



## Priority Issues

### 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. After the issues are gathered, they must be further prioritized. This report summarizes the prioritization meeting held on January 8<sup>th</sup>, 2020.



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

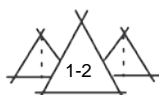
The 1W1P process is driven by local units of government, guided by an Advisory Committee made up of local stakeholders and state agencies. The decision-making body for the plan is a Policy Committee made up of elected officials from each County and SWCD. The Advisory Committee recommends the priority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



## 2. Priority Issues

A comprehensive list of issues and opportunities were generated during the topical meetings held in the fall of 2019. Topics included: forestry, lakes & wetlands, streams, farms and drinking water. During these meetings, the most important issues were ranked. From this list, we created the following list of priority issues (in no particular order).

- Increased **coordination** between entities in forest management at the Nemadji watershed level is needed to maximize environmental and economic benefits.
- **Forest health** is vulnerable to climate change and invasive species, which can affect species composition and forest productivity.
- **Wetlands** are in continued need of **protection and restoration**, which provides benefits including but not limited to water quality, peak flow reduction, habitat, recreational and cultural uses, and wildlife.
- A **better understanding** of function, historical changes and value is needed to prioritize restoration and protection of wetland function.
- Alteration of **lakeshore/vegetation and conversion of cabins to year-round homes** has the potential to negatively affect lake water quality and shoreline habitat.
- The **road and stream interface** (culverts, bridges, ditches, road maintenance) can contribute to stream instability, sediment transport, habitat fragmentation, and disruptions in public safety and commerce.
- **High peak flows** contribute to stream channel instability, sediment and biological impairments in the watershed.
- **Nutrient runoff** from agricultural areas has the potential to impact stream and lake water quality.
- **Livestock access** to streams and overgrazed pastures can cause erosion and affect stream habitat.
- **Drinking water** is vulnerable to contaminants in karst and sandy soils of the watershed.
- **Noncompliant septic systems** are a risk to drinking and surface water in the watershed.
- **A lack of public understanding linking impacts of land use decisions to water quality along with a lack of technical and financial assistance are barriers** for implementing lake, forest and farm best management practices.



The next step was to further prioritize these issues to help determine what work should be started first. The advisory committee was divided into small groups that ranked each statement based on its degree of difficulty and urgency. The degree of difficulty might be impacted by infrastructure, resources, technology, legislation, intergovernmental commitments or other impacts. The degree of urgency helps us understand where there may be higher potential for worsening conditions or future consequences if we do not start work in the next 10 years.

**Table 1. Explanation of the process used to prioritize the issue statements.**

<i>Issues</i>	<i>Difficulty</i>	<i>Urgency</i>	<i>Where</i>
<i>Issue Statement</i>	<i>Can we make progress in 10 years?</i>	<i>What do we want to tackle first?</i>	<i>Are there any specific areas that this is a known issue?</i>

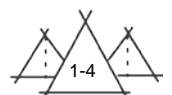
The results of this method helped organize the issue statements into tiered categories. Although each issue statement is still a priority, these categories can help determine where priority areas are or which projects to start with (Table 2).



**Table 2. Tiered priorities determined by the Advisory Committee. 1<sup>st</sup> and 2<sup>nd</sup> priority issues are those that we will address first in the plan timeframe and put the most time and funding into.**

1 <sup>ST</sup> PRIORITY	2 <sup>ND</sup> PRIORITY	3 <sup>RD</sup> PRIORITY
<p>The <b>road and stream interface</b> (culverts, bridges, ditches, road maintenance) can contribute to stream instability, sediment transport, habitat fragmentation, and disruptions in public safety and commerce.</p>	<p><b>Livestock access</b> to streams and overgrazed pastures can cause erosion and affect stream habitat.</p> <p><b>Nutrient runoff</b> from agricultural areas has the potential to impact stream and lake water quality.</p>	<p>Alteration of <b>lakeshore/vegetation and conversion of cabins to year-round homes</b> has the potential to negatively affect lake water quality and shoreline habitat.</p>
<p><b>A lack of public understanding linking impacts of land use decisions to water quality along with a lack of technical and financial assistance are barriers</b> for implementing lake, forest and farm best management practices.</p>	<p><b>Drinking water</b> is vulnerable to contaminants in karst and sandy soils of the watershed.</p>	<p><b>Forest health</b> is vulnerable to climate change and invasive species, which can affect species composition and forest productivity.</p>
<p><b>Better understanding</b> of function, historical changes and value is needed to prioritize restoration and protection of wetland function. This is needed to <b>protect and restore wetlands</b>, which provides benefits including but not limited to water quality, peak flow reduction, habitat, recreational and cultural uses, and wildlife.</p>	<p><b>Noncompliant septic systems</b> are a risk to drinking and surface water in the watershed.</p>	<p><b>High peak flows</b> contribute to stream channel instability, sediment and biological impairments in the watershed.**</p>
	<p>Increased <b>coordination</b> between entities in forest management at the Nemadji watershed level is needed to maximize environmental and economic benefits.</p>	

\*\*Although peak flows have a high urgency, the direct actions to affect them are difficult. Instead, we plan to work indirectly through watershed storage (wetland restoration).





### 3. Prioritizing Subwatersheds

To help us better understand where work is most needed, maps were created combining known datasets that represent the topic areas. In order to divide the watershed into more manageable parts, we used HUC 12 subwatersheds as a guide. For each piece of data, we scored the subwatersheds 1-4. For example, subwatersheds with more acres of privately owned forest would receive a score of 4, while subwatersheds with relatively few privately owned forest acres would receive a score of 1.



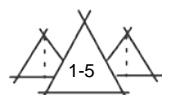
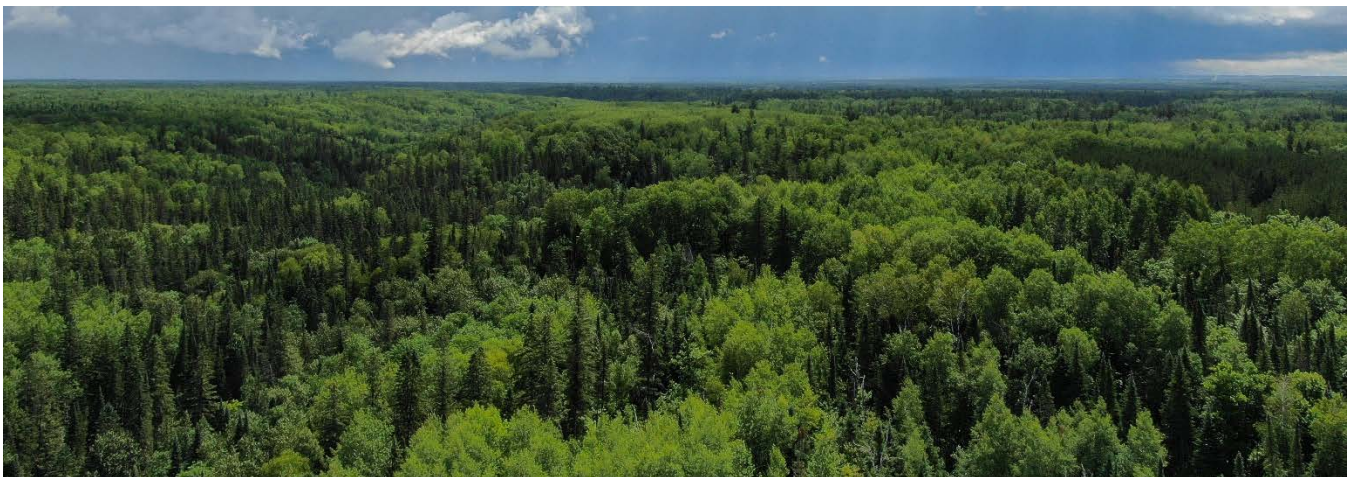
#### Forests

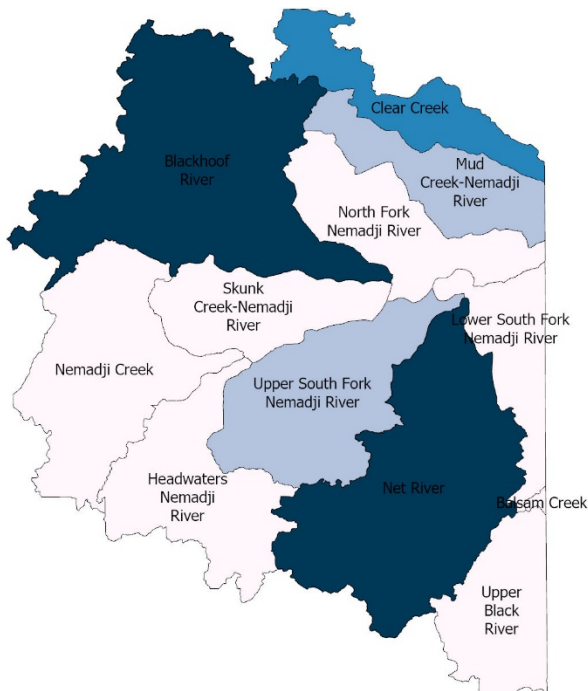
*Main focus is on adding Forest Stewardship Plans on private land*

#### Criteria

1. Private forest management potential
2. Private forest acres
3. Risk of conversion to ag

**Figure 1. Forestry map ranking each HUC 12 subwatershed based on private forest management potential, private forest acres and risk of forests being converted to agriculture based on soil type. A darker color indicates a higher rank.**





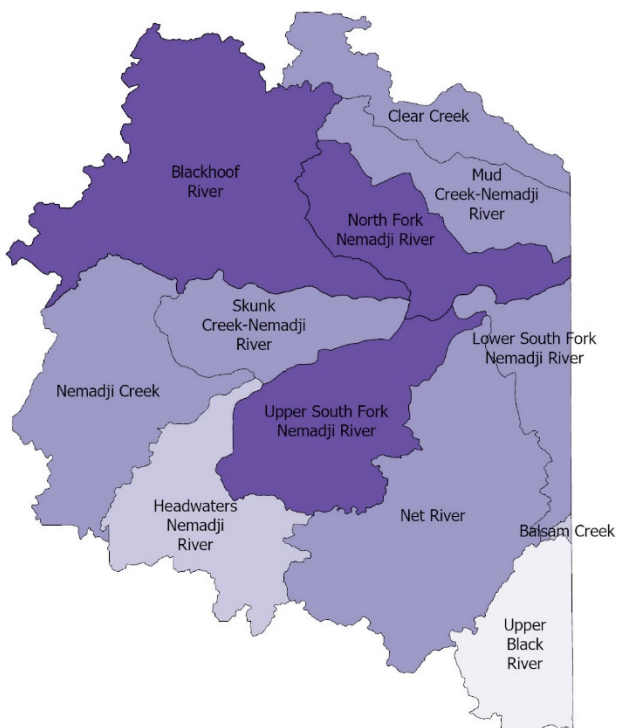
## Lakes

*Focus on lakes with high quality and high risk*

### Criteria

1. Phosphorus sensitivity
2. Impaired
3. Declining trend
4. Shoreland classification
5. Wild Rice

**Figure 2. Lake map ranking each HUC 12 subwatershed based on phosphorous sensitivity, impairment status, declining clarity trends, DNR shoreland classification and wild rice lake designation. A darker color indicates a higher rank. High priority lakes include Net, Chub and Hay lakes.**



## Wetlands

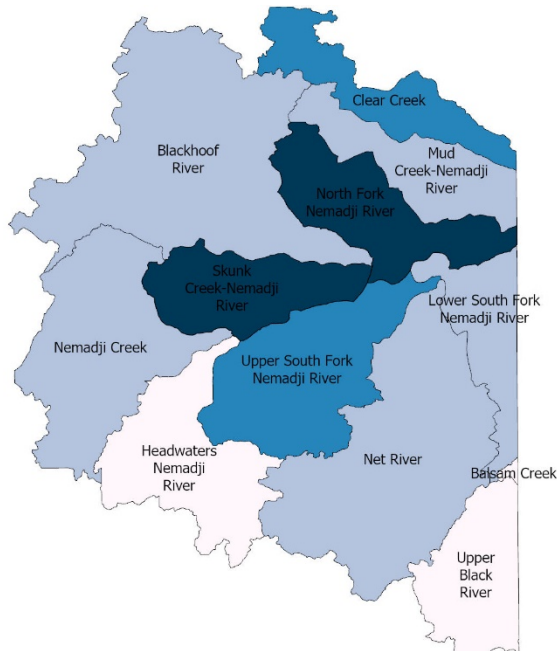
*Main focus is adding storage to reduce peak flows*

### Criteria

1. Wetland restoration for peak flow (St. Mary's tool)
2. Wetland restoration for lost storage (St. Mary's tool)
3. Noncontributing analysis (HEI)

**Figure 3. Wetland map ranking each HUC 12 subwatershed based on wetland restoration potential to reduce peak flows and increase watershed storage. A darker color indicates a higher rank.**





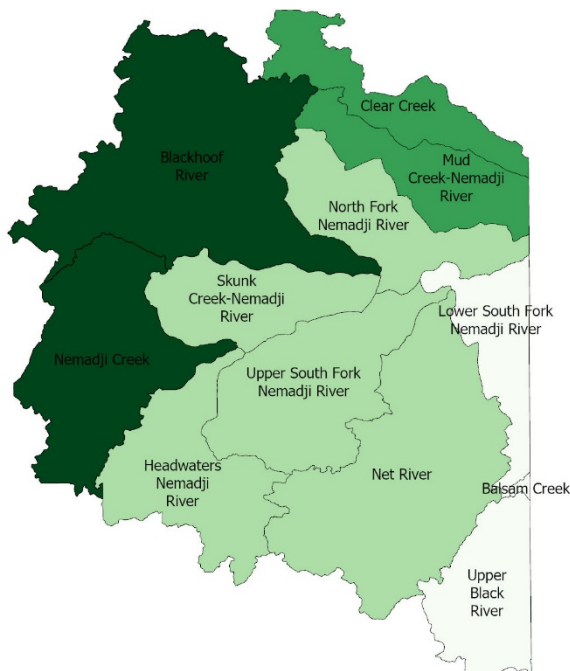
## Streams

*Main focus is fixing the road/stream interface to reduce sediment*

### Ranking Criteria

1. # of undersized culverts
2. # of perched culverts
3. Trout abundance
4. TSS Impairments
5. Red clay dams

**Figure 4. Stream map ranking each HUC 12 subwatershed based on number of undersized and perched culverts, trout abundance, Total Suspended Solids impairment status and presence of Red Clay Dams. A darker color indicates a higher rank.**



## Agriculture

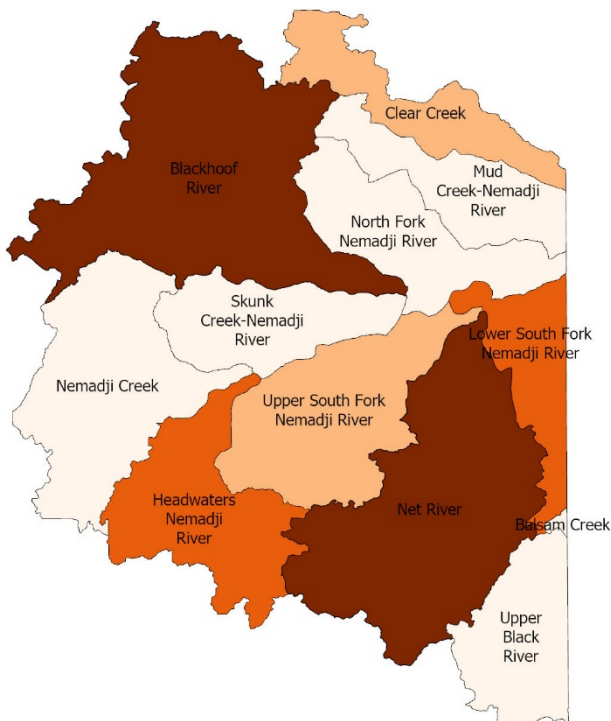
*Main focus is to add BMPs to reduce sedimentation and E.coli*

### Ranking Criteria

1. # of agricultural acres
2. # of animal units in feedlots
3. Approximate # of animal operations

**Figure 5. Farm map ranking each HUC 12 subwatershed based on number of agricultural acres, number of animal units in registered feedlots and approximate number of animal operations. A darker color indicates a higher rank.**





## Drinking Water

*Main focus is where there is most risk for contamination*

### Criteria

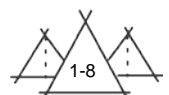
1. Pollution sensitivity
2. Known vulnerabilities

**Figure 6. Drinking water map ranking each HUC 12 subwatershed based pollution sensitivity (based on soil type) and known vulnerabilities. A darker color indicates a higher rank.**

Additional possible datasets that were discussed during include:

- ✦ 1854 Treaty wild rice data (lakes)
- ✦ Noncontributing analysis (wetlands)
- ✦ Number of wells per subwatershed (drinking water)
- ✦ Population Density (drinking water)
- ✦ Stream power index (streams)
- ✦ Amount of protected land and land cover in lakesheds (lakes)
- ✦ DNR FIRE Analysis (wetlands)
- ✦ Recoverable floodplain data (peakflows)

The next step will be to combine these data sets to help rank each HUC 12 subwatershed.





## 4. Prioritization Datasets

- ✦ **Wild Rice Lakes Identified by DNR Wildlife** - Minnesota DNR - Division of Fish & Wildlife - Wildlife Unit - 7/18/2014
- ✦ **Impaired Waterbodies, Minnesota, 2018** – Minnesota Pollution Control Agency – 2/6/2019
- ✦ **Pollution Sensitivity of Near-Surface Materials** - Minnesota Department of Natural Resources, County Geologic Atlas Program
- ✦ **Land Cover – Minnesota Land Cover Classification System** – Minnesota Department of Natural Resources – 4/9/2018
- ✦ **Parcel Data** – Carlton and Pine Counties
- ✦ **Forest Stewardship Planning Acres** – Department of Natural Resources, Forestry
- ✦ **Feedlots of Minnesota** – Minnesota Pollution Control Agency
- ✦ **Nemadji Watershed Culvert Inventory** – Carlton SWCD and Carlton County
- ✦ **Red Clay Dam Locations** – Carlton SWCD
- ✦ **Trout Abundance DNR Fisheries Survey Data** – Minnesota Pollution Control Agency Watershed Restoration and Protection Agency dataset
- ✦ **Lakes of Phosphorous Sensitivity** – Minnesota Department of Natural Resources
- ✦ **Soils Data** – U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) – National Geospatial Center of Excellence
- ✦ **Approximate Number of Animal Operations** – Carlton SWCD
- ✦ **Wetland Restoration Potential for Peak Flow Reduction and Increased Storage** – St. Mary's University Nemadji River Watershed Habitat Assessment Using LiDAR 3/2018

