

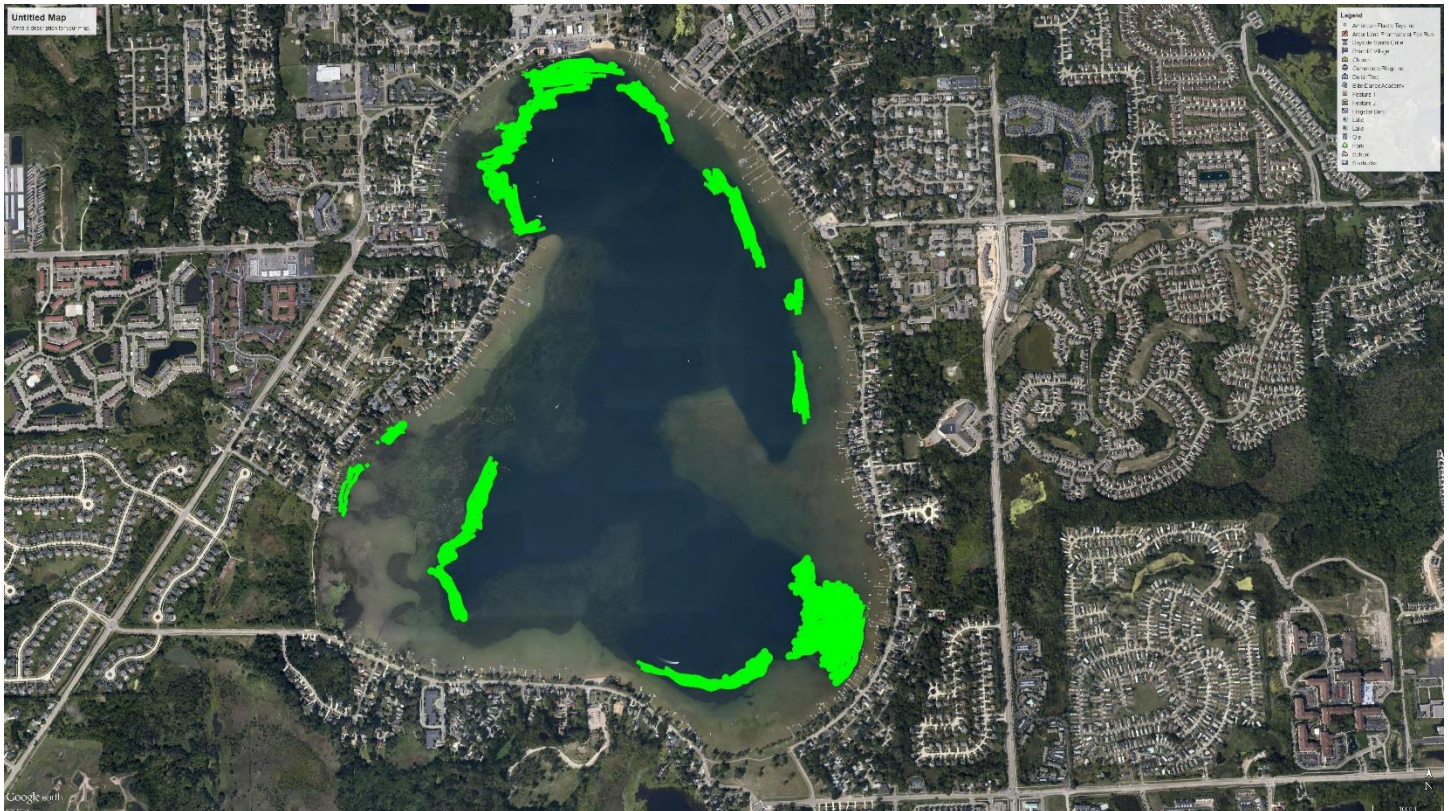
## Walled Lake 2015 – 2019 Treatment Review

### 2015 Treatment Summary:

In 2015 Savin Lake Services treated Walled Lake 3 different times. Treatment dates were June 8<sup>th</sup>, July 22<sup>nd</sup>, and August 31<sup>st</sup>. On June 8<sup>th</sup> we treated 77.5 acres of the lake for Curly leaf Pondweed, and Eurasian Watermilfoil utilizing contact herbicides. On July 22<sup>nd</sup> we treated 120 acres of the lake for Algae, and 18 acres for Starry Stonewort. On August 31<sup>st</sup> we returned to the lake to treat the 18 acres of Starry Stonewort a second time to minimize its densities and reduce the risk of it spreading to different areas of the lake.

Below you will find the treatment maps showing where all the treatments that took place for 2015.

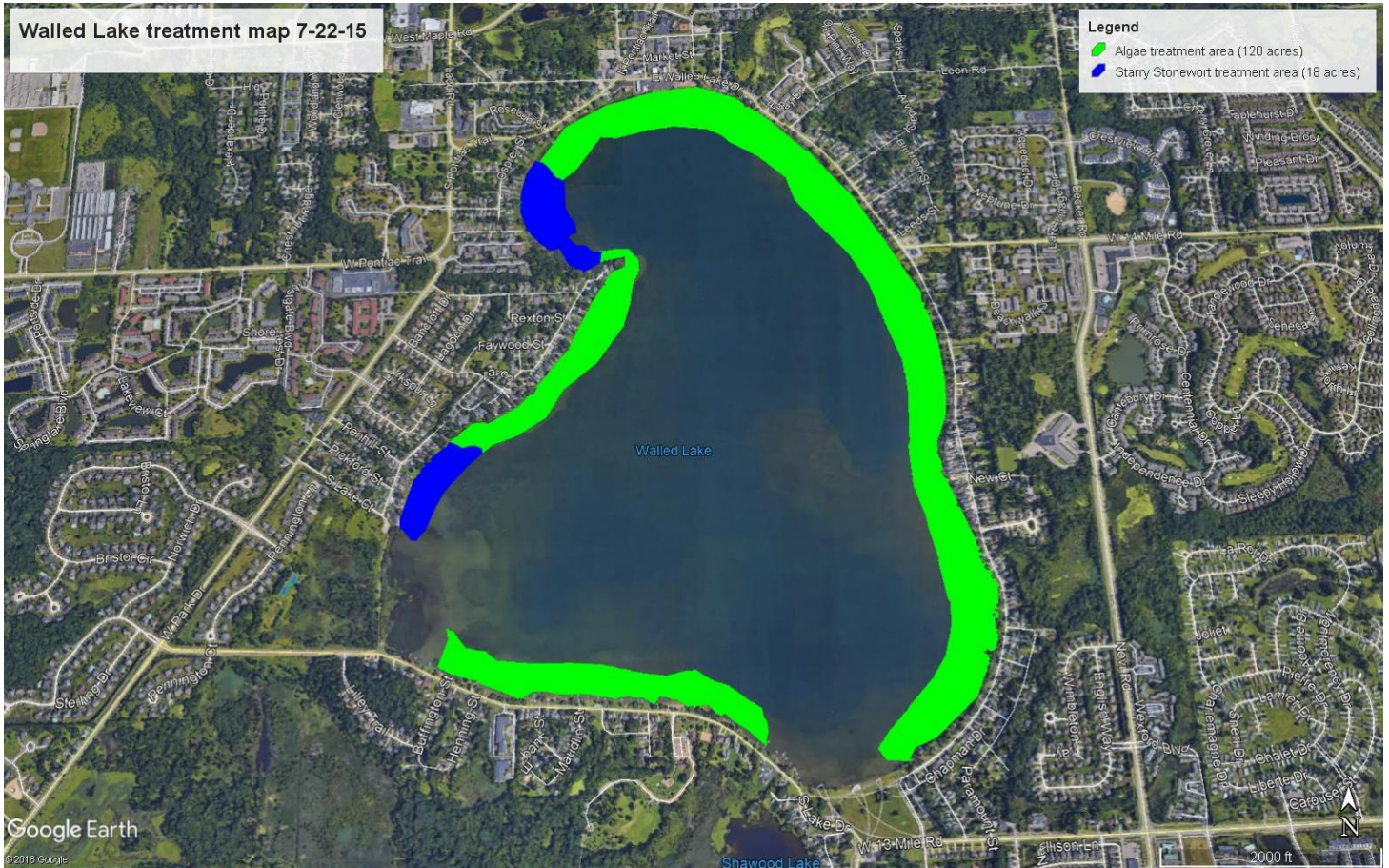
### June 8<sup>th</sup> treatment map:





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July 22<sup>nd</sup> treatment map:



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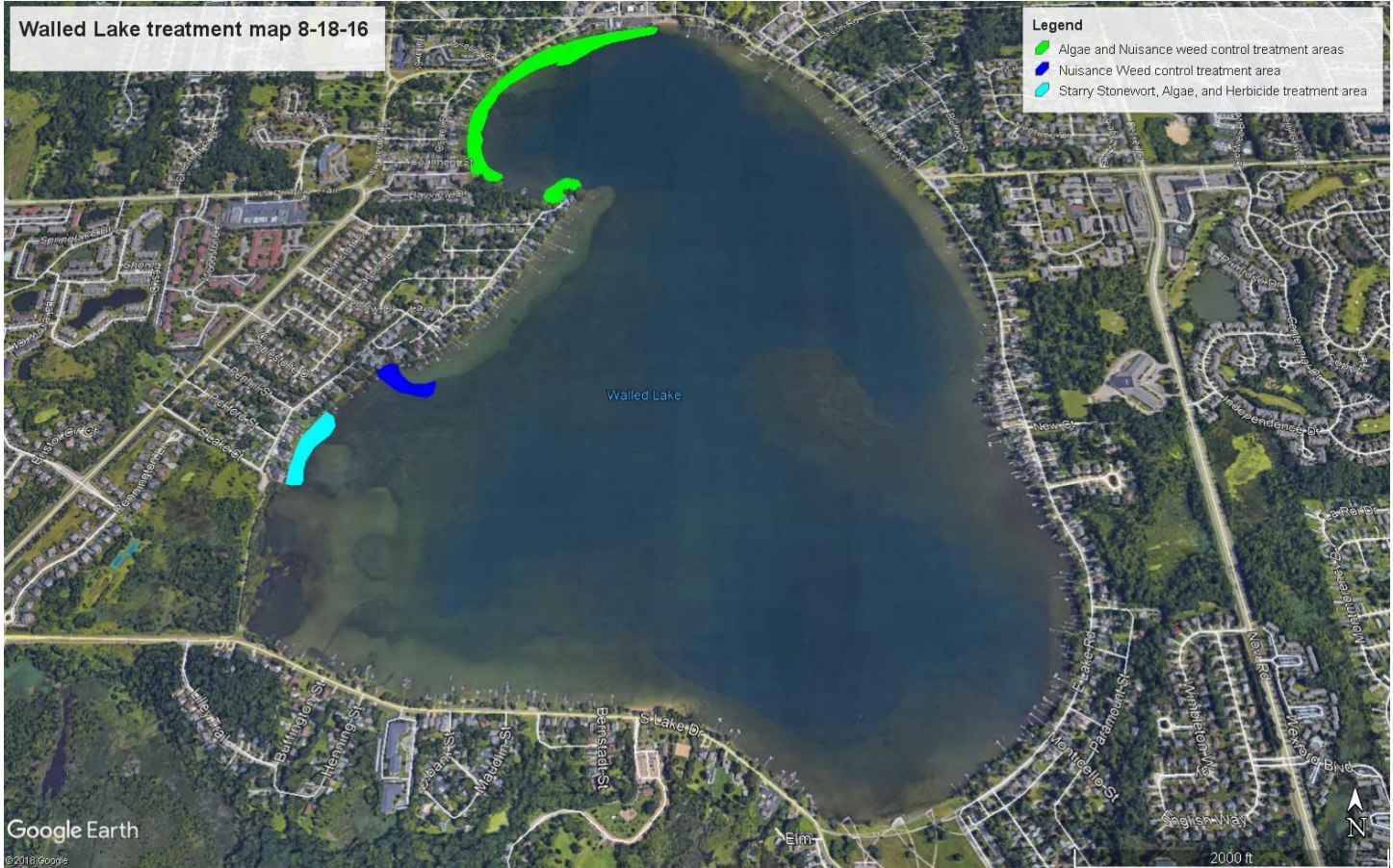


2016 Treatment Summary:

In 2016 Savin Lake Services treated Walled Lake 3 different times. Treatment dates were June 6<sup>th</sup>, August 18<sup>th</sup>, and September 27<sup>th</sup>. On June 6<sup>th</sup> we treated 75 acres of mixed weed beds containing mostly Curly Leaf Pondweed, and some contained small patches of Eurasian Watermilfoil utilizing contact herbicides. Also, during the June 6<sup>th</sup> application, we treated 14 acres of the lake containing Eurasian Watermilfoil with systemic herbicides. On August 18<sup>th</sup> we treated 17.5 acres of the lake containing Eurasian Watermilfoil, nuisance pondweeds, and algae. We also treated 2 acres of the lake containing Starry Stonewort and nuisance pondweeds during the August 18<sup>th</sup> application. On September 27<sup>th</sup> we treated 60 acres of the lake with a systemic herbicide, this treatment was for Eurasian Watermilfoil.

Below you will find the treatment maps showing where all the treatments took place for 2016







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## 2017 Treatment Summary:

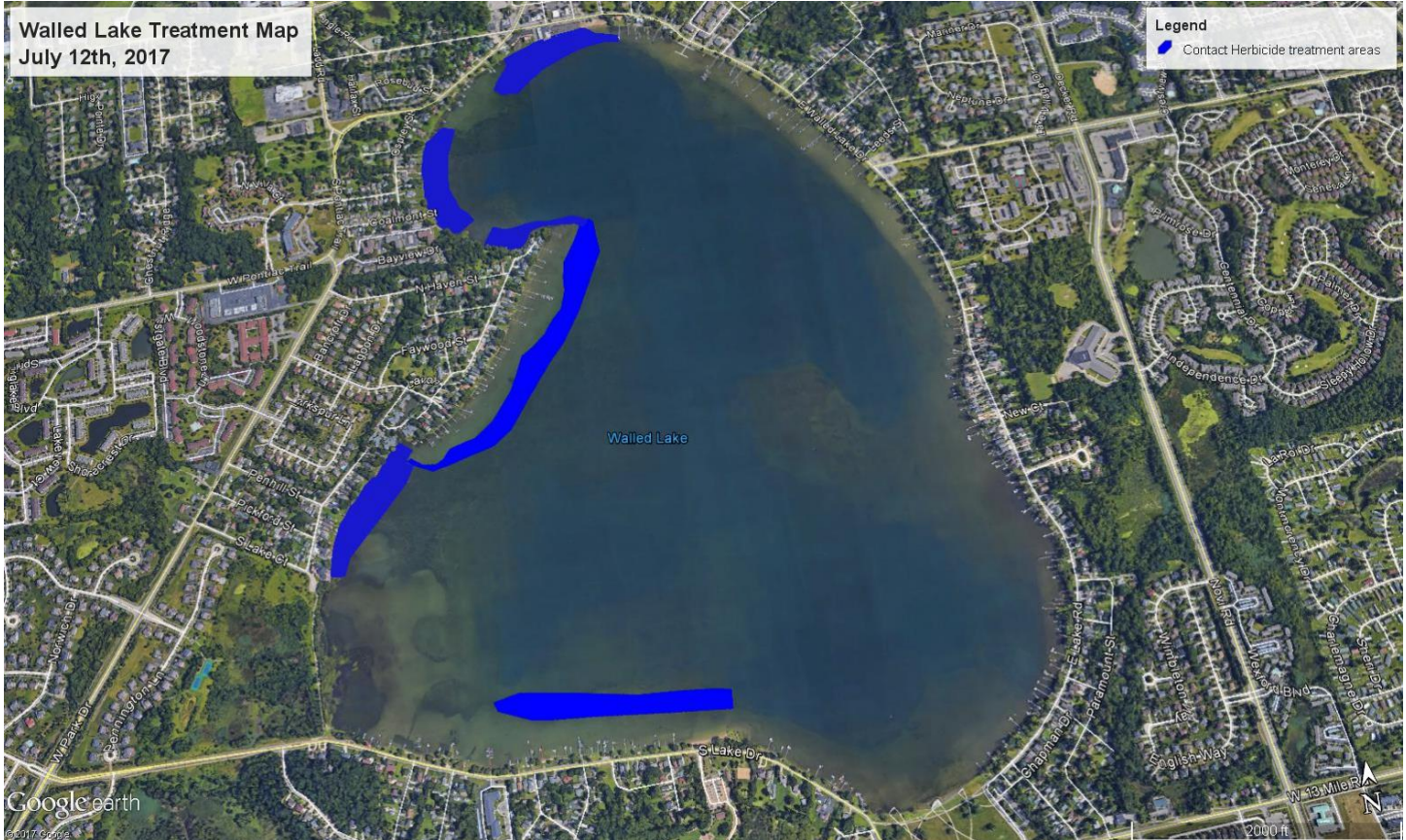
In 2017 Savin Lake Services treated Walled Lake 4 different times. The treatment dates were June 6<sup>th</sup>, July 12<sup>th</sup>, August 15<sup>th</sup>, and October 17<sup>th</sup> & 18<sup>th</sup>. On June 6<sup>th</sup> we treated 35 acres of the lake with contact herbicides for mixed beds of Curly Leaf Pondweed and Eurasian Watermilfoil. On July 12<sup>th</sup> we treated 40 acres of the lake for Eurasian Watermilfoil and 22.5 acres for Starry Stonewort. On August 15<sup>th</sup> we treated 30 acres of the lake for Eurasian Watermilfoil and 15 acres for Starry Stonewort. On October 17<sup>th</sup> & 18<sup>th</sup> we did another Systemic treatment for Eurasian Watermilfoil; this treatment was 61.5 acres of the lake.

Below you will find the treatment maps showing where all the treatments that took place for 2017





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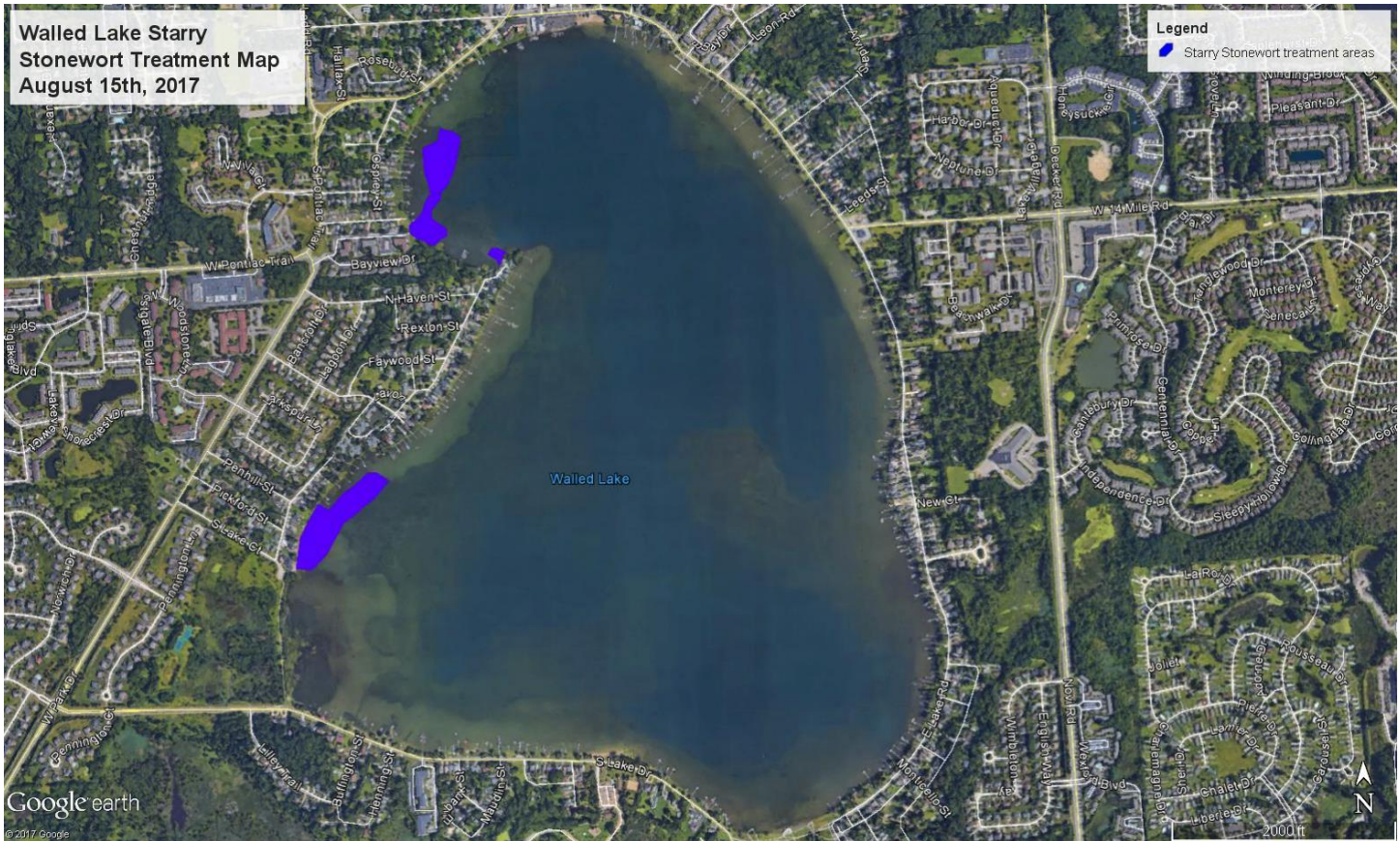
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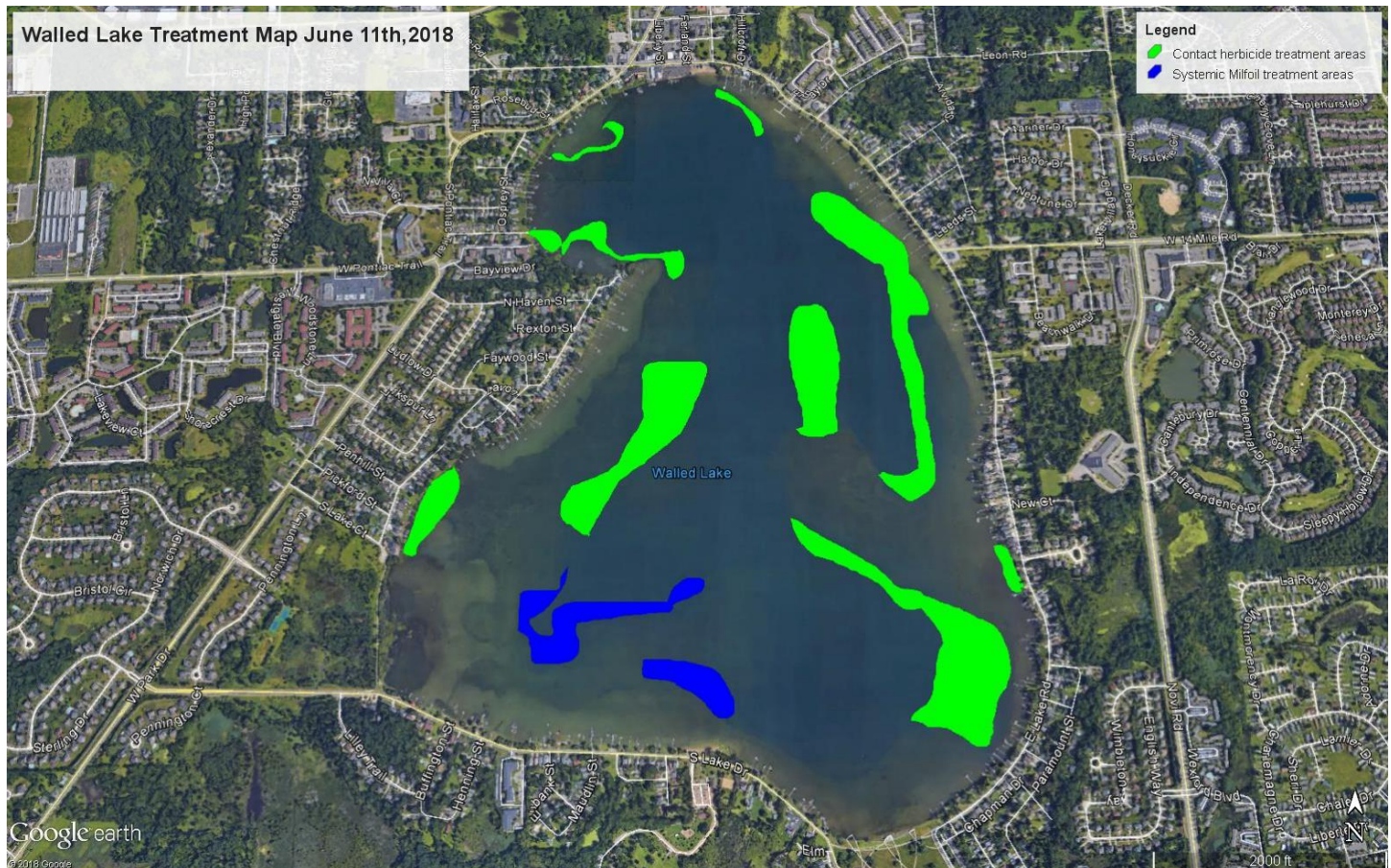
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2018 Treatment Summary:

In 2018 Savin Lake Services treated Walled Lake 4 different times. The treatment dates were June 11<sup>th</sup>, July 17<sup>th</sup>, September 18<sup>th</sup>, and October 25<sup>th</sup>. On June 11<sup>th</sup> we treated 90 acres of the lake. 15 of the 90 acres treated was a systemic treatment for Eurasian Watermilfoil, 65 of the 90 was for mixed beds of Curly Leaf Pondweed and Eurasian Watermilfoil utilizing contact herbicides, and 10 acres was treated for Nuisance Pondweeds utilizing contact herbicides. On July 17<sup>th</sup> we treated 80 acres of the lake for algae, 40 acres of the lake for Eurasian Watermilfoil, and 15 acres of the lake for Starry Stonewort. On September 18<sup>th</sup> we completed a touch up treatment on only 1 acre of the lake for a resident that brought to our attention his area needed treatment. During our final treatment on October 25<sup>th</sup> we treated 53.5 acres of the lake for Eurasian watermilfoil systemically. Below you will find the treatment maps showing where all the treatments took place for 2018.







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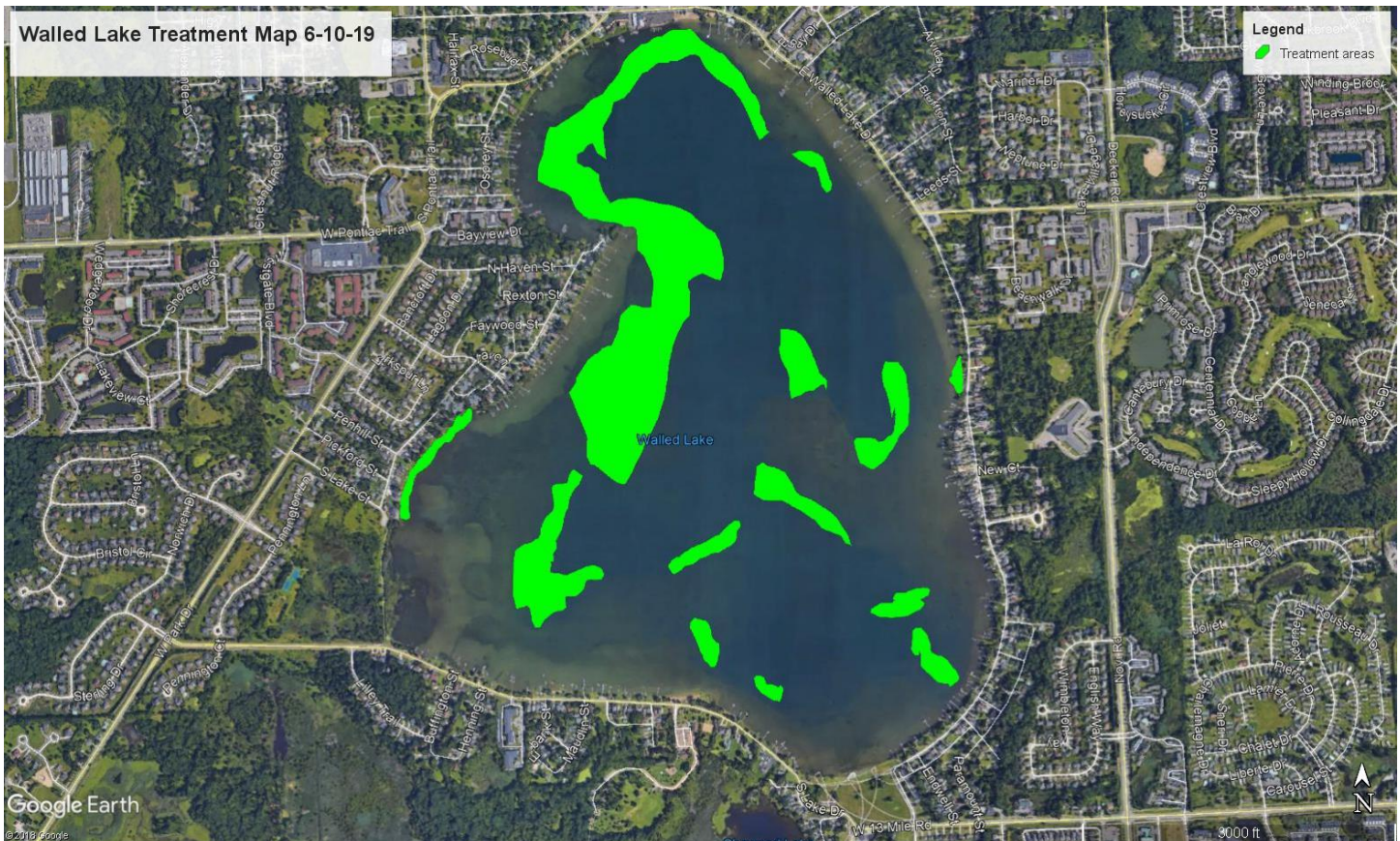


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### 2019 Treatment Summary:

In 2019 Savin Lake Services treated the lake 4 different times. Treatment dates were June 10<sup>th</sup>, July 23<sup>rd</sup>, August 22<sup>nd</sup>, and September 30<sup>th</sup> & October 1<sup>st</sup>. On June 10<sup>th</sup> we treated 87.5 acres of the lake for mixed beds of mostly Curly Leaf Pondweed and some Eurasian Watermilfoil. We also treated 42.5 acres of the lake for algae on June 10<sup>th</sup>. On July 23<sup>rd</sup> we treated 50 acres of the lake for Algae, 30 acres of the lake for Eurasian Watermilfoil and Nuisance Pondweeds, and 12 acres of the lake for Starry Stonewort. On August 22<sup>nd</sup> we treated 10 acres of the lake for Algae, Eurasian Watermilfoil, and Nuisance Pondweeds. The September 30<sup>th</sup> & October 1<sup>st</sup> treatment was another fall systemic treatment for Eurasian Watermilfoil. We treated 54 acres of Eurasian Watermilfoil systemically during this treatment.

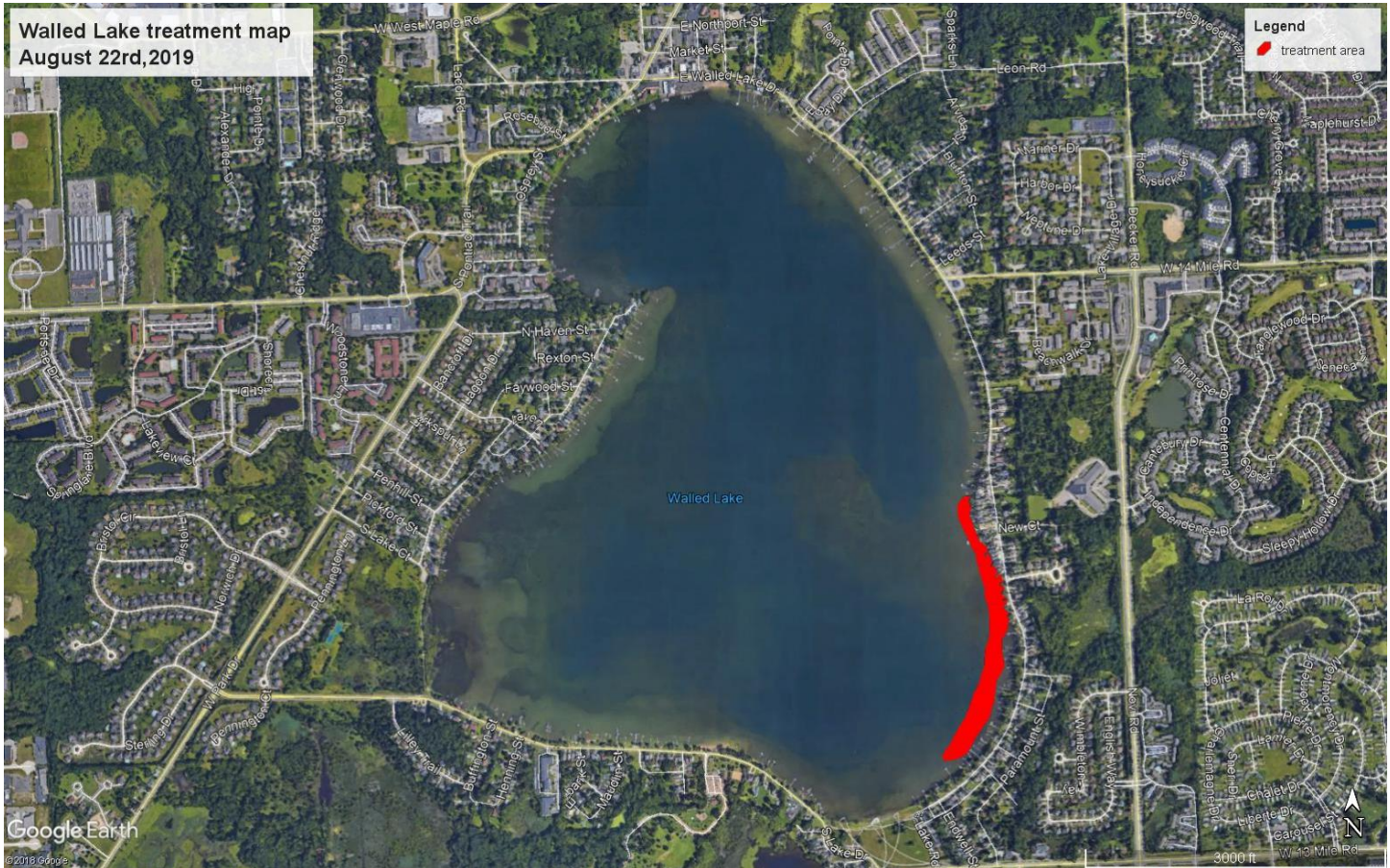
Below you will find the treatment maps showing where all the treatments took place for 2019.



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October 25, 2019

Walled Lake Improvement Board  
Attn: David Galloway/ Megan Mikkus  
c/o City of Novi Clerk's Office  
45175 W Ten Mile Road  
Novi, MI 48375

## **2020 Recommendations and cost analysis**

### **Permit fees, surveys, and studies:**

2020 DEQ permit fee = \$1,500.00  
2020 Water Quality study at (3) sites in spring and fall = \$1,325.00  
Annual spring vegetation visual survey = \$ 475.00  
Mid-Summer/Post treatment Survey = \$475.00  
Annual fall vegetation visual survey = \$475.00  
Annual treatment/services report including maps and 2021 recommendations = \$775.00

**Total recommendations costs for permit fees, surveys, and studies/reports = \$5,025.00**

In late May to early June Savin Lake Services will plan a treatment for Curly Leaf pondweed and any remaining Eurasian Watermilfoil after the annual Spring vegetation survey is completed. We anticipate this treatment to be around 80 – 100 acres of Curly Leaf pondweed (based on treatment records in the past years) with contact herbicides. If algal blooms are present during the spring survey, we will also treat them during the first application where they are present

80 – 100 acres of contact herbicides @ \$266.83/acre = \$21,346.40 - \$26,683.00  
60 – 80 acres of algae control @ \$59.71/ acre = \$3,582.60 - \$4,776.80

**Total projected cost range for first treatment in 2019 = \$24,929.00 - \$31,459.80**

Then in late June – early July we recommend treating the entire shoreline with algaecides for filamentous algae if necessary. After treating large amounts of vegetation as they are dying off they can produce a lot of algal blooms that usually float into the shoreline areas. The water temperatures are rapidly warming during this time and can also be a contributing factor in the large amount of algal blooms. Also, during this timeframe, we would recommend providing some relief and completing a

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treatment for the riparian owners in the near shore developed areas of the lake containing nuisance native weeds. During this treatment we will also treat the Starry Stonewort if it is present during the Mid-Summer Survey.

60 acres of shoreline algae control @ \$59.71/acre = \$3,582.60  
20 - 30 acres of contact herbicides @ \$266.83/ acre = \$5,336.60 - \$8,004.90  
15 -20 acres of Starry Stonewort treatment @ \$309.52/acre = \$4,642.80 - \$ 6,190.40

**Total projected cost range for second treatment = \$13,562.00 – \$17,777.90**

In August, we will complete another treatment for Starry Stonewort if needed and complete a touch up treatment for nuisance native vegetation in shore line areas in and around docks again.

15 - 20 acres of Starry Stonewort treatment @ \$309.52/acre = \$4,642.80 - \$ 6,190.40  
15 - 20 acres of contact herbicides @ \$266.83/acre = \$4,002.45 - \$5,336.60

**Total projected cost range for August treatment = \$8,645.25 - \$11,527.00**

If needed Savin Lake Services would like to conduct another late fall systemic treatment for Eurasian Watermilfoil. This treatment may not be necessary with the previous systemic Milfoil treatment being completed but for budgetary purposes I think it's a good idea to plan for it just in case.

**25 - 35 acres of systemic Milfoil control @ \$665.08/acre = \$16,627.00 - \$23,277.80**

**Total projected cost range for 2020 = \$68,788.25 - \$89,067.50**

Please keep in mind that these are approximate numbers based on treatment records in the past and survey evaluations completed this year. We expect the total overall cost to fall within these parameters. There are many variables in a lakes ecosystem that can change from year to year that make it hard to give an exact number. These figures should get us real close and should not exceed the higher end of the scale. Savin Lake Services would recommend an annual budget for 2020 of \$90,000.00 for Walled Lake. Please note that this is just a recommendation and the Savin Lake Services is willing to work within the parameters of any budget provided, prioritizing the non-native species first. We will only recommend and treat what we feel is needed to improve the overall health of the lake and make it more desirable for use by the riparian owners. Our goal is to keep the non-native and exotic plant communities in check throughout the entire lake and treat nuisance natives in and around riparian owner's docks and swim areas to make those areas more desirable for use.

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Savin Lake Services appreciates your business and we look forward to working with the Walled Lake Improvement Board to continuously improve the overall health of Walled Lake in the future. If you have any questions, comments, or require any additional information please feel free to contact us.

Sincerely,

**Paul Barber – Operations Manager**

**Savin Lake Services Inc.**

**3088 Hottis Road**

**Hale, Michigan 48739**

**Hale Office: 989-728-2200**

**Clare Office: 989-386-0600**

**Toll Free: 877-SAV-LAKE**

**Fax: 989-516-5900**

**Email: [Paulbarber@LakeAndPond.com](mailto:Paulbarber@LakeAndPond.com)**

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## **Future Lake Management Recommendations for Walled Lake**

Walled Lake currently has 3 non-native invasive plant communities that Savin Lake Services has been aggressively managing. The non-native invasive plant communities that have been detected in Walled Lake are Curly Leaf Pondweed, Starry Stonewort, and Eurasian Watermilfoil. In addition to providing non-native invasive weed control, we have also conducted algae treatments and nuisance native weed control in the near shore developed areas when/where treatment is needed.

Each year Walled Lake seems to bring its own unique set of challenges and we welcome the opportunity to meet these challenges for you each year. It has been a pleasure to see the transformation the lake has made since 2012. Which was when we first began managing the lake with herbicides. When herbicide control began the lake was severely infested with Eurasian Watermilfoil. The Eurasian Watermilfoil had already outcompeted the native plants and had pretty much taken over a lot of the littoral zone of the lake containing substrates that can sustain weed growth. In 2012 we treated a total of 168 acres of Milfoil systemically, compared to now treating approximately 60 acres or less systemically each year. Utilizing systemic herbicides like 2,4-D has greatly improved the overall health and aesthetics of Walled Lake. 2,4-D is a fantastic herbicide to use for Milfoil control because it is selective on what weeds it controls, therefore it targets the Milfoil and leaves the desirable native vegetation unharmed providing native plant communities the opportunity to outcompete the Milfoil. Walled Lake is proof that this product works. We have greatly reduced the Milfoil population and the lake now has a vast amount of plant diversity.

When herbicide treatment first started on Walled Lake, Eurasian Watermilfoil was so dominate that it required both a Spring and Fall systemic treatments. In 2019 the Spring systemic treatment was not required. Spring (early June) applications have converted to contact herbicide applications utilizing Diquat Dibromide to manage mainly Curly Leaf Pondweed and small amounts of intermixed Milfoil. Although Curly Leaf Pondweed is an exotic non-native invasive plant species and can pose a threat to the lake like Milfoil can if not properly managed, Curly Leaf Pondweed is much cheaper and easier to gain control of. Only one treatment is required per season for Curly Leaf Pondweed and that treatment is usually completed in May or early June before the plant releases its turions. The contact herbicide Diquat Dibromide that is utilized to control the Curly Leaf Pondweed will also drop the Milfoil that is intermixed for 4-8 weeks, then the Milfoil begins its growth cycle again. Even though the Milfoil does return in the same season utilizing Diquat Dibromide, by the time it does the water is warmer and its growth cycle is very slow until water temperatures start to cool. Once water temperatures begin to cool in the Fall, Milfoil goes through another active growth cycle and that is when we target to treat the Milfoil Systemically. This method of treatment has proven to be the most effective and efficient management technique for Walled Lake.

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Starry Stonewort was detected in Walled Lake in 2015 and has been very aggressively treated ever since. We have been very successful at containing the Starry Stonewort to the areas it was originally detected in. Treatments have been very effective for density reduction and more importantly in preventing it from spreading throughout the lake. Some years we have had to complete 2 treatments to keep it under control and isolated, but many years we were able to control it with a single treatment. Monitoring the lake often and treating as soon as Starry Stonewort begins to grow greatly increase the efficacy of the treatment and reduces the risk of it being spread to other areas of the lake. At this time there is no systemic treatment for Starry Stonewort, and we are using the best treatment methodology known to the industry at this time. Many lakes in Oakland County have become infested with Starry Stonewort. It is greatly impacting the ecosystems of many lakes by rapidly outcompeting native plant communities and vastly reducing plant diversity. Fortunately, we were able to detect it early and I feel if we continue to monitor the lake often and aggressively treat known areas, we can prevent it from becoming a major problem.

It is my belief that the management program we currently have implemented for Walled Lake's weed control is the most effective and efficient way to keep Walled Lake healthy, clean, and desirable for use by the Walled Lake property owners at this time.

After reviewing all the above factors and treatment records back to 2011, Savin Lake Services recommends the following for 2020 - 2025:

- Continue to complete Water Quality Studies in both the Spring and Fall of each year.
- Complete (3) Visual Surveys per year Spring, Mid-Summer, and Fall to identify treatment areas (Pre-treatment), ensure the efficacy of treatments (Post-treatment), and most importantly to make sure the invasive species are not getting out of control or infesting new areas of the lake.
- Complete a BioBase survey in 2022 and then again in 2025.
- Continue to aggressively treat the Eurasian Watermilfoil Systemically.
- Treat the Curly Leaf Pondweed utilizing contact herbicides like Diquat Dibromide and Endothall in Late May/Early June.
- Continue to aggressively monitor and treat the Starry Stonewort anywhere it is found in the lake.
- Continue herbicide control of Algae and Nuisance Natives when/where it's needed in the near shore developed areas of the lake.

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## Future Budget Recommendations for Walled Lake 2020 - 2025

Budgeting for future years is always a daunting task. There are many unknown factors like the weather, which plants are going to grow, when/where they will grow, etc. A lake is its own unique ecosystem, that I refer to as “being the boss”. Lakes change from year to year which makes accurately predicting what will need to be done in the future nearly impossible.

We use past treatment records, surveys, water quality data, and our knowledge of the lake to provide estimated treatment and budget recommendations. Often treatment recommendations are changed throughout the year to adapt to the current condition of the lake and/or to meet budgetary restraints/concerns. Changes are only made based on what is best for the lake and the property owners.

My belief is that it is better to be proactive instead of reactive and think many things should be considered when trying to set a budget for future years.

The following are some of factors that should be taken into consideration when planning the future budget/assessment for Walled Lake:

- The lake contains (3) non-native invasive species that can spread throughout the lake very rapidly if not managed properly in a timely manner.
- The assessment should fund all required studies/treatments that need to take place each year plus additional funds to be held in reserves to be utilized later if needed.
  - Here is an example for the need of the reserve fund: Let’s say the Eurasian Watermilfoil resurges and can be found in 80 acres of the lake, and we only anticipated 40 acres of treatment in the annual budget. By having additional available funds in reserve, we would be able to treat all 80 acres properly. If no funds were available 40 acres of Milfoil goes left untreated and turns into 100 acres of Milfoil the following year.
- It is always better to overfund a project and not need to use all the funds than to need the funds and not have them available. Assessments can always be reduced or returned once an adequate reserve fund is acquired.
- Awareness that plant communities can develop herbicide resistance/tolerance to a certain herbicide(s) and we may need to evaluate utilizing other herbicide options like Procellacor or Triclopyr to achieve systemic control of the Milfoil. Which are more costly herbicide applications than we are currently using.
- Native plant populations may become a nuisance in areas where herbicide management is not permitted, and we may need to implement vegetation harvesting again to manage them.

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After evaluating all the information from past treatment records, surveys, water quality data, and our knowledge of the lake, Savin Lake Services would recommend the budget be established for 2020 – 2025 as follows:

2020 - \$90,000.00  
2021 - \$95,000.00  
2022 - \$95,000.00  
2023 - \$100,000.00  
2024 - \$100,000.00  
2025 - \$100,000.00

We feel the above budgets for each year will provide adequate funding to properly manage Walled Lake.

These budgets are based on our experience on Walled Lake and the following plan each year:

25 – 50 acres of Systemic Milfoil control  
80 – 120 acres of Curly Leaf Pondweed control utilizing contact herbicides  
100 -140 acres of Algae control (total over 2 treatments)  
20 – 40 acres of Starry Stonewort control (total over 2 treatments)  
30 - 50 acres of Nuisance Natives control utilizing contact herbicides (total over 2 treatments)  
All studies, surveys, and recommendations

In the case Vegetation Harvesting is desired for offshore natives additional funding of approximately \$15,000.00 may need to be budgeted each year. Currently, I don't believe vegetation harvesting is necessary. I also believe if/when it becomes necessary, we will have reduced some of the herbicide control efforts and will be able to utilize part of the above budget for all or partial cost of the harvesting depending on amount needed to be harvested.

If you have any questions, comments, or require any additional information, please feel free to contact us.

Sincerely,

Operations Manager  
Savin Lake Services Inc.

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