

2024

LAKE LANSING

ANNUAL REPORT

PREPARED FOR:
LAKE LANSING S.A.D. ADVISORY BOARD
INGHAM COUNTY, MI

TABLE OF CONTENTS

EXECUTIVE SUMMARY - 1

INTRODUCTION - 2

WATER QUALITY - 3

- Lake Water Quality - 3
 - Temperature - 4
 - Dissolved Oxygen - 4
 - Phosphorus - 5
 - Chlorophyll-*a* - 5
 - Secchi Transparency - 5
 - Lake Classification Criteria - 5
 - pH and Total Alkalinity - 6
 - Sampling Methods - 7
- Sampling Results and Discussion - 7

NUISANCE AQUATIC PLANT CONTROL - 12

PLANT INVENTORY SURVEY - 15

INFORMATION AND EDUCATION - 16

APPENDICIES

- Appendix A - Lake Lansing 2024 Newsletters

TABLE OF CONTENTS

LIST OF TABLES

- Table 1 Lake Classification Criteria
- Table 2 pH and Alkalinity of Upper Midwest Lakes
- Table 3 Lake Lansing 2024 Deep Basin Water Quality Data
- Table 4 Lake Lansing 2024 Surface Water Quality Data
- Table 5 Lake Lansing 2024 Plant Control Activities
- Table 6 Lake Lansing 2024 Plant Inventory Data

LIST OF FIGURES

- Figure 1 Lake Lansing location map
- Figure 2 Lake classification
- Figure 3 Seasonal thermal stratification cycles
- Figure 4 Secchi disk
- Figure 5 Composite sampler
- Figure 6 Lake Lansing sampling location map
- Figure 7 Lake Lansing volume-weighted average total phosphorus, 1999-2024
- Figure 8 Lake Lansing mean secchi transparency, 2000-2024
- Figure 9 Lake Lansing mean chlorophyll-a concentrations, 1999-2024
- Figure 10 Natural shoreline graphic
- Figure 11 Eurasian milfoil
- Figure 12 Curly-leaf pondweed
- Figure 13 Starry stonewort
- Figure 14 Lake Lansing aquatic plant survey map
- Figure 15 Aquatic plant groups
- Figure 16 Lake Lansing DNR recommended wake boat zones

EXECUTIVE SUMMARY

The Lake Lansing Special Assessment District was formed in 1998 to improve conditions in Lake Lansing. In 2017, the project was renewed for a 10-year period. The project includes an update of the lake and watershed management plan, water quality sampling, nuisance aquatic plant control, watershed improvements, educational programs, and grant applications. The following is a summary of project activities:

Water Quality Sampling: In 2024, samples were collected from Lake Lansing in March and August. Phosphorus levels were moderate, with the exception of the deepest samples in late summer which were elevated. Water clarity was moderate in spring and summer, and algae growth was minimal during both sampling events. Tributary monitoring was conducted in spring and summer.

Nuisance Aquatic Plant Control: In 2024, 138 acres infested by non-native milfoil and curly-leaf pondweed required treatment in May and 38.25 acres of starry stonewort and nuisance native plants were harvested in August. An additional 8.25 acres of non-native milfoil was treated in August.

Information and Education: In 2024; newsletters were mailed to all residents in the spring and summer, the annual Landing Blitz was held at the Lake Lansing public launch site in June, and DNR wake boat recommendations were used to create a wake boat operation areas map and sign at the Lake Lansing boat launch.



INTRODUCTION

Lake Lansing is located in Meridian Township, Ingham County, Michigan (Figure 1). The lake is 456 acres in surface area with a maximum depth of 35 feet and a mean (average) depth of 8.7 feet. In 1998, the Charter Township of Meridian established a special assessment district (SAD) under provisions of Public Act 188 of 1954 for the purposes of studying water quality, planning and implementing aquatic plant control, and developing a lake and watershed management plan for Lake Lansing. In March of 2002, a management plan was prepared for Lake Lansing and its watershed. Public hearings were held in summers of 2002, 2007, and 2017 to continue the management program for the lake. Ongoing management is overseen by the Lake Lansing SAD Advisory Committee (hereinafter, the Advisory Committee) with assistance from the Advisory Committee's professional consultant, Progressive Companies. The Advisory Committee includes representatives from each of the tiers in the SAD, Meridian Township Engineering Department, Ingham County Parks Department, and Ingham County Drain Commissioner's Office. This report includes information on 2024 Lake Lansing management activities.

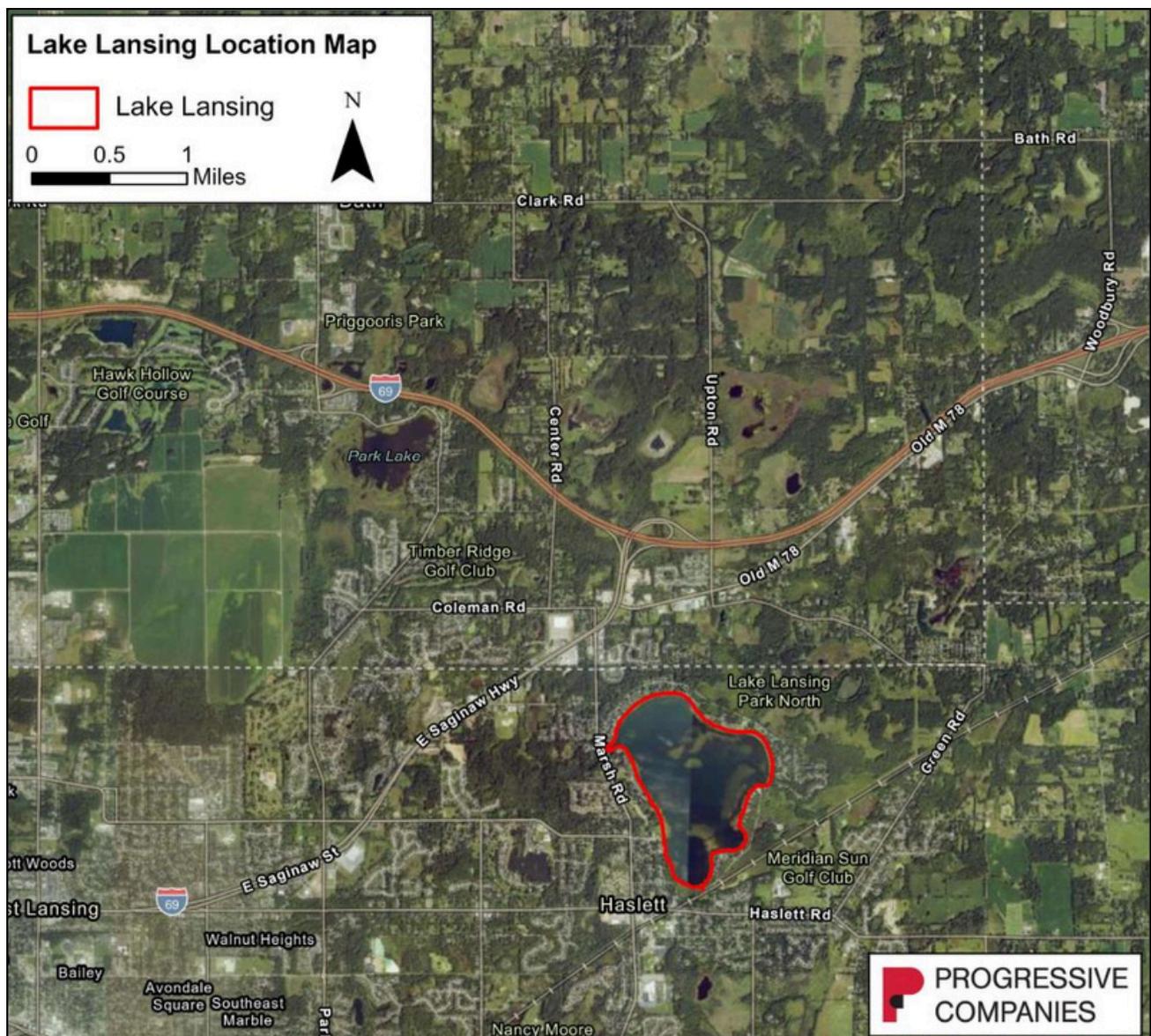


Figure 1. Lake Lansing location map. Source: NAIP Imagery.

WATER QUALITY

LAKE WATER QUALITY

Lake water quality is determined by a unique combination of processes that occur both within and outside of the lake. In order to make sound management decisions, it is necessary to have an understanding of the current physical, chemical, and biological condition of the lake, and the potential impact of drainage from the surrounding watershed.

Lakes are commonly classified as oligotrophic, mesotrophic, or eutrophic (Figure 2). Oligotrophic lakes are generally deep and clear with little aquatic plant growth. These lakes maintain sufficient dissolved oxygen in the cool, deep bottom waters during late summer to support cold-water fish such as trout and whitefish. By contrast, eutrophic lakes are generally shallow, turbid, and support abundant aquatic plant growth. In deep eutrophic lakes, the cool bottom waters usually contain little or no dissolved oxygen. Therefore, these lakes can only support warmwater fish such as bass and pike. Lakes that fall between these two extremes are called mesotrophic lakes.

Under natural conditions, most lakes will ultimately evolve to a eutrophic state as they gradually fill with sediment and organic matter transported to the lake from the surrounding watershed. As the lake becomes shallower, the process accelerates. When aquatic plants become abundant, the lake slowly begins to fill in as sediment and decaying plant matter accumulate on the lake bottom. Eventually, terrestrial plants become established and the lake is transformed to a marshland. The aging process in lakes is called "eutrophication" and may take anywhere from a few hundred to several thousand years, generally depending on the size of the lake and its watershed. The natural lake aging process can be greatly accelerated if excessive amounts of sediment and nutrients (which stimulate aquatic plant growth) enter the lake from the surrounding watershed. Because these added inputs are usually associated with human activity, this accelerated lake aging process is often referred to as "cultural eutrophication." The problem of cultural eutrophication can be managed by identifying sources of sediment and nutrient loading (i.e., inputs) to the lake and developing strategies to halt or slow the inputs. Thus, in developing a management plan, it is necessary to determine the limnological (i.e., the physical, chemical, and biological) condition of the lake and the physical characteristics of the watershed as well. Key parameters used to evaluate the limnological condition of a lake include temperature, dissolved oxygen, total phosphorus, pH and alkalinity, chlorophyll-*a*, and Secchi transparency.

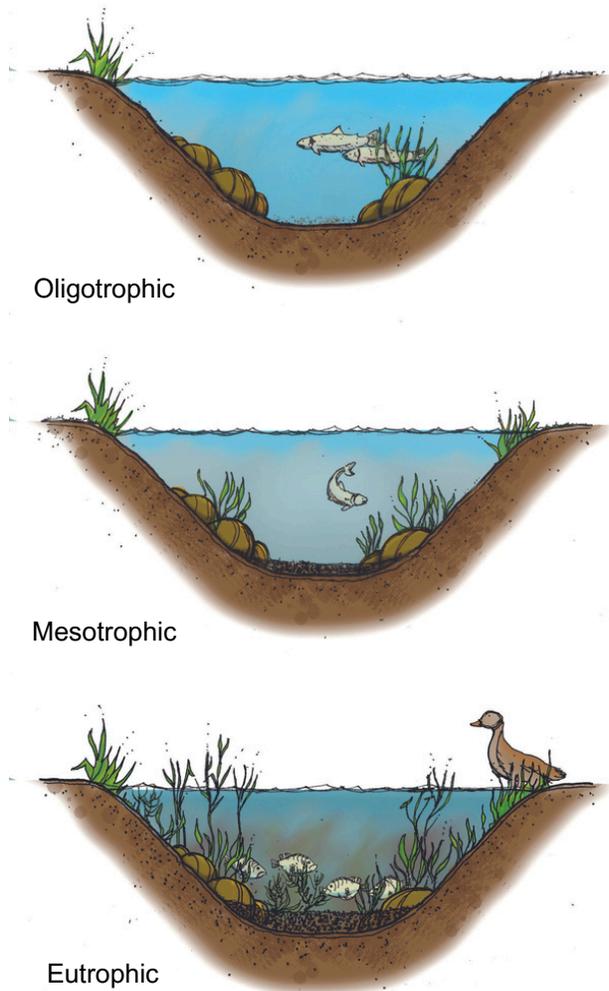


Figure 2. Lake classification.

WATER QUALITY

TEMPERATURE

Temperature is important in determining the type of organisms which may live in a lake. For example, trout prefer temperatures below 68°F. Temperature also determines how water mixes in a lake. As the ice cover breaks up on a lake in the spring, the water temperature becomes uniform from the surface to the bottom. This period is referred to as "spring turnover" because water mixes throughout the entire water column. As the surface waters warm, they are underlain by a colder, more dense strata of water. This process is called thermal stratification (Figure 3). Once thermal stratification occurs, there is little mixing of the warm surface waters with the cooler bottom waters. The transition layer that separates these layers is referred to as the "thermocline." The thermocline is characterized as the zone where temperature drops rapidly with depth. As fall approaches, the warm surface waters begin to cool and become more dense. Eventually, the surface temperature drops to a point that allows the lake to undergo complete mixing. This period is referred to as "fall turnover." As the season progresses and ice begins to form on the lake, the lake may stratify again. However, during winter stratification, the surface waters (at or near 32°F) are underlain by slightly warmer water (about 39°F). This is sometimes referred to as "inverse stratification" and occurs because water is most dense at a temperature of about 39°F. As the lake ice melts in the spring, these stratification cycles are repeated.

DISSOLVED OXYGEN

An important factor influencing lake water quality is the quantity of dissolved oxygen in the water column. The major inputs of dissolved oxygen to lakes are the atmosphere and photosynthetic activity by aquatic plants. An oxygen level of about 5 mg/L (milligrams per liter, or parts per million) is required to support warmwater fish. In lakes deep enough to exhibit thermal stratification, oxygen levels are often reduced or depleted below the thermocline once the lake has stratified. This is because the oxygen has been consumed, in large part, by bacteria that use oxygen as they decompose organic matter (plant and animal remains) at the bottom of the lake. Bottom-water oxygen depletion is a common occurrence in eutrophic and some mesotrophic lakes. Thus, eutrophic and most mesotrophic lakes cannot support coldwater fish because the cool, deep water (that the fish require to live) does not contain sufficient oxygen.

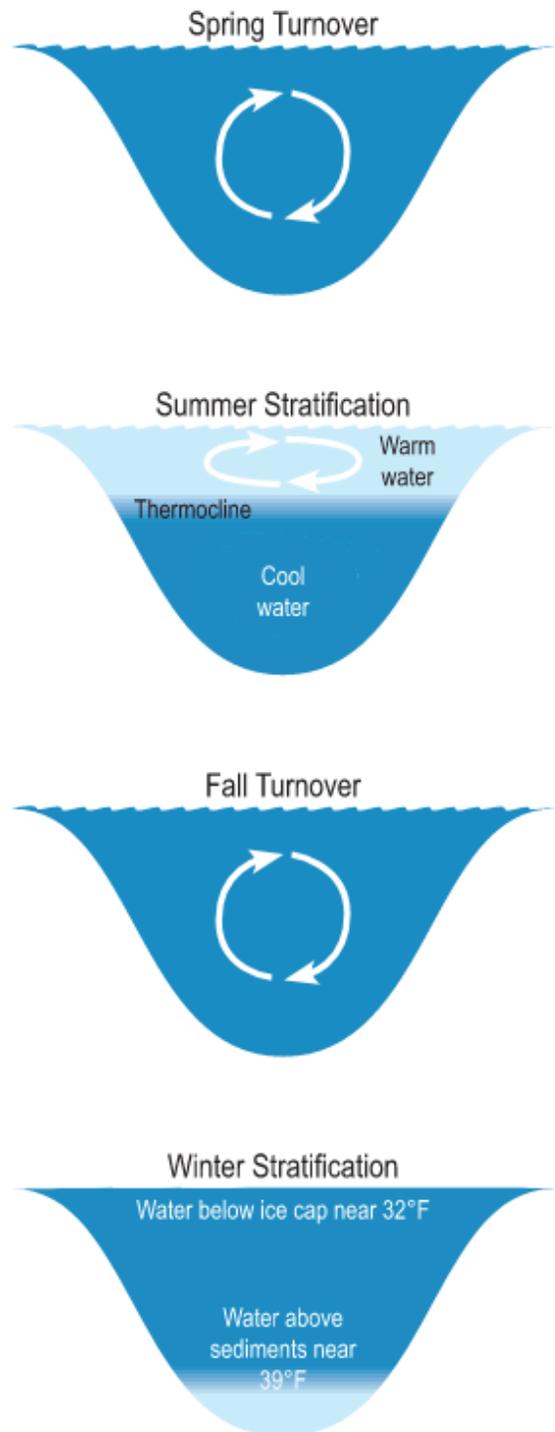


Figure 3. Seasonal thermal stratification cycles.

WATER QUALITY

PHOSPHORUS

The quantity of phosphorus present in the water column is especially important since phosphorus is the nutrient that most often controls aquatic plant growth and the rate at which a lake ages and becomes more eutrophic. By reducing the availability of phosphorus in a lake, it is often possible to control the amount of aquatic plant growth. In general, lakes with a phosphorus concentration of 20 µg/L (micrograms per liter, or parts per billion) or greater are able to support abundant plant growth and are classified as nutrient-enriched or eutrophic.

Phosphorus enters the lake either from the surrounding watershed, or from the sediments in the lake itself, or both. The input of phosphorus from the watershed is called "external loading," and from the sediments is called "internal loading." External loading occurs when phosphorus washes into the lake from sources such as fertilizers, septic systems, and eroding land. Internal loading occurs when bottom-water oxygen is depleted, resulting in a chemical change in the water near the sediments. The chemical change causes phosphorus to be released from the sediments into the lake where it becomes available as a nutrient for aquatic plants.

CHLOROPHYLL-a

Chlorophyll-a is a pigment that imparts the green color to plants and algae. A rough estimate of the quantity of algae present in lake water can be made by measuring the amount of chlorophyll-a in the water column. A chlorophyll-a concentration greater than 6 µg/L is considered characteristic of a eutrophic condition.

SECCHI TRANSPARENCY

A Secchi disk is often used to estimate water clarity. The measurement is made by fastening a round, black and white, 8-inch disk to a calibrated line (Figure 4). The disk is lowered over the deepest point of the lake until it is no longer visible, and the depth is noted. The disk is then raised until it reappears. The average between these two depths is the Secchi transparency. Generally, it has been found that aquatic plants can grow at a depth of at least twice the Secchi transparency measurement. In eutrophic lakes, water clarity is often reduced by algae growth in the water column, and Secchi disk readings of 7.5 feet or less are common.



Figure 4. Secchi disk.

LAKE CLASSIFICATION CRITERIA

Ordinarily, as phosphorus inputs (both internal and external) to a lake increase, the amount of algae the lake can support will also increase. Thus, the lake will exhibit increased chlorophyll-a levels and decreased transparency. A summary of lake classification criteria developed by the Michigan Department of Natural Resources is shown in Table 1.

TABLE 1 - LAKE CLASSIFICATION CRITERIA

| Lake Classification | Total Phosphorus (ug/L)* | Chlorophyll-a (ug/L)* | Secchi Transparency (feet) |
|---------------------|--------------------------|-----------------------|----------------------------|
| Oligotrophic | Less than 10 | Less than 2.2 | Greater than 15.0 |
| Mesotrophic | 10 to 20 | 2.2 to 6.0 | 7.5 to 15.0 |
| Eutrophic | Greater than 20 | Greater than 6.0 | Less than 7.5 |

* ug/L = micrograms per liter

WATER QUALITY

pH and TOTAL ALKALINITY

pH is a measure of the amount of acid or base in the water. The pH scale ranges from 0 (acidic) to 14 (alkaline or basic) with neutrality at 7. The pH of most lakes in the Upper Midwest ranges from 6.5 to 9.0 (Michigan Department of Environmental Quality (MDEQ)* 2012; Table 2). In addition, according to the Michigan Department of Environment, Great Lakes, and Energy (EGLE 2021):

While there are natural variations in pH, many pH variations are due to human influences. Fossil fuel combustion products, especially automobile and coal-fired power plant emissions, contain nitrogen oxides and sulfur dioxide, which are converted to nitric acid and sulfuric acid in the atmosphere. When these acids combine with moisture in the atmosphere, they fall to earth as acid rain or acid snow. In some parts of the United States, especially the Northeast, acid rain has resulted in lakes and streams becoming acidic, resulting in conditions which are harmful to aquatic life. The problems associated with acid rain are lessened if limestone is present, since it is alkaline and neutralizes the acidity of the water.

Most aquatic plants and animals are adapted to a specific pH range, and natural populations may be harmed by water that is too acidic or alkaline. Immature stages of aquatic insects and young fish are extremely sensitive to pH values below 5. Even microorganisms which live in the bottom sediment and decompose organic debris cannot live in conditions which are too acidic. In very acidic waters, metals which are normally bound to organic matter and sediment are released into the water. Many of these metals can be toxic to fish and humans. Below a pH of about 4.5, fish are unable to survive.

The Michigan Water Quality Standard (Part 4 of Act 451) states that pH shall be maintained within the range of 6.5 to 9.0 in all waters of the state.

Alkalinity, also known as acid-neutralizing capacity or ANC, is the measure of the pH-buffering capacity of water in that it is the quantitative capacity of water to neutralize an acid. pH and alkalinity are closely linked and are greatly impacted by the geology and soil types that underlie a lake and its watershed. According to MDEQ (2012):

Michigan's dominant limestone geology in the Lower Peninsula and the eastern Upper Peninsula contributes to the vast majority of Michigan lakes being carbonate-bicarbonate dominant [which increases alkalinity and moderates pH] and lakes in the western Upper Peninsula having lower alkalinity and thus lesser buffering capacity.

The alkalinity of most lakes in the Upper Midwest is within the range of 23 to 148 milligrams per liter, or parts per million, as calcium carbonate (MDEQ 2012; Table 2).

TABLE 2 - pH AND ALKALINITY OF UPPER MIDWEST LAKES

| Measurement | Low | Moderate | High |
|--|---------------|------------|------------------|
| pH (in standard units) | Less than 6.5 | 6.5 to 9.0 | Greater than 9.0 |
| Total Alkalinity or ANC (in mg/L as CaCO ₃)* | Less than 23 | 23 to 148 | Greater than 148 |

* MDEQ now the Michigan Department of Environment, Great Lakes, and Energy (EGLE)

* mg/L as CaCO₃ = milligrams per liter as calcium carbonate

LAKE LANSING WATER QUALITY

SAMPLING METHODS

Water quality sampling was conducted in the spring and summer of 2024 at the two deep basins within Lake Lansing (Figure 6). Temperature and dissolved oxygen were measured using a YSI ProSolo ODO/T probe. Samples were collected at the surface, mid-depth, and just above the lake bottom with a Van Dorn bottle to be analyzed for pH, total alkalinity, and total phosphorus. pH was measured in the field using a Hach Pocket Pro pH meter. Total alkalinity and total phosphorus samples were placed on ice and transported to Progressive Companies and to Summit Laboratory*, respectively, for analysis. Total alkalinity was titrated at Progressive Companies using Standard Methods procedure 2320 B, and total phosphorus was analyzed at Summit Laboratory using Standard Methods procedure 4500-P E. In addition to the depth-interval samples at each deep basin, Secchi transparency was measured and composite chlorophyll-*a* samples were collected from the surface to a depth equal to twice the Secchi transparency. Chlorophyll-*a* samples were analyzed by Prein and Newhof Laboratories* using Standard Methods procedure 10200 H. Tributaries were monitored in spring and summer for the most significant storm drains and inlet streams (Figure 6). When streams were flowing, discharge was estimated. Stream velocity was measured with a Global FP111 Flow Probe. Summit Laboratory analyzed samples for total phosphorus and total suspended solids.

SAMPLING RESULTS AND DISCUSSION

Sampling results are provided in Tables 3 and 4. A graphic summary of water quality data compiled to date is shown in Figures 7-9.

In March of 2024, sampling was conducted during spring turnover when water temperatures were cool and dissolved oxygen concentrations were high. At this time, only tributary site three exhibited flow. Total phosphorus and total suspended solids were both low within the tributary. During the August sampling period, Lake Lansing was thermally stratified; the lake was warm and well-oxygenated at the surface, and was cool with low oxygen near the bottom. In 2024, total phosphorus concentrations were moderate, with the exception of the deepest samples in late summer which were high - likely a result of internal loading. The elevated bottom-water phosphorus is likely due to internal release of phosphorus from the lake sediments. pH and total alkalinity were generally within the moderate range for Upper Midwest lakes. During August sampling, only tributary site one exhibited flow. Total phosphorus in the tributary was elevated, however, minimal discharge was recorded and is therefore assumed to have had minimal impact on Lake Lansing's water quality. Based upon recent and historical water quality data, Lake Lansing is mesotrophic.

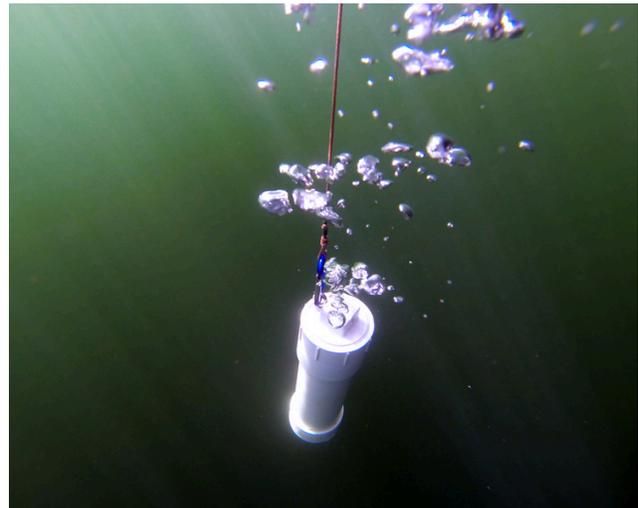


Figure 5. Composite sampler.

* Summit Laboratory, 900 Godfrey Ave SW, Grand Rapids, MI 49503

* Prein and Newhof Laboratories, 3260 Evergreen Dr NE, Grand Rapids, MI 49525

LAKE LANSING WATER QUALITY

TABLE 3 - LAKE LANSING 2024 DEEP BASIN WATER QUALITY DATA

| Date | Station | Sample Depth (feet) | Temp (F) | Dissolved Oxygen (mg/L)* | Total Phosphorus (ug/L)* | pH (S.U.)* | Total Alkalinity (mg/L CaCO3)* |
|-----------|---------|---------------------|----------|--------------------------|--------------------------|------------|--------------------------------|
| 12-Mar-24 | 1 | 1 | 45 | 11.7 | <10 | 7.1 | 74 |
| 12-Mar-24 | 1 | 16 | 44 | 11.7 | <10 | 7.1 | 120 |
| 12-Mar-24 | 1 | 32 | 44 | 11.6 | <10 | 7.1 | 115 |
| 12-Mar-24 | 2 | 1 | 45 | 11.7 | <10 | 7.0 | 124 |
| 12-Mar-24 | 2 | 12 | 44 | 11.8 | <10 | 6.9 | 130 |
| 12-Mar-24 | 2 | 24 | 44 | 11.8 | <10 | 6.9 | 128 |
| 14-Aug-24 | 1 | 1 | 76 | 9.4 | 17 | 8.6 | 109 |
| 14-Aug-24 | 1 | 15 | 74 | 9.3 | 14 | 8.4 | 109 |
| 14-Aug-24 | 1 | 30 | 57 | 0.1 | 82 | 7.3 | 158 |
| 14-Aug-24 | 2 | 1 | 77 | 9.3 | 11 | 8.2 | 111 |
| 14-Aug-24 | 2 | 14 | 72 | 5.5 | 13 | 7.9 | 112 |
| 14-Aug-24 | 2 | 25 | 54 | 0.2 | 93 | 6.7 | 168 |

TABLE 4 - LAKE LANSING 2024 SURFACE WATER QUALITY DATA

| Date | Station | Secchi Transparency (feet) | Chlorophyll-a (ug/L)* |
|-----------|---------|----------------------------|-----------------------|
| 12-Mar-24 | 1 | 9.5 | ND* |
| 12-Mar-24 | 2 | 10.0 | 1 |
| 14-Aug-24 | 1 | 8.0 | ND* |
| 14-Aug-24 | 2 | 8.0 | 1 |

* mg/L = milligrams per liter = parts per million

* ug/L = micrograms per liter = parts per billion

* S.U. = standard units

* mg/L CaCO3 = milligrams per liter as calcium carbonate

*ND = not detected

LAKE LANSING WATER QUALITY

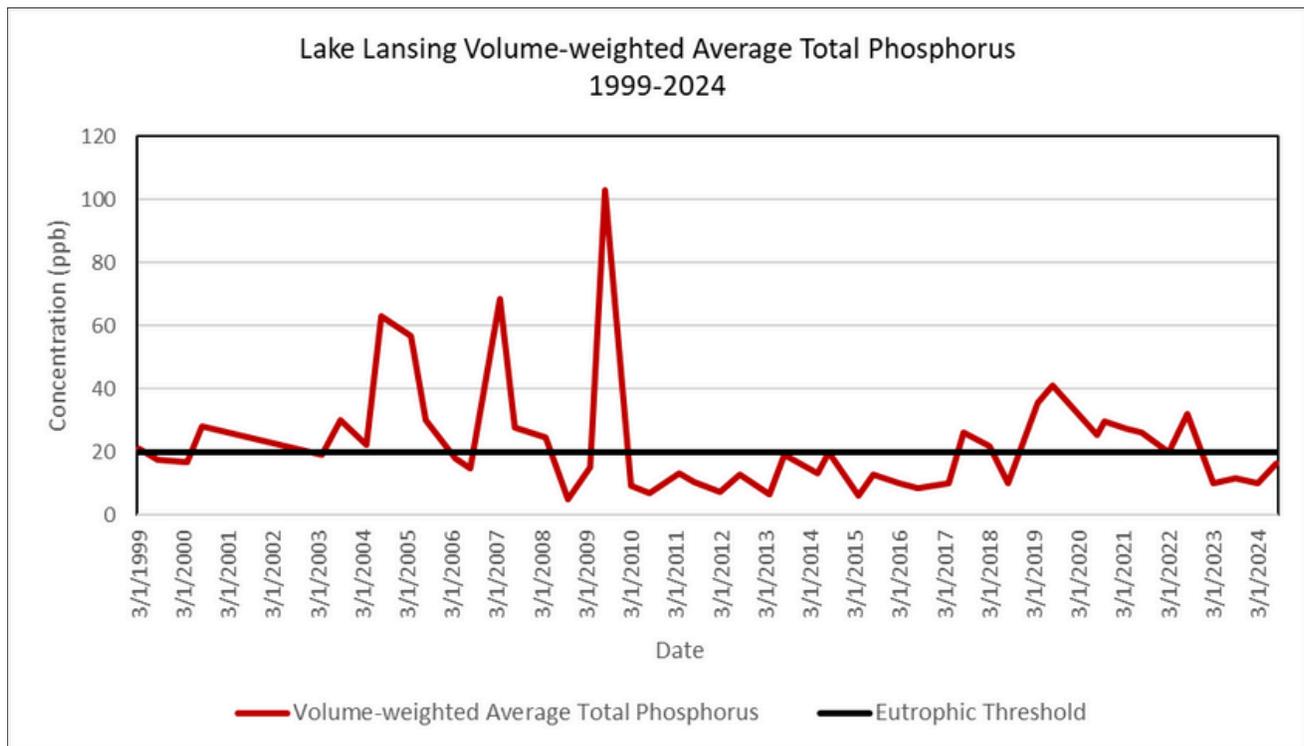


Figure 7. Lake Lansing volume-weighted average total phosphorus, 1999-2024.

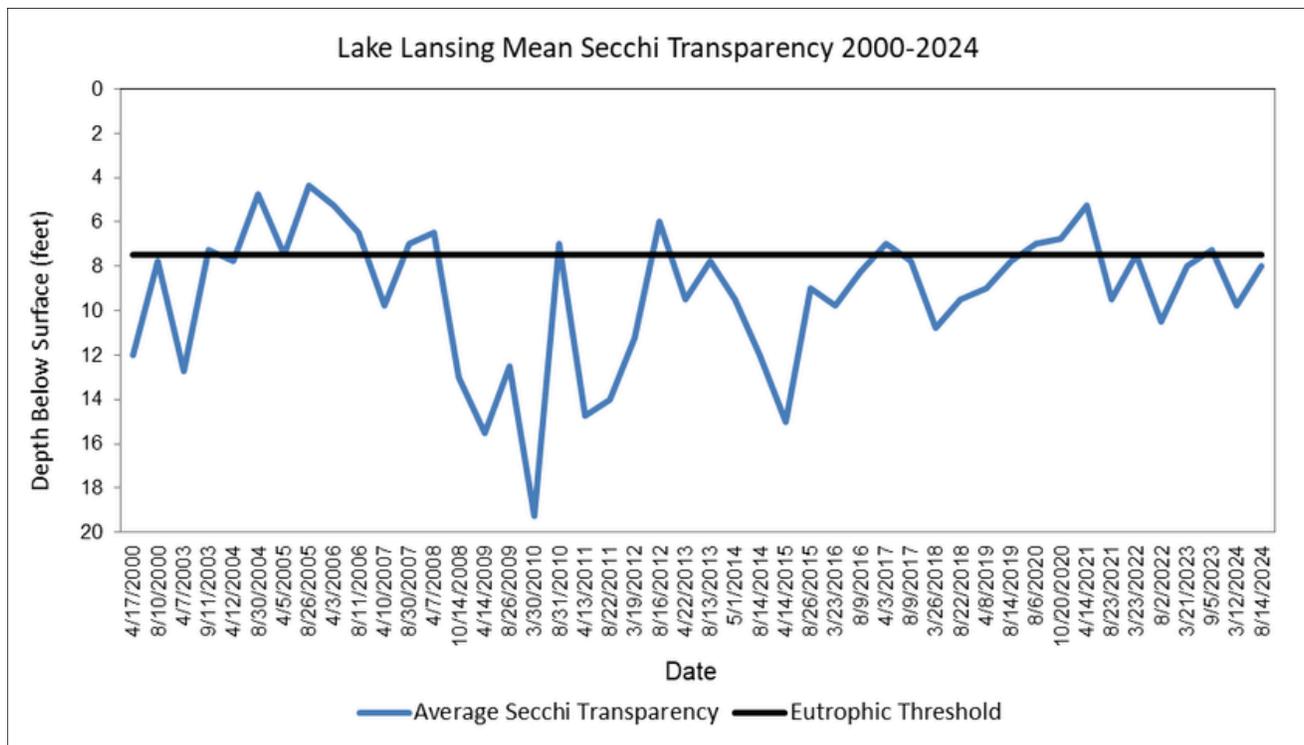


Figure 8. Lake Lansing mean secchi transparency, 2000-2024.

LAKE LANSING WATER QUALITY

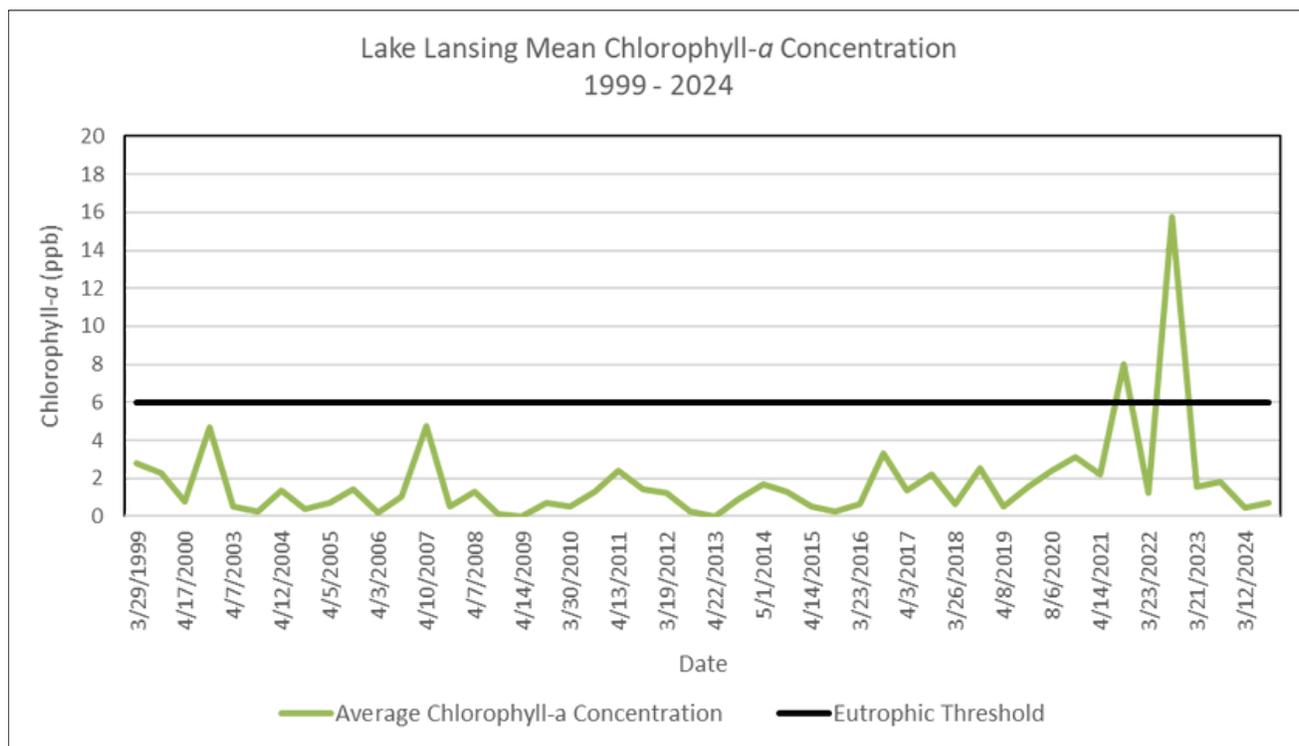


Figure 9. Lake Lansing mean chlorophyll-a concentrations, 1999-2024.

NUISANCE AQUATIC PLANT CONTROL

A nuisance aquatic plant control program has been ongoing on Lake Lansing since 1998. The primary objective of the program is to prevent the spread of invasive aquatic plants while preserving beneficial native plant species. This report contains an overview of plant control activities conducted on Lake Lansing in 2024.

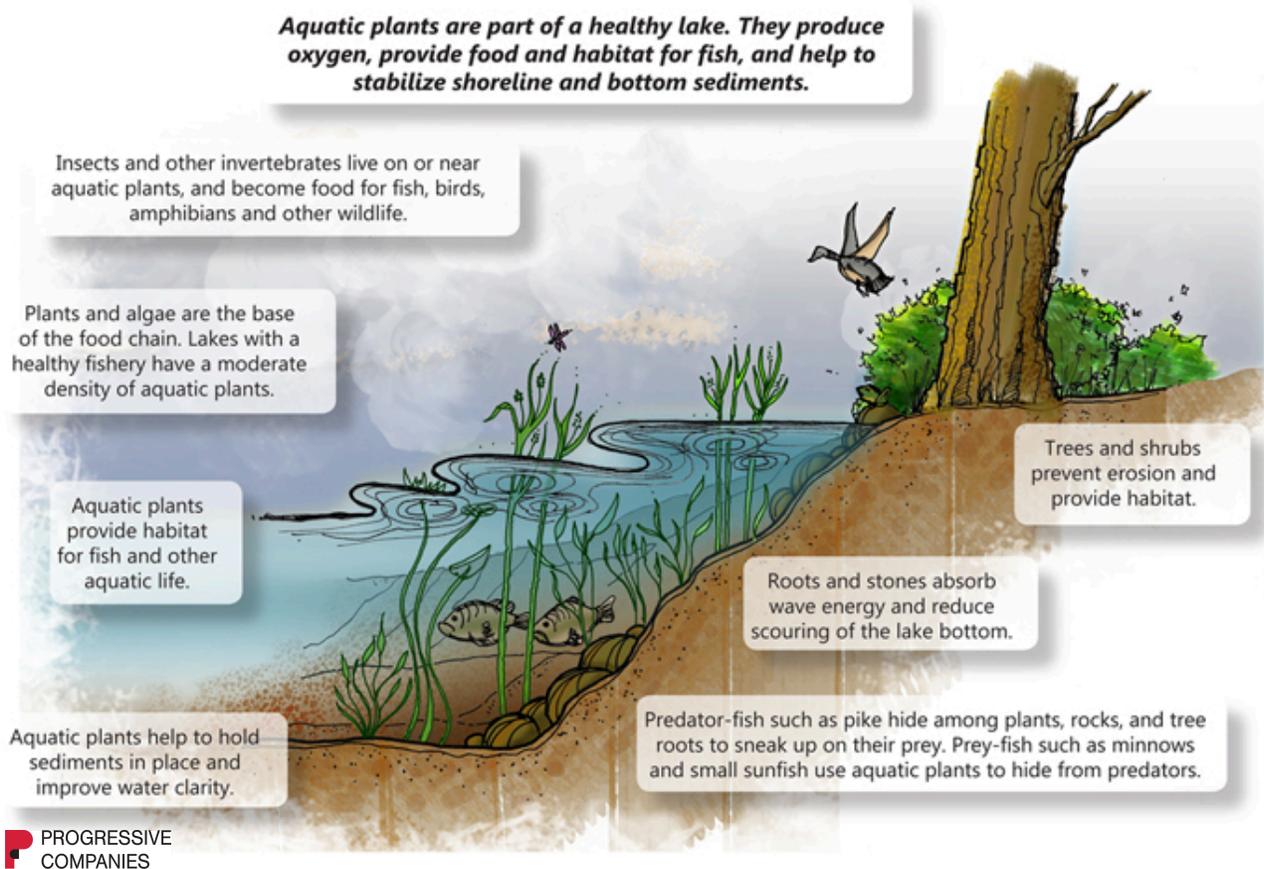


Figure 10. Natural shoreline graphic.

Aquatic plants are an important component of lakes. They produce oxygen during photosynthesis, provide food, habitat and cover for fish, and help stabilize shoreline and bottom sediments. There are four main aquatic plant groups: submersed, floating-leaved, free-floating, and emergent. Each plant group provides important ecological functions. Maintaining a diversity of native aquatic plants is important to sustaining a healthy fishery and a healthy lake. Invasive aquatic plant species have negative impacts to the lake's ecosystem. It is important to maintain an active plant control program to reduce the introduction and spread of invasive species within Lake Lansing. Plant control efforts in 2024 consisted of six aquatic plant surveys, two aquatic herbicide applications, and a mechanical harvesting event.

NUISANCE AQUATIC PLANT CONTROL

Plant control activities are coordinated under the direction of an environmental consultant, Progressive Companies. Scientists from Progressive conduct GPS-guided surveys of the lake to identify problem areas, and georeferenced plant control maps are provided to the plant control contractors. GPS reference points are established along the shoreline and a 300-ft grid over shallow areas of the lake. These waypoints are used to accurately identify the location of invasive and nuisance plant growth areas.



Figure 11. Eurasian milfoil *Myriophyllum spicatum*.



Figure 12. Curly-leaf pondweed *Potamogeton crispus*.



Figure 13. Starry stonewort *Nitellopsis obtusa*.

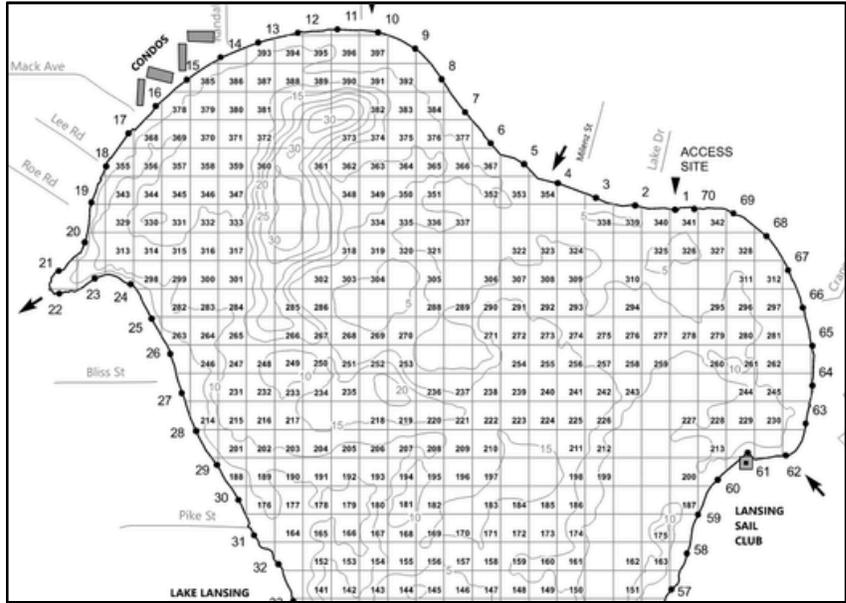


Figure 14. Lake Lansing aquatic plant survey map.

Primary plants targeted for control in Lake Lansing include Eurasian milfoil, curly-leaf pondweed, and starry stonewort. These plants are non-native (exotic) species that tend to be highly invasive and have the potential to spread quickly if left unchecked. Plant control activities conducted on the lake in 2024 are summarized in Table 5.

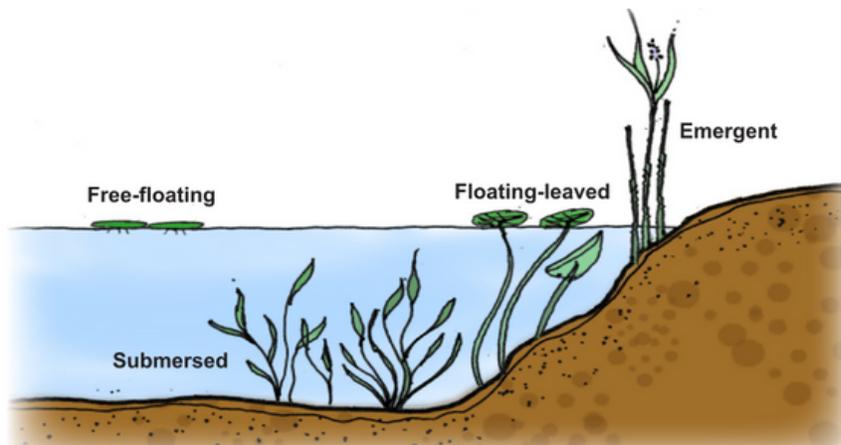


Figure 15. Aquatic plant groups.

NUISANCE AQUATIC PLANT CONTROL

TABLE 5. LAKE LANSING 2024 PLANT CONTROL ACTIVITIES

| Date | Activity | Acreage |
|--------------|---|---------------|
| May 22 | Herbicide Treatment: Hybrid milfoil, curly-leaf | 138.00 |
| August 1 | Herbicide Treatment: Hybrid milfoil | 8.25 |
| August 19-28 | Mechanical Harvesting | 38.25 |
| Total | | 184.50 |

In 2024, 146.25 acres of Lake Lansing were treated with aquatic herbicides, which is a 6% increase from 2023 treatments. This is due to the increase in curly-leaf pondweed growth during the spring. Hybrid milfoil was treated with the systemic herbicide, ProcellaCOR, for season-long control. A large curly-leaf pondweed treatment occurred on May 22 using contact herbicides which provided seasonal control of the invasive plant. A total of 38.25 acres of nuisance native plants and starry stonewort was mechanically harvested from the lake.

Lake Lansing has abundant invasive plant growth in the spring. This is most likely attributed to its shallow water, which allows for extended periods of light penetration throughout the water column during the winter months. Invasive species such as curly-leaf pondweed and hybrid milfoil start their growth cycles earlier in the season in cooler water, giving them the upper hand on native plant species during the winter and spring. It is important that hybrid milfoil continues to be addressed in the early growing season with systemic herbicides. These herbicides help with season-long control, reduction of future seed production, and reduction of basal mass year over year. Curly-leaf pondweed should also be treated in the early season to prevent the species from overcrowding native plant species in the summer. Harvesting on Lake Lansing should be conducted in the late growing season to remove excess biomass from the lake before senescence.

PLANT INVENTORY SURVEY

In addition to the surveys of the lake to identify invasive plant locations, a detailed vegetation survey of Lake Lansing was conducted on August 14 to evaluate the type and abundance of all plants in the lake. The table below lists each plant species observed during the survey and the relative abundance of each. At the time of the survey, 15 submersed species, two floating-leaved species, one free-floating species, and seven emergent species were found in the lake. Lake Lansing maintains a good diversity of beneficial, native plant species.

TABLE 6. LAKE LANSING 2024 PLANT INVENTORY DATA

| Common Name | Scientific Name | Group | 2024 Percentage of sites where present | 2023 Percentage of sites where present |
|----------------------------|-------------------------------------|-----------------|---|---|
| Wild celery | <i>Vallisneria americana</i> | Submersed | 91 | 94 |
| <i>Chara</i> | <i>Chara</i> sp. | Submersed | 84 | 81 |
| Large-leaf pondweed | <i>Potamogeton amplifolius</i> | Submersed | 47 | 57 |
| Whitestem pondweed | <i>Potamogeton praelongus</i> | Submersed | 34 | 0 |
| Starry stonewort | <i>Nitellopsis obtusa</i> | Submersed | 28 | 36 |
| Sago pondweed | <i>Stuckenia pectinata</i> | Submersed | 22 | 9 |
| Flat-stem pondweed | <i>Potamogeton zosteriformis</i> | Submersed | 22 | 6 |
| Slender naiad | <i>Najas flexilis</i> | Submersed | 21 | 17 |
| Brittle-leaf naiad | <i>Najas minor</i> | Submersed | 18 | 16 |
| Variable pondweed | <i>Potamogeton gramineus</i> | Submersed | 15 | 7 |
| Eurasian milfoil | <i>Myriophyllum spicatum</i> | Submersed | 12 | 39 |
| Bladderwort | <i>Utricularia vulgaris</i> | Submersed | 3 | 0 |
| Illinois pondweed | <i>Potamogeton illinoensis</i> | Submersed | 1 | 19 |
| Curly-leaf pondweed | <i>Potamogeton crispus</i> | Submersed | 1 | 0 |
| Thin-leaf pondweed | <i>Potamogeton</i> sp. | Submersed | 1 | 21 |
| Big duckweed | <i>Spirodela polyrhiza</i> | Free-floating | 3 | 0 |
| White waterlily | <i>Nymphaea odorata</i> | Floating-leaved | 21 | 14 |
| Yellow waterlily | <i>Nuphar</i> sp. | Floating-leaved | 1 | 13 |
| Cattail | <i>Typha</i> sp. | Emergent | 18 | 17 |
| Purple loosestrife | <i>Lythrum salicaria</i> | Emergent | 12 | 1 |
| <i>Iris</i> | <i>Iris</i> sp. | Emergent | 10 | 0 |
| Swamp loosestrife | <i>Decodon verticillatus</i> | Emergent | 4 | 10 |
| Pickeralweed | <i>Pontederia cordata</i> | Emergent | 3 | 6 |
| Buttonbush | <i>Cephalanthus occidentalis</i> | Emergent | 3 | 0 |
| <i>Phragmites</i> | <i>Phragmites australis</i> | Emergent | 1 | 0 |

Invasive exotic species

INFORMATION AND EDUCATION

The Lake Lansing Advisory Committee participated in several educational efforts in 2024.

Newsletters: Newsletters were mailed to all SAD residents in the spring and summer, and included updates on treatment and harvesting schedules, shoreland best management practices, clean drain dry initiatives, and DNR wake boat recommendations. Both newsletters from 2024 can be found in Appendix A.

Landing Blitz: The annual aquatic invasive species “Landing Blitz” was held on June 29th at the Lake Lansing public boat launch, coordinated by several agencies who partnered with Meridian Township and LLPOA. The Landing Blitz is a collaborative outreach campaign to raise awareness about preventing the spread of aquatic invasive species (AIS) through recreational boating and related activities.

DNR Wake Boat Recommendations: In 2023, the Michigan Department of Natural Resources (DNR) fisheries division published a literature review of wake boat impacts to lake ecology. Recommendations for safe and environmentally friendly wake boat operation was presented in this review. Progressive Companies used these recommendations to create a wake boat operational map for Lake Lansing (Figure 16). This map was posted at the Lake Lansing public launch site with copies for boaters in partnership with the county parks.

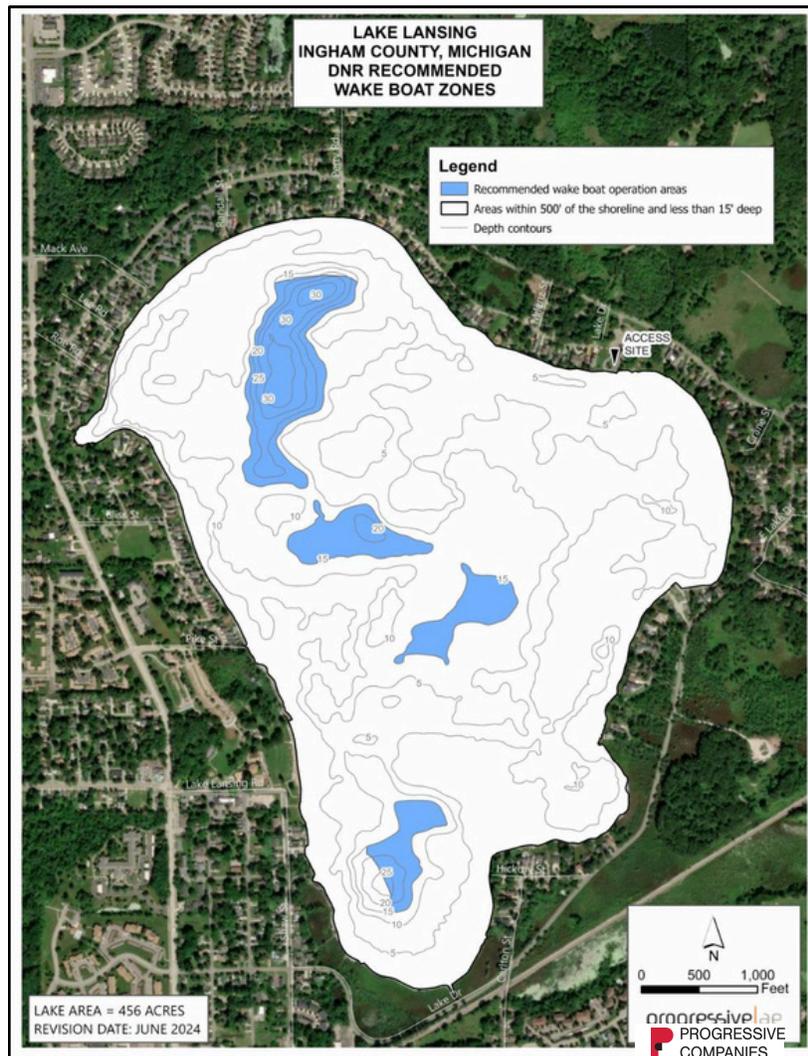


Figure 16. Lake Lansing DNR recommended wake boat zones.

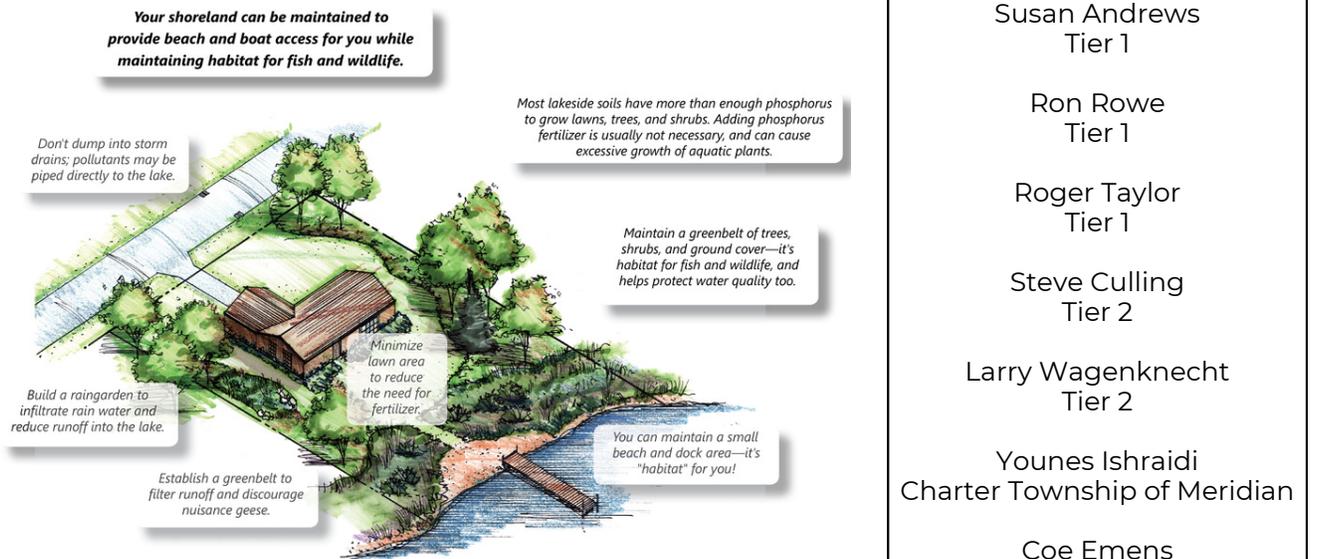
APPENDIX A

LAKE LANSING 2024 NEWSLETTERS

Lake Lansing Newsletter

Ways to help protect Lake Lansing

- Don't use lawn fertilizer that contains phosphorus. If you use a professional lawn care service, insist upon a fertilizer that does not contain phosphorus.
- Reduce fertilizer use when possible. Use the minimum amount of fertilizer as recommended on the label (if not, less than that).
- Water your lawn sparingly to avoid washing nutrients and sediments into the lake.
- Do not feed ducks and geese near the lake. Waterfowl droppings are high in nutrients.
- Do not burn leaves and grass clippings near the shoreline. Nutrients concentrate in the ash and can easily wash into the lake.
- Do not mow the water's edge. Instead, allow a strip of natural vegetation to become established along your waterfront. This natural buffer will trap pollutants and discourage nuisance geese from frequenting your property. Visit: www.shoreline.msu.edu
- Promote infiltration of stormwater into the ground. Building a rain garden helps to capture runoff from driveways and downspouts. Visit: www.raingardennetwork.com



For more information, visit:
michiganlakeinfo.com

Spring

2024

Lake Lansing SAD Advisory Committee

Curt Armbruster, Chair
Tier 1

Susan Andrews
Tier 1

Ron Rowe
Tier 1

Roger Taylor
Tier 1

Steve Culling
Tier 2

Larry Wagenknecht
Tier 2

Younes Ishraidi
Charter Township of Meridian

Coe Emens
Lake Lansing County Park
Supervisor

Paul Pratt
Ingham County Drain
Commissioner's Office

Aquatic Plant Control

Extensive offshore treatments have been conducted in May to address the growth of invasive plant species, hybrid milfoil and curly-leaf pondweed. Since 2022, these treatments targeting hybrid milfoil were conducted using the systemic herbicides Florpyrauxifen-benzyl (ProcellaCOR) and Triclopyr. These herbicides have reduced regrowth of the hybrid milfoil year after year to a more manageable level. Curly-leaf pondweed can be controlled using low-dose contact herbicides or mechanical harvesting. Due to the cost of mechanical harvesting, using an herbicide to control curly-leaf pondweed is preferred. Mechanical harvesting around the shoreline will be conducted again in 2024, primarily targeting starry stonewort and dense native plant growth. A tentative plant control program schedule can be found below. Please note, these dates are subject to change dependent on weather and growth conditions within the lake.

| Lake Lansing Tentative 2024 Aquatic Plant Control Program Schedule | | | |
|--|---------------------|-----------------|---|
| Tentative Survey | Tentative Treatment | Harvest | Description |
| Week of May 6 | Week of May 20 | No | Treatment of hybrid milfoil and curly-leaf pondweed. Potential algae treatment |
| Week of June 17 | Week of July 8 | TBD | Spot treatments for hybrid milfoil, harvest of nuisance natives and starry stonewort, if applicable. |
| Week of July 8 | None | Week of July 15 | Harvest of nuisance natives and starry stonewort (If not conducted in June). |
| Week of August 19 | Week of September 2 | Week of Sept 9 | No likely treatment unless hybrid milfoil and algae growth is significant. Harvesting may occur if plant growth is extensive. |

Wake Boat Updates from MDNR Fisheries Unit

In July of 2023 the Michigan Department of Natural Resources (MDNR) Fisheries Division released a report on wake boating and its impact to aquatic habitats. Based on their literature review, the MDNR provided recommendations on recreational wake boat use. Key highlights of these recommendations include:

1. Boats operating in wake-surf or wake-board mode are recommended to operate at least 500 feet from shore.
2. Boats operating in wake-surf or wake-board mode are recommended to operate in water at least 15 feet deep.
3. Ballast tanks should be thoroughly drained prior to transporting the watercraft over land.

With these recommendations, the areas on Lake Lansing that support wake-boating are limited.

Lake Lansing Newsletter

The Expansion of Aquatic Invasive Species

The introduction of invasive species can occur through various pathways, including ballast water discharge from ships, release by aquarium hobbyists, hitchhiking on waterfowl, and accidental transport on recreational boats and trailers. Once introduced to a new waterbody, these species can quickly overtake portions of a lake. The impact of aquatic invasive species extends beyond biological diversity; they can also cause economic losses by damaging fisheries and hindering recreational activities.

An additional permanent boat wash station has been added to the Lake Lansing Boat Launch to better accommodate incoming boat traffic (pictured below). This will provide further protection against the introduction of invasive species to Lake Lansing.

Required actions – it’s the law in Michigan

- Remove all aquatic organisms, including plants, from watercraft and trailers before launching or transporting.
- Remove all drain plugs and drain all water from bilges, ballast tanks and live wells before transporting a watercraft.
- Dispose of unused bait in the trash, not in the water.

Recommended additional actions – protect our waters by following these steps

- Clean boats, trailers and equipment by removing plants, debris, and mud before leaving the access area. Dispose of the material in a trash receptacle or otherwise away from the water body, if possible.
- Wash boats and trailers before leaving the access area, if possible, or at a nearby car wash or at home.
- Dry boats and equipment for five days before launching into a different water body.
- Disinfect live wells and bilges with a bleach solution (1/2 cup bleach to 5 gallons water.) (EGLE, 2023)



Summer

2024

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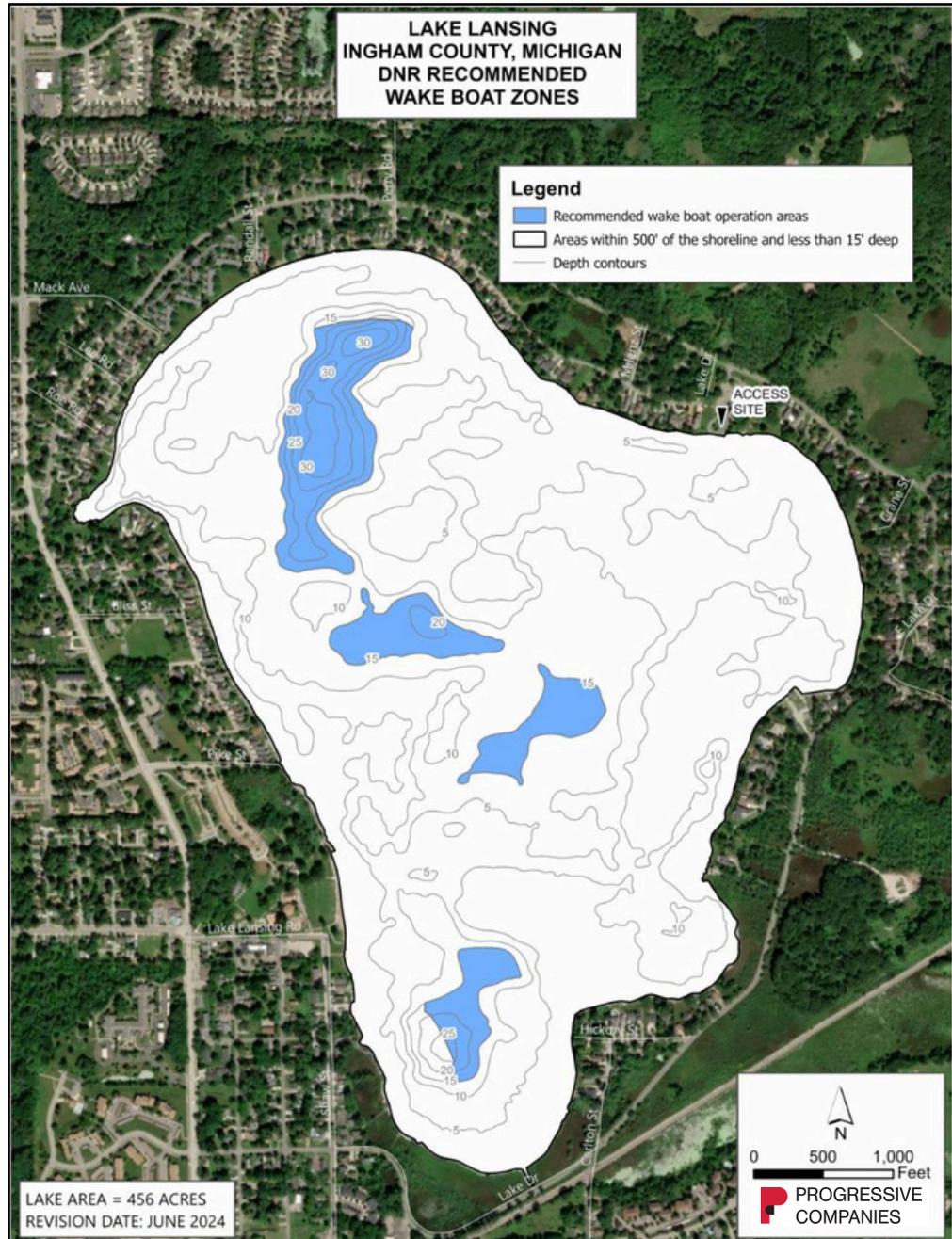
DNR Wake Boat Recommendations

A wake boat is a recreational powerboat that is used for the purpose of creating large wakes to enhance the sports of wakeboarding and wake surfing. In recent years, these boats have gained popularity on inland lakes like Lake Lansing. Their usage has resulted in unintended negative consequences to some lake ecosystems in Michigan. Boats used for wake surfing create larger wakes than other recreational watercraft as they typically fill ballast tanks with water to weigh them down, displacing immense amounts of water to create a large wake. Many of these boats are also outfitted with hydraulic trim tabs that increase the steepness of the wake.

The operation of wake boats in shallow water and near shore areas has significant impacts on the lake bottom and shoreline habitat. When a wake boat is operating at wake surfing speed, approximately ten miles per hour, the boat's stern is angled down, pointing the propeller towards the lake bottom. When operating in waters shallower than 15 feet, the turbulence from the propellers can disrupt the lake bottom, resuspending sediments, uprooting aquatic plants, and displacing valuable habitat. This resuspension of sediment reduces water clarity and introduces phosphorus into the water column, increasing the chance for algae blooms. Lake Lansing has extensive shallow areas, and is therefore at increased risk for ecosystem degradation.

The Michigan DNR has published recommendations for safe and environmentally friendly wake boat operation based on their literature review published in 2023. "The [Fisheries] Division recommends that wake boats operating in wake-surfing or wake-boarding mode do so in water that is at least 15 feet deep (MDNR 2023)." The Division also recommends "Boats operating in wake-surfing mode or wake-boarding mode, during which boat speed, wave shapers, and/or ballast are used to increase wave height, are recommended to operate at least 500 feet from docks or the shoreline, regardless of water depth (MDNR 2023)." **These recommendations are not rule or law, but are meant to educate wake boat owners on how to most responsibly operate wake boats to care for Michigan's inland lakes.**

The adjacent map shows a 500-foot buffer from the shoreline and areas shallower than 15 feet in white. Due to its extensive shallow areas, Lake Lansing has limited safe wake boating areas.



References:

EGLE. 2023. 'Clean, Drain, Dry' is the message at boating, fishing outreach events marking Aquatic Invasive Species Awareness Week.
Francis, J, J. Nohner, J. Bauman, and B. Gunderman. 2023. A literature review of wake boat effects on aquatic habitat. Michigan Department of Natural Resources, Fisheries Report 37, Lansing