Farm & Drinking Water 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 **Farm and Drinking Water** topic meeting held November 20th, 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 priotitize issues. In addition to the Nemadji 1W1P Advisory Committee, topic experts from Townships, Minnesota Department of Health, Minnesota Agriculture Water Quality Certification Program (MAWQCP), United States Department of Agriculture - Natural Resources Conservation Services (USDA-NRCS) along with local livestock and community supported agriculture producers participated in the **Farm & Drinking Water** meeting.

2. Nemadji Watershed Farms

The region has a long history of farming, and today agriculture is a valuable part of our community and economy. The Nemadji grows it all from beef, pork and chickens to many community supported agriculture (CSA) farms that grow fruit and vegetables. Based on estimates from USDA statistics, in the Nemadji Watershed there are approximately:

- 230 farms;
- 4,000 cows;
- 23 registered feedlots;
- 69 livestock producers; and
- 27,000 acres of agricultural land, which includes a variety of crops and pastureland.

Figure 2. A diversified vegetable farm in the northern part of the Nemadji Watershed

Nemadji Watershed Drinking Water

Because the watershed is largely rural, most residents have private wells. The watershed has 781 wells according to the Minnesota Well Index. In addition, there are 10 non-community public water suppliers in the watershed, and of that, 7 are considered vulnerable to contamination. Three have tested positive for E. coli levels in recent years. Although much of the watershed's ground water is protected by clay soils, the northwestern and southern parts of the watershed have high sensitivity to pollution due to sandy soils.

In 2019, a kickoff bus tour was held for watershed residents and stakeholders to provide input into the Nemadji 1W1P process. Through this event, we learned that 89% of attendees agreed that farms are an important resource.

In 2019, the Nemadji 1W1P planning group hosted a bus tour. The public was able to see the amazing resources within the watershed and share challenges they would like to address in planning.

Figure 4. 2019 Nemadji 1W1P bus tour

3. Nemadji Watershed Farm & Drinking Water Issues

There are many different thoughts on the ways best to manage our recourses. To illustrate the diversity of viewpoints, at the beginning of the **Farm & Drinking Water** meeting we asked the experts and Advisory Committee members to tell us what comes to mind when they think of Nemadji farms and drinking water. The responses were assembled to create a word cloud (Figure 5).

Figure 5. Word cloud depicting the diversity of responses to the question, "When you think of the Nemadji's farms and drinking water, what comes to mind?"

In order to help us understand what issues/opportunities surround farms & drinking water 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 farm & drinking water issues for the Nemadji 1W1P (see References for sources).

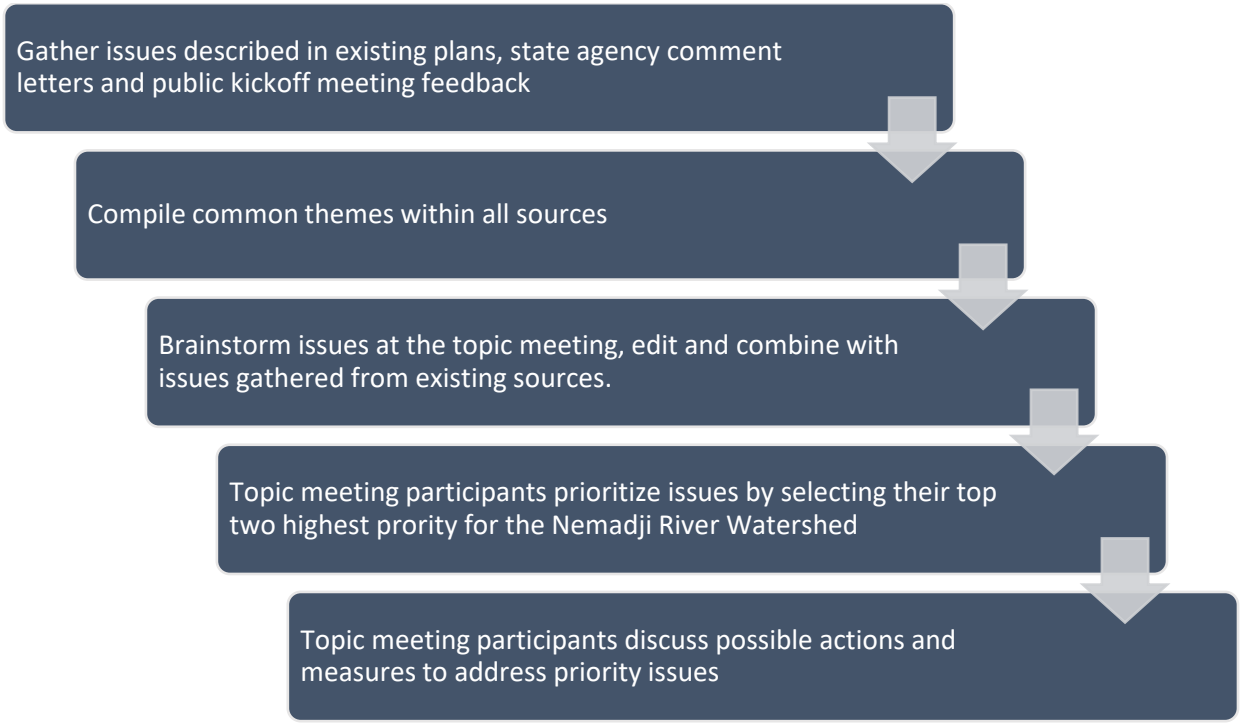

Figure 5. Issue statement development process.

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

Figure 6. Photos from the Farm & Drinking Water Meeting held November 20th, 2019.

Table 1. Farm & Drinking Water issue statements as revised at the Farm & Drinking Water topic meeting.

#	Topic	Issues Statement	References
1	Farms	**E.coli impairments** in streams can make them unsafe for recreation. Monitoring has shown that E.coli standard exceedances occur during rain events.	WRAPS/TMDL, BWSR
2	Farms	**Nutrient runoff** from agricultural areas has the potential to impact stream and lake water quality.	WRAPS/TMDL, Kickoff, Sediment Report
3	Farms	**Cattle access** to streams and overgrazed pastures can cause erosion and affect stream habitat.	Stream meeting, Kickoff, State Letters, Sediment Report
4	Farms	Increased precipitation and shorter winters (wet falls) decreases the **water storage** capacity in soils.	Stream meeting
5	Farms	Farmers need **technical and financial assistance** to protect the resource (Nutrient management, cover crops/soil health, BMPs	Kickoff, State Letters, WRAPS/TMDL, Sediment Report, Carlton & Pine County Water Plan
6	Drinking Water	**Septic System** maintenance and compliance may be a risk to drinking water in the watershed.	WRAPS/TMDL, Pine Co Water Plan
7	Drinking Water	**Drinking water** needs continued protection from contaminants.	Carlton County Water Plan, Pine County Water Plan, WRAPS/TMDL

Each participant ranked their top two issues for farms, and the three top priorities overall were:

- **Nutrient runoff** from agricultural areas has the potential to impact stream and lake water quality. (Tied for second)
- **Cattle access** to streams and overgrazed pastures can cause erosion and affect stream habitat. (Tied for second)
- Farmers need **technical and financial assistance** to protect the resource (Nutrient management, cover crops/soil health, BMPs.

Because there were only 2 issues for drinking water, no prioritization was needed.

The group brainstormed a list of possible actions to address the priority issues along with ways success might be measured.

Actions/Measures

Nutrient Run Off

- Improve buffers and riparian areas around farms
  - *Metric*: *Number of filter strips installed, length of buffers installed, number of farms with new design elements*
- Reduce phosphorous in streams and lakes
  - *Metrics*: *Phosphorous reduction based on models*
- Increase grazing management plans
  - *Metric: Number of plans or acres under management*
- Improve methods of wintering livestock and manure storage
  - *Metric: Number of feedlots improved*
- Increase soil health practices
  - *Metric*: *Number of acres*

Cattle Access

- Limit livestock access to streams
  - *Metric*: *Number or length of exclusion fences installed*
- Workshop to help livestock producers learn about the resources available
  - *Metric*: *Number of outreach events*

Technical and Financial Assistance

- Work with classrooms and 4-H to educate youth
  - *Metric*: *Number of meetings held*
- Increase one-on-one interactions to increase BMPs
  - *Metric*: *Number of farmers reached, number of acres in BMPs, number of stacked practices, number of BMPs*
- Use soil tests as a communication tool to help reduce nutrient inputs, including CECE versus pH/NPK recommendations
  - *Metric*: *Number of soil tests*
- Hold outreach events
  - *Metric*: *Number of events held, number of farmers in attendance*
- Work with Extension to collaborate on the wood ash program and calculations
  - *Metric*: *Number of meetings held*
- Work with Extension to ensure proper use and timing of wood ash by requiring a deposit to encourage timely application

- *Metric*: *Program updated*

- Increase peer-to-peer networks
  - *Metric*: *Number of people using the MDA program connecting livestock and crop producers, program developed to connect producers to gardeners*

- Assist owners of historic farm sites with concerns such as: drainage ditches, closing old manure storage facilities, old dump sites, old well, etc.
  - *Metric: Outreach campaigns, number of landowners*

- Work with farmers to integrate forestry and farming
  - *Metric*: *Outreach campaigns, number of farmers reached*

Drinking Water

- Start a drinking water monitoring program that tests a subset of watershed wells 3 times in 10 years to help understand trends. The Douglas County program could be used as a model, and MDH could help with program development
  - *Metric*: *Program developed and implemented*

- Gain a better understanding of artesian wells
  - *Metric*: *Meetings with key landowners to identify locations, location map developed*

- Increase education and outreach to private well owners
  - *Metric: Number of outreach campaigns, events held*

- Compile existing well data to increase our understanding of drinking water quality
  - *Metric*: *Database created*

- Consider point of sale septic inspections for all sales in Carlton County (Pine County already has this ordinance) or in areas of drinking water vulnerability
  - *Metric*: *Ordinance updated*

- Consider point of sale well inspection
  - *Metric*: *Ordinance updated*

- Prioritize watershed protection based on groundwater recharge/drinking water vulnerability areas
  - *Metric*: *Acres protected*

- Continue well sealing practices
  - *Metric*: *Number of wells sealed*

- Increase outreach on well sealing practices
  - *Metric*: *Number of outreach campaigns, number of people reached*

- Explore funding options for drinking water restoration and technical assistance
  Metric: *Funding sources identified*

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 un 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

Issues/Opportunities list generated during the Brainstorming Activity at the Farm & Drinking Water meeting

Agriculture

- Education and technical assistance on programs
  - Access to equipment
- Work with extension and learn about the wood ash program and calculations
- Buffers and riparian zones around farms to filter run off
  - Filter strips
  - Farm design elements
- Septage spreading in vulnerable ground water areas?
  - Education/work with spreaders
- Transitional agriculture land
  - Restore natural drainage and wetlands
- Overgrazed pasture
  - Grazing management plans
- Methods of wintering and siting appropriately
- Education on inputs and effects on water quality
  - Work with soil biology
  - Nutrient management, timing, source, placement
- Soil health
- Use and timing of wood ash
  - Require deposit – returned if it is spread
- Proper storage of soil amendments
- DNA source testing of E. coli

Drinking Water

- Contaminants of emerging concern
- Trend monitoring
  - 3 tests in 10 years
  - Douglas County example
- Better understanding of artesian wells
  - Monitor
  - Locations?
- Education and monitoring of private wells and public health
- Compile different data sources
- Septic system maintenance around shallow wells and vulnerable areas
  - County wide point of sale
- Watershed wide drinking water testing program
- Explore funding sources for drinking water program and technical assistance
  - MDH?
- Downstream drinking water communities - Duluth