

White Lake Citizens League
Recommendations to
White Lake Improvement Board

September 25, 2017

Overview

- 2013-17 SAD under budget
 - Approx \$35,000 Remaining Funds after Successful Completion of All Dredging
- White Lake Citizens League Board Recommendations for Next SAD
 - 3 Year 2018-2020 Assessment Period
 - Continuation of Weed Control & Sheriff Patrols
 - Addition of Lake Quality Study to Guide Future Lake Management Efforts
 - No Dredging Projects
 - Assessment Levels Reduced to 80% of Previous

Sheriff Patrols

- Past 5 Years Patrol Hours have Ranged from 215 to 240 Hours per season
- Sheriff had 452 contacts through August 13
 - 1 Ticket, 197 Warnings, 98 Inspections, 2 Assists
 - Significant Level of Warnings is an Indicator of High Need to Continue Patrols
- Recommend Next 3 years Assessment Based on 220 Hours per Season

Lake Quality Study

- Cleary Study has Guided Lake Management Efforts Since 1986. All Recommendations Successfully Completed
- White Lake Citizens League Board Recommends New Study to Assess Current Lake Health and Guide Future Efforts
- Initial Contacts with Professionals Indicates New Study can be Completed for Approx \$25,000

WHITE LAKE LIMNOLOGICAL ASSESSMENT

A. Review Existing Information

1. Review available data and information including the Cleary Engineers 1986 report, historical water quality and fisheries data.

B. Perform Base Mapping

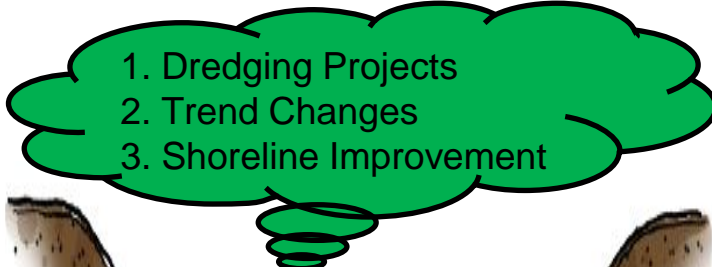
1. Create a geographic information system (GIS) database for the project.
2. Digitize the shoreline of the lake using recent aerial photography, rectified to NAD83 datum.
3. Conduct a detailed hydro-acoustic (i.e., a SONAR) survey to measure bottom depth and plant bio-volume (i.e., the height of plants in the water column). Grid points would be established with a global positioning system (GPS) at 100-foot intervals over the entire lake bottom to be used as a navigation guide in acquiring complete SONAR coverage of White Lake.
4. Import the hydro-acoustic data into the GIS database.
5. Create an updated bathymetric (i.e., depth contour) map of White Lake. The map would depict adjacent roadways and shoreline features in addition to depth contours.
6. Calculate the physical characteristics of the lake including lake surface area, maximum depth, mean (or average) depth, lake volume, area of the littoral (rooted plant growth) zone, lake shallowness factor, and shoreline development factor.
7. Create an aquatic plant survey map that includes the lake shoreline, depth contours, numbered survey waypoints, and Michigan Department of Environmental Quality (MDEQ) plant survey codes.
8. Create updated maps of the White Lake watershed overlain on USGS topographic base maps and recent orthorectified aerial photography.
9. Determine the number of homes currently bordering the lake and evaluate the extent of natural versus disturbed shoreline around the lake.

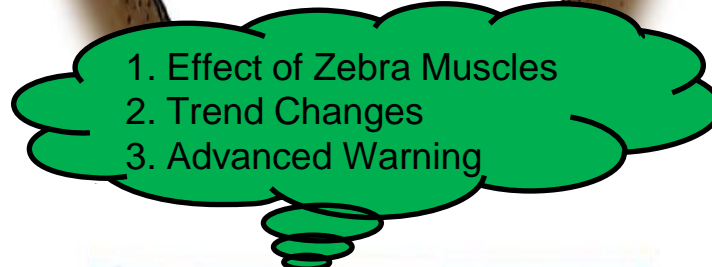
C. Assess Water Quality

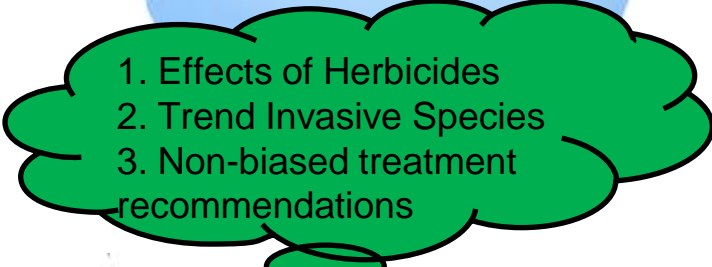
1. Collect water samples at five-foot intervals from the surface to the bottom from the deepest portions of the north and south lake basins during spring and late summer to measure temperature, total phosphorus, dissolved oxygen, chloride, pH, and total alkalinity. Measure chlorophyll-a levels within the photic zone and water transparency during each of the aforementioned sampling periods.
2. Determine lake trophic state; thermal and chemical stratification; oxygen depletion; and phosphorus levels relative to aquatic plant growth.
3. Compare data collected during the study with historical water quality data.
4. Assess the distribution and potential impact of zebra mussels (*Dreissena polymorpha*) on lake water quality.

D. Assess Aquatic Vegetation

1. Confer with the White Lake Citizen League's herbicide applicator as to timing, location, and targeted species for aquatic herbicide application(s) during the study period. Conduct a detailed aquatic plant survey using the point-intercept method. With this method, grid points would be established with a global positioning system (GPS) at 300-foot intervals along the shoreline and one-acre intervals (approximately 208 feet) across the vegetated portions of White Lake as determined by the hydro-acoustic survey. At each grid point, a two-sided rake attached to a line would be used to collect plant samples; the type and relative abundance of each plant species present would be recorded. This survey method would document the type and location of plant species in the lake. Based on the results of the survey, locations of invasive species such as stary stonewort (*Nitellopsis obtusa*) would be mapped. In addition, a table would be generated that lists all plant species observed in the lake and their relative abundance.
2. Import aquatic plant bio-volume data from the hydro-acoustic survey into the GIS. Create a geo-rectified map showing location and height of plant beds in White Lake.
3. Create a map that depicts the location of invasive species such as Eurasian milfoil (*Myriophyllum spicatum*) and stary stonewort (*Nitellopsis obtusa*).
4. Evaluate the White Lake Citizen League's current aquatic plant control program. Compile treatment records filed with MDEQ and assess type, amount, frequency, and timing of herbicide applications. Discuss the environmental fate of herbicides used in White Lake and the potential impacts of herbicide use such as copper accumulation in the lake's sediment.
5. Discuss the advantages and disadvantages of herbicides versus mechanical harvesting for nuisance aquatic plant control.

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1. Dredging Projects
 2. Trend Changes
 3. Shoreline Improvement

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1. Effect of Zebra Muscles
 2. Trend Changes
 3. Advanced Warning

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1. Effects of Herbicides
 2. Trend Invasive Species
 3. Non-biased treatment recommendations

Weed Control History

- 2013 Through 2017 History
 - SAD Budget was \$445,000 or \$89,000 Per Season
 - Actual Expenses \$411,000 or \$82,200 per Season
 - 2013 Was Highest Non Sonar Year - \$102,000
 - 2016 Was \$112,400 Due to Sonar
 - 2017 Is Lowest at \$50,500
- Recommend Use Inflation Adjusted 2011-2015 Average for Assessment
 - No Sonar for next 3 years

Weed Control History

	Actual Expense	3 % Annual Inflation	Inflation Adjusted 2018
2011	\$ 82,110.00	1.230	\$ 100,984.94
2012	\$ 82,650.00	1.194	\$ 98,688.42
2013	\$ 100,725.00	1.159	\$ 116,767.88
2014	\$ 77,892.50	1.126	\$ 87,668.69
2015	\$ 67,290.00	1.093	\$ 73,529.60
2011-2015 Total			\$ 477,639.54
2011-2015 Average excl News Letter			\$ 95,527.91
2011-2015 Average incl News Letter			\$ 97,150.00

Weed Control Assessment Alternatives

	Inflation Adjusted Ave Weed Control	MEMO Worst Case Scenario
2018	\$ 97,150.00	\$115,250.00
2019	\$ 100,050.00	\$118,707.50
2020	\$ 102,995.00	\$122,268.73
2018-2020 Total	\$ 300,195.00	\$356,226.23
Ave Yr	\$ 100,065.00	\$118,742.08

Proposed SAD 2018-20 Assessment

Year	Inflat. Adj'd Ave. Weed Control	Sheriff Boats	Administration	Study	Total
2018	\$ 97,150.00	\$ 7,442.60	\$ 2,000.00	\$ 12,500.00	\$ 119,092.60
2019	\$ 100,050.00	\$ 7,746.20	\$ 2,000.00	\$ 12,500.00	\$ 122,296.20
2020	\$ 102,995.00	\$ 7,823.20	\$ 2,000.00		\$ 112,818.20
			2018-20 Ave Annual Expenses		\$ 118,069.00
		Proposed Annual Assessments			
		Lake Front House	Lake Access House	Commercial Property	Total Assessments
	2018-2020	\$ 165.00	\$ 20.00	\$ 400.00	\$ 118,100.00
	2013-2017	\$ 210.00	\$ 25.00	\$ 515.00	\$ 150,500.00
	2010-2012	\$ 150.00	\$ 18.00	\$ 368.00	\$ 107,500.00

Proposed 2018-20 Operating Budget

Year	Inflat. Adj'd Ave. Weed Control	Sheriff Boats	Administration	Study	Total
2018	\$ 97,150	\$ 7,443	\$ 2,000	\$ 12,500	\$ 119,093
2019	\$ 100,050	\$ 7,746	\$ 2,000	\$ 12,500	\$ 122,296
2020	\$ 102,995	\$ 7,823	\$ 2,000		\$ 112,818
Total Assessment Remaining Funds	\$ 300,195	\$ 23,012	\$ 6,000	\$ 25,000	\$ 354,207
Total 3 Yr Budget	\$ 330,195	\$ 28,012	\$ 6,000	\$ 25,000	\$ 389,207

\$30,00 Remaining Funds Allocated to Weed Control Because Assessment is Average

\$5,000 Remaining Funds Allocated to Sheriff Because of Added Public Access

Questions/Discussion