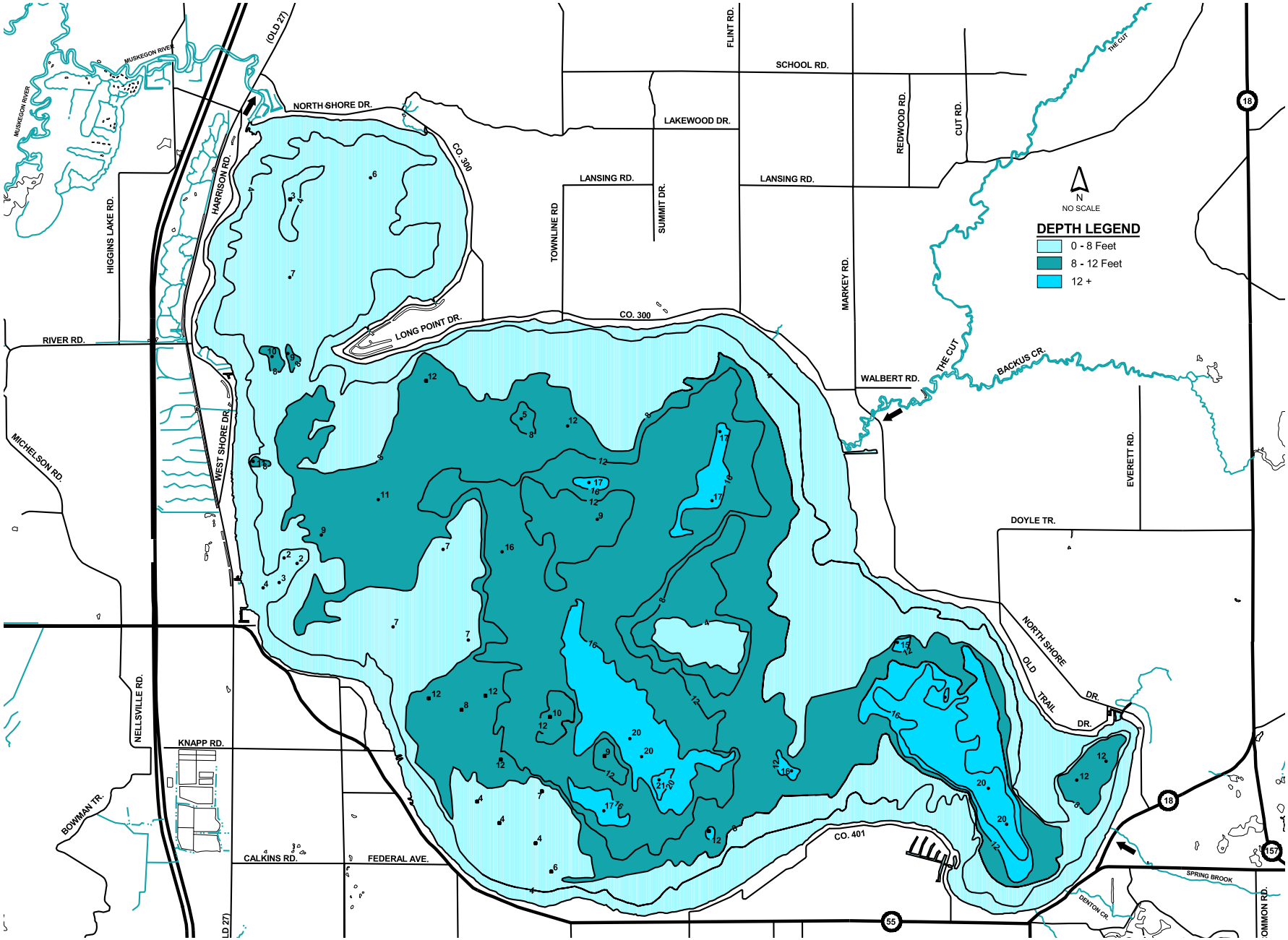
The shoreline of Houghton Lake is over 35 miles long and the shoreline development factor is 1.8. The shoreline development factor indicates the degree of irregularity in the shoreline. That is, the shoreline of Houghton Lake is 1.8 times longer than if the lake were perfectly round.

Houghton Lake contains about 172,000 acre-feet of water, a volume that would cover about 270 square miles to a depth of one foot. The water residence time of a lake is the time it takes for the entire volume of water in the lake to be replaced by incoming waters. The estimated water residence time for Houghton Lake is about 1.2 years.

Houghton Lake is over five miles wide and eight miles long. Strong winds can produce large waves on Houghton Lake and ice sheer along the shoreline can be significant.

How do other lakes compare?

Lake	County	Acres
Torch Lake	Antrim	18,770
Mullett Lake	Cheboygan	17,360
Lake Charlevoix	Charlevoix	17,260
Burt Lake	Cheboygan	17,120
Lake Gogebic	Ontonagon and Gogebic	12,800
Manistique Lake	Mackinac and Luce	10,130
Crystal Lake	Benzie	9,711
Higgins Lake	Roscommon	9,600
Hubbard Lake	Alcona	8,850
Hamlin Lake	Mason	4,990
Glen Lake	Leelenau	4,865
Walloon Lake	Charlevoix and Emmet	4,320
Lake Mitchell	Wexford	2,580
Lake St. Helen	Roscommon	2,390
Lake Missaukee	Missaukee	1,880



Houghton Lake depth contour map. Depths shown in feet.

Watershed Facts

The land area surrounding a lake that drains to the lake is called its watershed or drainage basin. The Houghton Lake watershed is 172 square miles in area, a land area over five times greater than the lake itself. Houghton Lake receives drainage from Higgins Lake via the Cut River and four major tributaries: Knappen Creek, Denton Creek, Spring Brook, and Backus Creek. The Houghton Lake watershed encompasses all or part of 13 townships.

Houghton Lake and Higgins Lake form the headwaters of the Muskegon River. Water draining to the Muskegon River from Houghton Lake travels over 200 miles downstream and drops about 560 feet in elevation before entering Lake Michigan at Muskegon.

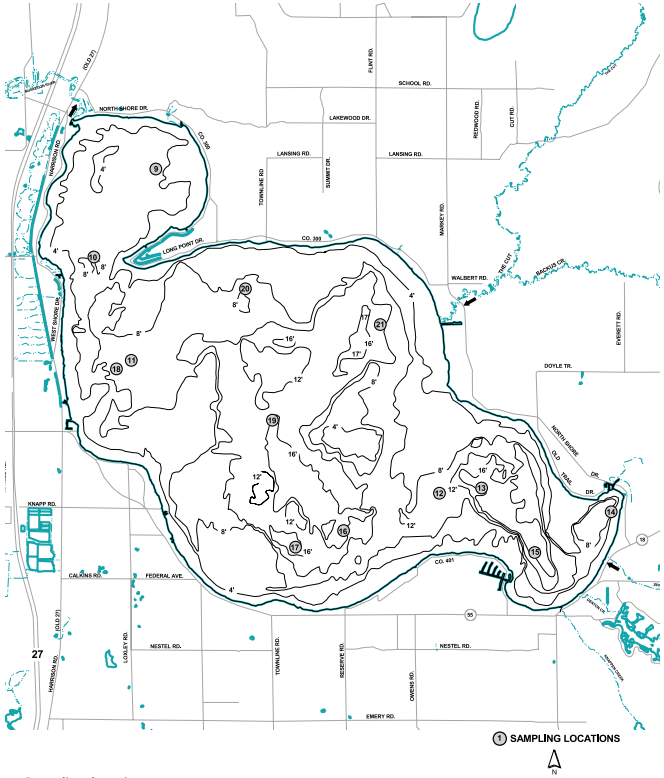
Over the long term, Houghton Lake's water quality will be influenced by land use activities in its watershed. Fortunately, much of the watershed is undeveloped, forested areas or wetlands that help to preserve water quality. With the construction of a sanitary sewer system around Houghton Lake in the 1970's, a primary source of pollution input to the lake was eliminated. However, much of the land adjacent to the lake has been urbanized and pollution sources such as lawn fertilizer and stormwater runoff threaten water quality.

Houghton Lake watershed map.

Water Quality

In recent years, sampling of Houghton Lake has been conducted to evaluate baseline water quality conditions. When evaluating water quality, the nutrient "phosphorus" is of primary concern in that phosphorus is the nutrient that most often stimulates aquatic plant growth and leads to a number of problems collectively known as eutrophication. Phosphorus concentrations in Houghton Lake are typically above the eutrophic threshold concentration of 20 parts per billion.

During ice-free periods, Houghton Lake is well mixed and temperatures in the lake are nearly uniform top to bottom. Similarly, oxygen is mixed throughout the water column and fish and other aquatic organisms are able to inhabit the entire water column. Algae growth in the open waters of the lake is minimal, however, transparency measurements are generally less than 10 feet. The low transparency is likely due to: 1) the mixing of the water column that suspends sediments, and 2) the presence of natural tannins draining from area wetlands that impart a brownish color to the lake.



Sampling location map.

Sampling location buoy.

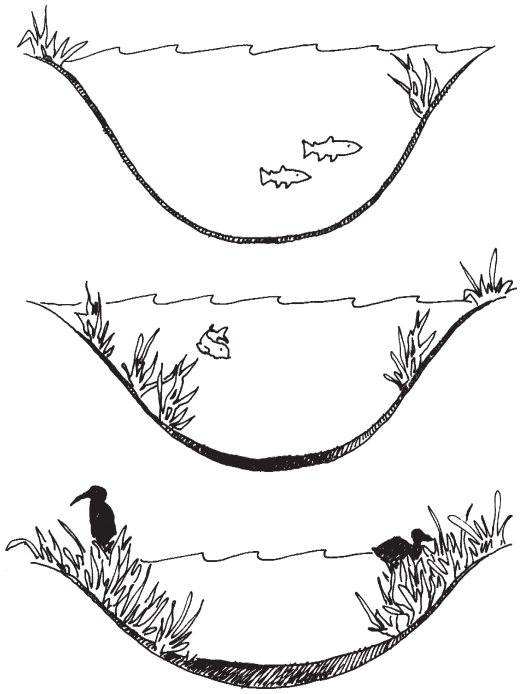
Collecting water samples.

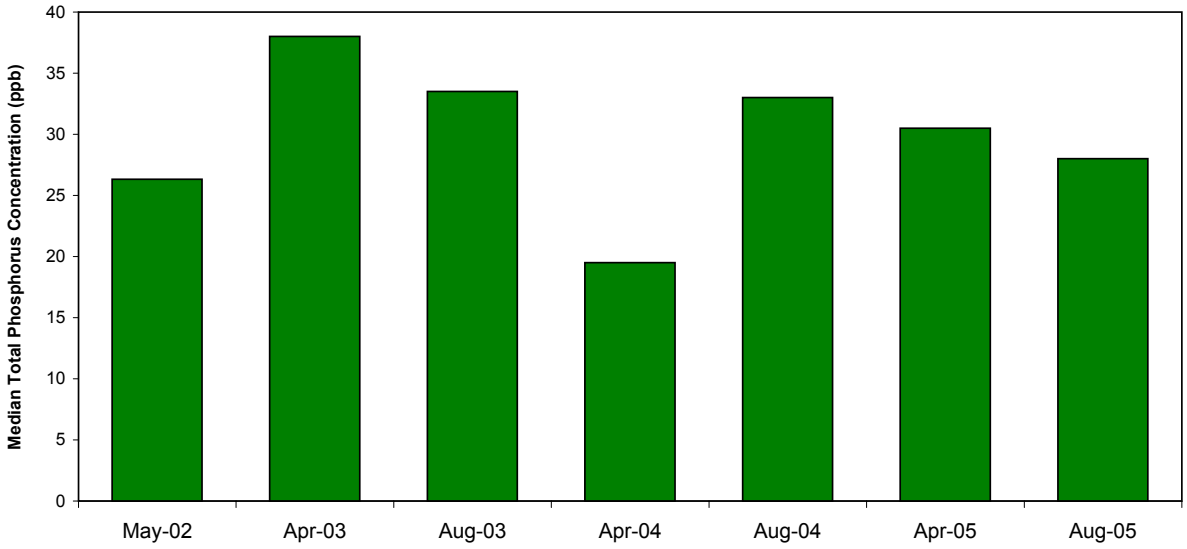
OLIGOTROPHIC lakes are generally deep and clear with little aquatic plant growth. These lakes maintain sufficient dissolved oxygen in the cool, deep bottom waters during late summer to support cold water fish such as trout and whitefish.

Lakes that fall between the two extremes of oligotrophic and eutrophic are called **MESOTROPHIC** lakes.

EUTROPHIC lakes have poor clarity, 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.

Recent sampling indicates that Houghton Lake's water quality is between mesotrophic and eutrophic.





Houghton Lake median total phosphorus concentrations 2002 – 2005

Aquatic Plants

Aquatic plants are a critical component of the lake environment. Plants in lakes produce oxygen during photosynthesis, help stabilize shoreline and bottom sediments, and provide habitat and cover for fish and other aquatic inhabitants. The shallow water and soft sediments in Houghton Lake provide ideal conditions for aquatic plant growth and the lake supports a healthy and diverse population of aquatic plants. Over 25 plant species have been identified in Houghton Lake.

In recent years, extensive surveys have been conducted to determine the type and distribution of plants in Houghton Lake. Of special concern is a plant called "Eurasian milfoil" (*Myriophyllum spicatum*). Eurasian milfoil is problematic in that it often establishes early in the growing season and can grow at greater depths than most plants. Eurasian milfoil can proliferate and spread via vegetative propagation, in which small pieces break off, take root, and grow. It often forms a thick canopy at the lake surface that can seriously hinder recreational activity. Eurasian milfoil generally provides poor fish habitat when compared to native plant species. Once introduced into a lake, Eurasian milfoil may out-compete and displace more desirable plants and become the dominant species. During the 1990s, Eurasian milfoil spread throughout much of Houghton Lake. By 2001, Eurasian milfoil infested nearly 11,000 acres of the lake and was common to dense in approximately 5,300 acres of the lake.

Aquatic Plants in Houghton Lake

Common Name	Scientific Name
Chara	*Chara sp.*
Elodea	*Elodea canadensis*
Small pondweed	*Potamogeton pusillus*
Naiad	*Najas flexilis*
Southern naiad	*Najas guadalupensis*
Illinois pondweed	*Potamogeton illinoensis*
Whitestem pondweed	*Potamogeton praelongus*
Thin-leaf pondweed	*Potamogeton sp.*
Water stargrass	*Heteranthera dubia*
Variable pondweed	*Potamogeton gramineus*
Eurasian milfoil	*Myriophyllum spicatum*
Flat-stem pondweed	*Potamogeton zosteriformis*
Large-leaf pondweed	*Potamogeton amplifolius*
Richardson's pondweed	*Potamogeton richardsonii*
Wild celery	*Vallisneria americana*
Ribbon-leaf pondweed	*Potamogeton epihydrus*
Variable-leaf pondweed	*Potamogeton diversifolius*
Robbins pondweed	*Potamogeton robbinsii*
Wild rice	*Zizania aquatica*
Bulrush	*Scirpus sp.*
Nitella	*Nitella sp.*
Coontail	*Ceratophyllum demersum*
Floating-leaved pondweed	*Potamogeton natans*
Bladderwort	*Utricularia vulgaris*
Yellow waterlily	*Nuphar sp.*
Curly-leaf pondweed	*Potamogeton crispus*

Eurasian milfoil canopy.

Milfoil fragmentation.

Many species of aquatic plants are collected from Houghton Lake during surveys.

Another plant of interest in Houghton Lake is wild rice (*Zizania aquatica*). In the early 1900's, wild rice grew in Muddy Bay, North Bay, and the Middle Grounds of Houghton Lake. The rice beds provided quality wildlife food and habitat. Wild rice has been in decline in Houghton Lake since the 1980's. Reasons cited in reports for its decline include disease, ice sheer, water level, decreases in water clarity, and competition with other plant species. While the exact cause of the decline is unclear, wild rice is beginning to slowly re-establish in the lake.

Wild rice
Zizania aquatica

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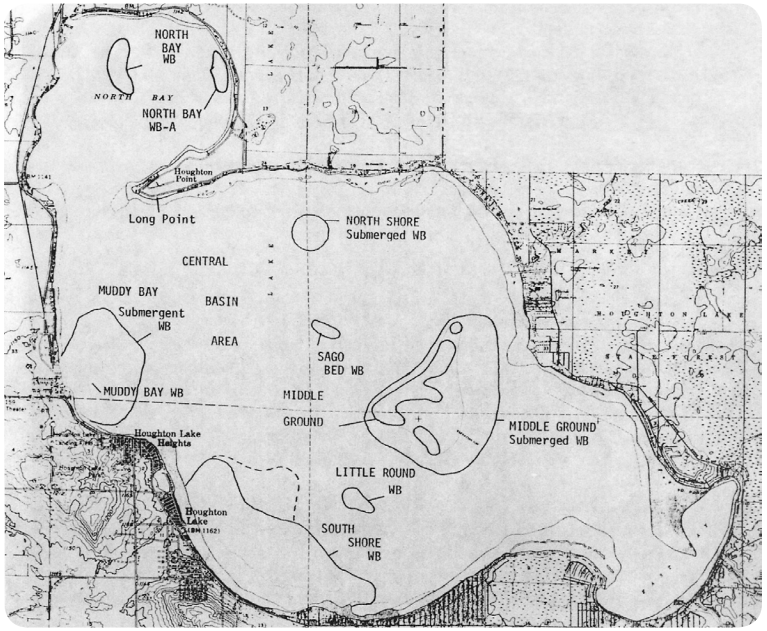
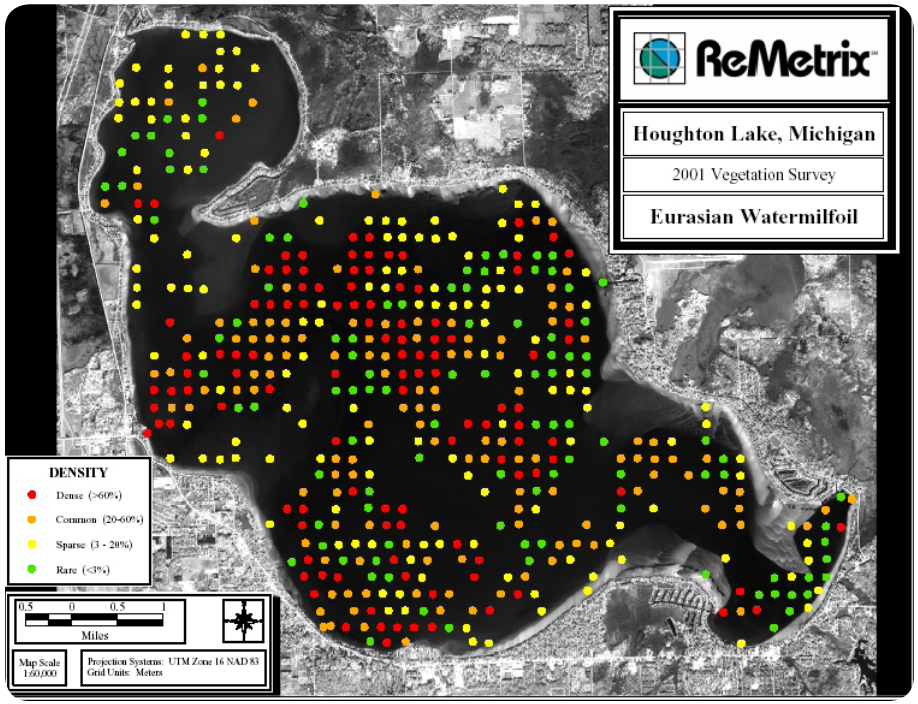


Location of Houghton Lake aquatic plant beds in early 1970's. Source: Evenson et al. 1973. Waterfowl at Houghton Lake. Technical Bulletin 73-3, Michigan Department of Natural Resources, Lansing, MI.



Aquatic Plant Control

The objective of a sound aquatic plant control program is to only remove nuisance and invasive plant species that adversely impact lake ecology and inhibit recreational use. Under no circumstances should an attempt be made to remove all plants from a lake.

Controlling the spread of Eurasian milfoil in Houghton Lake is an essential component of ongoing management efforts. Because of its ability to spread by fragmentation, mechanical harvesting is generally not recommended to control Eurasian milfoil in that it can actually promote the spread of the plant. Most often, Eurasian milfoil is controlled via the application of a systemic herbicide. Systemic herbicides kill the entire plant, unlike contact herbicides that leave the roots intact.

After several years of study by the U.S. Army Corps of Engineers and others, Houghton Lake was treated in 2002 with a systemic herbicide called fluridone (trade name Sonar) to control Eurasian milfoil. The fluridone was applied to the entire surface of the lake in two separate treatments spaced approximately three weeks apart. Vegetation surveys of Houghton Lake conducted since the treatment indicate that fluridone was highly effective and Eurasian milfoil has since been found only in small portions of the lake. Annual spot-treatments of Eurasian milfoil beds are being conducted to help prevent re-infestation of the plant. The control of Eurasian milfoil in Houghton Lake has improved recreational use and benefited both the lake ecology and the local economy.

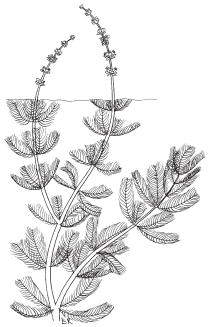
In addition to herbicide treatments, over 33,000 milfoil weevils (*Euhrychiopsis lecontei*) have been stocked in and around Houghton Lake. Milfoil weevils feed selectively on Eurasian milfoil while ignoring other plants. Several lakes in Michigan, including nearby Lake St. Helen, have had milfoil weevils stocked to help control the growth of Eurasian milfoil.

Houghton Lake in 2000 before fluridone treatment. Source: ReMetrix, Inc.

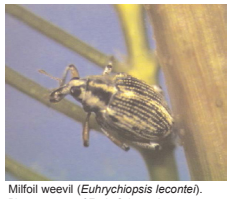
Houghton Lake in 2002 after fluridone treatment. Source: ReMetrix, Inc.

WEEVIL STOCKING AREA

The native insect known as the milfoil weevil has been stocked in this area to help control the growth of the exotic plant Eurasian milfoil. To help the weevils to be as effective as possible, please do not disturb plants in this area.



Eurasian milfoil (*Myriophyllum spicatum*). Aquatic plant line drawing is the copyright property of the University of Florida Center for Aquatic Plants (Gainesville). Used with permission.



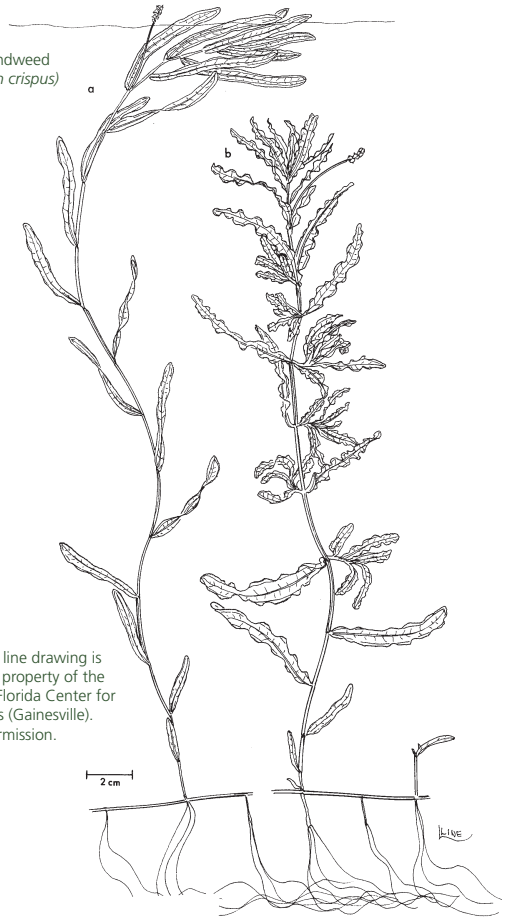
Milfoil weevil (*Euhrychiopsis lecontei*). Photo courtesy of EnviroScience, Inc.

Michigan Department of Natural Resources

HLIB Houghton Lake Improvement Board

Milfoil weevil
(Euhrychiopsis lecontei)

Like Eurasian milfoil, curly-leaf pondweed is a fast-growing, canopy-forming plant that often grows to nuisance levels. However, unlike Eurasian milfoil, this plant does not spread by fragmentation and can be harvested. To help prevent the spread of curly-leaf pondweed in Houghton Lake, mechanical harvesting equipment is being used to cut and remove the plant from the lake. Vigilant monitoring and selective control of aquatic plants in Houghton Lake will be required to ensure invasive plant species do not regain prominence in the lake.



Curly-leaf pondweed
(*Potamogeton crispus*)

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HOUGHTON LAKE PLANT CONTROL HISTORY

	Herbicides (acres treated)			Acres Harvested	Milfoil Weevils (# Stocked)
	Sonar®	Contacts	Systemic		
2002	20,044	17			
2003			32		
2004			44	81	5,000
2005		50	395	84	28,000

Aquatic plant harvesting

Lake Level

The maintenance of Houghton Lake's level has long been controversial. During periods of high water, low-lying properties around the lake have the potential to be flooded; during periods of low water, navigating portions of the lake can be difficult.

The level of Houghton Lake is controlled by a concrete dam located on the Muskegon River about three-fourths of a mile downstream of the lake. The current dam was constructed in 1938 to replace an undersized timber dam. However, on the advice of the contractor, the spillway of the new dam was constructed shorter than the length recommended by state engineers. An engineering study of the dam completed in 1954 by the Michigan Department of Conservation found that the dam and outlet channel could greatly restrict outflow from the lake. At that time, it was recommended that the dam be enlarged and that the outlet channel be deepened and widened. These recommendations were never implemented.

In the Department of Conservation report it was noted that:

> Observations during past years indicate that considerable development has taken place around Houghton Lake and that low marshy areas, previously considered undesirable, have been developed into lots and sold. Large marsh areas were developed and very shallow fills placed over these areas to prepare cottage sites for sale. As the years have gone by, the recreational public has observed Houghton Lake during the latter part of summer and purchased lots when lake levels were low. After construction of cottages on these lots, at elevations very little above the ground surface, trouble developed from high water levels flooding out the land immediately around the cottages themselves.

Lake Level Timeline

1926 - Legal lake level set at 1138.1 feet above sea level.

1938 - Current dam installed to replace undersized timber dam. On the advice of the contractor, the current dam was also undersized, against the recommendation of state engineers.

1954 - Department of Conservation engineering study reported that the dam and the outlet channel restrict outflow from the lake.

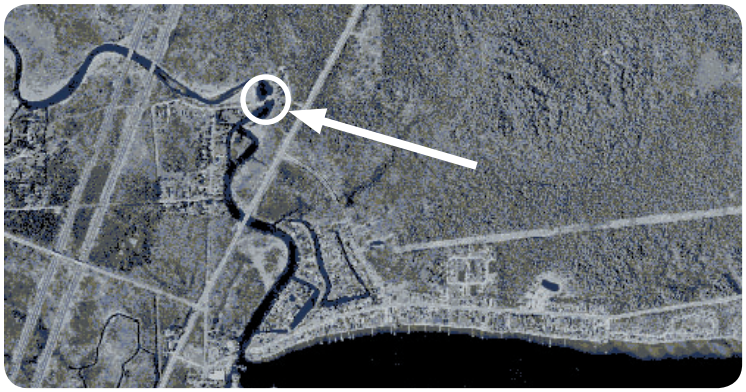
1982 - Circuit Court order sets winter level of Houghton lake 6 inches below the summer level at 1137.6 feet above sea level.

Ice movement on shore.

Construction of the Houghton Lake dam helped in moving logs during the lumbering era.
Source: Houghton Lake Historical Society.

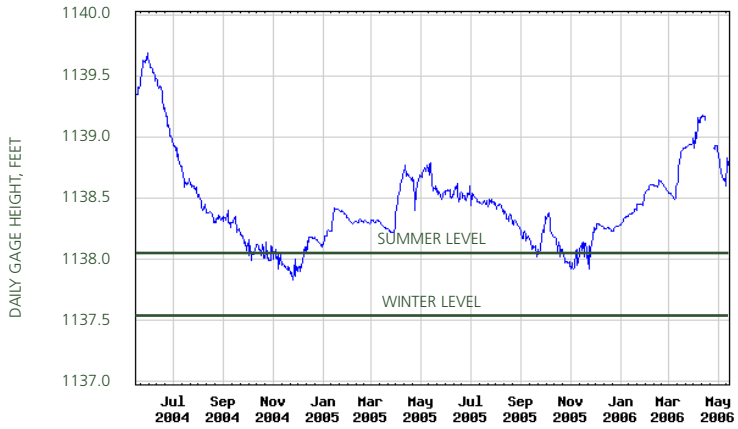
In 1926, a legal lake level for Houghton Lake of 1138.1 feet above mean sea level was set by the Roscommon County Circuit Court. However, flooding of low-lying properties occurred often during the period of spring ice break-up. To address this problem, the Roscommon Board of Commissioners petitioned the Roscommon County Circuit Court to establish a winter level for Houghton Lake. In 1982, the circuit court ordered that the legal lake level of Houghton Lake previously established at 1138.1 feet above mean sea level be maintained, provided that the level be lowered to not less than 1137.6 feet above mean sea level on or about November 1 of each year, and restored to its summer level commencing on or about April 15 or ice-out, whichever occurs first in any given year.

Thus, in recent times, an attempt has been made to maintain both a summer and a winter level on Houghton Lake. To the extent that the winter lake level can be maintained, some storage capacity exists in Houghton Lake to accommodate the spring surge in level without causing flooding. However, given the operational limitations of the Houghton Lake dam, it is not always possible to maintain the desired lake levels. At times, the level of the lake is significantly higher than the court-ordered levels, even with the gates in the dam fully open. Thus, it is important that the dam always be operated in a manner that prevents excess storage of water above the court-ordered winter and summer lake levels. Real-time lake level data from the US Geological Survey is available online at the HLIB web site at www.houghton-lake.com.



Dam location

The Houghton Lake dam today.



Houghton Lake Level
July 2004 - May 2006

Houghton Lake during a low-water period. From: Capsules of Time: A Saga of Houghton Lake by Beulah Carmen, 1987, Bankov Printing.

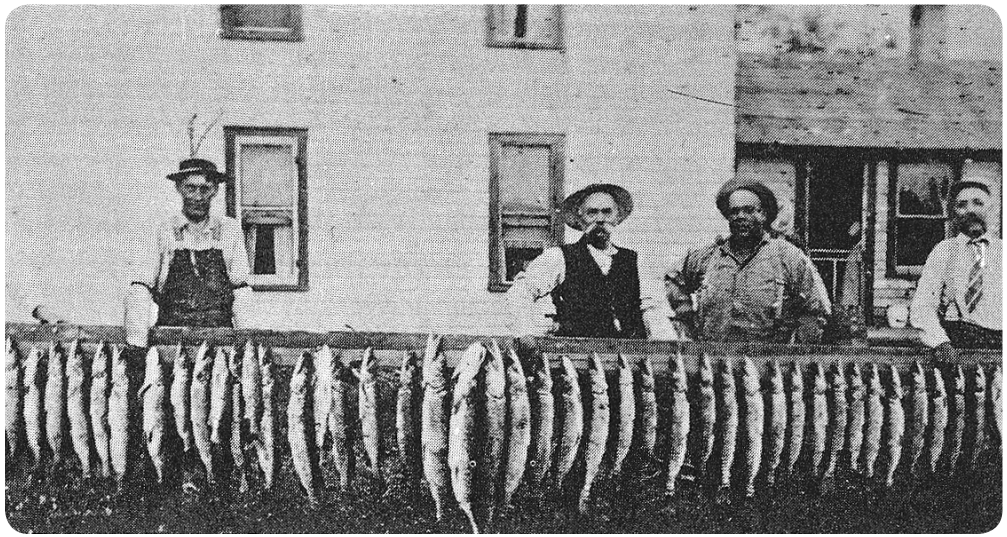
The Houghton Lake Fishery

Houghton Lake has one of the most diverse and abundant fish populations of any lake in Michigan. Since the 1930's, the Department of Natural Resources has identified 39 different species of fish in Houghton Lake including sunfish, perch, northern pike, walleye, and largemouth and smallmouth bass. However, the lake is too warm during the summer months to sustain coldwater fish species such as trout. Since 1994, Houghton Lake has had over 330 entries in the Department of Natural Resources Master Anglers Program including a 21-pound northern pike caught in 2003, a 30-inch walleye caught in 2004, and a 14-inch black crappie caught in 2004. Since 1979, the Department of Natural Resources has stocked over 1.9 million walleye in Houghton Lake ranging in size from fingerlings to 6-inches.

The fishery in Houghton Lake has been studied extensively. A study completed by the Department of Natural Resources in 2004 found that the fishery in Houghton Lake in 2001- 2002 was very similar to the fishery in 1957-1961. In particular, the report noted that the walleye fishery in Houghton Lake is healthy and that the northern pike population was also fairly healthy. Currently, the HLIB is working with the Department of Natural Resources to facilitate future stocking of Houghton Lake by enhancing the fish-rearing facilities at the Merritt walleye rearing complex. Houghton Lake remains one of Michigan's most productive fishing lakes and a cornerstone of the local economy.

Walleye Stocking Records

Year	Number	Average Length
1979	68,936	
1980	106,717	
1981	178,757	
1982	26,699	
1983	39,400	
1984	24,739	3.5
1985	70,663	2.2
1986	62,450	2.5
1986	45,500	2.3
1987	17,000	3.6
1988	75,200	2.6
1989	67,150	3.4
1990	106,049	1.8
1990	19,420	4.4
1991	101,050	3.5
1993	158,282	1.6
1994	10,000	2.6
1995	7,150	4.4
1999	152,346	1.9
2001	319,494	1.5
2005	212,568	1.5



A day's catch. Source: Houghton Lake Historical Society.

Source: Houghton Lake Historical Society.

Houghton Lake Flats Flooding

A dominant feature of the landscape west of Houghton Lake is the 770-acre Houghton Lake Flats Flooding that lies in a narrow strip between Old 27 and US 27. The Flats area was constructed when US 27 was built as part of a mitigation agreement between the Department of Natural Resources and the Michigan Department of Transportation. In the 1960's, the Flats were flooded in an attempt to restore functionality of the marsh area that had historically existed in the area. Early on, the Flats were managed for both pike spawning and waterfowl production. However, pike production was low and, since the late 1970's, the Flats have been managed with an emphasis on wildlife restoration and management as well as recreation and education. Over the years, management and maintenance activities in the Flats have included controlled burns, dredging, clearing, and water level manipulations. Improvements have included the installation of osprey platforms and construction of a parking lot and observation deck.

Water level manipulation within the Flats is performed to permit ditch cleaning, dredging, and other maintenance. Periodically, the Flats' water level is drawn down by pumping into Houghton Lake. In recent years, screens have been installed in discharge ditches to help ensure undesirable plant species and other debris is not transported to Houghton Lake. In 2005, approximately 28,000 Eurasian milfoil-eating weevils were stocked in the Flats to help control Eurasian milfoil growth. Given the enormous volume of water in Houghton Lake, the pumping of water to and from the Flats does not significantly impact the level of Houghton Lake. In fact, the average total volume pumped from the lake only results in about a 1/8-inch change in summer lake level.

Heron rookery in the Flats.

Flooded area in the Flats.

Wildlife in the Flats

Birds

- American black duck
- American coot
- belted kingfisher
- black tern
- blue-winged teal
- Canada geese
- common moorhen
- common snipe
- double-crested cormorant
- great blue heron
- green heron
- green-winged teal
- least bittern
- mallard
- northern harrier
- osprey
- pied-billed grebe
- red-winged blackbird
- ring-billed gull
- ring-necked duck
- tree swallow
- wood duck
- yellow warbler

Mammals

- beaver
- black bear
- mink
- muskrat
- raccoon
- river otter
- white-tailed deer

Reptiles and Amphibians

- northern leopard frog
- painted turtle
- snapping turtle

Fish

- bluegill
- bowfin
- bullhead
- carp
- smallmouth bass
- yellow perch

Invasive Species

Like many Michigan lakes, Houghton Lake is threatened by exotic species. Exotic species are plants or animals that are not native to an area. For example, exotic species in Michigan came from elsewhere in the United States or from foreign countries. Exotic species can be inadvertently spread to new areas by commerce and transportation, such as airplane cargo or ballast water. Once they've arrived, exotic species often outgrow the native species because there are no natural enemies to keep them in check. In some cases, the physical and environmental damage caused by an exotic plant or animal can be very costly to combat. In addition to Eurasian milfoil, other exotic species that have invaded Houghton Lake include zebra mussels and purple loosestrife.

Zebra mussels

Zebra mussels were first introduced to the Great Lakes region by ocean-going freighters in the 1980's and have since infested nearly 200 of Michigan's inland lakes. They are most likely transported in their larval stage when they are nearly invisible to the naked eye. They can attach to boat hulls and trailers or be carried in bilge water or live wells. The adult zebra mussels are thumbnail-sized with striped shells, hence their name. Zebra mussels filter algae from the water column. This, in turn, causes greater sunlight penetration to the bottom and may stimulate more rooted plant growth. Ecologically, zebra mussels cause the greatest damage to native mussels that compete for available food and substrate. Inland lakes that have large zebra mussel populations may experience a diminished fishery as zebra mussels deplete the food base of small fish.

Purple loosestrife

Purple loosestrife is a perennial plant native to Europe that was transplanted in this country (likely as an ornamental) in the 1800's. Its tall spikes of pinkish-purple flowers are now common around lakes, marshes, and roadsides in summer. Purple loosestrife generally flowers in early July and produces seeds in late July or early August. Each mature plant can produce thousands of seeds annually which are spread by wind, water, and wildlife. Seeds may lay dormant, but remain viable, for several years. Purple loosestrife over-winters with an extensive root system that chokes out other plant species. Because it is such a prolific seed producer and has no natural enemies in North America, purple loosestrife crowds out native plants, such as cattails, that wildlife need for food, nesting, and shelter. In Michigan, purple loosestrife is present throughout the lower peninsula and is expanding into several counties in the upper peninsula. In the summer of 2000, approximately 5,000 *Galerucella* beetles were released at the south end of the Houghton Lake Flats Flooding in an effort to control the exotic invasive plant purple loosestrife. These beetles were brought over from Europe, the same place the purple loosestrife originated, and are "host specific," meaning they feed exclusively on loosestrife. Since their release, sampling surveys have shown that the beetles have slowly spread to greatly reduce the number of plants in that area. Although they are not spreading as fast as would be desired, progress is steady and it is hoped that over the next decade the initial release will have spread to other problem areas of the county.

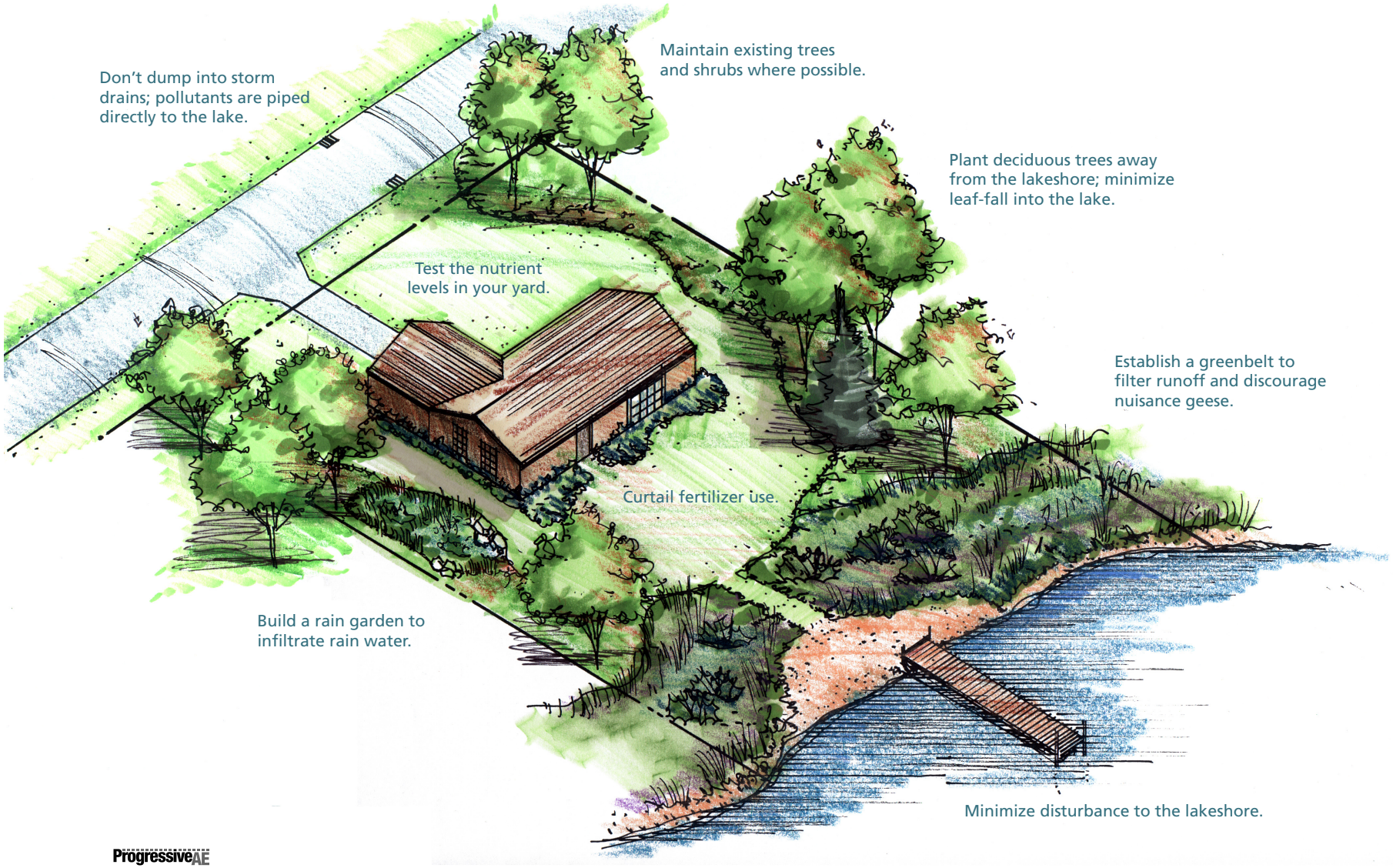
Exotic species are often introduced into a lake as discrete hitchhikers on boats and trailers. If you trailer your boat from lake to lake, you can help stop the spread of exotic hitchhikers by:

• Draining water and removing any plant fragments, mud, or debris from your boat, trailer, and fishing gear before you leave a lake.

• Washing your boat and trailer when you return from a different lake (especially a Great Lake) with hot water. A self-service car wash works well and it only takes a few minutes. If possible, let your boat dry for several days after use before launching into another lake.

Purple loosestrife
(Lythrum salicaria)

What You Can Do



ProgressiveAE

In General

- Rake and dispose of leaves away from the lake. Compost if possible. Do not burn leaves near shore. Nutrients concentrate in the ash and are easily washed into the lake.
- Avoid using pesticides near the lake; many are toxic to aquatic life.
- Where possible, promote infiltration of stormwater into the ground. Build a rain garden to capture runoff from driveways and downspouts. For more information on rain gardens, visit the Rain Gardens of West Michigan web site at www.raingardens.org
- To reduce runoff, maintain trees, shrubs, and ground cover.

Fertilizer

- If you don't use fertilizer, don't start now. If you do...
- Don't use fertilizer that contains phosphorus.
- If you use a professional lawn care service, be sure to request a fertilizer that does not contain phosphorus.
- Lightly water after fertilizer is applied. Too much water will cause the fertilizer to leach right past the lawn and into the lake; the turf roots will never get a chance to use it.
- When spreading fertilizer, don't allow fertilizer to fall directly in the water.
- Fertilizers are labeled with a 3-number system that indicates the percentage of the bag that contains nitrogen (first number), phosphorus (second number) and potassium (third number). Example: a 50-pound bag of 20-0-10 fertilizer contains 20% nitrogen (or 10 pounds), 0% phosphorus, and 10% potassium (5 pounds).

Guidelines are based on Michigan State University research

Lawn Care

- Don't cut the grass too short! Near lakes, a mowing height of 3 to 3 ½ inches or higher is recommended.
- Return grass clippings back to the lawn. You can reduce the nitrogen needs of your lawn significantly by doing so. If possible, use a mulching lawn mower to aid in this process.
- Irrigation during the hot, dry period of late summer can prevent the grass from turning brown. At that time, it's better to water for short periods (10 to 15 minutes) daily, rather than heavy watering once per week.

Greenbelt

A greenbelt is a strip of land along the lakeshore that contains plants to trap pollutants that would otherwise wash into the lake.

- A greenbelt should be at least 10 feet wide, but more than 30 feet wide is best.
- Don't fertilize the greenbelt.
- For a natural look, don't mow the greenbelt. Allow natural grasses and wildflowers to grow.
- For a landscaped look, plant groundcovers, ferns, perennials, and shrubs.
- Remember: Canada geese will often avoid properties with greenbelts.

Hazardous Waste and Recycling

- Don't dump motor oil, pesticides, solvents, and other household hazardous waste into the ground or storm sewers; it drains to the lake! Instead, contact the Crawford-Roscommon Conservation District at 989-275-5231 for proper disposal.
- The Conservation District also has a recycling program for items such as yard waste, glass, paper products, and more. Reuse, Reduce, Recycle!

Wetlands Protection

Wetlands provide important water quality and wildlife benefits.

- Keep track of your local wetlands: Are they being left alone, or are they being nibbled?
- Acquire a permit from the DEQ 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.

Soil Testing? How do I go about doing that?

If you take a 2-cup soil sample to MSU Extension in Roscommon, they will have the sample analyzed and help you interpret the results. For more information, contact them at:

Roscommon County MSU-Extension
County Annex, located at 112 S. Fourth Street
Mailing Address: PO Box 507
Roscommon, MI 48653-0507
Email: msue72@msu.edu
Phone: 989-275-5043

MICHIGAN STATE UNIVERSITY EXTENSION

Look for the middle number!
A zero in the middle means phosphorus-free!

Managing Our Natural Resources

10 Ways
To Protect Houghton Lake

1. Don't use lawn fertilizer that contains phosphorus.
2. Use the minimum amount of fertilizer recommended on the label—more is not necessarily better!
3. Water the lawn sparingly to avoid washing nutrients and sediments into the lake.
4. Don't feed ducks and geese near the lake. Waterfowl droppings are high in nutrients and may cause swimmer's itch.
5. Don't burn leaves and grass clippings near the shoreline. Nutrients concentrate in the ash and can easily wash into the lake.
6. Don't mow to the water's edge. Instead, allow a strip of natural vegetation (i.e., a greenbelt) to become established along your waterfront. A greenbelt will trap pollutants and discourage nuisance geese from frequenting your property.
7. Infiltrate drainage from your downspouts rather than letting it flow overland to the lake.
8. Don't dump anything in area wetlands. Wetlands are natural purifiers.
9. If you trailer your boat from lake to lake, wash your boat and trailer before launching back into Houghton Lake.
10. Don't be complacent—our collective actions will make or break the lake!