Comprehensive Watershed Management Plan: 2022–2031

Prepared for the
Watershed Alliance for the Greater Zumbro

Prepared through the
One Watershed, One Plan Program

November 2021

CLEAN WATER LAND & LEGACY AMENDMENT

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November 2021

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Comprehensive Watershed Management Plan

November 2021

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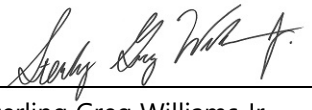
Certifications

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the Laws of the State of Minnesota.



Sterling Greg Williams Jr
PE #: 47642

November 24, 2021
Date

Abbreviations

1W1P	One Watershed, One Plan
ACEP	Agricultural Conservation Easement Program
AFO	Animal Feedlot Operations
AHPS	Advanced Hydrologic Prediction Service
AUAR	Alternative Urban Area-wide Reviews
BMPs	Best Management Practices
BVWD	Bear Valley Watershed District
BWSR	Board of Water and Soil Resources
CGM	Cooperative groundwater monitoring
CIG	Conservation Innovation Grants
CIP	Capital Improvement Plan
CRP	Conservation Reserve Program
CTA	Conservation Technical Assistance Program
CWA	Clean Water Act
CWMP	Comprehensive Water Management Plan (Plan)
DEOZ	Decorah Edge Overlay Zone
DWSMA	Drinking water supply management area
E. coli	*Escherichia coli*
EDA	Environmental Data Access
EIS	Environmental Impact Statement
EQB	Environmental Quality Board
EQIP	Environmental Quality Incentives Program (EQIP)
FIBI	Fish Index of Biological Integrity
FISRWG	Federal Interagency Stream Restoration Working Group
FSA	Farm Service Agency
FWS	Fish and Wildlife Service
GRAPS	Groundwater Restoration and Protection Strategies
HFRP	Healthy Forests Reserve Program
HSPF	Hydrological Simulation Program-FORTRAN
JPA	Joint Powers Agreement
LA	Load Allocation
LGU	Local Governmental Unit
LIWG	Local Implementation Work Group
LSP	Land stewardship plan
MAWQCP	Minnesota Agricultural Water Quality Certification Program
MBS	Minnesota Biological Survey
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MDNR	Minnesota Department of Natural Resources

MFRC	Minnesota Forest Resources Council
MGS	Minnesota Geological Survey
MHA	Minnesota Hydrogeology Atlas
MIBI	Macroinvertebrate Index of Biological Integrity
MLCCD	Minnesota Land Cover Classification Dataset
MnDOT	Minnesota Department of transportation
MOS	Margin of Safety
MPCA	Minnesota Pollution Control Agency
MPFA	Minnesota Public Facilities Authority
MRLP	Mississippi River-Lake Pepin
MS4	Municipal Separate Storm Sewer System
MSL	Mean Sea Level
NED	National Elevation Dataset
NGO	Non-governmental organization
NHIS	Natural Heritage Information System
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
NWS	National Weather Services
OHWL	Ordinary High-Water Level
PAC	Policy Advisory Committee
PCBs	Polychlorinated biphenyls
Plan	Comprehensive Water Management Plan
PWI	Public Waters Inventory
PWPS	Private well pesticide sample
RCPP	Regional Conservation Partnership Program
SAM	Scenario Application Manager
SDS	State Discharge System
SHPO	State Historic Preservation Office
SSTS	Subsurface sewage treatment systems
SWPPP	Stormwater Pollution Prevention Plan
SWCD	Soil and Water Conservation District
TAC	Technical Advisory Committee
TMDL	Total maximum daily load
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total suspended solids
TTP	township testing program
USACE	U.S. Army Corps of Engineers
USDA	United States Department of Agriculture

USFWS	United States Fish and Wildlife Services
USGS	United States Geological Survey
WASCBs	Water and Sediment Control Basin
WAGZ	Watershed Alliance for the Greater Zumbro
WBIF	Watershed-based implementation funding
WCA	Wetland Conservation Act
WHPP	Wellhead Protection Program
WLA	Wasteload Allocation
WRAPS	Watershed Restoration Protection Strategies
ZRW	Zumbro River Watershed

Acknowledgements for the Watershed Alliance for the Greater Zumbro Comprehensive Watershed Management Plan

Approved by the Minnesota Board of Water and Soil Resources (BWSR) October 27, 2021.

Approved by the Watershed Alliance for the Greater Zumbro Policy Committee on November 4, 2021.

This Comprehensive Watershed Management Plan (Plan) was prepared with the dedicated assistance of its Planning Work Group (PWG), Advisory Committee, and Policy Committee.

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…and all members of the Planning Work Group

The Policy Committee would also like to thank all members of the stakeholder advisory committee and members of the public who contributed to this Plan by completing the survey, attending the public kickoff or waterside chats, or otherwise providing input during Plan development.

1 Executive Summary

The Watershed Alliance for the Greater Zumbro (WAGZ) Partnership (Partnership) is a group of Counties, Soil and Water Conservation Districts (SWCDs), Bear Valley Watershed District, and the City of Rochester (Partners) located in southeastern Minnesota. The Partnership covers an area including the Zumbro River watershed and a portion of the Mississippi River-Lake Pepin watershed herein referred to as the "Greater Zumbro watershed" or "planning area." The Partnership was formed to develop a Comprehensive Watershed Management Plan (Plan) through the One Watershed, One Plan (1W1P) program detailed in Minnesota Statutes 103B.101. Through the 1W1P program, the local governments (Partners) prepared this document to guide cooperative water and natural resource management actions over the next 10 years.

1.1 Introduction

This Plan outlines a cooperative and coordinated strategy by which the Partners will work together to protect, maintain, and restore the water and natural resources within the planning area. Through prioritized and targeted actions, the Partners will make progress towards measurable, common goals. This Plan provides a framework for the Partners to operate as a local, coordinated partnership while effectively leveraging the resources of local governments (i.e., the Partners) and supporting organizations (e.g., State and Federal agencies). The Plan is a local plan emphasizing the interests of local water managers, policy makers, and affected stakeholders consulted during Plan development (see Section 2.5). The Plan was developed through the efforts of:

- Planning Work Group – comprised of technical staff of the Partners organizations
- Advisory Committee – including staff from state and local cooperators and invited stakeholders
- Policy Committee – comprised of elected officials representing the Partner organizations

This Plan will be executed through a Joint Powers Agreement (JPA) between the Partners (see Appendix A). The JPA recognizes the importance of partnerships to implement protection and restoration efforts for the Greater Zumbro planning area on a cooperative and collaborative basis pursuant to the authority contained in Minnesota Statutes Section 471.59.

1.2 Planning Boundary and Subwatersheds

The "Greater Zumbro" planning area includes the Zumbro River 8-digit HUC watershed (07040004) and a portion of the Mississippi River-Lake Pepin 8-digit HUC watershed (07040001). Approximately 86% of the planning area (1,421 square miles) drains to the Zumbro River, while the remaining 14% (233 square miles) is tributary to the Mississippi River-Lake Pepin. The planning area has been subdivided into eight subwatersheds as approximately the 10-digit HUC level for planning purposes.

Six counties are located within the planning area (see inset figure). The area includes agricultural land, pasture land, and natural forest. Growing urban areas are centered around the City of Rochester, as well as the Cities of Red Wing and Lake City. the terrain of the planning area is gently rolling in the western and central portions, transitioning to hills, bluffs, and ravines in the north and east where karst geology is more prevalent. A major hydrologic feature in the planning area is the Zumbro River, which collects inflow from four major forks and numerous smaller tributaries as it flows from west to east to the Mississippi River. In the Mississippi River-Lake Pepin watershed, the land general drains from south to north via several smaller streams.

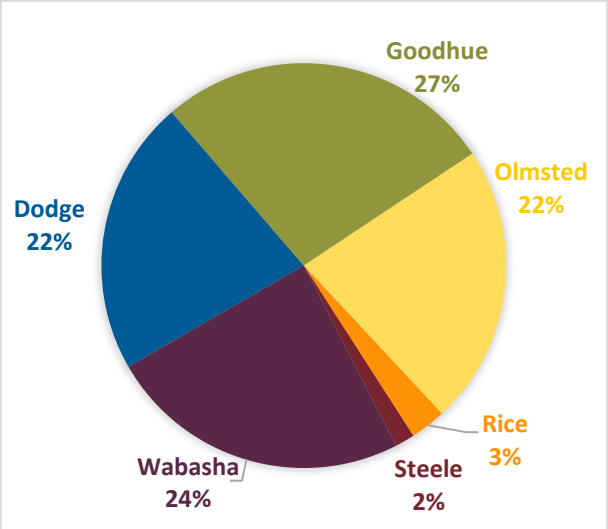


Table 1-1 Summary of Land Use/Land Cover within the Planning Area

Land Cover	Zumbro River Watershed	Mississippi River Lake Pepin Watershed
Barren Land	0.1%	0.1%
Cultivated Crops	56.2%	33.2%
Deciduous Forest	9.6%	25.4%
Developed, High Intensity	0.3%	0.2%
Developed, Low Intensity	2.5%	2.1%
Developed, Medium Intensity	0.9%	0.6%
Developed, Open Space	5.3%	4.5%
Emergent Herbaceous Wetlands	0.3%	0.2%
Evergreen Forest	0.1%	0.2%
Hay/Pasture	11.6%	12.7%
Herbaceous (grassland)	11.5%	10.9%
Mixed Forest	0.0%	0.0%
Open Water	0.5%	8.9%[1]
Shrub/Scrub	0.0%	0.1%
Woody Wetlands	1.1%	0.8%

Source: Minnesota Land Cover Classification Dataset (MLCCD)

(1) Includes a portion of the Lake Pepin water surface within Minnesota

Additional information about the physical and environmental characteristics of the planning area are presented in Appendix C.

1.3 Issue and Resource Prioritization

Section 3 of the Plan summarizes the issue identification and prioritization process used by the Partners and documents the resulting issue priorities. Section 3 also details the delineation of priority areas for focusing implementation activities related to surface water quality and groundwater quality issues. The Partnership implemented an iterative process to identify and prioritize watershed issues with consideration of existing data and input from the Technical Advisory Group and other stakeholders.

The Partners ultimately established a three-tiered issue prioritization, with four major issues categorized as Level 1 (top priority), three major issue categorized as Level 2 (medium priority), and two major issues categorized as Level 3 (lower priority) (see inset figure). Emphasis for implementation has been placed on Level 1 issues, although many of these activities have direct or indirect benefits for Level 2 and Level 3 issues.

The Partners used existing geospatial data, modeling results, and watershed assessments to identify areas that are a higher priority for the implementation of surface water quality and groundwater quality protection and restoration efforts. Priority implementation areas for surface water quality and groundwater quality are presented in Figure 3-6, Figure 3-7, and Figure 3-8.

1.4 Targeting of Projects and Practices

The Partners used digital terrain analysis to identify likely locations to implement best management practices (BMPs) to address accelerated erosion and sedimentation and surface water quality degradation issues. Potential BMPs include vegetated buffers, water and sediment control basins, cover crops, and others. Potential project locations were identified throughout the planning area, regardless of

subwatershed priority level including over 200 sites in the Zumbro River watershed and approximately 80 sites in the Mississippi River-Lake Pepin watershed (see Figure 4-1). The Partners used existing HSPF-SAM models to estimate pollutant reductions anticipated from implementing projects at these locations (see Section 4.2).

Groundwater priority areas presented in Figure 3-7 and Figure 3-8, are used to target projects, studies, and education efforts to achieve groundwater goals, as well as evaluate multi-benefit practices. Some activities are targeted to more specific geographics applicable to the specific need or outcome (e.g., educational materials targeting DWSMAs, stormwater reuse targeted in urban areas).

1.5 Measurable Goals

Section 5 describes the development of measurable goals. The Partners considered a range of available information, including:

- Goals from existing management plans, studies, reports, data, and information, including:
    - County Water Management Plans
    - Mississippi River-Lake Pepin WRAPS report
    - Mississippi River-Lake Pepin TMDL report
    - Rochester Comprehensive Plan and Surface Water Management Plan
    - Zumbro River WRAPS report
    - Zumbro River TMDL report
    - Zumbro River Watershed Landscape Stewardship Plan
    - Zumbro River GRAPS report
- Results from previous modeling/analysis efforts:
    - Zumbro River priority project identification
    - Mississippi River-Lake Pepin Scenarios Report
- Existing implementation programs and schedules
- Input received during Waterside Chats (see Section 2.5 and Appendix B)
- Input from the Planning Work Group
- Input from Technical Advisory Group members
- Input from Policy Committee members

Generally, goals were developed first at a qualitative level and refined to include quantifiable elements where supported by data availability. In situations where existing data is not sufficient to develop a quantitative goal, the goals focus on collecting and interpreting information to support developing more quantitative future goals. Measurable outputs for each goal were selected appropriate to the level of quantification. Emphasis was given to goals that address Level 1 priority issues, although goals were developed to address all nine priority issues.

Goals are established both for long-term (i.e., desired future condition) and for short-term (i.e., 10-year, or Plan goals). Long-term goals consider state and regional planning efforts (e.g., WRAPS and TMDL goals, Minnesota Nutrient Reduction Strategy). Plan goals represent achievable steps towards long-term goals

vetted by the Planning Work Group, Advisory Group. Specific pollutant reduction goals were estimated using HSPF-SAM.

A complete list of measurable goals developed by the Partners are presented in Table 5-2 and Table 5-3.

1.6 Implementation

The Plan includes a targeted and measurable implementation schedule that outlines the projects, programs, and strategies the Partners will implement over the next 10 years (see Section 6 and Table 6-4). The implementation schedule was established by the Partners with input from the Advisory Group (which represents many of the entities identified as cooperators in Table 6-4).

The implementation schedule provides sufficient direction and milestones while maintaining flexibility to adapt to developing opportunities. The targeted implementation schedule includes a range of strategies and tools, including capital improvements, cost-share projects, local controls, and new and expanded programs necessary to achieve the goals of the Plan.

The Plan implementation schedule is presented in Table 6-4. The activities included in the implementation program are intended to leverage the existing roles, capacities, and expertise of the Partners while providing a framework for the Partners to perform expanded roles. The activities and projects described in this Plan will be implemented through existing, new, and expanded programs of the Partners. Programs and activities may be adjusted based on the associated funding source.

Activities included in Table 6-4 are assigned to the following categories:

- Administration of the Partnership
- Projects and project support
- Monitoring and studies
- Education and public involvement
- Regulatory oversight

The proposed timeframe, estimated cost (local and non-local contributions), measurable outputs, and lead and cooperating entities are identified for each implementation activity. Estimates of costs, measurable outputs, and timeframes were developed based in HSPF-SAM documentation, Partner estimates of local capacity, consideration of future WBIF. The current implementation schedule (Table 6-4) was derived from iteration with the Partners and will be revised, as needed, during Plan implementation.

1.6.1 Implementation Costs

The implementation schedule includes planning level cost estimates for individual activities. Planning level costs are split between local funding sources and external funding sources. Local funding sources include funding borne by the Partners, while external funding sources include all other funding sources (e.g., cost-share with non-Partner entities, State grants). Costs are subtotaled by category and funding source as presented in Table 1-2 and Figure 1-1.

This Plan includes an ambitious implementation schedule. Total estimated annual costs (approximately $1.7M) exceed current local funding allocated to existing and similar programs within the planning area. Thus, additional funding provided from watershed-based implementation funding (WBIF), other State funds, Federal funding, and/or private funding sources will be necessary to accomplish Plan goals.

Table 1-2 Summary of Estimated Plan Funding

Type of Activity	Partner Local Funds	Estimated Landowner Contribution	Watershed Based Implementation Funds (WBIF)	Other state/ federal funding sources	Total
Partnership Administration	$452,500 $452,500	-- --	$402,500 $402,500	-- --	$855,000 $855,000
Project and Project Support	$6,235,000 $7,111,000	$750,000 $900,000	$5,600,000 $5,600,000	$3,835,000 $8,592,000	$16,420,000 $22,203,000
Studies and Monitoring	$910,000 $910,000	-- --	-- --	$260,000 $310,000	$1,170,000 $1,220,000
Education and Outreach	$375,000 $375,000	--	$110,000 $110,000	$150,000 $225,000	$635,000 $710,000
Regulatory Review/ Oversight	$59,000 $59,000	--	--	--	$59,000 $59,000
Total (base funding) **Total (additional funding)**	$8,031,500 $8,907,500	$750,000 $900,000	$6,112,500 $6,112,500	$4,245,000 $9,127,000	$19,139,000 $25,047,000

Notes: black text indicates base funding scenario; red text indicates additional funding scenario

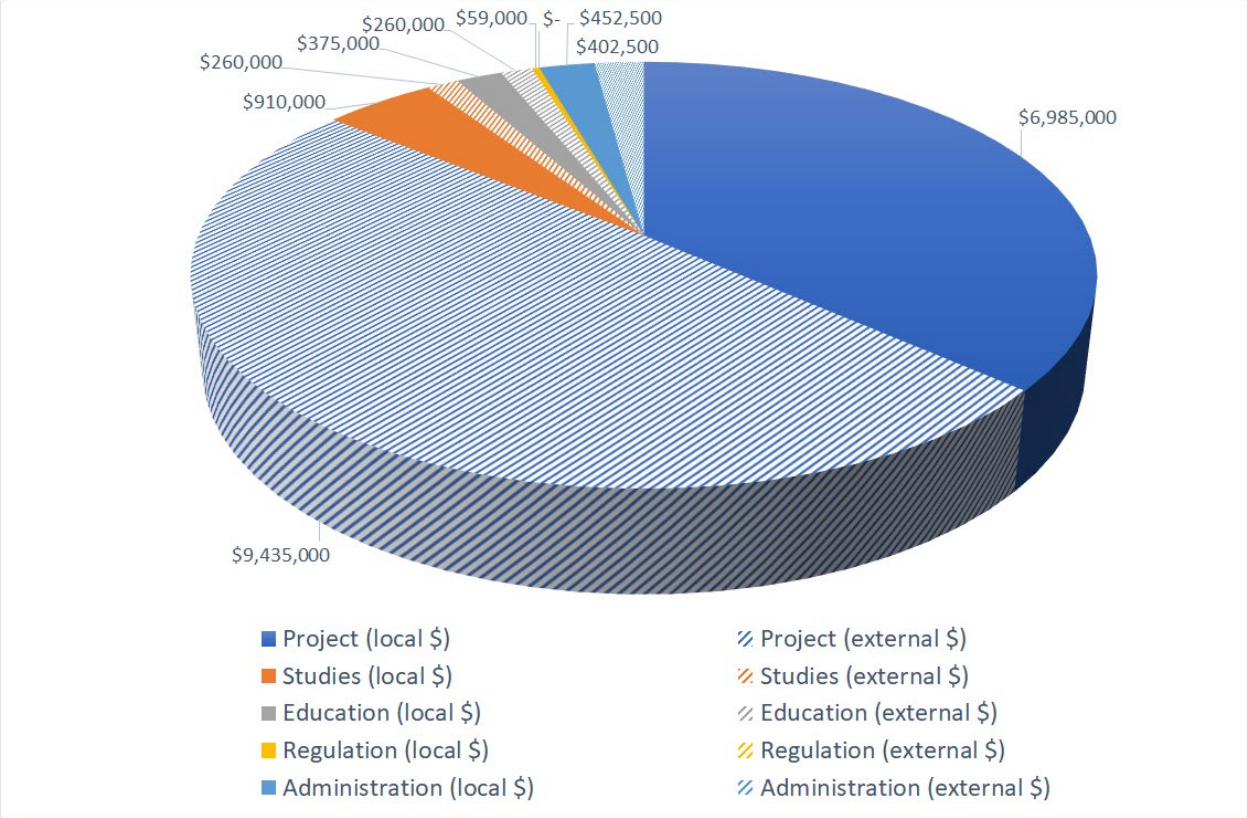


Figure 1-1 Estimated Plan Implementation Costs (Local and External Funds)

Additional non-governmental funding sources may be used to fund Plan implementation. The Partners will coordinate with NGOs to explore potential cost-share opportunities surrounding shared goals. The Partners will seek additional partnerships with private sector businesses as such opportunities arise. Future opportunities may include working with agri-business on incentives that provide opportunity for water resources improvements. Incentives may not be implemented through the Partnership but are instigated through Partnership actions.

Additional information about Plan costs and funding sources is included in Section 6.3.

1.6.2 Implementation Roles and Responsibilities

The Parties will implement this Plan according to the governance structure established in the implementation Joint Powers Agreement (JPA, see Appendix A). The JPA does not create a new entity. Instead, the JPA is a formal and outward commitment to work together as a partnership and specifies mutually accepted expectations and guidelines between partners. Per the JPA, the Partners will establish committees to carry out the coordinated implementation of this Plan. During implementation, the Plan will be executed through the coordinated effort of the following committees:

- Policy Advisory Committee
- Technical Advisory Committee
- Local Implementation Work Group

These groups are described in greater detail in Section 6.4. Annual work planning will be performed by the Local Implementation Work Group. Planning will be based on prioritized implementation activities, the availability of funds, and the roles and responsibilities for implementation. Coordination and communication are critical for a partnership operating under a JPA. The Partners will continue to coordinate with BWSR, MDA, MDH, MDNR, and MPCA as required through State-legislated programs and to accomplish the many Plan activities that identify State agencies as cooperating entities. The Partners will also coordinate with Federal partners where appropriate, including NRCS, FSA, USACE, EPA, and USFWS. Similarly, continued coordination and communication with local governmental units, such as cities, township boards, county boards, joint powers boards, drainage authorities, and other water management authorities is necessary to facilitate watershed wide activities. The Partners will also collaborate with non-governmental organizations where mutual benefit may be achieved.

2 Introduction

The Watershed Alliance for the Greater Zumbro (WAGZ or Partnership) is a partnership of Counties, Soil and Water Conservation Districts (SWCDs), the Bear Valley Watershed District (BVWD), and the City of Rochester located within the Zumbro River and Mississippi River-Lake Pepin watersheds. The partnership was formed as part of the One Watershed, One Plan (1W1P) program detailed in Minnesota Statutes 103B.101. Through the 1W1P program, the Partners prepared this document – the **Greater Zumbro Comprehensive Watershed Management Plan** (Plan).

2.1 Purpose and Scope

The purpose of this Plan is to develop and document coordinated, prioritized, and targeted practices and programs to achieve the water and natural resource management goals established by the Partnership (see Section 5). This Plan provides a framework for the Partners to operate as a local, coordinated partnership while effectively leveraging the resources of local governments (i.e., the Partners) and supporting organizations (e.g., State and Federal agencies).

The Plan includes a prioritized, targeted, and measurable implementation program (see Section 6) that outlines the projects, programs, and strategies the Partnership will implement over the next 10 years. The implementation program provides direction and milestones while maintaining flexibility to adapt to developing opportunities and/or immediate concerns. Plan development is based on a watershed-wide, science-based approach to resource and watershed management that leverages the technical expertise of Partner staff. The targeted implementation program includes a range of strategies and tools, including capital improvements, local controls, and new and expanded programs necessary to achieve the goals of the Plan.

This is a local plan emphasizing the interests of local water managers, policy makers, and affected stakeholders (see Section 3.1). This Plan was developed under and through a memorandum of agreement (MOA) between the Partners and will be executed through an implementation joint powers agreement (JPA, see Appendix A). The partners will operate as a joint powers collaboration, pursuant to the authority contained in Minnesota Statutes Section 471.59.

Much of the information contained within this Plan is compiled from existing water and natural resource management plans, studies, reports, modeling, and other sources. A complete list of documents referenced in the development of this Plan is included in Section 7.

2.2 One Watershed, One Plan Program

The One Watershed, One Plan (1W1P) program is an evolution of Minnesota's watershed management strategy that emphasizes management of water resources according to hydrologic boundaries instead of political boundaries. Legislation passed by the State in 2012 (Minnesota Statutes §103B.101, subd.14), led to the establishment of the1W1P program at the Board of Water and Soil Resources (BWSR). Additional legislation was passed in 2015 (Minnesota Statutes §103B.801) that outlines the purpose of and requirements for comprehensive watershed management plans developed through the 1W1P program.

The 1W1P vision is to align local planning and implementation with state strategies over a ten-year transition period into plans built largely around the state's major watersheds. The BWSR *One Watershed, One Plan Operating Procedures* is a policy document that outlines processes to achieve this vision. Additional information about the 1W1P program can be found on the BWSR website: http://www.bwsr.state.mn.us/planning/1W1P/index.html

As part of the 2012 legislation, BWSR was granted funding to initiate the 1W1P program. This Plan has been developed through a grant provided by BWSR.

2.3 Watershed Characteristics

The area addressed by this plan (i.e., planning area) includes areas of agricultural land, pasture land, and natural forests. The planning area also includes growing urban areas centered around the City of Rochester, as well as the Cities of Red Wing and Lake City. The terrain of the Zumbro River watershed includes gently rolling terrain in the western and central portions of the watershed transitioning to hills, bluffs, and ravines in the eastern portion of the watershed. The topography of the Mississippi River Lake Pepin portion of the planning area is characterized by rolling hills, ravines, and bluffs similar to the downstream part of the Zumbro River watershed. A major hydrologic feature in the planning area is the Zumbro River, which collects inflow from four major forks and numerous smaller tributaries as it flows from west to east to the Mississippi River. In the Mississippi River-Lake Pepin watershed, the land general drains from south to north via several smaller streams. Additional information about the physical and environmental characteristics of the planning area are presented in Section C.

2.4 Plan Boundary

The "Greater Zumbro" planning area is presented in Figure 2-1. The area includes the Zumbro River 8-digit HUC watershed (07040004) and a portion of the Mississippi River-Lake Pepin 8-digit HUC watershed (07040001). Portions of six counties comprise the planning area (see Table C-1). Approximately 86% of the planning area (1,421 square miles) drains to the Zumbro River, while the remaining 14% (233 square miles) is tributary to the Mississippi River-Lake Pepin. Tributary watersheds delineated at approximately the 10-digit HUC level (for planning purposes) are presented in Section C.1.1 and Figure C-3.

2.5 Planning Partners and Plan Development

The WAGZ Partnership includes the following 13 entities who committed to the implementation of this Plan through execution of the JPA included in Appendix A:

- The Counties of Dodge, Goodhue, Olmsted, Rice, and Wabasha (i.e., the Counties) by and through their respective County Board of Commissioners.
- The Dodge, Goodhue, Olmsted, Rice, Steele, and Wabasha Soil and Water Conservation Districts (i.e., SWCDs) by and through their respective SWCD Board of Supervisors.
- The Bear Valley Watershed District (BVWD) by and through their Board of Managers.
- The City of Rochester (i.e., the City) by and though their City Council Members.

The above entities collectively form the WAGZ Partnership and are referred to within this Plan as the "Partners." Steele County also participated in Plan development, but has not, to date, signed the implementation JPA due to the limited portion of the planning area in Steele County. In addition to the primary implementation responsibilities of the Partners, implementation of this Plan will rely on the involvement and cooperation of other federal, state, and local entities. Several of these cooperators were involved in the development of this Plan through the establishment and participation of the following committees:

- The **Policy Committee** served as the decision-making authority for the planning process. The committee was composed of one County Commissioner and one SWCD Supervisor appointed from each of the counties in the planning area, one manager from BVWD, and a City administrator or deputy city administrator from the City of Rochester.
- The **Technical Advisory Group (TAG)** served to provide input to the Policy Committee regarding the planning process and Plan content, including supplying technical information throughout Plan development. The committee was composed of local, State, and Federal agency staff, representatives from agricultural and conservation groups, and other stakeholders. A complete list of participating organizations is included in the Acknowledgements section.
- The **Planning Work Group (PWG)** guided the logistics of the planning process and drafted the Plan. The Planning Work Group was composed of local governmental staff from the counties and SWCDs in the planning area, as well as BWSR staff. A complete list of participating organizations is included in the Acknowledgements section.

Individuals who participated in these committees during Plan development are noted in the "Acknowledgements" section located at the beginning of the Plan.

Input from the Partners, cooperators, and public served a critical role during Plan development and contributed to a Plan that prioritizes local interests in coordination with broader goals. The Partnership performed the following stakeholder engagement activities during the planning process:

- **Notification of Plan Update** – April 2019 – The Partnership solicited input from state agencies regarding issues to be addressed by the Plan and data relevant to Plan development. The Partnership received input from the following agencies:
    - Minnesota Board of Water and Soil Resources (BWSR)
    - Minnesota Department of Agriculture (MDA)
    - Minnesota Department of Health (MDH)
    - Minnesota Department of Natural Resources (MDNR)
    - Minnesota Pollution Control Agency (MPCA)
    - Bear Valley Watershed District (BVWD)
    - City of Oronoco

- **Public Kickoff Meeting** – June 13, 2019 – The Partnership advertised and hosted an open house at the 125 Live event center in Rochester, Minnesota. Members of the Planning Work Group,

Policy Committee, Technical Advisory Group, and the public were invited to attend. BWSR staff, state agencies and the Partnership's planning consultant, Barr Engineering Co. (Barr), presented relevant data in poster format. The Partnership solicited input from attendees regarding priority concerns and resource use.

- **Online and mailed survey** – Summer 2019 – The Partners developed a brief survey to obtain input about how residents use and view the water and natural resources within the planning area. The survey was hosted online and mailed to approximately 1,000 residents within the planning area. Results of the survey are summarized in Section 3.1.4 and Appendix B.

- **Waterside Chats** – Fall 2019 – The Greater Zumbro River Watershed Partnership hosted "Waterside Chats" in three communities:
    - October 24th, 2019 at the Zumbro Valley Recreation Club in Mantorville
    - November 7th, 2019 at the Community Center in Mazeppa
    - November 14th, 2019 at the Sportsman's Club in Lake City.

  The Chats were facilitated by the local County or SWCD staff expert in each area. Waterside chat participants represented an assortment of local citizens, landowners, producers, and representatives from local and state government entities. At each waterside chat, facilitators summarized the priority resources and issues that had been identified in local and state plans, studies, reports, state agency feedback, and resident surveys. Following the presentation, attendees discussed a series of questions to provide their input and feedback on the list of priority issues to be addressed in the 10-year scope of the plan. Comments were captured by a facilitator from the planning partnership, summarized, and reported out to the large group. The waterside chats are described in greater detail in Appendix B.

- **Story Map –** February 2021 – The planning workgroup developed an ArcGIS story map collection to introduce the various stages of the planning process, present the primary list of watershed issues and resource concerns, and discuss the actions the Partnership plans to implement to improve them. Included in the storymap was a public input survey. The survey was developed to seek feedback from watershed residents on the activities and projects they would like to see accomplished in the watershed. Responses from the survey will advise the local implementation workgroup as they develop the workplan.

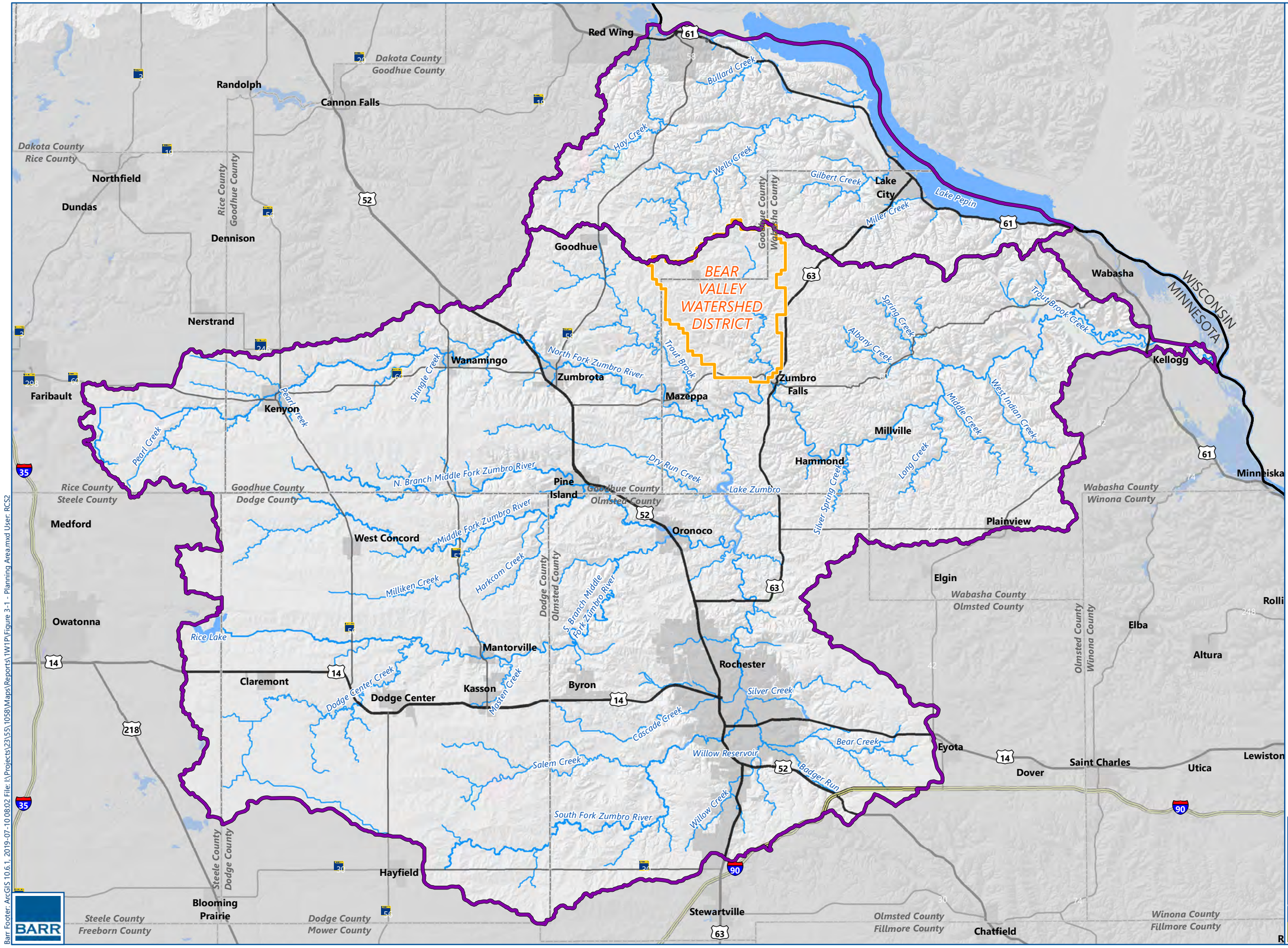
Throughout the planning process, stakeholder input was shared, received, and considered through frequent meetings of the Planning Work Group, Advisory Committee, and Policy Committee. Table 2-1 presents a timeline of key committee meetings held during the Plan development process.

Table 2-1 Key Plan development meetings held during Plan development

Date	Committee	Major agenda items
February 14, 2019	Policy Committee	First Policy Committee meeting, bylaws adopted, process approved for consultant selection and request for proposals.
April 4, 2019	Policy Committee	Approve structure and membership of the TAG; consultant selection;
June 13, 2019	Public	Public Kickoff Meeting
July 17, 2019	Planning Work Group	Watershed data aggregation; inventory narrative
August 8, 2019	Policy Committee	Approve logo and Waterside Chats structure
September 9, 2019	Technical Advisory Group	Summary of TAG priority concerns and responses to notification
September 26, 2019	Planning Work Group	Development of issue statements; planning for waterside chats
October 10, 2029	Planning Work Group & Technical Advisory Group	Joint issue identification and prioritization workshop
October 24, 2019	Public	Waterside Chat – Mantorville
November 7, 2019	Public	Waterside Chat – Mazeppa
November 14, 2019	Public	Waterside Chat – Lake City
December 13, 2019	Policy Committee	Summarize Waterside Chats, discuss organizational structure
January 9, 2020	Planning Work Group	Determine issue priority tiers and begin spatial prioritization
February 5, 2020	Planning Work Group & Technical Advisory Group	Spatial prioritization workshop
February 13, 2020	Technical Advisory Group	Review and discussion of priority concerns, spatial prioritization, targeting maps, and draft goals
February 25, 2020	Planning Work Group	Spatial prioritization
March 26, 2020	Planning Work Group	Spatial prioritization and draft goal development
May 6, 2020	Planning Work Group	Spatial prioritization and draft goal development
May 29, 2020	Technical Advisory Group	Spatial prioritization and goal development
June 11, 2020	Policy Committee	Discussion of governance structures; authorize terrain analysis of Mississippi River-Lake Pepin watershed
June 11, 2020	Technical Advisory Group	Spatial prioritization and goal development
June 23, 2020	Groundwater Advisory Group	Special meeting of TAG and other groundwater experts to review and revise the groundwater spatial prioritization, targeting maps
August 3, 2020	Planning Work Group	Hydrology and watershed storage; draft Plan section review
August 13, 2020	Policy Committee	Discuss Plan implementation organizational structure
September 10, 2020	Planning Work Group	Mississippi River-Lake Pepin terrain analysis
October 8, 2020	Policy Committee	Mississippi River-Lake Pepin terrain analysis
October 15, 2020	Planning Work Group	Implementation schedule
October 30, 2020	Technical Advisory Group	Discuss groundwater and surface water priority area targeting maps, terrain analysis for MRLP and the draft implementation table.
December 2, 2020	Planning Work Group	Implementation schedule; draft Plan section review
December 10, 2020	Policy Committee	Governance structure; implementation schedule

Table 2-1 Key Plan development meetings held during Plan development

Date	Committee	Major agenda items
February 11, 2020	Planning Work Group	Implementation schedule; Draft Plan review
March 11, 2021	Planning Work Group	Draft Plan review
April 8, 2021	Policy Committee	Review internal draft comments; approve Joint Powers Agreement for Plan implementation; authorize 60-day draft submittal
May 24, 2021	Planning Work Group	Project ranking system; draft implementation structure
June 10, 2021	Policy Committee	Establish schedule for public hearing; Project ranking system
July 8, 2021	Planning Work Group	Review comments from 60-day review and draft responses; executive summary document; local implementation policy
August 12, 2021	Planning Work Group	Local implementation policy; WBIF grant funding allocation
August 12, 2021	Policy Committee	Public hearing on the draft Plan; authorize 90-day draft submittal
October 7, 2021	BWSR Southern Regional Committee	Presentation on the WAGZ Plan by local lead staff
October 23, 2021	BWSR Board	Approve the WAGZ Plan
November 4, 2021	Policy Committee	Adopt the Plan; direct partners to seek Plan adoption by their respective boards


BEAR VALLEY WATERSHED DISTRICT
Red Wing
Randolph
Cannon Falls
Dakota County
Goodhue County
Dakota County
Rice County
Northfield
Dundas
Rice County
Goodhue County
Dennison
Nerstrand
Goodhue
Goodhue County
Wabasha County
Lake City
Lake Pepin
Miller Creek
Gilbert Creek
Wells Creek
Hay Creek
Bullard Creek
Wabasha
WISCONSIN
MINNESOTA
Kellogg
Trout Brook Creek
Spring Creek
Albany Creek
Wanamingo
Zumbrota
North Fork Zumbro River
Trout Brook
Zumbro Falls
Mazeppa
Faribault
Kenyon
Pearl Creek
Shingle Creek
Millville
Hammond
Middle Creek
West Indian Creek
Long Creek
Minneiska
Rice County
Steele County
Goodhue County
Dodge County
Pine Island
Goodhue County
Olmsted County
Dry Run Creek
N. Branch Middle Fork Zumbro River
Lake Zumbro
Wabasha County
Winona County
Medford
West Concord
Middle Fork Zumbro River
Oronoco
Plainview
Silver Spring Creek
Elgin
Wabasha County
Olmsted County
Olmsted County
Winona County
Elba
Altura
Rolli
Milliken Creek
Harkcom Creek
Dodge County
Olmsted County
S. Branch Middle Fork Zumbro River
Owatonna
Rice Lake
Mantorville
Rochester
Claremont
Dodge Center Creek
Kasson
Byron
Dodge Center
Masten Creek
Silver Creek
Cascade Creek
Bear Creek
Eyota
Willow Reservoir
Salem Creek
Badger Run
Dover
Saint Charles
Utica
Lewiston
South Fork Zumbro River
Willow Creek
Steele County
Dodge County
Hayfield
Blooming Prairie
Steele County
Freeborn County
Dodge County
Mower County
Stewartville
Olmsted County
Fillmore County
Chatfield
Winona County
Fillmore County
Study Area
Watershed District Boundary
Watercourses
Pond or Lake
Municipal Boundary
County Boundary
State Boundary
N
0
2.5
5
Miles
PLANNING AREA OF THE WAGZ COMPREHENSIVE WATERSHED MANAGAMENT PLAN
WAGZ Comprehensive Watershed Management Plan
FIGURE 2-1
Barr Footer: ArcGIS 10.6.1, 2019-07-10 08:02 File: I:\Projects\23\55\1058\Maps\Reports\1W1P\Figure 3-1 - Planning Area.mxd User: RCS2
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3 Identification and Prioritization of Issues and Resources

This section summarizes the issue identification and prioritization process used by the Partners and memorializes the prioritized issue statements used as input to develop measurable goals (see Section 5) and the targeted implementation plan (see Section 6). The Partners considered several types of data in identifying and prioritizing resources and issues, including:

- Existing plans, studies, and geospatial data (see Land and Water Resources Inventory included as Appendix C)
- Input from plan review authorities
- Public survey results
- Discussion at three watershed chats and the public kickoff meeting
- Paired analysis ranking by the PWG, TAG, and Policy Committee

The issue statements presented in Table 3-1 were developed and refined with consideration of each of the above sources.

3.1 Issue Identification and Prioritization Process

The PWG led the identification and prioritization of issues and resources as an iterative process, with each step incorporating outcomes from prior steps. This process is illustrated in Figure 3-1.

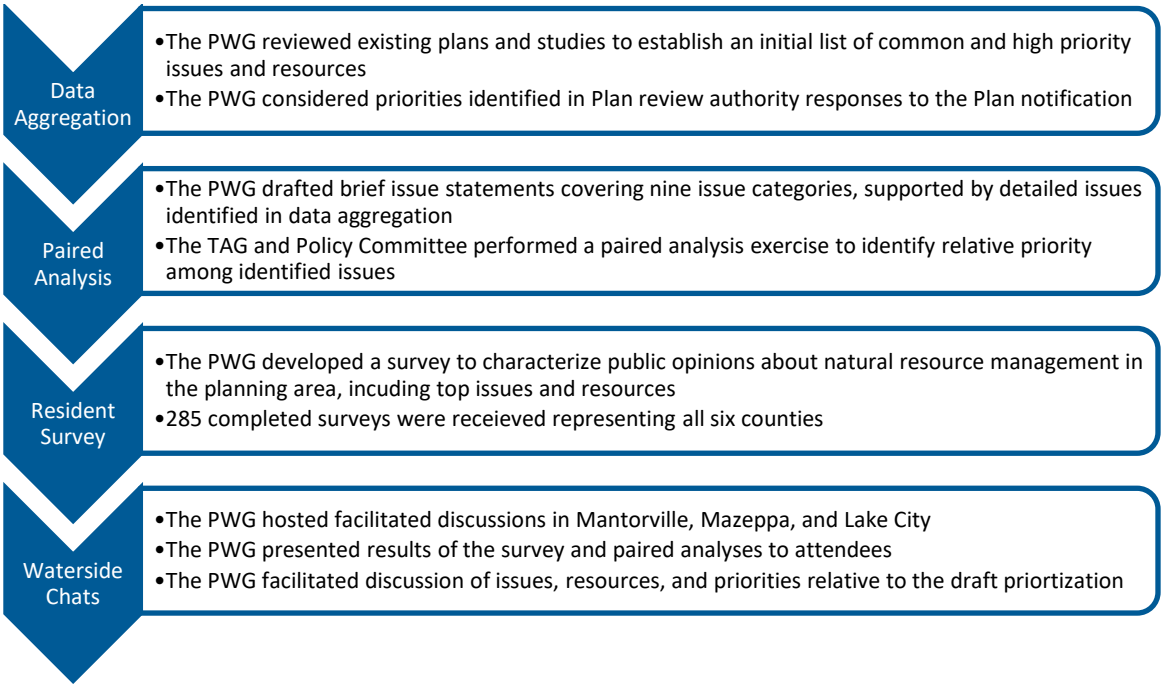


Figure 3-1 Issue and Resource Identification and Prioritization Process

3.1.1 Data Aggregation

Early in Plan development, the PWG reviewed existing studies and management plans relevant to natural resources management in the planning area. These include, generally:

- Watershed Restoration and Management Strategies (WRAPS) reports
- Total Maximum Daily Load (TMDL) studies
- County local water plans
- Municipal comprehensive plans
- Water quality monitoring and assessment reports
- Groundwater monitoring and studies
- Land and natural resource assessments

A complete list of the documents referenced in the development of this Plan is included in Section 7. The PWG also reviewed priority issues identified in responses to the Plan notification letter (see BWSR 1W1P Operating Procedures v.2, Section IV.A) from the following Plan review authorities:

- Bear Valley Watershed District (BVWD)
- City of Oronoco
- Minnesota Board of Water and Soil Resources (BWSR)
- Minnesota Department of Agriculture (MDA)
- Minnesota Department of Health (MDH)
- Minnesota Department of Natural Resources (MDNR)
- Minnesota Pollution Control Agency (MPCA)

The PWG identified approximately 90 unique issues, many of which were identified in multiple existing documents and/or by multiple stakeholders.

3.1.2 Development of Issue Statements

The specific issues identified through data review (see Section 3.1.1) were iteratively grouped into nine issue categories in cooperation with the PWG and TAG. Based on these categories and specific issues, the PWG drafted brief issue statements to characterize each category. The draft issue statements were later revised by the PWG based on discussion with the TAG and Policy Committee (see Section 3.1.3), results of the resident survey (see Section 3.1.4), and discussion at the waterside chats (see Section 3.1.5).

The final issue statements are presented in Table 3-1. The issue statements are, because of their brevity, broad in scope. Each issue category is described in greater detail in Section 3.2. Specific problems, risks, and opportunities within each issue category area are included in Table 3-3 and provide additional context for the issue statements.

Table 3-1 Priority Issue Statements

Issue Group	Issue Statement
Degraded Soil Health	Degraded soil health diminishes agricultural productivity and limits the beneficial ecological functions of soil.
Accelerated Erosion & Sedimentation	Excessive erosion and sedimentation diminish agricultural productivity, damages riparian areas, and degrades surface water quality and stream habitats.
Surface Water Quality Degradation	Surface water quality is threatened or impaired by pollutant loading and altered hydrology.
Water Quantity and Excessive Flooding	Excessive flooding threatens public safety, property, and riparian ecology.
Landscape Resiliency and Altered Hydrology	Landscape resiliency and the associated ecological functions are threatened by climate change, land use changes, and altered hydrology.
Groundwater/Drinking Water Contamination	Groundwater quality and drinking water safety is threatened by pollutant loading.
Threatened Groundwater Supply	Groundwater sustainability is at risk from consumptive use and loss of recharge.
Threats to Fish, Wildlife, and Habitat	Natural areas, forests, prairies, and wetlands providing habitat and other ecological benefits, and the species that inhabit them, are threatened by human activity.
Reduced Livability & Recreation	Outdoor recreation and overall quality of life are affected by the degradation of, and lack of access to, natural resources.

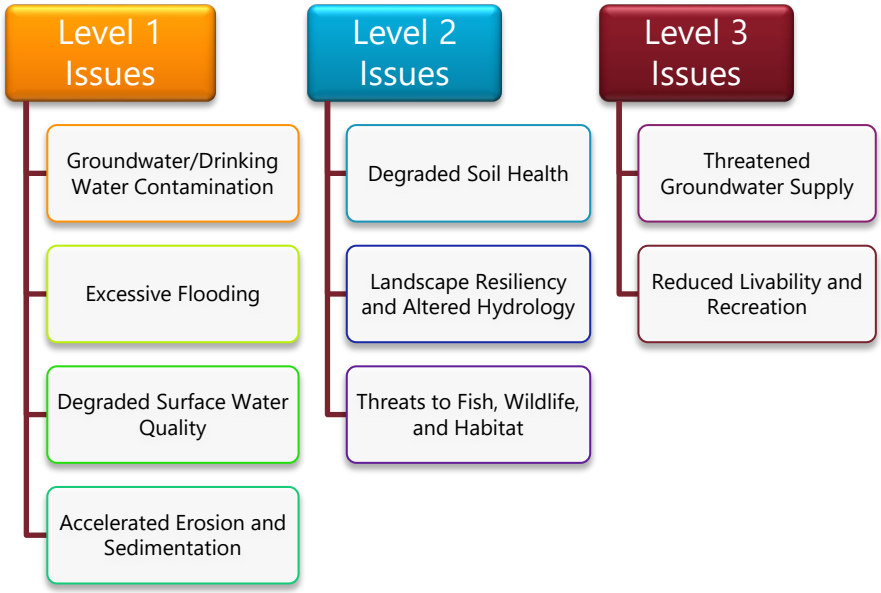
3.1.3 Issue Prioritization using Paired Analysis

Following the development of issue statements (see 3.1.2 and Table 3-1), the Policy Committee, TAG, and PWG used a paired comparison matrix to rank the nine issue categories. Eight members of the Policy Committee, eight members of the TAG, and nine members of the PWG completed the sample matrix shown in Figure 3-2. Possible scores for each issue range from 0 to 8, with higher numbers indicating a higher relative priority. Scores for each issue were calculated giving equal weight to the average Policy Committee score, average TAG score, and average PWG score. The results are presented in Figure 3-3.

In general, there is consistency between the scores assigned to each issue group by the Policy Committee versus those assigned by the TAG. Some notable discrepancies in issue priority scoring are apparent in Figure 3-3 and include:

- Issues related to flooding and groundwater supply were given a higher priority by the Policy Committee than the TAG or PWG
- Threats to fish, wildlife, and habitat issue was ranked higher by the TAG than both the PWG and, especially, the Policy Committee
- Landscape resiliency and altered hydrology issue was scored higher by the TAG and PWG than the Policy Committee

Additional discussion with Policy Committee, TAG, and PWG, in combination with the weighted average scoring, ultimately led to a consensus determination of Level 1 (high priority), Level 2 (moderate priority), and Level 3 (low priority) issue categories as follows:



Discussion of the priority issues by the Policy Committee, TAG, and PWG noted that many of the nine issue categories are interrelated. For example, the presence of Karst geology in the planning area results in a strong connection between degraded surface water quality and groundwater contamination. Degraded soil health negatively contributes to increased erosion, which can degrade surface water quality. Actions to address one issue category may have secondary benefits to other issues.

Table 3-2. Greater Zumbro 1W1P - Issue Area Paired Analysis

Instructions:

1. Work your way through each open square in the matrix one at a time.

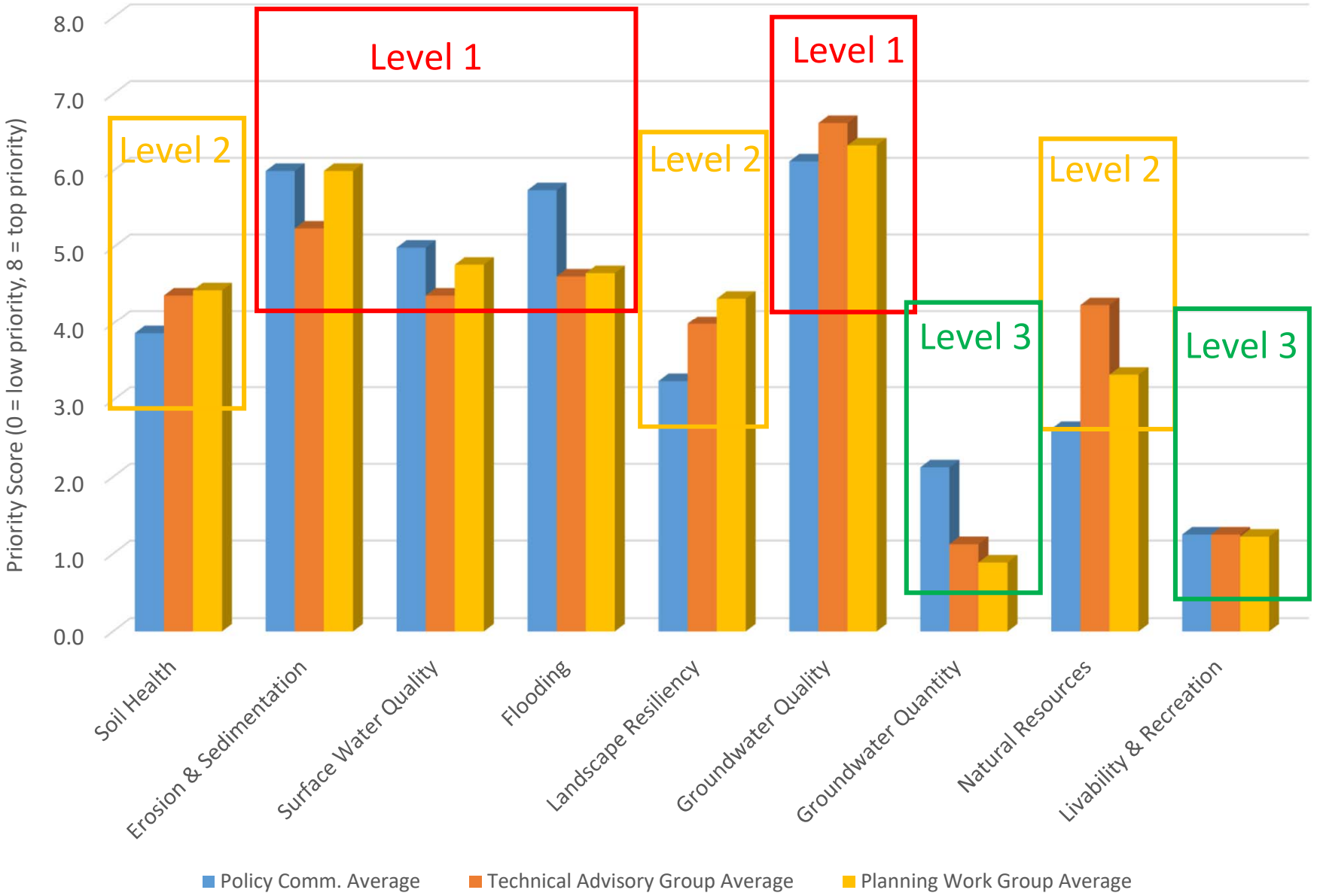
2. For each open square:
   2A. Consider only the **TWO** issue statement corresponding to its Row and Column.
   2B. Decide which of the two issues statements (the row, and the column) is a higher priority, in your opinion, to address in this 1W1P.
   2C. Indicate the higher priority issue in the square using the abbreviation (e.g., "E&S" for the issue of excessive erosion and sedimentation).

3. In the "Total Occurrences" column, record the total number of times your selected that issue in a blank square (they should sum to 36).

Issue Statement	**Code**	Degraded **soil health** diminishes agricultural productivity and limits the beneficial ecological functions of soil.	Excessive **erosion and sedimentation** diminishes agricultural productivity, damages riparian areas, and degrades surface water quality and stream habitats.	**Surface water quality** is threatened or impaired by pollutant loading and altered hydrology.	Excessive **flooding** threatens public safety, property, and riparian ecology.	**Landscape resiliency** and the associated ecological functions are threatened by climate change, land use changes, and **altered hydrology**.	**Groundwater quality and drinking water** safety is threatened by pollutant loading.	**Groundwater sustainability** is at risk from consumptive use and loss of recharge.	**Natural areas, forests, prairies, and wetlands** providing habitat and other ecological benefits, and the species that inhabit them, are threatened by human activity.	**Outdoor recreation and overall quality of life** are affected by the degradation of, and lack of access to, natural resources.
Issue Statement	**Code**	SH	E&S	SWQ	FL	LR	GWQ	GWS	NAT	REC
Degraded **soil health** diminishes agricultural productivity and limits the beneficial ecological functions of soil.	SH									
Excessive **erosion and sedimentation** diminishes agricultural productivity, damages riparian areas, and degrades surface water quality and stream habitats.	E&S									
Surface water quality is threatened or impaired by pollutant loading and altered hydrology.	SWQ									
Excessive **flooding** threatens public safety, property, and riparian ecology.	FL									
Landscape resiliency and the associated ecological functions are threatened by climate change, land use changes, and **altered hydrology**.	LR									
Groundwater quality and drinking water safety is threatened by pollutant loading.	GWQ									
Groundwater sustainability is at risk from consumptive use and loss of recharge.	GWS									
Natural areas, forests, prairies, and wetlands providing habitat and other ecological benefits, and the species that inhabit them, are threatened by human activity.	NAT									
Outdoor recreation and overall quality of life are affected by the degradation of, and lack of access to, natural resources.	REC									

Total Occurrences	
SH =	
E&S =	
SWQ =	
FL =	
LR =	
GWQ =	
GWS =	
NAT =	
REC =	

Figure 3-3: Issue Prioritization Scoring by Policy Commmitte, TAG, and PWG



3.1.4 Resident Survey

As part of an extensive stakeholder engagement effort, the PWG developed a brief survey to characterize public opinions regarding natural resource management in the planning area. The survey was made available at the project public kickoff meeting hosted in Rochester on June 13, 2019, county fairs, online via the project webpage, and mailed to approximately 900 residents in the planning area.

A total of 285 surveys were completed; complete survey results are summarized in Appendix B. Surveys were available and completed concurrent with other issue identification and prioritization efforts (see Sections 3.1.1 through 3.1.3) to maximize participation while maintaining project schedule. Results of the resident survey were used to validate the draft issue prioritization performed by the Policy Committee, TAG, and PWG (see Section 3.1.3).

Survey question 7 asked respondents to identify their top 5 water issues from a provided list in order of importance (see Figure 3-4). Responses to question 7 generally corroborate the issue prioritization performed by the Policy Committee, TAG, and PWG (see Figure 3-3). Survey question 9 provided an opportunity for survey respondents to submit general comments and/or suggestions in an open-ended response. Responses to question 9 address a wide range of issues. Some common themes included:

- Emphasis on soil health practices to achieve direct (i.e., in-field) and downstream benefits (e.g., improved water quality, reduced flooding)
- Frequent flooding in the watershed (exacerbated by altered hydrology) leads to erosion, water quality, and public health issues
- The importance of groundwater quality and groundwater protection
- A desire for more public education and engagement regarding water quality issues
- The need for enforcement of existing standards and/or appropriate land use management to limit non-point source pollution (nutrients and sediment)

The responses to the survey indicate strong public interest in the quality and management of water and natural resources in the planning area. Results identify several issues of importance, but generally identify groundwater quality, pollutant loading, erosion, and flooding as top priorities.

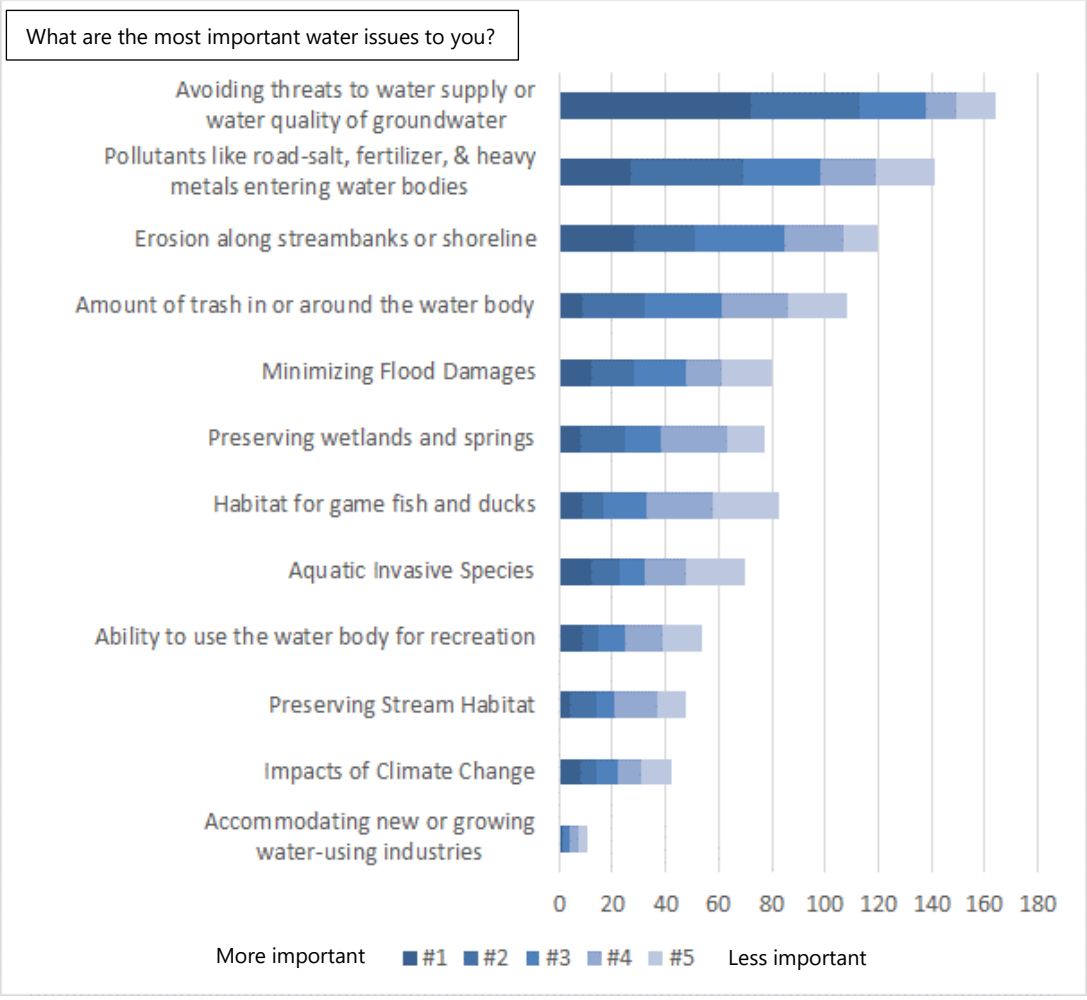


Figure 3-4 Results of survey question 7: What are the most important water issues to you?

3.1.5 Waterside Chats

In fall 2019, the Partnership hosted "Waterside Chats" in three communities across the watershed. These events were intended to present information to the public and obtain input informed by the public's local knowledge of the watershed. The three waterside chats were held:

- October 24th, 2019 at the Zumbro Valley Recreation Club in Mantorville
- November 7th, 2019 at the Community Center in Mazeppa
- November 14th, 2019 at the Sportsman's Club in Lake City

Each waterside chat began with a presentation by the local SWCD or County Staff which included a summary of the Plan development process, a summary of what has been accomplished, and information on how the public can participate. Staff summarized the priority resources and issues that had been identified in local and state plans, studies, reports, state agency feedback, and resident surveys. Initial results of the prioritization of these issues identified by a survey of watershed residents and ranked by the

policy committee, planning workgroup and technical advisory group were also shared to aid in the table conversations.

Following the presentation, attendees were broken into small groups. Each small group discussed a series of questions to provide their input and feedback on the list of priority issues to be addressed in the 10-year scope of the plan. Comments were captured by a facilitator from the planning partnership, summarized, and reported out to the large group.

The waterside chats were attended by over 60 participants who provided meaningful input on priority issues and implementation strategies. Discussion of priorities corroborated the draft prioritization performed by the Policy Committee, TAG, and PWG (see Section 3.1.3). The waterside chats identified many specific issues that were incorporated into Table 3-3 and potential implementation strategies carried forward in Plan development (see Section 6).

A complete summary of the waterside chats is provided in Appendix B.

3.2 Priority Issues

Through the process described in Section 3.1, the Partnership identified nine priority issues described in this section.

3.2.1 Groundwater/Drinking Water Contamination (Level 1)

Issue Statement: Groundwater quality and drinking water safety is threatened by pollutant loading.

Groundwater is the primary source of drinking water, industrial, and agricultural use within the watershed. Pollutants in groundwater, including nitrates and bacteria, pose a risk to human health. Private and public drinking water wells have shown high levels of nitrate contamination across the planning area. Nitrate in groundwater may be naturally occurring at low levels; data collected by USGS and others indicates background nitrate concentrations less than 1 mg/L in portions of the planning area (see Section C.5.2)Elevated nitrate levels are influenced by human activities (MDH, 2018). Land use within the planning area creates high potential for nitrogen and pesticide loading. Emerging and naturally occurring contaminants (e.g., arsenic, manganese) are also of concern. A complete assessment of groundwater quality and associated potential health risks is limited by the large spatial extent of aquifers and limited monitoring data. The vulnerability of non-community public water supplies (e.g., schools, campgrounds), in particular, is not well defined.

In the planning area, drinking water quality is threatened by activities occurring below the land surface as well as activities on the land surface that may infiltrate contaminants to the subsurface. Infiltration of pollutant-laden runoff can reach groundwater, potentially impacting drinking water sources in areas with vulnerable wells and aquifers. Hydrologic sensitivity to contamination is highly variable over short distances. This sensitivity is exacerbated in areas with porous soils and the Karst geology present throughout much of the eastern portion of the planning area. Additionally, unused or unsealed wells provide a conduit for surface contaminants to reach drinking water sources. Nitrate concentrations in the planning area are affected by both well construction and overlying geologic protection (MDH, 2012).

Pollution sensitivity of near-surface materials and wells are presented in Figure C-10 and Figure C-12, respectively. Table 3-2 lists the potential sources of groundwater contamination that may negatively impact the quality of drinking water.

Table 3-2 Potential sources of groundwater contamination

Location	Source	Contaminants of concern		
		Nitrate	Bacteria	Chemicals[1]
Subsurface	Improperly functioning subsurface sewage treatment systems (SSTS)	X	X	
	Leaking underground storage tanks			X
	Buried waste			X
Surface	Improperly functioning wastewater facilities	X	X	
	Nonconforming feedlot operations	X	X	
	Manure application	X	X	
	Landfills			X
	Fertilizer and chemical application to crops	X		X

(1) e.g., petroleum, pesticides

3.2.2 Excessive Flooding (Level 1)

Issue Statement: Excessive flooding threatens public safety, property, and riparian ecology.

Impacts from flooding can include damages to structures (such as homes), property, utilities and transportation infrastructure. Flooding can also threaten public health by flooding wells and septic systems and causing unexpected discharges of waste into surface waters. Excessive flooding carries a high cost for affected communities and individuals, including: flood fighting costs; post-flood cleanup costs; business and agricultural losses; increased expenses for normal operating and living during a flood situation; and benefits paid to property owners from flood insurance. Flooding and high flows can erode and destabilize streambanks, negatively impacting water quality.

Increases in development/urbanization, artificial drainage, and alteration of natural hydrology can exacerbate flooding concerns by elevating peak flows and runoff rates. Conversion of wetlands and other natural areas to other land uses throughout the watershed can diminish watershed storage, contributing to local and downstream flooding issues.

The amount, rate, and type of precipitation received are important in estimating stormwater runoff rates and associated flood implications. Changing regional precipitation patterns are resulting in more frequent, intense precipitation events. Existing stormwater management systems may be undersized for evolving precipitation patterns, further exacerbating flooding. In light of changing precipitation patterns, existing floodplain mapping/modeling may not accurately reflect current or future flood risk. Over time, a

combination of factors has led to increased peak flows and watershed yield in the planning areas (see Section C.9). Floodplains within the planning area are presented in Figure C-25.

3.2.3 Surface Water Quality Degradation (Level 1)

Issue Statement: Surface water quality is threatened or impaired by pollutant loading and altered hydrology.

Pollutants are discharged into surface waters as either point sources or non-point sources. Point source pollutants discharge to receiving surface waters at a specific point from a specific identifiable source. Examples of point source pollution include feedlots and wastewater treatment plants. Unlike point sources, non-point source pollution cannot be traced to a single source (i.e., geographically targeted) or pipe. Instead, pollutants that are carried from land to water in stormwater or snowmelt runoff, in seepage through the soil (non-functioning subsurface sewage treatment systems), and in atmospheric transport make up non-point source pollution. Both point sources and non-point sources can contribute to nutrient, sediment, bacterial, and other pollutant loading to lakes and streams.

For lakes, ponds, and wetlands, phosphorus is often a pollutant of major concern. Point sources of phosphorus typically come from municipal and industrial discharge to surface waters, whereas non-point sources of phosphorus come from urban and agricultural runoff, construction sites, and subsurface sewage treatment systems (SSTS). Nitrates, fecal coliform bacteria, and sediment (see Section 3.2.4) cause additional issues, especially in agricultural areas. Nitrates and sediment are commonly found in agricultural runoff and urban stormwater. Fecal coliform bacteria are usually associated with SSTS, feedlot operations, and concentrated wildlife, such as flocks of waterfowl. Fertilizer and pesticide applications also contribute to pollutant loading in lakes and streams. Sources of pollutants like nitrates, phosphorus, and bacteria in the planning area are summarized in Section C.8.5 and in Section 2.3 of the Mississippi River-Lake Pepin (MRLP) Watershed Restoration Protection Strategies (WRAPS) (MPCA, 2015) and Zumbro River WRAPS (MPCA, 2017). HSPF model results presented in the WRAPSs were used to estimate pollutant loading in the planning area (see Section C.8.7.1). Estimated watershed loadings of total nitrogen, total sediment, and total phosphorus are presented in Figure C-18, Figure C-19, and Figure C-20, respectively.

The addition of pollutants into surface waters and altered hydrologic patterns can pose significant stress to aquatic biota. These stressors can impair the ability of waterbodies to support beneficial uses such as aquatic life, recreation, and consumption. Many of the waterbodies in the planning area are listed as impaired by the MPCA because beneficial uses are impaired by one or more stressors, including: several stream reaches impaired due to turbidity, total suspended solids (TSS), bacteria, aquatic life (fishes bioassessments and macroinvertebrate bioassessments), PCB in fish tissue, and mercury in fish tissue; Lake Zumbro and Rice Lake are impaired due to excess nutrients/eutrophication.

Impaired waters are presented in Figure C-16 and summarized in Section C.8.6. Total maximum daily loads (TMDLs) are required to be developed for all impaired waters to determine the amount of a pollutant that the water may receive and still meet water quality standards. TMDLs may require actions by local governments to limit pollutant loading from point and non-point sources. Information from the Zumbro River Watershed TMDL (MPCA, 2017) and Mississippi River-Lake Pepin Tributaries TMDL (MPCA, 2015) were referenced during the development of this Plan.

3.2.4 Accelerated Erosion and Sedimentation (Level 1)

Issue Statement: Excessive erosion and sedimentation diminishes agricultural productivity, damages riparian areas, and degrades surface water quality and stream habitats.

Although erosion and sedimentation are natural processes, they can be accelerated by human activities such as development, agricultural production, and livestock grazing. Excessive or accelerated erosion and sedimentation can lead to a variety of negative economic and environmental consequences. Erosion of topsoil from farm and pasture lands can reduce soil health and productivity, increasing costs to landowners. Streambank erosion and sediment deposition (both linked to altered hydrology) can alter channels in ways that pose risks to infrastructure; streambank failure in critical areas can undermine roadways and utilities and can result in loss of valuable land. Sediment deposition can wholly or partially block culverts, manholes, and storm sewers, requiring more frequent maintenance and/or increasing flood risk to nearby properties.

Sediment is a major contributor to surface water pollution in the planning area, and excessive amounts of suspended sediment are carried by stormwater runoff when erosion occurs. Sediment deposition decreases water depth and degrades water quality, riparian fish and wildlife habitat, and aesthetics. Sediment often carries nutrients and other pollutants bound to sediment particles, and increases turbidity, which reduces light penetration and affects aquatic life. Several reaches of the Zumbro River and its tributaries are identified as impaired for aquatic life due to high turbidity (see Figure C-16). Reducing near-channel sources of sediment, especially, can mitigate negative impacts to downstream channel areas, aquatic habitats, and aquatic biota.

Section 3.3 of the MRLP WRAPS (MPCA, 2015) and Zumbro River WRAPS (MPCA, 2017) includes strategies to mitigate accelerated erosion of ditches and streams. Soil erosion risk in the planning area is presented in Figure C-7.

3.2.5 Degraded Soil Health (Level 2)

Issue Statement: Degraded soil health diminishes agricultural productivity and limits the beneficial ecological functions of soil.

Most of the land in the Zumbro River watershed and some of the land in the MRLP watershed is farmed or used for pasture. Agricultural and animal production are major components of the regional economy. Good soil health is very important as healthy soils are necessary to achieve sustainable agricultural and livestock production (crop productivity data is presented in Figure C-6). Healthy soils require less fertilizer and promote a number of environmental benefits, including allowing for increased infiltration following precipitation events, resulting in lower levels of overland runoff and associated soil erosion. Healthy soils are better able to filter and break down nutrients and other pollutants from the landscape.

Conversely, degraded soils may require higher than normal fertilizer applications to create/maintain productive farmland, increasing potential nutrient loading in the watershed while increasing costs to the producer. After farmland has been tilled, it is often left bare from fall to spring. This means there are no plants available to intercept rainfall to hold it on the surface for later evaporation, or to reduce the erosive

impact as raindrops strike the ground. In addition to increased runoff, erosion is more likely to occur due to the lack of roots holding the soil in place. The upper soil layers are the most fertile and the most likely to be eroded. Erosion of these top soil layers contributes to high levels of turbidity and total suspended solids in streams and rivers (see Section 3.2.4). Soil erosion risk in the planning area watershed is presented in Figure C-7.

Improving soil health can be accomplished through increased commitment to using other land management practices, including no-till/strip-till rotations, cover crops, perennial crops, crop diversity, etc. These practices promote infiltration and limit the amount of runoff and erosion from croplands when not in active production. Some landowners within the planning area have started implementing soil health best management practices (BMPs) that are intended to limit erosion and soil loss and improve soil productivity. In the planning area, there are opportunities to further realize the agricultural and environmental benefits of healthier soils through broader use of such practices.

3.2.6 Landscape Resiliency and Altered Hydrology (Level 2)

Issue Statement: Landscape resiliency and the associated ecological functions are threatened by climate change, land use changes, and altered hydrology.

In an unaltered condition (i.e., prior to development for residential, agricultural, or other land uses), the natural landscape retains and infiltrates significant amounts of precipitation. In forested or rural areas, runoff can be as low as 10 percent of the water budget (FISRWG, 1998). Development and land use changes lead to loss of permanent vegetation, increased impervious area, and altered drainage networks (e.g., drain tile, storm sewer). Approximately 43% of streams in the Zumbro River watershed have been altered by channelization (MPCA, 2017).

Alteration of the landscape and hydrology disrupts the natural water cycle and compromises the ability of the land to provide water quality, water quantity, and ecological benefits. Flow alteration can lead to increased variability and altered baseflow in streams. Flow alteration is cited as a significant stressor for biological impairments in the Zumbro River WRAPS (MPCA, 2017) and MRLP WRAPS (MPCA, 2015). Altered hydrology contributes to increased peak flows, erosion, and flooding. Altered hydrology and landscape changes (e.g., loss of wetlands, forest, and riparian floodplain) also reduce opportunities for infiltration, retention, and water storage.

Altered hydrology and land use changes further limit the ability of the landscape to mitigate negative impacts stemming from climate trends, including increased winter temperatures, precipitation volume, and precipitation intensity (i.e., landscape resiliency). Conversely, by restoring hydrologic function and

keeping precipitation and runoff on the landscape, the Partnership can minimize negative local and downstream impacts.

3.2.7 Threats to Fish, Wildlife, and Habitat (Level 2)

Issue Statement: Natural areas, forests, prairies, and wetlands providing habitat and other ecological benefits, and the species that inhabit them, are threatened by human activity.

Natural, undeveloped landscapes, such as forests, wetlands, and stream corridors, serve many ecological functions, including habitat for fish and wildlife. Over time, many of these natural areas have been converted to other land uses. The loss of habitat negatively impacts wildlife populations, including rare and endangered species; these impacts may be exaggerated when the remaining habitat areas are no longer connected. Much of the remaining habitats in the watershed are imperiled (e.g., calcareous fens, bottom land hardwood forests). Climate change further threatens native species and their habitats directly and through associated hydrologic changes. Loss of habitat is cited as a stressor for biological impairments in the Zumbro River WRAPS (MPCA, 2017) and MRLP WRAPS (MPCA, 2015).

The cumulative loss of wetlands and riparian buffer areas over time may increase sediment runoff, stream bank erosion, and nutrient loading. Diminished flood storage provided by these areas may increase flood risk in downstream areas. The loss of forested areas diminishes soil stability, further contributing to erosion and downstream water quality impacts. Altered landscapes are more susceptible to aquatic and terrestrial invasive species that can threaten native vegetation, alter habitats, and negatively impact agricultural production. Benefits provided by forests, wetlands, and other natural features, including ecological, habitat, and others, must be recognized and considered as part of land use decisions.

Areas of biodiversity significance in the planning area are presented in Figure C-27. Wetland areas identified in the National Wetland Inventory (NWI) are presented in Figure C-14.

3.2.8 Threatened Groundwater Supply (Level 3)

Issue Statement: Groundwater sustainability is at risk from consumptive use and loss of recharge.

Groundwater serves many consumptive uses in the Zumbro River and MRLP watersheds. It is the primary source of water for agriculture and irrigation, industrial uses, and drinking water. Drinking water supply management areas (DWSMAs) and wells within the planning area are presented in Figure C-9. Competing demands from domestic, agriculture, and industrial uses can strain municipal water supply systems. The urbanization of Rochester and other areas and associated future increase in population is also driving increases in municipal water supply withdrawals. Data published by the MDNR shows a moderate decline in water level in the Jordan aquifer within the planning area (MDNR, 2010), suggesting that current and projected consumptive use of groundwater may not be sustainable. Well-specific local data from the MDNR's cooperative groundwater monitoring (CGM) program is mixed. In addition, naturally occurring infiltration and groundwater recharge is limited by development, agricultural drainage, and other land use activities.

In addition to consumptive uses, groundwater inflow contributes to baseflow in local streams and impacts stream temperature, impacting the habitat quality of trout streams. These impacts may be magnified in areas of karst geology. Conservation and management of groundwater is necessary to promote the sustainability of the resource for future use and ecological benefits.

3.2.9 Reduced Livability and Recreation (Level 3)

Issue Statement: Outdoor recreation and overall quality of life are affected by the degradation of, and lack of access to, natural resources.

Natural resources, including lakes, streams, forests, and prairies, are an important part of life in the Zumbro River and MRLP watersheds. Many residents and visitors interact with nature through recreational activities like hunting, fishing, hiking, boating and other activities. Others find stress-relief and sanctuary by simply being in nature. The loss or degradation of these resources (and access to these resources) limits recreational opportunities and diminishes the public health benefits these areas provide. Degraded resources can negatively impact property values and sense of community pride.

Table 3-3 Priority issues categories and supporting specific issues

General Issue Area	Specific issues provided as examples of this category (Blue text indicates issue statement from agency response to notification letter - agency in parentheses)
Groundwater/Drinking Water Contamination	- some private wells in the watershed show high levels of nitrate (MDA, MDH) - nitrate in groundwater (drinking water source for the entire watershed) is a health concern for residents (MDNR, MDH, MDA, MPCA) - pesticides in groundwater is a public health concern (MDA) - several drinking water supply management areas (DWSMAs) are highly vulnerable to contamination (MDH) - abandoned, unsealed wells can provide conduit for groundwater contamination (MDH) - private well owners may lack water quality information/testing (MDH) - vulnerability of non-community public water supplies (e.g., schools, campgrounds) is not well defined (MDH) - large portions of the watershed show high pollution sensitivity of wells (MDH) (due in part to Karst geology) - non-functioning subsurface sewage treatment systems (SSTS) and wastewater treatment facilities (WWTF) may leach excessive nutrients and pathogens - hazardous waste generators, landfills, or other point sources have the potential to leach pollutants - feedlot sites and manure application sites may contribute to nutrient and pathogen contamination of groundwater - infiltration of runoff containing pollutants can impact drinking water in areas with vulnerable wells and aquifers - mining land uses may increase groundwater/surface water interaction and pollutant pathways between resources - emerging and naturally-occurring contaminants (e.g., manganese, arsenic) threaten drinking water safety
Excessive Flooding	- river flooding threatens to damage homes, property, and public infrastructure (cited in Rochester Comp Plan, 1999 SWMP) - local flooding from stormwater runoff threatens homes, property, and public infrastructure, especially in urbanized areas (cited in Rochester Comp Plan, 1999 SWMP) - urbanization/development increases rate and volume of runoff (~BWSR) - municipal stormwater systems may be undersized for current/future precipitation patterns - existing floodplain mapping/modeling may not accurately reflect current (or future) flood risk - high water levels, especially for longer durations, contribute to streambank instability/erosion (~BWSR) - increased precipitation/extreme weather events place increased risk and demand on infrastructure (MDNR, BWSR); trends show increased frequency/severity of events (BWSR) - maintain/add impounding structures in the watershed to cut down on flooding and sediment loss (BVWD) - artificial drainage that has occurred in the watershed may impact peak flows and flooding (BWSR) - altered hydrology contributes to more extensive flooding (MDNR; MPCA)

Table 3-3 Priority issues categories and supporting specific issues

Surface Water Quality Degradation	- several waterbodies are listed as impaired for aquatic life and/or aquatic recreation due to one or more stressors, including 5 stream reaches in the Mississippi River-Lake Pepin watershed, and 28 stream reaches and 2 lakes in the Zumbro watershed (MPCA) - Rice Lake water quality is degraded from internal loading of nutrients (MPCA) - Lake Zumbro water quality is degraded from phosphorus and sediment loading (MPCA) - recreational uses are impaired due to bacteria loading from feedlots, land application of manure, cattle in riparian areas, and leaking subsurface sewage treatment systems (SSTS) (MDNR) - there are many resources that are not degraded that should be a priority for protection (BWSR) - total maximum daily load studies may result in required corrective actions - pesticide and fertilizer application (e.g., nutrient management on crop and pasture lands) may contribute to nutrient loading to lakes and streams - nitrate-nitrogen in surface waters is a threat to human health and aquatic life (MPCA) - best practices to improve the water quality of runoff from agricultural lands are not consistently implemented - non-point sources contribute to nutrient, bacteria, and other pollutant loadings to lakes and streams (e.g., non-functioning SSTS, stormwater runoff); pollutant loadings vary across the watershed (BWSR) - high pollutant loading from developed portions of the watershed (from S. Zumbro Stormwater & Capital Improvement Plan) - point sources contribute to nutrient, bacteria, and other pollutant loadings to lakes and streams (e.g., feedlots, WWTPs) - dredge spoil disposal can lead to erosion and pollutant loading from deposited sediment - improper disposal of hazardous waste can result in pollutant loading to surface waters (e.g., burning of agricultural plastics)
Accelerated Erosion & Sedimentation	- accelerated soil erosion contributes to turbidity, total suspended solids (TSS), and other water quality issues; Zumbro WRAPS identifies TSS as a stressor; Mississippi River-Lake Pepin WRAPS identifies bedded sediment as a stressor (BWSR) - development activity increases stormwater runoff and erosion - erosion of streambank areas may pose risk to property and infrastructure - erosion of streambank areas eliminates or degrades riparian wildlife and fisheries habitat (~MDNR) - poorly managed urban stormwater can result in excessive erosion (BWSR) - help farmers maintain/add waterways to filter and reduce amount of sediment that moves downstream (BVWD) - gully erosion issues cited in BVWD Plan
Degraded Soil Health	- poor soil health may limit the soil's ability to filter nutrients and other pollutants (~BWSR) - poor soil health may require additional fertilizer applications, increasing nutrient loading - agricultural productivity is less than may be achieved with improved soil health - best practices to enhance/preserve soil health (e.g., no till, cover crops) are underutilized - degraded soil health can reduce infiltration and permeability, resulting in increased runoff and accelerated soil erosion (~BWSR)

Table 3-3 Priority issues categories and supporting specific issues

Landscape Resiliency and Altered Hydrology	- artificial drainage that has occurred in the watershed may impact peak flows and flooding (BWSR) - more frequent periods of low flow in some watercourses (BWSR) - hydrologic changes contribute to instability in natural and artificial watercourses (BWSR) - altered hydrology contributes to increased peak flows and flooding, reduced infiltration, loss of water storage capacity (MDNR) - restoring hydrologic function can reduce flooding, improve water quality, stabilize channels, and improve habitat (MDNR) - altered hydrology contributes to accelerated erosion (MDNR) - altered hydrology is a significant stressor to aquatic biology (MDNR, MDNR) - climate change threatens native species directly and via habitat impacts resulting from associated hydrologic changes (MDNR) - water storage is of heightened importance due to increased precipitation, runoff rates, and volumes resulting from climate change (MDNR) - impacts of altered hydrology and increased flow may be exaggerated by climate trends (e.g., extended periods of saturated streambanks) - forest resources (e.g., bottomland and hillside) are threatened by climate and land use changes
Threats to Fish, Wildlife, and Habitat	- Zumbro Stressor Identification Study identifies lack of habitat as a stressor for biological impairments (fish and macroinvertebrates) (BWSR, MPCA) - Mississippi River-Lake Pepin WRAPS identifies physical habitat as a stressor for Gilbert Creek (BWSR, MPCA) - quality and quantity of wetland habitats are reduced by altered hydrology (BWSR), conversion to other land uses - The Zumbro watershed and larger "bank service area 8" (BSA 8) have a low supply of wetland bank credits, leading to wetland mitigation moving outside the watershed (BWSR) - altered hydrology threatens fish and wildlife habitat - dams and limited aquatic connectivity affect recreation, fish passage (MDNR) - many rare habitats/species in the watershed are critically imperiled (e.g., calcareous fens, bottom land hardwood forests) (MDNR) - preserving baseflow in streams is critical to maintaining trout and other habitat (MPCA) - approximately 6,000 acres of conservation reserve program lands are set to expire soon (BWSR) - aquatic invasive species (AIS) threaten recreation and native ecosystems (cited in Wabasha AIS Prevention Plan) - emerging invasive weed threats pose risk to agricultural production - terrestrial invasive species threaten existing ecosystems
Threatened Groundwater Supply	- groundwater levels show decline over time in watershed (MDNR 2010 Water Availability Report) - infiltration recharge may be decreased by development, tiling, and other human activity - increasing groundwater withdrawals may result in well interference and affect water availability (i.e., sustainability) (MDNR) - preserving baseflow in streams is critical to maintaining trout habitat (MPCA)
Reduced Livability & Recreation	- preservation of quality natural resources is necessary to sustain recreational activities (e.g., hunting, fishing, bird watching) - degraded natural resources negatively affect property values, community vibrancy, and public health - expansion and management of trails enhances recreational enjoyment and improves wildlife habitat (MDNR) - maintenance/reconstruction of public canoe launches is needed; many are damaged from flooding (MDNR) - boat ramps are often crowded from high recreational use (MDNR) - dams and limited aquatic connectivity affect recreation and fish passage (MDNR) - recreational uses of waterbodies are impaired due to water quality issues (e.g., bacteria) (MDNR) - preserving baseflow is important to maintaining aquatic recreation

3.3 Spatial Prioritization of Issue Areas

The spatial extent and severity of resource issues vary across the watershed and prevent a one-size-fits-all approach to implementing practices and programs addressing priority issues. Therefore, the Partners prioritized areas for targeting planned actions to most effectively and efficiently utilize its financial and staff capacity to address these issues. The Partnership used available geospatial data, modeling and monitoring results, and existing technical knowledge of the Planning area to identify spatial areas for prioritized implementation.

Prioritization and/or targeting may be performed at various levels of geographic specificity according to available information. This section describes subwatershed scale targeting, defined as follows:

- **Subwatershed scale prioritization** – subwatersheds (at approximately the HUC 12 level) or portions of subwatersheds (e.g., HSPF model subwatersheds) are identified as priority areas for project or program implementation, although the specific location of proposed projects is not specified.

Subwatershed scale prioritization is differentiated from field scale targeting, described in Section 4, and summarized as:

- **Field scale targeting** – the location of potential field practices (e.g., vegetated buffers, WASCBs, stormwater practices) within a subwatershed are identified or estimated based on the results of available surveys, terrain analysis, modeling results, or other technical analysis (see Section 1).

The following sections describe the methodology used to target practices to address specific issue areas. The methods described in this section rely on the land and water resources data presented in Appendix C.

3.3.1 Priority Areas for Surface Water Quality

The Partnership identified surface water quality degradation as a Level 1 priority issue, as many waterbodies within the planning area are listed on the State of Minnesota's impaired waters list due to a variety of pollutants and stressors (see Section C.8). This issue is closely linked to the Level 1 priority issue of accelerated erosion and sedimentation; sediment negatively impacts water quality and is a vector for nutrients and other pollutants.

The Partnership considered the following geospatial datasets in prioritizing areas for actions to address surface water quality degradation and accelerated erosion and sedimentation. These include:

- Sediment loading as estimated by HSPF modeling (see Figure C-20)
- Total phosphorus (TP) loading as estimated by HSPF modeling (see Figure C-19)
- Total nitrogen (TN) loading as estimated by HSPF modeling (see Figure C-18)
- Watershed yield (runoff) as estimated by HSPF modeling (see Figure C-26)
- Streams and lakes listed as impaired (see Figure C-16)
- Streams identified by the MPCA as "nearly impaired," "barely impaired," or "nearly exceptional" (see Figure 3-5)
- Priority conservation areas identified by the MDNR Zonation analysis (see Figure 3-5)

The above-listed inputs were used to develop a three-level priority ranking (Level 1 = highest priority) for each HSPF subwatershed as follows:

1. HSPF subwatersheds were assigned a score of 0, 1, or 2 for each of four pollutants (sediment, TP, TN, runoff) based on whether the modeled subwatershed pollutant loading fell within the lowest (the 0-33 percentile), middle (34-66 percentile), or highest (67-100 percentile) third of modeled pollutant loading rates, respectively. *For example, a subwatershed with a sediment loading rate in 80th percentile, TP loading rate in the 50th percentile, TN loading rate in the 50th percentile, and runoff in the 30th percentile would receive pollutant loading scores of 2, 1, 1, and 0, respectively.*

2. Pollutant loading "scores" of 0, 1, or 2 were summed for the four pollutants to create a combined pollutant loading score ranging from 0 to 8.

3. Subwatersheds were split into the following categories based on combined pollutant load score:
    a. Priority 1 = pollutant load score 7-8 (higher priority)
    b. Priority 2 = pollutant load score 4-6
    c. Priority 3 = pollutant load score 0-3 (lower priority)

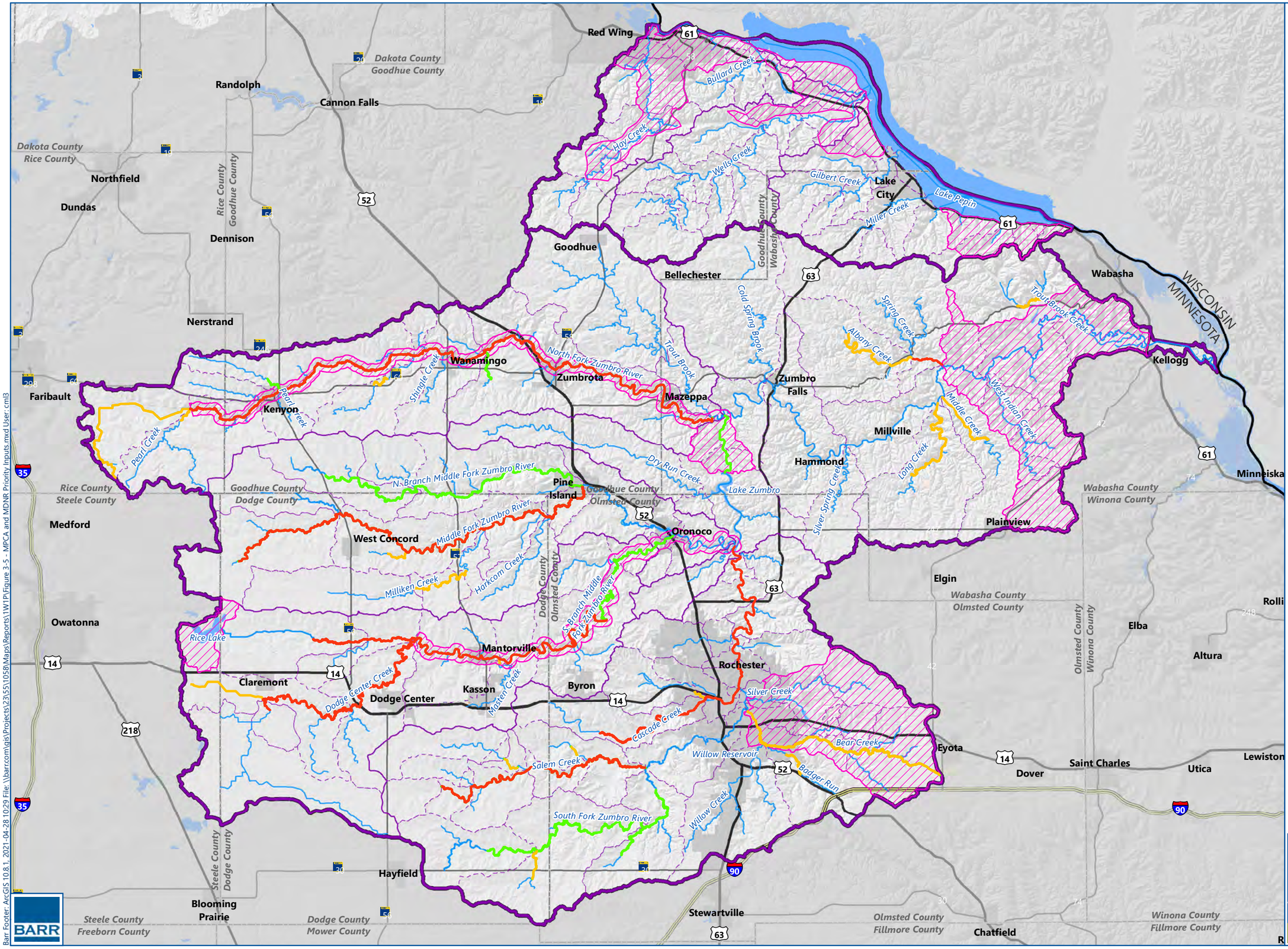
4. Subwatersheds were increased one priority level (i.e., priority 2 to priority 1) if they include an MDNR priority conservation area

5. Subwatersheds were decreased one priority level (i.e., priority 2 to priority 3) if the primary waterbody within the subwatershed was classified as "nearly exceptional" by the MPCA. *Note: while protection of existing good water quality is promoted by this Plan, the Partners incorporated this adjustment to distribute priority levels more evenly*

6. Subwatersheds were individually adjusted up or by one priority level at the discretion of the Planning Work Group based on specific resource knowledge (e.g., South Fork Zumbro River was increased in priority level due to local macroinvertebrate data from Dodge County which highlighted locations in the upper watershed with declining/poor macroinvertebrate numbers).

7. Subwatersheds in each priority level were subdivided into "Protect" or "Restore" categories based on whether the primary waterbody in each subwatershed is impaired or not. Classification as "protect" or "restore" is intended to focus or refine potential strategies, but does not affect relative priority level (i.e., priority Level 2 restore is equivalent to priority Level 2 protect)

The resulting surface water quality priority subwatersheds are presented in Figure 3-6. The percentage of area within the planning area according to surface water quality priority classification is presented in Table 3-4. Note that while the MPCA's delineation of nearly/barely impaired waters was initially considered, it is not omitted from the final prioritization sequence described above (nearly exceptional waters are considered in the prioritization).



Barr Footer: ArcGIS 10.8.1, 2021-04-28 10:29 File: \\barrcom\gis\Projects\23\55\1058\Maps\Reports\1W1P\Figure 3-5 - MPCA and MDNR Priority Inputs.mxd User: cmb

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MPCA AND MDNR PRIORITIZATION INPUTS

WAGZ Comprehensive Watershed Management Plan

FIGURE 3-5

Study Area
Watercourses
Pond or Lake
Municipal Boundary
County Boundary
State Boundary
Subwatersheds (HUC10)
HSPF Subwatersheds

Priority Areas

Higher Priority
- Protect 1
- Restore 1

Lower Priority
- Protect 2
- Restore 2
- Protect 3
- Restore 3

Priority Areas (v3) are based on HSPF pollutant loading scores as follows:
Load 0-3 = Priority 3
Load 4-6 = Priority 2
Load 7-8 = Priority 1
and presence or absence of impaired waters to determine restore or protect, respectively. Priority adjusted 1 higher if in a Zonation area, and adjusted 1 lower if nearly exceptional

N

0 2.5 5
Miles

PRIORITY AREAS FOR SURFACE WATER QUALITY IMPLEMENTATION
WAGZ Comprehensive Watershed Management Plan
FIGURE 3-6

Barr Footer: ArcGIS 10.8.1, 2021-04-28 11:36 File: \\barr.com\gis\Projects\23\55\1058\Maps\Reports\1W1P\Figure 3-6 - Priority Areas for Surface Water Quality Implementation.mxd User: cml3

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Table 3-4 Surface water priority area breakdown

Surface Water quality priority classification	Percent of Planning Area		
	Mississippi River-Lake Pepin	Zumbro River	Total
Protect 1	0.5%	5.5%	43%
Restore 1	--	37.6%	
Protect 2	3.4%	12.8%	39%
Restore 2	4.7%	18.5%	
Protect 3	1.8%	2.2%	17%
Restore 3	2.5%	10.8%	
Total	13.0%	87.0%	100%

See Figure 3-6.

During Plan development, the Partnership discussed possible ways to allocate resources to projects in areas of different priority. The Partnership will focus on Level 1 and Level 2 priority areas during the implementation of this Plan, with a significant portion of implementation funding directed to those areas (see Table 6-4). Focus on Level 3 priority areas will be deferred until later during Plan implementation and may receive fewer financial resources (see Table 6-4). Note that the final apportioning of resources between projects in Level 1, 2, and 3 priority areas is dependent upon individual project scoring criteria established and maintained by the Partners (see Section 6.1.1.1).

Field-scale targeting of best management practices within priority subwatersheds is described in Section 4.

3.3.2 Priority Areas for Groundwater Quality

The Partnership identified groundwater contamination as a Level 1 priority issue. During Plan development, the Planning Work Group and Technical Advisory Group reviewed available groundwater quality data and natural resource datasets to assess the scope of the issue (see Section C.5). Data considered during Plan development included:

- Soil types (see Figure C-5)
- Estimated groundwater recharge (see Figure C-8)
- Wellhead protection areas and drinking water supply management areas (DWSMAs, see Figure C-9)
- Pollution sensitivity of near-surface materials (see Figure C-10)
- Geologic formations including location of Karst geology (see Figure C-11)
- Pollution sensitivity of wells (see Figure C-12)
- Private well water quality monitoring data collected by counties, MDA's township testing program, and the Southeast Minnesota Groundwater Monitoring Network

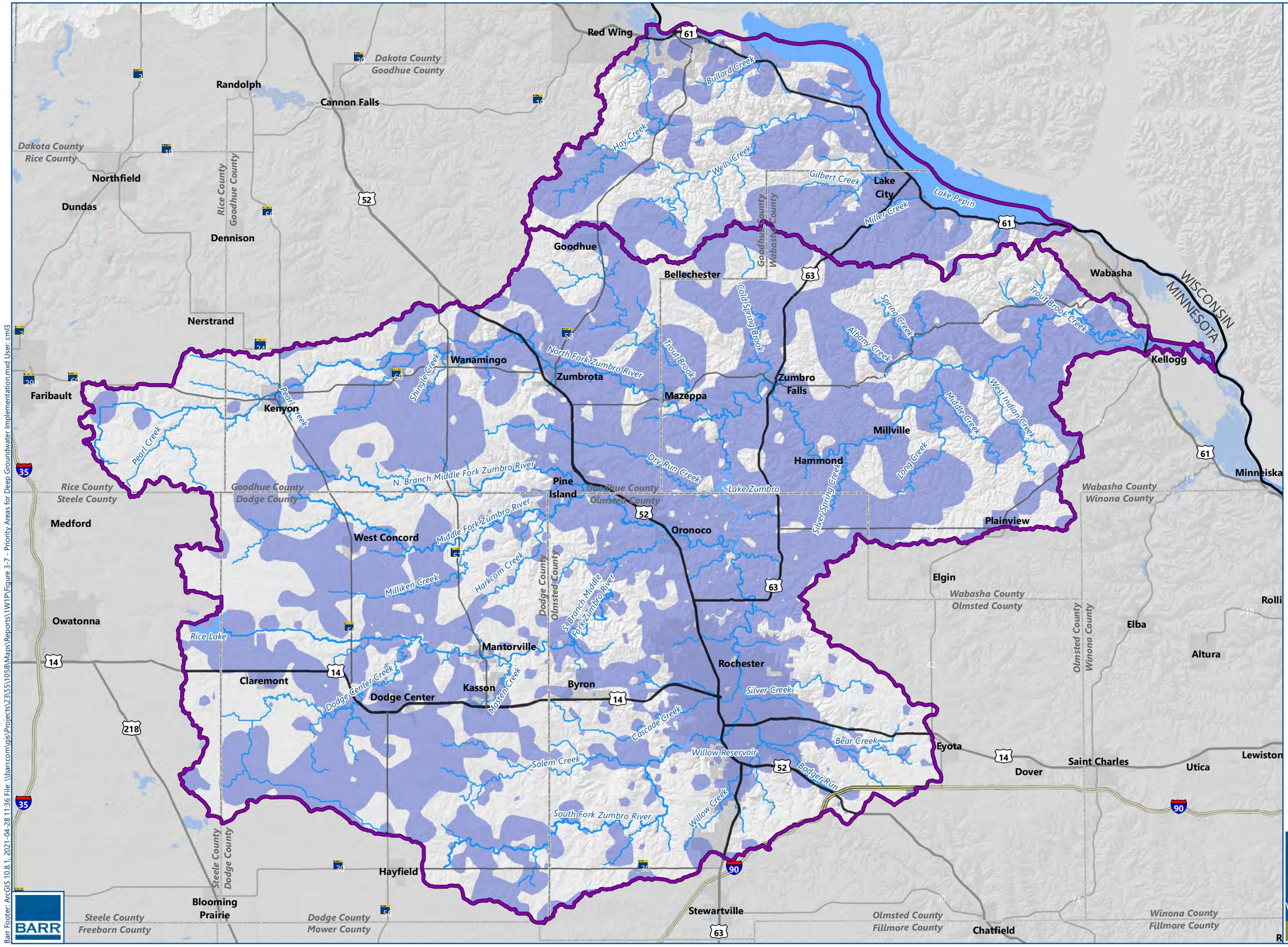
Because the nature of groundwater contamination and proposed protection strategies differ between deep and shallow aquifers, the Partnership delineated priority areas for deep groundwater and shallow groundwater issues separately.

Deep groundwater priority areas include areas of high or moderate pollution sensitivity of wells and DWSMAs categorized as having moderate or high vulnerability. These areas are presented in Figure 3-7.

The Partnership delineated priority areas to address near-surface groundwater issues through an iterative process that included convening a separate groundwater technical advisory group (including MDH, MDA, MDNR, Olmsted County/SWCD, Dodge County). Discussion and analysis considered the sensitivity of near surface materials to pollution as well as areas with concentrated occurrences of groundwater nitrogen above 10 mg/L as identified through recent monitoring. Discussion also addressed the extent of Decorah Edge areas (including areas protected by Olmsted County ordinance as an additional zoning overlay). The area mapped by Olmsted County was extended by mapping areas of similar geologic characteristics (surficial soil types and depth to bedrock less than 10 feet) outside Olmsted County. This information was used to delineate two levels of near-surface groundwater priority, presented in in Figure 3-8.

The groundwater priority areas presented in Figure 3-7 and Figure 3-8 will be used to guide future implementation, including coordination of a comprehensive groundwater monitoring plan developed in cooperation with state agencies (implementation item GWQ-10). The Partners will coordinate with MDH, MDA, and MDNR and other agencies that monitor groundwater to ensure that local monitoring needs are considered. Outcomes of groundwater monitoring may result in refinements to the groundwater priority areas and/or targeting of groundwater-related implementation activities.

While the groundwater priority areas serve as a basis for focusing partner action at a planning level, the implementation of BMPs at specific locations in the watershed should consider site-specific characteristics (e.g., well-depth, presence of confining layers) depending upon the primary goal of the BMP. Groundwater priority areas may also be cross-referenced with surface water priority areas (see Figure 3-6) for the prioritization and targeting of BMPs and projects with multiple benefits (e.g., manure management plans, cover crops).



Barr Footer: ArcGIS 10.8.1, 2021-04-28 11:36 File: \\barrcom\gis\Projects\23\55\1058\Maps\Reports\1W1P\Figure 3-7 - Priority Areas for Deep Groundwater Implementation.mxd User: cml3

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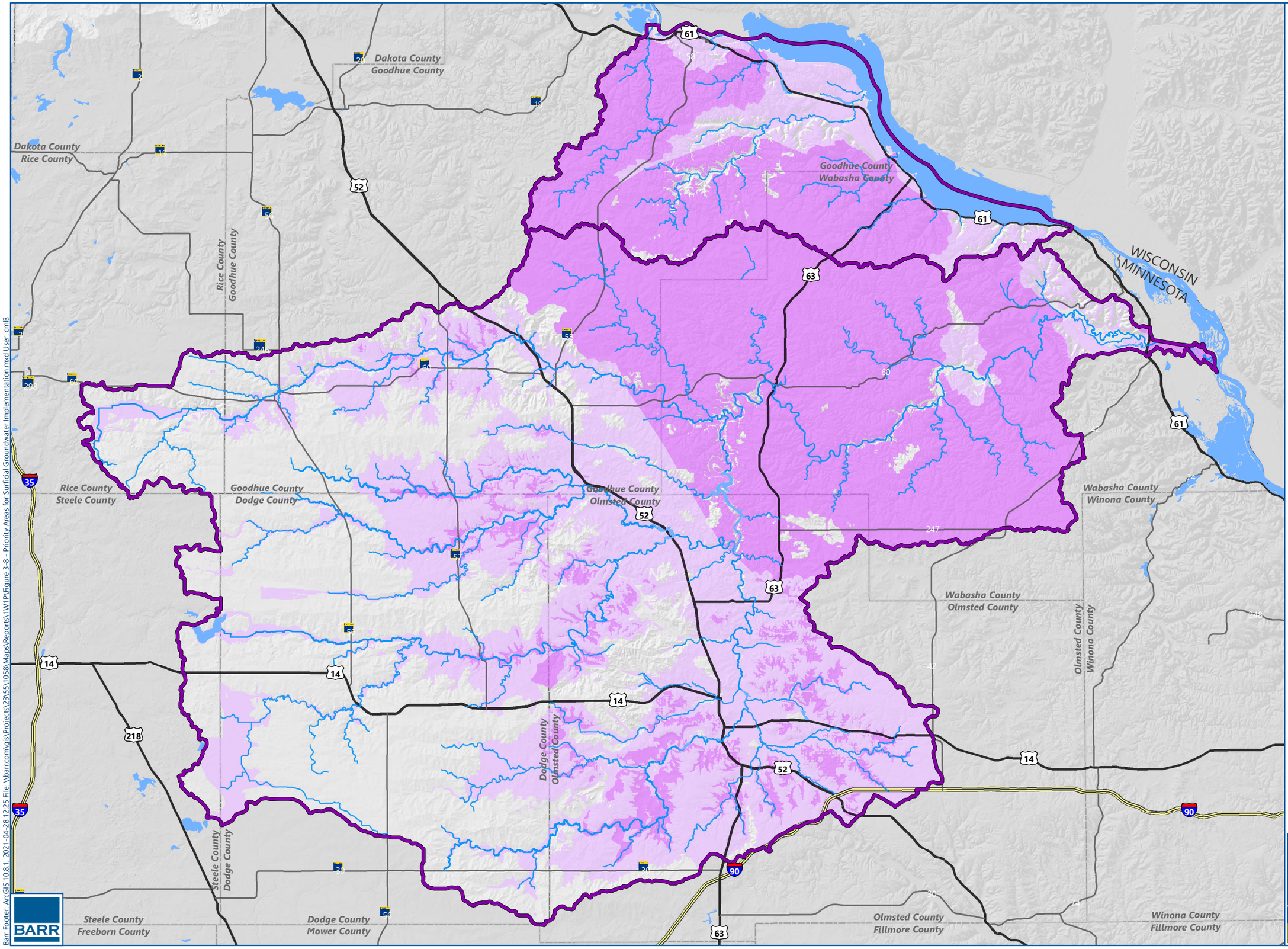
PRIORITY AREAS FOR DEEP GROUNDWATER IMPLEMENTATION

WAGZ Comprehensive Watershed Management Plan

FIGURE 3-7



PRIORITY AREAS FOR SURFICIAL GROUNDWATER IMPLEMENTATION

WAGZ Comprehensive Watershed Management Plan

FIGURE 3-8

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Barr Footer: ArcGIS 10.8.1, 2021-04-28 12:25 File: \\barrcom\gis\Projects\23\55\1058\Maps\Reports\1W1P\Figure 3-8 - Priority Areas for Surficial Groundwater Implementation.mxd User: cml3

3.3.3 Priority Areas for Excessive Flooding

Excessive flooding was identified by the Partnership as a Level 1 priority issue. During Plan development, the Planning Work Group and Technical Advisory Group reviewed available hydrologic datasets, including flow monitoring, floodplain mapping, and runoff modeling (see Section C.9).

The Partnership recognizes that increased flow, river stage, and flood risk are affected by increased runoff (as well as climate trends and increased shallow groundwater flow). Therefore, the Partnership included runoff (as estimated by watershed-wide HSPF modeling, see Figure C-26) as a "pollutant" in prioritizing subwatersheds for implementation actions (see Section 3.3.1 and Figure 3-6), recognizing that many BMPs implemented with a primary goal of addressing surface water quality issues may also reduce runoff. The Partnership will also use subwatershed estimates of runoff (see Figure C-26) in prioritizing the implementation of BMPs focused on reducing runoff and peak flows, targeting projects in subwatersheds with higher runoff values. The Partnership has identified the lower reaches of the Zumbro River as a priority area for floodplain reconnection projects due to the presence of riparian wetlands and opportunities for multi-benefit improvements; the Partnership will coordinate with the MDNR to implement projects in this area,

Estimates of runoff are not necessarily correlated with flood risk or impacts. Hydrologic and hydraulic modeling exists for portions of the planning area, although model platforms, inputs, and scale vary. As part of implementation, the Partnership seeks to evaluate flood risk in previously unmodeled portions of the watershed and develop subwatershed-specific peak flow rate reduction goals (see Table 6-4). In addition, in 2020 the City of Rochester began updating the city's stormwater management plan that will evaluate flood risk issues and identify flood risk reduction efforts within the city. When additional hydrologic and hydraulic data is available, the Partnership may refine priority areas for flood risk reduction activities, as needed.

4 Targeting of Field Practices

The geographic prioritization performed at the subwatershed scale (see Section 3.3) is intended to focus the Partnerships efforts over the next 10 years. Within prioritized spatial areas, additional analyses are needed to identify, ground-truth, and prioritize individual project opportunities at a finer scale (i.e., project targeting). During Plan development, the Planning Work Group and Advisory Committee considered the results of existing water quality modeling and geospatial information to identify targeted potential project opportunities. Application of these assessments to identify potential project locations is summarized in the following sections. The potential project locations are presented in Figure 4-1.

4.1.1 Digital Terrain Analysis

Digital terrain analysis was used throughout the planning area to identify potential project locations. This analysis includes the development and application of a hydro-conditioned digital elevation model (i.e., topography data adjusted to accurately reflect drainage direction), used in conjunction with soils and existing infrastructure and BMP data. The analysis identifies catchment outlet locations where beneficial field practices (e.g., filter strips, water and sediment control basins) could likely be implemented, as well as the area tributary to each location.

Digital terrain analysis is available for the Zumbro River watershed from 2015 work prepared for the Zumbro Watershed Partnership – that analysis identified 205 potential project locations and a top 50 priority locations (based on pollutant loading and local geospatial characteristics). Concurrent with the development of this Plan, similar analysis was performed for the 233 square mile Mississippi River-Lake Pepin watershed. That analysis identified 78 potential project locations that were ranked based on treated area and geospatial characteristics; the top 50 locations identified. Potential project locations in both the Zumbro River and Mississippi River-Lake Pepin watersheds are presented in Figure 4-1. Desktop analysis using GIS datasets provides a useful screening tool. However, field verification of potential project locations is ultimately necessary to determine feasibility and project design, as well as verify that existing, un-mapped BMPs are not already present.

This analysis also included development of a hierarchy of recommended practices for each location based on agro-ecoregion in which the potential project is located (see Table 4-1). Agro-ecoregions are presented in Figure 4-2. The suitability of practices relative to eco-region may be referenced during implementation as the Partners seek landowner cooperation for BMP implementation.

The partnership may not address all potential project locations within the next 10 years – the implementation schedule (see Table 6-4) lays out a schedule for executing projects within priority watersheds. The estimated number, benefit, and cost of projects anticipated to be implemented at these locations are included in Table 4-2. The project locations in Figure 4-1 represent potential opportunities that the Partners may draw on as opportunities dictate. Future progress assessments and resource assessments may alter priorities or identify additional project locations.

Table 4-1 BMP suitability by agro-ecoregions in the planning area

Natural Resource Conservation Service (NRCS) Practice Code	NRCS Number	Alluvium & Outwash	Blufflands	Level Plains	Rochester Plateau	Rolling Moraine	Steeper Alluvium	Undulating Plains
Conservation Crop Rotation	328	M	H	M	H	H	M	L
Conservation Tillage	329	M	L	M	L	H	M	M
Contour Buffer Strip	332	L	M	M	M	M	L	M
Contour Farming	330	M	H	M	H	H	M	M
Cover Crop	340	M	H	H	H	H	M	L
Critical Area Planting	342	M	L	M	M	M	H	L
Diversion	362	L	M	M	H	L	L	L
Drainage Water Management	554	M	L	M	M	M	M	L
Field Border	386	M	H	H	H	H	M	H
Grade Stabilization	410	L	H	M	H	L	M	L
Grass Filter Strip	393	M	M	H	H	H	H	M
Grass Waterway	412	H	H	H	H	M	H	H
Nutrient and Manure Management	590	H	H	H	H	H	H	H
Pasture & Hayland Planting	512	M	H	--	H	H	--	L
Prescribed Grazing	528A	M	M	--	M	M	--	L
Sinkhole Treatment	725	--	M	--	H	--	--	L
Streambank & Shoreline Protection	580	L	H	L	M	M	M	L
Strip-cropping	585	--	H	M	H	--	--	L
Terrace	600	--	M	--	H	M	--	M
Use Exclusion / Fencing	472/382	M	L	L	M	L	--	M
Upland Wildlife Habitat Mgmt.	645	--	M	--	M	--	--	--
Water & Sediment Control Basin	638	--	H	--	H	H	--	L
Wetland Restoration	657	L	--	M	--	L	--	L

Note: H = high suitability, M = moderate suitability, L = low suitability; "—" indicates practice/ecoregion combinations not evaluated at time of development.

4.2 Estimating Benefits and Costs of Field Water Quality Practices

Targeted locations for water quality improvement best management practices (BMPs) were developed based on digital terrain analyses (see Section 4.1.1). These locations include catchment outlets where field practices (e.g., filter strips, water and sediment control basins) could likely be implemented. These potential project opportunities are presented watershed-wide in Figure 4-1. Figure 4-3 presents a high-resolution example of this analysis applied to the Lake Pepin subwatershed, including the estimated drainage area tributary to each potential project location.

HSPF modeling of the Zumbro River watershed and Mississippi River-Lake Pepin watershed was performed prior to the development of this Plan and provides estimates of pollutant loading from the landscape (see Section C.8.7). The HSPF modeling considers the presence of existing BMPs, land use, and other factors affecting pollutant loading. Additional information about the HSPF modeling is available in the Zumbro WRAPS and MRLP WRAPS reports.

Water quality modeling output and digital terrain analysis were combined to estimate the potential benefit and cost of projects implemented at the locations shown in Figure 4-1, as described in the following sections.

4.2.1 Estimated Pollutant Loading to Proposed BMP Locations

The HSPF modeling performed for the planning area provides unit area (i.e., per acre) estimates of total nitrogen (TN), total phosphorus (TP), and sediment (TSS) loading rates as presented in Figure C-18, Figure C-19, and Figure C-20, respectively. The watershed divides used in the HSPF modeling efforts are more refined relative to the planning subwatersheds used in Plan development (see Figure C-3). For planning level estimates of cumulative field scale project benefits, average unit area loading rates for the 8 planning subwatersheds were calculated using GIS and are presented in Table 4-2. The number of potential project locations and corresponding tributary drainage area in each planning subwatershed, as estimated from digital terrain analysis, are also included in Table 4-2.

Table 4-2 Estimated pollutant loading aggregated to planning subwatersheds

Planning Subwatershed	Total Area (acres)	TN loading[1] (lbs/acre/yr)	TP loading[1] (lbs/acre/yr)	Sediment loading[1] (tons/acre/yr)	Potential BMP Locations[3]	Treated Area (acres)
Hay Creek	45,809	9.03	0.40	0.02	15	229.9
Wells Creek	45,956	10.54	0.48	0.03	24	439.5
Lake Pepin	57,393	9.98	0.45	0.03	39	405.3
MRLP Subtotal[2]	**149,158**	**9.86**	**0.44**	**0.03**	**78**	**1,074.7**
North Fork Zumbro	153,538	17.89	0.75	0.23	48	5,000.3
Middle Fork Zumbro	139,649	18.94	0.82	0.26	50	5,682.7
S. Branch Middle Fork Zumbro	138,314	17.71	0.88	0.30	19	3,032.2
South Fork Zumbro	226,091	15.01	0.78	0.29	47	4,261.0
Zumbro River (lower)	251,776	11.51	0.55	0.21	41	6,077.2
Zumbro Watershed Subtotal[2]	**909,367**	**15.54**	**0.73**	**0.25**	**205**	**24,053.4**
Total	**1,058,525**	**--[2]**	**--[2]**	**--[2]**	**283**	**25,128.1**

(1) Unit area pollutant loading is based on HSPF model results for TN, TP, and TSS and aggregated to planning subwatershed level using an area weighted average.
(2) Average pollutant loading values are presented for the two major watersheds but are not averaged over the entire study area due to differences in the HSPF models for each major watershed.
(3) Potential project locations identified in Figure 4-1.

4.2.1.1 Pollutant Loading to Proposed BMP Locations – HSPF subwatershed scale

The data presented in Table 4-2 is aggregated to the 8 planning subwatersheds. The HSPF model subdivides the planning area into 151 subwatersheds, providing a much finer resolution of pollutant loading estimates (i.e., pollutant loading rates vary between drainage areas tributary to proposed BMPs). Subwatershed-specific estimates of sediment, total nitrogen, and total phosphorus loading to each individual BMP are useful for tracking the estimated benefit of constructed projects (see Section 4.2.5). HSPF subwatershed-specific pollutant loading rates are applied to the BMPs included in each HSPF subwatershed to estimate the cumulative project benefits using the HSPF-SAM tool (see Section 4.2.4.1).

The average drainage area treated per project location differs between the MRLP watershed and the Zumbro River watershed due in part to the disparate landscapes. The average area draining to the 78 potential project locations in the MRLP watershed is approximately 14 acres per project, versus approximately 90 acres per project in the Zumbro River watershed. This may result in lower absolute pollutant reductions within the MRLP watershed relative to Zumbro River watershed, but also lower implementation costs per project (due to generally smaller-scale projects),

4.2.2 Potential Pollutant Reduction (estimated at field scale) and Associated Costs

Potential reduction in pollutant loading realized by the implementation of BMPs at locations shown in Figure 4-1 was estimated using values from the *Documentation of the BMP Database Available in the Scenario Application Manager* (RESPEC, 2017). The Scenario Application Manager (SAM) is a publicly available tool to estimate and aggregate pollutant reduction from various BMPs. A subset of the BMPs included in SAM applicable to the planning area were selected and grouped by type as presented in Table 4-3.

In practice, a range of applicable BMP types may be implemented at many of the individual proposed BMP locations identified in Figure 4-1 (or additional sites yet to be identified). At the planning stage, however, the specific BMPs and location of implementation are unknown. Therefore, an approximate average pollutant removal efficiency was assumed for each pollutant based on the six BMP groups presented in Table 4-3. The pollutant reductions achieved will ultimately depend on the specific BMPs implemented and may vary widely according to the associated pollutant removal efficiencies. The Partners understand that many treatment-oriented BMPS (e.g., WASCBs) have limited nitrogen/nitrate reduction potential. To address this, additional source control and pollution prevention activities are included in the implementation schedule (e.g., development of fertilizer management plans, see Table 6-4).

The estimated total pollutant load reduction for each pollutant in a given catchment (i.e., area tributary to a BMP) may be estimated as:

$$\Delta W_j = \sum_{n}^{i} A_i * W_{i,j} * \%_{reduction\ j}$$

Where: ΔW_j = total change in load of pollutant j

A_i	=	area tributary to BMP *i*
$W_{i,j}$	=	unit area load of pollutant *j* tributary to BMP *i*
%reduction j	=	approximate average removal efficiency for pollutant j
n	=	*number of BMPs located within the catchment*

Table 4-4 presents an example of this analysis applied in the Middle Fork Zumbro River planning subwatershed, which includes 50 potential BMP locations treating approximately 5,700 acres. The corresponding cost may be estimated using the present value (or annualized) cost averaged for the six BMP groups in Table 4-3 and multiplying by the total treated area in the Middle Fork Zumbro River planning subwatershed.

For the purposes of developing planning level costs associated with these practices to be included in the implementation schedule (see Table 6-4), an average project cost was estimated for each planning subwatershed. The average costs are based on the approximate average per acre BMP cost derived from the SAM documentation (and summarized in Table 4-3), average project treated area, and including an additional 50% to account for engineering and design, permitting, maintenance, and other associated costs that are excluded from the cost values included in the SAM documentation (RESPEC, 2017). Average project costs for planning range from approximately $3,000 per project in the Lake Pepin planning subwatershed to $43,000 in the South Branch Middle Fork Zumbro River planning subwatershed.

Table 4-3 Summary of BMP pollutant removal efficiencies and unit costs

BMP Group	Specific BMP	Average TN Reduction (%)			Average TP Reduction (%)			Average Sediment Reduction (%)	Approx. cost per treated acre[4] (excluding engineer., design, etc.)	Approx. cost per treated acre[4] (including engineer., design, etc.)
		Surface[1]	Tile Drainage[1]	Groundwater[1]	Surface[1]	Tile Drainage[1]	Groundwater[2]	Surface Runoff[1]		
Nutrient Management	Nutrient Management	0	12	12	4	0	3	0	$90	$135
	Nutrient Management and Manure Incorporation	10	14	14	13	0	8	0		
Tile Management	Controlled Tile Drainage	0	43	0	0	43	16	0	$220	$330
	Alternative Tile Intakes	66	0	0	66	0	25	90		
Buffers & Filter Strips	Riparian Buffers, 16 ft wide (replacing row crops)	43	0	35	50	0	28	74	$20	$30
	Riparian Buffers, 50 ft wide (replacing row crops)	66	0	35	67	0	38	84		
	Riparian Buffers, 100 ft wide (replacing row crops)	79	0	35	80	0	46	90		
	Filter Strips, 50 ft wide (cropland field edge	66	0	35	67	0	38	84		
	Riparian Buffers, 50 ft wide (replacing pasture)	44	0	23	45	0	28	50		
Crop Management	Conservation Crop Rotation	42	42	42	44	0	17	75	$600	$900
	Conservation Cover Perennials	91	93	93	84	0	48	96		
	Corn & Soybeans with Cover Crop	28	28	28	29	0	16	74		
	Short-Season Crops to Cover Crop	43	43	43	29	0	16	74		
	Corn & Soybeans to Rotational Grazing	75	75	75	59	0	16	75		
Till Practices	Reduced Tillage (30% + residue cover)	33	0	0	33	0	19	50	$130	$195
	Reduced Tillage (no till)	79	0	0	68	0	38	80		
WASCB	Water and Sediment Control Basin (cropland)	82	0	0	85	0[3]	0[e]	90	$50	$75
Average		**~30%**			**~25%**			**~60%**	**$ 180**	**$ 270**

Notes:

(1) Pollutant removal efficiencies are based on Table A1 of SAM BMP Reference Manual (RESPEC, 2017);

(2) Pollutant removal efficiencies not included in Table A1 of SAM BMP Reference Manual (RESPEC, 2017) and are based on Table 6-2 of the same document;

(3) WASCB total phosphorus removal efficiencies for tile drainage and groundwater are based on MPCA comment letter;

(4) Estimated costs are present value assuming 10-year lift extrapolated based on Table 5-1 of SAM BMP Reference Manual (RESPEC, 2017)

Table 4-4 Summary of estimated pollutant removal in the Middle Fork Zumbro River planning subwatershed

Pollutant	Total Pollutant Load[1]	Total Load to all potential BMPs[1]	Total Reduction	Reduction per BMP location
Total Nitrate	2,645,500 lbs/yr	107,650 lbs/yr	32,300 lbs/yr	646 lbs/yr
Total Phosphorus	114,100lbs/yr	4,643 lbs/yr	1,393 lbs/yr	27.9 lbs/yr
Sediment	35,800 tons/yr	1,460 tons/yr	873 tons/yr	17.5 tons/yr

(1) Sediment, TN, and TP loading based on HSPF model results

4.2.3 Establishing Field Scale Pollutant Load Reduction Goals for Subwatersheds

The methods described in Sections 4.2.1 and 4.2.2 provide estimates of pollutant loading, pollutant reduction, and associated cost averaged over a range of possible BMP types implemented at the locations identified in Figure 4-1. In practice, water quality improvement practices may not be implemented at all locations identified in Figure 4-1. Some potential BMP locations identified in Figure 4-1 may ultimately not be suitable for field practices, while additional projects may be identified at other locations with different pollutant loading and spatial characteristics. In addition, fiscal resources may limit the Partnerships ability to implement all planned projects during the 10-year life of this Plan.

Therefore, the Partners established pollutant reduction goals corresponding to the planned implementation of a given number of projects within each planning subwatershed. The number of planned projects is shown distributed among the planning area in item SWQ-1 of the Implementation Schedule (see Table 6-4). The corresponding pollutant load reduction goals are presented in Table 5-3. The number of projects planned for each planning subwatershed and timing of implementation are based on the determination of priority areas (see Section 3.3) and implementation budget (see Section 6).

4.2.4 Establishing Resource-specific Pollutant Load Reduction Goals

The methods described in Sections 4.2.1 and 4.2.2 allow the Partners to estimate the potential pollutant reduction achieved by a BMP at the point of implementation. These reductions may be summed to estimate the total pollutant load reduction at field scale. However, this method may not accurately reflect the cumulative pollutant reduction achieved at a location downstream in (or beyond) the catchment or planning subwatershed. Modeling tools that consider the spatial location of BMPs and flow routing are necessary to realistically estimate cumulative pollutant load reductions (and corresponding pollutant concentrations) in streams, lakes, and other resources located downstream of the implemented BMP(s).

4.2.4.1 Estimating Pollutant Reduction using HSPF-SAM

The Partnership used the HSPF-SAM watershed assessment tool to estimate the cumulative in-stream pollutant load reduction at the outlets of the eight planning level watersheds. The HSPF-SAM tool allows the user to select the type of BMP, extent of implementation (e.g., acres, stream reach length) applied to each planning subwatershed to evaluate potential future implementation scenarios. Multiple BMPs may

be applied to each planning subwatershed, and the user may adjust BMP treatment effectiveness if so desired.

At the planning level, the specific type and number of BMPs to be implemented is unknown. It is assumed that many of the practices implemented will be pollutant trapping BMPs (e.g., water and sediment control basins) or cover crops. For both the Zumbro River watershed and the Mississippi River-Lake Pepin watershed, separate HSPF-SAM model runs were performed assuming the following implementation:

- 30% of applicable area treated with water and sediment control basins
- 50% of applicable area treated with water and sediment control basins
- 30% of applicable area treated with corn and soybean cover crops
- 50% of applicable area treated with corn and soybean cover crops

The pollutant removal efficiencies used in each HSPF-SAM model run were set to the values presented in Table 4-3 – note that these removal efficiencies are based on Table A.1 of the HSPF-SAM BMP Reference Manual (RESPEC, 2017) and represents lower nitrogen removal efficiencies for tiled areas than the default values of the HSPF-SAM model for similar BMPs. The treated area and pollutant loading output from these model runs were used to determine a "per treated acre" pollutant reduction (averaged from both BMP types) at the downstream end of each planning subwatershed (e.g., North Fork Zumbro River). For planning subwatersheds with multiple outlets (e.g., Hay Creek) the pollutant load at each outlet tributary was summed to get a subwatershed load. The "per treated acre" pollutant reduction was multiplied by the estimated acres treated during the 10-year Plan implementation (according to the implementation schedule, see Table 6-4) in order to calculate the cumulative pollutant reduction at the outlet of each planning subwatershed. These pollutant reductions, estimated for total phosphorus, total suspended sediment, and total nitrogen, are presented in Table 5-3 under "10-year Plan Goals."

4.2.5 Tracking Pollutant Reduction Benefits through Implementation

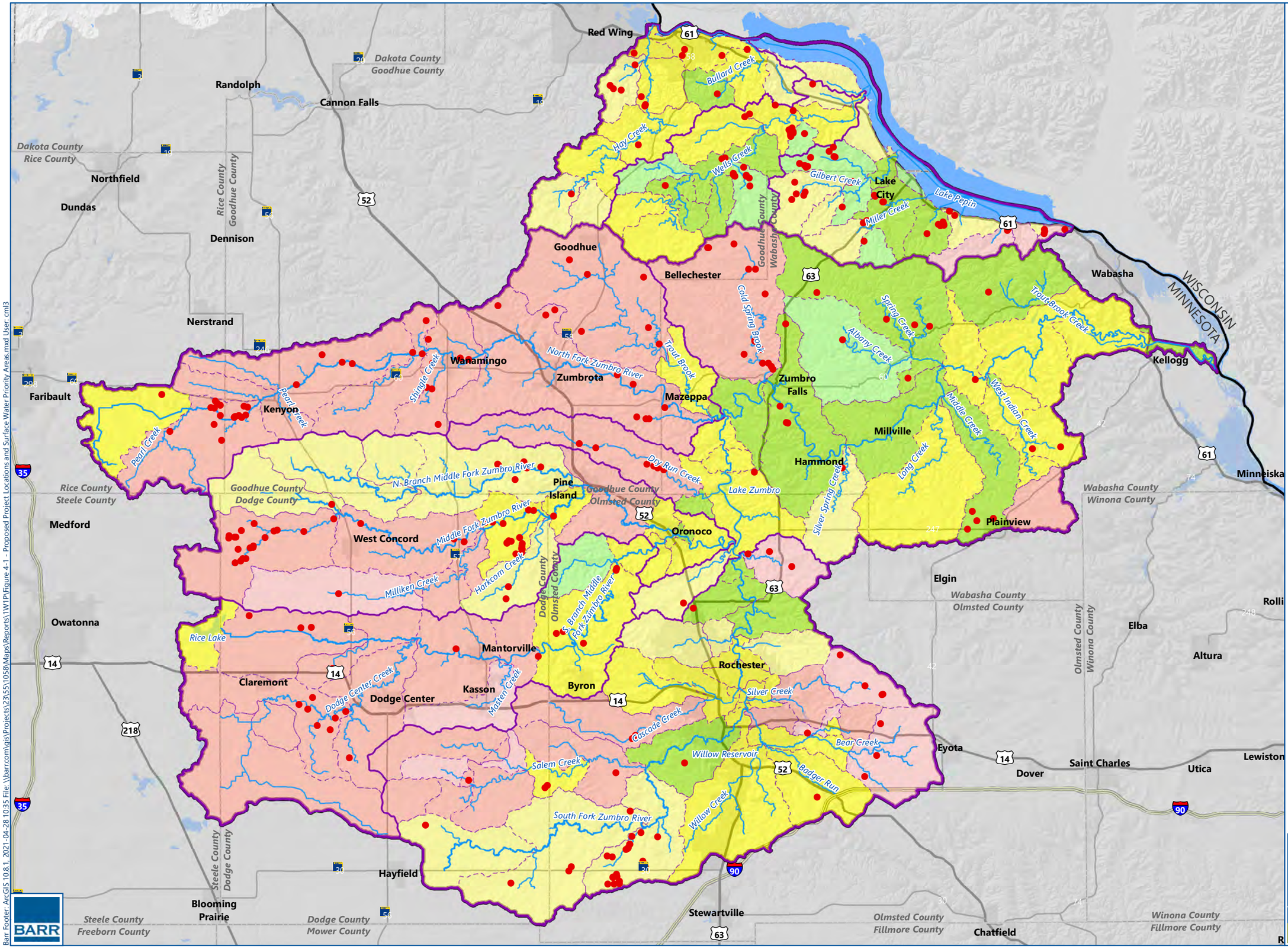
The methods described in Section 4.2.1 result in a tabular output for each planning subwatershed. The tabular output includes the following information for each proposed BMP location as a separate row within a spreadsheet:

- Drainage area (i.e., treated area)
- Sediment loading (tons/year)
- Total nitrogen loading (lbs/year)
- Total phosphorus loading (lbs/year)

When a BMP is implemented, the user may select the specific BMP and associated pollutant reduction estimates (i.e., percent reduction relative to existing load) based on SAM documentation (i.e., Tables 6-1 through 6-3 in the Documentation of the BMP Database Available in the Scenario Application Manager (RESPEC, 2017), and summarized in Table 4-3 of this Plan) or enter user-defined pollutant reduction estimates based on case-specific considerations. The user may also enter an "effective treated area" that differs from the total drainage area based on site-specific BMP design. The spreadsheet calculates the corresponding load reduction (i.e., mass/time) estimated for the BMP (based on existing field-scale load

estimates from HSPF modeling). The spreadsheet sums the cumulative benefit of BMPs implemented at multiple locations throughout the planning subwatershed. The Partners may use this tool to track BMP implementation over time and compare the cumulative benefits to the field-scale pollutant reduction goals presented in Table 5-3.

State agencies may have interest in overall pollutant load reductions achieved by BMPs and pace of progress relative to surface water quality goals established for individual resources. The Partnership will track project implementation (location, practice, estimated field-scale pollutant reduction) as projects are implemented. This data will be compiled approximately 5 years into Plan implementation to allow HSPF (or similar) water quality modeling to be performed to estimate cumulative in-resource pollutant reduction (and corresponding pace of progress towards meeting in-resource water quality goals). Cumulative pollutant reduction relative to TMDL goals will be assessed at the in-resource level. Note that while only a few projects are within the direct drainage area of Lake Zumbro, approximately 90 proposed project sites are located upstream of Lake Zumbro and will contribute to the cumulative reduction of nutrients to Lake Zumbro, specifically phosphorus and sediment.

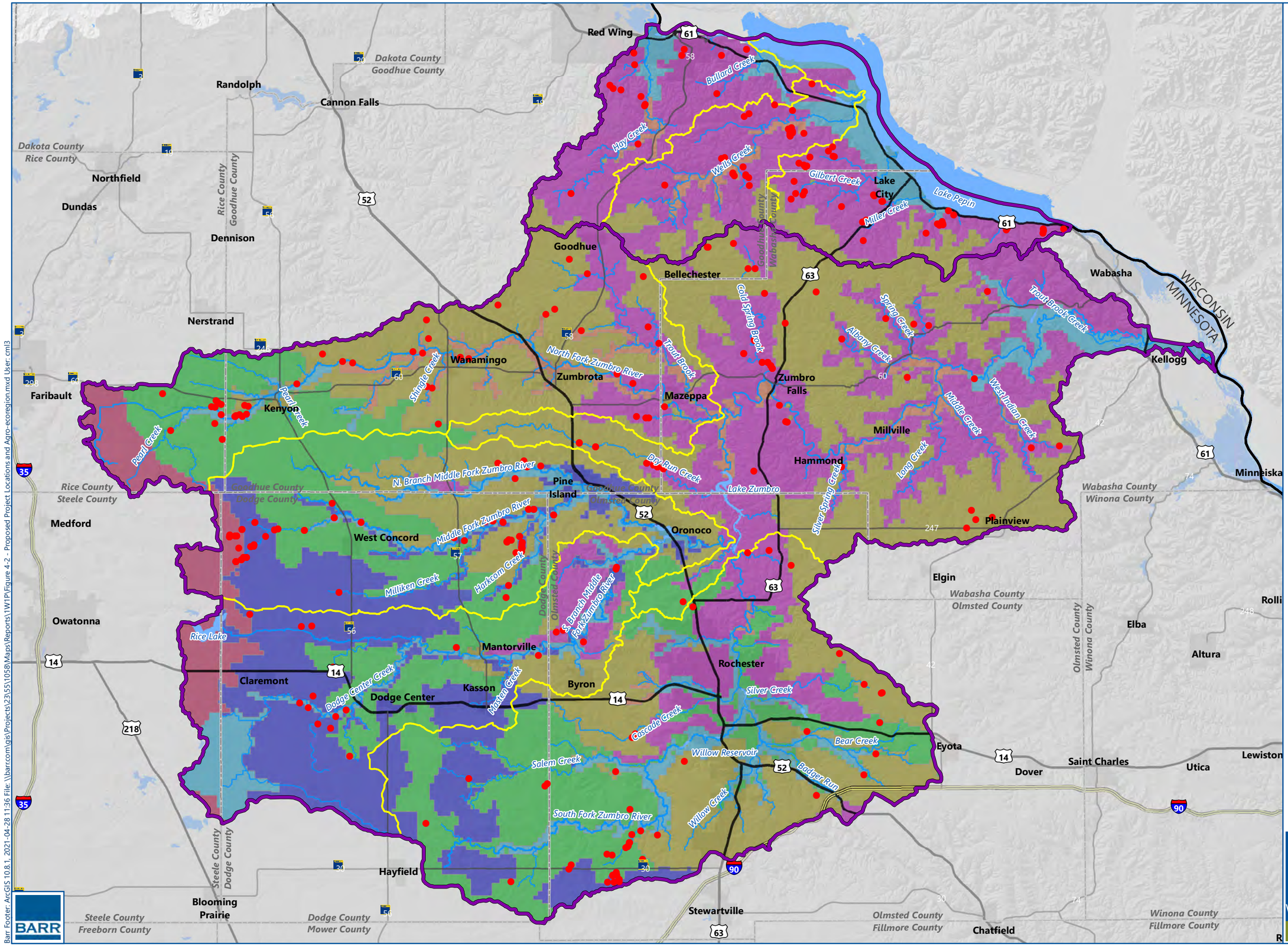


PROPOSED PROJECT LOCATIONS AND SURFACE WATER PRIORITY AREAS

WAGZ Comprehensive Watershed Management Plan

FIGURE 4-1

BARR

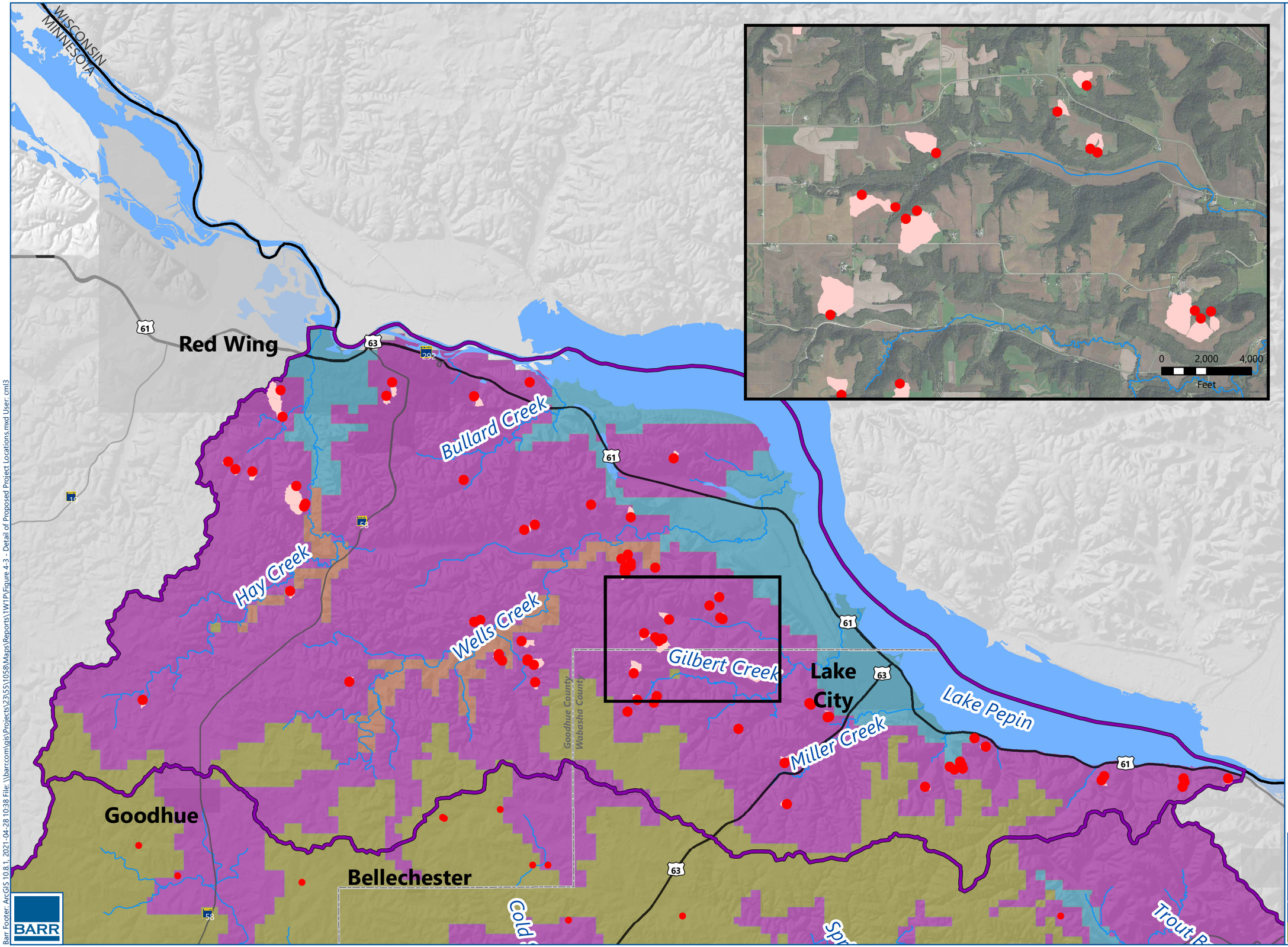


POTENTIAL PROJECT LOCATIONS AND AGRO-ECOREGIONS
WAGZ Comprehensive Watershed Management Plan

FIGURE 4-2

BARR

Barr Footer: ArcGIS 10.8.1, 2021-04-28 11:36 File: \\barrcom\gis\Projects\23\55\1058\Maps\Reports\1W1P\Figure 4-2 - Proposed Project Locations and Agro-ecoregion.mxd User: cml3



Study Area
Watercourses
Pond or Lake
Municipal Boundary
County Boundary
State Boundary
Potential Project Sites
Project Drainage Areas

Agro-ecoregions

Alluvium & Outwash
Blufflands
Rochester Plateau
Steeper Alluvium

Argo-ecoregions used in ZWP top 50 BMP analysis

DETAIL OF PROPOSED PROJECT LOCATIONS
WAGZ Comprehensive Watershed Management Plan
FIGURE 4-3

5 Establishment of Measurable Goals

This section summarizes the development of measurable goals to address the issues prioritized by the Partners (see Section 3). Goals may be applicable watershed-wide or focused on specific spatial areas, natural resources, or target audiences. Goals should also consider the prevention of future water and natural resource management issues.

The measurable goals developed for this Plan are presented in Table 5-2 and Table 5-3.

5.1 Goal Development Process

The Partners developed measurable goals through an iterative process performed over several meetings involving the Planning Work Group, Technical Advisory Group, and Policy Committee (see Table 2-1).

In developing measurable goals, the Partners considered a range of available information, including:

- Goals from existing management plans, studies, reports, data and information, including:
    - County Water Management Plans
    - Mississippi River-Lake Pepin WRAPS report
    - Mississippi River-Lake Pepin TMDL report
    - Rochester Comprehensive Plan and Surface Water Management Plan
    - Zumbro River WRAPS report
    - Zumbro River TMDL report
    - Zumbro River Watershed Landscape Stewardship Plan
    - Zumbro River GRAPS report
- Results from previous modeling/analysis efforts:
    - Zumbro River priority project identification
    - Mississippi River-Lake Pepin Scenarios Report
- Existing implementation programs and schedules
- Input received during Waterside Chats (see Section 2.5 and Appendix B)
- Input from the Planning Work Group
- Input from Technical Advisory Group members
- Input from Policy Committee members

Generally, goals were developed first at a qualitative level and refined to include quantifiable elements where supported by data availability. In situations where existing data is not sufficient to develop a quantitative goal, the goals focus on collecting and interpreting information to support developing more quantitative future goals. Measurable outputs for each goal were selected appropriate to the level of quantification. Emphasis was given to goals that address Level 1 priority issues, although goals were developed to address all nine priority issue areas. To address the "degraded surface water quality" issue area, the Partners developed goals that are specific to particular water resources and pollutants of concern; these goals were separated into a second table specific to surface water quality (Table 5-3).

The Plan goals are divided into long-term and short-term (i.e., 10-year) goals. **Long-term goals** describe desired future conditions (e.g., achieve applicable water quality standards) that may not be achievable within the 10-year life of the Plan. Therefore, the Plan identifies **10-year goals** as reasonable progression towards the desired future condition. The Partners may refine long-term and 10-year goals as they evaluate progress during Plan implementation.

In some cases, goals are anticipated to be refined or added to over the 10-year life of this Plan. For example, the Plan includes a goal to reduce runoff by an average of 0.25 inches across the watershed (goal FLD-1 in Table 5-2). More specific runoff reduction/storage goals will be developed for individual subwatersheds based on future hydrologic and hydraulic modeling to be completed during Plan implementation (goal FLD-2 in Table 5-2). Modeling results will further inform the overall watershed runoff reduction goal and allow the Partners to pursue the overall goal in a manner that maximizes available opportunities and achieves associated goals (e.g., reducing flood risk, goal FLD-4).

5.2 Measurable Goals and Associated Details

The measurable goals developed for this Plan are presented in Table 5-2 and Table 5-3. Table 5-2 includes goals to address all priority issues. Table 5-3 presents a subset of goals to address the "degraded surface water quality" issue area specific to the eight planning subwatersheds and applicable pollutants and/or stressors.

Table 5-2 and Table 5-3 includes the following information:

Priority Issue – Goals are grouped according to priority issues. Level 1 issues appear first in Table 5-2, followed by Level 2 and Level 3 issues. Table 5-3 includes goals addressing the Level 1 issue area of degraded surface water quality.

Subwatershed or Area – This field identifies the spatial area (e.g., subwatershed) or natural resource (e.g., wetlands) where the goal applies.

Specific Issue, Pollutant, or Stressor – This field groups or subdivides goals at a level that is more specific than Level 1, Level 2, or Level 3. For example, degraded surface water quality is subdivided into goals applicable to specific stressors that contribute to water quality impairments (e.g., phosphorus, total suspended solids). Similarly, groundwater contamination is subdivided into goals addressing nitrate and goals addressing *E. coli*.

Long-term Goal – This field presents the desired future condition for a resource or area that is likely to be achieved beyond the 10-year life of this Plan. For priority issues related to water quality, the long-term goal includes achieving applicable water quality standards.

Long-term Goal Rationale – This field presents the origin or basis for the long-term goals that extend beyond the life of this Plan. This field may reference existing documents (e.g., State water quality standards) or input from the Planning Work Group, Technical Advisory Group, and/or Policy Committee.

10-year Goal – This field presents goals estimated to be achieved within 10 years through the implementation of this Plan. Where existing data and analyses allow, quantitative goals have been assigned. Qualitative goals have been identified where data gaps exist, with an emphasis on filling those data gaps.

10-year Goal ID– This field presents an identifier unique to each goal such that implementation tasks presented in Table 6-4 may be cross-referenced to applicable goals.

10-year Goal Rationale or Source– This field presents the origin or basis for the 10-year goal. This field may reference existing documents (e.g., Zumbro River WRAPS report) or input from the Planning Work Group, Advisory Committee, and/or Policy Committee.

10-year Goal Measures – This field includes quantitative measures or outputs that will be used to assess progress towards the 10-year goal and long-term goal. Measures may include number of implemented practices, inventory results, modeling results, reports or other measures tailored to the individual goal. Measures are cross-referenced to items included in the implementation schedule (Table 6-4).

Related Implementation Items – This field includes the "Item ID(s)" of items included in the implementation schedule (Table 6-4) that are related to the 10-year goal. In many cases, multiple implementation items are associated with the goal.

Throughout the implementation of this Plan, the Partners intend to leverage their existing relationships and expertise to continue to provide technical services for a range of applicable activities. Such assistance is not specifically listed within the individual issue goals but remains a priority and focus for the Partners during implementation.

5.2.1 Level 1 Goals – Groundwater Contamination

Long-term goals addressing groundwater contamination in Table 5-2 are based on Federal and State drinking water standards and Minnesota Department of Health (MDH) health risk limits (HRLs) for nitrate and *Escherichia coli* (*E. coli*), as well as PWG goals for well management and emerging contaminants. 10-year goals (see Table 5-2) are focused on monitoring, education, and other activities needed to fill data gaps and address sources of *E. coli* and nitrates within the planning area. 10-year Plan goals were developed by the Partnership with significant input from the Technical Advisory Group, including the MDA, MDH, and MPCA in particular.

Goals addressing groundwater contamination are generally applicable throughout the planning area. Specific activities to address groundwater contamination in the implementation schedule (see Table 6-4) are targeted to specific geographic areas and/or audiences where the most benefit is anticipated (see also groundwater priority areas presented in Figure 3-6Figure 3-7 and Figure 3-8 and discussed in Section 3.3.2). The MDA has developed the Nitrogen Fertilizer Management Plan (NFMP) and Groundwater Protection Rule, which outline a process to prevent or minimize the impact of nitrogen fertilizer on groundwater. In combination, the NFMP and Groundwater Protection Rule, provide a

comprehensive effort to address nitrate in groundwater through voluntary adoption of practices and regulation, if necessary. . Actions outlined in the NFMP include working at the local level to implement nitrogen fertilizer management and other practices to mitigate nitrate impacts and protect groundwater.

Additional information is available from the MDA regarding the:

- Nitrogen Fertilizer Management Plan: https://www.mda.state.mn.us/pesticide-fertilizer/minnesota-nitrogen-fertilizer-management-plan
- Groundwater Protection Rule: https://www.mda.state.mn.us/nfr

5.2.2 Level 1 Goals – Excessive Flooding

Long-term goals related to excessive flooding include reducing runoff and increasing storage within the planning area, mitigating increases in peak flows in streams, and reducing flood risk to structures and major infrastructure. These long-term goals are consistent with Zumbro WRAPS, Mississippi River-Lake Pepin WRAPS, and local resource management plans. 10-year goals are focused on steps needed to achieve long-term goals, including the following (see Table 5-2):

- increasing watershed storage (i.e., retention) by 22,000 acre-feet (equivalent to 0.25 inches of runoff over the watershed)
- establishing subwatershed-specific storage and peak flow goals based on modeling results
- characterizing flood risk in un-modeled portions of the watershed
- managing and restoring floodplain areas to reduce risk to structures and infrastructure

Increased stormwater retention (i.e., the long-term storage of stormwater on-site) and detention (the short-term storage and delayed discharge of stormwater) are critical components of the overall strategy to mitigate or minimize increases in peak streamflow (and minimize the impacts of associated flooding) observed in the watershed (see Section C.9). Increased hydrologic storage is an opportunity to reduce the impacts of flooding; hydrologic storage refers to places in the landscape that provide temporary or permanent water storage, including surface depression storage, floodplain storage, wetlands, and soil storage. Increased stormwater retention also reduces pollutant loading and erosion, leading to water quality benefits.

Although reductions in runoff volume are not necessarily proportional to reductions in peak flows, significant storage volumes likely occupying large areas will be necessary to achieve the Partnership's long-term goals. A range of potential watershed storage values were considered by the Partnership in establishing the 0.25-inch (i.e., 22,000 acre-feet) retention goal (see Table 5-1). Table 5-1 presents a range of runoff retention (in inches) as a percentage of average annual runoff (for the 1981-2019 approximate climate normal period), an equivalent storage volume, and corresponding footprints and depths.

Through discussion with the Advisory Committee, the PWG ultimately recommended an initial storage (i.e., retention) goal of 0.25-inch (i.e., 22,000 acre-feet), which was adopted by the Policy Committee; the Partners believe this goal is achievable within the 10-year planning timeline while maintaining progress towards long-term goals related to excessive flooding.

Table 5-1 Potential watershed storage depths, volumes, and equivalent runoff

Inches of Runoff	Percent of Annual Runoff (1991-2019)	Storage Volume (acre-ft)	Storage Area (acres and % of total watershed) based on Average Depth (in feet)							
			0.5 ft		1 ft		2 ft		4 ft	
			acres	% area	acres	% area	acres	% area	acres	% area
0.25	2.2%	22,053	44,107	4.2%	22,053	2.1%	11,027	1.0%	5,513	0.5%
0.5	4.4%	44,107	88,213	8.3%	44,107	4.2%	22,053	2.1%	11,027	1.0%
0.75	6.6%	66,160	132,320	12.5%	66,160	6.3%	33,080	3.1%	16,540	1.6%
1.0	8.8%	88,213	176,427	16.7%	88,213	8.3%	44,107	4.2%	22,053	2.1%
1.25	11.0%	110,267	220,533	20.8%	110,267	10.4%	55,133	5.2%	27,567	2.6%
1.5	13.2%	132,320	264,640	25.0%	132,320	12.5%	66,160	6.3%	33,080	3.1%

Updated modeling and hydrologic assessments are currently being performed for portions of the planning area. The planning area surrounding Rochester has been modeled with hydrologic and hydraulic models of varying scales. Additional analysis of previously unmodeled areas is planned to further characterize flood risk and establish subwatershed-specific goals; this activity is included in the Plan implementation schedule (see Table 6-4).

5.2.3 Level 1 Goals – Degraded Surface Water Quality

Long-term surface water quality goals presented in Table 5-2 applicable watershed-wide are based on applicable water quality standards (MN Rules 7050) and the Minnesota Nutrient Reduction Strategy (MPCA, 2014). Goals are defined for individual pollutants/stressors, including:

- Total phosphorus (TP)
- Total nitrogen (TN)
- Total suspended solids (TSS)
- *Escherichia coli (E. coli)*
- Fish Index of Biological Integrity (FIBI)
- Macroinvertebrate Index of Biological Integrity (MIBI)

Long-term goals specific to individual planning subwatersheds (see Table 5-3) are similar but also incorporate target load reductions based on the TMDLs, where available.

Plan (i.e., 10-year) surface water quality goals are specific to the eight planning subwatersheds and are presented in Table 5-3. 10-year goals include cumulative target load reductions for nitrogen, phosphorus, and sediment for each subwatershed based on existing pollutant loading and estimated number of projects to be implemented. These goals were developed using established water quality tools and following the methodology described in Section 4.2. Note that while the discussion of surface water

quality degradation (see Section 3.2.3) specifically references nitrate, goals are presented as total nitrogen for consistency with available modeling tools.

The applicability of existing tools to directly estimate benefits relative to *E. coli* loading, FIBI, and MIBI is limited; thus, quantitative goals related to these parameters are not defined in this iteration of the Plan. Instead, 10-year goals for these pollutants/stressors focus on the implementation of strategies/practices specifically identified to address these issues, including those identified in the Zumbro WRAPS and Mississippi River-Lake Pepin WRAPS reports.

5.2.4 Level 1 Goals – Accelerated Erosion and Sedimentation

Long-term goals related to accelerated erosion and sedimentation include reducing the occurrence and severity of eroded streambanks, reducing loss of sediment from the landscape, and reducing TSS concentrations in streams and rivers to achieve water quality standards (see Table 5-2). 10-year goals include increasing runoff retention and storage within the watershed, increasing the use of cover crops and vegetated buffers, and implementing streambank stabilization and sediment reduction BMPs. Accelerated erosion and sedimentation issues are closely linked to degraded surface water quality. As such, additional 10-year goals include reductions in TSS loading in individual subwatersheds (see Section 5.2.1 and Table 5-3).

5.2.5 Level 2 Goals – Degraded Soil Health, Landscape Resiliency and Altered Hydrology, and Threats to Fish, Wildlife, and Habitat

Table 5-2 includes long-term and 10-year goals addressing the Level 2 issues of degraded soil health, landscape resiliency and altered hydrology, and threats to fish, wildlife, and habitat. Goals addressing these issues acknowledge existing data gaps while simultaneously recognizing the opportunity to achieve benefits through proactive action by the Partners. 10-year goals include further study to quantify the use and benefit of soil health practices (such as cover crops, perennial vegetation, and crop residue management), increasing the use of cover crops, forest cover, and perennial vegetation, and preserving wetlands and sites of biodiversity significance. Goals addressing threats to fish, wildlife, and habitat are based, in part, on applicable State rules and MDNR program guidance. The MDNR provided watershed-specific guidance in goal development through staff participation in the Advisory Committee.

The Partners recognize that some of the activities performed to address issues of degraded surface water quality, accelerated erosion and sedimentation, and excessive flooding may indirectly make progress towards Level 2 goals. For example, increased runoff retention achieved through select water quality field practices may simultaneously improve soil health and landscape resiliency.

5.2.6 Level 3 Goals – Threatened Groundwater Supply and Reduced Livability and Recreation

Table 5-2 presents long-term and 10-year goals addressing the Level 3 issues of threatened groundwater supply and reduced livability and recreation. Goals addressing these issues are generally focused on education and cooperative action to support other entities that are acting in a primary role. The implementation schedule identifies the specific activities to achieve these goals (see Table 6-4).

Table 5-2 WAGZ Plan Measurable Goals by Issue Area

Issue Level	Priority Issue	Specific Issue, Pollutant, or Stressor	Long-term Goal	Long-term Goal Rationale	10-year Goal	10-year Goal ID	Related items from Implementation Schedule (Table 6-4) and associated measures/outputs
Level 1	Groundwater Contamination	Nitrate	Achieve decreasing nitrate trends in all public drinking water supplies and private wells that are tested	US EPA Drinking Water Standards and Health Advisory Tables (2018); MDH Drinking Water Standards and Guidance	Provide annual education/outreach opportunities to all communities with MDH approved Wellhead Protection Plans, and BMP technical assistance for all moderate and high vulnerable public water suppliers	GWQ-1	10 workshops (GWQ-14); 10 articles/handouts (GWQ-12)
					In groundwater priority areas (see figures), provide all private well owners access to well testing programs and education about water quality specific to drinking water	GWQ-2	Number of tested wells (1,000 wells over 10 years) (GWQ-8); Groundwater quality monitoring report (GWQ-7); 20 educational articles/handouts (GWQ-13); 10 well testing/maintenance clinics (GWQ-20);
					Establish nitrate-nitrogen trends for all public systems with average concentrations ≥3ppm over the last 10 years; identify systems with chronically high nitrate concentrations relative to the MCL	GWQ-3	Monitoring plan (GWQ-10) Groundwater monitoring report (GWQ-7); Groundwater quality monitoring database (GWQ-15); Nitrate trend analysis of tested wells and identification of priority systems (GWQ-9)
					Establish nitrate-nitrogen trends for monitored private wells with average concentrations ≥3ppm over the last 10 years located in groundwater priority areas; identify wells/areas with chronically high nitrate concentrations relative to the MCL	GWQ-4	Monitoring plan (GWQ-10) Groundwater monitoring report (GWQ-7); Groundwater quality monitoring database (GWQ-15); Nitrate trend analysis of tested wells and identification of priority systems (GWQ-9)
					Reduce nitrogen loading to groundwater through the implementation of field practices and reduction of fertilization rates/increased nitrogen use efficiency (see goal SWQ-1 and SLH-3)	GWQ-5	Implementation of applicable BMPs (e.g., cover crop, reduced fertilizer application) - number of projects and estimated nitrogen load reduction (see Table 5-3); Number of nutrient, fertilizer, and/or manure management plans (100 plans) (GWQ-16); Increased acres of cover crops/perennial vegetation (2,000 acres) (ESC-6); Field days/site visits to promote soil health pratices (GWQ-17); Engagement of a nutrient management expert as shared service (GWQ-18);
					Minimize groundwater contamination resulting from infiltration in the Decorah Edge, near sinkholes, and other areas of Karst geology through regulation, incentives, and education	GWQ-6	Reviewed/revised ordinances guiding or regulating infiltration practices in Karst and other vulnerable areas (GWQ-21); Practices to protect/maintain "Decorah Edge Support Areas" (e.g., 3,000 acres committed to RIM/easements, 30 workshops) (LR-12); 10 well testing/maintenance clinics (GWQ-20); Targeted outreach to 100 property owners in priority areas (LR-12);

Table 5-2 WAGZ Plan Measurable Goals by Issue Area

Issue Level	Priority Issue	Specific Issue, Pollutant, or Stressor	Long-term Goal	Long-term Goal Rationale	10-year Goal	10-year Goal ID	Related items from Implementation Schedule (Table 6-4) and associated measures/outputs
Level 1	Groundwater Contamination	*E. coli*	Reduce the occurrence of *E. coli* contamination of groundwater supplies	US EPA Drinking Water Standards and Health Advisory Tables (2018); MDH Drinking Water Standards and Guidance	In groundwater priority areas (see figures), provide all private well owners access to well testing programs and education about water quality specific to drinking water (repeated from GWQ-3)	GWQ-7	Number of tested wells (1,000 wells over 10 years) (GWQ-8); Groundwater quality monitoring report (GWQ-7); 20 educational articles/handouts (GWQ-13); 10 well testing/maintenance clinics (GWQ-20);
					Reduce *E. coli* loading through management of SSTS, un-sewered discharges, and feedlots	GWQ-8	Projects to address non-functioning SSTS (500 over 10 years) (GWQ-4); Projects to improve feedlots (25 over 10 years) (SWQ-8); Number of nutrient, fertilizer, and/or manure management plans (100 plans) (GWQ-16);
		Emerging contaminants	Understand and minimize the environmental and public health risks from emerging contaminants in groundwater	Advisory Committee and Planning Work Group; MDH guidance	Increase understanding of emerging contaminant presence in the watershed through groundwater quality monitoring and education efforts.	GWQ-9	Number of tested wells (1,000 wells over 10 years) (GWQ-8); Groundwater quality monitoring report (GWQ-7); 20 educational articles/handouts (GWQ-13); 10 well testing/maintenance clinics (GWQ-20);
		Well Management	Reduce risk to public health through appropriate well management and maintenance	Advisory Committee and Planning Work Group; MDH guidance	Reduce risk of *E. coli* and other contamination through sealing of abandoned private and public wells	GWQ-10	Number of sealed private wells - 200 private wells (GWQ-1) and 2 high capacity wells (GWQ-2);
					Reduce risk to public health from wells through education and outreach regarding proper construction, maintenance, and sealing/abandonment of wells	GWQ-11	20 educational articles/handouts (GWQ-13); 10 well testing/maintenance clinics (GWQ-20);
Level 1	Excessive Flooding	Peak Flow	Increase storage and reduce runoff throughout the Greater Zumbro River watershed	Zumbro River WRAPS; Lake Pepin-Mississippi River WRAPS; Advisory Committee	Increase storage in the watershed corresponding to 0.25 inches of runoff (approximately 22,000 acre-ft), prioritizing headwater, high yield watersheds (based on HSPF modeling), and/or wetland storage areas	FLD-1	Estimated increase in watershed storage (22,000 acre-ft) resulting from implemented projects (FLD-1); Number of stormwater capture/reuse projects (2 projects) (FLD-10); Analysis to identify/evaluate feasible impoundment locations (FLD-4); Outreach events to promote low impact design (10 events) (FLD-11); Outreach events to promote runoff-reducing soil health practices (20 events) (GWQ-17);
			Mitigate/minimize increases in peak flow (relative to currently estimated conditions) resulting from increased precipitation and climate trends	Zumbro River WRAPS; Lake Pepin-Mississippi River WRAPS; Advisory Committee	Develop storage and discharge goals at a subwatershed level (e.g., <10 square miles) based on hydrologic and hydraulic analysis, to inform planned implementation activities	FLD-2	Development of hydrologic and hydraulic models for unmodeled areas (FLD-3); Development of subwatershed specific flow reduction goals (FLD-4); Analysis to identify/evaluate feasible impoundment locations (FLD-4; FLD-5);
		Floodplains	Reduce flood risk to structures and major infrastructure	Advisory Committee and Planning Work Group; Rochester Comprehensive Plan	Characterize flood risk in un-modeled areas and identify priority areas	FLD-3	Development of hydrologic/hydraulic models for unmodeled areas (FLD-3); Development of subwatershed specific flow reduction goals (FLD-4); Analysis to identify/evaluate impoundment locations (FLD-2; FLD-5);
					Manage and restore floodplains to reduce the risk to structures and critical infrastructure located adjacent to water resources	FLD-4	Acres of stream-adjacent lands in RIM/CRWP (500 acres) (FLD-8); Number of projects to stabilize/restore degraded streambanks (10 projects, 5,000 feet) (ESC-4); Projects to reconnect/restore riparian floodplain (6 over 10 years) (FLD-7);

Table 5-2 WAGZ Plan Measurable Goals by Issue Area

Issue Level	Priority Issue	Specific Issue, Pollutant, or Stressor	Long-term Goal	Long-term Goal Rationale	10-year Goal	10-year Goal ID	Related items from Implementation Schedule (Table 6-4) and associated measures/outputs
Level 1	Degraded Surface Water Quality	Phosphorus	Meet Western Corn Belt Plains water quality standards in Rice Lake (TP≤90 ug/L, chl a≤30 ug/L, SD≥0.7 m) by reducing total phosphorus loading by 88% (see TMDL)	MN Water Quality Standard (MN Rules 7050.0222 Subp.3); Zumbro River Watershed TMDL (MPCA, 2019)	Reduce phosphorus loading through implementation of practices identified in the Zumbro River Watershed TMDL and WRAPS studies	SWQ-2	- Identify and Implement 3 projects to reduce phosphorus loading in the Rice Creek watershed (SWQ-2) - Evaluate of carp management need (SWQ-3) - Evaluate in-lake alum treatment need (SWQ-4)
			Meet site-specific water quality standards in Lake Zumbro (TP≤65 ug/L, chl a≤22 ug/L, SD≥0.9 m) by reducing total phosphorus loading consisted with TMDL	Technical Justification for Draft Lake Zumbro (55-0004-00) Site-Specific Eutrophication Standard (MPCA, 2017); Zumbro River Watershed TMDL (MPCA, 2019)	Reduce phosphorus loading by up to 3,040 lbs/year through implementation of practices identified in the Zumbro River Watershed TMDL and WRAPS studies	SWQ-3	- Implement field practices at up to 88 priority sites upstream of Zumbro Lake identified through HSPF pollutant loading model (SWQ-1); - Cumulative reduction in phosphorus loading to Lake Zumbro by 3,040 lbs/year (as estimated with HSPF or similar) (SWQ-1)
		Phosphorus	Reduce phosphorus loading by 45% by 2040	MN Nutrient Reduction Strategy (MPCA, 2014)	See **Table 5-3** for subwatershed-specific goals addressing degraded surface water quality, including load reduction and project implementation targets	SWQ-1	Implemented projects (number and/or estimated benefit); see **Table 5-3** for values
		Total Suspended Solids	Reduce TSS concentrations in watershed streams to <10% of samples exceeding 65 mg/L (April 1 – September 30)	MN Water Quality Standard (MN Rules 7050.0222 Subp. 3, Subp. 4)			Implemented projects (number and/or estimated benefit); see **Table 5-3** for values
		Nitrate	Reduce total nitrogen loading by 45% by 2040	MN Nutrient Reduction Strategy (MPCA, 2014)			Implemented projects (number and/or estimated benefit); see **Table 5-3** for values
		E. coli	Reduce *E. coli* concentrations in the Zumbro River, its tributaries, and tributaries to Lake Pepin to monthly geometric means <126 CFU/100 mL (April 1 - October 31)	MN Water Quality Standard (MN Rules 7050.0220 Subp. 3a.D, Subp. 4a.D, and Subp. 5a.D)			Implemented projects (number and/or estimated benefit); see **Table 5-3** for values
		Fish Index of Biological Integrity	Achieve the following Fish Indices of Biological Integrity for streams: - Southern Rivers: 49 - Southern Streams: 50 - Southern Headwaters: 55 - Southern Coldwater: 50	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016)			Implemented projects (number and/or estimated benefit); see **Table 5-3** for values; Monitoring of water quality in trout streams (SWQ-11)
		Macroinvertebrate Index of Biological Integrity	Achieve the following Macroinvertebrate Indices of Biological Integrity for streams: - Southern Streams (high gradient): 37 - Southern Forest Streams (low gradient): 43 - Southern Coldwater: 43	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016)			Implemented projects (number and/or estimated benefit); see **Table 5-3** for values
Level 1	Accelerated Erosion and Sedimentation	Erosion	Reduce the occurrence and severity of eroded streambanks	Advisory Committee	Increase average runoff retention by increasing watershed storage by 0.25 inches (22,000 acre-feet)	ESC-1	Estimated increase in watershed storage (22,000 acre-feet) resulting from implemented projects (FLD-1)
					Achieve and maintain full compliance with MN Buffer Law with emphasis on diverse, high quality buffers	ESC-2	Ongoing education and outreach reagrding buffers (ESC-2); Site visits to cricital areas to promote buffer implementation/maintenance (ESC-3);
					Stabilize degraded and eroded streambank areas through 10 projects covering up to 5,000 feet (estimated sediment reduction up to 500 tons/year)	ESC-3	Inventory of highly degraded streambank as identified by streambank inventory (ESC-9); Number of projects to stabilize/restore degraded streambanks (10 projects, up to 5,000 feet) (ESC-4); Number of projects supported via technical support (10 projects, up to 5,000 feet) (ESC-5);

Table 5-2 WAGZ Plan Measurable Goals by Issue Area

Issue Level	Priority Issue	Specific Issue, Pollutant, or Stressor	Long-term Goal	Long-term Goal Rationale	10-year Goal	10-year Goal ID	Related items from Implementation Schedule (Table 6-4) and associated measures/outputs
Level 1	Accelerated Erosion and Sedimentation	Total Suspended Solids	Reduce the sediment loading to downstream water resources through the expanded us of conservation practices	Zumbro River WRAPS; Lake Pepin-Mississippi River WRAPS; Advisory Committee	Increase the use of cover crops, perennial vegetation, and conservation till strategies relative to baseline (established via implementation item SLH-4) (repeated from soil health goals)	ESC-4	Increased acres of soil health practices (2,000 acres) (ESC-6); Estimated/modeled reduction in sediment loading (see Table 5-3 for values, SWQ-1); 10 outreach events with agra-business (ESC-8); 5 demonstration projects to promote soil health BMPs (SLH-3)
			Reduce TSS concentrations in watershed streams to <10% of samples exceeding 65 mg/L (April 1 – September 30)	MN Water Quality Standard (MN Rules 7050.0222 Subp. 3, Subp. 4)	Reduce sediment loading by approximately 14,000 tons/year (estimated at field scale) and 4,000 tons/year (at watershed outlet) through the implementation of field practices (see goal SWQ-1); See **Table 5-3** for subwatershed-specific goals	ESC-5	Implemented projects (number and/or estimated benefit), see Table 5-3 for values (SWQ-1); Number of projects to stabilize/restore degraded streambanks (10 projects, up to 5,000 feet) (ESC-4); Number of projects supported via technical support (10 projects, up to 5,000 feet) (ESC-5);
Level 2	Degraded Soil Health	Cover crops & perennial vegetation	Maintain and improve soil health to increase productivity while protecting and improving the environment	Planning Work Group and Advisory Committee; Stakeholder engagement	Quantify the use and benefit (e.g., water storage, reduced runoff, increased organic matter) of cover crops, perennial vegetation, till strategies, and residue management throughout the watershed	SLH-1	Increased acres of cover crops/perennial vegetation (2,000 acres) (ESC-6); Increased acres of pasture land conservation practices (1,000 acres) (ESC-7); Inventory of soil health best practices (SLH-4); Study and quantification of soil health practice benefits (e.g., reduced runoff, water storage, increased organic matter) (SLH-1)
					Implement educational programs to increase awareness of soil health best practices and community capacity to implement BMPs	SLH-2	Digital communication to promote soil health (10 communications) (SLH-2); Inventory of soil health best practices (SLH-4); 10 outreach events with agra-business (ESC-8); 20 field day events to tour demonstration projects (GWQ-17); Implemented demonstration projects (5 projects) (SLH-3); Investment in forestry conservtion program (SLH-7)
					Increase the use of cover crops, perennial vegetation, and conservation till strategies relative to baseline (established via implementation item SLH-4) (see Goal ESC-4)	SLH-3	Increased acres of cover crops/perennial vegetation (2,000 acres) (ESC-6); Increased acres of pasture land conservation practices (1,000 acres) (ESC-7); Inventory of soil health best practices (SLH-4); 20 field day events to tour demonstration projects (GWQ-17) 10 outreach events with agra-business (ESC-8); Distribute articles to promote soil health BMPs (10 articles) (SLH-2)
					Leverage political influence to promote regulatory and/or incentive-based programs that encourage sustainable agriculture and soil health	SLH-4	5 meetings with state legislators (SLH-6) Development of lobbying strategy (partners, actions, etc.) (SLH-6) Coordinated messaging on soil health issues (SLH-5)

Table 5-2 WAGZ Plan Measurable Goals by Issue Area

Issue Level	Priority Issue	Specific Issue, Pollutant, or Stressor	Long-term Goal	Long-term Goal Rationale	10-year Goal	10-year Goal ID	Related items from Implementation Schedule (Table 6-4) and associated measures/outputs
Level 2	Landscape Resiliency and Altered Hydrology	Altered Hydrology	Limit the adverse impacts to water quality, flooding, and ecology resulting from hydrologic alteration of the watershed	Planning Work Group and Advisory Committee; Stakeholder engagement Zumbro WRAPS; Lake Pepin-Mississippi River WRAPS	Increase storage in the watershed corresponding to 0.25 inches of runoff (approximately 22,000 acre-ft), prioritizing headwater and/or high yield watersheds (based on HSPF modeling) (from excessive flooding category)	LR-1	Estimated increase in watershed storage (22,000 acre-ft) resulting from implemented projects (FLD-1); Number of large-scale stormwater capture/reuse projects (2 projects) (FLD-10); Outreach events to promote low impact design (10 events) (FLD-11); Outreach events to promote runoff-reducing soil health practices (20 events) (GWQ-17);
					Manage and restore floodplains to reduce the risk to structures and critical infrastructure located adjacent to water resources (from excessive flooding category)	LR-2	Number of projects to stabilize/restore degraded streambanks (10 projects, 5,000 feet) (ESC-4); Develop invnetory of floodplain restoration opportunities (LR-2); Projects to reconnect/restore riparian floodplain (6 over 10 years) (FLD-7); 500 acres of floodplain added to conservation programs (FLD-8) ~~Updates to floodplain and related ordinances, as needed~~
					Increase the use of cover crops, perennial vegetation, conservation till strategies relative to established baseline (from soil health category)	LR-3	Increased acres of cover crops/perennial vegetation (2,000 acres) (ESC-6); Inventory of soil health best practices (SLH-4); 20 field day events to tour demonstration projects (GWQ-17); 10 outreach events with agra-business (ESC-8);
					Limit the increase of runoff from development through regulation, incentives, and low impact design	LR-4	Continued application of development/redevelopment with rate control (LR-3); Updates to stormwater and zoning ordinances (LR-3); 10 urban stormwater management workshops (FLD-11); 200 Cost-share projects for individual stormwater BMPs (e.g., raingardens) (LR-4)
		Landscape Resiliency	Enhance the ability of the landscape to mitigate impacts of climate change and increased precipitation and promote soil health, water quality, and water quantity benefits	Planning Work Group and Advisory Committee; Zumbro WRAPS; Stakeholder engagement; Lake Pepin-Mississippi River WRAPS	Protect and increase forest cover through site and climate appropriate plantings on 1,000 acres (based on Zumbro Land Stewardship Plan)	LR-5	Review and recommendations for ordinances updates, as needed (LR-5); 3 workshops/year promoting conservation programs (LR-12); Continued education and outreach (targeting 100 landowners) (LR-12); 1,000 acres of new/restored forest area (LR-8); Assitance provided to landowners for 10 forestry plans (FWH-5)
					Protect and increase wetland areas to promote soil health, water quality, and water quantity benefits	LR-6	Review and recommendations for ordinances updates, as needed (LR-5); 2 workshops/year promoting wetland functions (LR-7); Continued education and outreach (targeting 100 landowners) (LR-12); Review of ordinances protecting wetlands (LR-9); Targeted outreach to 100 landowners in high priority wetland areas (LR-10)
					Increase enrollment of lands in easement and/or conservation programs (e.g.,, CRP); target 3,000 acres (based on Zumbro Land Stewardship Plan)	LR-7	Number of acres enrolled in conservation programs (3,000 acres) (LR-12); Identificiation of opportunities for enrollment in conservation programs (LR-6);

Table 5-2 WAGZ Plan Measurable Goals by Issue Area

Issue Level	Priority Issue	Specific Issue, Pollutant, or Stressor	Long-term Goal	Long-term Goal Rationale	10-year Goal	10-year Goal ID	Related items from Implementation Schedule (Table 6-4) and associated measures/outputs
Level 2	Threats to Fish, Wildlife, and Habitat	Wetlands	Preserve the quality and quantity of natural areas	Planning Work Group and Advisory Committee; Wetland Conservation Act; MDNR Aquatic Invasive Species Program	Preserve the quality and quantity of wetlands (see also goal LR-6)	FWH-1	Recommended updates to wetland and zoning ordinances, as needed (FWH-3) Technical assistance for 5 projects focused on wetland restoration (FWH-1) Continued implementation of Wetland Conservation Act
		Sites of biological significance			Preserve sites of biological significance	FWH-2	Technical assistance for invasive species and natural conservation projects (5 projects over 10 years) (FWH-4) Education via digital communication and/or articles (10 activities over 10 years) (FWH-2) Recommended updates to ordinances, as needed (FWH-3)
		Invasive species			Characterize the presence and impact of invasive species	FWH-3	Projects to address invasive species (5 projects over 10 years) (FWH-4); Database of invasive species present (FWH-6); Continued implementation of Wabasha County Cooperative Weed Management Program (FWH-7)
		Fish and Macroinvertebrates	See fish and macroinvertebrate IBI goals above under degraded surface water quality	see surface water quality goals above	see surface water quality goals above and goal ESC-3	FWH-4	see surface water quality goals above and goal ESC-3; Monitoring of water quality and flow in trout streams (SWQ-11) Projects to improve stream connectivity (FWH-9; FWH-10)
Level 3	Reduced Livability and Recreation	Recreation	Increase recreational opportunities across the watershed	MDNR comment letter; Stakeholder engagement	Incorporate/promote access opportunities into Partnership projects	REC-1	Support for efforts to improve recreational water trail access (REC-1) 10 Public events to promote stewardship (REC-2) 10 Volunteer activities supported over 10 years (REC-3; REC-4)
Level 3	Threatened Groundwater Supply	Groundwater sustainability	Maintain sustainable groundwater supply for future use	Conservation goal based on MDNR Draft Groundwater Strategic Plan (2013)	Promote the implementation of groundwater conservation and sustainability practices (e.g., recharge)	GWS-1	200 Cost-share projects for individual stormwater BMPs (e.g., raingardens) (LR-4) Projects to capture and reuse stormwater (2 projects) (FLD-10) 10 educational communication via handouts, articles, or digital communications (GWS-1)
					Characterize the state and trend of groundwater supplies and use in the watershed	GWS-2	Study and quantification of soil health practice benefits (SLH-1); Development of a groundwater monitoring strategy (GWS-2); Assessment of groundwater trends (GWS-3)

Table 5-3 WAGZ Plan Surface Water Quality Goals by Planning Subwatershed

Issue Area	Subwatershed	Specific Issue, Pollutant, or Stressor	Long-term Goal	Long-term Goal Rationale	10-year Goal	10-year Goal ID	10-year Goal Rationale or Source	10-year Goal Measures
Degraded Surface Water Quality	South Fork Zumbro River	Phosphorus	Reduce phosphorus loading by 45% (from average 1980-1996 conditions) by 2040; (45% reduction equals 79,000 lbs/year TP based on HSPF watershed loading estimates)	MN Nutrient Reduction Strategy (MPCA, 2014)	Implement structural and non-structural projects and practices to reduce watershed TP loading by up to 992 lbs/year (as estimated at field scale) and 1862 lbs/year in the South Fork Zumbro River	SWQ-1.1	Strategies included in WRAPS tables specific to this resource/watershed; field scale and in-resource load reductions will be based on HSPF model results	Up to 34 implemented projects; watershed TP load reduction up to 992 lbs/year (as estimated at field scale) and 1862 lbs/year in the South Fork Zumbro River
		Total Suspended Solids	Reduce TSS concentrations to <10% of samples exceeding 65 mg/L (April 1 – September 30) by reducing TSS loading in the watershed	MN Water Quality Standard (MN Rules 7050.0222 Subp. 3, Subp. 4)	Implement structural and non-structural projects and practices to reduce watershed sediment loading by up to 734 tons/year (as estimated at field scale) and 958 tons/year in the South Fork Zumbro River	SWQ-1.2	Strategies included in WRAPS tables specific to this resource/watershed; field scale and in-resource load reductions will be based on HSPF model results	Up to 34 implemented projects; watershed sediment load reduction up to 734 lbs/year (as estimated at field scale) and 958 lbs/year in the South Fork Zumbro River
		Nitrate	Reduce total nitrogen loading by 45% (from average 1980-1996 conditions) by 2040; (45% reduction equals 1,527,000 lbs/year TN based on HSPF watershed loading estimates)	MN Nutrient Reduction Strategy (MPCA, 2014)	Implement structural and non-structural projects and practices to reduce watershed TN loading by up to 19182 lbs/year (as estimated at field scale) and 17541 lbs/year in the South Fork Zumbro River	SWQ-1.3	Strategies included in WRAPS tables specific to this resource/watershed; field scale and in-resource load reductions will be based on HSPF model results	Up to 34 implemented projects; watershed TN load reduction up to 19182 lbs/year (as estimated at field scale) and 17541 lbs/year in the South Fork Zumbro River
		E. coli	Reduce *E. coli* concentrations to monthly geometric means <126 CFU/100 mL (April 1 - October 31) by achieving *E. coli* loading defined in the Zumbro River TMDL (see TMDL)	MN Water Quality Standard (MN Rules 7050.0220 Subp. 3a.D, Subp. 4a.D, and Subp. 5a.D); Zumbro River Watershed TMDL (MPCA, 2018)	Implement structural and non-structural practices to reduce *E. coli* loading	SWQ-1.4	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address non-functioning SSTS (500 over 10 years watershed-wide), and feedlots (5 over 10 years watershed-wide); see Implementation Schedule
		Fish Index of Biological Integrity	Achieve applicable Fish Indices of Biological Integrity for streams: - Southern Streams: 50 - Southern Headwaters: 55	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016); Zumbro River Watershed Assessment and Monitoring - Appendix 4.2 (MPCA, 2016)	Implement structural and non-structural practices to improve FIBI	SWQ-1.5	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address stressors including TP, TSS, N, and altered hydrology (see related Implementation Schedule Items)
		Macroinvertebrate Index of Biological Integrity	Achieve applicable Macroinvertebrate Indices of Biological Integrity for streams: - Southern Forest Streams (low gradient): 43	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016); Zumbro River Watershed Assessment and Monitoring - Appendix 4.3 (MPCA, 2016)	Implement structural and non-structural practices to improve MIBI	SWQ-1.6	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address stressors including TP, TSS, N, and altered hydrology (see related Implementation Schedule Items)
Degraded Surface Water Quality	South Branch Middle Fork Zumbro River	Phosphorus	Reduce phosphorus loading by 45% (from average 1980-1996 conditions) by 2040; (45% reduction equals 54,600 lbs/year TP based on HSPF watershed loading estimates)	MN Nutrient Reduction Strategy (MPCA, 2014)	Implement structural and non-structural projects and practices to reduce watershed TP loading by up to 799 lbs/year (as estimated at field scale) and 844 lbs/year in the South Fork Middle Branch Zumbro River	SWQ-1.7	Strategies included in WRAPS tables specific to this resource/watershed; field scale and in-resource load reductions will be based on HSPF model results	Up to 22 implemented projects; watershed TP load reduction up to 799 lbs/year (as estimated at field scale) and 844 lbs/year in the South Fork Middle Branch Zumbro River
		Total Suspended Solids	Reduce TSS concentrations to <10% of samples exceeding 65 mg/L (April 1 – September 30) by reducing TSS loading in the watershed	MN Water Quality Standard (MN Rules 7050.0222 Subp. 3, Subp. 4)	Implement structural and non-structural projects and practices to reduce watershed sediment loading by up to 544 tons/year (as estimated at field scale) and 489 tons/year in the South Fork Middle Branch Zumbro River	SWQ-1.8	Strategies included in WRAPS tables specific to this resource/watershed; field scale and in-resource load reductions will be based on HSPF model results	Up to 22 implemented projects; watershed sediment load reduction up to 544 lbs/year (as estimated at field scale) and 489 lbs/year in the South Fork Middle Branch Zumbro River
		Nitrate	Reduce total nitrogen loading by 45% (from average 1980-1996 conditions) by 2040; (45% reduction equals 1,102,000 lbs/year TN based on HSPF watershed loading estimates)	MN Nutrient Reduction Strategy (MPCA, 2014)	Implement structural and non-structural projects and practices to reduce watershed TN loading by up to 16110 lbs/year (as estimated at field scale) and 8638 lbs/year in the South Fork Middle Branch Zumbro River	SWQ-1.9	Strategies included in WRAPS tables specific to this resource/watershed; field scale and in-resource load reductions will be based on HSPF model results	Up to 22 implemented projects; watershed TN load reduction up to 16110 lbs/year (as estimated at field scale) and 8638 lbs/year in the South Fork Middle Branch Zumbro River
		E. coli	Reduce *E. coli* concentrations to monthly geometric means <126 CFU/100 mL (April 1 - October 31) by achieving *E. coli* loading defined in the Zumbro River TMDL (see TMDL)	MN Water Quality Standard (MN Rules 7050.0220 Subp. 3a.D, Subp. 4a.D, and Subp. 5a.D); Zumbro River Watershed TMDL (MPCA, 2018)	Implement structural and non-structural practices to reduce *E. coli* loading	SWQ-1.10	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address non-functioning SSTS (500 over 10 years watershed-wide), and feedlots (5 over 10 years watershed-wide); see Implementation Schedule
		Fish Index of Biological Integrity	Achieve applicable Fish Indices of Biological Integrity for streams: - Southern Streams: 50 - Southern Headwaters: 55	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016); Zumbro River Watershed Assessment and Monitoring - Appendix 4.2 (MPCA, 2016)	Implement structural and non-structural practices to improve FIBI	SWQ-1.11	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address stressors including TP, TSS, N, and altered hydrology (see related Implementation Schedule Items)
		Macroinvertebrate Index of Biological Integrity	Achieve applicable Macroinvertebrate Indices of Biological Integrity for streams: - Southern Forest Streams (low gradient): 43	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016); Zumbro River Watershed Assessment and Monitoring - Appendix 4.3 (MPCA, 2016)	Implement structural and non-structural practices to improve MIBI	SWQ-1.12	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address stressors including TP, TSS, N, and altered hydrology (see related Implementation Schedule Items)

Table 5-3 WAGZ Plan Surface Water Quality Goals by Planning Subwatershed

Issue Area	Subwatershed	Specific Issue, Pollutant, or Stressor	Long-term Goal	Long-term Goal Rationale	10-year Goal	10-year Goal ID	10-year Goal Rationale or Source	10-year Goal Measures
Degraded Surface Water Quality	Middle Fork Zumbro River	Phosphorus (Rice Lake)	Meet Western Corn Belt Plains water quality standards in Rice Lake (TP≤90 ug/L, chl a≤30 ug/L, SD≥0.7 m) by reducing total phosphorus loading by 88% (see TMDL)	MN Water Quality Standard (MN Rules 7050.0222 Subp.3); Zumbro River Watershed TMDL (MPCA, 2019)	Reduce phosphorus loading through implementation of practices identified in the Zumbro River Watershed TMDL and WRAPS studies	SWQ-2	Load reduction estimates from TMDL/WRAPS	Identify and Implement 3 projects to reduce phosphorus loading in the Rice Lake watershed
		Phosphorus	Reduce phosphorus loading by 45% (from average 1980-1996 conditions) by 2040; (45% reduction equals 51,300 lbs/year TP based on HSPF watershed loading estimates)	MN Nutrient Reduction Strategy (MPCA, 2014)	Implement structural and non-structural projects and practices to reduce watershed TP loading by up to 1393 lbs/year (as estimated at field scale) and 1652 lbs/year in the Middle Fork Zumbro River	SWQ-1.13	Strategies included in WRAPS tables specific to this resource/watershed; field scale and in-resource load reductions will be based on HSPF model results	Up to 32 implemented projects; watershed TP load reduction up to 1393 lbs/year (as estimated at field scale) and 1652 lbs/year in the Middle Fork Zumbro River
		Total Suspended Solids	Reduce TSS concentrations to <10% of samples exceeding 65 mg/L (April 1 – September 30) by achieving loading capacity identified in the Zumbro River TMDL (see TMDL)	MN Water Quality Standard (MN Rules 7050.0222 Subp. 3, Subp. 4)	Implement structural and non-structural projects and practices to reduce watershed sediment loading by up to 873 tons/year (as estimated at field scale) and 901 tons/year in the Middle Fork Zumbro River	SWQ-1.14	Strategies included in WRAPS tables specific to this resource/watershed; field scale and in-resource load reductions will be based on HSPF model results	Up to 32 implemented projects; watershed sediment load reduction up to 873 lbs/year (as estimated at field scale) and 901 lbs/year in the Middle Fork Zumbro River
		Nitrate	Reduce total nitrogen loading by 45% (from average 1980-1996 conditions) by 2040; (45% reduction equals 1,190,000 lbs/year TN based on HSPF watershed loading estimates)	MN Nutrient Reduction Strategy (MPCA, 2014)	Implement structural and non-structural projects and practices to reduce watershed TN loading by up to 32296 lbs/year (as estimated at field scale) and 17923 lbs/year in the Middle Fork Zumbro River	SWQ-1.15	Strategies included in WRAPS tables specific to this resource/watershed; field scale and in-resource load reductions will be based on HSPF model results	Up to 32 implemented projects; watershed TN load reduction up to 32296 lbs/year (as estimated at field scale) and 17923 lbs/year in the Middle Fork Zumbro River
		E. coli	Reduce *E. coli* concentrations to monthly geometric means <126 CFU/100 mL (April 1 - October 31) by achieving *E. coli* loading defined in the Zumbro River TMDL (see TMDL)	MN Water Quality Standard (MN Rules 7050.0220 Subp. 3a.D, Subp. 4a.D, and Subp. 5a.D); Zumbro River Watershed TMDL (MPCA, 2018)	Implement structural and non-structural practices to reduce *E. coli* loading	SWQ-1.16	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address non-functioning SSTS (500 over 10 years watershed-wide), and feedlots (5 over 10 years watershed-wide); see Implementation Schedule
		Fish Index of Biological Integrity	Achieve applicable Fish Indices of Biological Integrity for streams: - Southern Streams: 50 - Southern Headwaters: 55	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016); Zumbro River Watershed Assessment and Monitoring - Appendix 4.2 (MPCA, 2016)	Implement structural and non-structural practices to improve FIBI	SWQ-1.17	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address stressors including TP, TSS, N, and altered hydrology (see related Implementation Schedule Items)
		Macroinvertebrate Index of Biological Integrity	Achieve applicable Macroinvertebrate Indices of Biological Integrity for streams: - Southern Forest Streams (low gradient): 43	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016); Zumbro River Watershed Assessment and Monitoring - Appendix 4.3 (MPCA, 2016)	Implement structural and non-structural practices to improve MIBI	SWQ-1.18	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address stressors including TP, TSS, N, and altered hydrology (see related Implementation Schedule Items)
Degraded Surface Water Quality	North Fork Zumbro River	Phosphorus	Reduce phosphorus loading by 45% (from average 1980-1996 conditions) by 2040; (45% reduction equals 51,700 lbs TP/year based on HSPF watershed loading estimates)	MN Nutrient Reduction Strategy (MPCA, 2014)	Implement structural and non-structural projects and practices to reduce watershed TP loading by up to 1122 lbs/year (as estimated at field scale) and 2015 lbs/year in the North Fork Zumbro River	SWQ-1.19	Strategies included in WRAPS tables specific to this resource/watershed; field scale and in-resource load reductions will be based on HSPF model results	Up to 32 implemented projects; watershed TP load reduction up to 1122 lbs/year (as estimated at field scale) and 2015 lbs/year in the North Fork Zumbro River
		Total Suspended Solids	Reduce TSS concentrations to <10% of samples exceeding 65 mg/L (April 1 – September 30) by achieving loading capacity identified in the Zumbro River TMDL (see TMDL)	MN Water Quality Standard (MN Rules 7050.0222 Subp. 3, Subp. 4)	Implement structural and non-structural projects and practices to reduce watershed sediment loading by up to 699 tons/year (as estimated at field scale) and 928 tons/year in the North Fork Zumbro River	SWQ-1.20	Strategies included in WRAPS tables specific to this resource/watershed; field scale and in-resource load reductions will be based on HSPF model results	Up to 32 implemented projects; watershed sediment load reduction up to 699 lbs/year (as estimated at field scale) and 928 lbs/year in the North Fork Zumbro River
		Nitrate	Reduce total nitrogen loading by 45% (from average 1980-1996 conditions) by 2040; (45% reduction equals 1,236,000 lbs/year TN based on HSPF watershed loading estimates)	MN Nutrient Reduction Strategy (MPCA, 2014)	Implement structural and non-structural projects and practices to reduce watershed TN loading by up to 26838 lbs/year (as estimated at field scale) and 22289 lbs/year in the North Fork Zumbro River	SWQ-1.21	Strategies included in WRAPS tables specific to this resource/watershed; field scale and in-resource load reductions will be based on HSPF model results	Up to 32 implemented projects; watershed TN load reduction up to 26838 lbs/year (as estimated at field scale) and 22289 lbs/year in the North Fork Zumbro River
		E. coli	Reduce *E. coli* concentrations to monthly geometric means <126 CFU/100 mL (April 1 - October 31) by achieving *E. coli* loading defined in the Zumbro River TMDL (see TMDL)	MN Water Quality Standard (MN Rules 7050.0220 Subp. 3a.D, Subp. 4a.D, and Subp. 5a.D); Zumbro River Watershed TMDL (MPCA, 2018)	Implement structural and non-structural practices to reduce *E. coli* loading	SWQ-1.22	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address non-functioning SSTS (500 over 10 years watershed-wide), and feedlots (5 over 10 years watershed-wide); see Implementation Schedule
		Fish Index of Biological Integrity	Achieve applicable Fish Indices of Biological Integrity for streams: - Southern Streams: 50 - Southern Headwaters: 55	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016); Zumbro River Watershed Assessment and Monitoring - Appendix 4.2 (MPCA, 2016)	Implement structural and non-structural practices to improve FIBI	SWQ-1.23	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address stressors including TP, TSS, N, and altered hydrology (see related Implementation Schedule Items)
		Macroinvertebrate Index of Biological Integrity	Achieve applicable Macroinvertebrate Indices of Biological Integrity for streams: - Southern Forest Streams (low gradient): 43	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016); Zumbro River Watershed Assessment and Monitoring - Appendix 4.3 (MPCA, 2016)	Implement structural and non-structural practices to improve MIBI	SWQ-1.24	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address stressors including TP, TSS, N, and altered hydrology (see related Implementation Schedule Items)

Table 5-3 WAGZ Plan Surface Water Quality Goals by Planning Subwatershed

Issue Area	Subwatershed	Specific Issue, Pollutant, or Stressor	Long-term Goal	Long-term Goal Rationale	10-year Goal	10-year Goal ID	10-year Goal Rationale or Source	10-year Goal Measures
Degraded Surface Water Quality	Zumbro River (Lower)	Phosphorus (Lake Zumbro)	Meet site-specific water quality standards in Lake Zumbro (TP≤65 ug/L, chl a≤22 ug/L, SD≥0.9 m) by reducing total phosphorus loading by 90% (see TMDL)	Technical Justification for Draft Lake Zumbro (55-0004-00) Site-Specific Eutrophication Standard (MPCA, 2017); Zumbro River Watershed TMDL (MPCA, 2019)	Reduce phosphorus loading through implementation of practices identified in the Zumbro River Watershed TMDL and WRAPS studies	SWQ-3	Load reduction estimates from HSPF modeling	Implement 88 field BMP projects upstream of Lake Zumbro, resulting in cumulative load reductions of 3,040 lbs/year of total phosphorus
		Phosphorus	Reduce phosphorus loading by 45% (from average 1980-1996 conditions) by 2040; (45% reduction equals 61,700 lbs/year TP based on HSPF watershed loading estimates)	MN Nutrient Reduction Strategy (MPCA, 2014)	Implement structural and non-structural projects and practices to reduce watershed TP loading by up to 994 lbs/year (as estimated at field scale) and 1846 lbs/year in the Zumbro River	SWQ-1.25	Strategies included in WRAPS tables specific to this resource/watershed; field scale and in-resource load reductions will be based on HSPF model results	Up to 33 implemented projects; watershed TP load reduction up to 994 lbs/year (as estimated at field scale) and 1846 lbs/year in the Zumbro River
		Total Suspended Solids	Reduce TSS concentrations to <10% of samples exceeding 65 mg/L (April 1 – September 30) by reducing TSS loading in the watershed	MN Water Quality Standard (MN Rules 7050.0222 Subp. 3, Subp. 4)	Implement structural and non-structural projects and practices to reduce watershed sediment loading by up to 755 tons/year (as estimated at field scale) and 835 tons/year in the Zumbro River	SWQ-1.26	Strategies included in WRAPS tables specific to this resource/watershed; field scale and in-resource load reductions will be based on HSPF model results	Up to 33 implemented projects; watershed sediment load reduction up to 755 lbs/year (as estimated at field scale) and 835 lbs/year in the Zumbro River
		Nitrate	Reduce total nitrogen loading by 45% (from average 1980-1996 conditions) by 2040; (45% reduction equals 1,304,000 lbs/year TN based on HSPF watershed loading estimates)	MN Nutrient Reduction Strategy (MPCA, 2014)	Implement structural and non-structural projects and practices to reduce watershed TN loading by up to 20979 lbs/year (as estimated at field scale) and 23685 lbs/year in the Zumbro River	SWQ-1.27	Strategies included in WRAPS tables specific to this resource/watershed; field scale and in-resource load reductions will be based on HSPF model results	Up to 33 implemented projects; watershed TN load reduction up to 20979 lbs/year (as estimated at field scale) and 23685 lbs/year in the Zumbro River
		E. coli	Reduce *E. coli* concentrations to monthly geometric means <126 CFU/100 mL (April 1 - October 31) by achieving *E. coli* loading defined in the Zumbro River TMDL (see TMDL)	MN Water Quality Standard (MN Rules 7050.0220 Subp. 3a.D, Subp. 4a.D, and Subp. 5a.D); Zumbro River Watershed TMDL (MPCA, 2018)	Implement structural and non-structural practices to reduce *E. coli* loading	SWQ-1.28	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address non-functioning SSTS (500 over 10 years watershed-wide), and feedlots (5 over 10 years watershed-wide); see Implementation Schedule
		Fish Index of Biological Integrity	Achieve applicable Fish Indices of Biological Integrity for streams: - Southern Streams: 50 - Southern Headwaters: 55	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016); Zumbro River Watershed Assessment and Monitoring - Appendix 4.2 (MPCA, 2016)	Implement structural and non-structural practices to improve FIBI	SWQ-1.29	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address stressors including TP, TSS, N, and altered hydrology (see related Implementation Schedule Items)
		Macroinvertebrate Index of Biological Integrity	Achieve applicable Macroinvertebrate Indices of Biological Integrity for streams: - Southern Forest Streams (low gradient): 43	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016); Zumbro River Watershed Assessment and Monitoring - Appendix 4.3 (MPCA, 2016)	Implement structural and non-structural practices to improve MIBI	SWQ-1.30	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address stressors including TP, TSS, N, and altered hydrology (see related Implementation Schedule Items)
Degraded Surface Water Quality	Hay Creek	Phosphorus	Reduce phosphorus loading by 45% (from average 1980-1996 conditions) by 2040; (45% reduction equals 8,100 lbs/year TP based on HSPF watershed loading estimates)	MN Nutrient Reduction Strategy (MPCA, 2014)	Implement structural and non-structural projects and practices to reduce watershed TP loading to Lake Pepin by up to 27 lbs/year (as estimated at field scale) and 209 lbs/year from the Hay Creek subwatershed	SWQ-1.31	Strategies included in WRAPS tables specific to this resource/watershed; in-resource load reductions will be based on HSPF model results	Up to 21 implemented projects; watershed TP load reduction up to 209 lbs/year to Lake Pepin from the Hay Creek watershed
		Total Suspended Solids	Reduce TSS concentrations to <10% of samples exceeding 65 mg/L (April 1 – September 30) by reducing TSS loading in the watershed	MN Water Quality Standard (MN Rules 7050.0222 Subp. 3, Subp. 4)	Implement structural and non-structural projects and practices to reduce watershed sediment loading to Lake Pepin by up to 3 tons/year (as estimated at field scale) and 6.7 tons/year from the Hay Creek subwatershed	SWQ-1.32	Strategies included in WRAPS tables specific to this resource/watershed; in-resource load reductions will be based on HSPF model results	Up to 21 implemented projects; watershed sediment load reduction up to 6.7 tonsyear to Lake Pepin from the Hay Creek watershed
		Nitrate	Reduce total nitrogen loading by 45% (from average 1980-1996 conditions) by 2040; (45% reduction equals 186,000 lbs/year TN based on HSPF watershed loading estimates)	MN Nutrient Reduction Strategy (MPCA, 2014)	Implement structural and non-structural projects and practices to reduce watershed TN loading to Lake Pepin by up to 1390 lbs/year (as estimated at field scale) and 4040 lbs/year from the Hay Creek subwatershed	SWQ-1.33	Strategies included in WRAPS tables specific to this resource/watershed; in-resource load reductions will be based on HSPF model results	Up to 21 implemented projects; watershed TN load reduction up to 4040 lbs/year to Lake Pepin from the Hay Creek watershed
		E. coli	Reduce *E. coli* concentrations to monthly geometric means <126 CFU/100 mL (April 1 - October 31) by achieving *E. coli* loading capacity defined in the Mississippi River Lake Pepin Tributaries TMDL (see TMDL)	MN Water Quality Standard (MN Rules 7050.0220 Subp. 3a.D, Subp. 4a.D, and Subp. 5a.D); Mississippi River Lake Pepin Tributaries TMDL (MPCA, 2015)	Implement structural and non-structural practices to reduce *E. coli* loading	SWQ-1.34	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address non-functioning SSTS (500 over 10 years watershed-wide), and feedlots (5 over 10 years watershed-wide); see Implementation Schedule
		Fish Index of Biological Integrity	Achieve applicable Fish Indices of Biological Integrity for streams: - Southern Streams: 50 - Southern Headwaters: 55	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016); Mississippi River Lake Pepin Monitoring and Assessment Report - (MPCA, 2012)	Implement structural and non-structural practices to improve FIBI	SWQ-1.35	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address stressors including TP, TSS, N, and altered hydrology (see related Implementation Schedule Items)
		Macroinvertebrate Index of Biological Integrity	Achieve applicable Macroinvertebrate Indices of Biological Integrity for streams: - Southern Forest Streams (low gradient): 43	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016); Mississippi River Lake Pepin Monitoring and Assessment Report - (MPCA, 2012)	Implement structural and non-structural practices to improve MIBI	SWQ-1.36	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address stressors including TP, TSS, N, and altered hydrology (see related Implementation Schedule Items)

Table 5-3 WAGZ Plan Surface Water Quality Goals by Planning Subwatershed

Issue Area	Subwatershed	Specific Issue, Pollutant, or Stressor	Long-term Goal	Long-term Goal Rationale	10-year Goal	10-year Goal ID	10-year Goal Rationale or Source	10-year Goal Measures
Degraded Surface Water Quality	Wells Creek	Phosphorus	Reduce phosphorus loading by 45% (from average 1980-1996 conditions) by 2040; (45% reduction equals 9,900 lbs/year TP based on HSPF watershed loading estimates)	MN Nutrient Reduction Strategy (MPCA, 2014)	Implement structural and non-structural projects and practices to reduce watershed TP loading to Lake Pepin by up to 63 lbs/year (as estimated at field scale) and 142 lbs/year from the Wells Creek subwatershed	SWQ-1.37	Strategies included in WRAPS tables specific to this resource/watershed; in-resource load reductions will be based on HSPF model results	Up to 30 implemented projects; watershed TP load reduction up to 142 lbs/year to Lake Pepin from the Wells Creek watershed
		Total Suspended Solids	Reduce TSS concentrations to <10% of samples exceeding 65 mg/L (April 1 – September 30) by reducing TSS loading in the watershed	MN Water Quality Standard (MN Rules 7050.0222 Subp. 3, Subp. 4)	Implement structural and non-structural projects and practices to reduce watershed sediment loading to Lake Pepin by up to 6.9 tons/year (as estimated at field scale) and 0.4 tons/year from the Wells Creek subwatershed	SWQ-1.38	Strategies included in WRAPS tables specific to this resource/watershed; in-resource load reductions will be based on HSPF model results	Up to 30 implemented projects; watershed sediment load reduction up to 0.4 tonsyear to Lake Pepin from the Wells Creek watershed
		Nitrate	Reduce total nitrogen loading by 45% (from average 1980-1996 conditions) by 2040; (45% reduction equals 220,000 lbs/year TP based on HSPF watershed loading estimates)	MN Nutrient Reduction Strategy (MPCA, 2014)	Implement structural and non-structural projects and practices to reduce watershed TN loading to Lake Pepin by up to 1390 lbs/year (as estimated at field scale) and 2613 lbs/year from the Wells Creek subwatershed	SWQ-1.39	Strategies included in WRAPS tables specific to this resource/watershed; in-resource load reductions will be based on HSPF model results	Up to 30 implemented projects; watershed TN load reduction up to 2613 lbs/year to Lake Pepin from the Wells Creek watershed
		E. coli	Reduce *E. coli* concentrations to monthly geometric means <126 CFU/100 mL (April 1 - October 31) by achieving E. coli loading capacity defined in the Mississippi River Lake Pepin Tributaries TMDL (see TMDL)	MN Water Quality Standard (MN Rules 7050.0220 Subp. 3a.D, Subp. 4a.D, and Subp. 5a.D); Mississippi River Lake Pepin Tributaries TMDL (MPCA, 2015)	Implement structural and non-structural practices to reduce *E. coli* loading	SWQ-1.40	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address non-functioning SSTS (500 over 10 years watershed-wide), and feedlots (5 over 10 years watershed-wide); see Implementation Schedule
		Fish Index of Biological Integrity	Achieve applicable Fish Indices of Biological Integrity for streams: - Southern Streams: 50 - Southern Headwaters: 55	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016); Mississippi River Lake Pepin Monitoring and Assessment Report - (MPCA, 2012)	Implement structural and non-structural practices to improve FIBI	SWQ-1.41	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address stressors including TP, TSS, N, and altered hydrology (see related Implementation Schedule Items)
		Macroinvertebrate Index of Biological Integrity	Achieve applicable Macroinvertebrate Indices of Biological Integrity for streams: - Southern Forest Streams (low gradient): 43	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016); Mississippi River Lake Pepin Monitoring and Assessment Report - (MPCA, 2012)	Implement structural and non-structural practices to improve MIBI	SWQ-1.42	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address stressors including TP, TSS, N, and altered hydrology (see related Implementation Schedule Items)
Degraded Surface Water Quality	Lake Pepin	Phosphorus	Reduce phosphorus loading by 45% (from average 1980-1996 conditions) by 2040; (45% reduction equals 11,700 lbs/year TP based on HSPF watershed loading estimates)	MN Nutrient Reduction Strategy (MPCA, 2014)	Implement structural and non-structural projects and practices to reduce watershed TP loading to Lake Pepin by up to 55 lbs/year (as estimated at field scale) and 233 lbs/year from the Lake Pepin planning subwatershed	SWQ-1.43	Strategies included in WRAPS tables specific to this resource/watershed; in-resource load reductions will be based on HSPF model results	Up to 40 implemented projects; watershed TP load reduction up to 233 lbs/year to Lake Pepin
		Total Suspended Solids	Reduce TSS concentrations to <10% of samples exceeding 65 mg/L (April 1 – September 30) by reducing TSS loading in the watershed	MN Water Quality Standard (MN Rules 7050.0222 Subp. 3, Subp. 4)	Implement structural and non-structural projects and practices to reduce watershed sediment loading to Lake Pepin by up to 6.6 tons/year (as estimated at field scale) and 0.7 tons/year from the Lake Pepin subwatershed	SWQ-1.44	Strategies included in WRAPS tables specific to this resource/watershed; in-resource load reductions will be based on HSPF model results	Up to 40 implemented projects; watershed sediment load reduction up to 0.7 tonsyear to Lake Pepin
		Nitrate	Reduce total nitrogen loading by 45% (from average 1980-1996 conditions) by 2040; (45% reduction equals 258,000 lbs/year TP based on HSPF watershed loading estimates)	MN Nutrient Reduction Strategy (MPCA, 2014)	Implement structural and non-structural projects and practices to reduce watershed TN loading to Lake Pepin by up to 1213 lbs/year (as estimated at field scale) and 4017 lbs/year from the Lake Pepin planning subwatershed	SWQ-1.45	Strategies included in WRAPS tables specific to this resource/watershed; in-resource load reductions will be based on HSPF model results	Up to 40 implemented projects; watershed TN load reduction up to 4017 lbs/year to Lake Pepin
		E. coli	Reduce *E. coli* concentrations to monthly geometric means <126 CFU/100 mL (April 1 - October 31) by achieving *E. coli* loading capacity defined in the Mississippi River Lake Pepin Tributaries TMDL (see TMDL)	MN Water Quality Standard (MN Rules 7050.0220 Subp. 3a.D, Subp. 4a.D, and Subp. 5a.D); Mississippi River Lake Pepin Tributaries TMDL (MPCA, 2015)	Implement structural and non-structural practices to reduce *E. coli* loading	SWQ-1.46	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address non-functioning SSTS (500 over 10 years watershed-wide), and feedlots (5 over 10 years watershed-wide); see Implementation Schedule
		Fish Index of Biological Integrity	Achieve applicable Fish Indices of Biological Integrity for streams: - Southern Streams: 50 - Southern Headwaters: 55	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016); Mississippi River Lake Pepin Monitoring and Assessment Report - (MPCA, 2012)	Implement structural and non-structural practices to improve FIBI	SWQ-1.47	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address stressors including TP, TSS, N, and altered hydrology (see related Implementation Schedule Items)
		Macroinvertebrate Index of Biological Integrity	Achieve applicable Macroinvertebrate Indices of Biological Integrity for streams: - Southern Forest Streams (low gradient): 43	Biological Criteria for Tiered Aquatic Life Uses (MPCA, 2016); Mississippi River Lake Pepin Monitoring and Assessment Report - (MPCA, 2012)	Implement structural and non-structural practices to improve MIBI	SWQ-1.48	Strategies included in WRAPS tables specific to this resource/watershed	Implementation of projects and practices to address stressors including TP, TSS, N, and altered hydrology (see related Implementation Schedule Items)

6 Targeted Implementation Program

This section describes the Partners' implementation program. The implementation program is a combination of projects, studies, programs and practices intended to achieve the measurable goals described in Section 5. Recognizing that financial and staff resources limit the ability of the Partnership to completely address priority issues in the watershed (see Section 0), the Partnership prioritized and targeted (see Section 4) the implementation program described herein to achieve benefits consistent with the Partnership's locally driven priorities and goals.

The activities and projects described in this Plan will be implemented primarily through existing staff, funding, and operations of the Partners. Programs and activities may be adjusted based on the associated funding source (see Section 6.2.2). Some funding sources (e.g., watershed-based implementation funding) may have specific requirements that affect program design.

6.1 Implementation Schedule

The Plan implementation schedule is presented in Table 6-4. The activities included in the implementation program are intended to leverage the existing roles, capacities, and expertise of the Partners and provide a framework for the Partners to perform expanded roles to achieve Plan goals. Each activity in the implementation program is cross-referenced to one or more goals (see Table 5-2) that the activity is designed to support.

Activities included in Table 6-4 are organized by primary issue area and are assigned to the following four categories:

- Projects and project support
- Monitoring and studies
- Education and public involvement
- Regulation and administration

These categories are described in greater detail in the following sections. Information included in Table 6-4 includes:

Item ID – Each activity in the implementation schedule is assigned a unique alphanumeric identifier. The letters identify the primary priority issue (see Section 4.0) that the activity is intended to address.

Implementation Action Description – This field provides a brief description of the planned implementation activity.

Applicable Goals – Each activity is cross-referenced to one or more applicable Plan goals (see Table 5-2). Many activities address multiple Plan goals.

Priority Issues Addressed – These fields indicate whether the implementation activity directly (as indicated by "●") or indirectly (as indicated by "o") addresses each of the eight priority issues identified in Section 0. Many activities are intended to address multiple issue areas.

Target or Focus Area – This field identifies the physical area or resource for each implementation activity. Some activities are applicable watershed wide. This field may reference targeting maps that identify priority project areas (Figure 3-6, Figure 3-7, and Figure 3-8).

Measurable Output – This field identifies how performance of the implementation activity will be measured. The unit may be based on a spatial measurement (e.g., feet of stream restoration) or actions performed (e.g., number of educational workshops).

Timeframe – These fields indicate when the implementation activity will be performed. The 10-year planning window is subdivided into 2-year periods. Where applicable, numbers corresponding to activity measurable outputs are included in each two-year window (e.g., "20 projects in 2024-2025").

Estimated Total Cost – This field represents the total estimated cost (in 2020 dollars) to implement the activity over the 10-year planning window. This cost includes:

> **Estimated Local Contribution** – This field represents the portion of the total estimated cost (in 2020 dollars) borne by members of the Partnership.
>
> **Estimated External Contribution** – This field represents the portion of the total estimated cost (in 2020 dollars) estimated to come from external sources, including but not limited to: State funding, Federal funding, cost-share, and private partners.

Lead Local Governmental Unit (LGU) – This field designates the entity responsible for leading each activity. The lead LGU is limited to members of the Partnership. The lead LGU assumes responsibility to move the activity forward with assistance from cooperating entities, as needed.

Supporting Entities – This field identifies members of the Partnership and any State, Federal, or private entities that are anticipated to cooperate with the lead LGU in the completion of an activity. Supporting entities identified for an activity may not be limited to those included in Table 6-4.

6.1.1 Projects and Project Support

Activities in Table 6-4 categorized as "projects and project support" represent approximately 90% of the overall Plan implementation costs (see Section 6.2.2). This category includes capital improvement projects and cost-share field practices designed primarily to address issues related to surface water quality, groundwater quality, erosion and sedimentation, and flooding. This category also includes feasibility studies, planning, engineering, and design work necessary to design and construct these projects. Projects and project support activities will be funded through a combination of local and external funds (see Section 6.2.2).

6.1.1.1 Cost-Share Field Practices

A significant portion of the implementation program is tied to activity SWQ-1:

> *Implement BMPs at protect/restore Level 1 and 2 sites identified through terrain analyses (see Figure 4-1) to reduce erosion and filter pollutants; specific BMPs to be determined based on site-specific feasibility, with target implementation by subwatershed as follows:* [see Table 6-4]

Table 6-4 outlines the number of planned surface water quality improvement projects planned for each of the 8 HUC10 level planning subwatersheds within the planning area. Information regarding the prioritization and estimation of costs and benefits for projects related to SWQ-1 is described in Section 4.

The Partners intend to incentivize these projects through cost-share. A cost-share program is where the costs of implementing BMPs are shared with the landowner (as nearly all of the proposed project locations are located on private lands). Several cost-share programs are available at the local, state, and federal level that assist landowners in paying for BMPs. These practices include traditional conservation practices, structural and non-structural, that retain and control runoff to improve water quality. Structural practices that may be eligible include sediment control structures or controlled drainage practices. Nonstructural practices that may be eligible include implementing cover crops or nutrient management practices.

The implementation framework selected by the Partnership accelerates the implementation of these practices and efficiently works with the Partner entity that is sponsoring implementation at targeted locations within their jurisdiction. The individual practices implemented at proposed project locations presented in Figure 4-1 will depend on local landscape considerations, landowner willingness, and potential for multiple benefits (e.g., infiltration may be discouraged in areas of groundwater sensitivity). The Partners anticipate that many of the projects implemented as part of activity SWQ-1 will provide multiple benefits related to flooding, groundwater quality, soil health, and other concerns, in addition to directly prioritizing the issue of degraded surface water quality.

The Partners will utilize the application process to score and rank cost share opportunities from landowners or applicants, as described in Section 6.4.4.1. The project scoring criteria promote projects in higher priority areas (see Figure 3-6) and multi-benefit projects, while also considering other factors.

6.1.1.2 Capital Improvements

For the purposes of this Plan, capital improvement projects are those projects that are larger scaled, more expensive, and have a longer effective life than the projects typically funded through agricultural incentive and cost-share programs (see Section 6.1.1.1). Capital projects are intended to provide significant benefits, often on a regional scale, rather than on a field scale, and will require feasibility studies before design and construction.

Capital projects typically exceed $100,000 in cost and have an expected life greater than 25 years. Capital projects implemented as part of this Plan will require preparation of an operations and maintenance plan that details inspection and maintenance schedules and responsibilities over the intended life of the

project. Permanent easements may be required in order to provide access necessary for inspection and maintenance. Generally, maintenance responsibilities are assigned to the property owner. Capital projects are often completed in partnership with multiple with entities (including state agencies) and are good candidates for state or federal grant funding. The Partners will pursue early coordination with permitting and review agencies, as applicable to ensure proposed projects are aligned for grant funding.

The City of Rochester and Olmsted County maintain and update capital improvement plans (CIPs) outlining stormwater management, water quality, and flood risk-reduction projects planned by the City and/or County. Many of these projects are specifically or generally aligned with the goals of this Plan and may have regional benefit depending upon the project's location in the watershed.

Specifically, the City of Rochester is in the process of updating its local surface water management plan and associated CIP. The Partners anticipated that there will be specific projects from the City's CIP that may be implemented as part of this Plan. At present, these opportunities have been included as placeholders awaiting further definition:

- FLD-6: Implement cooperative flood risk reduction projects identified and prioritized in the City of Rochester CIP (FLD-6)
- SWQ-5: Implement projects to reduce phosphorus and sediment loading in urban stormwater runoff (above and beyond current minimum requirements)

Other capital improvement projects may include larger-scale streambank and floodplain restoration projects (see ESC-5 and FLD-7/8 in Table 6-4) as well as multipurpose drainage improvements. The Partners will update the implementation schedule (Table 6-4), as needed, to incorporate additional details for capital projects as they become more defined. The Partners will review capital improvement projects annually as part of the regular review and work planning process.

This Plan also includes implementation activities seeking to maintain and expand land protections prioritizing forest and floodplain areas (implementation activities SLH-7 and FLD-8 in Table 6-4).

6.1.2 Monitoring and Studies

Table 6-4 includes several implementation activities categorized as "monitoring and studies." These activities include those necessary to evaluate Plan progress and address data gaps related primarily to the Level 1 issues of degraded surface water quality, groundwater contamination, and excessive flooding. Additionally, several activities address the Level 2 issue of degraded soil health as these activities have direct and indirect benefits across a range of Level 1 issues.

Information collected through monitoring and studies will be used to identify future (or modify current) Plan implementation activities and priorities. For example, assessment of trends in nitrate concentrations in private wells (activity GWQ-9) may lead to the revision (or addition) of priority areas for project implementation (activity GWQ-3 and SWQ-1). Development of targeted hydrologic and hydraulic modeling (activity FLD-3) will identify preferred locations to implement watershed storage and flood risk reduction projects (activity FLD-4).

Monitoring and study activities included in Table 6-4 will leverage past and present programs operated in the watershed. These include, but are not limited to:

- MPCA water quality monitoring and analyses:
  - Zumbro River Total Maximum Daily Load (TMDL) study (2018)
  - Zumbro River Watershed Restoration and Protection Strategies (WRAPS) study (2017)
  - Zumbro River Watershed Monitoring and Assessment report (2016)
  - Mississippi River-Lake Pepin TMDL study (2015)
  - Mississippi River-Lake Pepin WRAPS study (2015)
  - Mississippi River-Lake Pepin Watershed Monitoring and Assessment report (2012)
  - Data collected/used in MPCA analyses, including:
    - Water chemistry (chloride, DO, E. coli, nitrate + nitrite, TKN, temperature, TP, TSS)
    - Biological monitoring (fish and macroinvertebrate)
    - Fish contaminants (mercury and polychlorinated biphenyls (PCBs))
    - Cooperative stream gaging (MPCA, MDNR)
- MDH groundwater monitoring and analyses:
  - Groundwater Restoration and Protection Strategies (GRAPS) (2019, draft)
- MDA/SWCD township private well water quality testing
- USGS/MDNR stream gaging
- Rochester Wellhead Protection Program (WHPP) activities
- County/SWCD volunteer nitrate monitoring
- County septic/SSTS monitoring
- County well inspection/monitoring

Data collected as part of existing, new, and expanded monitoring will be used in support of other implementation tasks (e.g., implementation item GWQ-7: establishing trends in nitrate concentrations in wells).

Additional information about existing monitoring programs is presented in Section C.7. Monitoring locations are presented in Figure C-15. Monitoring data collected within the watershed includes, generally:

- Surface water chemistry: nitrogen, phosphorus, TSS/turbidity, *E. coli*, fecal coliform
- Groundwater quality: nitrates, fecal coliform, arsenic, septic and well inspections
- Biological: invertebrate population data (MIBI), fish population data (FIBI), threatened species data
- Hydrologic: water surface elevations, discharge, precipitation

Available monitoring data is available from the MPCA's Environmental Data Access (EDA). This data is derived from the MPCA, with input from some other entities, and is not a comprehensive database of all monitoring activity. The EDA database is available online at: https://www.pca.state.mn.us/quick-links/eda-surface-water-data

Monitoring and study activities are generally scheduled early in Plan implementation to maximize the benefit over the 10-year planning window. Monitoring and studies are anticipated to be funded primarily

through local funds, due in part to limited State grant eligibility (see Section 6.2.2). The Partnership sees opportunities for further coordination and alignment of state monitoring programs with local implementation priorities through the implementation of this Plan. The Partners may perform or request additional monitoring more closely aligned with Plan implementation. Additional groundwater monitoring may also be needed to demonstrate trends and better understand local issues and implementation effectiveness.

Ongoing monitoring activities are also necessary to assess progress relative to Plan measurable goals. It is anticipated that ongoing MPCA and partner monitoring programs will be sufficient to address progress towards surface water quality goals. Performance monitoring of capital improvements or other individual projects may be implemented on a project-by-project basis, to be detailed as part of project scoping (for example, MPCA monitoring of Cascade Creek following improvement projects implemented through cooperative effort of the MDNR, MPCA, and Olmsted County).

The Partnership will consider the execution of monitoring efforts as part of its biennial review (i.e., what was planned and what was completed) to identify potential gaps during implementation. The Partners will incorporate local and state-led monitoring results into a 5-year assessment to evaluate Plan progress and determine whether programmatic changes are needed. This may include comparison of monitoring results to modeled conditions, trend analysis, and/or comparison to applicable standards and goals.

Throughout Plan implementation, the Partners will share locally collected data with appropriate state agencies for inclusion in public databases, as appropriate.

6.1.3 Education and Public Involvement

Table 6-4 includes implementation activities categorized as "education and public involvement." The Partners recognize that public awareness and support is necessary to successfully implement this Plan and achieve meaningful progress towards Plan goals. Public input was solicited at the initial public meeting hosted by the Partners, an online survey, three waterside chats performed in fall 2019, and an online story map developed in early 2020 (see Section 2.5 and Appendix B). Additional stakeholder input received through a diverse Advisory Committee, including local residents and business owners, was considered throughout Plan development.

The education and public involvement activities in Table 6-4 are primarily focused towards promoting soil, water, and natural resource stewardship through increased public understanding of priority issues and providing varying levels of technical assistance. Groundwater quality education and outreach activities additionally focus on issues of public health and safety. Planned engagement activities, generally, include:

- Site visits and site-specific technical assistance to support:
    - Buffer maintenance, repair, and improvement
    - Soil health practices
    - Wetland protection
    - SSTS management actions
    - Nutrient and manure management plans

- Workshops (e.g., addressing SSTS and well maintenance)
- Demonstration projects/research sites (e.g., soil health practices)
- Volunteer events (e.g., river clean-ups)
- Targeted mailings (e.g., information targeting owners of non-functioning SSTS)
- News articles/press releases/digital media (project- or initiative-specific)
- Educational flyers (e.g., information about vegetated buffers, groundwater conservation)

Plan implementation presents an opportunity to increase and optimize the existing education and public involvement roles of the Partners. The Partners will leverage existing relationships and public outreach methods as a foundation to implement the activities in Table 6-4, further developing capacity and methods through the assistance of cooperating entities and the targeting performed as part of this Plan. Existing education and public involvement programs include:

- County fair booths
- Envirothon and similar events
- Dodge County Expo
- Field Days
- Photo contest/social media engagement
- Annual reports
- Nitrate screening events (funded through MDH grants)
- Public outreach/education plan promoting drinking water safety for private well owners

Template education and outreach materials will be developed for use within each County and be hosted online (see activity ALL-1 in Table 6-4). Activities will be locally administered and implemented, with individual Partners tailoring administration to the particular needs of their jurisdictions.

6.1.4 Regulation and Administration

The priority concerns identified by the Partners and discussed in Section 0 are addressed in part through Federal, State, and local regulations. Table 6-4 includes implementation activities categorized as "regulation and administration." These activities include those actions related to the development and enforcement of rules, ordinances, or other official controls.

The activities included in Table 6-4 include those administered by the Partners and do not include State and Federal regulatory programs administered by others (e.g., MDNR administration of public waters rules). The Partners will continue to locally administer existing State, Federal, or local regulatory programs, as appropriate or required. These programs are summarized in Section 6.2.

6.2 Regulatory Roles and Responsibilities

State, Federal, and local entities implement regulatory programs, permit programs, and other official controls (e.g., ordinances) to manage select activities that may impact water and natural resources. In some cases, regulatory programs are designed at the State or Federal level but administered by local governmental units (e.g., Wetland Conservation Act). Programs applicable to the resources and issues

addressed by this Plan are summarized in the following sections. Note that this Plan does not include the authority to increase the regulatory responsibilities of any of the Partners. Local controls are described in Section 6.2.1. State and Federal agency roles and responsibilities are summarized in Appendix D.

6.2.1 Local Administration of Official Controls

The Partners locally administer several programs to regulate activities impacting water and natural resources. These programs include, but are not limited to, those described in the following subsections. Within their respective jurisdictions, the Partners implement and enforce various project reviews, permits, and approvals to ensure that development, redevelopment, and other land-disturbing activities are performed consistent with locally implemented controls. The regulatory roles of the Partners are summarized in Table 6-1. Note that other local entities adopt and enforce local controls within the planning area (e.g., city stormwater ordinances and zoning regulations).

Table 6-1 Summary of local regulatory authorities

Jurisdiction	Resource Regulation or Ordinance											
	Wetland Conservation Act	Stormwater Management	Shoreland Management	Floodplain Management	Subsurface Sewage Treatment Systems	Feedlots	State Buffer Law	Land Use /Zoning	Drainage Authority	Soil Loss Ordinance	Bluffland Ordinance	Well Management[3]
Bear Valley WD		X		X								
City of Rochester	X	X	X	X				X				
Dodge County	X		X	X	X		X	X	X			
Dodge SWCD							--[1]					
Goodhue County			X	X	X		X	X	X	X	X	X
Goodhue SWCD	X					X	--[1]					
Olmsted County			X	X	X	--[2]		X	X	X	X	X
Olmsted SWCD	X						--[1]					
Rice County			X	X	X	X	X	X	X			
Rice SWCD	X						--[1]					
Steele SWCD	X						--[1]					
Wabasha County			X	X	X		X	X	X		X	X
Wabasha SWCD	X						--[1]					

(1) SWCDs have a technical role in buffer law, but no enforcement authority
(2) Olmsted County has a feedlot officer, but have delegated feedlot regulatory authority to MPCA
(3) Partners have varying degrees of delegated authority from MDH

6.2.1.1 Wetland Conservation Act

Wetlands in Minnesota are regulated under the Wetland Conservation Act (WCA) of 1991, which is intended to result in "no net loss" of wetlands. Anyone proposing to drain, fill, or excavate a wetland must first try to avoid disturbing the wetland; second, try to minimize any impact on the wetland; and, finally, replace any lost wetland acres, functions, and values. Certain wetland activities are exempt from the act, allowing projects with minimal impact or projects located on land where certain pre-established land uses are present to proceed without regulation.

Within the planning area, the City of Rochester, Dodge County, Goodhue SWCD, Olmsted SWCD, Rice SWCD, and Wabasha SWCD serve as the local government units (LGUs) that implement the WCA locally. The Minnesota Board of Water and Soil Resources (BWSR) administers the WCA statewide, and the MDNR enforces the WCA.

6.2.1.2 Buffers and Soil Loss

The State of Minnesota passed the Buffer and Soil Loss Legislation (Minnesota Statute 103F.48) in 2015; this legislation is commonly referred to as the Minnesota Buffer Law. The statute requires a continuous buffer of perennial vegetation with a 50-foot average width and 30-foot minimum width around all public waters and a 16.5-foot minimum width continuous buffer of perennial vegetation along all public drainage systems.

Within the planning area, the SWCDs are tasked with implementing and assessing compliance with the buffer legislation and applicable city ordinances. SWCDs provide technical assistance, along with financial assistance options, for landowners to implement buffers. While SCWDs determine compliance with the buffer law, that information is provided to the Counties who are responsible for buffer law enforcement (with the exception of Olmsted County, where enforcement is the responsibility of BWSR). Landowners also have the option of working with their local SWCD to determine if alternative practices aimed at protecting water quality can be used, rather than a buffer.

6.2.1.3 Shoreland Management

The State of Minnesota established shoreland rules (MN Rules 6120.2500 - 6120.3900) to regulate land use and development of shoreland areas. These rules establish minimum standards to protect habitat and water quality and preserve property values. The rules include zoning provisions that require a 50-foot buffer around public waters and include structure height limits, impervious surface limits, lot requirements, and vegetation removal guidance. Permits are required from the local unit of government for intensive vegetation removal and excavations occurring in shoreland overlay areas.

These standards are implemented through local shoreland ordinances. Within the planning area, shoreland regulation is implemented through County zoning ordinances and city ordinances, as applicable. The MDNR's role is to ensure that local shoreland ordinances comply with the state shoreland rules and to provide technical assistance and oversight to these local governments.

6.2.1.4 Floodplain Management

Within the planning area, local governmental units regulate development and land disturbing activities within the floodplain to minimize risk to infrastructure, property, and health and safety resulting from flood events. Floodplain regulations are generally included as part of City and County zoning ordinances or watershed district rules and may apply to FEMA-designated floodplains (see Section 3.9.1) or floodplain areas designated by local entities (e.g., City of Rochester).

Floodplain ordinances require, at a minimum, that minimum building elevations (i.e., lowest floor) be at least 1 foot above the 100-year water surface elevations (this elevation is known as the regulatory flood protection elevation). Floodplain ordinances also prohibit or limit allowable land use and development within the floodplain. Some local units of government implement higher standards than the minimums required.

6.2.1.5 Subsurface Sewage Treatment Systems (SSTS)

At the State level, the Minnesota Pollution Control Agency administers programs regulating the design, construction, and maintenance of subsurface sewage treatment systems (SSTS) through MN Rules 7080 – 7083 (see Section 7.2.2.5). Locally, the Counties administer SSTS programs consistent with MN Rules 7080 – 7083, including an inspection program. County programs provide technical assistance, education, plan review, and SSTS inspections to protect water quality, prevent and control water-borne diseases, and prevent or eliminate nuisance conditions.

The Partners will prioritize activities to address SSTS systems classified as imminent threats to public health and safety (ITPHS) above activities to respond to non-compliant systems not classified as IHTs. An SSTS may be classified as an IHT if there is (1) sewage discharge to surface water; (2) sewage discharge to ground surface; (3) sewage backup; or (4) any other situation with the potential to immediately and adversely affect or threaten public health or safety. The Partners will continue to work towards compliance of all systems, as resources allow.

6.2.1.6 Well Management and Wellhead Protection

Through its Well Management Program, the MDH administers and enforces the Minnesota Water Well Code, which regulates activities such as well abandonment and installation of new wells (see Section D.5). The MDH also administers the Wellhead Protection Program, which is aimed at preventing contaminants from entering public water supply wells. Cities within the planning area have completed or will be completing wellhead protection plans consistent with MDH guidance (see Table C-6).

Some counties (e.g., Olmsted County)) maintain well ordinances that allow MDH to delegate administrative responsibilities related to permitting, construction, repair, and sealing of wells. Olmsted County has an ongoing program to administer the well ordinance and program, as do Goodhue County and Wabasha County.

Well maintenance is an important aspect of protecting wells from contamination. Examples of well maintenance protection include proper installation, well caps, and inventory and location of private wells.

Sealing wells that are unused or vulnerable is also an important part of protecting groundwater and managing a well network.

6.2.1.7 Feedlots

Minnesota Rules 7020 establish rules, regulations, and programs applicable to feedlots. At the State level, feedlot regulations and programs are administered by the MPCA. Within the planning area, Goodhue County and Rice County serve as delegated partners to the MPCA to provide feedlot regulatory oversight, implement technical assistance programs, and maintain a feedlot inventory within their respective jurisdictions. Within Dodge County, Minnesota Rules 7020 is administered by the MPCA. In Olmsted County and Wabasha County, the County and/or SWCD provides technical assistance, but does not retain regulatory oversight.

6.2.1.8 Stormwater Runoff and Erosion Control

Stormwater management and erosion control for land disturbing activities of an area one acre or more are regulated at the State level by the MPCA's construction stormwater permit (see Section 7.2.2.4). Additionally, land disturbing activity above or below the MPCA threshold may be subject to local stormwater management and erosion control requirements enforced via City or County ordinance. The City of Rochester and many other cities within the planning area enforce stormwater management ordinances. The Bear Valley Watershed District also implements a project review and permit program that addresses impoundments, stormwater conveyance, and drainage issues (see Section 6.2.1.11). Both Olmsted County and Goodhue County also maintain soil loss ordinances that help regulate erosion within their jurisdictions.

6.2.1.9 Drainage Management

Activities affecting public drainage systems (i.e., public ditches) are subject to Minnesota Statutes 103E and fall under the jurisdiction of a local drainage authority (e.g., county, watershed district). Generally, the counties maintain jurisdiction over the ditches. Within the planning area, drainage authorities include:

- Dodge County
- Goodhue County
- Olmsted County
- Rice County
- Steele County (not a member of the Partnership)
- Wabasha County

The Partnership includes all drainage authorities within the planning area with the exception of Steele County. As part of their respective roles in overseeing the public drainage system, each drainage authority will seek to ensure that proposed modifications and improvements to public drainage systems are consistent with the goals of this Plan, including increased storage.

Through the drainage authorities, the Partnership will consider opportunities to coordinate Plan implementation activities with drainage projects, leveraging programs like BWSR's multipurpose drainage

management grants. This non-local source of public funding could enhance a project, with on-system BMPs (e.g., alternative side inlets) with off-system (cover crops, tillage), wetland treatment/storage systems, or modified channel design. Projects that affect drainage systems can be implemented in such a way to promote benefits for flooding, landscape resilience, and wildlife ecology. When working on projects affecting public drainage system projects, the drainage authorities know it is important to consider project timing, especially for synching-up effort with the multi-purpose drainage grant program. The Partnership will offer technical and financial assistance for drainage management practices consistent with the goals of this Plan, including increased storage.

For ditch projects, the land adjacent to public ditches is required by the MDNR to include a buffer strip of permanent vegetation that is usually 1-rod (16.5 feet) wide on each side (Minnesota Statutes, Section 103E.021). Additional information regarding public drainage systems is included in Section C.6.3.

6.2.1.10 Land Use Planning

Counties and Cities within the planning area regulate the development and redevelopment of land through land use planning and zoning. Land use planning is necessary to balance economic development with appropriate management of natural resources. Land use regulations are typically implemented through zoning ordinances. Long-term land use and planning considerations for each Partner are detailed in Partner Comprehensive Plans (see Table 6-2).

Table 6-2 Partner Comprehensive Plan Adoption

Partner	Plan	Date Adopted
Bear Valley Watershed District	2012 Overall Plan	2012
City of Rochester	Rochester Comprehensive Plan 2040	April 2018
Dodge County	Comprehensive Plan Dodge County, MN	September 10, 2019
Dodge SWCD	Dodge County Comprehensive Local Water Management Plan	December 15, 2016
Goodhue County	Comprehensive Plan Goodhue County, MN	June 21, 2016
Goodhue SWCD	Goodhue County Comprehensive Local Water Management Plan	May 26, 2020
Olmsted County	Olmsted County General Land Use Plan	March 25, 2014
Olmsted County, Olmsted SWCD	Olmsted County Comprehensive Local Water Management Plan	April 25, 2019
Rice County	2040 Rice County Comprehensive Plan	In progress
Rice SWCD	Rice County Comprehensive Local Water Management Plan	December 11, 2019
Steele SWCD	Steele County Comprehensive Local Water Management Plan	July 11, 2017
Wabasha County	Comprehensive Land Use Plan for Wabasha County, MN	August 4, 1998
Wabasha SWCD	Wabasha County Comprehensive Local Water Management Plan	October 20, 2015

Among the Partners, each County and the City of Rochester maintain zoning ordinances to regulate land use and development with consideration for natural resources (see Table 6-1). Each Partner zoning ordinance includes additional development and land disturbance requirements applicable to shoreland and floodplain areas, including:

- Restrictions on permitted land uses
- Requirements for permanent vegetation
- Minimum setbacks from the ordinary high-water level (OHWL) of lakes and rivers for structures and SSTS
- Minimum building elevations relative to flood elevations
- Maximum allowable percent impervious surface
- Requirements for stormwater outfalls to waterbodies
- Protection of special groundwater recharge features (e.g., Decorah Edge provision)

In addition to the City of Rochester, most cities and townships within the planning area regulate land use and development through their own zoning ordinances and other official controls. City and township land use planning and zoning requirements must be at least as restrictive as County ordinances. Cities without land use planning guidance may rely on County ordinances for guidance.

Goals and issues identified in Partner comprehensive and local water plans were considered during Plan development. Land use planning and development present opportunities for the Partners to implement activities in pursuit of Plan goals, both within their jurisdiction and in coordination with the cities that have adopted their own land use planning requirements. Examples may include ensuring compliance with shoreland zoning requirements to limit the potential for future erosion issues or minimizing impervious area to reduce stormwater runoff volumes. This is especially relevant as the Rochester area continues to urbanize. As rural portions of the planning area are converted to less pervious residential, commercial, and urban land uses, application of ordinances with appropriate protections for water and natural resources is critical to prevent future problems.

As part of Plan implementation, the Partners will review existing ordinances and suggest revisions to minimize impacts to water and natural resources (see Table 6-4). The Partners will continue to offer technical assistance related to land use planning and development project review, as requested by local jurisdictions. The Partners will seek opportunities to collaborate with local jurisdictions as they amend, update, or adopt local land use controls.

6.2.1.11 Watershed District Rules and Permit Programs

Per the authority given to watershed districts in Minnesota Statutes 103D, the Bear Valley Watershed District (BVWD) adopted rules applicable within its jurisdiction. The BVWD enforces its rules through project review and permit programs. The BVWD Rules are summarized in this section but will be maintained and updated by the BVWD as a separate document outside of this Plan.

BVWD Rules

The BVWD Rules (2011, as amended) require a permit for projects seeking to:

- Create, remove, or alter water impoundments
- Alter the course, current, or cross section of any stream or watercourse
- Construct structures within the floodplain
- Construct bridges, culverts, or drains to manage stormwater runoff

Briefly, the BVWD Rules require:

1. Surface water shall not be artificially removed from upper land to and across lower land without adequate provision being made on the lower land for its passage, nor shall the natural flow of surface water be artificially obstructed so as to cause an overflow onto the property of others.
2. Water inlets, culvert openings, and bridge approaches shall have adequate should and bank protection in order to minimize land and soil erosion.
3. All septic tanks and drain fields, which outlet directly or indirectly into the waters of the district shall be constructed and maintained in accordance with the rules and recommendations of the State, as modified by the appropriate zoning ordinance of Goodhue and Wabasha Counties.
4. No reservoir for the impoundment of water may be constructed, removed, or abandoned without a permit from the managers, nor shall any dam be constructed to impound water without a permit from the managers.
5. No bridge or culvert and no drain from the disposal of storm waters, public or private, shall be constructed, reconstructed, laid or maintained in, to, or across any streams or public or private drain unless it has an adequate waterway opening.
6. To prevent obstruction to flood waters a permit shall be required from the managers for the construction of any building within the floodplain of Bear Valley.
7. No person or entity shall dispose of any waste, human, animal, or industrial by casting such waste directly or indirectly into any lake or stream, public or private drainage system, or road ditch within the district.
8. In order to preserve the same for beneficial use;
    a. No person or entity shall change or diminish the course, current or cross-section of any public waters within the watershed district without appropriate State permit(s) and a permit from the Watershed District.
    b. No person or entity shall alter, change, enlarge, diminish, straighten, deepen or otherwise dig in or interfere with the beds, banks, and shores of any stream or watercourse within the watershed district without a permit from the Managers of the Watershed District.
9. No person or entity shall abandon, deposit or dispose of any waste, litter, garbage, junk, or debris (natural or artificial) directly or indirectly, into the waters of the streams of the district.

Additional information is available from the BVWD at: https://www.goodhueswcd.org/bear-valley-watershed

6.2.2 Adequacy of Regulatory Controls

Review of local controls and ordinances indicates that local regulatory roles and official controls are generally sufficient to protect the resources prioritized in this Plan consistent with state requirements (e.g., MDNR shoreland rules, MS4 permits). There are opportunities to improve coordination and consistency across the planning area and address potential gaps in local control consistency. Examples include:

- Adoption of local soil loss ordinances by Partners in addition to Goodhue, Olmsted, and Wabasha Counties
- Adoption of zoning ordinance overlays similar to the Olmsted County Decorah Edge overlay in areas outside Olmsted County
- Expansion of low-impact design requirements or incentives within local stormwater management ordinances

The implementation schedule includes several actions related to review and update of local controls to address specific priority issues, for example:

- Review of stormwater ordinances to address infiltration in vulnerable areas (GWQ-22)
- Review of zoning and land use controls to assess protections for forests, wetlands, and areas of significant biodiversity (LR-5, LR-9, and FWH-3)

There may be additional opportunities to extend official controls implemented by some Partners across other portions of the planning area. For example, soil loss ordinances of Olmsted County and Goodhue County could serve as templates for others. Similarly, Partners may develop Karst area protections based on Olmsted County's protections for Decorah Edge areas.

6.3 Plan Implementation Costs and Funding

The implementation schedule (Table 6-4) includes planning level cost estimates for individual activities. Planning level costs are split between local funding sources and external funding sources. Local funding sources include funding borne by the Partners, while external funding sources include all other funding sources (e.g., cost-share with non-Partner entities, State grants). Costs are presented in 2021 dollars for planning purposes. More detailed cost estimates may be required for individual activities prior to execution. Costs presented in Table 6-4 are subtotaled by category and summarized in Figure 6-1 (total cost) and Figure 6-2 (local costs) and presented in tabular format in Table 6-3.

The Partners understand that there is some uncertainty in the amount of external funding (e.g., state funding, federal grants) that will be received during implementation. Therefore, the implementation schedule presented in Table 6-4 includes a "base funding scenario" representing expected funding values, as well as an "additional funding scenario" in which additional external funding is available. The implementation activity outputs and estimated costs associated with the additional funding scenario are presented in in red text in Table 6-4.

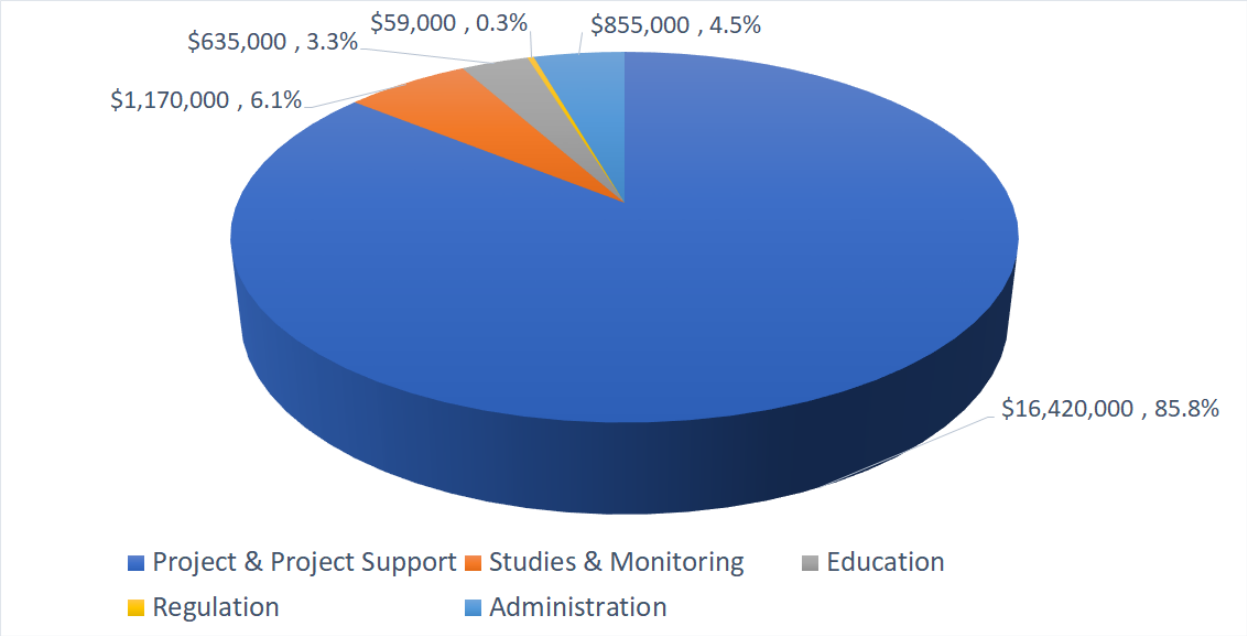


Figure 6-1 Summary of Implementation Schedule Total Costs – base funding scenario

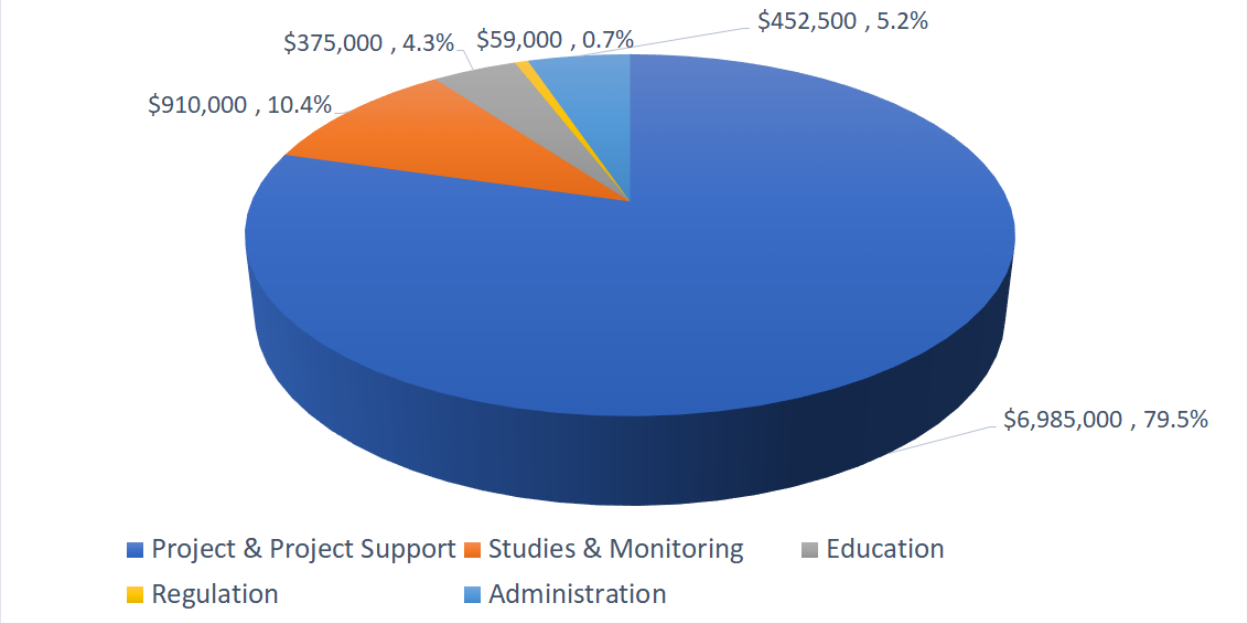


Figure 6-2 Summary of Implementation Schedule Local Costs – base funding scenario

This Plan includes an ambitious implementation schedule carrying a total estimated cost of approximately **$19.1M** for the base funding scenario and approximately **$25M** for the "additional funding scenario". Total estimated annual costs for the base funding scenario (approximately $1.9M) exceed current local funding allocated to existing and similar programs within the planning area. Organizational capacity of the Partners (i.e., staff time and expenses currently expended to address the issues addressed by this Plan)

was estimated during Plan development at approximately $650,000 per year (or approximately $6.5M over the 10-year planning period). The current level of Partner funding to address Plan issues is less than the estimated total annual cost of implementation. Thus, additional local funding and funding through State, Federal, and private grant or cost-share dollars will be necessary to accomplish Plan goals.

Table 6-3 summarizes the estimated implementation costs broken down by type of activity and funding amounts coming from Partner local funds, watershed-based implementation funding (WBIF), local landowner contributions, and other state and federal funding sources.

Table 6-3 Summary of Estimated Plan Funding

Type of Activity	Partner Local Funds	Estimated Landowner Contribution	Watershed Based Implementation Funds (WBIF)	Other state/ federal funding sources	Total
Partnership Administration	$452,500 $452,500	-- --	$402,500 $402,500	-- --	$855,000 $855,000
Project and Project Support	$6,235,000 $7,111,000	$750,000 $900,000	$5,600,000 $5,600,000	$3,835,000 $8,592,000	$16,420,000 $22,203,000
Studies and Monitoring	$910,000 $910,000	-- --	-- --	$260,000 $310,000	$1,170,000 $1,220,000
Education and Outreach	$375,000 $375,000	--	$110,000 $110,000	$150,000 $225,000	$635,000 $710,000
Regulatory Review/ Oversight	$59,000 $59,000	--	--	--	$59,000 $59,000
Total (base funding) **Total (additional funding)**	$8,031,500 $8,907,500	$750,000 $900,000	$6,112,500 $6,112,500	$4,245,000 $9,127,000	$19,139,000 $25,047,000

Notes: black text indicates base funding scenario; red text indicates additional funding scenario

6.3.1 Federal Funding Sources

Federal funding includes all funds derived from the Federal tax base. For example, this includes programs such as the Environmental Quality Incentives Program (EQIP), Conservation Reserve Program (CRP), Regional Conservation Partnership Program (RCPP), Conservation Innovation Grants (CIG), and Fish and Wildlife Service (FWS) funding for habitat projects. RCPP has been used in the planning area through the Southeast Feedlot RCPP. Federal funding excludes general operating funds obtained from BWSR, counties, fees for service and grants or partnership agreements with state government or other conservation organizations.

Federal Funding has been utilized and implementation work has been supported in targeted areas in the watershed. Mississippi River Watershed Basin Initiatives, National Water Quality Initiative and other funding opportunities have been utilized. Partners including Olmsted SWCD and Wabasha SWCD are currently leveraging (or have recently used) Federal 319 funds to complete studies in the planning area in

the West Indian Creek and Cascade Creek watersheds. Continued use of this funding source is anticipated and will be pursued. Federal 319 implementation funds may also be used to implement BMPs and measure effectiveness of practices. Implementation will be addressed by expanding these efforts, along with other federal initiative opportunities.

The estimated implementation costs include anticipated external funding from Federal sources, although an exact quantity is not specified. Partners will seek Federal funding during Plan implementation, where appropriate. The Partners anticipate that the NRCS Regional Conservation Partnership Program (RCPP) may be a funding source that can be targeted during implementation. Note that cost support provided by Federal programs like EQIP are considered in the breakdown of activity costs between local Partners and other sources for activity SWQ-1, see Section 4.2 and Table 6-4.

6.3.2 State Funding

The amount of funding needed for Plan implementation from non-local sources is approximately $800K annually and $8M over the 10-year planning period. This includes State funding (i.e., funds derived from the State tax base). State funds include money derived from all State-implemented grant programs (e.g., Clean Water Fund Projects & Practices program, etc.). The Partners anticipate that this will include State funded watershed-based implementation funding (WBIF).

State funding excludes general operating funds obtained from counties, fees for service, and grants or partnership agreements with the Federal government or other conservation organizations.

6.3.3 Local Funding

This Plan does not create any additional taxing authority among the Partners. The annual amount of funding needed from local sources to perform the activities included in the implementation schedule is approximately $8M over the 10-year planning period, or approximately $800,000 annually. Local revenue includes money derived from the local property tax base, and in-kind services of any personnel funded from the local tax base. Locally generated money for water management activities may include:

- County or watershed district (WD) support of Soil and Water Conservation Districts (SWCDs)
- Funds generated through the sale of services and products such as SWCD tree sales
- Fees for services performed by local SWCDs
- Local costs to administer ordinances including state rules and programs (e.g., shoreland, feedlots, SSTS, Wetland Conservation Act)
- Landowner contributions toward conservation implementation, including cash and in-kind services used as matching funds for state and federal cost-share programs
- Funds from locally based partnerships with non-governmental organizations (NGOs), corporations, local businesses, etc. that contribute to Plan activities
- Local funds for capital improvement projects that are initiated by local governments and that benefit water resources as described in the Plan (e.g., stormwater improvements, water quality treatment, flood risk reduction)
- Donated easements that have a primary or secondary purpose of water quality improvements

- City funds for stormwater management, drinking water supply, etc., if they are Plan activities
- County, City, Township, and Watershed District funding generated through levy authority

Local funds will be used for activities where opportunities for State and Federal funding are limited (e.g., monitoring and studies) or where local funds are required for grant-matching.

6.3.4 Other Funding Sources

Additional non-governmental funding sources may be used to fund Plan implementation. The Partners will coordinate with such NGOs to explore potential partnerships and cost-share opportunities surrounding shared goals (such as the University of Minnesota's Forever Green program). For example, the Partners will continue to support the Zumbro River Regional Water Trail Guiding Committee in their pursuit of shared goals.

Private sector companies, including those specifically engaged in agribusiness, may also be a potential source of funding for implementation. Partners may include Trout Unlimited, Fishers and Farmers Partnership, The Nature Conservancy, and others. Previous examples include collaboration between Wabasha SWCD and Trout Unlimited to perform improvement to Mazeppa Creek; this project is funded in part with EQIP and CPL funds.

The Partners will seek additional partnerships with private sector businesses as such opportunities arise. Future opportunities may include working with agri-business (e.g., seed companies, tool manufacturers) on incentives that provide opportunity for water resources improvements. Incentives may not be implemented through the Partnership but instigated through Partnership actions.

6.3.5 Collaborative Grants

The Partners recognize the importance of securing grant funding in completing the implementation activities identified in this Plan (see Table 6-4). The Partners will leverage this Plan in applying for competitive state and federal grants. As part of annual work planning (see Section 6.4.4).

6.4 Plan Administration and Coordination

The Parties, collectively known as the Watershed Alliance for the Greater Zumbro (WAGZ), will implement this Plan according to the governance structure established in the Joint Powers Agreement for implementation (JPA, see Appendix A). The JPA does not create a new entity. Instead, the JPA is a formal and outward commitment to work together as a partnership and it specifies mutually accepted expectations and guidelines between partners.

Per the JPA, the Parties will establish committees to carry out the coordinated implementation of this Plan. These committees will include:

> **Policy Advisory Committee (PAC)** – The Policy Advisory Committee (PAC) will operate cooperatively and collaboratively, but not as a separate entity. Each governing entity agrees to appoint one representative who must be an elected or appointed member of each governing

entity to the PAC. Each governing entity may choose to appoint one alternate to serve on the PAC, as needed, in the absence of the appointed member. PAC members shall keep their respective governing entities regularly informed on the implementation of the Greater Zumbro River Comprehensive Watershed Management Plan. Each representative shall have one vote, subject to the authority delegated by their respective governing entity. The PAC will establish bylaws to describe the functions and operations of all committee(s). Once established, the PAC will follow the bylaws adopted, and have the power to modify the bylaws. The PAC will meet as needed (anticipated to be quarterly), but no less than twice per year, to advise implementation of the Greater Zumbro River Watershed Management work plan. Each member of the PAC shall have the authority to act on behalf of the party they represent in all matters relevant to the implementation of the Greater Zumbro River Comprehensive Watershed Management Plan, including but not limited to, the recommendation to approve grant applications, grant agreements, interim reports, payment of invoices, and entering into professional contracts. The PAC shall also approve an annual work plan and annual budget consisting of an itemized statement of the Greater Zumbro River Comprehensive Watershed Management Plan, revenues and expenses for the ensuing calendar years, and shall be presented to the respective governing entities that are represented on the PAC.

Technical Advisory Committee (TAC) – The PAC will appoint or invite technical representatives to a Technical Advisory Committee (TAC) to provide support and make recommendations on implementation of the Plan. The TAC may consist of the Local Implementation Work Group (LIWG) members, contacts for the State's main water agencies and/or plan review agencies, and area stakeholders. The TAC will meet as needed.

Local Implementation Work Group (LIWG) – The parties agree to establish a Local Implementation Work Group (LIWG), which shall consist of, but not limited to, local staff, including local county water planners, local watershed district staff, local SWCD staff, and local city staff, for the purposes of logistical, and day-to-day decision-making in the implementation of the Greater Zumbro River Comprehensive Watershed Management Plan. The LIWG shall prepare a draft annual work plan and budget consisting of an itemized statement of the Greater Zumbro River Comprehensive Watershed Management Plan revenues and expenses for the ensuing calendar year which shall be presented to the PAC for review. The LIWG will meet as needed.

6.4.1 Fiscal Agent and Administration

A partnership established with a JPA cannot receive funds directly or hold funds or agreements that have a financial connection. One member of the Partnership must be designated as a fiscal agent for each grant or project in order to hold funds and agreements. The PAC shall appoint one of the parties to the JPA to be the Fiscal Agent for each source of funding received. Roles and responsibilities of the fiscal agent are specified in the implementation JPA (see Appendix A). Grants obtained outside of the Partnership will be administered by the local governmental unit, as is currently done.

The PAC shall appoint one of the parties to the JPA to be the Day-to-Day Contact, to be the point of contact for, and handle, the day-to-day administrative work of the Plan. The Day-to-Day Contact will handle this function and continue thereafter until and unless the PAC appoints an alternate Day-to-Day Contact. Roles and responsibilities of the Day-to-Day Contact are specified in the implementation JPA (see Appendix A).

6.4.2 Watershed District Plan Adoption

The BVWD is a watershed district subject to Minnesota Statutes 103D and is required to adopt a watershed management plan. In adopting the Greater Zumbro Comprehensive Watershed Management Plan (this Plan), the BVWD intends this document to serve as the organization's watershed management plan, with the understanding that this Plan, once approved by BWSR, shall meet the requirements of Minnesota Statutes 103D.405.

The BVWD shall maintain its rules (see Section 6.2.1.11) as a separate document outside of this Plan and independent of the Partnership. The BVWD also intends to maintain separate capital improvement programs (CIPs) informed by the implementation schedule included in this Plan. The BVWD CIP shall be integrated with the implementation schedule included in this Plan, as appropriate, by the LIWG through the annual work planning process.

6.4.3 Coordination and Shared Services

Coordination and communication are critical for a partnership operating under a JPA. The Partners will coordinate and collaborate with local, State, and Federal governments throughout the implementation of this Plan. The Partners seek to develop and maintain relationships that will promote effective coordination to accomplish Plan goals. As part of this coordination, the Partners have and will continue to consider opportunities for shared services (e.g., shared staff positions) to provide mutually beneficial and efficient service to multiple Partners in pursuit of Plan goals. This includes contracting a nutrient management expert as a shared service to provide technical assistance (see Table 6-4).

Future opportunities for shared services (e.g., outreach coordination, monitoring) will be considered by the Plan Implementation Work Group as additional needs are identified as part of annual work planning and progress assessment.

The Partners will coordinate the use and dispersal of WBIF to implement field practices according to the procedures described in Section 6.1.1.1 and following the priority area implementation sequence outlined in the implementation schedule (see Table 6-4).

Many governmental units have roles and responsibilities related to water and natural resource management within the planning area and have established plans, goals, and actions to manage these resources. Input from State and local governmental agencies was considered and incorporated in the development of this Plan, including information submitted to the Partners in response to Plan notification (see Section 2.5).

Many of the priority issues and associated goals included in this Plan directly or indirectly support the goals, objectives, and responsibilities of other governmental units. The Partners will continue to coordinate with BWSR, MDA, MDH, MDNR, and MPCA as required through State-legislated programs and to accomplish the many Plan activities that identify State agencies as cooperating entities. Similarly, continued coordination and communication with local governmental units, such as cities, townships, counties, watershed districts, joint powers organizations, drainage authorities, and other water management authorities is necessary to facilitate watershed wide activities. The Partners will also collaborate with non-governmental organizations where mutual benefit may be achieved. Many of these collaborations are intended to improve habitat, recreational opportunities, and water quality within the Plan area, while providing education and outreach opportunities.

For those activities identified in the implementation schedule (Table 6-4), one or more Partners will serve as the lead for implementation. Specific opportunities for coordination with other units of government that are not part of the Partnership are identified in the implementation schedule (Table 6-4). The "supporting entities" field in Table 6-4 notes those other governmental units or parties that the Partners will coordinate with in performing each activity.

6.4.4 Work Planning

Implementation of this Plan is based on coordinated action by the members of the Partnership. Therefore, annual work planning will be based on priority of implementation activities planned, the availability of funds, and the roles and responsibilities for implementation.

An annual work plan will be developed following the generalized process presented in Figure 6-3. The LIWG will develop a draft annual work plan based on the targeted implementation schedule (see Table 6-4) updated to reflect the current status of each activity. Factors the LIWG will use to develop and prioritize the annual work plan may include:

- Annual commitments from previous years
- Implementation of planned activities previously delayed
- Funding availability and/or partnering/cost-share opportunities
- Degree of benefit (e.g., water quality, flood relief) relative to other activities
- Consistency with Plan goals
- Distribution of activities to address Level 1, Level 2, and Level 3 goals
- Feasibility (e.g., can the activity be implemented?)

In prioritizing field practices planned as part of implementation activity SWQ-1, the LIWG will consider the process and considerations described in Section 6.4.4.1. Analysis of the degree of benefit may include estimates of pollutant load reduction based on HSPF, or similar model results, project location within priority Level 1, 2, or 3 watersheds (see Figure 3-6 and Figure 4-1, and/or project location relative to groundwater priority areas, if applicable (see Figure 3-7 and Figure 3-8).

The annual work plan will then be presented to the PAC and TAC for review. Members of the TAC may use this review to promote the inclusion of planned activities that may be a high priority to local, state, or other partnering entities. The LIWG may revise the annual work plan prior to final approval by the PAC.

The intent of the annual work plans will be to maintain coordinated and collaborative progress toward completing the targeted implementation schedule. The work plan and budget request will promote local water management priorities for state funding requests.

Biennially, the LIWG will also develop and submit (following PAC approval) a work plan and budget request for Watershed Based Implementation Funding (WBIF) to BWSR covering a 3-year period and based on this Plan. The Partners also intend to pursue competitive grants and other funding based on the work plan to accomplish the Plan implementation schedule. As a part of work planning, the Local Implementation Work Group (LIWG) will identify planned activities suited to available grant opportunities and make recommendations for pursuit of grants to the Policy Advisory Committee (PAC).

Figure 6-3 Generalized workflow for Plan implementation

6.4.4.1 Work Planning – Cost-share Grant Projects

The Partners intend to incentivize BMP projects through a cost-share program (see Section 6.1.1.1). The LIWG will utilize the application process to score and rank cost share opportunities from landowners or applicants. The scoring and ranking will consider:

- location of the project as it relates to the priority implementation areas (see Figure 3-6, Figure 3-7, and Figure 3-8)
- pollutants of concern/priority issues
- pollution reduction
- preliminary costs
- installation timing
- funds being requested

Other items that could be considered in the ranking process include potential for multiple benefits, landowner willingness, local landscape considerations etc. It is anticipated that funding will be available for projects identified in this Plan (i.e., points shown in Figure 4-1). For projects not identified in this Plan the individual project scoring and ranking criteria, as developed and maintained by the Partners, will be used to determine eligibility and priority.

The PIWG will work under the direction of the WAGZ Policy Advisory Committee to develop policies and processes and will guide project implementation and project selection using the following outline:

1. Local Implementation Policy development – creation and adoption of cost share policies or subagreements to direct how funds will be encumbered and distributed. The WAGZ will adopt cost sharing policies on an annual basis to direct fund distribution.

2. Cost-Share Rates – setting cost-share percentage, incentive payments, or flat rates in targeted priority areas.

3. Application Processing – creating a workflow of how an application would be processed through local boards and check points with the WAGZ based upon policy adopted.

Many of the cost-share implementation contracts to plan, develop, and install practices on the land will be held between the private landowners and the local entity. This method assures continuity with landowners and the traditional SWCD service model. These funds will be spent locally by individual Partners and reimbursed by the funding source fiscal agent when completed.

6.4.5 Evaluation and Reporting

6.4.5.1 Annual Reporting and Biennial Evaluation

The LIWG will annually provide the PAC with an update on progress of Plan implementation. As part of this process, the LIWG will request input and feedback on progress from the PAC and TAC. The LIWG will take this feedback into consideration when developing the annual work plan for the following year, including reevaluating priority for implementation schedule activities and pursuit of grants. The annual review process will also include an assessment of Partnership operations. This will include self-assessment of LIWG, TAC, and PAC function, adequacy of the current governance structure, and delivery of implementation. This may also include solicited input from external parties (e.g., service recipients.)

Local governmental units have a number of annual reporting requirements; their reporting responsibilities will be conducted per state agency requirements. Reporting related to grants and programs developed collaboratively and administered under this Plan will be reported by the LIWG. The LIWG will also develop an annual report documenting progress toward completing the implementation schedule and achieving Plan goals and any changes in Plan priorities. The information to be included in the annual report will be developed through the annual evaluation process described above.

The LIWG will track projects and practice locations through a collaborative, shared spreadsheet tracking system with projects and practices illustrated spatially on Partner webpages and visible to the public. The Partners, State agencies, and many stakeholders will have interest in overall pollutant load reductions

achieved by BMPs and pace of progress relative to surface water quality goals. The project sponsor will provide BMP location and estimated pollution reduction of each practice installed. The Partnership will use that data to inform model runs (e.g., HSPF-SAM) that provide cumulative results and pace of progress (see also Section 4.2.5). The LIWG may use resources to assist in this effort, at the discretion of the PAC.

Biennial assessment of progress will consider the achievement of "outputs" for individual implementation items identified in Table 6-4. Some items in the implementation schedule will provide additional data that may impact Plan priorities and help define future implementation activities (e.g., using results of hydrologic and hydraulic modeling to identify opportunities for increased storage, see implementation item FLD-6). Results of planned studies and similarly relevant activities will be considered and incorporated into the annual evaluation process. The Partnership will consider the execution of monitoring efforts as part of its biennial evaluation (i.e., what was planned and what was completed) to identify potential gaps.

6.4.5.2 Five Year Review

A more thorough evaluation of Plan progress is planned after five years (half way through the 2022-2031 period covered by this Plan). Over the 10-year life of the Plan, developments may arise that warrant revisions to the Plan. New priority issues may emerge. The relative importance of existing issues may change based on monitoring data, modeling results, or shifting priorities of the Partners. Progress towards Plan goals and the implementation schedule may deviate from that anticipated. Thus, a 5-year evaluation will be performed to assess whether revisions to priority issues, goals, activity targeting, and implementation schedule are needed. This evaluation may result in a Plan amendment (see Section 6.5) needed to update elements of the Plan, as needed.

6.5 Plan Updates and Amendments

The Partners understand that this Plan and its targeted implementation schedule are a guide. The Plan provides a roadmap for the next 10 years while maintaining flexibility for the Partners to use their local expertise to ensure that Plan resources are used efficiently and responsibly to address priority issues. The Partners will annually assess progress towards Plan implementation and adjust the implementation schedule through the development of its annual work plan (see Section 7.4.3).

Prior to a scheduled Plan update, the Partners may wish to make significant revisions to the Plan through a Plan amendment. A Plan amendment may be required to significantly change Plan priority issues, goals, targeted implementation schedule, or administrative processes.

Amendments to this Plan will follow the procedures described herein. This Plan will remain in full effect until an amendment is approved by BWSR and adopted by each Partner. The Plan amendment process shall be initiated only by the PAC. However, Plan amendments may be proposed by any agency, person, or local government, including the LIWG and TAC. The LIWG will intentionally consider potential changes that warrant a plan amendment ahead of annual work planning. Potential changes and a call for additional recommendations to be considered will be discussed as part of annual work planning. All

recommended Plan amendments must be submitted to the PAC along with an explanation of why the Plan amendment is needed.

Draft Plan amendments presented to the PAC for consideration shall be prepared and formatted as described herein. Amendments must be provided (printed or digitally) in the form of replacement pages for the plan, each page of which must:

- Show deleted text as stricken and new text as underlined
- Be renumbered as appropriate (unless the entire Plan is reproduced)
- Include the effective date of the amendment (unless the entire Plan is reproduced)

If the PAC, in coordination with BWSR, determine that a Plan amendment is needed, the LIWG will complete the amendment according to the procedure described in State statute.

In recognizing the need to maintain flexibility during implementation, a Plan amendment is generally not required for the following situations (but may be requested by the Partners):

- Revising the estimated cost for an individual project or program
- Adding or removing activities from the implementation schedule, provided that:
    - The activity is consistent with Plan goals, and
    - The action is performed through the annual work plan update
- Altering the timeline for planned activities within the implementation schedule
- Including new or updated monitoring data, model results, or other technical information

If it is unclear whether a proposed revision to the Plan requires an amendment, the PAC will coordinate with BWSR staff to determine the need for a Plan amendment. Examples of situations where a Plan amendment may be required include:

- Addition of capital improvement projects that are not described in the Plan
- Establishment of a water management district(s) to collect revenues and pay for projects initiated through, MS 103D.601, 605, 611 or 730 (only applicable within the BVWD). To use this funding method, MS 103D.729 requires a Plan amendment
- Addition of new projects or programs with significant financial impact relative to existing estimated costs

Partner entities maintaining individual CIPs outside of this Plan (e.g., City of Rochester, Bear Valley Watershed District) may periodically update their CIPs. The Partnership requests that Partners updating separate CIPs provide a courtesy notification and opportunity for discussion with the PAC.

Table 6-4 WAGZ Comprehensive Watershed Management Plan Implementation Schedule

Item ID	Implementation Action Description	Type (P = Project, S = Study, E = Educ., R = Reg.)	Applicable Goals (see Table 5-2)	Applicability to Goal Areas: Level 1 – Groundwater Contamination	Level 1 – Excessive Flooding	Level 1 – Degraded Surface Water Quality	Level 1 – Accelerated Erosion and Sedimentation	Level 2 – Degraded Soil Health	Level 2 – Altered Hydrology, Landscape Resiliency	Level 2 – Threats to Fish, Wildlife, and Habitat	Level 3 – Threatened Groundwater Supply	Level 3 – Reduced Livability and Recreation	Target or Focus Area	Measurable Output	Timeframe (Values are incremental for each 2-year period): 2022 to 2023	2024 to 2025	2026 to 2027	2028 to 2029	2030 to 2031	Estimated Total Cost	Estimated Local Contribution (landowner, SCWD/County locally budgeted/assessed)	Estimated External Contribution (WBIF, competitive grants, federal, 319)	Lead LGU	Supporting Entities
														Red text indicates higher level of planned implementation if additional external funding becomes available									
ADM-1	Develop template education materials and branding for consistent messaging between partners	E		●	●	●	●	●	●	●	O	O	Planning Area	Templates, Branding	X					$ 5,000	$ 2,500	$ 2,500	All Partners	BWSR
ADM-2	Annual work planning, budgeting, and reporting	S	All (indirectly)	●	●	●	●	●	●	●	O	O	Planning Area	Work plans, Annual report (1 per year)	X	X	X	X	X	$ 800,000	$ 400,000	$ 400,000	All Partners	BWSR
ADM-3	Interim progress assessment and possible amendment	S	All (indirectly)	●	●	●	●	●	●	●	O	O	Planning Area	Interim assessment report			X			$ 50,000	$ 50,000	$ -	All Partners	BWSR
																		ADM SUBTOTAL:		**$ 855,000**	**$ 452,500**	**$ 402,500**		
GWQ-1	Provide financial assistance to seal abandoned or unused **private wells** with a focus on groundwater target areas	P	GWQ-9	●									Groundwater Target Areas (see Figure 3-8)	Number of sealed wells (20 per year)	40	40	40	40	40	$ 200,000	$ 100,000	$ 100,000	County SWCD	MDH
														(40 per year)	60	60	60	60	60	$ 300,000	$ 100,000	$ 200,000		
GWQ-2	Seal abandoned or unused **high-capacity wells**, with an emphasis on groundwater target areas	P	GWQ-9	●									Groundwater Target Areas (see Figure 3-8)	Number of sealed wells (2 over 10 years)	2 high capacity wells over 10 years					$ 20,000	$ 10,000	$ 10,000	Cities County	MDH
														(4 over 10 years)	4 high capacity wells over 10 years					$ 40,000	$ 10,000	$ 30,000		
GWQ-3	Implement practices to reduce or limit nitrate movement into groundwater (e.g., nutrient management, cover crops, saturated buffers, two-stage ditches, wetland restoration)	P	GWQ-5	●	O	O	O	O	O				Groundwater Target Areas (see Figure 3-8)	Number of projects incorporating nitrogen reduction	See SWQ-1 actions					See SWQ-1, SWQ-2, SWQ-4	See SWQ-1, SWQ-2, SWQ-4	See SWQ-1, SWQ-2, SWQ-4	SWCD	County NRCS MDA
GWQ-4	Provide financial assistance for repair or replacement of non-functioning SSTS, and assistance for landowners to apply for loans to address SSTS issues	P	GWQ-8	●		●						O	Unsewered areas, Priority GW Areas (see Figure 3-8)	Number of addressed SSTS (50 per year)	100	100	100	100	100	$1,000,000	$ 700,000	$300,000	County	MPCA
														(75 per year); loan assistance	150	150	150	150	150	$1,500,000	$ 700,000	$800,000		
GWQ-5	Provide assistance for landowners to apply for loans to address SSTS issues	E	GWQ-8	●		●						O	Unsewered areas, Priority GW Areas (see Figure 3-8)	Loan assistance	X	X	X	X	X	$ 10,000	$ 10,000	$ -	County	MDH MDA
GWQ-6	Implement projects to provide adequate wastewater treatment to unsewered communities/areas.	P	SWQ-1, GWQ-8	●		●						O	Unsewered Areas	Communities connected to treatment	Two over the next 10 years					$ 300,000	$ 300,000	$ -	County	MPCA
GWQ-7	Monitor private groundwater wells for nitrate, bacteria, and other emerging contaminants; initiate special study on emerging contaminants	S	GWQ-3, GWQ-4, GWQ-8	●									Groundwater Target Areas (see Figure 3-8)	Groundwater monitoring report(s)	X	X	X	X	X	$ 100,000	$ 50,000	$ 50,000	County	MDH MDA
GWQ-8	Provide free and/or reduced cost well testing in groundwater quality priority areas, targeting non-community public suppliers (transient and non-transient)	S	GWQ-2. GWQ-3, GWQ-4, GWQ-7	●									Groundwater Target Areas (see Figure 3-8)	Number of wells sampled (1,000 over 10 years)	200	200	200	200	200	$ 100,000	$ 100,000	$ -	County	MDH MDA
														(1,500 over 10 years)	300	300	300	300	300	$ 150,000	$ 100,000	$ 50,000		
GWQ-9	Work with state partners to assess groundwater quality data, identify trends in nitrate concentrations in residential wells, and identify priority action areas	S	GWQ-4	●							●	O	Watershed-wide	Trend analyses; priority action areas		X				$ 20,000	$ 20,000	$ -	SWCD County	County MDH, MDA MDA, MPCA
GWQ-10	Develop a comprehensive strategy for groundwater monitoring and assessment within the watershed in coordination with MDH	S	GWQ-3, GWQ-4	●							●		Watershed-wide	Monitoring Plan	X					$ 10,000	$ 10,000	$ -	SWCD	County MDH MDA
GWQ-11	Develop inventory of non-functioning and/or non-compliant SSTS systems and contact landowners to address, prioritizing imminent threats	S	GWQ-8	●		●							Unsewered areas, Priority GW Areas (see Figure 3-8)	Inventory; 20 contacts per year	X 40	40	40	40	40	$ 20,000	$ 20,000	$ -	County	MPCA
GWQ-12	Distribute education materials increasing resident awareness of, and promoting practices to reduce, nitrogen loading to groundwater in DWSMAs	E	GWQ-1,	●									DWSMAs	News Article; digital communications (1 per year)	2	2	2	2	2	$ 5,000	$ 2,500	$ 2,500	County	MDH MDA
GWQ-13	Distribute education materials increasing resident awareness of groundwater issues, testing, and pollutant loading best practices	E	GWQ-2, GWQ-7	●									Unsewered areas, Priority GW Areas (see Figure 3-8)	News Article; digital communications (2 per year)	4	4	4	4	4	$ 10,000	$ 5,000	$ 5,000	County	MDH MDA
GWQ-14	Organize and/or facilitate meeting opportunities for public water suppliers to coordinate groundwater protection efforts	E	GWQ-1,	●									Public water suppliers	Meetings (1 per year)	2	2	2	2	2	$ 10,000	$ 10,000	$ -	County	MDH MDA
GWQ-15	Work with state agencies to compile and maintain a local database of groundwater quality data	S	GWQ-3, GWQ-4	●									Watershed-wide	Additions to monitoring database	X	X	X	X	X	$ 20,000	$ 20,000	$ -	County	MDH MDA
GWQ-16	Cooperate with agricultural producers to develop site-specific nutrient, fertilizer, and/or manure management plans	P	GWQ-5, GWQ-8	●		O		O					Priority GW Areas (see Figure 3-8)	Nutrient management plans (100 over 10 years)	20	20	20	20	20	$ 150,000	$ 75,000	$ 75,000	SWCD	MDA MPCA NRCS
														(150 over 10 years)	30	30	30	30	30	$ 225,000	$ 75,000	$ 150,000		
GWQ-17	Convene a group of local implementers to host field days/site visits to promote conservation tillage and other soil health practices.	E	GWQ-5	●		O	●	●					Watershed-wide	Volunteer Group; Field Day events (2 per year)	4	4	4	4	4	$ 30,000	$ 30,000	$ -	SWCD	MDA

Table 6-4 WAGZ Comprehensive Watershed Management Plan Implementation Schedule

Item ID	Implementation Action Description	Type (P = Project S = Study E = Educ. R = Reg.)	Applicable Goals (see Table 5-2)	Applicability to Goal Areas: Level 1 – Groundwater Contamination	Level 1 – Excessive Flooding	Level 1 – Degraded Surface Water Quality	Level 1 – Accelerated Erosion and Sedimentation	Level 2 – Degraded Soil Health	Level 2 – Altered Hydrology, Landscape Resiliency	Level 2 – Threats to Fish, Wildlife, and Habitat	Level 3 – Threatened Groundwater Supply	Level 3 – Reduced Livability and Recreation	Target or Focus Area	Measurable Output	Timeframe (Values are incremental for each 2-year period): 2022 to 2023	2024 to 2025	2026 to 2027	2028 to 2029	2030 to 2031	Estimated Total Cost	Estimated Local Contribution (landowner, SCWD/County locally budgeted/assessed)	Estimated External Contribution (WBIF, competitive grants, federal, 319)	Lead LGU	Supporting Entities
GWQ-18	Contract a nutrient management expert as a shared service to provide technical assistance	P	GWQ-5	●		O		O					Watershed-wide	Staff position and associated services	X	X	X	X	X	$ 800,000	$ 800,000	$ -	SWCD	County MDA MDNR
GWQ-19	Distribute education materials regarding private well maintenance, capping, and closure	E	GWQ-6	●									Watershed-wide	News Article; digital communications (1 per year)	X	X	X	X	X	$ 5,000	$ 2,500	$ 2,500	County	MPCA
GWQ-20	Host workshops for well maintenance	E	GWQ-2, GWQ-3, GWQ-5	●									Groundwater Target Areas (see Figure 3-8)	Workshops (1 per year)	2	2	2	2	2	$ 10,000	$ 10,000	$ -	SWCD County	MDH
GWQ-21	Review and recommend updates to local ordinances, if needed, addressing infiltration in vulnerable areas	R	GWQ-6	●		●							Groundwater Target Areas (see Figure 3-8)	Reviewed Ordinance(s)		X				$ 4,000	$ 4,000	$ -	Rochester County	MDH MDA
																		GWQ SUBTOTAL:		$ 2,824,000	$ 2,279,000	$ 545,000		
																				$ 3,569,000	$ 2,279,000	$ 1,290,000		
FLD-1	Implement projects to increase headwater storage and/or reduce peak flow rates at priority locations identified in below subwatersheds	P	FLD-1, ESC-1, LR-1		●	O	O	O					High yield subwatersheds (see Figure C-26)	Number of projects implemented and corresponding increase in storage	Numbers below indicate storage anticipated per biennium, by watershed					See SWQ-1	See SWQ-1	See SWQ-1	SWCD County	MDNR MPCA
	South Fork Zumbro Level 1-2 Areas	P	FLD-1		●	O	O	O						Up tp 33 projects over 10 years	Specific quantity and location of increased storage will be updated based on results of implementation item FLD-6 and SWQ-1 incorporating storage and/or runoff reduction					Costs included with SWQ-1 and other implementation items	Costs included with SWQ-1 and other implementation items	Costs included with SWQ-1 and other implementation items	SWCD County BVWD Rochester	MDNR MPCA
	South Branch Middle Fork Zumbro Level 1-2 Areas	P	FLD-1		●	O	O	O						Up tp 28 projects over 10 years										
	Middle Fork Zumbro Level 1-2 Areas	P	FLD-1		●	O	O	O						Up tp 28 projects over 10 years										
	North Fork Zumbro Level 1-2 Areas	P	FLD-1		●	O	O	O						Up tp 25 projects over 10 years										
	Zumbro Level 1-2 Areas	P	FLD-1		●	O	O	O						Up tp 18 projects over 10 years										
	Hay Creek Level 1-2 Areas	P	FLD-1		●	O	O	O						Up tp 20 projects over 10 years										
	Lower Wells Creek Level 1-2 Areas	P	FLD-1		●	O	O	O						Up tp 18 projects over 10 years										
	Lake Pepin Level 1-2 Areas	P	FLD-1		●	O	O	O						Up tp 26 projects over 10 years										
	South Fork Zumbro Level 3 Areas	P	FLD-1		●	O	O	O						Up tp 5 projects over 10 years										
	South Branch Middle Fork Zumbro Level 3 Areas	P	FLD-1		●	O	O	O						Up tp 5 projects over 10 years										
	Middle Fork Zumbro Level 3 Areas	P	FLD-1		●	O	O	O						Up tp 5 projects over 10 years										
	North Fork Zumbro Level 3 Areas	P	FLD-1		●	O	O	O						Up tp 5 projects over 10 years										
	Zumbro Level 3 Areas	P	FLD-1		●	O	O	O						Up tp 5 projects over 10 years										
	Hay Creek Level 3 Areas	P	FLD-1		●	O	O	O						Up tp 5 projects over 10 years										
	Lower Wells Creek Level 3 Areas	P	FLD-2		●	O	O	O						Up tp 5 projects over 10 years										
	Lake Pepin Level 3 Areas	P	FLD-1		●	O	O	O						Up tp 5 projects over 10 years										
FLD-2	Use modeling results to define floodplain and identify properties and infrastructure subject to flood risk and prioritize areas for feasibility studies to reduce risk	S	FLD-1, FLD-4		●								Watershed-wide	Prioritized inventory of flood risk areas		X				$ 25,000	$ 25,000	$ -	SWCD Rochester	MDNR
FLD-3	Identify areas to targeted hydrologic modeling/analysis and develop hydrologic models/analyses using most current precipitation data	S	FLD-3		●								Previously unmodeled areas	Hydrologic and hydraulic model/analyses	X	X	X			$ 150,000	$ 150,000	$ -	SWCD	MDNR
FLD-4	Use results of hydrologic and hydraulic modeling/analyses to refine storage and flow rate reduction goals for subwatersheds and identify priority locations for storage practices (see FL-3)	S	FLD-2	O	●	O	O						Watershed-wide	Subwatershed storage and flow rate goals			X			$ 50,000	$ 50,000	$ -	SWCD County	MDNR
FLD-5	Work with the City of Rochester to identify remaining flood-prone areas and perform feasibility studies to identify preferred solutions	S	FLD-4		●							O	Areas to be identified by FLD-2	Inventory of priority flood risk areas (in 2 years); feasibility study (in 6 years)	X	X	X			$ 50,000	$ 50,000	$ -	Rochester Olmsted SWCD	MDNR
FLD-6	Implement cooperative flood risk reduction projects identified and prioritized in the City of Rochester CIP	P	FLD-4		●							O	Locations TBD	1 project (and associated peak flow and/or storage benefits); (2 projects with additional funding)				X		$ 1,000,000	$ 500,000	$ 500,000	Rochester	SWCD MDNR
																			X	$ 2,000,000	$ 1,000,000	$ 1,000,000		
FLD-7	Implement projects to reconnect or restore disconnected floodplain areas to increase flood resilience (including cooperative efforts with MDNR)	P	FLD-4, LR-2		●				●	O			Floodplains (emphasizing lower Zumbro River)	6 projects over 10 years			2	2	2	$ 500,000	$ 250,000	$ 250,000	SWCD	MDNR
														8 projects over 10 years				1	1	$ 680,000	$ 250,000	$ 430,000		
FLD-8	Promote the enrollment of floodplain lands in RIM, CREP, and similar programs (note: estimated costs excludes easement land cost/value)	E	FLD-4		●				●	●			Floodplains	500 ac stream-adjacent lands in RIM/CRWP	100	100	100	100	100	$ 50,000	$ 25,000	$ 25,000	SWCD	BWSR NRCS FSA
														(750 acres with additional funding)	150	150	150	150	150	$ 75,000	$ 25,000	$ 50,000		

Table 6-4 WAGZ Comprehensive Watershed Management Plan Implementation Schedule

Item ID	Implementation Action Description	Type (P = Project, S = Study, E = Educ., R = Reg.)	Applicable Goals (see Table 5-2)	Applicability to Goal Areas: Level 1 – Groundwater Contamination	Level 1 – Excessive Flooding	Level 1 – Degraded Surface Water Quality	Level 1 – Accelerated Erosion and Sedimentation	Level 2 – Degraded Soil Health	Level 2 – Altered Hydrology, Landscape Resiliency	Level 2 – Threats to Fish, Wildlife, and Habitat	Level 3 – Threatened Groundwater Supply	Level 3 – Reduced Livability and Recreation	Target or Focus Area	Measurable Output	Timeframe (Values are incremental for each 2-year period): 2022 to 2023	2024 to 2025	2026 to 2027	2028 to 2029	2030 to 2031	Estimated Total Cost	Estimated Local Contribution (landowner, SCWD/County locally budgeted/assessed)	Estimated External Contribution (WBIF, competitive grants, federal, 319)	Lead LGU	Supporting Entities
FLD-9	Provide technical assistance and education for landowners regarding maintenance or removal of field dikes through targeted site visit	P	FLD-4		●				●	O			Floodplains	Site visits (5 per year)	10	10	10	10	10	$ 25,000	$ 25,000	$ -	SWCD	MDNR
FLD-10	Implement stormwater reuse projects to minimize urban stormwater runoff	P	FLD-1		●	●			●				Urban Areas	2 projects			X		X	$ 200,000	$ 80,000	$ 120,000	Rochester SWCD	MDNR
FLD-11	Host workshops to educate residents about local stormwater management, low impact design practices, and reuse	E	FLD-1		●	●			●				Urban Areas	1 workshop per year	2	2	2	2	2	$ 10,000	$ 10,000	$ -	Rochester SWCD	MPCA
FLD-12	Compile data on problem culverts from counties and toad authorities based on existing inventories; meet with Partner public works deparments annually to coordinate infrastructure improvements	S	FLD-4, FLD-3		●		O		●				Watershed-wide	Problem area database; meetings with PW depts	X	X	X	X	X	$ 20,000	$ 20,000	$ -	County	MnDOT
																		FLD SUBTOTAL		$ 2,080,000	$ 1,185,000	$ 895,000		
																				$ 3,285,000	$ 1,685,000	$ 1,500,000		
SWQ-1	Implement **BMPs** at protect/restore level 1 and 2 sites identified through terrain analyses (see **Figure X**) to reduce erosion and filter pollutants; specific BMPs to be determined based on site-specific feasibility, with target implementation by subwatershed as follows:	P	SWQ-3, SWQ-2, ESC-5	O	O	●	●	O	O	O	O	O	Level 1, 2, 3 Project Areas (see Figure 4-1)	Number of projects implemented and corresponding reduction in pollutant loading	Numbers below indicate planned number of projects per biennium, by watershed					See below	See below	See below	SWCD County Rochester	MDNR NRCS BWSR MDA
	South Fork Zumbro Level 1-2 Areas	P	SWQ-3, SWQ-2, ESC-5	O	O	●	●	O	O	O	O	O	Level 1 and 2	33 projects over 10 years	10	8	5	5	5	$ 825,000	$ 206,250	$ 618,750		
														38 projects over 10 years	12	10	6	5	5	$ 950,000	$ 206,250	$ 743,750		
	South Branch Middle Fork Zumbro Level 1-2 Areas	P	SWQ-3, SWQ-2, ESC-5	O	O	●	●	O	O	O	O	O	Level 1 and 2	28 projects over 10 years	10	5	5	4	4	$ 1,204,000	$ 301,000	$ 903,000		
														34 projects over 10 years	12	8	6	4	4	$ 1,462,000	$ 365,500	$ 1,096,500		
	Middle Fork Zumbro Level 1-2 Areas	P	SWQ-3, SWQ-2, ESC-5	O	O	●	●	O	O	O	O	O	Level 1 and 2	28 projects over 10 years	4	10	6	4	4	$ 868,000	$ 217,000	$ 651,000		
														33 projects over 10 years	5	12	8	4	4	$ 1,023,000	$ 255,750	$ 767,250		
	North Fork Zumbro Level 1-2 Areas	P	SWQ-3, SWQ-2, ESC-5	O	O	●	●	O	O	O	O	O	Level 1 and 2	25 projects over 10 years	1	4	8	8	4	$ 700,000	$ 175,000	$ 525,000		
														29 projects over 10 years	2	5	10	8	4	$ 812,000	$ 203,000	$ 609,000		
	Zumbro Level 1-2 Areas	P	SWQ-3, SWQ-2, ESC-5	O	O	●	●	O	O	O	O	O	Level 1 and 2	18 projects over 10 years	1	1	4	8	4	$ 720,000	$ 180,000	$ 540,000		
														22 projects over 10 years	2	2	6	8	4	$ 880,000	$ 220,000	$ 660,000		
	Hay Creek Level 1-2 Areas	P	SWQ-3, SWQ-2, ESC-5	O	O	●	●	O	O	O	O	O	Level 1 and 2	20 projects over 10 years	5	5	4	3	3	$ 80,000	$ 20,000	$ 60,000		
														27 projects over 10 years	7	7	5	4	4	$ 108,000	$ 20,000	$ 88,000		
	Lower Wells Creek Level 1-2 Areas	P	SWQ-3, SWQ-2, ESC-5	O	O	●	●	O	O	O	O	O	Level 1 and 2	18 projects over 10 years	5	5	3	3	2	$ 90,000	$ 22,500	$ 67,500		
														26 projects over 10 years	8	6	4	4	4	$ 130,000	$ 22,500	$ 107,500		
	Lake Pepin Level 1-2 Areas	P	SWQ-3, SWQ-2, ESC-5	O	O	●	●	O	O	O	O	O	Level 1 and 2	26 projects over 10 years	1	1	8	8	8	$ 78,000	$ 19,500	$ 58,500		
														31 projects over 10 years	2	2	9	9	9	$ 93,000	$ 19,500	$ 73,500		
	South Fork Zumbro Level 3 Areas	P	SWQ-3, SWQ-2, ESC-5	O	O	●	●	O	O	O	O	O	Level 3	5 projects over 10 years	1	1	1	1	1	$ 125,000	$ 31,250	$ 93,750		
														15 projects over 10 years	2	2	3	4	4	$ 375,000	$ 31,250	$ 343,750		
	South Branch Middle Fork Zumbro Level 3 Areas	P	SWQ-3, SWQ-2, ESC-5	O	O	●	●	O	O	O	O	O	Level 3	5 projects over 10 years	1	1	1	1	1	$ 215,000	$ 53,750	$ 161,250		
														15 projects over 10 years	2	2	3	4	4	$ 645,000	$ 161,250	$ 483,750		
	Middle Fork Zumbro Level 3 Areas	P	SWQ-3, SWQ-2, ESC-5	O	O	●	●	O	O	O	O	O	Level 3	5 projects over 10 years	1	1	1	1	1	$ 155,000	$ 38,750	$ 116,250		
														15 projects over 10 years	2	2	3	4	4	$ 465,000	$ 116,250	$ 348,750		
	North Fork Zumbro Level 3 Areas	P	SWQ-3, SWQ-2, ESC-5	O	O	●	●	O	O	O	O	O	Level 3	5 projects over 10 years	1	1	1	1	1	$ 140,000	$ 35,000	$ 105,000		
														15 projects over 10 years	2	2	3	4	4	$ 420,000	$ 105,000	$ 315,000		
	Zumbro Level 3 Areas	P	SWQ-3, SWQ-2, ESC-5	O	O	●	●	O	O	O	O	O	Level 3	5 projects over 10 years	1	1	1	1	1	$ 200,000	$ 50,000	$ 150,000		
														15 projects over 10 years	2	2	3	4	4	$ 600,000	$ 150,000	$ 450,000		
	Hay Creek Level 3 Areas	P	SWQ-3, SWQ-2, ESC-5	O	O	●	●	O	O	O	O	O	Level 3	5 projects over 10 years	1	1	1	1	1	$ 20,000	$ 5,000	$ 15,000		
														15 projects over 10 years	2	2	3	4	4	$ 60,000	$ 5,000	$ 55,000		
	Lower Wells Creek Level 3 Areas	P	SWQ-3, SWQ-2, ESC-5	O	O	●	●	O	O	O	O	O	Level 3	5 projects over 10 years	1	1	1	1	1	$ 25,000	$ 6,250	$ 18,750		
														15 projects over 10 years	2	2	3	4	4	$ 75,000	$ 6,250	$ 68,750		
	Lake Pepin Level 3 Areas	P	SWQ-3, SWQ-2, ESC-5	O	O	●	●	O	O	O	O	O	Level 3	5 projects over 10 years	1	1	1	1	1	$ 15,000	$ 3,750	$ 11,250		
														15 projects over 10 years	2	2	3	4	4	$ 45,000	$ 3,750	$ 41,250		
	Total (with base funding	P	SWQ-3, SWQ-2, ESC-5											236 projects over 10 years	**45**	**47**	**51**	**51**	**42**	**$ 5,460,000**	**$ 1,365,000**	**$ 4,095,000**		
	Total (with additional funding)													360 projects over 10 years	**66**	**68**	**78**	**78**	**70**	**$ 8,143,000**	**$ 1,891,250**	**$ 6,251,750**		
SWQ-2	Implement BMPs to reduce phosphorus loading in the watershed tributary to Rice Lake	P	SWQ-2			●	O			O		O	Rice Lake watershed	3 projects over 10 years		3				$ 100,000	$ 50,000	$ 50,000	Rice SWCD	NRCS MDA
SWQ-3	Evaluate the need for and Implement carp management in cooperation with MDNR	S	SWQ-2			●				●		O	Rice Lake watershed	Carp study	X					$ 5,000	$ 5,000	$ -	Rice SWCD	MDNR

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SWQ-4	Evaluate the feasibility and need for in-lake phosphorus reduction practices (e.g., alum treatment)	S	SWQ-2			●				O		O	Rice Lake watershed	Feasibility study			X			$ 10,000	$ 10,000	$ -	Rice SWCD	MDNR MPCA
SWQ-5	Implement projects to reduce phosphorus and sediment loading in urban stormwater runoff (above and beyond current minimum requirements)	P	SWQ-1, SWQ-3		O	●	●				●		Urban priority areas identified by City of Rochester (and others)	5 projects over 10 years	1	1	1	1	1	$ 500,000	$ 250,000	$ 250,000	Rochester SWCD	MPCA MDA
SWQ-6	Perform field verification of proposed project sites identified through terrain analysis (see Figure 4-1) to verify problems and evaluate feasibility	S	SWQ-1, SWQ-3		O	●	●	O		O	O	O	Level 1 and 2 Project Areas (see Figure 4-1)	Inventory of feasibility sites for future implementation	X	X				$ 50,000	$ 50,000	$ -	SWCD	MDNR MPCA
SWQ-7	Coordinate with MPCA and other state agencies to tailor agency monitoring plan(s) to focus on critical stressors for local priorities (e.g., nutrients, sediment, bacteria, biological impairments).	S	SWQ-1, SWQ-3			●				●		●	Watershed-wide	Monitoring Plan	X					$ 10,000	$ 10,000	$ -	SWCD	MPCA
SWQ-8	Provide financial assistance to implement animal waste management systems to reduce waste loading to streams	P	SWQ-1, SWQ-3	●		●							Subwatersheds with bacterial impairments	Number of assisted feedlots (25 over 10 years)	5	5	5	5	5	$ 3,000,000	$ 1,000,000	$ 2,000,000	County SWCD	NRCS MPCA MDA
SWQ-9	Develop subwatershed assessment and prioritized implementation plan for West Indian Creek (319 program)	S	SWQ-1, ESC-5			●	●		O	O			West Indian Creek subwatershed	Subwatershed assessment and implementation plan	X					$ 100,000	$ 20,000	$ 80,000	Wabasha SWCD	MPCA
SWQ-10	Develop subwatershed assessment and prioritized implementation plan (9 element plan) for South Cascade Creek (319 program)	S	SWQ-1, SWQ-3, ESC-5			●	●		O				South Cascade Creek subwatershed	Subwatershed assessment and implementation plan	X					$ 100,000	$ 20,000	$ 80,000	Olmsted SWCD Rochester	MPCA
SWQ-11	Seek partnerships and support state and regional efforts (i.e., MDNR, MPCA) to monitor the flow and water quality of trout streams in the planning area	S	SWQ-1, FWH-4	O		●			O	●	O	O	Trout stream watersheds	Monitoring Plan, stream monitoring data	X	X	X	X	X	$ 100,000	$ 10,000	$ 90,000	SWCD	MPCA MDNR
																		SWQ SUBTOTAL			$ 9,435,000	$ 2,790,000	$ 6,645,000		
																					$ 12,118,000	$ 3,316,250	$ 8,801,750		
ESC-1	Evaluate the condition of landowner dams near Zumbrota and develop an action plan to address failing dams	S	ESC-1		O	O	●		O				Zumbrota area	Dam management plan			X			$ 20,000	$ 20,000	$ -	SWCD BVWD	MDNR
ESC-2	Distribute educational materials promoting the establishment, maintenance, and effectiveness of buffers	E	ESC-2			O	●		O	O			Watershed-wide	Handouts; Pamphlets; News Articles	X	X	X	X	X	$ 5,000	$ 5,000	$ -	SWCD County	BWSR
ESC-3	Perform site visits to critical areas to engage landowners regarding buffer implementation (site visits to difficult, hard to maintain areas and also successful, exemplary sites to extrapolate to others.)	E	ESC-2			O	●		O	O			Riparian Areas	Site Visits	10	10	10	10	10	$ 25,000	$ 25,000	$ -	SWCD	BWSR
ESC-4	Implement projects to stabilize or restore degraded streambank areas (in addition to project sites identified in item SWQ-1)	P	ESC-3		O	O	●		O	O			See ESC-10; Wells Creek and tributaries	Number of projects; total restored feet	10 projects and/or up to 5,000 feet					$ 750,000	$ 375,000	$ 375,000	SWCD County	MDNR MPCA
															20 projects and/or up to 10,000 feet					$ 1,500,000	$ 375,000	$ 1,125,000		
ESC-5	Provide technical support for landowner projects to stabilize streambanks using natural design, in coordination with MDNR	P	ESC-3		O	O	●		O	O			See ESC-10; Wells Creek and tributaries	Number of projects; total restored feet	10 projects and/or up to 5,000 feet					$ 100,000	$ 100,000	$ -	SWCD County	MDNR MPCA
ESC-6	Implement and/or expand cost share assistance programs to promote maintenance and increased use of BMPs focused on soil health (e.g., cover crops, conservation tillage - defined as no-till and strip-till)	P	ESC-4, SH-3, LR-3		O	O	●	O	O				Cropland in Level 1 and 2 Project Areas (see Figure 4-1)	Number of acres added to soil health practices (>2000 over 10 years)	300 ac added	350 ac added	400 ac added	450 ac added	500 ac added	$ 300,000	$ 100,000	$ 200,000	SWCD	NRCS MDA BWSR
														(3000 acres over 10 years)	400 ac added	500 ac added	600 ac added	700 ac added	800 ac added	$ 450,000	$ 100,000	$ 350,000		
ESC-7	Implement and/or expand cost share assistance programs to promote the maintenance and increased use of BMPs focused on pasture land conservation	P	ESC-4, SH-3, LR-3		O	O	●	O	O				Pastureland in Level 1 and 2 Project Areas (see Figure 4-1)	Number of acres added to conservation practices (>1000 over 10 years)	100 ac added	150 ac added	200 ac added	250 ac added	300 ac added	$ 150,000	$ 50,000	$ 100,000	SWCD	NRCS BWSR
														(1,500 acres over 10 years)	150 ac added	200 ac added	300 ac added	400 ac added	450 ac added	$ 225,000	$ 50,000	$ 175,000		
ESC-8	Host outreach events for agri-business to promote soil health practices	E	ESC-4				●	O					Watershed-wide	1 Outreach event per year	2	2	2	2	2	$ 10,000	$ 10,000	$ -	SWCD	NRCS MDA BWSR
ESC-9	Watershed evaluation of streambank areas to determine priority restoration areas (leveraging HSPF and other model results, in partnership with MDNR)	S	ESC-3			●	●		O	O			Watershed-wide	Identification of priority areas	X					$ 10,000	$ 5,000	$ 5,000	SWCD	MDNR BWSR
ESC-10	Maintain impoundments in the Bear Valley Watershed District to minimize sediment loss and flood risk	P	ESC-3		O	O	●						Bear Valley Watershed District	Maintenance projects (1 per year)	2	2	2	2	2	$ 100,000	$ 100,000	$ -	BVWD	SWCD MDNR
																		ESC SUBTOTAL			$ 1,470,000	$ 790,000	$ 680,000		
																					$ 2,445,000	$ 790,000	$ 1,655,000		

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SLH-1	Assess/quantify the runoff reduction, water quality, water storage, and groundwater protection benefits of cover crops, perennial vegetation, and other soil health practices in the planning area, building on existing analysis at state level	S	SLH-1,	O	●	●	●	●			●		Soil health focus areas (to be determined)	Study; numeric benefit estimates	X	X	X	X	X	$ 50,000	$ 50,000	$ -	SWCD	NRCS MDA MOSH
SLH-2	Distribute education materials promoting the use of BMPs focused on soil health (e.g., cover crops, perennial vegetation, conservation tillage)	E	SLH-2,		O	O	O	●					Watershed-wide	News Articles; digital communications (1 per year)	2	2	2	2	2	$ 5,000	$ 2,500	$ 2,500	SWCD	BWSR MDA MOSH NRCS
SLH-3	Implement demonstration projects to show impact and implementation of soil health practices	E	SLH-2,		O	O	O	●					Watershed-wide	5 projects over 10 years	1	1	1	1	1	$ 50,000	$ 25,000	$ 25,000	SWCD	BWSR NRCS MDA MOSH
SLH-4	Collaborate with and utilize the products of the Tillage and Erosion Survey project to track soil health practice adoption. (e.g., cover crops, perennial vegetation)	S	SLH-3, LR-3	O	O	O	●	●					Watershed-wide	Inventory of soil health best practices	X	X	X	X	X	$ 15,000	$ 15,000	$ -	SWCD	BWSR UMN NRCS MDA
SLH-5	Work with regional partners to develop and coordinate messaging regarding soil health	E	SLH-4		O	O	O	●					Watershed-wide	Meetings (1/year); coordinated messaging	X	X	X	X	X	$ 5,000	$ 5,000	$ -	SWCD	BWSR NRCS MDA MOSH
SLH-6	Meet with state and federal legislators to communicate concerns and interests regarding soil health and sustainable agriculture	E	SLH-4		O	O	O	●					Watershed-wide	Meetings (biennial); Lobbying strategy	X	X	X	X	X	$ 10,000	$ 10,000	$ -	SWCD County	MASCWD BWSR MDA
SLH-7	Develop or increase incentive programs for implementing forestry conservation practices and easements	P	SLH-2	O	O	O	●	●					Level 1 and 2 Areas (see Figure 4-1)	Investment in forestry conservation program	X	X	X	X	X	$ 250,000	$ 125,000	$ 125,000	SWCD	NRCS MDNR
																		SLH SUBTOTAL		$ 385,000	$ 232,500	$ 152,500		
LR-1	Maintain an inventory of tile drainage within the watershed to apply for multipurpose drainage management (MDM) grants	S	LR-1		O				●				Watershed-wide	Tile drainage inventory	X	X	X	X	X	$ 40,000	$ 40,000		County	BWSR MDNR
LR-2	Develop an inventory of floodplain reconnection opportunities, critical habitat opportunities, and completed upstream projects	S	LR-2		O				●	O			Watershed-wide	Inventory of opportunities	X					$ 20,000	$ 20,000		SWCD	BWSR MDNR
LR-3	Review and revise, as needed, local stormwater ordinances and official controls to limit negative impacts from stormwater runoff	R	LR-4		O	O			●				Watershed-wide	Updated Ordinance(s)		X				$ 10,000	$ 10,000		County Rochester	MPCA
LR-4	Support cost-share programs for residential stormwater management practices (e.g., rainwater gardens, rain barrels)	P	LR-4		O	O			●				Cities and developed areas	20 cost-share stormwater BMPs per year	40	40	40	40	40	$ 100,000	$ 50,000	$ 50,000	Rochester SWCD	MPCA
LR-5	Review and recommend revisions for zoning ordinances and official controls to limit negative impacts to forested areas	R	LR-5		O	O			●	O			Watershed-wide	Updated Ordinance(s)		X				$ 10,000	$ 10,000	$ -	County	
LR-6	Identify priority opportunities for enrollment in conservation programs	S	LR-5		O	O			●	●		O	Level 1 and 2 Areas (see Figure 4-1)	Inventory of priority opportunities	X					$ 20,000	$ 20,000	$ -	SWCD	BWSR NRCS
LR-7	Host workshops in high priority protection areas addressing wetland and floodplain functions	E	LR-4		O	O			●	O			Level 1 and 2 Areas (see Figure 4-1)	2 workshops/year	4	4	4	4	4	$ 40,000	$ 20,000	$ 20,000	SWCD	MDNR
LR-8	Planting of additional forested areas in cooperation with USFS and/or MDNR	P	LR-5		O	O			●	O			Level 1 and 2 Areas (see Figure 4-1)	1,000 acres over 10 years (1,500 acres over 10 years)		100 acres	200 acres	300 acres	400 acres	$ 200,000	$ 100,000	$ 100,000	SWCD	BWSR MDNR
																150 acres	300 acres	450 acres	600 acres	$ 300,000	$ 100,000	$ 200,000		
LR-9	Review and recommend revisions for wetland protection ordinances to ensure adequate protection	R	LR-6, FWH-1		O	O			●	O			Watershed-wide	Updated Ordinance(s)		X				$ 10,000	$ 10,000	$ -	County	
LR-10	Targeted outreach to landowners with high priority wetland areas, including workshops and site visits	E	LR-6, FWH-1		O	O			●	O			See LR-6	Target 100 landowners (200 landowners in 10 years)	20	20	20	20	20	$ 50,000	$ 25,000	$ 25,000	SWCD	BWSR MDNR
															40	40	40	40	40	$ 100,000	$ 25,000	$ 75,000		
LR-11	Identify and Implement high priority wetland restoration projects in coordination with willing landowners	P	LR-6		O	O			●	O			See LR-6	Inventory of opportunities; 5 projects over 10 years	1	1	1	1	1	$ 250,000	$ 125,000	$ 125,000	SWCD	BWSR MDNR
LR-12	Promote enrollment in conservation programs through distribution of educational materials, hosting workshops, and/or targeted field visits	P	LR-7, FWH-1		O	O			●	O			See LR-6	3,000 acres (4,000 acres) enrolled over 10 years; 3 workshops/year; target 100 landowners over 10 years	200 acres	400 acres	600 acres	800 acres	800 acres	$ 300,000	$ 150,000	$ 150,000	SWCD	MDNR USFS
															200 acres	500 acres	800 acres	1,100 acres	1,400 acres	$ 400,000	$ 150,000	$ 250,000		
																		LR SUBTOTAL		$ 1,050,000	$ 580,000	$ 470,000		
																				$ 1,300,000	$ 580,000	$ 720,000		

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Item ID	Implementation Action Description	Type (P = Project, S = Study, E = Educ., R = Reg.)	Applicable Goals (see Table 5-2)	Applicability to Goal Areas: Level 1 – Groundwater Contamination	Level 1 – Excessive Flooding	Level 1 – Degraded Surface Water Quality	Level 1 – Accelerated Erosion and Sedimentation	Level 2 – Degraded Soil Health	Level 2 – Altered Hydrology, Landscape Resiliency	Level 2 – Threats to Fish, Wildlife, and Habitat	Level 3 – Threatened Groundwater Supply	Level 3 – Reduced Livability and Recreation	Target or Focus Area	Measurable Output	Timeframe (Values are incremental for each 2-year period): 2022 to 2023	2024 to 2025	2026 to 2027	2028 to 2029	2030 to 2031	Estimated Total Cost	Estimated Local Contribution (landowner, SCWD/County locally budgeted/assessed)	Estimated External Contribution (WBIF, competitive grants, federal, 319)	Lead LGU	Supporting Entities
FWH-1	Provide local technical assistance in support of wetland restoration and other natural resource projects	P	FWH-1, FWH-2, FWH-3						O	●			Watershed-wide	Number of projects for which assistance provided (1 every 2 years)	1	1	1	1	1	$ 50,000	$ 50,000	$ -	SWCD	MDNR
FWH-2	Distribute education materials addressing protection of biologically significant elements in the watershed to adjacent landowners	E	FWH-2						O	●			Areas of biological significance	News articles; digital communications (1 per year)	2	2	2	2	2	$ 10,000	$ 5,000	$ 5,000	SWCD	MDNR
FWH-3	Review and recommend updates, as needed, to zoning and land use regulations to promote the protection of sites of biological significance, wetlands, and habitat areas (e.g., trout streams)	R	FWH-2						O	●			Areas of biological significance	Updated Ordinance(s)		X				$ 10,000	$ 10,000	$ -	SWCD County Rochester	MDNR
FWH-4	Work with MDNR and other partners to provide local technical assistance in support of invasive species management and other natural resource projects	P	FWH-2, FWH-3						O	●			Watershed-wide	Number of projects for which assistance provided (1 every 2 years)	1	1	1	1	1	$ 50,000	$ 50,000	$ -	SWCD	MDNR MDA
FWH-5	Provide financial assistance to assist landowners in developing forestry plans	P	FWH-3						O	●			Watershed-wide	2 plans per year (4 plans per year)	4 8	4 8	4 8	4 8	4 8	$ 40,000 $ 80,000	$ 40,000 $ 40,000	$ - $ 40,000	SWCD	MDNR
FWH-6	Maintain a database of invasive species presence in the watershed (U of MN has extensive mapping/inventory of IS priority areas)	S	FWH-3						O	●			Watershed-wide	GIS Database	X	X	X	X	X	$ 10,000	$ 10,000	$ -	SWCD	MDNR MDA UMN Ext
FWH-7	Continue to implement Wabasha County Cooperative Weed Management Area activities	P	FWH-3						O	●			Wabasha County	Program implementation	X	X	X	X	X	$ 50,000	$ 25,000	$ 25,000	Wabasha SWCD	MDNR
FWH-8	Participate in technical review of groundwater appropriations permits within or upstream of trout streams	R	FWH-4						O	●	●		Trout stream watersheds	Technical Review	X	X	X	X	X	$ 10,000	$ 10,000	$ -	SWCD	MDNR
FWH-9	Support Partner and local efforts to improve stream connectivity through financial or technical assistance	P	FWH-4			O			O	●		O	Streams with modified hydrology	Partner projects supported (5 over 10 years)	1	1	1	1	1	$ 50,000	$ 25,000	$ 25,000	SWCD	MDNR
FWH-10	Removal of Mantorville Dam and replacement with riffle.	P	FWH-4			O	O		O	●		O	South Branch Middle Fork Zumbro River	Dam replacement with riffle	X					$ 500,000	$ 50,000	$ 450,000	County	MDNR
																		FWH SUBTOTAL		**$ 780,000**	**$ 275,000**	**$ 505,000**		
																				$ 820,000	**$ 275,000**	**$ 545,000**		
REC-1	Support recreation opportunities/access points through support of Zumbro River Regional Water Trail Master Plan and similar opportunities; actions may include survey, inventory, and/or repair/enhancement of canoe launch areas in the planning area.	P	REC-1									●	Watershed-wide	Support for recreation plans	X	X	X	X	X	$ 5,000	$ 5,000	$ -	SWCD	MDNR
REC-2	Organize and host volunteer events related to environmental stewardship (e.g., river cleanup)	E	REC-1			O			O	O		●	Watershed-wide	Host events to promote stewardship (1 per year)	X	X	X	X	X	$ 25,000	$ 12,500	$ 12,500	SWCD	MDNR
REC-3	Provide financial assistance for environmental stewardship volunteer programs organized by others	P	REC-1			O			O	O		●	Watershed-wide	Fund 1 event per year	2	2	2	2	2	$ 10,000	$ 5,000	$ 5,000	SWCD	MDNR
REC-4	Assist MDNR and other agencies with recreational site maintenance through volunteer recruitment	P	REC-1									●	Watershed-wide	Volunteer group	X	X	X	X	X	$ 40,000	$ 40,000	$ -	SWCD	MDNR
																		REC SUBTOTAL		**$ 80,000**	**$ 62,500**	**$ 17,500**		
GWS-1	Provide educational materials regarding groundwater conservation practices used within the watershed, seeking feedback from existing practitioners (MS4 communities, other agencies, public water suppliers)	E	GWS-1								●		Watershed-wide (with focus on public water suppliers)	Handouts; Newsletters; Articles; Digital communication (1 per year)	X	X	X	X	X	$ 50,000	$ 40,000	$ 10,000	County Rochester	MDNR
GWS-2	Work with MDNR and other partners to develop/revise a groundwater quantity monitoring strategy	S	GWS-2								●		Watershed-wide (with focus on public water suppliers)	Monitoring Plan		X				$ 5,000	$ 5,000	$ -	County Rochester	MDNR
GWS-3	Review available data and work with MDNR to establish groundwater quantity trends in the watershed	S	GWS-2								●		Watershed-wide	Monitoring report			X			$ 50,000	$ 50,000	$ -	County Rochester	MDNR
																		GWS SUBTOTAL		**$ 105,000**	**$ 95,000**	**$ 10,000**		
																		PLAN TOTAL:		**$ 19,064,000**	**$ 8,741,500**	**$ 10,322,500**	Base funding scenario	
																				$ 24,962,000	**$ 9,767,750**	**$ 15,194,250**	Additional funding scenario	

Notes: Estimated costs for Regulatory and Administrative Activities include only the estimated incremental/additional cost relative to the implementation of current programs

Red text indicates estimated outputs/costs if additional external funding becomes available

● = implementation activity directly benefits the priority issue

o = implementation activity may indirectly benefit the priority issue

ADM = Administration of Partnership

GWQ = Groundwater Contamination

ESC = Accelerated Erosion and Sedimentation

SLH = Degraded Soil Health

LR = Landscape Resiliency and Altered Hydrology

FWH = Threats to Fish, Wildlife, and Habitat

Table 6-4 WAGZ Comprehensive Watershed Management Plan Implementation Schedule

Item ID	Implementation Action Description	Type P = Project S = Study E = Educ. R = Reg.	Applicable Goals (see Table 5-2)	Applicability to Goal Areas									Target or Focus Area	Measurable Output	Timeframe (Values are incremental for each 2-year period)					Estimated Total Cost	Estimated Local Contribution (landowner, SCWD/County locally budgeted/assessed)	Estimated External Contribution (WBIF, competitive grants, federal, 319)	Lead LGU	Supporting Entities
				Level 1				Level 2			Level 3				2022 to 2023	2024 to 2025	2026 to 2027	2028 to 2029	2030 to 2031					
				Groundwater Contamination	Excessive Flooding	Degraded Surface Water Quality	Accelerated Erosion and Sedimentation	Degraded Soil Health	Altered Hydrology, Landscape Resiliency	Threats to Fish, Wildlife, and Habitat	Threatened Groundwater Supply	Reduced Livability and Recreation												

FLD = Excessive Flooding
SWQ = Degraded Surface Water Quality
REC = Reduced Livability and Recreation
GWS = Threatened Groundwater Supply

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Appendices

Appendix A

Joint Powers Agreement (JPA)

GREATER ZUMBRO RIVER COMPREHENSIVE WATERSHED MANAGEMENT PLAN
JOINT POWERS AGREEMENT

This Joint Powers Agreement (Agreement) is made and entered into by and between the following parties (sometimes referred to as members):

The Counties of Dodge, Olmsted, Goodhue, Wabasha, and Rice by and through their respective County Board of Commissioners, and
The Dodge, Olmsted, Goodhue, Wabasha, Rice, and Steele Soil and Water Conservation Districts, by and through their respective Soil and Water Conservation District Board of Supervisors, and
The Bear Valley Watershed District, by and through their respective Board of Managers, and
The City of Rochester, by and through their City Council.

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 provide technical assistance to landowners and 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 Watershed Districts of this Agreement are political subdivisions of the State of Minnesota, with statutory authority to carry out conservation of the natural resources of the state by land use controls, flood control, and other conservation projects for the protection of the public health and welfare and the provident use of the natural resources, pursuant to Minnesota Statutes Chapters 103B, 103D and as otherwise provided by law; and

WHEREAS, the City of this Agreement is a political subdivision of the State of Minnesota, with statutory authority to control or eliminate stormwater pollution along with soil erosion and sedimentation within its boundaries, and to establish standards and specifications for conservation practices and planning activities that minimize stormwater pollution, soil erosion and sedimentation, pursuant to Minnesota Rules Chapter 7001 and 7090; and

WHEREAS, the parties to this Agreement have a common interest and/or statutory authority to implement the Greater Zumbro River Comprehensive Watershed Management Plan 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 preserve and conserve 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, pursuant to Minn. Stat. Section 103B.101 Subd. 14, the Minnesota Board of Water and Soil Resources (BWSR) "may adopt resolutions, policies, or orders that allow a comprehensive plan, local water management plan, or watershed management plan, developed or amended, approved and adopted, according to chapter 103B,

103C, or 103D, to serve as substitutes for one another or be replaced with a comprehensive watershed management plan."

WHEREAS, it is understood by all the parties to this Agreement that the Greater Zumbro River Comprehensive Watershed Management Plan does not replace or supplant local land use, planning, zoning authority, but, instead, provides a framework to provide increased opportunities for cooperation and consistency on a watershed basis, and to allow local governments to cooperatively work together to implement projects with the highest return on investment for improving water quality/quantity issues on a watershed basis.

WHEREAS, the Parties have formed this Agreement for the specific goal of implementing the Greater Zumbro Comprehensive Watershed Management Plan pursuant to Minnesota Statutes § 103B.801.

NOW, THEREFORE, the Parties hereto agree as follows:

1. **Purpose of the Agreement:** The Parties to this Agreement recognize the importance of partnerships to implement protection and restoration efforts for the Greater Zumbro River Watershed Planning area *(see Attachment A with a map of the planning area)* on a cooperative and collaborative basis together under this Agreement pursuant of the authority contained in Minn. Stat. Section 471.59. The purpose of this Agreement is to collectively implement, as local government units, the Greater Zumbro River Comprehensive Watershed Management Plan while providing assurances that decision-making spanning political boundaries is supported by an in-writing commitment from participants.

   This Agreement does not establish a Joint Powers Entity but sets the terms and provisions by which the parties "may jointly or cooperatively exercise any power common to the contracting parties or any similar powers, including those which are the same except for the territorial limits within which they may be exercised." Minnesota Statutes § 471.59. This Agreement does not include a financial obligation, but rather an ability to share resources.

   Parties signing this agreement will be collectively referred to as The Watershed Alliance for the Greater Zumbro (WAGZ).

2. **Term:** This Agreement is effective upon signature of all Parties, in consideration of the Minnesota Board of Water and Soil Resources (BWSR) operating procedures; and will remain in effect until canceled according to the provisions of this Agreement or earlier terminated by law.

3. **Adding Additional Parties:** A qualifying party within the Greater Zumbro River Watershed Planning area desiring to become a member of this Agreement shall indicate its intent by adoption of a governing board resolution that includes a request to the Policy Advisory Committee to join The Watershed Alliance for the Greater Zumbro. 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 Advisory Committee.

4. **Withdrawal of Parties:** A party desiring to leave the membership of this Agreement shall indicate its intent, in writing, to the Policy Advisory Committee in the form of an official board resolution adopted by its governing body. Notice must be made at least 30 days in advance of leaving the Agreement. Any party that leaves the membership of the Agreement remains obligated to comply with the terms of any grants the Watershed Alliance for the Greater Zumbro has at the time of the party's notice to leave membership, and is obligated until the grant has expired or has been closed out.

5. **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 Statutes 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), and this is not intended to create any liability or exposure of one party for the acts or omissions of any other party.

    c. **Employee Status:** The parties agree that the respective employees or agents of each party shall remain the employees or agents of each individual respective party.

    d. **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 adopted records retention schedules pursuant to 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. The records retention will follow the Fiscal Agent's schedule. At the time this agreement expires, all records will be turned over to the Fiscal Agent for continued retention. (See 7. e. and 8. e.)

    e. **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.

    f. **Termination:** This Agreement will remain in full force and effect until canceled by all parties, unless otherwise terminated in accordance with other provisions of this Agreement. The parties

acknowledge their respective and applicable obligations, if any, under Minn. Stat. Section 471.59, Subd. 5 after the purpose of the Agreement has been Terminated.

g. **Amendment:** The Parties may modify this Agreement upon approval by a majority vote of all of the Parties to the Agreement. Any amendment to this Agreement shall be in writing, adopted by each Party in the same manner as the original Agreement.

6. **Administration:**

a. **Establishment of Committees for Implementation of the Greater Zumbro River Comprehensive Watershed Management Plan:** Committees will be established to carry out the coordinated implementation of the Greater Zumbro River Comprehensive Watershed Management Plan. The parties agree to establish, under this Agreement, a Policy Advisory Committee, a Technical Advisory Committee, and a Local Implementation Work Group.

i. **The Policy Advisory Committee:** The parties agree to establish a Policy Advisory Committee for the purpose of implementing the Greater Zumbro River Comprehensive Watershed Management Plan. The Policy Advisory Committee will operate cooperatively and collaboratively, but not as a separate entity. Each governing entity agrees to appoint one representative, who must be an elected or appointed member of each governing entity to the Policy Advisory Committee. Each governing entity may choose to appoint one alternate to serve on the Policy Advisory Committee in the absence of the appointed member. Policy Advisory Committee members agree to keep their respective governing entities regularly informed on the implementation of the Greater Zumbro River Comprehensive Watershed Management Plan. Each representative shall have one vote, subject to the authority delegated by their respective governing entity. The Policy Advisory Committee will establish bylaws to describe the functions and operations of all committee(s). Once established, the Policy Advisory Committee will follow the bylaws adopted, and have the power to modify the bylaws. The Policy Advisory Committee will meet as needed, but no less than bi-annually, to advise implementation of the Greater Zumbro River Watershed Management workplan. Each member of the Policy Advisory Committee, subject to the authority delegated by their respective governing body, shall have the authority to act on behalf of the party they represent in all matters relevant to the implementation of the Greater Zumbro River Comprehensive Watershed Management Plan, including but not limited to, the recommendation to approve grant applications, grant agreements, interim reports, payment of invoices, and entering into professional contracts. The Policy Advisory Committee shall also approve an annual work plan and annual budget consisting of an itemized statement of the Greater Zumbro River Comprehensive Watershed Management Plan, revenues and expenses for the ensuing calendar years, and shall be presented to the respective governing entities that are represented on the Policy Advisory Committee.

ii. **The Local Implementation Work Group:** The parties agree to establish a Local Implementation Work Group, which shall consist of, but not limited to, local staff, including local county water planners, local watershed district staff, local SWCD staff, and local city staff, for the purposes of logistical, and day-to-day decision-making in the implementation of the Greater Zumbro River Comprehensive Watershed Management Plan. The Local Implementation Work Group shall prepare a draft annual work plan and budget consisting of an itemized statement of the Greater Zumbro River Comprehensive Watershed Management Plan revenues and expenses for the ensuing calendar year which shall be presented to the Policy Advisory Committee for review. The Local Implementation Work Group will meet as needed.

iii. **The Technical Advisory Committee:** The Policy Advisory Committee may appoint technical representatives to a Technical Advisory Committee to provide support and make recommendations on implementation of the Greater Zumbro River Comprehensive Watershed Management Plan. The Technical Advisory Committee may consist of the Local Implementation Work Group, contacts for the state's main water agencies (Board of Water and Soil Resources, Minnesota Department of Agriculture, Minnesota Department of Health, Minnesota Department of Natural Resources, Minnesota Pollution Control Agency, and Environmental Quality Board), and/or plan review agencies, and area stakeholders. The Technical Advisory Committee will meet, as needed.

7. **Implementation of the Plan.** The Parties agree to adopt and begin implementation of the Greater Zumbro River Comprehensive Watershed Management Plan within 120 days of state approval, and provide notice of plan adoption pursuant to Minnesota Statutes Chapters 103B and 103D.

8. **Fiscal Agent:** The Policy Advisory Committee shall appoint one of the parties to the Agreement to be the Fiscal Agent for each source of funding received. The appointed Fiscal Agent agrees to:

   a. Accept all responsibilities associated with any grant agreements executed by the party for the implementation of the Greater Zumbro River Comprehensive Watershed Management Plan.

   b. Perform financial transactions as part of any executed grant agreements, and contract implementation.

   c. Provide for strict accountability of all funds, report all receipts and disbursements, and annually provide a full and complete audit report of the grant.

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

e. Include the grant information on the Fiscal Agent's website.

f. Retain fiscal records consistent with the Fiscal Agent's records retention schedule (See 5. c.).

9. **Plan Administration**: The Policy Advisory Committee shall appoint, annually, one of the parties to the Agreement to be the Day-to-Day Contact, being the point of contact for, and handling of the day-to-day administrative work of the Greater Zumbro River Comprehensive Watershed Management Plan.

    a. Accept all day-to-day responsibilities associated with the implementation of grants received for implementing the Greater Zumbro River Comprehensive Watershed Management Plan, including being the primary contact for any grant agreements, and any reporting requirements associated with any grant agreements not otherwise stated.

    b. Provide the Policy Advisory Committee with the records necessary to describe the implementation of the Greater Zumbro River Comprehensive Watershed Management Plan.

    c. Provide for proper public notice of all meetings.

    d. Ensure that minutes of all Policy Advisory Committee meetings are recorded and made available in a timely manner to the Policy Advisory Committee and maintain a file of all approved minutes including corrections and changes.

    e. Retain records consistent with the fiscal agent's records retention schedule until termination of the agreement (at that time, records will be turned over to the Fiscal Agent) (See 5. c.).

    f. Perform any other duties to keep the Policy Advisory Committee, the Technical Advisory Committee, and the Local Implementation Work Group informed about the implementation of the Greater Zumbro River Comprehensive Watershed Management Plan.

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

Dodge County
Jim Elmquist or successor
County Administrator
721 Main St. N.
Mantorville, MN 55955
Telephone: (507) 635-6239

Dodge Soil and Water Conservation District
Adam King or successor
District Manager
916 2nd St. S.E.
Dodge Center, MN 55927
Telephone: (507) 374-6364

Goodhue County
Scott Arneson or successor
County Administrator
509 W. 5th St
Red Wing, MN 55066
Telephone: (651) 385-3001

Goodhue Soil and Water Conservation District
Beau Kennedy or successor
District Manager
104 E 3rd Ave PO Box 335
Goodhue, MN 55027
Telephone: (651) 923-5286

Olmsted County
Heidi Welsch or successor
County Administrator
151 4th St SE
Rochester, MN 55904
Telephone: (507) 328-7967

Olmsted Soil and Water Conservation District
Skip Langer or successor
District Manager
2122 Campus Drive SE, Suite 200
Rochester, MN 55904
Telephone: (507) 328-7070

Rice County
Sara Folsted or successor
County Administrator
320 Third Street NW
Faribault, MN 55021
Telephone: (507) 332-6100

Rice Soil and Water Conservation District
Steve Pahs or successor
District Manager
1810 30th St NW
Faribault, MN 55021
Telephone: (507) 332-5408

Wabasha County
Michael Plante or successor
County Administrator
625 Jefferson Ave
Wabasha, MN 55981
Telephone: (651) 565-3073

Wabasha County Soil and Water Conservation District
Terri Peters or successor
District Manager
611 Broadway Ave. Suite 10
Wabasha, MN 55981
Telephone: (651) 565-4673

Bear Valley Watershed District
Paul Huneke or successor
Watershed District Board Member
254090 Co 16 Blvd
Goodhue, MN 55027
Telephone: (651) 923-4937

City of Rochester
Alison Zelms or successor
City Administrator
201 4th Street SE
Rochester, MN 55904
Telephone: (507) 328-2000

Steele County Soil and Water Conservation District
Eric Gulbransen or successor
District Manager
235 Cedardale Drive SE
Owatonna, MN 55060
Telephone: (507) 451-6730 ext. 3

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **DODGE COUNTY**

APPROVED:

BY: DocuSigned by: E170031EF79842C...
Board Chair Date

BY: DocuSigned by: 410EC0D289604CA...
County Administrator Date

APPROVED AS TO FORM

5/3/2021

BY: DocuSigned by: Paul Kiltinen CC6F5FBB0EF2462...
County Attorney Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **DODGE SOIL AND WATER CONSERVATION DISTRICT**

APPROVED:

BY: Larry Sickenger May/April 20-21
Board Chair Date

BY: [signature] May 14/21
District Manager Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **GOODHUE COUNTY**

APPROVED:

BY: _____ 6/2/2021

Board Chair Date

BY: _____ 6/2/2021

County Administrator Date

APPROVED AS TO FORM

BY: _____

County Attorney Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **GOODHUE SOIL AND WATER CONSERVATION DISTRICT**

APPROVED:

BY: _____ 4/26/21
Board Chair Date

BY: _____ 4/26/21
District Manager Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **OLMSTED COUNTY**

APPROVED:

BY: DocuSigned by: Stephanie Podulke 3F98A212909F415... 5/20/2021 | 2:10 PM CDT

Board Chair Date

BY: DocuSigned by: A8F097BBCC2244A... 5/24/2021 | 9:06 AM CDT

County Administrator Date

APPROVED AS TO FORM

BY: DocuSigned by: E89685A1A4F7441... 5/25/2021 | 4:11 PM CDT

County Attorney Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **OLMSTED SOIL AND WATER CONSERVATION DISTRICT**

APPROVED:

BY: Cheryl A. Winters 4-23-21
Board Chair Date

BY: 4/29/2021
District Manager Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **RICE COUNTY**

APPROVED:

BY: Jeff Docken 5/11/21

Board Chair Date

BY: Sara Sobolad 5-25-21

County Administrator Date

APPROVED AS TO FORM

BY: 5/20/2021

County Attorney Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **RICE SOIL AND WATER CONSERVATION DISTRICT**

APPROVED:

BY: _____ 5-13-21
Board Chair Date

BY: _____ 5-13-21
District Manager Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **WABASHA COUNTY**

APPROVED:

BY: Cheryl Key 5/18/2021

Board Chair Date

BY: 5/18/2021

County Administrator Date

APPROVED AS TO FORM

BY: 5/18/2021

County Attorney Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **WABASHA COUNTY SOIL AND WATER CONSERVATION DISTRICT**

APPROVED:

BY: _____ 4/22/21
Board Chair Date

BY: _____ 4/22/21
District Manager Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **BEAR VALLEY WATERSHED DISTRICT**

APPROVED:

BY: Paul Hmura 6-28-2021

President of the Watershed District Board Date

ATTEST: [signature] 6-28-2021

Secretary of the Watershed District Board Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **CITY OF ROCHESTER**

APPROVED:

BY: _____ 06/21/2021
Mayor Date

BY: _ATTEST: _____ 06/21/2021
CITY CLERK Date

IN TESTIMONY WHEREOF the Parties have duly executed this agreement by their duly authorized officers.

PARTNER: **STEELE COUNTY SOIL AND WATER CONSERVATION DISTRICT**

APPROVED:

BY: _____ 6-8-2021
Board Chair Date

BY: _____ 6/8/21
District Manager Date