Environmental Policy

The Higgins Lake Property Owners Association supports:

1. Maintaining the legal lake level established in 1926 as amended in 1982.
2. A comprehensive, science-based lake wide program to better understand and control swimmers itch.
3. Efforts to reduce nutrient levels in Higgins Lake, including: the proper and frequent servicing and maintenance of septic systems, the use of phosphate free detergents, the preservation and restoration of shrubs and trees along the shoreline to utilize nutrients and reduce sedimentation, minimizing the use of lawn fertilizers near the lake and promoting green belts around the lake.
4. Sustainable development and land use practices, including: sound watershed management planning, the conservation of land around the lake and in the watershed, the preservation of old growth trees and plantings of trees that benefit wildlife, zoning regulations to maintain property values and ensure building densities which do not exceed the environment's capability to assimilate.
5. Efforts to reduce the impact of toxic substances in the lake, including: reducing hydrocarbon emissions from watercraft, reducing or eliminating the nearshore or in-the-water application of pesticides, herbicides and chemicals that are persistent and or become concentrated in the food chain (bioaccumulation).

The HLPOA does not support any activity that is unlawful or any regulated activity which is conducted without the necessary local, state and federal permits or that is conducted in violation of such permits.

Higgins Lake Property Owners Association

Environmental Bulletin No.4

Biological Indicators of Water Quality

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What are they?

"Biological indicators" of water quality include bacteria, algae, rooted aquatic plants, insects, crustaceans, fish and birds. Their presence, diversity and numbers indicate the health of the lake ecosystem. Greater diversity typically indicates a healthy ecosystem while the absence of key species or the presence of invasive species can signal significant changes in the health of a lake.

Why are they important?

Aquatic organisms integrate water quality throughout their lifetime thereby giving a long term picture of the health of a lake, compared to water quality samples which show concentrations at a given point in time.

Bacteria, algae, rooted aquatic plants (macrophytes), clams, snails, crayfish, fish, and other organisms constitute the food web upon which energy and nutrients are transferred throughout the lake. Algae and macrophytes convert sunlight and nutrients into biomass (primary production) needed to support clams, snails, crayfish, fish and other aquatic and terrestrial animals. Changes in community structure affect how nutrients are cycled in the lake. The invasive zebra mussel has virtually eliminated clams and reduced phytoplankton thereby shifting primary production to benthic algae in the littoral zone resulting in the prolific growth of algae in the nearshore waters, increasing the organic content of sediments and utilizing dissolved oxygen necessary to support aquatic insects, fish eggs, crayfish and other organisms.

Donations for further environmental studies can be sent to the HLPOA, P.O. Box 55, Roscommon, MI 48653.

Then …

Figure 1. Clean sand/gravel sediment.
Figure 2. Native stonewort algae (*Chara sp).*

Figure 3. Clam (*Lamsilis radiata siliquoidea).*
Figure 4. Adult midge (*Tanytarsus sp)* 5x.

Figures 5 & 6. Mayfly nymph and adult. (*Hexagenia limbata).*

Figure 7. Northern Clearwater crayfish (*Orconectes propinquus*).

Changes and Trends

Higgins Lake once was an oligotrophic lake (low in nutrients and primary productivity) characterized by clean sediments (Figure 1), algae comprised of diatoms and *Chara sp*. (Figure 2), few rooted aquatic plants, and a diverse community of midges (Figure 4), caddis flies and mayflies. Historically, the hatch of midges in mid-April coincided with the arrival of purple martins and provided food for trout coming out of winter. July brought prolific hatches of the Michigan mayfly (Figures 5 & 6) that once covered buildings and is an important food source for many species of fish.

The Fat Mucket (Figure 3) and other clams which are sensitive to environmental stress have been decimated by the invasion of Zebra mussels. The population of crayfish (Figure 7), natural predators of snails which transmit swimmers itch, is declining likely due to changing water quality and oxygen-depleted sediments.

Higgins Lake is becoming more nutrient enriched and productive (mesotrophic), less biologically diverse and changes in the community structure are affecting how nutrients are distributed and cycled in the lake. This is evidenced by a high organic content in nearshore sediments (Figure 8) the prolific growth of benthic golden algae (diatoms) in the littoral zone of the lake. Green filamentous algae (Figure 9), associated with nutrient enrichment and once uncommon, is now common in shallow water around the lake and the sunken island.

Now …

Long time residents of the lake have observed declining populations of aquatic insects, fish (minnows, smelt, perch and trout), purple martins, scarlet tanagers and other songbirds that feed on aquatic insects. These are all signs of a stressed and impaired ecosystem.

Figure 8. Highly organic sediments.

Figure 9. Green filamentous algae. *(Cladophora sp).*

Biological assessments, in conjunction with water quality monitoring, are needed to determine the diversity and community structure of aquatic organisms, to document trends in the ecosystem and provide data to support programs to reduce nutrient levels, control invasive species and protect the lake.