



**A LAKEADVISE SURVEY REPORT  
FOR  
HICKS LAKE,  
OSCEOLA COUNTY, MI**

**August 30, 2007**

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# HICKS LAKE LAKEADVISE REPORT

## A LAKEADVISE SUMMARY FOR HICKS LAKE, OSCEOLA COUNTY MICHIGAN

August 2007

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### 1.0 THE LAKEADVISE PROGRAM

The LakeAdvise Program was created by ASI Environmental Technologies, Inc. to provide a relatively inexpensive survey for lakes with various water quality issues. Such water quality issues may include but are not limited to the following: 1) water quality, 2) nuisance growth of native or exotic aquatic plants, 3) erosion control and sedimentation, 4) algal blooms, 5) fishery impairment, and 6) land use activities.

A secondary purpose of the LakeAdvise survey is to provide an applied, lake-specific educational opportunity for lake riparians. Many riparians will accompany the experts on a survey to ask particular questions and receive professional answers that pertain to their particular lake or to the field of Limnology in general.

#### 1.1 LakeAdvise Components

LakeAdvise surveys consist of conducting a reconnaissance survey of a particular lake by circumnavigating the lake and assessing as many issues as possible that may be affecting the water quality and health of the lake. Each survey includes a preliminary characterization of the lake health and a classification of the current trophic status of the lake based on these observations. Lake classification status may be verified by looking at water quality data, although that is not part of the LakeAdvise protocol. In addition to the lake classification, the survey consists of a visual survey of all aquatic plant species present as seen during the boat tour. Every effort is made to include all growth forms of aquatic plants including floating-leaved, submersed, and emergent types. Finally, a list of professional recommendations is given to address the various issues that were discovered.

## **1.2 Limitations of LakeAdvise Surveys**

LakeAdvise surveys have some limitations in that they are not meant to take the place of a full lake management plan. These surveys rely on observational data only, but with expert background and guidance. Such observational data includes but is not limited to a list of aquatic plant species visibly present within the lake, visible issues which may contribute to poor water quality, and observed land use practices that may compromise the health of the lake. Historical data may also be used to facilitate recommendations.

## **2.0 HICKS LAKE LAKEADVISE SURVEY**

A LakeAdvise survey of Hicks Lake, Osceola County, Michigan was conducted on 25 May and 30 August of 2007 to assess the current limnological status of Hicks Lake. Residents have noted that the lake is currently experiencing nuisance aquatic vegetation growth. Two people (Nancy Beckwith and Mike Ritzer) accompanied staff from ASI Environmental Technologies, Inc. to participate in educational process offered by the LakeAdvise survey. These riparians provided essential historical information about Hicks Lake that assisted ASI in making important improvement recommendations.

### **2.1 Hicks Lake Classification**

Hicks Lake exhibits low water transparency (due to the abundance of stained tannins in the water and planktonic algae in the water column), and also contains abundant aquatic plant and some seasonal planktonic and filamentous algae growth. These findings suggest that the lake contains adequate nutrients in the water column and sediments to support dense aquatic plant growth and water column phytoplankton. Aquatic plants may be able to colonize water depths to approximately twelve feet. Algal blooms were previously noted on the lake in May but were not as prevalent during the August survey.

The water clarity of Hicks Lake falls within the eutrophic range. The dense aquatic plant and algae growth is also indicative of eutrophic conditions. As a result of these observations, we suggest that Hicks Lake is classified as eutrophic.

## **2.2 Hicks Lake Aquatic Plants**

The LakeAdvise survey conducted on 30 August, 2007 on Hicks Lake, revealed the presence of 19 species of aquatic plants. Four emergent species were found and include Pickerelweed (*Pontedaria cordata*), Bulrushes (*Scirpus* sp.), Broad-leaved cattails (*Typha latifolia*), and Swamp loosestrife (*Decodon verticillatus*). The submersed species include Large-leaf pondweed (*Potamogeton amplifolius*), Robbin's pondweed (*Potamogeton robbinsii*), Coontail (*Ceratophyllum demersum*), Leafless watermilfoil (*Myriophyllum tenellum*), Small pondweed (*Potamogeton pusillus*), Illinois pondweed (*Potamogeton illinoensis*), White-stem pondweed (*Potamogeton praelongus*), Pipewort (*Eriocaulon septangulare*), Slender naiad (*Najas flexilis*), Flatstem pondweed (*Potamogeton zosteriformis*), Wild celery (*Vallisneria americana*), Eurasian watermilfoil (*Myriophyllum spicatum*), Curly-leaf pondweed (*Potamogeton crispus*), and the macroalga, *Chara* sp. Four floating-leaved aquatic plants were also found and include the yellow Bullhead pond lily (*Nuphar variegata*), White water lily (*Nymphaea odorata*), and Watershield (*Brasenia schreberi*).

## **2.3 Hicks Lake Problematic Issues**

The presence of two exotic species was noted during the survey; Eurasian watermilfoil and Curly-leaf pondweed. Historical comparisons of AVAS survey results show that Eurasian watermilfoil has been increasing in recent years. A prominent exotic species sign is needed at the public access site to remind boaters to check boats and trailers for exotic species fragments.

Some shorelines with steel seawalls did not contain rip-rap or other ecologically favorable vegetation habitat. In addition, some lawns did not contain adequate riparian vegetation at the shoreline.

Storm drains currently enter the lake on the East side and effluent is likely to reach the lake during high-water periods or during heavy rainfall events.

A few riparian beaches were found to be eroding into the lake, resulting in increased sedimentation loads in localized areas. Localized sediment may be further transported into the lake via water turbulence or wave activity.

#### **2.4 Hicks Lake Recommendations**

A thorough lake management plan emphasizing long-term strategies which addresses the aforementioned problems is recommended. In particular, an aggressive management approach is needed for control of Eurasian watermilfoil. Control methods may include the use of biological control (milfoil weevil), mechanical methods (hand-pulling), or the use of chemical herbicides (such as Triclopyr). The septic fields surrounding Hicks Lake may be contributing more nutrients to the lake thus a septic drainfield management component should be added to a comprehensive lake management plan.

Shorelines that lack an adequate amount of riparian vegetation should consider enhancing the shoreline area with native riparian vegetation to protect the shoreline from erosion, increase macroinvertebrate biodiversity, and help to control geese from defecating on lakefront lawns. In addition, shorelines that contain metal seawalls should have a layer of natural rip-rap placed in front of the seawall to promote a diverse habitat for aquatic organisms that are a necessary component of a healthy lake food chain.

Storm drains entering the lake may be contributing nutrients to the lake and should be monitored as part of a comprehensive lake management plan. It is recommended that total phosphorus, total Kjeldahl nitrogen, total suspended solids, and *E. coli* bacteria be measured at the drain input locations.

A thorough investigation of sedimentation sources is recommended to determine the origin of the observed sediment inputs. Excess sediment inputs may contribute nutrients to Hicks Lake and will also cause the lake to accumulate sediments on the lake bottom, thereby leading to decreased water depths in shallow areas.

Rigorous mechanical harvesting is recommended for the native aquatic vegetation within Hicks Lake to decrease the amount of chemical herbicide use. Only exotic species such as Eurasian watermilfoil (*M. spicatum*) should be treated with chemical herbicides. If chemical herbicides are not desired, Hicks Lake would be an ideal candidate for the milfoil weevil, *Euhrychiopsis lecontei* due to its large amount of undeveloped shoreline, adequate overwintering habitat, and biomass density of Eurasian watermilfoil currently present within the lake. **It is critical to remember to harvest ONLY after gaining strong control of the Eurasian watermilfoil with the weevil, as harvesting may spread viable watermilfoil fragments.**

## 2.5 Hicks Lake Recommendation Cost Estimates

Mechanical harvesting of Hicks Lake would cost approximately \$150 per hour (based on a recent quote from a local contractor). At this time, approximately 15 acres of harvesting are recommended to remove nuisance naiad and native vegetation growth. Approximately 40 acres of *M. spicatum* were noted and would require that a minimum of 3 units of weevils (1,200 weevil units per unit) would be required to be placed in three locations to allow for adequate distribution of the weevil in the areas of the littoral zone infested with Eurasian watermilfoil. The estimated cost for 3 weevil units would be approximately \$3,600.

The formation of a Special Assessment District through Act 188 may be needed to collect the funds necessary for these suggested improvements. ASI Environmental Technologies, Inc. proposes to serve as a professional consultant for Hicks Lake (includes a newsletter, pre and post-treatment inspections with the contractor and the Association officers, presentations at Lake Association meetings, and expert oversight) for an annual fee of \$3,000. A comprehensive lake management plan can be prepared for Hicks Lake for a cost of \$2,800.