

# Brooks Lake



## Guidebook

Today, Tomorrow, and into the Future...

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## **Brooks Lake improvement Board**

**Warren Bender, Brooks Lake Property Owner/Brooks Township Representative**

**Jim Leonard, Brooks Lake Property Owner/Brooks Lake Association Representative**

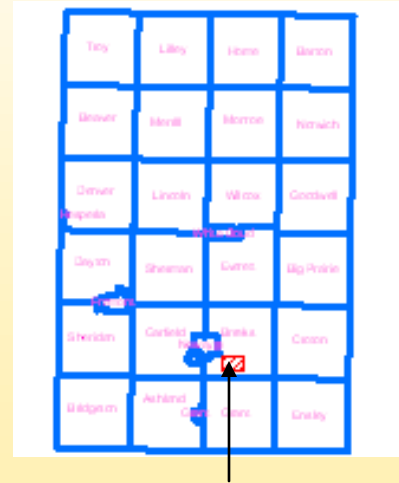
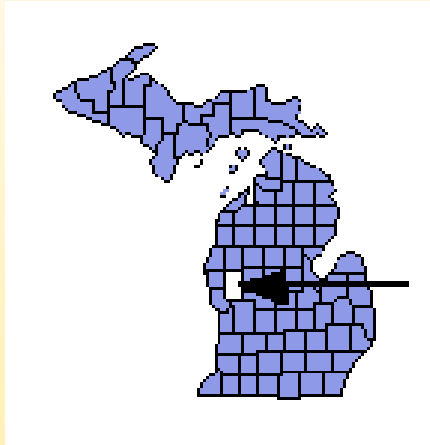
**Marv Mingerink, Brooks Lake Property Owner/Brooks Township Representative**

**Adam Wright, Newaygo County Commissioner/By Statute**

**Patricia L. Baker, Newaygo County Drain Commissioner/By Statute** Phone # 23-689-7213



# Location Map



Aerial photo taken in the spring of 2010



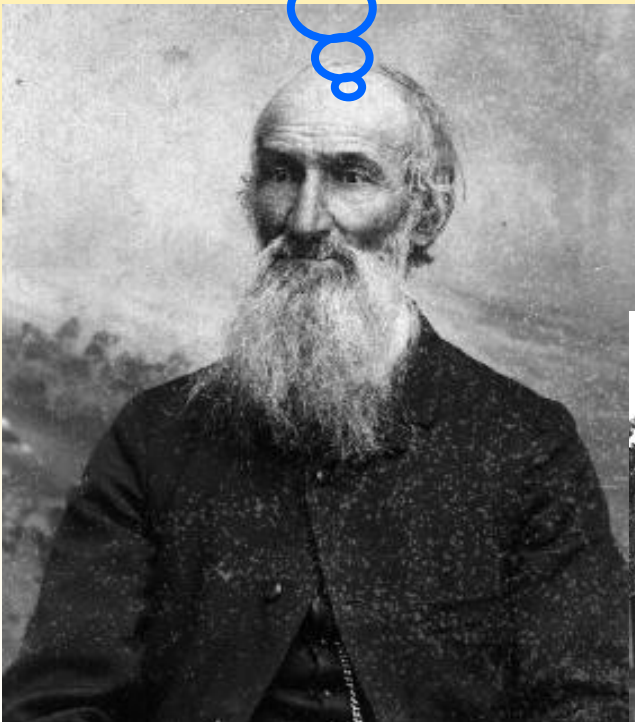


# History of Brooks Lake

Brooks Lake is a 265 acre lake located in Brooks Township. The area around Brooks Lake was first developed in the late 1800's, taking advantage of the lake for logging purposes. The mid 1900's brought heavy development and recreational use to the lake. On May 4, 1896, the Village of Newaygo acquired the right (for a term of ninety nine 99 years) to erect and maintain a dam across the outlet of Brooks Lake, of sufficient height, to raise the water four (4) foot above the normal watermark, but then in 1952 the Village of Newaygo relinquished their rights to the dam. In 1972 the lake level of 762.58 was established and is maintained by the Newaygo County Drain Commissioner (per court order). The Brooks Lake Improvement Board was established in 1988. The Board has chemically treated weeds and algae, gypsy moth control, conducted lake studies and various water samplings. The Board has also enacted a shoreline restoration program.

*We use to call em'  
Big & Little  
Brooks Lake not  
Brooks & Hess*

Great catch  
through the ice  
in the mid  
1950's!



John Brooks  
one of the first settlers of the area



# History of Brooks Lake



A southwest view.  
(often called Little Brooks)  
(1950's)

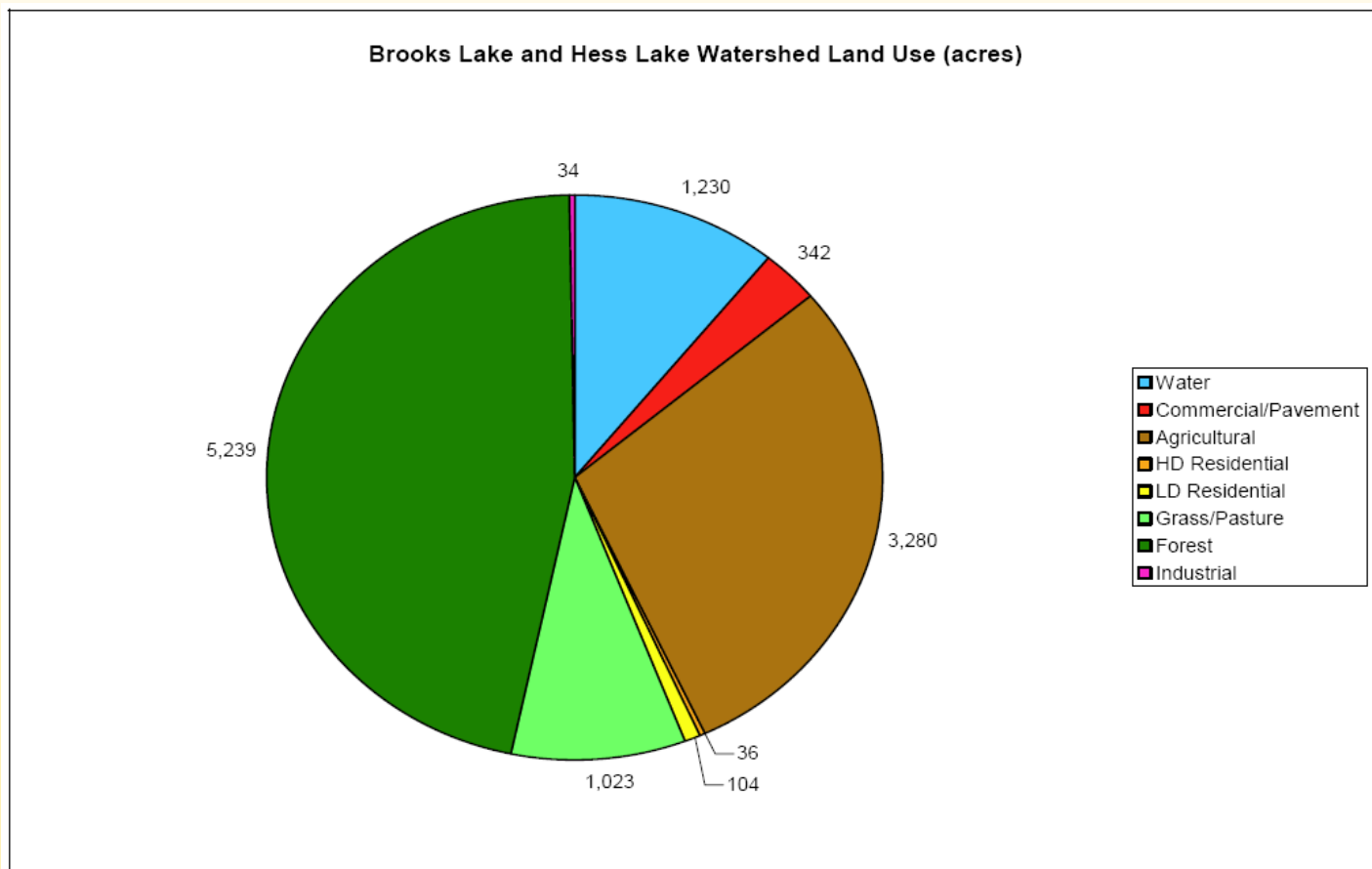
Looking East  
(1965)



The Leonard family with  
their days catch  
(1972)

# Watershed Data

The Brooks Lake watershed is approximately 17 square miles or 11,288 acres. Hess Lake is the main contributor bringing water from the south via Alger Creek and the Wheeler Drain. The water from Brooks lake flows through Brooks Creek and the Muskegon river eventually ending up in Lake Michigan.



**Figure 1: Watershed Land Use (based on Lower Peninsula Land Cover 2001) for the 11,288 acre Brooks Lake and Hess Lake Watershed.**

**Brooks Lake Level - Annual Inspection**  
(By law Lake Levels are inspected by an engineer every 3 years)

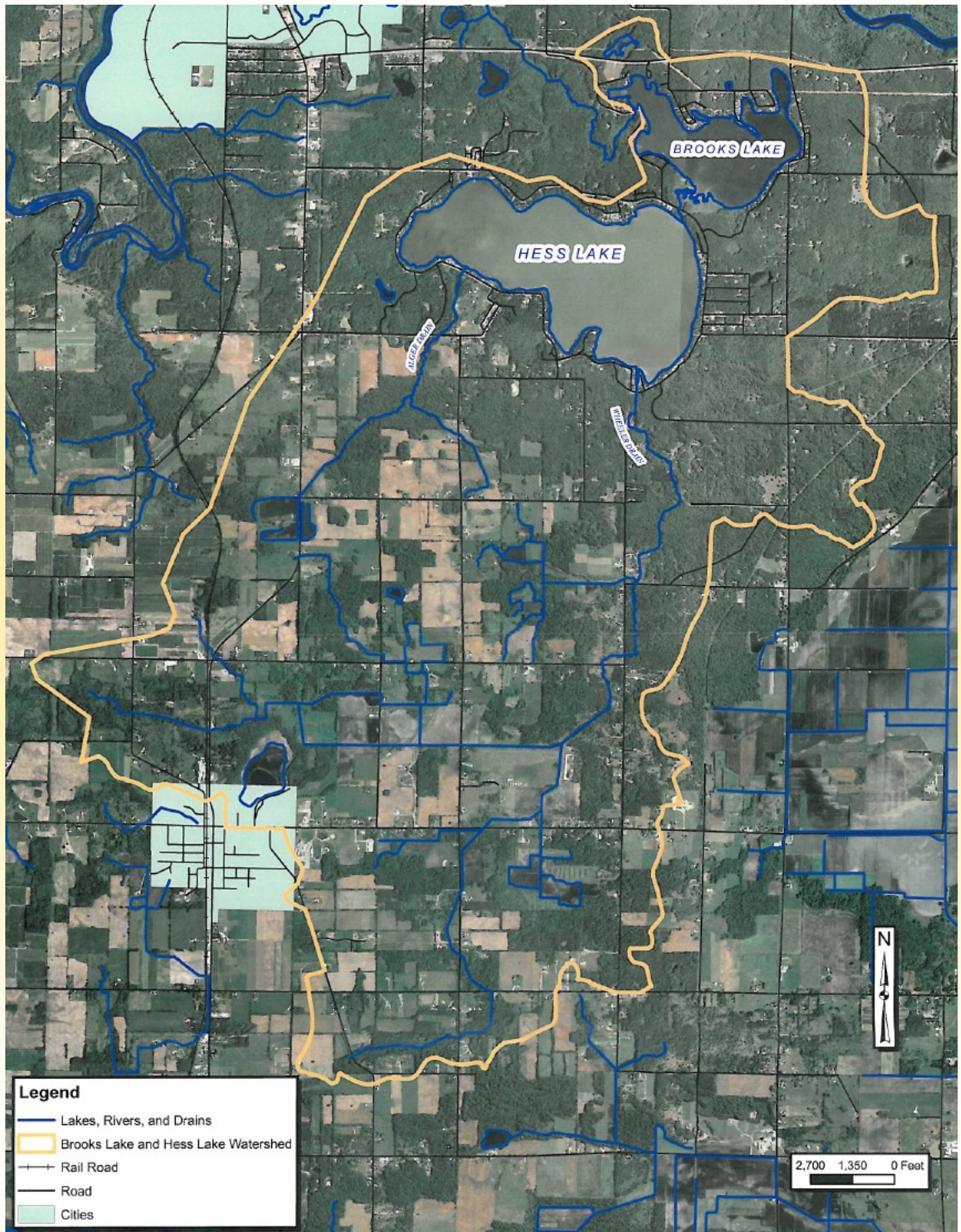


**Channel between Hess & Brooks, which acts as a natural filter**

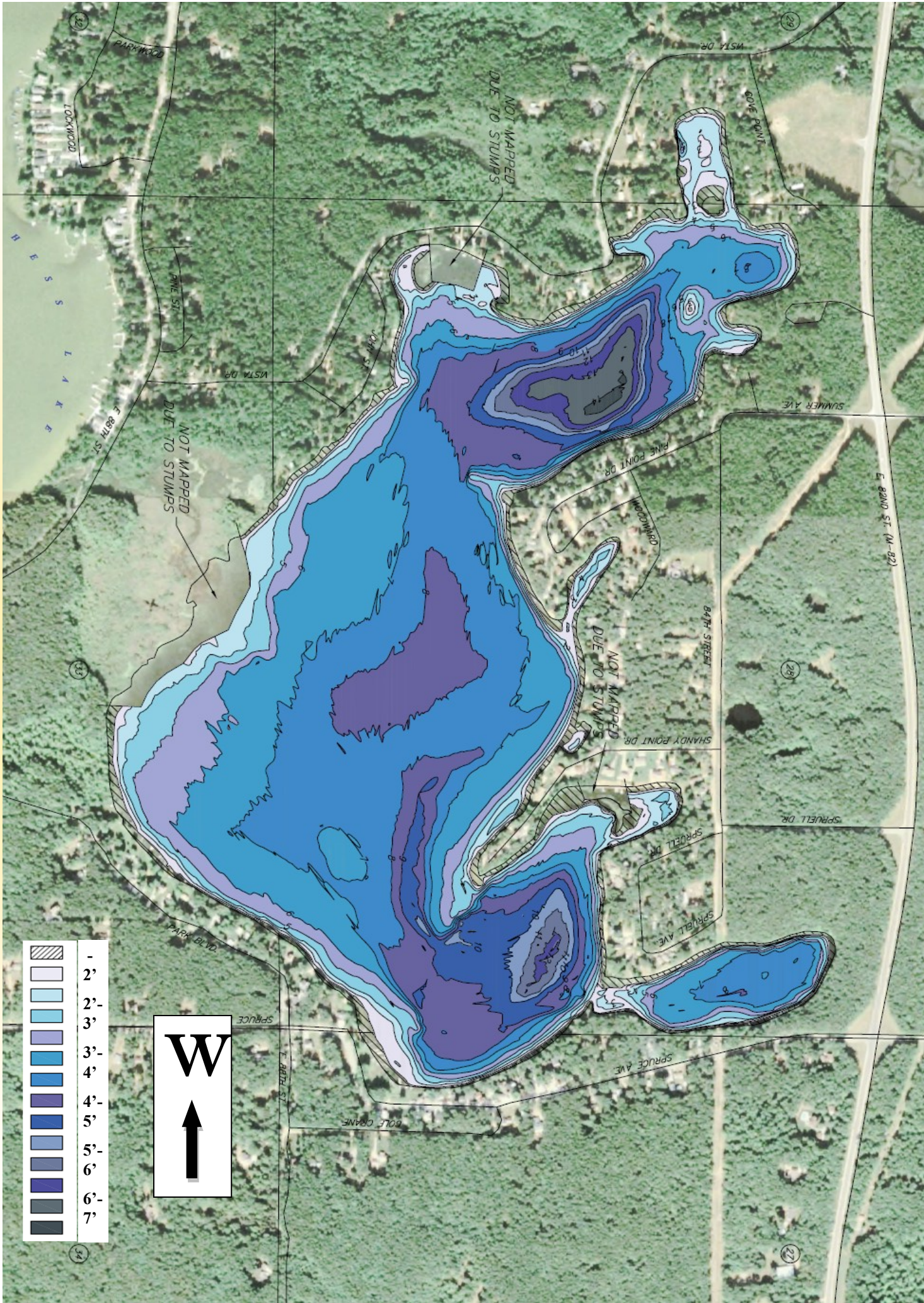




# Watershed Data









# Aquatic Plants

## What are the Types of Aquatic Plants?

**Emergent-** Found in the shallow water and has a large portion of stems and leaves growing above (emerging from) the water surface.

- ⇒ Interlocking roots anchor sediment and reduce erosion
- ⇒ Provide great nesting material



**Floating-** Have leaves that float on top of the water

- ⇒ Can be rooted (connected to the bottom) or free floating (not attached to the bottom)
- ⇒ Leaf shape and texture that resists tearing



**Submersed-** Grow underwater

- ⇒ Limp out of water
- ⇒ Little or no cuticle facilitates gas exchange between plant and water
- ⇒ Submerged leaves often dissected



## What Are the Benefits of Aquatic Plants?

- \* Provide habitat for fish, bird, insects
- \* Photosynthesize which oxygenates the water
- \* Absorb nutrients
- \* Can be aesthetically pleasing
- \* Provide shade, shelter & foraging opportunities for fish
- \* Stabilize sediments
- \* Slow down water

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## 10 of the most common weeds in Brooks Lake in 2010. (per Clarke Aquatic survey)

Thinleaf Pondweed

Illinois Pondweed

Eurasian Milfoil

Flatstem

Nymphaea (Lily Pad)

Vallisneria

Southern Naiad

Richardsons Pondweed

Variable Leaf Pondweed

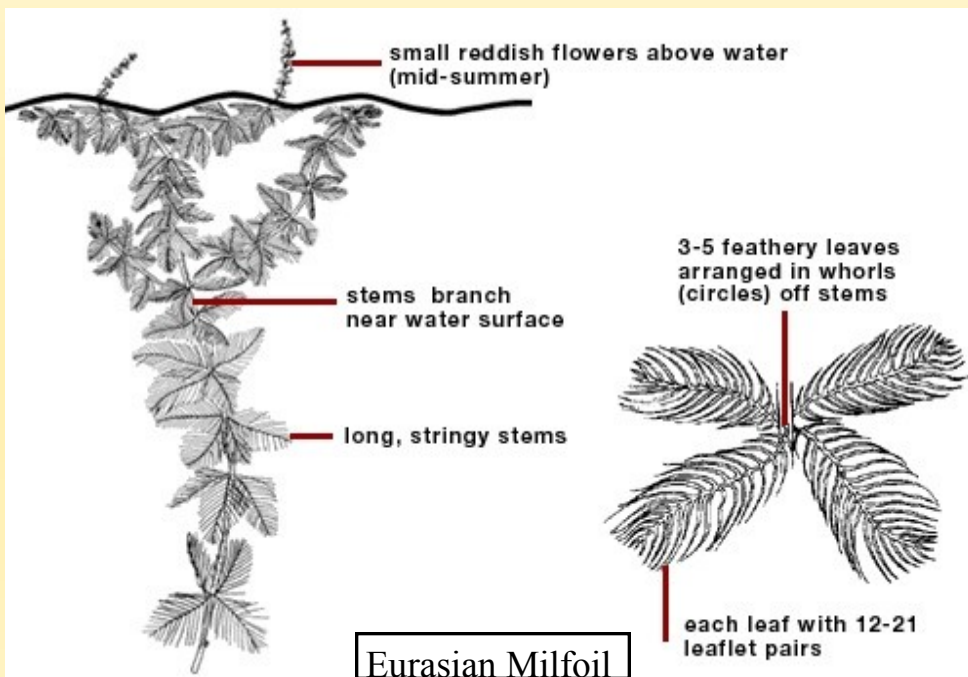
Ribbonleaf Pondweed



# Aquatic Plants

Eurasian Milfoil is an invasive aquatic plant. It was first found in the United States in the 1940's. Although it is non-native it is widespread in the state of Michigan. Eurasian Milfoil can cause many problems with the lake, it can choke out native desirable plant species, destroy fish habitat, and make water nearly impassable by boat. Eurasian Milfoil can grow in deeper water than most native plants and spread rapidly just from pieces broken or chopped off by boats or other water activities.

The practice to control Eurasian Milfoil in Brooks Lake is to try and keep it under control before it consumes massive areas of the lake. Brooks Lake periodically receives a Floridone treatment which virtually wipes it out, but between boats, docks, etc. a couple of little untreated pieces start re-growing sooner or later and the cycle begins again.



From 1990 to 2010 the Brooks Lake Board spent approximately \$291,770.00 on weed and algae control.

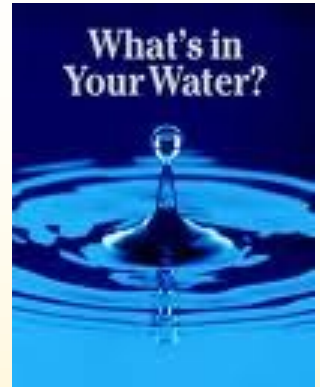
The chemicals used to treat aquatic weeds and algae are approved by the EPA (Environmental Protection Agency), and the MDDEQ (Michigan Department of Environmental Quality). Strict-detailed permits are obtained from the MDEQ on an annual basis.

A treatment **NOTICE** is mailed out to all residents on the lake every spring. The **NOTICE** includes any and all restrictions for each chemical that may be used. Before a treatment begins, signs are posted along the shoreline which indicate the chemical(s) to be used along with any restrictions.



# Water Quality

Water sampling has been done for years on Brooks Lake. Sampling has been done by the association, residents around the lake, and various firms who contracted with the Brooks Lake Board. Below are some of the most recent water sampling results, done by the Spicer Engineering Group in 2009.



Typical ph levels in this region are 7.5 - 8.4. Brooks Lake Ph levels ranged from 7.13 - 8.83 (ph levels over 8.5 increase phosphorous release from bottom sediments)

Temperature was consistent from the surface to a depth of around 14 foot.

Dissolved Oxygen levels were rated very well.



Total dissolved Oxygen levels are generally less than 1.5 g/l. Brooks Lake came in at .2 g/l

Turbidity (suspended solids in water) are closely linked to the look or clarity of the water. Brooks Lake was moderately clear at the top becoming more turbid toward the bottom.

E-coli tests, which would show septic system failures, were all very low and it was noted that the highest sample was from an area frequented by swans.

Phosphorous samples are a concern. Samples were very high at every site. Phosphorous ultimately decides the amount of plant growth. More plant growth leads to more decay, which creates more phosphorous. Common unnatural phosphorous sources are septic systems, increased—unfiltered runoff from land development and poor agriculture practices.





# Riparian Rights

Riparian rights are property rights which run with the land. Only land which abuts a natural body of water has riparian rights. A riparian property owner has the following property rights:

1. Access to water.
2. Install a dock anchored to his bottomland.
3. Anchor a boat on his bottomland or secure it to his dock.
4. Use water from the lake or stream for domestic purposes.
5. Controls any temporarily or periodically exposed bottomland from the water's edge to the high water mark against trespass



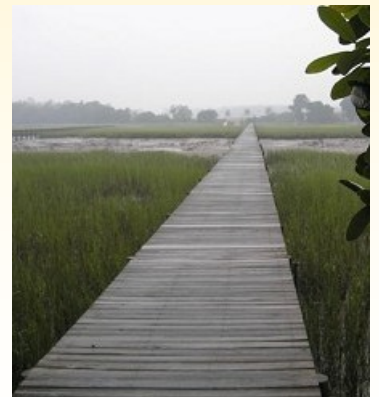
## **A PERMIT FROM THE DEPARTMENT OF ENVIRONMENTAL QUALITY (MDEQ) IS REQUIRED FOR ANY OF THE FOLLOWING:**

1. Dedicate any portion of the surface of a lake or stream for commercial use, such as a marina.
2. Build a seawall closer to the water's edge than the high-water mark.
3. Dredge or place fill in a lake or stream.
4. Increase or decrease the size of a lake or stream.
5. Dig a channel to connect a pond to a lake or stream.



## **A RIPARIAN MAY NOT:**

1. Permanently anchor a raft or moor a boat on bottomland that belongs to another riparian property owner.
2. Install a pier of unreasonable length out into a lake or stream.
3. Cannot transfer his riparian rights to another person.
4. Cannot unreasonably restrict the use of the surface of a lake or stream by members of the public.



More information can be found online @ [www.mlswa.org](http://www.mlswa.org) or [www.mwai.org](http://www.mwai.org)



# How You Can Help

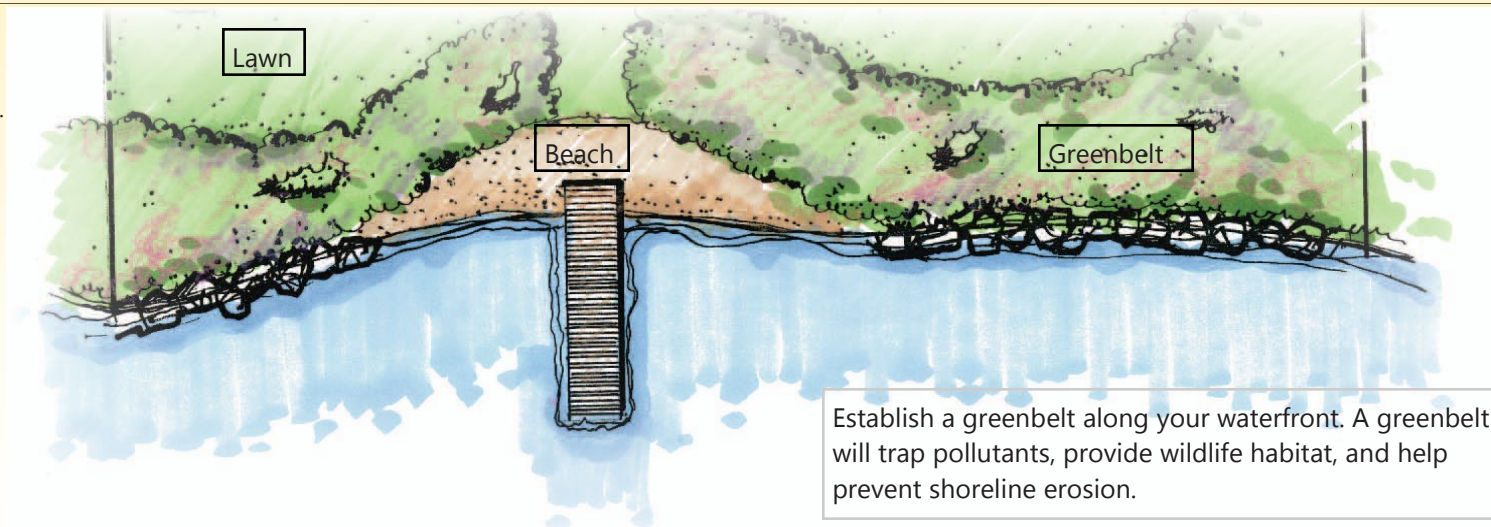
## Shorelands Management

### What lakefront property owners should know and do

By Progressive AE

Proper shoreland management is vital to protect both water quality and fisheries. During pre-settlement days, much of the shoreland around lakes was forested, wetlands, or grassland. Natural habitat was abundant. Over time, as shorelands were developed, much changed. Shoreland vegetation was removed, and natural areas that allowed rain waters to infiltrate were replaced by rooftops, roads, driveways, and other hard surfaces. Now, rather than infiltrating, storm water runs off these hard surfaces, often carrying fertilizer, oil, and other pollutants to the lake. Problems associated with excessive shoreland development include increased aquatic plant growth, diminished fisheries, and poor water quality. How we manage our shorelands can have a direct and profound impact on the quality of our lakes. Protecting shorelands is straightforward: Maintain or restore as much natural shoreland as possible. That is not to say that you can't—or shouldn't—have an area to swim, moor boats, fish or lounge by the shore. However, manicured lawn to the water's edge and boundless seawalls are not conducive to healthy lakes, nor is large-scale removal of aquatic vegetation. In addition to protecting or restoring natural shoreland, you should also be careful about the application of lawn fertilizers, especially fertilizers containing phosphorus. Phosphorus is the nutrient that most often stimulates excessive growth of aquatic plants and causes premature lake aging. Fertilizers should only be used sparingly near lakes, if at all. If you must use fertilizer, only use a phosphorus-free fertilizer. Once in the lake, a pound of phosphorus can generate hundreds of pounds of aquatic vegetation. This vegetation is most evident in the near-shore areas of the lake where we swim and recreate. Take a look at the following illustrations. Then take a look at your shoreland and see what you can do to help preserve the natural features of your lake.

*Minimize lawn area. Less turf means less fertilizer, less pesticides—and less mowing! It's better for the lake and easier on you*



Establish a greenbelt along your waterfront. A greenbelt will trap pollutants, provide wildlife habitat, and help prevent shoreline erosion.



**Aquatic plants are part of a healthy lake. They produce oxygen, provide food and habitat for fish, and help to stabilize shoreline and bottom sediments.**

Insects and other invertebrates live on or near aquatic plants, and become food for fish, birds, amphibians and other wildlife.

Plants and algae are the base of the food chain. Lakes with a healthy fishery have a moderate density of aquatic plants.

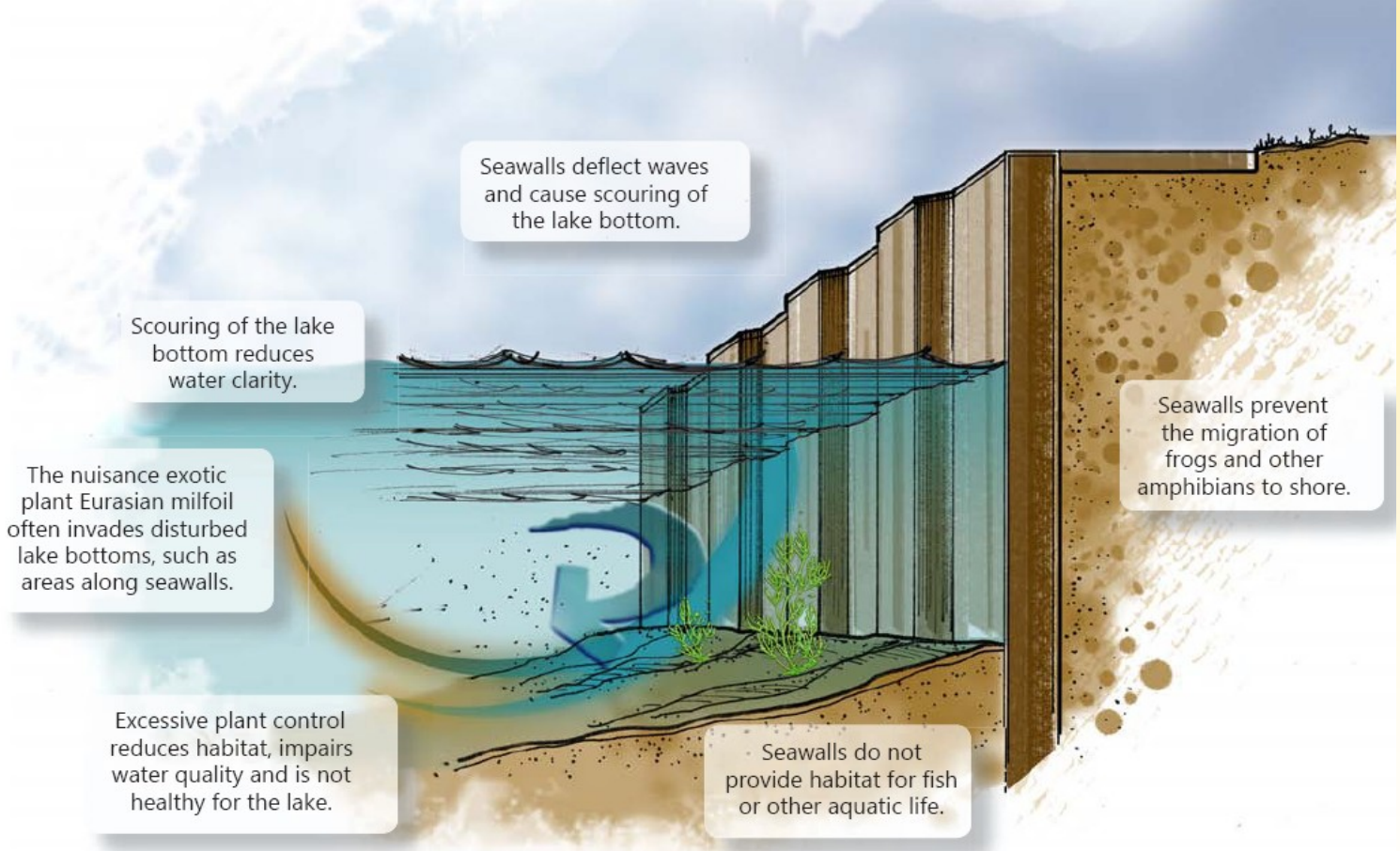
Aquatic plants provide habitat for fish and other aquatic life.

Aquatic plants help to hold sediments in place and improve water clarity.

Roots and stones absorb wave energy and reduce scouring of the lake bottom.

Trees and shrubs prevent erosion and provide habitat.

Predator-fish such as pike hide among plants, rocks, and tree roots to sneak up on their prey. Prey-fish such as minnows and small sunfish use aquatic plants to hide from predators.



Seawalls deflect waves and cause scouring of the lake bottom.

Scouring of the lake bottom reduces water clarity.

The nuisance exotic plant Eurasian milfoil often invades disturbed lake bottoms, such as areas along seawalls.

Excessive plant control reduces habitat, impairs water quality and is not healthy for the lake.

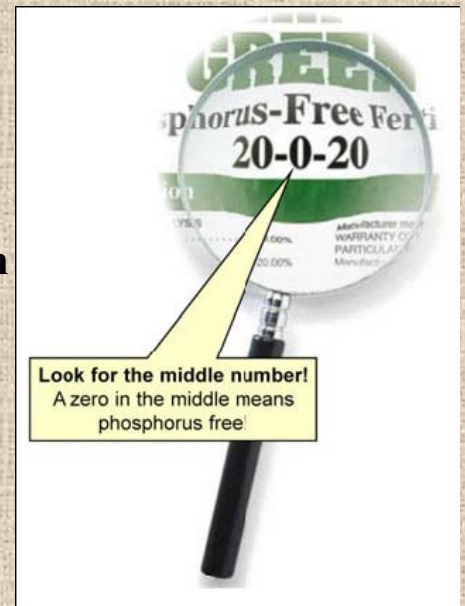
Seawalls do not provide habitat for fish or other aquatic life.

Seawalls prevent the migration of frogs and other amphibians to shore.



# 10 Ways to Protect Your Lake

1. Do not use fertilizer that contains phosphorous.
2. Use the minimum amount of fertilizer recommended on the label.
3. Water the lawn sparingly to avoid washing nutrients and sediments into the lake.



4. Do not feed ducks and geese near the lake. Waterfowl droppings are high in nutrients and may cause swimmers itch.
5. Do not burn leaves and grass clippings near the shoreline. The highly nutrient ash can easily wash into the lake.



6. Do not mow to the water's edge. Instead leave or plant a strip of natural vegetation, this will trap pollutants and sediments, and absorb nutrients.
7. Do not dump anything in wetland areas. Wetlands are natural purifiers.

8. If you have a septic system get your tank pumped every 2-3 years.
9. If you trailer your boat from lake to lake, wash your boat before launching it back into the lake.



**10. Don't be complacent! Our actions can make or break the lake!**