



## Lake & Wetland Report

### 1. Introduction

The Nemadji Watershed is located just south of Carlton, MN. The waters flow from the headwaters located in Northern Pine County and Central Carlton County, MN to Lake Superior in Superior, WI. The watershed covers 473 square miles with 276 square miles in Minnesota, with 353 miles of stream and 35 lakes on the Minnesota side.

The **Nemadji One Watershed One Plan** (1W1P) is a planning partnership between Carlton SWCD, Carlton County, Pine SWCD, and Pine County, with a goal of **prioritizing** opportunities to protect the watershed's valuable resources along with **targeting** projects to help solve water quality problems. The result will be a **measurable** improvement in water quality and protection of this important resource for future generations.

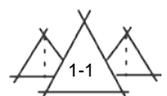
The general 1W1P process is outlined in Figure 1. For the first step, which is to gather and prioritize opportunities/issues in the watershed, four topic meetings that bring together watershed and topic experts are being held. The meeting topics include 1) forestry, 2) wetlands & lakes, 3) streams and 4) agriculture. This report summarizes the results from the **Wetland & Lake** topic meeting held October 2nd, 2019.



*Figure 1. The 1W1P process is displayed above. The topical meetings are the first steps within the process (circled in gray).*

The 1W1P process is driven by local units of government, guided by an Advisory Committee made up of local stakeholders and state agencies. The decision-making body for the plan is a Policy Committee made up of elected officials from each County and SWCD.

In order to gather as diverse a group as possible, topic experts were also invited to help gather and prioritize issues. In addition to the Nemadji 1W1P Advisory Committee, topic experts from Fond Du Lac Band of Lake Superior Chippewa, DNR Fisheries, DNR Wildlife, DNR Forestry, Carlton and Pine SWCD lakeshore and wetland technical specialists and private land owners participated in the **Lake & Wetland** meeting.



## 2. Nemadji Watershed Wetlands & Lakes

Wetlands make up a large portion of the Nemadji Watershed and play a vital role in protecting water quality, providing valuable habitat and helping to slow the flow of water during high rain events. In turn, this helps protect infrastructure and property. Approximately 30% of the watershed is considered wetland, but through historic land use changes, we have lost 18% of wetlands in the watershed. Approximately 85% of the lost wetlands are restorable. More data is needed to help us understand how well our wetlands are functioning.

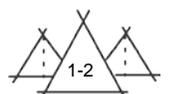


*Figure 2. Wetland near Lac La Belle.*

There are 35 lakes in the Minnesota side of the watershed, hosting a diversity of species including one wild rice lake (Hay Lake). While most of the lakes are healthy, high phosphorous levels can lead to algae blooms in some places. Lakes that have high phosphorous and chlorophyll-a (a measure of algae) levels are listed as impaired. The watershed has two impaired lakes (Lac La Belle and Net Lake). Transparency trends can indicate if a lake's water quality is improving or declining over time. With our current data, we know that three lakes have declining water quality (Graham, Chub and Net Lakes). In addition, there is one lake infested with Aquatic Invasive Species (Chub Lake-Eurasian Water Milfoil).

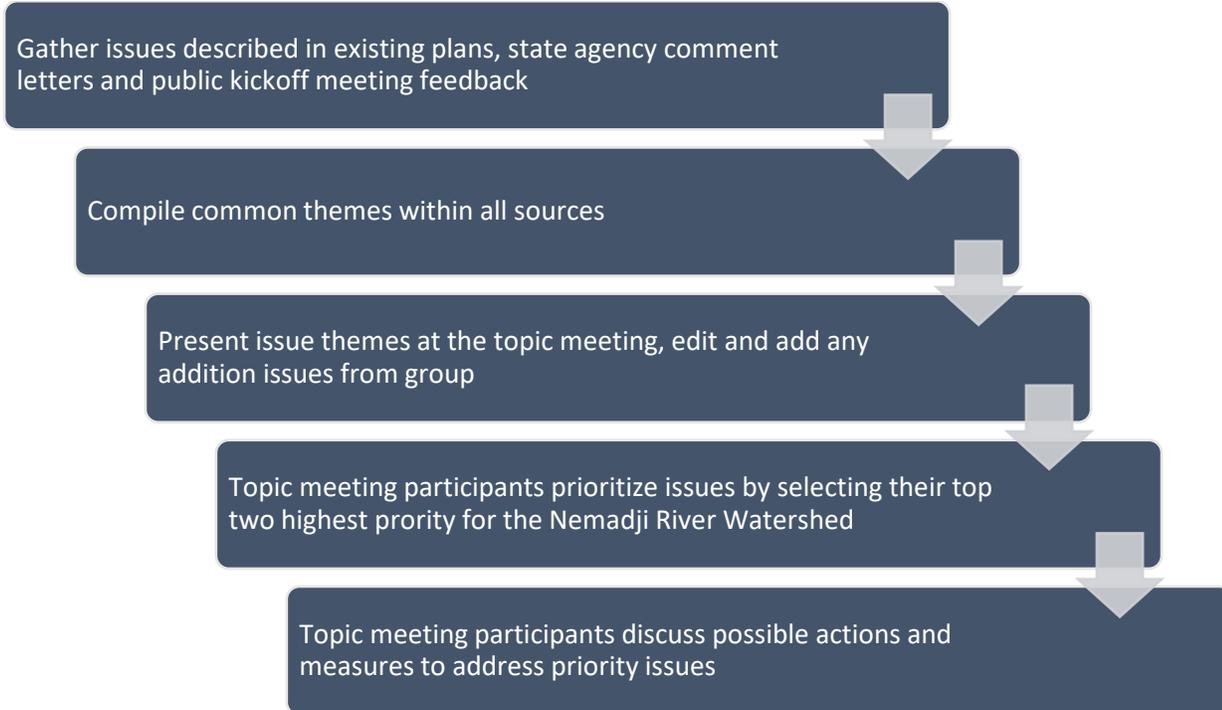


*Figure 3. Net Lake on the Carlton/Pine County border.*





In order to help us understand what issues/opportunities surround wetlands and lakes in the Nemadji Watershed, issues listed in previous plans, reports, agency comment letters and public input were gathered and compiled into common themes, becoming the basis of creating the priority wetlands & lakes issues for the Nemadji 1W1P (see References for sources).

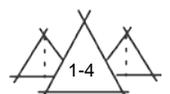


**Figure 5. Issue statement development process.**

A diverse group of wetland & lake experts plus the Nemadji 1W1P Advisory Committee gathered to provide input on the compiled issues list. The group agreed on a final list of 6 issue statements (Table 1) and were also provided the opportunity to add additional issues.

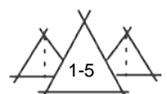


**Figure 6. Photos from the Wetland & Lake Meeting held October 2<sup>nd</sup>, 2019.**



**Table 1. Wetland & Lake issue statements as revised at the Wetland & Lake topic meeting.**

#	Topic	Issues Statement	References
1	Wetlands	Wetlands are in continued need of <b>protection and restoration</b> , which provides benefits for water quality, peak flow reduction, habitat, ecoservices & designated uses, and wildlife.	Carlton County Water Plan, Pine County Water Plan, Public kickoff, Erosion Report, North East Landscape Report, Exploring the Relationship Between Wetlands and Flood Hazards in the Lake Superior Basin. Carlton & Pine County wetland regulations, State and Federal wetland regulations
2	Wetlands	<b>Outreach and technical assistance</b> are needed to convey the value of wetlands, wetland laws, and impacts of wetland loss.	Carlton County Water Plan, Public Kickoff, Exploring the Relationship Between Wetlands and Flood Hazards in the Lake Superior Basin.
3	Wetlands	<b>Better understanding</b> of function, historical changes, and value to prioritize restoration and protection ( <i>need more data</i> ).	Wetland Topic Meeting
4	Wetlands	<b>Invasive species</b> are a threat to wetlands (buckthorn, EAB, purple loosestrife, phragmites).	Wetland Topic Meeting
5	Lakes	Poorly functioning <b>septic systems</b> can contribute bacteria and nutrients to water resources.	WRAPS, Public Kickoff, MPCA
6	Lakes	Alteration of <b>lakeshore/vegetation and conversion of cabins to year-round homes (nonconforming)</b> has the potential to negatively affect lake water quality and shoreline habitat.	WRAPS, Public Kickoff, MPCA, BWSR, A paleolimnological study of Net Lake and Lac La Belle, Carlton and Pine Counties, Minnesota.
7	Lakes	Lake owners need to be more <b>aware and engaged in</b> land use decisions/actions, buffers, lakeshore stewardship, ecosystem function through education.	Public Kickoff, WRAPS
8	Lakes	<b>Excess nutrients</b> (phosphorus) have caused impairments and decreasing water quality trends in some lakes.	WRAPS, TMDL
9	Lakes	<b>Aquatic Invasive Species</b> and lake access are a risk/concern.	Lake Topic Meeting
10	Lakes	<b>Changing land use</b> within the watershed may affect water quality	Lake Topic Meeting
11	Lakes	<b>Chloride</b> from road salt and water softeners is an emerging issue	Lake Topic Meeting
12	Lakes	<b>Climate change</b> can affect hydrology, water temperature and species composition.	Lake Topic Meeting



13	Lakes	<b>Better understanding of how to prioritize value</b> including natural environment, wild rice lakes, habitat and tannins and water quality	Lake Topic Meeting
14	Lakes	Different <b>regulation/enforcement</b> between counties and states within the watershed	Lake Topic Meeting

Each participant ranked their top two issues for wetlands and lakes, and the two top priorities overall were:

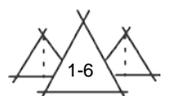
### Wetlands

- Wetlands are in continued need of **protection and restoration**, which provides benefits for water quality, peak flow reduction, habitat, ecoservices & designated uses, and wildlife.
- **Better understanding** of function, historical changes and value is needed to prioritize restoration and protection of wetlands (we need more data).

### Lakes

- Alteration of **lakeshore/vegetation and conversion of cabins to year-round homes (nonconforming)** has the potential to negatively affect lake water quality and shoreline habitat.
- Lake owners need to be more **aware and engaged** in land use decisions/actions, buffers, lakeshore stewardship, ecosystem function through education.

The group brainstormed a list of possible actions to address the priority issues along with ways success might be measured. A water quality category was added to capture additional management actions the group discussed.



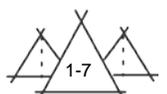
## Actions/Measures

### Wetland Protection and Restoration

- Restored wetlands in key subwatersheds
  - ✦ *Metric: Acres of wetlands restored*
- Investigate wetland banking opportunities in the Nemadji Watershed
  - ✦ *Metrics: Number of meetings with wetland bank regulators*
- Provide education and outreach on the value of wetlands along with opportunities for restoration and protection
  - ✦ *Metrics: Number of people reached*
- Increase watershed storage by restoring wetlands and improving wetland function
  - ✦ *Metrics: Acre/Feet increase in water storage*
- Increase wetland function
  - ✦ *Metrics: Percent increase in wetland function*

### Wetland Function Assessment

- Complete a functional analysis of wetlands in the watershed (a possible method was developed by Ralph Tiner at the U.S. Fish & Wildlife Service)
  - ✦ *Metric: Number of wetlands assessed*
- Develop a prioritization framework to select wetlands for protection and restoration
  - ✦ *Metrics: Framework completed*
- Assess drainage ditch and tiling assessment for the watershed
  - ✦ *Metrics: Assessment completed*
- Collaborate with agencies/tribal governments/universities to project emerging wetland data and tools
  - ✦ *Metrics: Contact lists compiled and communications established*
- Engage partnerships to help build our understanding of wetland function and ecosystem services valuation
  - ✦ *Metrics: Develop contact lists and communications established; number of meetings; valuation analysis completed*
- Evaluate the current status of invasive species in wetlands
  - ✦ *Metrics: Assessment completed*
- Assess species diversity in wetlands
  - ✦ *Metrics: Assessment completed*

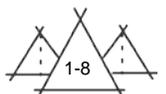


## Lakeshore Development

- Local shoreland regulators cooperating with SWCDs to provide technical services for lakeshore landowners
  - ✦ *Metric: number of landowners reached*
- Focus on impaired lakes and lakes with declining transparency trends to gather data including: DNR Score Your Shore, septic system inventories, ground truth upstream erosion issues and develop individual lake management plans
  - ✦ *Metric: number of lakes assessed or plans developed*
- Measure and monitor vegetative buffers, nearshore aquatic vegetation and impervious surface
  - ✦ *Metric: number of lakes assessed*
- Collaborate with the tribe on wild rice assessments
  - ✦ *Metric: number of lakes assessed*

## Lake Engagement

- Provide landowner workshops, flyers and outreach to encourage lakeshore BMPs and educate them on lake issues
  - ✦ *Metric: number of workshops, number of people reached*
- Use University of Minnesota Extension Civic Engagement techniques to reach lakeshore land owners
  - ✦ *Metric: number of people reached*
- Provide workshop/continuing education for realtors and contractors on lakeshore BMPs
  - ✦ *Metric: number of workshops*
- Provide education to road salt applicators and owners of water softeners on the concerns of chloride in lakes.
  - ✦ *Metric: number of people reached*
- Encourage cost effective lake data collection using citizen monitors, interns, students, and conservation corps
  - ✦ *Metric: number of lakes monitored; number of monitoring projects implemented*
- Encourage lake associations, provide lake association outreach and create a coalition of lake associations.
  - ✦ *Metric: number of contacts made, number of lake associations reached, number of lake associations or coalitions created*



## References

**WRAPS.** [2017. Watershed Restoration and Protection Strategy, Minnesota Pollution Control Agency](#)

**MPCA.** [2019. Letter outlining Minnesota Pollution Control Agency priorities for the Nemadji One Watershed One Plan.](#)

**DNR.** [2019. Letter outlining Minnesota Department of Natural Resources priorities for the Nemadji One Watershed One Plan.](#)

**BWSR.** [2019. Letter outlining Board of Water and Soil Resources priorities for the Nemadji One Watershed One Plan.](#)

**Natural Resource Conservation Service & United States Forest Service.** [Erosion and Sedimentation on the Nemadji River Basin](#)

**Natural Resource Conservation Service.** [USDA – NRCS Rapid Watershed Assessment Beartrap-Nemadji](#)

**Carlton County.** [Carlton County Water Plan.](#)

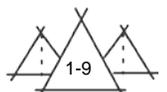
**Pine County.** [Pine County Water Plan.](#)

**Wisconsin Wetlands Association.** [Exploring the relationship between wetlands and flood hazards in the Lake Superior Basin](#)

**Carlton County.** [Wetland Regulation](#)

**Pine County.** [Wetland Regulation](#)

**EPA.** [Wetland Regulation](#)



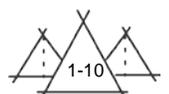
## Issues/Opportunities list generated during the Brainstorming Activity at the Wetland & Lake meeting

### Wetlands

- ✦ Opportunities for wetland restoration and wetland banking
- ✦ Prioritizing where to restore that results in multiple benefits including storage
- ✦ How to prioritize and understand the value, function of wetlands
- ✦ Need more river gages
- ✦ Culverts can:
  - Increase flow
  - Reduce storage
  - Increase erosion
- ✦ Wetland connectivity can be affected by
  - Old roads
  - Trails
  - Ditches
- ✦ Invasive species concerns
  - Example EAB
- ✦ Draining for agriculture
  - Allowed for type 1 wetlands
  - Work with new technology to understand location
- ✦ Past practices effect wetlands
  - Tile
  - Ditch creation

### Lakes

- ✦ Chlorides (emerging issue)
  - Road salt
  - Water softener
- ✦ Outreach
- ✦ Changing land use
- ✦ Wild rice lakes (sensitive to changes in hydrology)
- ✦ Climate change (hydrology, water temperature, changing species composition)
- ✦ Tannins in water – challenges with transparency evaluation
- ✦ How to prioritize value
  - Natural environment
  - Habitat
  - Wild rice
- ✦ Mercury in fish tissue



- ✦ Lake Association assistance
  - Sharing information locally and statewide
  - Empowering
  - Citizen monitoring
- ✦ Aquatic Invasive Species
- ✦ Cabins being changed to year-round homes (larger footprint)
- ✦ Septic Systems
- ✦ Different regulations between counties/states
- ✦ Public Access is a risk for AIS
- ✦ Excessive removal of emergent vegetation
  - Sand blankets
- ✦ Need more data

