



Tawas Lake Nuisance Aquatic Plant Control Report

Prepared for:
Tawas Lake Improvement Association

Prepared by:
Progressive AE
1811 4 Mile Road, NE
Grand Rapids, MI 49525-2442
616/361-2664

October 2015

Project No: 76850001

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APPENDIX A Department of Environmental Quality Correspondence, October 22, 1999

INTRODUCTION

In September of 2015, Progressive AE was retained by the Tawas Lake Improvement Association to conduct a study of alternatives to control nuisance aquatic plant growth and improve navigation in a portion of Tawas Lake within the City of East Tawas (hereinafter referred to as the project area, Figure 1). This report includes a summary of study findings, recommendations and conclusions.

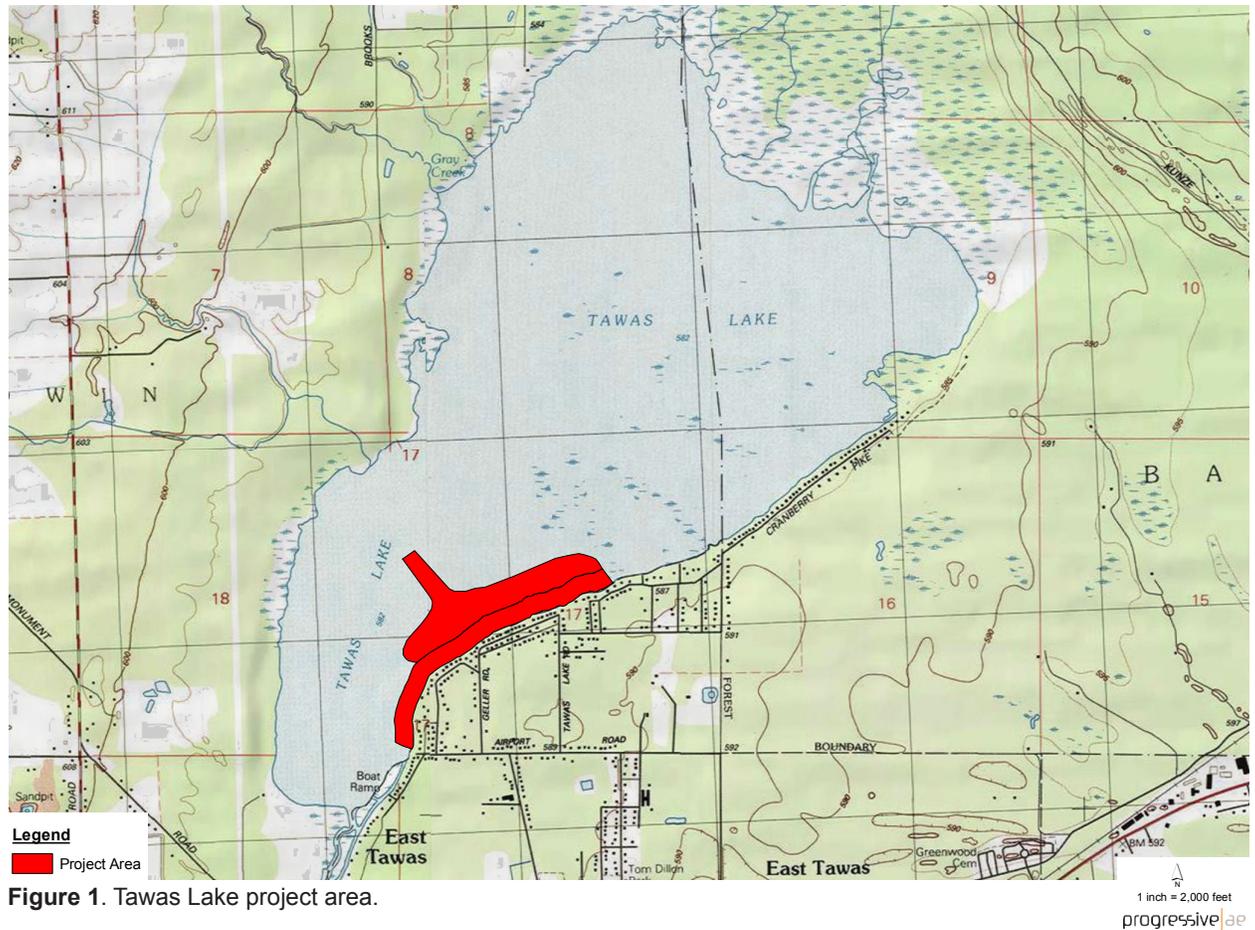


Figure 1. Tawas Lake project area.

CURRENT CONDITIONS

Tawas Lake is a 1,670-acre lake located adjacent to the City of East Tawas in Iosco County, Michigan (T.22N, R.6E). Despite its relatively large surface area, Tawas Lake is shallow with a maximum depth of only about 5 feet, and a mean or average depth of 2 to 3 feet (Figure 2). Much of the lake contains aquatic plants, including dense stands of emergent wild rice (*Zizania* sp.; Figure 3).

AQUATIC PLANT CONTROL

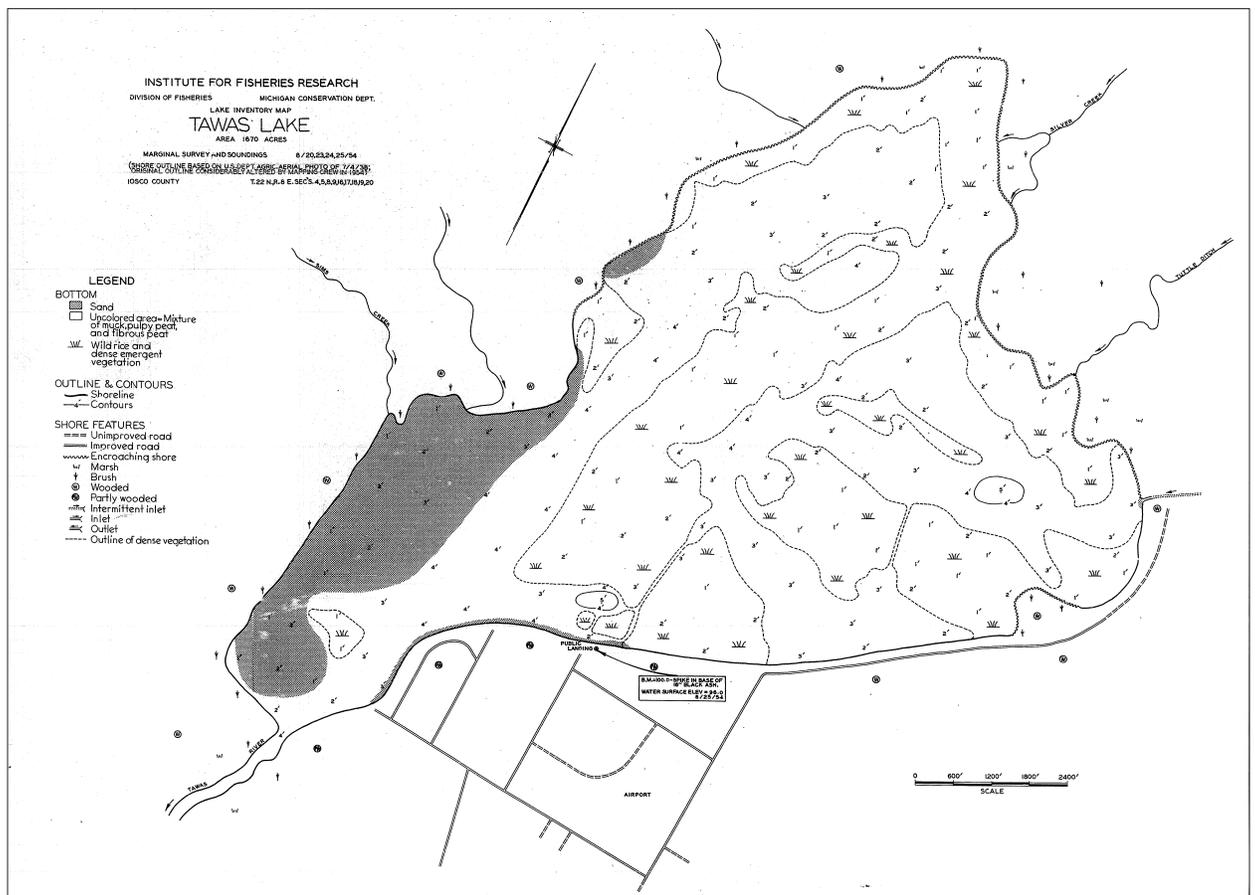


Figure 2. Tawas Lake depth contour map.



Figure 3. Project area.

AQUATIC PLANT CONTROL

To evaluate plant growth within the project area, biologists from Progressive AE conducted a plant survey in accordance with Michigan Department of Environmental Quality (MDEQ) Procedures for Aquatic Vegetation Surveys (MDEQ 2005). With these procedures, the type and relative abundance of plant species were identified at global positioning system (GPS) waypoints established at 300-foot intervals throughout the project area (Figure 4). Survey results are summarized in Table 1. At the time of the survey, 30 species of aquatic plants were observed within the project area. Of the plants found, 19 species were submersed, 7 species were emergent, and 4 species were floating-leaved. The most abundant plants present at the time of the survey included water bulrush (*Schoenoplectus subterminalis*), wild rice (*Zizania* sp.), bulrush (*Scirpus* sp.), white water lily (*Nymphaea odorata*), and Illinois pondweed (*Potamogeton illinoensis*). These plants are native to Michigan.

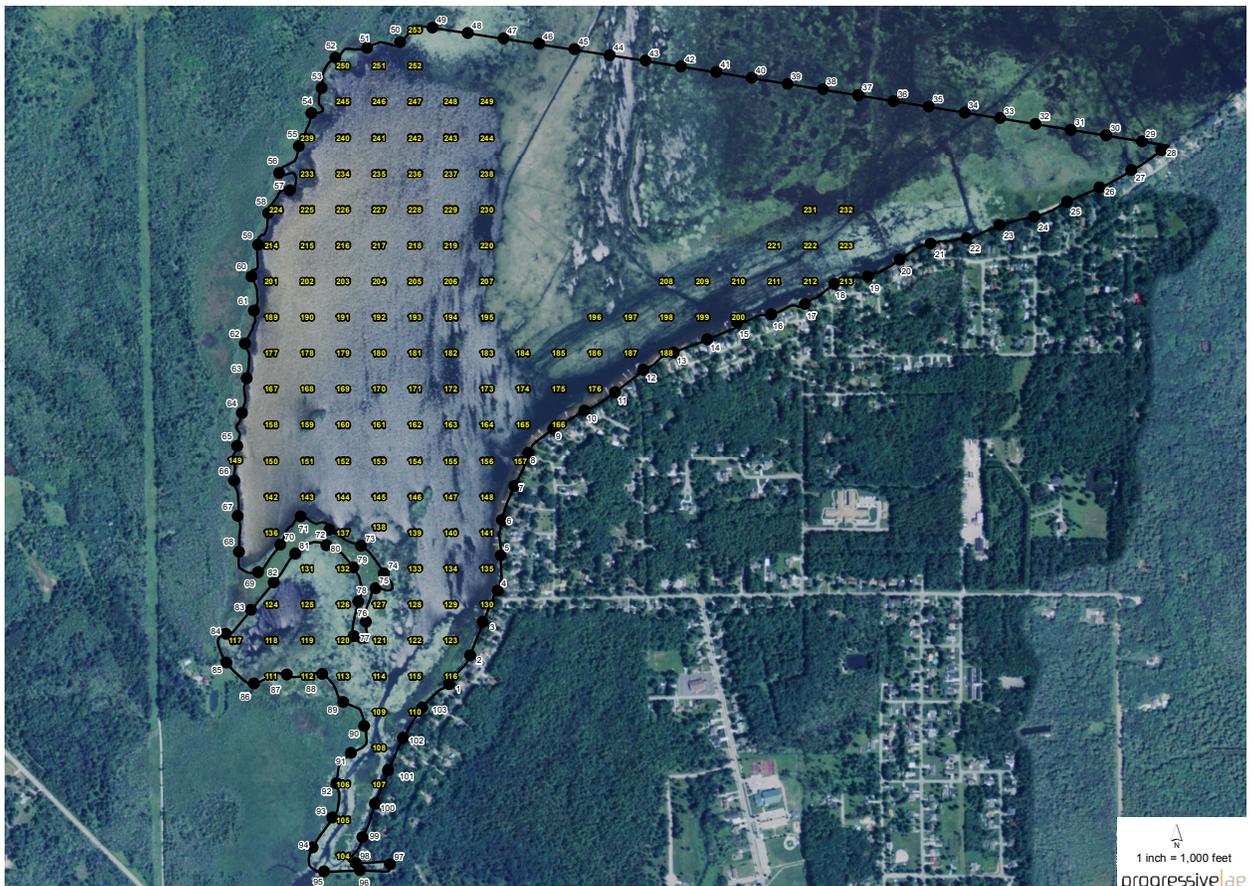


Figure 4. Project area GPS waypoints.

TABLE 1
TAWAS LAKE STUDY AREA AQUATIC PLANTS
September 17, 2015

Common Name	Scientific Name	Growth Type	Occurrence
Water bulrush	<i>Schoenoplectus subterminalis</i>	Submersed	Dense
Illinois pondweed	<i>Potamogeton illinoensis</i>	Submersed	Common to dense
Northern milfoil	<i>Myriophyllum sibiricum</i>	Submersed	Common
Wild celery	<i>Vallisneria americana</i>	Submersed	Common
Muskgrass	<i>Chara</i> sp.	Submersed	Common
Large-leaf pondweed	<i>Potamogeton amplifolius</i>	Submersed	Common
Bladderwort	<i>Utricularia</i> sp.	Submersed	Common
Naiad	<i>Najas</i> sp.	Submersed	Sparse
Waterweed	<i>Elodea canadensis</i>	Submersed	Sparse
Eurasian milfoil	<i>Myriophyllum spicatum</i>	Submersed	Sparse
Variable pondweed	<i>Potamogeton gramineus</i>	Submersed	Sparse
Water marigold	<i>Bidens beckii</i>	Submersed	Sparse
Richardson's pondweed	<i>Potamogeton richardsonii</i>	Submersed	Sparse
Robbins pondweed	<i>Potamogeton robbinsii</i>	Submersed	Sparse
Flat-stem pondweed	<i>Potamogeton zosteriformis</i>	Submersed	Sparse
Thinleaf pondweed	<i>Potamogeton</i> sp.	Submersed	Sparse
Water stargrass	<i>Heteranthera dubia</i>	Submersed	Sparse
Coontail	<i>Ceratophyllum demersum</i>	Submersed	Sparse
Sago pondweed	<i>Stuckenia pectinata</i>	Submersed	Sparse
Wild rice	<i>Zizania aquatica</i> var. <i>angustifolius</i>	Emergent	Dense
Bulrush	<i>Scirpus</i> sp.	Emergent	Common to dense
Cattails	<i>Typha</i> sp.	Emergent	Common to dense
Lakeshore sedge	<i>Carex lacustris</i>	Emergent	Common
Purple loosestrife	<i>Lythrum salicaria</i>	Emergent	Sparse
Smartweed	<i>Persicaria hydropiper</i>	Emergent	Sparse
Jewel weed	<i>Impatiens capensis</i>	Emergent	Sparse
White water lily	<i>Nymphaea odorata</i>	Floating-leaved	Common to dense
Floating-leaf pondweed	<i>Potamogeton natans</i>	Floating-leaved	Common
Spatterdock	<i>Nuphar variegata</i>	Floating-leaved	Sparse to common
Watershield	<i>Brasenia schreberi</i>	Floating-leaved	Sparse to common

PLANT CONTROL HISTORY

A review of historical treatment records indicate that herbicide treatments were conducted within the project area in the late 1990's. At that time, the MDEQ raised concerns about the potential presence of the state threatened variety of wild rice (*Z. aquatica* var. *aquatica*). Wild rice specimens collected from the lake at that time were identified as common northern wild rice (*Z. aquatica* var. *angustifolia*), a non-threatened wild rice variety, and treatments were allowed to proceed (Appendix A). A more recent botanical survey also confirmed that the wild rice found within the project area is the non-threatened variety, although the threatened variety of wild rice was found in Tawas Lake outside of the project area (Affiliated Researchers 2013).

In addition to herbicide treatments, mechanical harvesting in the project area was conducted in 2013 and 2014. The harvesting work was financed via special assessment of area property owners.

RECOMMENDATIONS

To improve navigation from shoreline areas to the open-water areas of Tawas Lake, a combination of herbicide treatments and mechanical harvesting is recommended. Potential areas for herbicide treatments and mechanical harvesting are shown in Figure 5.



Figure 5. Potential plant control areas map.

AQUATIC PLANT CONTROL

In Michigan, herbicide treatments in inland lakes require a permit from the MDEQ pursuant to Part 33 (Aquatic Nuisance Control) of the Natural Resources and Environmental Protection Act (P.A. 451 of 1994). Herbicide treatments should be conducted by a licensed applicator with general liability insurance that covers the application of aquatic herbicides. Herbicides would be applied early in the growing season (June) when plants are actively growing and herbicide treatments are most effective. MDEQ permit requirements generally only allow treatment of nuisance growth of native plants to occur in close proximity to developed shoreline areas.

In the off-shore areas of the project area, mechanical harvesting of plants should be considered. With mechanical harvesting, plants are cut and removed from the lake. To optimize the removal of plant biomass from the lake, harvesting would be most cost-effective if conducted later in the growing season (late July or early August). Unlike herbicide treatments, mechanical harvesting does not require an MDEQ permit.

The amount of herbicide treatment or harvesting conducted in any given year would depend on weather, water levels, and the type and distribution of vegetation within the project area. Given the extent of plant growth in the project area, it may take time for effective control of vegetation to be realized. In light of this consideration, a five-year plant control program is recommended.

It is further recommended that a consultant be retained to coordinate the implementation of the project. The consultant would be responsible for preparing specifications and bid documents for the herbicide treatment and mechanical harvesting work, assisting with the acquisition of bids for the project, conducting annual surveys of the project area to determine the scope of the herbicide treatment and harvesting operations, and conducting follow-up surveys to evaluate the effectiveness of plant control activities. The consultant would keep a written record of the timing, scope, and cost of all plant control work. If the plant control program is operating smoothly after the initial year or two, the consultant's role can be scaled back or eliminated and funds can be used exclusively for herbicide treatments or harvesting.

COST ESTIMATE AND FINANCING OPTIONS

An annual budget for the project is presented in Table 2. It is recommended that the project begin in 2016 and continue through 2020. The amount of herbicide treatment and harvesting each year would vary depending on lake conditions, but in any given year, the total budget would not be exceeded.

TABLE 2
TAWAS LAKE NUISANCE PLANT CONTROL PROGRAM
PROPOSED ANNUAL BUDGET 2016 - 2020

Work Item	Cost
Aquatic Herbicide Treatments (15 acres @ \$400 per acre)	\$6,000
Mechanical Harvesting (15 acres @ \$425 per acre)	\$6,375
Aquatic Plant Control Coordination and Inspections	\$6,000
Administration and Contingency	\$500
TOTAL	\$18,875

AQUATIC PLANT CONTROL

It is recommended that the nuisance aquatic plant control program be financed through special assessment of benefitting properties in accordance with the City of East Tawas Code of Ordinances. The proposed special assessment district for the project would include approximately 55 lakefront properties on the portion of Tawas Lake bounded by Tawas Lake Road and Lakewood Drive. This proposed special assessment district would be somewhat smaller than the previously-established plant control special assessment district. Assuming the cost of the project is spread evenly against each property in the proposed district, and property owners owning more than one parcel are only assessed once, the annual assessment for the project would be approximately \$345 per year for five years (2016 to 2020).

REFERENCES

Affiliated Researchers. 2013. Botanical Survey of State Threatened Wild Rice Variety (*Zizinia aquatica* var. *aquatic*) at Tawas Lake, Iosco County.

Michigan Department of Environmental Quality. 2005. Procedures for Aquatic Vegetation Surveys.

APPENDIX A
Department of Environmental Quality Correspondence
October 22, 1999

STATE OF MICHIGAN



JOHN ENGLER, Governor

DEPARTMENT OF ENVIRONMENTAL QUALITY

"Better Services for a Better Environment"
HOLLISTER BUILDING, PO BOX 30473, LANSING MI 48909-7973

INTERNET: www.deq.state.mi.us

RUSSELL J. HARDING, Director

REPLY TO:

LAND & WATER MANAGEMENT DIVISION
PO BOX 30455
LANSING MI 48909-7958

October 22, 1999

Mr. Robert Makie, Director
Tawas Lake Improvement Association
139 Warren
East Tawas, Michigan 48730

Dear Mr. Makie:

Thank you for your letter of August 23, 1999, to Ms. Diana Klemans, concerning the control of wild rice in Tawas Lake, Iosco County. Ms. Klemans asked me to respond to your concern on the slight delay in proposed chemical treatment of Tawas Lake.

There are two varieties of wild rice (*Zizania aquatica*) that occur in Michigan. One variety is state threatened, *Z. aquatica* var. *aquatica*, and the other is a more common variety, *Z. aquatica* var. *angustifolia*, which is not threatened. Neither the Department of Environmental Quality (DEQ) nor the Michigan Natural Features Inventory (MNFI) has records indicating the variety of wild rice that occurs in Tawas Lake. Therefore, the identification of the variety of wild rice was imperative. Any population of the state threatened variety, regardless of the size, is protected under endangered species legislation and requires an Endangered Species Permit prior to treatment.

Due to the complexity of identification, a specimen was submitted to Dr. Tony Reznicek of the University of Michigan - Ann Arbor herbarium. Dr. Reznicek promptly replied on August 19, 1999, identifying the specimen as the common northern wild rice and treatment was allowed to proceed, as planned, during the week of August 16, 1999.

The DEQ recognizes the need to maintain a balance between natural resource management and riparian recreational needs. It is important for the riparians to understand that Tawas Lake is a very shallow, highly productive deep-water coastal marsh. Although Tawas Lake may not support traditional recreational activities, such as boating and water-skiing, it does provide a variety of other valuable recreational opportunities, such as fishing, hunting, bird watching, and canoeing.

Hopefully, this addresses your concerns regarding chemical treatment of wild rice in Tawas Lake. If you have additional questions regarding this matter, please contact me.

Sincerely,

Laura A. Esman
Inland Lakes and Wetlands Unit
Land and Water Management Division
517-241-8878

cc: Dr. Tony Reznicek, University of Michigan
Mr. Ray Van Goethem, Aquatic Nuisance Plant Control
Ms. Jennifer Olson, MNFI
Ms. Diana Klemans, DEQ
Tawas Lake File

TO: BAY CITY DEQ
FILE NO: 99-8-927
RE: TAWAS LAKE