APPENDICES

APPENDIX A. PLAN SUMMARY

This summary can be printed as a brochure on 11x17 paper and folded in half for plan outreach.

Project Partners

Salo Township

Itasca County Minnesota

Itasca Soil and Water Conservation District

For questions or cost share to implement practices, please contact your local partners:

- Aitkin SWCD: 218-927-7284
- Cass SWCD: 218-547-7399
- Carlton SWCD: 218-384-3891
- Itasca SWCD: 218-326-5573
- North St. Louis SWCD: 218-749-2000
- South St. Louis SWCD: 218-723-4867

View the plan online!
Scan this QR code to visit the plan's website

Funded by

Clean Water Land & Legacy Amendment

Upper Mississippi Grand Rapids Watershed

Comprehensive Watershed Management Plan

WATERSHED VISION

From the peatlands to the iron range, we work to protect our vibrant Northwoods lands and waters for vibrant communities.

Clean Water Land & Legacy Amendment

Watershed Highlights

- The Upper Mississippi – Grand Rapids watershed is the first watershed downstream from the Mississippi Headwaters.
- It spans 1.3 million acres in Aitkin, Carlton, Cass, Itasca, and St. Louis counties.
- It also includes portions of the Mille Lacs Band of Ojibwe Indian Reservation, and a number of communities including Grand Rapids, Coleraine, Cromwell, Hill City, McGregor, and Remer.
- It is home to over 600 high-quality lakes, 2,000 miles of rivers, and abundant forests and wetlands.

Plan Highlights

- Implementation of this plan is voluntary, and outreach, cost share, and incentive programs will be used to assist with voluntary implementation on private lands (See map below).
- A Landscape Stewardship Plan was developed in parallel with this watershed plan that helped prioritize forest protection and management for water quality and habitat improvement.
- The Planning partners set goals during the planning process. The goals and their outcomes are highlighted below. Funding from the Clean Water Land and Legacy Amendment will be provided for plan implementation.

10-Year Goals for the UM-GR Watershed

Lakes

Goal: Reduce phosphorus in priority lakes by **40lbs/yr.** Restore **3 linear miles** of shoreline on priority lakes.

Outcome: Improved water quality and shoreland habitat.

Farms

Goal: Implement **3,659 acres** of agricultural best management practices.

Outcome: Improved water quality and soil health.

Streams

Goal: Protect or enhance **1 miles** of priority streams.

Outcome: Improved water quality and riparian habitat.

Wetlands

Goal: Maintain and enhance wetlands and peatlands at current rate.

Outcome: Water storage and wetland habitat is maintained.

Forests

Goal: Implement **8,162 acres** of forest protection. **Implement 36,000 acres** of forest management.

Outcome: healthy forests that protect water quality and are resilient to climate variability and invasive species.

Groundwater

Goal: Seal **50 unused wells.**

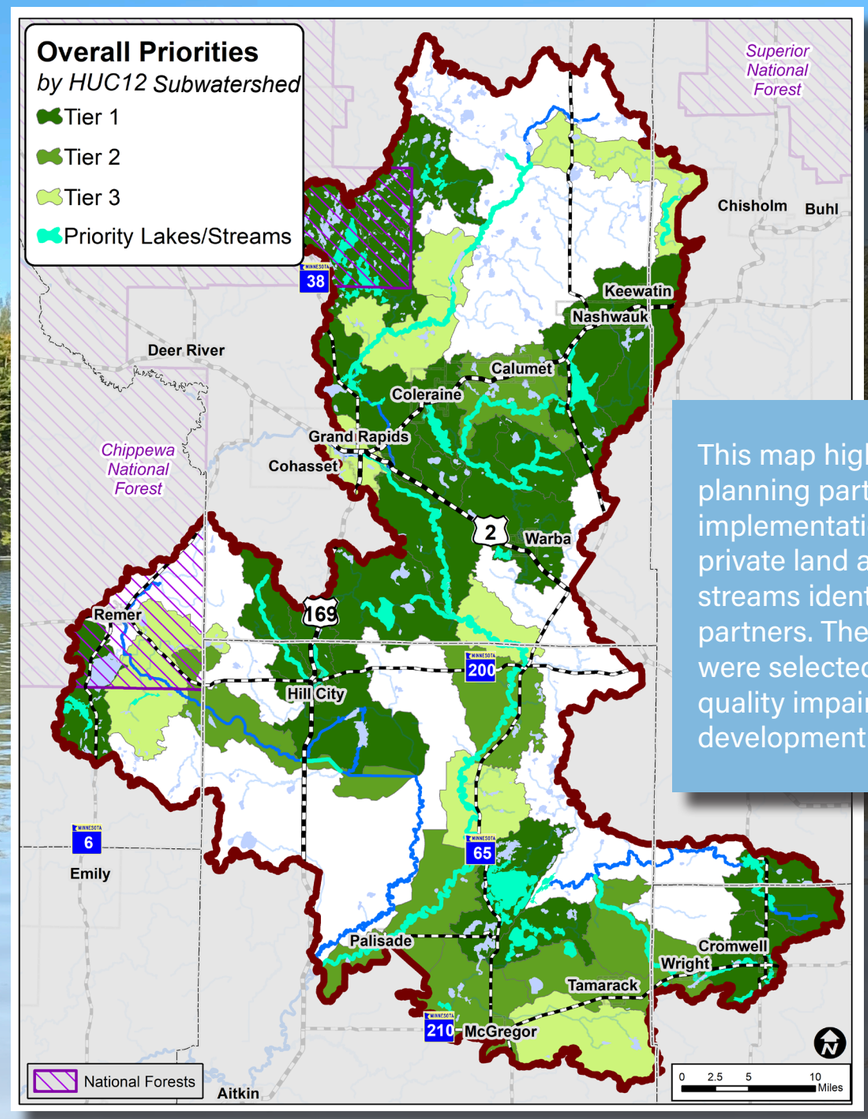
Outcome: Groundwater quality is protected.

Stormwater

Goal: Complete stormwater retrofit analysis for **3 communities.** Implement **5 stormwater projects**.

Outcome: Water quality is improved and communities are resilient to climate variability.

Where to Focus Work



This map highlights where planning partners can prioritize implementation efforts, including private land and priority lakes and streams identified by the planning partners. These lakes and streams were selected based on water quality impairments, trends, and development pressures.

APPENDIX B. PUBLIC INPUT REPORT

June 2023

The Upper Mississippi – Grand Rapids Watershed public kickoff meetings were held in June 2023. Two events were held, one in Tamarack and one in Grand Rapids to accommodate people in the southern and northern portions of the watershed. The goal of these meetings was to hear diverse viewpoints on watershed priorities and values. We also wanted to understand the issues, concerns and opportunities of watershed residents and stakeholders. This information was gathered by having participants complete two activities.

Seven topic areas were identified by the Steering Committee and Policy Committee. These included:

- Lakes
- Rivers / Streams
- Wetlands
- Forests
- Farms
- Groundwater / Drinking water
- Stormwater

Basic information on each topic was compiled into a poster for watershed stakeholders to view during the events. These posters were used to help residents have a shared understanding of the topics.

The events were advertised using print and social media ad campaigns. In addition, Steering Committee members advertised the events using their contact lists and connections. For those who could not attend the events in person, an online survey was made available. The survey ran for one month.

A total of 36 people participated in the events (22 in Tamarack and 14 in Grand Rapids). In addition, an online survey was available for those who could not attend in person. A total of 27 people submitted responses to the online survey.

Kickoff Meeting Activities

Identifying Issues, Concerns and Opportunities

A list of watershed issues, concerns and opportunities was compiled by the Steering Committee for each of the seven topics. The list was used to create a voting poster. Participants from each event used stickers to vote if they agreed on an issue. They were also provided with sticky notes to add new issues if they felt something was missing. A complete list of issues is listed at the end of this report.

Prioritizing Watershed Topics

Event participants were given four $100,000 bills at the beginning of the event. They were asked to view each of the seven topics and think about how they would spend this money to protect and restore natural resources in the watershed in the next 10 years. Money could be spent all on one topic or spread over four.

Other Information

Using a paper survey, we asked participants to describe how they interact with the watershed, and a list of words that describe the watershed. This information was used to understand representation of the seven topic areas. We were also able to generate a word cloud which will be used later in the process to develop our vision statement for the plan.

Online Survey

The online survey mimicked the in-person event as much as possible. The same list of issue statements was listed for each topic, and participants were asked to rank the four highest priority topics.

Results

Where were participants from?

As expected, those who attended the Tamarack meeting were largely from the south while the Grand Rapids meeting participants were mostly from the north. Participants indicated they were from:

- Cromwell
- Tamarack
- Wright
- Hill City
- Grand Rapids
- Swan River
- Big Rice Lake

Participants indicated that they interacted with the watershed in the following ways:

- Residents
- Lakeshore owners
- Forest owners, loggers or people who work in the wood products industry
- Farmers
- City residents
- People who hunt, fish or recreate in the watershed
- People who work in the watershed
- People with cultural or family ties to the watershed

The top three ranked issue statements were collected for each topic:

Lakes

- Some septic systems are too old or not maintained, and they are affecting lake health. (30)
- Lakeshore owners are not aware of their role in protecting lake health (27)
- Aquatic invasive species are affecting lake health or make it difficult to enjoy recreating on our lakes (20)

Rivers / Streams

- Ditched or altered streams need to be restored to their natural state (21)
- Stream banks/shorelines are not well protected or have too much erosion (17)
- People do not know how to protect or restore streams (17)

Wetlands

- Wetlands are at risk of being lost due to development or land use change (27)
- People don't understand the importance/value of wetlands (24)
- Ditching is impacting downstream lakes and streams (22)

Forests

- Forests are at risk of being converted to development, farming or other land uses (26)
- Some tree species are at risk of diseases/pests that are affecting forest health (22)
- Changing weather or environmental patterns are affecting forest health (20)

Farms

- Soil health could be improved with more cover crops, less tillage or grazing management (25)
- Manure runoff or livestock accessing lakes, streams or wetlands are impacting the health of water resources (19)
- There are not enough rules/regulations to protect water resources (18)

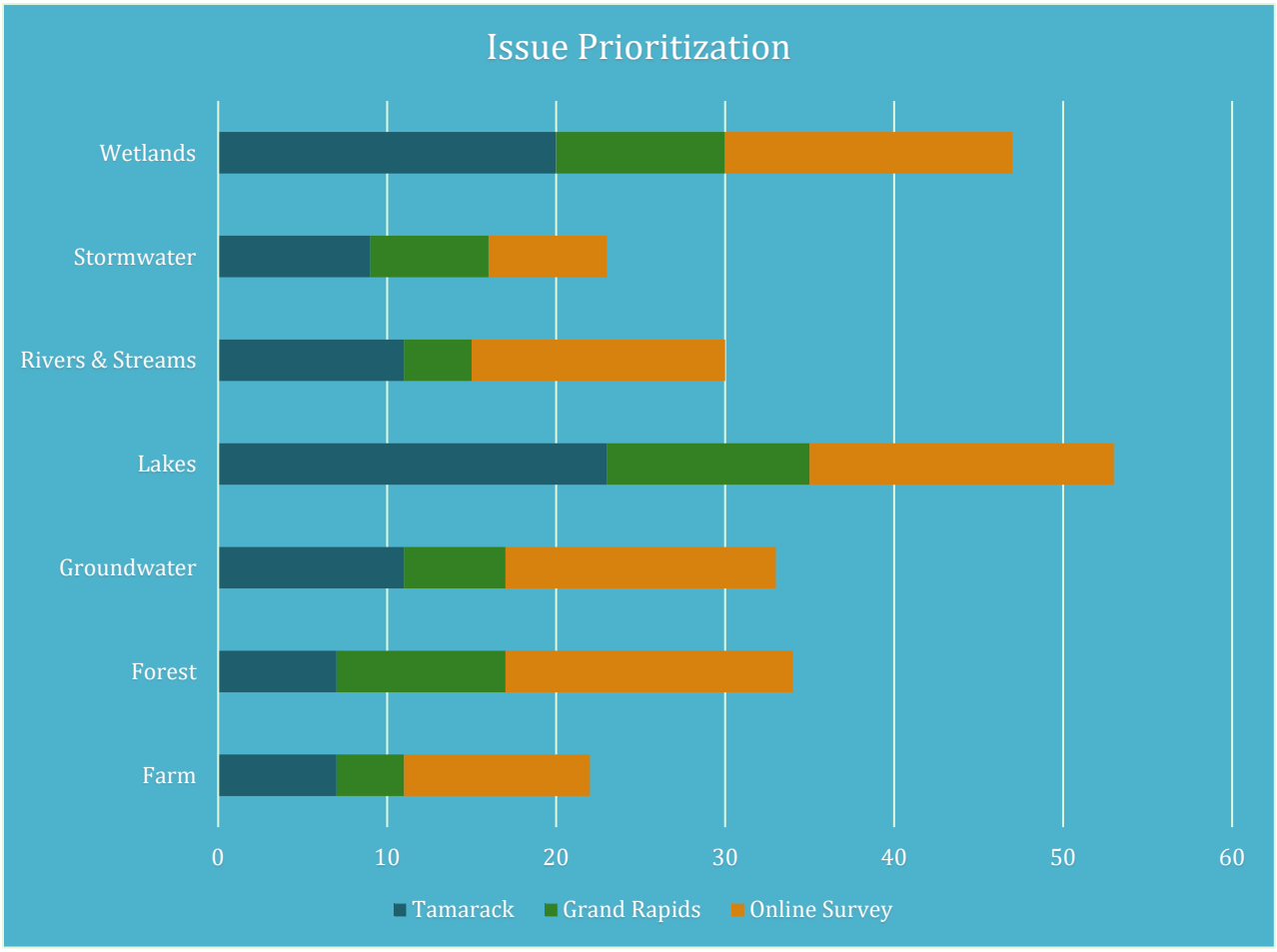
Groundwater / Drinking Water

- More testing/monitoring us needed to track groundwater safety/quality (24)
- More information is needed to understand groundwater risks (18)
- People are unaware of risks or concerns impacting groundwater / drinking water (17)

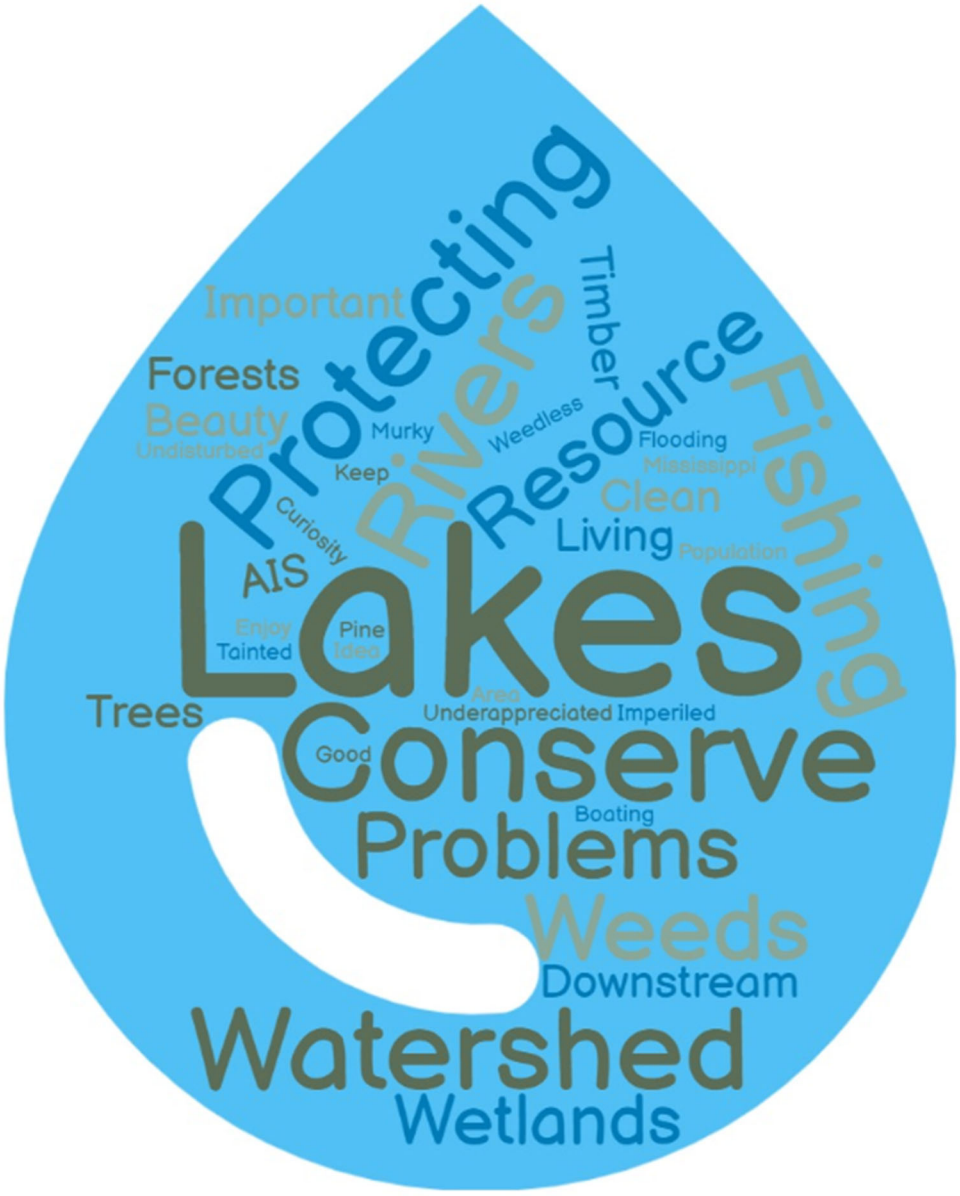
Stormwater

- Salt use from de-icing and dust control are impacting lakes, rivers and wetlands (25)
- Stormwater runoff is affecting lakes, streams and wetlands (19)
- Cities/Towns need professional help to manage stormwater (18)

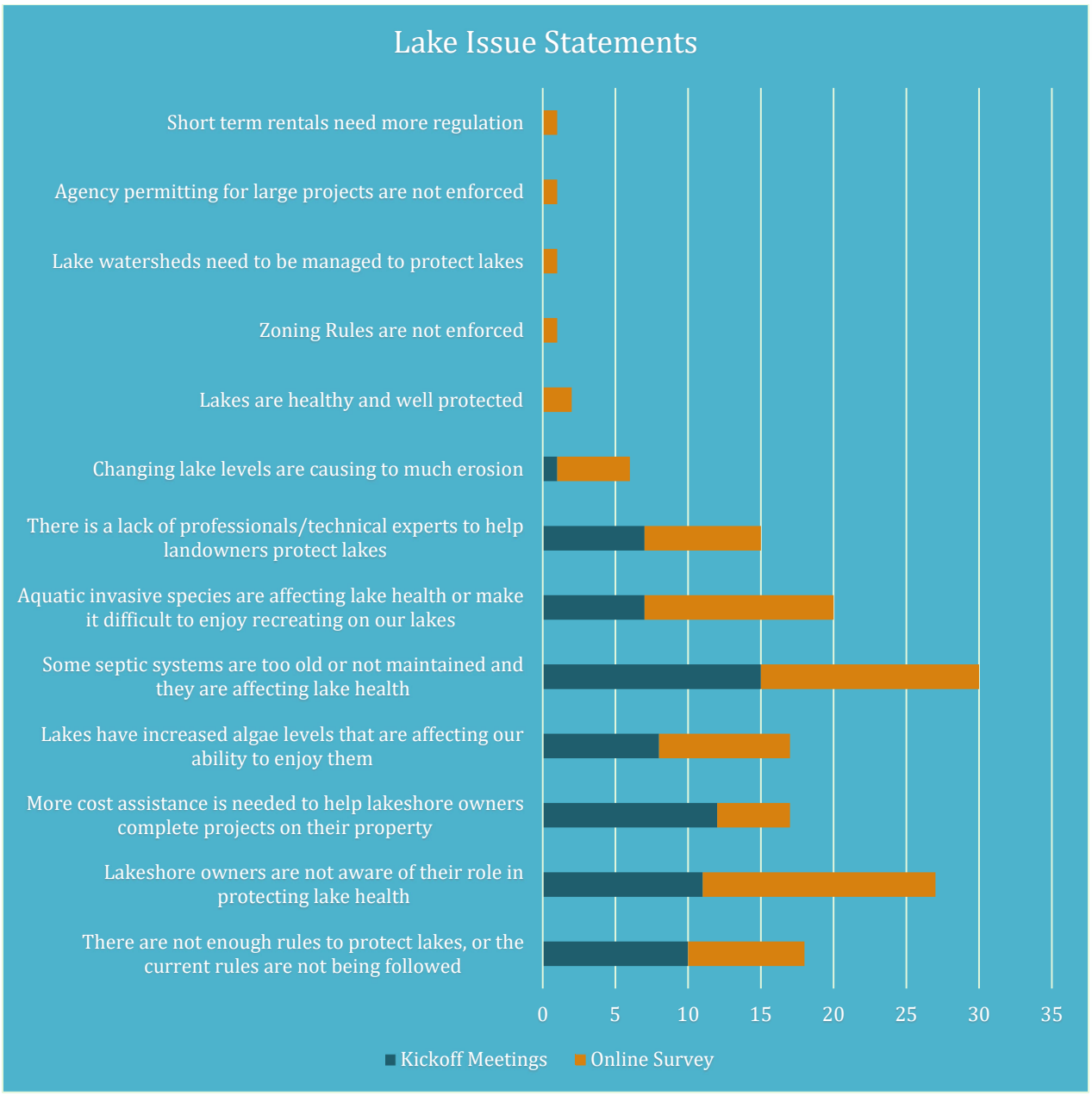
The results of the prioritization activity showed lakes to be the highest ranked topic followed by wetlands. The lowest ranked topic was farms.



The words used to describe the watershed focused on protecting and conserving the resources of the watershed. A word cloud was created to show the responses to the question: In just 4 or 5 words, when you think of the Upper Mississippi – Grand Rapids watershed, what comes to mind?



A complete list of the issue statement voting questions and the cumulative score are shown in the figures below.


Lake Issue Statements
Short term rentals need more regulation
Agency permitting for large projects are not enforced
Lake watersheds need to be managed to protect lakes
Zoning Rules are not enforced
Lakes are healthy and well protected
Changing lake levels are causing to much erosion
There is a lack of professionals/technical experts to help landowners protect lakes
Aquatic invasive species are affecting lake health or make it difficult to enjoy recreating on our lakes
Some septic systems are too old or not maintained and they are affecting lake health
Lakes have increased algae levels that are affecting our ability to enjoy them
More cost assistance is needed to help lakeshore owners complete projects on their property
Lakeshore owners are not aware of their role in protecting lake health
There are not enough rules to protect lakes, or the current rules are not being followed
0
5
10
15
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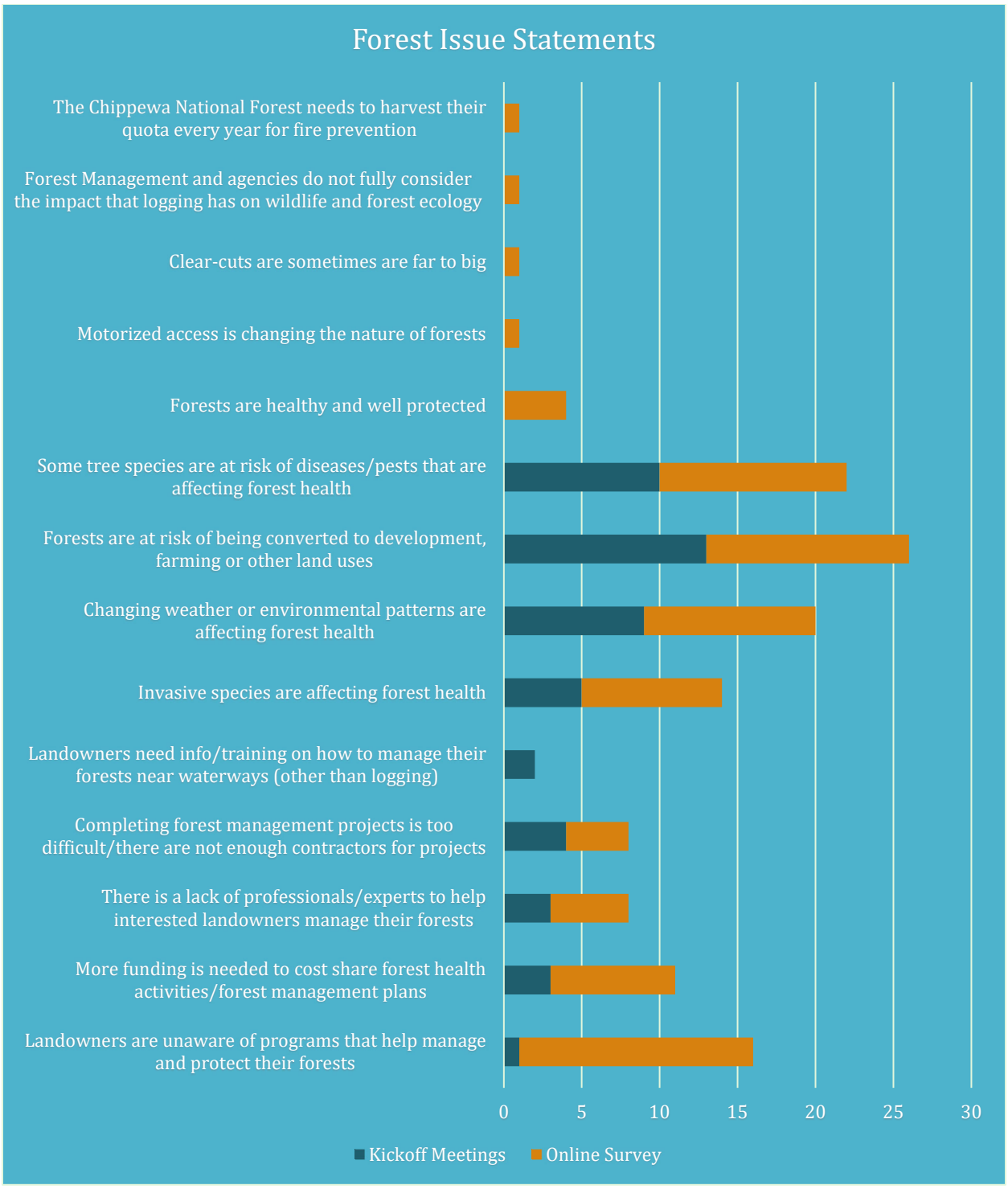
25
30
35
Kickoff Meetings
Online Survey


Forest Issue Statements
The Chippewa National Forest needs to harvest their quota every year for fire prevention
Forest Management and agencies do not fully consider the impact that logging has on wildlife and forest ecology
Clear-cuts are sometimes are far to big
Motorized access is changing the nature of forests
Forests are healthy and well protected
Some tree species are at risk of diseases/pests that are affecting forest health
Forests are at risk of being converted to development, farming or other land uses
Changing weather or environmental patterns are affecting forest health
Invasive species are affecting forest health
Landowners need info/training on how to manage their forests near waterways (other than logging)
Completing forest management projects is too difficult/there are not enough contractors for projects
There is a lack of professionals/experts to help interested landowners manage their forests
More funding is needed to cost share forest health activities/forest management plans
Landowners are unaware of programs that help manage and protect their forests
0
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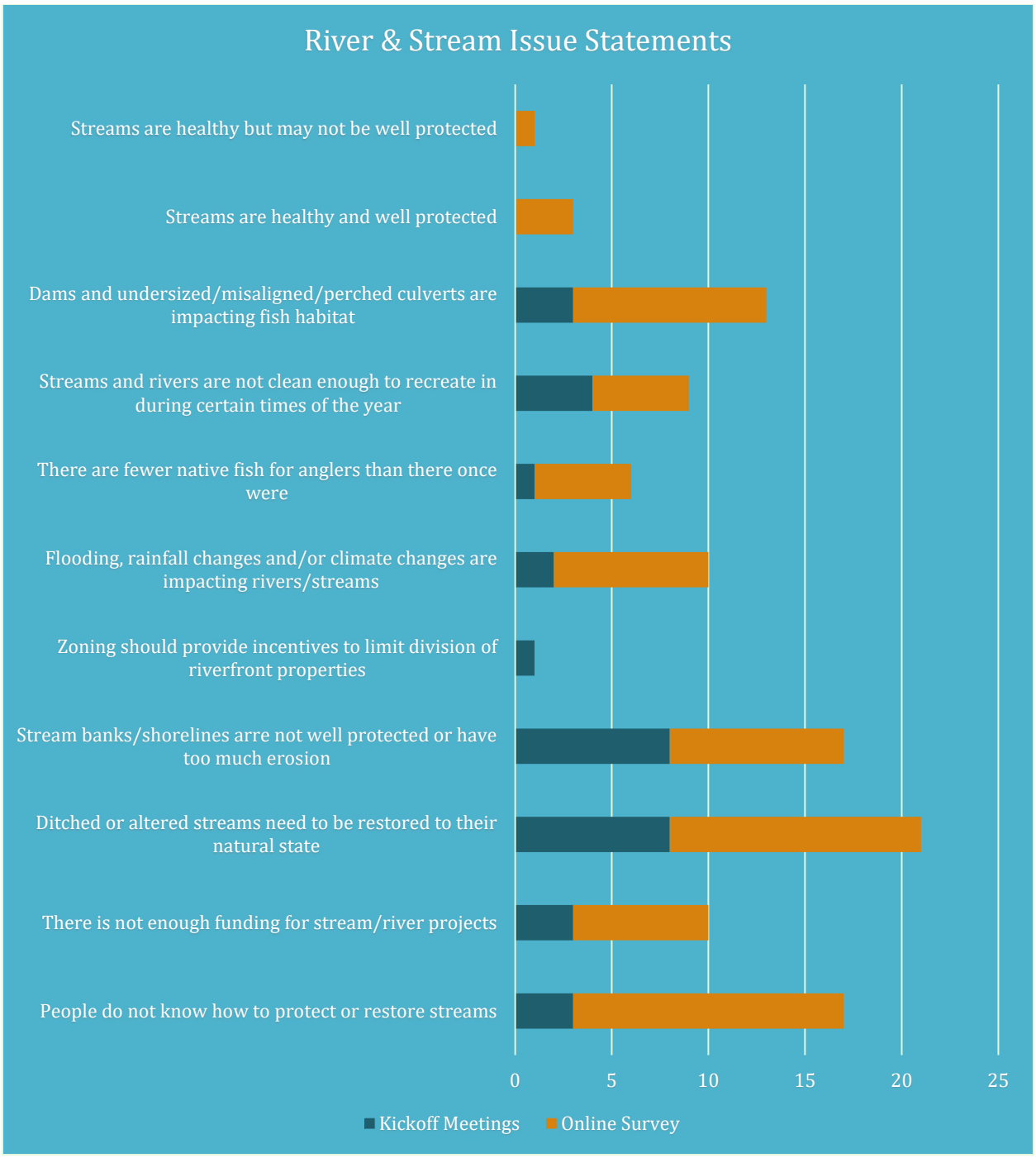
25
30
Kickoff Meetings
Online Survey


River & Stream Issue Statements
Streams are healthy but may not be well protected
Streams are healthy and well protected
Dams and undersized/misaligned/perched culverts are impacting fish habitat
Streams and rivers are not clean enough to recreate in during certain times of the year
There are fewer native fish for anglers than there once were
Flooding, rainfall changes and/or climate changes are impacting rivers/streams
Zoning should provide incentives to limit division of riverfront properties
Stream banks/shorelines arre not well protected or have too much erosion
Ditched or altered streams need to be restored to their natural state
There is not enough funding for stream/river projects
People do not know how to protect or restore streams
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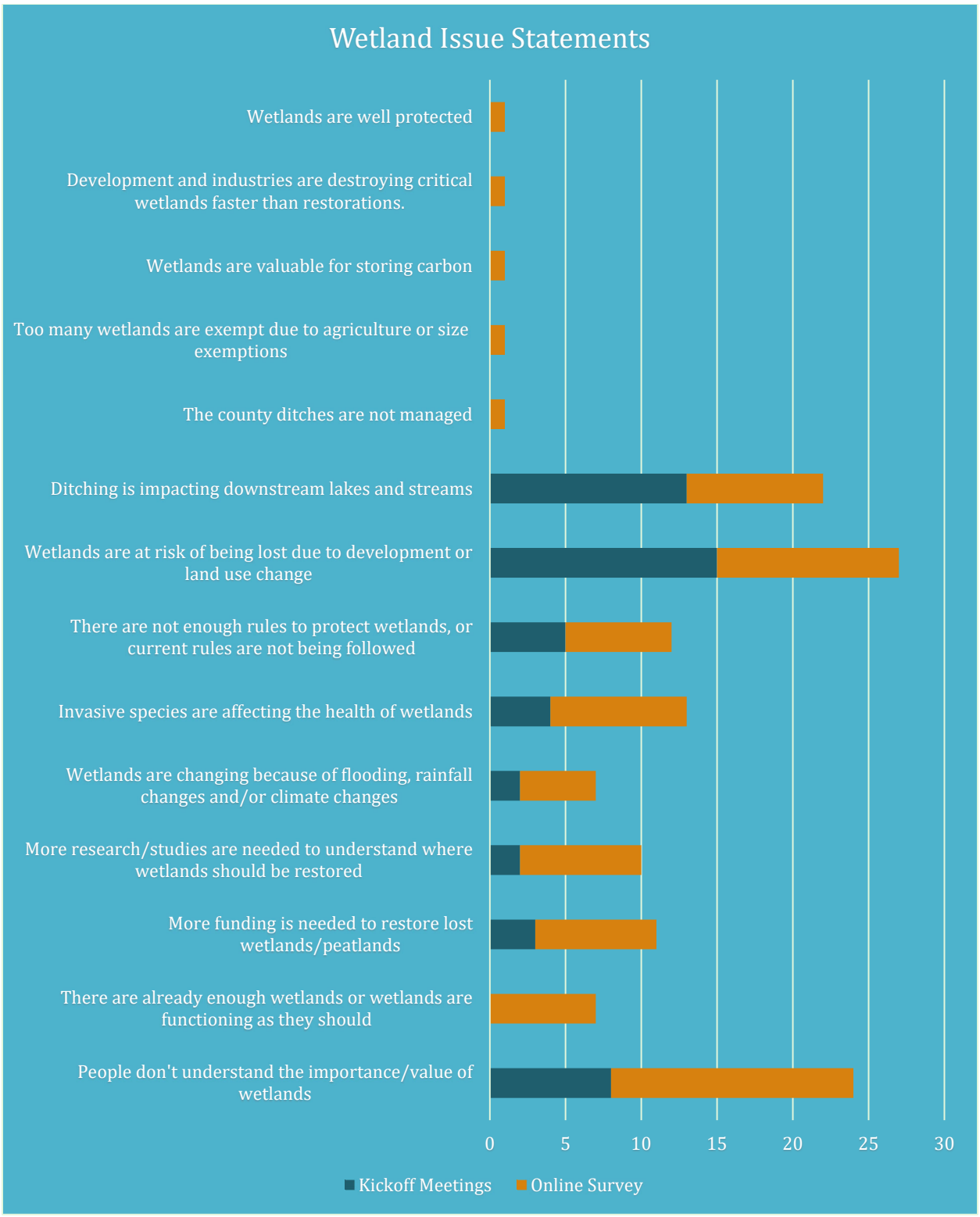
25
Kickoff Meetings
Online Survey


Wetland Issue Statements
Wetlands are well protected
Development and industries are destroying critical wetlands faster than restorations.
Wetlands are valuable for storing carbon
Too many wetlands are exempt due to agriculture or size exemptions
The county ditches are not managed
Ditching is impacting downstream lakes and streams
Wetlands are at risk of being lost due to development or land use change
There are not enough rules to protect wetlands, or current rules are not being followed
Invasive species are affecting the health of wetlands
Wetlands are changing because of flooding, rainfall changes and/or climate changes
More research/studies are needed to understand where wetlands should be restored
More funding is needed to restore lost wetlands/peatlands
There are already enough wetlands or wetlands are functioning as they should
People don't understand the importance/value of wetlands
0
5
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15
20
25
30
Kickoff Meetings
Online Survey


Farm Issue Statements
Invasive weeds are a problem
Farmers need more incentives to change industry practices to protect waters
Rotating crops and buffer zones are needed along the Mississippi River
Proper farming techniques can help store carbon
Lots of weltands are being drained of cleared for grazing / farming
Lack of enforcement of cattle near streambanks
Farms are already manages to protect water resources
Flooding, rainfall changes and/or climate changess are impacting farms
Soil health could be improved with more cover crops, less tillage or grazing management
Manure runoff or livestock accessing lakes,streams or wetlands are impacting the health of water resources
There are not enough rules/regulations to protect water resources
Timelines/deadlines for conservation programs are too strict
There os not enough cost share to help farmers install projects to protect lakes, streams or wetlands
There is too much paperwork/restrictions for farmers to enroll in conservation programs to protect lakes, streams or wetlands
Farmers are unaware of programs to help protect lakes, streams or wetlands
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15
20
25
30
Kickoff Meeting
Online Survey


Groundwater Issue Statements
Minneosta requires higher standards than bottled water
Groundwater is complicated and needs more stringent protections
A groundwater atlas is needed
Nitrate levels in groundwater is a concern
Groundwater is already protected and safe/healthy
More information is needed to understand groundwater risks
Flooding, rainfall changes and/orclimate changes are impacting groundwater
Groundwater safety/quality is at risk from porous soils
Thr groundwater supply is limites/at risk
More testing/monitoring us needed to track groundwater safety/quality
More rules are needed to protect groundwater
There is not enough funding to help landowners protect groundwater/drinking water
Groundwater withdrawal by extraction industries jeopordizes health, welfare and livelihoods
People are unaware of risks or concerns impacting groundwater / drinking water
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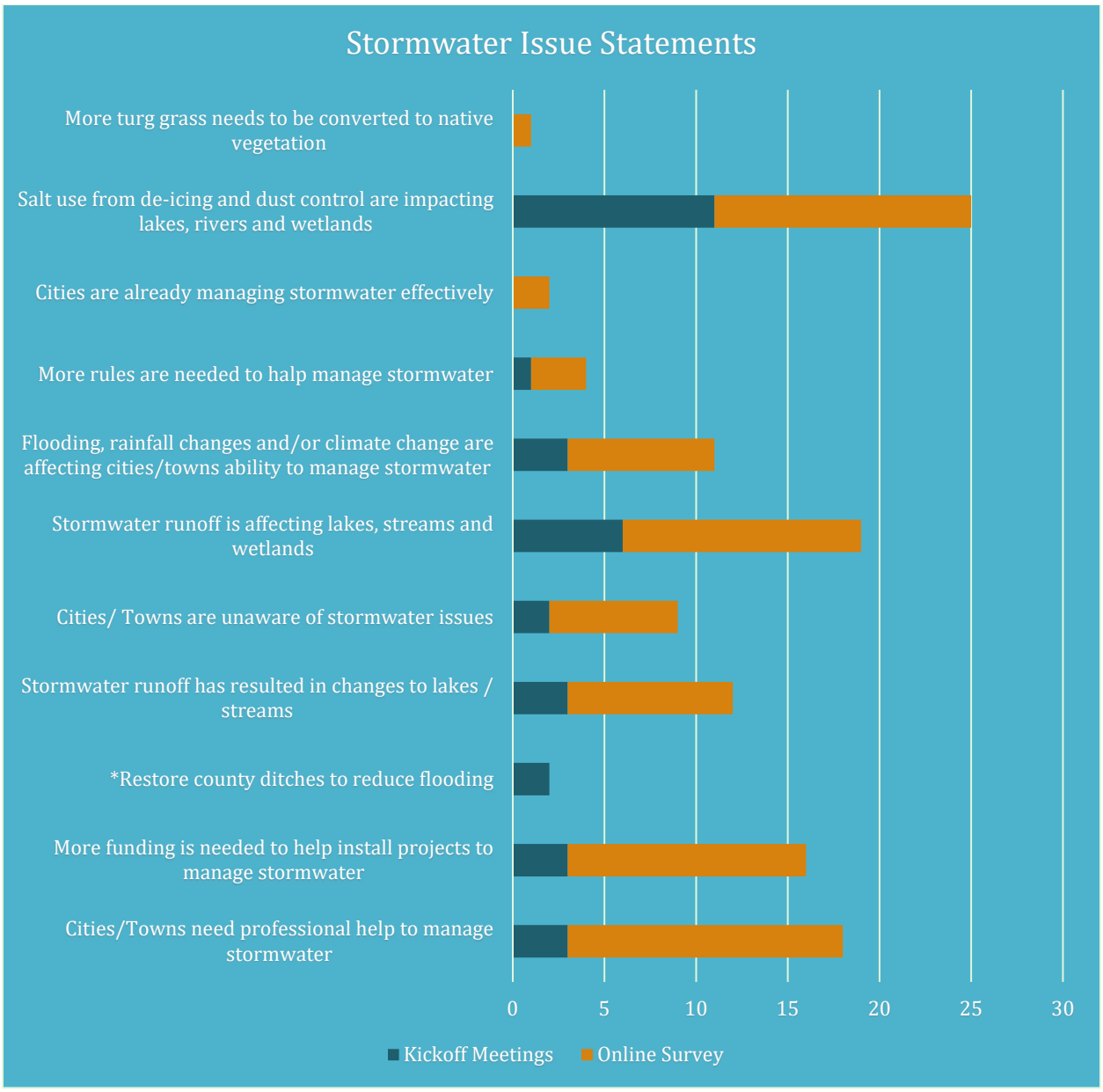
Kickoff Meetings
Online Survey


Stormwater Issue Statements
More turg grass needs to be converted to native vegetation
Salt use from de-icing and dust control are impacting lakes, rivers and wetlands
Cities are already managing stormwater effectively
More rules are needed to halp manage stormwater
Flooding, rainfall changes and/or climate change are affecting cities/towns ability to manage stormwater
Stormwater runoff is affecting lakes, streams and wetlands
Cities/ Towns are unaware of stormwater issues
Stormwater runoff has resulted in changes to lakes / streams
*Restore county ditches to reduce flooding
More funding is needed to help install projects to manage stormwater
Cities/Towns need professional help to manage stormwater
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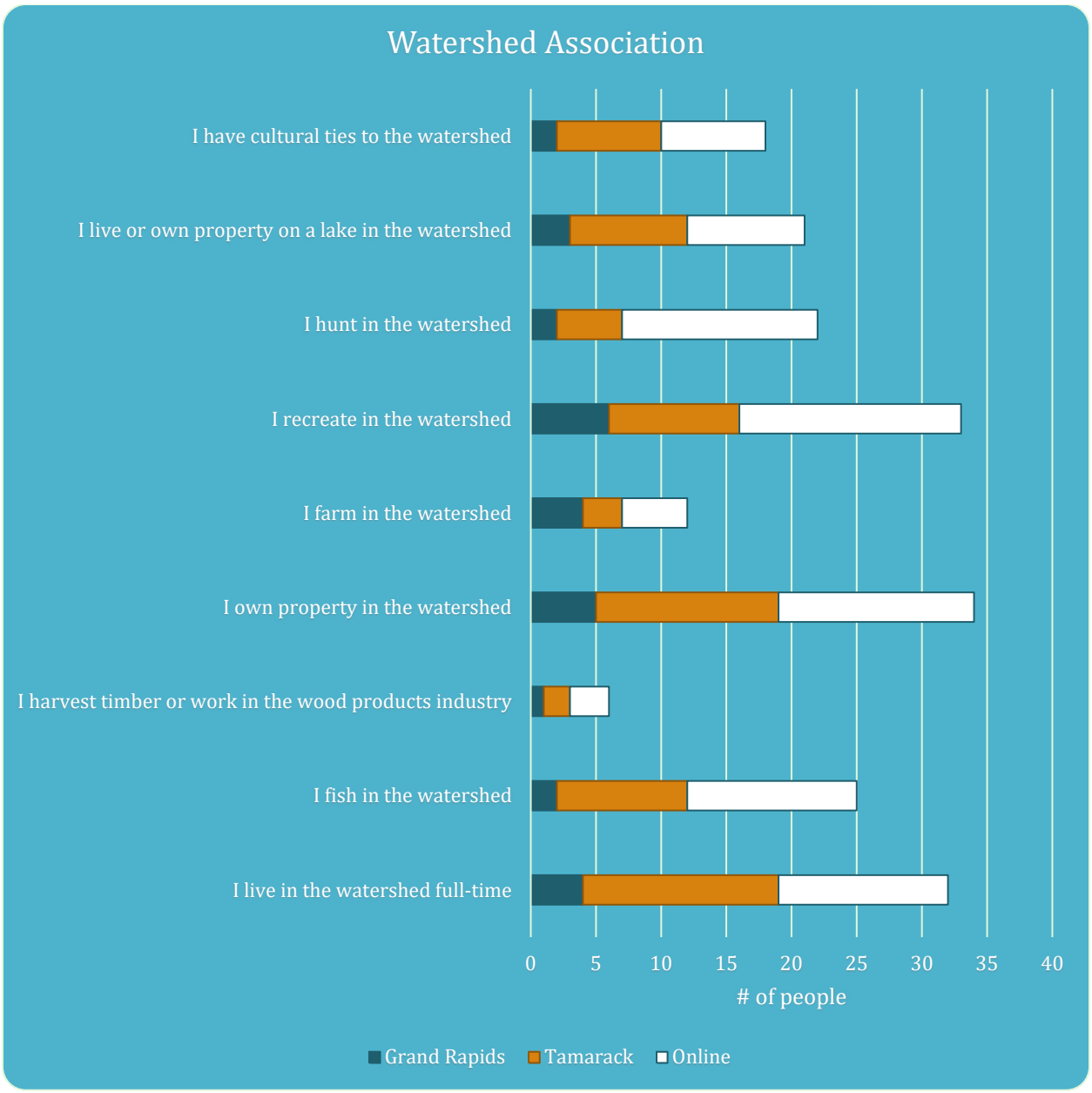
Kickoff Meetings
Online Survey


Watershed Association
I have cultural ties to the watershed
I live or own property on a lake in the watershed
I hunt in the watershed
I recreate in the watershed
I farm in the watershed
I own property in the watershed
I harvest timber or work in the wood products industry
I fish in the watershed
I live in the watershed full-time
0
5
10
15
20
25
30
35
40
# of people
Grand Rapids
Tamarack
Online

With the current rate of land use change in the watershed, what do you think the UM-GR watershed will look like in 50 years?

Tamarack:

- I can't imagine what changes will look like in 50 years
- Hard to predict. Hopefully replanting of forests.
- From the indicators on the wall if interest are followed=clean lakes and recreation. No ability for self-preservation=consumable resources will be gone.
- If talon/riotinto proceeds, in 50 years the watershed will be poisoned by acid mine drainage. RioTinto will be gone, leaving taxpayers on the hook. The water, fish, birds and people will be poisoned. Tamarack will be a superfund site.
- A lot more weeds to come
- Improved lakes.
- A lot more people; change in demographics.
- I expect more emigration to the area because of it's clean air, water and soil. The forests of the watershed will be increasingly valued for mitigation of climate change.
- Overdevelopment along lakes and rivers as more people head north.
- Overdeveloped.
- Probably remain much the same.
- More population.
- Pay attention now or it will be in a sorry state in 50 years.

Grand Rapids:

- Unfamiliar- needs to be preserved though.
- Nonexistent.
- I am concerned that lots of floodplain and wetland will be filled for development.
- Nothing good. Too much development, too many homes and their mown lawns too close to lakes. Not enough undisturbed forestland.

What would you like the watershed to look like in 50 years?

Tamarack:

- Clean and as close to untouched as possible.
- Stay the same.
- Wilderness.
- Clean and healthy.
- Wisely planned development- younger demographic.
- Clean water for our grandchildren.
- Improved water.
- Good stewardship of all resources.
- Safe place to do recreational things, fish and swim.
- Cleaner.

- I would like the peatlands restored, the marshes, wild rice lakes and rivers flourishing. The water will be clean. People will be able to eat more than 1 fish a week. The birds, especially our eagles and raptors will flourish rather than die of mercury poisoning.
- Try not to change things. Stop altering, and maybe the place will look as it does today.
- Close to what it is now.
- Continuation of clean rivers and lakes.
- Forested.

Grand Rapids:

- Undisturbed, clean, respected. Better lakeshore protections/plantings. No more "daylight" septic systems flowing into the rivers. More recreation that doesn't result in damage. More wildlife species and more resilient rivers/streams during flooding and drought.
- I would like the watershed to look much less "managed" with wild areas along wetlands and floodplains.
- Lush, abundant, and tended by Original Free Nations (Dakota & Anishinaabe).
- Heavily forested; diverse and healthy tree population. Lakes protected from AIS (surveillance at landings) and septic/sewer system rehaul. No farming or industry that impacts water negatively.
- Clean, clear and full of fish
- Accessible for the elderly ready available and handicapped programs
- Clean and healthy! We owe that to the next generations.
- Healthy and thriving
- Natural looking waterways with access for homes and cabins which are mainly hidden from view from the water; clean waters; planned response from climate change to keep vegetation including forests healthy; a place for humans and the natural environment to coexist
- Same or better than now
- natural and healthy
- Healthy lakes, streams, froests and wetlands the provide abundant recreational opportunities.
- I'd like it to be as good or better than it is now.
- Lakes without algae
- Less conversion to ag and more wetlands protected.
- Healthy and safe & fair for all
- Show modest improvement in quality and knowledge.
- Healthy in all areas.
- I want the watershed to be pristine, unencumbered by industry, and healthy for future generations to enjoy. I want strong processes and assurances that the ecology in the region will not be heavily and permanently impacted and altered by development, industrial projects, human recreation, or pollution. I want dams to be reviewed and removed, if their impact is no longer effective. I want mercury to be seriously addressed and stopped before all of the food webs including us are consuming it to

our detriment. I want run-off like pesticides, chloride, and sewage to no longer be a substantial risk to waterways. I want wetlands to be preserved as the life blood of the natural ecology of our region. I want the deep and rich heritage of our river and its many inhabitants to be protected, defended, and preserved so that future generations can understand and thrive in our beautiful region.

- More fish less people
- Much as it is now, with a fairly high percentage of public, undeveloped land helping to protect our lakes and rivers. A continual engagement and participation of privately ownd shoreland owners to protect water quality through incentives and education will help as well.
- I would like to see the army corps stop flooding in Pokegama lake. I would like to see a new Hydro power idea to help our power needs in the future in Itasca County.

Are there any topics or resources we didn't cover at the kickoff meeting?

Tamarack:

- I don't know yet.
- No.
- None.
- Problems with gold mining.
- It looks like you have this covered.
- No.
- I always enjoy learning at the meetings.
- Not a single poster addressed the threat that hard rock mining will bring to this very area. This is a real threat- no nickel sulfide mine has ever polluted the watershed. Doesn't matter what the shills for riotinto say. These are the facts.
- Wild rice, food resources that the watershed provides.

Grand Rapids:

- Providing a list of current resources to people attending this meeting would be helpful. Are there resources for lake (property) owners? River (property) owners? Professionals interested in helping with watershed restoration or management projects?
- Please avoid framing this project as a search for studying problems, but rather prioritizing problems. We know we're negatively impacting wetlands in our pursuit of personal benefit.
- Traditional Native multigenerational or millennial care for WATER, treaty rights of the nation-to-nation status with the U.S. government through congress (Constitutional instituted rights).

APPENDIX C. GOAL CALCULATIONS

Goals were calculated for each topic area in the UM-GR CWMP. This section describes how the numbers were calculated for each goal.

10-Year Goals for the UM-GR Watershed	
 **Lakes**	Reduce phosphorus in Priority Enhance and Restore lakes by **40lbs/yr**; Restore **3 linear miles** of shoreline on priority lakes
	Protect or enhance **1 mile** of priority streams  **Streams**
 **Farms**	Implement **3,659 acres** of agricultural best management practices (BMPs)
	Implement **8,162 acres** of forest protection; Implement **36,000 acres** of forest management  **Forests**
 **Wetlands**	Maintain and enhance wetlands and peatlands at **current rate**
	Complete stormwater retrofit analysis for **3 communities**; Implement **5 stormwater project**s  **Stormwater**
 **Groundwater**	Seal **50 unused wells**.

Lakes

Lakes

Reduce phosphorus in Priority Enhance and Restore lakes by **40lbs/yr**; Restore **3 linear miles** of shoreline on priority lakes

Phosphorus

The majority of the lakes in the UM-GR Watershed have excellent water quality, with very low phosphorus concentrations and forested lakesheds. These lakes are a focus for protection, and because their phosphorus concentrations are already so low (<20 µg/L), the Steering Committee determined it would be hard to have a loading goal that could be met in 10 years. Projects implemented on the "Enhance" and "Restore" lakes will reduce phosphorus by small increments. Therefore, the goal of 40 lbs applies to all the priority lakes and will be added up by each project installed (shoreline restoration, rain gardens, stormwater management, etc).

Shoreline

Minnesota's shorelines are being degraded at a rate of 1-2% each decade (Radomski 2024). The length of shoreline of the priority lakes, minus the "Vigilance" lakes and Big Sandy, totals 156 miles. The goal of 3 miles of restoration is 2% of 156 miles, therefore trying to keep up with the shoreline loss in the next 10 years and hopefully reverse this trend.

Streams

Protect or enhance **1 mile** of priority streams

Streams

Data from NRCS and eLINK shows that 2 miles of livestock pipeline and 0.5 miles of streambank restoration has been completed in the watershed between 2004 – 2023. This is an average of 0.13 miles/year. It was estimated that 1 mile could be accomplished by local partners in 10 years. If NRCS implements riparian projects, the 1 mile goal could be exceeded for the watershed.

Farms

Farms

Implement **3,659 acres** of agricultural best management practices (BMPs)

The Farms goal was determined as a percentage of agricultural acres in the watershed. Currently 3% of the crop and pasture acres have BMPs. This goal adds another 7% to get to 10% total for the watershed.

Total Ag Acres in the UM-GR	Crop: Pasture/Hay: **Total =**	7,358 acres 44,919 acres **52,277 acres**
Current Practices	CRP: MAWQCP: NRCS Crop: NRCS Pasture: Elink Crop: Elink Pasture: **Total =**	72 acres 814 acres 78 acres 668 acres 0 acres (thru 2020) 0 acres (thru 2020) **1,632 acres (3%)**
Goal Setting	**GOAL: 3,659 acres (366/yr) = 7%** **Brings total coverage to 10%**	

Forests

Implement **8,162 acres** of forest protection;
Implement **36,000 acres** of forest management

Forests

The protection goal was developed as 10% progress towards the landscape stewardship goals.

Total Protected Acres	Total Acres: Total Protected: % Protected	1,332,794 acres 984,370 acres 74%
Current Practices	Total Needed for LSP Goals:	81,620 acres
Goal Setting	**10% progress towards LSP Goals:** **Annual Progress:** **SFIA, easements, acquisitions**	**8,162** **816/yr**

The forest management goal was determined by tracking past progress in implementation. An average of 30 Forest Stewardship Plans have been written in the past three years. The goal is to continue this pace for the next 10 years.

Total Managed Acres	Total Acres: Total Private Acres: Total Forest Acres: Total FSP Acres: % Forest with plans	1,332,794 acres 640,340 acres 501,076 acres 178,418 acres 36%
Current Practices*	2023: 34 plans written 2022: 30 plans written 2021: 30 plans written Average size = 120 acres each	
Goal Setting	30 plans/year x 10 years = 300 plans 300 plans x 120 acres = 36,000 acres of plans	

Stormwater

Complete stormwater retrofit analysis for **3 communities**;
Implement **5 stormwater project**s

Stormwater

The stormwater goal was set by determining the current progress of stormwater studies in the watershed. The Advisory Committee spent multiple meetings gathering and revising the information. The full summary can be found on page 76 of the plan in the Stormwater topic section.

Groundwater

Groundwater

Seal **50 unused wells**.

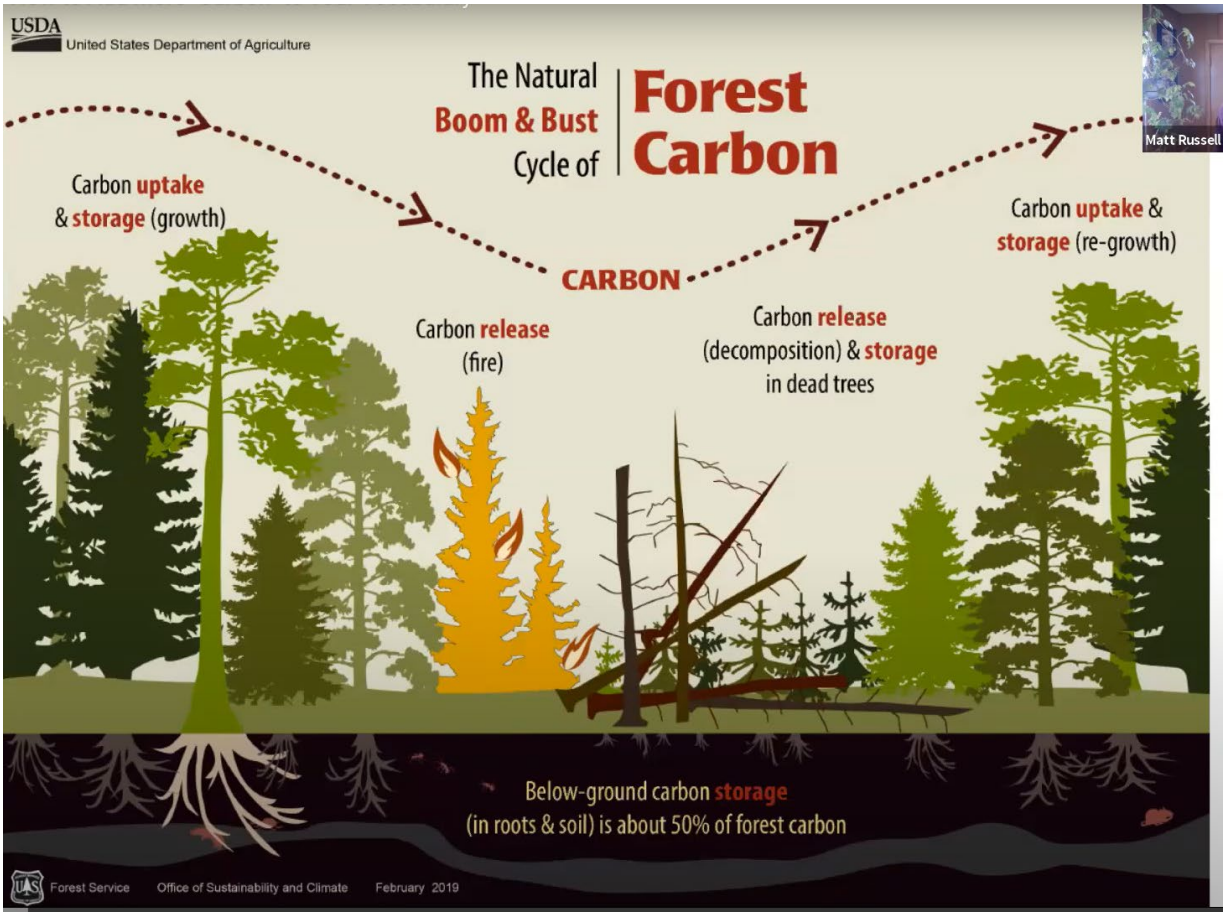
eLINK data showed that 4 wells had been sealed in the watershed since 2007. Planning Partners wanted to spend more effort on well sealing and thought 5 per year was reasonable to achieve in the next 10 years.

Carbon Benefits

Carbon benefits were calculated as additional stacked benefits from implementing plan goals.

Forests

Using the plan's Forest Management Goal, the carbon stored in the existing forests was quantified. Because this storage already exists, it was called "protected carbon storage" in the plan.



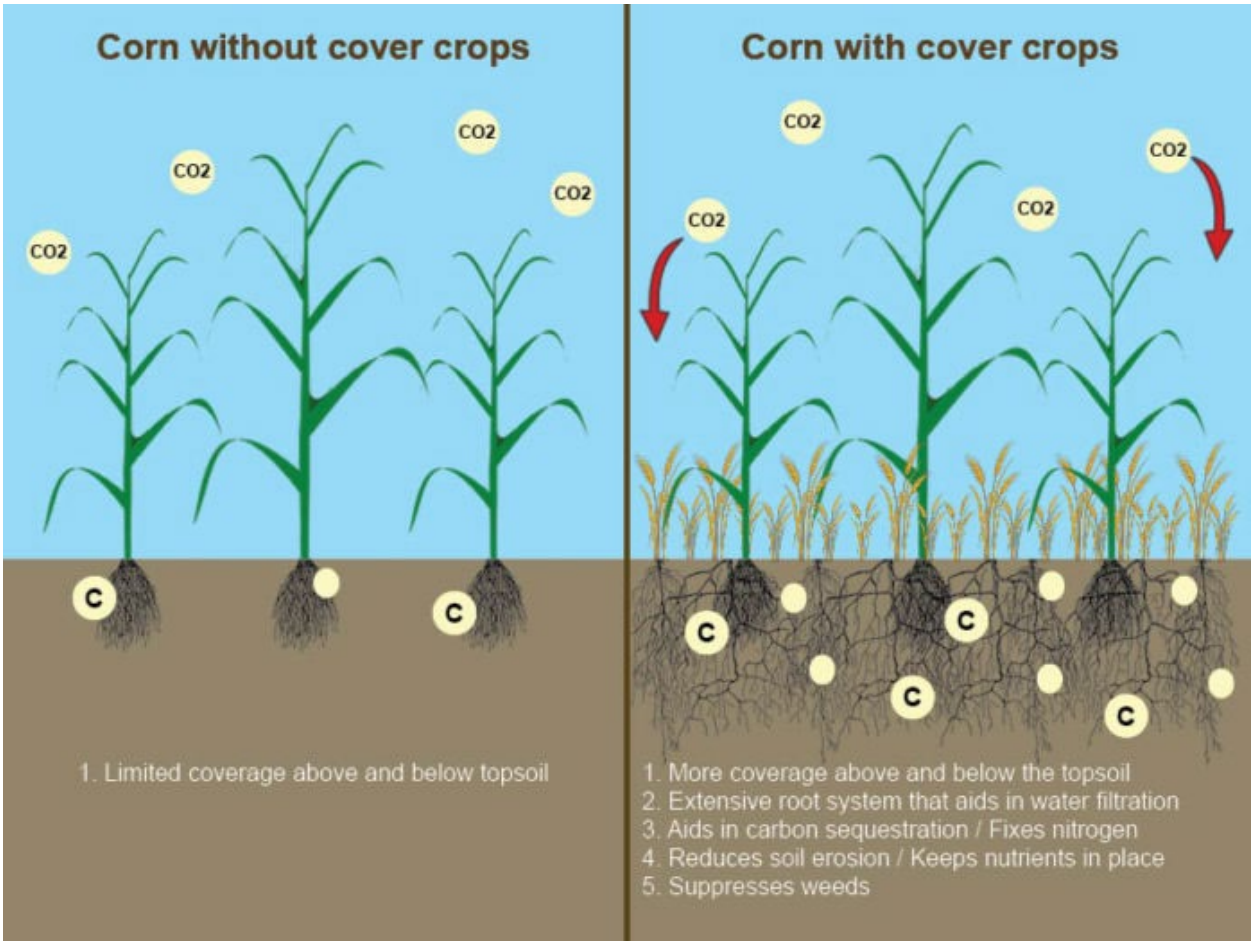
Reference for carbon calculations:

US Forest Service Forest Inventory and Analysis. EVALIDator tool:

https://www.fs.usda.gov/ccrc/tool/forest-inventory-data-online-fido-and-evalidator

Cover Crops

The number of acres that currently have Ag BMPs and the goal number of increased BMPs was used to quantify carbon sequestration gained from those practices as this would be new carbon capture.



Reference for carbon calculations:

COMET-Planner tool. Carbon and Greenhouse Gas Evaluation for NRCS Conservation Practice Planning. USDA and Colorado State University. Available at: http://www.comet-planner.com/

Storage Benefits

Storage benefits were calculated as additional stacked benefits from implementing plan goals.

Forests

Using the plan's Forest Management Goal, the amount of storage was quantified that would be lost if existing forests were cleared for agricultural production or subdivisions for development. Therefore, it was called "protected water storage" in the plan.

Reference:

Senay, G. B. and Kagone, S., 2019, Daily SSEBop Evapotranspiration: U. S. Geological Survey Data Release, https://doi.org/10.5066/P9L2YMV

Appendix D. HSPF SAM Scenario

To: Upper Mississippi – Grand Rapids (UM-GR) Partnership

From: Tim Erickson, PE

Houston Engineering, Inc.

Subject: BMP Scenario in HSPF-SAM for the UM-GR CWMP

Date: June 19, 2024

Project: 8870-0001

SCENARIO DEVELOPMENT

A best management practice (BMP) scenario was developed for the UM-GR Watershed using the Hydrologic Simulation Program-Fortran Scenario Application Manager (HSPF-SAM) and the UM-GR HSPF model. The UM-GR HSPF model simulates hydrology, sediment, and nutrients (nitrogen and phosphorus) in the UM-GR HUC08 watershed for the period 1996-2015 and was developed by the Minnesota Pollution Control Agency (MPCA). The model can be downloaded at https://www.respec.com/sam-file-sharing.

The BMP scenario applies non-structural BMPs to 3,659 acres in priority areas in the watershed. The breakdown of the non-structural BMPs is as follows:

- 3,659 acres of non-structural BMPs
  - 1,097.7 acres (30%) of cover crops on cropland,
  - 2,561.3 acres (70%) of pasture management on pastureland.

The BMPs were distributed evenly across the cropland and pastureland in the priority area. The priority areas are shown in **Figure 1**.

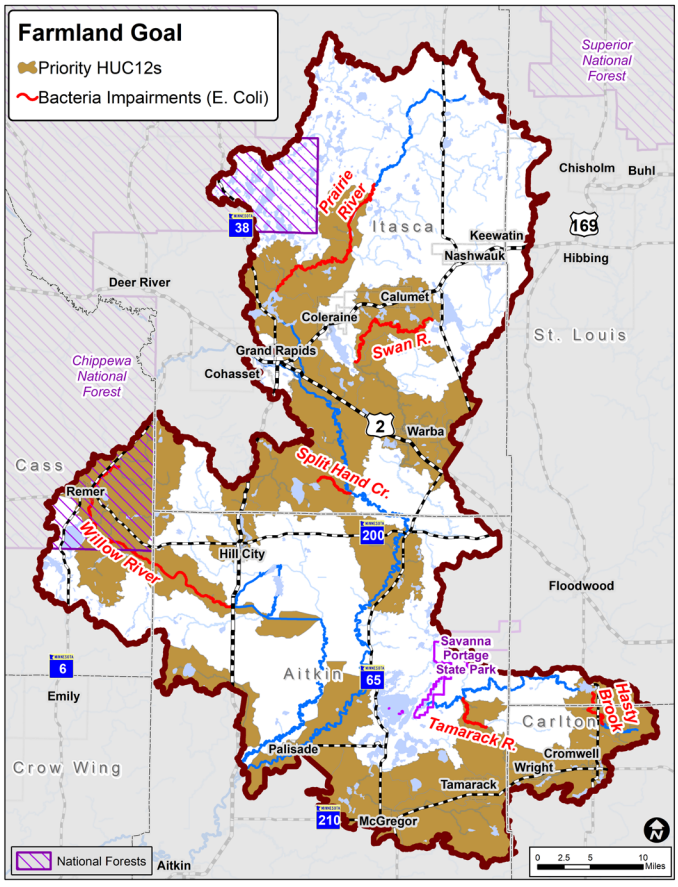


Figure 1. Priority areas for farm BMPs.

The total area covered by the HSPF model is 1,297,207 acres. The priority watershed covers a total area of 629,615 acres (48.5% total area) with a total cropland area of 11,315 acres and a total pastureland area of 30,269 acres. The BMPs are implemented on 9.7% (1,097.7 acres) of the cropland and 8.5% (2,561.3 acres) of the pastureland in the priority areas and represents 6.1% of total cropland and 6.8% of total pastureland in the watershed. The priority areas (basins) included in the BMP scenario are provided in Table 1, along with HUC12 ID and name, total area (in acres), total cropland area, and total pasture area.

Table 1. Priority basins and areas in the HSPF model.

Basin ID	HUC12	HUC12 Name	Total Area (acres)	Total Cropland Area (acres)	Total Pasture Area (acres)
A140	070101030203	Lawrence Lake-Prairie River	7,651.0	3.1	23.2
A150	070101030203	Lawrence Lake-Prairie River	4,811.2	6.3	45.5
A170	070101030206	Reiley Lake-Prairie River	21,933.1	33.4	113.0
A171	070101030207	Prairie River	4,953.5	4.1	41.2
A172	070101030207	Prairie River	2,459.4	12.6	16.0
A200	070101030207	Prairie River	10,456.7	14.0	64.7
A210	070101030207	Prairie River	12,898.5	58.9	129.8
A231	070101030302	Blueberry Lake-Mississippi River	8,350.8	37.5	106.9
A233	070101030302	Blueberry Lake-Mississippi River	5,145.0	21.1	9.5
A240	070101030302	Blueberry Lake-Mississippi River	8,823.2	119.9	68.0
A241	070101030302	Blueberry Lake-Mississippi River	7,004.4	41.0	117.0
A250	070101030302	Blueberry Lake-Mississippi River	7,346.8	117.5	206.2
A252	070101030303	Split Hand Creek	4,434.0	0.0	57.8
A256	070101030303	Split Hand Creek	20,249.1	227.1	199.2
A259	070101030303	Split Hand Creek	2,766.7	96.5	32.7
A261	070101030303	Split Hand Creek	8,103.0	331.6	675.5
A283	070101030403	Twin Lakes-Swan River	4,047.8	8.8	12.0
A284	070101030403	Twin Lakes-Swan River	1,560.9	6.2	0.0
A287	070101030403	Twin Lakes-Swan River	22,222.5	59.5	209.3
A293	070101030406	Warba Creek-Swan River	8,649.0	65.9	420.0
A297	070101030406	Warba Creek-Swan River	6,235.0	7.9	92.5
A299	070101030406	Warba Creek-Swan River	4,485.0	0.0	33.9
A301	070101030406	Warba Creek-Swan River	15,980.7	47.9	243.5
A303	070101030408	Swan River	3,585.9	2.2	38.6
A305	070101030408	Swan River	8,078.1	111.3	59.1
A307	070101030407	Bruce Creek	11,752.2	111.3	191.8
A309	070101030408	Swan River	9,802.7	147.5	425.1
A311	070101030408	Swan River	6,250.8	193.3	81.5
A313	070101030408	Swan River	3,467.2	20.4	9.3

Basin ID	HUC12	HUC12 Name	Total Area (acres)	Total Cropland Area (acres)	Total Pasture Area (acres)
A315	070101030408	Swan River	5,966.3	77.3	51.2
A317	070101030408	Swan River	2,079.7	95.1	18.3
A319	070101030901	Ball Bluff Lake-Mississippi River	9,064.5	158.0	274.8
A330	070101030901	Ball Bluff Lake-Mississippi River	5,518.5	62.9	509.3
A331	070101030901	Ball Bluff Lake-Mississippi River	6,789.0	105.5	527.0
A350	070101030901	Ball Bluff Lake-Mississippi River	10,102.1	223.0	1,095.0
A403	070101030501	Prairie Lake	17,894.6	470.9	335.5
A404	070101030501	Prairie Lake	5,577.8	181.5	153.2
A407	070101030502	Headwaters Tamarack River	4,323.7	155.1	125.3
A412	070101030502	Headwaters Tamarack River	2,307.1	62.1	148.1
A414	070101030502	Headwaters Tamarack River	1,721.3	95.4	52.7
A416	070101030502	Headwaters Tamarack River	482.8	22.2	18.5
A417	070101030502	Headwaters Tamarack River	286.8	48.3	0.0
A419	070101030502	Headwaters Tamarack River	10,458.7	956.1	656.9
A422	070101030504	Tamarack River	2,041.9	33.9	55.4
A423	070101030504	Tamarack River	12,253.0	156.6	1,458.8
A425	070101030503	Little Tamarack River	18,028.0	401.3	697.9
A427	070101030504	Tamarack River	7,818.8	113.8	736.9
A429	070101030504	Tamarack River	6,208.5	60.9	91.9
A437	070101030603	Mud Lake	16,117.7	159.4	1,398.1
A439	070101030603	Mud Lake	5,353.0	72.4	304.6
A443	070101030601	Headwaters Sandy River	6,775.4	101.9	1,500.6
A445	070101030601	Headwaters Sandy River	11,824.6	213.8	1,528.9
A447	070101030601	Headwaters Sandy River	14,541.0	115.8	1,469.4
A449	070101030602	Davis Lake-Sandy River	8,627.9	66.3	368.2
A451	070101030602	Davis Lake-Sandy River	7,477.7	43.9	323.6
A453	070101030602	Davis Lake-Sandy River	3,581.8	47.6	302.2
A455	070101030602	Davis Lake-Sandy River	4,065.5	157.8	200.2
A458	070101030602	Davis Lake-Sandy River	6,607.7	228.6	639.8
A461	070101030904	City of Palisade-Mississippi River	3,862.2	41.1	229.6
A470	070101030904	City of Palisade-Mississippi River	30,891.8	1,869.1	4,180.1
A490	070101030801	Headwaters Willow River	12,784.0	2.0	0.0
A530	070101030801	Headwaters Willow River	10,722.3	177.2	825.0
A539	070101030803	Little Thunder Lake-Willow River	6,166.0	125.2	156.3
A541	070101030803	Little Thunder Lake-Willow River	10,408.1	190.3	127.8
A551	070101030803	Little Thunder Lake-Willow River	8,897.2	106.5	35.6
A571	070101030805	Willow River Ditch	4,345.9	102.1	0.0

Basin ID	HUC12	HUC12 Name	Total Area (acres)	Total Cropland Area (acres)	Total Pasture Area (acres)
A590	070101030805	Willow River Ditch	18,829.3	425.7	671.5
A612	070101030702	Hill Lake	8,350.6	78.3	638.7
A615	070101030702	Hill Lake	3,472.2	155.0	225.3
A650	070101030805	Willow River Ditch	6,706.1	268.0	108.3
A670	070101030808	Willow River	10,136.1	130.3	533.7
A671	070101030808	Willow River	10,092.6	93.9	368.8
A690	070101030808	Willow River	18,165.9	575.6	2,120.5
A691	070101030807	White Elk Creek	4,407.1	139.1	74.3
A692	070101030807	White Elk Creek	2,960.6	40.0	49.8
A693	070101030808	Willow River	10,288.4	201.7	1,159.0

The BMP reduction efficiencies for the BMPs used in the simulation are provided in **Table 2**. The BMP reduction efficiencies represent the load reduction at the BMP as a percentage (e.g., a reduction efficiency of 75% for sediment means 75% of sediment is removed by the BMP.

Table 2. Reduction coefficients for BMPs

BMP	Reduction Coefficients (%)		
	Sediment	TN	TP
Cover Crops	74	28	29
Rotational Grazing	65	62	65

RESULTS

Priority Locations

Results from the BMP scenario were summarized for a select group of priority rivers/streams in the watershed. The locations where results are reported for the select priority rivers/streams include the Mississippi River at the outlet of the Grand Rapids-Mississippi River Watershed, the Mississippi River at the outlet of Split Hand Creek, the outlet of the Tamarack River, at the outlet of Willow Creek, at the outlet of Swam River, and at the outlet of the Prairie River (**Figure 2**). **Table 3** provides a summary of the expected annual load reductions for nitrogen, phosphorus, and sediment based on the BMP implementation scenario for the select locations. **Tables 4, 5, and 6** provide a summary of the loads and reductions for nitrogen, phosphorus, and sediment, respectively, for the select locations. The loads and reductions include the existing total base load, the total load for the scenario, the absolute load reduction from the scenario, and percent base load reduction from the scenario.

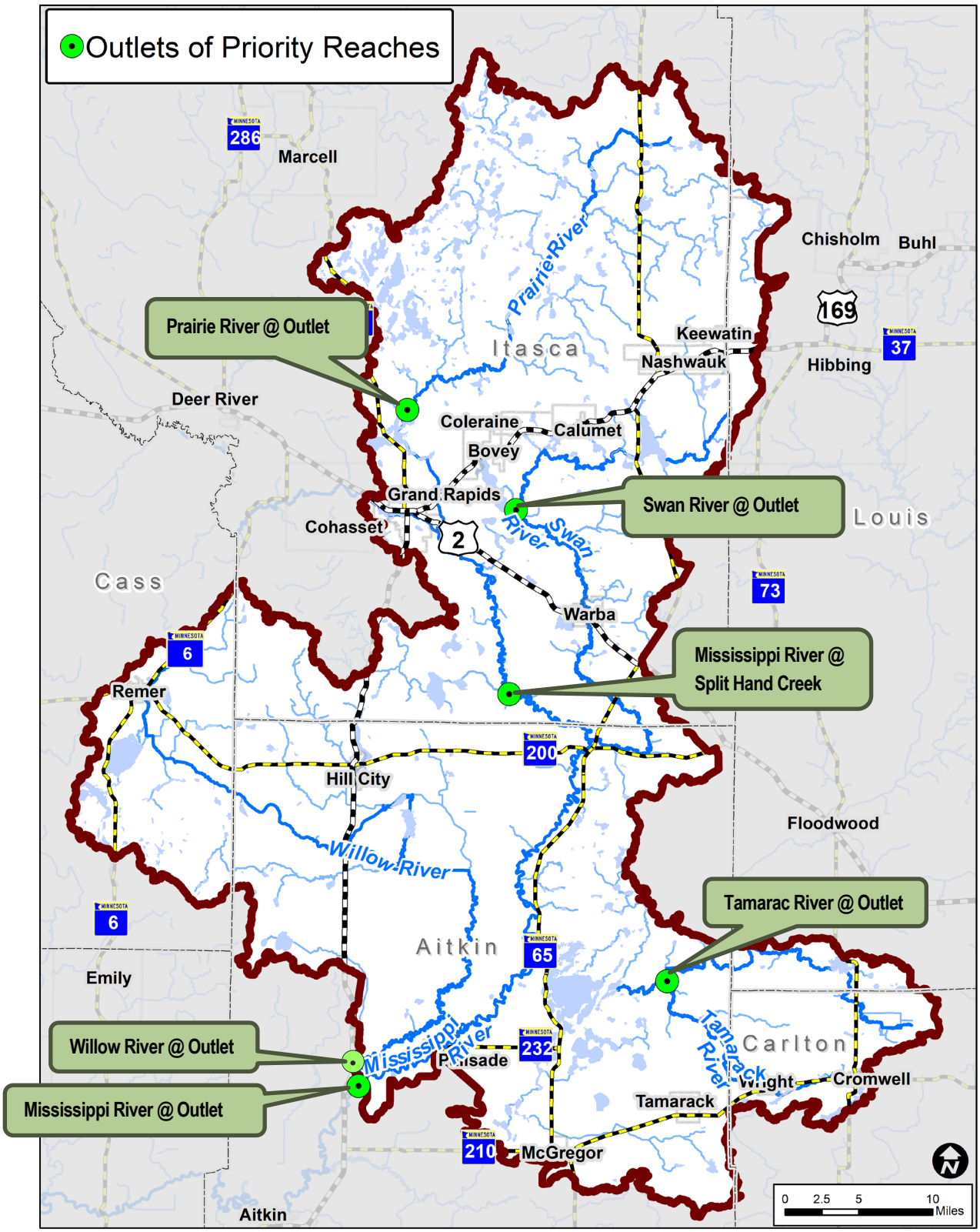


Figure 2. Priority resource points for load reductions.

Table 3. Summary of load reductions at select priority streams in the Grand Rapid-Mississippi Watershed.

Priority Reach	Load Reductions		
	Total Nitrogen (lbs/year)	Total Phosphorus (lbs/year)	Total Sediment (tons/year)
Mississippi River @ Outlet	2,463.6	175.7	43.7
Mississippi River @ Split Hand Creek	101.0	7.6	1.41
Tamarack River @ Outlet	466.5	36.8	14.3
Willow Creek @ Outlet	614.6	40.7	14.3
Swan River @ Outlet	14.9	1.0	0.41
Prairie River @ Outlet	18.3	1.8	0.33

Table 4. Summary of nitrogen loads and reductions at select priority streams in the Grand Rapid-Mississippi Watershed.

Priority Reach	HSPF Basin	Nitrogen (lbs/year)			
		Base	Scenario	Reduction	%Reduced
Mississippi River @ Outlet	A470 + A690	5,173,028	5,170,564	2,463.6	0.05%
Mississippi River @ Split Hand Creek	A250	3,787,686	3,787,585	101.0	0.003%
Tamarack River @ Outlet	A429	173,433	172,967	466.5	0.27%
Willow Creek @ Outlet	A690	616,982	616,368	614.6	0.10%
Swan River @ Outlet	A287	337,009	336,994	14.9	0.004%
Prairie River @ Outlet	A170	473,508	473,490	18.3	0.004%

Table 5. Summary of phosphorus loads and reductions at select priority streams in the Grand Rapid-Mississippi Watershed.

Priority Reach	HSPF Basin	Phosphorus (lbs/year)			
		Base	Scenario	Reduction	%Reduced
Mississippi River @ Outlet	A470 + A690	190,306	190,130	175.7	0.09%
Mississippi River @ Split Hand Creek	A250	145,062	145,054	7.6	0.005%
Tamarack River @ Outlet	A429	6,322	6,285	36.8	0.58%
Willow Creek @ Outlet	A690	21,760	21,719	40.7	0.19%
Swan River @ Outlet	A287	9,782	9,781	1.0	0.01%
Prairie River @ Outlet	A170	15,243	15,242	1.8	0.01%

Table 6. Summary of phosphorus loads and reductions at select priority streams in the Grand Rapid-Mississippi Watershed.

Priority Reach	HSPF Basin	Sediment (tons/year)			
		Base	Scenario	Reduction	%Reduced
Mississippi River @ Outlet	A470 + A690	20,817	20,774	43.7	0.21%
Mississippi River @ Split Hand Creek	A250	8,580	8,578	1.41	0.02%
Tamarack River @ Outlet	A429	1,346	1,332	14.3	1.06%
Willow Creek @ Outlet	A690	2,790	2,776	14.3	0.51%
Swan River @ Outlet	A287	796	796	0.41	0.05%
Prairie River @ Outlet	A170	3,017	3,017	0.33	0.01%

Edge-of-Field Reductions

The edge-of-field load reductions are reductions leaving the landscape or field. These load reductions will differ from load reductions seen at the outlet of the watershed because additional processes impact the sediment and nutrients as it travels through the river system. Table 7 provides the edge-of-field reductions by priority basin.

Table 7. Edge-of-field load reduction in the Grand Rapid-Mississippi Watershed from the BMP scenario.

Basin ID	Total Landscape Load			BMP Area		Load Reductions		
	Sediment (tons/yr)	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)	Cropland	Pasture	Sediment (tons/yr)	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)
A140	43.40	12,670	481.0	0.30	1.97	0.04	5.01	0.30
A150	29.62	9,030	340.3	0.62	3.85	0.09	9.87	0.58
A170	126.54	39,326	1,494.2	3.24	9.56	0.29	27.73	1.74
A171	17.59	8,289	311.3	0.39	3.49	0.03	7.80	0.43
A172	7.93	3,079	119.4	1.22	1.35	0.02	3.48	0.25
A200	34.18	15,729	590.5	1.36	5.47	0.06	13.51	0.79
A210	76.25	23,700	915.8	5.72	10.98	0.17	32.19	2.01
A231	48.25	17,309	657.5	3.64	9.04	0.24	28.01	1.74
A233	22.91	10,443	389.9	2.04	0.80	0.07	5.82	0.44
A240	57.23	15,784	640.6	11.63	5.75	0.19	25.76	2.00
A241	88.30	16,890	655.8	3.98	9.90	0.32	22.59	1.53
A250	38.83	15,174	609.6	11.40	17.44	0.57	62.50	4.07
A252	43.00	9,518	362.9	0.00	4.89	0.04	6.63	0.35
A256	222.68	45,304	1,823.0	22.03	16.86	1.47	73.58	5.72
A259	36.58	7,185	310.5	9.36	2.77	0.66	21.55	1.92
A261	129.61	22,580	1,019.7	32.17	57.16	2.39	151.57	10.70
A283	21.72	7,656	287.0	0.86	1.01	0.05	3.95	0.27
A284	9.27	2,518	98.4	0.60	0.00	0.02	1.22	0.11
A287	131.97	41,873	1,592.1	5.77	17.71	0.48	50.53	3.14
A293	66.55	17,758	703.6	6.40	35.54	0.78	90.90	5.39
A297	28.83	12,994	482.9	0.77	7.82	0.14	19.62	1.11

Basin ID	Total Landscape Load			BMP Area		Load Reductions		
	Sediment (tons/yr)	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)	Cropland	Pasture	Sediment (tons/yr)	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)
A299	22.27	8,435	322.2	0.00	2.87	0.04	6.65	0.36
A301	74.55	32,117	1,206.2	4.64	20.61	0.20	33.05	2.01
A303	17.03	7,143	266.6	0.22	3.27	0.06	7.99	0.45
A305	38.40	16,561	650.3	10.80	5.00	0.31	26.73	2.07
A307	58.65	20,685	807.4	10.79	16.23	0.26	35.59	2.41
A309	43.20	18,226	731.7	14.30	35.97	0.38	62.39	3.98
A311	27.47	12,613	516.2	18.75	6.90	0.44	46.40	3.41
A313	15.42	7,335	275.8	1.98	0.79	0.06	4.75	0.37
A315	24.68	9,909	395.5	7.50	4.33	0.17	17.41	1.30
A317	12.02	3,946	174.5	9.23	1.55	0.20	19.02	1.48
A319	40.00	17,263	690.1	15.33	23.25	0.50	74.38	4.68
A330	29.02	10,454	427.2	6.10	43.10	0.46	99.61	5.50
A331	128.93	19,737	842.4	10.23	44.60	1.88	159.07	10.00
A350	202.63	32,291	1,406.0	21.63	92.66	3.92	331.49	20.87
A403	311.33	54,107	2,285.9	45.69	28.39	3.15	203.96	15.85
A404	110.71	15,145	679.9	17.61	12.97	1.28	84.62	6.45
A407	78.23	13,492	590.2	15.05	10.60	1.08	70.88	5.43
A412	51.49	6,021	276.1	6.02	12.53	0.59	34.69	2.59
A414	35.04	5,016	236.2	9.26	4.46	0.60	37.48	2.99
A416	8.67	1,393	63.3	2.15	1.57	0.16	10.29	0.79
A417	8.04	1,182	67.4	4.68	0.00	0.23	12.27	1.13
A419	254.57	37,491	1,925.3	92.76	55.58	6.33	408.00	31.83
A422	35.82	5,443	227.1	3.29	4.69	0.31	22.52	1.59
A423	291.46	38,635	1,666.0	15.19	123.44	4.55	405.90	24.50
A425	329.43	54,751	2,311.7	38.93	59.05	3.75	277.17	19.39
A427	77.82	20,377	838.9	11.04	62.35	1.59	183.47	10.78
A429	46.11	14,565	571.1	5.91	7.77	0.36	33.19	2.26
A437	288.76	50,989	2,075.4	15.46	118.31	4.40	391.37	23.70
A439	40.35	14,221	558.9	7.02	25.77	0.74	81.43	4.95
A443	98.18	19,411	847.6	9.88	126.98	2.79	344.96	19.43
A445	137.65	31,368	1,338.7	20.74	129.37	3.22	375.74	21.94
A447	128.98	37,736	1,509.3	11.23	124.34	2.79	341.33	19.33
A449	103.64	25,281	979.4	6.43	31.15	1.16	106.01	6.69
A451	100.44	20,837	823.0	4.26	27.38	0.98	89.60	5.54
A453	50.15	10,130	419.7	4.62	25.57	0.93	85.32	5.33
A455	56.52	12,903	564.2	15.31	16.94	0.97	87.86	6.49
A458	44.35	13,435	574.4	22.18	54.14	0.77	48.83	4.17

Basin ID	Total Landscape Load			BMP Area		Load Reductions		
	Sediment (tons/yr)	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)	Cropland	Pasture	Sediment (tons/yr)	Nitrogen (lbs/yr)	Phosphorus (lbs/yr)
A461	24.47	9,991	386.0	3.99	19.43	0.20	34.21	2.04
A470	352.76	91,490	4,247.7	181.33	353.71	10.96	1324.44	82.06
A490	75.65	26,827	1,004.2	0.19	0.00	0.01	0.43	0.04
A530	102.59	27,933	1,127.9	17.19	69.81	1.52	220.44	12.70
A539	51.07	14,874	603.6	12.14	13.22	0.60	61.32	4.08
A541	78.23	22,986	942.8	18.46	10.81	0.78	68.93	4.94
A551	64.40	20,285	795.3	10.33	3.02	0.40	30.63	2.35
A571	32.37	10,104	413.0	9.90	0.00	0.34	21.80	1.86
A590	267.43	57,299	2,414.1	41.30	56.82	3.97	288.73	19.94
A612	75.84	19,214	784.7	7.59	54.05	0.98	158.09	8.76
A615	35.34	8,896	399.1	15.04	19.06	0.77	82.97	5.41
A650	76.46	21,115	911.4	26.00	9.16	1.62	99.08	7.96
A670	43.27	18,981	759.0	12.64	45.16	0.61	115.09	6.66
A671	103.78	30,196	1,177.1	9.10	31.21	1.49	121.70	7.62
A690	342.18	53,728	2,473.0	55.84	179.43	9.17	649.02	43.55
A691	56.75	12,312	528.1	13.49	6.29	0.80	51.81	4.22
A692	39.95	6,187	260.5	3.88	4.22	0.32	21.72	1.62
A693	205.78	30,028	1,329.4	19.57	98.07	4.56	327.12	21.24
Total	**6,731.58**	**1,557,895**	**64,584**	**1,098**	**2,561**	**98.77**	**9,003**	**583.7**

Overall, the BMPs will provide total annual landscape (edge-of-field) reductions of 98.8 tons of sediment, 9,003 pounds of nitrogen, and 583.7 pounds of phosphorus. This landscape reductions result in total load reduction at the outlet of the watershed (in Mississippi River) of 43.7 tons of sediment, 2,463.6 pounds of nitrogen, and 175.7 pounds of phosphorus.

APPENDIX E. REGULATORY COMPARISONS

The following table compares the ordinances between all the counties in the UM-GR Watershed.

General Ordinance Standards	Aitkin	Carlton	Cass	Itasca	St. Louis	Comments
County Wide Zoning Ordinance	Yes	Yes	Yes	Yes	Yes	
Department of Natural Resources Approved Shoreland Ordinance	Yes	Yes	Yes	Yes	Yes	**St. Louis**: has developed a trout stream river classification indented to provide increased protections
Subsurface Septic Treatment Systems Point of Sale – County Wide	Yes	No	Yes	Yes	Yes	**Carlton:** Inspection only required in shoreland areas. **Itasca**: Sale or transfer require certificate of compliance or escrow funds for upgrading. There are some exemptions.
Feedlots	Yes	Yes	Yes	Yes	Yes	**Aitkin:** New feedlots must not be located in the shoreland. Modifications or expansions to existing feedlots that are located within 300 feet of the OHWL or within a bluff impact zone are only allowed if they do not encroach into the existing setbacks. **Cass**: Additional restrictions on the maximum animal density allowances in shoreland areas. **Carlton:** Must follow MPCA standards. **Itasca**: On all lakes, animals shall be set back 150 feet, No animals may be fenced in the shore impact zone, bluff impact zone or steep slopes. New feedlots are only allowed in farm residential zoning districts, prohibited in all shoreland overly zoning districts, and must follow state feedlot regulations. Manure spreading in shoreland overlay zoning district must have an approved plan by the Itasca County SWCD and is prohibited in the shoreland impact zone. **St. Louis**: Runoff from animal waste directly into a lake, river, unsealed well or wetland is not allowed. In FAM zone, animals are allowed in shoreland area for watering purposes but require an approved USDA plan. Restrictions on animal density and zoning districts.

General Ordinance Standards	Aitkin	Carlton	Cass	Itasca	St. Louis	Comments
Subdivision Ordinance	Yes	Yes	Yes	Yes	Yes	
Wetland Conservation Act	Yes	Yes	Yes	Yes	Yes	
Grading & Filling - (Shoreland)	Yes	Yes	Yes	Yes	Yes	
Riprap-Permits	Yes	Yes	Yes	Yes	Yes	**Aitkin:** Only allowed in situations where active erosion exists. Any permit must also contain a plan to establish a vegetative buffer with the depth determined by the Aitkin Environmental Services Office. **Carlton & Cass**: Only be allowed in situations where active erosion problems exist that cannot be controlled using natural mulch, biomat, or similar bioengineering. Methods must be approved by the environmental services office. Any riprap plan must include a plan to establish a vegetative buffer. **Itasca**: Allowed for erosion control. To the extent possible, riprap should be designed to display natural aesthetics. **St. Louis**: No permit needed if projects comply with state rules.
Stormwater	Yes	Yes	Yes	Yes	Yes	**Aitkin & Stormwater:** Development must be planned in a manner that minimizes disturbed areas, runoff velocities and erosion potential. Stormwater management facilities must be designed and constructed by a qualified individual consistent with the SWCD office. New stormwater outfalls must provide filtering and settling of suspended solids. No direct connection shall exist for public waters. **Cass**: developments with one acre or more of impervious surface shall have stormwater prevention plan, and with grading & filling within designated distances of shoreline (depends on amount moved plus distance) **Itasca**: Subdivisions or Conservation Development within a shoreland overlay zoning district require an erosion control and stormwater management plan. One or more acres require a stormwater permit from MPCA. **St. Louis**: No permit is needed if general minim standards are followed.

General Ordinance Standards	Aitkin	Carlton	Cass	Itasca	St. Louis	Comments
Vegetation Removal - Bluff/Steep Slopes	Yes	Yes	Yes	Yes	Yes	**Aitkin:** Permit required. Must not be intensively cleared and an erosion and sediment control plan will be submitted to the SWCD office **Carlton:** Permit required and cleared areas must be stabilized with native vegetative cover to prevent erosion. **Cass:** Permit needed except for the removal of dead, down or safety hazard trees. **Itasca**: Intensive vegetation clearing within the bluff impact zone and on steep slopes is not allowed. **St. Louis**: No permit is required for most vegetation removal so long as they are not intensively cleared and a sediment control plan is approved by the county.
Vegetation Removal (Shoreland	Yes	Yes	Yes	Yes	Yes	**Aitkin:** The intent is to have a shoreline buffer consisting of trees, shrubs and ground cover for the purposed of retention and filtering runoff. Permits for vegetation removal is required. Limited pruning is allowed for dead, diseased or hazard trees, and landowners are encouraged to replace them. **Cass**: Restricted to 8 feet in width in areas of bluff or steep slope greater than 24%, 20 feet in width for residential properties and 50 feet in width for water-oriented commercial properties. **Carlton:** Permit required and cleared areas must be stabilized with native vegetative cover to prevent erosion. **Itasca**: Limited clearing of trees and brush is allowed to provide a view of the water and accommodate the placement of permitted water-oriented structures. Access paths shall not exceed 12 feet. Vegetation within the shore impact zone shall be maintained to screen structures with trees and shrubs so that structures are at most 50% visible from public waters in the summer leaf on conditions. Shading of rivers must be preserved. **St. Louis**: No permit required if minimum general standards are followed.

APPENDIX F.

MEMORANDUM OF AGREEMENT

This Agreement (Agreement or MOA) is made and entered into by and among:

The Counties of Aitkin, Carlton, Cass, and Itasca by and through their respective County Board of Commissioners, and The Aitkin, Carlton, Cass, and Itasca, Soil and Water Conservation Districts, by and through their respective Soil and Water Conservation District Board of Supervisors, Townships of Salo (McGregor) and Logan in Aitkin County (Palisade) and the Non-Removable Mille Lacs Band of Ojibwe, a federally recognized American Indian Tribal government, by and through its Department of Natural Resources, are collectively referred to as the "Parties" and individually each is a "Party."

RECITALS

WHEREAS, the Counties of this Agreement are political subdivisions of the State of Minnesota, with authority to carry out environmental programs and land use controls, pursuant to Minnesota Statutes Chapter 375 and as otherwise provided by law; and

WHEREAS, the Soil and Water Conservation Districts (SWCDs) of this Agreement are political subdivisions of the State of Minnesota, with statutory authority to carry out erosion control and other soil and water conservation programs, pursuant to Minnesota Statutes Chapter 103C and as otherwise provided by law; and

WHEREAS, the Non-Removable Mille Lacs Band of Ojibwe ("MLBO") is a local governmental unit of the State of Minnesota pursuant to Minnesota Statute §471.59, subdivision 1. (a) & (b) and as that definition is incorporated into Minnesota Statute §103B; and the MLBO Department of Natural Resources has the authority to manage its natural resources pursuant to Mille Lacs Band Statute Title 11; and portions of the MLBO Reservation is situated within the Mississippi River-Grand Rapids Watershed area and there are contiguous MLBO lands affected by Watershed flow as depicted on Attachment A; and

WHEREAS, MLBO strives to work cooperatively and collaboratively with other governmental agencies with which it shares an interest in maintaining, managing and protecting natural resources and desires to join in this Agreement with the other Parties. For this purpose and within this Agreement MLBO is also identified or referred to as a "Party" or "Parties," "County" or "SWCD"; and

WHEREAS, the parties to this Agreement have a common interest and statutory authority to prepare, adopt, and assure implementation of a comprehensive watershed management plan in the Mississippi River-Grand Rapids Watershed to conserve soil and water resources through the implementation of practices, programs, and regulatory controls that effectively control or prevent erosion, sedimentation, siltation and related pollution in order to protect natural resources, ensure continued soil productivity, protect water quality, reduce damages caused by floods, preserve wildlife, protect the tax base, and protect public lands and waters; and

WHEREAS, with matters that relate to coordination of water management authorities pursuant to Minnesota Statutes Chapters 103B, 103C, and 103D with public drainage systems pursuant to Minnesota Statutes Chapter 103E, this Agreement does not change the rights or obligations of the public drainage system authorities:

WHEREAS, this Agreement and the developed Mississippi River-Grand Rapids Watershed Management Plan does not replace or supplant local land use, planning/zoning authority of the respective Parties and the Parties intend that this Agreement shall not be construed in that manner; and

WHEREAS, the Parties have formed this Agreement for the specific goal of developing a plan pursuant to Minnesota Statutes § 103B.801, Comprehensive Watershed Management Planning, also known as *One Watershed, One Plan.*

NOW, THEREFORE, the Parties hereto agree as follows:

1. **Purpose:** The Parties to this Agreement recognize the importance of partnerships to plan and implement protection and restoration efforts for the Mississippi River-Grand Rapids Watershed depicted on Attachment A. The purpose of this Agreement is to collectively develop and adopt, as local government units, a coordinated watershed management plan for implementation per the provisions of the Plan. Parties signing this Agreement will be collectively referred to as "Mississippi River-Grand Rapids Watershed Collaboration."

2. **Recitals:** All recitals set forth above are hereby incorporated into this Agreement.

3. **Term:** This Agreement is effective upon signature of all Parties in consideration of the Board of Water and Soil Resources (BWSR) Operating Procedures for One Watershed, One Plan; and will remain in effect until adoption of the plan by all Parties unless canceled according to the provisions of this Agreement or earlier terminated by law.

4. **Adding Additional Parties:** A qualifying Party desiring to become a member of this Agreement shall indicate its intent by adoption of a board resolution prior to a date that is six months from the BWSR One Watershed, One Plan Planning Grant Agreement execution. The Party agrees to abide by the terms and conditions of the Agreement; including but not limited to the bylaws, policies and procedures adopted by the Policy Committee.

5. **Withdrawal of Parties:** A Party desiring to leave the membership of this Agreement shall indicate its intent in writing to the Policy Committee in the form of an official board resolution. Notice must be made at least 30 days in advance of leaving the Agreement.

6. **General Provisions:**

    a. **Compliance with Laws/Standards:** The Parties agree to abide by all federal, state, and local laws; statutes, ordinances, rules and regulations now in effect or hereafter adopted pertaining to this Agreement or to the facilities, programs, and staff for which the Agreement is responsible.

    b. **Indemnification:** Each Party to this Agreement shall be liable for the acts of its officers, employees or agents and the results thereof to the extent authorized or limited by law and shall not be responsible for the acts of any other Party, its officers, employees or agents. The provisions of the Municipal Tort Claims Act, Minnesota Statute Chapter 466 and other applicable laws govern liability of the Parties. To the full extent permitted by law, actions by the Parties, their respective officers, employees, and agents pursuant to this Agreement are intended to be and shall be construed as a

"cooperative activity." It is the intent of the Parties that they shall be deemed a "single governmental unit" for the purpose of liability, as set forth in Minnesota Statutes § 471.59, subd. 1a(a). For purposes of Minnesota Statutes § 471.59, subd. 1a(a) it is the intent of each Party that this Agreement does not create any liability or exposure of one Party for the acts or omissions of any other Party.

The Parties acknowledge that MLBO is not subject to the protections or provisions of Minnesota Statutes referenced within this subsection a. above but rather MLBO employees may be protected from personal liability under the Federal Torts Claims Act (28 U.S.C. Part VI, Chapter 171 and 28 U.S.C. Section1346) and indemnification provisions under MLBO statutes.

c. **Records Retention and Data Practices:** The Parties agree that records created pursuant to the terms of this Agreement will be retained in a manner that meets their respective entity's records retention schedules that have been reviewed and approved by the State in accordance with Minnesota Statutes § 138.17. The Parties further agree that records prepared or maintained in furtherance of the Agreement shall be subject to the Minnesota Government Data Practices Act. At the time this Agreement expires, all records will be turned over to Todd County for continued retention.

d. **Timeliness:** The Parties agree to perform obligations under this Agreement in a timely manner and keep each other informed about any delays that may occur.

e. **Extension:** The Parties may extend the termination date of this Agreement upon Agreement by all Parties.

f. **Amendment of Memorandum of Agreement:** This MOA may be amended by recommendation of the Steering Committee and approval of the amendment(s) by the Policy Committee with final Approval by the Aitkin, Carlton, Cass, and Itasca, County Boards of Commissioners, Townships of Salo (McGregor) and Logan in Aitkin County (Palisade), MLBO Department of Natural Resources Commissioner, and Aitkin, Carlton, Cass, and Itasca, Soil and Water Conservation District Supervisors.

7. Administration:

a. **Establishment of Committees for Development of the Plan.** The Parties agree to designate one representative, who must be an elected or appointed member of the governing board to a Policy Committee for development of the watershed-based plan and may appoint one or more technical representatives to a Technical Advisory Committee for development of the plan in consideration of the BWSR Operating Procedures for One Watershed, One Plan.

i. The Policy Committee will meet as needed to decide on the content of the plan, serve as a liaison to their respective boards, and act on behalf of their Board. Each representative shall have one vote.

ii. Each governing board may choose one alternate to serve on the Policy Committee as needed in the absence of the designated member.

iii. The Policy Committee will establish bylaws within 90 days of the execution of the Memorandum of Agreement to describe the functions and operations of the committee(s).

iv. The Steering Committee will be comprised of staff from local agencies formally participating in 1W1P by signing the MOA and BWSR staff acting as advisors. The Steering Committee will provide the logistical organization of the planning process and associated meetings. They may make recommendations to the Technical Advisory Committee and to the Policy Committee.

v. The Technical Advisory Committee will meet monthly or as needed to assist and provide technical support and make recommendations to the Policy Committee on the development and content of the plan.

b. **Submittal of the Plan.** The Policy Committee will recommend the plan to the Parties of this Agreement. The Policy Committee will be responsible for initiating a formal review process for the watershed-based plan conforming to Minnesota Statutes Chapters 103B and 103D, including public hearings. Upon completion of local review and comment, and approval of the plan for submittal by each Party, the Policy Committee will submit the watershed-based plan jointly to BWSR for review and approval.

c. **Adoption of the Plan.** The Parties agree to adopt and begin implementation of the plan within 120 days of receiving notice of state approval, and provide notice of plan adoption pursuant to Minnesota Statutes Chapters 103B and 103D.

8. **Fiscal Agent:** Itasca SWCD will act as the fiscal agent for the purposes of this Agreement and agrees to:
   a. Accept all responsibilities associated with the implementation of the BWSR grant agreement for developing a watershed-based plan.

   b. Perform financial transactions as part of grant agreement and contract implementation.

   c. Annually provide a full and complete audit report.

   d. Provide the Policy Committee with the records necessary to describe the financial condition of the BWSR grant agreement.

   e. Retain fiscal records consistent with the agent's records retention schedule until termination of the Agreement (at that time, records will be turned over to the Board of Water Soil Resources.

9. **Grant Administration**: Itasca SWCD will act as the grant administrator for the purposes of this Agreement and agrees to provide the following services:

   a. Accept all day-to-day responsibilities associated with the implementation of the BWSR grant agreement for developing a watershed-based plan, including being the primary BWSR contact

for the *One Watershed, One Plan* Grant Agreement and being responsible for BWSR reporting requirements associated with the grant agreement.

b. Provide the Policy Committee with the records necessary to describe the planning condition of the BWSR grant agreement.

10. The following parties agree to provide the following services:

    a. Grant Administration/Fiscal Agent: Itasca SWCD
    b. Policy and Advisory Committee Coordination: Itasca SWCD
    c. Outreach Coordinator: Aitkin SWCD
    d. Public Notice Requirements: Itasca SWCD

    In the event of a vacancy of the above listed roles, the Party responsible for the role will determine if there is adequate capacity within the organization to fulfil the listed role. If it is determined by the partner agency they no longer have capacity and would like to relinquish their duties they must inform the Steering Committee. The Steering Committee will then reassign the service to another Party with the capacity to fulfil the grant agreement.

11. **Multiple Counterparts:** The Parties may sign multiple counterparts of this Agreement. Each signed counterpart shall be deemed an original, but all of them together represent the same Agreement.

    Authorized Representatives: The following persons will be the primary contacts for all matters concerning this Agreement:

[THE REMAINDER OF THIS PAGE IS INTENTIONALLY LEFT BLANK. SIGNATURE PAGE FOLLOWS.]

IN TESTIMONY WHEREOF the Parties have duly executed this Memorandum of Agreement by their duly authorized officers.

PARTNER: ***Aitkin County***

APPROVED:

BY: _____ DATE: 6-27-23

Name

ITS: Chairperson

APPROVED AS TO FORM

BY: _____ DATE: 6-28-23

Name

County Administrator

IN TESTIMONY WHEREOF the Parties have duly executed this Memorandum of Agreement by their duly authorized officers.

PARTNER: ***Aitkin County SWCD***

APPROVED:

BY: Wayne M Anderson
Name
ITS: Chairperson

DATE: May 16, 2023

APPROVED AS TO FORM

BY: Janet Smude
Name
ITS: *District Manager*

DATE: 5/16/23

Carlton County Auditor/Treasurer

Kevin DeVriendt
Auditor/Treasurer
Kelly Lampel
Chief Deputy Auditor/Treasurer

Auditor
P.O. Box 130
Carlton, MN 55718
Phone 218-384-9127

Treasurer
P.O. Box 160
Carlton, MN 55718
Phone 218-384-9125

RESOLUTION NO. 23-047

BY COMMISSIONER: Peterson

ADOPTED: May 9, 2023

This Agreement (Agreement or MOA) is made and entered into by and among:
The Counties of Aitkin, Carlton, Cass, and Itasca by and through their respective County Board of Commissioners, and The Aitkin, Carlton, Cass, and Itasca, Soil and Water Conservation Districts, by and through their respective Soil and Water Conservation District Board of Supervisors, Townships of Salo (McGregor) and Logan in Aitkin County (Palisade) and the Non-Removable Mille Lacs Band of Ojibwe, a federally recognized American Indian Tribal government, by and through its Department of Natural Resources, are collectively referred to as the "Parties" and individually each is a "Party."

WHEREAS, the Counties of this Agreement are political subdivisions of the State of Minnesota, with authority to carry out environmental programs and land use controls, pursuant to Minnesota Statutes Chapter 375 and as otherwise provided by law; and

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WHEREAS, MLBO strives to work cooperatively and collaboratively with other governmental agencies with which it shares an interest in maintaining, managing and protecting natural resources and desires to join in this Agreement with the other Parties. For this purpose and within this Agreement MLBO is also identified or referred to as a "Party" or "Parties," "County" or "SWCD"; and

WHEREAS, the parties to this Agreement have a common interest and statutory authority to prepare, adopt, and assure implementation of a comprehensive watershed management plan in the Mississippi River-Grand Rapids Watershed to conserve soil and water resources through the implementation of practices, programs, and regulatory controls that effectively control or prevent erosion, sedimentation, siltation and related pollution in order to protect natural resources, ensure continued soil productivity, protect water quality, reduce damages caused by floods, preserve wildlife, protect the tax base, and protect public lands and waters; and

this Agreement are intended to be and shall be construed as a "cooperative activity." It is the intent of the Parties that they shall be deemed a "single governmental unit" for the purpose of liability, as set forth in Minnesota Statutes § 471.59, subd. 1a(a). For purposes of Minnesota Statutes § 471.59, subd. 1a(a) it is the intent of each Party that this Agreement does not create any liability or exposure of one Party for the acts or omissions of any other Party.

The Parties acknowledge that MLBO is not subject to the protections or provisions of Minnesota Statutes referenced within this subsection a. above but rather MLBO employees may be protected from personal liability under the Federal Torts Claims Act (28 U.S.C. Part VI, Chapter 171 and 28 U.S.C. Section1346) and indemnification provisions under MLBO statutes.

c. Records Retention and Data Practices: The Parties agree that records created pursuant to the terms of this Agreement will be retained in a manner that meets their respective entity's records retention schedules that have been reviewed and approved by the State in accordance with Minnesota Statutes § 138.17. The Parties further agree that records prepared or maintained in furtherance of the Agreement shall be subject to the Minnesota Government Data Practices Act. At the time this Agreement expires, all records will be turned over to Todd County for continued retention.

d. Timeliness: The Parties agree to perform obligations under this Agreement in a timely manner and keep each other informed about any delays that may occur.

e. Extension: The Parties may extend the termination date of this Agreement upon Agreement by all Parties.

f. Amendment of Memorandum of Agreement: This MOA may be amended by recommendation of the Steering Committee and approval of the amendment(s) by the Policy Committee with final Approval by the Aitkin, Carlton, Cass, and Itasca, County Boards of Commissioners, Townships of Salo (McGregor) and Logan in Aitkin County (Palisade), MLBO Department of Natural Resources Commissioner, and Aitkin, Carlton, Cass, and Itasca, Soil and Water Conservation District Supervisors.

7. Administration:
   a. Establishment of Committees for Development of the Plan. The Parties agree to designate one representative, who must be an elected or appointed member of the governing board to a Policy Committee for development of the watershed-based plan and may appoint one or more technical representatives to a Technical Advisory Committee for development of the plan in consideration of the BWSR Operating Procedures for One Watershed, One Plan.

      i. The Policy Committee will meet as needed to decide on the content of the plan, serve as a liaison to their respective boards, and act on behalf of their Board. Each representative shall have one vote.

      ii. Each governing board may choose one alternate to serve on the Policy Committee as needed in the absence of the designated member.

      iii. The Policy Committee will establish bylaws within 90 days of the execution of the Memorandum of Agreement to describe the functions and operations of the committee(s).

c. Outreach Coordinator: Aitkin SWCD
d. Public Notice Requirements: Itasca SWCD

In the event of a vacancy of the above listed roles, the Party responsible for the role will determine if there is adequate capacity within the organization to fulfil the listed role. If it is determined by the partner agency they no longer have capacity and would like to relinquish their duties they must inform the Steering Committee. The Steering Committee will then reassign the service to another Party with the capacity to fulfil the grant agreement.

11. Multiple Counterparts: The Parties may sign multiple counterparts of this Agreement. Each signed counterpart shall be deemed an original, but all of them together represent the same Agreement.

****

Upon motion by Peterson, seconded by Bodie, and carried, the above resolution was adopted.

Yea votes: Bodie, Brenner, Peterson, and Proulx
Nay votes: None
Absent: Zmyslony

I, Kevin DeVriendt, Auditor/Treasurer of the County of Carlton, do hereby certify that I have compared the foregoing with the original resolution filed in my office on the 9th day of May, 2023 and that the same is a true and correct copy of the whole thereof.

WITNESS MY HAND AND SEAL OF OFFICE in Carlton, Minnesota, this 9th day of May, 2023.

Kevin DeVriendt

Kevin DeVriendt
Carlton County Auditor/Treasurer

IN TESTIMONY WHEROF the parties have duly executed this agreement by their duly authorized officers.

PARTNER: Carlton SWCD

APPROVED:

BY: _____ May 8, 2023
Board Chair **Date**

BY: _____ 5/8/23
District Manager/Administrator **Date**

IN TESTIMONY WHEREOF the Parties have duly executed this Memorandum of Agreement by their duly authorized officers.

PARTNER: Cass Soil and Water Conservation District

APPROVED:

BY: _____ DATE: 5-4-2023

David Peterson

ITS: Board Chair, Cass SWCD

APPROVED AS TO FORM

BY: _____ DATE: 5-4-2023

Dana Gutzmann

ITS: Conservation Manager, Cass SWCD

IN TESTIMONY WHEREOF the Parties have duly executed this Memorandum of Agreement by their duly authorized officers.

PARTNER: Itasca County

APPROVED:

BY: _____ 5-25-23
Board Chair Date

BY: _____ 5/30/2023
County Administrator Date

APPROVED AS TO FORM

BY: _____ May 31, 2023
County Attorney Date

IN TESTIMONY WHEREOF the Parties have duly executed this Memorandum of Agreement by their duly authorized officers.

PARTNER: Itasca SWCD

APPROVED:

BY: _____ 6/1/23
Board Chair Date

BY: _____ 6/1/23
District Manager Date

IN TESTIMONY WHEREOF the Parties have duly executed this Memorandum of Agreement by their duly authorized officers.

PARTNER: Non-Removable Mille Lacs Band of Ojibwe

APPROVED:

BY: Kelly Applegate DATE: 6/29/2023

Kelly Applegate

ITS: Commissioner, Department of Natural Resources

APPROVED AS TO FORM

BY: DATE: 5/10/23

Caleb Dogeagle

ITS: Solicitor General

IN TESTIMONY WHEREOF the Parties have duly executed this Memorandum of Agreement by their duly authorized officers.

PARTNER: Salo Township

APPROVED:

BY: Charlene Vincent DATE: May 15-23

Charlene Vincent

ITS: *Chair*

APPROVED AS TO FORM

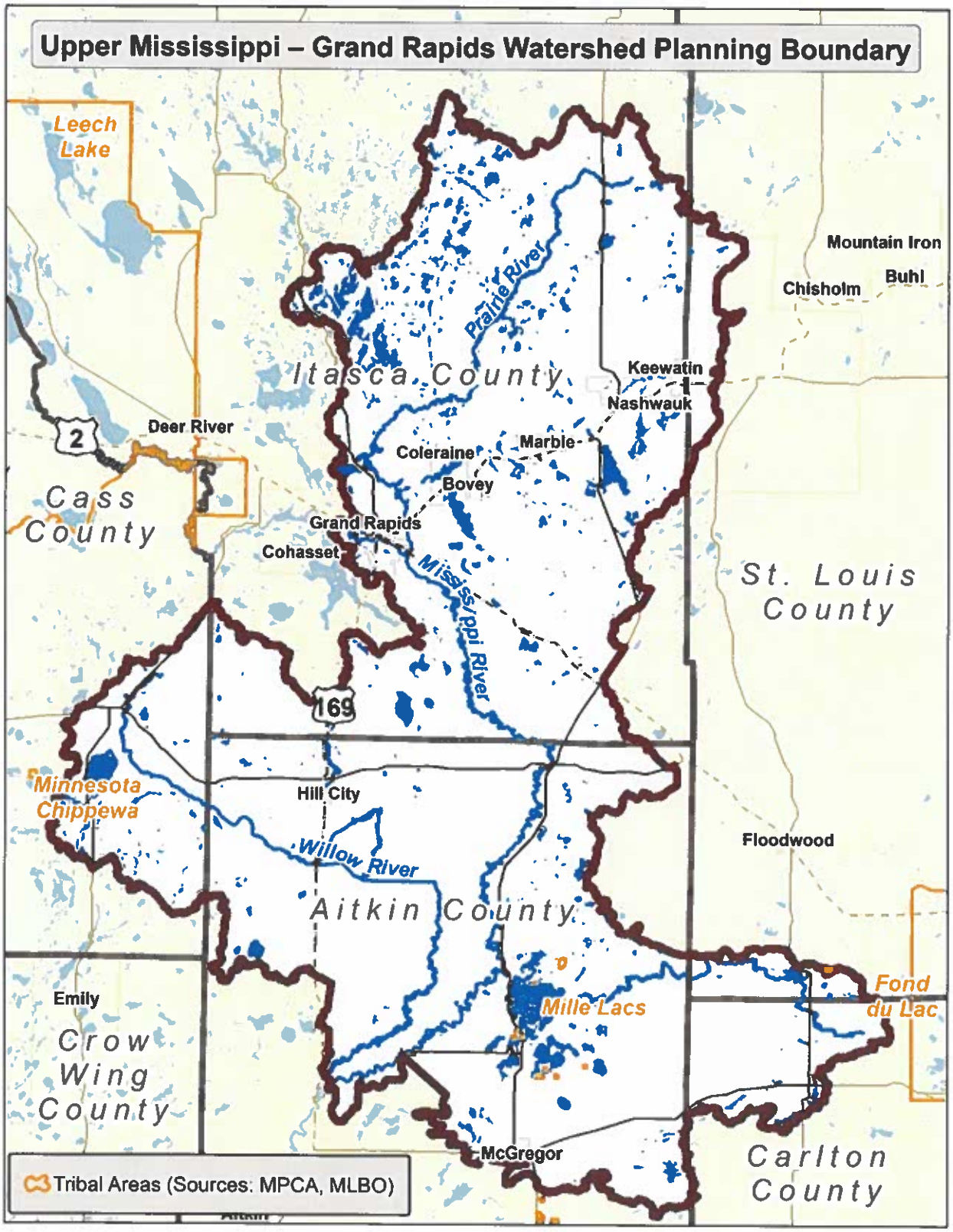
BY: Darlene Turnock DATE: 5-15-23

Darlene Turnock

ITS: *Clerk*

Attachment A

Mississippi River- Grand Rapids Watershed Planning Boundary Hydrologic Unit Code (07010103)



APPENDIX G. REFERENCES

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