DEQ

Water Bureau
Aquatic Nuisance Control and Remedial Action Unit
Field Report

Aquatic Plant Survey

Hicks Lake – Osceola County

Survey Date and Time:	7/28/2005
Survey Personnel:	Matthew Preisser, Eric Bacon, DEQ
Conditions:	Sunny, light breeze, survey time 1000 - 1330
Transparency:	4 feet; olive green water color

Submergent plant species observed:

Common Name	Scientific Name	Cumulative Cover
Naiad	*Najas spp.*	26.29
Robbin's pondweed	*Potamogeton robbinsii*	15.91
Coontail	*Ceratophyllum demersum*	6.71
Variable pondweed	*Potamogeton gramineus*	5.20
Eurasian watermilfoil	*Myriophyllum spicatum*	5.14
Illinois pondweed	*Potamogeton illinoensis*	3.86
Flat-stem pondweed	*Potamogeton zosteriformis*	3.49
Nitella	*Nitella spp.*	1.57
Thin-leaf pondweed	*Potamogeton spp. (thin-leaf)*	1.14
Bladderwort	*Utricularia spp.*	0.66
Wild Celery	*Vallisneria americana*	0.60
Elodea	*Elodea canadensis*	0.46
Curly-leaf pondweed	*Potamogeton crispus*	0.43
White-stem pondweed	*Potamogeton praelongus*	0.37
Water marigold	*Bidens beckii*	0.34
Large-leaf pondweed	*Potamogeton amplifolius*	0.09

Emergent plant species observed:

Common Name	Scientific Name	Cumulative Cover
White waterlily	*Nymphaea spp.*	14.60
Watershield	*Brasenia schreberi*	13.34
Pickerelweed	*Pontederia cordata*	8.43
Yellow waterlily	*Nuphar spp.*	6.29
Swamp loosestrife	*Decodon verticillatus*	1.77
Cattail	*Typha spp.*	1.09
Bulrush	*Scirpus spp.*	0.46
Rush	*Juncus spp.*	0.40
Smartweed	*Polygonum spp.*	0.14
Spike rush	*Eleocharis spp.*	0.14
Iris	*Iris spp.*	0.06
Duckweed	*Lemna spp.*	0.06
Sedge	*Carex spp.*	0.06
Arrowhead	*Sagittaria spp. (emergent)*	0.03

Methods

The survey was performed according to DEQ "Procedures for Aquatic Plant Surveys." This involved dividing the lake into 35 AVAS' (Aquatic Vegetation Assessment Sites) and using a combination of visual observations and weighted plant rake collections throughout the littoral zone.

In general, plant densities observed during aquatic vegetation surveys may be influenced by several factors, including the perception of the surveyor, the level of survey effort, the clarity of the water, and the seasonal timing of the survey. More species are likely to be observed in late summer than in the spring because most native species do not exhibit much growth early in the year. Plant densities are also influenced by on-going lake management activities, including those that are regulated (e.g., chemical treatments, lake draw-down, shoreline modification, benthic barriers) as well as unregulated activities (e.g., mechanical harvesting, some forms of biological control).

Background

Hicks Lake is a medium-sized public access lake. Approximately two-thirds of the shoreline is undeveloped, including significant wetland areas. Developed shoreline exists along the eastern side of the lake. Land use in this area consists of high-density residential development. There is a single public boat ramp at the north end of the residential area (northeast end of lake).

According to various resources, the lake's surface area is approximately 155 acres. According to the Hicks Lake bathymetric map, most of the lake is less than 20 feet deep. The maximum depth is approximately 33 feet. The lake drains into Hicks Creek on the north end. Hicks Creek is a tributary of the Middle Branch River, which is a designated high-quality trout stream.

Results

The survey identified a total of 16 submerged aquatic plant species. According to the calculated cumulative cover (CC) value, this lake was dominated by two species of aquatic plant. Naiads were the most dominant submerged species observed (26.29 CC). This species was observed in every AVAS location. The estimated density in each AVAS ranged from 2% to 60% coverage per AVAS. The next most dominant plant species was Robbin's pondweed (15.91 CC). It was found in 25 of 35 AVAS locations in densities ranging from <2% to 60% coverage per AVAS.

Several other submergent macrophytes were found less frequently, but were still common enough to contribute significantly to the aquatic community. These include coontail (6.71 CC), variable pondweed (5.20 CC), Eurasian watermilfoil (5.14 CC), Illinois pondweed (3.86 CC), and flatstem pondweed (3.49 CC). Nine other submergent species were identified during the survey, but relative to the entire lake's littoral zone, these species were not common.

The survey identified a total of 14 emergent aquatic plant species. The most significant emergents were white waterlily (14.60 CC), watershield (13.34 CC), pickerelweed (8.43 CC), and yellow waterlily (or spatterdock) (6.29 CC). In general, the emergent species were found along the undeveloped areas only.

Discussion

Inland lakes with a rich number of species and good densities of aquatic plants, combined with significant portions of natural shoreline and undeveloped watershed, offer considerable value to fish and wildlife resources. At the present time, Hicks Lake has a good diversity of aquatic plant species (some inland lakes have fewer than 6 submergent species). Much of the diversity in Hicks Lake can be attributed to the undeveloped shoreline areas, where a complex aquatic community remains largely in tact.

As discussed above, the observations made during this survey may be affected by on-going lake management activities. Two chemical treatment permits have been issued in 2005, however both involved relatively small treatment areas (less than 0.5 acres each). In addition, a mechanical harvester was operating on the survey date, and it appeared to be focusing on the deeper off-shore areas (10-20 feet deep). The machine probably cannot operate close to the shoreline due to the shallow depth. A lake resident reported to the surveyors that she believed this was the first day the harvester had operated this year. The harvesting operation may have affected the observed plant densities along the outer (deeper) range of the littoral zone.

At present, the most dominant plant species in the lake are naiads and Robbin's pondweed. The naiads were relatively dense in some areas, but overall the surveyors did not find this species in consistently high density levels throughout the entire littoral zone, as observed in other lakes. Both species are native to Michigan and provide considerable ecological value to the lake. For example, these species provide good habitat for the lake's fishery by acting as cover from predators and provide habitat for invertebrates that are grazed by fish and waterfowl. Naiads are also directly consumed by waterfowl.

Two exotic species were observed in the lake – Eurasian watermilfoil (EWM) and curlyleaf pondweed (CLP). EWM was not found in high densities, but was highly distributed (69% of the AVAS's). It is possible that the high native species densities are preventing EWM from expanding further. When given adequate space and good growing conditions, this species can quickly spread throughout a waterbody and cause considerable problems for recreation. EWM can grow so thick that it does not provide good value to the fishery or other aquatic organisms.

The exotic CLP was only found in six AVAS locations, however this is not surprising given that the survey was performed in late July. This plant typically grows aggressively in late spring or early summer, and dies back by mid-summer, making it less observable as the summer progresses. This plant was probably much more common in May.

All of the remaining submergent species are native to Michigan and offer water quality benefits, architectural habitat complexity for invertebrates and fish, and food resources to waterfowl and other wildlife. The native emergent species offer habitat value and shoreline protection benefits.

The aquatic plant community should be monitored periodically to document and measure any changes in species composition. Vegetation survey results may be important to develop possible future management options for exotic species control and if necessary, native plant control. Native plants should only be targeted when they are interfering with recreational activities, such as along the shoreline swimming areas and around docks or fishing piers. Wide scale removal of native plants may only serve to open larger sections of lake bottom to non-native invasive species such as EWM.

Many lake associations, groups of property owners, etc. choose to develop an exotic species management plan for their lake. If one does not already exist, an exotic species management plan may be warranted for Hicks Lake because of the presence and distribution of EWM. Several plant management options may be feasible and should be explored with regard to EWM control, including biological, chemical, and/or mechanical control. Which option(s) is chosen may depend on many factors, such as the desires of the lake user groups, financial resources, etc. Large-scale mechanical harvesting is generally not preferred when EWM is present in a lake because cut fragments can spread and form new plants (exacerbating the already fast natural spread of the plant). The use of an integrated methodology may prove most useful to accomplish the varied goals and objectives of the riparian property owners and lake user groups.