



April 1, 2021

Crooked Lakes Association  
Attn: Mike Spain  
67785 95<sup>th</sup> Ave  
Dowagiac, MI 49047

**PLM Lake & Land Management** will provide a lake management program for the control of exotic weeds and/or algae in **Big and Little Crooked Lakes for the 2022-2026 seasons**. The program will (1) control exotic plant species, (2) monitor water quality, and (3) monitor the aquatic plant community.

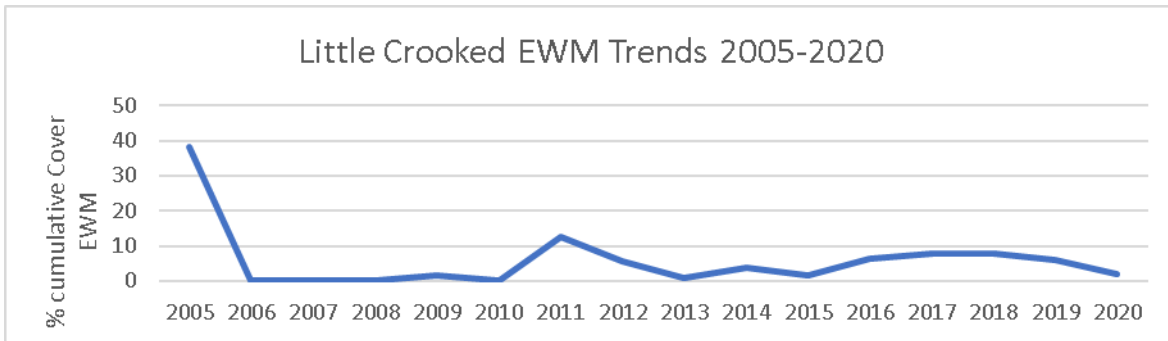
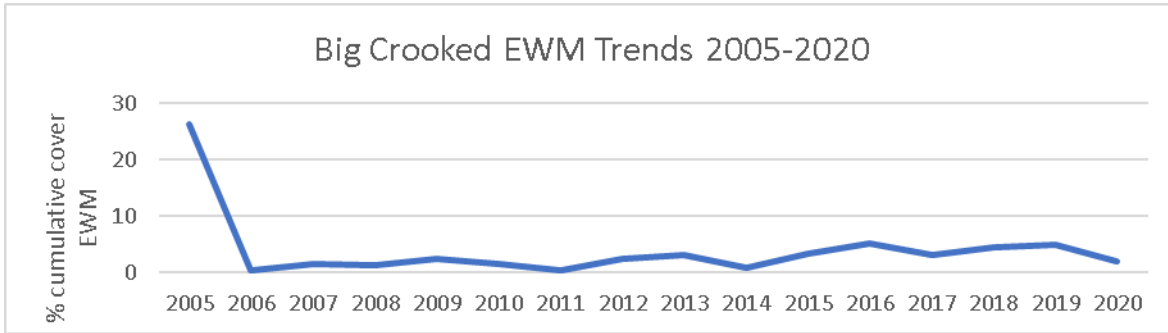
**Aquatic Vegetation Control Plan for Big and Little Crooked Lakes: 2006-2020 Treatment Summary and 2022 Recommendations.**

Management of Big and Little Crooked Lakes under PLM Lake & Land Management has been an ongoing effort since 2006. Prior to 2006, management had taken place under another company and was conducted based on individual permissions (no SAD). The pre-2006 approach is both difficult and inefficient in terms of permitting, treating and financing. Under the SAD, a more comprehensive management program was possible.

In 2005, PLM Lake & Land Management had conducted a survey of the lakes to evaluate problems and provide management recommendations. At that time, the lakes were experiencing a significant problem with the exotic and invasive species Eurasian watermilfoil. This is an aggressive species not naturally occurring in North America. It is fast growing and spreads quickly both by fragmentation and spreading root systems. Within a few years, it can quickly infest a lake creating ecological and recreational problems. Long term, this species can negatively impact native plant populations, fisheries, water quality, and recreation of the lake.

Due to extremely high levels of Eurasian watermilfoil in 2005 on both lakes, the program started with the use of Sonar A.S. This is a unique type of whole lake treatment intended to provide lake wide reduction of Eurasian watermilfoil and provide systemic (root system) control. The treatment worked perfectly on Big Crooked but had poor results on Little Crooked due to a hybrid type of milfoil. A second treatment using Renovate had to be conducted late in 2006 to provide complete control. For the past 14 years, both lakes have only required isolated spot treatments to keep Eurasian watermilfoil under control. Below are graphs showing the trends in percent cover of Eurasian watermilfoil over the last 14 years.

It is recommended that the lakes continue with a maintenance program in 2022 and beyond to ensure that Eurasian watermilfoil remains controlled. In addition, the management program includes several lake surveys per year to ensure that introductions of other exotic/invasive species are not introduced to the lakes as well as a continuation of water quality monitoring. The recommended management program is detailed below.



**Management Program using Conventional Herbicides (2022,2023,2024, 2026):**

Products to be applied: Navigate (granular 2,4-D), Renovate, Renovate Max G, Sculpin, Aquathol K, Hydrothol 191, Reward, Clipper and non-water restrictive products such as Nautique, Copper Sulfate, Cutrine-Plus, Cygnet Plus and shade as a tracer.

Products such as Navigate/ Sculpin (2,4-D), Renovate (trichlopyr), and Reward (diquat) can be used to control Eurasian watermilfoil. Navigate and Renovate are both selective for Eurasian watermilfoil and are systemic (able to control the root of the plant). Reward is a contact herbicide that only controls the portion of the plant above the sediment. Re-growth from Reward treated plants usually occurs 6-8 weeks after treatment. These options are best suited for localized Eurasian watermilfoil infestations where problems are only occurring in specific areas of a lake. Factors such as treatment size, location (offshore/near shore), well depths, water movement, time of year, and plant density need to be considered when selecting the appropriate herbicide for spot treatments.

**Whole Lake Treatments – Sonar A.S. (fluridone) 2025**

Whole lake treatments using Sonar A.S. (fluridone) can provide excellent, long term (2-3 seasons) control of Eurasian watermilfoil. Sonar A.S. also has the ability to provide selective control of Eurasian watermilfoil. Sonar A.S. treatments consist of two treatments conducted in late April and early May. It is applied at a low rate of 6 ppb (parts per billion) to selectively control Eurasian watermilfoil. The initial application is conducted once the lake has stratified and is applied at 6 ppb. Following the initial application, the concentrations are monitored (FastESTS) at various time periods. Based on the Sonar concentrations at 14 days after treatment, a “bump up” treatment is conducted to bring Sonar levels back up to 6 ppb. Since Sonar A.S. is applied to the entire lake, all Eurasian watermilfoil is controlled lake wide. Sonar A.S. is slow acting and control is usually achieved over a 45-60 day period. This treatment strategy is best suited for lakes that have a high density and wide distribution of Eurasian watermilfoil. The use of other herbicides are not permitted by MDEQ the year Sonar is applied. Sonar A.S. applications can only be conducted every three years.

**Cost for 2022,2023,2024,2026) using Conventional Herbicides:**

Management using conventional herbicides for spot treatments is billed on a per acre basis using one or a combination of the herbicides below. You will only be billed for the number of acres treated at the unit cost per acre below. Herbicide selection will be based on an evaluation of site conditions. Algae growth can be treated on an as needed basis. Invoices will be sent after each treatment is completed.

**Unit cost per acre.**

Navigate:	\$450.00
Sculpin:	\$385.00
Renovate 3:	\$355.00
Renovate Max G:	\$430.00
Renovate OTF:	\$500.00
ProcellaCOR:	\$150.00 / pdu
Reward:	\$220.00
Flumioxazin (200 ppb):	\$425.00
Aquathol K/Hydrothol 191:	\$225.00
Algaecides:	\$51.00
Survey:	\$245.00 (per lake)
Cost for Water Quality Program:	\$665.00 (per lake)
Cost for Chlorophyll sampling:	\$80.00/ sample (3 samples per lake)

**2025 Sonar A.S. Treatment (Big Crooked):**

**April/May of 2025:** Weed treatment of entire lake, applying restrictive product Sonar A.S. "Fluridone" for the control of exotic plant species. If required an algae treatment will be performed in conjunction with initial treatment free of charge.

Cost of Fluridone treatments at 6 ppb: \$10,600.00

A bump up treatment will be required ~2.5 weeks after the initial treatment to raise the concentration back to 6ppb (ppb=parts per billion). The actual amount needed will be based on testing results after 13 days. We estimate that a 1 to 4 ppb bump may be required. Cost per additional ppb will be \$1,765.00

**Note:** Additional fees will be required based on DEQ policy when using Fluridone. The DEQ requires: permit fees, fastest (measurements of ppb of Fluridone in the water body through the year, water quality, lake management plans, and surveys.) Cost per fastest: \$150.00

**Suggested budget for 2025 using Fluridone:**

April/May: Fluridone treatments 6ppb:	\$10,600.00	\$10,600.00
Fluridone bump treatment (1-4ppb):	\$1,765.00	\$7,060.00
June, July/August: Algae treatment if required:	\$0.00	\$1,000.00
Additional requirements by DEQ: ~	\$5,775.00	\$5,775.00
<b>Estimated total cost for treatments:</b>	<b>\$18,140.00</b>	<b>\$24,435.00</b>

**2025 Sonar A.S. Treatment (Little Crooked):**

**April/May of 2025:** Weed treatment of entire lake, applying restrictive product Sonar A.S. "Fluridone" for the control of exotic plant species. If required an algae treatment will be performed in conjunction with initial treatment free of charge.

Cost of Fluridone treatments at 6 ppb: \$9,600.00

A bump up treatment will be required ~2.5 weeks after the initial treatment to raise the concentration back to 6ppb (ppb=parts per billion). The actual amount needed will be based on testing results after 13 days. We estimate that a 1 to 4 ppb bump may be required. Cost per additional ppb will be \$1,600.00

**Note:** Additional fees will be required based on DEQ policy when using Fluridone. The DEQ requires: permit fees, fastest (measurements of ppb of Fluridone in the water body through the year, water quality, lake management plans, and surveys.) Cost per fastest: \$150.00

**Suggested budget for 2025 using Fluridone:**

April/May: Fluridone treatments 6ppb:	\$9,600.00	\$9,600.00
Fluridone bump treatment (1-4ppb):	\$1,600.00	\$6,400.00
June, July/August: Algae treatment if required:	\$0.00	\$1000.00
<u>Additional requirements by DEQ: ~</u>	<u>\$5,775.00</u>	<u>\$5,775.00</u>
<b>Estimated total cost for treatments:</b>	<b>\$16,975.00</b>	<b>\$22,775.00</b>

**Proposed Budget 2022-2026**

Estimated cost for management thru 2026:

2022 year:	\$17,000.00
2023 year:	\$17,800.00
2024 year:	\$18,000.00
2025 year:	\$47,210.00
2026 year:	\$14,000.00

**Estimated Total Cost of Management for Big and Little Crooked Lakes 2022-2026: \$114,010.00**

**Water Quality Program:**

The water quality program consists of two samples, occurring in the spring, and late summer each season. Parameter such as secchi disc, pH, D.O., conductivity, alkalinity and nutrient sampling of total nitrogen and total phosphorus give us the ability to monitor lake trends more efficiently. This information will enable us to include the tropic status of your lake. The program also tests your water for Fecal bacteria (E. Coli), in mid-summer which can determine the condition of your lake and if the water is safe for swimming. Reports will be issued annually in the fall.

**Contract Terms:**

**Contract Period:**

**Multiple Year Treatment Program:** As an incentive to establish a multiple year agreement we will treat your lake or pond at the same price structure as 2022 for 2023!!! The remaining three years (2024, 2026, 2026) will have cost increases of (3%) three percent per year or less. If total chemical cost increases 10% from the previous year a new agreement will have to be mutually acceptable. If during the life of the contract the DEQ or other regulatory agencies significantly change the approved treatment procedures, either party may terminate this agreement upon giving ninety (90) days advance written notice thereof. This management program will be subject to yearly review by the Keeler Township Board.

**One Year Treatment Program:** Pricing is based on the type and the amount of vegetation or algae present at the time of treatment, as well as, the products applied. Unlike the multiple year program, an agreeable price structure is not contracted into a one-year program. Therefore, an increase in the cost of products, labor, or changes made by the DEQ or other regulatory agencies may have a drastic effect on the pricing for following years.

**Permit Fee:**

PLM Lake & Land Management is responsible for completing and submitting aquatic nuisance permit applications. PLM Lake & Land Management will send an invoice or statement for the yearly DEQ permit application fee. It is your responsibility to send a check made out to the "State of Michigan" to our office. We must include this check with the DEQ permit application.

**Posting of Treatment Areas:**

Posting of shoreline treatment areas is the responsibility of PLM Lake & Land Management and will be conducted according to MIDEQ regulations. Signs will be attached to thick barked trees, posts or other suitable fixtures already on site. If homeowners wish to have signs posted in designated areas or on specific fixtures they must notify PLM Lake & Land Management, providing lake address, location of property, and where the signs are to be posted. Pictures are the most informative way to relay this information. Notification of alternate posting must be made at least 14 days prior to treatment and additional fees may apply. The removal of posting signs after the restrictions have expired is the responsibility of the homeowner.

**Notification of Treatments:**

It is your responsibility to notify each resident within **100 feet** of the treatment area **at least seven days** in advance, **but no more than forty-five days** prior to the first treatment date, that products will be applied to the lake. This notification requirement **must** be administered to each and every property owner within 100 feet of any treatment area. PLM Lake & Land Management will provide a tentative treatment schedule and the **Notice** of proposed products to be used during the spring of each year. We will also notify resident within 100 feet of the treatment areas on the day of treatment.

**Electronic Treatment Notification:**

In addition to the above-required notification procedures, the Department of Agriculture allows for electronic notification i.e. email with the contracting entity. Therefore, if the contracting entity is a township, lake board, or municipality, you will also receive the same information that is being distributed to each resident (Posting Sign) prior to the treatment. By signing this agreement with PLM Lake & Land Management Corp and providing us the contracting entity email address, we can legally implement the electronic notification procedure.

**Non-Target Species:**

Please be aware that we only control weeds and algae **present** at time of treatment. Emergent vegetation (cattails, bulrush, purple loosestrife), lily pads, eel grass and sago pondweed require separate programs for control and are not addressed unless specifically mentioned in the management program. We have no control over future weed or algae growth based on the current chemicals registered for aquatic use in Michigan.

**Invoicing and Payments:**

PLM Lake & Land Management will submit an invoice following treatment that will include the following information; lake and/or pond(s) treated, date of treatment and type of treatment or acres treated. Monies will be due net sixty (60) days after each treatment. Interest of 1.25% will be added to your bill for each additional ninety (90) days that payment is not received. Payment terms are negotiable.

**Liability Issues:**

We are responsible for workman's compensation and liability insurance for the duration of the contracted period. PLM Lake & Land Management is not responsible for fish loss due to low oxygen levels caused during warm water conditions. Please sign, check multiple or one year program and return one copy of this proposal as our contract. For further clarification or modifications please contact.

Sincerely,

Andy Tomaszewski  
Southern Regional Manager  
PLM Lake & Land Management

For **Big & Little Crooked Lake:**  
One-Year Program \_\_\_\_\_

\_\_\_\_\_  
**Print Name**

\_\_\_\_\_  
**Date**

\_\_\_\_\_  
**Signature**

