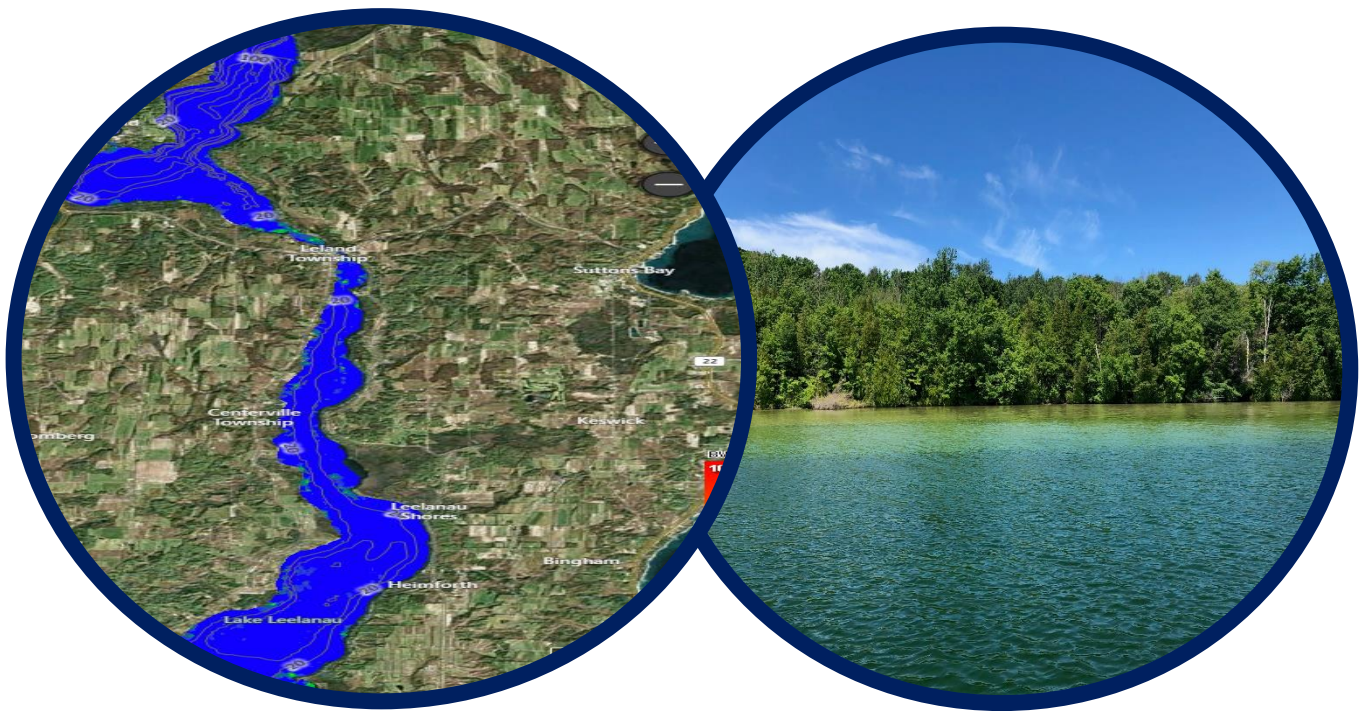




Lake Leelanau Aquatic Vegetation Study & Management Recommendations Report Leelanau County, Michigan



Provided for: Lake Leelanau Lake Association

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1.0 EXECUTIVE SUMMARY

Lake Leelanau is located in sections 2-3;9-11;14-16;22-23; and 26-27 and 34-35 for the north lake (T.30-31N, R.12W) and in sections 1-3;10-14;23-26;30;35-36 for the south lake (T.28-30N, R. 12W) in Leelanau County, Michigan. The lake is approximately 8,729.7 acres in surface area with a volume of approximately 262,002.7 acre-feet (RLS, 2020). It is a long lake with a length of 15.2 miles from the northernmost point to the southernmost point and 16.3 miles from end to end. The fetch (longest distance across the lake) is around 5.0 miles. The maximum depth is approximately 131.4 feet and the average depth is 19.5 feet based on the recent scan conducted by Restorative Lake Sciences (RLS; Figure 1). The lake is an embayment lake that was originally connected to Lake Michigan but it now separate from Lake Michigan. It is also oligotrophic which means that the nutrient concentrations are quite low and thus aquatic vegetation and algae are scarce.

Due to the great overall mean water depths and steep slopes that lead to the deep basins, the aquatic vegetation communities are scarce. Despite this occurrence, the overall aquatic plant biodiversity is quite high with 21 submersed, 2 floating-leaved, and 6 emergent native aquatic plant species for a total of 29 species. The majority of these species were found in the highly diverse narrows region. The most abundant aquatic plants included the macro alga, Chara, as well as Variable-leaf and Illinois Pondweeds. A whole lake aquatic plant survey and aquatic vegetation biovolume scan was conducted on June 22-25, 2020. The scan utilized a total of 128,304 GPS sounding points and the lake survey utilized a total of 1,922 GPS sampling location points. This comprehensive survey and scan allow for a great degree of certainty in regard to the overall biodiversity, location, and relative abundance of all aquatic vegetation. There were 16 locations of “a” level milfoil which means single plants was found. There were 21 locations of “b” level milfoil which means sparse growth was found. There was 1 location of “c” level milfoil which means common growth was found. There were no “d” level areas of milfoil; however, there were a few polygons that totaled 3.52 acres of milfoil.

The Lake Leelanau Lake Association (LLLA) desires to use natural (non-herbicide) methods such as Diver-Assisted Suction Harvesting (DASH) and the use of benthic barriers for the targeted management of invasive watermilfoil. Both of the methods can be effective for the successful management of invasive submersed aquatic plants in Lake Leelanau due to the fact that the prevalence of this invasive is quite low in the lake. Many areas contain a few plants or small areas of growth that can be effectively controlled. The scientists at RLS encourage the LLLA to continue to utilize these natural methods and also to regularly inventory the lake to assure that no new areas have been colonized. Lastly, RLS recommends that the LLLA should consider closing any small launch areas that cannot be patrolled. In addition, boat washing stations should be added to all major launch sites, along with Aquatic Invasive Species (AIS) educational signs. Although it is nearly impossible to enforce launch site washing compliance, Part 413 of PA 451 of 1994 mandates that no invasive aquatic species be introduced or transferred to inland waters.

4.0 LAKE LEELANAU MANAGEMENT CONCLUSIONS & RECOMMENDATIONS

Lake Leelanau contains a highly diverse aquatic plant community with 29 native aquatic plant species present. It also has three invasive aquatic plant species, including the submersed Eurasian Watermilfoil and the emergent Phragmites and Purple Loosestrife. All of these invasive species are an imminent threat to the ecology of the lake since the relative abundance of all native aquatic plants is low and the growth rate of invasives is often higher and thus is a threat to the aquatic vegetation community.

Current management methods for invasive watermilfoil consist of Diver Assisted Suction Harvesting (DASH) and the use of benthic barriers. The DASH method utilizes divers to remove the roots of the milfoil which is highly effective at reducing the spread. The use of benthic barriers is also an effective tool in small areas. These approaches should also accompany an Aquatic Invasive Species (AIS) educational program that encourages all lake users to wash their boats and trailers and also use boat wash stations at key launches. Small road ends and other areas of ingress should contain educational AIS signs or should be closed (if legally possible). The fewer areas of entry on the lake, the better the outcomes for reducing the entry and spread of invasive aquatic plant species.

The emergent aquatic plant species Phragmites and Purple Loosestrife are scarce and should be mechanically removed. This method physically removes the vegetative runners (stolons) and roots and thus would reduce the underground spread of the plants which produces new shoots that are capable of forming seed heads that are susceptible to wind dissemination. These methods serve as non-chemical options of control.

Regular surveys (inventories) of the lake aquatic vegetation community are recommended for the future to evaluate the efficacy of current control methods as well as to determine if any new invasives are present.