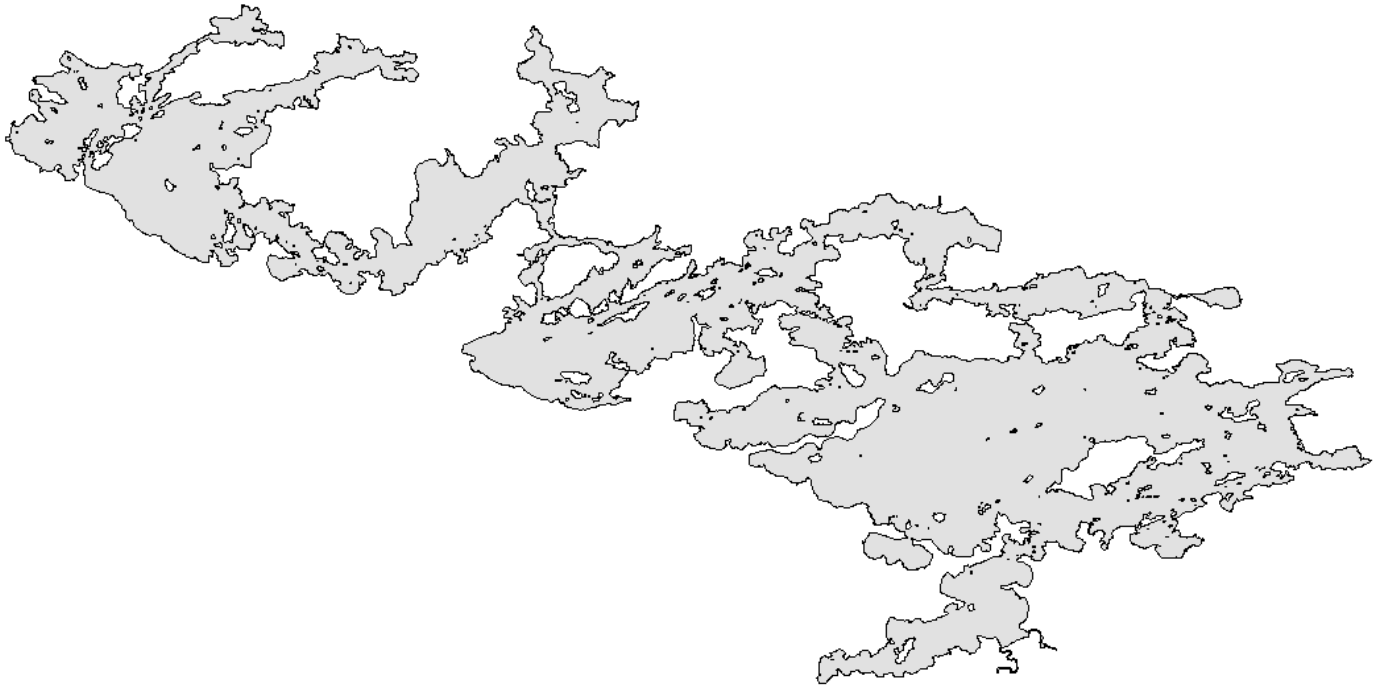
DEPARTMENT OF NATURAL RESOURCES

Executive Summary
Lake Vermilion Fisheries Management Plan
2017-2022



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Lake Vermilion Fisheries Input Group

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At-large	Jim Battin
Lake Vermilion Fisheries Committee	Bob Benson
Statewide Northern Pike and Muskellunge Work Group	Justin Birch
Statewide Bass Work Group	Al Grabowski
Statewide Walleye Work Group	Terry Grosshauser
Lake Vermilion Resort Association	Eric Hanson
Vermilion Lake Association, Inc.	Mel Hintz
Lake Vermilion Guides League	Buck Lescarbeau
At-large	Grant Lodden
At-large	Glenn Merrick
At- large	Billy Rosner
Lake Vermilion Resort Association	Jay Schelde
Vermilion Lake Association, Inc.	Ed Tausk
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Lake Vermilion Fisheries Committee	Jim Tolan
At-large	Brian Zak
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1854 Treaty Signatories

Fond du Lac Band of Lake Superior Chippewa	Brian Borkholder
Bois Forte Band of Chippewa	Gabrielle Holman

Executive Summary

Purpose

Develop a plan to guide fisheries management on Lake Vermilion for a six year period from 2017-2022, with the understanding that adaptive management strategies could occur outside the scope of this plan.

Background and Current Status

The last fisheries management plan for Lake Vermilion was developed in 2007 by Minnesota Department of Natural Resources (DNR) Fisheries staff with minimal input from stakeholders (Williams 2007). This plan defined goals and actions for managing specific fish species of primary management concern present within the fish community. Lake Vermilion is an important statewide resource and there has been increasing public interest in management issues in recent years. A more structured management planning process that included formal citizen participation and facilitated planning meetings was initiated to engage stakeholders in the development of this plan.

The DNR worked with a group of 20 stakeholders, which comprise the Lake Vermilion Fisheries Input Group (LVFIG) to provide input for the development of the 2017-2022 Lake Vermilion Fisheries Management Plan. This group provided diverse local and statewide perspectives and made recommendations on Lake Vermilion fisheries management. We will continue to work with the Input Group and other interested stakeholders through the duration of the plan. This will include holding annual update meetings to review the previous year's information, assess the status of the fishery with respect to the goals and objectives defined in the management plan, and provide opportunities to discuss any emerging issues.

The updated Lake Vermilion Fisheries Management Plan is designed to build on existing knowledge while preserving a sustainable, species-diverse fishery. The current plan is more detailed than previous management plans and will be updated on a more regular time frame. The plan will expire in 2022, however deviations from the plan may be necessary and appropriate under certain conditions. Potential deviations from this plan will be discussed with the LVFIG before implementation. The management plan not only addresses fish populations, but also other topics of lakewide interest including habitat, double-crested cormorants, fishing tournaments, and aquatic invasive species.

New to the 2017-2022 Lake Vermilion Fisheries Management is an increase in the use of defined fisheries goals, objectives, and management activities for individual fish species. Goals are defined as broad qualitative statements encompassing what the management plan hopes to achieve. Objectives are specific quantitative statements that contribute to achieving the goals. Finally, management activities are specific actions designed to monitor, support, regulate, and maintain the Lake Vermilion fishery. It is important to note that not all fish species will have defined goals and objectives and some management actions cover multiple species.

While taking into account historical trends, the objectives set forth in this plan are based on the most recent 20 years (1996-2015) of fisheries data available. This time period was selected as the baseline for several reasons. First, it reflects ten years of data collection before and after the implementation of the special walleye regulation in 2006. Secondly, it represents a period of generally higher walleye abundance than observed in the 1984 to 1995 surveys. Third, in the face of changing climate, technology, and other issues, the previous 20 years is more representative of contemporary conditions than historic observations.

Additionally, new to this plan is the use of percentiles and 3-year moving averages to define most objectives. For example, the 25th percentile means 25% of observed data points fall below a certain value and 75% of data points are above that value. A 3-year moving average, the average of the current year plus the previous 2 years, is used to minimize year to year variability. Most objectives in this plan use the 3-year moving average of annually collected data for the point of comparison. Conversely, objectives set based on creel survey data use a mean of the results from the two consecutive years of creel surveys that have previously occurred during six year periods. Any other variations from this will be noted.

One unique feature of Lake Vermilion is that it is comprised of two major basins, East Vermilion (area east of Oak Narrows) and West Vermilion (area west of Oak Narrows), and there are significant differences in habitat and the fish communities present in each basin (Johnson 1968). In addition to lakewide goals, objectives, and management actions, basin specific metrics are defined separately in some cases. Since walleye are the most sought after species by anglers on Lake Vermilion, management has focused primarily on that population via regulations, fry stocking, and assessments. The walleye population will continue to be a primary focus in this management plan. Additional fish species that have defined goals and associated management actions in this plan include black crappie, bluegill, largemouth bass, muskellunge, northern pike, smallmouth bass, and yellow perch. Additional fish species of management importance that are addressed include cisco (tullibee), lake whitefish, and white suckers.

Fish Population Goals and Objectives

Walleye Goal: Support a robust walleye fishery with sufficient spawning stock to meet reproductive needs and provide the opportunity for anglers to both harvest walleye and catch quality-sized fish.

Walleye Objectives:

1) *Abundance:* Maintain lakewide walleye gill-net catch of 14 fish/net (25th percentile) or greater.
    a. Maintain East Vermilion walleye gill-net catch rate of 16 fish/net (25th percentile) or greater.
    b. Maintain West Vermilion walleye gill-net catch rate of 10 fish/net (25th percentile) or greater.
2) *Reproductive potential:* Maintain mature female walleye biomass between 1.3 and 2.1 pounds/acre (25th-75th percentiles).

a. Maintain East Vermilion mature female walleye biomass between 1.1 and 1.8 pounds/acre (25^{th}-75^{th} percentile).
b. Maintain West Vermilion mature female walleye biomass between 1.6 and 2.5 pounds/acre (25^{th} -75^{th} percentile).

3) *Recruitment:* Maintain walleye year class strength index of 0.4 (25^{th} percentile) or greater.
    a. Maintain East Vermilion walleye year class strength index of 0.5 (25^{th} percentile) or greater.
    b. Maintain West Vermilion walleye year class strength index of 0.5 (25^{th} percentile) or greater.
4) *Harvest:* Maintain summer (May through September) boat angler walleye harvest near 65,000 pounds.
5) *Angler catch rate:* Maintain a targeting boat angler catch rate of 0.38 walleye/hour (25^{th} percentile) or greater based on the open water creel survey.
    a. Maintain a targeting boat angler open water catch rate on East Vermilion of 0.45 walleye/hour (25^{th} percentile) or greater.
    b. Maintain a targeting boat angler open water catch rate on West Vermilion of 0.16 walleye/hour (25^{th} percentile) or greater.

Yellow Perch Goal: Support a self-sustaining yellow perch population that provides a stable prey base for other sportfish.

Yellow Perch Objective:

1) *Abundance:* Maintain gill net catch rate of 19 fish/net (25^{th} percentile) or higher.

Muskellunge Goal: Support a muskellunge population that provides opportunity to catch trophy fish (50 inches or larger).

Northern Pike Goal: Support a self-sustaining northern pike population that provides opportunity for harvest.

Smallmouth Bass Goal: Support a self-sustaining smallmouth bass population.

Largemouth Bass Goal: Support a self-sustaining largemouth bass population.

Bluegill Goal: Maintain a sustainable harvest level of bluegill.

Black Crappie Goal: Maintain a sustainable harvest level of black crappie.

Aquatic Habitat and Water Quality Goal

Goal: Protect and improve aquatic habitat and water quality through education, permitting, monitoring, and relevant projects.

Management Activities

Fisheries Assessments, Monitoring, and Analysis

Annual Large Lake Assessments

- Shoreline seining targeting young-of-the-year gamefish and other non-game fish species
    - Weekly sampling throughout July at 14 standard stations (7 stations in East Vermilion; 7 stations in West Vermilion)
- Multispecies gill netting
    - Twenty standardized gill net sets (12 nets in East Vermilion; 8 nets in West Vermilion)
    - Two additional research net sets in Head of the Lakes Bay, West Vermilion
- Fall night electrofishing targeting young-of-the-year walleye
    - Nine standard stations (6 stations in East Vermilion; 3 stations in West Vermilion)
    - Research additional sites
    - Implement collecting age-1 walleye also

Periodic Targeted Surveys

- Spring ice-out trap net assessments
    - Targeting northern pike (1 of 6 years)
        - Conduct an ice-out trap net assessment targeting northern pike in 2017
    - Targeting muskellunge (2 of 6 years)
        - Likely 2019 and 2020
        - Assess feasibility of mark and recapture techniques to obtain adult population estimates
- Spring night electrofishing targeting largemouth bass and smallmouth bass (1 of 3 years)
    - Conduct smallmouth bass and largemouth bass spring electrofishing assessments once every three years at nine standard stations (6 stations in East Vermilion; 3 stations in West Vermilion)
    - Assess the use of otoliths in developing age and length keys for both species
- Summer trap-netting targeting bluegill and black crappie (1 of 3 years)
    - Conduct summer trap-netting once every three years to assess black crappie and bluegill populations
    - Evaluate sampling methodology and use of otoliths for aging

Creel Survey

- Open water creel survey
    - Conduct an open water (May fishing opener through September) creel survey one out of every four years beginning in 2021

Hatchery Operation and Stocking

Pike River Hatchery Operation

- Ensure walleye spawn take is sustainable while producing Pike River strain walleye fry for Lake Vermilion and statewide stocking needs based on individual lake management plans
- Operate hatchery annually, adjusting production targets as needed
- Monitor walleye run for size and sex-ratios
- Continue white sucker harvest in cooperation with the Vermilion Lake Association

Walleye Fry Stocking

- Stock Pike River strain walleye fry based on the lakewide 3-year moving average of mature female walleye biomass (i.e., spawning stock biomass [SSB]) estimated from the gill-net catch:
    - 15,000,000 fry if the average SSB is below 1.3 pounds/acre
    - 10,000,000 fry if the average SSB is 1.3 to 2.1 pounds/acre
    - 5,000,000 fry if the average SSB is above 2.1 pounds/acre
- Fry are distributed proportionally lakewide based on littoral area per basin
- Surplus fry produced at the Pike River Hatchery will be stocked in Vermilion only on a limited basis
- Continue to refine fry stocking levels and relate to SSB
- Continue to investigate relationship between SSB and year class strength

Muskellunge Fingerling Stocking

- Stock 3,000 Leech Lake strain muskie fingerlings annually as a base quota
- Stock up to 2,000 additional (surplus) Leech Lake strain fingerlings per 2-year period when available (8,000 fish maximum per 2-year period)
- Manage stocking priority as a "Premier" lake as defined by the DNR Muskellunge Technical Committee
- Implanting Passive Integrated Transponder (PIT) tags into fingerling muskellunge stocked into Lake Vermilion as funding and time permit
- Consider outside partnerships and funding opportunities to support muskellunge management including PIT tagging supplies, rearing pond operations, and surplus fingerling muskie stocking if the fish meet DNR standards and protocols

Regulations

Walleye

- Implement a walleye regulation change in May 2017
    - All walleye from 20-26 inches must be immediately released, only one over 26 inches allowed in possession
    - Keep the four walleye possession limit
- Review walleye population metrics annually in response to the regulation and evaluate angler harvest following the next creel survey

Northern pike

- Consider regulation change to match statewide northern pike zone regulations
    - Evaluate regulation following additional data collection and analysis of the northern pike population
    - Follow state rulemaking procedures

Habitat, Water Quality, Zooplankton, Aquatic Invasive Species, and Disease

- Continue annual water quality, water temperature, and zooplankton monitoring
    - Evaluate additional water quality and zooplankton sites
    - Maintain water temperature loggers and deploy additional loggers
- Explore shoreline habitat assessments and aquatic vegetation sampling following DNR protocols (Perleberg et al. 2016)
- Coordinate with DNR Ecological and Water Resources staff and other government and non-government organizations to assist with aquatic invasive species (AIS) monitoring, prevention, education, and management efforts
- Continue partnership with the Minnesota Pollution Control Agency in the Watershed Restoration and Protection Strategy (WRAPS) process
- Protect aquatic habitat through permitting and technical advice
- Continue to monitor fish populations for disease such as viral hemorrhagic septicemia (VHS) and contaminants

Other Fisheries Management Concerns

Double-crested Cormorant Monitoring and Management

- Monitor the double-crested cormorant (DCCO) nesting colony on Potato Island and search for the establishment of new nesting colonies annually in cooperation with DNR Ecological and Water Resources Non-Game staff
- Gather data to better understand DCCO population dynamics, evaluate impacts on sportfish communities, and develop a lake specific consumption and control model
- Work with State, Tribal, and Federal resource management staff to evaluate potential DCCO impacts on fish populations and methods for population control
- Pursue control measures when legally available and impacts to sportfish populations are demonstrated
- Follow guidance in the Management Plan for DCCO on Lake Vermilion as appropriate
    - Reevaluate the plan annually and modify if necessary following review by the Minnesota Cormorant Work Group

Fishing Tournaments

- Continue Lake Vermilion specific fishing tournament permit restrictions
    - No more than 100 boats or 200 entrants per tournament, except for the grandfathered-in City Auto Glass Walleye Classic tournament with a 125 boat, 250 entrant maximum
    - No wake zones (e.g., Everetts Bay Narrows) and staggered starts and weigh-ins
- No bass tournaments permitted from Memorial Day up to the 3rd Saturday in June
- Bass tournaments will be allowed in June from the 3rd Saturday to the end of the month with conditions:
    - Bag limit of 3 fish per angler or 6 fish per boat (with 2 anglers)

    - No more than 5 weigh-in bags shall be in the queue to minimize time bass are out of the water at weigh-in
    - Live release boats/pontoons will be used to transport bass for release
    - Released fish are redistributed to the east or west basins in proportion to where they were caught
- Prior to 2017, no bass tournaments were allowed from Memorial Day to June 20th, so the reduced blackout period will be a trial
    - If excessive mortality occurs, DNR will return to not permitting tournaments from Memorial Day to June 20th
- Tournament organizers will be strongly encouraged to work with the Vermilion Lake Association and the Northern St. Louis Soil and Water Conservation District for voluntary AIS prevention and inspection

<u>Potential Research and Projects</u>

- Winter creel survey to estimate fishing pressure, catch, and harvest
- Broader water quality monitoring
- Walleye research focused on movement, behavior, and understanding basin specific population dynamics
- Further investigate the impacts of walleye fry stocking on year-class strength via oxytetracycline (OTC) marking and recapture methods
    - Quantify wild fry production, determine the contribution of stocked fry to the total fry density, and determine optimum fry densities
- Sport gill netting creel survey to assess pressure, bycatch, and harvest
- Partner with agencies and organizations to address shoreland zoning issues
- Aquatic vegetation surveys and restoration

Note: Many of these initiatives will only be possible with additional resources including both funding and staff.