

Field Report

SITE: Joslin Lake, Washtenaw County, MI

DATE OF INQUIRY: 29 September 2010

FIELD PERSONNEL: G. Douglas Pullman, Aquest Corp

METEOROLOGICAL CONDITIONS: Mostly Sunny, 59°F water temp., Breezy, 5-10 mph

PURPOSE OF INQUIRY: To evaluate status of the submersed flora of Joslin Lake.

SPECIFIC WORK ELEMENTS: Visual observations of submersed flora from the boat with underwater video and plant samplers.

General Observations

The water clarity was extremely good at the time of the investigation. Blue green algae blooms have been observed in most other SE Michigan Lakes during the past 6 weeks and Joslin is more the exception than the rule. The bottom of nearly the entire lake is densely covered by charoid algae and it is common for the water in lakes that are dominated by charoid algae to be very clear. The large plant community, including the charoid algae, was considered to be remarkably uniform over the entire of the lake. A pondweed, that appeared to be variable pondweed or a pondweed hybrid, dominated the vascular plant flora and was uniformly distributed throughout most of the lake. Eurasian/hybrid milfoil was found in a dense and substantial patch just off the central part of the southern shoreline that may have been 1 acre in size. However, only a few scattered and sickly Eurasian/hybrid milfoil plants were found elsewhere in Joslin Lake. Fortunately, nuisance and invasive wild celery was not particularly common in Joslin Lake as it has been found in most other SE Michigan Lakes.

Specific Findings

Milfoil: Eurasian watermilfoil (*Myriophyllum spicatum* L.) or a milfoil hybrid was found in large nuisance patches in most of the lake prior to 2010. Very little milfoil has been observed in the lake during 2010 and a modest control effort successfully suppressed the few areas where it was considered a nuisance in July. Widely scattered plants were observed in AROS Tier 5 during this investigation and the only area where nuisance growth was observed was in a small, approximately 1 acre patch located near the central part of the southern shoreline. It was believed that starry stonewort would virtually eliminate the milfoil from the deep water areas of the lake; however, starry stonewort was clearly suppressed at the time of these observations and it is unclear why milfoil densities are so low in Joslin Lake.

Green/Variable Milfoil: Green or variable milfoil (*Myriophyllum verticillatum* L. or *Myriophyllum heterophyllum* Michaux) has emerged as an invasive species of concern in the past 3 years in lakes throughout Michigan. Several patches have been observed in the southern end of the lake since 2009. The number of patches has increased slightly since the first observations, but they are still not considered to be growing at nuisance levels. It is very important to monitor the growth and spread of this plant in Joslin Lake.

Pondweeds: There are four common and native Michigan pondweed species that are known to freely hybridize and this has resulted in the development of pondweed populations that can be difficult to identify. Generally, the pondweeds observed in a lake will strongly resemble one of the parental pondweed types and plants are assigned the epithet of the parental genotype that most closely resembles the plants observed in the lake. However, the normal variation observed in pondweed hybrid populations can make it very difficult, or impossible to compare pondweed species data from year to year. It may be more useful to consider the pondweed genotypes in a lake from the perspective of leaf type or morphology rather than specific epithet. Leaf type variation is arguably a more important consideration from an ecosystem perspective because variations in leaf type may contribute to increased structural

complexity. A small leaf pondweed that more closely resembles variable pondweed (*Potamogeton gramineus* L) was found in moderate densities throughout the lake. Typically this pondweed is observed to be senescing at this time of year, but the variable pondweed in Joslin Lake appeared to be actively growing. It may grow to nuisance levels in 2011.

Charoid Algae: Starry stonewort (*Nitellopsis obtusa* (Desv.) J.Groves) was the dominant form of vegetation in the lake until the time of this survey. Nuisance levels were controlled with algaecides earlier in the year. It appeared to be in a significant state of decline at the time of this investigation. Similar growth patterns have been observed in other lakes prior to 2009 when starry stonewort seemed to decline during the hot summer months. However, starry stonewort continued to grow aggressively in most Michigan lakes during the hot, mid summer of 2009 and 2010. Despite the observed decline in September, it is believed that starry stonewort will be a nuisance in 2011.

Starry stonewort is an enigma because it can provide some benefits to the lake management program by excluding the noxious growth of milfoil and other invasive species in the deep waters of the lake without creating a similar nuisance. It can also increase water clarity by covering exposed sediments, thereby preventing re-suspension of sediments and increases in turbidity associated with bottom foraging fish and wind. However, it can also be a disaster for the stability and diversity of species and structure for the ecosystem because it is so invasive and aggressive. Like many other opportunistic invasive plant species, it is unusually susceptible to the impact of some aquatic herbicides and some algaecides. It is relatively easy and inexpensive to control.

A weedy form of Chara (*Chara* sp.) was found growing fairly dense in most areas of the lake and appeared robust in areas where starry stonewort had been controlled. It was clearly the dominant plant in the lake, but starry stonewort was observed to cohabit areas where it was found, but at very low densities. The emergence of this weedy form of chara is a disturbing finding that has been observed in 2009 in numerous other lakes. This plant needs to be closely monitored and may require control in 2010.

Water lilies (*Nymphaea* sp.) and Spatterdock (*Nuphar* sp.): Waterlily populations were healthy and do not represent a nuisance.

Water Celery (*Vallisneria americana*): This plant is very difficult to control and can become a nuisance fairly quickly. It is a "late season plant" and typically does not begin to grow or become conspicuously present until late July or August. Celery was present in Joslin Lake at the time of this investigation, but fortunately, it was found at very low densities.

INDICATIONS AND RECOMMENDATIONS:

The limited 2010 herbicide applications appear to have been extremely successful and invasive species and nuisance conditions were found at low levels. Milfoil populations are expected to grow to greater levels than those observed in 2010 and will require greater effort to suppress these populations.

Starry stonewort is expected to dominate the submersed lake flora in 2011, despite the apparent decline that was observed at the time of this investigation. It will out-compete milfoil and any other species and may grow to nuisance levels along the shore of the lake and require treatment next year. A combination of algaecides is required to achieve acceptable control. Sometimes, it is considered to be desirable to only remove the upper portions of starry stonewort with algaecide applications rather than removing all starry stonewort biomass from an afflicted area. This is done to prevent the incursion of milfoil to other highly undesirable and opportunistic plants into the denuded areas, which appears to have occurred in Joslin Lake. These areas need to be observed to see if higher quality plants can cohabit an area where starry stonewort height is controlled but not totally eliminated.

Variable pondweed was the dominant plant in the lake during this investigation. It is highly likely that the observed plant is a newly emerged pondweed genotype that is very capable of growing to nuisance levels. Control efforts may need to be applied to nuisance pondweeds in 2011.

Variable milfoil populations must be closely monitored. If they appear to begin growth at nuisance levels, immediate control action is strongly recommended.