



October 9, 2023

Cascade Charter Township
Attn: Melanie Manion, Parks & Rec Director
5920 Tahoe Dr. SE
Grand Rapids, MI 49546

PLM Lake & Land Management Corp. will provide a professional aquatic plant management program for the control of weeds and/or algae for the **Thornapple River - Cascade** for the 2024 season.

Management Program for 2024: The primary goal of aquatic plant management in the Thornapple River is the control of exotic aquatic plants. The exotic plant species, Eurasian watermilfoil, should be controlled throughout the river. The abundance of this species should be reduced to the maximum extent possible, and efforts should be made to reduce their recovery after treatment. Aquatic plant management should preserve species diversity and cover of native plants sufficient to provide habitat for fish and other aquatic organisms. Native plants should be managed to encourage the growth of plants that support the Thornapple River fishery (by creating structure and habitat) provided that they do not excessively interfere with recreational uses of the lake (e.g., swimming and fishing) in high-use areas. Where they reach recreational nuisance levels, management techniques that reduce the stature of native plants without killing them (e.g., harvesting, contact herbicides) should be used whenever possible. Specific areas should be set aside where native plants will not be managed, to provide habitat for fish and other aquatic organisms. Management will also include performing surveys (AVAS surveys when required), pre/post treatment surveys, water quality analysis and algae treatments if required.

Below are the associated costs (on a per acre basis) of products that may be used as part of the aquatic weed management program.

Unit Cost per acre:

Contact Herbicides:

Diquat	\$154.00 (exotics)
Diquat	\$215.00 (hybrid/natives)
Aquathol K	\$175.00 (exotics)
AquaStrike	\$435.00
Flumioxazin 100ppb w/Contacts	\$435.00
Flumioxazin 200ppb	\$565.00

Systemic Herbicides:

Renovate 3 (liquid)	\$334.00
Renovate OTF	\$597.00
ProcellaCOR	\$103.00/PDU

Algaecides:

Copper sulfate/Chelated copper	\$45.00
Chelated copper	\$128.00
SeClear, filamentous algae	\$200.00
SeClear G, SSW Control	\$385.00
Green Clean	\$309.00
Phycomycin	\$128.00

PLM Consulting Services:

Vegetation AVAS Survey	\$575.00
Mid-summer brief checks	No Charge
Water Quality Program	\$925.00
Lake Management Plan	\$770.00
EGLE Permit Fee	\$1600.00

Estimated Budget for 2024: \$25,000.00 to \$45,000.00

This budget is an estimate and can be adjusted to meet the needs of the residents of the Thornapple River. Any management tool listed is an option and is the suggestion of PLM to meet those expectations. You will only be charged for the actual amount of control required, at the unit per acre prices listed above. All treatments are pending the approval of the Department of Environment, Great Lakes & Energy (EGLE). Treatments must be timed accordingly and conducted during low flow conditions. If native plant control is requested or recommended through the use of herbicides or mechanical harvesting, the high-end budget may be needed.

Mechanical Harvesting Program:

Mechanical harvesting is best suited for nuisance native plant species. Mechanical harvesting can be used to provide relief from native plant species if they are causing a recreational nuisance. Harvesting does not kill the plants, but simply reduces it's stature, leaving lower growth for fish habitat and sediment stabilization. PLM will not harvest Eurasian watermilfoil, as this plant spreads by fragmentation.

PLM owns and operates 3 mechanical harvesting machines that operate throughout the state. We will cut down to a maximum depth of five (5) feet and require a minimum of 18 inches of water depth for harvester flotation. Harvested vegetation will be dumped at a predetermined location designated by the client within a ten (10) mile radius of the river. Any cost associated with the disposing of vegetation is the responsibility of the client, i.e., landfill disposing costs. There will be no set-up or breakdown fees of our equipment if a suitable access site is available. Expenses of an unsuitable launch site will be the responsibility of the river. A representative of the client will be required to periodically evaluate workmanship.

Cost of Harvesting: \$290.00/hour with a minimum per cutting of \$2,500.00

Description of Technical Management Services:

On-site Lake Evaluations: Each time a PLM representative is on Thornapple River, to perform a survey, WQ testing, treatment, etc, the following will typically occur: Pre-notice to Lake Representative of schedule (i.e email the week before of estimated date). Following the service, a follow up evaluation to Lake Representative of services provided, condition of lake, future recommendations are made. Arrangement can be made to send information via email or voicemail. This is standard as part of our program to keep Lake Board/Association aware and involved in all decision making and serves as a checks and balances of lake management.

Water Quality Program: The water quality program consists of sampling **two** sites on the river twice a season, spring and late summer. Parameter such as secchi disc, pH, D.O., conductivity, alkalinity and nutrient sampling of nitrates and total phosphorus give us the ability to monitor lake trends more efficiently. This information will enable us to include the trophic status of your lake. The program also tests your water for Fecal bacteria (E. Coli), in mid-summer at three separate locations, which can determine the condition of your river and if the water is safe for swimming. Reports will be issued annually in the fall.

Surveys: Performing surveys is a vital part of any lake management program. PLM surveys a lake in the spring and fall as well as surveying for pre/post treatments. Lake representatives are welcome to arrange joining PLM for a survey. Depending on the type of survey performed, a cost may apply. An AVAS survey is a more specific survey performed for specific reasons. Performing a fall AVAS survey of the lake will allow for all vegetation within the lake, native and exotic, to be recorded along with density. This data is important in determining management plans and treatment areas. A full understanding of the vegetation growing within the lake can indicate problems within an aquatic environment. Surveys will be supplied to the association upon completion with a breakdown of what the survey indicates.

Meeting Attendance/Presentation: A representative of PLM is available to attend association/board meetings upon request. This request has to be made prior to meeting to allow for conflict in representative's schedule. If conflict in meeting time does arise, alternative dates and times need to be determined between representative and board. Residential concerns can always be brought to the lake association/board and then to PLM or directly to PLM by calling our office.

I look forward to the challenge of controlling the weed and algae growth in **Thornapple River** and working with you next summer.

Information regarding proposed treatment dates will be mailed in spring of 2024.

For further clarification or modifications please contact.

A handwritten signature in cursive script that reads "Jaimee Desjardins".

Jaimee Desjardins, Environmental Scientist
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