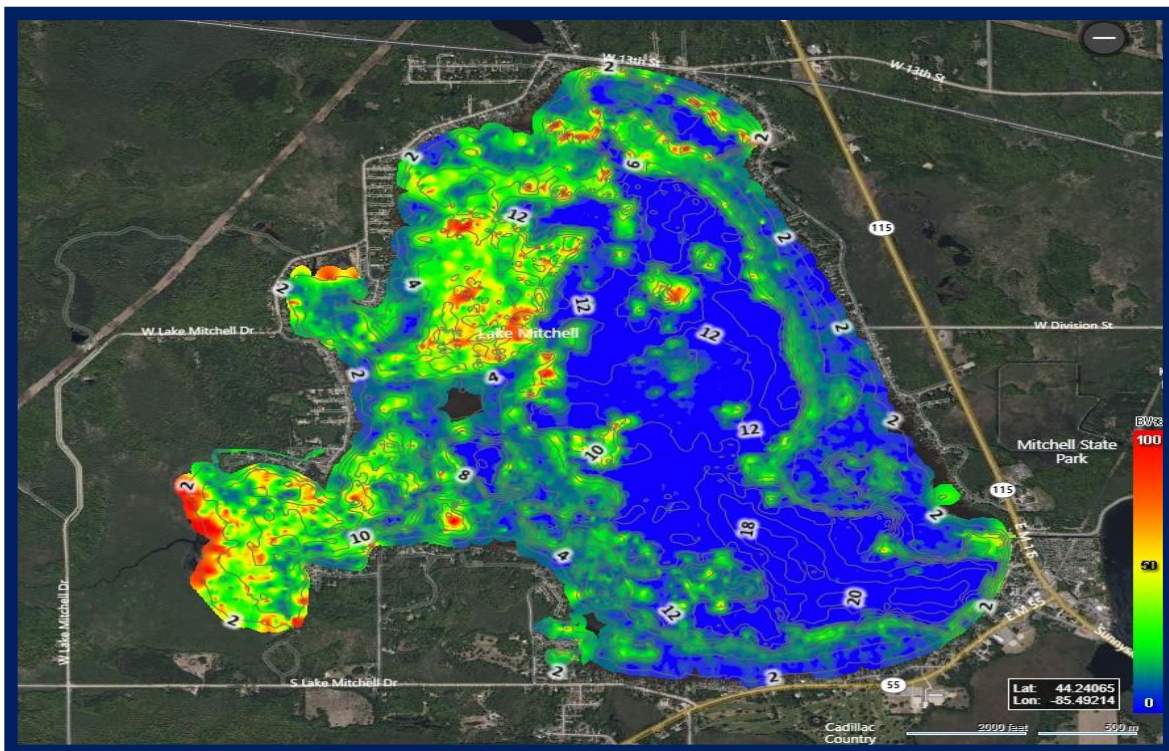




# Lake Mitchell 2024 Aquatic Vegetation, Water Quality, and 2025 Management Recommendations Report



**April, 2025**

# **Lake Mitchell 2024 Aquatic Vegetation, Water Quality, and 2025 Management Recommendations Report (2009-2024)**



**© Restorative Lake Sciences  
18406 West Spring Lake Road  
Spring Lake, Michigan 49456  
Phone 616.843.5636**

**Website: <http://www.restorativelakesciences.com>**

# Table of Contents

Section 1: Lake Mitchell Summary (2024) .....	4
Section 2: Lake Mitchell Water Quality Data (2009-2024) .....	5
Section 3: Lake Mitchell Aquatic Vegetation Data (2024) .....	13
Section 4: Management Recommendations for 2025 .....	22

# **Lake Mitchell 2024 Aquatic Vegetation, Water Quality, and 2025 Management Recommendations**

The overall condition of Lake Mitchell in 2024 was good with favorable water clarity, reduced total phosphorus concentrations, and reduced EWM growth compared to the 2023 season showing some good residual control. The result of rigorous whole-lake surveys, intermittent site visits, and rigorous applications of systemic herbicides for the target plants was effective in controlling a seedbank re-emergence of primarily nuisance natives. The water clarity in 2024 averaged around 7.2 feet which is favorable. In 2024, RLS continued to utilize the systemic herbicide ProcellaCOR® along with diquat with excellent success and that is recommended again for 2025. RLS is always present to oversee these herbicide treatments to assure that exact locations are addressed. Over the past decade, the LMIB has saved much needed funds due to these efforts. The EWM in Big Cove has continued to show sustained reduced growth in 2024 after rigorous 2022 and 2023 ProcellaCOR® treatments. ProcellaCOR® has proven to require less frequent treatments.

Protection of the 35 native aquatic plant species is paramount for the health of the lake fishery and these plants should not be managed unless they are a nuisance to lakefront property owners and possess navigational and recreational hazards (i.e., lily pads or nuisance pondweeds in the coves). RLS scientists did notice an infestation of dense natives within the north portion of the lake and sent a couple of different proposals to EGLE for controlling/opening boat paths, but these proposals were denied by the state. Thus, we are only able to treat nuisance native vegetation 100 ft x 100 ft of developed shoreline per frontage property.

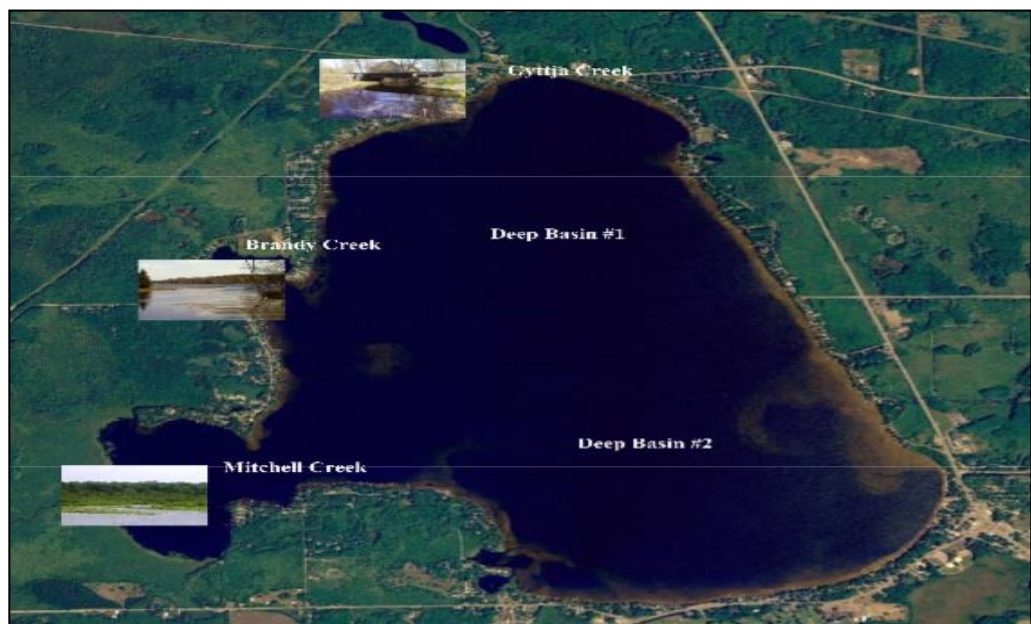
Invasive species such as Eurasian Watermilfoil (EWM) are able to grow in moderate nutrient waters and thus are a challenge to the Lake Mitchell ecosystem. In 2024, approximately 58 acres of EWM were treated throughout the entire lake. RLS has recommended alternating use of different systemic herbicides to reduce the probability of herbicide tolerance which reduces efficacy. The treatment of Purple Loosestrife with triclopyr occurred in 2023-2024 due to a lack of beetles. A thorough section on management recommendations for 2025 is offered at the end of this report.

## Lake Mitchell Water Quality Data (2009-2024)

### Water Quality Parameters Measured

There are numerous water quality parameters one can measure on an inland lake, but several are the most critical indicators of lake health. These parameters include water temperature (measured in °C), dissolved oxygen (measured in mg/L), pH (measured in standard units-SU), conductivity (measured in micro-Siemens per centimeter- $\mu\text{S}/\text{cm}$ ), total alkalinity or hardness (measured in mg of calcium carbonate per liter-mg  $\text{CaCO}_3/\text{L}$ ), total dissolved solids (mg/L), secchi transparency (feet), total phosphorus chlorophyll-*a* (in  $\mu\text{g}/\text{L}$ ), and algal species composition. Water quality was measured in the deepest basins of Lake Mitchell on September 25, 2024 (Figure 1). Trend data was calculated using mean values for each parameter for each season. Lake Mitchell would be considered meso-eutrophic (relatively productive) since it does contain ample phosphorus, nitrogen, and aquatic vegetation growth but also has good water clarity and moderate algal growth. General water quality classification criteria are defined in Table 1. 2024 water quality data for Lake Mitchell and its tributaries are shown below in Tables 2-4.

**Figure 1. Water quality sampling locations for Lake Mitchell and its tributaries**



**Table 1. Lake trophic classification (MDNR).**

<i>Lake Trophic Status</i>	<i>Total Phosphorus (<math>\mu\text{g L}^{-1}</math>)</i>	<i>Chlorophyll-a (<math>\mu\text{g L}^{-1}</math>)</i>	<i>Secchi Transparency (feet)</i>
Oligotrophic	< 10.0	< 2.2	> 15.0
Mesotrophic	10.0 – 20.0	2.2 – 6.0	7.5 – 15.0
Eutrophic	> 20.0	> 6.0	< 7.5

**Table 2. Lake Mitchell water quality parameter data collected over the north deep basin on September 25, 2024.**

<i>Depth ft.</i>	<i>Water Temp <math>^{\circ}\text{C}</math></i>	<i>DO <math>\text{mg L}^{-1}</math></i>	<i>pH S.U.</i>	<i>Cond. <math>\mu\text{S cm}^{-1}</math></i>	<i>Turb. NTU</i>	<i>Total Dissolved Solids <math>\text{mg L}^{-1}</math></i>	<i>Total Alk. <math>\text{mg L}^{-1} \text{CaCO}_3</math></i>	<i>Total Phos. <math>\text{mg L}^{-1}</math></i>	<i>TKN <math>\text{mg L}^{-1}</math></i>
0	19.2	8.0	7.8	161.2	0.9	103.1	47	0.010	1.2
10	19.1	8.0	7.8	161.1	0.9	103.1	47	<0.010	1.3
16	19.1	8.0	7.9	161.0	1.4	103.0	44	<0.010	1.4

**Table 3. Lake Mitchell water quality parameter data collected over the south deep basin on September 25, 2024.**

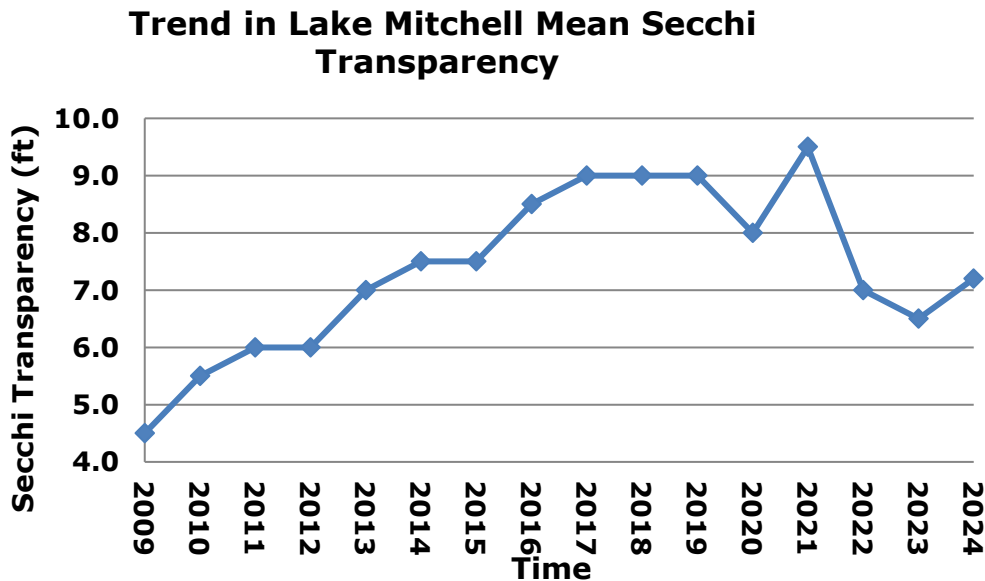
<i>Depth ft.</i>	<i>Water Temp <math>^{\circ}\text{C}</math></i>	<i>DO <math>\text{mg L}^{-1}</math></i>	<i>pH S.U.</i>	<i>Cond. <math>\mu\text{S cm}^{-1}</math></i>	<i>Turb. NTU</i>	<i>Total Dissolved Solids <math>\text{mg L}^{-1}</math></i>	<i>Total Alk. <math>\text{mg L}^{-1} \text{CaCO}_3</math></i>	<i>Total Phos. <math>\text{mg L}^{-1}</math></i>	<i>TKN <math>\text{mg L}^{-1}</math></i>
0	19.5	8.1	8.0	161.8	0.4	103.5	45	<0.010	1.4
10	19.5	8.1	8.0	161.7	1.0	103.5	45	<0.010	1.5
20	19.3	8.1	8.0	161.6	2.1	103.4	44	<0.010	1.6

**Table 4. Lake Mitchell Tributary water quality parameter data collected on September 25, 2024.**

<i>Tributary</i>	<i>Water Temp °C</i>	<i>DO mg L<sup>-1</sup></i>	<i>pH S.U.</i>	<i>Cond. µS cm<sup>-1</sup></i>	<i>TDS mg L<sup>-1</sup></i>	<i>Total Phos. mg L<sup>-1</sup></i>	<i>TKN mg L<sup>-1</sup></i>
Mitchell	14.8	7.0	7.4	260.2	166.4	0.032	1.9
Brandy	14.7	4.6	7.1	143.2	91.6	0.090	2.5
Gyttja	16.8	7.1	7.5	192.1	123.0	<0.010	1.6

## Water Clarity (Transparency) Data

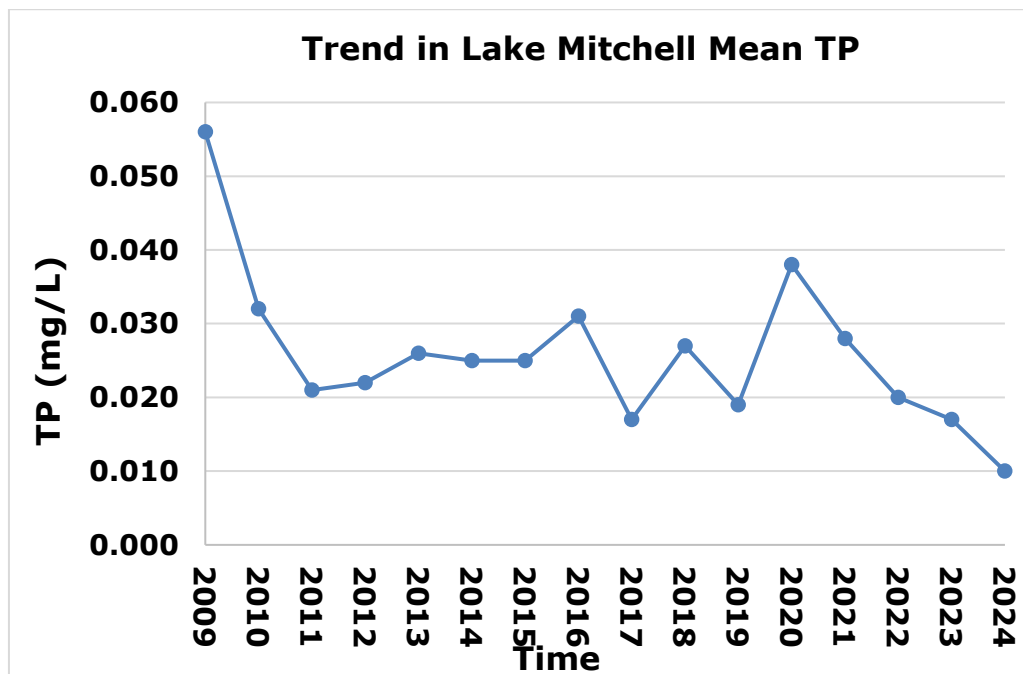
Elevated Secchi transparency readings allow for more aquatic plant and algae growth. The transparency in Lake Mitchell during the 2024 September sampling event averaged around 7.2 feet which was slightly higher than observed in 2023. Secchi transparency is variable and depends on the number of suspended particles in the water (often due to windy conditions of lake water mixing) and the amount of sunlight present at the time of measurement. Other parameters such as turbidity (measured in NTU's) and total dissolved solids (measured in mg/L) are correlated with water clarity and show an increase as clarity decreases. The turbidity and total dissolved solids in Lake Mitchell were low to moderate in 2024 at ≤2.1 NTU's and ≤103.5 mg/L, respectively. The graph below shows the trend in mean Secchi transparency over time for Lake Mitchell.



**Figure 2.** Mean Secchi transparency in Lake Mitchell from 2009-2024.

## Total Phosphorus

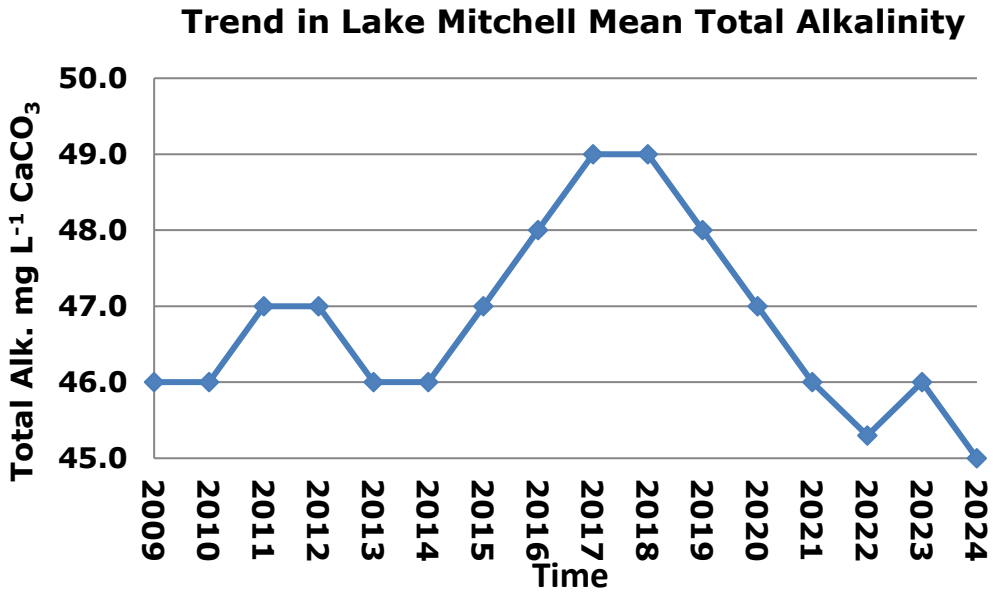
Total phosphorus (TP) is a measure of the amount of phosphorus (P) present in the water column. Phosphorus is the primary nutrient necessary for abundant algae and aquatic plant growth. TP concentrations are usually higher at increased depths due to higher release rates of P from lake sediments under low oxygen (anoxic) conditions. Phosphorus may also be released from sediments as pH increases. Fortunately, even though the TP levels in Lake Mitchell are moderate, the dissolved oxygen levels are good enough at the bottom to not cause release of phosphorus from the bottom. TP concentrations during the 2024 sampling event averaged 0.010 mg L<sup>-1</sup>. This is a favorable concentration and is well below the eutrophic threshold. The mean concentrations of TP have been declining in recent years.



**Figure 3:** Mean concentrations of Total Phosphorus within Lake Mitchell from 2009 - 2024.

## Total Alkalinity

Lakes with high alkalinity (> 150 mg L<sup>-1</sup> of CaCO<sub>3</sub>) are able to tolerate larger acid inputs with less change in water column pH. Many Michigan lakes contain high concentrations of CaCO<sub>3</sub> and are categorized as having “hard” water. Total alkalinity may change on a daily basis due to the re-suspension of sedimentary deposits in the water and respond to seasonal changes due to the cyclic turnover of the lake water. The alkalinity of Lake Mitchell is quite low and is indicative of a “soft water” aquatic ecosystem. The total alkalinity during the sampling event in 2024 averaged 45.0 mg L<sup>-1</sup> of CaCO<sub>3</sub> which is similar to recent years (below figure).



**Figure 4:** Average Total Alkalinity Levels for Lake Mitchell from 2009-2024.

## pH

Most Michigan lakes have pH values that range from 6.5 to 9.5. Acidic lakes (pH < 7) are rare in Michigan and are most sensitive to inputs of acidic substances due to a low acid neutralizing capacity (ANC). Lake Mitchell is considered “neutral” on the pH scale. The pH of Lake Mitchell in 2024 was similar to previous years with a mean of 7.9 S.U. (below figure).

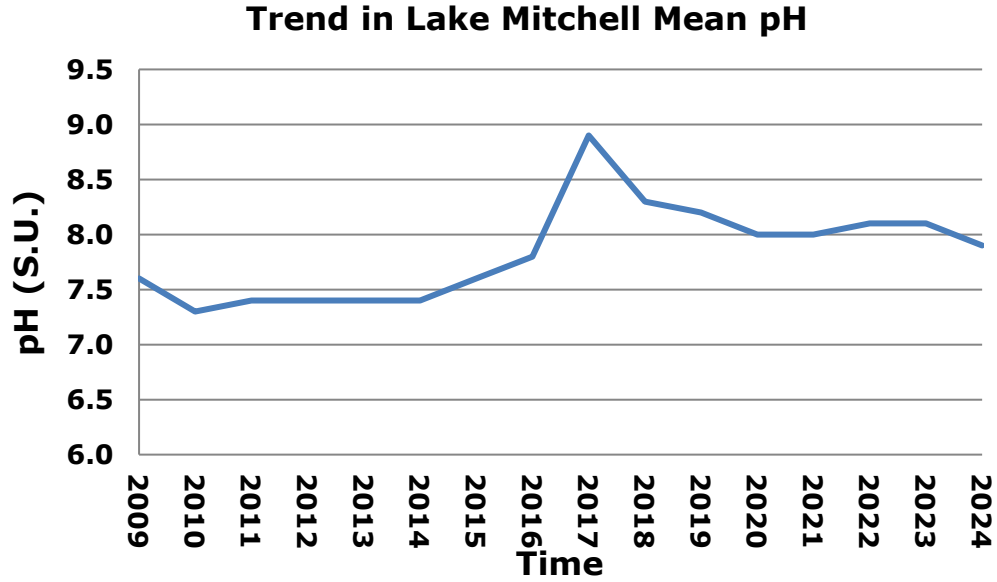


Figure 5: Mean pH within Lake Mitchell since 2009.

## Conductivity

Conductivity is a measure of the number of mineral ions present in the water, especially those of salts and other dissolved inorganic substances. Conductivity generally increases as the amount of dissolved minerals and salts in a lake increases, and also increases as water temperature increases. The conductivity values for Lake Mitchell are moderately low for a large, shallow inland lake and the mean was 161.4  $\mu\text{S}/\text{cm}$  during the 2024 sampling event and has been holding pretty consistent since 2021 (below figure). Severe water quality impairments do not occur until values exceed 800  $\mu\text{S}/\text{cm}$  and are toxic to aquatic life around 1,000  $\mu\text{S}/\text{cm}$ . Conductivity may be increasing due to more road salt applications during recent harsh winters.

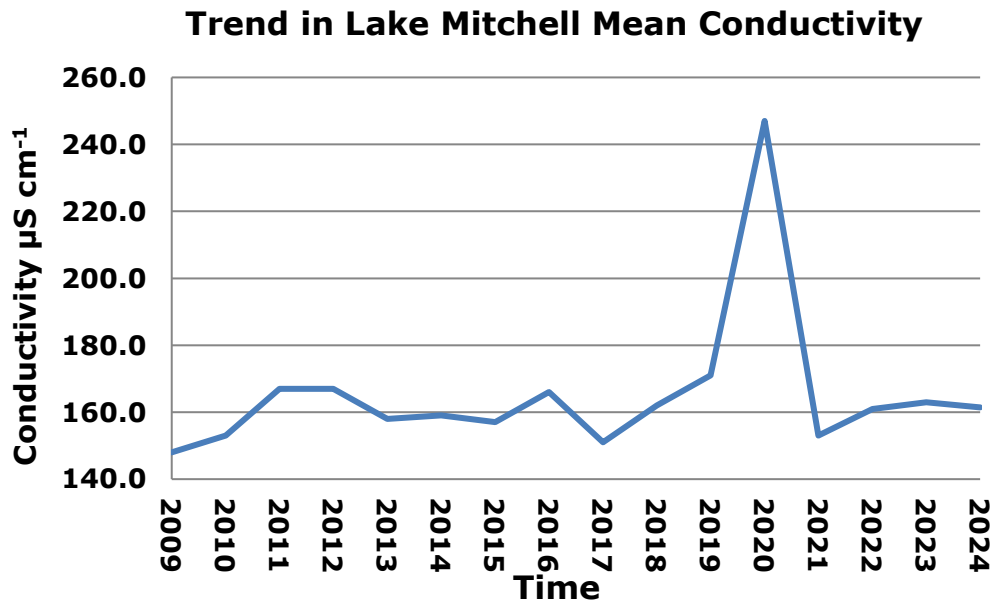


Figure 6: Trend in mean conductivity within Lake Mitchell since 2009.

## Chlorophyll-*a* and Algal Species Composition

Chlorophyll-*a* is a measure of the amount of green plant pigment present in the water, often in the form of planktonic algae. High chlorophyll-*a* concentrations are indicative of nutrient-enriched lakes. Chlorophyll-*a* concentrations greater than 6 µg L<sup>-1</sup> are found in eutrophic or nutrient-enriched aquatic systems, whereas chlorophyll-*a* concentrations less than 2.2 µg/L are found in nutrient-poor or oligotrophic lakes. The mean chlorophyll-*a* concentrations on August 25, 2024 in Lake Mitchell was 3.0 µg/L which was lower than last year but still below the 6.0 µg L<sup>-1</sup> which is characteristic of eutrophic lakes. (below figure).

The algal genera were determined from composite water samples collected over the deep basins of Lake Mitchell in 2024 were analyzed with a compound bright field microscope. The genera present included the Chlorophyta: *Chlorella* sp., *Ulothrix* sp., *Mougeotia* sp., *Haematococcus* sp., and *Pediastrum* sp. The Cyanophyta (blue-green algae): *Microcystis* sp.; The Bascillariophyta (diatoms): *Synedra* sp., *Cymbella* sp., *Diatoma* sp., *Navicula* sp. The aforementioned species indicate a diverse algal flora and represent a good diversity of alga with an abundance of diatoms that are indicative of good water quality.

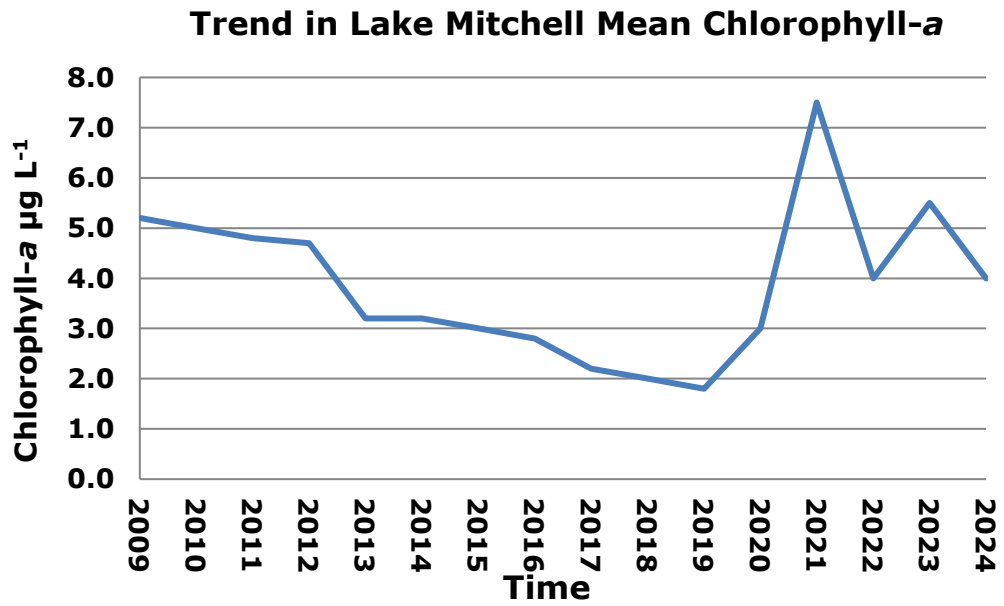


Figure 7: Trend in average Chlorophyll-a concentrations within Lake Mitchell since 2009.

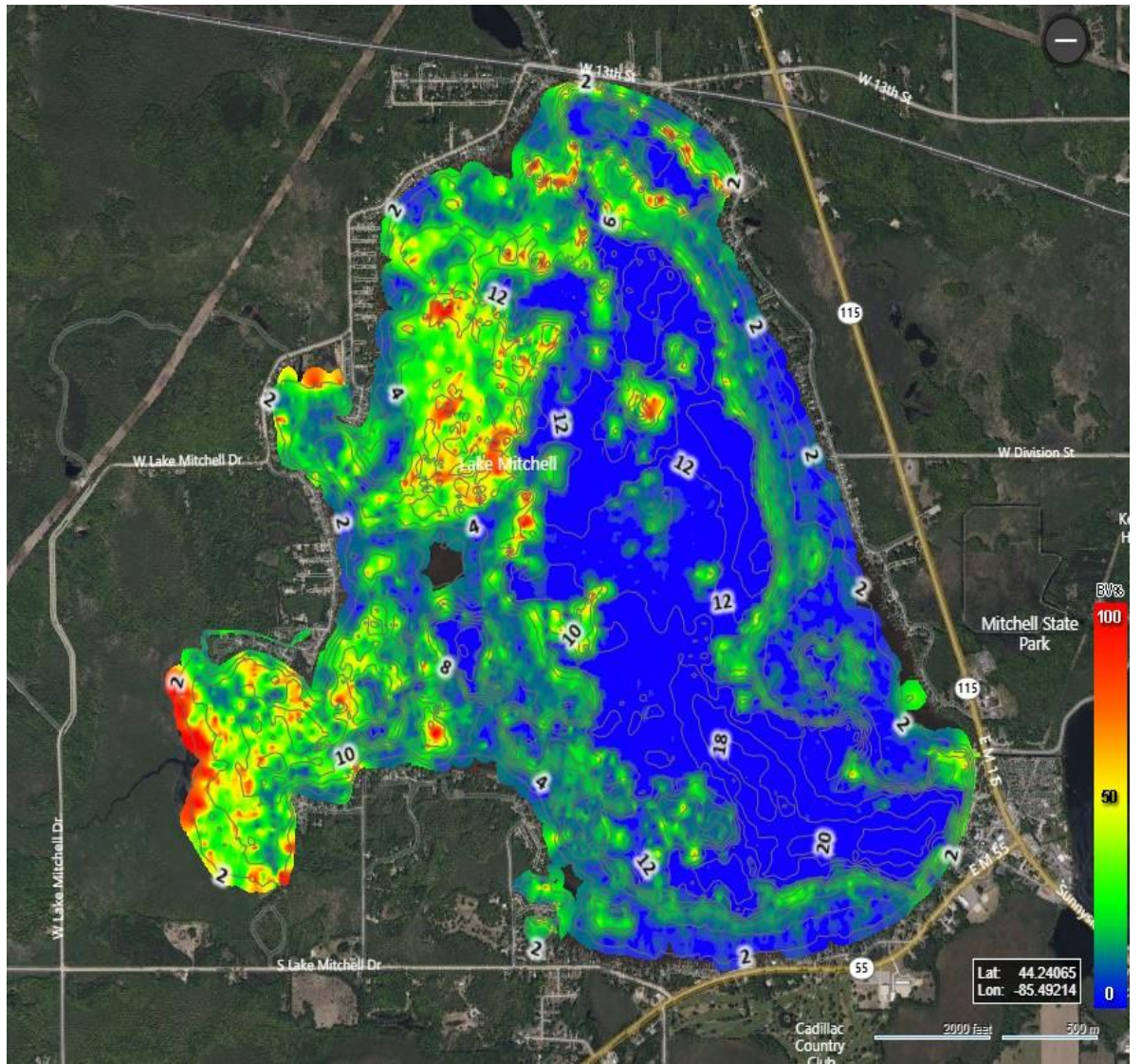
## Aquatic Vegetation Data (2024)

### Status of Native Aquatic Vegetation in Lake Mitchell

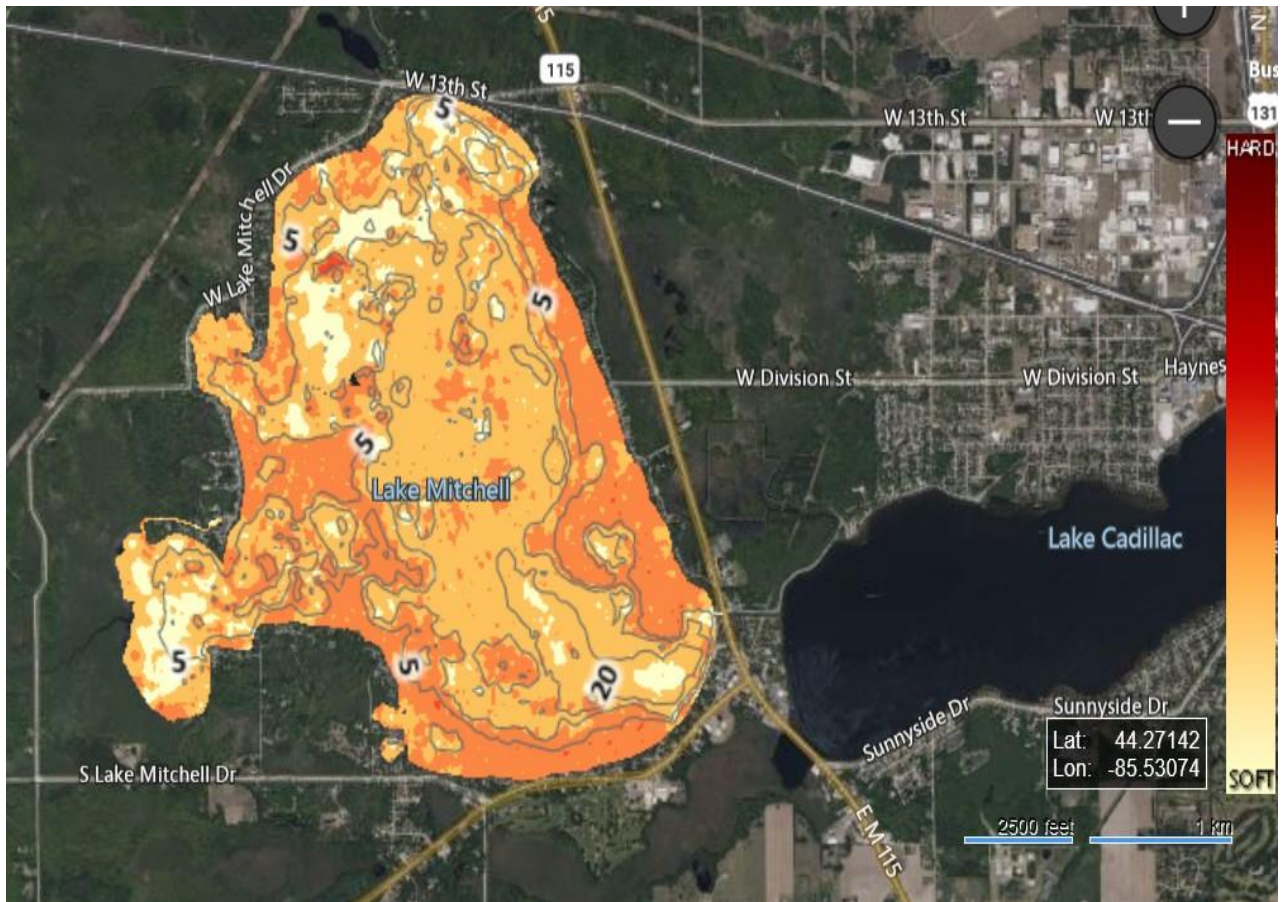
The native aquatic vegetation present in Lake Mitchell is essential for the overall health of the lake and the support of the lake fishery. The July 2, 2024 all species inventory survey determined that there were a total of 35 native aquatic plant species in Lake Mitchell. These include 23 submersed species, 5 floating-leaved species, and 7 emergent species which is similar to recent years and means that the lake is maintaining its biodiversity. This indicates a very high biodiversity of aquatic vegetation in Lake Mitchell and is likely a significant reason for the great fishery in the lake. The overall % cover of the lake by native aquatic plants is moderate relative to the lake size and thus these plants should be protected and not treated unless they become a nuisance in shallow coves or the Torenta Canal. In these cases, RLS may recommend the use of mechanical harvesting in some areas of Big Cove and/or Little Cove along with the Torenta Canal. A list of all native aquatic plants and their relative abundance can be found in Table 5 below. The most common aquatic plants found during the 2024 surveys included: 1) Fern- Leaf Pondweed, which grows in the bottom half of the water column typically creating a dense mat on the bottom of the lake. This mat will provide habitat for fish, macro-invertebrates along with occupying space to keep other invasives in check. 2) Chara, which creates a grass like carpet across the bottom, filtering the water, increasing clarity and increasing sediment stabilization. All of these species are favorable when in moderate amounts and help to reduce sediment suspension from the lake bottom during turbulent events to result in clearer waters, and 3) Variable leaf Pondweed, which creates very favorable fish and macro-invertebrate habitat without creating extremely dense beds. During the whole-lake scan, an aquatic vegetation biovolume map (Figure 8) was developed which shows the areas where aquatic vegetation is absent (blue color), sparse (green color), or high-growing (red color). The red colors usually represent milfoil growth in Lake Mitchell which has declined over the past few years. Most of the biomass is located in Big Cove, Little Cove, and the northwest region of the lake. In Big Cove, the red areas represent tall pondweeds and lily pads. This scan also produced a sediment composition map that shows the sediment hardness of the bottom of the lake. The darker shaded colors are harder compared to the lighter shades. (Figure 9)

**Table 5. Native aquatic plants found in Lake Mitchell on July 2, 2024.**

<b>Aquatic Plant Species Name</b>	<b>Aquatic Plant Common Name</b>	<b>Aquatic Plant Growth Form</b>	<b>% Coverage of Lake (2024)</b>
<i>Chara vulgaris</i> (macroalga)	Muskgrass	Submersed; Rooted	8.8
<i>Potamogeton pectinatus</i>	Sago Pondweed	Submersed; Rooted	3.3
<i>Potamogeton robbinsii</i>	Fern-leaf Pondweed	Submersed; Rooted	9.6
<i>Potamogeton gramineus</i>	Variable-leaf Pondweed	Submersed; Rooted	8.6
<i>Potamogeton praelongus</i>	White-stem Pondweed	Submersed; Rooted	7.9
<i>Potamogeton richardsonii</i>	Clasping-leaf Pondweed	Submersed; Rooted	4.2
<i>Potamogeton illinoensis</i>	Illinois Pondweed	Submersed; Rooted	2.8
<i>Potamogeton amplifolius</i>	Large-leaf Pondweed	Submersed; Rooted	8.6
<i>Myriophyllum sibiricum</i>	Northern Watermilfoil	Submersed; Rooted	0.1
<i>Potamogeton pusillus</i>	Small-Leaf Pondweed	Submersed; Rooted	4.0
<i>Ceratophyllum demersum</i>	Coontail	Submersed; Non-rooted	1.2
<i>Elodea canadensis</i>	Common Waterweed	Submersed; Rooted	4.8
<i>Utricularia vulgaris</i>	Common Bladderwort	Submersed; Non-rooted	2.1
<i>Najas guadalupensis</i>	Southern Naiad	Submersed; Rooted	0.3
<i>Najas flexilis</i>	Slender Naiad	Submersed; Rooted	1.8
<i>Myriophyllum tenellum</i>	Leafless Watermilfoil	Submersed; Rooted	0.4
<i>Potamogeton zosteriformis</i>	Flat-stem Pondweed	Submersed; Rooted	2.4
<i>Nitella flexilis</i>	Nitella sp.	Submersed; Rooted	0.2
<i>Tolypella nidifica</i>	Tolypella sp.	Submersed; Rooted	1.6
<i>Drepanocladus revolvens</i>	Scorpion Moss	Submersed; Rooted	0.2
<i>Vallisneria americana</i>	Wild Celery	Submersed; Rooted	0.4
<i>Megalodonta beckii</i>	Water Marigold	Submersed; Rooted	0.5
<i>Nymphaea odorata</i>	White Waterlily	Floating-leaved; Rooted	1.0
<i>Potamogeton nodosus</i>	American Pondweed	Floating-leaved; Rooted	0.4
<i>Potamogeton natans</i>	Floating-leaf Pondweed	Floating-leaved; Rooted	0.03
<i>Nuphar variegata</i>	Yellow Waterlily	Floating-leaved; Rooted	1.0
<i>Brasenia schreberi</i>	Watershield	Floating-leaved; Rooted	0.1
<i>Lemna trisulca</i>	Star Duckweed	Floating-Leaved; Non-rooted	0.2
<i>Pontedaria cordata</i>	Pickerelweed	Emergent	0.3
<i>Typha latifolia</i>	Cattails	Emergent	0.9
<i>Peltandra virginica</i>	Arrow arum	Emergent	0.3
<i>Schoenoplectus acutus</i>	Bulrushes	Emergent	1.2
<i>Decodon verticillatus</i>	Swamp Loosestrife	Emergent	0.3
<i>Iris</i> spp.	Wild Iris	Emergent	0.2



**Figure 8.** Aquatic Vegetation Biovolume in Lake Mitchell (July 2, 2024).



**Figure 9.** Bottom hardness map (composition) of Lake Mitchell from the July 2, 2024 scan.

## Status of Invasive (Exotic) Aquatic Plant Species in Lake Mitchell plus treatment information

The amount of Eurasian Watermilfoil (Figure 10) present in Lake Mitchell varies each year and is dependent upon climatic conditions, especially runoff-associated nutrients. A whole-lake survey of the main lake was conducted on May 13, 2024 and revealed that approximately 25.5 acres of milfoil were found throughout the entire lake. This survey also revealed 2 acres of CLP within Little Cove. On May 29, 2024, these infestations were treated using ProcellaCOR @ 6pdu's + 1 gallon of diquat for the EWM and diquat @ 1 gallon / acre for the CLP. Additionally, there were 2 acres of nuisance natives treated using Aquathol-K @ 2gal/ acre and flumioxazin 100ppb. Franke North had 0.75 acres and Franke South had 1.25 acres. On June 6, 2024 there was a treatment for nuisance natives in the Torenta Canal of 0.3 acres with Aquastrike @ 2.5gal/acre and flumioxazin 200ppb. The next full lake survey occurred on July 2, 2024 where there was not any treatable EWM found but the canal and coves had dense nuisance native vegetation. On July 17, PLM conducted a treatment in the following areas using Aquastrike @ 2.5gal/ acre + flumioxazin @ 100ppb to address the nuisance natives; Big Cove = 5 acres, Little Cove = 1.5 acres, Torenta Canal = 1 acre, and Franke North = 2.5 acres. A third whole lake survey was done on August 2<sup>nd</sup>, 2024 after reports of dense nuisance native vegetation was occurring in the lake. RLS scientists discovered ~ 170 acres of dense native vegetation along with 32.5 acres of EWM. Treating all of this native vegetation would have been detrimental to the health of Lake Mitchell so we broke it down into navigational channels and this request was denied by EGLE, thus we had to abide by the 100ft x 100ft rule while controlling nuisance vegetation. On August 20<sup>th</sup>, 2024 PLM was able to treat 20 acres of nuisance natives with Aquastrike at 2.5gal/ acre + flumioxazin @ 100 ppb + Hydrothol-191 @ 0.5gal/ acre in the following locations; Franke North = 1.5 acres, Franke South = 1.5 acres, Little Cove = 5 acres, and North Shore = 12 acres. On this same day, 32.5 acres of dense EWM was treated using ProcellaCOR @ 6pdu's + diquat @ 1gal /acre with 0.45 acres treated in Big Cove and the other 32 acres treated in the main lake. On September 4<sup>th</sup>, 2024 PLM conducted their annual Phragmites and Purple Loosestrife treatments in Big Cove and the Franke Coves. Table 6 below shows the total acres of milfoil and nuisance weeds found in each region of the lake that was treated on various dates. Also noted are the effective products and doses used. A spring 2025 survey is needed, however, to determine the 2024 treatment efficacy as EWM plants were senesced by late September 2024 but may re-germinate in the same locations in 2025. Treatment maps for each of these invasive species are shown in the maps below (Figures 12-13). Also noted are the effective products and doses used.



**Figure 10. Eurasian Watermilfoil**



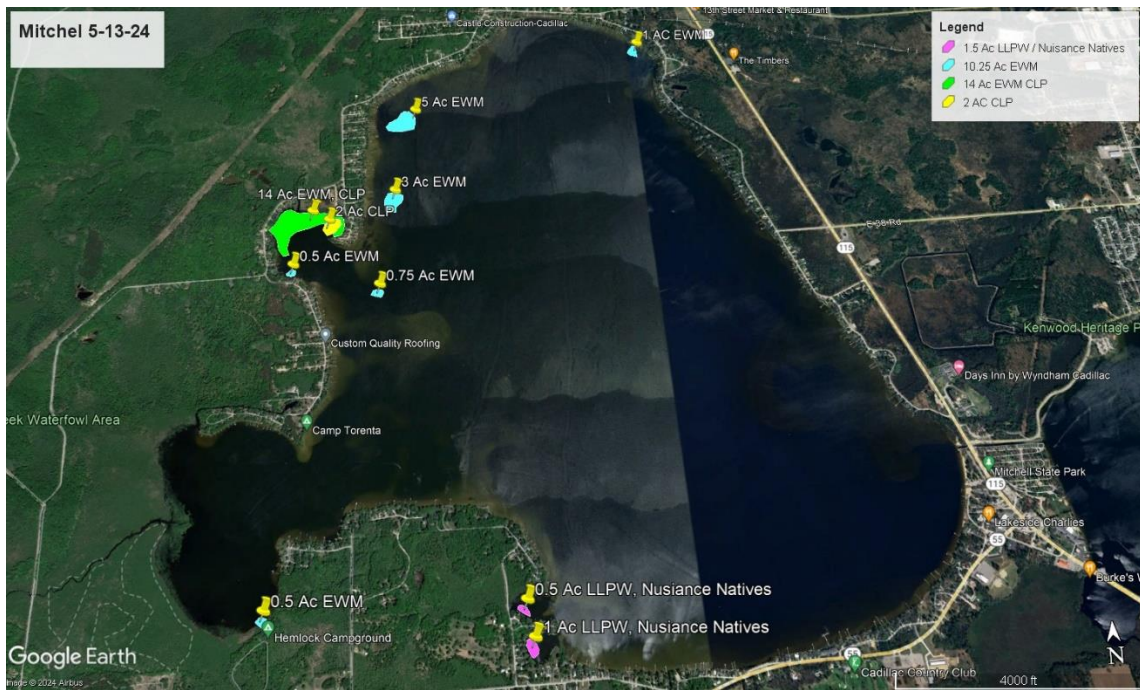
**Figure 11. Curly-leaf Pondweed**

**Table 6. Number of acres of nuisance aquatic vegetation managed in various regions of Lake Mitchell (May - September 2024).**

Area of Lake Treated	Date Treated	# Acres of EWM	# Acres of CLP or Nuisance Pondweeds	Products Used and Associated Doses
<b>Franke South Cove</b>	5-29	--	1.25	Aquathol-K® (2 gal/acre) +flumioxazin @ 100ppb
	8-2	--	3	Aquastrike @2.5gal / acre + flumioxazin @ 100ppb, + Hydrothol -191 @ 0.5gal/ acre
<b>Main Lake</b>	5-29	25.5		ProcellaCOR®/diquat (6 PDU + 1 gal/acre) & 1 gal diquat / acre (CLP)
	8-20	32	--	ProcellaCOR®/diquat (6 PDU + 1 gal/acre)
<b>Big Cove</b>	5-29	0.5	--	ProcellaCOR®/diquat (6 PDU + 1 gal/acre)
	7-17	---	5	Aquastrike @ 2.5 gal/acre + flumioxazin @ 100ppb
	8-20	0.45	---	ProcellaCOR / diquat (6PDU + 1gal/ac)
<b>Little Cove</b>	5-29	15	2	ProcellaCOR / diquat (6PDU + 1gal/ac), diquat 1gal/acre (CLP)
	7-17	--	2.7	
	8-20	---	5	Aquastrike @2.5gal /acre + SeClear G@ 20#/acre  Aquastrike @2.5gal/acre + flumioxazin @100ppb + Hydrothol-191 @0.5gal/acre
<b>Franke North Cove</b>	5-29	--	0.75	Aquathol-K @ 2gal/acre + flumioxazin@100ppb
	7-17	--	2.5	Aquastrike @2.5gal/acre + flumioxazin@100ppb

<b>Torenta Canal</b>	6-26	--	0.3	Aquastrike @ 2.5gal/acre
	7-17	---	2.5	Aquastrike @ 2.5gal/acre + flumioxazin @50ppb

**NOTE: Purple loosestrife treated with triclopyr on September 4, 2024 in Franke North, Little Cove, and Franke South.**



**Figure 12. Distribution of EWM and CLP in Lake Mitchell (May 13, 2024). A marked reduction in EWM in the main lake occurred relative to previous years due to intense treatment efforts and surveys.**



Figure 13. Late-season Distribution of EWM in the main lake and coves (August 5, 2024)

### Evaluation of Purple Loosestrife Beetles on Lake Mitchell Purple Loosestrife Reduction:

The beetle, *Galerucella* sp. had been previously stocked around areas of Lake Mitchell infested with Purple Loosestrife. The goal was to introduce enough beetles each season to create a sustainable population around the lake to naturally take over management of the invasive Purple Loosestrife. Previously, beetle counts were performed on the plants each year to evaluate the number of beetles found along with damage of the inflorescences (flower portions of the plants). Due to lack of beetle availability, the beetle population began declining in 2020-2021. Due to this issue, RLS recommended the application of the herbicide triclopyr to the Purple Loosestrife still present in Franke North, Big Cove, and Little Cove. These areas were treated on August 28, 2023 and on September 4, 2024 and showed sustained control in 2024. They will need to be evaluated again in the summer of 2025 to determine if more treatments are needed for continued control. RLS will report those results in the 2025 annual report.

## Management Recommendations for 2025

Detailed aquatic vegetation surveys will be done in 2025 to determine locations of EWM, CLP, and any other nuisance invasive species or natives that may be a threat to the Lake Mitchell ecosystem. Along with the surveys, bottom scans will be conducted to determine changes in aquatic biovolume and distribution of aquatic vegetation. These surveys will occur during the summer or early fall depending on weather patterns that correspond with growth patterns. A post-treatment survey will also be scheduled after each treatment, along with intermittent post-treatment surveys if small-scale treatments are conducted. RLS scientists will oversee all treatments as in previous years. RLS will notify the LMIB of the 2025 survey and treatment dates and update the LMIB on all management activities. Treatments may need to be rescheduled depending upon wind and other weather conditions.

In 2025, RLS is recommending treatment of large offshore areas with a combination of the systemic herbicide ProcellaCOR® along with the contact herbicide diquat, which resulted in sustained control on EWM. Diquat and/or flumioxazin or Aquathol-K® will continue to be used in the cove areas for nuisance natives, especially dense pondweeds. An additional triclopyr treatment may be needed in Franke North, Little Cove, and Big Cove for the treatment of Purple Loosestrife later in the season. Phragmites will also continue to be monitored and recommended for treatment when infestations arise. Maintaining EWM at existing low levels will be the top priority to keeping a healthy aquatic plant balance and continuing to maintain a low assessment for the lakefront owners in the special assessment district. RLS is aware that mid to late season seedbank germination can occur and is prepared to address those with lake surveys and mapping. The canal will be assessed for the need for a possible harvest and scheduled if necessary although those harvests have lasted for a few years at a time.

Water quality will continue to be monitored in the lake and tributaries. The water quality of the tributaries in 2024 was improved relative to reduced nutrients, likely due to less rainfall and runoff. New water quality data from 2025 will be compared to historic data to continue evaluation of long-term trends. Lake Mitchell is a healthy lake with excellent aquatic plant diversity. In 2024, there was a community shift in some of the native plant densities, but this is normal due to environmental factors such as icepack and the amount of rainfall in the early season. Nutrients in the lake deep basins are at acceptable levels below the eutrophic threshold and there is a robust fishery indicated by the many fishing tournaments held on the lake.

Temporary algal blooms occur during hot windless periods or after intense rainfall events. RLS will continue to monitor the lake for any problematic algal blooms. If there are intense algae blooms or you suspect there to be an HAB (harmful algae -bloom) from blue-green algae, please report this by emailing: [algaebloom@michigan.gov](mailto:algaebloom@michigan.gov) or calling the Environmental Assistance Center @ 800-662-9278.

Lake Mitchell Improvement Board meetings will be attended by an RLS scientist as in previous years and RLS will develop a comprehensive annual report during the year that will be presented to the LMIB in the fall/winter of 2025. The graph below shows the results of the successful EWM reduction plan for Lake Mitchell which has resulted in substantial savings to the LMIB over the years. In 2024, there was a late season germination which can occur at any time. The quick response resulted in ample time for the treatment to be effective for late season decay of treated milfoil plants. This year's treatments was the lowest on record showing good residual control from the 2023 treatment season.

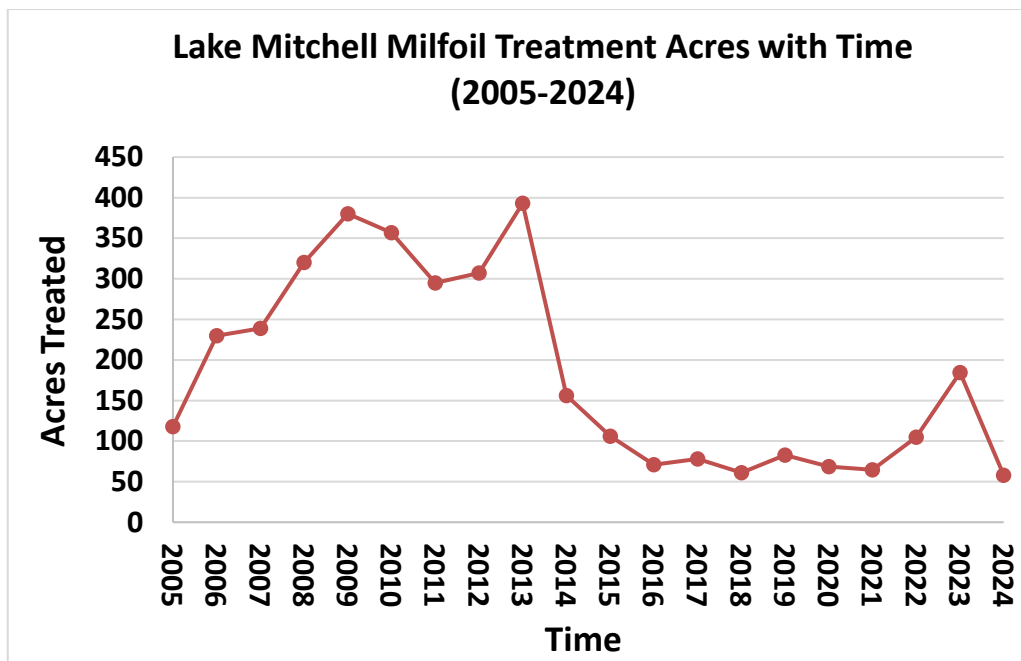


Figure 14. Trendline of EWM treatment over time within Lake Mitchell since 2005.