Fish Hook Lake and River Association

FISH HOOK LAKE AND RIVER MANAGEMENT PLAN 2025

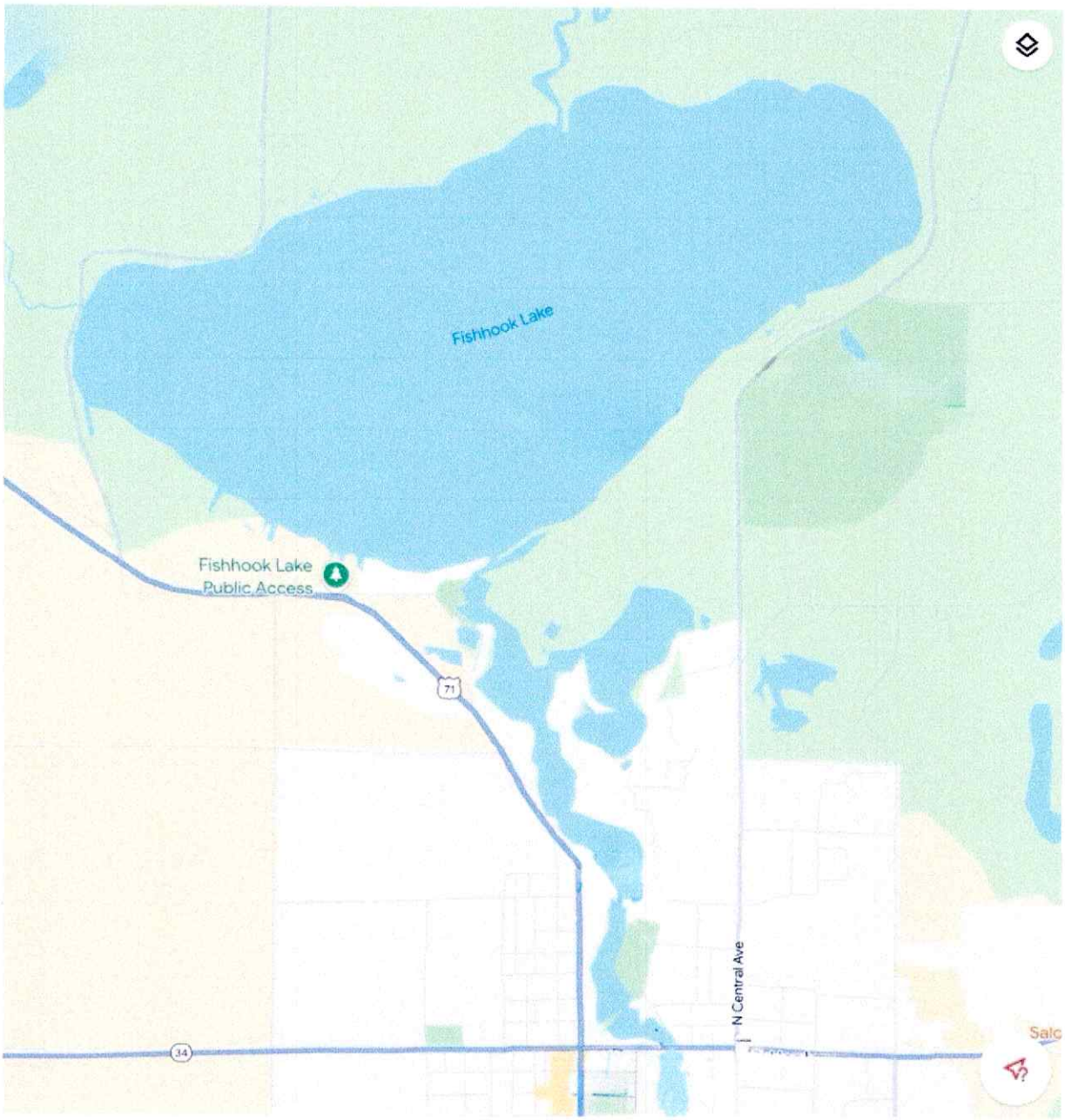


Table of Contents

I. INTRODUCTION

Summary of Healthy Lakes & Rivers Partnership Program

In October 2003, the Fish Hook Lake and River Association (FHLARA) participated in the Initiative Foundation's Healthy Lakes and Rivers Partnership Program along with eight other Lake Associations (LA) from Hubbard and Wadena Counties. Under the coordination of Darrin Moe (then Hubbard County Local Water Planner) and Kari Tomperi (Wadena County Water lanner), representatives of FHLAR attended two days of training on strategic planning, communication, and nonprofit group leadership.

Representatives of many state and local agencies, as well as nonprofit organizations also attended the training sessions in order to offer their assistance to each group in developing a strategic Lake Management Plan. Sharon Rezac-Anderson, Vicki Hartz, Ruth Brown, Ginger Carter, and Kent Shirley represented FHLARA.

We would like to thank the following for funding the Healthy Lakes & Rivers Partnership program for Hubbard and Wadena Counties: The McKnight Foundation, Laura Jane Musser Trust, Northwest Minnesota Foundation, Hewitt Family Charitable Fund, McDowall Company, Hubbard County Water Plan, Wadena County Water Plan, Hubbard County Coalition of Lake Associations, Minnesota Board of Water and Soil Resources, Lake Hubert Association-Crow Wing County, Linda Kaufamann, Don Hickman and Sandra Kaplan.

On April 24, 2004 the FHLARA held an inclusive community planning/visioning session, designed to identify key community concerns, assets, opportunities, and priorities. Larry Wannebo, Initiative Foundation facilitator for Healthy Lakes and Rivers Program, facilitated this planning session. This document carries the results of that effort forward and builds upon the efforts of previous Board contributions to the environment of Fish Hook Lake and River.

This document creates a record of historic and current conditions; this document identifies and prioritizes the goals of the Fish Hook community; ultimately, this document guides stakeholder action in the priority action areas. State agencies and local units of government have a vital role and responsibility in managing our surface waters and other natural resources, but above all else this management plan is intended to be an assessment of what we as stakeholders can influence, what the desired outcomes are, and how we will participate in shaping our lake's destiny. The FHLARA will review the plan annually as new information becomes available; as we accomplish our goals; or as we discover alternative strategies, we will update this plan.

We have tried to express everything as simply as possible, however it is impossible to avoid all scientific or technical terms. Therefore, a glossary of common terms and list of common abbreviations are provided in the Appendix.

Physical Characteristics and Location of Fish Hook Lake

Fish Hook Lake (DNR ID# 29-0242[1] is located 2 miles north of Park Rapids, MN, in Henrietta-Todd Township, Hubbard County. Fish Hook Lake is within the Crow Wing Watershed; the Northen Lakes & Forests Ecosystem (NLF[2]); and the Upper Mississippi River Basin (UMB)[3]. The Hubbard County DNR Shoreline Development Classification[4] of Fish Hook Lake is a Recreational Development Lake.[5] The Fish Hook River (reservoir north of the dam) is not classified.

The lake has a Surface Area of 1642 acres of which 661 acres (41% is in the littoral zone)[6]. The maximum depth is 76 feet, mean depth is 26 feet, and length of shoreline is 9.1 miles.[7]

Tributaries, which drain into Fish Hook Lake, include a river from Potato Lake to the North and a stream from Portage Lake to the west. The outflow of Fish Hook Lake is the Fish Hook River that discharges to the Straight River below the City of Park Rapids.

Ordinary High Water Level (OHWL) for Fish Hook Lake is 1426.3 ft. The recorded water level range is 2.12 feet, which includes a high of 1426.23 feet and a low of 1424.11 feet.[8]

On June 24, 2002 the DNR completed a Lake Survey on Fish Hook Lake. This survey is no longer on the DNR website. The follow up Lake Survey now on file is a Biological Survey for vegetation on Fish Hook lake reported July 7, 2006[9]. has a summary of vegetation identified on the south shore of the lake. The DNR Ecological services lake mapping of Fish Hook lake has a 5 ft contour interval which shows major below surface features.[10]

---

[1] Minnesota DNR lake identification number from DNR (Department of Natural Resources), 1968 publication "Bulletin 25: An inventory of Minnesota Lakes." The first two digits indicate the county; the next four digits indicate the lake number.

[2] The U.S. Environmental Protection Agency (EPA) mapped the ecoregions

[3] Minnesota has nine (9) river basins. Basins and eco regions are used to compare lake conditions.

[4] Hubbard County DNR Shoreland Classifications.
https://www.dnr.state.mn.us/waters/watermgmt_section/shoreland/lake_shoreland_classifications.html

[5] Recreational Development Lake usually have between 60 and 225 acres of water per mile of shoreline, between 3 and 25 dwellings per mile of shoreline, and are more than 15 feet deep.

[6] Littoral Zone: the portion of the lake that is less than 15 in depth. The littoral zone is where the majority of aquatic plants are found and is a primary area used by young fish. This part of the lake also provides the essential spawning habitat for most warm water fishes (e.g. bass, walleye, and panfish)

[7] https://www.dnr.state.mn.us/lakefind/lake.html?id=29024200

[8] https://www.dnr.state.mn.us/lakefind/showlevel.html?downum=29024200

[9] https://files.dnr.state.mn.us/natural_resources/water/lakes/aquatic_plant_reports/29024200_1285.pdf

[10] https://www.dnr.state.mn.us/lakefind/lake.html?id=29024200

History of Fish Hook Lake

The "History of Fish Hook Lake," Appendix 2 of the 1991 LAP Report, was originally compiled and written by Carolyn Spangler.

1871: A military road skirting the south side of Fish Hook Lake was used by the government for transporting soldiers and supplies from Leech Lake to the White Earth Reservation.

1881: Two years after the first settlers arrived, D. Rice, owner of the town site named it Park Rapids. The park-like groves on the prairie and the rapids on the Fish Hook River (not dammed at that time) provided the impetus for the name.

1881: The Rice brothers build the first dam on Fish Hook River west of the footbridge. The dam powered their rolling stone and gristmill. The sawmill turned out rough lumber used for window, doorframes, floorboards and roof boards. The dam broke in 1885 destroying the lumber mill.

1885: The dam at Park Rapids was the only developed water power in the county.

1885: A wooden bridge financed by private donations was built across the Fish Hook River (where Highway 34 presently crosses the river).

1886: A new dam was built where the present dam exists. A new flour and feed mill was built beside this dam.

1886: Peter Turnbull settled 40 acres on the northwest side of the lake. Durin this year, he received receipt from the government to live on the property before buying it in 1887. This property is now the Zinniel Farm. A story is told that before the dam was built on the river, Zinniel claims that he drove his cattle across the lake near the present boat access. Harry Jones, a retired farmer living on Fish Hook Lake next to the Portage Creek, said this story is possible because there is a ridge across the lake in the area Zinniel claims to have crossed.

1889: The railroad came to Park Rapids.

1890-1910: The "Lottie Lee" excursion boat operated on the Fish Hook River.

1890: Logging began in the area when one of the biggest logging companies, The Red River Logging Company, drove piles for a sawmill in Akeley. In these days, Fish Hook Lake was used primarily for logging. The pine Tree Logging Company logged Norway and White Pine from acreage near Itasca State Park where steam haulers traveling along ice roads carried the huge lumbering logs to ice covered lakes. In the spring, a boom was formed around the logs by chaining a circle of logs end-to-end to keep the logs in order. Barges pulled the boom down the rivers and lakes. Men, called "river pigs," as they were very skilled on their feet, would run on

the logs with spiked shoes to break up jammed logs. Logs from the Two Inlets area traveled through Island, Eagle, Potato and Fish Hook Lakes for a destination of Little Falls, Minnesota.

1891: Prior to 1891, the Northern Pacific Railroad owned the Eagles Nest Plat. In March 1891, it was sold to Frederick Wayerhauser, M.G. Norton, and Peter Musser under the corporation named the Immigration Land Company of Little Forks, MN. In 1904 the property was sold to J.C. Peabody and in 1914, he surveyed and platted the property and designated it as Eagles Nest. (The acreage is north of the Potato River and part of Peabody Bay.

1892-93: A single circular sawmill built by Ellersick & Sones on the east side of the river was later converted to band saw mill by the new owners, Sawyer & Burnet in 1897. This mill operated until 1911.

1892: The Timber Act made possible the purchase of land and tree removal to lumber companies. Timberland sold for $1.25 to $2.50 an acre.

1896: Henry and Harriet Rose purchased a Homestead Patent of 145 acres on NE and NW of Portage Creek on the west side of Fish Hook Lake. One of two farms on the lake changed ownership several times until Harry Jones, the present owner, bought the fame (excluding the Pine Park acreage, part of the original property) from his parents for $2000 in 1945.

Circa 1900: The lumber people changed the mouth of Fish Hook River for the logs to flow more freely down the river. The mouth originally took a sharp turn and made the transport of logs down the river difficult.

1901-1918: The era of logging – at times logs covered the entire lake surface.

1902: Dr. Stone built the first hospital in Park Rapids on the site of the present Park Terrace. Known as Park Sanitarium, the wooden building burned on Christmas Day and was replaced by a brick structure in 1903 according to Pauline Schleicher, granddaughter of Dr. Stone. While the hospital was being built, Dr. Stone secured the Germania Hall on North Park Avenue as a temporary hospital. The hospital later became the Rainbow Inn, a clubhouse and resort where per person weekly rates were $5 or $1 per night. The Rainbow Inn was named for the Rainbow Division in which Herbert Stone, a son of Dr. Stone, served during World War I. Sons of Dr. Stone, A.W. and Herbert, managed the Inn. The property was in the Stone family until 1962. Some sources indicate the Inn burned around 1960 and was not rebuilt.

Dr. Stone also operated a health sanitarium on a 45-acre plot now owned by the Methodist Church, Northern Pines Campground. The lake resort consisted of three buildings: a lodge, a girl's dormitory and one cabin. These were used by house guests and recuperating hospital patients. Cottage rented for $1 per day, $20 per month, or $50 per season. Dr. Stone sold his

sanitarium for $4000 to a group of Methodist ministers and laymen who were looking for a campsite to serve people of the districts in a camping program. The church then sold lots to ministers, laymen and churches to pay back money borrowed to pay for the property. Lots sold for $100 to $200. In later years, some of the lots were given back or sold back to the Assembly grounds.

Margaret Nygaard, a Park Rapids resident since 1904, says a road existed next to the lake on the south side across from Deane Park. Folk lore from logging days indicates that road may be remnant of a road around the lake used to transport loggers and supplies to supply boats in peak logging years. The existing road, built as a Works Progress Administration project, is between the cabins and Deane Park.

1908: At the peak of logging activity, 4,000 or 5,000 men were employed in the woods.

1912: A steel bridge with plank flooring replaced the wooden bridge across Fish Hook River (Highway 34). The clatter of the loose planks could be heard in the quiet of summer evenings, and it became known as a "rattling good bridge."

1914: A launch service was provided to carry supplies, fisherman, and passengers to local lakes. A page from the logbook of Captain Oscar Thomas says it took seven hours to travel from Fish Hook Lake to Island Lake for a day excursion. The journey cost $5 for seven people.

1917: Bill Taber gave property on Fish Hook River to the city in memory of his son Deane, who died in World War I.

Circa 1918: River and lake logging ended and the big sawmill on the river was dismantled.

1920: after the cessation of big tree logging, the logging industry changed. Small logging companies started logging for smaller trees such as Jackpine and Birch while moving around the area with their own mills. A process called deadheading where downed logs were picked out of the water became popular. Deadheading did not last long as it was not profitable. In later years, farmers or local loggers brought their logs by truck and used the sawmills on the river for cutting logs into rough lumber. The logging industry still brightens the economy of Park Rapids and logs are now sold for studs and planks. Potlatch owns much of the logging land in the area.

1923: Fred Fulton bought the Fish Hook Resort, which became White City and is now Loon's Nest Resort. Fulton added the dance hall, restaurant, and eventually 15 cabins for tourists. The resort was a popular place in the Big Band days when 8-piece band entertained locals two nights a week. This is the only resort that exists today on Fish Hook Lake. Fulton sold the resort in 1947.

1928-30: A box factory across from the present Heartland Park on Fish Hook River provided jobs for local people.

Circa 1930: When Mrs. Higgs, who owned one of the first cabins on the lake wanted to sell her property on the east shore for $3.75 a front foot, people thought she was crazy to sell for so much.

1933: A wider, more heavily constructed bridge was constructed over the Fish Hook River (Highway 34). There was opposition to the large amount of fill used to shorten the span.

1937: Permits were required to fill public wetlands. Wetlands on Fish Hook Lake were not considered public wetlands and were allowed to be filled before 1976.

1938: The dam on the Potato River was built on County Road 18 as a Works Progress Administration Project.

1938-40 County Road 18 on the west end of the lake was moved into the lake to straighten out the original curvy and dangerous road. Horses pulled rail ore carts to the dirt pit to be filled with two tons of dirt, and then it rolled down to the lake with a brakeman riding in back to stop the car. Being a winter project, the pit was covered with straw on weekends to prevent freezing and dynamite was used to break up the pit, if needed. The Works Progress Administration did the construction. The road originally had water on either side, but homeowners filled the area between their lawns and the road.

1940: Matt Michaels sold his farm (one of two farms on the lake) to Harry Jones' father. The foundation of the present Jones house is made from hand-hewn logs.

1940-45: During World War II, barges roamed the lake searching for sunken logs to be hoisted out for lumbering. It was usually the 'butt cut' the best part of a log that sank while being driven down the lake during logging days. Logs were grabbed from the bottom of the lake with ice pick-like hooks and then towed to shore to be milled into lumber.

1945 and after WW II: Tourism opened up in Hubbard with the advent of bulldozers to area and building of roads. Without bulldozers and heavy equipment, access to lakes was difficult.

1950's: A 50-foot bank was bulldozed to build homes on the north side of the lake.

Circa 1976: The Corps of Engineers formulated regulations that required permits to fill wetlands with certain characteristics.

1976: Hogs from a local farm bathed in Portage Creek.

1982: A new dam was built in the summer of 1982. The dam broke on October 12, 1982, after heavy rains and upper river receded 10 feet (unofficial footage). It was rumored that one million dollars worth of damage was done. The dam was repaired by October 16, 1982.

1985: Fish Hook Lake Association was formed.

1991: A mobile home park was built on property south of the lake and across from the Heartland Golf Course. Originally a wetland, this property was filled in the early 1970's.

1991: Fishing in Portage Creek is almost impossible with the rampant weed growth, unlike the 1940's when boats easily trolled the clear creek.

1991: The Wetlands Conservation Act enacted state laws designed to protect wetlands not covered under previous regulations.

1991: The Fish Hook Association conducted a survey on on-site sewage treatment systems and noted that 434 systems had been installed since 1980, including, 39 conventional systems with septic tanks and drain fields, and 4 with septic tanks and seepage pits. This survey also identified 74 systems installed prior to 1980, of which only 16 had conventional tanks and drain fields. The remaining pre-1908 systems were cesspools, seepage tanks, and seepage tanks with drain field. Eleven wastewater systems were identified as "unknown," and three landowners refused to participate. Additional background on this survey is included in MPCA's 1992 LAP Study, Appendix I.

1992: Flourmill stones were discovered in the river near the city park when the new dam was being built. They had been left in the bottom of the river with the destruction of the mill and probably covered naturally over the years. The millstones are at the Hubbard County Historical Society.

The housing development property North of White City Resort, filled in during the1980's was once a wetland and cow pasture.

While the plan was to build an amphitheater by Heartland Park, and abundance of sawdust on the bank north of the footbridge deemed the project unsafe and impossible. This is near where a planer and a sawmill existed in the early 1900's and an estimate 100,000 feet of lumber traveled through the mills each day. The planer mill continued operation until 1935.

History of the Fish Hook Lake and River Association

The Fish Hook Lake and River Association formed in 1985.[11] Any owner or occupier of lands within 1000 feet of Fish Hook Lake or Fish Hook River in Hubbard County, Minnesota, is eligible for membership. In 2005 there were 126 members and in 2024 there were 98 members.

Mission Statement

> The Fish Hook Lake and River Association shall be an advocate of the environment of our lake/river system. We shall be a partner with other lake associations and agencies which have an impact on water quality. We shall act as an educator in community understanding of the issues and goals of our association. The objectives of our efforts are better water quality and property values for everyone. As a group, we have a stronger voice than as individuals.

The mission statement is included in every issue of our newsletter.

In the summer of 1991, a "Lake Assessment Program" (LAP) study of Fish Hook Lake was conducted through an innovative program that combined the Fish Hook Association with the following public agencies: The Minnesota Pollution Control Agency (MPCI), the Hubbard County Environmental Services Office, the Hubbard County Soil and Water Conservation District (SWCD), the Headwaters Regional Development Commission (HRDC).

For about 7 years, Fish Hook Association sponsored a two-mile section of Highway 71 for roadside cleanup.

Fish Hook Association has been a member of the Hubbard County Coalition of Lake Associations (HCCOLA) since its inception. Hubbard County COLA was organized in 1988 to facilitate cooperation among member lake associations.

Annually the Fish Hook Lake and River Association conducts the following activities:

1. Publishes a printed newsletter to members in the spring.
2. Prepares periodic correspondence via email reports on current topics and AIS education topics.
3. Holds an annual meeting in June or July with a catered outdoor picnic and educational program.
4. Sponsors a 4th of July boat parade.
5. Holds an Annual Fall Dinner/Social for members.
6. Conducts a water monitoring program during the summer that includes Secchi disc readings and water testing.
7. Actively participates with Hubbard County Coalition of Lake Associations (HHCOLA)

[11] Appendix A Fish Hook Lake and River Association Bylaws

8. Works with the local DNR office and county zoning office to keep informed on local developments affecting Fish Hook.
9. The Board of Directors meet regularly over the summer months and work to keep members educated and informed.
10. Belongs to the Minnesota Lakes and Rivers Association (MLA) which is a group active with the state legislature and with educating lake owners.
11. Provides funds to support additional boat inspection hours.

II. Review of Historical and Existing Conditions for Eight Focus Areas

1. Water Quality

The Fish Hook Association identified preserving the quality of the lake water as the number one goal of the Association. As the DNR states "Water is one of Minnesota's most valuable resources. Lakes, rivers, and wetlands are important assets."[12]

The Fish Hook Lake and River Association has had a long history of attention to the water quality of Fish Hook Lake and follows general practice requirements to track water quality. Secchi Disk transparency, chlorophyll a, and total phosphorus are the quantitative measures used to evaluate water quality.

Since 1989, volunteers from the Fish Hook Lake and River Association have participated in gathering and reporting Secchi depth readings on Fish Hook Lake. The Secchi disk is an eight-inch black and white disk used to measure water transparency. The depth is determined by lowering the disk to the point of disappearance. It is raised slightly and lowered a second time.[2] The reading is the average of the two depths. Secchi readings are inexpensive and straightforward. Since 2011, the annual average reading on Fish Hook Lake ranged from an average low of 9.3 feet in 2014, to an average high of 13.8 feet in 2012.[3] Current data shows a mean depth of 11.9 (Site 202) and 10.8 (Site 201). [4] For years 1989 to 2024 there is evidence of no change in water clarity at this lake. For the most recent year of the analysis, median water clarity was 3.00 feet shallower than the watershed median.[5] Complete available 20 years of data is provided in the Appendix.

Chlorophyll *a* is a specific form of chlorophyll that is used in oxygenic photosynthesis.[6] It is a measure of algae growing in the water.[7] The lowest measured ratio was 3.9 µg/L in 2015 and highest 5.3 µg/L in 2018. Most recent data[8] shows the mean Chlorophyll *a* between 4.7 and 4.8 µg/L a minimum of 1 µg/L and a maximum of 99 µg/L. The variation depends on the test location and other environmental conditions. Complete 20 years of data is provided in the Appendix.

Phosphorus [P] needs to be regularly tested in the lake as even small amounts of phosphorus make a difference— P is the crucial pollutant connected with accelerated aging (eutrophication) of Minnesota lakes, according to the DNR, "one pound of phosphorus can

---

[12] https://www.lrl.mn.gov/docs/pre2003/other/900530.pdf A Guide for Buying and Managing Shoreland, 1990 MN Department of Natural Resources

[2] https://en.wikipedia.org/wiki/Secchi_disk

[3] 2020 HC COLA Water Monitoring Trend Analysis Reports, https://www.hubbardcolamn.org/water-quality-monitoring-reports.html

[4] RMB Environmental Laboratories, https://lakes.rmbel.com/OnePageSummary.aspx?LakeID=86

[5] https://webapp.pca.state.mn.us/surface-water/impairment/29-0242-00

[6] https://en.wikipedia.org/wiki/Chlorophyll_a

[a] MPCA Lake Water Quality Database

[7] https://www.epa.gov/national-aquatic-resource-surveys/indicators-chlorophyll

[8] RMB Environmental Laboratories, https://lakes.rmbel.com/OnePageSummary.aspx?LakeID=86

lead to the growth of 500 pounds of algae. This changes the lake and impairs recreational uses. Total phosphorus (TP) is a key factor in determining the degree of eutrophication in a lake. Total phosphorus measurements suggest that Fish Hook is at the lower range of mesotrophic conditions, with a mean total phosphorus mean concentration of 15 µg/L with measurements as low as 2.5 µg/L and as high as 36 µg/L.[9] Complete 20 years of data provided in the Appendix.

The trophic state index [TSI] is used to rate the biological productivity of a lake, the Secchi depth, the chlorophyll *a*, and total phosphorus measurements are used to calculate the Carlson's Trophic Index (TSI) value; a score between 0-100 that allows comparison of water quality from other lakes and/or other times. The TSI score for Fish Hook Lake Transparency is 44 and within the expected range of 43-54 for lakes in the same ecoregion. The TSI score for Chlorophyll *a* is 45 and slightly below the expected range. The TSI score for phosphorus is 42 and below the expected range of 49-61. When combined, Fish Hook like has an overall TSI index score of 44.[10]

Lakes with TSI values ranging between 30 and 45 are considered to have a mid-range of nutrients and are reasonably productive; they have an adequate amount of nutrients and generally support a fair growth of algae, aquatic plants, birds, fish, insects and other wildlife.[11] Complete TSI data for 20 years is provided in the Appendix.

Another scale available to assess lakes is the Lake Health score. This measure is also a combination of factors which include water quality, biology and hydrology. The Lake Health Score for Fish Hook Lake is reported at 65 (maximum is 100 or best health and 0 is least healthy) with a Health Grade of B (A is excellent health, B would be good).[12] The Major Watershed mean value is 66 with a min/max within the watershed is 45/90. Fish Hook Lake components show Phosphorous at or above goal levels(a positive result), water clarity at or above goal levels (a positive result), the fish community at or above threshold and lake plant community at or above threshold. At or above thresholds indicate Fish Hook meets or exceeds the minimum criteria used in the modeling. [13]

Lake quality is an important resource not only for swimming and for fishing, but additionally, lake quality is an important resource for property values. A Bemidji State University co-authored study titled "Lakeshore Property Values and Water Quality: Evidence from Property Sales in the Mississippi Headwaters Region" a direct relationship between water quality and lakeshore property values. In other words, the better the water clarity in a lake, the higher the value of the land around that lake. 'The study compared clarity in three-foot increments per frontage foot [FFI of lakeshore.[14] In 1990, Hank Todd, former director of the Minnesota State Tourism

[9] RMB Environmental Laboratories, https://lakes.rmbel.com/OnePageSummary.aspx?LakeID=86
[10] https://webapp.pca.state.mn.us/surface-water/impairment/29-0242-00
[11] https://lakeadmin.org/whatisthetrophicstateindex/
[12] https:// www.dnr.state.mn.us/whaf/about/scores/lake-health
[13] https://arcgis.dnr.state.mn.us/ewr/whaflakes/lakedetails/29024200/topic/summary
[14] Krysel, C., Boyer, E., Paron, C. and Welle, P., Lakeshore Property Values and Water Quality: Evidence from Property Sales in the Mississippi Headwaters Region, Mississippi Headwaters Board and Bemidji State University, May 14,2003.

Department, used lake surface area as a basis for estimating the economic impact of lakes on the local economy. He estimated that lakes generate around 16.5 jobs per thousand acres and consumer purchases of around $509 per acre.[15] Even if the numbers are estimates, the evidence clearly shows that clear water is important for all stakeholders. No recent studies have been identified with our region to update the findings from these two reports.

[15] There is no identifiable reference to these figures. The information was copied from the 2005 Fish Hook Lake Management document and repeated here. Attempts to verify the information were unsuccessful.

2. Fisheries

The Minnesota Department of Natural Resources [DNR] conducted a fisheries survey for Fish Hook Lake in July 2022 and observed "Fish Hook is a popular lake and receives a fair amount of fishing and recreation in summer and winter. [16] According to the DNR Lake Information in the report:

> Walleye abundance was in line with recent surveys, and above the management goal. Most adult fish were spread out from 8 - 23 inches, with a strong class of 14 -16 inch Walleye for anglers. Walleye sampled had an average length of 15.5 inches with fish measuring up to 26.4 inches. Yellow Perch, an important forage species for Walleye were sampled in average numbers, but very few were large enough for anglers to target.
>
> Largemouth Bass were sampled in good numbers again in 2022, with fish averaging just over 11 inches. The longest Largemouth Bass sampled was 19 inches in length. Smallmouth bass have been sampled in the past, but none were sampled in 2022.
>
> Northern Pike abundance was down, but still in moderate numbers for this lake class. Anglers will find most northern from 18 - 24 inches in length, with fish up to 38 inches. Northern Pike sampled had an average length of 21.7 inches and weighed 2.3 pounds.
>
> Only a few crappies were sampled in this survey, with the largest at 11 inches. Fish Hook also provides fishing for Bluegill and Pumpkinseed; with some nicer fish up to 8.5 inches.

Walleye stocking on Fish Hook Lake data for the past 10 years.[17] No data available regarding 2025 stocking.

- 2023: 14,784 walleye fingerlings (660 lbs.)
- 2021: 10,720 walleye fingerlings (660 lbs.)
- 2019: 11,396 walleye fingerlings (660 lbs.)
- 2017: 27,966 walleye fingerlings (1,320 lbs.)
- 2015: 19,800 walleye fingerlings (1,320 lbs.)

The Environmental Protection Agency issued a fish consumption advisory for Fish Hook Lake due to mercury in Fish Hook Lake. This is the basis for the Minnesota State Health Advisory on fish consumption.[18]

---

[16] https://www.dnr.state.mn.us/lakefind/showreport.html?downum=29024200
[17] https://www.dnr.state.mn.us/lakefind/showstocking.html?context=desktop&downum=29024200
[18] https://www.dnr.state.mn.us/lakefind/fca/report.html?downum=29024200

3. Aquatic Vegetation

As it is unlawful in Minnesota to launch watercraft with prohibited aquatic plants or exotic species attached, Fish Hook Association has signage at both public accesses for educational purposes.

Aquatic plants are a crucial part of the natural ecosystem in the lake. A 2006 survey by the Department of Natural resources cataloged the aquatic plants along the south lake shore. Thirty-three (33) varieties of aquatic and shoreline plants were identified. None were invasive species.[19] What are considered exotic/invasive aquatic plants are not part of Fish Hook's natural ecosystem. Hubbard County Aquatic Invasive Species lists Curly Leaf Pondweed (CLP) and Purple Loosestrife (PLS) present in Fish Hook Lake.[20]

Curly Leaf pondweed is a non-native, invasive aquatic plant. One of the first noted invasive plants in Minnesota develops thick surface mats that hinder water activities and creates an unfit habitat for boats, swimmers; fish and native plants. Portage Lake has curly pondweed and Portage Lake drains into Fish Hook Lake through a stream and is the likely source of Curly Leaf Pondweed in Fish Hook. Examination of suspected Curly Leaf Pondweed in recent years has not identified any new outbreaks. CLP is a submersed plant growing from the shore to 15 feet of water. It is most visible up to early June. It dies back in mid-summer.[21]

Purple Loosestrife (PLS) is a wetland plant with purple flowers arranged on flower spikes. Like Curly Leaf Pondweed, PLS can create mats on the surface that inhibit water recreation. It will overtake native habitat and out competes the native plants which leads to deceased plant diversity. They have very dense root systems that are very difficult to manage. PLS was first identified in 1987 around Little Mantrap and Petit Lakes and has been identified in over a dozen other lakes since that time.[22]

The highest emerging threat plants for Fish Hook Lake are Starry Stonewort and Eurasian watermilfoil. Starry Stonewort, like other invasive plants, overtakes native vegetation, creates dense vegetation mats with similar negative outcomes. Starry Stonewort was discovered on Long Lake in Hubbard County during an aquatic vegetation survey.[23] Eurasian watermilfoil is a non-native, invasive aquatic plant, In July 2004, a swimmer discovered Eurasian watermilfoil in Leech Lake, Walker, Cass County, Minnesota, near the public access on state highway 200.[24] Leech Lake also has curly leaf pondweed. In 2025 two additional lakes reported Starry Stonewort in 2025, Garfield Lake[25] and Benedict Lake.[26]

---

[19] https://files.dnr.state.mn.us/natural_resources/water/lakes/aquatic_plant_reports/29024200_1285.pdf

[20] https://hubbardcounty.maps.arcgis.com/apps/MapSeries/index.html?appid=d4243da020f347159a60844c4e4e1309#

[21] ibid

[22] ibid

[23] Lakeland News, August 24, 2023

[24] https://www.peteport.com/portage/milfoil.html

[25] https://www.dnr.state.mn.us/news/2025/08/21/starry-stonewort-confirmed-four-minnesota-lakes

[26] https://www.walkermn.com/news/starry-stonewort-confirmed-in-benedict-lake-in-hubbard-county

4. Wildlife

The brochure Developing a Lake Management Plan notes that:

> Minnesota's lakes are home to many species of wildlife. From our famous loons and bald eagles to otters, and frogs, wildlife is an important part of our relationship with lakes. In fact, Minnesota's abundant wildlife can be attributed largely to our wealth of surface water. From small marshes to large lakes, these waters are essential to the survival of wildlife.[27]

Fish Hook Lake and River Association has participated in the Minnesota Loon Monitoring Program (MLMP) in the past.[28] Through volunteers in this program, the DNR annually gathers information about common loon numbers on more than 600 lakes in Minnesota. Minnesota Department of Natural Resources supports a Voluneer Loon Watcher Survey.[29] Gathering information on loons provides data that aids in conservation of the Minnesota state bird.

The Fish Hook L and river system supports many other forms of wildlife – ducks (multiple varieties), swans, geese, songbirds, muskrats, beavers, otters and others. Clean water includes efforts to reduce the amount of lead tackle being used. Lead is toxic. Minnesota Pollution Control Agency cites an estimate of 25% of adult common loon deaths are due to lead poisoning after ingesting lead fishing tackle.[30] It likely impacts others that consume fish with lead tackle attached or from bottom feeding.

---

[27] https://shorelandmanagement.org/depth/plan.pdf, pg.18
[28] https://www.dnr.state.mn.us/eco/nongame/projects/mlmp_state.html
[29] https://www.dnr.state.mn.us/eco/nongame/projects/loon_survey.html
[30] https://www.pca.state.mn.us/air-water-land-climate/getting-lead-out-of-fishing-tackle

5. Exotic Species

Chinese Mystery snails and Zebra mussels (ZM) have been identified in Fish Hook Lake. [31] Chinese Mystery snails were commonly imported and sold to aquarium users. Their primary negative impact is large die-offs covering beaches and shoreline. Zebra mussels were discovered in Potato Lake, north of Fish Hook Lake, in the fall of 2024 which lead to the MN DNR examining docks and boat lifts along the north shore of Fish Hook Lake in early 2025. They discovered adult ZMs across the north shore on both sides of the inlet from Potato. Their source is not known but it is suspected they traveled downstream to Fish Hook Lake from Potato Lake. The adult ZMs suggest there are sufficient ZMs to have a breeding population. This discovery was disappointing since efforts to sample for ZMs was conducted but did not detect any larval stage in the prior year.

ZMs live underwater, attached to natural and manmade substrates such as rocks, wood, plants, native mussels, pipes, docks, boat lifts, swim rafts, moored watercraft, and other debris. A female can produce 100,000 to 500,000 eggs per year. Fertilized eggs develop into microscopic, free-living larvae, called "veliger's," that form shells. After two to three weeks, the veliger's settle and attach to a firm surface using tiny fibers called byssal threads. Beds of ZMs can reach tens-of-thousands within a single square yard. They are filter feeders which means they filter tiny food particles out of the water, which can reduce available food for larval fish and other animals and can increase aquatic plant growth because of increased water clarity. The disruption caused in the food chain ultimately can impact the apex predators of the aquatic food chain – small panfish and large gamefish.[32]

Chinese mystery snails are large, invasive aquatic snails with smooth, coiled shells that grow up to 2–3 inches long. Their shells are typically olive to brown and feature 6–7 whorls and a hard operculum ("trapdoor") that seals the snail inside. They are called "mystery" snails because females give birth to young, fully developed snails that suddenly and "mysteriously" appear. Their lifespan is about four years. These snails can die off in large numbers and wash up on shore. There is no known effective population control for Chinese mystery snails in natural water bodies currently. [33]

---

[31] https://hubbardcounty.maps.arcgis.com/apps/MapSeries/index.html?appid=d4243da020f347159a60844c4e4e1309#

[32] ibid

[33] https://www.dnr.state.mn.us/invasives/aquaticanimals/chinese-mystery-snail/index.html

6. Land Use and Zoning

While there are a variety of factors that affect lake quality, we can control some factors through prudent zoning. According to the United States Census Bureau, Hubbard county population in 2024 was 22,050. Its annual growth since 2020 has averaged 3.3%. [34]

Hubbard County uses the DNR lake classifications in their zoning regulations. The DNR classifications are: General Development (GD), Recreational Development (RD), or Natural Environmental (NE) lakes. Hubbard County used these classifications to establish minimum lot area and setbacks to preserve the nature reflected by the lake classification.

Fish Hook is a Recreational Development Lake. The Hubbard County Shoreland Ordinance explains that:

> The Recreational Development (RD) management district is established to manage proposed development reasonably consistent with existing development and use; to provide for the beneficial use of public waters by the general public, as well as the riparian owners; to provide for a multiplicity of lake uses; and to protect areas unsuitable for residential and commercial uses from development.[35]

Links to the Environmental Services Department and Planning and Zoning Department provide details on shoreland standards, answers to frequently asked questions, and educational resources.[36]

The Hubbard County Shoreland Management Ordinance policy clearly underscores the concern for the shorelands:[37]

> The uncontrolled use of shorelands of Hubbard County, Minnesota adversely affects the public health, safety and general welfare by contributing to pollution of public waters and by impairing the local tax base. It is, therefore, in the best interest of the public health, safety and welfare to provide for the wise subdivision, use and development of shorelands of public waters. The Minnesota State Legislature has delegated responsibility to local governments of the state to regulate the subdivision, use and development of the shorelands of public waters in order to preserve and enhance the quality of surface waters, conserve the economic and natural environmental values of shorelands, and to provide for the wise use of waters and related land resources. This responsibility is hereby recognized by Hubbard County and will be accomplished through the enforcement of this Ordinance, which shall be known and cited as the Hubbard County Shoreland Management Ordinance.

The city of Park Rapids governs the shoreline and homes along Fish Hook River reservoir and parts of Mud Lake that lie within City Boundaries. Therefore, municipal shoreline ordinance should also apply to this section. In the city, there is concern about adequate stormwater retention and treatment.

---

[34] https://www.census.gov/quickfacts/fact/table/hubbardcountyminnesota/PST045222
[35] Hubbard County Shoreline Management Ordinance No. 17, Amendment February 2, 2024
[36] https://www.co.hubbard.mn.us/index.asp
[37] Hubbard County Shoreline Management Ordinance No. 17, Amendment February 2, 2024

7. Managing Water Surface Use Conflicts

Lake management provides benefits that attract homeowners and users. However, wherever there are people, there are conflicts among users. We promote resolution of conflicts by working collaboratively to arrive at solutions. Fish Hook Lake and River Association does not regulate or have authority over the lake or river use. It can assist in the information process of new use restrictions. Currently the only limitations are within the River areas for closed throttle in channels, under bridges, and in narrow waterways.[38]

With over 800,000 boats registered in Minnesota, some conflicts can be expected in the years to come. This information is designed to address the most frequently asked questions regarding this process - called "water surface use management" (WSUM) or "water surface use zoning." The goal of surface use management is to enhance the recreational use, safety, and enjoyment of lakes and rivers and to preserve them as natural resources of the state.[39]

The MN DNR maintains that if a restriction is needed the following should be considered in its development:[40]

- accommodating all compatible uses, where feasible.
- minimizing adverse impacts on natural resources.
- minimizing conflicts between users to provide for maximum use, safety and enjoyment.
- conforming to the standards set in law and rule.

Annual distribution of state standards for watercraft operation, setbacks from shorelands, loon nests, swimming areas, and other topics helps create public awareness of proper activities. Fish Hook Association distribute "welcome packets" with state and local information to assist in educating our community.

A current issue for lake use is the developing conversation around wake boat activities on the lake. Wake impact research show that wake boats have the potential to disturb lake bottom sediments as deep as 20 feet and can impact shorelines with waves generated from the lake in excess of other powered watercraft.[41] There are currently no ordinances in place. For Fish Hook Lake and River we are recommending operating wake boats in 20 feet of water at least 500 feet from shore.

---

[38] https://files.dnr.state.mn.us/rlp/regulations/boatwater/local_regs.pdf
[39] https://www.dnr.state.mn.us/regulations/boatwater/surfaceusezoning.html
[40] ibid
[41] https://cse.umn.edu/college/news/new-study-powerboats-can-impact-lakes-below-surface

8. Public Water Access

The Minnesota Department of Natural Resources, Trails and Waterways Unit is responsible for pubic water access including the acquisition, development, and management of access sites. The DNR can manage the access itself or contract with county or local government. Hubbard County manages access to Fish Hook Lake. The goal of the DNR public water access program is free public access to all of Minnesota's lake and river resources consistent with demand and capabilities to provide recreation opportunities. Any lake that receives fisheries stocking must have public access.

There is one public access on Fish Hook Lake located approximately 1.5 miles northwest ot Park Rapids off US Highway 71. Administered by Hubbard County, the DNR website lists the following amenities at this facility (amended by FHLARA):[42]

- 2 ramps (type=natural) (observation concrete ramps with natural soil approaches)
- 1 parking lot (type=asphalt) (observation is that there is no asphalt parking lot)
- no vehicle parking spaces (no designated spaces)
- 16 vehicle/trailer parking spaces (not marked)
- No (marked) accessible parking spaces
- 1 dock
- 1 restroom (seasonal)

There is a river access point maintained by Hubbard County at Heartland Park. This public access has restroom facilities in the park not at the ramp. The ramp has two concrete lanes, at a steep angle, with two docks.. The approach is paved with asphalt as is the parking area with approximately 8 trailer spots available.

The Fish Hook Lake and River Association in the past has performed volunteer inspections for exotic species and provided signage to alert access users to exotic plant identification and problems at the Fish Hook Lake ramp. Today the Hubbard County AIS Program has a Delegation Agreement with the State of Minnesota that authorizes Hubbard County to conduct watercraft inspections at public water accesses. AIS inspectors are contracted employees who are MN DNR certified and trained Level I Watercraft Inspectors. These inspectors work with boaters to educate them on AIS prevention methods and best management practices around public access areas. In addition to education, Level 1 Inspectors have the legal authority to deny launch of a watercraft if there is AIS attached or verified water on board that cannot be drained. These inspections usually take a few minutes.[43]

The AIS program supports a free Watercraft Decontamination Station provided by Hubbard County. Decontamination is an important step in preventing the spread of AIS. The Decontamination Station is staffed by MN DNR trained and certified Level II Watercraft Inspectors. The decontamination process consists of three possible components: hand

[42] https://www.dnr.state.mn.us/lakefind/
[43] https://www.co.hubbard.mn.us/ais

removal, hot water treatment, and high-pressure treatment. If there are plants or mussels attached to a boat, they can be removed by hand or with high-pressure water. Any organisms that may be too small to see can be killed by flushing with hot water 100-140° F. [44]

[44] ibid

III. Summary of Visioning/Planning Session

On April 24, 2004, the Fish Hook Lake and River Association held an inclusive community planning/visioning session designed to identify key community concerns, assets, opportunities and priorities. For the meeting, announcements were sent to key community partners, Fish Hook Lake and River Association members, and information was advertised in the local paper. The Initiative Foundation facilitated the session as part of the Healthy Lakes and Rivers Program.

The focus areas from the meeting were:

- Increase participation of membership of association members
- Create teams to work on focus areas
- Identify neighborhood teams to monitor their area of the lake

A summary of the Planning/Visioning Session was presented at the FHLARA annual meeting.

The focus areas identified and reported at the visioning/planning session were incorporated in the 2005 Lake Management Plan. Further feedback was provided by association members at the Annual Meeting in 2024. The data collected identified four areas of current concern as follows:

1. Association Membership
2. Water Quality
3. Aquatic Vegetation/Exotic Species
4. Land Use Zoning

This information, in conjunction with past activities of the Fish Hook Lake and River Association, provided input to the formation of the Goals and Actions plan in the following section.

IV. Goals and Action Plan

GOALS	ACTION*	SUCCESS CRITERIA	IMPLEMENTATION	RESPONSIBLE PARTY	BUDGET
Maintain Critical Association Membership Levels					
	Communication	Education of membership benefits; list of FHLA Actions/Accomplishments	Email, Facebook and Website materials developed	All Board Members Contribute	NA
	FHLARA Social Activities	Review for Increased Annual participation rates New Social Activities planned	Annual Meeting Picnic	Board Member	$$
			Annual Dinner	Board Member	NA
			4th Of July Parade	Board Pres or designate	NA
			Women's Coffee	Varies	NA
Lake Management Plan					
	Annual Review and Update	Completed Annual Review	Review for changes and summarize accomplishments	Board Members	None
Water Quality					
	Review Trends in Water Quality	Completed Review	Water Samples Completed	Volunteer	Testing $$
			Secchi Disc Readings Completed	Volunteer	
	Summarize Trends to Membership	Report Completed and Distributed	Report Distributed Annual Meeting	Board	
Wildlife Monitoring					
	Loon Watch	Participating in Voluntary Loon Watch Program	Recruit members to track and report	Board Recruiting	
			Loon Platforms	Volunteers	$$
Partnering					
	Annual Meetings with Upstream Lake Associations		Collaborate Joint Education Opportunities	President and Vice President	
	Maintain Active HCCOLA membership	Regular attendance and reporting on HCCOLA	Share HCCOLA Information with members	Board	$$
Aquatic Invasive Species					
	Maintain public access signage	Inspect signage for relevance	Visit Public Access Points	Volunteer	
	Communicate	Inform/educate members on AIS issues and conditions	Email, Annual Meeting, Facebook and Web Site	Board	

	HCCOLA AIS Activities	Members participating in HCCOLA training activities for AIS	Inform and recruit members for HCCOLA training opportunities	Volunteers	
	Education	Monthly topics for email, web, or Facebook members	Prepare AIS topics for communications	Board or Volunteers	
	Eyes On The Water	Volunteers participating	Regular Shoreline Checks Rakes for Rake Toss	Volunteers	$
			Zebra Mussel Samplers	Volunteers	
	Inventory Aquatic Plant Species	Conduct survey every 3-5 years			$
Advocate for FHLAR Owners	Land Use and Zoning	Monitor state, county and local ordinances that impact shoreline and AIS	Provide comment on developments/activities that impact FHLAR	Board	

APPENDIX A

Fish Hook Lake and River Association

Bylaws

BYLAWS OF THE FISH HOOK LAKE & RIVER ASSOCIATION, INC.

ARTICLE I. MANAGEMENT

1. Management. The management of the business and affairs of the Corporation shall be in the hands of a Board of Directors, who shall be chosen by a majority vote of all members present at the annual meeting of said Corporation.

2. Election. At such annual meeting, the Corporation shall elect up to 11 directors. The term for directors shall be three years. Board members must be composed of both Lake and River members. The COLA representative and the Membership chair can be elected members of the Board or can be positions appointed by and reporting to the Board of Directors. The immediate past president may serve on the Board of Directors in an advisory capacity with no voting privileges and is in addition to the 11 elected directors.

3. Vacancies. The Board of Directors shall have the power to fill any vacancies occurring in said Board for any cause other than expiration of term of office. Persons appointed to fill such vacancies shall only serve until the next annual meeting.

Should any member of the Board of Directors miss three consecutive meetings of the Board, the office may be declared vacant on vote of the majority of all members of the Board of Directors.

4. Officers. At the first meeting of the Board of Directors after the annual meeting, the Board of Directors shall elect officers for the coming year. The officers of the Corporation shall be: President, Vice-President, Secretary, and Treasurer and shall be chosen from the Board of Directors. The Secretary and Treasurer may be combined into a single office. A simple majority in number of the Board of Directors shall constitute a quorum.

5. President. The President, and if absent, the Vice-President, shall preside at all meetings of the Corporation and at all meetings of the Board of Directors. The President shall have the power to appoint such committees as may be necessary, with the approval of the Board of Directors. These committees shall act under the direction of the Board of Directors.

6. Secretary. The Secretary shall keep a record of all meetings of the Corporation and of the Board of Directors and perform such duties as are usually performed by secretaries of such corporations.

7. Treasurer. The Treasurer shall keep safely all the funds of the Corporation and remit funds as provided by the constitution and by-laws of the Corporation. At each annual meeting, the Treasurer shall render a complete statement of the finances of the

Corporation for the past year, and such other statements from time to time as shall be required by the Board of Directors.

8. Removal. Any officer of the Corporation may be removed from office for malfeasance of duties by two-thirds vote of the Board of Directors.

9. Quorum. A Quorum shall consist of ten percent of the total number of members.

10. Meetings of Directors. Regular meetings of the Board of Directors shall be held at least 4 times a year at such time and place as shall be designated by the President. Directors shall be notified prior to the date of the meeting. Special meetings may be held at the call of the President or at the request of any director submitted to the Secretary who will notify the President.

ARTICLE II. MEMBERSHIP

1. Classes. The membership of the Corporation shall be made up of a single class.

2. Membership. Any owner or occupier of lands within 1000 feet of Fish Hook Lake or Fish Hook River in Hubbard County, Minnesota, is eligible for membership. Any interested person may become an associate member by paying the annual dues. However, they shall not have voting privileges.

3. Voting. Each member who has paid annual dues shall have one vote. A household is viewed as a single member and shall have only one vote. However, if each household member has paid their annual dues, then each of them shall have one vote.

4. Members meeting. The annual meeting of the Corporation for the selection of a Board of Directors and other business shall be held during the summer months at the discretion of the Board of Directors. Meetings of the Corporation may be called at any time by order of any officer or by three members of the Board of Directors or by ten members upon notification to the Secretary, who shall notify all members by mail or telephone at least three days prior to the date for such special meeting.

ARTICLE III. DUES AND FEES

1. Dues. The annual dues shall be set by the Board of Directors and are due and payable by July 1st. The Membership chairperson shall mail bills to the members on or about May 1st of each year.

2. Reductions. No reductions in dues shall be made to persons paying dues after July 1st.

3. Refunds. Members resigning shall receive no refunds.

4. Membership List. The Membership chairperson shall maintain a list indicating each member's name, address, phone number, e-mail and dues status. The list shall be confidential with the exception of COLA.

5. Assessment of members. The Board of Directors may assess the membership during the course of the year to support special projects or extraordinary expenses. Statements or bills for assessments shall be sent at the direction of the Board of Directors, all such bills payable within 30 days.

ARTICLE IV. SPECIAL COMMITTEES

1. Appointment. The President and the Board of Directors shall appoint such special committees as they deem fit.

2. Duties. Special committees shall perform such duties as shall be designated by the Board of Directors.

3. Expenses. All expenses incurred in the special committees shall be audited, checked, and approved for payment by the Chairperson of the committee under whom such expenses is incurred before being paid by the Treasurer.

ARTICLE V. FINANCES

1. Limit of Indebtedness. The Board of Directors shall not incur any indebtedness on the part of the Corporation in excess of money in the hands of the Treasurer, and the debts, dues, and obligations in process of collection from the membership, less amount of unexpected appropriations unless such indebtedness be authorized by the Corporation at the annual meeting or at a special meeting called for that purpose.

2. Allocations. The Board of Directors shall not allocate more than $1000 from the Corporation's treasury to be spent without the approval of the membership at a membership meeting or by a vote of the membership by mail.

3. Scholarship fund. The FHLRA Board may award to "COLA Children's Freshwater Festival" an annual monetary scholarship toward the Festival from donations and memorials received by the FHLRA.

4. Special Funds. An Environmental Fund shall be set aside for a major crisis or pollution clean-up. This fund shall come from 25% of the dues collected each year.

5. Money Requests. Any requests for money from the Corporation's funds must be submitted in writing to the President at least 14 days before the next Board meeting. There shall be a form to fill out to make the request.

6. Annual Report. The Board of Directors shall at the annual meeting report on the condition of the Corporation including membership, a complete account of the financial transactions of the past year, and offer suggestions for the welfare and improvement of the Corporation. Any written reports shall be kept on file in the archives of the Corporation and shall be subject to the inspection of any member.

ARTICLE VI. SEAL

1. Seal. The Corporation shall act without seal.

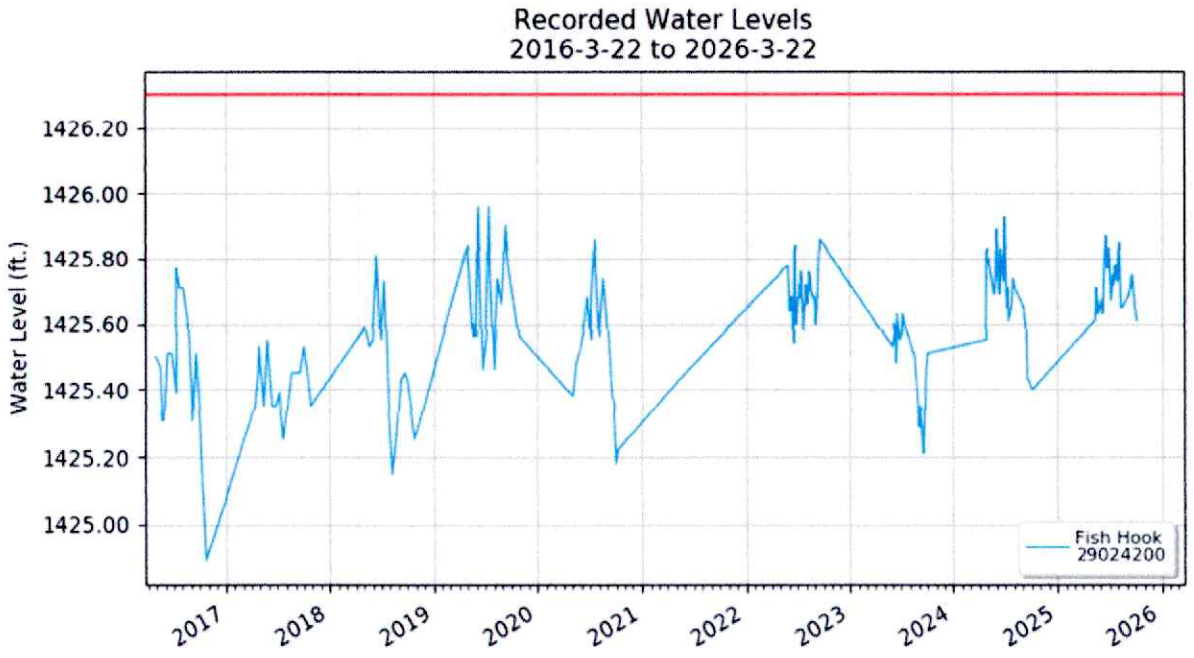
ARTICLE VII. AMENDMENTS

1. Amendments. The By-Laws may be modified, altered, or amended by two-thirds vote of the members present at the annual meeting of the Corporation, or at a special meeting called for that purpose, provided that due notice of any proposed modification, alteration, or amendment shall be given to all members, giving the substance of such modification, alteration, or amendment.

Adopted by the Board of Directors in May 2001; ratified by the membership at the annual meeting on July 13, 2001. Amended by the membership at the annual meeting on June 6, 2008.

Water Level Data Fish Hook Lake[1]

Period of record: 06/16/1977 to 10/09/2025
Number of readings: 1045
Highest recorded: 1426.23 ft (07/14/1997)
Lowest recorded: 1424.11 ft (06/24/1988)
Recorded range: 2.12 ft
Last reading: 1425.61 ft (10/09/2025)
Ordinary High Water Level (OHW) elevation: 1426.3 ft
Datum: NGVD 29 (ft)



[1] https://www.dnr.state.mn.us/lakefind/showlevel.html?downum=29024200

WATER QUALITY SUMMARY

Recreational suitability measures[1]

The Overall Trophic State Index for this lake: 44 which indicates Fish Hook Lake is healthy with a moderate nutrient load. We are at or below the low end of the Expected TSI range for lakes in the same ecoregion which is a good indicator of lake health.

The Trophic State Index (TSI) is a number that summarizes a lake's overall nutrient richness. Nutrient richness ranges from clear lakes, low in nutrients (oligotrophic), to green lakes, with very high nutrient levels (hypereutrophic). The TSI calculations are based on data collected between June and September 2016 to 2025.

Scale Interpretation:

0–30: Oligotrophic (clear, low nutrient, high oxygen).

30–50: Mesotrophic (moderate nutrients, healthy).

50–70: Eutrophic (high productivity, lower transparency).

70–100: Hypereutrophic (extremely high productivity, algal blooms)

Parameters	10-Year average of all summer samples	Parameter TSI	Expected TSI range of lakes in same ecoregion	Number of samples
Transparency (meters)	3	44	43 - 54	48
Chlorophyll-a (parts per billion)	5	46	46 - 61	47
Total Phosphorus (parts per billion)	15	43	49 - 61	47

[1] https://webapp.pca.state.mn.us/surface-water/impairment/29-0242-00

APPENDIX D

Secchi Disk Seasonal Trends

Secchi Disk (Transparency) Trends[1]

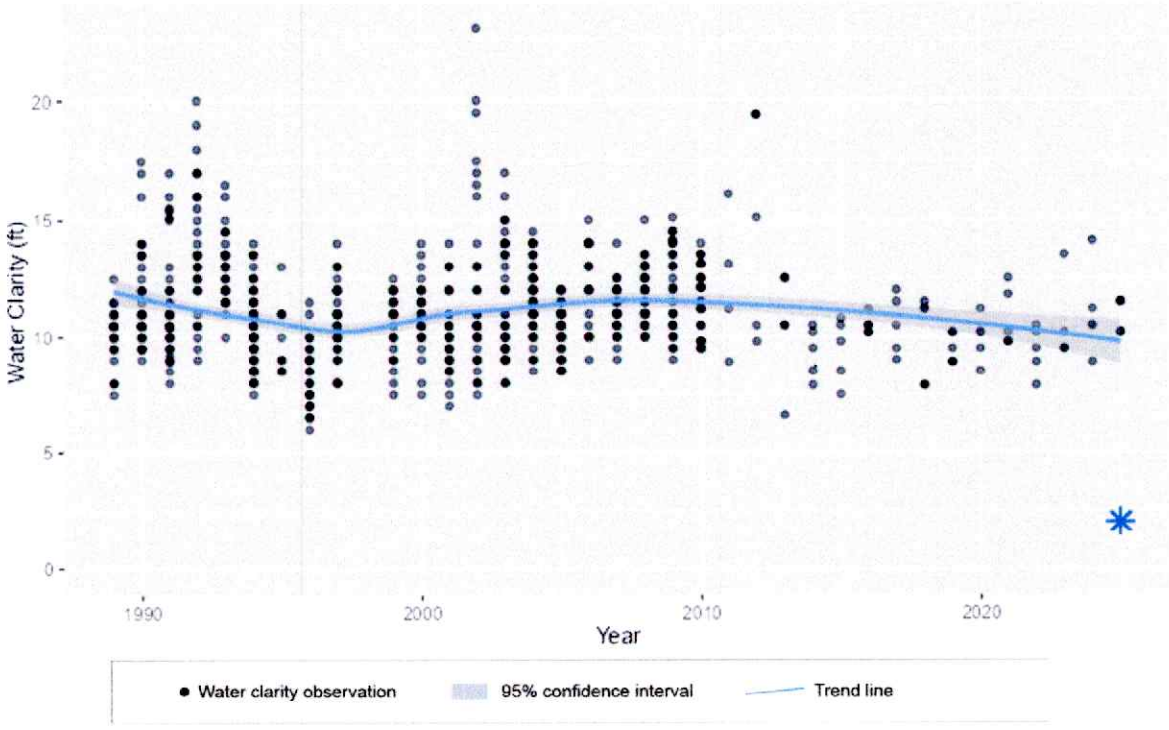
Secchi Disk

Lake Transparency Trend

The Figure below shows the water transparency measurements. The trend analysis was performed with a Seasonal Mann Kendall test. This statistical test detects changes in water clarity over time by comparing months across years (example - Mays are compared to Mays, Junes to Junes, etc...). For lakes with enough data, the figures include a trend line, which shows the direction of detected changes in water clarity. The gray area around the trend line represents the range where the actual clarity measure will fall with 95% certainty.

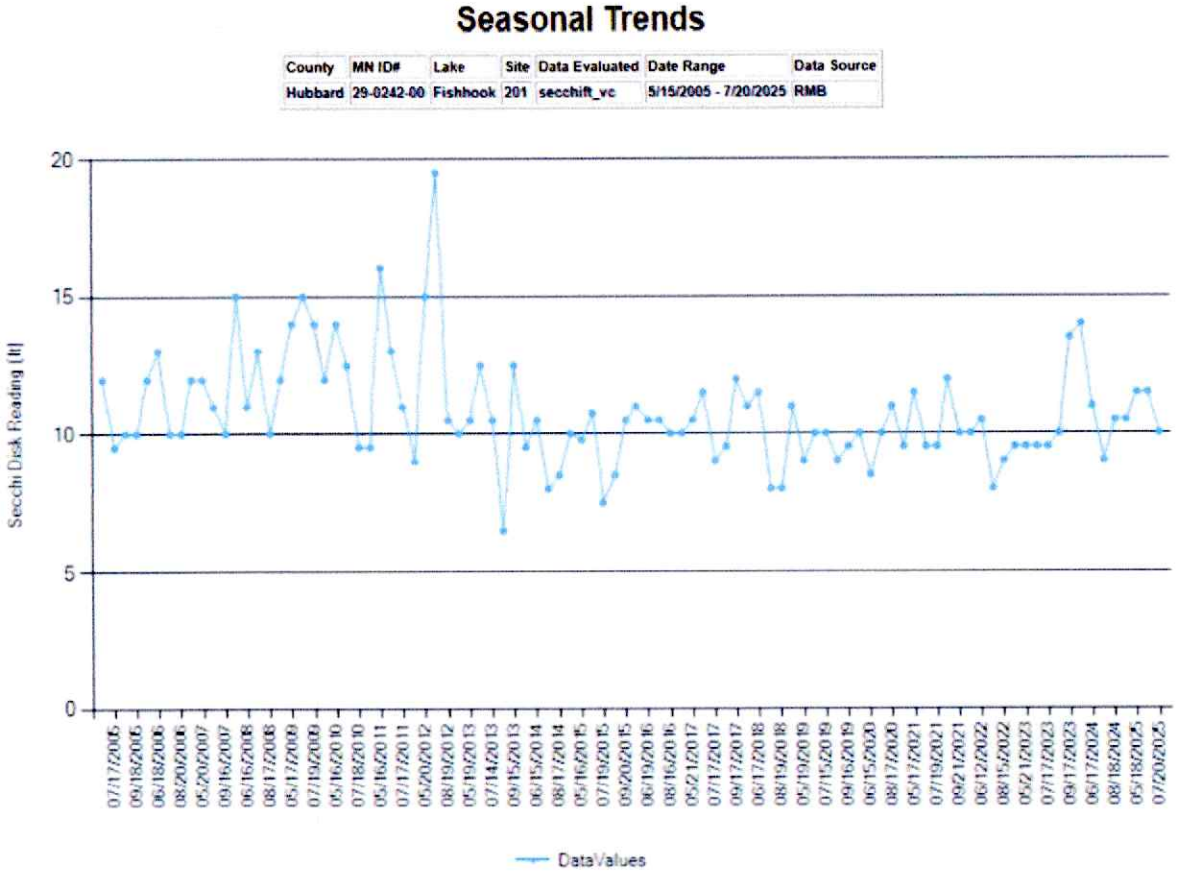
Trend analysis result: For years 1989 to 2025 there is evidence of no change in water clarity at this lake. For the most recent year of the analysis, median water clarity was 2.65 feet shallower than the watershed median.

The trend line is showing a moderate decline over the past 15 years.



[1] https://webapp.pca.state.mn.us/surface-water/impairment/29-0242-00

The same data from the previous information is also presented by sampling data in the figure below.[2] What is somewhat more clearly observed is the change that appears to exist prior to 2012 and after that time to present conditions. It appears that, while not varying significantly



the values do seem lower than the previous period. However, due to larger variation in the pre-2012 range, a statistical change may not be demonstratable, thus the change is only an observation.

[2] RMB Laboratories, Inc.

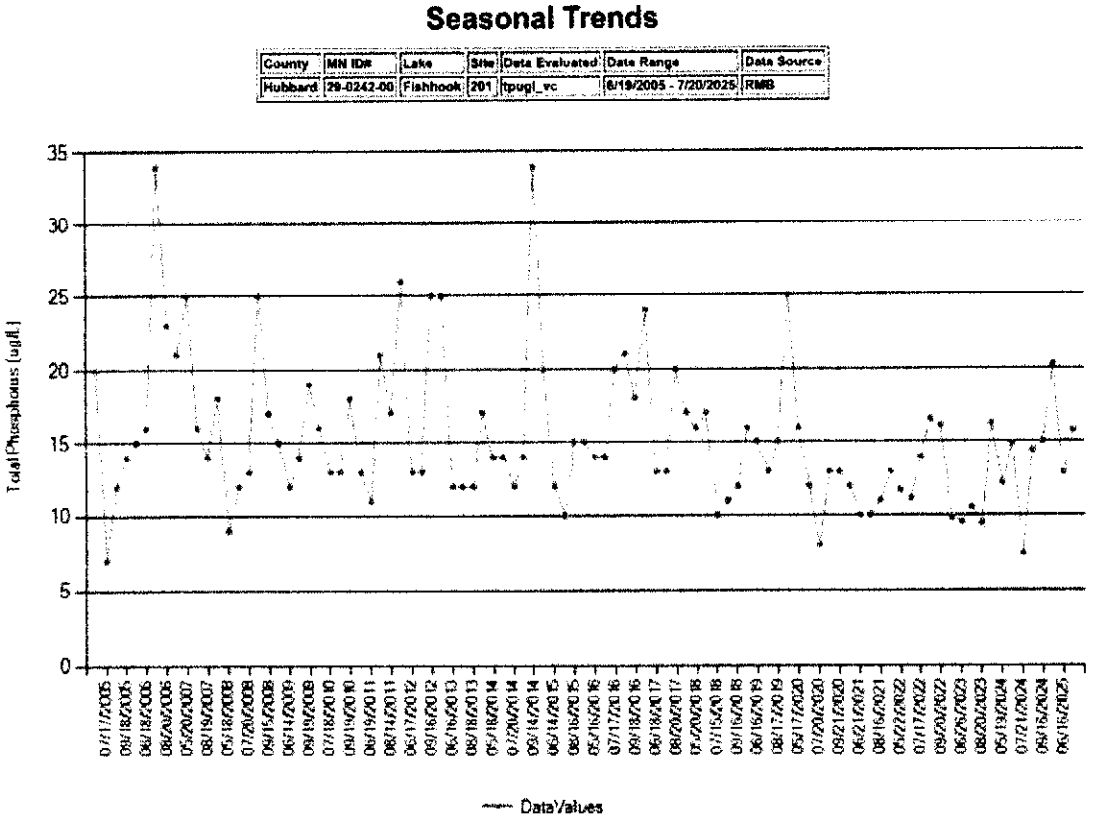
APPENDIX E

Total Phosphorus Seasonal Trends

Total Phosphorus Seasonal Trends

Phosphorus is a common element in agricultural fertilizers, manure, and organic wastes in sewage and industrial discharges.

Rain and snowmelt can wash fertilizers and manure off agricultural land and into ditches, streams, and lakes. It can also be in discharges of treated wastewater from communities and businesses. Erosion of soil and other particles is another source of phosphorus, which binds to sediment. Reducing any runoff, including hard surfaces in urban areas and cropland in rural areas, is an important strategy for reducing phosphorus in lakes and streams.[1] The seasonal trend data plot shows 20 years of data for Fish Hook Lake. The trend shows a decline over time in the average total phosphorus with current levels average around 15 µg/liter (also 15 ppb).



[1] https://www.pca.state.mn.us/pollutants-and-contaminants/phosphorus

Fish Hook Lake's Total Phosphorus load is in an acceptable range for most uses. As noted n the able below.[2]

Most Sensitive Lake Uses and Their Phosphorus Criteria by Ecoregion

ECOREGION	MOST SENSITIVE USE	P LEVEL
Northern Lakes and Forests	Drinking water supply	<15 ppb
	Cold water fisheries	<15 ppb
	Swimming and aesthetics	<30 ppb
North Central Hardwood Forests	Drining water supply	<30 ppb
	Swimming and aesthetics	<40 ppb
Western Corn Belt Plains	Drinking water supply	<40 ppb
	Swimming and aesthetics	
	- full support	<40 ppb
	- partial support	<90 ppb
Northern Glaciated Plains	Recreation and Aesthetics	
	- partial support	<90 ppm

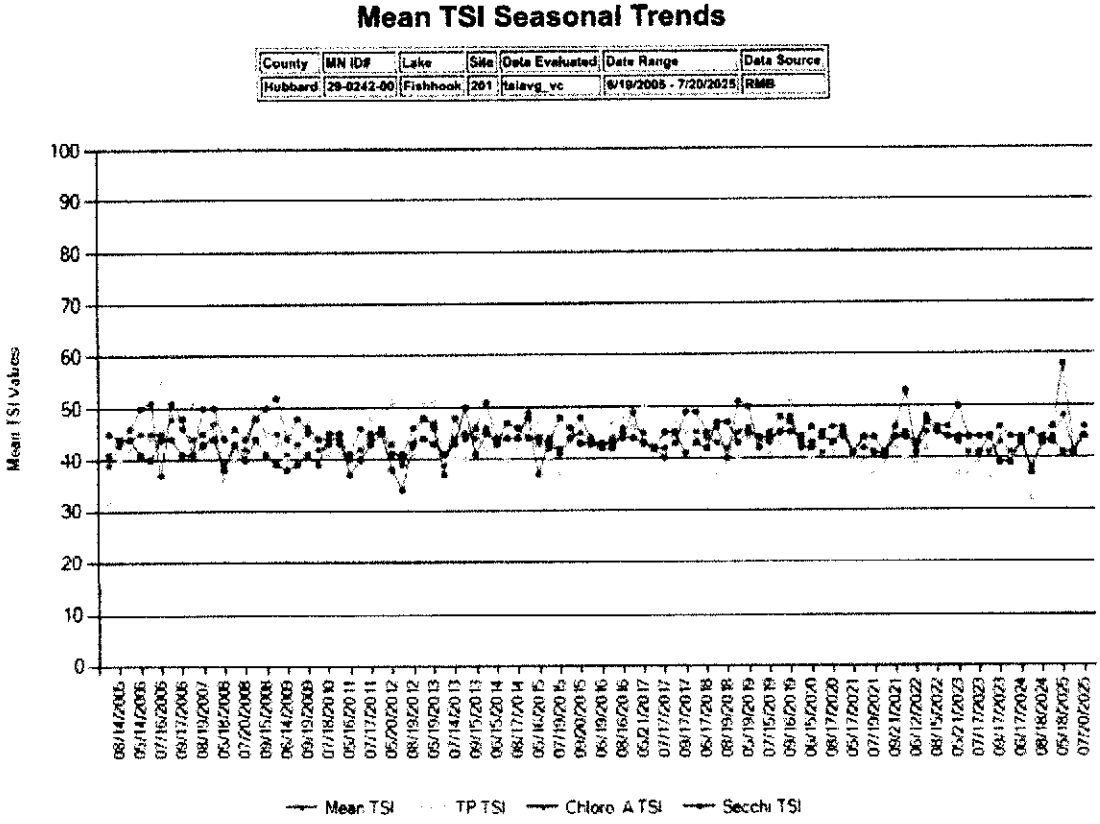
[2] Fact Sheet Phosphorus Concentration, Minnesota Environmental Indicators Initiative, p. 3 6/1/98

APPENDIX F

Chlorophyl-a Seasonal Trends

TSI Seasonal Trends

The Trophic State Index was defined and more detail on the components in Appendix C – Water Quality Summary Information. The purpose of this Appendix is to present the full 20 years of TSI data. While hard to read in black and white, there has been no discernable change over time shown in the graph. [1]



[1] RMB Laboratories, Inc.

APPENDIX G

Fish Hook Lake Summary

Fishhook Lake Summary

This one-page summary produced by RMB Laboratories summarizes much of the previously presented data in a condensed form. Of note the phosphorus loading is showing as declining by the statistical measurements used by RMB which is impacting the Trend for the TSI data. However, in all three primary measurements, Fish Hook Lake is in the expected range. It is noted that Zebra mussels may have an impact on our water quality over time. These data are a good starting point from 2025, the year Zebra mussels were detected in Fish Hook Lake.

Fishhook 29-0242-00

Lake Information

MN Lake ID: 29-0242-00
County: Hubbard
Ecoregion: NLF
Major Drainage Basin: UM
Latitude/Longitude: 46.95777778 / -95.06222222
Years Monitored: 1999 - 2025
Monitored Sites: 201,202

MPCA Assessment Report
Search County Monthly Precipitation Data
MN DNR Watershed Health Assessment Framework

Physical Characteristics

Surface area (acres): 1632
Littoral area (acres): 861
% Littoral area:
Max depth (ft): 76
Max depth (m):
Mean depth (ft): N/A
Watershed size (acres): N/A
Aquatic Invasive Species: Zebra mussel

View MN DNR Fisheries Report
View MN DNR Lake Level Report

Water Quality Characteristics

(data from RMB monitoring database only)

Parameters	Primary Site 202	Site 201
Total Phosphorus Mean:	14.5	15.6
Total Phosphorus Min:	2.5	7
Total Phosphorus Max:	28	35
Number of Observations:	24	104
Chlorophyll-a Mean:	4.7	4.9
Chlorophyll-a Min:	1	2
Chlorophyll-a Max:	9	16
Number of Observations:	24	104
Secchi Depth Mean:	11.9	10.6
Secchi Depth Min:	8	0
Secchi Depth Max:	23	19.5
Number of Observations:	23	101
Trophic State Index Mean:	41.9	43.6

Trophic State: Mesotrophic

Trends

For detecting trends, a minimum of 8-10 years of data with four or more readings per season is recommended by the Minnesota Pollution Control Agency.
Where data does not meet these criteria, trends can be misidentified because there are many factors that affect water quality naturally.
Trend analysis does not take into consideration aquatic invasive species. Species like zebra mussels can alter water chemistry over time.
The data was analyzed using the Mann Kendall statistical analysis.
Primary site only.

Years Monitored: 1999 - 2025
Total Phosphorus: Declining with 90% confidence.
Chlorophyll-a: No significant trend exists.
Secchi Depth: Improving with 80% confidence.
Trophic State Index: Declining with 80% confidence.

Ecoregion Comparisons

Minnesota is divided into seven ecoregions based on land use, vegetation, precipitation, and geology. The MPCA has developed average ranges of water quality expected for lakes in each ecoregion. Comparisons are based on interquartile range, 25th-75th percentile, for ecoregion reference lakes. Primary site only.

Ecoregion: NLF
Total phosphorus: Within Expected Range
Chlorophyll-a: Within Expected Range
Secchi depth: Within Expected Range

RMB Environmental Laboratories, Inc. • 218-846-1465 • lakes@rmbel.com • www.rmbel.com

APPENDIX H

Basic Lake Data

Basic Lake Data from MN Lake Finder[1]

Area (acres)	1,643
Lake Watershed Area (acres)	154,848
Maximum Depth (feet)	76
Maximum Depth (meters)	23.2
Mean Depth (feet)	27
Mean Depth (meters)	8.1
Littoral Area (acres)	603
Shoreline (miles)	9.1
Water Body Class	Lake or Pond
Managed Fisheries Lake	Yes
Basin	Mississippi Headwaters (0701)
Major	Crow Wing River (12)
Catchment ID	1202400
County (Majority)	Hubbard
County (Percent)	Hubbard: 100%

[1] https://whaf-lakes.dnr.state.mn.us/lakedetails/29024200/topic/summary

APPENDIX I

Fish Consumption Guidelines

DEPARTMENT OF HEALTH

Pregnant Women, Women Who Could Become Pregnant, and Children under Age 15

STATEWIDE SAFE-EATING GUIDELINES

Every week eat some of these fish!

2 SERVINGS of any of these fish

Purchased fish

- Catfish (farm-raised)
- Cod
- Herring ♥
- Mackerel (Atlantic) ♥
- Pollock
- Salmon (Atlantic or Pacific; not Great Lakes) ♥
- Sardines ♥
- Shellfish (such as crab, oysters, scallops, shrimp)
- Tilapia
- Fish sticks and sandwiches

♥ Higher in Omega-3 fatty acids

OR

1 SERVING of any of these fish

Purchased fish

- Canned "light" tuna
- Halibut

Minnesota caught fish

- Bullhead
- Crappie
- Inland trout (brook, brown, rainbow)
- Lake herring (Cisco)
- Lake whitefish
- Sunfish (such as Bluegill)
- Yellow perch

And, 1 serving each month of any of these fish

Purchased fish

- Canned "white" (albacore) tuna
- Chilean seabass
- Grouper
- Marlin
- Tuna (steak or fillet)

Minnesota caught fish

- Bass
- Catfish
- Lake Trout
- Northern pike
- Walleye
- Other Minnesota species not listed

DO NOT EAT these fish!

Purchased fish

- Swordfish
- Shark
- King mackerel
- Tilefish

Minnesota caught fish

- Muskellunge

Fish Guidelines Program
651-201-4911
www.health.state.mn.us

02/2020

To obtain this information in a different format, call 651-201-4911

https://www.health.state.mn.us/communities/environment/fish/docs/pregntstateguide.pdf

DEPARTMENT OF HEALTH

Men, Boys Age 15 and Over, and Women Not Planning to Become Pregnant

STATEWIDE SAFE-EATING GUIDELINES

Every week eat some of these fish!

4 SERVINGS per week* of these fish

Minnesota caught fish

- Bullhead
- Crappie
- Inland trout (brook, brown, rainbow)
- Lake Herring (Cisco)
- Lake whitefish
- Sunfish (such as Bluegill)
- Yellow perch

OR

1 SERVING of any of these fish

Minnesota caught fish

- Bass
- Catfish
- Northern pike
- Walleye
- Other Minnesota species not listed

*previously unrestricted

And, 1 SERVING each month of any of these fish

Purchased fish

- Swordfish
- Shark
- King mackerel
- Tilefish

Fish Guidelines Program
651-201-4911
www.health.state.mn.us

02/2020

To obtain this information in a different format, call 651-201-4911.

https://www.health.state.mn.us/communities/environment/fish/docs/menstateguide.pdf