PLM
LAKE & LAND
MANAGEMENT CORP

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Duncan Lake Association
Derrek Kim
6919 N. Noffke Dr.
Middleville, MI 49333

At the request of the Duncan Lake Association, PLM Lake & Land Management Corp. conducted water sampling at multiple inlets around Duncan Lake to evaluate potential nutrient inputs from the surrounding watershed. The primary objective of this study was to determine whether elevated Total Phosphorus (TP) concentrations are entering the lake from tributary or surface water inflows. Understanding these external nutrient sources is essential for identifying contributing areas within the watershed and developing effective management strategies to protect and improve overall lake water quality.

Total Phosphorus (TP)

Total phosphorus includes all forms of phosphorus, organic, inorganic, dissolved, and particulate. In most lakes, phosphorus is the limiting nutrient for algal growth, meaning that excess phosphorus often leads to algal blooms. Most Midwestern lakes exhibit elevated phosphorus levels that support more algal growth than is desirable. Lower phosphorus concentrations are typically associated with better water quality and reduced risk of nuisance algal growth, though very low phosphorus may limit fish productivity.

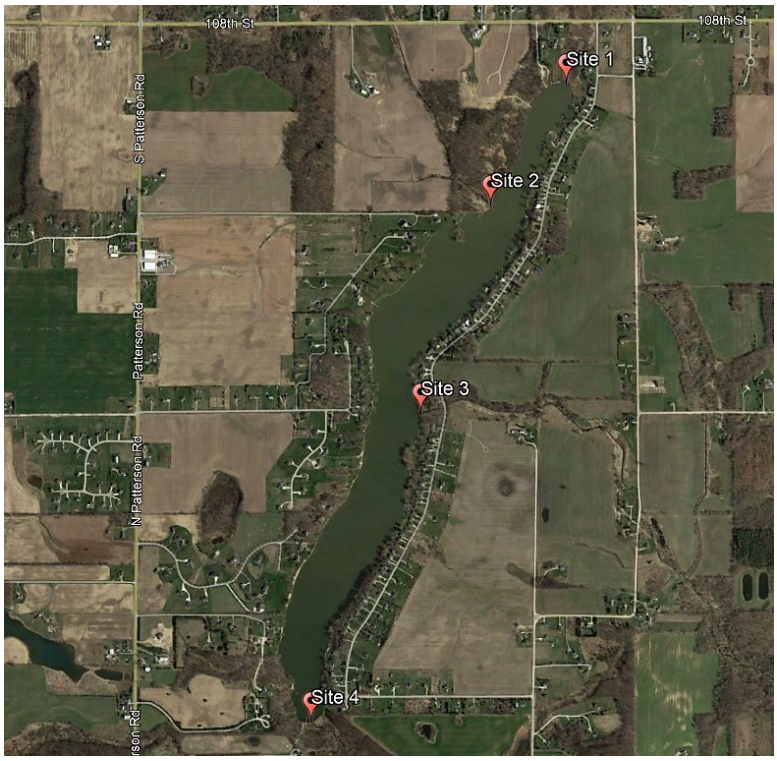
Inlet Monitoring

Obtaining inlet flow information is essential for understanding how water and pollutants enter a lake. Monitoring total phosphorus (TP) in the inflow is critical, as it is a key nutrient that can drive algal growth and lead to eutrophication of the lake. By sampling multiple inlets, it is possible to identify which areas of the watershed contribute the greatest phosphorus loads and to assess how these inputs vary under different flow or seasonal conditions. This information helps distinguish between natural background levels and those influenced by human activities such as lawn fertilization, agricultural runoff, or stormwater discharge. Inlet monitoring provides valuable data for developing targeted management practices aimed at reducing external nutrient loading and improving the overall ecological health of Duncan Lake.

Sample Date	*Location*	*Total Phosphorus (ug/L)*	*Result Indicator*
10/20/25	Site 1 – 108th St.	61	*Highly Eutrophic*
	Site 2 – Hanna Lk.	81	*Highly Eutrophic*
	Site 3 - Outlet	15	Moderately Eutrophic
	Site 4 – S. Inlet	16	Moderately Eutrophic

PO Box 132 · Caledonia, Michigan 49316
phone 616.891.1294 · fax 616.891.0371
www.plmcorp.net

Figure 1. Inlet Sampling Map



Conclusion

The results of the inlet monitoring indicate that nutrient enrichment is entering Duncan Lake from multiple locations within the surrounding watershed. Total phosphorus concentrations measured at Site 1 (108th St.) and Site 2 (Hanna Lake Inlet) were 61 µg/L and 81 µg/L, respectively, both within the *highly eutrophic* range, suggesting these inflows are significant contributors of external phosphorus loading. In contrast, phosphorus levels at the outlet (15 µg/L) and the south inlet (16 µg/L) were *moderately eutrophic*, indicating lower but still notable nutrient concentrations. These findings highlight the importance of addressing watershed sources to reduce phosphorus loading and limit algal growth potential within Duncan Lake.

To build on this initial dataset, additional inlet sampling during the spring season is recommended. Spring typically represents a period of increased runoff and nutrient transport due to snowmelt and early rainfall, which can provide valuable insight into peak phosphorus loading conditions from the surrounding watershed. Continued seasonal monitoring will help confirm the consistency of nutrient sources and guide the development of effective long-term management strategies.

To help mitigate phosphorus inputs, the implementation of a targeted nutrient reduction approach, such as the use of EutroSORB G, a lanthanum-modified bentonite designed to bind and inactivate soluble phosphorus, should be considered. A phosphorus mitigation program utilizing EutroSORB G, in combination with continued inlet monitoring, would support long-term improvements in water quality and help maintain the ecological balance of Duncan Lake. If the Duncan Lake Association is interested in learning more about EutroSORB G or potential phosphorus mitigation options, please contact me for additional information and next steps.

Sincerely,

Jaimee Desjardins

Jaimee Desjardins, Environmental Scientist
Senior Regional Manager
PLM Lake & Land Management Corp.
jaimeed@plmcorp.net